

CHESAPEAKE BAY JOURNAL

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Construction crews restore Chinguapin Run in Baltimore city, moving sewer line out of a channel and stabilizing banks. Trees planted along stream by volunteers were taken out, but officials say the reductions in erosion and sewage leaks outweigh the loss. (Dave Harp)

Localities challenged to meet stormwater reductions

❗ Critics question effectiveness of some methods, say MD has let some places off easy.

By TIMOTHY B. WHEELER

Stormwater pollution is proving to be one tough nut to crack in restoring the Chesapeake Bay. To understand how tough, just look at how Maryland's largest city and the state's biggest suburbs have struggled with it.

A year ago, despite having spent more than \$100 million on a slew of projects, Montgomery County failed to meet state requirements for reducing polluted runoff from its streets, parking lots and rooftops. In a consent agreement with state regulators, it pledged to catch up and pay a \$300,000 fine — or spend a like amount on an extra stormwater management project.

Officials in the city of Baltimore and

Anne Arundel and Baltimore counties said they've managed to avoid a similar fate. But they only did so with help from the Maryland Department of the Environment, which approved ways of complying with its mandates that critics find questionable.

Baltimore city, for instance, did it mainly by sweeping its streets — an approach that experts say is, at best, only modestly effective at curbing the nutrient pollution that plagues the Bay.

Anne Arundel County, meanwhile, took advantage of a new state program that permits pollution "trading." This let the county offset its big shortfall in reducing stormwater runoff by taking credit for the better-than-required performance of its sewage treatment plants.

And Baltimore County benefited from another helpful state decision. The MDE announced late last year that

localities could claim greatly increased pollution reduction credits for stream restoration projects — far beyond what a number of experts think is warranted.

State officials say they did those things to provide flexibility in meeting the ambitious stormwater reduction target they set because the effort was costly and difficult and each locality seemed to have different challenges meeting it.

"Each county is finding practices that work best in their landscape and environment," said Lee Currey, director of the MDE Water and Science Administration.

But environmentalists and even some stream restoration professionals contend that the state has let localities off easy. Under pressure from local officials, they say, regulators permitted and

Coal ash contaminated groundwater at almost all monitored sites

≈ Sites found in MD, PA and VA; one in the Patuxent watershed was among the 10 worst in the nation.

By WHITNEY PIPKIN

Just after Virginia legislators voted to end the storage of coal ash in pits where it could leach into groundwater and rivers, a report released in March revealed widespread coal-ash contamination in 39 states — and at more than 91 percent of the power plants monitored. They include sites in Maryland, Pennsylvania and Virginia.

The report by Earthjustice and the Environmental Integrity Project relies on monitoring data from coal-fired power plants that an Obama era regulation required them to release for the first time in 2018. Of the 265 power plants that were impacted by the requirement, the report found that groundwater near 242 of them contained "unsafe levels" of one or more pollutants from coal ash. It also cited a coal ash landfill in Maryland's Patuxent River watershed as one of the 10 worst coal ash contamination cases in the country.

The snapshot of the industry "confirms that virtually all coal [ash sites] are polluting our groundwater," said Abel Russ, senior attorney with the EIP and lead author of the report.

Coal ash, the byproduct of burning coal for power, can contain toxic chemicals and heavy metals such as arsenic, lead and mercury. Environmental lawyers and researchers have been trying to prove how easily these contaminants can leach from unlined or clay-lined pits into groundwater and, eventually, enter drinking water and nearby waterways.

The data used to produce the report came from groundwater monitoring

RUNOFF CONTINUES ON PAGE 21

COAL ASH CONTINUES ON PAGE 20



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Editor's Note

New special issue, new changes & new faces



It's been a hectic start to the year here at the *Bay Journal*. We have a lot of plans for this year, including a first-ever special issue that will focus on climate change, and updating our publication and website. Fortunately, we have some help on the way.

With this issue we are welcoming two additions to our reporting staff: *Sarah Vogel song* is an environmental and agricultural reporter based in Richmond with a background in local news. She's worked as a general assignment reporter for the *Progress-Index* (Petersburg, VA) and the *Caroline Progress* (Caroline County, VA).

Her reporting has covered environmental justice, an award-winning series about the revitalization of the city of Hopewell, as well as an award-winning series about the environmental impacts of a sand and gravel mining proposal in Caroline County.

Sarah has also written for numerous regional publications. She came to journalism via academic editing, working on textbooks and nonfiction books for companies including Oxford UP, Princeton UP, Palgrave Macmillan, and others. She is a graduate of the College of William and Mary.

Ad Crable covered the outdoors, environment and agriculture for

LNP newspaper in Lancaster, PA, for nearly 37 years, winning more than 20 statewide writing awards.

His reporting has ranged from coverage of the Three Mile Island and Peach Bottom nuclear plants, to efforts to preserve the scenic Lower Susquehanna Gorge and its river towns, to the challenges of farmers seeking to conform to more stringent conservation measures on their farms while trying to eke out a living during tough times in the dairy business.

For 20 years, Ad has led and written about backpacking forays to different wild spots in Pennsylvania in the heart of winter. He is a graduate of West Virginia University and tries to be a good steward of land along the Lost River in the Mountain State, where he owns a cabin.

He lives with his wife and two college-bound twin daughters along the Conestoga River in Lancaster, within view of an eagle's nest.

Sarah, whose freelance work had already appeared in the *Bay Journal*, joined our staff with this issue, and Ad's work will begin appearing in the next edition.

Meanwhile, we are saying farewell to Donna Morelli, who had been working with us for nearly two years, helping with our Pennsylvania coverage and our Local Government Edition. Donna is planning to relocate to her native New York (where her horse has already moved). We wish her the best in the future.

— Karl Blankenship

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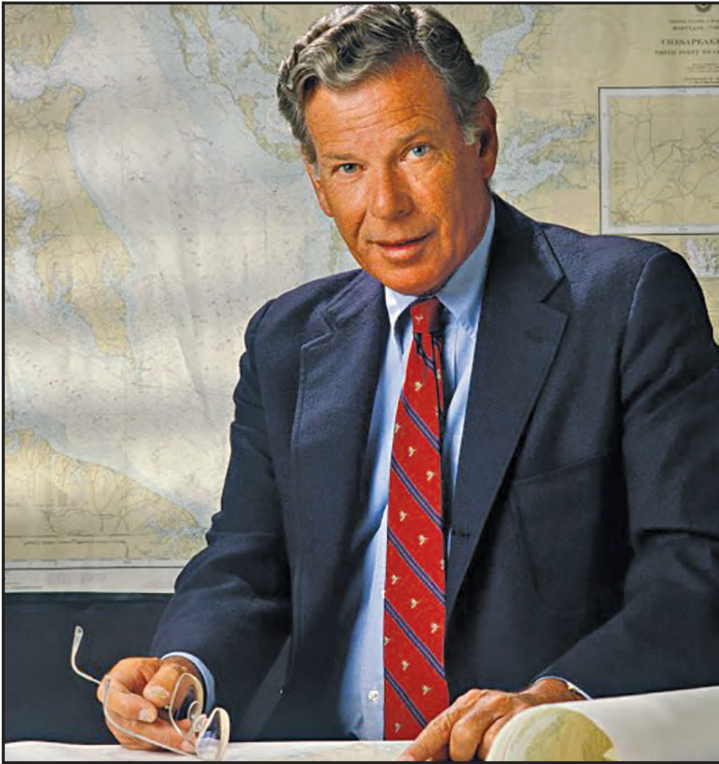
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Correction

A photo caption in the March issue gave the wrong location for the Little Blackwater River. It's in Dorchester County, which is in southern Maryland but is not one of counties that is part of the region known as Southern Maryland. The *Bay Journal* regrets the error.



Clockwise from left:

Ann Swanson, long-time executive director of the Chesapeake Bay Commission, called Maryland's late Gov. Harry Hughes, (shown here in a 1987 photo) a "trail blazer" who "used science as his guidepost and common sense as his tactic" in tackling the Bay's problems. See article on page 8. (Dave Harp)

White Horse Mountain in West Virginia was saved from development partly because its forest helps protect water quality in the South Branch of the Potomac River. Now owned by the state of West Virginia as a wildlife area, it's open for the public to explore. See article on page 26. (Bill MacFarland)

The bamboo worm is one of the fascinating creatures found in the Chesapeake. A quiz to test your knowledge about this species and other marine worms in the Bay is found on page 28. (Courtesy of Smithsonian Environmental Research Center & Florida Museum of Natural History)

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Yorktown coffee roaster brews up support for the Bay in its community

By LUCY HELLER

The Alliance for the Chesapeake Bay believes that the best way to restore the Bay is by forging strong, diverse partnerships with a wide variety of stakeholders — including businesses.

The Alliance works with businesses that are already environmental stewards, as well as those that require some guidance and support in their efforts. Members of our Businesses for the Bay program not only work to protect and restore the Chesapeake and its watershed's rivers and streams, but help to foster environmental stewards in the workplace.

Mobjack Bay Coffee Roasters in Yorktown, VA, a B4B member, takes pride in acting locally by spreading awareness about the work that is needed to support the Chesapeake's restoration. The business, which specializes in roasting fair trade, organic or Rainforest Alliance Certified coffees, trains its employees to become environmental stewards while offering an environmentally friendly product.

"When we started living on the Chesapeake Bay, we wanted our kids to be able to go swimming, but our neighbors told us not to let them because of how bad the water quality is ... that started to bring more awareness to us as a couple as to what was going on with the Bay," said Celeste Gucanac of Mobjack.

With the Bay as their new backyard, Celeste and her husband, Jo, started Mobjack in Yorktown in 2007. At first, the couple didn't know much about starting a business. What they did know is that they both loved coffee enough to make a career out of it and that they wanted to help support the Bay in some way. Mobjack Bay Coffee Roasters was the result. After studying how to roast coffee using the most environmentally friendly processes, Celeste and Jo opened shop.

Mobjack's partnership with the Alliance began when Celeste, while exploring articles and searching the Internet for information about the Chesapeake resto-



The Mobjack Bay Coffee Roasters shop is located in the historic Cole Diggs House, (circa 1730) in Yorktown, VA. Its owners, Celeste and Jo Gucanac, have created an environmental ethic in their workplace and organized local cleanups. (Submitted photo)



ration, learned about the organization's projects to conserve the Chesapeake. It started with Mobjack making monthly donations. Today, Mobjack is a proud Businesses for the Bay Gold Member.

In addition to sourcing socially responsible coffee beans and using recycled bags, Mobjack Bay Coffee Roasters also has a "give back to the Bay" component. Celeste said that if an employee isn't already an environmental steward before arriving at Mobjack, he or she certainly learns to become one. "We believe in something and we modeled our entire business after doing what we believe to be the right thing — helping to restore the Chesapeake Bay."

Environmental stewardship in the workplace is essential to create awareness

and expand people's knowledge about how their everyday lives can affect the health of the Bay watershed. "Our employees get used to the way we operate, our efficiency, how we recycle and the way we care about our product, so it just becomes second nature to them because there is no other option," Celeste said.

A major part of the Alliance's Chesapeake restoration mission is inspiring communities to take part in stream cleanups, tree plantings, installing stormwater treatment practices and more. Working with businesses brings us one step closer to achieving this goal.

The Businesses for the Bay Membership Association encourages its members to take voluntary and measurable actions to protect and restore the Chesapeake as well as help the public understand the valuable role of the business community in sustaining the health of the Bay and its watershed. B4B members often participate in or lead stream cleanups throughout the year.

For example, January's government shutdown included the services that clean up Colonial Parkway, a National Park Service road that links Jamestown, Williamsburg and Yorktown, and runs right along the James River. A friend posted pictures of the trash coving the parkway during the shutdown on Facebook, and within minutes, Celeste responded by organizing a community cleanup. Three days later, more than 40 volunteers had signed up. The volunteers, a mix of Celeste's family, Mobjack employees and members of the community, cleaned up 23 miles of the roadway.

"All of that trash would have gone in the river, no doubt. The river is right

there!" Celeste said.

To encourage employees to participate in trash cleanups, Celeste and Jo close the store so that every worker can attend. This is to remind employees about why the eco-friendly production they do in the store is important. "When attending a stream cleanup," Celeste said, "first, you learn how disrespectful it is to litter; secondly, you realize how little effort it really takes to make a difference; and finally, you get to see how much of an impact you can make." Celeste said that she loves to see a source of pride develop in her employees as they help to pick up trash.

When asked if she has any advice for businesses that are looking to boost environmental stewardship in their workplace, Celeste said, "Just get out there and start doing something. It doesn't have to be a huge orchestrated event, just get it started. It can be something small, because even just the little bit of effort makes an impact."

What started out as an idea slowly grew into a place where people can enjoy socially responsible coffee, see firsthand how coffee is made, recycle everything they use and sign up for a local cleanup event. Celeste is passionate about how she and her husband have worked to create a healthier Chesapeake watershed, and is looking forward to learning more about how they can expand.

To learn about Mobjack Bay Coffee Roasters, visit mobjackbaycoffee.com. For information about the Alliance and its business partnerships, visit allianceforthebay.org.

Lucy Heller is a Chesapeake Conservation Corps intern in the Alliance for the Chesapeake Bay's Annapolis office.

Rick Middleton, founder of Charlottesville-based SELC, retires

≈ Lawyer created the 'legal powerhouse' to protect the Southeast's environment.

BY WHITNEY PIPKIN

Rick Middleton didn't fancy himself an environmental lawyer when he graduated from Yale Law School in 1971. That category didn't exist.

The United States had only just commemorated its first Earth Day, and the future founder of the Southern Environmental Law Center still felt like a fish out of water in New England's semi-industrial corridor, pining for the bucolic valleys around his Alabama hometown of Birmingham. But during those years, he began to realize two things: The South had something worth saving, and no one else was doing it.

This spring, Middleton, 72, is retiring after leading the SELC to become the Southeast's largest environmental law firm, employing more than 80 attorneys and 140 employees in six states, from Virginia to Alabama. The SELC's longtime deputy director, Jeff Gleason, has come out of retirement to lead the organization, headquartered in Charlottesville, VA.

Three of the SELC's nine offices are in Chesapeake Bay portions of Virginia and Washington, DC, where



Under Rick Middleton's leadership the Southern Environmental Law Center has become the Southeast's largest environmental law firm with employees in six states, from Virginia to Alabama. (Bill Sublette)

the nonprofit's work on air pollution, wetland protections and coal ash waste, to name a few, have left an indelible mark.

watching the SELC grow from a two-office suite on Charlottesville's downtown mall into a leading litigator for Virginia's environmental community and "a highly respected, legal powerhouse."

Hoagland said water quality advocates in the state were "pretty crippled" and unable to pose legal challenges to industrial discharge permits before the SELC's work led to changes in the mid-1990s. It was the SELC's team of lawyers that led a successful, nearly 15-year battle against a proposed King William Reservoir slated to provide drinking water to Virginia's Lower Peninsula by flooding more than 1,500 of acres of farms and forests to form what would have been the commonwealth's second-largest lake. The nonprofit also had a hand in forming the organizations that would become the Virginia Conservation Network, an umbrella organization for many of the smaller environmental groups the SELC still represents.

"It wasn't that they had one attorney working on these. They invested a number of attorneys over the life of these debates," said Hoagland, who is now senior program officer at the

Roy Hoagland, who was a Virginia staff attorney and Virginia executive director at the Chesapeake Bay Foundation through the 1990s, recalled

SELC CONTINUES ON PAGE 6

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SELC FROM PAGE 5

Virginia Environmental Endowment. “They became the lead litigation arm of the environmental community in Virginia.”

The SELC’s work in Virginia is indicative of its state-based efforts to balance an on-the-ground presence with advocacy for regional and national environmental priorities. Middleton said advocates in one state “only see part of the elephant” that is SELC’s larger body of work.

“The major value of a regional model is you can have that local presence, and you can easily take what works in one state and export it to other states,” Middleton said.

That local presence has proven key, he said, particularly in the South. For the last 33 years, as the SELC established offices in each state, its attorneys have practiced what a journalist might call “beat reporting” — or, in this case, “beat lawyering,” developing expertise by handling the same topics over many months or years.

The lawyers would make a habit of attending commonplace utility commission meetings where decisions with sweeping environmental implications were made amid the doldrums of everyday proceedings. Middleton tells of a female lawyer who faithfully attended meetings of an all-male commission in Atlanta, GA, for six months before a member said one day: “I want to hear what that nice lady from the Southern Environmental Law Center has to say.”

Middleton, grinned as he told the story, with his Alabama accent coming through.

“It’s just great lawyering. You’ve gotta be polite, you’ve gotta stick with it, and you’ve gotta show ‘em you’re not crazy,” he said. Today, “we know more about the way utilities operate than any other environmental organization in the country. [For years,] we were the only people in the room.”

Jean “Jeanie” Nelson, president and executive director of the Land Trust for Tennessee — and a friend of a friend who became a SELC board member — said that from the beginning, Middleton built the Southern-minded



Rick Middleton studied law at Yale University before cutting his teeth as an environmental lawyer for the Alabama Attorney General’s Office. This photo was taken in 1988. (SELC)

organization around relationships.

When he was first forming the organization, “he flew down to Nashville to see how deep my caring was for these places,” Nelson said. When she asked what sort of issues he was thinking of championing, Middleton mentioned billboards going up along the scenic highways near a national park in her state, an eyesore more than an environmental problem that got to the core of preserving the South’s unique character. “I really hate to think what the Southeast would be like if it weren’t for SELC.”

Billy Want, a professor at the Charleston School of Law and a friend of Middleton’s since law school, said Middleton’s care in choosing who to hire at SELC is just as “legendary, as

are the results.”

Middleton went beyond checking a person’s provided references. He would find contacts that weren’t listed and ask how the applicant treated his or her administrative assistant — “a good indicator of what kind of person they are,” Want said.

Growing up in Birmingham at a time when the city was the focal point of the civil rights era, Middleton gleaned a deep sense of place and a conviction “that it’s worth fighting for what’s right and against what’s wrong.”

“You learned that, to make a place good, you’ve got to focus on correcting the bad — along with preserving the good,” he said.

The same principles applied to the early environmental movement, which was weaving its way into federal policies just before Middleton returned to Alabama, a couple years out of Yale, to work in the state attorney general’s office. Yale had been a hotbed of activism in the late 1960s, with civil rights demonstrations bleeding into Vietnam War protests. Environmentalism found fertile soil there, too.

The federal Clean Air Act of 1970 gave industrial facilities a few years to ratchet down emissions with a suite of new regulations, and, Middleton said, “the big question was whether people were going to enforce this new law.”

A fresh face in the Alabama attorney general’s office, Middleton took on the task. His first case — against the Tennessee Valley Authority, the country’s largest polluter at the time — went to the U.S. Supreme Court.

“It was really only when I started doing that work that I knew, ‘This is exactly what I want to be doing,’” he said.

He went on to work for seven years at the Sierra Club Legal Defense Fund, now Earthjustice, one of a handful of environmental law firms in DC at the time. Some of his fellow Yale alumni had founded another law firm, the Natural Resources Defense Council. The community in DC had a small-town feel, but it had very little grasp of — or interest in — the issues affecting the South.

“Environmental law had been invented, but no one had stepped forward to take it to the South,” Want said. “It was unclear whether it could succeed, but Rick had a vision. And he didn’t have any competition.”

Middleton saw the University of Virginia as a hub producing some of the South’s most prominent leaders, which is one of the reasons he got his bachelor’s degree there. That’s also among the reasons he settled on Charlottesville as the headquarters of the SELC. The university town of fewer than 50,000 in the shadow of the Blue Ridge Mountains seems to have inherited a bit of the intellectual outdoorsmanship for which its longtime neighbor at Monticello, Thomas Jefferson, was known.

“There’s just a certain mix of people here,” Middleton said from his Charlottesville office early this year. “There’s a great love of the land and of beauty, mixed in with just a lot of people who understand the importance of environmental policy.”

Middleton’s 36-year-old twin daughters were 11 when his family moved into an 1870s farmhouse just outside of town, with views of Shenandoah National Park. Or, at least, there should have been views. In the early 1990s, despite air pollution restrictions like the ones Middleton had helped enforce in Alabama, “there were still 33 days in the summer that I could not even see those mountains.”

Once the law center got off the ground, reducing air pollution again became a priority for Middleton, including an SELC case to close loopholes for power plants that won at the U.S. Supreme Court. “We’re extremely proud of that,” he said.

Middleton’s organization has opposed potential rollbacks of some of those federal laws today. But now, “there hasn’t been a day in 15 years that I haven’t had a crystal-clear view of that mountain.”

Chesapeake Challenge

Answers to

The wonderful weird world of water-dwelling worms

on page 28.

1. Common Clam Worm
2. Oyster Flatworm
3. Milky Ribbon Worm
4. Acorn Worm
5. Bamboo Worm

Bay Buddies

Answers to Earthworms on page 28.

1. D
2. C
3. True
4. B
5. B
6. E
7. B
8. B
9. D
10. A
11. A

Trump makes Land and Water Conservation Fund permanent

≈ New law does not ensure fund, used to acquire public lands in watershed, will get money any year.

BY SARAH VOGELSONG

The federal Land and Water Conservation Fund — which has supported dozens of projects in the Chesapeake Bay region — was made permanent on March 12, when President Trump signed the bipartisan bill doing so into law.

The Land and Water Conservation Fund has existed since 1965, but until now had to be periodically reauthorized by Congress. The new law makes those votes unnecessary but has no impact on how much funding the LWCF will receive in the future.

Its permanence is part of the John D. Dingell, Jr., Conservation, Recreation and Management Act, which the U.S. House of Representatives approved with a vote of 363 to 62 on Feb. 26. Earlier in February, the Senate had voted 92 to 8 in favor of the measure.

Joseph McCauley, a fellow with the Chesapeake Conservancy and a former U.S. Fish and Wildlife Service official who oversaw land acquisitions through the LWCF for the Northeast Region, including the Chesapeake Bay watershed, called the passage “a big deal.” Even “if some future Congress isn’t enamored with the Land and Water Conservation Fund, at least it’s permanently reauthorized, and that won’t be a way to undermine it,” he said.

Since the LWCF’s inception, the Chesapeake Bay watershed has been an important beneficiary of its funds, which have led to major acquisitions of public lands in the region.

“Virtually every national park, national wildlife refuge, [Bureau of Land Management] natural resource management area, national forest addition since 1965 in our watershed has had funding from LWCF,” said Jody Couser, director of communications for the Chesapeake Conservancy.

Congressional disagreements have plagued the LWCF in prior years, stalling its reauthorization and holding projects



Rappahannock River Valley National Wildlife Refuge received money from the Land and Water Conservation Fund (Dave Harp)

in limbo until a compromise could be brokered — delays that could be especially detrimental in deals the government was seeking to make to acquire land from private owners.

“They’re working with real people out there, and to have some certainty when working with individuals who are thinking of selling their land is important,” McCauley said.

The Dingell Act has removed that chokepoint, but not the challenges involved in releasing the designated funds.

Since the LWCF first went into operation, Congress has authorized more than \$40 billion for the fund, with the majority of that money — \$37.8 billion — coming from revenues from oil and gas leases on the Outer Continental Shelf. (The remainder comes from the federal motorboat fuel tax, surplus property sales and, since 2006, revenue from the Gulf of Mexico Energy Securities Act.)

While \$900 million is authorized to be placed in the LWCF every year, only once, in fiscal year 2001, has Congress appropriated all of that for conservation and recreation projects. Altogether, only \$18.4 billion of the total authorized amount has been drawn from the fund over its history to acquire federal lands

and waters; channel grants to the states for recreational purposes; and further other related programs.

While LWCF money is unattached to the Chesapeake Bay Program, the funds fit neatly into one of the key goals of the 2014 Chesapeake Bay Watershed Agreement, which seeks to “conserve landscapes treasured by citizens in order to maintain

water quality and habitat; sustain working forests, farms and maritime communities; and conserve lands of cultural, indigenous and community value.”

Most recently, LWCF funding for the Bay peaked in fiscal year 2016, when Congress appropriated \$10.7 million for land conservation projects throughout the watershed.

