CHESAPEAKE
BAY JOURNAL
SEPTEMBER 2018 VOLUME 28 NUMBER 6

Many localities in Maryland are struggling with the daunting task of curbing stormwater runoff, a source of pollution that continues to grow across the Chesapeake Bay watershed even as progress is being made on other fronts. (Dave Harp)

MD county took on runoff challenge, still fell short

≈ Montgomery, a leader in addressing stormwater, could face penalty for missing goal.

By Timothy B. Wheeler

There's a price to be paid, sometimes, for being at the head of the pack. In the case of Montgomery County MD, the price is $300,000. That's the penalty the Washington, DC, suburb agreed earlier this year to pay for its failure to curb pollution sufficiently from its streets, sidewalks, parking lots and buildings.

Under a municipal stormwater permit issued by the state in 2010, Montgomery was the first county in Maryland required to capture or treat runoff from 20 percent of its pavement and buildings. Eight other counties — Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard and Prince George's have since gotten similar marching orders, as did Baltimore city and the State Highway Administration.

But in April, Montgomery County signed a consent decree with the Maryland Department of the Environment acknowledging it had fallen far short of the 20 percent goal. The county pledged to catch up over the next two years. It also agreed to either pay a penalty of $300,000 or spend that much on a pollution-reduction project that would go beyond what's already required.

"You can always tell the pioneers, because they have the arrows in their backs," said Frank Dawson, chief of watershed capital projects for Montgomery's Department of Environmental Protection. "We're not the only jurisdiction, I think, that's having trouble."

Montgomery may be the first held to account, but it's far from the only locality to struggle with the daunting task of curbing stormwater runoff, a source of pollution that continues to grow across the Chesapeake Bay watershed even as progress is being made on other fronts. MDE officials say that while Carroll County, Baltimore city and the state highway system are "close" to complying with the 20 percent requirement, the rest are lagging.

"Stormwater [control] is not in the place it needs to be," acknowledged Lee Currey, director of the MDE's water and science administration. As state officials draw up plans for getting the rest of the way to the 2025 Bay cleanup goals set by the U.S. Environmental Protection Agency, he recently said that they're looking at how to keep making progress while giving localities more leeway in

STRUGGLE CONTINUES ON PAGE 26

Washed away? Torrential rains threaten Bay restoration gains

≈ Scientists are waiting to see if recent progress will help the Chesapeake more easily bounce back from July storms.

By Jeremy Cox

Up to her chest in muddy water, Cassie Gurbisz had a clear realization.

"When I just went down, it was pitch-black at the bottom," said Gurbisz, a coastal ecologist with Maryland's St. Mary's College, as she prepared for another dive into the Upper Bay. "I've never been in water this murky before."

The chocolate-colored water was caused by an unusual summertime deluge that dumped a foot or more of rain in parts of Maryland and Pennsylvania over a five-day span beginning July 21. Just as water levels began falling, a smaller sequel roared into northern Pennsylvania and southern New York, adding another 2–6 inches of rainfall.

The health of the Chesapeake has shown signs of improvement in recent years, with underwater grass beds reaching levels not seen in decades, and dissolved oxygen levels ticking upward in deepwater areas. The persistent storms could be a setback, at least in the short term, for recovery efforts, though it will take weeks, if not months, of monitoring for scientists to fully assess the potential damage — or even know the amount of water-fouling nutrients and sediment that were flushed into the Bay.

The pollution could spur late-summer algae blooms, bury bottom habitats in silt and contribute to oxygen-starved "dead zones," advocates fear. It is one of the biggest tests the ecosystem has faced since the state-federal Bay Program partnership kicked off a new 15-year restoration effort in 2010.

"We hope the Bay has recovered

FLOOD CONTINUES ON PAGE 18

CHESAPEAKE BAY JOURNAL

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

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

BAY JOURNAL MEDIA

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

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

STAFF

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

ADVERTISING

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

BOARD OF DIRECTORS

Tom Lewis, President
Mary Barber, Vice-President
Karl Blankenship, Secretary
Frank Felbaum, Treasurer
Bill Eichbaum

CONTACT US

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

by phone:
717-428-2819

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

Correction

In the Alliance for the Chesapeake Bay column in the July-August 2018 issue, the captions for Matt Kofroth and Beau Breeden were reversed. The *Bay Journal* regrets the error.

Editor's Note

Many talked about a better Bay, Batiuk helped to make it happen

No one is irreplaceable, or so they say, but some people are raising that question when it comes to Rich Batiuk, who retired from the U.S. Environmental Protection Agency's Bay Program Office at the end of July.

For me and for others, he was a valued source of information and, if he didn't know something, he'd direct you to someone who did. Even though he worked legendary long hours, he always answered his phone if he was in, rather than letting it go to voice mail.

Though Batiuk announced his retirement plan a couple of years ago, I — like many others — was more or less in denial until the months just before his departure. Although he never led the Bay Program office, he was a fixture there since 1985 — starting work just a year after it opened. Ultimately, he became the most quoted person in *Bay Journal* history. (See *Batiuk, the boy, knew Bay was his destiny; as a man, he helped change its fate,* on page 12.)

Batiuk was so thoroughly versed in the Bay, you might think he would bleed its brackish water if cut. He worked his way up from intern to associate director for science, building solid relationships among a constantly changing array of state officials and stakeholder groups.

I like going to science meetings, learning new things and figuring out how to take cool new information and explain it in a story. Batiuk, though, used that information to make a difference. "It wasn't science for science sake, it was translating it into policy," said Jon Capacasa, former head of EPA Region 3's water protection division.

More than once, I remember talking to Batiuk about how a particular initiative he was working on might pan out, and I'd go away thinking, "That's an interesting concept, but I'm not sure it'll work in reality." But he usually found a way.

Batiuk was a driving force behind developing the Bay's unique system of water quality standards and the cleanup effort. He would take science and figure out how to mesh it into a policy framework others hadn't envisioned.

That vision has left the Bay in a better place than he found it and set a course to guide the region for years to come.

Thanks for your thoughts

To the thousands of *Bay Journal* readers who filled out and returned the survey we mailed this summer — thank you! The response rate has far exceeded our expectations — so much that it is going to take more time than we imagined to tabulate all of them and read all of the comments.

I know that readers are overwhelmingly positive about the *Bay Journal*, but we want to learn about your ideas for fine-tuning our products as we plan for the future. I'll keep you posted as we analyze the information.

— Karl Blankenship

Sign Up for the Bay Journal or Change your Address

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

Check One: ❑ New Subscription ❑ Change of Address
❑ Please remove my name from your mailing list
Please note that it may take up to two issues for changes to become effective.

Name: _____

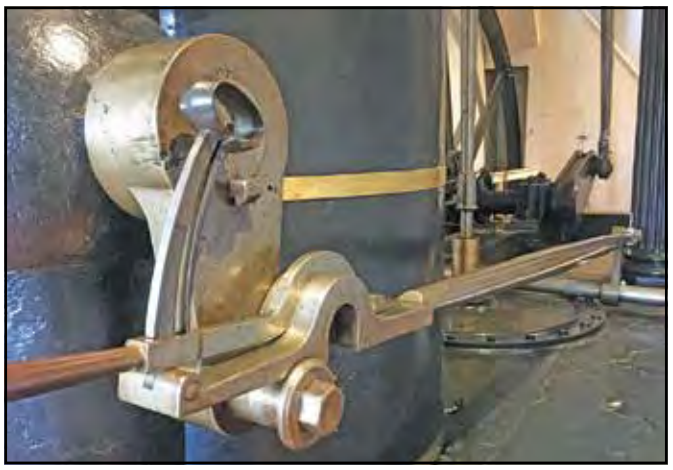
Address: _____

City: _____ State: _____

Zip: _____

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

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



Clockwise, from left:

A roseate spoonbill delighted local birders with its rare visit. See article on page 39. (Matt Felperin / FelperinFoto)

A setting sun casts dramatic colors along the shoreline of the Eastern Neck National Wildlife Refuge, which was recently threatened with at least partial closure due to funding cuts. See article on page 8. (Dave Harp)

The C&D Canal Museum reveals the mechanics that once controlled the water level in the canal connecting the Chesapeake and Delaware bays. See article on page 24. (Wendy Mitman Clarke)

WHAT'S INSIDE

TRAVEL

FEATURES

FORUM

Commentary • Letters • Perspectives

www.bayjournal.com

WE'RE JUST A CLICK AWAY

visit us online:
bayjournal.com
like us on FaceBook:
Chesapeake Bay Journal
or send us a Tweet:
@ChesBayJournal

Turkey Hill Dairy leads way on Lancaster County, PA, farms

By Jenna Mitchell

Lancaster County, PA, is an astonishing county. Of the 650,000 acres that make up the county, 425,000 acres are used agriculturally. The county is home to almost 6,000 farms, of which 99 percent are owned locally.

Lancaster is ranked No. 1 in the United States for productivity on non-irrigated soil and the value of market products sold annually is $1.5 billion. Farms in Lancaster County provide pork, poultry, eggs and milk for millions of consumers.

These great numbers do not come without a cost, though. More than half of Lancaster County's 1,400 miles of streams are impaired.

Take a look at any pollutant-loading map and Lancaster is easy to find. Clearly outlined, without any political boundaries, the county shows up bright red for nitrogen, phosphorus and sediment. Lancaster County, alone, is responsible for 21 percent of the nitrogen load in Pennsylvania's Phase III Watershed Implementation Plan.

While it has been a state requirement for all farms to have an Agricultural Erosion and Sedimentation or Conservation plan since 1972, it is estimated that only about half of the county's 6,000 farms have a plan.

Increased pressure from the U.S. Environmental Protection Agency and Pennsylvania Department of Environmental Protection has resulted in a greater focus on compliance efforts from conservation districts in the state. Lancaster County has the largest conservation district staff in the state. But at current capacity, it is estimated that it would take 30 years to support every farmer in the county in obtaining a conservation plan. Resources for implementation continue to be a challenge, but new leadership rising in the private sector could be the game changer that is needed.

John Cox, the president of Turkey Hill Dairy, an ice cream distributor founded and headquartered in Lancaster County, is stepping up. Cox has been passionate about Lancaster's waterways for quite some time, and serves as the chair of the Lancaster Clean Water Partners, an organization that coordinates water quality restoration work along with many other partners in the county.

After attending an Alliance for the Chesapeake Bay Businesses for the Bay Forum that urged companies to consider how they could change their operations to improve water quality, Cox was inspired to think about Turkey Hill's direct impact.

These Holstein heifers belong to an Amish dairy farm that supplies milk to the Maryland & Virginia Milk Producers Cooperative Association. As part of its contract with Turkey Hill Dairy, the cooperative must ensure that its providers not only have conservation plans but implement the practices contained in plans. (Jenna Mackley / Alliance for the Chesapeake Bay)

Knowing that Turkey Hill is Lancaster's largest dairy distributor, and that dairy has one of the largest footprints in Lancaster, it became clear that their focus needed to be on their farmers. Turkey Hill does not work directly with its farmers, though, and receives its milk from a dairy cooperative. A dairy cooperative or co-op, is a business comprised of a collective of farmers that market their milk together.

Timing was on Cox's side, because Turkey Hill's reconsideration of its environmental footprint coincided with the rebidding of its contract with dairy cooperatives.

During their contract negotiations, Cox and his team added requirements that all farmers providing milk to Turkey Hill would not only have a conservation plan, but would be implementing the practices written into the plan. Once all farmers achieved this, Turkey Hill would pay a premium for the higher quality product. The Maryland & Virginia Milk Producers Cooperative Association, Inc., which has members in Lancaster, PA, responded positively to the idea, and was selected as Turkey Hill's dairy co-op.

Meanwhile, the Alliance for the Chesapeake Bay and Turkey Hill had partnered to receive a Conservation Innovation Grant from the Natural Resource Conservation Service to support the farmers who could not afford the cost of a plan and subsequent implementation. Turkey Hill has prioritized helping and supporting their farmers in achieving this goal together.

This leadership led to the Turkey Hill Clean Water Partnership, which includes the Turkey Hill team working alongside the Maryland & Virginia co-op and the Alliance for the Chesapeake Bay, and has as its goal providing their farmers with the best support possible. This partnership hit the ground running in the winter 2017–18, and started with strategizing how to best inform and support Turkey Hill's farmers. Both Maryland Virginia field staff and the Pennsylvania office of the Alliance have met with all of Turkey Hill's 130 farmers to explain the new goal and discuss options for assistance. The goal is for all of the farmers supported by the NRCS grant to have the required conservation plans in place by winter 2019. The Alliance is in the process of seeking additional funding and resources to support the farmers' implementation of conservation practices on these 130 farms.

The Alliance believes that the most impactful results come from diverse and collaborative partnerships. We know that by working alongside our partners, we can accomplish much more than we could alone. Providing farmers with the technical assistance and resources to establish and implement conservation plans supports them in improving their farm's functionality while also improving the health of Lancaster County's streams, rivers and ecosystems. The Alliance is thrilled to be involved in this project, which is a holistic partnership between the public and private sector.

Turkey Hill is leading by example and impacting a systems-level change in how the dairy industry operates in Lancaster. Their leadership is going to catapult the county forward in achieving their conservation goals. When the public and private sectors work together in partnership, our ability to scale up implementation is tremendously enhanced. Leadership from within the private sector, like Turkey Hill's, is the catalyst that Lancaster County, the State of Pennsylvania and the Chesapeake Bay have been waiting for.

Jenna Mitchell is the Alliance for the Chesapeake Bay's Pennsylvania state director.

Chesapeake crab industry pinched by work visa shortage

≈ Processors' inability to meet demand could send buyers to Gulf of Mexico, other nations.

By Jeremy Cox

At Lindy's Seafood, workers receive $4.50 per pound of crab meat they pick. That adds up to roughly $12–$16 per hour — about the same pay as a home health aide or preschool teacher.

Dorchester County may have one of the highest unemployment rates in Maryland, but Lindy's and other crab processors in the remote southern half of the county still struggle to find local takers for their jobs. If the repetitive nature of the work doesn't repel them, the seasonal schedule usually does, said sales manager Aubrey Vincent.

