CHESAPEAKE
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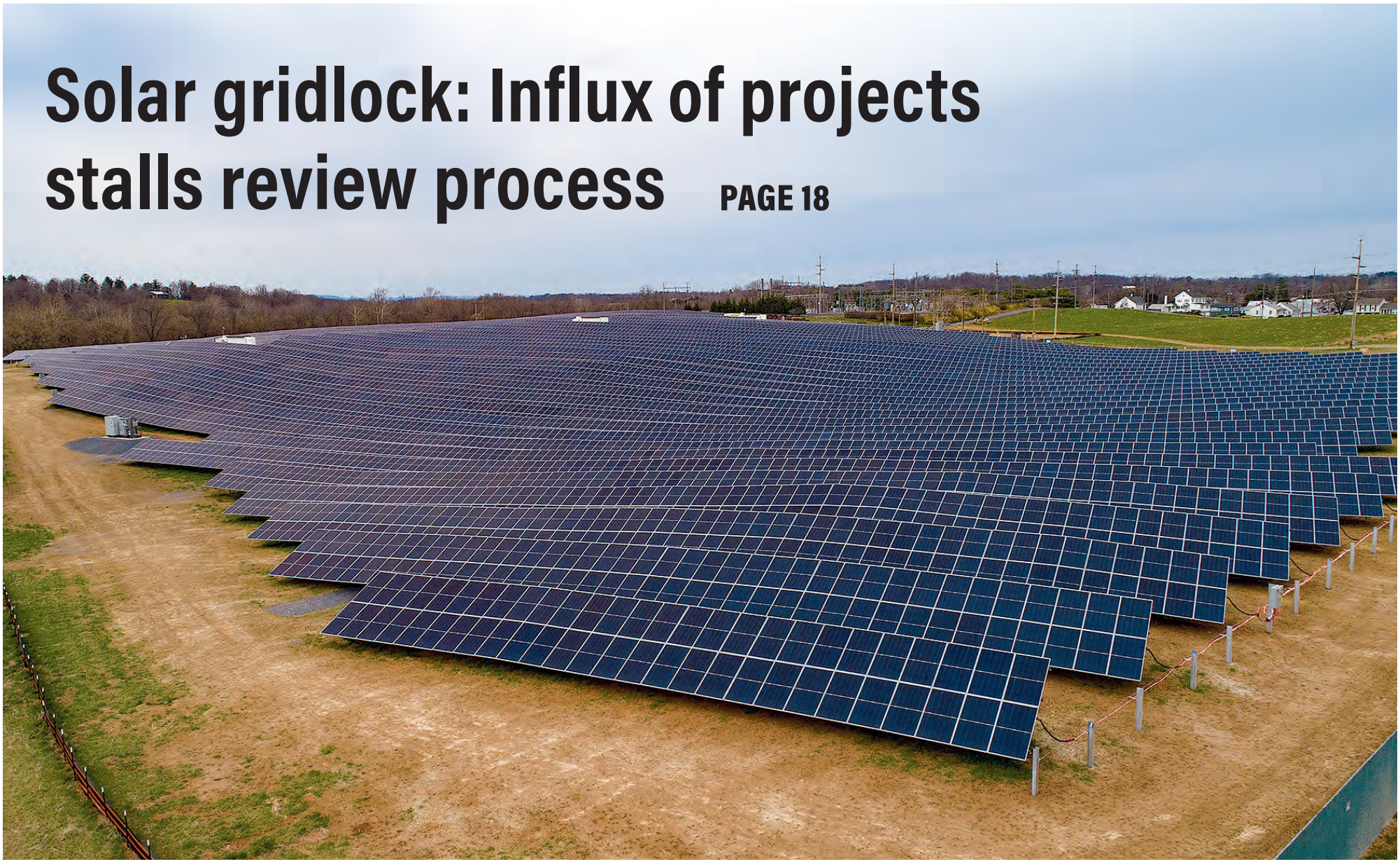
Independent environmental news for the Chesapeake region

Solar gridlock: Influx of projects stalls review process PAGE 18



LANDSCAPING FOR THE BAY

Program shows that design, maintenance matters PAGE 12

GLENROY PRESERVE

A new PA nature preserve is welcoming visitors PAGE 24

DEFENSORES DE LA CUENCA

Spanish-speaking volunteers train for stewardship PAGE 17

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CONTENTS

During a test of the forest flooding system at the Smithsonian Environmental Research Center in Edgewater, MD, researcher Kendalyn Morris of the Pacific Northwest National Laboratory records data from a soil gas analyzer. Read the article on page 23. (Timothy B. Wheeler)

EDITOR'S NOTE

It takes a village – or a watershed

The proverb, "It takes a village to raise a child," expresses the importance of communal influence, hopefully in ways that are healthy and supportive, on the journey to adulthood. It also points to the need for broad community engagement in the task.

The same can be said for the pursuit of a healthy environment in the Chesapeake Bay region. But in that effort, the village is a large watershed of more than 18 million people. In this month's *Bay Journal*, you'll find articles showing some of the many ways this "village" is at work and, we hope, gain a sense of why solutions come in so many varied but critical forms.

Some people are working on large-scale, technical projects. The transition to renewable energy is critical for meeting the goals in many states' climate policies. But the proliferation of solar proposals has created a gridlock in the review process as managers of the electricity grid grapple with impacts on the transmission system. In Pennsylvania, work is under way to learn if acid mine drainage can be a source of valuable minerals, which could lead to faster cleanups.

At the same time, nonprofit groups are working to empower stewards at the local level. Defensores de la Cuenca (Watershed Defenders) is a program for Spanish-speaking community volunteers, and the Chesapeake Landscape Professionals program is helping to ensure better design and maintenance for pollution controls, site by site.

Policymakers are at work, too, dealing with enforcement and funding issues, as well as trying to understand and reduce the impact of "forever chemicals." Scientists have launched a study to learn more about how increased rainfall creates "ghost forests."

The variety of scope, talent and passion at work for the region's environment is a constant inspiration. You can rely on the *Bay Journal* each month to learn more about it.

— Lara Lutz

ON THE COVER

Boston-based Citizens UB Solar recently completed this 8.2 megawatt photovoltaic array on 65 acres of farmland near the Lehigh Cement Co. plant in Union Bridge, MD. (Dave Harp)

Bottom photos: Left and right by Dave Harp, center by Ad Crable.

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BY THE numbers

22,610
Square miles of Pennsylvania in the Bay watershed

21,762
Square miles of Virginia in the Bay watershed

9,230
Square miles of Maryland in the Bay watershed

7.95 billion
Approximate number of trees on forestland in Pennsylvania

52,000
Estimated number of black ducks that winter in wetlands around the Bay

100,000
Chesapeake Bay Program goal for number of black ducks wintering in the Bay region

A sign of spring: The return of the Chesapeake's ospreys

Osprey facts

- Ospreys can be found on every continent except Antarctica, but the largest breeding population lives in the Bay region.
- Males and females usually mate for years, sometimes for life.
- In the spring, males fly northward first to scout nest sites.
- Adults return each year to nest in the same area in which they were born.
- Forty years ago, the population of ospreys around the Bay bottomed out at 1,450 nesting pairs. The cause was DDT, a pesticide that ran off farmland and moved its way up the food chain. DDT poisoned the birds and fatally weakened eggshells.
- Congress banned DDT in 1972, and ospreys began to rebound. Today, an estimated 12,000 nesting pairs live in the Bay region.

Standing watch over a channel marker, soaring above the water, effortlessly snatching a fish — ospreys are among the most recognizable bird species in the Chesapeake Bay region. And they have begun their annual springtime return from South America.

Background: Ospreys use branches, corn stalks, shoreline debris and other materials to build large, bulky nests. (Will Parson/Chesapeake Bay Program)

Above: The Chesapeake Conservancy's webcam caught this view of two nesting ospreys off Kent Island, MD. Catch the action at chesapeakeconservancy.com/webcams.

bayjournal.com/podcast

LOOKING BACK

30 years ago

Shad seem to face fishing pressures

Resource managers were concerned that recreational anglers were impacting the struggling shad population by catching them on their way to spawn. ■

— Bay Journal, April 1992

20 years ago

Hatchery crabs help boost dwindling wild population

Scientists in Virginia and Maryland were planning an experimental release of 40,000 hatchery-raised crabs to boost the Chesapeake's dwindling crab population. ■

— Bay Journal, April 2002

10 years ago

Wavyleaf basketgrass gaining ground in MD

The presence of invasive wavyleaf basketgrass in Maryland increased from about 150 acres in 1996 to more than 1,000 acres. ■

— Bay Journal, April 2012

ABOUT US

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

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BAY JOURNAL NOTEBOOK

Bay Journal writer Ad Crable pauses by a waterfall in Pennsylvania's Loyalsock State Forest during his annual winter backpacking excursion. (Sheldon Horst)

Excursions around the watershed

As spring weather spreads across the Chesapeake region, we offer you a recent icy photo of *Bay Journal* writer **Ad Crable** (above) during his annual winter backpacking trip. Ad and some companions traveled 11 miles on the Loyalsock Trail during the last weekend in February to see remote frozen waterfalls and two mountain vistas only accessible on foot. "The goal," Ad said, "is to experience the unique beauty of a winter landscape, hobnob about life and gain a measure of satisfaction from being outdoors at a time when most people shrink from the elements."

Writer **Jeremy Cox** wisely waited until a warm day in late March to explore a nook near Salisbury, MD, by kayak. He paddled to Leonard's Mill Pond, the product of an 18th-century grist and sawmill. After a less-than-scenic start, an upstream paddle leads to a grove of cypress trees. "The trees make their own little islands in the water. It's kind of like paddling through a full chessboard," Jeremy said.

Writer **Whitney Pipkin** also found herself in a kayak recently while researching an upcoming story about living shorelines in Virginia. She spotted an animal in the water that looked like an otter. "All I could think of was keeping my arms inside the kayak," she said — that's because our photographer, **Dave Harp,** once had his elbows bitten by an otter while he was taking photographs from his kayak.

Meanwhile, in neither woods nor water, the *Bay Journal's* marketing director, **Jacqui Caine,** began making the rounds to recruit new subscribers, an activity just resuming as pandemic restrictions lessen. In March, Jacqui spread word about the *Bay Journal* at the Upper Shore Youth Environmental Action Summit in Chestertown, MD, and at the Naturally Latinos conference in Silver Spring, MD.

If you'd like to learn more about the Bay restoration effort and explore some of its fabulous places from the comfort of your own home, tune in for Chesapeake Bay Week April 17–23 on Maryland Public Television (with some programs streamed on its website). The *Bay Journal* is partnering with MPT on the annual Chesapeake Bay Summit on April 21, which will include discussion of the *Bay Journal* film *Water's Way. Water's Way* and other *Bay Journal* films will air throughout the week, too. Check the schedule at mpt.org/bayweek.

— Lara Lutz

EPA adds MD creek to Superfund program, proposes DE site

The U.S. Environmental Protection Agency is moving to clean up a contaminated creek bottom near Baltimore while also proposing to act on polluted groundwater near Georgetown, DE.

The EPA announced March 18 that it is adding Bear Creek, a tidal tributary of the Patapsco River, to its Superfund National Priorities List, making the cleanup eligible for federal funding. The same day, the agency announced it is proposing to add the Georgetown North groundwater site.

A 60-acre area of Bear Creek's bottom sediment is contaminated with toxic metals and organic chemicals that were discharged in wastewater or stormwater runoff from the steel mill that operated on the adjoining Sparrows Point peninsula from 1887 to 2013, according to the EPA.

Under a consent agreement, the former mill site is being cleaned up by Tradepoint Atlantic, the company redeveloping the peninsula. But responsibility for the offshore contamination was limited by the bankruptcy of the mill's long-time owner, Bethlehem Steel Corp.

With the creek now in the Superfund program, the EPA said it plans to conduct a more comprehensive investigation of the sediment contamination and evaluate potential remedies.

In Delaware, groundwater beneath about one square mile of mixed commercial and residential use is contaminated with tetrachloroethylene, a likely cancer-causing solvent that's been traced back to two dry cleaning operations there that used it.

Georgetown installed a treatment system in 2017 to remove the chemical from its drinking water wells, but contamination persists in the groundwater, posing a threat of toxic vapors seeping into homes and buildings.

The EPA is taking public comments through May 17 on its proposal to add the Georgetown North groundwater cleanup to its Superfund program.

— Timothy B. Wheeler

PA updates policy on environmental justice

Pennsylvania is updating its 21-year-old environmental justice policy to include communities located near natural gas drilling and those disproportionately affected by climate change.

See **BRIEFS**, *page 6*

The historically African-American community of Turner Station, near Baltimore, is seen here across Bear Creek from the former site of the Bethlehem Steel mill on Sparrow's Point. (Dave Harp)

briefs

From page 5

The revisions also seek to improve the approval process for projects that could have environmental impacts in areas with minority and low-income residents, aiming to share information and collect feedback earlier in a project's development and not just during the state's permitting process.

"Minority and low-income communities have been disproportionately impacted by environmental hazards in their communities and have not had equitable opportunities to participate in decisions that may adversely affect their environment," the revised policy says.

In addition to requiring public meetings with project developers and government officials, the state Department of Environmental Protection said it will prioritize inspections and enforcement in environmental justice communities. It may also increase civil penalties in environmental justice areas.

The state is making changes to the policy after several years of critiques from those communities.

"I am honored to further efforts to expand and improve upon the existing plan," said Justin Dula, the new director of the state's Office of Environmental Justice.

The revisions are undergoing public hearings.

The current state policy defines such areas as communities where at least 20% identify as "a non-White minority," based on U.S. Census data.

Among the activities that trigger environmental justice scrutiny: sources of air pollution, trash and medical waste incinerators, sludge-processing facilities, large sewage treatment plants, trash transfer stations, scrap metal facilities, landfills and fracking at natural gas drilling sites.

In the revised policy, the state wants managers of fracking operations to host community meetings each year to review anticipated activities. It also instructs the Pennsylvania Climate Action Plan to inform environmental justice communities of strategies that will help mitigate the impacts of climate change in their locations.

— Ad Crable

Restored oyster reefs thriving in VA's Lafayette River

Oyster reefs created through restoration efforts in Norfolk's Lafayette River are succeeding beyond expectations, according to a recent survey by the Chesapeake Bay Foundation.

The survey found hundreds of oysters per square meter of river bottom. An oyster reef must have at least 50 oysters per square meter to ensure a healthy reef ecosystem and meet standards set by the state-federal Chesapeake Bay Program.

All three reefs surveyed by the foundation in December 2021 surpassed those standards, with densities ranging from 156 to 365 oysters per square meter. The reefs included oysters of various ages and sizes, which indicates they are reproducing.

In 2018, the Lafayette became the first river in Virginia to meet goals for oyster habitat restoration, which have been set for 11 Bay tributaries.

As part of the efforts in the Lafayette, the foundation planted more than 40 million spat-on-shell oysters on crushed concrete reef bases constructed in the river by the Elizabeth River Project. Restoration partners have also placed reef balls and oyster "castles" in the river to provide additional habitat. The 12 constructed reefs total 32 acres.

Oysters on the restored reefs have shown growth. The reef near the Hampton Boulevard bridge averaged 92 oysters per square meter in 2017 and grew to 365 oysters per square meter in 2021. The reef at the mouth of Knitting Mill Creek had 52 oysters per square meter in 2017 and grew to 253 per square meter in 2021. Near the Virginia Zoo, a reef with 100 oysters per square meter in 2017 had 156 per square meter in 2021.

— Lara Lutz

Worker shortage threatens MD crab industry again

Maryland's crab industry is once again calling for help.

The perennial problem: As it has in most recent years, the nation's demand for temporary foreign workers has far surpassed the visa cap set by Congress. The H-2B agricultural visa program administered by the U.S. Department of Homeland Security and U.S. Department of Labor received applications for more than 130,000 workers for this summer, but its quota will only admit 33,000 people.

Chef John Shields of Gertrude's Chesapeake Kitchen in Baltimore speaks at a Feb. 24 rally on Hoopers Island, supporting changes to the H2B visa program that would help meet the demand for workers in Maryland's crab-picking industry. (Dave Harp)

This year, the lottery system used to award the visas left nine out of 10 crab-picking houses on Hoopers Island without workers. The Chesapeake Bay-hugging island in Dorchester County is the epicenter of Maryland's crab-picking industry.

The crab-picking houses typically need 500–600 seasonal workers each season, which runs from April to November. A study conducted on behalf of

briefs

the Chesapeake Bay Seafood Industry Association found that if the visa cap isn't raised, it will cost Maryland's economy about $140 million.

Gov. Larry Hogan warned that the worker shortage could deal a "potentially fatal blow" to the industry.

"The crab-processing companies that have not received workers ... will not be able to operate this season," he said in a Feb. 15 letter to the state's federal delegation. "Many will be forced to close their businesses and lay off year-round workers — temporarily or even permanent — if their H-2B visas worker requests are not fulfilled."

Hogan is seeking an exemption from the cap for the region's seafood businesses. In recent years, Congress has addressed the issue by temporary increasing the limit on the number of visas available.

— Jeremy Cox

Ukraine war triggers push for more fracking in PA

The Russian invasion of Ukraine has prompted a Pennsylvania state representative to seek legislation to increase fracking for natural gas.

Republican Rep. Seth Grove, chair of the State Government Committee, introduced a bill in March to pump up gas production, reform the drilling permitting process and provide funding for more gas pipelines — all aimed at helping Pennsylvania produce more natural gas for distribution at home and abroad.

"Now is not the time to hinder our natural gas industry. Rather, we must increase it to further secure our energy sector and decrease, if not zero out completely, Americans' reliance on foreign gas," Grove said in a press release.

The impending bill comes amid a war of words between Pennsylvania politicians, natural gas advocates and environmental groups over whether the state should produce more natural gas in the interest of national energy security.

The exchange began after Republican legislators who back the controversial method of drilling for natural gas in the Marcellus Shale region cited a patriotic duty to "invest in freedom" and produce more gas to help offset the decrease in the natural gas supply from Russia due to sanctions.

In a slew of press releases, 15 Republican leaders in the state House and Senate called on Gov. Tom Wolf to loosen environmental restrictions, cut taxes on drillers, allow more pipelines and open up more state land for drilling.

"Seeing the Russia and Ukraine atrocity makes it so vividly clear that we need to focus on accessing domestic energy sources. Pennsylvania is blessed to sit atop an abundant amount of clean-burning natural gas and we need to focus on getting that to market," said House Rep. Daryl Metcalfe, a Republican from western Pennsylvania, in one of the releases.

Wolf countered by accusing Republicans of politicizing a tragedy to increase profits of the natural gas industry while standing in the way of actions that would help address climate change by reducing reliance on fossil fuels.

In their responses to Metcalfe, Wolf and environmental groups said that gas drillers in Pennsylvania have not used 40% of the wells for which they hold permits and that the U.S. is a net exporter of natural gas and receives virtually no natural gas from Russia.

Environmental groups argued that the Ukraine war is further proof that the nation needs to seek energy independence through renewable energy.

— Ad Crable

Potential sale of NASA forest pushed back at least 3 years

The mostly forested NASA property that conservationists feared could be bulldozed has won yet another reprieve.

The federal Public Buildings Reform Board, which late last year called for the sale of the 105-acre site, part of NASA's Goddard Space Flight Center in Greenbelt, MD, has decided to hold off on recommending the disposal of any government properties for at least three years.

It is the second reprieve for the tract, which NASA calls Area 400. The space agency had declared the land, once used to test rocket fuels, to be "underutilized" and proposed that it be fast-tracked for sale. The public buildings board then included the site on a list of federal properties it was recommending for sale.

That spurred protests from some conservationists, who argued that the federal government should be preserving rather than selling the forested land.

The U.S. Fish and Wildlife Service has expressed interest in adding the tract to its adjoining Patuxent Research Refuge, a 12,800-acre expanse of forest, meadows and woodlands. The board endorsed such a transfer but said that either the service must pay full market value or the land would be sold publicly. Fish and Wildlife officials and conservationists objected to those terms and pressed for a no-cost transfer.

But on Jan. 27, the White House Office of Management and Budget said the board had not sufficiently documented the costs associated with its proposed sales or the efforts made to solicit public feedback. The OMB directed the board to resubmit its recommendations by Feb. 27.

A few days before that deadline, the board declared that it no longer has a quorum of members needed to make decisions. The board said it would incorporate the feedback received on its list and "carry forward" those properties in a second round of proposals. By law, that second round cannot occur until at least three years after the initial recommendations, which were submitted Dec. 27, 2021.

