

Soil health practices increasingly helping farmers hit pay dirt

~ Cover crops, no-till practices reduce runoff, erosion and need for herbicides and pesticides

By AD CRABLE

As he has dozens of times since stumbling into the benefits of cover cropping and no-till farming nearly 50 years ago, Pennsylvania farmer Leroy Bupp set up his props for a talk on soil health at a large Chesapeake Bay conference.

There were goofy moments, like calling out volunteers from the audience to replicate how worms breed. But the real wow moment came when he dropped two clods of soil — one from his no-tilled, cover-cropped farm and one from a neighbor's conventionally tilled field — into beakers of water.

The neighbor's dirt quickly dissolved and fell to the bottom, showing how easily it would be whisked away in a rainstorm. But Bupp's handful of dirt stayed clumped together even as holes from worms, bugs and air passages soaked up some of the water.

"Mother Nature made soil work, then with tillage we

destroyed this," he told the audience, now riveted. "In tilled soil, without air spaces, the water is running off into the Bay. Leave the soil alone!" said the 75-year-old Bupp.

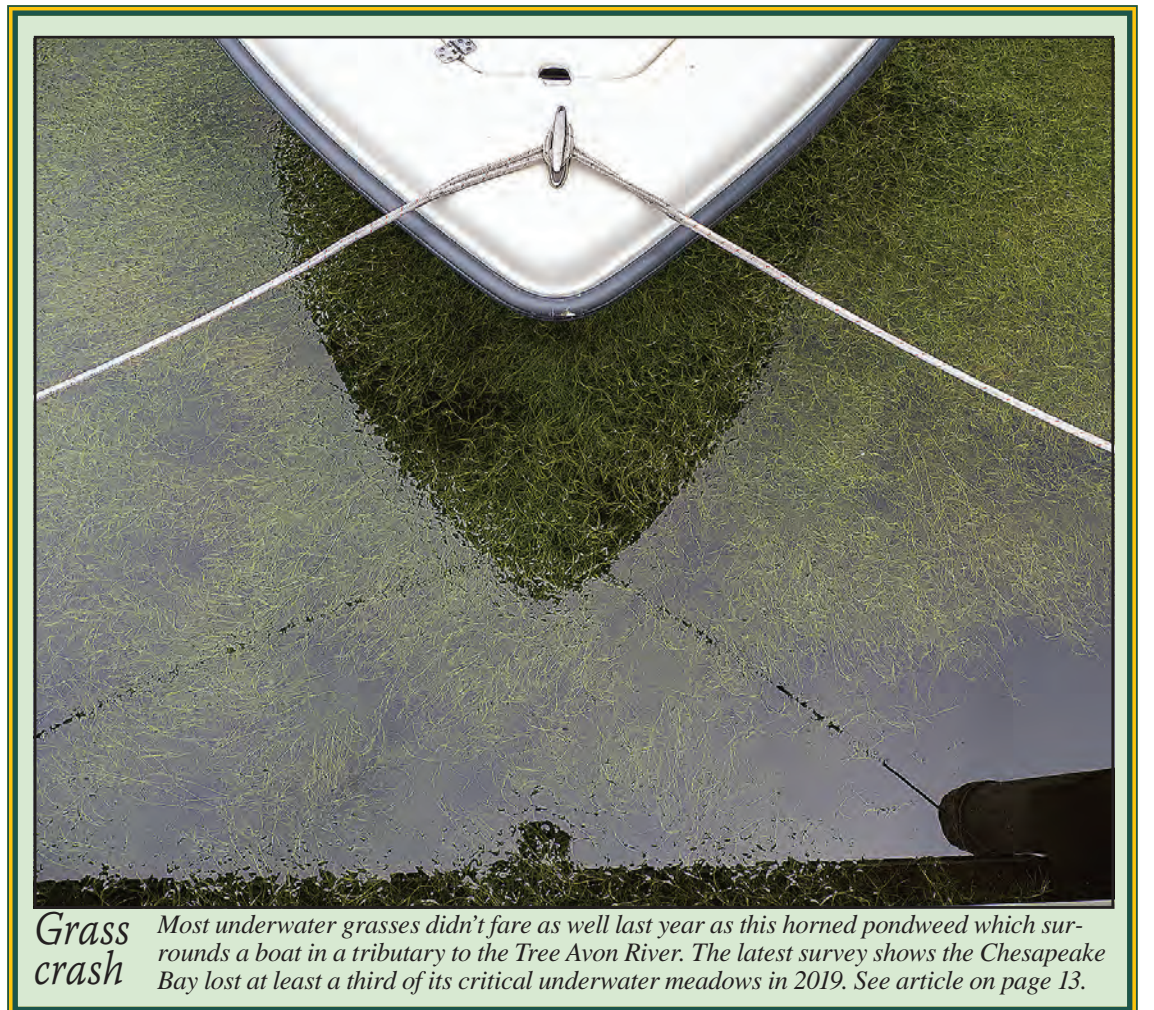
Relatively quiet and driven by farmers themselves, a revolution of sorts is happening in agriculture in the Chesapeake Bay region: soil health. It's a way of improving the soil that reduces runoff pollution in the Bay region while helping farmers turn a profit.

Farmers have tilled the earth into submission since Biblical times. But now, growing numbers are spreading the gospel about a fundamental shift in which soil is left unplowed and covered with a diverse mix of plants in all seasons.

"This soil health movement is big, growing and critical," said Lamonte Garber of the Stroud Water Research Center, a world-renowned freshwater research facility in Pennsylvania.

Instead of constantly pumping fertilizers and pesticides into worn-out soil, a more hands-off approach encourages an underground living

SOIL CONTINUES ON PAGE 20



Grass crash

Most underwater grasses didn't fare as well last year as this horned pondweed which surrounds a boat in a tributary to the Tree Avon River. The latest survey shows the Chesapeake Bay lost at least a third of its critical underwater meadows in 2019. See article on page 13.

Ready for a dip, but what's in the water?

~ Tainted stormwater poses bacteria risks, but researchers say the risk of COVID-19 in open water seems low

By WHITNEY PIPKIN

There are plenty of reasons to stay out of some Chesapeake Bay waters, particularly after a heavy rain. When stormwater hits local waterways, it may be carrying bacteria, toxins, animal waste and even raw sewage. Can it carry the coronavirus too?

Some researchers are tracking the virus' presence in sewage as an indication of how many people might be infected in a given area. They are also hustling to answer a secondary question: If the virus can be detected in sewage, could it also be in waterways that are tainted with sewage after it rains?

The short answer is yes — but probably not in a form that could infect additional people. While the virus that causes COVID-19 can be detected in untreated wastewater, the U.S. Centers for

Disease Control and Prevention say "there is no evidence to date" that a person exposed to it in this form can contract the disease.

There are, however, still plenty of reasons to be concerned about swimming or recreating in water that has recently been polluted by sewage or stormwater runoff. As swimming season begins, experts who study waterborne diseases say that catching the coronavirus from water contact is probably among the least of those concerns.

"Sewage was already dangerous. That's why we have these standards about recreational waters," said Mark Mattson, Waterkeeper for Canada's Lake Ontario and president of the nonprofit Swim Drink Fish.

Mattson said he's more concerned about people being able to prevent virus transmission by maintaining a social distance on busy beaches than he

WATER CONTINUES ON PAGE 22



BAY JOURNAL is published by Bay Journal Media to inform the public about ecological, scientific, historic and cultural issues and events related to the Chesapeake Bay. The **BAY JOURNAL**, circulation 35,000, is published monthly except in midsummer and midwinter. It is distributed free of charge. Bundles are available for distribution. Material may be reproduced, with permission and attribution. Publication is made possible by grants through the U.S. Environmental Protection Agency's Chesapeake Bay Program Office, the Campbell Foundation, the National Oceanic and Atmospheric Administration's Chesapeake Bay Office, the Sumner T. McKnight Foundation, the Rauch Foundation, the Fair Play Foundation, the Shared Earth Foundation, the Virginia Environmental Endowment, anonymous donors, and by reader contributions. Views expressed in the **BAY JOURNAL** do not necessarily represent those of any funding agency or organization.

For mailing list additions/changes, please use the form on this page or contact: Bay Journal, P.O. Box 222, Jacobus, PA 17407-0222
E-mail: subscribe.bayjournal@earthlink.net

BAY JOURNAL MEDIA

Bay Journal Media is a nonprofit 501(c)(3) organization with a mission to further public education and awareness of issues affecting the Chesapeake Bay and the mid-Atlantic environment by creating and distributing journalistic products. In addition to producing the BAY JOURNAL, Bay Journal Media operates the Bay Journal News Service, which distributes BAY JOURNAL articles and original op-eds about the Chesapeake Bay or regional environmental issues to more than 400 newspapers in the region, reaching several million readers each month.

Karl Blankenship, Executive Director
Andrew Nolan, CPA, Chief Financial Officer

STAFF

Editor: Karl Blankenship (kblankenship@bayjournal.com)
 Managing Editor: Lara Lutz (llutz@bayjournal.com)
 Associate Editor/Projects: Timothy B. Wheeler (twheeler@bayjournal.com)
 Bay Journal News Service Editor: Tim Sayles (tsayles@bayjournal.com)
 Copy/Design Editor: Kathleen A. Gaskell (kgaskell@bayjournal.com)
 Staff Writer: Jeremy Cox (jcox@bayjournal.com)
 Staff Writer: Ad Crable (acrable@bayjournal.com)
 Staff Writer: Whitney Pipkin (wpipkin@bayjournal.com)
 Photographer: Dave Harp (dharp@chesapeakephotos.com)

ADVERTISING

Marketing & Advertising Director: Jacqui Caine (jcaine@bayjournal.com)

BOARD OF DIRECTORS

Mary Barber, President
Bill Eichbaum, Vice-President
Karl Blankenship, Secretary
Kim Coble, Treasurer
Donald Boesch
Don Luzzatto
Mark Platts



CONTACT US

by mail:
The Bay Journal
619 Oakwood Drive
Seven Valleys, PA
17360-9395

by phone:
717-428-2819

*To inquire about
advertising, contact
Jacqui Caine at
540-903-9298*



The BAY JOURNAL is printed on 100% recyclable/recycled paper using vegetable-based inks.

Editor's Note

Bay Journal recognized by regional press associations



The Maryland-Delaware-DC Press Association and the Virginia Press Association recently announced the winners of their 2019 media awards, and we have some bragging to do — a total of nine awards.

In the Maryland-Delaware-DC contest, our staff was selected for the top two awards in the environmental reporting category in our division (non-dailies, 20,000+ circulation). First place went to Whitney Pipkin for her September story on scientists witnessing a live dolphin birth in the Potomac River. Second place went to Jeremy Cox and Tim Wheeler for their October article on the negative impact of last year's storm-related low-salinity levels on the Bay's oyster population.

Photographer David Harp won second place in the general news photo category for his photos accompanying our September article on the release of hatchery-raised endangered Chesapeake logperch into the Susquehanna River in Lancaster County, PA.

Jeremy also won first place in the growth and land use category for his October article about concerns that the location of a new Bay bridge crossing had already been decided by Maryland transportation officials.

Jeremy also won first and second place in the multimedia category for his videos accompanying stories about the closure of the Fox Island Education Center, which is falling victim to sea level rise, and about environmental concerns over surging

snakehead populations.

Copy/design editor Kathleen Gaskell won second place in the headline category for *Lawyers not cannons the big guns in latest round of oyster wars*, which accompanied an article in the January-February issue about oyster aquaculture disputes.

In the Virginia Press Association Awards, Jeremy won second in the video category of our division (specialty publications) for his Fox Island video, while I won third place in the health, science and environmental writing category for my November article on mycobacteriosis infections in striped bass.

Every month, I see the results of our small but excellent team, and I'm honored that others have acknowledged it, too. I hope you continue to enjoy the work we produce.

Thank you, *Bay Journal* readers!

It turns out that award judges were not the only ones recognizing our work. Readers like you are, too.

Given the uncertain economic conditions, we were concerned about how our annual spring fundraising campaign would fare. It turned out that we didn't need to worry — it produced the best-ever results for our spring mailing. Like all nonprofit organizations, we're facing budget uncertainties this year, so I can't overstate how thankful we are that so many people were willing to invest in our work at this time.

Thank you, *Bay Journal* readers, for coming through!

—Karl Blankenship

Sign Up for the Bay Journal or Change your Address

The BAY JOURNAL is distributed FREE by Bay Journal Media, Inc. If you would like to be added to its mailing list or need to change your present address, please fill out this form and mail it to BAY JOURNAL, P.O. Box 222, Jacobus, PA 17407-0222.

Check One: ☐ New Subscription ☐ Change of Address

☐ Please remove my name from your mailing list

Please note that it may take up to two issues for changes to become effective.

Name: _____

Address: _____

City: _____ State: _____

Zip: _____

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

☐ From time to time, the BAY JOURNAL includes a list of its supporters in the print edition. Please check here if you would like your gift to remain anonymous and not be recognized in the BAY JOURNAL.



Susan Middleton and David Liittschwager



From left:

The Madison Cave isopod (Antrolana lira) is an eyeless, translucent crustacean that in 1982 was listed as threatened under the federal Endangered Species Act. The Virginia cave where it lives has finally been permanently protected. See article on page 8. (David Liittschwager & Susan Middleton / 1993)

Janes Island State Park on Maryland's Eastern Shore offers a campground, hiking trails, and an expansive marsh for paddling. See article on page 26. (Wendy Mitman Clarke)

WHAT'S INSIDE

News

- 4 Pipeline projects draw criticism for 'environmental racism'** • Residents of minority neighborhoods say they bear the brunt of risks from natural gas infrastructure
- 6 VA menhaden season starts with reduced harvest cap for Bay** • New Chesapeake limit set to avoid federal shutdown of entire fishery for species in state
- 8 Cave, home to unique blind isopod, gains permanent protection** • VA, cave group pool resources to purchase watery home of rare creatures
- 10 Size counts: Smaller Bay stripers die at twice the rate of big fish along coast** • Results from electronic tagging unclear on cause and raise call for more study
- 11 Hogan vetoes pesticide ban in favor of regulatory phase-out** • Environmentalists contend state rule leaves loopholes
- 12 EPA faces suit over slow pace of cleanup progress in PA, NY** • Downstream states want agency to be more forceful
- 13 Chesapeake's grasses hard hit by heat, high flows in 2019** • SAV in higher salinity water fared the worst
- 14 Sustainability sells: Firms funding farms' conservation measures** • On-the-ground practices improve consumer demand and bottom line
- 16 WV environmentalists criticize proposal to relax water protections** • Standards would be dropped for chemicals known to cause cancer, harm liver and lungs or are fatal in higher doses
- 17 Upper Susquehanna Coalition wins Arbor Day Award** • NY-based group has planted more than 10,000 trees in state and PA
- 18 Coronavirus victims include restoration, monitoring of Bay** • Social distancing, budget cuts hinder researchers and watermen

- 21 Bay crab population decreases, but numbers still 'robust'** • Dredge survey suggests crustaceans should be readily available through summer

Travel

- 24 Conowingo Islands paddle sure to rock your world**
- 26 Meander through marshy curves at Janes Island State Park**

Columns

- 38 Steward's Corner** • Organization critical to a tree planting event's success
- 39 On the Wing** • Cape May warbler: Don't let this fascinating bird's name fool you
- 40 Bay Naturalist** • Do you like to eat and breathe? Thank a pollinator

Puzzles & Events

- 23 Chesapeake Challenge** • A whopping whale of a quiz for you
- 23 Bay Buddies** • Whales!
- 35 Bulletin Board** • Virtual Learning • Volunteer Opportunities • Events • Activities • Resources

Forum

Commentary • Letters • Perspectives

- 32 Outdoors act could come to the rescue in uphill battle to save Fones Cliffs**
- 33 Chesapeake Born** • Social distancing at its finest now appearing on a website near you
- 34 COVID-19 crisis underlines poultry industry's impact on health, the Bay**



WE'RE JUST
A CLICK AWAY

Visit us online:
bayjournal.com
Like us on FaceBook:
Chesapeake Bay Journal
or send us a Tweet:
[@ChesBayJournal](https://twitter.com/ChesBayJournal)

Pipeline projects draw criticism for 'environmental racism'

≈ Residents of minority neighborhoods say they bear the brunt of risks from natural gas infrastructure

By TAMARA DIETRICH

Virginians calling in to the State Corporation Commission on May 12 pulled few punches: “environmental racism,” “sacrifice zone,” an “unfair and unjust project.”

Many struggled to get through, repeatedly dropped from the call-in queue for public comment by technical glitches.

But they kept calling back, hammering against a proposal to install yet more natural gas infrastructure in the state — 24 miles of 30-inch pipe, three compressor stations and two large gas plants.

The \$346 million Header Improvement Project (HIP) proposed by Virginia Natural Gas would impact neighborhoods in the city of Chesapeake and several counties — Fauquier, Prince William, Hanover, New Kent, Caroline and Charles City — as well as about 68 streams and rivers, 150 acres of wetlands and 313 acres of forest.

It would particularly impact majority-minority communities where residents claim they're sidelined in the decision-making. They want to know why the infrastructure is being foisted on them and what health and environmental repercussions would be visited on their families because of it.

This is the essence of environmental justice, a concept that grew from activism in the 1960s and gained its name in the 1980s. Environmental justice is now at the heart of debates over how pollution, climate change and environmental hazards disproportionately impact the vulnerable and the voiceless.

Recent actions in Virginia have



Lynn Godfrey, a Chesapeake, VA resident, stands near the proposed site of the Gidley Compressor Station. The station would be part of a larger \$346 million natural gas project, proposed by Virginia Natural Gas, which would impact the city of Chesapeake and several counties, as well as 68 streams and rivers, 150 acres of wetlands and 313 acres of forest. (John Clark)

emphasized environmental justice, too. In March, Gov. Ralph Northam established a permanent advisory Council on Environmental Justice, and in January a federal appeals court tossed out an air permit to build a compressor station in Union Hill, a historic African-American community in Buckingham County founded by freedmen and freedwomen after the Civil War.

“That was a hallelujah moment,” said Lynn Godfrey, a community outreach coordinator with Sierra Club’s Stop the Pipelines campaign. “That definitely was a victorious moment for environmental justice and for the Union Hill community, who fought a valiant fight against a Goliath.”

Now in the fight over the HIP, the SCC

heard the public testimony as well as an evidentiary hearing for industry representatives the next day.

Because of the technical difficulties during the hearing, though — held virtually because of COVID-19 restrictions — the SCC extended the public comment period and will schedule another virtual public hearing.

Ken Schrad, SCC’s director of information resources, said a decision on the project “is not imminent.”

Safe...or not

The HIP is one of several contentious fracked natural gas projects in Virginia. Two high-profile ones are the Atlantic Coast Pipeline and the

Mountain Valley Pipeline, both hung up by legal challenges.

There’s also the Southside Connector, a high-pressure transmission line already buried beneath densely populated neighborhoods in South Hampton Roads.

Industry insists that natural gas infrastructure is safe. They contend that pipelines, compressor or pumping stations and gas plants can be built, operated and maintained to limit or mitigate damage to the environment and natural resources. They also say that purported risks of explosions, noise, methane leaks and particulate matter are overblown.

VNG declined to answer questions for this article about the HIP or provide information on an environmental justice analysis, which it said it will conduct after receiving SCC approval.

In testimony for the SCC hearing, Patrick Winnubst, a senior environmental specialist for VNG’s parent corporation, Southern Company Gas, assured commissioners that the company will work with environmental regulatory agencies and obtain all appropriate approvals and permits.

Kenneth W. Yagelski, Southern Company’s director of gas supply, confirmed its commitment to “meeting or exceeding all applicable federal, state and internal safety guidelines during and following construction.”

“Indeed,” Yagelski said, “safety first is the No. 1 value that drives the company’s approach to all of our daily operations.”

But physician and environmental health advocate Brita Lundberg has studied and co-authored several reports on health risks to local communities from fracked natural gas development. Her most recent article, *The False Promise of Natural Gas*, appeared in the *New England Journal of Medicine* in January.

“Gas is associated with health and environmental hazards and reduced social welfare at every stage of its life cycle,” Lundberg wrote. “Fracking is linked to contamination of ground and surface water, air pollution, noise and light pollution, radiation releases, ecosystem damage and earthquakes.”

“Transmission and storage of gas result in fires and explosions. The pipeline network is aging, inadequately maintained and infrequently inspected. One or more pipeline explosions occur every year in the United States.”

“Gas compressor stations emit toxic

Bernadette “BJ” Brown speaks to a group gathered in Richmond on May 17, 2019, to protest a proposed natural gas compressor station in Union Hill, a historic African-American community in Buckingham County, VA, founded by freedmen and freedwomen after the Civil War. In January, a federal court rejected an air permit needed to build the station. (Nina Ernest/Southern Environmental Law Center)



JUSTICE FROM PAGE 4

and carcinogenic chemicals such as benzene...and formaldehyde. Wells, pipelines and compressor stations are disproportionately located in low-income, minority and marginalized communities, where they may leak gas, generate noise, endanger health and contribute to environmental injustice while producing no local benefit.”

Such reports have mobilized some residents when they learn that natural gas infrastructure is coming to their neighborhood.

Virginia frontier

When Godfrey, a Chesapeake native, moved into her home several years ago, she saw streets dug up and pipe being laid. She and her neighbors thought they were water pipes.

But they were part of the Southside Connector, nine miles of steel buried under or near a string of historic black neighborhoods to connect two major interstate pipelines routed into South Hampton Roads from the north and west.

“Its whole route comes straight through working class and African-American neighborhoods,” Godfrey said. “I don’t know how nefarious it is. ... I can’t tell you whether they sat down and said, ‘We’re going to build it this way and we’re going to get the least resistance because these are the most vulnerable populations.’ That’s oversimplifying it. But that has been a trend. It’s been a trend nationally.”

The Atlantic Coast Pipeline would route in another pipe, spurring off the main line farther west.

The gas lines would converge at a new compressor station that VNG wants to build in Chesapeake. The station would go up at the site of the current Gidley Gate metering and regulation station, also near a populated area.

With years under her belt as a public health, environmental, social and economic justice advocate, Godfrey got busy.

She found out what she could about the Southside Connector, then the HIP, and spread the word. In December, she was hired by the Sierra Club.

Mary Finley-Brook, a professor at the University of Richmond, studies environmental justice implications of natural gas development. The proposed Chesapeake compressor station, she said, is cause for alarm.

“(It’s) being put by 6,500 people in a one-mile radius,” Finley-Brook said. “That is huge population density, and that just doesn’t happen normally. That’s a huge red flag. And the fact that 65% of them are people of color, it’s shocking. And 31% are low-income.”

The decision-making process for pipelines in Virginia over the last five years, she said, is “absolutely broken,” with too little transparency and an



Virginia Natural Gas has been criticized for its proposal to build a new compressor station in Chesapeake, VA. Mary Finley-Brook, a professor at the University of Richmond, said that approximately 6,500 people are living within in a one-mile radius of the site, and 65% are people of color. (Image / Stephen Metts)

industry with too much clout.

“Virginia is a frontier in terms of natural gas infrastructure, and not in a good way,” she said.

“They’ve got such a glut that they’ve got to keep pushing on and have this expansion to justify what they’ve already done.

“This is a point in time where the gas companies realize they have to go as hard as they can to get this stuff out before people start realizing the climate implications and the water and the air implications. There’s a race against time.”

Frustrating, scary

The HIP would build a compressor station in Prince William County and expand the existing Ladysmith compressor station in Caroline County.

Charles City County would not only get new gas lines, but two large gas plants within 1.1 miles of each other: the C4GT and the Chickahominy. Construction faces stiff financial hurdles, though, in part because of COVID-19.

Charles City County’s population is majority-minority — about 55% people of color. La’Veesha Allen Rollins, a design firm intern, grew up there. Most of her family still lives there, although Rollins

and her husband moved their family recently to neighboring New Kent.

Rollins found out about the gas project when a letter arrived at her church from the climate group Mothers Out Front.

“We kind of hesitated a little bit, because we didn’t know,” she said. “We were just a little shocked. We thought they had the wrong person initially.”

She began researching the gas plant design, the emissions and health risks, and how it

would be supplied and monitored. She learned C4GT would go within 2.5 miles of her family, and she joined the Concerned Citizens of Charles City County. She also found out the project has been in the works since 2014.

“So it’s been six years that they could have gotten with the black population and had these conversations to get feedback,” Rollins said. “And it hasn’t taken place.”

She considers local leaders ill-equipped to oversee such large projects, relying instead on industry officials and the Virginia Department of Environmental Quality, “which is already understaffed and overworked.”

Taylor Lilley, environmental justice staff attorney with the Chesapeake Bay

Foundation, said it’s tough for citizens to find information and navigate what can be a daunting process even for professionals.

“A lot of citizens aren’t aware of the projects that are happening,” Lilley said. “They aren’t aware of the impacts they will have on them. And for a long time, many people have been told to ignore a lot of the impacts because these entities come with jobs, they come with financial commitments.”

“It’s not only frustrating, it’s scary,” Rollins said. “I can understand that businesses need to operate. I understand that power needs to be generated. That’s the world we live in. But my concern is for the people who live there. No one’s protecting them.”

The county has no 24-hour firefighting and emergency services, she said, no way to handle the level of fires that gas plants and gas lines can generate, and no effective way to notify citizens in an emergency.

“We’re pretty much already setting ourselves up for failure if, indeed, something happens,” Rollins said.

Overburdened

Many residents of Chesapeake and Charles City County think their communities already bear their fair share of environmental risk: Chesapeake has high-powered gas lines and some of the worst air pollution in the state, and neighborhoods around the proposed compressor station already rank high in environmental justice screening for proximity to a Superfund site and wastewater discharges. Charles City County is home to a regional mega-landfill with a history of violations.

“These communities are overburdened,” Lilley said. “And they’re feeling as though their lives and their communities don’t matter, because they’re frequently chosen. VNG said several times in the application, ‘We’re picking these sites because we already have infrastructure there.’

“And that’s exactly the point of environmental justice — these (proposed) sites are there because these communities have been chosen to be the home to these facilities, no matter what the impact to their health is. And that can’t be allowed to go on.”

VA menhaden season starts with reduced harvest cap for Bay

≈ New Chesapeake limit set to avoid federal shutdown of entire fishery for species in state

By TIMOTHY B. WHEELER

The purse net fishing season for Atlantic menhaden kicked off May 4 as usual in Virginia, but with a much-reduced limit on how many of the commercially and ecologically valuable fish can be taken from the Chesapeake Bay.

The Virginia Marine Resources Commission unanimously adopted a new regulation April 28 that requires this year's Bay menhaden harvest be cut by nearly half from what it was in 2019. The move, which affects just one company's fishing fleet, was made to head off a federal shutdown in June of all menhaden fishing in the state.