"They can't afford to move here for seasonal work," she said.

So the iconic Chesapeake Bay industry depends almost exclusively on temporary foreign workers, mostly from Mexico. Crab processors have grown accustomed to impromptu labor shortages caused by shifting economic and political winds, but nothing could have prepared them for this year's gale, they say.

In Dorchester, home to 90 percent of Maryland's crab meat production, three crab-picking houses this year received their full quota of temporary work visas, and the other five got none. U.S. Citizenship and Immigration Services awards applicants either the full number of requested visas, or none.

A worker with a temporary visa checks crab meat for cartilage. (Dave Harp)

That led to a shortage of about 40 percent of the workforce, said Bill Seiling, executive director of the Chesapeake Bay Seafood Industries Association.

The temporary visas, known as H-2B visas, are made available annually to workers in seafood, landscaping, construction and other seasonal fields. To be eligible, employers must prove there aren't enough domestic workers willing or able to fill the positions.

This year, the federal government received requests for more than 81,000 visas nationwide, far surpassing the cap of 33,000 for jobs extending from April through September. Under pressure from affected industries, federal immigration officials released another 15,000 visas in the summer.

But only one additional Dorchester crab processor got its share of visas — A.E. Phillips & Son. Four are still missing their workers, leaving the industry with a 35 percent labor shortfall, Seiling said.

Without enough workers picking crabs, the industry faces a bottleneck in a supply chain that stretches from crab pots on the Bay to plastic tubs of crab meat sold to grocery stores and restaurants. Buyers will simply get their crab meat from the Gulf of Mexico or other countries if the Chesapeake region can't supply it, Seiling said.

If the problem isn't fixed soon, Seiling fears it could be the death knell for some Maryland seafood companies.

"These are all small, family businesses," he said. "They don't have huge stores of money. Most of these companies can probably survive this year. But if this happens again next year, you would probably see a lot of companies going out of business."

Jack Brooks, co-owner of J.M. Clayton Company in Cambridge, was one of the lucky ones. The processor got its 95 visas early in the season, which began in

Visas continues on page 6

VISAS FROM PAGE 5

April. But Brooks wasn't celebrating.

"It's a catastrophe," said Brooks, president of the American Seafood Jobs Alliance.

What made this year's visa process so troublesome, crab processors say, was the Trump administration's shift from a system that awarded visas based on a first-come, first-serve process to one that placed all employers into a lottery, regardless of when they applied.

"The company that did the worst job and filed on the last day got visas, and you didn't," Seiling said. "We thought that was very unfair, but what can you do?"

In Dorchester, where Trump carried nearly 56 percent of the vote in 2016, the policy has soured some supporters on the president, Brooks said.

"I don't know if it's helping him much," he added. "Hell, this is something that could be fixed so damn easily."

An official with the U.S. Citizenship and Immigration Services said the agency is committed to helping fix a broken system.

"USCIS is focused on ensuring the integrity of the immigration system and protecting the interests of U.S. workers," spokesman Michael Bars said in a statement. "We are committed to reforming employment-based immigration programs, so they benefit the American people to the greatest extent possible."

But the road to reform will have to travel through Capitol Hill.

Crab processors are pushing for a permanent increase in the cap on guest workers, but they admit that will be an uphill battle with an administration and Republican-controlled Congress that have shown virtually no appetite for liberalizing immigration policies. Instead, they pin their hopes on alternatives, such as carving out the seafood industry for its own pool of visas or renewing a measure that expired last year that exempted returning workers from the cap.

Supporters say such measures would create jobs for U.S. workers, pointing to a 2008 Maryland Sea Grant analysis suggesting that each arrival of a temporary worker generates 2.5 jobs for Americans. For example, a cut in a crab processor's workforce would reduce the workload among companies that support the industry, such as commercial refrigeration firms, the analysis said.

In June, Rep. Bob Goodlatte, a Virginia Republican, sponsored a bill that would, among other things, create a returning worker exemption, but the party's right wing quashed it.

The situation is less dire in Goodlatte's home state. The labor force was 90 percent staffed after two out of the three processors received all of their guest workers, said Johnny Graham, owner of the Graham & Rollins seafood plant in Hampton, which got its visas.

Jesse Diaz Soto weighs picked crab meat at Lindy's Seafood processing facility on Hooper's Island, MD. (Dave Harp)

Ironically, the seafood industry's breaking point on the Chesapeake could be triggered by a bountiful crab harvest.

Through the end of July, processors hadn't been "overwhelmed" by picking crabs, said Vincent, whose picking house has been operating with 30 workers instead of the usual 100. "But I'm worried they'll come in late because everything has been coming late this year."

An unusually long and cold winter kept watermen from filling their boats for the first few months of the season. The cold killed 16 percent of adult crabs in Maryland and 8 percent in Virginia, according to last winter's dredge survey. Overall, it estimated that the Bay contained 371 million crabs of all sizes, down from 455 million last year.

Catches are likely to pick up as younger crabs grow large enough to be harvested, fishery managers say.

Larger crabs caught in the fresher water north of the Chesapeake Bay Bridge are sold whole in Baltimore, New York and other large cities. Crab processors typically buy smaller crustaceans, which are found in the saltier waters south of the bridge.

So crabbers based on Tangier Island in Virginia's waters have been watching the visa controversy closely. At least 75 percent of the fleet's crabs are purchased by a boat from Lindy's Seafood, said Dan Dize, a Tangier waterman. Since that company didn't get its foreign workers, he finds himself in the strange position of rooting against full crab baskets.

"A Bay full of crabs is not what we're after" because such a supply glut would depress prices, Dize said. As of the end of July, he added, the worker shortage hadn't hurt him much "because the prices have been good, and there hasn't been an abundance of crabs in our area."

"But," Dize warned, "it's picking up now."

Brooks agreed: "I fear things are starting to tip. I've been turning down offers for crabs left and right the last six, eight days."

One recent morning at Lindy's, hairnet-clad workers picked meat out of crab shells on either side of a long line of stainless-steel tables. Mexican pop music played over a speaker as pickers filled tub after tub with succulent lump meat.

Vincent said she has 18 foreign workers because their visas from last fall are still valid. But she's without more than two-thirds of her needed labor force. So she has been doling out overtime and hoping that she can keep pace with the catch.

Meantime, Vincent is looking to the future. She has applied for her share of the 33,000 visas set to become available in October and installed pasteurization equipment so any excess crab meat that arrives in the summer can be processed in the fall. That extends the shelf life from four months to 6–18 months, she said.

The larger immigration debate has muddied the waters surrounding the need for temporary visas, she said. She has heard people criticize crab processors for hiring foreign workers instead of Americans. To them, she has a message: "Send them my way."

"If we don't solve the problem in the future," Vincent added, "people will stop buying Maryland product because they can't depend on the consistency and the availability."

PA officials delay plan to shut largest hatchery in watershed for shad

≈ Research station on Juniata was 1 of 3 threatened with closing amid budget dispute.

By Karl Blankenship

Pennsylvania fishery officials have put on hold, at least for now, plans to close the Chesapeake Bay region's largest remaining shad hatchery as part of a budget-cutting move.

The Pennsylvania Fish and Boat Commission at its July meeting deferred the decision it made last year to cut $2 million from its budget for this year.

That cut would have closed three hatcheries, including its Van Dyke Research Station along the Juniata River, which has reared more than 281 million American shad and released them in the Susquehanna River over the last 42 years.

The reversal came after leaders of the House and Senate Game and Fisheries Committee said they would seek additional funding for the commission next year.

Although the Fish and Boat Commission is an independent state agency, it cannot unilaterally approve a hike in its primary source of revenue: general fishing licenses. Those increases must be approved by the General Assembly, which has not done so since 2005.

But legislative leaders were angered last year when the commission proposed budget cuts that would close the three hatcheries, including two trout hatcheries. Some introduced legislation to limit the term of the commission's executive director to eight years, which would have put current director John Arway out of a job.

Prior to the commission's July meeting, though, the chairs of the House and Senate committees issued a statement pledging they would pursue a fee increase early next year.

In the meantime, the commission said it would help plug its budget shortfall by raising the price on a variety of fees and permits over which it has direct control, which would raise about $1.2 million.

Because the commission operates on a July-through-June fiscal year, the delay ensures that the Van Dyke facility would be funded through next spring's spawning season, though its fate for future years could change based on whether the General Assembly acts.

Meanwhile, Arway, announced that he would retire in November, after serving 38 years with the commission, including eight as its executive director.

Shad runs approach record highs in some rivers, lows in others

≈ Rappahannock, Potomac runs strongest in years, while James, York and Susquehanna numbers are way down.

By Karl Blankenship

This year's shad run was a study in contrasts for Chesapeake Bay tributaries, as some saw the strongest spawning migrations in recent decades while others hit or approached record lows.

Scientists at the Virginia Institute of Marine Science were surprised by the unusual disparity in the three rivers they monitor, with the Rappahannock producing the strongest shad run since its monitoring began in 1998, while the runs at the James and York were among their worst.

"It is not uncommon to have some good high years, but usually that's seen among all three rivers at once," said Patrick McGrath, a VIMS marine scientist who works on the annual shad index. "This is really a first where one river is doing so drastically well compared with the others."

"That's the perplexing part," he added. "Why would one river do so well?"

The disparity wasn't limited to Virginia. The Potomac River, which neighbors the Rappahannock, also continued its strong recovery. It's home to one of the strongest remaining East Coast shad runs in recent decades, when most other rivers have been mired near record lows. Monitoring by the Potomac River Fisheries Commission showed that the river's shad run continued to increase this year.

In the Susquehanna River, which has had a series of poor years, only 6,992 shad passed over the Conowingo Dam near the mouth of the river, the worst performance since a multimillion-dollar fish lift went into operation in 1997, and well below the peak of 193,574 in 2001.

Tens of millions of dollars have been spent on shad restoration. (Dave Harp)

Josh Tryninewski, a fisheries biologist who oversees shad restoration for the Pennsylvania Fish and Boat Commission, said cool spring temperatures delayed the migration and, by the time shad started working their way upstream, river flows had increased, which often hurts the spawning run and fish passage performance.

Shad spend most of their lives in the ocean, but return to their native rivers to spawn. Historically, tens of millions thronged East Coast rivers, supporting fisheries hundreds of miles upstream. But overfishing, the construction of dams that blocked access to historic spawning grounds, pollution and other factors have reduced their numbers in recent decades to all-time lows.

To counter that trend, utilities and states in the Bay region have poured tens of millions of dollars into efforts to improve fish passage past dams and bolster populations with hatchery-reared fish.

This year, though, shad stocking hit its lowest level in recent history, with fewer than 9 million released in various Bay tributaries, primarily because of budget cuts. As recently as 2000, about 36 million hatchery-reared shad were stocked throughout the Bay watershed. This was the first year in more than two decades that none were placed in the James River.

Stocking in the Susquehanna was hurt by high flows, Tryninewski said. Biologists had hoped to stock more than 3 million this year, but frequent high water levels, which can be lethal to the larval fish, forced them to keep the fish in the hatchery longer than planned, where some died. As a result, just 2.74 million were stocked.

"It's a roll of the dice," he said. "We were holding them while waiting for river conditions to improve. But I'd rather hold onto them than just put them out if the river is up and hope for the best."

On the Nanticoke River, biologists released 360,000 shad this year, well below the record 1.4 million a year ago. "This was one of the lowest stockings, ever," said Johnny Moore, a fisheries biologist with the Delaware Department of Natural Resources and Environmental Control. "It was very disappointing, to say the least."

Although plenty of shad seemed to be in the river, Moore said the survival rate of the eggs was poor, and was likely the result of rapidly fluctuating water temperatures.

In Maryland, stocking efforts were close to their targets. The Maryland Department of Natural Resources placed 260,000 larvae and 75,000 larger juvenile shad in the Patapsco River, hitting their marks.

On the Choptank, biologists stocked 1.55 million larvae — below their goal of 2.75 million — and 460,000 early juveniles, which was higher than average.

"We didn't get as many larvae stocked as what we try to every year," said Chuck Stence of the DNR's anadromous fish program. "But we are toying with the idea of allocating more juvenile fish than larvae. Survival is so much better with juveniles."

Eastern Neck refuge spared from closure, but funding crunch continues

≈ Across the nation, refuges are cutting back or looking for ways to reduce spending under a shrinking budget.

BY JEREMY COX

The U.S. Fish and Wildlife Service is hiring a new manager at Eastern Neck National Wildlife Refuge, sparing a natural area popular with hunters, anglers and birdwatchers from at least partial closure.

The refuge, located in Maryland on the Eastern Shore of the Chesapeake Bay, was left without a full-time manager in September 2017 when that official took a job elsewhere in the Fish and Wildlife Service. Lacking funds to hire a replacement, agency officials began warning Eastern Neck supporters this summer that public access to the refuge was in jeopardy.

Although the agency hasn't received any additional money, it announced in August that Eastern Neck will remain open to the public. That decision came about three weeks after the *Bay Journal* reported on the potential closure and the growing outcry from user groups and elected officials.

The refuge consists of a 2,285-acre island at the confluence of the Chester River and Chesapeake Bay. According to the Fish and Wildlife Service, about 70,000 people visit each year to catch glimpses of tundra swans and more than 200 other bird species; hunt deer and turkeys; and hike among the island's pine trees and saltwater marsh.

"We're very excited [about the decision]," said Melissa Baile, president of the Friends of Eastern Neck, a support group for the refuge. "I think they did not realize how much the refuge meant to the constituency and the country in general."

Eastern Neck NWR

≈ *Established:* 1962

≈ *Where:* An island at the mouth of the Chester River, 15 minutes south of Rock Hall, MD, on Eastern Neck Road.

≈ *Size:* 2,285 acres

≈ Activities: Hiking, birding, wildlife viewing, hunting deer and turkey, paddling, fishing, crabbing

≈ *Notable wildlife:* Tundra swans between November and March, bald eagles, Delmarva fox squirrels, Canada geese, diamondback terrapins, white-tailed deer, beavers. To view a list of recent bird sightings, visit ebird.org/places/usfws and search for Eastern Neck National Wildlife Refuge.