—Timothy B. Wheeler

PA, DE move to limit two ‘forever chemicals’ in drinking water

States not waiting for nationwide PFAS standards

By Timothy B. Wheeler

Pennsylvania and Delaware have joined a growing list of states moving to set enforceable limits in drinking water for two “forever chemicals” that have been linked to health concerns, including cancer.

The two states have taken steps to establish state-specific maximum contaminant levels for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). Those compounds are among the most thoroughly studied of a group of highly persistent chemicals called per– and polyfluoroalkyl substances, or PFAS. Studies have shown that exposures to certain PFAS can cause a variety of health problems, including decreased fertility, developmental delays in children and reduced immunity to infection.

PFOA and PFOS have been used in a wide array of consumer and industrial products, including nonstick cookware and waterproof and stain-resistant fabrics. Their use in firefighting foam sprayed on military bases and at airports for decades has led to extensive contamination of ground– and surface waters.

Pennsylvania’s action comes three years after Democratic Gov. Tom Wolf signed an executive order calling for a comprehensive approach to addressing PFAS contamination in the state, including moving to limit it in drinking water. At that time, the chemicals had been identified at 11 sites, a number that has since grown.

Delaware’s legislature last year enacted a law requiring the state to set its own maximum contaminant levels on the same two compounds. PFOA and PFOS have contaminated public drinking water in New Castle County and in the town of Blades, which is in the Chesapeake Bay watershed. The latter site has been added to the U.S. Environmental Protection Agency’s Superfund National Priorities List for federally funded cleanups.

PFAS are currently unregulated nationally in drinking water. The U.S. Environmental Protection Agency has had a health advisory level since 2016 for PFOA and PFOS of 70 parts per trillion (ppt), combined. Last year, the agency declared its intent to regulate PFOA and PFOS in drinking water, but it will take a year or more to set nationwide safe levels.

The two states are eyeing similar limits for drinking water. Pennsylvania’s Department of Environmental Protection has proposed maximum contaminant levels of 14 ppt for PFOA and 18 ppt for PFOS, which are substantially below the federal advisory level. Delaware’s Division of Public Health has chosen ceilings of 21 ppt for PFOA and 14 ppt for PFOS, with a cap of 17 ppt when the two compounds are found together.

If those proposals are finalized, Pennsylvania and Delaware would join seven other states that have set their own enforceable limits. New York is the only other state in the Chesapeake watershed to do so, having set maximum contaminant levels in 2018 of 10 ppt each for PFOA and PFOS. The other watershed states are waiting for nationwide standards, which may not be finalized for another year or more.

Environmental and health advocates, arguing that there are no known safe levels, have urged other states’ regulators to set limits of 2 parts per trillion, the lowest level that current treatment technology can reach.

Pennsylvania’s Department of Environmental Protection is taking public comments through April 27 on its proposal. The agency expects to submit it to the state’s Environmental Quality Board in the fall for a decision. The draft rule proposes requiring initial water testing for compliance by Jan. 1, 2024, with smaller water systems given an extra year before having to test.

In Delaware, the health agency is drafting its regulation. It plans to formally propose it by July and finalize it in the fall, with water systems required to start testing in spring 2023. ■

Bay restoration work gets a boost from federal funding

Increase is less than advocates hoped for

By Karl Blankenship

The Chesapeake Bay restoration effort is slated to get increased federal funding this year, though less than advocates had been hoping for just a few months ago.

The $1.5 trillion "omnibus" funding package, which finances the federal government for the remainder of this fiscal year, was signed by President Biden March 15 and will boost spending for the U.S. Environmental Protection Agency's Chesapeake Bay Program Office in Annapolis to $88 million this year.

That's up from $87.5 million last year but is less than the $3 million increase that the Biden administration and many advocacy groups had requested.

The Bay Program Office coordinates the federal-state partnership that conducts monitoring, computer modeling and research projects related to Chesapeake restoration efforts. More than two-thirds of the money goes toward grants related to cleanup activities.

But the annual spending bill doesn't provide the full picture of federal funding for the Bay. The Infrastructure Investment and Jobs Act approved by Congress last year provided an additional $238 million for the Bay Program over five years — including $46.7 million this year — though the EPA has yet to determine how that money will be spent. Many other Bay-related initiatives will benefit from the infrastructure bill, but most of those funding decisions have not been made either.

Meanwhile, this year's omnibus spending package also included $4 million for the new Chesapeake Bay Watershed Investments for Landscape Defense (WILD) initiative. That is a competitive grant program created in 2020 to support local efforts to conserve wetlands, reduce pollution, and restore fish and wildlife habitat. This is the first time that funding has been allocated for the program, but it is less than the $15 million advocates had hoped for.

"Thriving habitat is vital to the health of the Bay watershed, and Chesapeake WILD will make much-needed investments in restoration projects across the region," said Denise Stranko, federal executive director of the Chesapeake Bay Foundation. She added that the organization "is eager to see [Chesapeake WILD] get a larger budget increase in fiscal year 2023 so watershed communities can take full advantage of this new funding source."

The spending package also includes a nationwide increase from $734 million to $760 million in funding to provide technical assistance for farmers who want to take part in U.S. Department of Agriculture conservation programs. Increased funding for such one-on-one farmer assistance is considered essential to boost participation in those programs.

The package also includes $2 million in Land and Water Conservation Fund money to protect Fones Cliffs, part of the Rappahannock River National Wildlife Refuge in Virginia. Fones Cliffs has been a high priority for conservation groups in recent years.

Reed Perry, the Chesapeake Conservancy's manager of external affairs, called the site "a treasure and an important part of the ancestral lands of the Rappahannock Tribe. This funding will help to protect this iconic and endangered landscape and preserve a vital part of the Chesapeake's history and culture."

The National Park Service Chesapeake Bay Office will receive $3 million for its Chesapeake Bay Gateways and Watertrails program, which provides financial and technical support for water access projects, educational programming, and interpretation of the Bay's natural, cultural and historical resources.

In addition, the Army Corps of Engineers is receiving $3.88 million for Chesapeake Bay oyster restoration in Maryland and Virginia rivers.

The Corps is also getting $30 million for Anacostia River watershed restoration work, which will be used to restore 7 miles of instream habitat, open 4 miles for fish passage and connect 14 miles to previously restored stream reaches in Prince George's County, MD. ■

American Rescue Plan helps fund 'green' work in Bay region

Federal funds helping to meet a variety of environmental needs

By Jeremy Cox

When Congress hit the start button one year ago on a massive $1.9 trillion COVID-19 aid measure, it also sent a surge of spending toward environmental efforts.

The American Rescue Plan Act was largely directed at providing a financial stimulus to households and speeding the country's response to the pandemic.

But the aid package also delivered $100 million to the U.S. Environmental Protection Agency, which was split in half: $50 million for environmental justice initiatives and $50 million for air-quality monitoring.

It also set aside $350 billion for states and local governments, with modest restraints on how it could be spent. The fate of much of that total is up in the air, as the states and jurisdictions grapple with spending plans and, in some cases, the capacity to implement them.

Last summer's first wave of payments largely went toward plugging budget gaps caused by the pandemic's economic fallout. To prepare for the second wave, due to begin in May, many cities and counties over the past few months arranged in-person and online meetings to seek ideas for how to best spend the money. In some places, officials and community members are advocating for clean water and conservation projects, pointing out that some projects bring multiple benefits, such as outdoor space for recreation, "green" jobs and the reduction of urban "heat islands."

All funds must be committed by the end of 2024 and spent by the end of 2026.

Across the Chesapeake Bay region, some funding announcements are trickling in. Here is a look at some of the recipients (and proposals) in the green sector.

The rooftop of the Maycroft Apartments in the District's Columbia Heights neighborhood is covered with photovoltaic panels, squeezed in among air conditioning units, skylights and vents. The District's Solar for All program aims to provide 100,000 low-income families with the benefits of locally generated clean energy and cut their energy bills in half in the process. (Timothy B. Wheeler)

District of Columbia

The District received $2.3 billion. As of the end of last August, the deadline for the first federal reporting period, the District had spent $83 million of that sum.

- $16 million to the DC Department of Energy & Environment and the DC Sustainable Energy Utility to provide grants to "under-resourced" buildings to conduct energy audits and predevelopment design and construction work. Eligible facilities include senior care centers, schools, hospitals and places of worship.
- $17.5 million to DOEE's Solar for All program to provide solar energy assistance funds to an additional 3,800 low– and moderate-income households and install more community solar projects.

Maryland

The act set aside about $3.9 billion for state government. This year's budget swallowed about $2.1 billion of that sum. About $1.7 billion remains.

City and county governments across Maryland will divvy up a separate pot of $2.3 billion.

- $200,000 for Baltimore's YH2O mentoring program, an on-the-job training program for young adults. Participants are involved in water quality monitoring, sampling and reporting — skills that will help them transition into water infrastructure jobs. To be eligible, they must be 18–24 years old, have a high school diploma or GED and be unemployed or underemployed. The new funding is drawn from $50 million set aside nationwide from EPA funds dedicated to environmental justice.
- $13,000 to the Ward Museum of Wildfowl Art in Salisbury to develop materials for a new series of artwork highlighting Black experiences on Maryland's Eastern Shore. The funding comes from an Institute of Museum and Library Services grant program tied to the rescue plan.
- $1.5 million to Baltimore County (proposed) to plant trees in less-affluent areas where the existing tree canopy is often thin.
- $6.6 million to Baltimore County (proposed) to complete a living shoreline and aquatic habitat project along the Middle Branch of the Patapsco River.
- Nearly $23 million to Prince George's County to address stormwater problems, flooding and stream restoration needs, including $2.3 million to develop a stormwater management plan. One of the projects will restore 3,100 linear feet of streams in the historically Black community of Eagle Harbor, where a nearby power plant has exacerbated flooding in recent years.

Virginia

Virginia received $4.3 billion at the state level, while its cities and counties got $2.9 billion. The current state budget is absorbing $3.2 billion of the funding, leaving $1.1 billion to be spent in the future.

- $50 million to the Department of Health to support equal access to clean drinking water in small and disadvantaged communities.
- $125 million to the Department of Environmental Quality to help pay for sewage treatment plant upgrades aimed at reducing the frequency of overflows. Alexandria and Richmond would each receive $50 million, while Lynchburg would get $25 million. Each city must provide 100% matching funds.
- $75 million to DEQ for septic, pipe and sewer system repairs and upgrades.
- $2 million to Norfolk (proposed) to reduce flooding along Surrey Crescent, a residential road in the low-lying Larchmont/Edgewater neighborhood.
- $850,000 to Norfolk Botanical Garden (proposed) to establish "Nature's Wonderland," which would include a new destination exhibit, renovations to the butterfly house and the creation of a staff-guided kayak program on Lake Whitehurst.
- $1.5 million to Richmond to acquire land for new parks on the Southside, a historically underserved section of the city. The goal is to reduce the number of residents who don't have access to park space within a 10-minute walk of their homes.
- $19 million to Richmond in environmental spending, including $12.5 million in stormwater system upgrades and $1.5 million for a climate-risk assessment plan.
- $1 million to the state Department of Conservation and Recreation to be provided to Fairfax County for trail system connections at Lake Royal Park.
- $25 million to DCR to cover outdoor recreation area maintenance and construction needs.

Pennsylvania

The act made available about $7.2 billion for the state government. The state's current budget used about $1 billion of that total, leaving $6.2 billion to be spent by the 2026 deadline.

Federal officials allotted $6 billion for local governments in Pennsylvania. In Lebanon County, Palmyra Borough received $752,000 to bore a stormwater pipe below a rail line and extend the system elsewhere.

Bills are pending in the General Assembly that would apply more funds from the American Rescue Plan Act to clean water projects across the state. ■

Historically Black beach to be saved as Annapolis parkland

Site was centerpiece of Bayfront recreation during segregation

By Jeremy Cox

Carr's and Sparrow's beaches in Annapolis, MD, were thriving gathering places in the 1950s and '60s. Historical images, clockwise from upper left, show lifeguards, a beachgoing family, and women attending a music performance that took place there. The lower right photo shows part of the contemporary shoreline now slated for preservation. (Historical images from the collection of the Maryland State Archives, shoreline by Jody Couser/Chesapeake Conservancy)

Time was running out to save the last vestige of a rollicking African American getaway on the shores of the Chesapeake Bay.

The pair of neighboring Jim Crow era resorts once buzzed along the waterfront of the Annapolis Neck peninsula. At their height during the 1950s and '60s, Carr's and Sparrow's beaches attracted crowds by the thousands who came to relax and enjoy some of the top Black entertainers of the day, from Little Richard to Aretha Franklin.

But after the venues closed in the 1970s, their once-expansive acreage began to be swallowed by suburban development: a gated subdivision, a marina, a senior-living community and the expansion of a wastewater treatment plant.

Now, the leaders of a broad coalition of public and private groups say they have struck a deal to save the last piece of the original resort. Their plan is to transform the 5-acre, shore-hugging property into a city park that celebrates the site's heritage.

"We are proud to partner with the city of Annapolis to reclaim part of this beautiful waterfront area that is of such great historic and cultural significance," Maryland Gov. Larry Hogan said, announcing the pending $6.4 million transaction March 14. "As a major music venue and beloved gathering place for generations of Black Marylanders, Carr's Beach left an incredible legacy that we will now be able to preserve for posterity."

Vince Leggett, founder and president of the group Blacks of the Chesapeake, began trying to purchase the property 15 years ago. But he said it quickly became apparent that he would need help.

"It was like putting together a million-piece jigsaw puzzle," he said. "No one entity was strong enough to do it on its own."

The project ended up getting funding from a patchwork of city, county and federal sources. An earmark obtained by U.S. Sens. Ben Cardin and Chris Van Hollen of Maryland in the recently approved 2022 federal funding bill will provide $2 million for designing and planning the park. Meanwhile, state Sen. Sarah Elfreth, whose district includes Annapolis, is pushing legislation to designate the property as a state park to be operated jointly with the city.

The Conservation Fund plans to purchase it from its owner, developer Theo Rodgers. Afterward, the group plans to sell the land to the city, officials said.

In addition to its cultural importance, the parcel's salvation would advance environmental goals, said Joel Dunn, president and CEO of the Chesapeake Conservancy, another partner. The mostly wooded, undeveloped parcel can absorb pounding surge during strong storms, protecting neighboring built-up areas from erosion. Dunn added that its preservation ensures that the landscape will continue to be a home for wildlife.

"To me, this is a symbol that land conservation is important to everyone, and everyone benefits from it," Dunn said.

The park would also offer public water access, but its final look and feel remain to be determined. Supporters hope it will tell the story of one of the most popular summer havens in the mid-Atlantic that catered to African Americans when others shut them out.

"It's more than a pin or a dot on the map," Leggett said. "It was an authentic space owned by African Americans."

That story began with Frederick Carr, a formerly enslaved man who purchased 180 acres of farmland on the Bay at the mouth of the Severn River. In the early years, in addition to continuing to farm the land, he and his wife, Mary Wells Carr, hosted picnics and outings.

In 1926, they founded Carr's Beach as a family-oriented Black retreat. Five years later, one of the Carr's daughters, Florence Carr Sparrow, started her own attraction, which she called Sparrow's Beach, on adjoining land she had inherited. Her older sister, Elizabeth Carr Smith, took over management of Carr's Beach.

Over time, patrons simply called the area "the Beach." New amenities popped up, including a midway lined with slot machines and a pavilion that hosted dances and some of the most popular acts on what was known as the Chitlin' Circuit — the string of venues in segregated parts of the country that catered to Black performers and audiences.

The list of entertainers who performed at the beaches presents a who's who of African American stars: Billie Holiday, Count Basie, Ella Fitzgerald, Chuck Berry, James Brown, the Coasters, the Temptations and more.

After segregation formally ended, the resorts struggled to draw crowds the way they once did and closed. The preservation effort aims to save the last slice of the beach complex, now known as Elktonia Beach.

Leggett, 68, has vivid memories of visits to the beaches as a child in the 1950s and '60s. His father worked at a canning plant in Baltimore with separate unions for Black and White workers. Each year, the unions would organize separate weekend-long outings for their members. Leggett's father told him that in the lunchroom afterward, the White workers always seemed envious of the time that their Black counterparts had had at Sparrow's and Carr's.

"Everybody has a Carr's Beach story," Leggett said, "and my tagline is, 'Come out and tell me yours.'" ■

For a cleaner Bay, start with the maintenance crew

Program teaches landscaping pros Bay-friendly basics

By Jeremy Cox

It all begins with a single, seemingly innocuous raindrop. Instead of splattering onto soil and oozing into the ground, as it would have done a half-millennium ago, the droplet lands on a roof, road or parking lot. From there, it zips along one hard surface to another. Until this tiny traveler finds a larger body of water — a ditch, a creek, the Potomac River — it is fair game for any pollutant that wants to tag along.

And that's why, as far as the Chesapeake Bay is concerned, cities and towns are vast pollution factories, said Kelley Oklesson, a landscape architect based in Hyattsville, MD.

"Water moves downhill, so as it moves, it picks up a lot of things … that can go with it, like heavy metals, oil and trash," she said. "And then it just continues to go to the low point, and that's our Bay."

For Oklesson, it isn't enough for a client's yard to look pretty. It must also be designed to prevent raindrops from destroying the fragile health of the largest U.S. estuary. So, she incorporates into her designs things from nature to capture and filter stormwater before it leaves the yard or garden.

Where did Oklesson gain the knowledge and skills to pull off such Bay-friendly projects? Not from her college degree, or even from a decade of experience in the landscaping industry. It mostly came, she said, from the Chesapeake Bay Landscape Professional certification program, which provides training for designers, installers and maintenance personnel in the landscaping field.

Since its inception in 2016, the program has certified more than 800 professionals in Maryland, New Jersey, Pennsylvania, Virginia and the District of Columbia. The first class in Delaware began meeting earlier this year.

Reducing pollution from urban and suburban stormwater is one of the most important and ambitious aims of the multistate and federal Bay restoration effort. The training program's leaders say they work to ensure that a qualified workforce is available across the 64,000-square-mile watershed to help carry out that objective.

"It's a living system you're installing," said Joyce Kelley, a landscape designer and one of the program's instructors. "There's nothing worse than these projects that go in that [cost] several hundred thousand dollars that look terrible in five years or get mowed over."

Making progress

In 2010, the U.S. Environmental Protection Agency issued a "pollution diet," officially called the total maximum daily load, aimed at making states more successful and accountable in the regional effort to clean up the Bay. The TMDL outlines limits for the amounts of pollutants each jurisdiction could send downstream. That set into motion a renewed cleanup effort with a 2025 deadline.

The Chesapeake Bay Program, a federal-state partnership that oversees the effort, recognizes more than 400 pollution controls, known as best management practices or BMPs, that landowners can use to reduce water pollution. They can take many shapes and sizes — rain gardens, pervious pavers and bioswales are just some examples — but the general idea is the same: slowing drainage toward the Bay, giving pollutants like nutrients and sediment the means and the time to separate from the water.

Installing a BMP, though, is only the first step. Each state is required to track the BMPs and verify that they're achieving their pollution-reduction goals. That means they must be maintained properly throughout their life cycle to continue receiving credit toward the cleanup.

The maintenance responsibility falls to whoever owns the property — whether it's a hospital, public school system, town government, private landowner or homeowners association.

A 2012 study commissioned by the Hampton Roads Planning District Commission found evidence of tens of millions of dollars worth of BMPs already installed on private properties in Virginia — but nothing to indicate whether those practices were installed properly or are being maintained.

The study led to a statewide summit of industry, environmental, governmental and academic leaders. One of their top recommendations was to "build an effective and integrated network of powerful water quality and stormwater experts and advocates." Afterward, members of the Virginia-based group Wetlands Watch, the author of the BMP study, began building financial and technical support to launch what became the Bay Landscape Professional program.

"Early on," said Shereen Hughes, assistant director of Wetlands Watch and the Virginia coordinator of the landscape training program, "we saw that these stormwater practices were being implemented across the watershed to meet the TMDL. But when you look at those practices, they're not always being maintained."

It was not a problem confined to Virginia. In 2014, the Bay Program's Local Government Advisory Committee, whose members include local officials from around the watershed, said that increasing the pool of qualified employees and contractors to carry out restoration and protection projects was one of its top priorities.