The money was spread widely in the region, supporting the conservation of more than 2,000 acres in Maryland’s Nanjemoy Natural Resource Management Area, Blackwater National Wildlife Refuge and Piscataway Park; Virginia’s Meadowood Special Recreation Management Area and Rappahannock River Valley National Wildlife Refuge; Pennsylvania’s Gettysburg National Military Park; and the interstate Washington–Jefferson National Forest and Captain John Smith Chesapeake National Historic Trail.

That windfall, McCauley said, was due to two factors: the high-profile acquisitions of sites such as Werowocomoco, a major Powhatan religious and governmental center where Captain John Smith’s famous encounters with the leader Powhatan occurred, and the collaborative approach that the region took to its funding needs.

In 2013, the Department of the Interior, under Secretary of the Interior Ken Salazar and in concert with the U.S. Department of Agriculture, launched the Collaborative Landscape Planning Program, which sought to identify significant landscapes for conservation and channel funding toward them through the LWCF.

The Rivers of the Chesapeake project was the Bay region’s response to this call, coordinating the LWCF requests of federal agencies including the National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management and U.S. Forest Service, as well as the nonprofit Chesapeake Conservancy. Thanks to this effort, McCauley said, “the Chesapeake did compete very successfully.”

Under the Trump administration, the collaborative approach was dropped “with little fanfare,” McCauley said. Nevertheless, the conservancy has continued to spearhead the Rivers of the Chesapeake group to continue coordinating funding efforts.

In the years after 2016, LWCF funding for the Chesapeake watershed declined: According to data from the Chesapeake Conservancy, the LWCF appropriated almost \$7.4 million for projects in the Chesapeake region in fiscal year 2017, with appropriations of \$6 million in FY2018 and a little more than \$4 million in FY2019.

Looking forward, the future of LWCF funding for the watershed remains uncertain. Although Trump’s signature on the Dingell Act makes the fund permanent, the administration’s proposed FY2020 budget not only adds no new money to the LWCF for the upcoming year but claws back \$23 million of its FY2019 budget.

Still, McCauley said that cut is unlikely to happen: “That’s just the president’s request, so Congress is not likely to go along with that,” he said, pointing out that “LWCF has been a bipartisan program for its entire life. This is not a partisan issue, at least not in Congress.”

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Former MD Gov. Harry Hughes, who launched Bay restoration, dies

≈ Eastern Shore native forged regional cleanup partnership, and acted to limit shoreline development and save rockfish.

By TIMOTHY B. WHEELER

Former Maryland Gov. Harry R. Hughes, who launched the Chesapeake Bay restoration effort, died March 13 at his home on the Eastern Shore. He was 92.

The state's 57th governor, in office from 1979 to 1987, forged the federal-state partnership that for the last 35 years has labored to reverse the decline of North America's largest estuary.

An Eastern Shore native, Hughes made saving the Bay a lasting touchstone of Maryland politics and policy, taking steps that might seem radical even today. He pushed through a landmark law limiting development along the Bay shore, for one, and braved the ire of watermen and other Shore politicians to impose a moratorium on striped bass, a popular sport and commercial catch, to save it from overfishing.

News of his death drew public tributes from Maryland politicians and environmentalists. Gov. Larry Hogan issued a statement calling him a "Maryland legend" and ordered flags flown at half-staff.

Ann Swanson, long-time executive director of the Chesapeake Bay Commission, called Hughes a "trail blazer" who "used science as his guidepost and common sense as his tactic" in tackling the Bay's problems.

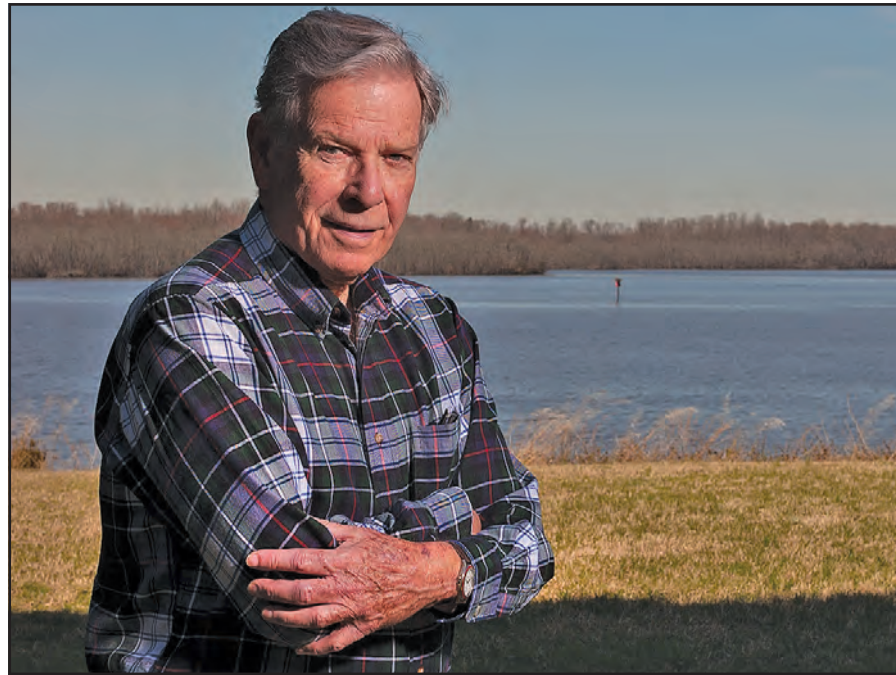
"He was a great leader and inspiration for all of us," she added.

John Griffin, a former secretary of natural resources who served as Hughes' environmental aide, recalled that he had not been elected on a platform of saving the Bay. Hughes resolved to act after being briefed on the results of a five-year, \$27 million federal study concluding that the Chesapeake was suffering from worsening nutrient pollution, toxic contamination in places and loss of underwater grasses.

His initiative came amid a public outpouring of concern: He recalled in an interview years later how people called out to him to "save the Bay" as he rode in local Fourth of July parades.

Hughes directed his staff to come up with a plan to address the Bay's problems, Griffin said, and then reached out to the governors of Virginia and Pennsylvania and the mayor of the District of Columbia to join with Maryland in a regional effort.

That diplomacy culminated in a summit conference on the Bay at George Mason University in Northern Virginia in December 1983. There,



Harry Hughes, [shown here at his Caroline County home in 2005] "was a consensus builder — not divisive at all, and he always reached across the aisle. His leadership style is the reason we're as far along as we are with the Bay cleanup," said Russ Brinsfield, who was the first director of the Harry R. Hughes Center for Agro-Ecology. (Dave Harp)

Hughes and the other elected executives, along with the administrator of the U.S. Environmental Protection Agency and the chairman of the Chesapeake Bay Commission, signed the first Chesapeake Bay Agreement.

It was a simple, four-paragraph document pledging to "fully address the extent and sources of pollutants entering the Bay," and launching the state-federal Chesapeake Bay Program to assist and coordinate their efforts.

"So much of the subsequent progress we have made on restoring the Bay in the last three decades traces to this foundational document," said U.S. Sen. Ben Cardin, D-MD, who was speaker of the Maryland House of Delegates at the time and has since become a champion of the Chesapeake in Congress.

Gerald Winegrad, an ardent environmental advocate who represented the Annapolis area in the Maryland General Assembly from the early 1980s into the 1990s, said Hughes' low-key, ever-polite and thoughtful manner helped corral political support for the Bay restoration in Annapolis and in neighboring states.

"Without him, it wouldn't have happened," Winegrad said of the first Bay agreement. Maryland had a state yacht then, he recalled, and Hughes used it to take legislative leaders, governors and federal officials cruising on the Bay for crabcakes and persuasion.

"I never met anyone like him," said Winegrad.

Shortly after the agreement was signed, Hughes pushed through an

ambitious legislative agenda, including major increases in state staff and spending to upgrade sewage treatment plants and deal with other pollution sources. He also won legislative approval of the Critical Area Act, a pioneering law that regulates development within 1,000 feet of the Bay and the tidal reaches of its tributaries.

The legislation was highly controversial, Griffin recalled, and only passed after being watered down to accommodate those concerned about the state involving itself in land use decisions traditionally left to local governments. In an interview more than 20 years after its passage, Hughes said he doubted the bill could have passed later. It's been criticized since by some as interfering with property rights and by others as being too weak, but it has survived legal and political challenges.

In 1985, Hughes overcame opposition from national detergent manufacturers to push through a statewide ban on the sale of laundry soap containing phosphate, a chemical compound implicated in causing algae blooms and dead zones in the Bay. Other states later followed suit.

On the regulatory front, Hughes was similarly resolute. Amid worrisome declines in the catch of striped bass, the state fish also known as rockfish, scientists warned that the migratory Atlantic Coast species was on the verge of collapse. Hughes' aides urged him to go beyond just limiting their harvest and to impose a moratorium on catching the most valuable finfish in

the Bay. The move was expected to be highly unpopular among watermen, for whom rockfish represented a significant source of their livelihood.

"He listened intently," Griffin said, "and he said OK ... go do it, I'll back you up."

Shore lawmakers criticized the move, and some went further.

"We had watermen calling death threats and all," Griffin said. "It was a pretty brutal time, but Harry never wavered."

The 1985 moratorium withstood legal and legislative challenges, and Virginia followed suit, with tight catch limits also imposed up and down the Atlantic Coast in the rest of the species' range. After five years, the population had recovered enough to ease the moratorium.

Upon leaving office, Hughes continued to help with the Bay restoration effort in various volunteer roles.

One involved chairing a politically charged commission appointed by one of his successors, Gov. Parris Glendening. It had the task of recommending ways to prevent outbreaks of a toxic microbe, *Pfiesteria*, which was blamed at the time for fish kills and even some health problems of people exposed to the infested waters. Subsequent research suggested another microorganism could be the culprit for the fish kills, but scientists told the commission that nutrient pollution was a factor in triggering toxic algae blooms generally, and that phosphorus-laden runoff from farm fields fertilized with poultry manure was a significant source. The commission's findings prompted Glendening to introduce legislation in 1998 requiring farmers to manage their manure and fertilizer more carefully. Though watered down to overcome farmers' resistance, the measure passed and remains on the books today.

Hughes also helped launch and lead the University of Maryland's Harry R. Hughes Center for Agro-Ecology, a research facility subsequently named in his honor that seeks to apply science to maintaining farming and forestry while also protecting the environment.

"Gov. Hughes was a cornerstone for the Chesapeake Bay cleanup initiative," said Russ Brinsfield, a University of Maryland agricultural scientist who was the first director of the Center. "Most importantly, for me, he was the kindest man I think I ever knew, and his attitude was so positive all the time."

"He was a consensus builder — not divisive at all, and he always reached across the aisle. His leadership style is the reason we're as far along as we are with the Bay cleanup."

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Otsego bass: the fish that didn't go away, thanks to some help

≈ Alewives' departure makes room for whitefish to move back in.

BY DONNA MORELLI

Scientists around Cooperstown, NY, are celebrating a rare victory: the slow return of a native species in Otsego Lake. There, in the upstate lake that spawns the Susquehanna River headwaters, the whitefish known as "Otsego bass" are making a comeback after having been decimated by predation and poor water quality.

The decline of the Otsego bass was so severe that a local outdoors columnist in 2012 pronounced the fishery dead, mourning the tradition of trolling for the popular fish. The loss began after 1986, when the alewife — a newcomer with a big appetite — began to appear in the lake. Prior to its arrival, scientists caught an average of 8.1 Otsego bass per net in fishing surveys. Surveys taken between 1990 and 2000 turned up an average of less than one per net.

The Otsego bass is actually a lake whitefish (*Coregonus clupeiformis*) native to and no different than those swimming in other coldwater lakes in the northern United States and Canada. The local fishing community dubbed it the Otsego bass, and the moniker stuck. Its abundance and popularity is well-documented back to the 1700s. An



A close-up of the wide and toothy grin of a walleye makes it easy to understand how they controlled the alewife invasion within a few years. (Scott Wells/ New York Department of Environmental Protection)

account in the *State of the Otsego Lake, 1936 to 1996*, described gill nets pulling in 5,000 fish at each haul.

Since the 1900s, local fisherman and farmers supplemented their income by catching and selling Otsego bass. The tasty fish was on the menus of mom-and-

pop restaurants that lined the shores of the lake. Some fishermen sold them right off the boat, and one man sold them from a cooler at a hardware store.

During the winter, Otsego Lake was an ice fishing mecca. As soon as the lake froze, hundreds of ice shanties were

occupied by men, women and children who were handy with an ice auger. Some of these mostly homemade, portable shacks had heaters and pictures on the walls, and anglers could drop their lines through holes in the ice from the comfort of recliners.

"It was quite a fishery 30 or 40 years ago," said Cooperstown resident and fishing guide Tom Trelease. "The whitefish used to be part of the identity of the area."

Otsego bass numbers began their decline by the late 1950s, but their massive slide began when the alewives arrived.

The alewife, a species of fish that lives part of its life in freshwater and part in the Atlantic Ocean, may have been introduced to the lake accidentally as bait or deliberately to provide prey for the lake trout.

If the latter is true, the strategy worked. The alewives quickly multiplied and, within a decade, became the dominant forage species in Otsego Lake. The trout, feeding on the alewives, put on size and weight, and trout fishing was unprecedented.

"Fisherman were getting used to, and loving, catching those large lake trout that were supported by an unusual abundance of prey," said Mark Cornwell,

OTSEGO CONTINUES ON PAGE 11

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OTSEGO FROM PAGE 10

chair of the Department of Fisheries and Wildlife at the State University of New York at Cobleskill. “They were caught up with the euphoria of catching big fat fish.”

But the alewives were also voracious feeders, and their large population was taking a toll on the lake’s ecosystem. Otsego bass declined rapidly as the alewives grazed on their spawn.

The alewives were eating another important species, too: Daphnia, a tiny crustacean that consumes plankton and keeps algae in check. By the 1990s, the alewives had drastically reduced daphnia in the lake. With the growth of algae unchecked, the lake was turning green, and it experienced summertime periods of low-oxygen “dead zones.”

“The lake was hammered,” said Scott Wells, a fisheries biologist with the state Department of Environmental Conservation. “When you get a prey species like the alewife, it changes the whole ecosystem of the lake, chemically and biologically.”

New York state fisheries staff and scientists joined with researchers from SUNY Cobleskill and SUNY Oneonta’s Biological Field Station to return Otsego Lake to its pre-alewife state.

The field station, with laboratories, offices and classrooms spread out over 2,600 acres along and near the lake, was a vital research hub for the project and



Fresh from the State University of New York Cobleskill hatchery, 164 juvenile Otsego bass are placed in a plastic bag and laid on the ice of Otsego Lake to acclimate to the temperature before being slipped under the lake ice in January 2019. (Brent Lehman / SUNY Cobleskill hatchery)

the lake’s health as whole.

“Up until the 1990s, our management goal was to reduce [pollution from] nutrients where we could,” said Holly

Waterfield, a researcher at the field station. “The impact of the alewives was similar to nutrient loading, but more extreme. We needed to work on management that dealt with alewives and increased the numbers of [daphnia].”

After years of study, researchers decided that yet another fish species might help rebalance the lake’s ecosystem: the walleye, which already had a small presence there. Walleye prey on alewives, and scientists believed that more walleye would mean fewer alewives.

“We were very cautious about the walleye,” Waterfield said. “Walleye made sense. They seem to fit our situation.”

Researchers began by adding approximately 80,000 young walleye to the lake in 2000, and the process continued for 14 years until the stocked fish began reproducing naturally.

Soon after the walleyes’ introduction, they began to eat their way through the alewife population. As a result, the daphnia began to rebound. Water clarity started slowly improving shortly after the walleye were introduced and greatly improved by 2009.

The trout and other larger species soon faced a shortage of forage food because the alewives, before their own decline, had eaten and depleted many of the other forage fish. It’s taking time for the ecosystem to adjust, but Wells said that some of those species are rebounding.

And so are the Otsego bass. In 2014, the first juveniles were observed in the lake in decades. State fisheries staff netted 20 adults in 2016 and 40 in 2018.

While alewives remain in the lake, they are so few in number that scientists describe them as almost undetectable.

The recovering population of Otsego bass has also been getting a boost from hatchery-raised fish. Students from SUNY Cobleskill have collected eggs and milt from the adult fish, and fertilized and reared them in the school’s hatcheries. Most recently, a group of 164 fingerlings were released under the ice of the lake in January 2019. They were marked with a dye that stains hard body parts and can be used to identify any that are captured — hopefully as adults — through surveys or recreational fishing.

Rearing the young fish in the hatchery has proven to be a delicate and difficult process, so partners in the program are taking a yearlong break with plans to continue the effort.

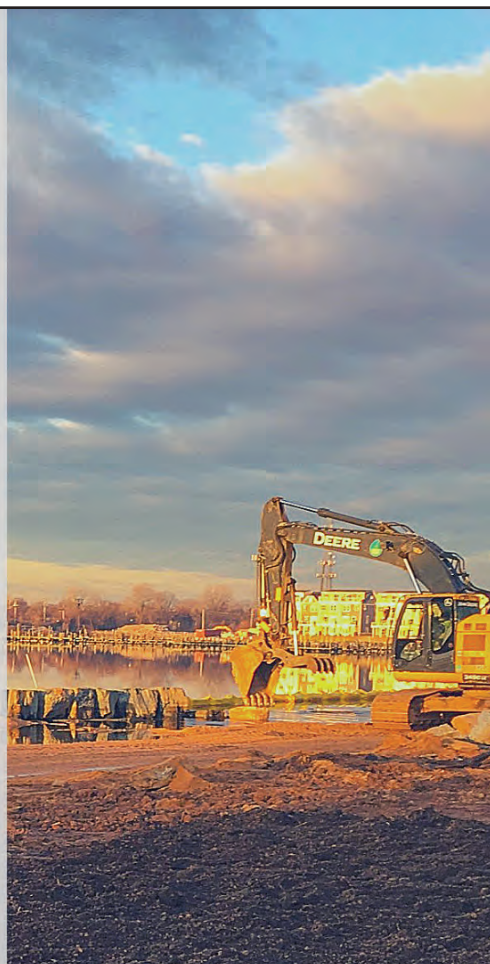
“It is rare and it is amazing that this is happening,” said Cobleskill’s Cornwell. “The future of [Otsego bass] in Otsego Lake is — hopefully — that people will be able to catch them again.”



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VA state board lets pipeline permit stand, despite violations

Decision draws emotional reactions.

By WHITNEY PIPKIN

The Virginia State Water Control Board voted on March 1 not to revoke a permit allowing a natural gas pipeline to be built across streams as it winds its way across the state's southwest corner.

The Mountain Valley Pipeline is one of two pipeline projects touching parts of West Virginia and Virginia. The second project, the Atlantic Coast Pipeline, would cross part of the Chesapeake Bay watershed on its path to North Carolina. Both had earned federal permits in support of their construction, but several have been revoked or challenged over the last year.

Virginia had approved water quality permits for both projects in 2017, but the Mountain Valley Pipeline has since logged a large number of environmental violations. Virginia Attorney General Mark Herring and the state Department of Environmental Quality sued the project on Dec. 7 over more than 300 violations between June and mid-November, mostly related to improper erosion control and storm-water management.

The governor-appointed board decided to reconsider the permit but opted to uphold it after a four-hour, closed-door meeting, during which the board consulted with its attorneys and DEQ staff.

Protestors who oppose the Mountain Valley Pipeline shouted "Shame!" as the seven-member board revealed its decision. A group of union workers hired to build the pipeline and seated in an opposite corner of the room — many of them unemployed while work has stopped — applauded.

Board members Robert Wayland and James Lofton said they recently visited some of the sites where the pipeline was under construction to see the water quality violations for themselves.

"I saw sediment and erosion controls that had failed... and the sediment that was escaping from the right of way," Lofton said of the visit before abruptly revealing the board's decision. "I'm deeply concerned about that, but I'm also deeply concerned that the board simply does not have the authority to revoke the permit."

The state board could have allowed the projects to proceed under their federal water-quality permit from the U.S. Army Corps of Engineers but decided instead to issue its own permits under Section 401 of the Clean Water Act, which came with additional requirements. Board chair Heather



Virginia residents who oppose the Mountain Valley Pipeline formed a circle to chant and sing during a State Water Control Board meeting on March 1, while the board deliberated the status of a permit for the project behind closed doors. (Whitney Pipkin)

Wood explained that that move was as unprecedented as a decision would be to revoke it, and that the board did not take it lightly.

The board held the special meeting at a hotel in Richmond's Bon Air suburb to allow room for the more than 200 people who have previously overwhelmed pipeline-related hearings.

About 50 police officers lined the room's walls to maintain order at the meeting, where public comments were not accepted and "outbursts" resulted in attendees being escorted from the room. The officers formed a line between the board and attendees — some of them shouting and crying — as the crowd reacted to the board's unanimous vote.

Skirting rules that did not permit signs at the meeting, some protestors wore shirts with the words "Our Water, Our Lives" printed on the front, and others taped "Revoke" signs to their clothes. While the board was in its closed-door meeting, several began to chant and sing songs until staff said the singing was

too loud for a hotel setting.

Problems and decisions involving the Mountain Valley Pipeline could have implications for the Atlantic Coast Pipeline, which has stopped all of the construction that had begun in West Virginia as federal permits have been called into question. Some tree-clearing for the project began in Virginia last year, but major construction has not.

The Mountain Valley Pipeline demonstrates the difficulty of protecting water quality while building a pipeline across mountainous terrain and hundreds of stream crossings.

Though thousands of public comments urged the board to deny the Mountain Valley permit altogether, or to require individual permits for each time the project crossed a stream, the board issued the overall permit with 16 conditions that they said go beyond what the federal permit requires. The board then reopened the permit to public comment last summer after construction led to hundreds of water quality violations when heavy rains hit steep slopes that

had been cleared of trees.

Lofton said at the meeting that revoking the state permit would jeopardize those provisions while allowing the project to potentially proceed under its federal permits anyway.

"The board is very sympathetic to the landowners and people closest to the pipelines," Lofton said. "That's why we approved the 16 conditions. I am deeply concerned we will lose the 16 provisions that are in the board's certification if we attempt to revoke the certification."

David Sligh, conservation

director for Wild Virginia, one of several groups that have opposed the project, disagreed with that reasoning. Before the decision, he said the state board "definitely" had the authority to revoke the certification because members made their approval contingent on the project's compliance.

Indeed, the certification states that it "is subject to revocation for failure to comply with the above conditions and after proper hearing."

"It says, 'We can revoke this if you don't live up to it,'" Sligh said, paraphrasing. "Since those conditions became part of the federal permit, that's one of the reasons we think there is no question they have reserved the right to [revoke it]."

The board members also said their decision considers the state's ongoing actions against the project for water quality violations, and they don't want to "handcuff the commonwealth's ability to apply enforcement," as board chair Heather Wood put it.

The board's motion urged the state to pursue "swift and vigorous prosecution and enforcement action" against the project but fell short of calling for a stop work order or injunction that could be placed on the project until it is back in compliance.

A 17-page letter sent to the board a

PIPELINE CONTINUES ON PAGE 13

The Atlantic Coast Pipeline "could reroute, but instead it should scrap this boondoggle and stop running up a bill it wants to stick to customers."

—D.J. Gerken, SELC senior attorney

PIPELINE FROM PAGE 12

day before the hearing outlined what signatories considered the board's legal authority to revoke the permit or call for an injunction until violations are corrected. Lawyers from the Chesapeake Bay Foundation, Wild Virginia, the Southern Environmental Law Center and a half-dozen other organizations signed the letter.

Considering the number of lawsuits filed against nearly every permit granted to the pair of pipeline projects, their fate is likely to be decided by the courts. Early last week, a federal appeals court said it would not reconsider a decision to throw out a key permit for the Atlantic Coast Pipeline that would have allowed it to cross two national forests, including parts of the Appalachian Trail.

Judges have reversed three federal permits that would have allowed the Atlantic Coast Pipeline to cross national parks and trails or to impact endangered species, halting construction while Dominion Energy, the project's backer, regrouped to appeal.

The court's decision in February to reject Dominion's appeal on the Appalachian Trail permit came in a lawsuit filed by the SELC on behalf of the Sierra Club and other organizations. In a press release, the SELC said the decision should send the project "back to the drawing board."