Baile added that her group's work isn't over. Federal funding has been shrinking for the refuge system during this decade. If Eastern Neck supporters don't stand guard, they could be facing another closure threat within a few years, she said.

To pay for the new staff member, the Chesapeake Marshlands National Wildlife Refuge Complex, a branch of the service that oversees the region's refuges, will have to reallocate funds it had reserved for other causes, said Terri Edwards, a Fish and Wildlife spokeswoman. So far, no time frame has been set for making the new hire.

In July, Marcia Pradines, the Chesapeake Marshlands' project leader, told the *Bay Journal* there was a possibility of a full shutdown at Eastern Neck and a gate turning back visitors at the entrance. "It's not something we want to happen," she said at the time. "In the end, it's a budget reality."

The staffing decisions wouldn't have affected access to the county road that traverses the island, Pradines said. It would have remained open to Bogles Wharf, home to a county-maintained boat ramp and small pier.

By early August, Fish and Wildlife officials softened the potential blow. The entrance gate would remain open, allowing hunting, fishing, birdwatching and "other wildlife-dependent uses," regardless of staffing decisions, they said in a message posted to the refuge's website.

The fate of the visitor center, along with the five walking trails, two boardwalks and maintenance activities, remained in limbo.

As the agency pondered its next step, employees from the Marshlands complex's headquarters in Dorchester County shared the refuge's administrative work — and the four-hour roundtrip drive that accompanies it.

The all-volunteer Friends of Eastern Neck has stepped in to complete other chores. In addition to their longtime responsibility of managing the visitor center, members are helping to conduct special events and performing countless hours of repairs and upkeep across the island.

At times, the island is devoid of paid or volunteer staff, save for a lone volunteer clerk manning the front desk, said Phil Cicconi, vice president of the Friends group.

The Friends group, Baile said, wrote letters and emails to elected officials and Fish and Wildlife staff to keep their beloved refuge open. They lined up a growing list of allies in the fight, including the Kent County commissioners, the Patuxent Bird Club and the Friends of Blackwater National Wildlife Refuge.

Birding at the Eastern Neck National Wildlife Refuge is especially rewarding during migration season. (Dave Harp)

The movement attracted the help of Sen. Chris Van Hollen of Maryland, among others. In December, he wrote a letter to Fish and Wildlife's parent agency, the Interior Department, calling for the position to be filled in light of Eastern Neck's importance to Kent's economy.

Van Hollen applauded the move to keep the refuge open. But like Baile, he counseled vigilance.

"Filling this position will help the Refuge better serve visitors, the local community and area wildlife. I will continue working to ensure our state has the federal resources necessary to support our economy and our environment," Van Hollen said.

Eastern Neck's supporters also looked to Rep. Andy Harris, who represents the Eastern Shore. He is a member of the powerful House Appropriations Committee and belongs to the controlling party. Harris said in a statement that earmarking funding specifically for Eastern Neck would violate congressional rules, but that he was actively seeking other solutions.

Eastern Neck is not alone in its budget challenge.

Accounting for inflation and fixed costs, the nation's network of more than 560 refuges receives nearly $100 million less funding today than in 2010, according to the Cooperative Alliance for Refuge Enhancement, a coalition of wildlife, sporting and conservation groups. The funding crunch has led the Fish and Wildlife Service to leave 488 refuge jobs unfilled, a loss of one out of seven positions.

"It's a nationwide system problem. What's happening in Eastern Neck is happening all across the United States," said Desiree Sorenson-Groves, vice president of government affairs with the National Wildlife Refuge Association. "You can limp along for a few years, tightening your belt and no travel and, whenever somebody retires, you don't fill the position. But at a point, you can't do any more."

Over the last 15 years, national refuges across the country have been forced to shut down visitor centers or cut back on the number of days they're open. The popular J. N. Ding Darling National Wildlife Refuge in Florida, for example, was forced to close its visitor center two days a week after it lost two park rangers to budget cuts.

In Rhode Island, the Sachuest Point National Wildlife Refuge visitor center was closed for three consecutive winters. Supporters raised money to install solar panels, cutting costs enough to allow it to open for the winter of 2008–09.

The Trump administration requested $473 million in funding for the refuge system in fiscal 2019, a 2.7 percent decrease from current spending. An Interior Department appropriations bill approved by the Republican-controlled House along party lines in July sets aside nearly $489 million, an increase of less than 1 percent. The Senate passed its own version, sending the legislation to a conference committee to hash out the differences.

"You have to understand that you can berate the administration as much as you want, but ultimately it comes down to the legislative branch — Congress — to appropriate the money," Sorenson-Groves said.

Groups fighting for coal ash regulation balk at new rules

≈ Environmentalists concerned that relaxed standards for storage pits will allow contents to leak into groundwater, waterways.

By Whitney Pipkin

Power companies could soon have more flexibility in how they handle the ash that remains from a legacy of burning coal for power, but not if environmental groups have any say in the matter. Several facilities located near Chesapeake Bay rivers are in the process of closing pits where coal ash and water have comingled for decades amid changing regulations at the federal and state level.

The U.S. Environmental Protection Agency in July finalized its first batch of significant changes to standards imposed in 2015 by the Obama administration that required companies to begin closing certain inactive coal ash storage facilities. The rollback of those rules will take effect at the end of August, though they are likely to face legal challenges.

This summer's 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.

"With this rule, EPA continues its pattern of rolling back environmental protections," said Lisa Feldt, the Chesapeake Bay Foundation's vice president for environmental protection and restoration, in a statement. "There are many documented cases where groundwater has been contaminated by coal ash storage facilities, damaging waterways and potentially, drinking water."

Coal ash storage has been the subject of heated debate in Virginia, both at public meetings about environmental permits and in the General Assembly. Legislators passed a bill this year that requires companies with coal ash pits in the Chesapeake watershed to take another step toward recycling their contents rather than allowing the ash to be permanently stored in place.

An ash pit at Dominion Energy's Possum Point Power Plant near the Potomac River in Virginia was among the first in the state drained and excavated under the new coal ash regulations. The state has put a moratorium on new permits for draining and closing certain types of ash pits until legislators and the utility can agree on best practices for closure. (Whitney Pipkin)

Though the bill stops short of requiring recycling, it does force companies such as Dominion Energy, which maintains nearly a dozen coal ash pits in the state, to seek proposals from recycling contractors who integrate the ash into concrete and construction materials. The companies must compile the proposed costs in a report for lawmakers to consider by the end of the year.

The measure also extended until July 1, 2019, a prohibition on new state permits that would allow facilities to close coal ash pits by permanently storing their contents in place. Pits where the removal process is under way or completed, however, may finish the closure process.

Dominion officials say they support the measure and will work with legislators to further investigate the possibility of recycling long-stored coal ash from the sites. The company's own report at the end of 2017 concluded that recycling would be too expensive at most of the sites in the Bay watershed. It favored an option, opposed by environmentalists, to store millions of tons of coal ash in mostly unlined pits, many of them located next to the Potomac and James rivers.

There has also been much debate in Virginia about how much groundwater monitoring should be required — and for how long — if coal ash is stored underground at sites near local rivers. The new federal rule would suspend groundwater monitoring altogether if evidence shows contamination would not reach an aquifer.

In Maryland, companies were already prohibited from storing coal ash in the watery pits that were the focal point of the 2015 regulations. But at least 31 landfills and mine fills containing ash still exist in the state, many of them in Allegany County, according to records maintained by the environmental group, EarthJustice. The organization considers many of Maryland's regulations regarding groundwater monitoring to be "purely discretionary" and in need of reform.

The Trump administration drafted changes to the coal ash rules in the spring under former EPA administrator Scott Pruitt. Although some groups hoped the agency's new leader, Andrew Wheeler, might change course on coal ash, the final changes take a similar tack, emphasizing the need to incorporate "flexibility" into the regulations.

"This is the first major rule signed during Andrew Wheeler's time running the EPA, and his true colors are shining through. Wheeler is ignoring the serious health threats to hundreds of communities at risk from contaminated drinking water," Earthjustice attorney Lisa Evans said in a statement that represented six organizations vowing to fight the changes.

Many of those groups spent more than a decade lobbying for the 2015 coal ash rule and the incremental improvements they believe will help protect waterways and drinking water from potential contamination.

Groups opposing the administration's new rule have until the end of October to file legal challenges. The changes took effect on Aug. 29.

Virginia's Piankatank River gets 15 new acres of oyster reef

≈ Future for other restoration projects in VA, MD unclear as funding dries up.

By Timothy B. Wheeler

Oysters are getting another new home in the Chesapeake Bay watershed, as the construction on 15 acres of artificial reef made of crushed granite began in July in Virginia's Piankatank River.

Under mostly sunny skies, the Capt. Ellery, a boat owned by the W. E. Kellum seafood company in Weems, cruised slowly back and forth at a designated spot in the river while water cannons in its stern sprayed heaping mound of golf ball-size stones overboard. They will provide a fresh substrate, or hard surface, on the river bottom where newly hatched oyster spat can settle and grow.

The 24-mile long Piankatank, tucked between the Rappahannock and York rivers, is one of five Bay tributaries in Virginia that the state, federal agencies and others have targeted for large-scale efforts to restore the Chesapeake's once-bountiful oyster population. Five of Maryland's tributaries also have been selected for similar efforts, but federal funding for reef construction there has dried up.

Oyster restoration continues in Virginia, though, with money from a variety of sources. The Virginia Marine Resources Commission, which this year received state funding for restoration for the first time, has teamed up with The Nature Conservancy to build these 15 acres.

The new reefs, to be built in four sites, are upriver of a 25-acre reef constructed last year by the U.S. Army Corps of Engineers, Norfolk District. That reef was built with large granite boulders, shipped in by barge and offloaded by a crane, at a cost of $2 million.

The latest construction with much smaller stone is estimated to cost a fraction of last year's project — about $200,000, with the state and conservancy splitting the tab.

"It's a lot less expensive than some projects we've done," said Andy Lacatell, conservation specialist with The Nature Conservancy.

These reefs are being built farther upriver in a less "dynamic" area, Lacatell explained, where currents are not as strong, so there's no need for such heavy-duty oyster habitat. Plans are to deposit a 6– to 8-inch layer over the bottom. The 100 tons deposited that day in July are just the first installment of what is to be a total of 3,750 tons of granite.

Once home to about 7,000 acres of oyster reefs in the 1890s, the Piankatank — like the rest of the Bay — lost all but a fraction of its shellfish habitat to disease, overharvesting and natural degradation. Today, it has about 250 acres, including 50 acres restored since 2014 by the Corps and the conservancy, and other reefs restored even earlier by the state. With the amount of viable oyster bottom left much reduced, the goal is to add another 175 acres of reef, Lacatell said.

Water cannons aboard the Capt. Ellery, a boat owned by the W.E. Kellum seafood company, spray crushed granite into the Piankatank River. The golf ball-size stones were being placed in a 6– to 8-inch layer over 15 acres of river bottom to provide artificial substrate on which oyster spat may settle and grow. (Timothy B. Wheeler)

But the Army Corps has run out of funds to continue reef construction in the Piankatank, so for now, at least, the effort will have to be carried on by others.

"We have 175 acres to go," Lacatell noted. "We want to be as cost-effective as we can."

If left alone, oysters would build their own reefs, as newly hatched spat settle and grow on the shells of their predecessors. Centuries of harvesting shellfish and disease mortality, though, have undercut that natural regeneration.

The seafood industry and the state do what they can to replenish the supply of substrate by using the shells of at least some oysters harvested for consumption and by dredging up buried shell from ancient reefs. But to date, there hasn't been enough shell from those sources to replenish all of the reefs being actively harvested, much less supply material to build new reefs that would restore lost habitat.

So, for several years now, Virginia has been using granite and even crushed concrete to build reefs, mainly in sanctuary areas where no harvest is permitted, as is the case in the Piankatank.

Granite has also been used to build reefs as part of restoration efforts in Maryland's Harris Creek and the Tred Avon River. The state's watermen have asserted that oyster shells are the only suitable substrate for Bay reefs, but a review by the National Oceanic and Atmospheric Administration Chesapeake Bay Office concluded that, in most cases, granite does as well as oyster shells — and often better — in getting spat to settle and grow.

"What I've seen of those reefs is stunning," said NOAA's Stephanie Westby of the granite reefs built earlier in the Piankatank. "The stone material...really works."

The Piankatank, like several of Virginia's Bay tributaries, generally experiences decent natural oyster reproduction, so restored reefs can usually count on getting spat to settle on them from spawning oysters elsewhere in the river.

The reefs begun in July are getting a kick-start, though, with about 300 bushels of spat set in tanks on oyster shells, part of an effort run by Virginia Commonwealth University to recycle shells for return to the Bay. The first installment — about a dozen bushels of spat-seeded shells — got dumped overboard Tuesday from a boat carrying state and federal officials, representatives of the conservancy and VCU, as well as a bevy of reporters and photographers.

Oyster restoration work is nearing completion in another Virginia tributary, the Lafayette River in Norfolk, where two conservation groups, the Chesapeake Bay Foundation and Elizabeth River Project, are to seed 5 acres of newly built reef with hatchery-bred spat on shell planning later this summer. That is expected to complete the 80-acre goal for that waterway.

Reef construction is already complete in Maryland's Harris Creek — the largest restoration effort in the Bay, with 350 acres of reef constructed — and in the Little Choptank River, where the state Department of Natural Resources scaled back the restoration plan and limited the need for more reefs.

But work in the Tred Avon River, which had been federally funded, has ground to a halt, because there has been no new funding for Bay oyster restoration approved in the Corps' budget for three years. The Army Corps leadership also declined pleas to allocate some of its discretionary funding to the effort.

That could affect the completion of oyster restoration planned for at least one of the other two Maryland tributaries recently selected by the state — Breton Bay, which DNR officials had hoped would be handled by the Baltimore District of the Corps.

With federal oyster restoration funding in doubt, the outlook for completing work in Virginia's other targeted tributaries — the Piankatank, Lynnhaven, lower York and Great Wicomico rivers — is similarly cloudy at the moment.

But in one bright spot, at least some federally funded reef work is on tap for the Lynnhaven in Virginia Beach, though for a slightly different purpose.