"There's a disconnect in the maintenance," said Beth Ginter, executive director of the Chesapeake Conservation

Above and inset photo: Landscape architect Kelley Oklesson, kneeling, confers with (standing, left to right) Maureen Robinson of the Association of Professional Landscape Designers, neighborhood activist and gardener Jean Lee Cole and landscape architect Maya Mule. (Dave Harp)

Kelley Oklesson (left) talks with neighborhood activist and gardener Jean Lee Cole at the Contee-Parago Park in Baltimore. Oklesson worked with the area residents to redesign the park and will oversee the work of volunteers who will plant native species there this spring. (Dave Harp)

Landscaping Council, which co-manages the program with Wetlands Watch. She said she has too often seen property owners receive hefty grants to install a BMP, only to allow it to fall into disrepair because they lack the funding and expertise to maintain it.

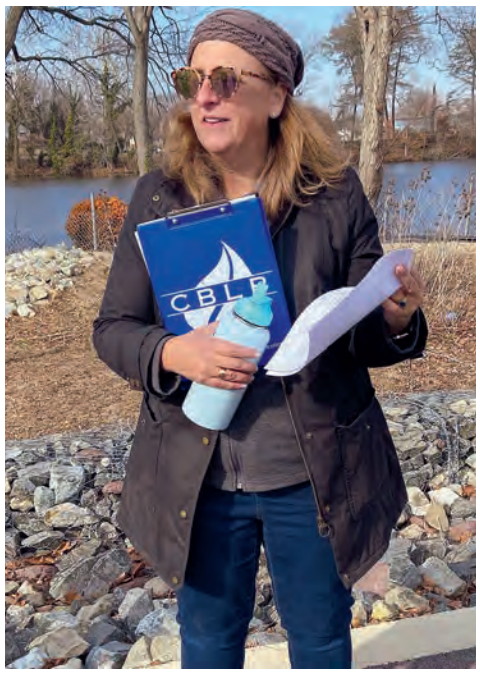
Brent Jett, a senior project engineer with the firm George, Miles and Buhr, said some of his own projects have deteriorated across the Delmarva Peninsula for lack of proper care.

"It's disappointing," he said. "You understand budget constraints and man hours. You hope for the best. But at the end of the day, it's not your money and it's not your land."

An education in dry ponds

On a sunny and chilly February morning, Jett guided a group of about a dozen maintenance professionals on a driving tour in and around Seaford, DE, a former manufacturing hub in the southwest corner of the state. Once known as the "Nylon Capital of the World," Seaford these days derives most of its economic vigor from its community hospital, a Walmart and a recently opened Amazon distribution center.

None of those institutions were on the tour. Instead, the itinerary included stops at a bioretention pond and bioswale outside a Catholic church, a rectangular pond behind a government services building, and a "submerged gravel wetland" beside a medical office complex, which turned out to be a rock-strewn low spot tucked into a narrow strip between a parking lot and a dam-widened pond.



Above: Brent Jett, a project engineer with George, Miles and Buhr, talks about a stormwater pond with participants in the Chesapeake Bay Landscape Professional Certification program in Seaford, DE. Jett said some of his stormwater projects on the Delmarva Peninsula have deteriorated for lack of proper care. (Jeremy Cox)

Left: Beth Ginter, executive director of the Chesapeake Conservation Landscaping Council, directs a Chesapeake Bay Landscape Professional certification class that took place in Seaford, DE. (Jeremy Cox)

Clad in a black windbreaker outside a second medical complex, Jett steered the group toward a BMP with an oxymoronic name: a "dry pond." It consisted of a shallow bunker rimmed with shrubs. As the moniker suggests, it's intended to be dry most of the time, gathering water only after heavy rains, he said.

Local regulations require such ponds to handle stormwater during 10-year rain events, downpours that have a 10% chance of occurring in a given year. That equates to 5.6 inches of rainfall during a single event. But Jett said he routinely designs the ponds to store more water — up to 7 inches of falling rain — because climate change is triggering heavier cloudbursts.

"It literally rains differently now," he told the group. "When we get 2 inches in a half-hour, it just blows everything out."

Trailing along with the clipboard-carrying pack was Lisa Wool, executive director of the Nanticoke Watershed Alliance. This class — Delaware's first — grew out of her concern that the region lacked the technical expertise to implement the new stormwater controls.

She acknowledged that the new methods involve more work and time. For example, workers may need to pull weeds with their hands instead of spraying an herbicide, which might kill desirable native plants, Wool said.

"A lot of these guys want to weed-whack, spray and then get out," she said.

Wool directed grant money from the Delaware Department of Natural Resources and Environmental Control to bring the Bay Landscape Professional Program to the state. Initially, she and other organizers struggled to attract participants. So, they also used the money to fund scholarships, and the slots quickly filled up.

Rob Mason, who owns a landscape maintenance company based in West Ocean City, MD, said he hopes that the program can be a gateway to a new line of business. "There are not a lot of landscapers in this field," he said as he leaned against his truck at the end of the Seaford tour.

He added that the program's advice sometimes conflicts with his landscaper's instincts to keep grass trimmed low and to avoid messiness at all costs. His new outlook: "Let it do what it's supposed to do."

Designing with nature

To become certified, participants must pass a final exam with a score of 75% or higher. The program offers a Level I certification, which emphasizes maintenance practices. Level II is available to graduates of the first level and provides an advanced course in design and installation.

Classes typically take place December to March and June to September to avoid landscapers' busy seasons in the spring and fall.

Another early realization, Ginter said, was that there was no textbook for the region's landscape professionals looking to green up their practices. So, with funding support from the DC Department of Energy and Environment, program officials wrote an 83-page *Sustainable Landscape Maintenance Manual*.

During the pandemic, organizers moved some of the education online and purchased equipment to make in-person interactions safer. But the health crisis did little to stem the program's growth. Last fall, instructors integrated the curriculum — previously only available to working adults — with a class at a high school in Portsmouth, VA, and repeated the project this spring at a school in Gloucester. Some of the program's partners are working to develop a Spanish language version.

Oklesson, the Hyattsville landscape architect, is certified in both levels.

She now tries to incorporate BMPs into her work even if they aren't required by local regulations.

"Nature has had it figured out for so long," she said. "We have so much to learn ourselves with how to design with nature." ■

For information about Chesapeake Bay Landscape Professional training, visit cblpro.org.

MD water pollution enforcement hits 20-year low

Environmental groups say there are fewer inspections and fewer fines for water pollution

By Timothy B. Wheeler

Enforcement of water pollution laws in Maryland has trended downward over the last two decades but has nosedived under the Hogan administration, according to a new report by several environmental groups.

Drawing on data reported annually by the Maryland Department of the Environment, the Chesapeake Accountability Project, a coalition of four groups, tallied a 39% decline in water-related inspections and a 67% drop-off in enforcement actions under the Hogan administration, compared with its predecessor.

Environmentalists contend that lax enforcement undermines efforts to restore the Chesapeake Bay and threatens public health.

"Imagine how our roads would be if there were no speed cameras or police officers to pull over speeders," said Katlyn Schmitt, a policy analyst with the Center for Progressive Reform and lead author of the report. "In Maryland, polluters can essentially get away with polluting and breaking environmental rules."

The coalition — which includes the Center for Progressive Reform, Chesapeake Bay Foundation, Chesapeake Legal Alliance and Environmental Integrity Project — released its "enforcement scorecard" on March 9 in support of pending legislation that would require MDE to conduct more inspections and impose harsher penalties on polluters.

The coalition focused on compliance and enforcement activity reported by MDE on discharges to surface and groundwater, disturbances of wetlands and waterways, and stormwater runoff from existing and new development. It also took stock of staffing levels at the state agency and a long list of facilities operating on so-called "zombie" permits with outdated discharge limits.

Annual MDE reports show water-related inspections and enforcement, while peaking at times, have declined overall since 2001. The 75 enforcement actions reported by MDE's Water and Science administration in the year ending last July 1 marked a 20-year low, the coalition said. That was less than half the annual average of 168 actions taken since 2001, according to the report.

Under Hogan, the coalition found, MDE identified 70% fewer significant pollution violations — those generally deemed threats to public health or the environment — than it had in the previous administration and collected 47% less in fines. The number of significant violations cited last year was the lowest in 20 years, it said.

Multiple water pollution violations were uncovered in 2021 at the Back River wastewater treatment plant, which processes sewage from about 1.3 million residents in Baltimore City and Baltimore County. (Will Parson/Chesapeake Bay Program)

While the decrease in violations might suggest MDE's enforcement has had a deterrent effect, the report said a review of industrial stormwater compliance indicated otherwise. State inspectors found noncompliance in nearly two-thirds of the processing plants, auto salvage yards and landfills it checked for stormwater pollution controls from 2017 through 2020. Of those, nearly half were repeat offenders, yet only 14 formal enforcement actions were taken, the report said.

Early in the Hogan administration, MDE said it was providing more "compliance assistance" without taking enforcement action, to address minor violations before they could become significant. The number of cases handled that way did increase markedly for a few years but have since declined. Last year, compliance assistance was 67% below the 20-year average.

The coalition said MDE has suffered budget and staffing cuts over the past two decades that have chronically hampered its ability to monitor the growing number of regulated entities. Its workforce is about 14% smaller than it was 20 years ago, and its share of state funding has shrunk by one third, the report said.

The emergency workplace restrictions imposed at the outset of the coronavirus pandemic may have caused some inspections to be delayed or skipped, but the coalition pointed out that sharp declines were occurring before COVID-19 showed up.

"This is a terrible time for a drop-off in water pollution enforcement," said Courtney Bernhardt, research director for the Environmental Integrity Project. The Bay restoration effort has made limited progress to date, and it faces increased stresses from population growth, development and climate change.

MDE spokesman Mark Shaffer said officials weren't able to review the report before its release. But he issued a statement saying that "MDE has never wavered in its commitment to compliance and enforcement, which continues to be a priority."

He cited examples of "significant and impactful" water-related actions to stop water pollution at the Verso paper mill in western Maryland, the Dominion coal ash ponds at Possum Point on the Potomac River, and in Baltimore city, where there have been sewage overflows and wastewater treatment violations. He also pointed to Maryland's lawsuit, with two other states and the District of Columbia, seeking to compel the U.S. Environmental Protection Agency to take more aggressive action against Pennsylvania for its lagging role in the Bay restoration.

But the coalition's report noted that some of the biggest pollution cases recently — including those involving the state's two biggest sewage treatment plants in Baltimore and the Valley Proteins poultry rendering plant on the Eastern Shore — were first spotted by watershed activists, not by MDE inspectors.

"We can't fix pollution problems that aren't being identified due to lack of inspections and enforcement by MDE," added Doug Myers, senior Maryland scientist for the Chesapeake Bay Foundation.

The report comes after a legislative briefing in January when lawmakers grilled MDE Secretary Ben Grumbles over his department's oversight of drinking water supplies, shellfish safety, poultry runoff, sewage treatment and industrial waste. Grumbles acknowledged some lapses and pledged to hire more staff to increase inspections.

Two bills pending in the General Assembly seek to boost enforcement of state environmental laws. One measure, SB221/HB402, backed by Attorney General Brian Frosh, would give MDE more leeway in pursuing violators and would increase penalties for some offenses. The other, HB649/SB492, would require MDE to hire more staff, conduct more inspections and increase penalties.

That measure also orders MDE to eliminate its lengthy backlog of more than 150 facilities with so-called "zombie" or outdated discharge permits, some of which have been allowed to continue for years.

MDE has warned that the second bill would force it to hire more than 200 new staff at a cost of nearly $23 million. Del. Sara Love, a Montgomery County Democrat who is one of the measure's prime sponsors, called that a "ridiculous" overestimate but said she and other sponsors are working on amendments to lower the potential cost.

"Everybody recognizes that this is a problem and that MDE has been short-staffed, and that it cannot continue," Love said. "I believe that the [MDE] secretary is going to hire some people. I think he already has. But the question is: Is that going to be enough? And we need to make sure that it is enough." ■

Another VA county considers going big on data centers

Land use changes would impact 'rural crescent' in Prince William County

By Whitney Pipkin

A handful of proposed projects are turning Prince William County, VA, into the next frontier for debates over appropriate data center development as the industry continues to expand its footprint across Northern Virginia.

Data centers are the infrastructure behind our internet-based lives. These often expansive, low-slung buildings — imagine windowless Walmart stores all in a row — are filled with racks of computer servers that store and process information. Online behemoths such as Amazon and Google continue to invest billions of dollars in the data centers to support cloud-based services.

Counties that welcome the facilities can receive millions of dollars in tax revenue in return. But smart growth advocates worry that such a dynamic could make decisions about where they should be located inherently lopsided.

In Virginia, Prince William's northern neighbor Loudoun County is already home to the world's largest concentration of data centers, with 27 million square feet of them in operation and another 9 million square feet coming online, according to the website *Data Center Frontier*. The industry brings an estimated $500 million into the county's tax coffers each year, and surrounding localities have taken notice.

"In order for Prince William County to have a bright future, a huge expansion in the tax base must come about, and data centers are the only way to achieve that," one county resident said during a public meeting in March over whether a set-aside zoning area for data centers should be expanded.

That project is among a handful being considered by the county that would help accommodate data centers.

Prince William County, which borders Fairfax County to the northeast, has for more than two decades concentrated urban and suburban growth along the I-95 and I-66 corridors, leaving a "rural crescent" of land that is out of reach of such development.

Now, data centers are being proposed for some of that rural land, including parcels that drain to a regional drinking water reservoir and that border national parks. Even as the county looks to approve an "opportunity zone" where data centers would be concentrated around existing infrastructure, officials are considering a smattering of data center proposals outside of that area.

A resident of Prince William County, VA, holds a poster at a public meeting while expressing objections to proposed land use changes. (Whitney Pipkin)

Residents of Prince William County, VA, view maps showing potential land use changes that would allow for the development of data centers. (Whitney Pipkin)

"We are looking at radical changes to the long-range land use map," Kim Hosen, executive director of the Prince William Conservation Alliance, said of the data center decisions before her county's leaders. "We have, right now, more than 2,000 acres under consideration for data centers — some in the watershed for our public drinking water supply — with very little assessment."

One proposal to accommodate data center development came not from county planners but from residents who, despite living in the rural crescent, see the conversion of their properties as inevitable and would like to be able to sell them directly to data center developers.

Dozens of people living on larger parcels along Pageland Lane have come together to propose rezoning in support of forming a "Prince William Digital Gateway." In addition to their original rezoning request, the county is considering, at the request of additional landowners, if data centers would be a fit for a broader area that would total 194 parcels and more than 2,000 acres.

Mike Grossman, one of the Pageland Lane landowners, said the road's proximity to Loudoun County, power lines and fiberoptic cables make it a good fit for data center development. He said farmers and residents neighboring his property are tired of fighting "battle after battle" to prevent development from reaching this area. Several residents — who would be able to sell their land at higher prices if the zoning changes are approved — pointed to how data center development would also improve the county's commercial tax base.

"Without the data centers, Pageland Lane is going to get widened and the taxpayers will have to pay for it," Grossman said. "Why not let these people that live up and down Pageland Lane sell to the data centers and get out with dignity?"

Residents who oppose the change in land use say the county, not a group of property owners, should decide where to locate data centers. They are also concerned about the impact of so much concentrated development on land that drains to the Occoquan Reservoir, a drinking water source to the area, and to the Occoquan River.

"This is our environmental resource. All of the hard surfaces — the parking lots, buildings, rooftops — are going to contribute runoff to the streams nearby," said county resident Stephanie Chartrand. "That's a big concern."

Environmental and smart-growth groups are also concerned about the precedent this type of development sets for the county and whether the economic benefits will outweigh the other costs.

"Prince William is really considering a new approach, which is to let land speculators identify where we're going to put data centers," said Julie Bolthouse, deputy director of land use at the Piedmont Environmental Council. "What they're looking at is the cheapest land that's available. That's why [they're considering] rural parcels that are not currently connected to water and sewer and that are next to a national park."

The Digital Gateway proposal has drawn opposition from a range of advocates for cultural and natural resources, too. In a letter to the county, the superintendent of the 5,000-acre Manassas National Battlefield Park called the proposal "the single greatest threat to [the park] in nearly three decades."

The county's watershed management division has said the project would entail extensive impacts to forests, streams and wildlife that many of the county's existing policies aim to prevent.

"Thus far, development of data centers has resulted in mass grading that does not preserve forests, steep slopes or other sensitive features, resulting in little preservation of natural resources outside of areas protected by state or federal law," the agency's review states.

The land use decisions will ultimately be up to the county's Board of Supervisors. One of them has said he will recuse himself from the Pageland Lane decision because he lives in the area up for zoning changes. ■

Extracting rare elements could help clean up industrial waste

Advocates in PA say acid mine drainage, coal ash could be a source of valuable resources

By Ad Crable

An increasingly concerned United States has accelerated its quest to find domestic sources of so-called rare earth elements critical to daily life and national security. In Pennsylvania, industrial waste from mining and coal-fired energy production might be part of the solution.

Right now, China produces or processes almost all of the rare earth elements — or REEs — that the U.S. relies on for a variety of products. REEs are indispensable for manufacturing touch screens, hard drives, medical devices and catalytic converters, as well as planes, satellites and drones used by the military.

And they will be needed in even greater quantities to support a transition to renewable energy: Solar panels, magnets for wind turbines, and energy storage cells need them, as do the magnets, batteries and fuel cells that power electric vehicles.

In Pennsylvania, more than a century of coal mining and burning coal for electricity has left behind accessible concentrations of these now-valuable elements. The state is pushing to ramp up domestic production, saying it has a ready supply of REEs from such seemingly unlikely sources as acid mine drainage, coal waste piles, ash dumps at coal-fired power plants and clays found under coal seams.

For example, coal refuse is expected to yield significant quantities of cobalt, critical in magnets that are used in military aircraft, radar and missile guidance systems, and at least for the time being in lithium-ion batteries. Coal waste can also provide manganese, used in iron and steel production.

The clays found under some coal seams can contain lithium, a component in batteries, and alumina, used to produce aluminum. Acid mine drainage also can yield lithium.

Scientists and backers say the recovery of these critical minerals would fuel massive environmental restoration by removing coal waste piles, restoring abandoned mine lands and staunching the acid mine drainage that has contaminated 7,356 miles of streams in the state.

That environmental transformation, combined with addressing the domestic supply issue and aiding down-and-out mining communities, may give Pennsylvania an edge in the race to produce REEs.

This Pennsylvania facility successfully extracted valuable elements from ash waste left over by coal-fired power production. (Winner Water Services)

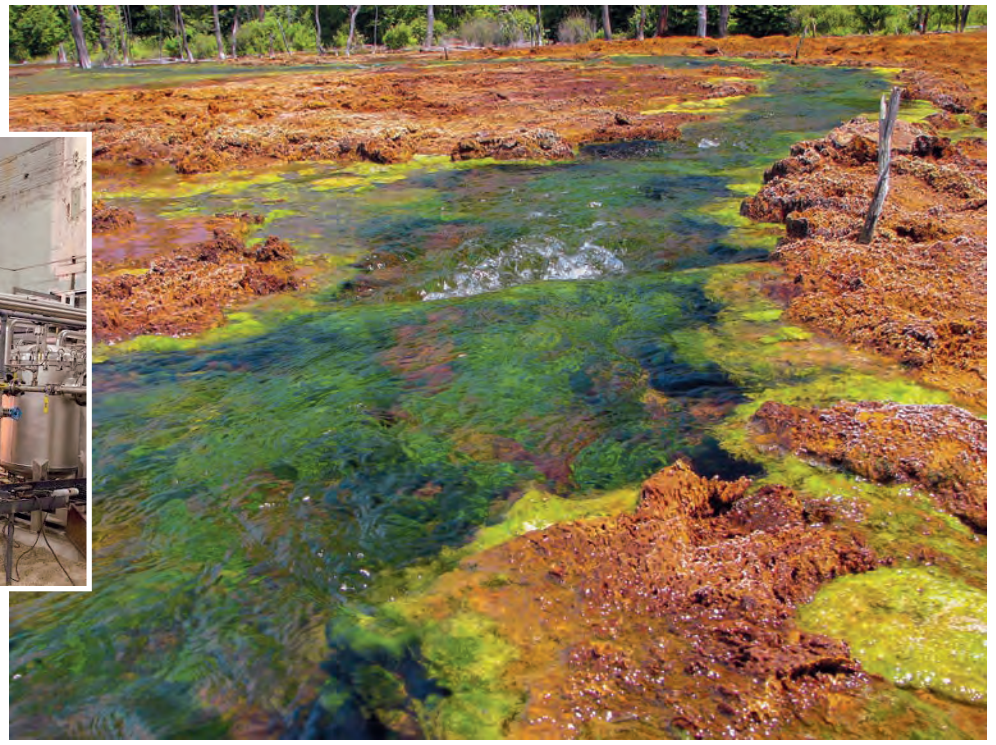
"The potential for this to become a burgeoning industry in Pennsylvania is substantial," Sarma Pisupati told state legislators in January. Pisupati is director of the Penn State Center for Critical Minerals, created in 2019 to strengthen the state's hand.