Skirting rules that did not permit signs during the meeting, some protesters taped messages to their shirts or bodies. (Sarah Vogelsong)

The Atlantic Coast Pipeline "could reroute," said SELC senior attorney D.J. Gerken, "but instead it should scrap this boondoggle and stop running up a bill it wants to stick to customers."

Dominion officials contend that the pipeline is essential to meet growing energy demands along the

East Coast and to replace coal-fueled power generation with natural gas. But, with so many federal permits currently rejected by the courts, the Atlantic Coast Pipeline had to stop all construction activity. Construction on the Mountain Valley Pipeline has stopped around all stream crossings but continued in some areas.

Pipeline workers who have worked on each of the projects filled four rows of the water board's meeting room during the hearing, wearing small yellow stickers in support of the project.

David Butterworth, a representative for Pipeliners Local Union 798, acknowledged the sediment and erosion issues that plagued Mountain Valley Pipeline construction last year but pointed to "an abnormal amount of rain" that contributed to the problem.

"I'm sure our guys are doing what the state has asked them to do to control the erosion. We're not against doing it right," Butterworth said, pointing out that state regulators at the time didn't require them to do more. "Just tell us what we gotta do, you know?"

"We just always take a black eye if there's a problem," he continued. "It's not like we're not willing to fix something."

In an attachment to their letter, environmental lawyers said that fixing violations that are ongoing should have been the board's first priority before granting the project de facto permission to continue.

"If this pipeline never gets built where they want it built because of some of the lawsuits, [the board is] going to be even more embarrassed that they let this damage happen for no reason at all," Sligh said. "We could have miles and miles of carnage out there that never leads to a pipeline."



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Court overturns permits for transmission line built over James

≈ Ruling calls Corps analysis 'scientifically unsound' and cites concerns of federal agencies.

By SARAH VOGELSONG

Mere days after Dominion Energy powered up its new transmission line across the James River from Surry to Jamestown, VA, a ruling by a federal court of appeals has cast the controversial infrastructure's future in doubt.

On March 1, the U.S. Court of Appeals for the District of Columbia issued an opinion overturning the project's key permit from the U.S. Army Corps of Engineers on the grounds that the agency did not meet its obligations under the National Environmental Protection Act and directing the Corps to prepare an environmental impact statement on the 17-tower, 500-kilovolt line.

"Congress created the EIS process to provide robust information in situations precisely like this one, where,

to construct what became known as the Surry-Skiffes Creek-Wheaton project. The plan called for the construction of not only a 500-kV line passing just south of Jamestown near Hog Island but also a switching station in James City County and a 230-kV line running down to Hampton.

The Surry-Skiffes Creek portion of the project crossing the James River proved the most controversial, requiring the construction of 17 steel-lattice towers between 127 and 296 feet in height across the waterway designated by the U.S. Congress as "America's Founding River."

Dominion's application justified the project on the basis of "continued load growth" in the northern part of the Hampton Roads region, "coupled with aging infrastructure and increasingly stringent environmental requirements on emissions."

These more stringent environmental regulations included new standards set

and the Captain John Smith National Historic Trail.

Based on this finding, the Corps claimed that it did not need to prepare a formal environmental impact statement and could instead rely on a more basic "environmental assessment" — a contention disputed by opponents of the project and highlighted in the original suit against the Army Corps, which was brought by the National Parks Conservation Association, National Trust for Historic Preservation and Association for the Preservation of Virginia Antiquities.

In its March 1 ruling, the U.S. Court of Appeals for the District of Columbia found that the Corps' determination of "no significant impact" was "arbitrary and capricious."

The ruling relied heavily on the criticisms offered by other federal agencies, including the National Park Service's finding that the project "would forever degrade, damage, and destroy the historic

setting of these iconic resources"

and the Argonne National Laboratory's finding that the Corps' environmental analysis had been "scientifically unsound" and "completely contrary to accepted professional practice."

"These are hardly the hyperbolic cries of 'highly agitated,' not-in-my-backyard neighbors 'willing to go to court over the matter,'" the Court of Appeals wrote regarding its decision. "Instead, they represent the considered

responses — many solicited by the Corps itself — of highly specialized governmental agencies and organizations."

After the Court handed down its opinion, Dominion Energy issued a statement saying: "The Corps of Engineers spent four years on its environmental assessment of this project, going above and beyond what was required. We are disappointed this ruling dismisses that effort."

The ruling does not affect the immediate operation of the Skiffes Creek transmission line, which Dominion Energy communications specialist Jeremy Slayton confirmed is "energized and ... sending power and electricity to the 600,000 people who

live and work on the peninsula." Looking forward, the National Trust for Historic Preservation on March 7 announced that it "intends to push Dominion Energy to deconstruct the towers and find an alternative solution that protects the historic landscape and resources along the James River."

Slayton said that at present, Dominion is "not really speculating on what the ultimate ruling means for the line."

The Court of Appeals ruling does not appear to affect the roughly \$90 million in mitigation payments Dominion made as part of an agreement with state and federal agencies. Slayton confirmed that all of those funds have already been paid out.

"Since the mitigation dollars were meant to offset any disturbances or damages associated with the work on the transmission line which has already been completed, we doubt that the appeals court decision will have any effect on the mitigation funds," wrote Joe Maroon, executive director of the Virginia Environmental Endowment, which received about \$16 million from Dominion, in an email. "We haven't received any word to the contrary."

Chesapeake Conservancy president and CEO Joel Dunn commented that the transmission line controversy revealed the need for states to "take a much more comprehensive approach" to large-scale linear energy projects.

In 2018, the Environmental Law Institute issued a report for the Chesapeake Conservation Partnership, a group of nonprofits and government agencies that works to protect the region's landscapes, that sought to offer states the tools to assess the impacts of proposed projects of this type and mitigate their conservation effects.

That report, Dunn said, emerged directly from the Skiffes Creek proposal as the Conservancy Partnership realized that the Army Corps of Engineers would likely issue the permit for the transmission line.

"The state of Virginia had numerous opportunities to impact this power line before it even got to the Army Corps of Engineers," Dunn said. "I don't fault anyone who was in charge, because I think they did the best they could with the policies that were in place at the time, but I think there's an opportunity moving forward to improve these state-level policies even before [a permit] gets to the federal level."

The definition of state-level landscape objectives and new approaches to permitting could help avoid siting controversies, the report suggests.

"We need to think like the Native Americans," Dunn said, "and think seven generations ahead."



These transmission line towers, located near the James City County side of the James River, are shown here under construction in the summer of 2018. (Jamie Brunkow)

following an environmental assessment, the scope of a project's impacts remains both uncertain and controversial," the three-person court's opinion, penned by Judge David S. Tatel, reads.

Furthermore, it states: "Important questions about both the Corps' chosen methodology and the scope of the project's impact remain unanswered, and federal and state agencies with relevant expertise harbor serious misgivings about locating a project of this magnitude in a region of such singular importance to the nation's history."

The decision was the culmination of a battle that has raged since 2013, when Dominion applied to the U.S. Army Corps of Engineers for a permit

by the U.S. Environmental Protection Agency on ozone and sulfur dioxide emissions, coal combustion residuals and mercury, among other emissions.

The Surry-Skiffes Creek-Wheaton project sparked broad protest from not only environmental groups but also federal agencies, including the National Park Service, the federal Advisory Council on Historic Preservation and the Department of Energy's Argonne National Laboratory.

The heart of this opposition centered on the Army Corps' conclusion that the transmission line across the James River would have "no significant impact" on surrounding historic resources such as Historic Jamestowne, Carter's Grove

New Bay Program director has worked on water quality, Bay issues for decades

≈ Dana Aunkst tackled water discharge and fracking issues in PA and wrote state's 'reboot' strategy to meet Bay cleanup goals.

BY KARL BLANKENSHIP

When Dana Aunkst grew up in Northcentral Pennsylvania, he didn't have to look far from home to see water quality problems.

He grew up in Watsonstown, a small community along the West Branch of the Susquehanna, one of the state's most troubled waterways, with vast stretches rendered largely lifeless by a legacy of acid mine drainage.

Watsonstown wasn't near the worst of the problems. Still, Aunkst recalled, "the fishing at that time was limited to what we called trash fish — carp and warmwater types of fish that were pollution-tolerant."

Over time, efforts to fix damaged headwater streams have delivered results for the river — and created a popular bass fishery.

"It's obvious that a lot of the work that's been done in the upper part of the watershed has really benefitted the lower part," Aunkst said. "It's a completely different fishery at this point."

Now, Aunkst hopes to see upstream efforts pay off on an even greater scale. As the newest director of the U.S. Environmental Protection Agency's Chesapeake Bay Program Office — and the first native Pennsylvanian to hold that position — he oversees a multibillion-dollar effort aimed at restoring the health of the nation's largest estuary by improving rivers and streams that drain its 64,000-square-mile watershed.

Although the Bay has seen improvements in recent years, it remains far from meeting its water quality goals, and scientists are still assessing the extent of damage inflicted by last year's record-high rainfall that flooded the Chesapeake with water-fouling mud and nutrients.

"I am someone who really, really enjoys being challenged in my work," said Aunkst, who started in the new position in late December. "I don't get much from coming to the office and doing the same thing."

Aunkst, 58, has been working on water quality issues for more than three decades since graduating from Penn State University with a degree in chemical engineering. He worked on environmental programs for local governments and private industry before joining the state's environmental agency, then called the Department of Environmental Resources, in 1985 as an entry level engineer stationed in its regional office in Meadville, not far from Lake Erie.

Over the years, he worked in other regional offices and the department's



"I am someone who really, really enjoys being challenged in my work," said Dana Aunkst, who became the new director of the Chesapeake Bay Program in late December. (Chesapeake Bay Program)

headquarters in Harrisburg, often tackling assignments related to developing permits and programs that would protect water quality from discharges. He rose steadily through the ranks of what is now the Department of Environmental Protection, and even served as acting secretary in 2014.

A number of difficult assignments came along the way. In the wake of the fracking boom that began a decade ago, he was the primary author of new regulations to control discharges of total dissolved solids, or TDS, from rapidly expanding natural gas drilling activities.

During hydraulic fracturing, large amounts of water are pumped into the ground under high pressure to break up rocks and release pockets of natural gas — a process that creates huge amounts of polluted wastewater.

"Their discharges [have] really highly concentrated TDS," Aunkst said. "Our watersheds really wouldn't sustain that type of load over a lengthy time."

He had to come up with new regulations and treatment technologies to protect streams, many of which were in some of the most pristine areas of the state. As a result, he said, "the industry has really changed the way it manages its wastewater. It really pushed them toward recycle and reuse versus treatment and discharge because of cost. So we prevented the potential for a lot of problems in Pennsylvania."

His interactions with the Bay Program go back to 1991, when he worked with its modelers in establishing the first round of state and river nutrient reduction goals. His worked

has periodically intersected with the Bay ever since.

In the early 2000s, he helped develop the state's permitting strategy for wastewater treatment plants to meet Bay restoration goals. And, with Pennsylvania facing threats from the EPA over its lagging cleanup efforts, Aunkst was given the task of writing the state's "reboot" strategy in 2016, which continues to serve as the blueprint for accelerating its efforts to meet Bay cleanup obligations.

That on-and-off involvement with the Chesapeake over the years made him interested in the Bay Program position after its last director, Nick DiPasquale, retired at the end of 2017. "I enjoy being challenged and solving problems," Aunkst said. "And this is one that — having been in and out of this program as part of Pennsylvania over the years — I just can't let go."

Indeed, the region as a whole is off track for meeting nutrient reduction goals established in the 2010 Chesapeake Bay Total Maximum Daily Load, or pollution diet. And nowhere is the problem more acute than in the Keystone State, which needs to accomplish roughly six time more nitrogen reductions in the next seven years than it has done since the TMDL went into effect.

But Aunkst said he is encouraged that Pennsylvania — which could face actions from the EPA if it doesn't make adequate headway — is starting to come to grips with its problem, and not just at governmental levels, but with stakeholders such as farmers. "I think it really has changed course," he said.

"I think it is a problem that is solvable. It is not going to be easy."

That will be tested in the coming months as states need to complete new watershed implementation plans showing how they will meet Bay cleanup goals by 2025. Plans are due to the EPA for review in April, with final documents expected in August.

But the Bay restoration is about more than just water quality. The 2014 Chesapeake Bay Watershed Agreement, which the Bay Program is in charge of implementing, outlines 31 specific outcomes, only three of which relate to reducing nutrient and sediment pollution.

Other goals address issues as varied as restoring oysters, improving stream health, expanding

tree canopies in urban areas, improving fish passage, increasing the diversity of people involved in restoration efforts, conserving land, and expanding environmental education, among many others.

Efforts to meet many of those goals are starting to fall behind as well, and Aunkst acknowledged that the Bay Program will need to quickly pivot to put more focus on those initiatives once the watershed implementation plan process is complete.

"Right now, the water quality piece, because of the TMDL, is the regulatory driver," Aunkst said. "And yet, in order to sustain water quality once we get there, we really need to be accomplishing all of those other things as well."

Without improving local stream health and fish habitats, restoring water-filtering wetlands and building engaged and diverse public support for those initiatives, "all of this effort could easily go away in the future," he said. "Without everything else in place as we move forward, the sustainability of that water quality effort is in question."

In the end, that goal ties back to his own roots. Growing up, Aunkst said, he gained an appreciation for the outdoors from his father and grandfather, who were avid hunters and anglers.

When he began working in the environmental field, he said, he was helping to preserve those opportunities for future generations. "That got me back into what I loved — not just the engineering component, but also the component about conserving and protecting the resources for my kids and my grandkids."

New data from VIMS finds sea-level rise is accelerating in Bay

≈ Tide gauge data from 5 cities reveal rate is faster in Lower Bay.

By SARAH VOGELSONG

As sea-level rise increasingly becomes part of public discourse and the public agenda, the Virginia Institute of Marine Sciences is ramping up efforts to provide reliable data for policy makers seeking to combat the changing circumstances.

“There’s a lot of resiliency planning going on looking at sea-level-rise projections, and we feel it’s important to know when we’re doing this planning how the data match up with the projections,” said Molly Mitchell, a marine scientist with VIMS’ Center for Coastal Resource Management.

This winter, VIMS released the second iteration of its annual Sea-Level Report Cards, a set of data from 32 coastal stations around the United States that also projects sea-level trends forward to 2050.

For the first time, VIMS has included a Chesapeake Bay-specific report card drawing on tide gauge data from five sites in the region: Norfolk and Yorktown in Virginia and Annapolis, Baltimore and Solomons Island in Maryland.

“We have a higher rate of sea-level rise in the Bay than along most of the Atlantic Coast, so there’s a lot of interest in how the rate of rise may vary around the Bay and for a lot of localities,” Mitchell said.

What the new data primarily show, Mitchell said, is stronger evidence that sea-level rise is accelerating, particularly



Masons fill in holes from steel beams used to raise a house in the Larchmont neighborhood of Norfolk, VA. The Lafayette River often floods the area. (Dave Harp)

in the Bay region and along the Gulf Coast. According to the new projections, of the 32 locations monitored in the broader study, Norfolk will have the highest rate of sea-level rise on the East Coast, with the water’s height expected to increase 5.2 millimeters per year, a slight uptick compared with last year’s projection of 5.14 mm per year.

In the Bay region, Yorktown trails Norfolk for the second highest predicted rise rate, at 4.92 mm per year. Solomons Island is next at 4.73 mm per year. Baltimore’s rise rate is expected to be 3.51 mm per year and Annapolis’ 3.84 mm per year.

These rates continue to be outstripped

at three Gulf Coast locations: Grand Isle, LA; Galveston, TX; and Rockport, TX, where rise rates are 7.75 mm, 6.24 mm and 6.77 mm per year, respectively.

Depending on whether these rates remain relatively steady or accelerate over time, those projections ultimately mean that, in 2050, Norfolk’s sea level could be between 0.3 and 0.49 meters above its 1992 level, while Baltimore’s could be 0.2 to 0.38 meters higher than that baseline.

The Chesapeake has long been known to be especially vulnerable to sea-level rise because of land subsidence in the region, which Mitchell said is “a little bit higher at the southern part of the Bay than the northern part of the Bay.”

Such subsidence is the result of both geologic and human activity.

The larger geological processes involved in the sinking of the region’s land as ice sheets from the last glacial maximum continue to retreat are unavoidable. Nevertheless, these changes, as a 2015 study published by the Geological Society of America points out, risk “exacerbating the effects of global sea-level rise and impacting the region’s large population centers and valuable coastal natural resources.”

Other major contributors to subsidence include large withdrawals of groundwater and development on marshes. Paper mills in the Franklin and West Point areas of Virginia have had a particularly significant impact on the state’s groundwater reserves. A 2016 report by Virginia’s Joint Legislative Audit and Review Commission found that together, these mills “used nearly half of all permitted groundwater” withdrawals in the commonwealth. Large-scale chicken farming on the Eastern Shore has also prompted concerns about overstressing local aquifers.

“Understanding the magnitude and impact of [withdrawal-related subsidence] is critical for adaptation and management efforts, since it can be relatively easily

controlled,” concluded a paper accompanying the 2018 Sea-Level Report Cards by VIMS scientists John D. Boon, Molly Mitchell and Jon Derek Loftis and communications director David Malmquist.

The report cards are intended to provide policymakers and local communities with the data needed to plan for the rising water.

“Success here may mean that a coastal community receiving these reports will be able to use the information to its advantage when revising or updating its flood defense plans,” the 2018 VIMS paper noted.

Mitchell described the VIMS projections as an “outlier” among forecasts because of its planned yearly frequency. The two other major sea-level rise forecasts, put forward by the U.S. Army Corps of Engineers and the National Oceanic and Atmospheric Administration, are issued less frequently.

VIMS projections differ from those of the Corps and NOAA in other ways as well. Most notably, they are based on the observed water level record, which Mitchell said would be the closest to “the experience of a person standing on the land” and monitoring sea level in person.

In contrast, the Corps and NOAA forecasts are based on computer models involving global sea-level trends that incorporate global, regional and local factors. They also project forward much further than the VIMS estimates, providing forecasts to 2100 rather than VIMS’ 2050 cutoff.

VIMS has chosen that year as its horizon, a Center for Coastal Resources Management newsletter explains, “because of the likelihood that patterns controlling sea level rise (and therefore, sea level rise trends) will change in the future.”

“There are pros and cons for both of those [approaches], and that’s why having both of them is very informative,” Mitchell said.

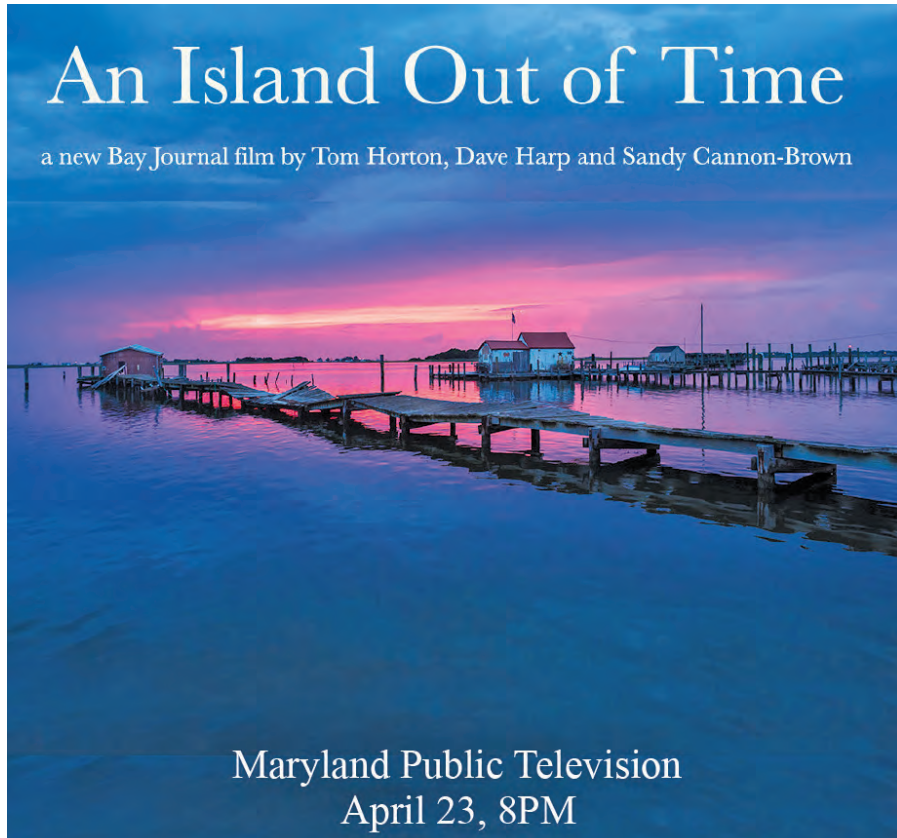
Among other uses, the new projections have been incorporated into the AdaptVA portal developed by the VIMS Center for Coastal Resources Management, Virginia Coastal Policy Center, College of William & Mary Public Policy Program, and Wetlands Watch.

For Mitchell, the next step in applying the data collected by VIMS is to increase awareness of how communities affected by rising sea level will be impacted by events like hurricanes and high tides, because sea-level rise calculations focus on the average level of the water without taking into account the high and low tides that occur throughout the day.

“We’ve been talking about mean sea level for so long, [and] for a while that was just trying to get people to understand that sea level is changing,” she said. “But now we’ve been ignoring the tide and the storms, so we need to bring those back in the conversation.”

An Island Out of Time

a new Bay Journal film by Tom Horton, Dave Harp and Sandy Cannon-Brown



Maryland Public Television
April 23, 8PM

CREP program interruptions hinder streamside tree planting efforts

≈ Holdup threatens to worsen lagging efforts to expand forest buffers in Chesapeake watershed.

By TIMOTHY B. WHEELER

Israel Creek meanders through rolling pastureland on Steve and Ruth Ann Derrenbacher's farm in Frederick County, MD. A fence keeps their sheep away from the clear, cold water as it flows toward the Monocacy River.

Alder, willow and sycamore saplings in plastic tubes line a portion of the stream. Steve Derrenbacher, a veterinarian and third-generation farmer, said they'd like to add more streamside trees and even permanently preserve the entire 148 acres their family has owned since 1942.

"We intend to pass it on the way we found it — in fact, better than we found it," Derrenbacher said.

But their conservation hopes are on hold, because the federal program that would pay them to extend the forest buffer is not taking any new applicants right now. Without it, they can't qualify for a lucrative state conservation easement to preserve the pasture land.

The U.S. Department of Agriculture stopped accepting new enrollments last fall in its Conservation Reserve Enhancement Program, interrupting one of the more attractive ways for farmers in the Chesapeake Bay watershed to voluntarily protect water quality. It's not clear when sign-ups will resume, and those working to restore the Bay say the holdup threatens to undermine already lagging efforts to plant forest buffers along streams and rivers in the watershed.

"Any kind of disruption in this is not helpful," said Craig Highfield, director of forest programs for the nonprofit Alliance for the Chesapeake Bay.

Under CREP, part of a larger USDA Conservation Reserve Program, farmers take cropland or marginal pasture land — typically located along or near water — out of production and plant it with native grasses, trees or other vegetation. In exchange, they get an annual payment based on the removed acreage, plus incentive and cost-share payments. The plantings serve as buffers that help to reduce erosion, protect water quality and create wildlife habitat.

"It's a great deal," said Rob Sch-nabel, a restoration biologist with the Chesapeake Bay Foundation, who helped the Derrenbachers put in their first riparian buffer. The CREP payments to farmers, provided in a partnership with states and nongovernmental organizations, are among the most generous of any government conserva-



Steve Derrenbacher's plans to install more trees along Israel Creek, which runs through his pasture were held up when a USDA program to help farmers extend their buffers stopped accepting new applicants. (Timothy B. Wheeler)

tion program. In Virginia, for instance, farmers in the Bay watershed can get rental and maintenance payments of up to \$100 per acre per year, plus a signing incentive of \$10 per acre for each year of the 10- or 15-year contract, with additional incentives and tax breaks available from the state. The bulk of the installation costs are also picked up.

The USDA's Farm Service Agency, which administers CREP, suspended enrollments near the end of the last fiscal year on Sept. 30. At that time, according to those who work with the program, the agency said it did so to avoid exceeding a national cap set by the 2014 Farm Bill on the number of acres of land that could participate.