The Army Corps headquarters recently allocated $10 million under its fiscal 2018 work plan to carry out a broader ecological restoration plan for the Lynnhaven, which includes the restoration of wetlands and submerged vegetation, as well as reef habitat. That represents a down payment on a project expected to cost $38 million — but it should be enough to build 8 acres of reefs, along with 9 acres of wetlands and 7 acres of underwater grass meadow.

"Ecosystem restoration isn't necessarily the top priority for funding right now," said Susan L. Conner, chief of the Norfolk District's planning and policy branch. "To get new-start construction funding is a big deal." Work should begin there "within the next year or two," she said.

Invasive snakeheads found in Susquehanna tributary

≈ Octoraro fish quickly drew anglers but raise concerns for eels and Chesapeake logperch.

By Donna Morelli

Pennsylvania angler Mark Mabry knew he had something big on his line while fishing the Lancaster County section of Octoraro Creek this summer.

He didn't expect to reel in a 25-inch northern snakehead — a notorious invasive species with a big appetite and the ability to shuffle short distances on land.

"I was a little shocked," he said. "They're fun to catch, but it's not what I want to see."

Mabry's catch was the first snakehead confirmed in the Pennsylvania portion of the Octoraro Creek, a tributary of the Susquehanna River. According to Michael Kauffmann, the Southeastern Area Fisheries Manager for the Pennsylvania Fish and Boat Commission, it was soon followed by others.

"One of the first anglers that contacted me said, 'I caught one, but a friend of mine caught two the other day,'" Kaufmann said. "And then we got a message that there were five of them lying on the bank. We kept getting calls or emails indicating they caught single fish but friends caught multiple fish. This went on for about three weeks before it started dying down."

Snakeheads, a fish native to Asia, caused a great deal of concern in the Chesapeake Bay region in 2002, when they first appeared in a suburban Maryland pond. Scientists and anglers worried about the potentially widespread impact of their voracious appetite on the ecosystem as they competed with native fish for food.

A snakehead, center, can breathe out of water as long as it stays wet, and use its fins to travel short distances on land. (Dave Harp)

Fifteen years later, with snakeheads living in many of the Bay's creeks and rivers, such fears have generally been put to rest, at least for now. But there is concern about the localized effect the Octoraro snakeheads might have on American eels and Chesapeake logperch.

Snakeheads are toothy, slimy and huge, weighing up to 20 pounds. They can also breathe out of water as long as they stay wet, and use their fins to travel short distances on land. They mostly eat fish, frogs, small minnows, crawfish and eels, but have also been known to bring down ducks and small mammals.

Until this summer, known Pennsylvania populations of snakeheads have been mostly limited to the Schuylkill and Delaware rivers and small ponds and lakes near Philadelphia. The fish living there, and in random ponds and lakes in the state, have been introduced by people, Kaufmann said.

The Octoraro snakeheads appear to have traveled north on their own and were caught below the Octoraro Reservoir. The threatened Chesapeake logperch and the American eel, which biologists are trying protect and propagate, have been found near the reservoir's dam.

"We are concerned, besides the usual concerns about all invasive species, that this is the general location where eels are trapped and transferred," Kaufmann said. "They gather there."

So far, the presence of snakeheads in other Bay tributaries has not wreaked environmental havoc.

Snakeheads now swim in many Maryland rivers that drain into the Bay, including on the Eastern Shore. They were noted in the lower Potomac River by 2004 and have since become well-established in most, if not all, of that river's tributaries in Virginia, Maryland and the District of Columbia. One was found in Opequon Creek, a West Virginia tributary to the Potomac, in April.

In 2012, snakeheads moved into the

SNAKEHEAD CONTINUES ON PAGE 13

Batiuk, the boy, knew Bay was his destiny; as a man he helped change its fate

≈ Retired scientist orchestrated plans to reverse Chesapeake's ailing health during his 33 years at the Bay Program.

BY KARL BLANKENSHIP

When he was a teenager packing for a family vacation in the Maine woods, Rich Batiuk brought along some light reading.

Among the stack were William Warner's epic blue crab story, *Beautiful Swimmers*; Rachel Carson's wake-up call about pesticides, *Silent Spring*; and James Michener's classic, *Chesapeake* — nearly 2,000 pages of reading in all, mostly describing a waterbody hundreds of miles from his home in Massachusetts. Nonetheless, during rainy days, he would perch in the cabin's loft, flipping pages.

Batiuk, who was born in Abington, PA, and grew up in New York, Colorado, Alabama and finally Massachusetts, settled on his career goal early in high school.

"It bugged the heck out of my sisters," he recalled. "They said, 'You already know what you want to do.' I wanted to come down and work on the Chesapeake."

By the time he retired at the end of July, Batiuk had helped transform a vague notion that the Chesapeake needed to be cleaned up into a scientifically based understanding of what a "clean Bay" would look like — and he helped orchestrate a pollution control plan to make that vision a reality.

Still, as Batiuk wrapped up his 33-year career with the Environmental Protection Agency's Chesapeake Bay Program Office, he acknowledged that the Bay's restoration is far from complete. But, he added, the legally tested framework he helped to develop has put the region on a trajectory few other major water bodies can boast: measurable progress toward a cleaner future.

"The Gulf of Mexico is heading in the wrong direction, and Lake Erie is repeating itself back into the 1970s," Batiuk said. "Our dead zone is shrinking, our underwater grasses are coming back, our rivers are running cleaner."

Batiuk spent his entire career in the EPA's Bay office. Most of that time he headed its science programs, where he coordinated work among the region's scientists to support management decisions made by the multitude of Bay partners. In coffee– and donut-fueled meetings — federal agencies are prohibited from buying food, so he bought it himself — he would press scientists to focus their work and reach consensus on issues such as how much light underwater grasses need to grow, how much oxygen fish need to survive and how much fertilizer and manure crops actually need.

"Rich pushed himself really hard. His work ethic was phenomenal," said Bill Dennison, vice president for science applications with the University of Maryland Center for Environmental Science. "But more importantly, he pushed all of us, and we kept working harder. It was sort of a motivator."

Many wonder how the cleanup effort will fare without Rich Batiuk's ability to organize and explain the science, and find solutions that all parties can buy into. "Nobody is irreplaceable except for Rich," said Roy Hoagland, former Chesapeake Bay Foundation vice president. (Dave Harp)

Batiuk racked up tens of thousands of miles driving across the Bay watershed to meet with state and federal officials, as well as environmental and industry groups, to explain the research behind the cleanup and to persuade them to buy into the often-daunting goals that resulted.

"This program was built from the ground up with the states at the table, and keeping that program together takes exactly what Rich did," said Jeff Corbin, who often worked with Batiuk while holding various positions with the Chesapeake Bay Foundation, state of Virginia and the EPA. "And it is not easy. Not all the information that EPA ends up delivering is a present inside of a box. … Rich was able to carry that message, not just the public message, but the scientific message, better than anybody."

Batiuk's interest in the Bay stemmed from reading related articles in *National Geographic* and a general fascination with shallow waters. "I always wanted to be Jacques Cousteau, but in the shallow waters," he said. "I liked the edge of the tide where you could see the bottom."

That he would have laid out his life's work while still a teenager wouldn't seem unlikely to those who know him. A workaholic and meticulous organizer, Batiuk was known for making detailed, long-range plans — often stretching years into the future.

Ann Swanson, executive director of the Chesapeake Bay Commission, an advisory panel of state legislators, recalled a trip to France where she and Batiuk were making presentations at a conference. She thought they'd chat during a two-hour train ride.

Instead, she recalled, "Rich has two notebooks out, and his calendar out, and then another calendar out. One of his calendars was a to-do calendar. He was not just writing a to-do list, but cataloging it by days when he would look up information and get answers back to people. At the same time, he is systematically taking care of emails," she said. "I never saw anything like it."

He was known for putting in long days. Nick DiPasquale, former director of the Bay Program Office, usually showed up for work at 7:30 a.m. "Rich was invariably already there and probably had been there for about an hour," he recalled. "When I left in the evening, at 5:30 or 6 o'clock, Rich's car was always there. I started to think he just parked his car there and rode his bicycle back and forth to work."

Batiuk's path to the Bay Program started at American University in Washington, DC, while he was pursuing a master's degree in environmental toxicology. While there, he attended a lecture about the Bay and met Kent Mountford, a biologist working with the EPA's newly created Chesapeake Bay Office. Mountford encouraged him to apply for an internship there. Batiuk won the Annapolis-based position in spring 1985 and never left, working his way up from intern to EPA staffer to the office's associate director for science, a position he held since 1996.

Early in his career, he began working with other scientists to identify habitat requirements for living resources in the Bay — the water quality conditions that various fish, shellfish and aquatic grasses need to survive.

Over the years, Batiuk continued to press scientists for more precise definitions of those conditions. That eventually produced a remarkably detailed plan that divided the Bay into 92 segments and, for each, set out the different oxygen needs for species living near both the surface and the bottom; the amount of light needed to sustain underwater plants; and the amount of algae (chlorophyll *a*) needed to both provide food for fish, crabs and oysters yet curtail harmful blooms.

Once adopted by states, those standards became the basis for limiting the amount of nutrient pollution that could reach the Bay. It was a plan unlike one for any other coastal water body, and many didn't like it at first. EPA headquarters, Batiuk said, "thought we were crazy."

Environmentalists were initially opposed, too. Traditional water quality standards were typically based on concentrations of pollutants in the water. Batiuk argued that wasn't realistic because *concentrations* of the pollutants in this case — the nutrients nitrogen and phosphorus — naturally fluctuate widely. Unlike pollutants such as toxic chemicals, it wasn't their concentration in the water at a given time that was important, but rather the total *amount* that entered the system over a period of time. Under the Bay system, these standards would become the tool to limit the annual loads of water-fouling nutrients and, in turn, support aquatic life.

After months of meetings, Batiuk's concept won.

"Rich is a skillful advocate, but an honest advocate," said Roy Hoagland, who was serving as vice president with

BATIUK CONTINUES ON PAGE 13

Batiuk from page 12

the Chesapeake Bay Foundation at the time and initially opposed the idea. "You don't get false information from him, and you get his rationale and you get his big picture. And then he also listens."

Wastewater treatment plant operators came on board, too. Batiuk's approach allowed more flexibility in their operations.

"You can't build a regulatory program on a standard that people can never meet," said Chris Pomeroy, who represented wastewater utilities in Virginia and Maryland. "Rich brought an honest scientific approach to the problem and he was always careful to listen and to understand what people's questions and concerns were. He deserves a lot of credit for holding the partnership together and making as much progress as has been made."

Indeed, Corbin said, if the region had adopted standards based on nitrogen and phosphorus concentrations rather than total loads, "we would still be fighting over those numbers after 20 years."

"Extrapolating back into how much oxygen fish need or how much grass a crab needs, it makes perfect sense now. But that path was not laid out for Rich or anyone to grab and implement. They had to develop that."

After those standards were in place, Batiuk turned his attention to crafting a cleanup plan.

Working with others in state and federal agencies, they created the Chesapeake Bay Total Maximum Daily Load — often referred to as the Bay's "pollution diet" — which identifies the maximum amount of nitrogen and phosphorus the Bay can receive and still meet water quality goals.

The Bay TMDL is driving the cleanup plans that are now under way. While thousands of TMDLs are in place around the country, the Bay plan is dramatically different. It not only defines maximum loads, but requires states to write detailed plans about how they will be achieved, establishes two-year check-ins to monitor progress and includes "consequences" that the EPA can impose if progress is lacking.

Forging the plan was a grueling, multi-year process among states and stakeholders. Batiuk and Robert Koroncai of the EPA's Region III largely led the effort and made extensive trips throughout the region to explain the plan to often skeptical groups.

The crush to meet an end-of-2010 deadline for finishing the TMDL, completing internal documentation, tweaking state water quality standards and responding to thousands of comments led Batiuk and others to work nearly round-the-clock that December. Batiuk became seriously ill. His voice remained rough for months.

"I remember being in my pajamas on Christmas Eve in front of a fire, feeling like crap," Batiuk said, working away on a card table in the family room of his home. "I was sitting there editing line by line, parts of the TMDL." Then, barely able to talk, he would get on the phone with colleagues in Philadelphia to give them his edits.

Rich Batiuk was known for putting in long hours at his office. "His work ethic was phenomenal," said Bill Dennison, vice president for science applications with the University of Maryland Center for Environmental Science. "But more importantly, he pushed all of us, and we kept working harder. It was sort of a motivator." (Dave Harp)

Less than two weeks after it was adopted, the plan was challenged in court by agricultural groups, homebuilders and others who feared it could lead to similar TMDLs elsewhere. But the years of stakeholder outreach ultimately paid off.

All four judges who heard the case at the district and appeals court level backed the TMDL, praising it as a model of "cooperative federalism" between the EPA and states. In 2016, the U.S. Supreme Court declined to hear an appeal.

"Looking back, it was actually healthy to go through the lawsuit and show that in fact, from a legal standpoint, from a technical standpoint, and from a scientific standpoint, it was robust," he said. "Yes, it dragged out a long time, but it closed that door. It was sort of like, 'We're all over that. Let's focus on implementation.'"

Afterward, Batiuk continued to bring science to bear on the implementation of the TMDL. After a 2011 report by the National Academy of Sciences raised questions about the Bay Program's ability to track whether reported cleanup actions were actually in place and working, he led a multi-year effort to develop protocols for verification. Starting this year, cleanup actions will not be counted toward TMDL goals unless states use that process to verify them.

Batiuk also oversaw the Bay Program's "midpoint assessment" of the 2025 cleanup goals — an effort that incorporated new science into updated computer models and put a new focus on climate change and the release of nutrients from behind the Conowingo Dam. The assessment showed that the restoration effort has made progress, but it's not on track to deliver the clean Bay he spent years working to define.

Still, Batiuk points to hopeful signs. He wrote his master's thesis about underwater grasses, and the Chesapeake today has three times as much of that critical habitat than it did then. "I never thought I'd see 100,000 acres of underwater grasses," he said.