In December, U.S. Commerce Secretary Wilbur Ross had declared Virginia out of compliance with an interstate fishery management plan that caps the Bay harvest of menhaden at 51,000 metric tons per year. He imposed a moratorium on fishing for menhaden in state waters effective June 17.

That federal action came after a fishing fleet working for Omega Protein Corp. netted 67,000 metric tons of the fish from the Bay last year, more than 30% more than what it was permitted to catch.



The Virginia Marine Resources Commission has adopted a new regulation that requires this year's Bay menhaden harvest be cut by nearly half from what it was in 2019. (Dave Harp)

The Atlantic States Marine Fisheries Commission, which regulates recreational and commercial harvests of migratory fish from Maine to Florida, has capped the Chesapeake Bay menhaden harvest since 2006 for the benefit of other species. The small oily fish are a food source for other fish, including striped bass, a valu-

able commercial fishery and popular recreational catch.

Omega, a division of a Canadian fishing company, has a processing plant in Reedville, VA, that "reduces" menhaden into animal feed and nutritional supplements. Its seven fishing vessels account for about three-fourths of the fish taken along

the entire East Coast, and it is allowed to take 90% of the overall harvest permitted in Virginia. The rest of the state's catch is sold for use as bait in other fisheries.

The company said last year that it had exceeded the Bay cap because rough weather had made it unsafe to pursue the fish in Atlantic waters.

But Omega has long challenged the basis for the Bay catch limit. It maintains that there is no scientific justification for the cap, and a company spokesman last week referred to previous statements by commission officials acknowledging that.

A scientific review in 2017 found that the entire East Coast menhaden stock was not overfished, and the

commission at that time increased the allowable catch in coastal waters. But it reduced the Bay catch at the urging of conservationists and recreational anglers.

The groups have long contended that the abundance of menhaden in the

MENHADEN CONTINUES ON PAGE 7



**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 

**Restoring the
native balance**





ernstseed.com
sales@ernstseed.com
800-873-3321



MENHADEN FROM PAGE 6

Chesapeake affects the fish that feed on them, particularly striped bass.

Technically, Virginia had been out of compliance since 2018 with the interstate commission's menhaden management plan because it did not adopt the lowered Bay harvest cap. The state's General Assembly retained authority to regulate menhaden and refused repeatedly to pass legislation imposing the lower limit. The Atlantic states commission held off taking enforcement action but declared the state out of compliance once Omega exceeded the cap.

Threatened with the federal moratorium, state legislators voted earlier this year to transfer authority over menhaden to the Virginia Marine Resources Commission, which regulates all other fisheries. The state commission then crafted new rules for the menhaden fishery, including the lower Bay harvest cap.

Chris Moore, senior regional ecosystem scientist for the Chesapeake Bay Foundation, called the legislature's action a "huge victory" for conservation.

"After years of advocacy, finally the largest fishery in Virginia is being managed by experts at the VMRC, just like every other saltwater fishery in the state," Moore said last week in a statement.

After the VMRC vote on Tuesday,

April 28, Commissioner Steven Bowman praised its "swift and decisive action" to bring the state into compliance. It avoided a moratorium that would have hurt not just Omega, but the bait fishery and all other fisheries that depend on menhaden for bait.

"We strive to be a conservation leader," Bowman said, "and we will continue to manage this fishery based on the best available science to ensure a healthy future for the coastal communities who depend on sustainable fisheries and a healthy Chesapeake Bay."

Under the VMRC rule, the harvest is to be capped at 51,000 metric tons — the limit set by the Atlantic states commission. But because Omega exceeded that cap last year, the allowable catch for this year has been reduced to 36,196 tons. Rules set by the Atlantic states commission require this year's cap to be lowered by the amount exceeded in the previous season.

The VMRC is to notify the Atlantic states commission of its actions, according to deputy VMRC commissioner Ellen Bolen. Robert Beal, executive director of the Atlantic states commission, is expected to forward a recommendation to the commerce secretary to lift the moratorium once he determines the state is in compliance.

If Ross agrees with Beal, he will notify both Virginia and the Atlantic

states commission in writing that the moratorium is withdrawn, effective immediately, according to John Ewald, spokesman for the National Marine Fisheries Service, part of the Commerce Department.

Omega intends to operate "in full compliance" with all state and federal fisheries regulations, spokesman Ben Landry said.

Meanwhile, Landry said, the company "remains hopeful that the [Atlantic states commission] will one day review the usefulness and fairness of the Chesapeake Bay cap."



A fishing fleet working for Omega Protein Corp., harvests the small, oily fish for processing into animal feed and health supplements. But they also serve as a vital food source for other fish and wildlife. (Dave Harp)

Want a diversified investment portfolio with a low carbon footprint?
Your Money, Your Values.



Environmental, Social and Governance (ESG) investment strategies allow investors to put their money into corporations that are working towards:

- Reducing carbon emissions
- Harnessing renewable energy
- Taking measures to reduce pollution
- Respecting human rights
- Demonstrating accountability
- ...and much more.

Contact our advisors to get more information about ESG investment options and to see where your current financial plan can be aligned with your personal values to make greater impact on the future.

410.810.0800
www.valliantwealth.com

Bruce & Mary Ellen Valliant, Registered Principals, RJFS, Inc.
110 S. Queen Street | Chestertown, MD | 21620
3033 Kent Narrows Way, S. | Suite 5 | Grasonville, MD | 21638

VALLIANT
WEALTH STRATEGIES

RAYMOND JAMES®

Valliant Wealth Strategies is not a registered broker/dealer and is independent of Raymond James Financial Services, Inc. Securities offered through Raymond James Financial Services, Inc., member FINRA / SIPC. Investment advisory services offered through RJFS Advisors, Inc.



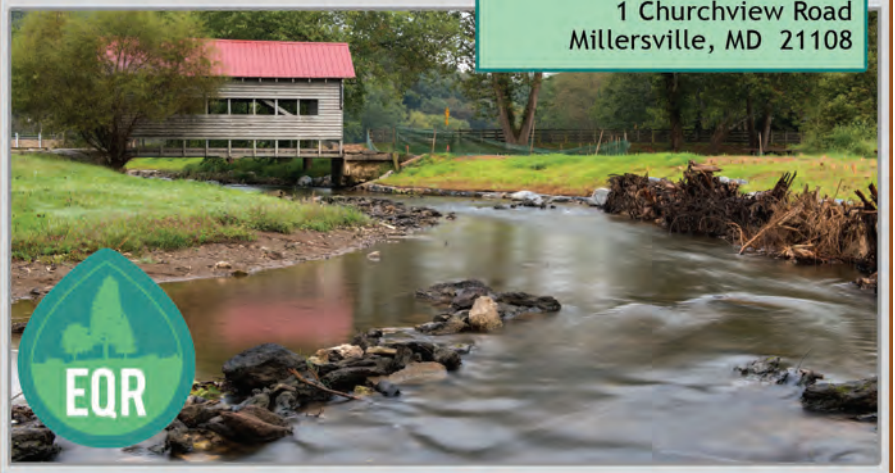
Environmental Quality Resources

**LEADER IN
ECOLOGICAL
SERVICES
SINCE 1991**

www.eqrlc.com

410-923-8680

1 Churchview Road
Millersville, MD 21108



Cave, home to unique blind isopod, gains permanent protection

VA, cave group pool resources to purchase watery home of rare creatures

BY WHITNEY PIPKIN

Deep in the bowels of a cave in the hills of Augusta County, VA, lay pools of brilliant blue water. Snowflake-like mineral deposits floated on their surface. But what captivated the biologists who dipped their hands into these crystal-clear waters in the 1950s was what lived beneath the surface: paperclip-size creatures so rare that scientists and land-owners would work for many decades to preserve the hollows they call home.

This year, their conservation quest became reality. The Cave Conservancy of the Virginias purchased Madisons Saltpetre Cave and the 88 surrounding acres and partnered with Virginia to turn it into the Cave Hill Natural Area Preserve.

It is the latest member of the state's network of natural area preserves, created in 1989 to protect rare plants, animals and environments. It has conserved nearly 60,000 acres since then, from the forest and wetlands at Crow's Nest in Stafford County to the Chesapeake Bay shoreline at Savage

Neck Dunes.

The state Department of Conservation and Recreation owns most of the preserves, but several are owned by other nonprofits or individuals. The most recent landscape added to the program before Cave Hill was the vegetated rock formations at Bald Knob in Franklin County in 2016.

"Because there is no dedicated funding source to establish natural areas, and limited state resources overall, partnerships like the one to protect Cave Hill Natural Area Preserve are critical to protect the commonwealth's biodiversity," said Jason Bulluck, director of the Virginia Natural Heritage Program.

Madisons Cave will not be open to the public because of its sensitivity, but the surrounding property will provide opportunities for public fishing, boating and walking along the South River. After coronavirus restrictions are lifted, visitors can see similar cave structures at nearby Grand Caverns in the town of Grottoes, considered one of the cave-filled region's top attractions.

The groundwater-flooded nooks of Madisons Cave have been targeted for



The Madison Cave isopod (Antrolana lira) is an eyeless, translucent crustacean that in 1982 was listed as threatened under the federal Endangered Species Act. (David Liittschwager & Susan Middleton / 1993)

shrimp.

Such rare, colorless creatures are the norm in Virginia's underground caves, and about 200 species depend on them for their sole habitat.

"But, of all the couple hundred species we have [in caves], the Madison Cave isopod is probably the most unique from an evolutionary point of view," Orndorff said. "It has this really old lineage going back to marine ancestors, while everything else has a surface water ancestor."

protection for many reasons, but an unusual isopod is the headliner. The Madison Cave isopod (*Antrolana lira*) is an eyeless, translucent crustacean, originally an ocean-dwelling species that adapted to these freshwater environs over "eons of geological time," according to Wil Orndorff, karst protection coordinator for the state Department of Conservation and Recreation.

"The Madison Cave isopod is perhaps the most unique creature of the Shenandoah Valley," he said of the species, which was listed under the federal Endangered Species Act in 1982 as threatened.

The rare isopod is the only species in its genus and the only freshwater cirolanid isopod — some might describe them as aquatic pill bugs — identified north of Texas. Its known range is limited to pools in a belt of caves stretching from Lexington, VA, to Charles Town, WV.

This isopod is in good, if equally rare, company at the Cave Hill site, which state scientists consider to be a "biological hotspot." The caves are home to six globally rare invertebrates, earning the state's highest ranking for biodiversity significance. This means that, for most of the animals, there are 10 or fewer locations on Earth where they're known to occur. The caves also contain some species that are still new to science and have yet to be formally described, Orndorff said.

Among the creatures identified at Madisons Cave are two pseudoscorpions (they resemble scorpions but lack the stinging tail), a cave spider and the state-threatened Madison Cave amphipod, which looks like a tiny

Orndorff said the isopod could be traced back an estimated 60 million years, when one of its ancestors left the coral reefs in the Atlantic Ocean and swam inland toward what would be the Shenandoah Valley's aquifer.

Today, the waters of the Shenandoah Valley still flow toward the ocean through an intricate and somewhat mysterious geological system known as karst. Formed from the dissolution of soluble rocks such as limestone, karst is characterized by abundant sinkholes and caves that drain land and transport water. Karst is a defining geologic feature in western Virginia, which boasts more than 4,000 caves, some more accessible than others.

Western Virginia is also a headwater region for the Chesapeake Bay. And in these permeable karst areas, pollutants from the surface generally reach groundwater more quickly. That makes them a prime example of the water quality concerns that arise throughout the Bay's watershed, where land use decisions impact water quality downstream.

"Anything that happens on the surface is carried into the cave systems and can alter the conditions that were natural or pre-existing in those systems," Orndorff said.

To date, the pools in Madisons Cave that support these species contain some of the cleanest water Orndorff has seen. Monitoring over the past decade shows that the water's temperature, conductivity and turbidity basically never change. For turbidity, which measures the water's transpar-

Partners in the effort to establish the Cave Hill Natural Area Preserve visit Madisons Cave in Augusta County, VA. While the cave will not be open to the public because of its sensitivity, the surrounding property will provide opportunities for public fishing, boating and walking along the South River. (Virginia Department of Conservation and Recreation)



CAVE FROM PAGE 8

ency, “anything below a 10 is crystal clear, and we’ve never had a reading above one,” Orndorff said.

And, for those who aren’t as passionate about protecting cave species as he is, Orndorff adds the reminder that these same water systems provide residents with their drinking water.

“You’d be surprised how often I’ve flushed dye down someone’s toilet and had it show up in their well,” he said.

The Steger family that owned Madisons Cave and its surrounds for decades understood the property’s significance. Virginia biologists had a long relationship with the family going back to when renowned cave expert Tom Barr first discovered the rare isopod in 1958. His protégé, John Holsinger, a founder of the Virginia Cave Board who made the isopod discovery with Barr, carried the preservation torch during his tenure, garnering endangered species protections for the isopod in the 1980s.

The state made several attempts over the years to formally conserve the property, and the Steger family saw themselves as stalwart stewards in the meantime.

“It came down to not one specific moment but just, over time, realizing that the conservation community was trustworthy and that we would do our best to preserve this for Virginians in



Passages in Madisons Cave provide windows into the karst aquifer of Virginia’s Shenandoah Valley. The mineral calcite, or calcium carbonate, is floating on the water’s surface. (Dave Socky)

perpetuity,” Orndorff said. “It was a long relationship that finally came to fruition.”

The Cave Conservancy of the Virginias, which will own and manage the property, bought the land from the family this year with funding from a DuPont settlement program for restoration projects in the South River watershed. The settlement was

established to mitigate impacts from a Waynesboro DuPont plant’s mercury pollution into the South River watershed leading up to the 1950s.

Mike Ficco, chairman of the Cave Conservancy, said the beauty of the site makes it easy to see why the Steger family found parting with it difficult. He and Orndorff also said they think the cave, perched on a bluff overlook-

ing the river, would have been special to any of the people who experienced the area over time.

“If you tried to put yourself in a native’s frame of reference, it would have been a pretty spectacular place just on its own, even without these crystal-clear pools of water,” Ficco said.

The pre-colonial history of Cave Hill is fairly obscured by heavy use in recent centuries. European settlers mined the caves for saltpetre nitrogen deposits, that were used to manufacture gunpowder, which turned the caves into economic engines through much of the 1800s.

Prominent early Americans might have been familiar with these caves, too. Thomas Jefferson was believed to have visited Cave Hill, which was owned by a man thought to be a cousin of James Madison.

In recent weeks, even Virginia’s cave experts haven’t been able to return to Madisons Cave. The state has further limited access due to concerns about coronavirus transmission between humans and bats. But, under the new protections, the cave and its creatures are even less likely to change anytime soon.

“It’s a real balance to protect the resource and provide education and outreach for the citizens,” Orndorff said. “The main thrust is to protect the biodiversity, and then public access is designed to get people out there so they can develop an appreciation for these things.”

Give them Knowledge, Share your Passion

Help preserve
independent journalism
for future generations
when you include
Bay Journal in your
Estate Planning

Contact us and your estate planning attorney
jcaine@bayjournal.com
jacqui caine (540) 903-9298

SELLER OF TUBEX TREE SHELTERS

36, 48 and 60-inch standard shelters and
30-inch shrub shelters available.*



TUBEX
Advancing growth

PARKTON WOODLAND SERVICES

For pricing call
301-606-1207
billbond119@hughes.net

*Other products may be available if ordered in advance

parktonwoodlandservices.com

Size counts: Smaller Bay stripers die at twice the rate of big fish along coast

≈ Results from electronic tagging unclear on cause and raise call for more study

By TIMOTHY B. WHEELER

Striped bass that stay year-round in the Chesapeake Bay are dying at nearly twice the rate of those that migrate each year to the Atlantic Ocean, a new study has found. The cause or causes aren't clear, but the lead researcher said that it needs to be addressed to right a troubling decline in the prized finfish.

An electronic tagging study led by scientists from the University of Maryland Center for Environmental Science found that large mature striped bass leave the Bay every year to roam coastal waters until the next spring. Those smaller, younger fish that remain in the Chesapeake died off at the rate of 70% a year.

"The mortality rate is alarming," said Dave Secor, a professor at the UMCES Chesapeake Biological Laboratory in Solomons. "If fish are dying at greater than 50% or 60% a year, that's a problem."

The study, published in the journal *PLOS One*, appears likely to draw further attention to disease and overfishing, two suspects in the decline of striped bass, also known as rockfish, which are among the most sought-after fish in the Chesapeake and along the Atlantic coast.

UMCES scientists implanted acoustic transmitters in 100 striped bass from the Potomac River and tracked their movements over four years. Signals emitted by their tags were picked up as they swam by receivers stationed in the Bay and along the coast — a kind of E-Z Pass network for fish, as Secor described it.

The telemetry data revealed that fish 32 inches and longer left the Bay as soon as spawning ended in spring and migrated as a group north to near-shore waters off Massachusetts, where they are a favorite target of recreational anglers. They headed south in late fall, returning to the Potomac by the next spring to spawn.

That migratory pattern is well known, but the tagging study helped scientists get



Acoustic transmitters inserted in striped bass caught and released on the Potomac River were tracked over a four-year period. Smaller fish stayed in the Bay year-round, while larger ones left when spawning season ended to migrate up and down the Atlantic coast. (UMCES)

a firmer handle on which fish migrate, which do not and where they wind up.

"The scale of this is unique," Secor said, because it relied on collaboration with a number of partners. "We couldn't have done this study otherwise."

While it's been thought that only large female striped bass migrate out of the Bay, Secor said the study found that larger tagged male fish also joined the exodus.

Over time, the receiver network stopped detecting signals from some fish, which the scientists took as evidence that they had died. The much lower 37%

mortality rate seen for migratory striped bass suggests something is happening to fish that stay in the Bay.

The mortality rates seen in the study are similar to the estimates the Atlantic States Marine Fisheries Commission relied on in determining in 2019 that striped bass have been overfished in recent years. The Congressionally authorized panel, which regulates migratory fish in coastal waters from Maine to Florida, called for new fishing restrictions to reduce striped bass mortality by 18%.

Of particular concern to fisheries man-

agers was catch-and-release, a popular sport fishing practice, because scientists have found that a significant percentage of fish die after being hooked and returned to the water. That mortality is highest in summer, when warm water and lower oxygen levels add to the stress of being caught and handled.

The restrictions imposed in the Bay, which halve the allowed daily recreational catch to one fish of 19 inches or longer, have been a bitter pill for anglers.

In Maryland, the fishing season is also closed for two weeks in late August, when the water tends to be warmer — though not as warm as in July or early August.

Even though Atlantic striped bass are all members of the same species, Secor said the finding that fish spawned in the Bay behave differently based on size could warrant treating them as a separate subgroups of the coastal population. The migration of larger fish along the coast was part of what helped striped bass recover in the 1980s, the study notes, when "extremely intense" fishing pressure in the Bay drove the population down lower than it is now.

The study's authors suggest the high Bay mortality could be linked to mycobacteria infections, which have been found to afflict the vast majority of striped bass in the Chesapeake.

A different tagging study of resident striped bass estimated that 64% died in 2017, similar to the 70% mortality rate observed the latest research.

The die-off seen in 2017 was attributed mainly to mycobacteria, but Secor said the frequent catch-and-release of fish that are too small to be kept may also be playing a role in increasing mortality. Even if most fish survive being caught and released with care, he noted, that fish may get hooked more than once. "If you're bringing a fish up to the boat several times...cumulatively it can be significant," he said.

For a time-lapse video showing the tagging operation, visit youtube.com/watch?v=Kzl-y9e-LMs&feature=youtu.be.

Long-time Supporter of Environmental Causes...



Over 80% of our non-consumable items are recycled
Our straws are compostable
All food waste is composted
All oysters shells recycled (over 100,000 in 2019!)



Carry-out To-Go 11:30 am – 8:00 pm & Crab Cakes online

400 Fourth St Annapolis, MD boatyardbarandgrill.com 410-216-6206

A NEW BAY JOURNAL FILM Nassawango Legacy



Watch on BayJournal.com or on YouTube

Hogan vetoes pesticide ban in favor of regulatory phase-out

≈ Environmentalists contend state rule leaves loopholes

By TIMOTHY B. WHEELER

A widely used pesticide found to pose health risks for children and wildlife is due to be phased out in Maryland next year, but the state's lawmakers may still have the last word on making sure it's done.

After two years of debate, the General Assembly finally overcame industry objections and passed legislation in March that would ban aerial spraying of chlorpyrifos by Oct. 1 and forbid all uses of it by the end of 2021. It was one of just a handful of environmental bills to pass in this year's legislative session, which was cut short by the coronavirus pandemic.

But on May 7, Gov. Larry Hogan vetoed the measure, saying the lawmakers' action had been rendered moot by a Maryland Department of Agriculture regulation adopted shortly after their vote. Environmentalists disagree and want legislators to override the governor's veto.

On the market since 1965, chlorpyrifos (pronounced klor-PEER-uf-foss) has been used to prevent insect damage to corn, soybeans and other crops. It's also been used to treat golf courses, lawns and utility poles as well as to fog mosquitoes and to kill ants and roaches indoors.

Research has mounted, though, indicating it can damage the brains and nervous systems of young children and can harm bees, fish, birds and other wildlife.

After a lengthy study, the U.S. Environmental Protection Agency was preparing to ban it until the Trump administration blocked the move in 2017. That led environmentalists to sue and press states to ban it. In Maryland, legislation failed two years in a row amid pushback from farm groups, golf course owners and pesticide manufacturers, who argued



Chlorpyrifos has been used since 1965 to prevent insect damage to crops, such as the soybeans shown here, but research has found that it can damage the health of children and wildlife. (Dave Harp)

that the chemical is needed and already restricted in use.

This year, state lawmakers moved early to enact the ban. Then Agriculture Secretary Joe Bartenfelder announced in February that his department was working on "reasonable and responsible regulations" to phase out chlorpyrifos. Environmentalists accused the administration of trying to torpedo the legislation. The department officially took no position on it, but the announcement came as lawmakers were preparing to vote on it. The state regulation, rushed through on an emergency basis, took effect March 27, just after lawmakers left Annapolis.

"This regulatory action is in the best interest of the agriculture industry and the environment," Hogan said in a veto message to legislative leaders,

"and will protect the independence and integrity of MDA's robust science-based regulatory authority and framework."

The state regulation mostly mirrors the vetoed legislation. Both would forbid aerial spraying of chlorpyrifos starting Oct. 1 and ban most other uses after Dec. 31. The pesticide could still be used to treat snap beans and fruit trees through June 30, 2021, and the agriculture secretary could extend that until the end of next year.

State agriculture officials say the use of chlorpyrifos in Maryland has declined dramatically, and a leading U.S. manufacturer, Corteva Agriscience, will cease production in 2021. It is now mainly used to treat fruit trees, though some treated seeds are used to grow crops for canning, according to MDA

spokesman Jason Schellhardt.

But the state rule contains a catch-all exemption not in the legislation: The agriculture secretary can allow other unspecified uses of chlorpyrifos through the end of 2021. That would only be permitted "as an absolute last resort," Schellhardt said, in cases where no other product is effective.

The Smart on Pesticides Coalition, an umbrella group of community, environmental, faith and public health organizations, called Hogan's veto "extremely misguided." It contended that the state's agriculture department lacks the funds or expertise to enforce or defend a regulatory ban on chlorpyrifos.

"MDA's regulations would allow for delays, exemptions and loopholes resulting in continued exposure of this toxic chemical," the coalition said. "MDA could change its regulations at any time, and opponents could file lawsuits challenging the regulation."

Sen. Clarence Lam, a Howard County Democrat who was the lead sponsor of the legislation, said the regulations are "not sufficient to protect the public from the harms of chlorpyrifos... It is important that the General Assembly overrides this veto when it is able to meet next."

Citing the need to limit spending amid budget gaps created by the coronavirus pandemic, Hogan also vetoed a bill that would have funded an effort to have Maryland's universities and other state institutions buy more locally grown food.

He allowed several other environmental bills to become law without his signature. Among them were measures prioritizing state funding for long-term farm runoff control practices, banning fire-fighting foam containing toxic per- and poly-fluoroalkyl substances (PFAS), expanding fisheries for invasive snakeheads and tweaking the state's oyster management plan.



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

EPA faces suit over slow pace of cleanup progress in PA, NY

≈ Downstream states want agency to be more forceful

By KARL BLANKENSHIP

The 37-year-old Chesapeake Bay cleanup effort in May edged closer to a legal showdown over the lagging pace of pollution control efforts in Pennsylvania and New York.

Attorneys general for Maryland, Virginia, Delaware and the District of Columbia joined with the Chesapeake Bay Foundation in sending letters to the U.S. Environmental Protection Agency saying they intended to file suit over its failure to force greater pollution reduction actions from the upstream states.

The attorneys general contend that their own states have made large investments to curb pollution to the nation's largest estuary, but that the EPA needs to use its legal authority to compel their northern neighbors to do significantly more.

"Maryland has engaged in heroic efforts and made huge sacrifices," said Maryland Attorney General Brian Frosh. "But this is a struggle we cannot win without the commitment of our neighbors and more importantly without the engagement of the United States Environmental Protection Agency. The EPA has flat-out walked away from that responsibility."

EPA Administrator Andrew Wheeler shot back that the threatened legal action was "without merit" and that "all the states have room for improvement, and all the states need to make more progress on their commitments for 2025."

A spokeswoman for the Pennsylvania Department of Environmental Protection warned that any lawsuit would "distract and divert federal and state agency resources" from its pollution control efforts.

Wheeler spoke at a news conference announcing the EPA's award of \$6 million in funding to support the implementation of agricultural pollution controls in areas of the Bay watershed where it would have the greatest impact, with most of it — \$3.7 million — going to Pennsylvania.

"We are trying to work with everyone in trying to solve the problems for the Bay while other people are out there trying to create headlines and discontent with their state partners," Wheeler said.

Still, the added funding was less than 1 percent of the annual budget shortfall that Pennsylvania officials have identified in their Bay cleanup plan, which illustrates the magnitude of the challenge ahead.

The states and EPA have worked since 1983 to restore the Chesapeake Bay. As part of that, they set — and missed — cleanup goals for 2000 and 2010.

When it became clear the 2010 goal would be missed, the EPA worked with the states to establish a new 2025 goal. That plan, known as the Chesapeake Bay



Nutrient pollution from farmland continues to be the largest form of pollution in the Chesapeake Bay. All states in the watershed face significant challenges in reaching pollution reduction goals by 2025. (Dave Harp)

Total Maximum Daily Load, set a limit on the amount of the nutrients nitrogen and phosphorus that could reach the Bay and still maintain healthy water quality.

States were to write plans showing how they would reduce nutrients to meet those limits. If they fell behind schedule in implementing their plans, the EPA could take a variety of actions.

Pennsylvania and New York have fallen far behind schedule, in part because agriculture is their primary source of nutrients. While all states have made significant headway in reducing discharges from wastewater treatment plants, all have struggled to control runoff from farms and developed lands. The problem is particularly acute in Pennsylvania, which has more farms and stormwater — and contributes more nutrients to the Bay — than any other state.