The new Farm Bill passed in December by Congress retains CREP and increases the nationwide acreage cap. But the hold on enrollments has yet to be lifted. Those who work to encourage conservation practices say they've heard it may be fall before the process resumes.

Sylvia Rainford, a USDA spokeswoman, said the Farm Service Agency is evaluating unspecified changes to CREP and other conservation programs that may be dictated by the new Farm bill.

"We will work to implement those changes as quickly as possible," she said. "We also will address resuming CREP acreage enrollment as quickly as we can."

CREP has played a major role in creating forest buffers in the Bay region. The federal-state Bay Program has had a goal since 2003 to plant 900 miles of riparian forests annually

throughout the six-state watershed. While there was progress early on, that campaign is lagging badly. Reasons vary — some farmers prefer grassy buffers instead of trees and shrubs, and some shy away from the red tape and oversight involved with taking government money. But another deterrent has been repeated interruptions in CREP, observers say.

CREP was shut down "for a while" about four years ago, recalled Anne Hairston-Strang, associate director of the Maryland Forest Service. And for the last couple of years, she said, there have been "program pauses" to keep from exceeding the nationwide acreage cap.

If the USDA resumes enrollments soon, there shouldn't be a major interruption in CREP buffer plantings, say some of those working with the program. But some farmers, like the Derrenbachers, were hoping to conduct plantings this spring.

Maryland has been offering one-time payments of \$6,000 an acre to acquire conservation easements on cropland and marginal pastureland in Frederick County. To be eligible, 10 percent of the land must be under CREP contracts. That's why the Derrenbachers want to enroll more acreage in the program.

"We're not going anywhere," Derrenbacher said, but he noted that some farmers are already skittish about dealing with the government. "When [CREP] closes down, this is one more reason for landowners to be skeptical about the program."

Jamie Weaver, a state forester in

Carroll County, said there were six or seven landowners he'd been working with who weren't able to enroll, and one was "very frustrated" because he'd been counting on the CREP payments to help cover farm expenses.

"He was not very happy with us when he found out this contract didn't go through," Weaver said.

The CREP holdup has interrupted plans in other Bay watershed states as well. Virginia farmer Bobby Whitescarver, who's working for the Bay Foundation to enroll other Virginia farmers, said he's got five who'd like to sign up and also take advantage of state conservation funding.

"CREP just threw a monkey wrench in our plans," he said.

The holdup may aggravate an existing problem for the Bay's restoration: Some farmers are not renewing their CREP contracts to maintain forested stream buffers.

Under program rules, farmers can typically re-enroll even if their 10- to 15-year contracts have expired — but it isn't so forgiving for those farmers with forest buffers. If they don't renew before their contracts expire, they can't re-enroll. The USDA spokeswoman didn't say whether that rule will impact farmers whose contracts expire while the enrollment and re-enrollment process is closed.

There's already been a decline in the Bay region's CREP-funded forest buffers, according to Sally Claggett, a U.S. Forest Service program manager in the Bay Program office. Across the six-state watershed, she said, contracts covering 4,374 acres of forest buffers were not renewed in fiscal year 2017, the most recent year for which data are available.

Dropping out of CREP doesn't mean the trees automatically come down. But once farmers stop getting payments for the buffers, they're free to do something else with the land.

Contracts covering another 3,500 acres of forest buffers in the Bay watershed are slated to expire on Sept. 30, according to USDA figures. Nearly 2,000 of those acres are in Pennsylvania alone, with 600 in New York, 500 in Virginia, more than 200 in West Virginia and 175 in Maryland. Delaware has none.

If CREP doesn't come back online soon, advocates warn, the forest buffer effort could lose even more momentum trying to achieve the 2025 Chesapeake restoration goals.

"Every day or week that goes by that we're just left sitting on our hands, is just opportunity lost for us to be reaching out to these landowners," said Weaver of the Maryland Forest Service.

Conditions in James River lead to proposal for new chlorophyll levels

Adjusted criteria could mean hundreds of millions of dollars in savings for upgrade costs.

BY JEREMY COX

The James River poses one of the most perplexing cleanup challenges in the Chesapeake Bay watershed, according to researchers who have attempted to unravel its mysteries.

Its tidal waters range from nearly as salty as any ocean to as fresh as any inland lake. Its many twists and turns slow downstream flow to a crawl, providing a potential breeding ground for harmful algae blooms. And its shallowness only ensures that those blooms are never far from the sunlight they need to explode.

“It’s like a perfect storm there for algae,” said Tish Robertson, an assessment coordinator with the Virginia Department of Environmental Quality.

But figuring out the acceptable levels of algae — enough to help feed fish but not cause water quality problems — has proved to be a daunting task that has gone on for more than 15 years. It’s closely intertwined with determining the acceptable levels of nutrients, which feed algae blooms, that can go into the James.

Now, Virginia officials have emerged with adjusted criteria and a proposed regulatory framework to address concerns over algal growth. The proposal allows for some cases in which nitrogen and phosphorus — which feed the algae blooms — can exist in the river at higher levels than those set by the 2010 Bay cleanup plan, but are more in line with earlier estimates.

As a result, the new regulations could save wastewater treatment plants and other large polluters hundreds of millions of dollars in costs tied to upgrading their nutrient-removal technology. But those involved with creating the plan say it will still reduce algae blooms and their harm to the ecosystem.

“It is counterintuitive,” said Jamie Brunkow, riverkeeper for the James River Association. But his organization and many other environmental groups are nonetheless lining up to support the new framework, save for a few tweaks.

“I’ll admit it’s quite complicated. It’s hard to communicate with the public,” added Brunkow, a member of an expert panel that helped shape the proposal. “It’s not really a winners or losers kind of thing. It’s a consensus process. We had to all agree this is the right approach.”

The history of the problem is complex. The state in 2005 developed criteria for chlorophyll — a measure of algae growth — that would require additional nutrient reductions in the river. Then, in 2010, when the U.S. Environmental Protection Agency put forth its Bay cleanup plan,



The alga (*Margalefidinium polykrikoides*) blooms in the James River near the Monitor Merrimac Bridge in August 2013. (Wolfgang Vogelbein / VIMS)

the Chesapeake Bay Total Maximum Daily Load, it estimated that even greater nutrient reductions would be needed — a conclusion that raised immediate calls for more study.

The result was a 70-page report, which Brunkow said represents “a realistic and scientific path to get to a restored James River.”

The report stemmed from a \$3 million, state-led study that took six years to complete and the development of a complex new computer model to better simulate the James’ unique conditions. The work led to a revised set of limits on the acceptable amount of chlorophyll in the river.

In what would be the first update to the chlorophyll caps since they were established in 2005, the DEQ is proposing that eight of the seasonally averaged concentration levels be lowered and two be raised. The limits vary by season and river segment. Regulators also created separate criteria that would apply to durations of one day for certain segments and one month for others.

The new criteria overall are more stringent, but the new rules would allow them to be exceeded more often. The net effect would still require wastewater treatment plants and industries to reduce their nutrient discharges, but by smaller amounts than the Bay TMDL had estimated.

If they take effect, the new criteria would require roughly three dozen affected dischargers on the river to spend about \$250 million for upgrades instead of the nearly \$950 million previously anticipated, according to state economic forecasters.

Before the study began, “we really didn’t have a strong science guiding what too much algae is,” Robertson said. “We feel like we have a more-sound basis for the criteria than what we had in 2005.”

The chlorophyll standards are receiving mostly positive reviews from wastewater officials.

“The science that has been brought to bear on this topic has just been tremendous and impressive,” said Jim Pletl, head of water quality for the Hampton Roads Sanitation District, which operates seven of its 16 southeastern Virginia plants on the Lower James.

The proposal could go before the Virginia Water Control Board as early as this summer. If the board approves the measure, Gov. Ralph Northam and the EPA would have to sign off before it takes effect.

The James is the only Bay tributary to have a specific numerical limit for chlorophyll except for tidal portions of the Potomac and Anacostia rivers within the District of Columbia. A “narrative” limit has been in force for other areas of the Bay since 2003.

Why the different treatment for the James?

The nutrient reduction goals for most waterways in the Chesapeake watershed were based on what was needed to reduce algae growth in order to relieve oxygen-starved “dead zones” in the Bay itself. But that is less of a factor for the James, experts say, because it empties near where the Bay meets the Atlantic Ocean. Its water quality has relatively little bearing on the Bay’s health.

Instead, its nutrient reduction goals were based on chlorophyll targets aimed

at improving aquatic life in the river itself, said John Kennedy, director of the DEQ’s office of ecology. The metrics included water clarity, acidity, the abundance of harmful algae bloom species and dissolved oxygen.

The 2005 regulation was underpinned, in some cases, by “best professional judgment” about the interplay between the James’ nutrients and algae, Pletl said. Little was known at the time about how an

uptick of nutrients would affect chlorophyll levels and, in turn, how to link a rise in chlorophyll to ecological damage, such as fish kills and toxic algae blooms.

“Chlorophyll itself is not a toxicant,” Pletl said. “Making that link back to actual impact to populations and aquatic species is much more difficult.”

The new limits reflect improvements in modeling technology and a greater scientific understanding of the river’s plants and creatures, said Carl Hershner, director of the Center for Coastal Resource Management at the Virginia Institute of Marine Science.

“It’s really encouraging that both DEQ and EPA were willing to look at this issue and realize there was the potential for something unique,” Hershner said. “It’s a sign of the increasing sophistication of our water-quality management efforts.”

The James River carries water from as far away as the Appalachian Mountains and delivers it nearly 350 miles downstream to the Chesapeake Bay. The new chlorophyll measures target the 110-mile tidal stretch below Richmond.

Algae blooms are common, particularly in the Hopewell area, from May to September, scientists say. The blooms often produce microcystin, the same toxin that forced Toledo, OH, to temporarily shut off its water intake from Lake Erie in 2014.

The James’ tidal flow ensures enough mixing in the water column to tamp down toxins. But even if no toxins are present, algae can upend an aquatic ecosystem.

In response to the 2005 chlorophyll criteria, the state began requiring large

Bay Program advocates seek 23% funding boost as fed budget calls for 90% cut

≈ This is third year that administration proposal has slashed money for program; Congress has restored support in previous years.

BY TIMOTHY B. WHEELER

Chesapeake Bay advocates are seeking to boost Bay Program spending to its highest-ever levels, even as the Trump administration has once again called for deep cuts to the state-federal restoration partnership.

The competing requests between a 23 percent increase or a 90 percent cut from current funding levels were made to Congress in recent weeks as it begins its annual deliberations over how much it will appropriate for the Bay and other programs.

In a budget proposal submitted to Congress March 11 — just days after members of Congress from the Bay watershed proposed a boost in spending — the Trump administration called for cutting funds to the Environmental Protection Agency's Bay Program Office from \$73 million this year to \$7.3 million in the fiscal year that begins Oct. 1.

It was the third year in a row that the White House has proposed slashing the Bay Program. In President Trump's first year in office, he called for eliminating its federal funding completely. Last March, he also proposed a 90 percent reduction. Congress rejected both of those cuts and, in fact, slightly increased funding.

The administration's 150-page budget summary provided no explanation for the reduction, saying only that the Trump administration proposes to only fund programs that "measure and assess the health" of the Bay.

The EPA's Great Lakes restoration effort is also targeted for a 90 percent reduction, from \$300 million to \$30 million while other watershed efforts, including those focused on cleaning up the Gulf of Mexico, South Florida and



Tundra swans fly over a classic Eastern Shore house at Bishops Head along Hoopers Straits in the Chesapeake Bay. (Dave Harp)

the Puget Sound, would be zeroed out altogether.

The EPA's Bay office coordinates the Chesapeake restoration efforts among the states and other federal agencies, provides grants to states, local governments and nonprofits for restoration work, and oversees regional water quality modeling and monitoring efforts to support restoration actions.

The proposed reduction drew quick bipartisan criticism. "Not only is the Bay a national treasure, its health is crucial to the health of our Maryland economy," Sen. Chris Van Hollen, D-MD, said. He pledged to "fight tooth and nail" to restore funding to the Bay Program.

Sen. Mark Warner, D-VA, tweeted that slashing Bay Program funding would be "a complete disaster" for Virginia and the region.

Gov. Larry Hogan, chairman of the

Chesapeake Executive Council which oversees the restoration effort, issued a statement calling the proposed Bay Program cut "potentially devastating."

"The EPA administrator himself called the Chesapeake Bay Program a 'high priority,'" the Republican governor said, "making this week's cut in the budget a total betrayal."

William C. Baker, president of the Chesapeake Bay Foundation, also said the cut came only days after a meeting in which EPA Administrator Andrew Wheeler "affirmed" his full support of the federal-state cleanup effort, though he did not make any specific funding commitments.

Bay restoration efforts are working, Baker said, but "to achieve our long-term goals the pace must be accelerated."

He and others are working with Congress to instead boost funding.

Members of Congress from Bay states representing both parties in March introduced legislation in the House and Senate that would reauthorize the cleanup effort for another five years and increase its funding to \$90 million next year and then allow for a \$500,000 increase in each of the next four years.

Rep. John Sarbanes, D-MD, who is co-chair of the Chesapeake Bay Watershed Task Force in Congress, called the \$455 million authorized through fiscal 2024 a "critical investment."

"States rely on the EPA Chesapeake Bay Program to provide federal accountability, enforceability and resources," Sen. Ben Cardin, D-MD, said in a statement. "Less pollution means more oysters and crabs, healthier farmland,

more boats and tourism on the water, and more jobs."

Joining in the sponsorship of the bill was Sen. Shelley Moore Capito, R-WV, who said that it would provide "critical grant funding" to her state for meeting its obligations to help restore the Bay's water quality.

The Chesapeake Bay Commission, which represents state legislatures in the region, wrote Congress in March supporting the increased funding level for next year, noting that as the region approaches its 2025 cleanup goal, "both the challenge and urgency of our work grows."

More than 100 representatives from the Choose Clean Water Coalition, which represents more than 230 nonprofit groups in the region, visited Congress on March 7 to make the same pitch.

Karl Blankenship contributed to this article.

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polluters along the river to scrub more nutrients from their discharges. That led to at least \$400 million in investments to jump-start the cleanup. So far, the James River cleanup accounts for 65 percent of the statewide reduction in nitrogen and 60 percent of its reduction in phosphorus from so-called "point" sources, according to a recent state tally.

The DEQ's Robertson said those upgrades are factored into the new James River water quality model. The improvements since 2005 account for some of the 70 percent decrease in projected costs that large polluters face for complying with the new framework, she said.

But controversy continues. Some environmental groups say the new criteria give polluters too much license to exceed their limits. The measure would allow chlorophyll limits to be surpassed by as many as two seasons in six years.

But because the regulation considers springs and summers separately, that could allow up to four failing seasons — two springs and two summers — and still produce a passing grade. If those high chlorophyll seasons happen consecutively, the ecological consequences could be devastating, Brunkow said.

"Our concern is if you allow that back-to-back years of exceedances, you're not allowing the system to rebalance itself," he said.

DEQ officials say that exceedances are expected to be small and unlikely to do much harm. The daily and monthly limits will act like a backstop to keep the severity of potential algae blooms in check.

Wastewater industry representatives are pushing the DEQ to take those short-term checks off the table. They question whether a scientific link exists between a single day's exceedance and a sudden downturn in the river's health. The short-term limits would force facilities to construct systems to unnecessarily high and expensive standards, they say.

"It doesn't make sense to build 30-year facilities around one day," said Chris Pomeroy, general counsel for the Virginia Association for Municipal

Wastewater Agencies.

Robertson said the short-term limits are necessary to hedge the agency's bets against the uncertainty of the model. "We're trying to ensure protection of aquatic life, so having both sets of criteria working in tandem shores up the protection," she said.

The James River has been slow to give up its secrets. But those involved in the regulation's development say the latest effort should help the river recover more fully.

"We're happy with the outcome," Brunkow said. "It's been a long process for sure. For the most part, these are good criteria and we're excited to move them into the next phase of the process."

COAL ASH FROM PAGE 1

wells on or near the coal ash storage sites, and includes both sites with ongoing pollution problems and sites where the pollution has been addressed.

But Jim Roewer, executive director of the Utility Solid Waste Activities Group, which represents the dozens of utilities that generate waste while producing energy, said the data show that the federal rules regulating coal ash are working — and that more analysis is needed to determine whether the pollution actually exceeds legal standards.

“It is important to note that even if the required monitoring finds groundwater impacts in the shallow groundwater immediately next to a disposal unit on power plant property, this does not necessarily mean that neighbors’ drinking water is affected or that a health risk exists,” Roewer wrote in a statement.

Sites that do exceed groundwater allowances under the federal rule, he noted, already are required to eventually take corrective action.

Among the sites included in the report are nine in Pennsylvania, six in Virginia and three in Maryland, though not all are inside the Chesapeake Bay watershed.

According to the report, one of the 10 worst coal ash contamination cases lies within the Bay watershed at the Brandywine Coal Ash Landfill near Mataponi Creek, a tributary to the Patuxent River, in Prince George’s County, MD. Ash from three coal plants has been collected for years at the site, where groundwater was contaminated with unsafe levels of at least eight pollutants, including lithium at more than 200 times greater than safe levels and molybdenum (which can damage the kidney and liver) at more than 100 times greater than what is considered safe.

The Maryland Department of the Environment sued the facility for violations of the Clean Water Act and state laws. A \$1.9 million settlement



AshTracker.org, an Environmental Integrity Project website, shows where monitoring wells are located at a coal ash site along the Susquehanna in Pennsylvania. Almost all of the 70 monitoring wells, pictured in red and green, at the Brunner Island Power Plant detected pollution of groundwater near the site, according to AshTracker.org. (Environmental Integrity Project)

was reached in early 2013, and triggered cleanup efforts.

An EIP attorney at the time lauded the penalties as one of the toughest she’d seen a state impose on a coal ash site.

In Virginia’s portion of the Bay watershed, a power station in Yorktown made the list for leaching unsafe levels of arsenic, beryllium and other pollutants into not only groundwater but also the drinking water for about 55 residents in the years leading up to 1980. About 25 drinking water wells near a golf course in Chesapeake, VA, where coal ash was used as structural fill, had elevated levels of boron and other contaminants, the report states.

Virginia’s governor signed into law in March a bill that requires coal ash to be excavated from four impoundments located

along Virginia rivers and then recycled or placed in lined landfills. Water quality advocates vehemently opposed previous plans by Dominion Energy’s to permanently store the ash in the existing pits.

Earthjustice and other national and local groups are pushing for similar legislation in North Carolina and Illinois.

In the new report, the Brunner Island Power Plant, just south of Harrisburg on the Susquehanna River, posted unsafe levels of contaminants such as arsenic, nitrate and lead in 64 of its 70 groundwater monitoring wells in samples between 2011 and 2017. Run by Talen Energy, the plant still burns coal for fuel but is adding natural gas-firing capabilities and has “closed” several of its onsite coal ash storage pits while sending the coal ash that is currently generated to another unlined basin at the plant, according to the report.

A water discharge permit for the plant expired in 2006, and the EIP has submitted comments to the Pennsylvania Department of Environmental Protection asking that the permit be updated to include modern pollution controls. The nonprofit also filed a notice of intent to sue in August.

A generating station north of Pittsburgh, outside of the Bay watershed, was among the report’s 10 most contaminated sites for posting levels of arsenic in the groundwater that were 372 times greater than the amount considered safe for drinking water. The drinking water requirements are commonly referenced in legal cases but, as Russ said, “this doesn’t tell you about risks to aquatic life or risks to fish that are eaten” if the groundwater also leaches into a nearby waterway.

The EIP also developed AshTracker.

org, a searchable database of information from more than 4,500 monitoring wells at 189 sites currently storing ash nationwide. Seventy-seven percent of the wells have been contaminated at levels exceeding safe drinking water standards established by the U.S. Environmental Protection Agency, the website states. Those standards are enforced differently by each state, though, and the groundwater may not actually be tapped for drinking water — but it is a common source of drinking water, particularly in rural areas.

Earthjustice attorney Lisa Evans said she has spent most of the last two decades traveling the country to learn about the impact of coal ash on communities. Combing over the power plants’ own monitoring data over the last year, Evans said, provided additional evidence of the contamination that residents near coal ash sites have long suspected.

“Industry has dumped these billions of tons of ash in the cheapest way possible,” she said. “This is a crisis because it is poisoning an invaluable resource — groundwater — a resource for more than one-third of the United States’ drinking water, especially in rural areas.”

Utilities across the country say they are working with federal and state authorities on plans to clean up coal ash, which can cost millions of dollars to dig up for recycling or removal to sites where it is less likely to leak. The Supreme Court decided last month to hear a Clean Water Act case that could have broad implications for how utilities store ash and push more of them to consider lined landfills.

Coal ash contaminants drew attention in 2008 when 1.1 billion gallons of coal ash slurry breached a dam in Tennessee and flowed into the Emory and Clinch rivers, tributaries of the Tennessee River. Federal regulations that followed in 2015 required utilities to begin dismantling the long legacy of coal burning by more safely disposing of its byproduct and closing the so-called ponds where ash is often stored for decades.

The Trump administration aimed to soften the blow of those regulations to the industry, releasing last year a batch of significant changes to the 2015 standards, which Earthjustice and others are challenging in court.

The revisions incorporate “alternative performance standards” that the EPA or a state could use to approve a coal ash permit, such as those required to release ash-tainted water into nearby waterways. The agency also raised allowable levels of contaminants in groundwater. Boron, an element that is considered a leading indicator of the presence of other contaminants, was removed from the list.

Earthjustice’s Evans said the “new rule encourages utilities to continue dumping into leaking pits.” She said the report provides fresh evidence of the need for additional protections for water quality.



Lower Susquehanna Riverkeeper Ted Evgeniadis stands in front of a coal pile outside the Brunner Island coal-fired power plant near Harrisburg. He filed an intent to sue the owner of the coal plant alleging that its ash dumps have been leaking toxic contaminants into both groundwater and a stream that flows into the Susquehanna. (Tom Pelton/EIP)

RUNOFF FROM PAGE 1

expanded credit for measures of debatable value in reducing polluted runoff — or, in the case of trading, that simply put off dealing with it until sometime in the future.

“This agency is trying to turn every environmental restoration initiative into an accounting exercise, ripe for accounting gimmicks to make the status quo look like progress,” said Evan Isaacson, a policy analyst with the Center for Progressive Reform. “Whether it’s a juiced stormwater accounting guidance document, nutrient trading market or rigging stream restoration assumptions, there is just far too much talk of ‘credit.’”

The MDE’s Currey rejected the criticism, insisting that the agency’s actions were based on research and expert advice.

“I don’t agree that this is being done just to meet the [permit requirement],” he said. “I believe that the science is evolving, and we’re doing our best to adapt to that in a thoughtful and meaningful way.”

The dispute matters because stormwater is a significant source of the nutrients and sediment fouling the Bay and, according to the federal-state Bay Program Office, the only source of those pollutants that’s still growing.

When rain falls on streets, highways, parking lots, sidewalks and rooftops, it runs off, flushing fertilizer, sediment, pet waste, oil, chemical contaminants and litter into nearby waterways. In most



Stream sampling in Baltimore city has detected drops in phosphorus and bacteria levels in some places. City officials attribute the declines to their stormwater reduction efforts, but acknowledge they could also be from fixing sewage leaks and overflows. (Dave Harp)

urban areas, it is the number one cause of stream impairment, according to the Center for Watershed Protection, a nationally recognized research nonprofit based in Maryland.

The best way to curb stormwater pollution is to let rainfall simply soak into the ground. States are now required to ensure that new development is built in a

way that directs runoff to holding ponds, wetlands or open vegetated areas that can soak up the precipitation. But older cities and suburbs built before those controls were required must find ways to retrofit storm sewer systems that were designed mainly to siphon rainfall off streets and into streams as quickly as possible.

The Bay watershed’s older communities are all struggling to get stormwater under control, especially in Maryland, the nation’s fifth most densely populated state. Controls on new development runoff are far from complete, and progress retrofitting older areas has been slow. Since the 1990s, the U.S. Environmental Protection Agency has required large and medium cities everywhere, as well as counties with at least 100,000 residents, to regulate their stormwater. Under EPA oversight, states have issued those localities discharge permits for their storm drain outfalls. The permits typically require plans for controlling polluted runoff and must be renewed every five years.