Many openly wonder how the cleanup effort will fare without Batiuk's ability to organize and explain the science, as well as find solutions that all parties can buy into. "Nobody is irreplaceable except for Rich," Hoagland said. "I don't know how they will replace the talent and skill set he has brought to the Bay Program."

Batiuk still plans to be involved. But, at least for a while, he'll use his hands rather than his head. The avid hiker and angler plans to work as a volunteer with Trout Unlimited and the Appalachian Mountain Club.

He and a colleague, Holly Greening, former executive director of the Tampa Bay Estuary Program, are launching a consulting service called CoastWise Partners. Their stipulated fee: "We'll work for (good) food!"

But after decades of long days, Batiuk also hopes to find more time for fishing (he calls it "resource monitoring") and traveling. He doesn't plan to walk away from the Chesapeake, though. "It's been in my life's blood since I was a teenager," he said. As he wrapped up final days in the office, he still had a collection of *National Geographic* magazines on his shelf with the Bay-related articles that helped lead him to the Chesapeake.

Snakehead from page 11

Rappahannock River and reached the James River this year, said John Odenkirk, fisheries biologist with the Virginia Department of Game and Inland Fisheries.

Odenkirk said that snakeheads in the Potomac tributaries have reached an equilibrium with their surroundings and their growth has plateaued. His surveys of snakeheads and bass showed that, on average, 10 snakeheads were caught every hour and largemouth bass were counted at 25 fish per hour. Both fish occupy similar niches and seem to be coexisting for now.

Like the nonnative blue and flathead catfishes, snakeheads have become popular sportfish — and fishery managers in Pennsylvania, Maryland and Virginia encourage the catch to help keep its population in check. There are no limits as to when or how to catch them, nor how many an angler can take. Anglers work from shore and by kayak. They are caught even by bowfishing, in which a rig that combines a casting line with the structure of a bow and arrow is used.

"Anglers love them, especially the bow hunters," Odenkirk said. "Snakeheads like shallow water so they are vulnerable to being attacked from above."

Some anglers get paid for their catch. Maryland and Virginia allow the commercial sale of snakehead, which has become a specialty dish in some Washington, DC, and Baltimore restaurants. According to the Maryland Department of Natural Resources, a cumulative total of 17,151 pounds of snakeheads were commercially harvested from the Potomac River between 2011 and 2017.

Virginia passed a law this year allowing commercial harvest of the fish.

Fishing for snakeheads has become so popular that some anglers are calling for catch-and-release to protect their numbers. If anglers were to successfully lobby for the management of snakeheads as sportfish, limits on the catch could further strengthen their hold in the Bay region.

That's the last thing that Joseph Love, a fisheries biologist with the Maryland Department of Natural Resources, wants to see.

"We've had sea lamprey in the Great lakes area for 40 or 50 years and they didn't become a problem until a certain set of conditions happened, and now, *boom*, they are a problem," Love said. "We've had blue cats in the Potomac for a while now, but it's only recently where the population has surged to the point where people are worried about crab fisheries in the Bay."

Heavy rains, like those in the Bay region this summer, help snakeheads move into new areas, Love said. They tend to travel on freshets — a flow of freshwater from storms or melting snow.

"I was surprised to see how fast they have spread," Love said. "Fifteen years isn't a whole heck of a lot of time."

VA gets a year to comply with menhaden limits or face moratorium

≈ East Coast commission struggles to balance demands of conservationists, fishing industry.

By Karl Blankenship

East Coast fishery managers have decided to give Virginia until next year to adopt regulations that limit catches of menhaden in the Chesapeake Bay rather than seek an immediate moratorium on harvests.

Conservation groups and the fishing industry have been engaged in a long-running battle over how many menhaden can be caught without ecological consequences.

Humans don't eat menhaden, but the small, oily fish are a critical food for a host of marine life from whales to striped bass. While the overall stock is considered healthy, conservationists have argued that such evaluations do not account for its role as forage for fish, birds and marine mammals.

Last fall, forage fish advocates persuaded the Atlantic States Marine Fisheries Commission to slash the maximum allowable harvest in the Bay — where much of the East Coast harvest takes place — from 87,216 metric tons to 51,000 metric tons a year, even as it increased the total allowable coastwide catch.

But the action angered Omega Protein, which operates a facility in Reedville, VA, that "reduces" large amounts of menhaden caught by its fishing fleet into other products, such as fish oil supplements and animal feed. Omega is by far the largest harvester of menhaden in the Chesapeake and the entire East Coast. The company has not exceeded the new limit for Bay waters in years because it has drawn more of its catch from the Atlantic, but officials said the lower number restricts their future options and has no scientific basis.

States are required to adopt harvest limits set by the ASMFC. But in Virginia, where the General Assembly sets menhaden regulations, Omega opposed the change, and the legislation was not brought to a vote.

In May, the ASMFC's menhaden board considered acting against Virginia, but decided to give the state more time to come into compliance.

That didn't happen, though. In a June letter to the commission, Virginia Gov. Ralph Northam said that he and his staff sought to get lawmakers to adopt the new regulations, but "unfortunately, we were not successful."

The governor said he remained "hopeful" he would ultimately resolve the issue with the General Assembly and asked the commission to not formally find the state out of compliance unless it actually exceeds the new catch limits, which seems unlikely.

Menhaden from a pound net are offloaded at Kool Ice Seafood in Cambridge, MD. The fish will be used as crab pot bait. (Dave Harp)

At their August meeting, members of the commission's menhaden board struggled over whether to take action — and whether the federal government would back it up if they did.

Bob Ballou, of the Rhode Island Department of Fish and Wildlife, said failure to act could set a precedent of allowing a state to not enact the commission's regulations, instead saying "trust us, we're not going to go over."

"I worry that it tears at the fabric of what this commission has always been about," he said. "We take, for better or for worse, what this board adopts, and then we implement it. If we don't or we can't, there needs to be some level of accountability."

On the other hand, Jim Gilmore, director of the New York Division of Marine Resources, said the Virginia situation was only a "technical noncompliance" because Omega's menhaden harvests in the Bay appeared likely to stay within the commission-approved limit.

"I know it is not following our process, but when you start looking at all those other factors, folding in noncompliance at this point in time may do more damage than it is going to do good," he said.

Several members argued that Virginia was getting a break because the commission was worried that the U.S. Department of Commerce would not back up its decision.

If the commission finds a state failed to comply with its actions, it sends a recommendation to the Department of Commerce requesting that it impose a moratorium on all catches of that species within the offending state.

That's happened about two-dozen times since 1993 when Congress gave the Commerce secretary the power to enforce the commission's actions.

But last year, for the first time, Secretary Wilbur Ross rejected a request by the commission to find New Jersey out of compliance for its failure to adopt a new catch limit for summer flounder, a move many viewed as political.

"If all of us believed that our action here would be supported by the secretary of Commerce there would not be a discussion around the table right now," said Andy Shiels, a commission member from the Pennsylvania Fish and Boat Commission.

Shiels said if the commission did not exert its authority, "at some point there is not going to be an Atlantic States Marine Fisheries Commission with the ability to make decisions about how fisheries are managed up and down the East Coast."

Winning support from the Commerce Department could be an issue. Chip Lynch, an attorney with the National Marine Fisheries Service — which is part of the department — told board members that the law requires the federal review to focus on the conservation of the fishery and whether any noncompliance jeopardizes the stock.

He said the commission's own data raised questions about whether menhaden are in jeopardy. The ASMFC's latest review found that menhaden are not overfished, and the commission itself agreed last fall to increase the coastwide catch by 8 percent.

"This would be the first time ever," Lynch said, "that the federal government would receive a noncompliance referral for a fishery that is not overfished, [and where] overfishing is not occurring."

Recreational fishermen and conservation groups have long argued that the Bay is an important nursery area for menhaden, and they contend that the species may suffer "localized depletion" because of heavy fishing pressure and therefore warrants extra protection.

But the management plan the ASMFC adopted last year stated there was little evidence to support that concern. It noted that a multi-year research program found that menhaden are highly mobile and local depletion would occur only on a "relatively small scale for a relatively short time." Nonetheless, the commission has supported a cap on Omega's catch in the Bay since 2005, saying it "does provide a greater level of protection."

Ultimately, members of the menhaden board voted to table the issue of Virginia's compliance until next year, giving the General Assembly another chance to act.

After the meeting, environmental groups criticized Omega for working against the adoption of the lower limits. "Omega Protein continues to undertake a risky gamble with the health of the Bay's menhaden population, undermining ASMFC's efforts to ensure vibrant fish populations and healthy fisheries all along the Atlantic Coast," said Chris Moore, regional ecosystem scientist for the Chesapeake Bay Foundation.

Omega, meanwhile, said it believed the extra time granted by the menhaden board would allow time for it to work with the state and other stakeholders to find an "equitable solution" for the Bay and that, in the meantime, menhaden were being sustainable managed.

Omega spokesman Ben Landry said "there is nothing in the current operations of the menhaden fishery that would justify a noncompliance finding."

MD tells 3 power plants to reduce toxic wastewater discharges

≈ MDE opts to stick to strict rule that administration indicates it might roll back

By Timothy B. Wheeler

Maryland regulators have decided to make three power plants in the state reduce toxic wastewater discharges by 2020 under a federal regulation that the Trump administration has delayed and indicated it may roll back.

Heeding arguments made by environmental groups and some state lawmakers, the Maryland Department of the Environment gave NRG Energy until Nov. 1, 2020, to meet new limits on the discharges of certain pollutants — including toxic metals like arsenic, mercury and selenium — at its three plants.

The affected generating stations are Morgantown, on the lower Potomac River in Charles County; Chalk Point, on the Patuxent River in Prince George's County; and Dickerson, also on the Potomac north of the District of Columbia, in Montgomery County. The facilities discharge water that's been used in their air pollution scrubbers and to flush bottom ash out of their boilers.

In making its final determination on the renewal of the plants' five-year discharge permits, the MDE backed away from its earlier, tentative decision to give the facilities up to five years before they'd have to curtail the discharges under "effluent limitations guidelines" from the U.S. Environmental Protection Agency.

The EPA finalized those limits in 2015, making them the first federal limits on toxic metals and other harmful pollutants discharged to rivers and streams by coal-burning power plants. Citing technology improvements over the last three decades, the agency required coal plants to install or upgrade wastewater treatment systems or otherwise adjust the plant's operations to curtail such discharges.

The EPA decreed at that time that the rule would be phased in starting this year, with all plants to be in compliance by 2023. But last year, responding to industry complaints about the rule's cost, the EPA initially stayed the rule, and then delayed its effective date to 2020 or beyond while the agency considered revisions. Environmental groups sued, and the case is pending in federal appeals court.

In the face of such uncertainty, the MDE had at first proposed giving the plants the option of complying with the federal rule by November 2020 or delaying until 2023 to await potential changes. Environmental groups, some lawmakers and others had submitted written comments urging the MDE not to wait, citing the impacts such discharges could be having on fish and human health.

In a written response to those comments, the MDE said it never intended to delay implementation of an active regulation. While the EPA rule did allow for granting more time beyond Nov. 1, 2020, the MDE said it had received no proposal from the company specifically arguing that it needed more time to comply. Indeed, the MDE noted that at the Morgantown plant, for instance, the company has already installed an advanced biological treatment system to help it meet the new limits.

The MDE still gave the company an option to delay compliance until 2023 but, if it did so, it would have to meet even stricter discharge limits.

An NRG spokesman referred questions to GenOn, a one-time NRG subsidiary that owns the plants and has recently spun off from the Princeton, NJ-based energy company. A GenOn spokeswoman did not respond to requests for comment. The company had submitted comments to state regulators urging them to wait until the EPA rulemaking was complete before imposing any new standards, according to the MDE, but it also acknowledged that it had already done much to meet the rule.

Environmentalists welcomed the MDE's decision, though they said it did not resolve all of their concerns.

"I don't like the flexibility in compliance deadlines," said Abel Russ, an attorney with the Environmental Integrity Project, a Washington, DC-based non-profit. But he said he could accept it as an incentive to get the plants to reduce pollution even more, and noted that the plants would be required to report their progress every six months, so the public could tell if they are trying to evade compliance.

Still, Russ said in a statement that his group was pleased to see that the MDE "is following the law and stepping up to protect the environment at a time when the EPA is actively trying to undermine environmental protection."

The MDE imposed additional requirements at two of the plants. For Dickerson, upriver from the District's water supply intake, the state required monitoring the discharge for bromide, which is associated with cancer-causing byproducts in drinking water. The plant also is barred from using any bromine-containing chemicals in its treatment process.

At Morgantown, where the Potomac Riverkeeper obtained aerial photographs of a reddish plume coming from one outfall last summer, the MDE said it had been unable to verify any inappropriate discharge. But state regulators are requiring the plant staff to make a daily visual inspection of the outfalls emptying into the discharge canal where the plume was seen.

"We're happy that MDE adopted many of the additional restrictions we pushed for," Potomac Riverkeeper Dean Naujoks said in a statement.

Amid rising waters, Smith Island puts faith in jetties, God

≈ $6.9 million project 'not a cure-all,' but a welcome sign to islanders that they haven't been written off.

By Jeremy Cox

Only on Smith Island would someone get choked up about a jetty, a constructed wall of stones that functions like a bulwark against waves and water currents.

Eddie Somers, a civic activist and native of the island in the middle of the Chesapeake Bay, delivered remarks at a recent press conference called by the U.S. Army Corps of Engineers to mark a milestone in the construction of two jetties off its western flank. He was close to finishing when he suddenly stopped, holding back tears — tears of joy.