Last year, in an updated version of their cleanup plans, both states failed to submit strategies that met their 2025 targets. Pennsylvania's plan achieved only about 75% of its nitrogen goal, and New York's reached about 67%.

The EPA cited those shortcomings when it reviewed the plans at the end of the year, but it did not take any specific actions against the two states. Actions could include such things as withholding grant funding or forcing wastewater treatment plants to achieve even more reductions — which would be hugely

expensive.

Critics, though, have contended that just the threat of such steps could spur states to invest more money in farm runoff controls measures, such as planting stream buffers or nutrient-absorbing cover crops.

"EPA's failure to hold Pennsylvania and New York accountable undermines the very integrity of this historic federal-state partnership," said Will Baker, president of the Chesapeake Bay Foundation.

Pennsylvania is not the only state challenged to reduce polluted agricultural runoff by 2025. While other state plans meet their goals on paper, they rely on implementing practices at rates that vastly exceed what they have done in the past.

Baker, speaking at a news conference announcing the action, noted that cleanup actions taken since 2010, though short of meeting goals, had improved Bay water quality. "The EPA seems intent on snatching defeat from the jaws of victory," he said.

Added Virginia Attorney General Mark Herring, "the Trump EPA is rubber-stamping plans that are plainly inadequate and allowing some watershed states to do less than they are supposed to."

On May 18, the states and the foundation filed letters with the EPA formally announcing their intent to file suit. They were joined by the District of Columbia, Anne Arundel County in Maryland and the Maryland Watermen's Association. Delaware sent a letter two days later.

The law requires that federal agencies be given 60 days formal notice of such action to try to resolve issues before a suit can be filed, though the attorneys general

and CBF representatives held out little hope that would happen.

The move was swiftly criticized in Pennsylvania.

"The Chesapeake Bay partnership and plans were always intended to be a collaborative effort among the seven jurisdictions in the watershed," said Deborah Klenotic, a spokeswoman for the state Department of Environmental Protection. "This lawsuit would undermine the cooperative spirit of that partnership."

She said the state has launched numerous initiatives in recent months as part of an effort to accelerate its pollution control efforts, but she added that "a lawsuit of this nature would further distract and divert federal and state agency resources from our effort and fail to advance our common goal to improve water quality here in Pennsylvania and in the Chesapeake Bay."

Pennsylvania is not the only state challenged to reduce polluted agricultural runoff by 2025. While other state plans meet their goals on paper, they rely on implementing conservation practices at rates that vastly exceed what they have done in the past. Most of the plans were criticized for not clearly showing how that would happen.

Liam Migdail, communications director with the Pennsylvania Farm Bureau, declined to directly comment on the potential legal action and acknowledged the state has "a long ways to go" to meet its goals.

But he commended the state's plan for trying to involve the farm community in developing "a realistic approach about how we're going to get there. If you look at what Pennsylvania has to do compared to the other states in the Bay watershed, it is a heavy lift."

Chesapeake's grasses hard hit by heat, high flows in 2019

≈ SAV in higher salinity water fared the worst

By KARL BLANKENSHIP

Overwhelmed by record high flows and warm temperatures, the Chesapeake Bay's vast underwater meadows last year suffered their largest drop since surveys began, with acreage plummeting at least 33% from 2018.

But the declines were not uniform throughout the Bay. Underwater grass beds in many fresh and low-salinity areas of the Chesapeake and its tidal tributaries held their own, while beds in mid- and high-salinity areas suffered the brunt of the impact.

"We see a lot of little losses in a lot of places, and little gains in a lot of places," said Christopher Patrick, assistant professor of biology at the Virginia Institute of Marine Science, which conducts the annual aerial survey of the Bay's grass beds. "And then we've had a couple places that just had a really bad year."

The Bay lost a bit more than 33,000 acres of submerged aquatic vegetation, or SAV, erasing nearly a third of the plants from the shallow waters around the Bay.

The loss was probably larger, scientists say, but it wasn't fully documented: Bad weather kept them from completing the survey in 2018.

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

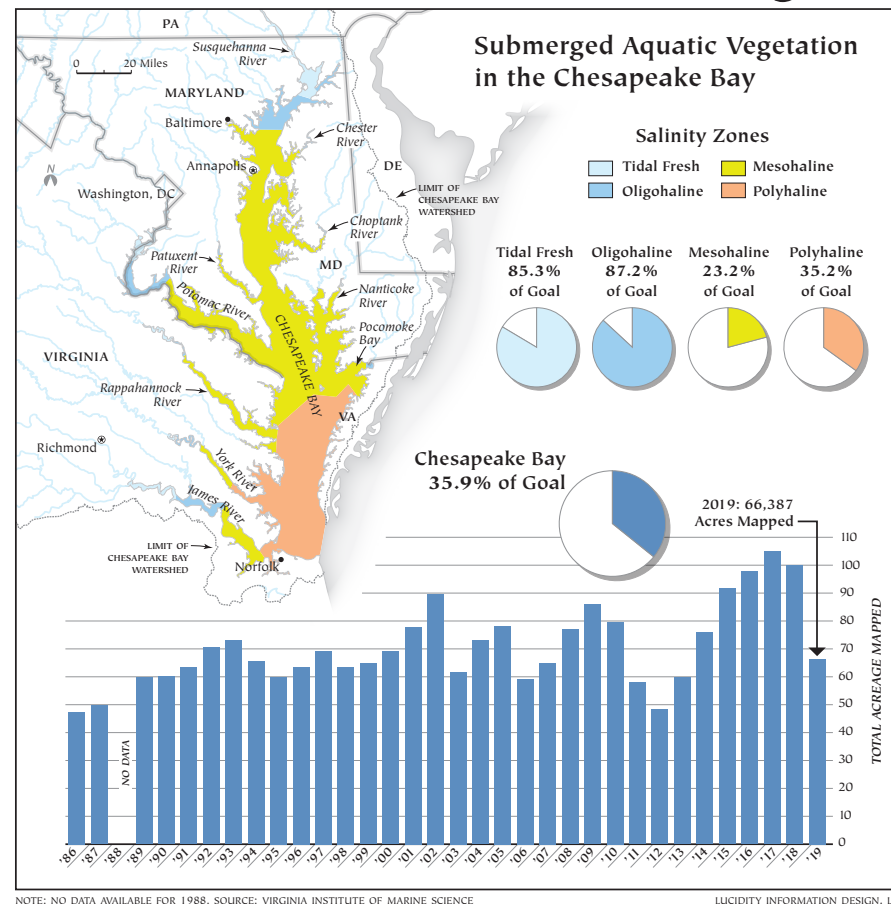
Grasses are considered one of the most important indicators of Bay health because they require clear water to survive. Chesapeake nutrient reduction goals are aimed at improving water clarity enough to reach the underwater grass restoration acreage target.

Still, scientists feared the loss could have been even greater. According to the U.S. Geological Survey, 2019 had the highest volume of river flows since the monitoring of river flows into the Bay began in 1937.

High freshwater flows are typically bad news for underwater grasses. They carry large amounts of sediment that can smother beds and cloud the water. They also flood the Bay with nutrients that are flushed off the land, spurring algae blooms that block critical sunlight.

Surprisingly, grass beds in fresh and low-salinity areas of the Bay — areas that receive the full force of river flows entering the Chesapeake — generally held their own or even expanded.

The Anacostia River, parts of the upper tidal Rappahannock River, Mattawoman Creek and the



upper Potomac River were among those seeing significant gains. The Susquehanna Flats, now the largest bed in the Chesapeake, held steady despite high flows coming from the Bay's largest tributary.

"It looked good," said Cassie Gurbisz, an assistant professor of environmental studies at St. Mary's College in Maryland, who has been working on the Susquehanna Flats for years. "The water was clear. It looked pretty much like it always looks."

Scientists said the nature of the flows during 2019 may have helped the beds survive. Normally, high-flow years are associated with hurricanes or tropical storms that send a deluge of water downstream. In 2011, the flood of water that poured into the Bay from the Susquehanna after Tropical Storm Lee literally ripped apart grass beds on the flats.

"When you get super high flows you can get scouring, but we don't know what the threshold needs to be in order to get scouring," Gurbisz said. Last year's flows appeared to have been well under that threshold.

Many freshwater species of grasses also form canopies. That is, their leaves brush the surface of the water, which allows them to absorb sunlight even if the water turns murky.

The story was dramatically different in the mid- and high-salinity areas that

dominate most of the Bay and contain most of its potential underwater grass habitat.

The mid-salinity mesohaline area was hit the worst. It decreased 56% from 2018, from 62,900 acres to 27,900 acres.

Huge grass beds in Tangier Sound lost more than two-thirds of their grass coverage, accounting for almost half of the Baywide loss. Other large beds in the Honga River on the Eastern Shore were cut by more than half.

The mesohaline is dominated by widgeon grass, a species that is notorious for its boom-and-bust characteristics, disappearing quickly when conditions are poor, but bouncing back rapidly when they improve.

"It just blows us away that we see such dramatic changes in widgeon grass," said Bob Orth, a VIMS scientist who has overseen the annual survey since it began in 1984. "This happens in other areas, too. It's not just the Chesapeake."

Part of the problem, scientists say, is that beds in those regions used to also include multiple other species, such as eelgrass, redhead grass and sago pondweed. The presence of several more durable species likely helped buffer the impacts of a bad year.

They point out that parts of the mesohaline, such as the Chester, Severn and Magothy rivers in Maryland, had

notable increases last year. But the widgeon grass there is mixed with other species

"What we've seen in those areas is that they are really increasing in diversity," said Brooke Landry, a biologist with the Maryland Department of Natural Resources and chair of the Bay Program's SAV Workgroup. "So maybe these areas aren't as susceptible to these changes like big monospecific stands of widgeon grass would be."

But in other mid-salinity areas, those other species largely disappeared after Tropical Storm Agnes devastated the Bay's grasses in 1972. They haven't come back.

Also hard-hit was the very salty polyhaline region in the Lower Bay, which lost 35% of its grasses.

Grass coverage in that region has been trending downward since the mid-1990s, and the roughly 11,800 acres observed last year is approaching the all-time low mapped in 2006.

The polyhaline is dominated by eelgrass, which is near the southern edge of its range in the Chesapeake. It suffered a double hit — the grass does not tolerate warm temperature, and both 2018 and 2019 were unusually warm. Also, eelgrass requires more light than most other underwater grasses, so it was further stressed by murky water that persisted through much of those years.

Reduced salinities associated with the high flows likely stressed the plants as well, scientists say.

The higher than normal flows and warmer temperatures — both predicted to continue as the climate changes — suggest that eelgrass may eventually disappear from the Bay. This was the third time since 2005 that eelgrass has suffered a large dieback after unusually warm weather.

"We were hoping to get to a point where water clarity had improved enough that eelgrass might withstand the added stress of that increased temperature," Landry said. "But it clearly hasn't impacted water clarity enough at this point to counteract the unpredictability of climate impacts and climate change. I think that is the story."

Underwater grass beds are important food for waterfowl, as well as hiding areas for juvenile blue crabs and many types of fish. They are also a critical component of the ecosystem in their own right, pumping oxygen into the water, trapping sediment and buffering shorelines from the erosive impact of waves.

No one knows how much underwater grass was once in the Chesapeake. Some think there may have been up to 600,000 acres.

Sustainability sells: Firms funding farms' conservation measures

≈ On-the-ground practices improve consumer demand and bottom line

BY AD CRABLE

Chris Landis, a seventh-generation dairy and organic poultry farmer in Lancaster County, PA, had been up until 1 a.m. cutting hay by headlight to beat forecasted rain. Because dairy cows wait for no one, he was up again about four hours later, milking them. Then he grabbed a broom and pushed fallen hay on a concrete runway back within eating distance of Holstein cows in the farm's new heifer barn.

The 32-year-old farmer embraces the need for conservation on the farm — his father was among the first in the county to fence cows away from streams. He tore down the old lean-to barns because he could see that the manure inside them, sometimes mixed with rainwater, washed downhill into the grass, polluting a stream or filtering into groundwater.

Nearly half of the \$150,000 required to build new barns with a manure and stormwater collection system was paid for by a program started by Landis' corporate boss, Turkey Hill Dairy, the well-known maker of milk, ice cream and iced tea. Another corporate icon, Perdue Farms, paid for a new pasture and shade for his free-range chickens.

Large corporations that do business in Chesapeake Bay states are spending unprecedented amounts of money to help supply line farmers like Landis combat air and water pollution. The growing trend is being driven by the demands of environmentally conscious consumers, as well as the companies' investors and sometimes their employees.

As a result, corporate financial aid for environmental work is filtering down to growers in Bay states from brand names like Campbell Soup, Land O'Lakes, Philip Morris cigarettes, Perdue Farms, Tyson Foods, Turkey Hill Dairy, Nestle and Walmart.

The money is helping to fund on-the-ground conservation practices for dairy, grain, poultry and tobacco farmers in Bay states.

The approaches vary. Some livestock farmers are getting financial help to use feed that has fewer nutrients, which reduces the nitrogen and phosphorus in animal manure that pollute the Bay and its rivers. In Pennsylvania, a tobacco company paid to produce prototypes for horse-drawn, no-till planters that their Plain Sect growers could use to help reduce erosion. In another project, local ag retailers are trained to encourage



Chris Landis, a seventh generation farmer in Lancaster County, PA, attends to his calves in their new barn. The structure, which captures manure and stores it, thereby preventing runoff, was partly financed by a project started by Turkey Hill Dairy to make sure its dairy farmers are farming sustainably. (Ad Crable)

clients to use cover crops, a practice that reduces nutrient pollution.

On the Delmarva Peninsula, corporations are paying to help poultry farmers transport excess manure out of the Bay watershed where it can be used on fields with less risk of water pollution.

Across the Bay watershed, corporations have paid for streamside buffers on farms and programs that promote soil health. Two power utilities have donated money to help dairy farmers in Virginia, Maryland and Pennsylvania switch from barnyard feeding to rotational grazing, which helps grasses store greenhouse gases.

And it's not just on land. Northrop Grumman, a Virginia-based aerospace company, is working with the Chesapeake Bay Foundation to develop a tool to monitor oyster reef habitat.

A convergence of factors has led to a peak in corporate involvement in Bay states, experts say.

Perhaps foremost is a class of consumers in the digital age who are informed and demand that the products they buy be sustainably made all the way down the supply line.

"Doing the right thing by our environment is not disputable anymore. The vast majority of people want the business doing the right thing," said John Cox, chairman of the board of Turkey Hill Dairy, which now requires 180 of its dairy farmers in Pennsylvania to have conservation and manure management plans and is helping to pay for needed best management practices.

"Consumers now want to know how their food is grown, and they want it more nutritious," said Steve Groff, a Pennsylvania cover crop consultant. Groff's clients include Wrangler Jeans, which wants its cotton grown sustainably.

In his upcoming book, *The Future-Proof Farm*, Groff notes that shoppers will soon be able to take handheld

devices into grocery stores and point at an apple or cucumber and get a reading of the level of minerals and nutrients.

"They want to purchase products they feel good about," said Kate Fritz, executive director of the Alliance for the Chesapeake Bay. "And they are willing to pay a little more."

"They are buying with their pocketbook more and more," agreed Jenny Ahlen of the Environmental Defense Fund, which has partnered with such retail giants as Walmart and Tyson's Foods in on-the-farm improvements. "Companies are seeing real growth opportunities. They are finding from consumers what they want and that is becoming a great motivator."

It's now a world where a company's environmental practices and stated goals receive unparalleled transparency, noted Turkey Hill's Cox.

PARTNERS CONTINUES ON PAGE 15

PARTNERS FROM PAGE 14

If a company doesn't deliver, chances are it will be called out. "The ability to hide your business behind platitudes is getting real thin. You can't just run nice ads because your consumers will find out about it," Cox said.

Among those to initiate the modern corporate environmental responsibility was Walmart, when the nation's second-largest retailer in 2005 announced it would move toward zero waste, use 100% renewable energy and sell products that "sustain our resources and environment." The company has required changes far down their supply line. It expanded its goals in 2013 to reduce nitrogen use on farms.

That set in motion other green initiatives by food and beverage companies.

But many corporations set environmental goals without realizing that it would take changes and money for improvements far down the supply line, said Lindsay Reames of the Maryland & Virginia Milk Producers Cooperative Association, which is involved in two partially corporate-funded projects to get conservation measures installed on dairy farms in Pennsylvania, Virginia and Maryland.

Now, Reames said, corporations understand they have to help finance on-the-farm improvements to achieve pollution reductions. "And farmers say, 'Hey, you're not just saying this!'" she said.

Corporations are increasingly hearing from stockholders and investors about sustainable practices. According to *The New York Times*, BlackRock, the world's largest investment fund, has put companies on notice that it expects them to serve a social purpose.

And the younger workforce these days, containing many millennials, is demanding their employers go green. They are willing to relocate to places to join a company they feel good about, even if the job may pay less.

To gain credibility, many companies are partnering with environmental groups and nonprofits.

One is the The Sustainability Consortium, a nonprofit formed with seed money from Walmart in 2009 that helps companies launch and rate their sustainability practices. They have more than 1,000 partners all over the world.

"A lot of other nonprofits work on the consumer side. Because we are not consumer-based, the companies we deal with really are interested in changing some of their practices," said Erika Ferrin, senior director of marketing, communication and development.

Another nonprofit helping corporations go green is the Environmental Defense Fund, the group that sued the federal government in 1965 in the eventually successful campaign to ban DDT. In the Bay region, the group has partnered with Walmart, Tyson's Foods, Campbell Soup Co. and Land O'Lakes to guide green practices.

"There are often times that companies worry they wouldn't be taken seriously if they do it on their own," said Jenny Ahlen, the New York-based company's supply chain director. "We can validate to some extent the action and results they are having on the ground."

Landis noted that in a time when farmers are struggling financially, corporate assistance is welcomed. "It's definitely piquing these guys' interest," he said. "I think it's going to push somebody to pull the trigger on a project that they're a little apprehensive about."



A stream crossing for cattle is installed on a farm in Lancaster County, PA. Financial aid from corporations increasingly is being funneled to farmers as consumers demand that products come from sustainable agriculture. (Maryland & Virginia Milk Producers Cooperative Association)

Corporate Support

Here are some environmental initiatives in the Chesapeake Bay region that involve corporations:

📌 **Turkey Hill Dairy, Maryland & Virginia Milk Producers Cooperative Association, Alliance for the Chesapeake Bay.** As part of a plan for sustainable milk production, Turkey Hill requires its milk suppliers in Pennsylvania to have state conservation plans and provides incentives for those that implement needed best management practices. Dairy farmers are then paid a higher premium for their milk. The Alliance, which has provided financial assistance and secured grants, says implementing all of the conservation practices needed on a majority of the farms could cost \$5 million or more.

📌 **Nestle, Maryland & Virginia Milk Producers Cooperative Association, Alliance for the Chesapeake Bay.** Six pilot farms in Virginia, Maryland and Pennsylvania will be used to build a model for conservation practices that can be replicated on all 900 farms that supply milk to Nestle.

📌 **Giant Food Stores, Alliance for the Chesapeake Bay.** The partners are seeking grants to help dairy farmers implement conservation practices that supply milk to Giant stores in Virginia, Maryland and the District of Columbia. The project includes the in-store education of consumers that their milk is coming from sustainable sources.

📌 **WGL Energy, Sterling Planet, Chesapeake Bay Foundation.** So far, \$1.5 million collected from the two utilities and another \$2.2 million in federal grants have been used by CBF to fund farm projects such as soil health, stream-side buffers and rotational grazing to reduce greenhouse gas emissions and improve water quality.

📌 **Perdue Farms.** The company has spent \$80 million to recycle nutrients from poultry litter and hatchery waste and paid \$2.3 million to the Maryland Transport Program to move excess litter to where it is needed. All contracted suppliers and poultry farmers in Virginia, Maryland, Pennsylvania and New York are required to follow all environmental laws and have up-to-date nutrient management plans. The Perdue Foundation has donated \$10,000 to the Eastern Shore Waterkeeper to install conservation practices on a farm and to identify cost-share sources for other poultry and grain farmers. The company is working with the Alliance for the Chesapeake Bay to secure a grant to help poultry farmers put needed conservation measures on their farms.

📌 **Tyson Foods, Environmental Defense Fund.** In 2019, the two entered into a partnership to work with supply line farmers to adopt practices to reduce nitrogen and soil loss from 2 million acres of corn fields in Pennsylvania and the Midwest.

📌 **Altria Group, National Fish and Wildlife Foundation.** The owner of Philip Morris cigarettes financed the building of a horse-drawn no-till tobacco planter prototype so Plain Sect farmers would use no-till farming when growing tobacco.

📌 **Campbell Soup Co.** The company, which owns a Pepperidge Farms plant in Lancaster County, PA, works with local wheat farmers to adopt practices to reduce soil and nutrient runoff to make sure the ingredients that end up in Goldfish crackers are sustainably grown.

📌 **Land O'Lakes, Environmental Defense Fund.** Local ag retailers are trained to encourage their client farmers to use no-till planting and cover crops.

WV environmentalists criticize proposal to relax water protections

Standards would be dropped for chemicals known to cause cancer, harm liver and lungs or are fatal in higher doses

By JEREMY COX

Environmentalists are slamming a West Virginia Department of Environmental Protection proposal to loosen water-quality safeguards on more than a dozen toxic pollutants. The revisions include a 10,000-fold leap on the limit for a chemical linked to liver and lung damage.

The agency in March recommended updating the fish-consumption and drinking-water protections for 24 pollutants. If approved by the state legislature next year, the changes would relax pollution limits for one or both types of exposure for 13 of those contaminants.

A coalition of 19 conservation groups is calling on the state to reject those changes and only endorse revisions for the 11 pollutants that would receive stricter standards under the proposal.

One of the most dramatic changes would be for a chemical known as “1,1 dichloroethylene,” which is used in plastics, such as food wrappers and carpet backing. The new rules would boost the acceptable concentration from 0.03 parts per billion to 300 parts

per billion in rivers, lakes and other “surface” waters that can be used by utilities to supply water.

The chemical is believed to harm the liver, kidneys and respiratory system, according to the U.S. Centers for Disease Control and Prevention.

State officials say the recommended changes come directly from criteria set by the Obama era U.S. Environmental Protection Agency in 2015. That list includes 94 pollutants. Many of the revised federal standards are more stringent than West Virginia’s protects. Some are weaker.

The DEP plans to form an advisory panel that would begin meeting in June to study the remaining 70 pollutants on the EPA list and recommend any modifications to their criteria for the 2022 legislative session.

Among the contaminants on the state’s waiting list: ethylbenzene, a gasoline additive and cancer-causing agent emitted at 39 sites statewide, and dinitrophenol, an herbicide that is potentially fatal in high doses.

The alliance of conservation groups, led by the West Virginia Rivers Coalition, opposes the formation of the study group, saying it would cause needless delay.

“By not making these updates, we’re unnecessarily leaving people at risk,” said Angie Rosser, the West Virginia Rivers



In West Virginia, state water quality regulations must be ratified by lawmakers instead of being handled through the executive branch. (Upstateherd / CC BY-SA 4.0)

Coalition’s executive director.

Many of the pollutant standards on the books in West Virginia haven’t been updated in more than 30 years. The state stands alone in the Chesapeake Bay watershed with its requirement that water-quality regulations be ratified by lawmakers instead of being handled solely through the executive branch.

An effort to update about 60 of the state’s 94 water-quality standards failed to pass in Charleston last year. In a compromise, lawmakers tapped the DEP to review the list and make recommendations. The agency expects to finalize the proposal by the end of August.

The state’s powerful manufacturing lobby is supporting the proposal.

“The criteria that were proposed for adoption by the DEP are protective of human health and are developed in a process that makes multiple conservative assumptions that results in very low levels,” said Rebecca McPhail, president of the West Virginia Manufacturers Association.

Of the 24 proposed drinking water limits, seven would allow more pollution than the amounts put forward by the trade group.

The Manufacturers Association and other industry groups warn that making the rules too stringent could drive away jobs in an important sector. Manufacturing represents about 10% of the state’s

economic output. With a value of nearly \$3 billion in 2017, chemicals are by far the top type of manufactured good.

A major sticking point between the environmental and industrial factions has been the way that the state calculates health risks from toxic pollution.

In its latest proposal, the DEP has sided with environmental groups, who pushed the state to use the EPA’s national fish-consumption rate of 22.2 grams per day, or just less than an ounce. Industry groups argue that state residents eat less fish than the national average, so higher levels in those fish would be acceptable.

The West Virginia Manufacturers Association has backed off asking the state to account for residents’ higher-than-average body weights and lower-than-average water consumption rate. Both factors could lead to allowing higher pollutant levels. The now-discarded stance drew harsh rebukes from inside and outside the state. One headline read: “U.S. group says ‘big’ residents don’t need safer water.”

About 80 people participated in a virtual town hall hosted by the DEP about the proposal on May 19. In a process upended by the coronavirus quarantine, environmental leaders, state delegates and concerned residents patiently waited to be unmuted over a Zoom connection to share their opinions. All 18 people who spoke were critical of weakening the standards.

“I cannot believe we have to have discussions about limiting the poisonous materials that are dumped into our rivers and streams,” said Margaret Worth, a lifelong resident of Pocahontas County.

“I cannot believe we have to have discussions about limiting the poisonous materials that are dumped into our rivers and streams.”

—Margaret Worth
Resident of Pocahontas County

“It’s embarrassing. It’s demoralizing.”

Del. Evan Hansen (D-Monongalia) urged the agency to complete criteria for all of the remaining pollutants this year without turning to a committee for help. “I don’t think there’s any

guarantee that they’ll reach an agreement,” potentially delaying action even further, he said.

West Virginia has higher rates of chronic diseases than much of the country, including the third-highest cancer death rate, said Michael McCawley, an environmental health professor at West Virginia University.

“Increasing the levels of pollutants that cause those kinds of reactions is not good for the people of West Virginia,” he told DEP officials during the meeting. “I’d like to see more jobs created, but I don’t want to see them at the expense of people’s health.”



Angie Rosser, executive director of the West Virginia Rivers Coalition, wants the state to adopt the EPA’s water standards but only where they’re stronger than existing state regulations. (West Virginia Waters Coalition)

Upper Susquehanna Coalition wins Arbor Day Award

≈ NY-based group has planted more than 10,000 trees in state and PA

By JEREMY COX

Planting a tree can be its own reward. But one Chesapeake Bay watershed nonprofit transformed the simple act into one of the most prestigious environmental awards in the nation.

The Arbor Day Foundation in April named the Upper Susquehanna Coalition one of five recipients of its 2020 Arbor Day Awards, which honor organizations and individuals for tree planting and environmental stewardship.