The initial stormwater permits didn’t require much. Pressure to do more grew in later years, especially for the Bay states after 2010, when the EPA imposed nutrient and sediment reduction requirements through its Baywide “pollution diet.”

About that time, Maryland ordered its localities with more than 250,000 residents to essentially double their efforts to either reduce or treat their stormwater discharges. The state’s stormwater permits required those localities to restore the runoff-absorbing capability of 20 percent of their “impervious” surfaces, meaning their lands covered by pavement and buildings. That was a tall order — unrealistic, some say — requiring them to treat thousands of acres.

The most direct way to do that is through “green infrastructure” that collects and absorbs stormwater — ripping up pavement, for example, so rainfall could soak into soil again, or covering roofs with moisture hungry-plants. Other approaches involved building or enlarging stormwater detention ponds, creating a multitude of “rain gardens” or planting more trees.

But in heavily developed areas, it’s not easy to find enough open space to collect rainfall. Forty-five percent of Baltimore city is covered with pavement and buildings, for instance, but in some rowhouse neighborhoods, it’s up to 85 percent impervious. Costs also were a challenge, with early estimates for various retrofit projects ranging from \$20,000 to more than \$300,000 per acre.

With local officials worried about logistical and financial challenges, the MDE issued guidance in 2014 approving a menu of practices and projects for treating impervious surfaces, including some, like street sweeping and stream restoration, that only dealt with runoff indirectly.

According to state officials, those alternative measures provide equivalent benefits by reducing nutrient or sediment pollution, or both. Others, though, are skeptical.

The five-year stormwater permits for five localities have now expired. Here is a summary of what each says it has achieved:

Baltimore City

With 52,000 storm drains across its 81 square miles, Baltimore had been ordered by the state to deal with runoff from 4,300 acres of pavement and buildings. City officials announced earlier this year they’d succeeded in treating the equivalent of 4,530 acres. Four-fifths of that came from sweeping streets.

Kimberly Grove, chief of compliance and laboratories for the city’s Department of Public Works, said officials originally planned to install a greater amount of green infrastructure. But Grove said planners had to scratch many projects because of difficulties getting access to private property. And some sites were so small the projected expenses were exorbitant. In one case, she said, it would have cost up to \$250,000 per acre.

The city did go after stormwater in other ways, cleaning more than 500 tons of dirt and debris out of storm drain inlets last year. The work the city is doing separately under regulators’ orders to fix and replace leaky sewer lines also likely reduced stormwater pollution, Grove said.

But the city needed to find less expensive ways to make stormwater progress, as its mandated sewer overhaul is expected to cost more than \$2 billion by 2030. The MDE had blessed street sweeping as an

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alternative to retrofitting storm drains and other capital projects, even though it has to be repeated constantly to have any effect.

The MDE's Currey said regulators based their decision on the findings of a panel of experts for the Bay Program.

But the panel revisited the issue a couple of years later and concluded that they had overestimated the pollution reduction benefits of street sweeping.

"No monitoring studies have shown a detectable water quality change within storm drains that can be attributed to upland street sweeping, and it is doubtful whether future monitoring efforts will be any more successful," the panel's 2016 report said.

Currey acknowledged the new findings but said state officials decided not to change the rules because it would be unfair to localities like Baltimore that had acted on the earlier guidance. Baltimore city bought a fleet of nearly 40 street-sweeping trucks equipped with vacuum equipment to whisk dust and dirt from streets and gutters.

"It's only a five-year permit," Grove pointed out, "and to find the funding and execute things, it's difficult to do that when the rules suddenly change midway through."

Frequent sweeping using vacuum trucks does keep some sediment and contaminants out of the streams, experts say. It also picks up some litter, which helps the city with another regulatory mandate it faces — to halt the torrent of trash getting into the harbor from streets and parking lots.

The trucks vacuum some streets in the city's core four times a week, Grove said, with others getting weekly or monthly sweeping. Larger debris clogs the vacuums, though, so the drivers have to stop and deal with that manually. And the sweepers can't get at dirty gutters when residents don't move their cars on scheduled street cleaning days — a chronic issue in some neighborhoods.

A recent study in Madison, WI. found that the rigorous removal of fallen leaves from streets — including before every rainfall — did reduce phosphorus in streams, but its authors acknowledge that this is not realistic. Stream sampling in Baltimore has detected phosphorus and bacteria reductions in places, but those could also be the result of fixing leaky sewers.

MDE officials say they may very well reduce the stormwater credit for street sweeping in the next permit, which is to be issued later this year. If that happens, the city will have to find other ways to meet most of its treatment requirements.

The city is also at work on other projects to be completed in the next two years. One involves restoring more than two miles of Chinquapin Run, a channelized stream that flows through northern



Baltimore city relies heavily on vacuum-powered street sweepers, like the one shown here with its operator Alonzo Ames, to pick up dirt, litter, sediment and other pollutants. Experts' reviews found the practice only modestly effective at cleaning up stormwater, even if done frequently. (Dave Harp)

Baltimore neighborhoods. Stream restorations rework and sometimes armor stream channels to reduce bank erosion. In some cases, they also recreate flood plains or wetlands to enhance wildlife habitat. This project also involves moving a failing sewer line out of the channel.

Stream restorations in the city have proven controversial, as the projects require felling trees in an urban landscape that lacks adequate canopy. Along Chinquapin Run, hundreds of trees were removed that had been planted by volunteers over the last several years. Grove called the tree removal unfortunate, but said the environmental benefits of the stream restoration, including the sewer upgrade, outweigh the temporary loss of foliage. She said the trees would be replaced elsewhere.

Jenn Aiosa, executive director of the nonprofit watershed group Blue Water Baltimore, said she's glad the city has met its stormwater permit requirements and avoided having to pay a fine. But she hopes to see more done to reduce runoff with projects that also enhance neighborhoods' quality of life.

"We are seeing highly urbanized cities like Philadelphia, like the District of Columbia, like Atlanta, like Cleveland that are committed to doing more green infrastructure," Aiosa said, "not only for the ... pollution reduction benefits but because there's a whole slew of other benefits associated with planting trees and perennials and letting rain seep into the ground."

Anne Arundel County

Just south of Baltimore, Anne Arundel County faced a different dilemma. Needing to treat runoff from nearly 5,000 acres of pavement and buildings, the county

relied more on reducing shoreline erosion, retrofitting stormwater detention ponds, stream restoration and pumping out septic tanks. But by year's end, with its permit about to expire, the county had treated the equivalent of just 2,300 acres, less than half of what was required.

The county just couldn't get enough runoff treatment projects built by the permit's five-year deadline, explained Erik Michelsen, administrator of watershed protection and restoration for Anne Arundel's Department of Public Works.

Anne Arundel managed to close the gap through nutrient trading, using state regulations finalized last July. Trading is designed to let parties needing to reduce nutrient pollution acquire credits from another party that has already reduced its pollution more than the law requires. For example, municipalities facing costly stormwater requirements might be able to save taxpayers money by paying industries or farmers who've been able to reduce their runoff for less.

In this case, though, the trade will be cost-free and in-house — taking advantage of state-subsidized upgrades made to Anne Arundel's wastewater treatment plants, which are now removing much more nutrients than their discharge permits require. The trade essentially buys the county time to comply with its stormwater mandate, Michelsen said. But the county fully expects to do the needed projects, he added, and already has them in the pipeline.

"We will be using the credits generated by the overperformance of the county's wastewater treatment plants to close that 2,700-acre gap," he said, "with the expectation that we will 'burn off' that nutrient trade with stormwater projects in the ground — all of which

are in design or under construction at this point — during the next permit cycle."

Baltimore County

Suburban Baltimore County had also hoped to use nutrient trading to help it meet its requirement to treat 6,036 acres of impervious surfaces. But the county found itself in a bind because Baltimore city owns and operates the treatment plants that process the county's wastewater, and it wasn't clear what, if any, credits the county might be able to take.

So, county officials began searching for whatever might count to close the gap.

"We've got a pretty accomplished restoration program, and when we noticed we were looking like we were behind, that gave us some pause and reason to go back and make sure we were accounting for what we were doing," said Robert Hirsch, manager of watershed management and

monitoring for the county's Department of Environmental Protection and Sustainability.

Officials found some related projects that were done before the stormwater permit had been issued, which MDE credited. But what put the county over the top was the MDE's decision late last year to increase the stormwater reduction credit for stream restoration projects. Baltimore County has been a leader regionally in such projects.

Using the new MDE guidelines, Hirsch said, the credits the county could claim for stream restoration increased up to eightfold. Hirsch welcomed the change, saying it was overdue.

"It's like some of the pollution removal work that we've known stream restoration has done simply wasn't accounted for in the [original] 2014 guidance," Hirsch said.

There's been debate for years among scientists and stream restoration practitioners about the effectiveness of such projects, with some agreeing that it depends on how and where they're done.

Several consultants engaged in stream restoration say that the state initially gave such projects too little credit for reducing sediment and nutrient pollution. But the policy change last fall, prompted by one consultant's request for credit on a single project, went too far, they contend, and boosted the credit beyond what the science supports. The change effectively lets localities off the hook, they say, even though more is needed to curb stormwater pollution.

"It's going to reduce the amount of restoration we have to do to comply with the law, but it won't get us the restoration we need," warned Jim Gracie, president

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of the environmental consulting firm Brightwater, Inc., who has been doing stream projects for three decades.

“There’s a huge disconnect,” he added, between doing what it takes to meet the state’s stormwater permit and actually improving water quality.

Hirsch rejected such criticism and suggested that stream consultants are complaining because they fear they might not be hired by counties and municipalities to do as many projects.

Gracie acknowledged that he’s concerned about the impact on the industry. But he and other stream professionals say they’re more concerned about the impact on the pace of the cleanup.

“Does it affect what work we might get?” asked Rich Starr, a senior water resources scientist with Ecosystem Planning and Restoration, a Columbia consulting firm. “Yeah, potentially, but I do this because I’m passionate about streams and want to see the Bay get better. I want to see it done right.”

MDE’s Currey said the stormwater treatment credits given to stream restorations are “the best estimate we have today” of the benefits, based on estimates from the Bay Program’s expert panel.

But Tom Schueler, co-chairman of the panel, said he can’t vouch for the way the MDE converted the group’s estimates of pounds of pollutants reduced into acres of impervious surface treated. And Schueler, executive director of the nonprofit Chesapeake Stormwater Network, said the panel is taking yet another look at available research and may revise its estimates.

Bill Stack, deputy director of the Center for Watershed Protection, said he thinks the MDE significantly overestimated the sediment removal benefits of stream restorations in deciding how much credit to give them.

“They’re pretty sharp people,” said Stack, who’s the other co-chair of the Bay Program panel. “But I do question their making such a dramatic change.”

Currey said regulators had tried to account for uncertainties about stream restoration benefits, imposing a cap on how much credit could be taken for any one project. But he said the MDE would revisit its decision if the experts decide that stream restoration is less effective.

“Stormwater management is an evolving science,” Currey said. “In some ways it’s still in its infancy.”

Stack said that, while he’s a believer in stream restoration, he worries that the MDE crediting decisions put too much emphasis on such projects now, discouraging efforts to reduce or treat runoff in upland areas. And too many of the projects he sees are focused almost exclusively on reducing nutrient and sediment pollution, he said, without also trying to restore aquatic life to the waterway — which he said should be the ultimate goal.

“Hopefully, the next permit will be written differently,” Stack said.

Prince George’s County

Though lauded by some as a trailblazer for forging a public-private partnership to tackle stormwater pollution, Prince George’s County appears likely to fall short of the state’s treatment requirement. County officials are still finalizing their report on the permit, which expired Jan. 1, according to Jerry Maldonado, head of water quality and compliance in the stormwater management division of the county’s Department of Environment.

Under the county’s permit, it was required to reduce or treat runoff from 6,100 acres of pavement and buildings. Last year, county officials reported they had completed work on 2,215 acres, with another 2,860 acres in planning, design or construction.

The county had hoped to cover the gap with credits from overperforming wastewater treatment plants, as Anne Arundel did. But the county’s waste is treated by a regional authority, the Washington Suburban Sanitary Commission, and a credit-sharing agreement has not been reached, according to Maldonado.

Three years ago, Prince George’s drew widespread attention when it signed an agreement with a private company to take over much of the job of dealing with its stormwater issues. Corvias Solutions had partnered before with the Pentagon and universities to build and manage military housing complexes, college dormitories and other government facilities. County officials said the deal promised to save costs and speed pollution reductions.

“Their contracting targets are being met,” Maldonado said of Corvias. But the company was only responsible, he pointed out, for doing about a third of the required impervious surface treatment.

Maldonado, though, questioned the logic behind the state’s stormwater credit system.

“Baltimore [city] spent \$20 million in four years on street sweeping

and achieved it,” he said, “and Prince George’s spent \$200 million, and we haven’t achieved it. Houston, we have a problem here.”

Montgomery County

Long recognized as a leader among state localities in tackling stormwater pollution, Montgomery County discovered that it was still difficult to meet the state’s permit requirement. But after admitting failure last year, county officials say Montgomery has now caught up and achieved compliance, albeit more than three years after the original deadline. The county reported to the MDE that it had reached the permit goal of treating runoff from 3,778 acres of impervious areas and also completed its extra stormwater project.

“We used every single possible tool we could to meet this,” said Amy Stevens, section chief for watershed planning and monitoring in the Montgomery Department of Environmental Protection. “Everything in the guidance that MDE put

for stream restoration. Dawson said the decision came too late for county officials to factor it into their reporting. But he said if the MDE guidance remains unchanged, he hopes the county can take additional credits from already completed stream projects to apply to the next stormwater permit the county must work on.

The next permit?

With permits issued in 2013 and early 2014 now expired, state officials are preparing to issue new ones this year, setting goals for localities’ stormwater pollution reduction efforts from 2019 to 2023.

Some want the state to keep the pressure on localities to treat another 20 percent of their built landscape. Others want to apply a different yardstick, requiring measurable reductions in pollution rather than awarding credits for various surrogate practices and projects deemed equivalent.

“We would like to see actual water quality improvements rather than participation awards,” said Elaine Lutz, a lawyer



Amanda Oxendine and Matt Cherigo, pollution control analysts with the Baltimore City Department of Public Works, check water quality in Gwynns Run. City crews make regular checks for nutrients, bacteria and other pollutants at dozens of storm outfalls and stream sites. (Dave Harp)

out, we worked to try to access that credit.” The county did street sweeping, outfall repairs, stream restorations and even planted more than 11,000 trees, she noted.

“It was a tremendous lift, even in an eight-year period to get this work done,” said Frank Dawson, the department’s chief of watershed capital projects.

The county did not take advantage of the MDE’s decision to increase credits

with the Chesapeake Bay Foundation.

The MDE’s Currey said that state officials haven’t decided yet what to require next, but he indicated it’s likely to be different.

“It’s going to be tailored to each jurisdiction,” he said, “because we’ve learned the last five years, trying to achieve that 20 percent ... each jurisdiction faces different challenges.”

Old Wye Grist Mill still grinding after all these years



A volunteer at the Wye Grist Mill on Maryland's Eastern Shore pours corn kernels into a hopper beneath the mill's floor. The corn is transported to the grinding stones by a waterwheel-driven system of driveshafts, gears and belts.

It was 1682, the year that Delaware and Philadelphia were founded, and the year that French explorer Robert Cavelier de La Salle canoed into the lower Mississippi River basin, claimed the land for his king (Louis XIV), named it accordingly (Louisiana).

It was also the year that a new grist mill was built at the end of a 50-acre pond on what is now the upper Wye East River on Maryland's Eastern Shore. And that is where I found myself on a mild, late winter day for a preseason tour of that very mill — a mere 337 years later.

Here's the thing: *The mill still works.* On the first and third Saturday of the month, from May to mid-November, it grinds out whole wheat flour, buckwheat flour, rye flour, barley flour, cornmeal and grits — all of which are sold at the mill, \$8 per 2-pound bag. The equally old and historic Robert Morris Inn in Oxford, MD, still buys grits from the mill, when available, and proudly advertises it on its menu. Granted, the mill only runs two days a month, but it works. It's more than three centuries old and it still works.

And here's the other thing: For the last two thirds of its life, the mill has been fully automated. Originally, the churning of the waterwheel only operated the millstones, which grind the grain. But in the late 1700s or early 1800s, the building essentially became a fully water-powered machine. The upgrade was courtesy of Oliver Evans, the Delaware inventor who developed and patented the water-powered "Automated Flour Mill" and likely supervised its installation at the Wye Grist Mill.

"Oliver Evans at the time was living up in the Tuckahoe area," said John Nizer, president of the Friends of Wye Mill,

as he led photographer Dave Harp and I around the three-story building. The mostly volunteer organization has owned and operated the mill since 1996.

"We don't really know if he used this mill as one of his [test sites], but people speculate that he did," Nizer said. "He was selling the system himself, so it's assumed that he came down to oversee the installation here. He invented it in the late 1780s, so we think [it was installed] somewhere between 1790, when he got the U.S. patent, and 1810 or 1820. That was patent number three, by the way."

Yes, patent number three, as in only the third U.S. patent issued. Indeed, only three were issued in 1790, when the first U.S. patent law was enacted — the first for a system of manufacturing potash and the second for a candle-making process. Thomas Jefferson was in charge of patents that year, as a sort of side gig to his main job as Secretary of State. Jefferson reviewed and signed off on Evans's patent, as did President George Washington and Attorney General Edmund Randolph.

"It's completely, 100 percent automated, all powered by the waterwheel," Nizer said.

The miller pours in the grain, he told us, pointing to wooden hatch on the main floor, and the machinery takes it from there, driven by the big red iron waterwheel on the south side of the building.

"Downstairs it gets picked up by an elevator, goes [to the top floor], where it goes through a fanning process, on rollers, to dry it out a little bit," Nizer said. Then it drops down a chute into the hopper above the grinding stones, which feeds the grain into a sort of squared-off funnel, called a horse, which in turn feeds it into the axle hole in the center of the running stone.

From there, Nizer explained, the grain fans out between the stones, following geometrical grooves carved into the grinding surfaces of the massive wheel-shaped stones, each about 4 feet in diameter. The stationary bottom stone, or bed stone, weighs about 1,800 pounds, while the running stone on top is closer to 2,600 pounds. The miller controls how finely the grain is ground by a turning a wheel on the floor next to the grindstone housing, which minutely raises and lowers the running stone.

But wait, there's still more to the process. The pulverized grain falls to the floor of the grindstone housing, where it is fed into another chute and returns to the lower



Winthrop H. Blakeslee (center) was the last private owner and miller of the Wye Grist Mill, which at one point was owned by an American colonel in the Revolutionary War.

STORY BY T. F. SAYLES
PHOTOS BY DAVE HARP



The Wye Grist Mill was built in 1682 near what is now the Wye East River in Maryland. Along with providing a place for local farmers to process their corn and other grains, the mill helped supply the Continental Army with flour during the Revolutionary War, when troops in northern states were struggling for food. Today, volunteers operate the mill from May through mid-November and produce flour, cornmeal and grits for sale to the public.

floor. There, it's picked up by another elevator (these are vertical conveyor belts, about 4 inches wide, fitted with copper scoops every foot or so) and taken once more to the top floor, where it's sifted to remove the chaff.

In the case of wheat, the sifted flour finally goes down one last chute into a large bin, where it's ready for bagging. The wheat chaff is kept by the miller to either grind again for a bit more flour or sell as animal feed.

For corn, there's one more product to extract. The fine cornmeal goes into the meal bin just like the wheat flour, but the corn chaff is sifted again, coarsely, to produce grits.

Little is known about the very early history of the mill, except that it was built in 1682 by Edward Barrowcliff, on or near the site of a mill that had stood there since the late 1660s. Barrowcliff operated the mill for a decade or so before selling it to Richard Sweatham, who died in 1697, passing it on to his son, William. After a procession of owners and mostly hired millers through the 1770s, the mill was purchased late in that decade by Col. William Hemsley, head of the Queen Anne's County Militia during the American Revolution and grandson of Philemon Hemsley, a prominent citizen and planter who had established a nearby estate that became known as Cloverfields.

Hemsley's portrait hangs on the east wall on the lower floor, over an 8-foot-wide, glass-enclosed diorama

of the mill and its surroundings. Perhaps even more important to the Revolution than his role as commander of the county's militia, Hemsley is credited with supplying flour to feed the Continental Army in the critical later years of the war — as were many other mills on the Eastern Shore. Partly because of wheat crop diseases plaguing northern states in that period, the Eastern Shore became the "breadbasket of the Revolution" and continued as a major wheat producer well into the 1800s.

In the not-to-distant future, the Hemsley name will figure even more prominently in the story of the mill. In 2017, the Annapolis-based Cloverfields Foundation — founded by Stephen J. Hemsley, a descendent of the colonel and executive chairman of the United-Health Group in Minnesota — began restoring Cloverfields, the family's ancestral home across the Wye East River a mile or so from the mill. And late last year, the foundation purchased the even more closely

related "miller's house," a 1740s fixer-upper perched on a small hill a few hundred feet south of the mill.

"We used to come up here and board this place up because kids used to come in here and have drinking parties," Nizer said as we circled the

now tightly sealed two-story brick house. "A lot of the [architectural detail] inside goes back to the original, so we got permission from the owner at the time to board it up and help cut down on the vandalism... Now the Cloverfields Foundation owns it, and they came in and cleaned things up and temporarily replaced some roof structures. They have it all closed up and sealed, with dehumidifiers and fans and everything. So somewhere along the line, when [Cloverfields] is done, this is their next project."

The more immediate project, Nizer noted as we said our good-byes, is the annual April prep and cleanup necessary for this year's opening on May 1. The mill may be fully automated thanks to Oliver Evans, he said, but getting ready for its annual coming out party takes good old-fashioned, hands-on work.

The Wye Grist Mill (900 Wye Mills Road in Wye Mills, MD) is open daily from May 1 to mid-November. Hours are 10 a.m.

to 4 p.m. Monday through Saturday and 1–4 p.m. on Sundays. Grinding days are the first and third Saturday of every month. Flour, cornmeal and grits are available for purchase as long as supplies last. For information, call 410-827-3850 or visit oldwyemill.org.



John Nizer, president of the Friends of Wye Mill, explains the automated system — given the third patent issued by the United States — that was installed in the mill during the late 1700s or early 1800s.

White Horse Mountain worth the millions paid to protect it



A view from White Horse Mountain in West Virginia includes the South Branch of the Potomac River. The Potomac Conservancy led a successful effort to save the mountain, now a state-managed wildlife area, from development. (Bill MacFarland)

BY WHITNEY PIPKIN

Hugging the slow s-curves of road winding into a mountainous sliver of West Virginia's Hampshire County, I remembered why they call this portion of the Chesapeake Bay watershed "wild" — and why clean water advocates were desperate to keep it that way.

I was headed to White Horse Mountain, an almost entirely tree-covered heap of rocky hills hugging and draining into the South Branch of the Potomac River. It's one of the largest undeveloped forestlands remaining in the region, home to rare wildflowers and habitats, hike-worthy vistas and the occasional bobcat or black bear. And it's only recently been reopened to the public.

Five years ago, the Potomac Conservancy began raising more than \$3 million — twice the nonprofit's annual operating budget — to buy White Horse Mountain and keep its 1,730 acres of hardwood forest, rocky outcroppings and shady streams from being developed into 70 homes. Their fundraising efforts trumpeted the importance of preserving the forest not only because it filters cool, clean water headed for the Potomac but so the public could continue to visit and enjoy the mountain.

Now, they can.

"The ability to get onto land that's [been] conserved — being able to enhance wildlife and having places where the public can get on and experience those animals — is unique," said Emily Warner, the conservancy's senior director of land conservation and a West Virginia native.

Last year, after successfully completing the months-long purchasing process and protecting the land from development through a conservation easement, the nonprofit

it turned the ownership of White Horse Mountain over to the state. West Virginia's Division of Natural Resources is maintaining it as a wildlife area, open to hunters, hikers, birders, mountain bikers and others whose uses align with conservation goals.

The state played a similar role 15 years ago when a timber company that owned White Horse Mountain leased it to the DNR to be managed as the Springfield Wildlife Management Area. The relic title still appears on the Google Maps label for the green area that includes White Horse Mountain. The area gained a reputation over the years as prime hunting grounds.