He calls it "a win-win-win situation that we simply cannot pass up. Pennsylvania coal and coal-associated byproducts have the highest concentrations of these rare earth elements and critical minerals in the U.S."

The state's Bureau of Geological Survey also has been drafted to buttress the state's case. With federal aid from the U.S. Department of Energy, the bureau is involved in expansive surveys on the ground and from the air to locate old coal waste piles and coal seams likely to contain the minerals.

"Pennsylvania has an advantage over hard rock [mining] areas in the West because in the East we are potentially cleaning up the environment as we're extracting the elements," said Kris Carter, Pennsylvania's assistant state geologist. "What makes acid mine drainage such an intriguing prospect is that you can extract the rare earth minerals essentially during [cleanup] treatment."

The federal government has poured millions of dollars into Pennsylvania research projects to verify that the precious material is there and can be recovered without harming the environment.



Acid mine drainage, shown here on the Little Conemaugh River, may help Pennsylvania become a leading source of rare earth elements used in a variety of technology and consumer products. (John Blough)

Despite their name, REEs are not rare in the earth's crust, but they are widely spread out in low concentrations that often make mining for them uneconomical and environmentally destructive. That's why the world has largely let China corner the market — 80% of the nation's rare earth imports came from China in 2019, according to the U.S. Geological Survey. Even the small quantity mined in the U.S. is shipped to China for processing into products that are then sent back at a higher price.

But the lack of control over such a crucial material has become a national defense and consumer security issue.

This is not a new or unexpected problem. Both Presidents Donald Trump and Joe Biden have issued executive orders to build a domestic rare earth elements supply chain. And billions of dollars have been pumped into universities and industry for research to develop harvesting technologies.

Pennsylvania's widespread acid mine drainage is seen as giving the state an edge in seeking to become a source of REEs. One of the big challenges is getting them out of the rocks they are found in. But acid mine drainage has already done that by leaching the material out of rocks containing sulfur minerals.

"The mineral wealth under the feet of these communities could amount to the millions, if not billions, and there is no reason why these communities should not be empowered to tap into these amazing prospects," Yechezkel Moskowitz said at the recent legislative meeting on prospects for Pennsylvania. He is founder of Synergos Holdings, a New York company that has worked with Penn State to prove that REEs can be recovered from acid mine drainage.

There has been promising research to verify that REEs can be plucked from the state. For example, in northwestern Pennsylvania, a demonstration facility funded by the DOE has successfully used chemical and physical processes to recover a concentration of REEs from coal ash. A DOE official called it a "crucial stepping stone" toward commercial-scale facilities.

Still to be proven, though, is whether the hundreds of millions of dollars needed to kickstart what Moskowitz calls "the next generation of industrial greatness" will follow.

"It's going to take some kind of government support to get it to the point where private capital wants to make an investment," predicted Anthony Marchese, chairman of Texas Mineral Resources, a mineral exploration company that has worked with Penn State and the DOE on several demonstration projects.

"Once they prime the pump, they can step back and let private capital step in." ■

‘Defensores’ broadens watershed work — in Spanish

Volunteers train to be advocates in their communities

By Jeremy Cox

Joel Rodrigues and his daughter, Guadalupe, compare images of plants and animals in a Spanish language guidebook with what they see during an outing on the Anacostia River sponsored by Defensores de la Cuenca and the Anacostia Watershed Society. (Dave Harp)

Jorge Bogantes of the Anacostia Watershed Society explains the concept of a watershed during a cruise on the Anacostia River with Defensores de la Cuenca. (Dave Harp)

“*Bienvenidos al Rio Anacostia*!” Jorge Bogantes’ introduction — translation: “Welcome to the Anacostia River!” — established more than just the affable tone of his boating excursion. It signaled that the next 90 minutes would be ensconced in the language most familiar to his audience.

Minutes later, the pontoon boat pushed away from the slip, carrying more than two dozen adults and children on an unhurried voyage from Maryland into Washington, DC. At the wheel stood Bogantes, narrating the trip almost exclusively in Spanish.

This wasn’t purely a pleasure cruise. This was the first field trip for the first class of a program that trains people to be environmental guardians.

Such “stewardship academies” have proliferated across the Chesapeake Bay watershed in recent years. But they traditionally have been taught in English.

That has left a void for a key demographic, said Abel Olivo, executive director and one of the founders of *Defensores de la Cuenca* (Watershed Defenders), a nonprofit based in DC’s Maryland suburbs that strives to connect the Latino community with the natural world.

“There are so many communities that are unengaged,” Olivo said. “If we want to make significant strides in addressing climate change and environmental justice, we need to reach the communities that are the most impacted. And that is the Black and Brown community.”

So, Defensores, which was established in July 2020, partnered with the Anacostia Watershed Society to create a new academy. Well, an “*academia*.”

“We’re not here to exploit the free labor of the Latino community,” Olivo said. “We want to provide opportunities for people to increase their education in nature and the environment.”

Last year, Olivo’s group won funding from the highly competitive Chesapeake Bay Stewardship Fund’s Small Watershed Grants program. The National Fish and Wildlife Foundation and the U.S. Environmental Protection Agency make between $8 million and $10 million in funding available each year for community-based projects that seek to protect or restore natural resources within the Chesapeake’s 64,000-square-mile drainage basin.

Defensores received $167,000 and plans to combine it with $59,000 in matching funds to operate the academy.

The first cohort started meeting in March. The academy’s instruction on watershed issues takes place over four months, pairing workshops with hands-on experiences, Olivo said. At the end, each person has up to one year to complete a stormwater-cleanup project of their own choosing — with up to $5,000 available to support it. His goal is to enroll 15–25 participants per cycle.

Olivo hopes to establish Spanish-language watershed academies throughout the Bay region, particularly in places where there are large concentrations of Latino residents. For now, he is concentrating his energies on a cluster of ethnically diverse communities along the Anacostia in Maryland’s Prince George’s County.

Known collectively as “the Port Towns,” the communities of Bladensburg, Colmar Manor, Cottage City and Edmonston are home to 13,000 people. Of those, about one-third identify as Hispanic.

“It’s not the White, middle-class retiree who is interested in nature [and] lives in a single-family detached home with lots of green space access,” said Olivo, a fourth-generation Chicano who spent years working on Capitol Hill as a lobbyist for municipal interests in California and the Pacific Northwest. “It’s a completely different demographic.”

He added that the program is tailored toward environmental issues that resonate the most with the Latino community, such as air quality, heat islands and tree canopies.

The Anacostia Watershed Society has long taken strides to engage with Latinos, offering boat cruises in Spanish and an annual bilingual festival that blends family activities with environmental education.

Latinos care deeply about the environment, said Bogantes, a natural resources specialist with the Anacostia Watershed Society. But the odds are stacked against their getting involved. Many are first-generation immigrants — those born outside the United States — and work too many hours to have spare time for outside causes. Many struggle to make ends meet. And many have borne a disproportionate burden from the COVID-19 pandemic because they couldn’t work remotely.

The Defensores academy offers each participant $1,000 to encourage and support their enrollment.

“It’s sort of an experiment,” Bogantes said. “This is an opportunity to work with other types of people that are not traditionally involved in this type of stuff.”

The group that gathered at the Bladensburg Waterfront Park for the boat tour was greeted by a cool breeze and cloudy skies. Several participants brought their children. There were no empty seats on the boat.

Speaking in Spanish, Bogantes was a dutiful tour guide. He pointed out how the red maples were beginning to bud, living up to their colorful name. He answered questions about the turtles that lolled on logs along the shoreline. And he called out the names of landmarks, such as the National Arboretum and the gray husk of RFK Stadium.

But he also delved into the Anacostia’s ills: how toxic contamination from PCBs has spurred an effort to clean up its sediment; why it’s important to sponsor trash pickup days; and why foreign plants such as phragmites and bamboo are so problematic.

Dulce Gonzalez, a DC resident and one of the academy’s participants, said afterward that she was dismayed to see so many floating pools of trash in the river — but not surprised. “So many people don’t care [about littering],” she said. “They’re like, ‘It’s only one bottle.’”

For many participants, the Anacostia River is like a ghost — ever-present in their lives but rarely visible. Bogantes said that he hopes the academy inspires people to pay more attention to it.

“What we have seen is people have lived here for decades, [but] they don’t know the river or they don’t know we have bald eagles and beavers and otters,” he said. “It’s just an amazing public asset that still needs some work.” ■

More than 800 solar projects in Bay states stuck waiting for review

Grid operator's fix would fast-track some, delay others

By Ad Crable & Timothy B. Wheeler

The rollout of solar and other renewable energy projects that Maryland, Pennsylvania and Virginia are counting on to end fossil-fuel reliance is caught up in a review bottleneck that is severely hampering the transition.

In those three Chesapeake Bay drainage states, 807 utility-scale, commercial rooftop, community solar and solar storage projects have been stuck in a growing regulatory traffic jam. Proposals have been waiting a year and often longer for PJM Interconnection, the organization that coordinates electricity transmission in 13 states and the District of Columbia, to complete the required studies that would move the projects forward.

Across PJM's region, about 2,500 solar, solar storage and wind energy projects are awaiting a decision on whether they can connect to the electricity transmission network. Although that number will likely drop for a variety of financing and logistical reasons, the backlog has slowed the rollout of renewable projects, and delays can cause some projects to fail.

The slowdown comes at a time when each of the three major Bay watershed states, like many others, have adopted aggressive climate-change mitigation policies that rely on renewable energy. The combined solar projects waiting in line, if built, could power an estimated 5.6 million homes. At present, existing solar sites in the three states produce enough power for about 128,000 homes.

PJM is responsible for ensuring that the transmission grid can handle any new electricity added to the mix. It has the authority to require new projects to build equipment and upgrade transmission systems so that the grid has enough power at any moment to keep the lights on in homes and businesses during any kind of weather. As part of that evaluation, PJM reviews the finances for each new project and considers how the proposed power generation would affect the grid.

Photo: Elk Hill Solar 2 is a 17.5-megawatt solar array near Greencastle, PA, that went online in early 2021. It is owned and operated by Lightsource bp. (Dave Harp)

In the last four years, PJM has approved just 130 renewable energy projects from a long line of applicants.

To help relieve the backup, PJM is planning to develop a streamlined review process intended to dramatically shorten the study period. But that overhaul could take two years.

In the meantime, PJM is not taking any new applications, and it's proposing a two-tiered process to handle projects already in the pipeline. The projects deemed most "shovel ready" would be fast-tracked, according to PJM. That would include about half of the backlogged projects.

Those less ready, for whatever reason, would have to wait until the new review process is in place, which may not be until late 2025. For them, a determination of whether they can hook into the electric grid may not come until 2027.

PJM's plan, which needs approval from the Federal Energy Regulatory Commission, has widespread support from the company's 507 voting members, which include power utilities, transmission line owners, renewable energy developers, financial traders, state consumer advocates and others.

Support for pressing pause

Despite the prospect of further delays for many projects, PJM said that Bay watershed states will be able to meet the renewable energy goals they have set to help address climate change.

"We have met with the states, including Pennsylvania, Maryland and Virginia, that have aggressive goals," said Kenneth Seiler, PJM's vice president of planning. "We are very well-positioned to facilitate the interconnection of renewable generation and help the states meet their goals out into the future.

"Had we not done anything, there would be limited opportunities for the states to achieve their goals. We are trying to be the voice of reason here."

The states, though not happy about the current impediments, agree.

"Pausing the process and creating new rules to speed the more-ready projects in the queue we hope will break the logjam and reduce process congestion in the future," said Jamar Thrasher, a spokesman for the Pennsylvania Energy Office. "We also hope that the pause will be shorter than anticipated."

The suspension of new project reviews comes at a time when demand for solar energy is growing. Solar made up more than half of all new electricity generated in the United States during the first three quarters

of 2021, according to the Solar Energy Industries Association and Wood Mackenzie, a global energy consultant. Most of the renewable projects in the PJM queue are solar.

Virginia in 2020 set a goal of achieving 100% clean electricity by 2050. It has 416 backlogged projects, enough to power 3.7 million homes, according to PJM. In 2021, the state ranked fourth in the nation in new solar installations. But since 2016, at least 225 solar projects in the state have dropped out of the PJM waiting list.

"We need the ability for projects to come into the queue and get built," said Harry Godfrey, executive director of Virginia Advanced Energy Economy, a business coalition seeking affordable clean energy. "Otherwise, that is a short– and long-term problem for Virginia in meeting its clean economy goals."

Pennsylvania has committed to reducing greenhouse gas emissions 26% by 2025 and 80% by 2050. It has 443 solar projects awaiting approval in the PJM queue. That's enough to power approximately 1.4 million homes.

Maryland, which aims to get 50% of its energy from renewable sources by 2030, with a minimum of 14.5% from solar power, has 48 solar projects in line, enough to power 410,000 homes.

Roots of the problem

PJM has long operated by managing grid access for a relatively small number of large and centrally located power plants. But the nonprofit corporation found itself overwhelmed by the surge of smaller renewable-energy projects, many located in rural areas away from population centers and needing a way to tap into the grid.

Based in Valley Forge, PA, PJM is the largest of 10 transmission operators in the U.S. It oversees more than 84,000 miles of transmission lines and serves more than 65 million people in Maryland, Pennsylvania, Virginia, West Virginia, Delaware, New Jersey and Ohio, as well as parts of Kentucky, Tennessee, Illinois, Indiana, Michigan and North Carolina.

But its review staff of engineers and other specialists couldn't keep up as new proposals were filed — with applications tripling in three years. PJM has been expanding staff and hiring consultants to aid with reviews.

PJM officials also say the backup is caused by many projects being filed on speculation, with little chance of actually being developed.

"We have found that to be an issue," said PJM spokesman Jeff Shields. Solar developers may apply for 10 projects, hoping to find a buyer along the way, but only expect two or three to become reality, he said.

This 8.2-megawatt photovoltaic array, recently completed by Boston-based Citizens UB Solar, is located on 65 acres of farmland in Union Bridge, MD. (Dave Harp)

Indeed, many solar projects in the PJM queue end up being withdrawn because of siting, financing or public opposition issues.

PJM hopes the new filing guidelines, with firmer controls on financing and ownership, "will go a long way [in] allowing us to focus on projects that are actually going to be built," Seiler said.

While applauding the newer rules and the fast-tracking of the most viable projects, some representatives of the solar industry and environmental groups say that PJM should have anticipated the problem sooner and is not doing enough to expand the electrical transmission system and accommodate all of the new projects.

PJM's response to the surge in solar and wind projects was hampered by staffing issues, said Cyrus Tashakkori, president of Open Road Renewables, a Texas-based developer of utility-scale solar. But he said that PJM also clung to an inefficient "first-come, first-served" review process that slowed the flow of projects.

"It did not sneak up on us," said Tom Rutigliano of the Natural Resources Defense Council, an environmental group. "Other regional transmission operators have done better jobs at this."

Gizelle Wray, senior director of regulatory affairs and general counsel for the Solar Energy Industries Association, noted that Midcontinent Independent System Operator, the regional transmission operator in the central part of the nation, reviews renewable energy projects in about one year.

There's also grumbling over whether renewable energy projects should have to assume the burden of paying for needed transmission upgrades instead of spreading the costs among all customers who benefit, as some grid operators have done in other parts of the country.

SOLAR PROJECTS WAITING FOR REVIEW

Maryland
In queue: 48
Potential power capacity: 2,502 megawatts (enough to power 410,000 homes)

Pennsylvania
In queue: 443
Potential power capacity: 8,854 megawatts (enough to power 1.4 million homes)

Virginia
In queue: 416
Potential power capacity: 22,679 megawatts (enough to power 3.7 million homes)

In reply to criticism, Seiler said that because PJM is in such a heavily developed area, building new transmission lines has been difficult. And he said that, until the Biden administration made it a priority, there was a question of whether the push for renewable energy would continue. Wholesale changes would not have been supported by PJM members several years ago, he said.

Aiming for a reset

Backed-up PJM reviews aren't the only obstacles to expanding solar energy in the region. Supply chain impacts from COVID, equipment price increases, siting disputes, resistance from utilities and the demise of the federal Build Back Better legislation in Congress, with its generous clean energy tax credits, are also affecting projects. State and local disputes over converting farmland and forests to solar fields are factors, too.

But everyone agrees that PJM's lengthy reviews have been a major hurdle. Advanced Energy Economy, a nonprofit that advocates for clean and affordable energy, said the long wait at PJM with its uncertainty and connection costs are "often project killers."

PJM's plan to put a two-year hold on many projects that have already been waiting for years is likely to add to their problems.

"There are going to be a lot of projects, particularly late entrants to the [renewable energy] market in Virginia, that are going to be hurt by this," said Open Road's Tashakkori. He predicted that the Federal Energy Regulatory Commission's expected approval of the PJM plan could be challenged in court.

Yet Tashakkori said he believed that PJM's plan to fast-track some projects while holding up others is "the best combination of bad options, given the underlying problem," which is the grid's lack of capacity to handle all of the proposed projects.

Rapidly expanding renewable energy in the region, he said, will require an interstate or federal investment to proactively upgrade the transmission network — a kind of "front-loading" that a few states have undertaken.

For now, everyone seems relieved something is being done to relieve the backup.

"It sounds bad," said Mike Tidwell, executive director of Chesapeake Climate Action Network, a nonprofit group advocating for increased renewable energy in Maryland, Virginia and the District. But if PJM's pause leads to a truly streamlined review process, he added, "it could actually be positive for solar." ■

Photo: Virginia is poised to dispense an unprecedented amount of funding in 2023 to programs that help reduce water pollution from farms, city streets and troubled sewage-treatment plants. (Dave Harp)

Divided VA General Assembly delivers mixed environmental results

Legislators move to revoke citizen permitting powers, fund farm programs, delay ban on foam containers

By Jeremy Cox

For environmental advocates, the just-concluded Virginia legislative session had its victories, highlighted by repelling a former Trump official's nomination to oversee the state's natural resources.

But under a new Republican governor and a divided legislature, there were also disappointments. One of the most troubling, environmentalists say, is a proposed delay on a hard-won ban on foam food containers.

Drama was to be expected. After the 2019 elections, Democrats held the reins of the state's executive and legislative branches in Richmond for the first time since 1993. The monopoly ended in November, with the House switching back to Republican control, and political newcomer and Republican Glenn Youngkin replacing Democrat Ralph Northam in the governor's mansion.

All that stood in the way of total GOP dominance during this spring's legislative session was the Democrats' narrow 21–19 grip on the Senate.

The outcome hasn't been determined just yet. The session ended March 12 with the House and Senate still needing to negotiate a final budget deal, and many environmental initiatives hang in the balance. Lawmakers will need to return for a special session beginning Monday, April 4, to iron out the budget differences. They also could take up and pass any legislation that didn't cross the finish line.

This is a look at where the state landed on major environmental issues.

Former EPA chief makes waves

A former Trump administration figure lost his bid to become the cabinet's voice for the environment. But he will still have the ear of the governor.

Former coal lobbyist Andrew Wheeler didn't make many friends in the environmental community during his 2019–21 tenure as the administrator of the U.S. Environmental Protection Agency. There, he oversaw several attempts to roll back federal air and water pollution regulations, including protections for wetlands and streams.

Youngkin offered Wheeler a job, nominating him to become the state secretary of Natural and Historic Resources. The cabinet-level position oversees five state agencies, including the departments of Environmental Quality and of Conservation and Recreation. Environmental groups were nearly unanimous in their opposition.

"We based it simply on his record of really attacking many of the foundational virtues of protecting natural resources at the EPA," said Pat Calvert, the policy and campaign manager for the Virginia Conservation Network.

In a rare move, Senate Democrats stripped Wheeler's name from a list of appointees requiring legislative approval, blocking his nomination. Under state law, though, he was allowed to remain in the position until the end of the session.

The role of the state's top environmental official was transferred on an "acting" basis to Travis Voyles, Wheeler's top deputy during his short-lived term. But Wheeler isn't leaving state government. The Youngkin administration announced he will be staying on board as a special adviser to the governor.