The foundation applauded the New York-based coalition for planting more than 10,000 native trees in northern Pennsylvania and southern New York in 2018 alone. The organization also involved more than 100 student volunteers in its efforts while educating more than 1,500 people about the role that trees play in improving water quality that year.

The coalition has created a “sustainable, replicable and measurable program which engages a diverse group of partners and community members,” said Jen Hallaman, an Arbor Day Foundation spokeswoman. “The Upper Susquehanna Coalition has most certainly demonstrated leadership in this field.”

Kathleen Peters can see some of fruits of the coalition’s labors in her backyard. When Peters, a graphic artist, and her husband, a retired New Jersey state school official, moved to a 22-acre property in rural New York, the creek in their backyard was surrounded by goldenrod and vines.

Peters worked with the Otsego Land Trust to protect the creek and its shoreline



The Upper Susquehanna Coalition has partnered with soil and water conservation districts in New York and Pennsylvania to plant thousands of trees along ditches and streams on private properties like this one in Madison County, NY. (Troy Bishopp)

under a conservation easement. Then, the couple decided to go a step further, partnering with the Upper Susquehanna Coalition to plant about 300 trees and shrubs along the waterway, known as Herkimer Creek.

At first, there wasn’t much to look at except for the white tubes that protected the saplings from the teeth of deer and groundhogs. “But now that the trees are starting to come up above the tree tubes, it’s starting to look like the pretty thing that we wanted from the beginning,” Peters said.

Trees planted along stream and ditch banks serve many purposes, said Lydia Brinkley, the coalition’s buffer coordinator. The right greenery slows the flow of stormwater, catching sediment and nutrients before they wash downstream. Reducing such pollution is at the heart of the state-federal Chesapeake Bay Program.

“Nutrient and sediment reduction is the reason we’re paid to do it,” said Brinkley,

noting that much of their funding comes from the New York Department of Environmental Conservation’s “Trees for Tribes” program.

The group also aims to stabilize streambanks and provide habitat for native wildlife, she added. Trees shade the water, keeping it cool enough to support certain coldwater aquatic species, such as brook trout and the hellbender salamander.

Across the Bay watershed, though, the pace of planting continues to fall short of the Bay Program’s goal of creating 900 miles of stream buffers per year. Since 2010, when the current restoration program was launched, the length of plantings has averaged about 30% of that total each year, officials estimate. The U.S. Environmental Protection Agency and the six participating states have set a 2025 deadline for putting in place the program’s pollution-reducing actions.

The Upper Susquehanna Coalition was created in 1992 to help extend the reach of soil and water conservation districts in the 7,500-square-mile region straddling the New York-Pennsylvania border. The coalition consists of 21 districts — 17 in New York and four in Pennsylvania. The area forms the headwaters of the Susquehanna River, the Chesapeake Bay’s largest tributary.

Having a nonprofit arm helps the districts pool resources and employ a standard set of practices across the region, Brinkley said. Its workload includes rehabilitating stream corridors, implementing agricultural best management practices and restoring wetlands.

The forest buffer program sprouted in

2015, and Brinkley was named its first director. Its clients are mostly large landowners, such as farmers. But planting trees isn’t always an easy sell.

“The hardest part is the mindset that trees are not as valuable as a crop,” said Troy Bishopp, who works with both the Madison County, NY, district and the coalition to persuade farmers to be better land stewards. “We’re basically in the salesman business.”

Normally, conversations begin with farmers seeking a district’s help with improving the health of pastureland or fencing livestock out of streams. For Brinkley, those are cues to start her pitch.

“Nobody’s really contacting the district for planting more trees, but it always ends with it,” she said.

What they plant depends on local conditions, but some tried-and-true varieties include sycamore, red maple, river

birch and swamp white oak. The coalition’s 2019 records show it planted 26 tree species and 14 types of woody shrubs.

The work doesn’t stop with the last shovel of dirt. The group is in its third year of a stewardship program in which it dispatches interns to inventory the trees that have been planted and to take actions, when necessary, to shore up their survival, such as standing up tree tubes and removing encroaching vegetation.

The Arbor Day Foundation has been recognizing groups like the Upper Susquehanna Coalition through the Arbor Day Awards since 1972. The group won in the “headwaters” category. This year’s other recipients were Larry Biles of the Kansas State Forest Service, Gabriela E. Lopez of Million Trees Miami, the city of Toronto and Bank of America.

In 2018, the foundation presented another organization in the Chesapeake region with the headwaters award. The Cacapon Institute of West Virginia, which helps to protect water quality in the Potomac River watershed, was recognized for forestry programs that include tree planting, education and stewardship.

Peters said her patch of trees has been fortified with additional plantings to make up for losses caused by hungry animals. The tallest specimens now stand at about 8 feet. She hopes that as they grow, they will keep the banks from eroding and preserve her bucolic view.

“My tax dollars going to an actual benefit,” she said with a laugh. “It’s a good feeling that there are programs like this out there.”



Buffer plantings like this in Madison County, NY, help filter stormwater and prevent erosion along stream banks, scientists say. (Troy Bishopp)

Coronavirus victims include restoration, monitoring of Bay

≈ Social distancing, budget cuts hinder researchers and watermen

BY TIMOTHY B. WHEELER, JEREMY COX & KARL BLANKENSHIP

Efforts to rebuild shad populations in the Chesapeake Bay watershed took a beating. Water quality went unchecked for the longest time in more than three decades. State and local governments face huge budget gaps that could impact Bay restoration for years to come.

The impacts of the novel coronavirus that has killed more than 100,000 people nationwide continues to ripple through the Bay region — sometimes in unexpected ways — and will continue to do so. Environmental restoration efforts have already been hit and the impacts are just beginning to play out.

With the Bay cleanup deadline about five years away, many pollution control actions were delayed while state and county governments and conservation districts struggled with staffing cuts and curtailed field work.

“In our county conservation districts, we’ve seen some furloughs and some reduced capacity,” said Pat McDonnell, secretary of the Pennsylvania Department of Environmental Protection. “We obviously lost at least part of the construction season.”

For now, state and federal officials say they intend to meet Bay cleanup goals. “We are committed to the 2025 timeframe,” said Ben Grumbles, Maryland secretary of the environment. “We are continuing to make real progress despite the last couple of months.”

But, he added, “it is fair to say this is a challenge for all of us.”

Lost tax revenue stemming from springtime shutdowns has left state and local governments facing billions of dollars of shortfalls, though officials say it will be weeks or months before they know exactly how that will affect conservation programs.

A *Bay Journal* survey of 18 local governments found that more than half deemed it “highly likely” that their environmental programs would experience budget cuts. Many said on-the-ground projects have been delayed, and some said stormwater inspection and maintenance programs have already been affected.

In Virginia, funding for farmers to install conservation practices was slashed about 10% this spring as Gov. Ralph Northam sought to trim the state’s expenses.

“Compared to other agencies and programs, we feel quite fortunate,” said Darryl Glover, head of the Depart-



Shad swim by window at Conowingo Dam after being lifted over the 94-foot high structure blocking their spawning run up the Susquehanna River. Coronavirus concerns limited fish lift operations this year. (Dave Harp)

ment of Conservation and Recreation’s soil and water conservation program.

Maryland officials have made only limited spending cuts so far, but more are likely.

“We don’t know where we are as far as the budget,” Hans Schmidt, assistant secretary of agriculture, recently told members of the state’s Soil Conservation Commission. “We’re kind of at a wait-and-see moment.”

Shad restoration stymied

One of the most unlikely victims of the pandemic restrictions were American shad. Once one of the Bay’s most valuable fisheries, shad are now at historic lows. Bringing them back has been a goal of the Chesapeake restoration effort for decades.

But when the governors of Maryland and Pennsylvania ordered shutdowns of all nonessential activities, operators of Conowingo, Holtwood and Safe Harbor dams on the lower Susquehanna River decided not to operate the lifts that usually start lifting migrating fish over the hydroelectric facilities around April 1 each spring.

That sparked objections from environmentalists, who contended that the utilities were compelled by their federal licenses to operate the lifts to help get fish to upstream spawning grounds. Federal regulators appeared to concur.

Exelon Corp., which operates Conowingo Dam — the largest and also the first hydroelectric facility encountered by migrating fish — sought and obtained approval from Maryland on May 12 to start lifting fish, and the two upriver dams followed suit.

That lasted less than four days. The lift moved 485 American shad upriver — 10% of last year’s total. But lift operators also saw 35 invasive northern snakeheads passing upriver.

They managed to net 14, but 21 got through. Two were later caught farther upstream. It marked the first documented occurrence of snakeheads above the dam.

Concerned that more snakeheads would get through, and with the typical shad spawning season mostly over, fishery biologists recommended shutting down the lifts. By that time, just 21 American shad had made it past Holtwood, and only one got lifted over Safe Harbor.

Efforts to rear shad in hatcheries fared even worse, as biologists were unable to safely gather shad eggs for hatchery operations in Pennsylvania, Maryland and Delaware.

“It’s hard to do the work and practice social distancing,” said Josh Tryninewski, a biologist with the Pennsylvania Fish and Boat Commission.

Typically, hatcheries along Bay tributaries stock millions of young shad each year. This is the first time since 1977 that none will be released.

Crabs grab record prices

The seafood industry has been hard hit by restaurant closures. But seafood markets, grocery stores and restaurants offering carryout service have struggled to meet the demand for crabs as the harvest continues to lag behind its performance from last spring.

The combination of low supply and high demand created a perverse sort of “price war,” according to Jason Ruth, owner of Harris Seafood Co. in Grasonville, MD. He estimates that the prices paid at the dock — which reached \$220 per bushel in May, according to industry sources — are 60% higher than at any point in the company’s history.

Before the pandemic restrictions, restaurants accounted for nearly three-quarters of his sales, Ruth said. But that has been at least partially offset by a rise in people buying whole crabs

off the shelf and going through the painstaking process of steaming them at home.

“One of the precursors to having crabs at home is you have to have a lot of time,” Ruth said. “Well, people have a lot more time right now.”

Robert Newberry, executive director of the Delmarva Fisheries Association, was flabbergasted by the prices.

“I can’t believe it,” he said. “I’ve never seen crab prices this high in my life — ever. If they’re \$200 [a bushel] coming off the boat, they need a Brinks truck to be delivering these crabs.” Retail prices ran much higher.

But the high prices have put seafood processors in even more of a pinch, Newberry said, because they can’t sell the meat they pick to consumers for as much as it costs for them to buy the crabs from watermen.

Watermen say they don’t expect the high prices to persist through the season. As the weather warms, they expect crabs will become more active and start filling watermen’s pots in bigger numbers.

Seafood disaster funds

Overall, though, the seafood industry is suffering. As part of the \$2 trillion economic stimulus bill passed in late March, Congress provided \$300 million in aid for fisheries hurt by the pandemic as their restaurant markets dried up.

On May 7, the U.S. Department of Commerce announced that Maryland fisheries would be aided by \$4.1 million and Virginia by \$4.5 million.

Matthew Strickler, Virginia’s natural resources secretary, said state officials were “greatly disappointed” by that amount, saying it falls “woefully short” of compensating the state’s seafood businesses for their losses. But federal officials said the allocations were based on a five-year average of revenues reported by affected operations.

The funds are meant for commercial watermen, charter fishing captains, oyster and clam farmers and seafood wholesalers and processors who’ve seen their business or markets hurt by the pandemic. To qualify, applicants for aid must show that they’ve suffered at least a 35% loss from COVID-19 relative to previous years.

Monitoring hiatus

Because of the difficulty in practicing social distancing and taking other safety precautions on research boats, scientists in Virginia halted their monthly Bay water quality surveys in March. Maryland did the same after February.

Although surveys in both states

COVID-19 CONTINUES ON PAGE 19

COVID-19 FROM PAGE 18

resumed the last week in May, it was the longest gap in data collection since the Baywide water quality monitoring program began in 1985.

Bruce Michael, who oversees the water-monitoring program at the Maryland Department of Natural Resources, said the overall impact should be minor, as the program's 35-year history has allowed observations in a wide range of conditions over time.

Still, he said, this year's warm winter followed by a long, cool spring was an unusual weather pattern for the Bay. The absence of monitoring means scientists will gain little information about how that may have impacted water quality or aquatic life.

"Every year is an unusual year in the Chesapeake Bay in some way," he said. "This year, it's been a very unusual spring, and that's one of the things we missed a little bit, characterizing that."

Monitoring of nutrient concentrations in many rivers and streams around the watershed was also missed this spring.

But the U.S. Geological Survey, which measures the amount of nutrients entering the Bay from each of its largest nine tributaries, was able to maintain that effort through the spring, said Scott Phillips, USGS Chesapeake Bay Coordinator.

State officials said they expect to resume monitoring soon, as are sampling programs by riverkeepers and other groups around the region.

Research on hold

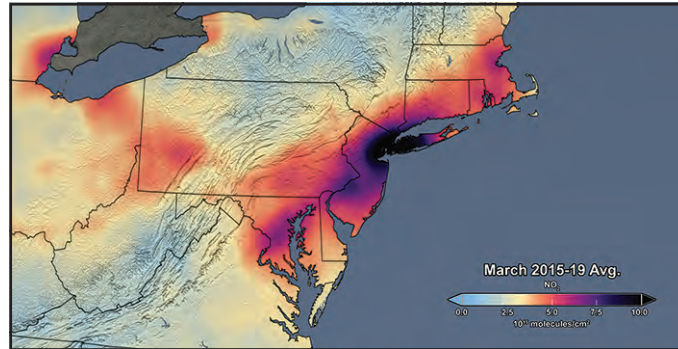
Scientific research and routine surveys have been largely shut down since March, with scientists teleworking and focusing on data analysis, modeling and other projects that can be done remotely. University research vessels throughout the Bay were idled until protocols can be worked out for crewing them safely.

Most impacted were researchers studying time-sensitive natural processes, according to Peter Goodwin, president of the University of Maryland Center for Environmental Science.

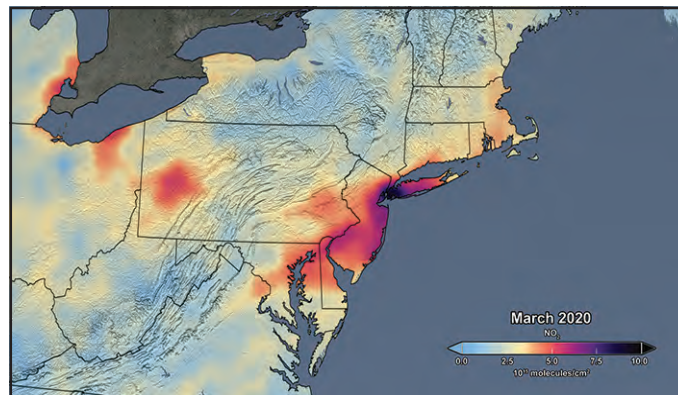
"If it's a seasonal effort and you've missed this year's window, those programs will have a significant delay," Goodwin said.

Mark Luckenbach, associate dean of research and advisory services at the Virginia Institute of Marine Science, said the need for social distancing required cutting back lab work and working remotely as much as possible. Field work that was not time-sensitive was put off.

The pandemic punched a hole in VIMS' longest-running fisheries survey. Every spring since 1955,



The average amount of air pollution from nitrogen dioxide during the month of March 2015-2019. Nitrogen dioxide gets into the air mostly from the burning of fossil fuels. (NASA)



The average amount of air pollution from nitrogen dioxide in March 2020, while travel — and the related burning of fossil fuels — was greatly reduced to address the outbreak of COVID-19. (NASA)

researchers have regularly trawled the Bay to sample the abundance and diversity of juvenile finfish. This year's trawls were canceled, Luckenbach said, and June's cruise is uncertain. Given the lengthy data record, he said, a gap of a few months isn't critical.

Still, some field work has gotten done. VIMS' arrangement with local watermen to sample and tag striped bass carried on — but instead of going out on the boat, the VIMS staff met the watermen at the dock and dealt with the fish there.

One of the biggest worries VIMS and other research institutions face, Luckenbach noted, is the unknown impact the pandemic will have on government funding for their work. Budget cuts are coming, he predicted, but the details likely won't be known until later this year or next.

Luckenbach said expenditures on government research grants already were down in April by 20% compared with outlays in the previous two months.

As states begin to ease stay-at-home orders, researchers expect to get back to the lab and into the field more often, though still with social distancing and other precautions.

Air pollution declines

One thing that benefited as activity in the region ground to a halt was air quality.

Researchers at NASA in Greenbelt, MD, have been tracking atmospheric

nitrogen dioxide since 2005.

Analysis shows that March set a record for the lowest levels of the pollutant for that month during 20 years of tracking. The amount was 30% lower than the typical March reading from 2015–19 along the Interstate 95 corridor from Washington, DC, to Boston.

Air pollution has been trending downward for years, "but this is a step-change down because of the emissions reductions we're seeing now," said Ryan Stauffer, a NASA research scientist who studies the atmosphere.

"This is like a grand, unintended experiment in atmospheric chemistry."

Ground-level sensors tell a similar story. The District of Columbia metro area saw a string of healthy air days stretching from March 20 to May 12, according to monitors that detect ozone and particulate matter. That 54-day streak shattered the region's previous record of 22 consecutive days, Stauffer said.

About a quarter of the nitrogen reaching the Bay stems from air pollution. About half of that is nitrogen oxides emitted from cars, power plants and other sources that burn fossil fuels. The rest is ammonia, which largely comes from agriculture.

Scientists are anxious to see if the emission reductions translate into less nitrogen in the region's waterways.

"The emissions have got to be dropping considerably," said the DNR's Bruce Michael. "If we can detect that in our water quality monitoring, that would be awesome."

Scientists don't expect the air quality gains to be permanent. By late May, traffic was already returning to pre-pandemic levels in some parts of Virginia.

Farming is hard hit

The pandemic has upended the region's farming sector.

Agriculture is the single largest contributor of nutrients and sediment to the Bay, and reduced production could mean a temporary reduction in polluted runoff. But it comes at a

tremendous cost to the region's farmers, and some warn that cash-strapped farmers will have difficulty participating in conservation programs.

During the pandemic, corporations such as Tyson Foods and Perdue Farms have slowed production because of worker shortages at processing plants. The close quarters inside the facilities have led some to become hot spots for infections. At two plants on Virginia's Eastern Shore, for example, nearly one out of five workers tested positive for COVID-19, according to local health officials.

The processing bottleneck left some farmers with nowhere to send their market-ready chickens. In Maryland and Delaware, nearly 2 million chickens were destroyed on their farms instead of entering the food supply.

"When the processing plants aren't able to process and run those chickens through, then that backs up what is out on the farm," said Holly Porter, executive director of the Delmarva Poultry Industry trade group. "Our chickens are only able to get to a certain size, and you start to have some animal welfare issues."

To keep plants from getting overwhelmed, poultry companies have been delivering fewer chicks for farmers to raise or extending the amount of time in between flocks. In Delaware and Maryland, the number of chicks delivered between April 11 and May 2 dropped by 28% and 45% respectively.

The reduced production is taking a toll on farmers. Virgil Shockley's two chicken houses sat empty in late May. He didn't expect to get a shipment of birds until June 1, or 49 days after his last chickens departed. Typically, the "layout," between flocks is no more than 24 days.

Any time not spent raising birds is time not spent making money, the Eastern Shore farmer said.

Dairy farmers who had already been struggling in recent years have been further slammed by the pandemic.

The closure of schools and restaurants sharply reduced demand for milk across the country, said Lindsay Reames, director of sustainability and external relations for the Maryland and Virginia Milk Producers Cooperative Association.

Cows must be milked twice a day, and that milk must get to market within about 48 hours. Some dairy farmers had no choice but to dump their milk down drains or onto fields.

"For a lot of farms, this was going to be the recovery year," said Liam Migdail, communications director for the Pennsylvania Farm Bureau. "They've been treading water for the last couple of years, waiting to get by for that good year when they could pay down their debts and get back on solid ground to go into the future, and this pandemic just pulled the rug back on all of that."

SOIL FROM PAGE 1

ecosystem of bugs, worms, fungi, microbes and bacteria to make the soil healthier and less threatening to the environment.

The result, over time, is a soil with a rich, intertwined web of living matter. You may have heard it called soil health, regenerative agriculture or carbon farming.

While no-till and cover crops are key ingredients, soil health is broader than those two environmentally friendly farming methods and can also incorporate changes to crop rotation, livestock grazing and other actions.

“It’s using the soil not simply as a medium. It’s a win-win. Farmers can cut costs, and we can clean up the water,” said Franklin Egan, of the Pennsylvania Association for Sustainable Agriculture. Though each farm is different, farmers generally see benefits within a couple of years, and soil fertility increases each year for up to 20 years or so without drop-offs in crop yields from cutting back on commercial fertilizer.

Proven dividends of this laissez-faire approach include less soil runoff and more nutrients being manufactured by the plants themselves, reducing the need for other sources of fertilizer. The protective layer of plants hinders the growth of weeds, and organic matter in the soil discourages plant diseases. Beneficial insects attack crop pests. Herbicide and fertilizer costs are cut — though generally not eliminated — and farmers have more time for other farm chores because they are not plowing fields. Cover crops can be used as feed for livestock or grazed, saving farmers more money.

Over time, as all of the underground elements team up, soil structure improves too — increasing its ability to act like a sponge to both hold more moisture during storms and release water during dry periods. Farmers call it weatherproofing their fields: A single acre can hold 25,000 gallons more water than one that is tilled.

While not tilling soil would seem to invite more weeds and insect pests, advocates of soil health say the use of pesticides



No-till and cover crop consultant Steve Groff of Lancaster County, PA, takes a deep whiff of soil to check its bouquet, the sweet smell of fertility, the result of managing his farm fields with soil health practices. (Dave Harp)

and herbicides can be vastly reduced because crops grown in healthy soil resist pest pressure and allow natural enemies of pests to thrive. And, the use of cover crops suppresses the growth of weeds.

The constant layer of plants also sucks up earth-warming carbon. According to a 2018 study by government and university scientists, the use of cover crops on all of the nation’s farmland could remove 103 million metric tons of carbon dioxide each year from the air. That’s equivalent to eliminating harmful global warming emissions from 21 million vehicles.

That would help farming become part of the climate change solution rather than be part of the problem. Currently, agriculture accounts for 10% of all greenhouse gas emissions in the United States, according to the U.S. Environmental Protection Agency.

For the consumer, crops grown in fields with healthier soil have more nutrition and essential oils that aid immune systems and bodily functions.

“I just feel this is the future of agriculture and this is where we need to be at a national level,” said Lisa Blazure, coordinator of a newly created soil health position at the Stroud Water Research Center in Pennsylvania.

The Natural

Resources Conservation Service, the federal government’s chief conservation agency for farmers, was formed after severe dust storms during the Depression ravaged U.S. prairies — a landmark example of the price to be paid for poor soil management. The agency was slow to embrace soil health but now is one of its main cheerleaders, calling it “the next frontier of conservation.” Tilling the soil, it says, “is like burning down the house” and destroying the microbiological community under the surface.

Agency handouts urge farmers not to “treat your soil like dirt.” One says, “We believe improving the health of our nation’s soil is one of the most important endeavors of our time.”

Advocates say a soil health ethos also is badly needed to keep the nation’s soil from disappearing. In the last 40 years, it’s estimated that one-third of all the world’s food-production soil has been lost to erosion. Soil is vanishing 10–100 times faster than it is being formed.

“There’s soil and then there’s dirt. Farming is a degraded resource right now and we’ve kind of accepted that as normal,” Blazure said. “We used to have the viewpoint of what can the soil do for the plant. With soil health, we realize it’s not a one-way street. The plants and that crop are doing as much for the soil as the soil is doing for the plant.”

For the Chesapeake Bay, the movement could be fortuitous, over time reducing significant amounts of runoff sediment and nutrients flowing into the Bay, though it is unlikely to be adopted on a wide enough scale in time to help states such as Pennsylvania meet its reduction goals for sediment

and nutrient by 2025.

“Our hope is it will help the Bay. We really want to try to help the scientific community understand what the impact of healthier soils is on delivery of pollutants to waterways,” said Garber of the Stroud Water Research Center.

PennFuture, a Pennsylvania environmental group, now considers soil health practices more important than planting streamside buffers for the state to attain its Bay cleanup commitments.

State and federal farm agencies are pushing to make soil health a standard land management practice in Bay states. And research institutions are rushing to complete studies to prove the benefits farmers have found on their own.

In 2019, Pennsylvania added soil health, for the first time, to the seven priority conservation practices for farmers listed in its most recent Bay cleanup plan.

And a state program that gives Pennsylvania farmers tax credits in exchange for using conservation practices now includes soil health best management practices.

Elements of the soil health movement are starting to take hold in the region. Pennsylvania farmers have led the way nationally in bringing no-till agriculture to the fore. In 2002, 20% of farmland in the state used no-till methods to grow crops. That figure has risen to 60%, according to the National Agricultural Statistics Service.

Maryland ranks first in the nation for the use of cover crops on farms. In 2017, the legislature created a Healthy Soils Program and instructed the Department of Agriculture to expand the adoption of soil health practices. Agency officials estimate that more than half of the state’s ag fields use cover crops and conservation tillage.

“My impression is soil health is pretty mainstream in Maryland. Our farmers are progressive thinkers,” said Alisha Mulkey, head of the Healthy Soils Program.

Virginia ranks third in the nation in the percentage of farm fields using cover crops.

New York has spent \$5 million since 2015 on climate resilient farming. Soil health practices are a linchpin. And in 2018, legislation was passed to create a two-year soil health project.

The federal government is investing in Bay region soil health, too. Last fall, Maryland got a grant from the National Fish and Wildlife Foundation to launch a \$2.3-million program to get 150 more farmers to adopt soil health practices.

Another grant and matching funds will support a \$2-million program at Virginia Tech to help the Virginia Soil Health Coalition expand soil health practices in the Shenandoah Valley and the lower Eastern Shore. The effort also will educate consumers and producers about the benefits of soil health.