"When it got sold to the developer, it was a big loss to the local community," said Rich Rogers, a wildlife biologist.



Eastern red columbine hugs the base of a tree on White Horse Mountain. (Tracy Lind)



Wildlife biologist Rich Rogers (above) of the West Virginia Division of Natural Resources said the mixture of tree species and ages in the forest is one reason that White Horse Mountain harbors a wide range of plant and animal species. (Left / Bill MacFarland; Above / Whitney Pipkin)

wildlife management areas in West Virginia: no campgrounds or swing sets or ballparks. There are a few trails, but mostly it's woods and dirt roads."

gist with the DNR who has hunting stories of his own tied to this land.

The land reopened to the public this fall, and the hunters who'd sought deer and turkey in these forests for decades flocked back.

While local hunters might know their way through these woods "like the back of their hand," Rogers said, the state has only begun its work to make the property more accessible to other outdoors enthusiasts. The division recently hired a wildlife manager to oversee White Horse Mountain and three other wildlife areas, and he'll be logging plenty of hours at White Horse this spring and summer.

New signs will go up at the entrance, parking areas will be built and roads left rutted by winter hunting vehicles will be restored, Rogers said. In the future, the division will work on removing invasive mile-a-minute vines in the forests and weedy fescue in the fields, replacing them with native species.

But there are already plenty of unique and native habitats to take in during an excursion on White Horse Mountain — as long as you remember it could be a wild one.

"Right now, it's more like a refuge than a state park," said the conservancy's Warner. "It's similar to other

"Whatever you can do to amuse yourself with that," she said, "go for it."

Just east of the small town of Springfield, Rogers and I turned off Springfield Pike onto Swisher Hollow Road, where a small bridge straddles Abernathy Run. The nondescript road winds past the homes of a couple of private landowners — one of whom has discarded old vehicles and trash along the road, an eyesore that DNR staff say they'll deal with soon. The road forks twice and we kept to the left, then right, with a gate closing off an old road that made the second choice clear.

Under a late-March sky that was still making up its mind between snow and rain, we decided to drive up a well-trod portion of the road that loops around the mountain. If we weren't in a sturdy truck, or had better weather and a half-day to kill, I'd say the route would be easier by foot.

The forest around us was a diverse mix of hardwoods with some saplings just getting a foothold along the road. Rogers said that the mix of tree ages is one feature of the property that makes it so appealing to conservationists — and wildlife.

It's not uncommon to see white-tailed deer and wild turkey in these parts. If the hunting season is open (in the fall for deer and from fall

through April/May for turkey), be sure to wear bright-colored clothing and stay on the trails to avoid a hunter mistaking you for an animal. Black bear, bobcats and fishers — a dark-colored weasel that can look like some sort of black panther when it leaps past your headlight beams — are here, too. Rogers and others at the DNR are studying the bobcats and should know more about their activities soon.

Birds like the powder-blue, cerulean warbler, whose population has been diminishing, depend on a variety of habitats, including early successional forests. West Virginia "is a big part of their range," Rogers said.

"This [younger] age of forest is what we're really missing in West Virginia, where a lot of our forests have matured," Rogers said, gesturing to the saplings sprouting nearby. "This is what really seemed to be lacking."

The diversity of both ages and species of trees on White Horse Mountain is a remnant of its history as a landscape that was, in Rogers' opinion, well-managed for years by a local timber company. Other pockets of the mountain are home to clusters of black cherry trees, fowl-friendly grasslands and rare rocky habitats that Warner said increase the diversity of plants and wildlife that can be spotted in one small space.

The Nature Conservancy donated eight of the area's acres to permanently protect one of those habitats, called the Rock Dome Preserve, located on a southeast part of the

mountain that's not easily accessible and not open to the public. A recent study found that the mossy rockface, made of rare sandstone and acidic glades and sandstone cliffs, is likely home to two types of equally rare wildflowers: the imperiled oldfield toadflax and critically imperiled eastern fameflower.

Portions of the rocky area — and a rockface that Rogers said contains a historic shell midden — are visible on a drive-by from Clarence Taylor Road. After taking the long drive up and around White Horse Mountain, pull off the road for a moment here, where it runs alongside the South Branch of the Potomac River, to take in the height of it.

Don't forget to admire that cool, clear water in the river, for which the mountain was preserved — at least in part — to protect.

Explore White Horse Mountain

- ✦ For a direct route to the best roadside parking spot, type "Swisher Hollow Road & White Horse Loop, WV" into Google Maps.
- ✦ The gate to White Horse Loop is closed after hunting season ends (in April/May), but visitors are welcome to travel the road by foot.
- ✦ The path from Swisher Hollow Road to a powerline clearing on White Horse Loop is just less than 2.5 miles one way, with a change in elevation of more than 700 feet. The full White Horse Loop to the powerline and back along White Horse Ridge Road is 4 miles. The road continues another 1.5 miles beyond the powerline for an even longer hike.

For information, visit potomac.org/white-horse-recreation. Be sure to follow the links there for safety information about hunting season dates and times and the recommendation for wearing blaze orange apparel during those periods.

The wonderful, weird world of water-dwelling worms



Bambo Worm (*Clymenella torquata*)



Common Clam worm (*Alitta* sp.), above
Milky Ribbon Worm (*Cerebratulus lacteus*), right



Oyster Flatworm (*Stylochus ellipticus*) (Robert Aguilar)



Acorn Worm (*Saccoglossus kowalevskii*)

Photos courtesy of Smithsonian Environmental Research Center & Florida Museum of Natural History

The mud flats, waters and shores of the Chesapeake Bay and its rivers are home to more than 100 species of benthic or "bottom-dwelling" worms. Here are five of those fascinating worms. Match them with their descriptions. Answers are on page 6.

Acorn Worm
Bamboo Worm
Common Clam Worm
Milky Ribbon Worm
Oyster Flatworm

1. The most abundant bristle worm in the Bay looks like a squishy centipede. The 5- to 6-inch worm has a bristled appendage on each side of the many segments that make up its reddish bronze body, and it is able to regenerate any lost or injured part. Unlike some worms, its head is easily identifiable with its tentacles, four eyes and two palps (protuberances used for touching and tasting). It uses two hooks at the end of a long tubular sucking proboscis to snatch soft food — worms, dead organisms and algae — and pull it into its mouth. This worm can be found roaming on the bottom or in its tunnel. When tunneling, it discharges mucous, which hardens into a flexible tube that the creature can quickly enter or leave.

2. Observers of this worm moving through water have likened it to a flying carpet. Out of the water, usually hiding under a shell or rock, it looks like a small (1 inch or less) blob of pale jelly with tiny tentacles on top and eye specks in front. Juveniles eat algae, and nutrient-fed blooms have helped a greater number of them reach adulthood. The preferred food of the carnivorous adults is young oysters. They ooze into the shell and

eat the bivalve from the inside out.

3. This flat, white to yellowish pink worm can be 3-4 feet long. When lifted out of the water, it will twist and turn until it is a pile of knots. It lives in the Lower Bay and in high-salinity areas of tributaries, where it devours bivalves and crustaceans. In late spring or summer, its breeding season, the worm turns dark red. It reproduces through mating or by breaking into pieces that grow into new worms.

4. There's no mistaking this worm, which has three distinct body sections: a brown body, bright orange collar and pale pink proboscis. It sucks in oxygenated water through its mouth, which then flows out of gills located on its trunk, much like a fish, leading some to think it is a link between invertebrates and vertebrates. It eats by swallowing sand or mud that contains organic matter and microorganisms. At low tide, it sticks its rear end out of its tunnel, where it deposits coils of processed sediments, called casts.

5. This 6-inch worm, which looks like a reddish segmented twig, lives head-down in a vertical, mud-encrusted tube that sticks slightly above the surface of a mud flat. This worm cannot turn around in its tube and is nourished by organisms found in the sediment it takes in. It is frequently found in colonies, which attracts other marine life. The worm's tail has a fleshy growth that can close off the tube, but it is not always successful. An amphipod often found in the tube is harmless, but one type of snail eats this worm.

— Kathleen A. Gaskell

April showers bring...earthworms to the surface to escape soggy soil! This quiz will test your wiggle wisdom. Answers are on page 6.

1. Why do worms secrete a slimy fluid?

- A. It helps them move through dirt more easily.
- B. It tastes bad, so it repels predators.
- C. It keeps their skin moist.
- D. A & C

2. At least 3,000 earthworm species are found on Earth. Of the 182 species in the



United States, how many are native?

- A. 82
- B. 102
- C. 122
- D. 142

3. True or False? Each earthworm is both male and female.

4. An earthworm egg resembles a miniature fruit. Which one?

- A. Banana
- B. Lemon

- C. Pineapple
- D. Raspberry

5. Earthworms are detritivores. What's that?

- A. An organism that does not have teeth
- B. An organism that eats decaying plants or animals
- C. An organism that is detrimental to agriculture
- D. An organism that eats garbage

6. How do earthworms help plants?

- A. Their tunneling aerates the soil, making it easier for roots to take in oxygen.

B. Earthworm poop, called "casts," is a great plant fertilizer. (It is even sold in some garden stores.)

- C. Their tunnels makes soil more absorbent
- D. Some eat nematodes — harmful plant and animal parasites.
- E. All of the above

7. Worms can crawl backward & forward. How do they move?

- A. It has tiny toes.
- B. Its body consists of ringlike segments covered with small bristles that propel it.
- C. It bunches up, then pushes itself

where it wants to go.

D. Scientists haven't figured it out yet.

8. An earthworm does not have eyes, although one end of its body is more sensitive to light. If it is outside in light for too long, an earthworm will die. As a rule, how long is too long?

- A. Half an hour or more
- B. 1 hour or more
- C. 4 hours or more
- D. 24 hours or more

9. An earthworm's blood is red, just like humans. Unlike humans, some earthworms have more

than one heart. Up to how many hearts can a worm have?

- A. 2
- B. 3
- C. 4
- D. 5

10. Worms need moist soil or they dehydrate and die. In dry conditions, they have two choices: move to deeper, wetter soils or enter a hibernation state called diapause. What does a worm do in diapause?

- A. It ties itself up in a knot in a slimy little hole to prevent moisture loss.

B. It grows a hard shell to seal the moisture in.

C. It dens with other worms to keep each other wet.

D. It shrinks.

11. Earthworms can survive in soggy soil under what condition?

- A. There is enough oxygen in the water.
- B. The soil is sandy.
- C. The area has just experienced a drought of 6 weeks or more.
- D. The worm is more than 10 years old.

— Kathleen A. Gaskell

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Wild azaleas bloom along the upper Choptank, a clear sign of spring. (Dave Harp)

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Wild violets brighten the floor of wooded wetland. (Dave Harp)

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Saint Michaels, MD

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Washington, DC

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Mechanicsville, VA

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The fringe tree blooms in late April to early May. (Dave Harp)

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FORUM

COMMENTARY • LETTERS • PERSPECTIVES

Go big: Constitutional amendment needed for climate change

By TAMARA TOLES O'LAUGHLIN

In August 2018, the Maryland Environmental Health Network and its membership of impacted residents in the community, health advocates and environmental activists came together to strategize on ways to confront the root causes of climate and health threats in our state. Among other ideas, we decided to raise our collective voice in favor of bold action. What developed was a proposal for an addition to the state constitution, now known as the Healthy Green Maryland Amendment.

While it may seem like a difficult task, amendments to state constitutions happen with relative frequency when the state legislature determines that there is a need. For example, Pennsylvania and Montana have amended their state constitutions to provide for a green amendment, a right to clean air and pure water for their citizens. Twice since 2013, individuals used Pennsylvania's amendment (passed in 1971) to win victories at the state's highest court to prevent fracking because of the health issues it causes. New York and New Jersey are considering similar proposals.

The bill for a Healthy Green Maryland Amendment, sponsored by Del. Stephen Lafferty among others, built on a 2018 proposal and made explicit the right to a healthy environment, now and for future generations, vested in the government as a plain duty to hold the promise of public lands and the enjoyment of them as a multigenerational pledge. This amendment, alongside plans to add community solar projects, clean energy jobs and climate-conscious transportation, would make Maryland the first state in the nation to realize the vision for a Green New Deal.

By taking the form of an amendment, this pledge would be bound by our state's declaration of rights. And why not? That's where we keep the highest values of our union, where we balance our freedoms for, and responsibilities to, one another.

We have built constitutions at every level to imperfectly defend against tyranny and oppression, and it's more clear than ever that there is no greater threat to liberty in this age than what climate change will do to our way of life, our freedom to migrate, and our pursuit of the state vision of



Students demonstrate in support of climate action and the Healthy Green Maryland Amendment during the General Assembly session in Annapolis. (Tamara Toles O'Laughlin)

happiness, be it crab, beach, or Old Bay-related. All of it — including human health — is threatened by rising tides, eroded shores and development that occurs without consideration of these impacts.

A recent poll of statewide voters from OpinionWorks found that a resounding 74 percent of Marylanders support a Healthy Green Maryland Constitutional Amendment. Not only that, but 71 percent of Maryland voters are worried about climate impacts on their property, health or family. Similarly, 75 percent, including more than half of the Republicans polled, expressed concern about the weakening rollbacks or lack of action on climate change at the national level, with 65 percent of voters supporting increased action in the state to combat climate change. This is a clear mandate to ramp up environmental action in Maryland.

Although the Healthy Green amendment bill will not go forward in 2019, we have the opportunity in 2020 to give people the chance to make their own decision and hold a referendum in the state.

The 2019 bill may have been ahead of its time, but it was surely not

ahead of our need for it. In fact, the United Nations Environment Program published its first *Global Report on the Environmental Rule of Law*, in January where it explicitly recognized the rights of future generations and the need for action on climate within a constitutional framework as a right to a healthy environment. The Healthy Green Maryland Amendment was supported by attorneys from four states covering the Chesapeake.

The validation of environmental and health rights is necessary, urgent, possible, and inevitable, if we can hold onto it in the face of the unsubstantiated fear of change.

Change is already here, and it's coming at the speed of climate. Maryland could be well-positioned to act if we can recall that constitutions are meant to be shaped and sheared to meet the challenges of the time. Rather than become stale and held in unnecessary reverence — they should adapt to the challenge of the day to remain relevant.

In recent days we've witnessed one of the largest mobilizations on climate, ever. On March 14, 1 million youths answered the call to camaraderie, made possible by technology, and

emerged in real life in more than 2,000 protest sites in 125 countries. Every shout, every sign, and every single body in motion (and empty classroom chair) served as a referendum for immediate action on climate and the end of incrementalism in the age of extinction level threat. More than a few gathered in Annapolis as a part of a growing response to the static promise of the legislative session.

And on hand at this year's legislative session was 14-year-old Kallan Benson, a single silent protester, an energetic standard bearer for her generation. Kallan dedicated 90 days of her young life to protest, preceding the weekly gatherings for #climatestrike Fridays.

She was supported by numerous faith partners and members of ecumenical traditions who have long understood that creation care happens beyond church halls.

It's time to admit that we are at the end of incremental campaigning for piecemeal wins. It's time to go big or risk our place on the planet.

A growing number of legislators recognize the necessity of action at this scale, and understand the power of an environmental rights amendment. During a hearing for the bill, our favorite inquiry (paraphrased here) came from Del. Vaughn Stewart, who asked how we could reasonably hesitate to act on climate and health when Maryland has considered constitutional amendments to enable sports, slots and marijuana, among other things.

It's time to "go big." We have the entire future of Maryland to consider — and it demands action. Our mandate is scrawled on the placards of tweens and teens. Let's follow their direction to act, and do it next in the run-up to the next general election. Otherwise, we may have no place to call home.

Tamara Toles O'Laughlin is the executive director of the Maryland Environmental Health Network.

FORUM

COMMENTARY • LETTERS • PERSPECTIVES

Bay Program's 2017-18 *Bay Barometer* shows Chesapeake's resilience

BY RACHEL FELVER

Pick up any article about the health of the Chesapeake these days and you are sure to see the term “resilient.” It’s become the trendy way of saying that despite pollution continuing to run off into the Bay and extreme weather events, the Bay is thriving.

From record acreage of underwater grasses to an unprecedented effort to restore oysters, experts are cautiously optimistic that the Chesapeake is bouncing back. The Bay Program’s 2017-18 *Bay Barometer* provides the science and data to back up this sentiment.

The *Barometer* is the Bay Program’s annual report on environmental health and restoration in the 64,000-square-mile watershed. Containing the most up-to-date data and information from the program’s many partners, it is a science-based snapshot that presents the whole picture about the region’s health — from the blue crabs in tidal waters to the brook trout in freshwater streams to the progress being made in training the next generation in environmental literacy.

The Chesapeake Bay Program — the regional partnership that sets the policy and management decisions for restoring the Bay and is primarily funded by the U.S. Environmental Protection Agency — tracks 31 indicators to keep an eye on the progress of the Bay cleanup. This information is accessible at chesapeakeprogress.com.

Other organizations use the *Barometer* data and information in their own assessments of the Bay’s health, including the Chesapeake Bay Foundation’s *State of the Bay* report and the University of Maryland Center for Environmental Studies’ *Chesapeake Bay Report Card*.

Now, for the very first time, the *Bay Barometer* is tracking climate resiliency.

In the Chesapeake Bay Watershed Agreement, the Bay Program committed to increase the resiliency of the Chesapeake watershed, including its living resources, habitats, public infrastructure and communities, to withstand the adverse impacts from changing environmental and climate conditions. These indicators provide scientific evidence of what many watershed residents have long suspected — our climate is changing, and the entire watershed is seeing the impacts.



Oyster reef construction has been completed at Harris Creek in Talbot County, MD. (Chesapeake Bay Program CC BY-NC 2.0)

The *Bay Barometer* looks specifically at stream temperature, air temperature and sea-level rise. (The full suite of nine indicators is available on chesapeakeprogress.com.) In a nutshell, the air we breathe and the streams that flow through our backyards are growing warmer. Data observed across the entire watershed from as far back as 1901 found that the temperature of the air has increased anywhere from 0.4 degrees Fahrenheit in southern West Virginia to more than 2.5 degrees Fahrenheit in Delaware. Areas closer to the mainstem of the Bay are more likely to feel these changes than those farther upstream.

Since 1960, the U.S. Geological Survey observed that 79 percent of monitoring stations throughout the watershed recorded an increase in the average annual stream temperature. Overall, this means the water flowing in our streams is at least 1.1 degrees Fahrenheit warmer than it was six decades ago. This may not seem like a drastic change, but to species like the brook trout, it becomes a life and death situation. Brook trout thrive in cold, clean water.

Then there is sea-level rise. Monitoring stations throughout the Bay noted that since 1960, the water is rising at a rate of one-eighth to approximately one-sixth of an inch each year. Some

areas of the Bay are worse than others — for example, the water level in Baltimore rose about 7 inches in comparison with Norfolk’s 10 inches. Flooding has become a regular issue across the watershed — Annapolis, where the Bay Program Office is located, experienced 63 days of nuisance flooding in 2017 compared with an average of 3.8 days 50 years ago.

There are other areas our partners can help to improve — we need to plant more forest buffers, reduce the toxic contaminants flowing into the Bay, restore and/or create more wetlands and work on improving the health of our streams. Our indicators for environmental health are all connected — progressing in any of these areas will also help to improve climate resiliency.

Don’t let these observations depress you. The good news is that the Bay Program is regularly tracking and reporting this information, helping to better realize the impact that a changing climate is having on the entire Chesapeake watershed.

And there are a lot of other signs of resiliency to celebrate:

☞ Nine tributaries have been selected in Virginia and Maryland for oyster restoration. Of these, eight are in different levels of progress, and in two of those — Harris Creek and the

Lafayette River — reef construction has been completed.

☞ Between 2012 and 2017, 1,236 miles of waterways were opened to fish passage, marking a 124 percent achievement of our goal to open 1,000 miles of historical fish migration routes.

☞ In 2017, the highest acreage of underwater grasses was noted throughout the Bay since monitoring began more than 30 years ago. At 104,843 acres, this marks a 57 percent achievement toward the restoration goal of 185,000 acres and is the first-time that total abundance has exceeded 100,000 acres.

☞ According to preliminary data, during the 2015–2017 assessment period, an estimated 42 percent of the Chesapeake Bay and its tidal tributaries met clean water standards. This is the highest record for water quality reported since monitoring began in 1985. This increase is due in large part to reductions in chlorophyll *a* (a measure of algae growth) and increases in underwater grass abundance and dissolved oxygen in the open waters of the Bay.

☞ Water quality monitoring shows that in 2017, approximately 240 million pounds of nitrogen, 12.7 pounds of phosphorus and 4.3 billion pounds of sediment reached the Bay: a 0.4 percent, 7 percent and 14 percent decrease from the previous assessment period, respectively. This indicates that the many efforts by Chesapeake Bay Program partners to reduce pollution are working.

The collaboration and efforts of the Bay Program’s many partners — from local communities to nonprofits to state governments and federal agencies — are reason enough to celebrate these successes. But to see the Chesapeake show these positive signs of resiliency, proving that our collective actions do make a difference, makes all of the hard work worth it.

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

FORUM

COMMENTARY • LETTERS • PERSPECTIVES

Time to swat the litterbug again

Hi citizens ... who remembers “the litterbug?”

Two generations ago, when empty bottles, cans, paper bags and cigarette butts littered our public places, sidewalks, trails, and roads as well as beaches and along the shores of rivers and streams, the litterbug campaign was the nation’s most effective message against trashing the public environment.

The litterbug cleanup campaign in the 1950s heightened our awareness about the beauty of our natural environment. Litterbugs, the trash villains, depicted the negative impacts of rubbish in public spaces much like the more recent symbolism of broken windows for neighborhood blight.

Sixty years ago, the anti-litter campaign was so effective that no one but no one wanted to be called a litterbug. Brigades of volunteers walked along roads to bag trash. Civic clubs adopted a highway. City and state leaders passed fines for littering. It was not popular to be a litterbug.

Over time, the litterbug public broadcast message for a clean environment faded. Today, generations later, litterbugs have returned in full force. Our highways, lined with plastic bags waving from trees and gutters full of

paper, plastic, Styrofoam and old rugs, are mini dumps for rubbish

Rubbish accumulation in public places sends a clear message that despite waste management efforts, we are losing the war against trash. Rubbish on our roads declares the litterbug is alive.

In this age of pinched pennies, dedicating tax dollars to cover the irresponsibility of a litterer is not hip. Ignoring throwaway rubbish in public places is in vogue.

Government maintenance staff throw up their hands in exasperation as rubbish grows in public spaces. “What to do, what to do?” Corporations that package the stuff we buy for convenient snacks march on, giving us more trash to throw away.

The word, litterbug, was first coined in 1947. Perhaps it is time to bring back the that campaign. Radio, cable networks, social media and newspapers have public service components. These important public education networks can to remind us again that not all trash is beautiful and that the litterbug villains are no longer welcome to trash the world around us.

It is time to recycle that message.

Ellen Moyer
Annapolis, MD



Rubbish accumulation in public places sends a clear message that despite waste management efforts, we are losing the war against trash.
(Dave Harp)

LETTERS TO THE EDITOR

Don't just be a tree-hugger; our forests need no-net-loss heroes

Marylanders have an exciting opportunity right now to stake a claim in protecting our forested land. To protect the health and well-being of generations to come, we must pass the “No Net Loss” bill of the Maryland Forest Conservation Act.

A lone tree can remove an average of 48 pounds of carbon dioxide from the air each year, but a forest of trees has a far greater impact on the air we breathe, water we drink, and the temperature we feel. Maryland’s forests are responsible for removing thousands of metric tons of pollutants from our air and water supply each year — an estimated ecosystem value of tens of billions of dollars — all while providing a space for exploration, education and enjoyment.

Currently, the state of Maryland touts a goal to maintain its level of “40 percent of the state covered in tree canopy.” The operative word here is “canopy.” The Forest Conservation Act’s “No Net Loss” bill would change this wording to “40 percent of the state covered in forest

land.” As an English-major-turned-urban-forester in the city of Baltimore, I can see how people get lost in these semantics, but I can assure that this change is essential to the health of our state and its residents.