Carbon-reduction program survives

One of the signature environmental achievements of the Northam administration was to join the Northeast's carbon cap-and-trade program, known as the Regional Greenhouse Gas Initiative.

In December, Youngkin, a former CEO of a private-equity firm, announced plans to remove the state from the program through executive action. At an average monthly cost to ratepayers of $4.37, or slightly more than $50 per year, participation in the program was too costly, Youngkin argued.

But it is unclear from a legal standpoint whether he can pull out of the program unilaterally. That's because the legislature folded the RGGI language into state law.

A Republican-backed effort to repeal the 2020 RGGI act couldn't overcome united Democratic pushback in the Senate.

But the program isn't out of the woods yet. Language in the House version of the budget would prevent state agencies from spending the $371 million in expected proceeds from RGGI credit auctions over the next two years. It wouldn't end the state's participation in the program, though.

"We prevented a lot of rollbacks thanks to mindful legislators who realized we can't go back on this," Calvert said. "There's too much work that has gone on to get us there."

Citizen power revoked

The Senate Democratic bulwark didn't hold up in the face of one of the session's most controversial environmental bills.

The measure would take permitting authority away from the citizen air and water boards and hand it to the Department of Environmental Quality.

The Chesapeake Bay Foundation and other opponents argued that the change would conceal key decisions behind closed doors. The bill's proponents in the business and manufacturing sectors said the change would ensure more certainty on whether projects will move forward.

The James River flows past the city of Lynchburg, VA. State legislators have not yet agreed on the amount of funds that the next fiscal year budget should provide to help the city reduce chronic sewage overflows. (Annette Tenges/CC BY 3.0)

Such concerns were overblown, Calvert said. "The narrative was just erroneous that they were denying permits. But really, they've only denied a handful of permits over the past couple decades."

Virginia's system of creating and empowering citizen boards to make major permit decisions has few equivalents across the country. In neighboring Maryland, for example, the ultimate air and water permitting authority lies with the Department of the Environment.

The move to weaken the boards came after the Virginia air board denied a permit for a compressor station along an extension of the Mountain Valley Pipeline, dealing a blow to the project's viability. The pipeline's developer is appealing that decision in a federal lawsuit.

The bill sailed through the Senate on a 32–8 vote, with 13 Democrats joining a solid block of GOP support. Youngkin has until April 11 to sign or veto the legislation.

But environmental groups successfully lobbied for revisions that tempered the bill's impact before its passage, adding language requiring DEQ to bring controversial permits before the boards to gather public opinion before the agency issues final rulings. The law would also leave intact the boards' power to issue regulations, such as new water and air standards.

Funding for clean water

Virginia is poised to dispense a historic amount of funding in 2023 to programs that help reduce water pollution from farms, city streets and troubled sewage-treatment plants.

For the 2023 fiscal year that starts July 1, the House budget set aside $256 million for the state's agricultural cost-share program, which assists farmers with implementing pollution controls. The Senate version stands at about $230 million. Either amount would be a record high.

"That's the program that addresses the largest source of pollution to the Bay," said Peggy Sanner, Virginia executive director for the Bay Foundation. "For the first time, literally, with this budget Virginia is on track to fully fund the program that we need most."

Environmentalists say the 2023 amount would meet the program's funding needs over the full two-year budget period.

They also are applauding the full funding in both houses of the Stormwater Local Assistance Fund, which provides matching grants to local governments for pollution-reduction projects. The Senate bill includes $50 million for the program in the coming year; the House, half that total.

Calvert said that although this year's action will enact the budget over two years, lawmakers can still amend the 2024 budget during next year's legislative session.

The House and Senate are further apart on an initiative to halt decades of untreated wastewater spills into the James and Potomac rivers.

In Alexandria, Richmond and Lynchburg, the wastewater systems routinely become overwhelmed and overflow during heavy rainfall because the same pipes also collect stormwater runoff. The problem has gotten so bad in Richmond that state lawmakers have set a 2035 deadline for the city to eliminate the discharges.

The Senate matched the $165 million total that Northam had proposed in his final budget: $100 million for Richmond, $40 million for Alexandria and $25 million for Lynchburg. The House version only includes $62 million: $50 million for Richmond and $12 million for Lynchburg.

The Virginia General Assembly wants to delay the statewide ban on foam food containers for five years, putting the law into effect in 2028 instead of 2023. (Dave Harp)

Reprieve for foam containers

Both budgets delay by five years the ban put in place during last year's legislative session on food containers made from polystyrene, or plastic foam. The law would go into effect beginning in 2028 instead of 2023, if the proposal is finalized.

Some lawmakers are concerned that the ban will impose higher costs on small businesses. They have called for the final budget to include fund to study the development of an "advanced recycling" industry, which environmental groups have opposed.

Sanner said she hopes that lawmakers will keep the original deadline in place. "It is beyond dispute now that we as a commonwealth and a nation are producing too much plastic waste, and our programs for addressing it are inadequate."

More environmental actions

Other environmentally themed actions taken by the 2022 Virginia legislature (so far) include:

- Investing $400,000, per the Senate budget, in freshwater mussel restoration. The funding would enable the state to implement a program to restore and protect many species. Mussels are prized for their ability to filter pollutants from streams.
- Expanding the number of localities eligible to enact programs to replace or preserve trees threatened by development. Preliminary data suggest that 50,000 acres of forest and non-urban tree canopy are converted to other land uses each year in Virginia. Currently, the tree preservation program authority is only available in northern Virginia, and the tree replanting program is only allowed within the Chesapeake Bay watershed. The bill would allow cities and counties statewide to participate in either initiative.
- Killing a bill that would have banned driveway sealants made with coal tar. Environmentalists had supported the ban, saying that one of the substance's chief ingredients — polycyclic aromatic hydrocarbons — poses threats to the health of humans and wildlife.
- Establishing a committee to advise the state on coastal resilience. The legislation also directs officials to draft a statewide flood-protection master plan by the end of 2026 and to update the coastal resilience master plan (first released in December by executive decree) by the end of 2024.
- Expanding scenic river designations to an 8.8-mile portion of the North Fork of the Shenandoah River, 23 miles of the Maury River (adding to the 19 miles previously designated) and 45 miles of the Middle James River (adding to the 19 miles previously designated). ■

Although Virginia's budget for the next fiscal year is not yet final, the Senate's version of the budget includes $400,000 to help restore and protect freshwater mussels. (Whitney Pipkin)

‘Forever chemicals’ linger in WV city’s groundwater, streams

Contaminants still found in area residents’ blood years after treatment system installed

By Timothy B. Wheeler

It’s been nearly six years since city officials in Martinsburg, WV, learned that one of the wells supplying drinking water to their community contained harmful levels of per– and polyfluoroalkyl substances, extremely persistent compounds often called “forever chemicals.”

Authorities promptly took the tainted well out of service and only resumed using it in December 2017 after installing a granular activated-carbon treatment system to deal with the contaminants. Since the treatment system went online, PFAS concentrations in Martinsburg’s water have been below the health threshold recommended by the U.S. Environmental Protection Agency.

But the compounds have continued to show up in the area’s groundwater and local streams, and questions remain about health effects on area residents from lengthy exposure to the toxic chemicals.

A recent report by the U.S. Agency for Toxic Substances and Disease Registry found that residents of Martinsburg and surrounding Berkeley County who drank public tapwater had elevated levels of two PFAS compounds in their bodies roughly 3.5 years after the contaminated well had been taken offline.

“I think there was a sense that installing granular activated-carbon would solve the problem, and now there may be reason to believe that’s not the case,” said Scott Faber, senior vice president of the Environmental Working Group, a national nonprofit based in Washington, DC.

PFAS are a group of thousands of synthetic chemicals used as stain and water repellants in a large number of industrial and consumer products. In Martinsburg’s case, the source of contamination is Shepherd Field Air National Guard base outside of town, where aqueous film-forming foam containing PFAS had been used since the early 1970s to fight fires and train firefighters.

The compounds in the foam soaked into the ground and seeped off-site. They are believed to have entered Martinsburg’s Big Springs well, which supplies drinking water to both the city and some parts of Berkeley County.

PFAS were first detected in the Big Springs well in 2014, but at that time the levels did not exceed provisional safety levels set by the EPA. Two years later, though, after the EPA established health advisory levels for two PFAS compounds, the city took Big Springs offline and didn’t reactivate it until the treatment system had been shown to work.

Officials at the Big Springs water plant in Martinsburg, WV, shut down withdrawals from the Big Springs well in 2016 after PFAS contamination was detected. They brought the well back online after installing and testing a filtration system, but unsafe levels of PFAS persist in the blood of some area residents. (Brent Walls/Upper Potomac Riverkeeper)

The toxics substances agency has launched assessments of PFAS exposure in Martinsburg and seven other communities nationwide.

One of the chemicals found at levels higher than the national average in the Martinsburg area blood samples is perfluorooctane sulfonic acid, or PFOS, a common ingredient in the firefighting foam that had been used at Shepherd Field.

The other is perfluorohexane sulfonic acid, or PFHxS, which the toxic substances agency said showed up in Martinsburg area blood samples at a level 2.5 times higher than the national average. The agency said firefighting foam used until 2016 also contained other chemicals that could break down into PFAS, one of them being PFHxS.

True to their nickname, these PFAS compounds can persist for years, even decades, and the agency said that PFHxS is one of the longest-lived, which may explain why it has remained at high levels in residents’ blood.

While higher than the national averages in some cases, the levels of PFHxS and other compounds found in the West Virginia blood samples were well below what had been detected in samples from other communities with contaminated drinking water, the agency said.

It only assessed PFAS exposures among public water system customers, and not those of people drinking from private wells. “There are only a few private wells affected by PFAS,” an agency spokesperson said.

The agency urged residents “when possible” to eliminate or decrease potential exposure to PFAS in stain-prevention products and food packaging materials. The agency found PFOS and perfluorooctanoic acid, or PFOA, another problematic compound, in household dust sampled in some residents’ homes, but said the levels found were “within the range” of levels detected in other U.S. communities with and without known PFAS contamination.

The toxic substances agency also advised Martinsburg area residents to heed local fish consumption advisories. But Brent Walls, the Upper Potomac Riverkeeper, pointed out that West Virginia has issued no PFAS-related fish consumption advisories, even though water samples found the chemicals in nearby streams.

“There are a lot of low-income and minority groups that routinely fish for sustenance in Opequon Creek,” Walls said.

Walls and his co-workers at the Potomac Riverkeeper Network have begun catching fish from those area waters and sending them for chemical analysis to the U.S. Geological Survey’s National Fish Health Laboratory in Kearneysville, WV.

A remedial investigation has been commissioned to determine the extent of PFAS contamination at Shepherd Field and evaluate options for dealing with it. Maj. Holli Nelson, spokesperson for the West Virginia Air National Guard, described that as a “multiyear effort.”

A handful of lawsuits, meanwhile, have been filed on behalf of more than 100 local residents, as well as for all public water system customers, seeking damages from manufacturers of PFAS-laced firefighting foam.

“The contamination still exists, and there are people who have basically been in contact with high levels of PFAS since the early ’70s around the air base at Martinsburg,” said Stephen Skinner, the leading local lawyer behind the lawsuits.

In one lawsuit, a property owner contends his private well is contaminated, while residents in other cases contend health problems they’ve developed may be related to chronic exposure to the chemicals.

The toxic substances agency steered clear of discussing potential health effects of such exposures, noting that the science is still developing. Studies have found that exposure to certain PFAS to affect reproduction, the immune system and children’s development.

There are no plans to do any more blood testing in the Martinsburg area, the agency said, nor does it recommend residents get retested on their own. Because the chemicals stay in the body for so long, it said, “PFAS blood levels are not expected to change significantly in the near-term, even if exposure stops.” ■

Scientists flood forest patches to study impacts of storms

Researchers look for tipping point in creation of 'ghost forests' by heavy rain, sea level rise

By Timothy B. Wheeler

In low-lying spots bordering the Chesapeake Bay, it's easy to spot the dead trees, leafless and shorn of limbs. These "ghost forests," their gray trunks pointing skyward from marsh or open water, bear mute witness to the creeping inundation of coastal land as sea level rises.

The switch from lush green forest to a stubble of trunks and snags is so gradual that it's often not noticed until it's obvious. But now, a team of scientists is undertaking what they expect to be a decade-long study of the transition by repeatedly flooding a pair of forest patches at the Smithsonian Environmental Research Center in Edgewater, MD.

Starting in June, each 2,000-square meter plot is to be doused periodically with 80,000 gallons of water. One will get freshwater, the equivalent of a 6-inch downpour in 10 hours. That's many times the normal rainfall for the region, but it simulates the kind of extreme deluge that is predicted to become more common with the changing climate.

The other will get brackish water pumped from the nearby Rhode River, mimicking the episodic flooding from storm surges that are reaching progressively farther inland.

They'll be watching for changes in the trees in both plots, which are mostly tulip tree, red maple and American beech. But they'll also be monitoring for less visible chemical signs of stress and decline.

"We're interested in how the first storm surge that gets pushed up into a forest that has never had any exposure to seawater starts to impact the biology and the ecology of these upland forests," said Pat Megonigal, an ecosystem ecologist and SERC's associate director for research. "We know that just one isn't going to kill the forest, so we'll be running these 10-hour events ... with increasing frequency, basically simulating what we hope is a 10-year period of rising sea level and storms washing farther and farther into the forest."

More than 150 square miles of forest in the Chesapeake region have turned into marsh since the mid-1800s, one study estimates, and the rate of forest loss has been accelerating dramatically. Climate change combined with a gradual sinking of the land around the Bay are causing sea level to rise faster than in some other places, killing off trees and other vegetation that can't tolerate the salty water.

Scientist Anya Hopple looks at a probe inserted into a tree at the Smithsonian Environmental Research Center in Edgewater, MD. Hopple, a researcher at the Pacific Northwest National Laboratory, is leading the study about the impacts of sea level rise on forests. (Dave Harp)

Other studies have identified changes in the types of near-shore plants as early warnings of saltwater intrusion. This project aims to look for even earlier cues.

"We know that the forest will die," Megonigal said. "What we're interested in is: What's the tipping point? And also, what are the mechanisms that dictate how the forest dies and how it starts to transform into marsh?"

It's taken three years of planning and preparation to launch this large-scale field experiment, which appropriately enough is called TEMPEST (Terrestrial Ecosystem Manipulation to Probe the Effects of Storm Treatments). It's part of a larger research project called COMPASS (with a full name that's even longer), funded by the U.S. Department of Energy. With fieldwork in the Great Lakes and Bay watersheds, COMPASS aims to understand how coastal ecosystems respond to short– and long-term change.

Researchers will pipe freshwater to the forest from large nearby storage tanks that must be replenished by truck. They will pump water from the Rhode River a short distance uphill to a 20,000-gallon inflatable bladder that will be refilled four times during each simulated flood. The water dribbles evenly into the forest plots via an irrigation system. A network of sensors installed on the trees and in the soil feed data to a computer, enabling researchers to track the impacts in real time.

Pat Megonigal, associate director for research at the Smithsonian Environmental Research Center, checks out plants among the irrigation lines used to flood two forest plots with either fresh or salt water. (Dave Harp)

High-tech as it sounds, it involved some good old-fashioned shopping for parts. "I spent a lot of time at Home Depot trying to find the right thing," said Anya Hopple, a post-doctoral researcher with the Pacific Northwest National Laboratory who's leading the project. Her lab, part of the Department of Energy, is partnering with the Smithsonian center and several other institutions on the project.

Home Depot yielded the caulking needed to seal "flux chambers," small boxes attached to the trunks of trees to capture the methane and carbon dioxide the trees absorb or emit through their bark.

Some tree trunks are also fitted with paired sets of needles, which measure the flow of sap beneath the bark. Probes on and in the ground measure soil characteristics, including temperature, water content and methane both before and during flooding.

Like carbon dioxide, methane is a gas that contributes to global warming. Depending on conditions, forests can absorb methane or release it. When the soil is dry, bacteria in the ground consume methane "like little natural gas stoves," Megonigal said. But when the soil is flooded, different microbes produce methane, releasing it into the atmosphere.

Last year, during a test run with freshwater, Megonigal said they were surprised how quickly the soil began producing methane, as water ponded on the forest floor and some began to run off.

Researchers don't expect to see dramatic changes to the forest plot that will be flooded with freshwater. Those trees may actually benefit from inundation because their growth is typically limited in late summer when there is usually little rain.

The patch to be saturated with brackish water should be another story. The salt stays behind in the soil when the water drains away, impairing tree roots' ability to absorb the water they need to grow and survive.

"Each time you do it, you're adding a little more salt to the system," he said, "and there will come a tipping point where the trees here aren't adapted to the stress and they'll start to decline."

The information gleaned from this study will be used in computer modeling to help scientists refine predictions of how quickly and extensively upland forests might respond to extreme weather and sea level rise.

"This isn't going to stop sea level rise," Hopple said. "It's just going to help us understand how it unfolds." ■

Wild abundance awaits at new Glenroy Nature Preserve

By Ad Crable

Top photo: This is one of the babbling brooks, some with modest waterfalls, found at the Glenroy Nature Preserve in Pennsylvania. (Ad Crable)

Right photo: A juvenile green heron rests in a wetland at the preserve. (Ad Crable)

Nancy Ware Sapp erupted in glee as she spotted a juvenile green heron, its feathers iridescent in the morning light, perched in a tree beside a wetland, regarding us inquisitively only 50 feet away.

By the time I grabbed my camera and telephoto lens and inched forward for a closer shot, Sapp had already moved away, wooed by a pair of Baltimore orioles in another tree.

In the previous hour, despite driving through the woods and fields of the new Glenroy Nature Preserve in a moderately noisy all-terrain vehicle, we had many close encounters with wildlife: a red fox, bald eagles, wild turkeys, deer and a largemouth bass that hurled itself out of a lake in a vain attempt to snag a low-flying swallow.

The broader landscape in this southeastern Pennsylvania preserve is filled with mature and second-growth forest, with edges that attract many wildlife species. There are four ponds, along with some thickets where rabbits and other creatures can hide from foxes, owls and coyotes.

Elevated knobs with views are scattered across the preserve. The land slopes down to Octoraro Creek, a meandering, midsize, tree-lined stream that is remarkably undeveloped and forms the boundary between Lancaster and Chester counties.

The wildlife profundity and natural beauty on these 577 acres of former farmland makes its conversion into a nature preserve all the more reason to celebrate.

For the last 50 years, the Thouron family lovingly managed the land within the preserve as part of a 1,000-acre property in both Lancaster and Chester counties, mostly for wildlife and deer hunting. When the family patriarch died a few years ago, absentee family members wanted to see the land preserved.

They approached the Brandywine Conservancy, a nonprofit that protects and preserves open space and water quality in the region, which drains into both the Chesapeake and Delaware bays. The conservancy bought 577 acres of the property using a grant from the state Department of Conservation and Natural Resources, combined with its own funding and support from the Oxford Area Foundation and Chester County Preservation Partnership Program.

After the conservancy bought the tract, it looked for a trustworthy local steward that knows what area residents wanted in a preserve.

It didn't have to look far. The Oxford Area Foundation is a small nonprofit founded by

The Glenroy Nature Preserve spans 577 acres in southeastern Pennsylvania. (Brandywine Conservancy)

Sapp's grandfather in 1947. The foundation has supported many local organizations: a youth center, an arts alliance and a neighborhood services center.

Becoming caretaker of a nature preserve that is likely to be a regional destination is a new, exciting role for the foundation.

"Our mission has always been to support local organizations that build a better community," Sapp said. "This just adds another level to what we've already done."

Her mother spent part of her childhood living in the property's former Globe Tavern, which dates to the 1800s and once served travelers at a ford on the Octoraro and later a bridge crossing. The building may serve as a visitor's center in the future.

Although some trails and improvements will be added, John Goodall of the Brandywine Conservancy said the preserve is already a wonderful place to explore.

"It's already great because of the stewardship of the family," he said.

In the heart of the property, the Thouron family left 5 miles of interconnecting dirt and grass trails winding through woods and fields, over knolls, through streams, across a lake and past wetlands. That includes almost 2.5 miles of trails along Octoraro Creek, one of the prettiest waterways in that part of the state and the state's first designated scenic river.

"A lot of it is turnkey where you can walk right in," Goodall said.

Visitors can hike, fish, paddle, watch birds and other wildlife, wade in the creek, and more. All of those open fields tucked into surrounding woods made me think of kite flying. Dogs are allowed on a leash.