The Stroud Water Research Center will spend \$2.9 million to get 4,500 farmers in Pennsylvania to turn to cover crops, no-till

SOIL CONTINUES ON PAGE 21



A winter cover crop of crimson clover in a farm field in Clinton County, PA. It not only helps to fix nitrogen in the soil but can be used for forage. (Lisa Blazure)

Bay crab population decreases, but numbers still 'robust'

≈ Dredge survey suggests crustaceans should be readily available through summer

BY JEREMY COX & TIMOTHY B. WHEELER

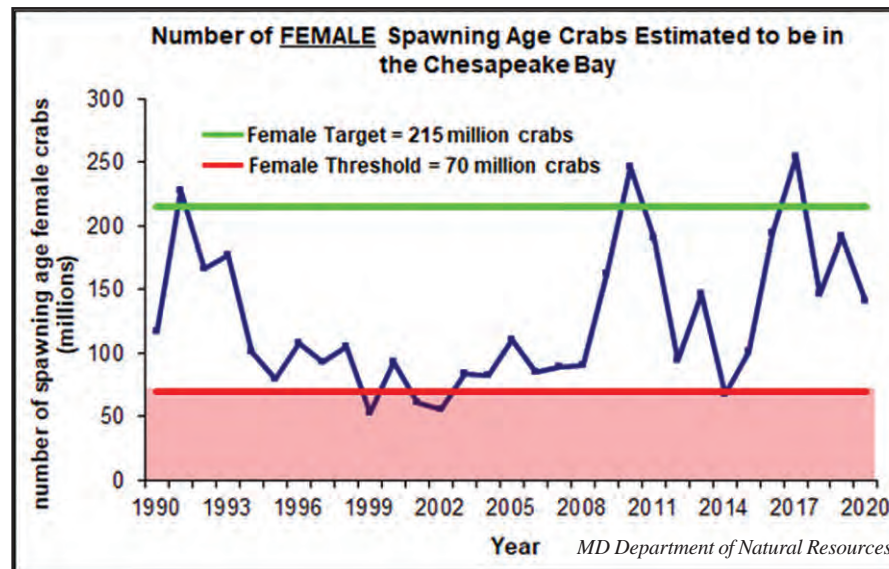
A survey that historically has guided blue crab management in the Chesapeake Bay and its tributaries shows the population has dipped by nearly 32% but likely not enough to trigger new restrictions on this season's harvest.

The annual winter dredge survey, released May 20, suggests that the crustacean's numbers remain "healthy and robust," despite the downturn, said Steven Bowman, head of the Virginia Marine Resources Commission, which oversees the state's fishing regulations.

"We don't expect this will change our 2020 management measures for blue crab, and we will continue to manage blue crabs based on the best available science," he added.

Officials in Maryland also emphasized the population's resilience in their remarks on the report, but they stopped short of indicating how it might influence their management decisions.

The dredge survey results suggest that crabs should be available in their "normal capacity," said Genine McClair, blue crab program manager for the Maryland Department of Natural Resources. The department



conducts the survey jointly with the Virginia Institute of Marine Science. "We're in a place where we want to be," McClair said. The overall population of 405 million was near the average number of crabs counted during the survey's 30-year run.

Biologists use dredge equipment to capture crabs at 1,500 sites throughout the Chesapeake Bay from December through March. They were just able to complete their work before the lockdowns began in late March, McClair said.

By every significant measure, this year's numbers pale compared with last year's study. But most were still above the threshold that scientists consider safe to sustain the population.

For example, adult females, a key indicator of future reproductive capacity, fell by more than a quarter to 140 million. That is below the 215 million target set by scientists but still twice the minimum safe total of 70 million.

The female population has been above

that threshold for nine of the last 10 years, a sign that the species' spawning pool is not in the danger zone, officials say.

Much of this year's decrease was because of a drop in this year's "juvenile" class, which was down 43%. "That doesn't sound good for this fall and next spring," when the newcomers will finally grow large enough to harvest, said Billy Rice, a waterman from Charles County, MD.

Regulators and environmentalists attribute the crab's overall rebound to measures implemented in Maryland and Virginia waters after the U.S. Department of Commerce declared the fishery a disaster in 2008.

Reactions to the survey, from environmentalists to watermen, appeared upbeat when contrasted against this season's other turmoils. State-enacted lockdowns shuttered restaurants to slow the spread of the coronavirus just days before the April 1 opening of the season. Poor weather sidelined watermen for much the first month, and a shortage of temporary foreign workers has left many crab processors shorthanded.

Still, demand for crabs has skyrocketed in recent weeks, and prices have, too.

Watermen say they don't expect the high prices to persist through the season. As the weather warms this summer, crabs will become more active and start filling watermen's pots in bigger numbers.

SOIL FROM PAGE 20

and rotational grazing through farmer-to-farmer soil health "hubs."

Big ag business is starting to jump on the bandwagon as well.

General Mills, Tyson Foods, Pepsi, Walmart, Monsanto and others are encouraging their supply-line farmers to use soil health practices to deliver better quality foods and satisfy consumer demands for healthy farming. Even Wrangler has rolled out a brand of high-end jeans, called its Rooted Collection, made of cotton grown using cover crops and no-till fields.

One of the remarkable things about the soil health movement is that it has been unearthed and championed by farmers themselves, with little initial support from government.

"The farmers believe in it because they've come up with it," Blazure said.

"The Pennsylvania No-Till Alliance was tired of hearing my agency or Penn State Extension or conservation districts saying this won't work around here when they were having success," said Mark Goodson, state agronomist in the Pennsylvania office of the federal Natural Resources Conservation Service.

"When you hear from another farmer it's a lot more believable than hearing it from a government person or an academic," said Charles White, a Penn State assistant profes-

Cover crops planted in farm fields for the winter not only bind the soil, but help insect life and suck up carbon dioxide.
(Dave Harp)



sor and Extension specialist in soil fertility and nutrient management. "The conversation has really changed. Credit pioneering farmers."

Even today, the movement grows primarily through field demonstrations by farmers hoping to convert their neighbors. The Extension and NRCS are increasingly holding similar field days.

"That's been the spark plug," said Steve Groff of Lancaster County, a vegetable farmer who travels the world as a cover crop and no-till consultant. "It relies on farmers (realizing) that it's about our own farms and we can actually grow our cash crops in a way that is most cost-effective."

Like Bupp, many of the pioneers of soil

health discovered its benefits by accident.

Thirty years ago, Lancaster County, PA, dairy farmer Jim Hershey tried no-tilling as a way to save time and fuel as he and his wife struggled to run the farm themselves. "There was nothing much talked about back then about keeping nutrients on our soil. And I thought the Chesapeake Bay was not even close to me and it's not something I had to worry about." A lot has changed since then. Hershey was a founding member of the Pennsylvania No-Till Alliance and has been its president since 2010.

"I like to say no-till without cover crops is still dead soil," he said. "It's not providing any nutrients to the soil biology and

microbes to keep that soil alive, healthy, productive and able to recycle nutrients."

Groff, who experiments with cover crop mixes with up to 13 different plant species to enrich the soil, only stumbled into the deep-rooted benefits of soil health. "We didn't know about soil health back then. I did it because I didn't want ditches in my field."

What will it take to make soil health mainstream and the most common method of farming?

More peer-to-peer mentoring, reinforcing scientific research, nudging agri-business and consumer demand, experts say. Also needed is finding ways to reward farmers who use soil health practices, such as getting more for their products or discounts on federal farm insurance premiums.

Part of the resistance by some farmers is simply change. "We've been trying to tame nature and make soil into a monoculture for so long. We've always said you have to kill everything so we can plow the soil. And now we're replacing the paradigm and it's just hard," Goodson observed.

Soil health advocates also find pushback from fertilizer, pesticide and equipment companies.

But Hershey, for one, thinks most farmers will see the light. "This is a revolution that's occurring and it's very promising for cleaner agricultural production. Much cleaner."

WATER FROM PAGE 1

is about coronavirus spreading through open water. And plenty of other harmful bacteria could be present instead.

To that end, he helped create the Swim Guide app, where groups collecting water quality data can post it for the public to consider before engaging in water recreation. The app is now used in nine countries and by several Chesapeake Bay advocacy groups to post the results of weekly bacterial monitoring programs.

“The COVID-19 pandemic has added a new intonation to the question of whether or not you can get sick if you go to the beach,” a post about new coronavirus risks on the Swim Guide’s website begins. But, it continues, the tests on which the website’s information is based are “already designed to provide you with an indication of your health risks from recreational water illnesses when you go swimming.”

In other words, the tests already flag sites that might be unsafe for water contact because of sewage leaks or overflows — posing risks from bacteria, if not coronavirus.

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

Scientists worldwide have pivoted much of their research to focus on the coronavirus, and that is true for the sewage and wastewater industries as well.

The U.S. Environmental Protection Agency in May hailed a new study showing that SARS-CoV-2, the virus that causes COVID-19, could be detected in urine and stool samples at wastewater treatment facilities. So far, the virus has turned up there in higher concentrations than expected based on the number of clinically confirmed cases.

This data could help localities determine how many people are actually infected in a given area — including those without symptoms — and help them track changes in infection rates over time.

But these findings also raised new concerns about whether wastewater could be an additional conduit for the disease, particularly for those whose work puts them in potential close contact with sewage. The initial concern was for wastewater treatment plant workers, but those whose work involves collecting water samples that could contain traces of sewage also took notice.

There is currently “no evidence to date” that the coronavirus has been transmitted to a person via wastewater, either before or after the sewage moved through a wastewater treatment plant, according to the World Health Organization.

When wastewater became the latest frontier for coronavirus research this



Researchers say the risk of contracting COVID-19 from swimming appears low, but the public should always use caution when recreating in water that receives sewage overflows during rain. (Dave Harp)

spring, the Hampton Roads Sanitation District in southeast Virginia was uniquely positioned to respond. The district, which provides wastewater treatment to 18 cities and counties in the region, had recently begun using molecular technology to identify emerging pathogens that could be coming in with the region’s wastewater as part of a pilot project started last July.

This foray into “wastewater epidemiology” could be used to identify public health trends in the population, from opioid use and antibiotic resistance to disease outbreaks.

The technology uses DNA sequencing to identify the presence of certain pathogens or chemicals while another machine allows the scientists to quantify how much is present. The district began monitoring for coronavirus in early March, around the time the World Health Organization declared a global pandemic.

“We were already set up to monitor wastewater, so it was a matter of validat-

ing and verifying the coronavirus methods as soon as they became available,” said Raul Gonzalez, an environmental scientist leading the effort.

So far, the treatment plants’ data reflects that the region could have about 10 times more coronavirus cases than were being counted by clinical statistics, a number that mirrors findings from studies in other locations.

But the district’s technology can’t tell researchers whether the coronavirus strains they find in wastewater are still “alive” or able to infect additional people. The technology identifies the virus by its RNA, but doesn’t culture the virus to see whether it is still viable. Doing so would require a lab with one of the highest levels of pathogen safety. Few exist, but one in Arizona is conducting such a study.

“It’s still too early to definitively state whether wastewater contains infectious coronavirus,” Gonzalez said. “But we have an idea of which way all the studies are leaning.”

As of mid-May, he said, most of the studies indicate that coronavirus is no longer viable once it has passed through the digestive tract. One study indicated that fluid in the colon would be strong enough to deactivate the virus, “so by the time it gets into the stool and then wastewater, it’s likely inactive,” Gonzalez said.

This conclusion mirrors other scientific findings that coronaviruses have a “low environmental viability” and can easily be deactivated by disinfection or other environmental stressors.

A spokesman for DC Water, which runs the largest advanced wastewater treatment facility in the world at Blue Plains in the District of Columbia, said their treatment process would inactivate the virus.

“Right now, all water treatment processes using disinfectant would kill any bacteria, including COVID-19,” spokesman Vincent Morris said.

The virus could still be present in any raw sewage that overflows into streams and rivers, when rain overwhelms underground pipes or a treatment plant’s capacity. These polluted spills, called combined sewer overflows, occur in many communities throughout the Chesapeake region.

“In general, where there are combined sewer overflows, we tell everyone to avoid the water and so do not expect to change the guidance now,” Morris said.

The Waterkeeper Council sent out a memo at the end of March suggesting waterkeepers take additional precautions to protect themselves when collecting water samples, especially near outfalls for sewage-tainted stormwater.

The memo mentioned that, during the SARS-CoV outbreak in 2003, there was “documented transmission associated with sewage aerosols” at a sewage treatment plant, a potential concern that was reiterated by more recent coronavirus research out of China.

Because waterkeepers collect water samples that could contain sewage, the potential for those particles to become aerosolized through a splash or spill led the council to recommend gloves, masks and other precautionary measures.

Baltimore Harbor Waterkeeper Alice Volpitta said she wasn’t sure how to feel in advance of Memorial Day weekend as she prepared to take her first samples of the season — equipped with a face mask, goggles and gloves.

Volpitta said concerns about coronavirus in wastewater are another reminder that it’s important to curb sewage leaks and overflows in the region, which make water recreation inherently risky.

“Today, it’s coronavirus. Four years ago, there was Ebola, and there will be something else,” she said. “There are always horrible pathogens in sewage, which is why we can’t let our guard down even after this virus starts to leave the news cycle.”

A whopping whale of a quiz for you

English colonists were quick to take advantage of whales visiting the Chesapeake Bay. Processing the carcass left a ton of whale blood and bits in the Bay, which reeked and depleted the water's oxygen when they decayed. This led Virginia's Middlesex Court, in 1698, to ban the killing of whales in the Bay — one of the first legal actions against water pollution in the Chesapeake. Answers are on page 37.

- The scientific name for the humpback whale is *Megaptera novaeangliae*. What does this mean?
 - Big-winged New Englander
 - Oceanic exploding star
 - Large ocean angel
 - Sky leaper
- Humpbacks are known for being the most athletic whales when it comes to leaping out of the water (also known as breaching). Their breaches are about as long as the whale itself. How long is this?
 - About 40–45 feet
 - About 45–50 feet
 - About 50–55 feet
 - About 55–60 feet
- On average, how thick is humpback whale blubber?
 - 6 inches
 - 12 inches
 - 18 inches
 - 24 inches
- Toothed whales, as a rule, have one blow hole. Why do humpbacks and other baleen whales almost always have two blowholes?
 - They tend to be larger whales, and the two holes can inhale and exhale large amounts of air more effectively.
 - One hole is used to inhale while the other exhales.
 - Baleen whales' large sneezes would overpower one blowhole.
 - One hole is a backup if the other gets clogged with plankton.
- Humpback whales eat plankton, small crustaceans and small fish, including herring and anchovies. What Chesapeake species is particularly enticing to humpbacks?
 - Baby blue crabs
 - Menhaden
 - Striped bass
 - Yellow perch



A breaching humpback whale is a wonder to behold. There are many theories about why they do this, but no one knows for sure. (Whit Welles / CC BY 3.0)



See question 6 below. (Image collected under MMPA research permit #17355. / NOAA Fisheries/Leah Crowe)



- In the bottom photo, a pair of humpbacks are circling their prey and blowing bubbles toward them, which forces the fish into a tight ball, making it easier for the whales to swallow them. What is this technique called?
 - Bubble net fishing
 - Circle seining
 - Humper hunting
 - Whale-pooling
- The humpback's flippers, about a third of the length of the whale's body, are the largest appendage in the animal kingdom. About how long do they grow?
 - 8 feet
 - 12 feet
 - 16 feet
 - 20 feet
- Humpbacks are known to be very protective not only of other members of their pod, but other

species as well. Which of these are documented incidents?

- A snorkeling whale biologist reported that in 2017 she was saved from a tiger shark by two humpbacks: One pushed her away from the shark while the other used its tail as a barrier between her and the predator.
- In 2009, a marine ecologist with the U.S. National Oceanic and Atmospheric Administration in Antarctica saw a group of killer whales pursuing a seal that they had knocked off an ice floe. Two humpbacks appeared. One rolled over on its back and swept the seal onto its chest. When the killer whales closed in, the humpback raised its chest, along with the seal, out of the water. As the seal started to slide off, the humpback used its flipper to push the seal to the center of its chest. The seal stayed there until it was able to safely swim to a nearby ice floe.
- There are numerous reports of humpbacks guarding gray whale calves and sunfish from killer whales.
- All of the above.

— Kathleen A. Gaskell

Humpback whales are occasional visitors near the mouth of the Chesapeake Bay. If you took a time machine back 10 million to 14 million years ago, you would have regularly seen a variety of whale species in the Bay, which was a subtropical, shallow sea at that time. Now is the time to test your knowledge of whales. Answers are on page 37.

- Whales are a(n):
 - Amphibian
 - Fish
 - Mammal
 - Reptile
- Which species is the whales' closest living relative on land?
 - Elephant
 - Hippopotamus
 - Rhinoceros
 - Warthog
- There are two types of whales: toothed whales, which capture prey with their teeth, and baleen whales, which capture and filter prey and plankton through large filters called...baleen. Baleen are strips that hang from a whale's upper jaw, with brushlike bristles on one side that filter the food. Baleen are made from the same type of material as:
 - Bones
 - Fingernails
 - Skin
 - Tendons
- All whales have blubber, a thick layer of fat just beneath their skin. What is the purpose of blubber?
 - It prevents whales' internal organs from freezing in cold ocean water.
 - It helps whales, which are very heavy, float.
 - In many adult whales, blubber is too thick for predators to bite through.
 - It is a source of energy when sources of food are low.
 - All of the above.
- A whale's tail has two lobes, called flukes, which meet in a v-shaped notch. The tail helps the animal swim, but not in the same way that it helps fish. How is it different?

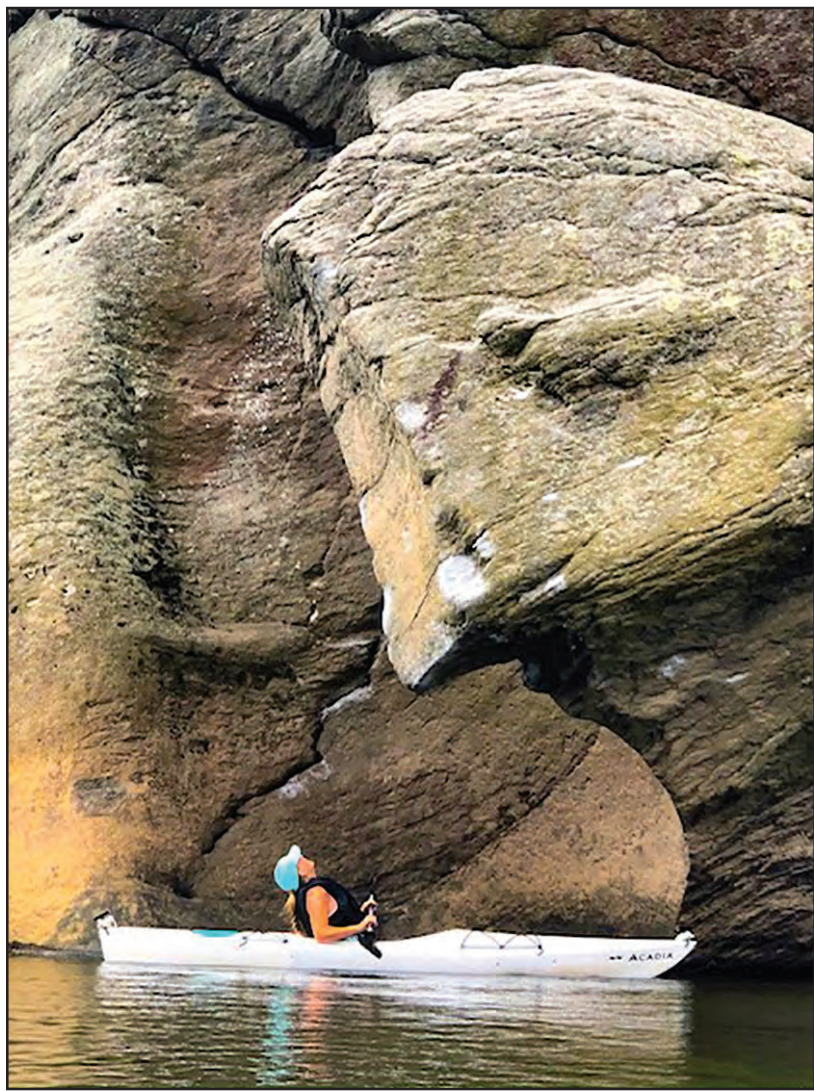


Bay Buddies Whales

- The tip of each fluke flaps in the opposite direction of the other.
 - The fluke moves up and down instead of side to side.
 - The fluke spins in circles like a propeller.
 - The fluke is only used for steering. Flippers make the whale move.
- True or false? There are no bones in a whale's flukes.
 - What is the purpose of a whale's blowhole?
 - The whale uses it to release the water it has swallowed after all of the fish and plankton have been filtered out.
 - The whale uses it to breathe.
 - The whale uses it to sing.
 - Both A & C.
 - How does a whale breathe when it is underwater?
 - It breathes through its gills.
 - It breathes through its mouth.
 - It has special air sacs in its throat.
 - It can't breathe underwater and must hold its breath until it returns to the surface.
 - If a whale had ears that stuck out, they would make the animal less streamlined. In fact, their ears aren't even open to the outside. But a whale's sense of hearing is so keen that it allows the whale to keep track of its child, locate food, navigate and communicate with other whales in its pod. Where is this hearing structure located?
 - Blowhole
 - Flippers
 - Forehead
 - Jawbone

— Kathleen A. Gaskell

Conowingo Islands paddle sure to rock your world



A kayaker on the Susquehanna River marvels at a rock formation on the Conowingo Islands. (Troy Hassler)

BY AD CRABLE

Years ago, Roberta Strickler, a kayaker from Lancaster, PA, stood on the Norman Wood Bridge across the Susquehanna River, transfixed by an odd assortment of rounded rock islands just downriver.

"It's one of the few places on the Susquehanna that still looks the same as when the Indians saw it," observed her companion, an area naturalist.

Indeed, the Conowingo Islands — "The Boulders" if you are a paddler — are unique and one of the most scenic river landscapes in Pennsylvania. They have become a popular yet uncrowded getaway for paddlers from novice to experienced, as well as those on foot who can often hop onto one of the islands.

Just below the towering Norman Wood Bridge (PA Route 372) in southern Lancaster County, about 8

miles upriver of the Maryland line, the cluster of about 30 water-sculpted rock islands is like no other on the Susquehanna.

"It's just sort of a magical little getaway and you never know what's around the corner," said Amy Jo Mitchell, a Pennsylvania paddler who explores the labyrinth of islands and shifting currents in her homemade kayak.

Their uniqueness derives from being shaped by thousands of years of erosion from river bedrock. In contrast, most islands in the Susquehanna were formed from deposits of silt.

This difference has created a landscape both harsh and beautiful. Some are reminded of a slice of Maine.

Matt Samms, a two-time member of the U.S. Canoe and Kayak Wildwater Team, likes the islands and the nearby Holtwood Whitewater Park so much that he moved to a home within sight of the islands.

"It's an awesome spot," he gushed. "It's so moist down there, and the soil is so fertile. There are little ponds on the islands, and the islands are so dense and jammed with rich moss. It's like the Pacific Northwest."

The islands of varying sizes stretch from the base of the Holtwood Dam to 3.5 miles downriver. But the islands that paddlers head to are all below the Norman Wood Bridge on PA Route 372.

The islands range from small outcroppings to 65-acre

Upper Bear Island. All of the islands are uninhabited except for several at the downriver end of the chain that have a few cottages

"I definitely think it's almost an otherworldly feel. Certainly, it's like no other stretch of the Susquehanna," said Devin Winand, who guides paddlers through the islands for Shank's Mare Outfitters in nearby Long Level, PA.

For the kayaker, the Conowingo Islands are a playground filled with a maze of channels to explore amid towering rocks, hidden coves, vistas, sandy beaches and swimming holes. You'll also find huge river "potholes," created by a trapped rock grinding downward for hundreds of years, that can be 10–20 feet deep and wide. Get out of your boat and explore.

"They looked like this mysterious wonderland," said paddler and photographer Seth Dochter of New Holland. "Every single island looks different. Every single channel is different."

There are weird currents to play in and excellent fishing. Cliffs are everywhere, some towering 200 feet above the water.

For the adventurer on foot, one of the large islands, Peavine Island, is usually accessible from the shoreline Mason Dixon Trail on the York County, or western side of the river.

Bushwhack through thick forests to scale craggy summits for breathtaking views of the islands and explore little ponds and rare plants that have adapted to constant inundation and exposure. Deposits of soil filling in cracks, crevices and potholes in the schist and gneiss metamorphic bedrock sprout plants uncommon to Pennsylvania. Other plants such as Bradley's spleenwort, American holly and arrow-feathered three awn are found near the northern limit of their range.

Wildlife is abundant also. Look for beavers, otters, deer



A huge pothole in the Conowingo Islands, now broken open, was formed as swirling water drilled a trapped rock through bedrock for thousands of years. (Troy Hassler)



The Conowingo Islands, with their sculpted faces and unique flora, are the most unusual islands in the Susquehanna River. They are located in southeastern Pennsylvania, about 8 miles upstream from Maryland. (Ad Crable)

and all kinds of birds. Bald eagles are all but guaranteed. Jack Ridings, Jr., of Lancaster likes to cruise between the islands at night with a bow and arrow, looking for carp and catfish. He has arrowed carp weighing up to 46 pounds, and the state record flathead catfish of nearly 51 pounds was caught in the area.

One of the pleasures of paddling the islands is that you rarely run into personal watercraft or large power boats because of rocks lurking just below the surface. It's a retreat for quiet-water paddlers. "You don't have that noise or the smell of diesels when you're on the water," Mitchell said.

The islands' uniqueness extends to its many and fluctuating water levels and currents. Though paddling is usually in calm water in summer months, river levels can change abruptly and dramatically. The hydroelectric Holtwood Dam just upriver of the islands can release water at any time. So can the Muddy Run Pumped Storage Facility on the Lancaster County side. And the Conowingo Dam downriver can drain river levels.

Though not treacherous, changing water levels in the narrow channels between the islands can create changing eddies, swirls and currents that can slam you against rocks if you aren't paying attention. Paddlers who frequent the boulders emphasized

the need to stay abreast of scheduled water releases, listen for the warning sirens at the Holtwood Dam and wear a personal flotation device.

"I've experienced the water level go up a foot in a half hour to an hour, and the current changed considerably," said Joe Hainey of Dover. There have been water rescues for swimmers getting into trouble in the currents and for people stranded on the islands after sudden rises in river levels.

"If you have no experience with moving water, and if you thought you were going to be paddling on a lake all day, you can get pinned up against a rock," Samms advised.

Most paddlers launch from the Pennsylvania Fish and Boat Commission's Muddy Creek Access off 534 Johnson Road in Delta or the adjacent Lock 15 Interpretive Park. The Muddy Creek boat launch has a 20-foot-wide ramp and docks, but you will need a PFBC unpowered boat launch permit sticker on your kayak. They cost \$12 a year. Or, you can launch for free from the bank at Lock 15. It's about a half-mile upriver to reach the islands.

To check on scheduled releases and water levels at Holtwood Dam, go to safewaters.com/facility/10. If water is spilling over the dam, it generally will be rough paddling upriver for most paddlers. Kayakers should wear personal flotation devices.

Highlights

The path between the Conowingo Islands is part of the 53-mile Susquehanna River Water Trail. A map is available for purchase from the Susquehanna National Heritage Area at susquehannaheritage.org or 717-252-0229.

A must see: On the upriver tip of Lower Bear Island, climb up to a plateau for a panoramic view of the Conowingo Islands. A half-mile downriver of the boat launch you can paddle up scenic Muddy Creek for about a half mile.

For kayak rentals and guided kayak tours: Shank's Mare Outfitters in Wrightsville, PA, 717-252-1616, shanksmare.com; or Kayaking Made E-Z in Conowingo, MD, 443-731-1100, kayakingmadeez.com.