Tree canopy typically reflects the individual trees that form a connected buffer to shade and cool our streets during increasingly hot summer months. It is essential in its own right: At the same time of day during a heat wave last summer, some neighborhoods in Baltimore city faced temperatures that were 16 degrees hotter than other neighborhoods. This incredible public health disparity, called the urban heat island, is largely dependent on the tree canopy that protects residents from the dangers of extreme heat.

Forested land encompasses more than just the tree canopy — it reflects a full ecological system that significantly filters and cleans our air, supports a diverse wildlife habitat, prevents the extremity of devastating floods (like the “thousand-year floods” that occurred twice in two

years in Ellicott City), and reduces the runoff of pollution into our waterways. Forests are environmental powerhouses.

Without trees, our quality of life diminishes greatly. And without the forests that contain them, our state suffers from the current and impending costs of climate change on our health, agriculture and economic infrastructure. “No net loss” means far more than maintaining 40 percent forested land — it also means

no net loss of the priceless services our forests provide.

Maryland can define its role in protecting our status of 40 percent forested land and be a nationwide example of what it means to truly prioritize the land that serves us so readily.

Sheila McMenamin
Director of Programs
Baltimore Tree Trust
sheila@baltimoretreetrust.org

LET US KNOW

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

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

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



VOLUNTEER OPPORTUNITIES

Irvine Nature Center

Irvine Nature Center in Owings Mills, MD, needs *Weekend Weed Warriors*, ages 14 & older, to remove oriental bittersweet and multiflora rose May 11 & 25 and June 1, 15 & 29. Training and tools are provided. Wear sturdy shoes that can get wet/muddy and bring water and nonrefrigerated snacks or a lunch. Meet at the main entrance. Info, including hours: 443-738-9230, fertigb@explorenature.org.

Help out at CBEC

The Chesapeake Bay Environmental Center in Grasonville, MD, has a variety of volunteer opportunities for those who want to drop in a few times a month to assist with a project or event, or help out on a more regular basis. Volunteers are needed to help with educational programs, such as *School's Out* and *Summer Camp*, early childhood education such as *Creepy Crawler*, and guided kayak trips or hikes. Help staff the front desk of the visitor center. Lend a hand with trail maintenance, landscape projects, landscaping, mowing, maintaining the Pollinator Garden. Consider becoming a feeder or handler of CBEC's captive birds of prey. Help maintain birds' living quarters. Participate in the team of wood duck box monitors or other initiatives to support wildlife. Or, take part in fund-raising events as well as behind-the-scenes operations, including website development, writing for newsletters and events, developing photo archives and supporting office staff. Volunteers donating more than 100 hours of service per year receive a complimentary 1-year family membership to CBEC. Info: volunteercoordinator@bayrestoration.org.

Atlantic white cedar planting

The National Aquarium's Conservation team, The Nature Conservancy and the Chesapeake Bay Trust need volunteers to plant Atlantic white cedar trees, a vulnerable species in Maryland, 9 a.m.–2 p.m. March 30 at Nassawango Creek Preserve in Snow Hill. Participants must be 10 or older (17 & younger w/ a supervisory adult). Preregistration is required. The cleanup takes place rain or shine; dress for the weather. Register at aqua.org/conservation-events. Info: 410-576-1068, conserve@aqua.org.

Watershed Stewards Academy

Learn how to become a *Harford County Master Watershed Steward* at an information session 6–7 p.m. May 14 at the McFaul Activities Center in Bel Air, MD. Stewards become leaders in their community, helping to improve the health and function of local streams

and the Chesapeake Bay. There is no registration for this free event. Info: bit.ly/WatershedStewards, 410-638-3217 x2448 or wsa@harfordcountymd.gov.

Masonville Cove cleanup

The Aquarium Conservation Team needs cleanup volunteers 9:30 a.m.–12:30 p.m. April 13 at the Masonville Cove Environmental Education Center in Baltimore. Participants, who must be 10 or older (17 & younger w/ a supervisory adult), will remove harmful marine debris from the center's shoreline. Debris data collected will be used by Project Clean Stream, an initiative coordinated by the Alliance for the Chesapeake Bay. Preregistration is required. Info: Andrea@avanwyk@aqua.org, 410-576-1079.

York County (PA) Parks

Upcoming volunteer opportunities in York County (PA) Parks include:

☞ *NestWatch*: March to August. Various parks. Become a certified Nestwatcher in the Cornell Lab of Ornithology's nest monitoring program. Visit boxes about twice a week in the breeding season to check on the progress of nesting birds. This long-term citizen science project helps track trends in bird populations, environmental health.

☞ *Earth Day Service Project / Garlic Mustard Pull*: 1–4 p.m. April 27. Nixon Park, Jacobus. Learn about this invasive weed then hit the trails in teams or individually to remove it. Return to center 3–4 p.m. to taste dishes containing garlic mustard. Good for Scout service projects. Registration is required for both projects. Info: 717-428-1961.

Little Paint Branch Park

Help the Maryland-National Capital Park and Planning Commission remove invasive species 11 a.m. to 3 p.m. the last Saturday in April, May and June at Little Paint Branch Park in Beltsville. Learn about native plants. Sign in for a safety orientation. Gloves and tools are provided. Info: Marc.lmly@pgparks.com, 301-442-5657.

Cromwell Valley Park

Cromwell Valley Park in Parkville, MD, needs volunteers for:

☞ *Earth Day Celebration*: 1–3 p.m. April 20. All ages. Learn how important the Earth is to human beings. Help plant a pawpaw forest to reduce carbon dioxide. Bring a trowel if possible. Free. Preregistration required.

☞ *Habitat Restoration Team / Weed Warrior Days*: 2–4 p.m. April 20, 24 & 27 and May 4, 8, 11, & 15. All ages (12 & younger w/adult). Remove invasive species, plant native ones, maintain habitat. Service hours available. Meet at Sherwood House parking lot. Preregistration required. Info: ltmitchell4@comcast.net.

Adopt-a-Stream program

The Prince William Soil & Water Conservation District in Manassas, VA, wants to ensure that stream cleanup volunteers

WORKDAY WISDOM

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

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

have all of the support and supplies they need for trash removal projects. Participating groups receive an Adopt-A-Stream sign in recognition of their stewardship. Adopt a stream or get a proposed site. Info: waterquality@pwsacd.org. Groups can register their events at trashnetwork.fergusonfoundation.org.

Magruder Woods

Help Friends of Magruder Woods 9 a.m. to 1 p.m. the third Saturday in April, May and June remove invasive plants in the forested swamp in Hyattsville, MD. Meet at farthest end of parking lot. Info: Marc.lmly@pgparks.com, 301-283-0808, (301-442-5657 the day of event); or Colleen Aistis at 301-985-5057.

American Chestnut Land Trust

The American Chestnut Land Trust in Prince Frederick, MD, needs volunteers for invasive plant removal workdays 9–11 a.m. Thursdays and 10 a.m. to 12 p.m. Wednesdays. All ages (16 & younger w/ adult) are welcome. Training, tools and water are provided. Preregistration is required. Info: actweb.org, 410-414-3400, landmanager@actweb.org.

Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation 10 a.m. to 4 p.m. the second Saturday in April, May and June remove invasive plants at Ruth Swann 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 the Sierra Club MD Chapter office at 9 a.m. and return at 5

p.m. Carpool info: 301-277-7111.

Creek Critters App

Audubon Naturalist's *Creek Critters App* empowers people to check on their local streams' health through finding and identifying the small organisms that live in freshwater streams, then generating stream health reports based on what they find. The free app can be downloaded from the App Store and Google Play. Info: anshome.org/creek-critters. To learn about partnerships or host a Creek Critters event: cleanstreams@anshome.org.

Tree planting events

Volunteers are needed to help plant trees 9–11 a.m. April 13 in Walkersville, MD, and April 27 in Frederick, MD. Info: streamlinkededucation.org/plantings, lisa.streamlink@gmail.com.

Eden Mill

Eden Mill Nature Center in Pylesville, MD, invites volunteers, ages 5 & older, to help on its *Plant Invaders* workdays, 1 p.m. May 1 & 9:30 a.m. May 25. Participants will learn about native and invasive plants, then remove invasive plants. Preregister 24 hours in advance. Info: edenmillnaturecenter@gmail.com.

Occoquan River cleanup

Prince William Trails and Streams Coalition's *Ninth Annual upper Occoquan River Cleanup* takes place 9 a.m. to 2 p.m. April 20 (rain date 4/27), at nine sites along the Occoquan River, ranging from Cedar Run/Broad Run, through Lake Jackson, and from the base of Lake Jackson Dam to Hooes Run. Experienced kayakers, canoeists, jon boaters and pontoon boaters are needed for this on-the-water effort. Some kayaks and canoes will be available for loan. Info: pwtsco.org. To register: whmccarty101@gmail.com, 571-379-7514, waterquality@pwsacd.org. This effort is part of the Alice Ferguson Foundation's Potomac River Watershed Cleanup (fergusonfoundation.org).

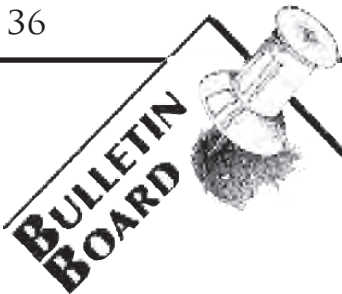
RESOURCES

5 MD libraries offer fishing gear

The Maryland Department of Natural Resources' Aquatic Resources Education Program is providing rods and reels, tackle and fishing books geared toward children to the Eastport-Annapolis Neck Community Library and Mountain Road Community Library in Anne Arundel County; Westminster Branch Library in Carroll County; Brunswick Branch Library in Frederick County; and Joppa Branch Library in Harford County. The libraries, which are close to public fishing areas, have partnered with local fishing clubs to ensure inventory levels and maintenance of the equipment.

Potomac paddle-in camping sites

The Maryland Department of Natural Resources and National Park Service last fall enhanced paddle-in camping



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opportunities in Southern Maryland along the Potomac River with enhancements at Point Lookout State Park and Newtowne Neck State Park, both located in St. Mary's County. At Point Lookout, amenities and infrastructure were upgraded at 15 existing campsites. These campsites are close to the shore and near existing piers with floating dock facilities for canoes and kayaks. At Newtowne Neck, two primitive paddle-in campsites were added along trails through the property's forests and meadows. Info: Enter Point Lookout State Park or Newtowne Neck State Park into search engine.

FORUMS / WORKSHOPS

MD stream survey training

The Maryland Department of Natural Resources is offering training and certification in Maryland Biological Stream Survey sampling protocols May 28–31 at Howard County Community College in Columbia. Participants will learn about and be tested on benthic macroinvertebrate/fish sampling methods, physical habitat assessment, fish taxonomy and how to be a crew leader. Sessions are intended for professionals but are open to anyone. The registration deadline is May 1. The fees are \$250 for all four days or \$100 per single day. Info: Enter Maryland Biological Stream Survey into search engine.

EVENTS / PROGRAMS

Boating safety classes

U.S. Coast Guard Auxiliary Flotilla 25-08 is offering *Boating Safety* classes 7:30 a.m.–5 p.m. April 13, May 18 and June 15 at the Washington Farm United Methodist Church in Alexandria, VA. Learn about boat handling, regulations, nautical rules of the road, trailering and required gear. Preregistration is required. Info: jdburt@verizon.net, 703-307-6482. The auxiliary's website, www.uscgaux.info/content.php?unit=B-DEPT, also features boating safety tools and materials.

CBL spring seminars

Learn about *Training the Future Face of Science, Technology, Engineering, & Math (STEM)* at the University of Maryland Center for Environmental Studies' Chesapeake Biological Laboratory's Science for Citizens seminars, which take place 7–8 p.m. in the CBL Bernie Fowler Lab in Solomons, MD. Upcoming seminars are:

☞ *Embracing Uncertainty - From Scientist to Entrepreneur*: April 16. Recent CBL graduate Suzan Shahrestani will discuss her journey from student to start-

up founder.

☞ *PlasticWatch - Reducing Plastic Waste on Solomons Island*: April 23. CBL scientists and Solomons Island restaurants are teaming up to reduce single-use plastics, plastic pollution. Associate Research Professor Helen Bailey will describe the project, how to help.

Admission is free. Seating is first-come, first-served. Info: bit.ly/Science4Citizens.

Fly Fishing for Women

The Donegal Chapter of Trout Unlimited is offering *Introduction to Fly Fishing for Women* 1–4 p.m. April 27. Participants at this free event will brush up on their skills or learn basics of fly fishing: casting, fly-tying, equipment, aquatic insect identification, knot-tying and the TU conservation mission. Info, including location: 717-368-9741, pwilliams@donegaltu.org.

Native bees of Maryland

The Chesapeake Audubon Society invites the public to *An Introduction to Maryland's Native Bees*, a presentation by Sam Droege of the Patuxent Wildlife Research Center at 6 p.m., April 27 at St. Bartholomew's Church in Baltimore. The discussion includes high-definition photographs of the state's 450+ bee species as well as how to use binoculars when bee watching. Fee of \$10 includes spaghetti dinner. Info: 443-423-1847.

Choptank River talk

The University of Maryland's Center for Environmental Studies' Horn Point Laboratory in Cambridge, MD, invites the public to *Good news for the Choptank: Improving Water Quality in the Estuary!* 5:30–6:30 p.m. April 29 at the Easton Branch of Talbot County Library. Tom Fisher's presentation will discuss that while the Choptank estuary station near the U.S. Route 50 bridge is showing improvements in water quality primarily because of upgrades in wastewater plants in the Choptank Basin, that is not the whole picture. Learn about the many factors impacting improvements in the estuary's water quality. The free presentation is part of *Science After Hours with Horn Point Laboratory*, which helps to make the science of the Chesapeake Bay accessible. Register online: usmf.org/events/41118-science-after-hours. Info: 410-221-8408, cstarr@umces.edu.

Manada Conservancy

Upcoming events offered by Manada Conservancy include:

☞ *Backyard Pollinator Habitat*: 7 p.m. April 24 at Grace United Methodist Church in Hummelstown, PA. Ryan Davis, Pennsylvania Forests Program manager for the Alliance for the Chesapeake Bay, will discuss native pollinators, from their biology to ways to improve property to give these beneficial insects a home. Free. Preregistration required.

☞ *19th Annual Spring Native Plant Sale*: 10 a.m.–3 p.m. May 4 at Schaffner (Boro) Park in Hummelstown, PA. Native perennials, trees, shrubs grown by Manada, regional vendors. Nature-themed art

vendors, live music, refreshments. Shop online for early purchases through April 15.

Info: office@manada.org, manada.org, 717-566-4122.

CBMM decoy talk, boat sale

Upcoming events at the Chesapeake Bay Maritime Museum in St. Michael's, MD, include:

☞ *Deconstructing Decoys - The Culture of Collecting*: Exhibit runs April 13 through Nov. 1. Learn what makes a decoy collectible, how collectors study a decoy to determine its maker, history, significance. The exhibition is free with general admission. Info: cbmm.org, 410-745-2916.

☞ *Spring Boat Sale*: 10 a.m.–4 p.m. April 14. More than 50 craft, from luxury boats to dinghies, are for sale. All offers will be considered. Titling will be done on site. Discounted two-day admission will be offered to guests on the day of the sale: \$10/adults; \$7/ages 65+, retired military, students w/college ID; \$3/ages 6–17; free/ages 5 & younger, active military w/ID. CBMM accepts and sells donated boats year-round, with proceeds benefitting the museum's education, restoration, exhibition programs. To preview boats: cbmm.org/boatdonation. Other queries: boatdonation@cbmm.org.

Managed Aquifer Recharge

The Chesapeake Environmental Protection Association invites the public to a free forum, *The Future of Sustainable Water Supply in Anne Arundel County & Southern Maryland* at 7–9 p.m. May 10 at Anne Arundel Community College's CALT Building in Arnold, MD. Learn how *Managed Aquifer Recharge*, which involves purified wastewater being injected into aquifers, can address: aquifer sustainability, meeting Bay Total Maximum Daily Load-mandated requirements, ineffective and failing septic fields, and aquifer saltwater intrusion. A representative from the Hampton Roads, VA, Sanitary District, which is operating a demonstration plant, will discuss their experience. The other speaker, Chris Phipps, Anne Arundel County director of

NEW SUBMISSION GUIDELINES

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

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

☞ *Bulletin Board* contains events that take place (or have registration deadlines) on or after the 11th of the month in which the item is published through the 11th of the next month. Deadlines run at least two months in

advance. See below.

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

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

☞ **May issue: April 11**

☞ **June issue: May 11**

public works, has been leading an effort to evaluate the practicality of managed aquifer recharge for the county. A question & answer session takes place after their presentations. Registration is not required. Info: garyanto@verizon.net, altucker@cepaonline.org.

Backyard Chicken Keeping

The Maryland Agricultural Resources Council is offering *Intro to Backyard Chicken Keeping* at 6 p.m. April 23 at the Baltimore County Agricultural Center in Cockeysville. Attendees will learn about the steps, equipment, time and money needed to raise layer hens and how chickens can be a form of integrated pest management. The fee is \$20. Info: marylandagriculture.org/intro-to-backyard-chicken-keeping, 410-887-8973.

Cromwell Valley Park

Upcoming programs at Cromwell Valley Park's Willow Grove Nature Center in Parkville, MD, include:

☞ *Bird Walks*: 8–10 a.m. Saturdays through May 25. Meet at Willow Grove Farm gravel parking lot.

☞ *Children's Garden Club*: Meets about twice a month 9:30–11 a.m. Saturdays, April 13 to Oct. 19 in the Children's Garden. Ages 5 to 13 w/adult. Grow vegetables, flowers, herbs; explore a garden's natural world. Participants play, learn, craft, eat food they grow themselves. Only registered children attend (no siblings). Fee: \$45 includes all sessions. Registration for this program must be done online.

☞ *Polliwog Preschool Club*: 10:30–11:30 a.m. Tuesdays, April 16 to May 21 or Wednesdays, April 17 to May 22. Ages 2–5 w/adult. Explore the natural world through nature play, stories, crafts. Non-mobile siblings only, parent/guardian is an active participant. Dress for outdoors. Fee: \$80 for 6 sessions. Registration for this program must be done online.

☞ *Garden Club*: 8:30–10:30 a.m. Thursdays, April 18 to Oct. 24. Meet at



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Children's Garden at Willow Grove Farm. Ages 18+ Like to garden but don't have the space? Meet twice a month to grow vegetables, herbs, flowers; tend to community plots. Seeds, seedlings provided. Share recipes. Fee: \$45 for all sessions.

☞ **Full Fish Moon Hike & Campfire:** 8–9:30 p.m. April 19. Ages 5+ Fish migrate through the park's waterways to spawn in April. Take an aquatic hike, then eat s'mores around a campfire. Shoes or boots will get wet. Fee: \$4.

☞ **Easter Sunday Self-Guided Trail Trek:** 11 a.m.–3 p.m. April 21. All ages. Pick up a booklet at the center, set off on a self-guided hike, return to the center for a prize. Meet a special guest bunny. Free; no registration.

☞ **Garlic Mustard Pull & Pesto:** 1–2:30 p.m. April 27. Ages 5+ Pull this invasive weed, then learn how to make garlic mustard pesto. Fee: \$5.

☞ **Girl Scouts Day:** 1–3 p.m. April 28. Ages 5–11 (Daisies, Brownies, & Juniors) Meet animals, explore their natural habitat. Participants receive a Cromwell Valley Park patch. Fee: \$5.

☞ **Primitive Technology Weekend:** 10 a.m.–4 p.m. May 4 and 10 a.m.–1 p.m. May 5. Willow Grove Farm. All ages. Hands-on experience replicates items composed of stone, bone, wood, natural fibers. Free; no registration.

☞ **Night Out with Nature / Backyard Gardening to Save the Bay:** 7–9 p.m. May 10. Meets at Sherwood House. Adults. Deborah Bacharach of Baltimore County Master Gardeners will discuss how mowing, mulching, watering, fertilizing and planting affect the health of the Bay, environment. Learn about Bay Wise practices. Fee of \$10 includes dessert.

☞ **Orioles - Neo-Tropical Migrants:** 11 a.m. to 1 p.m. May 11. All ages+ Look for an oriole's nest, listen for its song. Bring binoculars. Free.

Programs take place at the Willow Grove Nature Center unless noted otherwise. Ages 12 & younger must be accompanied by an adult. Except where noted, preregistration is required for all programs. Info: info@cromwellvalleypark.org, cromwellvalleypark.org, 410-887-2503. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

Oregon Ridge Nature Center

Upcoming programs at the Oregon Ridge Nature Center in Cockeysville, MD, include:

☞ **Bird Walks:** 8–9:30 a.m. April 12 &

May 10. Adults. Bring binoculars, wear shoes for hiking. Free.

☞ **Shoots & Letters:** 10–11 a.m. April 11 (*Aquatic Insects*); April 18 (*Worms*); April 25 (*Earth Day*); May 2 (*Pollinators*); May 9 (*Snakes*). Ages 3+ Outdoor activities. Fee: \$2/child. No registration.

☞ **Turtle-y Awesome:** 1–2:30 p.m. April 13 & 14. Ages 3+ Learn about turtle adaptations, meet resident turtles, explore the park to learn where turtles live, make a craft. Fee: \$3 per child.

☞ **Amphibian Walk:** 2–3 p.m. April 16 & May 21. Ages 10+ Visit the wetlands, listen for calling frogs, toads. Learn about the FrogWatchUSA monitoring effort. Free.

☞ **Garden Growers Club:** 10–11:30 a.m. Tuesdays, April 16 through May 14. Ages 3–5 w/adult. Nonmobile siblings only, adult is an active participant. Learn gardening basics while planting in the Children's Garden. \$20 fee includes all 5 sessions.

☞ **Wicked Big Puddles Hike:** 7–9 p.m. April 19. Ages 5+ Explore the pond, vernal pools searching, listening for calling amphibians. Fee: \$4.

☞ **Homeschool Nature Days / Remarkable Reptiles!** 10–11:30 a.m. or 1–2:30 p.m. April 26, May 3, 10 & 17. Ages 6–13 Parents welcome, no siblings. Learn about the center's native reptiles. \$20 fee includes all 4 sessions.

☞ **Earth Day Scavenger Hunt:** 10 a.m.–3 p.m. April 27. All ages. Follow clues on drop-in self-guided hike to learn how to care for the Earth. Moderately difficult hike may take 60–90 minutes. Return to center to check answers, claim prize. Fee: \$2. No registration.

☞ **Bookworm Story Time:** 11–11:45 a.m. May 3. Toddlers to age 6. Nature story w/ storyteller's choice of an activity (animal encounter, puppets or craft). May include outdoor experience. Free. No registration.

☞ **Senior Stroll:** 10:30 a.m. April 20, May 4. Adults. Take a stroll along the Marble Quarry Loop, a paved, 0.3-mile interpretive trail. Stay for a guided reflection activity. Free.

☞ **Wildflower Walk:** 10 a.m.–12 p.m. April 28. Ages 8+ Look for spring ephemerals, learn their lore on easy-moderate hike. Fee: \$3.

☞ **Cane Pole Fishing:** 10 a.m.–12 p.m. May 4 & 5. Ages 5+ Fish for bluegill, largemouth bass with cane poles, worms (provided). Ages 16+ must have a valid MD fishing license to participate in this catch and release program. Fee: \$5/person fishing.

☞ **Native Plant Swap:** 1–3 p.m. May 11. All ages. Bring extra perennials to trade with others in this drop-in event. Identification resources available. Free, no registration.

Ages 16 & younger must be accompanied by an adult. Except where noted, preregistration is required for programs and payment must be made within five business days of registration. All programs take place rain or shine. Programs are designed for individuals and families, not groups. To arrange a program for a group,

contact the park office. Info: 410-887-1815, info@OregonRidgeNatureCenter.org. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTD/Deaf), giving as much notice as possible.

Irvine Nature Center

Upcoming events at Irvine Nature Center in Owings Mills, MD, include:

☞ **Tales & Tails - Danny Joe's Treehouse:** 10–11 a.m. Fridays. All ages. Story, songs, puppet show, animal encounter. Free.