The initial use of the preserve centers on the walking trails. More trails and other improvements will be added in the future, including a formal boat launch for kayaks and canoes.

Even the clusters of farm fields braided into the woods in terraced strips are full of waving native grasses, planted as part of the Conservation Reserve Enhancement Program. CREP is a federal program that pays farmers to take environmentally sensitive lands out of crop production and plant grasses or trees for wildlife habitat.

Because the state grant used to purchase the property requires active farming to be retired on the landscape, those at the Oxford Area Foundation are thinking outside of the box.

Some fields might be planted with pollinator species. Others may be left in native grasses and spared cutting during nesting time, which could help bring back the bobwhite quail and ring-necked pheasants that once roamed the area. Some areas may be planted with native trees. A land management study is under way to help sort out the options.

The foundation also hopes to use the preserve for scientific study and outdoor education.

"We've got an empty canvas here. That is part of what makes it so exciting," Goodall said.

Recently, a $1.2 million state grant was awarded to the foundation to provide partial funding to purchase another 156 acres of Lancaster County farmland, woods and wetlands along the Octoraro and bordering the preserve. This land would be used for the preserve's outdoor education and scientific studies.

When asked about the value of preserving the various pieces, Goodall said, "First, you have to look at what you could have lost — the amount of forests that were vulnerable if turned into a development, all the carbon sequestration and ecosystem services of a forest system, the water quality benefits that would have been compromised. It's an incredible resource.

"For water quality along the Octoraro, this is an immensely important project."

Through a combination of easements and outright purchases, the conservancy has protected almost 18,000 acres within 5 miles of the new preserve. It holds more than 485 conservation and agricultural easements and has preserved more than 66,000 acres in the area.

But for now, all roads lead to the Glenroy Nature Preserve and its natural jewels. "We're beyond excited," Sapp said. "We're ready to share it with everyone else." ■

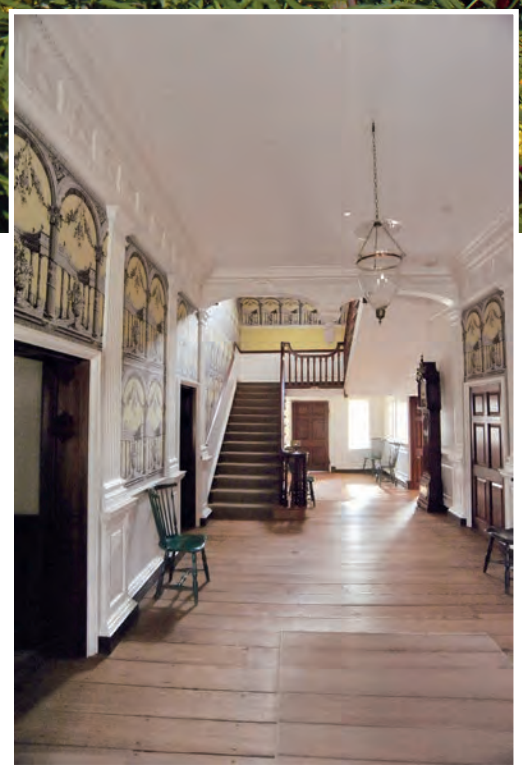
Octoraro Creek, which traverses the preserve, was the state's first designated scenic river. (Ad Crable)

If you go:

- Glenroy Nature Preserve is located at 50 West Christine Road (PA Route 272), Nottingham, PA. There is an 18-space parking area where Route 272 crosses Octoraro Creek. Trails begin from the parking area. Visit oxfordareafoundation.org.

Other nearby natural areas:

- White Clay Creek Preserve, 405 Sharpless Road, Landenberg, PA, 610-274-2900, and White Clay Creek State Park, 750 Thompson Station Road, Newark, DE, 302-368-6900. The two parks adjoin each other along the Pennsylvania-Delaware border and together boast 3,422 acres and 67 miles of trails.
- Nottingham County Park, 150 Park Road, Nottingham, PA, 610-344-5656. This park includes one of the East Coast's largest serpentine barrens, one of the rarest ecosystems on the planet.
- Wolf's Hollow County Park, 1399 Schoff Road, Atglen, PA, 610-344-6415. This 569-acre park has high bluffs overlooking Octoraro Creek, as well as glades and 10 miles of trails.
- Brandywine River Museum of Art, 1 Hoffman's Mill Road, Chadds Ford, PA, 610-388-2700. An intersection of nature and art along bucolic Brandywine Creek featuring the works of N.C., Andrew and Jamie Wyeth.



See how the garden grows at historic Gunston Hall

By Whitney Pipkin

Top photo: Archaeology was key to understanding how the garden grew beside historic Gunston Hall along Virginia's shore of the Potomac River. (George Mason's Gunston Hall)

Bottom photo: Gunston Hall features high ceilings, painted faux arches and ornate moulding. (Whitney Pipkin)

For years, the backyard garden at George Mason IV's historic home near the banks of the Potomac River featured, like many Colonial era residences, rows of ancient-looking boxwoods. Then the operators of Gunston Hall started doing some digging.

They found evidence that a lot more than the 220-year-old boxwoods once thrived in the garden that unfolds neatly behind the Virginian's Georgian-style home. Worked by enslaved people, the one-acre plot of land could have produced almost all of the food needed to sustain Mason, his wife and their 12 children.

"We found, through archaeology, seeds and pollen for species that don't exist any longer in Virginia," said Scott Stroh, executive director of Gunston Hall. "The horticultural books at the time said you needed an acre to feed 14 people, so everything grown here was used in the house."

The garden also doubled as the contemplative space where Mason — who influenced key documents protecting individual liberties — ruminated during regular walks. The garden, newly redesigned and planted to reflect what it looked like in the mid– to late-1700s, will open to the public in late April.

The 555-acre former plantation first opened to the public in 1952 after a family that owned the land donated it to the state. Virginia still owns the property, but a private board of regents manages Gunston Hall's daily operations.

The original plantation included about 6,000 acres — almost the entirety of the Mason Neck peninsula that juts into the Potomac River just south of Fort Belvoir. Most of the peninsula is preserved as parks and refuges, managed by a mix of federal, state and regional partners. It's peppered with popular trails for hiking, birding and horseback riding.

"We're pretty much part of a vast network of publicly accessible, preserved land out here," Stroh said, "which is great."

Gunston Hall offers 3 miles of trails that are a bit of a well-kept secret. One easy-to-navigate trail leads from the visitors' center in a wide loop at the forest's edge, following bluebird boxes around the perimeter of an open field. The longest trail starts behind the schoolhouse. One branch treks nearly 2 miles along a stream while the other leads through denser woods. Both end at the beachy shores of the Potomac River.

The grounds of Gunston Hall in Fairfax County, VA, offer 3 miles of trails. The longest trail starts behind the schoolhouse, with one branch trekking nearly 2 miles along a stream and the other leading through denser woods. (Whitney Pipkin)

While paths at nearby Mason Neck State Park can be swarmed with visitors on a nice weekend, Gunston Hall offers a quieter alternative. After the former plantation's indoor facilities were closed for many of the pandemic months, the facility posted a large map near the parking lot with a box where visitors can deposit $5 for a grounds pass or pay by scanning a QR code.

On a recent hike with my family, we saw teeth marks beavers had left behind on tree trunks and bald eagles diving and dining at sunset. Closer to the shore, where the kids dashed back and forth along the sand, we spotted a large screw jutting out of moss-covered wood that looked like it was part of an old roadbed.

Wandering visitors can have a picnic near the bluebird trail, take in the exterior of the historic home or visit the Mason family burial grounds. But a first visit to Gunston Hall during regular hours should also include (for an additional fee) a tour of the museum and first floor of the home, which was completed in 1759.

"One of the interesting things about Gunston Hall is it was never enlarged or modified by George," Stroh said while walking up a wide gravel road to the home.

George Washington's Mount Vernon and Thomas Jefferson's Monticello were both enlarged over time to the scale and grandeur visitors can see today.

But George Mason, Stroh said, "was fairly wealthy and fairly frugal."

Still, building one of the first brick homes in the region was expensive. And its interior quickly impresses. High ceilings in the entryway are offset by yellow-and-black wallpaper featuring columns. Ornate woodworking adorns the arches that would have been open to visitors in Mason's day.

Yet even the home's floorboards — which creak noisily in rooms that were kept for private family use but are quieted by extra support beams in areas that hosted guests — hint at Mason's frugality. The decorations also vary accordingly. Visitors would have dined in a mustard-yellow room with Chinoiserie-style wallpaper, which combines French and Asian motifs, and woodworking, while Mason spent most of his time in a comparatively plain study overlooking the back garden.

"This was his library and study, and we know he was an early riser," Stroh said of the room with windows facing east over the garden. "We know that one of the sources of his greatest reflection and inspiration was spending time in the garden. He would walk there and contemplate the issues of the day."

Spending time in the facility's small but thoughtful museum is a great way to consider some of those same issues today. Gunston Hall doesn't shy away from acknowledging some of the contradictions inherent in the grand ideas Mason championed. While he wrote in the Virginia Declaration of Rights that "all men are by nature equally free and independent," he also enslaved more than 300 people, none of whom he freed.

Rotating exhibits focus on the rights of women and on modern bills of rights that are still loosely inspired by the ideas Mason put forth.

The facility is also working with archaeologists to better tell the story of indigenous people, who likely lived on the landscape before Mason's family.

Archaeology was also key to understanding how Mason's garden grew. For decades, the backyard acre was interpreted as a Colonial Revival-style garden, with boxwood edges forming a type of maze.

While the boxwood plants dated back to Mason's time, the researchers found they never would have gotten as big as they have in recent years. Instead, the boxwoods would have been trimmed to create a small hedge lining the garden beds to make them tidy, while a diversity of plants blossomed in between. The entire garden now grows on a thick layer of fresh topsoil that helps preserve the archaeological resources below.

Along with the archaeological excavations that revealed pollen and seeds, the researchers read letters in which Mason mentioned trading seeds and talking shop with other gardeners like Washington and Jefferson. In one letter, he mentioned going to Philadelphia to track down a certain type of grapevine.

This summer, the garden will be in its second year producing foodstuffs such as heirloom varieties of eggplant, peppers, tomatoes and okra that would have fed Mason's family through the labor of an enslaved workforce. Today, a staff horticulturalist and volunteers care for the land. Its bounty is shared with the nearby Lorton Community Action Center's food pantry.

Staff at Gunston Hall are working with archaeologists to better tell the story of the plantation and its landscape, including the experiences of enslaved people and indigenous communities. (Whitney Pipkin)

Beyond the food-growing beds, the garden produces annuals and perennials that have both decorative and medicinal appeal. Apple and pear trees are being trained to grow espalier-style, their branches secured to the surrounding white fence to grow in the shape of a candelabra.

A similar level of geometric symmetry and order runs throughout the garden, which unfolds in a perfect grid of beds and paths. The paths are covered with a hardened but permeable material that's navigable for strollers and wheelchairs.

A rectangular pad just beyond the garden fence marks an elevated lookout area Mason called "the spacious walk." From here, the ground cascades down neatly reconstructed terraces toward a lower field, with views of the Potomac River beyond. For years, researchers wondered why Mason didn't built his home closer to the water. They now have a hunch.

"If you take a laser down this central path in the garden and straight out that way, it points to the house where he was born," Stroh said, overlooking a now-wooded area that would have been cleared for farming at the time. "So he very intentionally oriented his house and redesigned this natural ridge feature to look right at the house where he was born."

Having the "spacious walk" here also would have forced Mason to get out of his desk chair to take in the view, to remember where he came from.

Today, Stroh said it's hard to even estimate the amount of effort that went into planning and constructing the home and conforming the landscape to this vision — a vision that was carried out with the labor and shovels of the hundreds of people he enslaved.

"But I can tell you how involved it has been to bring this back today," he said. ■

Gunston Hall features Georgian symmetry that extends from the front door to the backyard. (Whitney Pipkin)

If you go

- Timed tickets can be reserved online and are $10 for adults, $8 for seniors and $5 for children ages 6–18. Grounds passes are $5 per person and free for ages 6 and under. Additional fees may apply on special program days.
- Admission is free for active-duty military and holders of an EBT card through the Museums for All Program.
- Visit GunstonHall.org for information.
- View other parks and activities in nearby South Fairfax County at FXVA.com/SouthCounty.

A serviceberry bush blooms at the edge of a wooded area. It is also called shadbush, because, it is said, its early spring flowering coincides with the upstream runs of migrating shad. (Dave Harp)

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An osprey pair takes up residence on a rock jetty. (Michele Danoff)

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A green heron perches on a snag on the marshy edge of a pond in Blackwater National Wildlife Refuge in Dorchester County, MD. (Dave Harp)

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An eastern gray squirrel enjoys new spring leaves. (Michele Danoff)

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You can love your burger and the Bay at the same time

By Tom Horton

Confessions of an environmental studies prof: When I ask my university students to name the best ways to save the Chesapeake Bay and the planet and they answer, "don't eat meat," I realize I might have gone a bit overboard, or perhaps not put enough emphasis on industrial when I talk about *industrial* meat.

The environmental damage from mass-produced meat, the source of most Americans' beef, poultry and pork, is quite real. The extreme concentrations of animals required, along with their manure, create serious pollution problems. The grain fed to them requires massive acreages of row crops that degrade water quality, even with environmental advances like cover crops and minimal plowing.

And there's nothing wrong with forgoing meat for ethical/moral reasons. I've swung toward a veggie diet and back multiple times, settling on less meat than I used to, but most weeks you can smell flesh cooking at my place.

Which brings me to Pops Old Place, Darlene Goehringer's little farm on Maryland's Eastern Shore that for a couple of years has been my source of what I'd call "responsible meat." Photographer Dave Harp and I are working on a new *Bay Journal* film, focused on Pops and on the question: Can you be a carnivore and be good to the Bay?

Darlene is part of a small but growing movement of meat, vegetable and even flower farmers who are striving to farm "regeneratively" — attempting to leave soil, air and water better off each year.

From 70 acres worked by her family for well over a century, she sells beef, lamb, pork and eggs. But what she really farms — the key to being regenerative — is grass, the permanent pasture that covers the bulk of her acreage.

The sight of sheep or cows grazing in lush, green fields may seem the height of domestication, but *if the farmer manages it right*, it closely mimics what was one of Earth's dominant wild ecosystems for millions of years.

Grasslands grazed by wild herbivores — from Africa's Serengeti to North America's Great Plains, bethundered with bison — covered nearly half of the land on Earth: among the most "functional and productive terrestrial ecosystems ever to exist," says a 2013 annotated bibliography of research papers by ecologist Stephen L. Thomforde.

A study of six pastured livestock farms in Pennsylvania, Maryland and Virginia from 2015–19 indicates that, compared with conventional grain farms, they were reducing Bay pollutants dramatically. They were also reducing climate-changing greenhouse gases by an estimated 42%. The greenhouse gases fell despite an increase in one such gas, methane, from cattle belching as they digest. (While cattle are "guilty" of this, estimates are that North America's original wild herbivores produced about 80% of what's belched by current populations of both domestic and wild grazers, according to a 2020 book, *Sacred Cow*).

Modern pastures don't automatically confer all of the above environmental benefits. Darlene spends a lot of time seeding her fields with a complex mixture of plants to promote both soil and animal health. She must constantly rotate her animals from field to field, so their munching and pooping and peeing stimulates pasture growth and suppresses parasites, while not overgrazing. (In wild grasslands, wolves and lions did the job of keeping herbivores on the move.)

She only sells from her farm home near the towns of Preston and Hurlock. "I want my customers to see where their food comes from ... to know who raises it," she said.

When you turn up the oak-lined lane to Pops (named for Darlene's grandfather), you're likely to see her herd of about 22 smallish cattle with unusual markings,

With her herd of sheep in the background, Darlene Goehringer is joined by her 6-month-old Australian shepherd at Pops Old Place, near Preston, MD. (Dave Harp)

known as Randall Linebacks. As is the case with all of the farm's animals, they are no match for modern, commercial breeds that maximize size and fast growth.

Randalls, a breed that goes back at least a few centuries, were down to less than 20 in the world in 1986. Darlene began her herd by writing a letter to Cynthia Creech, a Tennessee woman who rescued them from extinction. Today, there are more than a thousand.

Darlene chose them partly for adaptability and easy management: "As much as I love raising farm animals, I love walking more ... Working with animals is a dangerous profession."

But it's taste that really drives her. The Randalls, she said, "keep being picked number one in taste tests." She's also selected a sheep crossbreed to get "just the right bite" to the meat. For pigs she went with "a lard hog ... not like the commercial lean meat breeds." By managing their diet, including running them in her woods to eat acorns, she avoids too much fat and ends up with sausage and chops that routinely sell out.

Her relationship with the animals is complex. Most, of course, will go to slaughter, a reality that makes the job "hard to do every day." She will put down a sick or injured animal herself, and she talks about celebrating twin lambs: "The first pays for its mother's upkeep. ... The second is your profit."

Yet she'll bring in a just-born, half-frozen calf and nurse it in her living room, knowing it will inevitably become a "pet," nothing she could bear to butcher. She'll walk outside on starry nights to sit on a haybale in the peaceful company of the sheep. The ewes will live out their lives at Pops even after they get too old to bear lambs: "That's the deal we've made."

Her farm may sustain the Earth and the Bay, but can it sustain Darlene? That's a question that hangs over small, regenerative farmers everywhere. Their products won't be as cheap as big agriculture's — at least so long as the latter gets nearly $40 billion a year in federal subsidies, by some estimates, and does not pay the real cost of its impact on air, water and soil.

Darlene is close to making her farm "a place I don't ever want a vacation from." But she won't continue if she can't make a living. Having only recently given up her off-farm job, the jury's still out.

Our film will follow Darlene's journey, so critical for the Bay, and for Chesapeake-loving carnivores. ■

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.

MD silent on recreational impacts of Potomac bridge project

By David Cottingham

In all of the discussions of toll lanes for the American Legion Bridge, which carries Interstate 495 over the Potomac River west of Washington, DC, something big has been left out: the project's adverse impacts on the Potomac and people who use it for recreation.

The section of the river that flows under this bridge is a priceless scenic and historic resource enjoyed by thousands of canoe and kayak paddlers, anglers and birders.

It is anticipated that the construction of the bridge will take five years and double the size of the current one. This will inevitably harm natural and recreational experiences and the river itself. Increased noise, restriction of the channel with barges, riprap and heavy equipment are certainties, and intermittent closures of the river to recreational boating are very likely.

And will rocks and concrete be placed in the Potomac channel to allow access by construction equipment? The Maryland Department of Transportation does not say.

Beyond the initial construction, MDOT's most recent draft environmental document for the project says the new bridge will "allow for future superstructure modifications and additional foundation and future superstructure capacity." What additional harm does this portend for the Potomac River? Will new superstructure supports be required? Again, MDOT does not say.

The Potomac River is nationally recognized as an important historic, scenic and recreational waterway. The section of the river within 5 miles of the bridge is a navigable waterway for small craft and was used by Native Americans before the arrival of Europeans. George Washington plied the river throughout his life and planned for a canal upriver from Georgetown.

Two of the 11 nationally designated scenic land and water trails in the U.S. run under the American Legion Bridge:

Rob Soreng of the Washington Biologists Field Club and Bay Journal reporter Tim Wheeler visit Plummers Island in the Potomac River. The island, which would be impacted by replacing the American Legion Bridge as part of the Capital Beltway widening project, has been the focus of a century's worth of ecological studies. (Dave Harp)

- The National Park Service's Potomac Heritage National Scenic Trail traverses hundreds of miles, from the mouth of the Potomac to the Allegheny Highlands in Pennsylvania. It passes through 20 NPS-managed areas and the C&O Canal National Historical Park.
- The Captain John Smith Chesapeake National Historic Trail follows the explorer's map and written accounts and is the nation's first all-water national historic trail. It connects dozens of national wildlife refuges, parks and trails, encompassing 3,000 miles and 15,000 years of culture.

MDOT's environmental documentation fails to even mention the impact of bridge construction on these monumental historic and recreational sites.

Maryland has designated the Potomac in Montgomery County as a "scenic waterway" under the state Department of Natural Resources' Scenic and Wild Rivers System. The state policy is to "preserve and protect the natural values of these rivers," including a requirement for state and local governments to "*take whatever action is necessary to protect and enhance the qualities of a designated river*" (emphasis added). Even so, MDOT does not appear to have consulted the state's Wild Rivers Advisory Council regarding impacts to the river as a scenic, recreational and historic resource.