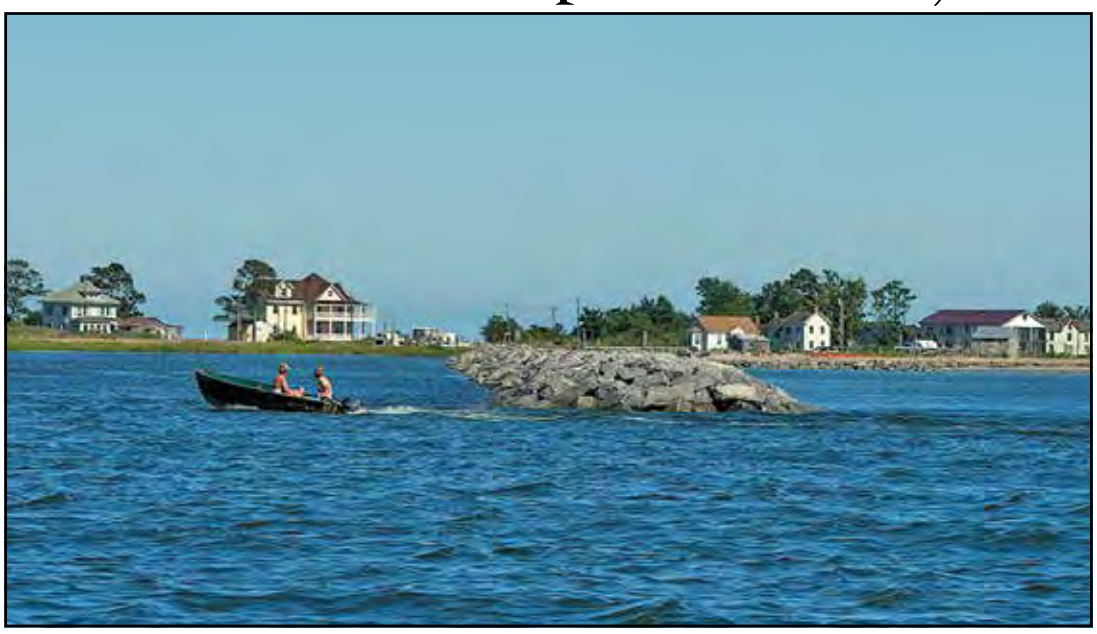
"Those barrier islands were in danger of breaching in a couple places, and when that happens, you're one hurricane away from losing your home," he said when asked later about the moment. "So, for a lot of people, it's emotional — not just me."

On Smith Island, Maryland's only inhabited island with no bridge connection to the mainland, residents prize self-reliance. But for more than two decades, Somers and his neighbors had been pushing for outside help to save their low-lying island properties from slipping away into the surrounding Bay.

Now, they've gotten it. Since 2015, federal, state and local sources have invested about $18.3 million in three separate projects on and around Smith Island, adding about 2 miles of reconstructed shoreline, several acres of newly planted salt marshes and hundreds of feet of jetties.

That money may buy a lot of jetty stones and sprigs of cordgrass, but all it can really buy is time, according to climate researchers and Army Corps officials.

Smith Island is an archipelago, with a population spread across three small communities: Ewell, Rhodes Point and Tylerton. Since 1850, erosion and rising sea levels have put about one-third of the islands underwater. By 2100, the Bay is expected to rise by at least 3 more feet — bad news for a land that's mostly less than 3 feet above current sea level.



A boat motors its way past one of two jetties completed earlier this year to protect the low-lying community of Rhodes Point on Smith Island. (Dave Harp)

Clad in fatigues, Col. Ed Chamberlayne, head of the Army Corps' Baltimore District office, now retired, boarded the Maryland Department of Natural Resources research boat, Kerhin, after the press conference to tour the new jetties with an entourage of state and local officials. He described the $6.9 million project, which also includes dredging a boat channel and using the fill to restore about 5 acres of nearby wetlands, as a temporary fix.

"How long this will last is an obvious question," Chamberlayne said. "As far as what this does to Smith Island long-term, this is not a cure-all."

Nor are any of the other projects. So, with each inch of sea level rise and dollar spent fighting it, an old question gains more urgency: To what lengths should society go to defend Smith Island and other places believed to be highly vulnerable to climate change?

Two jetties extending out into the Bay were built by the U.S. Army Corps of Engineers to protect a navigational channel near Rhodes Point on Smith Island. (Jeremy Cox)

Facing land losses of their own , coastal communities in Alaska and Louisiana are getting ready to relocate to new homes farther inland.

A similar debate hit Tangier Island, about 10 miles south of Smith Island in Virginia waters, after a 2015 Army Corps study declared that its residents may be among the first "climate refugees" in the continental United States. In the wake of a CNN report about the shrinking island last year, President Donald Trump, who has referred to global warming as a "hoax," called its mayor to assure him he has nothing to worry about.

In a view shared by many on the boat, State Sen. Jim Mathias expressed confidence that Smith Island would be around for a long while. "It's man's hand intervening," said Mathias, a Democrat who represents the lower Eastern Shore. "We have the top engineers working for us. We'll figure it out."

When the final phase of the jetty project is completed this fall — channel dredging and marsh restoration remain — it will mark the end of a chapter in the community's history that started with, as some residents interpreted it, its proposed destruction.

In October 2012, Superstorm Sandy walloped the New Jersey coast and flooded lower Manhattan in New York City, and in Maryland caused extensive flooding in Crisfield and along the Bay shore in Somerset County. Smith Island suffered relatively little damage in comparison.

Still, state officials, conscious of the long-term threat to Smith posed by rising seas, set aside $2 million in federal relief money to buy out voluntary sellers. Plans called for homes or businesses acquired by the state to be torn down and that future development to be banned on the properties.

"The people didn't want to be bought out, and they were sort of insulted by it," said Randy Laird, president of the Board of County Commissioners in Somerset County, which includes Smith island. "They felt like they (state officials) were trying to close down the island."

The buyouts would have created a domino effect, Mathias said.

"Once it starts, it doesn't stop," he said. "It goes from one parcel to another parcel. And another family falls on hard times, and the state shows up with a check."

Enter Smith Island United.

The archipelago has lost nearly half of its population since 2000. Among the fewer than 200 who remain, one-third are age 65 or older. Most young people leave after finishing high school for lack of jobs on the island. "We didn't really have a voice in government," Somers said.

To push back against the buyouts, residents formed a civic group and began hosting regular community meetings. Those talks turned into Smith Island United. Somers, a part-time resident and captain of a state icebreaker boat, was installed as its president.

Soon, the organization persuaded the state to drop its buyout offer in favor of a "visioning" study. The report, finalized in 2016, outlined several possible actions for reversing the downward course, ranging from creating a seafood industry apprenticeship program to providing more public restrooms for island visitors.

That same year, Maryland named Smith Island a "sustainable community," giving the community access to a suite of revitalization initiatives from the Maryland Department of Housing and Community Development and grant programs. The island received a $25,000 grant last year to fix store facades because of the program.

In the meantime, long-stalled plans to shore up Smith Island's marshy coastline began to materialize. The U.S. Fish and Wildlife Service built a $9 million "living shoreline" in the Glenn Martin

JETTY CONTINUES ON PAGE 17

Jetty from page 16

National Wildlife Refuge, a marshy island that protects Smith's north side from erosion. Then came a $4.5 million county project, completed in late 2017, that created another living shoreline on the island's west side near Rhodes Point, its most endangered spot.

The Army Corps complemented that work with the construction of two jetties earlier this year, one on either side of an inlet called Sheep Pen Gut. Workers are expected to return in the fall to dredge the channel, deepening it from 3 feet to 6 feet. That will restore vessel passage through the island, eliminating the circuitous, gas-wasting journey that some watermen must take to reach the open Bay because the inlet has shoaled up.

Once the DNR vessel had returned to Ewell, Chamberlayne, Mathias and other VIPs embarked on a Natural Resources Police boat to get a closer look at the jetties. The Kerhin's draft was too deep for the shallow waters around the inlet.

Everett Landon caught a glimpse of the construction while standing on the second-floor balcony of a home still under construction.

"It looks very good," said Landon, a Rhodes Point native who took over as pastor of the community's three churches last year. "With the erosion we've been facing, people have been wondering how long until it makes them move away."

The Rhodes Point jetty project had been on the books at the Army Corps since the mid-1990s. Some residents had all but given up hope that it would ever get built.

"You get a community that struggles a lot, and you get a project like this — it puts the wind in your sails. It just shows persistence," Landon said.

He added that the help is especially welcome in Rhodes Point, where the 40 or so remaining residents live on an ever-shrinking strip of high ground. For his part, Landon measures that loss in the gradual disappearance of a beach once visible — high and dry — beyond the marsh that fringes Rhodes Point.

"My grandmother told me that when she was younger, she could sit on the second floor of her home and all she could see was sand," he said. "When I was growing up, it was just a narrow strip and then marsh. When my kids came along, it was just gone."

As seas rise and erosion takes its toll — and the population shrinks — some homes have been abandoned on low-lying Smith Island, including this two-story structure in the community of Rhodes Point. (Jeremy Cox)

Most Smith Island residents have incomes tied to the seafood industry, from the crabs they catch or pick or the oysters they dredge. Support for Trump was near unanimous on the island in 2016, and most share his skepticism toward human-caused climate change.

They concede that their island is vanishing, but they prefer to speak of it in terms of erosion instead of sea level rise.

Marianna Wehnes moved to Smith Island in 2011 to live with her boyfriend, and she quickly fell in love — with the island.

After her relationship with the man ended, Wehnes moved back to the mainland on Maryland's Eastern Shore, only to return. She missed the community's tranquil way of life and knowing her neighbors. She now works in one of Ewell's gift shops, where eight customers walking through the door qualifies as a busy day.

The new jetties and restored marsh will help keep the island above water for a while, she agreed. Beyond that, Wehnes added, Smith Island's fate will be up to a higher power.

"It's been here 400 years, and it's going to be here for 400 years," she said. "The only reason it won't be is if the good Lord tells it to go."

FLOOD FROM PAGE 1

over the past 10 years, so that it can recover from these types of [storm] events and not be set back this time," said Doug Myers, a scientist with the Chesapeake Bay Foundation, a nonprofit environmental group.

The July rains supercharged flows on the Susquehanna River — which provides about half of the freshwater entering the Chesapeake — to a peak of 375,000 cubic feet per second at the Conowingo Dam on July 26, according to the U.S. Geological Survey.

Exelon, the dam's owner, opened 22 floodgates, triggering voluntary evacuation orders for the Cecil County town of Port Deposit, about 6 miles downstream of the dam.

The August storm boosted flows to 211,000 cubic feet per second and prompted another round of floodgate opening.

That peak came the day that Gurbisz and her fellow scientists were taking sediment and grass samples within view of the Thomas J. Hatem Memorial Bridge, which spans the Susquehanna in Maryland just upstream from its confluence with the Bay. The water was tinged the color of chocolate milk and either dotted or smeared, depending on the spot, with tree trunks and branches.

"It's spectacular with all this debris, but what actually affects the Bay is the suspended sediment," said Cindy Palinkas, a University of Maryland Center for Environmental Science researcher also working on the study.

Since the spring, the researchers have been examining small patches of underwater grass near the mouth of the Susquehanna. The team recently received additional funding from Maryland Sea Grant to study how the grass responded to the rainfall in one of the largest patches of them all: the Susquehanna Flats.

They plan to compare their findings with measurements they took of the Flats during a separate study in 2014–15, which were comparatively dry years.

Grass beds in the Flats trap some of the sediment and nutrients as they flow out of the Susquehanna, Palinkas said, helping to improve water quality in the area. Those beds were wiped out after Tropical Storm Agnes — the largest storm on record — hit in 1972. They have since bounced back to cover more than 9,000 acres of Bay bottom, making the Flats one of the largest underwater beds in the Bay.

The grasses could use some dry weather this fall to recover, Palinkas said. The murky water can block the sunlight, causing the plants to die off. The sediment particles can also settle on the leaves themselves, spreading more shade.

The grass beds appear to be able to weather a heavy pulse of water now and then, but not repeatedly, Palinkas said.

Cassie Gurbisz, a St. Mary's College coastal ecosystem ecologist, prepares to take an underwater vegetation sample near the Susquehanna Flats during a research cruise in mid-August. (Jeremy Cox)

This clump of wild celery was gathered from a small patch near the Susquehanna Flats. (Jeremy Cox)

"You can withstand the occasional cold," she said. "You can't withstand 20 colds in a row."

The size of the storm was not particularly unusual. River flows of 375,000 cubic feet per second at Conowingo would be expected about every four years on average, said Joel Bloomquist, a USGS hydrologist. This was the first time flow had approached the level since 2011, when a deluge from Tropical Storm Lee led to slugs that were twice a high.

But the timing of the rain events — during typically dry midsummer months — is unusual.

Very high stream flows are usually associated with spring rains and snowmelt as well as tropical storms and hurricanes that strike in late summer or fall. (But Agnes, the most severe storm on record, hit in June 1972.)

High flows in the summer can be more damaging than at other times because it's the peak of biological activity for many important Bay species, from underwater grass beds to juvenile fish and crabs.

The July rainfall was especially heavy in a band extending north and south along Maryland's Western Shore into southern Pennsylvania. Storms dumped at least 10 inches of rain in the area, with one spot in Baltimore County receiving as much as 15 inches, according to the National Weather Service. BWI Marshall Airport got inundated with nearly 11.2 inches of rain. Norfolk, at the base of the Bay, received slightly more than 4 inches. Dulles Airport and the District of Columbia's Northern Virginia suburbs got hit with 5 inches of rain on July 21 alone, fueling a total of 7.7 inches over those five soggy days.

One bright spot with the influx of water is that it flushed out to sea much of the water that was in the Bay, including the deeper portions that had grown inhospitable to life, Myers said.

In June, scientists predicted that a larger than average "dead zone" would spread across the bottom of the Bay this summer. They based their forecast on heavy spring rains, which sent nutrients streaming down the Susquehanna and Potomac rivers. The nutrients feed algae blooms, which, in the process of sinking and dying, deplete the water of oxygen.

By late July, though, Maryland's Department of Natural Resources was recording the best oxygen conditions it had ever found for that time of year in the Bay. The recent rain and wind had churned up the water so much that the only oxygen-starved areas were restricted to depths of 65 feet or deeper.

But all of the freshwater pushed into the Bay could be bad news for some species, such as oysters, which like higher salinities.

In Virginia, oysters beds were already dying in the James River and other tributaries, said Ryan Carnegie, a researcher with the Virginia Institute of Marine Science.

Salinity readings at the mouth of the York River plummeted to 10 parts per thousand, about half of the normal value, according to VIMS. Researchers found that the unusually fresh water was all but devoid of potentially harmful algal species in the wake of the July rains. Young striped bass were venturing farther downstream than normal, taking advantage of the saltwater's retreat.