To explore Peavine Island by foot, park at the Lock 15 Historic Interpretive Park, 270 River Road, Airville. Follow the blue-blazed trailhead for the Mason Dixon Trail near the park entrance upriver for about a half-mile. If the river level is low enough, you will see a place to rock-jump the short distance to the island. No fires or overnight camping are permitted on any of the Conowingo Islands, according to owner Exelon.

Please enjoy the outdoors responsibly. Boating, hiking and fishing are acceptable forms of outdoor activities under current coronavirus guidelines, as long as social distancing is practiced.



A group of kayakers enjoys the rocks of Conowingo Islands on the Susquehanna River. (Troy Hassler)

Meander through marshy curves at Janes Island State Park



Kayakers explore the saltmarsh at Janes Island State Park on Maryland's Eastern Shore.

STORY & PHOTOS
BY WENDY MITMAN CLARKE

Midmorning, early November, and our walk-and-coffee ritual along Daugherty Creek Canal at Janes Island State Park in Maryland comes to an abrupt halt as a white-tailed deer leaps through the marsh across the canal. Bounding over shimmering saltmeadow hay and saltmarsh cordgrass, she's headed north, a full-racked buck in lively pursuit.

We watch the drama until they're out of sight, thinking that's the end of it — but moments later the doe is back in view racing south.

She jumps into the canal, swimming straight for us and a few other people who've been equally startled to a standstill. We yell at her to turn her back. The campground side of the canal is lined with a bulkhead as far as you can see, the tide is low, and there's no way she could climb out.

The doe reverses course, scrambles back into the marsh and takes off again, heading for the tufts of pines that mark higher ground and possible respite from the chase, though the buck follows relentlessly a quarter-mile behind.

Not your average morning coffee, but that is part of the surprise and wonder of this state park near Crisfield on the Eastern Shore of the Chesapeake Bay.

Though its mainland campground and facilities are easily accessible by car, the park's jewel is its namesake island right across the canal from the campground and reachable only by boat. With 2,900 acres of saltmarsh island to explore by kayak and canoe, Janes Island offers that rarest of treasures in an increasingly noisy and populated region — the ability to go off grid for a couple of days or hours; immerse in nature, water and weather; and absorb with awe an untrammelled horizon and boundless sky.

More than 30 miles of well-marked water trails perforate and circumnavigate the island. For those who make

the 2-mile paddle from the park's boat launch to the island's western shore, the reward is a 6-mile white ribbon of beach along Tangier Sound. If you're lucky, you may have it to yourself.

And with this solitude and natural beauty, you can have all of the comforts of home after a day at the edge of the wild — unless you want to camp in the wild at one of the island's three paddle-in sites.

In the mainland campground, about 100 sites are tucked within a loblolly forest, half of them with electrical hookups for RVs, as well as a handful of waterfront cabins, camp store, a small but informative nature center, boat ramp and fish-cleaning station, and canoe and kayak rentals if you don't bring your own.

Besides paddling, people come here to take their children crabbing or go fishing by paddle, powerboat or casting into the canal from land.

Birders check a variety of species off their "life lists." Meanwhile, you can climb the park's 24-foot-high observation tower to watch the setting sun fire the marsh in tones of gold, red and copper as it drops into the horizon beyond Tangier Sound.

For all of these reasons, Janes Island is an extremely popular park, and we felt lucky to snag a last-minute site twice last fall. Our first trip in late September included our Chesapeake Light Craft teardrop camper, a two-person kayak and two dogs. (Several sections of the park offer pet-friendly camping.)

We left the dogs at home when we returned in early November to enjoy some solitude and paddling. The additional advantage of coming later in the season is to avoid the bugs — for which Janes Island is rather notorious.

The island has deep history. Peoples of the late Paleolithic period settled the area about 13,000 years ago. At that time, according to stateparks.com, sea levels were 350 feet lower than today, with mammoths, mastodons, horses and bison roaming across land that is now Maryland's Somerset County. As Tangier Sound shifted from a freshwater river to an estuary, humans moved into the area that became Janes Island. Among later inhabitants were Native Americans of the Annemessex Nation.

As recently as the late 1800s, Janes Island was still fertile and high enough above sea level to support farming and fishing communities. At Old House Cove — directly



The campground at Janes Island State Park in Maryland offers about 100 sites tucked within a loblolly forest, half of them with electrical hookups for RVs.



across from Crisfield — a thriving farming community in the 1800s grew watermelons, apples, peaches and other crops. In 1900, a fish-processing plant was built at the cove's southernmost point; today "the Stack," a 50-foot-tall brick chimney, is all that remains.

Like so many of the Bay's offshore islands, time, erosion and sea level rise have slowly rendered Janes Island from solid ground to something decidedly more sievelike.

I purchased a fold-out map printed on water-resistant paper from the park's store to guide our paddling adventures. On one side of the map, an aerial image shows Janes Island to be a loosely connected mesh of marshy islets, riven with guts, thoroughfares and meandering water paths, joining Old House Cove to the south all the way up to Rock Hole, Rock Pond and Acre Creek to the north.

Daugherty Creek Channel — dredged decades ago to provide Crisfield's watermen a safer, quicker way to the Big Annemessex River — is the only straight line amid the winding tangles of water that constitute the island's main body and make it a paddler's paradise. Seven marked trails range in length from 2–12 miles and range in difficulty from sheltered canals to the open waters of Tangier Sound and the Big Annemessex River.

During our September visit, we provided entertainment (or at least suspense) at the boat ramp as we loaded ourselves and our two dogs into a two-person kayak and set off

on the yellow trail into Ward Creek, which cleanly bisects the island. Fortunately for us, given our rather low waterline, the first section is fully protected to the south by loblolly forest and to the north by marsh that once was home to family farms called the Acre.

Once the trail opened out into Flatcap Basin, the breeze gave us a helpful push across the little bay to the landing on the backside of Flatcap Beach. Here, we pulled up the kayak and launched the dogs for a walk north up to Rock Hole, where a gut of water prevented us from going farther. This was part of the 6.25-mile green trail, which winds through the island, then up and around its northern tip.

We turned around and walked south for about 2 miles, then sat on a driftwood log and took in the stunning view across Tangier Sound. Though most of the osprey had already migrated south, we saw a few stragglers, as well as terns, gulls, herons, hawks and bald eagles. As for humans, we encountered about four. We looked for the northeastern beach tiger beetle (one of Maryland's endangered species that dwells here) but didn't spot one.

Later that evening at our campsite, I looked upward through the pines into an ink-black sky. It felt as if we were inside a piece of jewelry, the darkened pines like the long, elegant prongs of a ring, their dark tufted tops the setting, the stars glittering among the needles like diamonds.



Hiking, paddling, fishing and crabbing are all popular activities at Janes Island State Park in Maryland. When not impacted by the coronavirus restrictions, solo and tandem kayaks and canoes are available for rent through the park store from late April through October, weather permitting.

About six weeks later we returned, this time ahead of a cold front that promised a blast of northwest wind but in the interim provided unseasonable warmth that made for ideal paddling. We had our pick of sites and chose one right on the canal, with one distant neighbor in a tent and another in a small RV.

Dogless this time, we set out up the yellow trail again, watching scores of small baitfish leaping and rushing along the autumn-gold marsh edge, undoubtedly being chased by rockfish. We broke off the yellow trail and off the chart (or at least, off the named trails). For about two hours we meandered in pristine silence, paddling open thoroughfares and straying off into branches that narrowed until

we could touch the saltmarsh cordgrass. Now and then, we caught the call of a great-horned owl from one of the hummocks that still held small forests. We saw no other people.

That night, the cold front came in like a freight train and chased off our tent neighbors by dawn. Cozy in our camper, we emerged to go for a walk on the nature trail behind the campsites. There, we were sheltered from the wind among bright red sweet gums and golden persimmons, immense willow oaks and groundsel trees glowing with silvery autumn flowers.

For information on Janes Island State Park, visit dnr.maryland.gov/publiclands and click on "Find a State Park." Be sure to check for any closures or restrictions related to COVID-19 and recreate safely and responsibly.



Visitors at Janes Island State Park stroll along the edge of the canal as sunset throws golden tones over the marsh.

CONTINUED FROM 28

Shelton Alley
Cape Charles, VA
Gary Antonides
Edgewater, MD
Louis W. Bachtell, Jr.
Suffolk, VA
James Baird
Takoma Park, MD
Dr. & Mrs. Robert H. Batchelor
Hydes, MD
Melvin Bender
Artemas, MD
Judy & John Blomquist
Havre De Grace, MD
Timothy & Celeste Brooks
East Petersburg, PA
Anne Brown
Saint Leonard, MD
Winston W. Burks III
Bedford, VA
Jan Crable
Salt Lake City, UT
Kathryn Creamer
Baltimore, MD
Deana Crumbling
& James M. McGlone
Alexandria, VA
Charles Deegan
Beltsville, MD
In memory
of Virginia Maney Coggeshall
from Lauren DeSimone
Richmond, VA
Gene Downing
Silver Spring, MD
Jane & Joseph Duffy
Potomac, MD
Thomas Fisher III
Chestertown, MD
Lissa & David Fox
Harpers Ferry, WV
Megan Gallagher
The Plains, VA
Tina & Jeff Gleim
Wellsville, PA
Goose Creek Association
Middleburg, VA
Greg Greisman
Elkridge, MD
Michael Grim
Henrico, VA
Glenn & Trish Guy
Leonardtown, MD
Paulette Hammond
Baltimore, MD
Mr. & Mrs. Miles Cary
Johnston, Jr.
New Kent, VA
Edward F. Kilduff
Royal Oak, MD



A tiger swallowtail butterfly feasts on phlox nectar along the bank of upper Barren Creek, a tributary of the Nanticoke River near Mardela Springs, MD, on a warm April morning. (Dave Harp)

John Kraeuter
Kennebunkport, ME
Sydney Levitus
Rockville, MD
Sarah & Henry Lord
Baltimore, MD
Ann Macneille
Baltimore, MD
Daniel Marcin
Silver Spring, MD
Kennie Mauche
Lusby, MD
Judy & Dave Mauriello
Severna Park, MD

Gary Michael
Artemas, MD
Steven Miller
Saint Augustine, FL
Wayne & Delores Mills
Hutchinson Island, FL
Sherrill Modlin
Severna Park, MD
Mrs. Robert Mosher
Charlton, NY
Bob Murphy & Amy Rice
Edgewater, MD
Roger Newill
Virginia Beach, VA

Carolyn Osborne
Bethesda, MD
Sandra Patmore
Taylors Island, MD
Steve Patten
Annapolis, MD
Sarah W. Pearre
Union Bridge, MD
Robert Pugh
North Chesterfield, VA
Jeffrey Putt, Sr.
York, PA
Patrick & Ann Ranck
Quarryville, PA

G. Carleton Ray, Ph.D. &
Mary Geraldine McCormick-Ray
Charlottesville, VA
Roberta Schaff Ross
Alexandria, VA
George & Shirley Schmidt
Chesapeake Beach, MD
Marietta M. Schreiber
Annapolis, MD
David Sears
Holtwood, PA
Bill Semenuk
Annapolis, MD
Frank Sharpe
Burtonsville, MD
Soon Ballantine Slayman
Palmyra, PA
Franklin Smith
Kenton, DE
Jason & Andrea Smith
Nazareth, PA
William Smyth
Powhatan, VA
Mrs. John Stack
Yorktown, VA
Jacob Stoltzfus
Myerstown, PA
Marvin & Andrea Storey
Laurel, MD
Joseph Strakna
Columbia, MD
Daniel H. Street
Ashburn, VA
Gregory L. Van Blargan
Montgomery Village, MD
Charles Wachsmuth
Chester, MD
Lt. Col. John Walker
Perry Hall, MD
Dale Weammert
Glen Burnie, MD
Mr. & Mrs. John M. Williams
Elkton, MD
Steve Williams
Towson, MD
Bill Wolinski
Crocheron, MD
Mr. & Mrs. R. Charles Woods
Springfield, VA
Vernon & Lucy Wright
Cockeysville, MD
Jeffrey Zeller
Myerstown, PA
SUPPORTER
Joseph Cours
West Abington Township, PA
Edward A. Ames
Bronx, NY
Bernard & Josephine Bodt
Churchville, MD
Bob Boxwell
Lusby, MD

Herman Daly
Midlothian, VA
Janet Davis
Castleton, VA
Mike Davis
Alexandria, VA
Pat Devlin
Dillsburg, PA
Michele Dobson
Bel Air, MD
Charles Dykema
Norfolk, VA
In memory
of John A. Coe
from Vera & John England
Urbanna, VA
In memory
of Ethel Forlifer
from George & Nancy Forlifer
Corriganville, MD
Ruann Newcomer George
Boonsboro, MD
Charles Paul Goebel
Architect, Ltd.
Easton, MD
Mrs. Shelby P. Guazzo
Maddox, MD
Diane Hoffman
Annandale, VA
Duane Hunt
Baltimore, MD
David Jones
Reston, VA
Richard Lewis
Finksburg, MD
Dr. Lloyd Lewis
Edgewater, MD
Barry Mates
Alexandria, VA
David & Kathryn McCorkle
Lemoyne, PA
John Merriner
Beaufort, NC
Lee Miller
Woodbine, MD
Potapskut Sailing Association
Pasadena, MD
Michael C. Reusing
Keedysville, MD
Steven Russo
Midlothian, VA
Tom Savage
Hampton, VA
Katherine Soltysiak
Bel Air, MD
June & Ben Stilmar
Alexandria, VA
Charles Sydnor
Heathsville, VA

CONTINUED ON PAGE 30

Thank You To These Philanthropic Donors



THE CURTIS AND EDITH MUNSON FOUNDATION

The Sumner T. McKnight Foundation



CONTINUED FROM 29

In memory
of James "Tony" Pitcher
From Buddy Williams
King George, VA
Kyle Woodley
Gaithersburg, MD
Glen Besa
North Chesterfield, VA
Kimberly Freeman
Catonsville, MD
Douglas Kearney
Annapolis, MD
Eric Wissel
Ellicott City, MD
Glenn Carlson
Silver Spring, MD
Eldred Cherrix
Leonardtown, MD
Sally Ann Cooper
Columbia, MD
Ron Gray
Halifax, PA
Alan Grubb
Baltimore, MD
Keith Homza
Fredericksburg, VA
Jerry Hopkins
Annapolis, MD
John W. Koontz
Davidsonville, MD
Frank Mastro
North Abington Township, PA
Maisy & W. Brooke Yeager
Wilkes Barre, PA
Doug & Sandra Clow
Solomons, MD
Warren & Cheryl Evans
Dunnsville, VA
Tina Minshed
Stafford, VA
Woody Morris
Harbeson, DE
Virginia Phillips
Gaithersburg, MD
Ann Ray
Shady Side, MD
Steven P. Alpern
Towson, MD
Anthony Adee
Bowie, MD
Anayezuka Ahidiana
Baltimore, MD
M. Stephen Ailstock
Artemas, MD
Kathleen Amidon
Frederick, MD
Philip Anderson
Church Creek, MD
Richard Ayers
Powhatan, VA
Robert W. Baker
Ashburn, VA
Nancy G. W. Baker
Sugar Run, PA
Michael Barbour
Abell, MD
Janet Barnes
Saint Leonard, MD
Scott Bartram
Yorktown, VA
Mr. & Mrs. David Bauereis
Wilmington, NC
John Beckner
Colonial Beach, VA
Norm & Sara Bell
Monterey, VA
Nancy & Dick Biggs
Chestertown, MD



A skiff is stored safely above high tide in Tylerton, MD, on Smith Island. (Dave Harp)

Emily Blum
Baltimore, MD
Mary Burney Bolling
Washington, DC
Joseph & Betty Boone
New Windsor, MD
Stephen Bowler
Catonsville, MD
Jim Brackbill
Strasburg, PA
Allison Burnett
Hughesville, MD
Jon Castro
Shady Side, MD
Vanessa Cieslak
& Kevin Holloway
Washington, DC
Mr. & Mrs. William P. Cleveland
Alexandria, VA
Bill Cole
Fredericksburg, VA
Will Conyngham
Dallas, PA
Clay Coupland
Norfolk, VA
Rick Cox
Warsaw, VA

Chris Craig & Ed Wheelless
Harpers Ferry, WV
Jeffery Crockett
Tangier, VA
Glenn & Helen Davis
Kingston, NJ
C. W. Dexter
Newport News, VA
Gerald Dietz
Loganville, PA
Timothy P. Dillingham
Hopewell, NJ
Perry B. Duryea III
Montauk, NY
Warner Ferguson
Lancaster, VA
Thomas Filip
Ocala, FL
Robert Frantz
Annapolis, MD
Doily Fulcher
King George, VA
Kathleen A. Fulchiron
Lexington Park, MD
Ken Goldsmith
Williamsburg, VA

Brad & Annette Gray
Selinsgrove, PA
Russell Green
Baltimore, MD
Melissa Gross
Montross, VA
Robert Guiles
Catawba, VA
Dwayne Haines & Edie Holton
Gaithersburg, MD
Aubrey Hall
Urbanna, VA
John R. Haram
Martinsburg, WV
Frederick & Margaret Hardy
Silver Spring, MD
Tim Harvey
Montgomery Village, MD
Chris & Michelle Heaton
Edgewater, MD
C. Damon Hecker
Alexandria, VA
Dee Hockman
Strasburg, VA
Bruce & Madi Hoffmann
Jarrettsville, MD

In memory
of Lauren "Big Boy" Ferguson
from Warren Holloway
Poquoson, VA
John & Padi Hollowell
Port Republic, MD
Joseph Homburger
Cooperstown, NY
Tom Horton
Salisbury, MD
Michael Huntley
Phoenix, MD
James R. Jarvis, Jr.
Glen Burnie, MD
Noel Kaplan
Springfield, VA
Melvyn L. Kay
Reston, VA
Victor & Deborah Kennedy
Port Republic, MD
Connie Kirkland
Oakton, VA
Dave Klapka
Baltimore, MD
James Klapka
Baltimore, MD
Ronald J. Klauda
Prince Frederick, MD
Phil & Lynn Klein
Monkton, MD
Stan & Alice Kotala
Altoona, PA
John I. Kraus
Artemas, MD
Joseph & Jane Lawrence
Hanover, PA
Mary Lepley
Hunt Valley, MD
Karin E. Limburg
Syracuse, NY
Joan Locastro
Silver Spring, MD
Michael Lukes
Saint Paul, MN
Warren Magruder
Pasadena, MD
Babs Manges
North East, MD
Noah Martin
Port Trevorton, PA
Tom Meiser
Lexington Park, MD
Howard Metzger
Baltimore, MD
William Miller
Cochranville, PA
Milleson's Walnut Grove
Campground
Springfield, WV
Al Minutolo
Crozet, VA
Muddy Run Recreational Park
Holtwood, PA
Edward C. Owen
Laurel, MD
Vytautas Penkiunas
Annapolis, MD
Neal E. Perkins
Landenberg, PA
Tom Powers
Poquoson, VA
Thomas & Sally Price
Sperryville, VA
Bernadine Prince
Georgetown, DE
Prince William Soil & Water
Conservation District
Manassas, VA
Carl Pristavec
Gambrills, MD

Andrew Reed
New York, NY
Stephen Rettig
Waynesboro, PA
Jeff & Ginny Rice
Lusby, MD
Jennifer Roach
York, SC
John Roberts
Richmond, VA
James E. Rogers
Richmond, VA
Dan Rohrbeck
Catonsville, MD
Judy Rose
Joppa, MD
Joseph Roussos
North Chesterfield, VA
James Barry Royer
North Prince George, VA
Lawrence Schneider
Bethany Beach, DE
David & M. Diane Scholten
Mechanicsville, MD
Jean Scholz
Wayne, PA
Kevin Seed
Ellicott City, MD
Ellen M. Smith
Glenville, PA
Debbie Smith
Duncansville, PA
Joseph Southerton
Lewisburg, PA
Susan & Richard Sprout
Picture Rocks, PA
Rodney Stark
Pocono Lake, PA
Jeff Stauffer
Chester, MD
Charles Stegman
Salisbury, MD
John D. Stewart
Norfolk, VA
Henry Stromberger
Middle River, MD
Sarah Taylor-Rogers
Baltimore, MD
Stephen & Carole Tevault
Reedville, VA
Elvia Thompson
Annapolis, MD
Tim Tinker
Baltimore, MD
Tri-County Council
for Southern Maryland
Hughesville, MD
David Trubey
Baltimore, MD
Steve Turnage
Hague, VA
Bryan Vagenos, Sr.
Essex, MD
John Vaszko
Rockville, MD
Ronald Watson
Beaverdam, VA
Danielle Weglar
Hampton, VA
Tim Weglicki
Owings Mills, MD
Michael Weisner
Salisbury, MD
Darlene White
Virginia Beach, VA
Douglas Wion
State College, PA

CONTINUED FROM 30

In memory
of Helen Bass Whitehead
from Willie Anne Wright
Richmond, VA

Pamela & James Wroten
Arlington, VA

Ted & Charlotte Yeatman
Dameron, MD

Dr. Lawrence C. Zacharias
Richmond, VA

FRIEND

Willy Uhlig
Halethorpe, MD

Gary Visscher
Silver Spring, MD

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

Lynn Wenger
Schaefferstown, PA

Susan Wilder
Mechanicsburg, PA

Mr. A. Thomas Young
Onancock, VA

Frances & Richard Younger
Lusby, MD

Bayford Oyster Co.
Franktown, VA

Joseph A. Breen
Philadelphia, PA

Susan Christopher
Wicomico Church, VA

Dorothy Clark
Charlottesville, VA

John Conolly
Elkton, MD

Jeffrey Gerhart
Robeson, VA

Greg Godon
Birdsboro, PA

Phyllis Gootee
Lottsburg, VA

Ronald Griffin
McDaniel, MD

William Hitch
Indian Head, MD

Douglas & Renee Howard
White Hall, MD

Barnett James
Glen Burnie, MD

William Judkins
Burgess, VA

Maria Kerns
Harrisburg, PA

Jim Laird
Hagerstown, MD

Letty Limbach
Washington, DC

William P. Lombardi
Timonium, MD

Ray Moses
Virginia Beach, VA

Thomas O'Brien
Kingsville, MD

Chris Owings
Catonsville, MD

Al Peasley
Huntingtown, MD

John Pritts
Devon, PA

Ben Pruette
Philadelphia, PA

Leroy Russell
Avenue, MD

John & Laura Jean Sadler
Grasonville, MD

Era Saunders
Hampton, VA

Don Schweitzer
Fruitland, MD

Patricia M. Soltys
Hampton, VA

William J. Spake
Queenstown, MD

Lee Yohn
Mechanicsburg, PA

Jon Bauer
Rose Valley, PA

Gerard Bockstie
Nottingham, MD

Paula A. Bounds
Henderson, MD

Donald & Sara Lee Brohawn
Tyaskin, MD

Carol A. Brown
Chestertown, MD

John Cantilli
Cranford, NJ

Rebecca & Robert Charles
Etters, PA

Colin DeLeyer
Baltimore, MD

Nancy Dennis
Berwick, PA

Ned & Lori Dickie
Chestertown, MD

Robert & Brenda Elwood
Albuquerque, NM

Robert Eshleman
Lancaster, PA

Barry Fisher
State College, PA

Mary Beth Friedel
Oakland, MD

Jo Frock
Olney, MD

Jeff Greeve
Saint Leonard, MD

Mo Hamilton
Hatboro, PA

Charles Hogge
Hayes, VA

Bruce Jezek
Baltimore, MD

Robert Knowlton
Arlington, VA

Cairn Krafft
Owings, MD

J. Krutzler
Edison, NJ

Tony Langbehn
Bowie, MD

Neal Leatherman
Glen Rock, PA

Michael McCauley
Charlotte Hall, MD

Sandy Medford
Stevensville, MD

Wayne K. Morris
Salisbury, MD

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

Jane K. Parks
Cambridge, MD

Gary Parsons
Smithfield, VA

James H. Payne, Jr.
Manassas, VA

Scott Perkins
Frederick, MD

Sally Perry
Lititz, PA

Mary L. Pipkin
Parkville, MD

Joan Quigley
Baltimore, MD

Gloria Shelmerdine
Advance, NC

Olivia Su
Wilmington, DE

Daniel Tamkus
Aberdeen, MD

Vicki Toye
Fredericksburg, VA

William E. Trout III
Madison Heights, VA

Glenda Wilson
Carlisle, PA

Ed & Amber Zygmunt
Laceyville, PA

Dave Browne
Virginia Beach, VA

Steven Coffman
Alexandria, VA

Jessie A. Coleman
Mardela Springs, MD

Patrick Flanagan
Laytonsville, MD

Charles Fletcher
Sykesville, MD

Robert Kozlowski
Baltimore, MD

Shelley & Dennis Miller
Frederick, MD

Kevin Mock
Camp Hill, PA

Peggy Murchake
Grasonville, MD

Ed Reisman, Jr.
Camp Springs, MD

Christian Rose
Lutherville, MD

Robert Tait
North Beach, MD

N. Vastardis
Malvern, PA

John H. Walker
Williamsburg, VA

Lois Webber
Boonsboro, MD

Mark Lai
New York, NY

Beverly McDonald
Inwood, WV

Edward & Thelma Betz
Glen Arm, MD

Steve Blanks
Roanoke, VA

Ruth Knott
Marriottsville, MD

Eric & Marianne Pluchino
Cape Canaveral, FL

Paul Rogers
Cape Charles, VA

Carolyn Zeman
Glen Burnie, MD

Ferne Snelson
Aylett, VA

Stephen Bono
Baltimore, MD

Warren Lee Brown
Annapolis, MD

Kurt Bruwelheide
Silver Spring, MD

Mr. & Mrs. John K. Bryant
Cohasset MA

John & Deborah Burk
Baltimore, MD

Rick Carrion
Earleville, MD

Carl F. Cerco
Albuquerque NM

Grover Chamberlain
Silver Spring, MD

Stephen Clark
Bel Air, MD

Wayne Davis
Springfield, VA

Paul Derrickson
Broadlands, VA

Frederick Dreisch
Clarksville, MD

Julie Dunlap
Columbia, MD

Richard Ferenz
Conowingo, MD

Byron Firestone
Mechanicsburg, PA

John & Susan Ford
Maryland, NY

Carole Fox
Rockville, MD

Michael A Fry
Baltimore, MD

Robert Garner
Catonsville, MD

Arthur G. Geigley
Mount Joy, PA

Debra Gutenson
Lovettsville, VA

Robert Hollenbach, Jr.
Dornsife, PA

Suzanne Jenkins
Midlothian, VA

Dorothy Jones
West Lafayette, IN

David Kirby
Montross, VA

Thomas Klein
Pasadena, MD

Elizabeth Law
Frederick, MD

Steve Lay
Havre De Grace, MD

Gary Lentz
White Marsh, MD

Thomas & Kathryn Manrodt
Ramah, NM

Lloyd Mcallister
Salisbury, MD

Charles McGuire
Leland, NC

Sarah Nicholas
Mechanicsburg, PA

Col. & Mrs. Geoffrey Parker
Prescott AZ

Virginia Phillips
Austin, TX

Sally Pierce
Catonsville, MD

James J. Potter
Baltimore, MD

William Pratt
Virginia Beach, VA

David A. Prescott
Boiling Springs, PA

David Reitz
Hanover, PA

Millard Rice
Phenix, VA

Dave & Shirley Ritondo
Selbyville, DE

Norma Roberts
Alexandria, VA

James & Jean Robinson
Oakton, VA

Margaret Robinson
Marydel, MD

Paul Sanborn
Berwyn, PA

Lou Schroeder
Virginia Beach, VA

Mary Seidel
Pasadena, MD

Bill Shirley
Shippensburg, PA

Dr. Sherman Silverman
Silver Spring, MD

Chris Smack
Boynton Beach, FL

C. Allen Spicer
Bethany Beach, DE

Jule Szabo
Fairfax, VA

Mark Walther
Perkiomenville, PA

Sharon Wilson
Ellicott City, MD

Mr. & Mrs. Paul Bailey
Leonardtown, MD

David Bowen
Dickerson, MD



A great blue heron nabs a small fish in the mill race at Wye Mills, MD. (Dave Harp)

FORUM

COMMENTARY • LETTERS • PERSPECTIVES

Outdoors act could come to the rescue in uphill battle to save Fones Cliffs

By JOE McCAULEY

The coronavirus pandemic has affected nearly every facet of life in the United States, including the workings of Congress. While legislators have rightly focused on providing economic relief for millions of unemployed workers, the result is that other critical legislation is being ignored. One such piece of legislation is the Great American Outdoors Act.