In its literature for the Potomac Heritage Trail, the NPS says "outdoor recreation opportunities are increasingly recognized as an important contributor to local, regional and state economies and an important component of healthy communities."

We know that thousands of people use the river near and under the American Legion Bridge every year. Both the NPS and Maryland have recognized this section of the Potomac as a significant resource. But MDOT has yet to assess how replacing the bridge will adversely affect the river and the people who use it. The department must describe how it can and will avoid adverse impacts. ■

Washington, DC, resident David Cottingham is chair of the Canoe Cruisers Association, the area's oldest and largest whitewater canoeing and kayaking organization.

LETTER TO THE EDITOR

An overdue conversation

Thank you for the March issue of the *Bay Journal*, which juxtaposed the opinion columns by Tom Horton, Alison Prost and Lynton Land. Perhaps this will begin a long overdue conversation of redirecting efforts to "Save the Bay."

I want to add the book *A Place Like No Other* by Sinclair and Beyers to those books referenced. I had the good fortune to visit the Serengeti, and this book was my guide. It is relevant to the Chesapeake Bay because, while fortunately still intact, the Serengeti is experiencing threats of human encroachment and climate change. The book takes the scientific principles of the Serengeti and applies them to how those threats might be met. The book also applies the processes to other large landscapes.

In short, as Tom Horton indicated, we need to use tools such as these to reimagine what we want and what is scientifically possible for the Bay watershed. Continuing the business as usual, as suggested by Prost and Land, will only result in continued failing grades for our efforts and ultimately a loss of interest.

The following is an example of how we might look differently at things. While in Tanzania I saw horrific erosion. It reminded me of the pictures of erosion in the mid-Atlantic after the clearing of forests decades ago. Fortunately, our landowners and farmers with the assistance of conservation agencies eliminated similar gullies, some of which were two stories deep, and have greatly reduced soil runoff. Can more be done? Yes, but most likely the last increment can be better achieved through new conservation practices focused on soil and forest health.

I hope Tom Horton's article and its contrast with the succeeding articles leads to a process to create a new vision for the Bay.

Wally Lippincott
Baltimore, MD

Profoundly linked to the Bay, PA needs the Clean Streams Fund

By Brian Cutler & Scott Martin

Several bills with bipartisan support are pending in the Pennsylvania General Assembly that would dedicate new funding for clean water projects at no additional cost to state taxpayers, using federal money provided for pandemic recovery.

Senate bill 832 and House bill 1901 would seed a new Clean Streams Fund with $250 million from the American Rescue Plan Act to support clean water efforts across the state, including two new programs. One would provide for administration of the dollars at the local level through county conservation districts, with guidance from a local oversight committee. The other would create a Clean Water Procurement program to direct some of the money to innovative and cost-effective projects.

As state legislators, we support this legislation because we recognize the connection between activities in Pennsylvania and water quality downstream in the Chesapeake Bay. More importantly, we recognize the benefits of these programs to our own local creeks and communities.

Lancaster County, which we represent in Harrisburg, is blessed with some of the most productive farmland in the United States. With its fertile soil and sufficient rainfall, this land is the foundation of our local economy and culture. It has defined our region for more than 400 years.

All of the county's creeks, streams and rivers flow into the Susquehanna River, which forms the county's western boundary and flows into the nation's largest and most productive estuary, the Chesapeake. The Bay's bounty supported the founding of our nation, a strong seafood economy and a culture of watermen.

It's no coincidence that this most productive farmland and most productive estuary exist near one another, for they are inextricably linked by the Susquehanna River.

For centuries, the farmlands of Lancaster County and the waters of the Bay co-existed in ecological balance. But in the 1900s, profound changes began to occur.

A young sycamore tree emerges from its protective tubing along the East Branch of Octoraro Creek in Christiana, PA, in 2019. (Will Parson/Chesapeake Bay Program)

Cows lounge in a pasture between a cornfield and Pequea Creek in Lancaster County, PA. The creek flows into the Susquehanna River about 30 miles upstream from the Chesapeake Bay. (Donald Kautz/CC BY-NC-ND 2.0)

Crop yields and fishing harvests increased as the human population grew, and the balance was gradually lost. The wild oyster population is at 1% of historic levels. Blue crabs, another once-robust fishery, are barely sustainable. Some days it is dangerous to swim in or eat from the Bay because of harmful algae and bacteria.

The consequences of this imbalance are not limited to the Bay. One-third of Pennsylvania's creeks are not safe for fishing, drinking or swimming. It's even worse in Lancaster County, with more than half of our local creeks not meeting clean water standards.

The good news is that modern farming and a healthy Bay watershed can co-exist. All corners of Lancaster County have examples of best management practices that are keeping soil and nutrients on the farmland — where they belong — instead of turning into pollution heading downstream. What's needed is more widespread implementation.

The county already has a partnership in place to make the most of a new Clean Streams Fund. Lancaster Clean Water Partners, a coalition of local governments, nonprofits and private companies, has embraced a shared vision of clean and clear water in the county by 2040. This is a legacy worth pursuing.

While the estimated $100 million annual cost of the partnership's work to achieve its vision is daunting, such expenses translate into investments: local materials such as fencing and concrete, as well as local talent, from farmland conservation planners to heavy equipment operators and other skilled laborers, all critical to best-management success.

Furthermore, these investments will benefit the county's farmers by helping to keep them competitive in global markets. The community will benefit through improved recreational opportunities and quality of life.

Another great benefit to these efforts is that they will help to reduce the impacts of increased flooding, which continues to plague many areas across the state.

We look forward to working with our colleagues across the state to finally turn the corner toward restoring a balance between productive, healthy farmlands and productive, healthy waters in the Bay and throughout the commonwealth. ■

Scott Martin is a Pennsylvania state senator (R-Lancaster). Bryan Cutler (R-Lancaster) is speaker of the Pennsylvania House of Representatives.

SHARE YOUR THOUGHTS

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

Letters to the editor should be 300 words or less. Submit your letter online at bayjournal.com by following a link in the Opinion section, or use the contact information below.

Opinion columns are typically a maximum of 900 words and must be arranged in advance. Deadlines and space availability vary. Text may be edited for clarity or length. Contact T. F. Sayles at tsayles@bayjournal.com or 410-746-0519. You can also reach us at P.O. Box 300, Mayo, MD, 21106. Please include your phone number and/or email address.

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

Rabbit roundup

Who are you calling a rat? Rabbits and hares are not rodents. They are members of their own order, *Lagomorpha,* which includes pikas — also known as rock rabbits or mouse hares.

They're everywhere! The eastern cottontail is the most abundant rabbit in North America and the Chesapeake Bay watershed. Its range expanded when forests were cleared, creating more of its preferred habitat: grassy fields.

Bay's bunnies: The Bay watershed is home to two other cottontails — the Appalachian cottontail (found in mountain habitats) and the mainland marsh rabbit (found in southeast Virginia's brackish and freshwater marshes). It is also home to the snowshoe hare.

Doing the binky bop: Happy rabbits are known to jump around and twist in midair while flicking their heads and feet.

Scut-tle butt: Because the rest of a rabbit's fur blends in with its surroundings, predators mostly see only the white tail, or scut. A fleeing rabbit zigzags, causing the pursuer to lose track of the small target, thus buying the rabbit precious seconds to escape. Zigzagging also makes it harder to track a rabbit's scent.

Ear conditioning: Blood vessels near the surface of a rabbit's huge ears allow heat to escape on a hot day. When it's cold, these vessels contract, keeping the heat in. Those ears also rotate 270 degrees and can hear threats almost 2 miles away.

On the catwalk: Although the mainland marsh rabbit can hop, it usually walks with a catlike gait, putting each foot down alternately.

Ear's how: To tell an Appalachian cottontail from its eastern cousin, look for the dark patch between the former's ears.

A. The ears of the marsh rabbit are smaller and rounder than its other cottontail cousins in the watershed. It is an excellent swimmer. (Kenneth Cole Schneider/CC BY-NC-ND 2.0)

B. A newborn eastern cottontail lies hidden in its nest. So as not to call attention to predators, mother cottontails only visit their young at dawn and dusk, nursing them while standing over the nest to keep them hidden. (Katherine Whittemore/U.S. Fish and Wildlife Service)

C. The snowshoe hare's disproportionately large hairy feet enable it to run over snow at speeds of up to 27 miles per hour and jump almost 10 feet. (D. Gordon E. Robertson/CC BY-SA 3.0)

Snowshoe hare: bunny bigfoot

Unlike its cottontail cousins, the snowshoe hare's ears are not its most notable features. That distinction belongs to its oversize, heavily furred feet. These "bunny slippers" not only keep the feet warm but their large size helps prevent them from sinking when traveling over snow.

Here are some facts about the Bay region's snowshoe hares. Which are unique to hares and which are shared with their cottontail cousins? Answers on page 36.

1. Fur changes color for camouflage: grayish brown (late spring to early fall) and white (late fall through early spring).
2. Eats local vegetation.
3. Occasionally eats carrion.
4. Defecates soft and hard pellets. Eats the soft, still-nutritious pellets.
5. Top incisor teeth grow throughout its life.
6. Born fully furred with eyes open. Does not need much parenting.
7. Solitary (except for mating season).
8. Spends most of its life above ground.
9. Predators include foxes, minks, owls, hawks and bobcats.
10. Communicates by stamping its hind feet.

Icon: The Appalachian cottontail is the Bay watershed's smallest rabbit species. (Kristof Zyskowski, Cataloging Nature/CC BY 2.0)

BULLETIN BOARD

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Project Clean Stream
The Alliance for the Chesapeake Bay, through its Project Clean Stream, provides supplies for stream cleanups anywhere in the Chesapeake watershed. To volunteer for/register an event, or report a trashy site in need of cleanup, contact: Lucy Heller at lheller@allianceforthebay.org. Those who become a site captain will receive an Alliance hat.

DC, VA, MD shoreline cleanups
Learn about cleanup opportunities in the Potomac River watershed: Click on "Cleanups" at fergusonfoundation.org.

Clean Swell App
Use the Ocean Conservancy's free Clean Swell app to instantly upload your stream cleanup results to a database that provides a global snapshot of trash, suppling researchers and policy makers with insight to inform solutions. The app also keeps track of your results and lets you share them on social media. Info: Put "Ocean Conservancy Clean Swell app" in search engine.

Citizen Science: Creek Critters
Use Audubon Naturalist's Creek Critters app to check a stream's health by identifying small organisms living in it, then creating a report based on what you find. Get it for free at App Store or Google Play. Info: anshome.org/creek-critters. To learn about partnerships/host a Creek Critters event: cleanstreams@anshome.org.

VIRGINIA

Reedville Fishermen's Museum
The Reedville Fishermen's Museum needs volunteers for docents and crew to operate the gift shop, boat shop, research collections/library. Info: rfmuseum.org, office@rfmuseum.org.

Pond cleanup program
Join a Prince William Soil & Water Conservation District's One-Time Pond Cleanup in the fall or spring with no other commitments. The district needs kayaks to support this effort. Info: waterquality@pwswcd.org.

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

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

Citizen Science: Ghosts of the coast
The Gedan Lab at George Washington University and the Virginia Coast Reserve Long-Term Ecological Research project are documenting the formation of ghost forests — dead forests created by rising sea level. See a ghost forest? Submit observations to storymaps.arcgis.com/stories.

Become a water quality monitor
Train online with the Izaak Walton League to volunteer or become a certified Save Our Streams water quality monitor. Follow up with field practicals, then adopt a site of your choice in Prince William County. Info: Rebecca Shoer at rshoer@iwla.org, 978-578-5238. Web search "water quality va iwla." Activities include:
- *Snap a Stream Selfie:* Collect trash data, take a photo of local stream.
- *Become a Salt Watcher:* Test for excessive road salt in a stream.
- *Check the Chemistry:* Spend 30 minutes at a waterway with a handful of materials, downloadable instruction sheet.
- *Survey Stream Critters:* Use app to identify stream inhabitants. Number, variety of creatures reveal how clean a water is.
- *Monitor Macros:* Become a certified Save Our Streams monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess habitat, report findings, take action to improve water quality.

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

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

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

PENNSYLVANIA

Keep PA Beautiful
To learn about cleanup opportunities, including free work gloves, safety vests and trash bags (while supplies last) as well as available landfill space for trash collected during a cleanup for free or reduced cost through April 30: keeppabeautiful.org/programs/pick-up-pa.

Middle Susquehanna River
Get involved with the Middle Susquehanna Riverkeeper Association. Contact Riverkeeper John Zaktansky at 570-768-6300, midsusriver@gmail.com.
- *HERYN (Helping Engage our River's Youth with Nature):* Assist with youth outdoor activities.
- *Susquehanna Stewards:* Deliver programs, info to people in your region, help to develop new initiatives.
- *Water Reporter App:* Track the health of the Middle Susquehanna watershed's fish species by sharing photos, info about catches via an app. Reports, interactive map available at middlesusquehannariverkeeper.org.

MARYLAND

Tree teams, nursery teams
Streamlink Education in Walkersville needs volunteers of all to ages help plant native trees and shrubs at Toms Creek in Frederick County. Planting events are scheduled 9–11 a.m. April 23 & May 7. To register/info: streamlinkeducation.org/volunteer, streamlinkeducation.org or Lisa Baird at Lisa.streamlink@gmail.com, 443-538-6201.

Severn River Association
The Severn River Association needs volunteers for its 2022 water quality monitoring. Crews visit 51 stations from the mouth of the river to its headwaters. Those interested in joining a tour or captaining their boat for a tour, should contact Jack Beckham at fieldinvestigator@severnriver.org.

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

Patapsco Valley State Park
Volunteer opportunities include: daily operations, leading hikes or nature crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons. seamstresses. Info: 410-461-5005, volunteerpatapsco.dnr@maryland.gov.

Maryland State Parks
Search for volunteer opportunities in state parks at ec.samaritan.com/custom/1528. Click on "opportunity search" in volunteer menu on left side of page.

Delmarva Woodland Stewards
Delmarva Woodland Stewards is an outreach program by the Maryland Forest Service and U.S. Department of Agriculture's Forest Service to enhance forest & wildlife management practices, promote benefits of prescribed fire, pursue tree planting opportunities, highlight the need for low grade/biomass markets. For direct training, outreach to landowners and volunteers, contact: Matthew Hurd at matthew.hurd@maryland.gov.

Annapolis Maritime Museum
The Annapolis Maritime Museum & Park needs volunteers. Info: Ryan Linthicum atmuseum@amaritime.org.

Anita Leight Estuary Center
Remove invasive plants and install native species 1–3 p.m. April 24 at the Anita C. Leight Estuary Center in Abingdon. Volunteers, ages 14+, will learn to identify problem plants, removal & restoration strategies. Wear sturdy shoes, long sleeves, work gloves. Weather permitting. Preregistration required. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

Submission Guidelines

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

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

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

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

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

CHESAPEAKE CHALLENGE
Answers to: *Rabbit roundup* on page 35

Snowshoe hare only:
1, 3, 6, 8

Snowshoes and cottontails:
2, 4, 5, 7, 9, 10

BULLETIN BOARD

St. Mary's County museums
Join St. Mary's County Museum Division Volunteer Team or Teen Volunteer Team.
- *Adults:* Assist with student/group tours, special events, museum store operations at St. Clement's Island Museum or Piney Point Lighthouse Museum & Historic Park. Work varies at each museum. Info: St. Clement's Island Museum, 301-769-2222. Piney Point Lighthouse Museum & Historic Park, 301-994-1471.
- *Students:* (11 & older) Work in the museum's collections management area on artifacts excavated in the county. Info: 301-769-2222.

National Wildlife Refuge at Patuxent
Volunteer in Wildlife Images Bookstore & Nature Shop with Friends of Patuxent Research Refuge, for a few hours a week or all day 10 a.m.–4 p.m. Saturdays; 11 a.m.–4 p.m. Wednesday–Friday. Help customers, run the register. Training provided. Info: Visit the shop in the National Wildlife Visitor Center, ask for Ann; email: wibookstore@friendsofpatuxent.org.

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

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

Chesapeake Bay Environmental Center
Volunteer at the Chesapeake Bay Environmental Center in Grasonville a few times a month or more frequently. Help with educational programs; guide kayak trips & hikes; staff the front desk; maintain trails, landscapes, pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; monitor wood duck boxes; join wildlife initiatives. Or, participate in fundraising, website development, writing for newsletters & events, developing photo archives, supporting office staff. Volunteering more than 100 hours of service per year earns a free one-year family membership to CBEC. Info: volunteercoordinator@bayrestoration.org.

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

Citizen science: angler surveys
The Volunteer Angler Survey smartphone app helps the Department of Natural Resources collect species, location, size data. Information is used to develop management strategies. Surveys: artificial reef initiative, blue crab, freshwater fisheries, muskie, shad, striped bass. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

EVENTS / PROGRAMS

WATERSHEDWIDE

Watershed moments series
Watch *Appalachian Water Security – Impacts and Opportunities of a Changing Climate* with Dr. Nicolas Zegre of West Virginia University at 6:30 p.m. April 28 on Zoom. This presentation explores the role of water in our lives, what climate change impacts look like throughout the regio*n,* and the opportunities to reshape our future. Free. Registration required: umces.edu/watershed-moments or contact Rhonda Schwinabart at rschwinabart@umces.edu.

PENNSYLVANIA

York County parks
Programs take place at Nixon Park in Jacobus and are free unless otherwise noted. Space is limited to ensure social distancing. All programs are weather permitting for safety and may be rescheduled. Registration is required for all events: NixonCountyPark@YorkCountyPA.gov, 717-428-1961. Include name, number of participants, children's ages, phone number. Info: YorkCountyParks.org.
- *Earth Day Nature Walks:* 2–3:30 p.m. April 23 & 24. Families. Explore the woods while learning how improve the environment. Bring grocery bags to collect garlic mustard, an edible invasive plant.
- *Wildflower Walk:* 2–3:30 p.m. April 16 Teens, adults. Casual walk along a woodland trail.
- *Dyeing with Mushrooms:* 11 a.m.–2 p.m. April 23. This event takes place at the Brown Thrasher Pavilion at Rocky Ridge Park in York. Teens, adults. Eastern Penn Mushroomers Club demonstrates how to dye protein fibers using fungi. No registration.
- *Native & Invasive Plant Drop-in:* 8:30 a.m.–4:30 p.m. April 23 & 30; 12–4:30 p.m. April 24 & May 1. Displays depict trouble with invasive plants, benefits of natives. Learn to ID the worst species with hands-on samples, what to replace them with.
- *York County Master Gardener Native Plant Sale/Pines Pavilions at John C. Rudy Park, York:* May 7. Purchase native plants. Educational talks, "ask the expert," food, children's activities.
- *Sunset Scrambler Bike Rides on Heritage Rail Trail:* 6:30 p.m. April 12, meet at Brillhart Station; April 19, meet at Glatfelter Station; April 26 & May 3, meet at Seven Valleys; May 10, meet at Hanover Junction. 13 – 15 mile roundtrip journey. Bring bike, helmet, light, water, snack money. No registration.

VIRGINIA

Run/walk for a tree
We Plant Trees invites people of all ages to hit the trails of Sky Meadows State Park in Delaplane for its Family 5K Fun Run/Walk April 30. Check in begins 9 a.m. at the Turner Pond Entrance. The run/walk starts at 10 a.m. Rain or shine. Go at your own pace. Free. Preregistration strongly encouraged. Leashed dogs welcome. Info: weplanttrees.org, megan@weplanttrees.org. Register: web search "sky meadows state park fun run."

MARYLAND

Anita Leight Estuary Center
Take part in any of these programs at the Anita C. Leight Estuary Center in Abingdon. Except where noted, ages 12 & younger must be accompanied by an adult. Events meet at the center and require registration. Payment is due at time of registration. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org:
- *Nature Discovery Tots:* 10:30 a.m. April 16. Ages 0–6 w/adult. Explore the Nature Discovery Area with a naturalist. Free.
- *Tots of the Earth:* 10:30–11:30 a.m. April 23. Ages 2–5 w/adult. Fee: $10/child. Hike, dig, plant. Treat. Register by April 20.
- *Bug Love:* 2–3:30 p.m. April 23. Ages 8+ Learn about beneficial insects, hunt for them, build a bug hotel to take home. Register by April 20. Fee: $12/project.
- *Meet a Critter:* 1 p.m. April 24. All ages. Learn about, get close to live animal. Registration required. Free.
- *City Nature Challenge / Wild Wetlands Hike at Bosely Conservancy:* 10–11:30 a.m., April 29. Ages 6+ Search for plants, animals. Free. Register by April 28.
- *City Nature Challenge / Fish Seining:* 12:30–2 p.m. April 29. Ages 6+ Get feet wet while discovering Otter Point Creek's creatures. Free. Register by April 28.
- *City Nature Challenge / Amphibian Hunt:* 10:30–11:30 a.m. April 30. Ages 6+ Look for animals in the park. Fee: $10/family. Register by April 29.