It's unclear how the Bay's plant and animal life will respond over the long term to the lashing from sediment and nutrients, Carnegie said.

"Estuaries are inherently variable environments," he said, "but extreme events can be beyond what many inhabitants can manage. The 1972 Agnes event is a classic illustration. We will just have to wait and see how detrimental this year's event was to key resource species."

Although rivers throughout the region were choked with debris, some pointed a finger at the Conowingo Dam, which is up for relicensing. They want Exelon to do more to control nutrients, sediment and debris being pushed downstream of the dam. Maryland, as part of the condition for the new license, is pressing to spend up to $172 million a year to control nutrient and sediment pollution and to more frequently clean debris that builds up behind the 94-foot-high structure.

"None of that pollution would be building up and causing a danger or hazard but for the dam," said Betsy Nicholas, executive director of Waterkeepers Chesapeake, which has pressed the state to go even further. She added that climate change is expected to make severe storms more frequent.

Exelon has said it is not responsible for pollution originating upstream that flows past the dam, and that the state's proposal would cost more than it makes from the hydroelectric facility. It has challenged Maryland's requirements in court.

Back on the Upper Bay, the UMCES boat carrying Palinkas kept making unscheduled stops because the motor was getting choked with grass growing in the Flats. The pattern repeated itself more than a half-dozen times: remove, go, sputter.

But she was optimistic the Bay would bounce back. "It looks really dramatic now with all the sediment and the water. But you give it time, I think it will recover."

Karl Blankenship contributed to this report.

FERC approves 'Potomac pipeline' that would carry gas from PA to WV

≈ Decision's dissenters take issue with ignoring the impacts it would have on climate change.

By Timothy Wheeler

Over objections from environmentalists, the Federal Energy Regulatory Commission has given the green light to building a hotly disputed natural gas pipeline through Western Maryland and under the Potomac River.

With one of its five commissioners voting no and another dissenting in part, the five-member commission in July approved the Eastern Panhandle Expansion Project, a 3.5-mile pipeline proposed by Columbia Gas Transmission that would carry gas from Pennsylvania to West Virginia.

Environmental groups and some western Maryland residents have waged a lengthy campaign against the "Potomac pipeline," as they call it, staging repeated protest demonstrations and garnering resolutions against the project from several local governments. Opponents argue that the project's construction poses risks to the river and drinking water supplies, both near the drilling and downriver. They also contend that it will accelerate climate change by encouraging more natural gas production and consumption.

In its 53-page order, the commission majority brushed aside those concerns, saying the company's plan for drilling beneath the Potomac addressed the risks and potential impacts of a leak or blowout.

Environmentalists had asked the commission to require Columbia Gas, a subsidiary of TransCanada, to follow a lengthy list of conditions for drilling beneath the river that the Maryland Department of the Environment had proposed in approving a state permit for the project. But the federal panel declined to do so, saying it would instead encourage the company to adhere to the state conditions.

The panel's majority also dismissed contentions that the pipeline would stimulate more gas production using hydraulic fracturing, a controversial technique blamed for instances of drinking water well contamination and other problems. They likewise said they lacked information to determine whether the pipeline could significantly exacerbate climate change by allowing for more gas to be produced and consumed, as environmentalists contended.

But two of the five panel members took issue with the majority on those last two points. Commissioner Cheryl LaFleur concurred with the majority in approving the pipeline, but she disagreed with its decision to ignore the project's climate-change impacts. Commissioner Richard Glick opposed the project, arguing that the commission had abrogated its legal responsibility by refusing to consider those impacts.

"Climate change poses an existential threat to our security, economy, environment and, ultimately, the health of individual citizens," Glick wrote. He said the majority "goes out of its way to avoid seriously addressing the project's impact from climate change" by disregarding the potential emissions of carbon dioxide and methane that might result from increased gas production and consumption.

In August, two environmental groups — Chesapeake Climate Action Network and the Potomac Riverkeeper Network — filed a request with FERC seeking a rehearing, arguing that the commission did not adequately consider the direct and indirect greenhouse gas emissions from the project. The groups also have criticized Maryland Gov. Larry Hogan for his administration's decision not to subject the pipeline to more rigorous environmental review.

VA to monitor water quality at 3 controversial chicken farms

≈ Research will help document how much water pollution is generated by large poultry operations.

BY JEREMY COX & WHITNEY PIPKIN

A surge in the number of chicken houses is taking place on Virginia's Eastern Shore, including those shown here under construction along Route 13 in the fall of 2017. (Dave Harp)

Virginia environmental officials are setting out to answer a question that has long dogged Delmarva's poultry industry: Do industrial-size chicken farms foul streams and other waterways with polluted runoff?

The Department of Environmental Quality announced that as of August, it is conducting a yearlong study of water quality near three poultry farms in Accomack County on the Eastern Shore. Researchers plan to take samples both upstream and downstream of each farm and will inspect the water for nutrients, sediment and other contaminants.

"We'll get a much better idea of what contributions the farm is having on water quality," said Neil Zahradka, DEQ's manager of land application programs.

The study comes after neighbors and environmental advocates pressured the state to require rigorous environmental monitoring as a condition of the farms' stormwater permits. Representatives of Accomack's $108 million poultry industry warned that such an obligation would be a burden that could cripple one of the rural region's few money-makers.

The state didn't tie the sampling to the permits, but most of the farms' critics accepted the compromise. It marks the first time that specific poultry farms will be formally monitored for pollution anywhere on the peninsula, they said.

"For the first time, we're really going to be able to say, 'Yes, these BMPs really are working' or 'No, they're not,'" said Jay Ford, the Chesapeake Bay Foundation's outreach coordinator in Virginia. Ford recently joined the foundation in this new position after pushing for these reforms as the region's shorekeeper.

Getting farmers to create and maintain BMPs, or best management practices, represents one of the top strategies under the federal and multistate Chesapeake Bay cleanup program. The 83,000 farm operations in the watershed are the Bay's largest single source of nutrient and sediment pollution, researchers say.

Practices that can soften that pollution punch include digging bioretention ponds where stormwater can collect and planting a buffer of trees and shrubs on the edges of fields to filter runoff. Such steps are widely embraced as effective. But little is known about how well they perform on modern chicken farms, which produce far more birds and, therefore, more nutrient-laden waste than their older counterparts.

The three Accomack farms are receiving extra scrutiny because federal inspectors discovered violations of the Clean Water Act at each property in 2010.

The county, population 33,000, is home to two sprawling plants that slaughter and package the chickens grown at nearby farms under contracts with Tyson Foods Inc. and Perdue Farms. The companies are Accomack's two largest employers.

The squat, metal-roofed buildings where those birds are housed provide some of the only structural variety in a landscape dominated by fields of soybeans, corn and wheat — much of it cultivated to feed the chickens.

A tougher zoning ordinance approved by the county's board of supervisors in February 2016 has done little to slow the industry's growth.

Spurred by the expansion of Tyson's processing facility in Temperanceville, Accomack is on pace to nearly double the number of chicken houses within its borders in the coming years, with permit applications submitted for 273 new structures as of August 2017, according to county documents.

In 2010, when the U.S. Environmental Protection Agency found the three farms doing little to prevent polluted runoff from leaving their sites, it ordered the DEQ to issue them federal permits, which are ostensibly stricter.

Some neighbors suspect other poultry operations aren't in compliance as well, but they admit they have no evidence to support those claims.

"I don't know if these are the only three or if there are others because we don't do any monitoring," said Arthur Upshur, president of Citizens for a Better Eastern Shore, which also pushed for the testing.

If the DEQ's monitoring finds problems, it could open the door to a broader industry examination, he added. He said that he hopes the findings persuade state regulators to enact tighter pollution controls when its overall federal stormwater permit is reviewed in the next few years.

Critics have long worried that regulatory programs are not as effective as hoped when it comes to mitigating the impacts of the huge new poultry operations.

In Maryland's last two state legislative sessions, activists have fallen short in their efforts to pass a law mandating air emissions tests on the Eastern Shore. They charge that the ammonia blowing out of the houses' huge fans is a detriment to nearby residents' health.

In Accomack, the DEQ proposed that the three farms'operators conduct their own "visual monitoring" tests: taking stock of their runoffs' color, odor and amount of solids each time it rains. When Ford and other detractors learned that would be the only failsafe at the farms, they turned out by the dozen at a DEQ hearing in January.

At a Virginia State Water Control Board in April, regulators signed off on the permits — the first ever issued for individual poultry farms. The board required visual monitoring. But outside the bounds of the permit, DEQ officials said they would be studying nearby waters themselves and share the results with the public.

"We were pleasantly surprised the state was very responsive to our questions," the CBF's Ford said. "When we have major storm events, we know water is leaving the sites, but we have no data anywhere on Delmarva to know what is leaving."

The poultry industry is changing and regulators need to change their protocols to keep pace, he added.

"Our permits were written for a different size industry," Ford said. "I think our regulators are doing the best they can to keep up with an industry that is growing."

The ordeal demonstrates that farmers are responsive to environmental concerns and take swift action when problems are found, said James Fisher, a spokesman for the trade group Delmarva Poultry Industry.

"The situation that EPA found was fixed, and then all three farms went further and applied for — and this April obtained — these permits that the EPA said farms that discharge have to have," he said. "That's one more sign of how seriously growers and the chicken community take water quality."

At the Brady Farm, one of the three that received the new permits, owner Ryan Brady said he has taken several steps to clean up runoff, including planting tree buffers, treating poultry manure and installing channels that drain into a new $400,000 pond.

He told those gathered at the January hearing, though, that he supports research into how much pollution CAFOs discharge. "We need to make sure we're doing the right thing and taking the right steps before we put these permits into place," Brady said.

Manure management questions stall plans for MD poultry farm

≈ Rules that require outdoor enclosures raise concerns about how runoff will be controlled.

By Jeremy Cox

Maryland has withdrawn a permit for a large organic chicken farm in Cecil County after its neighbors appealed the decision, saying it would leave manure-laden runoff unchecked.

The Maryland Department of the Environment notified Zion Acres Poultry in June that the permit won't be approved without more detailed information about how the company will stop polluted stormwater runoff from entering groundwater and nearby streams.

The Cecil decision represents a rare victory for Maryland activists who oppose poultry operations that they see as too big to safely contain the farms' air and water emissions. And it deals a blow to agribusiness companies that have sought in recent years to marry organic practices with increasingly industrialized farm footprints.

Animal manure remains a stubborn source of nutrient pollution in the Chesapeake Bay. On poultry farms, manure gets tracked onto areas outside chicken houses and washed into streams with the rain; much more is scraped out of sheds and spread onto cropland as fertilizer.

Once in the Bay, the nutrients fuel algae blooms that block sunlight from underwater grass beds. When the blooms die, the bacteria that feed on them suck up oxygen, creating so-called "dead zones" where there's almost no oxygen for fish or other marine organisms to breathe.

Galen and Crystal Horst, the owners of Zion Acres, want to build four chicken houses, raising up to 830,000 birds a year on a farm in North East, a town just off the northern banks of the Chesapeake Bay. The Horsts are under contract with Perdue, one of the largest poultry producers in the country.

The MDE approved their stormwater plan last November, but a community group, the Calvert Neighborhood Alliance, appealed the decision to the agency's administrative law judge. Officials agreed to withdraw the permit before the case went to a hearing.

"MDE has revisited its assessment of these documents and has made the determination that further information is necessary" before the permit can be approved, wrote Hilary Miller, director of the land and materials division, in a June 22 letter.

State environmental regulators have now rejected three farm stormwater permits out of nearly 500 applications, according to department statistics.

One of the other reversals also came in June. The MDE rejected a permit for a Worcester County farm after an administrative law judge recommended the action. Officials had initially approved the eight chicken houses, giving the farmer up to two years after it went into operation to construct a required manure shed.

A state permit for the Zion Acres poultry farm in Cecil County, MD, was withdrawn until the owners provide a more detailed stormwater management plan. (Dave Harp)

The Cecil case stands out because, unlike in Worcester, MDE officials acted without a judge's urging, said Keith McKenica, one of the founders of the Calvert Neighborhood Alliance, which formed to contest the 24-acre project.

"I was shocked," McKenica said.

The Horsts didn't return messages seeking comment for this report. But Perdue representatives said the information being sought shouldn't delay the project for long.

"It's more of an administrative issue," said Steve Levitsky, vice president of sustainability. "They had some questions with the original application, so they pulled the permit to get more information."

Added Perdue spokesman Joe Forsthoffer: "We don't see this as any red flag situation or big change."

Still, the pair of recent successful challenges may ratchet the Shore's poultry battle to a new level. A confluence of factors — cheap grain prices, relatively low interest rates and rising consumer demand — has led to a wave of new chicken house construction on the Eastern Shore. The 21st-century houses are considerably larger than their 20th-century counterparts and tend to be clustered in groups of six or more, instead of the usual two or three.

Community activists, often backed by environmental groups, have struck back, pushing local governments to enact stricter development and zoning controls. That happened in the wake of the Zion Acres proposal in Cecil County. The new rules that the county council voted for in March largely mirror those put forward by the Delmarva Poultry Industry, a trade group consisting of the region's chicken farmers and agribusiness companies.

McKenica, a member of the citizens committee that initially drafted the rules, said he found himself outnumbered by interests arrayed in favor of the industry. The final document doesn't require new chicken buildings to be set back far enough from neighboring homes and doesn't go far enough to protect air quality, he added.

"I told the committee you don't have enough information to know what the decision should be," McKenica said. "They took everything they wanted and made it the new zoning package."

Hence his surprise with the MDE's recall of the Zion Acres permit, which at minimum delays the construction of four chicken houses and at most adds years of bureaucratic headaches for the industry.

The state's biggest sticking point with Zion Acres' stormwater plan centers on one of the main features that distinguishes an organic poultry farm from a non-organic farm.

Perdue requires its contract farmers to raise organic chickens according to standards set by the Global Animal Partnership, a certification program established by Whole Foods for the meat it buys. At most non-organic farms, chickens never see the light of day, living their lives entirely under artificial lights inside a long, narrow shed. In contrast, Perdue's organic chicken houses are festooned with hatches that allow older birds to skedaddle outdoors into a fenced pasture.