One provision of the act would provide full and permanent funding for the Land and Water Conservation Fund, which is the primary source of federal funding for national parks, national wildlife refuges and national forests.

In this time of crisis, Virginians are looking to our beloved outdoors for solace and recreation more than ever. The Chesapeake Conservancy's work to protect the Bay region's natural and cultural heritage continues urgently even as we cope with the same challenges faced by our neighbors, partners and supporters.

The need for a boost in land conservation funding is aptly illustrated by an iconic feature along the Rappahannock River that has a rich story to tell both of the distant past and the uncertain present.

Fones Cliffs stand prominently as a near pristine natural feature: striking 100-foot-high bluffs stretched along 4 miles of the river in Richmond County. The cliffs are cited as a priority for acqui-

sition by the Rappahannock River Valley National Wildlife Refuge, and the area is listed by the National Audubon Society as "globally important" for migrating and resident bald eagles.

The cliffs were noted as a significant stop during Capt. John Smith's voyages in the early 1600s, and the National Park Service has identified several characteristics of the cliffs as having importance to the Captain John Smith Chesapeake National Historic Trail.

Chief Anne Richardson of the Rappahannock Indian Tribe recently stated that, "Fones Cliffs and the Rappahannock River are important to my tribe's culture, history and identity. Fones Cliffs is a sacred site, home to our ancestors for thousands of years and the site of key encounters with the English."

Chesapeake Conservancy has made Fones Cliffs the focal point of our land conservation activities in Virginia and, along with the tribe and other conservation partners, we have for years advocated for their permanent protection.

With appropriations from the Land and Water Conservation Fund, the first Fones Cliffs property was purchased and added to the national wildlife refuge in 2019. The Conservation Fund bought the 252-acre tract and sold it at cost to the U.S. Fish and Wildlife Service. Such transactions are often only made possible by the federal fund, which draws on the public's profit from energy development



Chief Anne Richardson of the Rappahannock Indian Tribe and Joe McCauley of the Chesapeake Conservancy visit Fones Cliffs along Virginia's Rappahannock River in 2016. (National Park Service)

in federal waters rather than tapping taxpayer dollars.

In 2012, the U.S. Fish and Wildlife Service was poised to purchase a larger parcel of 968 acres at Fones Cliffs. The landowner signed a purchase agreement that was in place for 13 months before he grew frustrated at the lack of closure and refused to extend it.

His frustration is understandable, and not uncommon: The Land and Water Conservation Fund, despite being intentionally set aside for conservation, is raided every year by Congress to pay for other items. Historically, less than half of the total funds have been made available for conservation projects. Under those limitations, no funds were appropriated to complete the purchase, or even begin a phased approach, to which the landowner was amenable.

In the ensuing years, this same property has been embroiled in turmoil. In 2015, preliminary rezoning was approved that would have permitted more than 700 residential units, an 18-hole golf course, lodge, restaurant and other resort amenities.

In 2017, a newly formed corporation purchased the property and proceeded to illegally clear more than 13 acres of trees and other vegetation without obtaining the required land clearing and sediment control permits. In 2019, the cor-

poration declared bankruptcy and the future of the property remains in question today. Will this remain a tale of lost opportunity, or could this be a once-in-a-generation conservation success story?

The answer largely depends on whether Congress will pass the Great American Outdoors Act in a timely fashion. Passing the act now would immediately stop the raiding of the Land and Water Conser-

vation fund and ensure that the program's full \$900 million is available every year for worthy projects like Fones Cliffs.

In this scenario, the Rappahannock refuge could be included on the Fish and Wildlife Service list for appropriations in fiscal year 2021.

The extremely challenging circumstances our society faces have also made evident just how important public lands and open spaces are to our health and well-being. There are battles being waged in our nation's medical institutions to save lives. The battle to save Fones Cliffs offers life support in a different kind of way, a permanent salve for an increasingly scarred landscape.

Adding this treasured landmark to our national wildlife refuge system will create a place for discovery and rejuvenation. Conserving Fones Cliffs is emblematic of the need to expand our public lands, where nature is allowed to do what it does best: heal itself — and us.

Passage of the Great American Outdoors Act is the key to Virginia finally securing protection for this icon, as well as countless other communities fighting to save their own beloved places all across the country. This legislation has broad bipartisan support, including a strong endorsement from President Trump, and was scheduled for a vote in Congress before the COVID-19 crisis hit in March. It should be included in a forthcoming package as soon as possible to aid in our nation's coping and recovery.

Joe McCauley is a Chesapeake Fellow and adviser at the Chesapeake Conservancy.



Fones Cliffs stretch along 4 miles of the Rappahannock River in Richmond County, VA. They are important for historic, cultural and ecological reasons, and conservationists hope to spare them from proposed development. (Jeffrey Allenby / Chesapeake Conservancy)

FORUM

COMMENTARY • LETTERS • PERSPECTIVES

Social distancing at its finest now appearing on a website near you

By TOM HORTON

Photographer Dave Harp and I began our cool, April morning paddle (kayaks 6 feet apart, of course) down one of the Chesapeake's biggest ditches, 120 feet wide, stretching for miles and designed to usher rainfall with superb efficiency from nearly 100,000 acres of Maryland and Delaware farmland.

A landscape of corn and soybeans and poultry could not exist without it, nor the thousands of miles of smaller ditches that feed it. Though it's far from the Bay, deep in the interior of the Delmarva Peninsula, you could run a cabin cruiser down it.

The arrow-straight Marshy Hope Ditch, which used to be the sinuous and swampy upper Marshy Hope Creek, was a staple field trip for my Chesapeake Bay class at Salisbury University. On a faculty of mostly Ph.D.s, exploring outdoors is what this bachelor's degree guy brings to the party.

Where the ditching ends, 7 or so miles upstream from Federalsburg, MD, we can see from our little paddlecraft how nature quickly reasserts itself, foot by foot, transforming a single-purpose drainageway into a gloriously diverse nontidal forested wetland.

The transformation is remarkably swift — the power of humans doing nothing but letting nature work, a power we too seldom exercise. The trip, which takes a few hours, makes for an excellent discussion of humankind's penchant for straight lines and linear thinking, versus nature's wont to maximize no single thing, just life in all of its splendor.

COVID-19 ended university life as we knew it this spring, especially the field trips core to my teaching. My scattered students Zoom in now from as far off as Boston's Charles River. So with a departmental budget of 50 bucks (maybe) to pay the generous Mr. Harp, I filmed my first "virtual" field trip.

For me it was a lovely respite from the shuttered society of humans — "social distancing at its finest," I exclaimed in the film; realizing even as I said it how inadequate the virtual outdoors is for students. Our modest effort won't win any film festivals, but educationally, well... you can view it yourself at <https://vimeo.com/409254224>.



The red and green hues of early spring greet paddlers on Marshyhope Creek, a tributary to Maryland's Nanticoke River on the Delmarva Peninsula. (Dave Harp).



Chesapeake Born

What would have been my next socially distant field trip, were the semester not cut short, was just a few blocks' walk from the school to Salisbury's City Park at the head of navigation on the Wicomico River. On a moonlit, windless night in early May, one of spring's great enthusiasms was in full swing.

You could hear them thrashing the dark waters, boiling silver in the moonbeams; legions of river herring on their annual spawning run from the ocean. Each spring, they invade every river and stream of the Chesapeake, thrusting to the uttermost capillary ends of the watershed.

The forces that drive them are cosmic, the pull of seasons and lengthening days to start, then currents, and finally the odors

emanating from the rivers and streams of their birth. Their numbers are a trickle of what once handsomely fed native Americans and the birds and animals of the whole watershed — yet the annual return still flickers, perhaps to be rekindled someday.

It is a homecoming underappreciated, seldom celebrated except by the great blue herons that stand ready to spear the bright little fish as they wiggle across a low dam and on up through the Salisbury Zoo, where a higher dam ends their journey. A woman walking her dog looked on curiously. They have come from the Atlantic Ocean, I said. She clapped her hands: "From the ocean!"

I thought back to a similar scene almost 50 years ago in Washington, DC's Rock Creek Park, where I filed a whimsical "breaking news" report for the *Baltimore Sun*. I observed then that few denizens of the nation's capital knew what the herring were, or what a wonderful, vital connection they were witnessing.

Half a century later, most people still don't know. It's glad news that generally goes unreported. I find that a troubling commentary on environmental awareness, which has made great strides in recent decades — but leaves us far too socially distant

from a world with which we strive to live sustainably.

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.

LET US KNOW

The BAY JOURNAL welcomes letters pertaining to Chesapeake Bay issues. Letters should be no more than 400 words. Send letters to: Editor, BAY JOURNAL, 619 Oakwood Drive, Seven Valleys, PA 17360-9395. E-mail letters to: bayjournal@earthlink.net

Letter writers should include a phone number where they can be reached. Longer commentaries should be arranged in advance with the editor. Call: 717-428-2819.

Views expressed are those of the writers and do not necessarily reflect those of the BAY JOURNAL or Bay Journal Media.

FORUM

COMMENTARY • LETTERS • PERSPECTIVES

COVID-19 crisis underlines poultry industry's impact on health, the Bay

By ABEL RUSS

Meat processing plants have been in the news recently because of the spread of the coronavirus among laborers, who frequently must work in close quarters — in dangerous, unsanitary conditions — to slaughter chickens, hogs and other livestock in the Chesapeake region and elsewhere. This is a very serious health crisis, and we should not force these plants to remain open.

But this is also an opportunity to re-examine the many public health and environmental risks of industrial meat production. Concentrated Animal Feeding Operations and large slaughterhouses are not only a threat to workers, but also to local communities and the wider environment — especially the Bay.

Let's start with the living animals. There are more than a billion chickens and turkeys produced every year in the Chesapeake watershed, most of them spending their lives in giant confinement barns, more factory than farm. These operations are a major source of air pollution, with profound local effects. A 2018 study by Johns Hopkins researchers found that people who live near high-density poultry production are 66% more likely to be diagnosed with pneumonia, for example.

One of the pollutants released by poultry operations is ammonia, an extremely hazardous and pungent gas. A recent report by the Environmental Integrity Project estimated that poultry in the Bay watershed produces about 200 million pounds of ammonia air



Exhaust fans ventilate a chicken house near Princess Anne, MD. (David Harp)

pollution per year. Ammonia can cause respiratory problems, asthma attacks and other health issues. If a poultry operation moves into your neighborhood, the smell of ammonia alone can destroy your quality of life and your property value.

Ammonia is also a serious threat to the ecological health of the nation's largest estuary. Ammonia is a nitrogen compound, and nitrogen is, of course, the leading driver of algae blooms and dead zones in the Chesapeake Bay. Our report estimates that the ammonia

from poultry operations, after settling on land or water in the Bay watershed, adds about 12 million pounds of nitrogen to the estuary every year. This is more nitrogen than all of the sewage and industrial wastewater plants in Maryland (which released 10 million pounds of nitrogen in 2018) or Pennsylvania (9 million pounds).

On top of the ammonia air emissions, poultry operations are also responsible for another 12 million pounds of nitrogen reaching the Bay every year as runoff from crop fields

where poultry litter is land-applied as fertilizer, often in excess.

Once chickens and turkeys are fattened up in CAFOs, they are trucked to one of the region's slaughterhouses. As we now know all too well, these slaughterhouses can be deadly to workers. But they are also a huge source of water pollution. As the Environmental Integrity Project documented in 2018, a typical slaughterhouse will dump hundreds of pounds of nitrogen into the water every day. The industry routinely violates its water pollution permits with impunity, even though it operates under lax and outdated pollution limits that the U.S. Environmental Protection Agency refuses to update.

The current state of affairs is reckless and unsustainable. Industrial meat production should be regulated like any other industry. Its workers should be protected, and its air and water pollution should be monitored and limited. At the end of the day, the corporate owners of these factories must be held accountable for the harm to public health and the Chesapeake Bay that too often hides from sight.

Abel Russ is senior attorney at the Environmental Integrity Project and co-author of the recent report, *Poultry Industry Pollution in the Chesapeake Region* (environmentalintegrity.org/reports/poultry-industry-pollution-in-the-chesapeake-region/).

LETTER TO THE EDITOR

Commit to combating climate change, COVID-19

We're facing an uncertain future, and yet we have leaders in Congress whose first reaction in the COVID-19 and climate change crisis is to provide care packages to wealthy CEOs instead of communities. This isn't the rapid relief we need to move our country forward.

The coronavirus pandemic is teaching us to rethink and reshape our economy in the face of climate change, and public health disasters.

In Baltimore, birds like the yellow-throated warbler and the scarlet tanager have been telling us for a long time that they cannot survive without the resources they need to raise their

young. According to Audubon's *Survival by Degrees* report, two-thirds of North American bird species are at risk of extinction under a 3-degrees Celsius warming scenario. Today, communities across the Chesapeake region are suffering from COVID-19 and climate change.

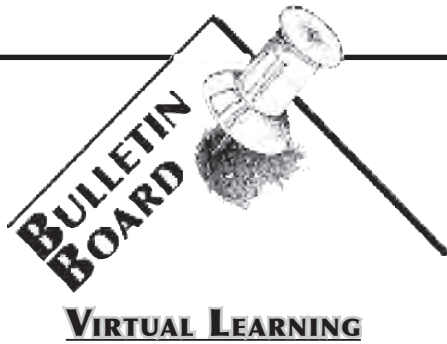
For families across Maryland, this means communities are struggling to put food on table as sectors of the economy shutdown, jobless numbers rise and businesses we know and love close their doors.

The solution is clear: Congress must take comprehensive climate action now. To protect our health and envi-

ronment, we must pass the bipartisan S. 2302, America's Transportation Infrastructure Act (ATIA), and S. 2657, the American Energy Innovation Act (AEIA). These bills will remove barriers to execute and complete clean energy projects as part of any future stimulus package.

I urge Sens. Ben Cardin and Chris Van Hollen to move Maryland forward, building a resilient 21st century economy to support clean jobs in every county and rural community. From the Eastern Shore to East Baltimore, we need a bipartisan commitment to combat COVID-19 and climate change.

Jaime D. Sigaran
Baltimore, MD



CBMM *Island Life & Rising Tides*

Because the public cannot go to the Chesapeake Bay Maritime Museum in St. Michaels, MD, during the COVID-19 crisis, CBMM is offering virtual experiences to bring the museum to their homes:

☞ *Island Life - Changing Culture, Changing Shorelines*: Originally planned for display at CBMM, this exhibit of photographs by Jay Fleming is now online. His photographs reveal how the changing environment is affecting the cultures and shorelines of inhabited and formerly inhabited offshore islands in the Bay. Visit: cbmmislandlife.org.

☞ *Rising Tide After-School Program*: 3:30 p.m. Thursdays. Grades 6–9. Log on to work with CBMM educators on a variety of lessons, including origami, building cardboard boats, participating in a green energy scavenger hunt or understanding buoyancy and displacement. Most sessions include a virtual field trip, inviting students to experience other places and cultures. To register / info: risingtide@cbmm.org. New students are welcome!

For updates on when the museum might reopen, visit cbmm.org or call 410-745-2916.

Tour Maryland parks

Learn about history and fascinating nature highlights — Harriet Tubman's story, a corn snake, a wildflower hike — while taking a virtual tour of Maryland's state parks. To view one of the 29 videos, put "MD DNR virtual park tour" in your search engine, go to *DNR Offers Virtual State Park Tours* LexLeader and follow the instructions.

Connect with nature

The Maryland Department of Natural Resources is providing an assortment of free and low-cost programs for various grade levels. To learn about birds, bees, scat, leaves, nature journals and more, put "MD wildlife education resources" in your search engine. To learn about what a park ranger does, put "Maryland Junior Ranger Program - Maryland DNR" in your search engine.

St. Mary's County, MD, museums

The St. Mary's County (MD) Museum Division is featuring *Wayback Wednesdays*. Every Wednesday, a new, short video (previous weeks also available) will feature a quirky or fascinating aspect of St. Mary's history, including *Horse Racing in Leonardtown*, the *Black Diamond Disaster*, *Why Maryland Didn't Secede* and more. Visit facebook.com/watch/SCIMuseum (Close "the video not available" box and the video should start).

VA Living Museum

Virtual learning programs offered daily by the Virginia Living Museum in Newport News feature lessons, animal ambassadors, adventure challenges, live feeds and other activities for all ages. The programs are available on various social media platforms: Facebook [F], Twitter [T] and Instagram [I]. Here's the schedule:

☞ *Diet of the Day*: 8 a.m. Monday, Wednesday & Friday. Learn about what VLM animals eat. [F, I, T]

☞ *Awesome Animal Ambassadors*: 8 a.m. Sunday. Meet a VLM ambassador animal. [F]

☞ *VLM Live*: 11 a.m. Daily & 2:30 p.m. Monday–Friday. Fish & animal care / enrichment. Ask questions. [F]

☞ *Nature at Noon*: 12 p.m. Tuesday, Thursday, Saturday. Learn about nature found in your own backyard. [F, I, T]

☞ *VLM Mysteries - What is it?* 4 p.m. Daily. Try to identify what the daily photo is a picture of. It could be part of an animal or an item from VLM's collections. Answer revealed the next day. [I]

☞ *Virginia Skies*: 6 p.m. [T] & 8 p.m. [F] Daily. Stargaze, learn stellar facts. [T]

☞ *Family Fun*: Visit the museum's YouTube channel for nature activities, including outdoor adventures, astronomy, living sustainably, home science, learning about VLM's awesome animal ambassadors and age-specific activities. Visit thevlm.org. Info: thevlm.org, 757-595-1900, facebook.com/VirginiaLivingMuseum, twitter.com/VLMuseum, instagram.com/valivingmuseum.

Annapolis Maritime Museum

The Annapolis Maritime Museum & Park is providing students, as well as adults, with worksheets, crafts, videos and lesson plans at its *Virtual Learning Resources* page on its website, amaritime.org/education/virtual-learning.

WORKDAY WISDOM

Make sure that when you participate in cleanup or invasive plant removal workdays to protect the Chesapeake Bay watershed and its resources that you also protect yourself. Organizers of almost every workday strongly urge their volunteers to wear long pants, long-sleeved shirts, socks and closed-toe shoes (hiking or waterproof). This helps to minimize skin exposure to poison ivy and ticks, which might be found at the site. Light-colored clothing also makes it easier to spot ticks. Hats are strongly recommended. Although some events provide work gloves, not all do; ask when registering. Events near water require closed-toe shoes and clothing that can get wet or muddy. Always bring water. Sunscreen and an insect repellent designed to repel both deer ticks and mosquitoes help.

Lastly, most organizers ask that volunteers register ahead of time. Knowing how many people are going to show up ensures that they will have enough tools and supervisors. They can also give directions to the site or offer any suggestions for apparel or gear not mentioned here.

resources. Go on a trash scavenger hunt, explore the museum's oral histories collection, learn about the life cycle of Chesapeake creatures or take a virtual tour of the museum's exhibits. *Earth Day Resources* features lesson plans & activities and videos. *Chesapeake Bay Animals* features background research, worksheets, arts & crafts and videos. *Maritime Heritage* features research, worksheets and arts & crafts. *Watershed Stewardship* features research, lesson plans & activities, worksheets, arts & crafts and videos.

VOLUNTEER OPPORTUNITIES

Mid Susquehanna reports

The Middle Susquehanna Riverkeeper Association takes reports of any concern regarding the river or its tributaries very seriously. If you have a report of something out of the ordinary, email Riverkeeper John Zaktansky at atmidusriver@gmail.com or call 570-768-6300.

Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation 10 a.m.–4 p.m.

the second Saturday in June, July and August remove invasive plants at Ruth Swann Park in Bryans Road. Meet at the 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 MD Chapter office at 9 a.m.; return at 5 p.m. Carpool contact: 301-277-7111.

Severn River Association

The Severn River Association still has opportunities for volunteers who can work independently on land and water to track conditions in the river's watershed. As the group slowly restarts its scientific monitoring operations, it is working with the MD Department of Natural Resources to develop COVID-19 safety protocols to protect staff and volunteers working in the field. Training in new procedures will be offered as circumstances allow. The citizen scientist opportunities include:

☞ *Water Quality Monitoring*: Through October. Crew needed to conduct weekly boat tours to monitor the Severn's health.

☞ *Water Quality Crew*: Morning river cruise collects scientific data and monitors wildlife habitat.

☞ *Join the SAV Navy!* Set your own hours through September. Use kayak, canoe or a small boat to map SAV beds, identify submerged aquatic vegetation. Paddlers of all skill levels welcome. Gear supplied.

☞ *GEMS Expedition*: Explorers, naturalists and foresters are needed for a land-based expedition to map 500 ecological features throughout the Severn watershed: wetlands, trees, ferns, plants, wildlife, creeks, historical & cultural features to create a GIS map of watershed's ecology.

☞ *Tell Severn's Story?* Writers, photographers, reporters, memoirists needed to record story of river's wildlife, people, forests, history, culture and sailing. SRA can create internships for budding journalists of all ages who want to tell a story, cover meetings, take pictures, build up their clip file.

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

MD angler survey

Become a citizen scientist by helping the MD Department of Natural Resources collect species, location, size data on a smartphone using its *Volunteer Angler Survey*. The data is used to develop management strategies.



BULLETIN FROM PAGE 35

The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs also have been upgraded with mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Mount Harmon Plantation

Help Mount Harmon Plantation in Earleville, MD, with the manor house student tours, colonial crafts, hearth cooking, guided nature walks and the herb garden. Special event volunteers assist with the manor house tours, admission/ticket sales, gift shop and auction and raffle fundraisers. Training is provided. Docents are asked to commit to 8 hours of service per month during tour season: 10–3 p.m. Thursdays–Sundays, May–October. Info: 410-275-8819, info@mountharmon.org.

VA Master Naturalists

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

Creek Critters app

Using Audubon Naturalist's *Creek Critters* app, check a stream's health by finding, identifying small organisms that live in freshwater, then creating a report based on what is found. Get the free program at the App Store and Google Play. Info: anshome.org/creek-critters. To learn about partnerships/ host a Creek Critters event: cleanstreams@anshome.org.

Project Clean Stream

Summer is almost here and it's time to plan a fall cleanup event. Be part of the Alliance for the Chesapeake Bay's *Project Clean Stream*. Volunteers in all six Bay states and the district pick up trash in waterways and parks using supplies (trash bags, gloves) provided by the Alliance. Residents, local businesses, environmental organizations, local governments, community

SUBMISSION GUIDELINES

The Bay Journal regrets it is not always able to print every notice it receives because of space limitations. Priority is given to events or programs that most closely relate to the preservation and appreciation of the Bay, its watershed and resources. Items published in Bulletin Board are posted on the online calendar; unpublished items are posted online if staffing permits. Guidelines:

✎ Send notices to kgaskell@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.

✎ 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 month. Deadlines run at

least two months in advance. See below.

✎ Submissions to Bulletin Board must be sent either as a Word or Pages document, or as simple text in the body of an e-mail. PDFs, newsletters or other formats may be considered if there is space and if information can be easily extracted.

✎ Programs must contain all of the following information: a phone number (include the area code) or e-mail address of a contact person; the title, time (online calendar requires an end time as well as a start time), date and place of the event or program. Submissions must state if the program is free, requires a fee, has age requirements, has a registration deadline or welcomes drop-ins.

✎ **July-August issue: June 11**

✎ **September issue: August 11**

groups, houses of worship, schools and universities are invited to participate. Learn about projects that are scheduled to coincide with the *National Day of Service* on Sept. 11. Info: chesapeakeanetwork.org/groups/project-clean-stream/ projectcleanstream@allianceforthebay.org.

Howard County Conservancy

The Howard County Conservancy needs volunteers to lead elementary and secondary school hikes. No experience is necessary. Volunteers choose which hikes they would like to do. No minimum or maximum time requirement. Volunteers are also needed for other events. Info: Carole at 410-465-8877, volunteer@hcconservancy.org.

Patuxent Refuge bookstore

The Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel, MD, needs volunteers to open & close the store and run the register. Training is provided. Info: lindaleechilds@hotmail.com, 301-497-5771.

CBL Visitor Center

The Chesapeake Biological Laboratory's Visitor Center on Solomons Island, MD, needs volunteers, ages 16 & older. They must commit to a minimum of two, 3– to 4-hour shifts each month in spring, summer, fall. Training sessions are required. Info: brzezins@umces.edu.

Adopt-a-stream / pond

The Prince William Soil & Water Conservation District in Manassas, VA, gives stream cleanup events the supplies and support they need for trash removal projects. Groups also receive an Adopt-A-Stream sign recognizing their efforts. For info / to adopt a stream / get a proposed site: waterquality@pwsacd.org. Register events at trashnetwork.fergusonfoundation.org.

Test for chemicals in water

The Prince William (County) Soil and Water Conservation District and the Virginia Department of Environmental Quality need volunteers to join their *Chemical Water Quality Monitoring Teams*, who collect data from local streams. DEQ will teach volunteers techniques to collect and read the data. Monitoring sites are accessible for easy collection. Info: waterquality@pwsacd.org, pwsacd.org.