☞ **Day Off Camps:** 8:30 a.m.–4 p.m. (Aftercare, 4–6 p.m.) April 16 (*Into the Deep Blue*); April 22 (*Pollinator Power*); June 5 (*Aquatic Adventures*). Age groups: 5–7 and 8–10. No school? Children can explore outdoors (even if there is snow), expect trail walks, nature games, crafts, stories, animal encounters. Wear nature-friendly clothing, bring a lunch. Fee: \$85. Aftercare is an additional fee.

☞ **White Swans & Sauvignons:** 6:30–9 p.m. April 18. Adults. Learn about Maryland's three swan species. Fee: \$55.

☞ **City Nature Challenge:** 9 a.m. to 5 p.m. April 27 & 28. Join Irvine and the National Aquarium for this year's City Nature Challenge in Baltimore City and County. Find wildlife, take a picture, share observations on the iNaturalist App. Free. A naturalist challenge walk offered at 12–2 p.m. April 28 is \$10.

☞ **Outdoor Adventures:** 9–11 a.m. April 27, May 19 & June 9. Ages 7–12. Outdoor skills, science projects, spring discoveries. Work as a team to explore, respect, protect nature. Fee: \$25/session.

☞ **Overnight Adventure / Appalachian Trail's Harper's Ferry Section:** 8 a.m. April 27 to 12 p.m. April 28. Ages 14+ Participants must have all their own gear. Irvine Bus Transportation included on first-come, first-served basis. Fee: \$175.

☞ **Wildflowers & Wildlife:** 12–1:30 p.m. April 30. Adults. Learn about animals that depend on native wildflowers, the ways they interact. After lunch (provided), stroll through the Woodland Garden. Fee: \$20.

☞ **Spring & Summer Intern Symposia:** 10 a.m.–12 p.m. May 3. Learn about Irvine's internships for college, high school students. Light refreshments. Applications for summer & fall 2019 internships are being accepted. Info: Ben Fertig: fertigb@explorenature.org.

☞ **Mud Painting:** 12–1:30 p.m. May 4, 11. All ages. Take a short hike to collect mud, natural materials to create art. Fee: \$10.

☞ **Plantastic Mother's Day Gifts:** 12–1 p.m. May 5. Families. Learn about the best wildflowers for butterflies, fill a pot with wildflower seeds. Fee: \$10/families.

☞ **Feathers, Scales & Tails in Focus:** 9–10:30 a.m. May 11 & June 1. Adult professional, amateur photographers. Photograph Irvine's Animal Ambassadors up close. Learn tips on wildlife photography, then go outside for a field study. Fee: \$10.

☞ **HOOT-enanny!** 1–3, May 19. All ages. Join Hoot the Owl to celebrate spring. Sneak preview of the butterfly house, scavenger hunt, spring treats. Fee: \$5.

Preregistration is required for each program; payment is required at time of registration. Info: ExploreNature.org, 443-738-9211.

Ladew Topiary Gardens

Upcoming events at Ladew Topiary Gardens in Monkton, MD, include:

☞ **The Healing Power of Nature:** 10:30 a.m.–12:30 p.m. April 13. Ages 16+ Heidi Schreiber-Pan, who has studied the connection between one's well-being and nature, will discuss how nature impacts human resilience and overall mental health, and the role of spirituality in this relationship. Explore the Nature Walk after her indoor presentation. Fee of \$30 is required when preregistering and includes admission to Ladew. Info: 410-557-9570 x213, smyers@ladewgardens.com.

☞ **Renewal of the Blue Garden in Newport, RI:** 10:30 a.m. April 17. The Blue Garden, designed by Frederick Law Olmsted Jr., opened in 1918, it was famous for its architectural and horticultural riches. By the 21st century it had become subsumed under a thick covering of weeds and invasive trees. Sarah Vance will discuss how the restoration team used archived materials from the garden's creators to reinterpret and rebuild the garden using contemporary sustainable standards. Fee: \$35. Preregistration recommended.

☞ **Little Explorers Nature Preschool / Rotting Log:** 10:30–11:30 a.m. or 12:30–1:30 p.m. April 24. Ages 2–6 w/ adult. Explore the tiniest critters under a log. Nature walks, stories, songs, nature ABCs and 1,2,3s. Fees (per session): \$18/child & adult pair; additional siblings \$6 each. Fee includes admission to the gardens, and nature walk. Preregistration recommended.

Info: LadewGardens.com, 410-557-9570.

CBEC events

Upcoming events at the Chesapeake Bay Environmental Center in Grasonville, MD, include:

☞ **School's Out Camp / Egg-stravaganza:** 9 a.m.–3:30 p.m. (after-care available until 5 p.m.) April 19. Activities include hands-on environmental education lessons & games, hiking, exploring the woods, arts & crafts, healthy snacks. Participants should dress for the weather (bring layers & a change of clothes in case they get muddy). Pack a lunch, water bottle. Details will be sent in an email to all registrants 1–2 days before the camp. Fee: \$45. After-care an additional \$10. Info: knelson@bayrestoration.org. Register: bayrestoration.org/schools-out-camp.

☞ **Critters & Cocktails / Vultures - The Face Only a Mother Could Love:** 6:30–8 p.m. April 24. Jean-Francois Theirrien will dispel myths about the misunderstood vulture and its quirky behaviors. He will also review recent results from Hawk Mountain Sanctuary's research



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on vultures worldwide. Refreshments, beverages served at 6:30 p.m. The presentation runs 7–7:45 p.m. Fee: \$15. Registration required. Info: bayrestoration.org/speaker-series.

☞ *Guided Kayak Tour*: 10 a.m.–12 p.m. May 5. Beginner to intermediate kayakers. Explore Marshy Creek's watershed while looking for wildlife. Instruction on equipment, paddling/safety techniques, loading/unloading the vessels included. Cost of \$20 per person includes kayaks, equipment. Preregistration is required. Info: bayrestoration.org/guided-kayak-tours.

MD youth fishing rodeos

The MD DNR Fishing & Boating Services and partners in local communities are running free Youth Fishing Rodeos for ages 3–15. Participants learn basic angling skills; develop an understanding of the environment and natural resources; and have an experience that fosters interest in conservation and fishing. The DNR helps raise and supply thousands of hybrid sunfish, channel catfish and rainbow trout for this year's fishing rodeos with support from the U.S. Fish and Wildlife Service and Sport Fish Restoration Program. Because of space limitations, would-be attendees should call the contact at each venue to register. Upcoming rodeos include:

☞ *High Point Pond / Harford County*: 7 a.m. April 20. Info: Mary Beth O'Bryan / Ecotone, Inc., 410-346-518

☞ *Westminster Community Pond / Carroll County*: 8 a.m. April 28. Info: Loren Lustig / Carroll County Parks & Recreation. 410-386-3705.

☞ *John Carroll High School / Harford County*: 11 a.m. May 4. Info: Bob Wall / Churchville Recreation Council, 410-245-0854.

☞ *Rising Sun / Cecil County*: 8 a.m. May 5. Info: Joy Melton / Rising Sun Chamber of Commerce, 410-658-5353.

☞ *St. Mary's River / St. Mary's County*: 8:30 a.m. May 12. Info: Will James / St. Marys River State Park, 301-872-5688.

York County (PA) parks

Upcoming programs at York County (PA) Parks include:

☞ *Boardwalk Bird Walk*: 8:30–10:30 a.m. April 14. Kain Park, York, Meet at Hess Farm Road parking lot. Hike to the boardwalk to view early spring migrants and migrating water birds. Take a slow-paced half-mile walk on a woodland trail along the lake's edge. Lending binoculars available. Preregistration required.

☞ *Sunset Scramble Bike Ride /*

Heritage Rail Trail: 6:30–8:30 p.m. April 16. (Meet at Brillhart Station, York); April 23 (Meet at Glatfelter Station, Seven Valleys); April 30 (Meet at Seven Valleys parking lot). Ride a 13– to 15-miles round trip. Group determines the pace. Light, helmet, water required. Snack money is optional.

☞ *Moonlight Bike Ride / Heritage Rail Trail*: 8:30–10:30 p.m. April 20. Meet at Hanover Junction. Ride about 9 miles. Bring bike, light, helmet.

☞ *Meet Nixon Park's Live Reptiles*: 12:30–3:30 p.m. (drop-in program) April 21. Nixon Park, Jacobus.

☞ *Native Plants Drop-in Program*: 9 a.m.–4 p.m. April 27 & 12–4 p.m. April 28. Nixon Park, Jacobus. Visit self-serve stations to learn benefits of planting native species. Pick up information on species, where to shop.

☞ *Spring Wildflowers*: 2:30–4 p.m. April 28. Nixon Park, Jacobus. Look for wildflowers.

Except where noted, programs do not require registration. Info: 717-428-1961.

Anita Leight Estuary Center

Programs at the Anita C. Leight Estuary Center in Abingdon, MD, include:

☞ *Bluebell Hike*: 11 a.m.–12:30 p.m. April 13. Ages 6+ Meet at Gunpowder State Park. Look for signs of spring. Free.

☞ *How to Attract Birds to Your Backyard*: 9–11 a.m. April 13. Ages 8+ Learn to manage plants to complement feeders, food to attract birds. Hike to view birds, habitats, food supplements. Free.

☞ *Full Moon Kayak*: 7:30–10 p.m. April 19. Ages 10+ (16 & younger w/adult) Paddle the creek from Leight Park to the marsh & back. Fee: \$12.

☞ *Marsh Appreciation Pontoon*: 9:30–11 a.m. April 20 Ages 2+ Look, listen for signs of spring. Fee: \$10.

☞ *Osprey Adventure*: 3–4:30 p.m. April 20. Ages 8. Hike to spy on the park's osprey couple, their nest. Fee: \$3.

☞ *Kayak Cruising on the Creek*: 10 a.m.–12:30 p.m. April 25. Adults. Explore nooks, crannies of Otter Point Creek and upper Bush River. Fee: \$12.

☞ *Earth Day 2019 Celebration at Aberdeen Festival Park*: 11 a.m.–4 p.m. April 27. All ages. Live music, native animals, exhibits, games, recycled crafts, local food. Stop by the Center's booth for face painting. Free; no registration.

☞ *Critter Dinner Time*: 10:30 a.m. April 27. All ages. Learn about turtles, fish, snakes while watching them eat. Free. No registration.

☞ *Children's Garden Club*: 1–2 p.m. April 27. Ages 5–8 w/adult. Cook, create, explore while learning how a garden is connected to the wild world. Fee: \$5.

☞ *Marsh Meander Canoe*: 2–4:30 p.m. April 27. Ages 8+ Canoe on the winding channel of Otter Point Creek as it travels through marsh and swamp. Fee: \$12.

☞ *Night Froggin' Fun*: 7:30–9 p.m. April 27. Meet at Bosely Conservancy. All ages. Traipse through wetlands to search for frogs. Wear boots that can get

wet. Fee: \$3.

☞ *Meet a Critter*: 2:30 p.m. April 28. All ages. Meet a live animal up close, learn what makes it special. Free. No registration.

Ages 12 & younger must be accompanied by an adult for all programs. Events meet at the center and require preregistration unless otherwise noted. Payment is due at time of registration. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

Patuxent Research Refuge

Upcoming programs at the Patuxent Research Refuge's North Tract [T] and National Wildlife Visitor Center in Laurel, MD, include:

☞ *Introduction to Birding*: 9–10 a.m. April 12. [T] Ages 10+ Learn how to find, identify birds. Binoculars provided.

☞ *Bird Walk at Cash Lake*: 8–10 a.m. April 13. [C] Ages 5+ (parent participation required) Take a 2-mile leisurely bird walk around Cash Lake searching for and identifying birds. Walk is weather-dependent. Water bottle, binoculars recommended. Walk is *not* stroller-friendly.

☞ *BSA 10+ Mile Hike*: 9 a.m.–4 p.m. April 13 (15 miles) & 27 (20 miles). [T] Do two of the hikes required for the Scouts BSA Hiking Merit Badge.

☞ *Turtle Time*: 10–10:45 a.m., April 13. [C] Ages 4+ Meet a painted turtle. Learn about its habitat, diet, what to do if you encounter one.

☞ *Meet the American Kestrel*: 12:15–12:45 p.m. April 13, 20, 27. [C] All ages. Meet this tiny bird of prey, learn how to protect their homes. Drop-in program, no registration.

☞ *Bird Walk*: 8–10 a.m. April 17. [C] Ages 16+ participation). Search for spring migrants in various habitats. Binoculars recommended.

☞ *Family Fun / Spring Fling!* 10 a.m.–1 p.m. April 26 & 27. [C] Hands-on activities, games, crafts for all ages. Drop-in program. No registration.

☞ *North Tract Bicycle Ride*: 1–3:30 p.m. April 28. Ages 10+ Learn the importance of reducing one's footprint & leaving no trace on 12-mile guided ride. Discover local wildlife, plants, historical sites. Bring bike, energy bar/snack, water bottle, helmet. Ride is weather-dependent.

☞ *Nature Tots / Flutter Friends*: 10:30–11:30 a.m. April 30. [C] Ages 3–4. Learn about butterflies through songs, crafts, stories.

All programs are free; donations are appreciated. Except where noted, programs are designed for individuals/families and require preregistration. Contact: 301-497-5887. For disability-related accommodations, notify the refuge, giving as much notice as possible. Info: fws.gov/refuge/Patuxent.

MARC Farm Sprouts

The Maryland Agricultural Resource Center invites children, ages 5 & younger and their parents to its *Farms Sprouts* programs, *Welcome to the Farm*: Hay vs.

Straw on April 26 and *Flowers* on May 3 at the Baltimore County Agriculture Center in Cockeysville. Each class features movement, stories and arts & crafts. Participants must choose between two sessions: 9:45–10:45 a.m. or 11:30 a.m. to 12:30 p.m. The fee for children ages 9 months and older is \$8 per workshop. Parents are free. (If financial constraints prevent someone from attending, contact MARC to see if arrangements can be made.) Preregistration is required; no walk-ins. Info: info@marylandagriculture.org.

Eden Mill Nature Center

Upcoming programs at Eden Mill Nature Center in Pylesville, MD, include:

☞ *Adult Hiking Series / Hiking 101*: 1–2 p.m. April 16. Ages 18+ Hiking games, learn about essential items to bring on every hike, look for animals that have come out of hibernation. Fee: \$3.

☞ *Child & Adult Paint Afternoon / Spring Bird*: 3–5 p.m. April 18. Ages 5–10 w/adult. Child & adult each complete a 14"x 18" acrylic painting on canvas with instruction provided throughout event. Fee: \$50 per pair.

☞ *Nature Storybook Art for Homeschoolers / Native American Themes*: 12:30–2:30 p.m. April 24, May 1 & 8. Ages 6–12, parents do not attend. Learn about books, illustrators, art techniques such as drawing, painting, collage, crafting/constructing. Fee: \$44 for the month.

☞ *Critter Dinner Time*: 1–2 p.m. April 20, May 4 & 18. Ages 5+ Learn about, help feed some of the center's animals.

☞ *Historic Grist Mill Tour*: 10–11 a.m. April 27. All ages. Fee: \$3.

☞ *Spring Blooms*: 1–2:30 p.m. April 28. All ages. Make a paper seed bomb, sponge sprout. Take a short wildflower hike. Fee: \$5.

☞ *Preschool Nature Series*: 10–11:15 a.m. April 30 (*Seeds of Life*); May 7 (*Slithering Snakes*). Ages 2–5 w/adult. Nature games, story, craft, hike. Fee: \$10 per session.

☞ *Ferns & Fauna*: 10:30 a.m.–12:30 p.m. May 3. Ages 6+ Learn about Eden Mill's plants, animals. Fee: \$3.

☞ *Herpetology Hunt*: 9–10:45 a.m. May 4. Ages 8+ Help catch, catalogue the reptiles, amphibians of Eden Mill. Learn how to identify Maryland's herps. Fee: \$3. Preregister by April 20.

☞ *Nature Storybook Art for Homeschoolers / Creek Life*: 12:30–2:30 p.m. May 15, 22 & 29. Ages 6–12, parents do not attend. Learn about books, illustrators, art techniques such as drawing, painting, collage, crafting/constructing. Fee: \$44 for the month. Preregister by May 1.

Preregistration is required for all programs and closes 24 hours in advance of each program. Weekend program registration closes at noon on the prior Friday. Info: edenmillnaturecenter@gmail.com.

It's time to ruffle feathers again – seek actions to protect birds

By MIKE BURKE

It was April 28, 1988, and I was aboard Amtrak, heading to Washington, DC, to see the Pennsylvania congressman whose re-election campaign I would soon be running. As the train slowly pulled out of the BWI station, I looked out the window at the forested wetlands that border the tracks. A brilliantly white long-legged wading bird stood at the edge of some open water, its imposing yellow bill in profile.

I had just started watching birds in an organized way. Not knowing a heron from an egret, that night I looked up the bird in my new field guide. It was a great egret (*Ardea alba*), and it became one of the first entries on my life list of birds.

Seeing the great egret when and where I did was no fluke. These birds love wetlands of all kinds, from freshwater to estuarine to marine, from forested to riverside to open marsh. This generalist nature has facilitated the recovery of the species from near extirpation in the United States.

From the 1870s to 1910, herons and egrets were slaughtered in vast numbers. Unlike oysters and waterfowl, which were also being devastated, the wading birds were not being harvested for the dinner table. They were being killed for their feathers.

A century ago, beautiful plumes were an essential part of any fashionable woman's hat. The craze lasted for decades and decimated the nation's population of wading birds. The number of great egrets plummeted to less than 5 percent of their 1870 numbers.

The wanton slaughter finally awakened the conscience of many. Organized efforts to save the birds multiplied quickly. The National Audubon Society, formed in 1905, led the legislative effort in 1910 to ban killing birds for the millinery trade. An international treaty protecting the birds soon followed. Legislation putting the pact into action, the Migratory Bird Treaty Act of 1913, also contributed to the heartening recovery of multiple avian species.

The conservation effort — and Audubon — took the great egret as its emblem. The reason is simple: It's a beautiful bird.

Great egrets are easy to identify because of their all-white feathers, yellow bill and black legs. Both sexes look alike, and juveniles look like their parents.

The bird's appearance changes for a short time during breeding season. The bare yellow skin in front of the eyes turns a brilliant lime green, the upper bill becomes dark while the lower bill becomes orange-yellow. The birds also



The bright green fleshy area in front of the eyes is only visible during the great egret's breeding season. This bird was photographed on Wade Island in the Susquehanna River near Harrisburg. (Joe Kosak of the Pennsylvania Game Commission / U.S. Fish and Wildlife Service)



add lovely aigrettes, long lace-like white plumes that gracefully fall off the shoulders.

Except for Antarctica, great egrets can be found on every continent in the world. In the eastern United States, they have established permanent homes from coastal Virginia south through Florida and across the southeastern states.

In spring, some of these egrets migrate north to nest. The largest breeding colony in the Chesapeake watershed is in Maryland, but rookeries are established annually in

percent of their diets. Most prey on minnows and the like, but great egrets can eat surprisingly large fish, too. I remember seeing one use its daggerlike bill to spear a catfish. After carefully shaking loose the mortally wounded fish, the egret tossed the catfish into the air and caught it head-first in its mouth. The outline of the oversized meal was clearly visible in the egret's long white throat as it swallowed the fish whole.

The diet of the great egret is not limited to finfish. It may also include eels, crustaceans, frogs, salamanders, snakes and small mammals.

Aboard the train all those years ago, I knew little about the important role laws played in the recovery of the great egret. In the intervening 30 years, I changed careers from political campaigns to environmental policy. My understanding of the law grew alongside my knowledge of birds. Laws governing the establishment of wildlife refuges, protection for migratory songbirds, recovery of waterfowl, banning of certain pesticides, and many more left me impressed with the breadth and effectiveness of legislative action.

Every time we stand in the woods, beside a river or overlooking wetlands with binoculars in hand and birds in view, we owe a great debt to the laws that make that viewing possible.

But the job is far from finished. Discarded plastic can kill birds as surely as DDT did. Habitat loss of forests and wetlands devastates avian communities just as clear-cutting and marsh filling did years ago. And climate change threatens vastly more birds than the millinery trade did a century ago.

We need to emulate those passionate advocates from 100 years ago who saved the great egret. Birders need to organize and advocate for

new laws that will address these new threats to the objects of our passion. Indeed, the perils are graver now than ever before. Are we up to the challenge?

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



The lace-like aigrettes are only visible during the great egret's breeding season. These plumes, once prized for women's hats, nearly led to the bird's demise until protective laws were put into place. (U.S. Fish and Wildlife Service)

Virginia, Delaware and Pennsylvania as well. After the young have fledged, great egrets scatter across the watershed and much of the nation in late summer and early fall.

These birds primarily eat fish, which can constitute more than 90

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Plant native shrubs, trees for their blossoms; get birds as a bonus

By KATHY RESHETILOFF

Arbor Day and Earth Day. Both of these celebrations encourage tree planting. Whether you are working on a community greening project or just want to add a tree to your landscape, consider planting one (or all) of these early blooming natives.

Creamy white blossoms of the shadbush tree (*Amelanchier spp.*) pop out in April against an often still gray background. There are about a dozen *Amelanchier* species native to the United States. They range from low spreading shrubs to tall trees.

In the East, there is shadbush or shadblow — so named because it flowers around the same time that American shad are returning to their springtime spawning grounds. The term “blow” means blossom.

Another common name, serviceberry, may have originated from colonial times. After the spring thaw, clergy would visit outlying areas to provide services to those who had died over the winter. These coincided with the blooming of the tree.

Blooming in spring, these flowering shrubs and trees provide a site for early-pollinating insects. The insects, in turn, provide fuel for our spring migratory songbirds, as well as attract resident birds, tired of their winter diet of seeds.

The word *Amelanchier* is an ancient Celtic word for apple. The sweet, reddish purple shadbush fruit were eaten by Native Americans and are an important food for songbirds, squirrels, bears and other woodland wildlife.

Besides being an excellent source of food for wildlife, the shadbush is a great tree for your yard. In addition to the early white blossoms and dark fruits, shadbush leaves are gorgeous in fall with colors of yellow and orange that deepen to red.

Another early spring tree (and my personal favorite) is the eastern redbud (*Cercis canadensis*). Flowers of the redbud paint the landscape with shades of pink to reddish purple from March through May. Eastern redbuds are found throughout the lower Great



Clockwise from left: The eastern redbud's flower provide nectar for pollinators and its seeds are food for songbirds. The flowering dogwood's blooms will yield to red berries that feed songbirds and small mammals in the fall. Insects attracted to the shadbush's flower are eaten by resident and migratory songbirds. (Redbud & shadbush by Britt Slattery / USFWS Dogwood by R. Harrison Wiegand / MD DNR)



Plains and eastern United States.

Like the shadbush, these early bloomers provide nectar for bees and other pollinating insects, which in turn are food for resident and migratory birds. Ruby-throated hummingbirds are also attracted to the flowers and



turn golden yellow in the fall.

Another excellent tree choice is the familiar flowering dogwood (*Cornus florida*). Large white four-petal flowers bloom from April through May. Flowering dogwood is native throughout the eastern United States and grows best on well-drained soils and in mid to full sunlight. Loved for its bright spring display, the dogwood leaves paint the autumn landscape with scarlet hues.

Red berries, which develop in the fall, are an important source of food for resident and migrating songbirds, as well as small mammals. White-tailed deer may also graze on leaves and twigs.

Shadbush, eastern redbud and flowering dogwood are three of the many native trees that can be found at

nectar of eastern redbuds.

A member of the pea family, eastern redbuds produce clusters of flat green pods that turn brown when mature. Each pod contains four to 10 small hard black or brown seeds. Bobwhite quail and songbirds eat the seeds. Squirrels occasionally eat the buds, bark and seed. White-tailed deer browse the foliage and twigs in the spring and summer.

Typically found in the woodland understory, the eastern redbud is also a lovely tree for your yard, with an average height and spread of 20–35 feet. After blooms are done, heart-shaped leaves appear on arching branches that form a spreading graceful crown. They

local nurseries. Native trees, shrubs, flowers and grasses are a great addition to any yard as they are already adapted to local conditions and provide food and shelter to our local wildlife.

To find out about other native plant choices, visit nativeplantcenter.net to search for plants that fit your location, and soil, moisture and light conditions. Or download a copy of *Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed* by putting “Landscaping: Chesapeake Bay Watershed” in your search engine.

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office in Annapolis.