Ladew Topiary Gardens
These events in Monkton include:
- *Specialty Plants & Garden Ornaments Sale:* 8 a.m.–4 p.m. May 7. More than 30 vendors will offer perennials, specialty annuals, small trees, container specialties, garden furniture, urns, architecture. Tickets must be bought in advance: $75/8 a.m.; $50/10 a.m.; $30/12 p.m.; $20/2 p.m.
- *Herpetology Hike:* 11 a.m.–1 p.m., May 14. Ages 13+ Scott McDaniel, executive director of the Susquehannock Wildlife Society, will discuss reptiles and amphibians during search in gardens and along nature walk. Fee of $20 includes admission to gardens. Info: 410-557-9570, information@ladewgardens.com.

RESOURCES

WATERSHEDWIDE

Calvert Marine Museum
Calvert Marine Museum in Solomons has joined Museums for All, a program of the Institute of Museum and Library Services administered by the Association of Children's Museums, which encourages people of all backgrounds to visit museums regularly. The program supports those receiving food assistance benefits to visit the museum for free (up to four people) with the presentation of a SNAP Electronic Benefits Transfer card. Info: calvertmarinemuseum.com, 410-326-2042.

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

PENNSYLVANIA

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

MARYLAND

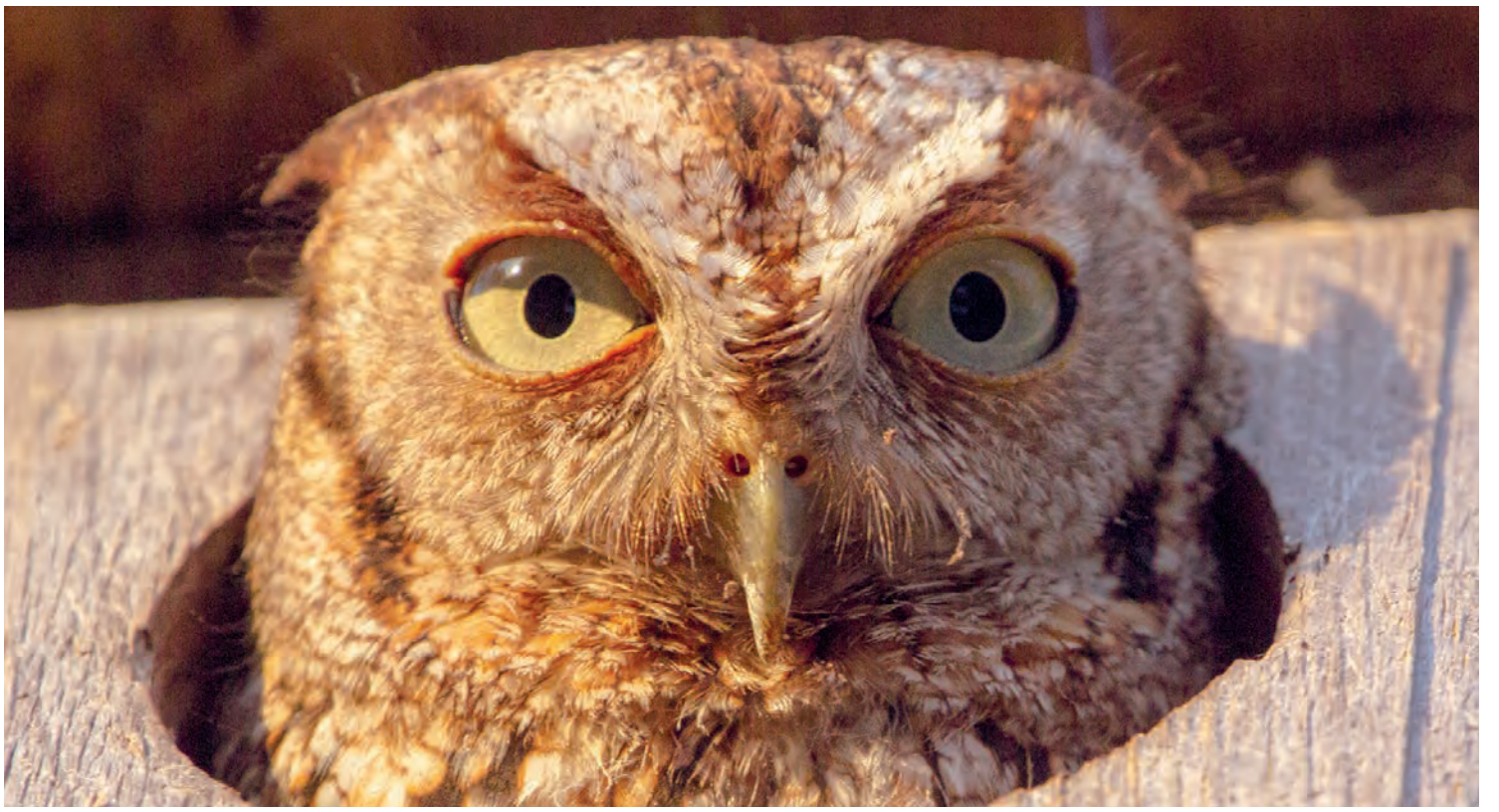
App locates key oyster sites
The MD Department of Natural Resources' new app, iShellfish, provides interactive maps for those on state waters that show the location of aquaculture leases; demonstration leases; fixed fishing devices, such as registered pound net sites; natural clam or oyster bars; oyster sanctuaries; public shellfish fishery areas; submerged aquatic vegetation protection zones; Yates bars; and other data. Instructions for downloading and using the app are available on the DNR website. Web search "md dnr ishellfish."

Fishing/crabbing guide
The 2022–23 Maryland Fishing and Crabbing Guide is available online. Find information about rules, state records, species identification, licensing, and more. Info: eregulations.com/maryland/fishing.

Fishing report
The MD Department of Natural Resources' weekly report includes fishing conditions, species data, weather, more. Read it online or web search "MD DNR fishing report" to sign up for a weekly report.

The Rolling Road Nest Box Crew, where stewardship's a hoot

By Tyler Walston



An eastern screech owl peers from its nest box. (Dennis Church/CC BY-NC-ND 2.0)

Bob Ross, the beloved artist most of us know from *The Joy of Painting* on PBS, once said, "Talent is a pursued interest. Anything that you're willing to practice, you can do." This quote has stuck with me since I first heard it years ago, and it applies to my passion and (limited) knowledge of birds, which started somewhat accidentally in 2014.

As a park ranger at Elk Neck State Park in Cecil County, MD, I was patrolling a heavily used area when a visitor stopped me and asked if I could identify a birdsong coming from the woods along the trail. I couldn't. Back then, my knowledge of birds wasn't just limited. It was virtually nil.

Later in the day, I heard the song again and asked another visitor, who seemed to be paying attention to birds, if he could identify the species. It was a northern cardinal, he said — a common bird not only in the park but also across the eastern half of the United States. I was somewhat embarrassed that I couldn't help the first visitor identify such a common bird.

I think most visitors look to park rangers to answer their questions about not only the park, but also nature in general. It's a reasonable expectation, I realized, and from that point I have made a habit of learning as much as I can about native birds — not only their songs and calls but also their appearances, behaviors, diets and habitats.

Not long after my "awakening," I had the good fortune of tagging along on a bird-banding project at the park that focused on saw-whet owls. I came away with tons of tidbits about the owls and their behavior, which only encouraged me to learn more about this and other owl species.

At another bird-banding ride-along, I learned how native cavity-nesting birds, like many owls, face competition from invasive birds such as starlings and house sparrows. They also encounter a lack of habitat due to a shortage of mature forests, where the cavities are more common.

These discoveries led me to begin building nest boxes, which mimic tree cavities, and installing them on trees in my parents' backyard. I then learned that native birds such as Carolina chickadees need their habitat to consist of 70% native plants, which attract the native insects they eat and feed to their offspring.

After moving to my grandparents' old farm in 2015, I began adding native plants to my yard, which until then had been mostly turf grass, with a couple of ornamental, nonnative shrubs. Over the years I have noticed more birds using my nest boxes and hunting for insects in my gardens.

My interest in birding often spills over into my social life. Indeed, many of my friends likely tire of hearing me talking about birds or pointing them out whenever I see them. This includes a group of friends I met through my coworker, Clark Meadows, who lives in the same neighborhood on Rolling Road in Salisbury, MD. We regularly meet at John Timmons' house for cocktails on Wednesday evenings.

While they initially weren't as interested in birds as I was, they nonetheless maintained feeders in their yards and would tell me (the "bird guy") that they often heard owls in their neighborhood. After some discussion and listening to recordings of owls, we determined that at least one of the species was an eastern screech owl, a cavity nester that I'd been able to attract to boxes on my parents' property.

With last spring's breeding season approaching, I persuaded Clark to put up a nest box sized for screech owls. He did so, and within a few weeks he had a nesting pair in his yard.

Over the next several weeks, Clark and his wife, Cheryl, spent their evenings observing the screech owl couple (named Lucy and Desi) from a respectful distance in their garage. They noticed their routines and were lucky enough to observe them hunting songbirds and bats in their yard.

John followed suit and built a screech owl nest box. It, too, had a tenant within a few weeks — a great crested flycatcher. Not disappointed in the least, John and his wife, Lisa, spent the spring learning more about the species and observing the nesting pair.

In the weekly hangouts that followed, both couples were regularly sharing pictures and stories about their nest box families. Before long they knew more about the owls and flycatchers than I did!

This year, as we approach another nesting season, it is exciting to hear the neighborhood buzz in anticipation of what birds we may (or may not) attract. Preparations are being made: The nest boxes are cleaned out and backyards have been altered to improve habitat. The Rolling Road Nest Box Crew is anxious to see what birds decide to raise families in their yards.

Given what seems like a daily bombardment of bad or worrisome environmental news, it's easy to understand why people who don't work in the environmental field think there's nothing they can do to help. Admittedly, citizen stewardship isn't the answer to all of our problems, but I think giving people agency to effect change in their own backyards can lead to a citizenry more engaged in environmental matters.

Ultimately, I believe stewardship allows people to open their eyes to worlds they had little to no awareness of to begin with.

And as happened with me, one thing leads to another. To be a well-rounded birder, you need to learn about bird behavior and habitat and biology. And that might eventually turn you into a well-rounded amateur ecologist.

I encourage you to consider planting some native trees, shrubs and flowers and installing a nest box or two in your yard this spring. You never know what pursued interest might turn into skill, knowledge or maybe even a lifelong passion. ■

Tyler Walston is the Maryland Agriculture projects coordinator for the Alliance for the Chesapeake Bay. He lives in Salisbury, MD.

Chestnut-sided warbler a sight to behold, if you can

By Mike Burke

During its journey north from Central America and for most of the summer breeding season, the male chestnut-sided warbler sports a bright yellow cap and black bars through and below its eyes. (Michael Janke/CC BY-NC-ND 2.0)

Female and juvenile chestnut-sided warblers have little to no chestnut on their flanks. (Kenneth Cole Schneider/CC BY-NC-ND 2.0)

Timing is everything, as I am learning the hard way.

It's early spring in the Chesapeake Bay watershed, time for nature to throw off its winter blankets and rise to its feet. The forest floor erupts in patches of skunk cabbage, bloodroot, spring beauties and Virginia bluebells. Dogwoods, mountain laurel and other understory trees and shrubs ready their blossoms. The large trees above them will soon leaf out, shading lower vegetation.

Early spring also represents the beginning of migration for an estimated 3.5 billion birds that winter in Central or South America. These neotropical migrants, as they are known, are a birder's delight. Many are just passing through on the way to their breeding territory in the far north. For a short time, though, they bring color and variety to our landscape. Their glory is ephemeral.

The chestnut-sided warbler (*Setophaga pensylvanica*) is such a bird. During winter, the shade-grown coffee plantations of Costa Rica are this species' epicenter. In late March, these songbirds begin their spring migration. Fattened up with the insects that thrive in tropical heat, the birds perform an extraordinary act of endurance and navigation. Drawing on these energy stores, they set out above the open waters of the Gulf of Mexico, flying nonstop to the U.S. shore.

If you live in Alabama, your best chance of seeing these colorful warblers in spring would be during the week surrounding April 1. Timing, you see, is everything. You can follow the species as it spreads across the eastern section of the nation, all the while moving north.

Along the Appalachian ridge from Georgia north, a few stop to breed. In piedmont and coastal Virginia, chestnut-sided warblers make their appearance in late April. In my part of Maryland, it's more like May 3–10. They need to catch our insects emerging in the growing warmth of longer days. For some chestnut-sides, Pennsylvania is as far north as they need to go to find suitable breeding territory, but most continue into New York, New England and up into Canada. Many midwestern migrants stop around the Great Lakes to nest and raise another generation.

Like many birds, these warblers migrate at night — a perilous thing in modern times. Disoriented by lights, thousands are killed annually as they fly into buildings and TV towers. Those that survive establish breeding territory in young, second-growth forests, thickets and other sites with plenty of small and medium-size trees.

Typically, chestnut-sides produce a single brood annually. The breeding season runs from mid-June to early August. Breeding pairs are thought to be monogamous.

The female fashions a cup nest very low in a small tree or shrub. She lays three to five eggs (usually four) then sets about incubating them until they hatch 11–12 days later. The young are helpless. Fed by both parents, they grow rapidly, and in just 10 days the hatchlings are ready for their first flight. Soon they will be fully fledged and prepared to leave their parents.

Not that I would know from first-hand experience, but the chestnut-sided warbler is a gorgeous, tiny bird. The breeding male has a bright yellow cap atop a white face. He has black lines through his eyes and a thick, black "moustache." His chestnut flanks are unmistakable. The back and wings are black and yellow. Underneath, he is all white, from his chin to his tail. The female looks similar, but in subdued colors. She has the namesake chestnut sides, usually fainter, but instead of a yellow cap, hers is mossy green. Her underside, instead of bright white, is pale gray.

Although just 5 inches from tiny beak to tail tip and weighing less than half an ounce, the male chestnut-sided warbler sings a loud tune throughout the breeding season. The song establishes territory and attracts its mate. Usually it is rendered, *"pleased, pleased, pleased to meetcha!"* The final note is strongly accented.

As soon as his partner is on the nest, though, the singing stops — except for occasional territorial disputes. His voice has done its job for another season.

The warbler's diet consists primarily of insects, particularly moth and butterfly caterpillars and fly larvae. An active forager, this bird hops from branch to branch, examining the underside of every leaf. It has a distinctive posture while feeding — holding its tail high and drooping its wings low. Ornithologists aren't clear why these warblers exhibit this foraging behavior.

Because this warbler usually feeds in low branches or brush — often at eye level — and is so active, the yellow or green cap and chestnut sides should make it relatively easy to see. But only if your timing is right.

My history with this bird has been one of frustration. I have missed the northern migration because of a packed work schedule, family obligations and pandemic shutdowns. Sometimes, my attention to the calendar has been better. Still, I have come up empty.

Central Maryland is full of second-growth forests and thickets — just the kind of layover habitat this warbler loves. As confirmed by eBird postings every spring, these birds are out there. For years, though, they have managed to evade my gaze.

Timing is everything. On May 5, I'll be out along the forest edge, scanning the trees and scrub as I look for this elusive bird. This year, I'm hoping to finally add the chestnut-sided warbler to my "life list" of birds. Wish me luck. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

Protecting the Chesapeake from aquatic invaders

By Kathryn Reshetiloff

The northern snakehead, a native of Asia, was first discovered in the Bay watershed two decades ago and now seems to be firmly established. (Brian Gratwicke/CC BY 2.0)

The Asian spotted lanternfly first showed up in Pennsylvania in 2014, but it has since spread southward into Maryland, Virginia and West Virginia, ruining vineyards and orchards. (Rhododendrites/CC BY-SA 4.0)

Across the nation, invasive, nonnative plants and animals are becoming a larger threat to our waterways. And the Chesapeake Bay watershed is not immune.

These unwelcomed species didn't just show up on their own. Most were introduced, either intentionally or accidently, by people. The possibility of these species multiplying in our waters — and eating, displacing or infecting native aquatic life — is a real concern to citizens and natural resources managers.

All living things have evolved to thrive in specific places on Earth. Local climate, geology, soil, available water, nutrients and food all determine which plants and animals can live in a particular ecosystem.

Species that have evolved in a particular place are considered native; those that arrive from elsewhere are considered nonnative — but are not necessarily invasive.

Purple loosestrife, a wetland plant brought to North America in the 1800s as an ornamental, is aggressively displacing native marsh species. (St. Arnualer Wiesen/CC 0)

That distinction belongs to plants and animals that threaten native species, often by crowding them out or establishing themselves more quickly in disturbed land, in the case of plants, or outcompeting them for food, in the case of animals.

Invasives may also have an advantage over natives because of a lack of natural controls, such as predators or disease. Also, invasive herbivores and carnivores may eat native species, and invasive plants could introduce a disease deadly to natives.

Invasive species damage natural systems by disrupting the intricate web of life for native plants, animals and microorganisms, including those that are rare or close to extinction. Once invasives have consumed all of the food sources or destroyed the habitat for other wildlife, they move on to the next suitable site.

They are often spread unknowingly by people while boating, fishing or taking part in other recreational activities. Invasive "hitchhikers" attach to boat bottoms, motors and other items, then are transported to new waterways.

Dumping unwanted aquarium fish and plants and releasing unused live bait are another way they are introduced.

Other invaders arrive in the discharged ballast water of ships coming from all over the world.

Invasives, like the zebra mussel, reproduce and spread quickly, wreaking havoc on native wildlife, ruining boat engines and large water-intake systems, and making lakes and rivers unusable for boaters and swimmers.

Another infamous invader is the nutria, a voracious, almost beaver size, rodent native to South America. An aggressive trapping and hunting program has all but eradicated them from the Eastern Shore, where they had chewed their way through marshes, accelerating the loss of thousands of acres of wetlands.

The red-eared slider, a popular aquarium species native to the southern and southwestern U.S., is spreading to northern states, helped along by people who release them when they grow too big. (Robert J. Sharp/CC BY-SA 4.0)

The list goes on. The northern snakehead fish, a native of Asia introduced in 2000, is essentially out of control. Blue and flathead catfish, natives of the Mississippi, Missouri and Ohio river watersheds compete with Bay species for food and habitat. The spotted lanternfly, spreading like wildfire through the region, is killing trees and devastating orchards and vineyards. Purple loosestrife, an invasive wetland plant, was introduced as an ornamental in the 1800s and now dominates marshes. Even the seemingly innocent red-eared slider, a semi-aquatic turtle native to the southern and southwestern U.S. — a very popular pet — is invading northerly states because many owners set it free when it outgrows its aquarium.

Once an invasive species has a foothold, the cost — in terms of degraded natural areas, loss of native wildlife or control efforts — can be incalculably high. In addition, other economic resources and lifestyle choices are lost. Recreational activities, such as swimming, fishing, boating or wildlife-watching are affected, as are the sources of income associated with these activities: the seafood industry, sales of outdoor equipment and clothing, hunting and fishing licenses, guide services, travel and tourism, and service stations for boats and automobiles.

What can you do to prevent the spread of invasive aquatic species? The overarching rule of thumb is this: Never release a plant or animal in an environment if you are not certain where it came from. Bait can come from anywhere, and it is believed that rusty crayfish, a very troublesome invader from the Ohio River watershed, has established itself in the Bay region mostly as discarded bait.

Some organisms are so small you may not even realize they are hitching a ride with you. So it's important to follow this checklist every time you leave any body of water. Examine your boat, trailers, clothing, shoes and gear, then:

- Remove any plants, fish or animals.
- Remove all mud, dirt and plant fragments. The larvae of an animal, perhaps too tiny to see, can live in mud, dirt, sand and plant fragments.
- Eliminate water from equipment before moving it.
- Clean and dry anything that was in contact with water (boats, trailers, equipment, clothing) before using it in another waterway. ■

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To learn about invaders in your area, contact your state's natural resources or environmental protection agency. One of the most comprehensive and user-friendly online resources for invasive species is the USDA's National Invasive Species Information Center, at invasivespeciesinfo.gov.