Volunteer at CBEC

The Chesapeake Bay Environmental Center in Grasonville, MD, has volunteer openings for people who only want to drop in a few times a month as well as those who want to help more frequently. Openings include: helping with educational programs; guiding kayak trips or hikes; staffing the front desk; maintaining trails, landscapes & pollinator garden; feeding or handling captive birds of prey; maintaining birds' living quarters; participating in CBEC's team of wood duck box monitors

and other wildlife initiatives. Other opportunities include fundraising events, website development, writing for newsletters and events, developing photo archives and supporting office staff. Volunteers donating more than 100 hours of service per year receive a free one-year family membership to CBEC. Info: volunteercordinator@bayrestoration.org.

ACTIVITIES / EVENTS

MD DNR photo contest

The Maryland Department of Natural Resources is accepting entries for its annual photo contest. Images can be: birds, fauna, flora, insects, natural phenomena, outdoor recreation, scenic landscapes, weather or wildlife. First, second and third place are awarded for each season. An overall grand prize winner will be chosen from the first-prize winners. Social media users may select a "Fan Favorite" via the department's Facebook page. Photographers, novice or professional, may submit up to three entries for \$10 with additional entries (no limit) at \$3 each until Aug. 31. The contest is open to residents and out-of-state visitors alike, but only photos of Maryland qualify. The best overall photo receives a grand prize of \$500 cash, a one-year Maryland State Park and Trail Passport, a complimentary five-year subscription to *Maryland Natural Resource* magazine and five copies of the 2021 calendar. First, second, and third place winners also receive prizes. Winning entries will be posted online, featured in an issue of the magazine and placed in the 2021 wall calendar. Visit dnr.maryland.gov/Pages/photocontest.aspx for rules.

RESOURCES

Treat yourself to a tree

Using the extra time at home time to spruce up your landscape? Put "How to plant a container tree Maryland DNR" in your search engine for a YouTube video.

Property pointers

The Alliance for the Chesapeake Bay offers resources for property owners who want to make their landscapes more friendly:

✎ *Wood you Like to Learn about Forests?* Put "Alliance Websites, Resources, Videos, Blogs" in your search engine, then scroll down to the Forest for the Bay's *Tree Talks*.

BULLETIN CONTINUES ON PAGE 37



BULLETIN FROM PAGE 36

Topics include: *How to Plant A Tree, What's That Conifer?, Live Staking, Gray Dogwood, Boxelder, Poison Ivy, Black Raspberry, Pawpaw, Blackgum, Snags, Witch Hazel, Christmas Fern, White Cedar, Mountain Laurel, Atlantic White Cedar, and A Hobbyist's Guide to Maple Sugaring.*

✎ *Bouquets for the Bay:* Visit NativePlantCenter.net to find the perfect native species for your landscape.

✎ *Right as Rain Landscape:* Learn how to design a stormwater runoff plan that will help you better manage water running off your property. Visit the Alliance for the Chesapeake Bay's Yard Design Tool at stormwater.allianceforthebay.org.

Severn River speakers online

Severn River Association's John Wright Speaker Series presentations are available online. Titles include *Oyster Farming in St. Jerome's Creek; The Demise of Our Yellow Perch Fishery; Land Preservation: How Does it Work?; Tree Care In The Critical Area; Enjoy The Severn River – Standing Up!; Runoff, Permits & Water Quality; Annapolis Neck – Mud Floods, Fishing on the Severn; and Will Butterflies & Bees Survive?* These, and other titles, are available at severnriver.org/category/speaker-series.

Chesapeake Network

Join the Alliance for the Chesapeake Bay's *Chesapeake*

Network (search engine those terms) to learn about events, or opportunities that protect or restore the Bay, including webinars, job postings and networking. Stay connected with the conservation world.

Bilingual educator resources

Educational programs are available in English and Spanish from the Interstate Commission on the Potomac River Basin. Info: potomacriver.org/resources/educator.

Track Severn River's health

Check the health of the Severn River online at cmc.vims.edu/#/home. Water quality data collected from the Severn River Association's network of 41 monitoring stations, from Indian Landing near the headwaters to Lake Ogleton and the creeks of Whitehall Bay, are posted on Data Explorer, a data-sharing platform run by the Chesapeake Monitoring Cooperative. The site also contains SRA water quality monitoring data for 2018 and 2019 and fecal bacteria levels collected by *Operation Clearwater*, run by Professor Tammy Domansky at Anne Arundel Community College. Anne Arundel County's bacteria reports are also posted.

Watershed capsules

Prince William (VA) Soil and Water Conservation District's Watershed Capsules, which teach students about the important functions of watersheds, are available, first-come, first-served. Info: pwsacd.org/capsules.

Boating safety instruction

Boating safety classes are required for operators of recreational boats in Virginia, Maryland, the District of Columbia,

most other states. Online opportunities include:

✎ *Virginians:* boat-ed.com/virginia

✎ *Marylanders:*

boatus.org/maryland

✎ *DC residents & nonresidents:*

boat-ed.com/districtofcolumbia

✎ *Comprehensive list of training options:* uscgboating.org/recreational-boaters/boating-safety-courses.php

✎ *Free boating safety tools & materials from the Coast Guard Auxiliary:* Put "recreational boating safety outreach" in your search engine.

Stormwater class

The Alliance for the Chesapeake Bay's Municipal Online Stormwater Training Center's *Dig Once Course* suggests how local leaders can integrate green infrastructure into community capital projects such as road construction and school & park improvements. Interactive lessons and videos in a user-friendly format give communities tools to build and enhance local stormwater programs. Info: mostcenter.org.

Is your yard Bay-Wise?

Master Gardeners in Prince George's County, MD, are part of *Bay-Wise*, a program offering free consultations on environmental practices to help county residents certify their landscapes. Those who demonstrate healthy lawn maintenance, efficient watering, pest control and create habitat for native trees & plants for wildlife receive Bay-Wise signs. Homeowners can evaluate their property online using the *MD Yardstick*, which tallies pollution-reducing gardening and landscaping practices. To be certified, though, a landscape must be visited, evaluated by a Master Gardener. Info: Esther Mitchell at estherm@umd.edu, extension.umd.edu/baywise/program-certification. Click on "download the yardstick" to evaluate a landscape and/or vegetable garden online.

Wetlands Work website

The Chesapeake Bay Program's website, *Wetlands Work*, at wetlandswork.org, connects agricultural landowners with people and programs that can support wetland development and restoration on their land.

Marine debris toolkit

The National Oceanic and Atmospheric Administration's offices of National Marine Sanctuaries and Marine Debris Program have developed a toolkit for students and educators in coastal and

inland areas to learn about marine debris and how to monitor local waterways. The toolkit supports efforts to reduce impacts on marine ecosystems through hands-on citizen science, education and community outreach. Info/search engine: marine debris monitoring toolkit for educators.

Turf / lawn programs

For information on Prince William (VA) Cooperative Extension's *12 Steps to a Greener Lawn / Building Environmental Sustainable Turf BEST Lawns* low-cost, research-based programs for lawn education, contact: bestlawns@pwcgov.org, 703-792-4037.

Floatable monitoring program

Help the Prince William Soil & Water Conservation District in Manassas, VA, assess and trace trash in streams to reduce nonpoint source pollutants in urbanized and industrialized areas in relation to the County's Municipal Separate Storm Sewers (MS4) permit. Cleanup supplies provided. Info: waterquality@pwsacd.org.

Baltimore Biodiversity Toolkit

To help meet habitat needs of native plants & animals, the *Baltimore Biodiversity Toolkit* identifies species that represent habitats within and historic to a community. It shows how to support specific wildlife needs; helps citizen scientists monitor and collect data; and develops a culture of conservation and stewardship. Using 20 ambassador species from four habitats, the toolkit helps prioritize community greening projects based on representative species, citizen science data and spatial analysis that includes social, economic and ecological indicators. Info: fws.gov.

Wildlife education trunks

MD Department of Natural Resources Wildlife Education Trunks are available to teachers, home-school educators and naturalists. Free, interdisciplinary tools are designed to interest students in local wildlife while building on art, language arts, math, physical education, science, social studies skills. It contains an educator guide, lesson plans, hands-on K–12 activities, supplies, books, furs, replica tracks, videos. Subjects include aquatic invasive species, bats, black bears, furbearers, white-tailed deer and wild turkeys. Trunks can be borrowed on a first-come, first-served basis for up to two weeks. Info/search engine: Wildlife Education Trunks.

Chesapeake Challenge

Answers to
A Whopping Whale of a Quiz
on page 22.

1. A 2. B 3. A 4. A 5. B 6. B
7. C 8. D

Did you know that whales tattoos are often symbolic for protection, guidance, close family ties and motherhood?

Bay Buddies

Answers to *Whales!* on page 22.

1. C 2. B 3. B 4. E 5. B
6. True 7. B 8. D 9. D



Humpback whale
(Whit Welles / CC BY 3.0)

Organization critical to a tree planting event's success

BY AMANDA BLAND

There are many ways to make an impact in your community, but it can be a challenge to know how to get started. Planting trees is an incredible way to create and expand community space, tree canopy, wildlife habitat and stormwater runoff protection.

Throughout the winter and spring, I set out to organize a volunteer-based tree planting at North Brentwood Park in Prince George's County, MD, as a part of my year assigned to the Alliance for the Chesapeake Bay through the Chesapeake Conservations Corps.

This was my first opportunity to organize a tree planting. Here are steps I took while preparing for an event that aligned with my goals as well as the many lessons I learned along the way. Aspects include working with partners, creating a budget and timeline, site specifics, planting day execution and post-planting follow-up. Considering these factors early in the process will save you time and energy, as well as support the overall success of the project.

Things to consider

A few basic components of the tree planting will determine the steps needed to move forward. First, nail down the "when and where."

Will you host a spring or fall tree planting? There are positives and negatives to both and, depending on your location and tree species, one season may be better suited than the other.

Determining where includes deciding whether the planting will take place on public or private land. Planting on land you do not own or manage may require permits, land access and special approval. Planting on public land may create the opportunity for community involvement. When weighing these two options, keep in mind that landowners managing tree planting projects on their own land will not have to tackle permitting requirements.

Partners & budget

Once the location of the tree planting has been determined, it will become easier to decide who to include. Depending on the size, budget and scope of the project, you might want to host a volunteer-based planting or hire contractors to complete the work. Consider these aspects:

Hiring a contractor

- Can concentrate project logistics to one partner. Rather than having to communicate with various volunteers, the project manager works with contractors on logistics.

- May increase the cost of the



Amanda Bland stands near trees planted adjacent to a stream in North Brentwood Park in Prince George's County, MD. (Alliance for the Chesapeake Bay)

project due to labor.

- Can consolidate the purchase of labor, trees, mulch and other supplies through one supplier.

- Can increase project success by hiring individuals skilled in proper tree-planting methods.

Engaging volunteers

- Enables the community to participate, providing an opportunity to connect with local residents and expand their knowledge of the benefits of trees.

- May increase project impact because community members may be more inclined to plant trees in their yards or lead their own tree plantings.

- Requires the time and materials needed to teach volunteers proper tree planting methods.

- May decrease a project's cost. This is ideal for large projects that would otherwise exceed the budget if a contractor was hired.

Designing a timeline

Creating, following and updating your timeline is essential for success. Select a date for the tree planting as far in advance as possible to allow enough time to work through challenges that might pop up and still keep to the timeline. Based on the a project's size, you may need to begin planning the location, size and partners five to six months in advance. Be sure to allow enough time to gather supplies, line up a contractor and get the proper permits. Don't forget to include pre-construction meetings with partners and post-planting maintenance in the timeline.



Site Specifics

Every location has unique features, and it's important to consider them when deciding on a site. These may include existing trees, underground utilities, nearby homes, infrastructure, roads, soil type and sidewalks. Some features may improve the quality of a planting, while others may pose challenges. For example, planting trees may help mitigate the stormwater runoff in a location experiencing flooding. In other cases, utilities, existing infrastructure and proximity to sidewalks may not be conducive to tree health or land stability. It's important to consider all of a site's features before designating a planting location.

Executing planting day

Throughout the project, it is essential to communicate with all of your partners. Monthly meetings can help track progress and keep partners involved in project adjustments. Ensure that all requirements have been met, including permits, land access and a maintenance plan. Communicate with volunteers or contractors about planting day logistics. Keep a list throughout the project to ensure that all materials

have been ordered and obtained, and are at the site the day of the planting. Make a list of everything that has to be done to refer to throughout the workday.

Post-planting maintenance

Project maintenance is essential to the success of a tree planting. In the months after the planting, you should implement your maintenance plan and keep in contact with all involved parties to ensure that duties are being completed. Taking time initially to design a thorough plan will alleviate stress and ensure that trees receive water and proper care.

Scheduling a post-planting site visit is important to ensure that trees were planted properly and are growing as anticipated. Depending on the project's size and scope, you may need to make multiple visits up to a year after the planting.

Be flexible

Unexpected challenges are always going to arise while executing a project. Nearly a week before a tree planting at North Brentwood Park in Brentwood, MD, all nonessential gatherings were canceled to protect the health and safety of the public from COVID-19. A day that was initially scheduled to have dozens of volunteers on site quickly turned into a project that was completed by a small contracting crew.

Although this challenge was unanticipated, when faced with circumstances such as this, it's important to keep your goals in the forefront of your mind to figure out how they can still be achieved.

I believe that by adapting to situations and coming up with new solutions, we are able to challenge ourselves and reach levels of impact that otherwise would not have been achievable.

Want to have an impact in your community? Visit allianceforthebay.org to check out the staff's blog and do-it-yourself resources.

Amanda Bland, a member of the Chesapeake Conservation Corps, is assigned to the Alliance for the Chesapeake Bay.

Cape May warbler: Don't let this fascinating bird's name fool you

By MIKE BURKE

Initial reports started to come in during the final days of April. By the first week of May, the eBird sightings turned into an avalanche. Birders were appropriately social distancing, but that wasn't stopping them from some major league backyard birding. The spring migrants were coming through, and reports of Cape May warbler sightings were hard to keep up with.

The male Cape May is one of the prettiest wood warblers in the Americas, a real prize every year. Stuck close to home, I wasn't able to see one this year, but I was enjoying the electronic postings. The tiny bird is an arresting combination of bright yellow, jet black and mossy green. The male also has a handsome chestnut cheek patch and flashing patterns of white on wing and tail. This multi-hued bird is a visual delight.

It is also badly named.

Today, Cape May, NJ, is a birding mecca. Sitting at the southern tip of the state, bordering the Delaware Bay and the Atlantic, it is a natural funnel for migrating species. In the spring, birds heading north "fall out" at Cape May, the first land they encounter after arduous overwater flights.

In the fall, it's the last stop for birds to feed and rest before embarking on the return trip over the Bay or ocean. Sure, this warbler has been seen in its namesake town, but so have literally hundreds of other species.

A more accurate name might be spruce warbler, given its preference for these conifers. Or maybe the French-Canadian name, *Pauline tigrée* (tiger warbler), which stresses the bird's tiger-striped undersides and echoes the



The chestnut cheek on this Cape May warbler tells the world that it is a male. The female has a gray cheek. (U.S. Fish and Wildlife Service)

species' Latin name: *Setophaga tigrina*.

In truth, it got its name solely because the first specimen described in scientific literature was taken from Cape May more than 150 years ago.

Regardless of what you call it, the Cape May warbler is a fascinating little bird.

Here in the Chesapeake watershed, the Cape May only stops on its way elsewhere. The species winters in the West Indies, from Puerto Rico and Cuba west to Central America. It leaves the tropical forests in the early

densities ranged from 70 pairs per square-kilometer in the 1940s, to zero pairs in the 1950s, back up to 148 in the 1980s. The heavy, widespread use of organophosphate pesticides in 1975–76 destroyed most of the pests. Consequently, the Cape May population dropped by 91%, hit by the double devastation of pesticide poisoning and starvation.

Today, more targeted spraying, less lethal pesticides and non-chemical measures have improved forest health without sacrificing birds.

Because of this up-and-down population cycle, the Cape May produces large (for warblers) clutches of about six eggs. During times of plenty, the species expands its population by as much as 13% annually.

The female builds its nest high in spruce or fir trees. She also does all of the incubating of the eggs. Dad chips in once the chicks are hatched. Both parents feed the young.

Female Cape May warblers are a paler version of their male companions. Instead of jet black, the same areas are a muted gray. The cheek patch is also gray. The young look like their mothers until they reach their adult feathering. Birds are ready to breed by age one.

With its reliance on spruce budworms in its breeding territory, you might wonder what Cape Mays do for food on their tropical wintering habitat, which lack towering spruce trees. Not surprisingly, it is a radically different diet. Unique among warblers, the Cape May has a semi-tubular tongue that enables it to drink nectar from tropical flowers.

Maybe this bird should be called the hummingbird warbler.

The wintertime Cape May doesn't completely forgo insects. It consumes lots of spiders, beetles, flies and the like. Working its way through trees and shrubs, the warbler gleans insects, sips nectar and eats small fruits, easily meeting its dietary requirements.

What are we to make of this strange and wonderful little bird?

Maybe the Cape May name for this warbler is just fine.

Names alone don't tell us much. Only by getting to know the specifics about an individual can we really get at the truth. It takes a bit of effort, but the reward can be another fascinating glimpse of life. Regardless of what you call it, that's a wonderful outcome.

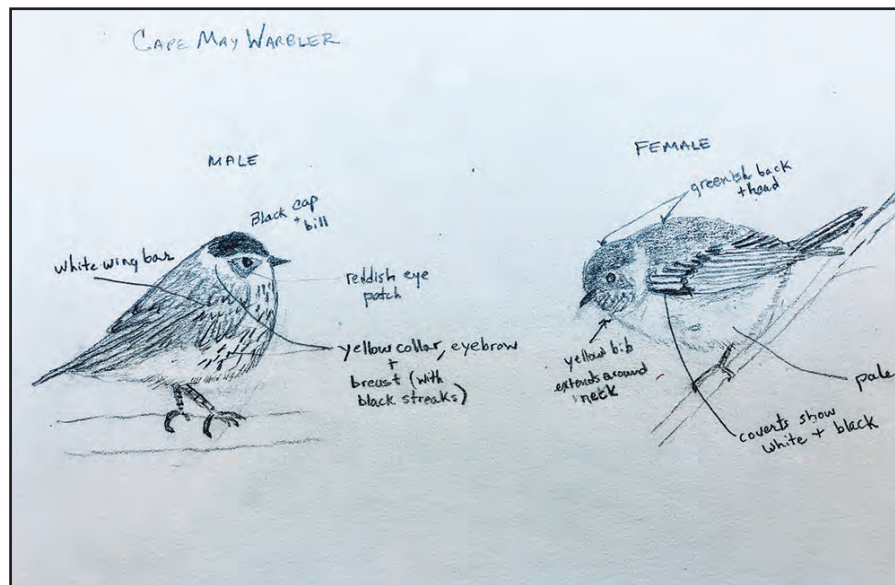
Mike Burke, an amateur naturalist, lives in Mitchellville, MD.



spring, coming into Virginia in late April and making its way up through New York and beyond in May. The birds are heading to the spruce-fir forests that stretch from Saskatchewan to Nova Scotia. A modest number will breed in the forests of the upper Great Lakes and northern Maine.

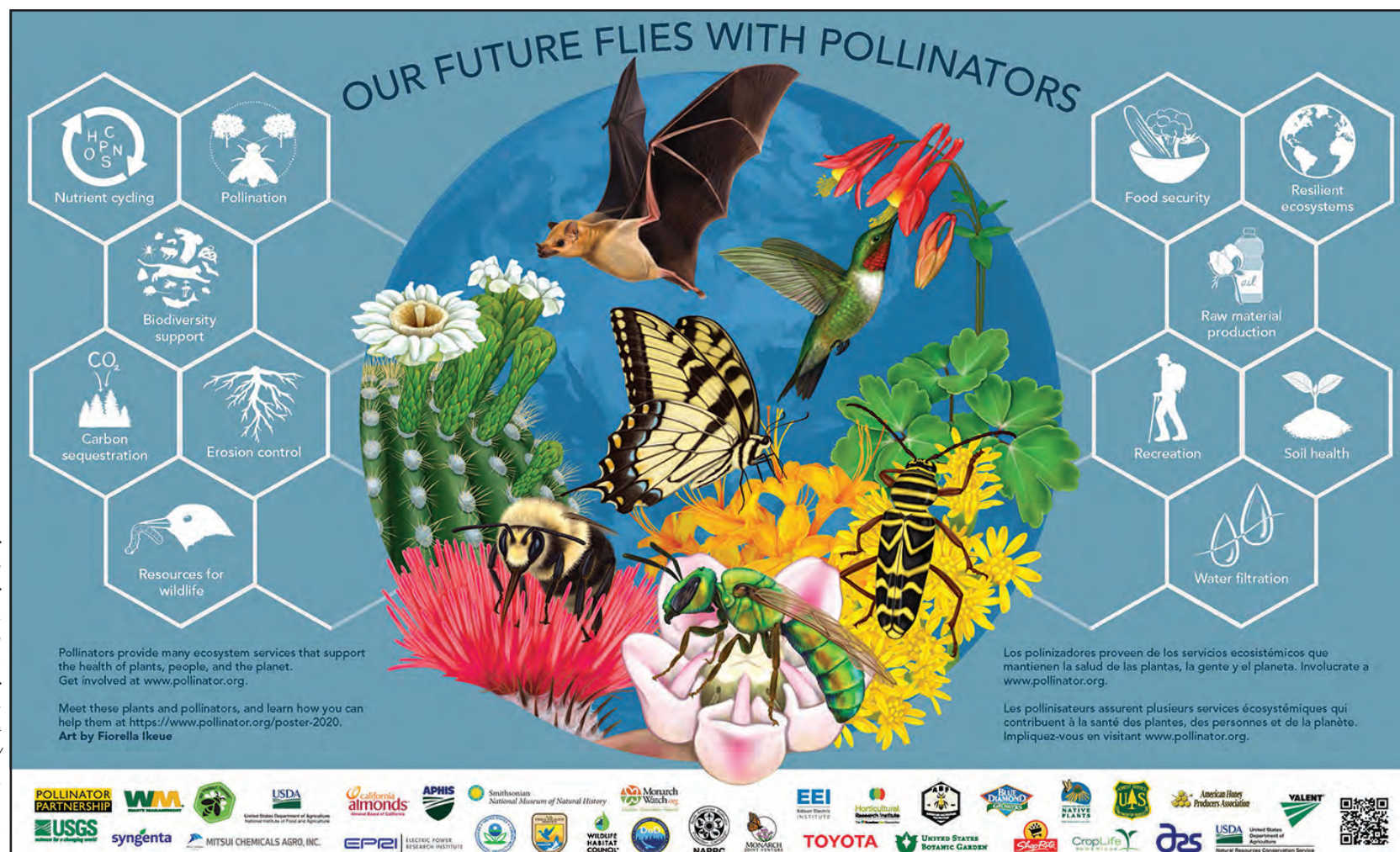
Few species are as intricately linked as the Cape May warbler and the spruce budworm, an insect that eats conifer needles. Viewed as a major pest, the budworm (the caterpillar stage of the budworm moth) is a widely distributed forest defoliator. It is also the primary food for Cape May warblers on their breeding territory.

The boom-and-bust cycle of budworms corresponds with that of the Cape May warbler. In northern Ontario during the last century, population



Sketches help the artist develop an eye for detail that not only helps to identify a bird's species, but its gender as well. (Mike Burke)

Pollinator Week is June 22–28. For information on how to help, including pollinator planting guides, visit fws.gov/ and click on “Pollinators” in the navigation menu..



Do you like to eat and breathe? Thank a pollinator

BY KATHRYN RESHETILOFF

Pollination ensures that a plant will produce full-bodied fruit and a full set of viable seeds. It occurs when pollen is moved within flowers or carried from flower to flower by animals such as birds, bees, bats, butterflies, moths, beetles and other animals, or by the wind. This leads to fertilization, then seed and fruit production in plants.

A diverse array of plants rely on pollinators, including more than 180,000 plant species, including 1,200 crops, making pollinators essential to the health of plants, other animals and people.

Without pollinators, many plant species would simply disappear. This, in turn, would influence other natural and economic functions within our world.

Biodiversity

Biodiversity is the amount of different species in a given environment or habitat. Pollinators improve biodiversity by facilitating the reproduction of many diverse plant species that, in turn, provide food and shelter for birds, mammals and insects. Biodiverse ecosystems are more resilient against sudden changes caused by disease, natural disasters, changes in weather and human activities. It also promotes



sustainable natural and agricultural ecosystems.

Carbon sequestration

Carbon sequestration is the removal of carbon from the atmosphere through the capture or storage of the gas in plants and soils. Photosynthesis, the process in which plants synthesize their food, uses atmospheric carbon dioxide and gives off oxygen in its place, storing atmospheric carbon as biomass. The plants that rely on pollinators are absolutely critical to maintaining the balance of our atmosphere and mitigating climate change, thus allowing us to survive and thrive.

Food security

Pollinators help produce one of every three bites of food we consume. Pollinators add \$217 billion to the global economy, and honey bees alone are responsible for between \$1.2 billion and \$5.4 billion in agricultural productivity in the United

States. Pollinators promote food security, the assurance that an individual has a sufficient supply of food rather than uncertainty regarding his or her next meal. Without pollinators, the amount and types of food produced would be greatly diminished. Foods like tomatoes, broccoli, beans and cucumbers would not even be possible without pollinators.

Raw materials

Raw materials are natural resources processed and used in a variety of ways. Each year, 6 billion tons of natural biomass are converted to fuel, paper, wood products, cotton fiber, cooking oil, herbs, essential oils, cosmetics and medicines. The plants that produce these products often rely on pollinators.

Soil

Soil health and stability determine the protein health of plants, which helps plants fight pests and disease. When plants supported by pollinators die and decay, necessary nutrients become available for the next generation of life. A decline in pollinators means less nutrient cycling and less fertile soil. A lack of fertile soil and plant life would render large parts of our world unlivable.

Food for wildlife

Pollinators and the plants they support

provide sustenance and other resources to other forms of life. Honey from bees provides food for a wide variety of animals. As primary producers, plants provide energy that all living animals need to consume. If native plants suffer from a lack of pollinators and are outcompeted and replaced by invasive species, other plants and animals — including us — are also affected.

These are just some of the ways that bees, butterflies, moths, beetles and other pollinators contribute to the natural and economic health of the world.

But just as important is how they enhance our lives. Pollinators are often the first types of wildlife we come into contact with, whether it's an elegant butterfly, fuzzy moth, plump bumblebee or acrobatic hummingbird. We can get close to watch them move from flower to flower. They don't even seem to notice us.

There is increasing evidence that many pollinators are in decline. Here are simple things you can do to encourage pollinator diversity and abundance:

- ☑ Plant a pollinator garden.
- ☑ Provide nesting habitat.
- ☑ Avoid or limit pesticide use.

Kathryn Reshetiloff is with the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office in Annapolis.