Inevitably, the chickens poop outside. Where does the manure go? How is it treated?

Zion Acres' plan, as originally submitted, doesn't answer those questions, according to the appeal filed by the Environmental Action Center on behalf of McKenica's group. The Washington, DC-based advocacy group also represented citizens contesting the Worcester project.

"The lack of operation-specific parameters to address the scattered manure violates the [general discharge permit] and federal requirements by failing to ensure that the zero-discharge standard is met," wrote Environmental Action Center attorney Sarah Edwards in the appeal.

Environmentalists and farmers dispute whether the pastures next to chicken houses capture and filter nutrients on their own.

According to the Global Animal Partnership guidelines, the outdoor area must be at least the size of the adjoining chicken house. Edwards and other opponents question whether that's enough space.

"Chickens, I'm telling you, they will tear up a piece of ground," said Carole Morison, a former Perdue contract farmer who now raises chickens independently at her organic operation in Worcester County. She consulted with the Environmental Action Center on the Zion Acres case. "They will scratch, constantly do. It's normal behavior. If you've got nothing but dirt, it's just going to run off."

Perdue's Levitsky disagreed, saying there appears to be ample time for the grass to rebound in between flocks and during the weeks when the birds are too young to venture outside.

"What I've seen is it looks like your lawn, a nice grass cover," he said.

MDE spokesman Jay Apperson confirmed that the agency is seeking more information from Zion Acres about how it will resolve the outdoor manure problem.

"The farmer will need to submit a revised [certified nutrient management plan] with additional information to address the presence and assimilation of poultry manure in the outdoor access area next to the chicken houses, among other issues," Apperson wrote in an email.

Zion Acres will have to resubmit the plan for the MDE's approval and undergo another round of public comment before it is finalized, he added.

Edwards said she hopes the case leads the MDE to make industrial-scale organic farmers account for pollution in the pasture. She will be watching to make sure that the Zion Acres plan lays out what she considers meaningful steps to address the runoff.

Pleasant Grove Park a connection to nature, the past

At least 100 acres at Pleasant Grove Park, located along Virginia's Rivanna River, have been transformed into habitat for birds, butterflies, and other pollinators and wildlife. (Stan Kaslusky)

By Leslie Middleton

In the small central Virginia county of Fluvanna, a triangle of historic farm and forest is wedged between the Rivanna River and Virginia Highway 53, just 20 miles southeast of Charlottesville.

At the western end stands a three-story story brick house, built in 1854 by Col. William Haden where he raised 12 children and managed a plantation of approximately 3,000 acres. In those days, the river connected the Haden family to the world — and markets — beyond their home.

Today, 830 acres of the original Haden land have become Pleasant Grove Park, named after the original plantation, connecting visitors from near and far to the river, local history and the natural world.

For thousands of years, the Rivanna River (which bisects Fluvanna County) and James River (which marks its southern boundary) were thoroughfares. The Monacan Indians, a Siouan tribe, had settlements on both rivers, including Rassawek, once located 14 miles downstream from the current park at the confluence of the two rivers.

When the English began to colonize the land upstream from Jamestown, they called the James River above that confluence the Fluvanna or "River of Anne," for the English Queen. They also named the smaller river, the Rivanna, in her honor.

Haden's plantation, established about 200 years later, hugged the Rivanna shoreline and took advantage of a series of dams constructed by the time Hayden built his home. The dams created flatwater impoundments, allowing the passage of people and farm products and powering of gristmills along the river.

Pleasant Grove Park stretches along 3 miles of the Rivanna, just downstream of an S-curve where the river cuts through rocky outcroppings. The park has more than 20 miles of trails that are part of the Virginia Birding and Wildlife Trail. They wind through meadows managed for birds and other wildlife, as well as fields on their way to becoming forests. Some trails are for equestrians. The park provides handouts: nature activities for all ages, trail guides and checklists for birds, plants and butterflies.

Walter Hussey, a former federal program manager from the District of Columbia area, is an enthusiastic master naturalist and master gardener who helps tend the land at Pleasant Grove Park and coordinate its many volunteers.

Together, they have transformed more than 100 acres of parkland into bobwhite quail habitat, hedgerows and pollinator demonstration gardens.

"We're basically trying to enhance the natural experience at the park," Hussey said, "and increase the wildlife diversity." Some projects showcase how homeowners can create small butterfly gardens in their front yards and how farmers can border their fields with vegetated strips to increase game and decrease runoff.

The Heritage Trail, one of Hussey's favorites, was one of the first to be built. It's named for the Heritage Trail Foundation, which is responsible for establishing this and other trails in the park. The trail follows the Rivanna River for almost 3 miles from a parking lot at the Eastern Trailhead to the Western Trailhead close to the Haden House parking.

Much of the trail traverses a forested bluff above the river, occasionally dipping down to cross one of the smaller creeks entering the river. Bridges help hikers over soggy ground through tall stands of Joe Pye weed, which in some years have drawn thousands of migrating monarchs.

"The river here is kind of slow and easy," Hussey said. "And you don't see another farm, house, condo or office building, only the river."

But you might see canoeists and kayakers traveling downriver or stopping to play in the shallows. Many paddlers put in at the Crofton Landing 6 miles upstream from the park and take out just below the park at the Palmyra landing. Parks and Recreation staff can provide boats and even a shuttle for a small fee.

On the opposite side of the river, hikers on the Heritage Rail Trail can often be heard through the leafy branches overhanging the river. This half-mile ADA-accessible trail follows the former route of the Virginia Air Line Railway, a popular local spur that connected Fluvanna residents to Charlottesville and Richmond through the 1930s.

Parking for the rail trail is across the river from Pleasant Grove in the small village square of Palmyra, the

Pleasant Grove Park is bounded for 3 miles by the Rivanna River. The park offers canoe and kayak rentals. (Fluvanna County Parks and Recreation)

The stately 1854 Haden House has been restored to highlight the architectural features of its time. (Stan Kaslusky)

county seat, which is also well worth a visit, especially for history enthusiasts and genealogists. It includes the Old Stone Jail, a museum run by the Fluvanna County Historical Society, and "Maggie's House," the society's offices and archives.

"We're fortunate," said Tricia Johnson, executive director of the society. "Our records are intact back to 1777, unlike [those of] many Southern towns whose public buildings were ravaged during the Civil War."

People who come to the museum and archives, Johnson said, "are astonished at the richness and depth of history here — and how available it is."

Connections are deep and sometimes surprising. "Many times people come looking for their ancestors, only to find that a descendent of that ancestor is here volunteering," Johnson said.

Historic society members serve as docents at the Old Stone Jail and Maggie's House, as well as the Haden House at Pleasant Grove Park.

While the Haden family is not as storied as Thomas Jefferson, who presided at Monticello near Charlottesville, nor as prosperous as other plantation owners in the county, the Haden House shows that the family benefited from the wealth of the land and those who labored on it – many of whom were enslaved.

"The house was by any stretch of the imagination a rather imposing residence," said Marvin Moss, president of both the Fluvanna County Historical Society and Fluvanna Heritage Trail Foundation. The two groups have been instrumental in raising private funds and securing grants for the park and its historic amenities over the last two decades, including restoration of Haden House.

The house has both Greek revival features and traditional Federalist style details, and it now boasts a two-story modern addition, rendered historically accurate and environmentally sensitive by W. Douglas Gilpin, Jr., a restoration architect from Charlottesville.

The addition, Moss said, "is a little more sophisticated than the Pleasant Grove House, but it fits in beautifully." It also includes modern features, such as geothermal heating and cooling and an elevator, as well as a kitchen for the events that groups host year-round at the park.

Like the park itself, the small but elegant house serves multiple uses — the third floor provides staff offices, and the first floor is the county's welcome center.

The second floor houses two rooms of the small but delightful transportation exhibit, "On the Move: Rivers, Roads, and Rails."

The permanent exhibit includes models of the evolving watercraft used to transport crops and people: first, the double dugout canoe; then the batteau, developed after a 1771 flood destroyed many of the canoes; and finally canal boats. Each required more sophisticated ways to tame the flow of the Rivanna.

Museum attendant Brian Coffield likes to highlight the replica hogshead barrel that anchors one corner of the exhibit room.

Such round, planked containers were used to transport tobacco from fields to boats, moving along crude farm roads and then onto increasingly larger boats on the way downriver and across the ocean. "We built this to give people a sense of scale," he said. A typical hogshead was packed so tight it could weigh as much as 1,000 pounds.

Coffield is well-suited to talk about local watercraft of the 1700 and 1800s. Every year he captains his own modern replica of a batteau, the Queen Anne, in the annual summer James River Batteau Festival, a 10-day re-enactment journey down the James.

One artifact, carefully displayed in the center of the room, is part of an 1850-era batteau recovered by Virginia Canals and Navigation Society volunteers from a mud bank along the Rivanna River in 1996.

Even on a humid, gray, summer morning, the museum's tall windows ensure that models, maps and photos are drenched with natural light that seems to invite the visitor outside.

On the grounds of the house, centuries-old boxwoods — remnants of the original English garden — flank the brick path from the home's front portico. The Haden family cemetery lies under towering oak trees between the lawn and restored meadow.

A covered walkway leads from the side entrance of the house to a separate building called the "summer kitchen," where enslaved servants prepared food for the family.

The summer kitchen is now the headquarters for the park's many nature programs and projects, with shelves of animal skulls, feathers, and leaf and plant identification keys.

Moss is unabashedly proud of the offerings that he and other devoted locals helped to make possible at the park. "I think it's probably one of the best county parks in all of central Virginia," he said.

Historic society director Johnson thinks this is because the county has struck the appropriate balance for honoring and respecting the past while looking ahead to the future.

At Pleasant Grove Park, historic preservation, recreation and wildlife enhancement are woven together to provide something for everyone — plants, pollinators and people who come to soak up fresh air, green spaces and history.

Pleasant days at Pleasant Grove Park

Pleasant Grove Park is located near the town of Palmyra in Fluvanna County, VA. Park grounds are open dawn to dusk daily. The Haden House museum is generally open 8 a.m. to 5 p.m. Monday to Friday and 12–4 p.m. Saturday to Sunday. Hours may vary by season so check before visiting by calling 434-589-2016. Admission to both the park and museum is free. The park offers canoe and kayak rentals, as well as a shuttle service. Call for information.

Annual events include the Old Farm Day, next set for May 4, 2019. For information, visit oldfarmday.org.

For information about the Fluvanna Historical Society, visit fluvannahistory.org.

A covered walkway connects the main house to its "summer kitchen" where enslaved servants prepared meals. (Leslie Middleton)

C&D museum sure to float the boat of any canal lover

The C&D Canal Museum in Chesapeake City, MD, is housed in the orignal pump house for the Chesapeake & Delaware Canal. The canal opened in 1829 and still serves approximately 15,000 vessels each year.

Story & Photos By Wendy Mitman Clarke

The year was 1829, and the news was big — big enough to be trumpeted on a broadside that exercised all of the exaggerated fonts and eye-grabbing capitalization of the day:

"Notice is hereby given," it stated, "that this CANAL is NOW OPEN FOR NAVIGATION ... The rates of Toll have been fixed so low, as to make this the CHEAPEST as well as the most EXPEDITIOUS and Safe channel of communication, between the waters of the Chesapeake and Delaware. Horses for towing vessels may be hired at reasonable prices at each end of the Canal."

They had reason to shout. The new waterway, which today is the only 19th-century canal built in the United States that remains a major shipping route, cut about 500 miles from the travel route for vessels between the ports of Baltimore and Philadelphia. While the world's eyes turned southwest toward the great canal in Panama, which wouldn't open for another 83 years, the Chesapeake and Delaware Canal — C&D for short — quietly transformed shipping on the East Coast. It remains a vital waterway, with more than 15,000 vessels transiting annually.

I have traveled the C&D Canal dozens of times in sailboats, sidling past the enormous walls of car carriers and container ships as they make their careful way along the waterway's narrow confines. And every time, like all of these world travelers, I have passed three unassuming, interconnected buildings that sit beside the canal in Chesapeake City, MD. Their elegant flagstone walls and peaked roofs look like something from another era — which they are.

Built in 1837, 1851 and 1853, these buildings, which served as a pump house to raise the canal's water level, are on the National Register of Historic Places and today house the C&D Canal Museum. The remarkable examples of 19th-century engineering within their stout stone walls — including the oldest steam engines still on their original foundations in the country — are just one reason why this museum is, for my money (even though it's free), one of the most riveting in the Bay region.

Most museums have to move or replicate historical features to represent them. But the C&D Canal Museum itself is a piece of history, intact and in place, resulting in a kind of sensory time travel. You can still smell the oil and fluids that kept the enormous pistons of the engines sliding smoothly in their cylinders. And, the past wafts upward in the moist, cool air of the cavern housing the massive cypress water wheel that moved water into the canal. That tangible history lingers as you walk outside and see a modern car carrier sliding silently by in today's greatly expanded, sea level canal.

"It was one of the first civil engineering projects proposed in the New World, and one of the most difficult to carry out," according to the American Society of Civil Engineers, which has placed the canal on its list of national historic landmarks. The American Society of Mechanical Engineers has also listed the engines and water wheel as national landmarks.

Entering the museum, you encounter the broadsides and other bits of the canal's history, including artifacts, displays and photographs that introduce the story of the canal. It began when Augustine Herman, as early as 1661, envisioned a waterway connecting the top of the Chesapeake and Delaware bays. It would be another 100 years before that dream would edge toward reality, with an initial route mapped out in 1764. Another 35 years would pass before the young states of Maryland, Pennsylvania and Delaware signed on with the fledgling federal government to buy stock in what would become the Chesapeake and Delaware Canal Company.

It took four years and $2.5 million to build the canal, which initially had four locks. A marble plaque embedded on an exterior wall of the museum building, dedicated at the canal's opening in 1829, provides some of the pertinent figures, principals and engineering challenges: "On the Deep Cut more than 375,000 cubic yards of earth slipped from the regulated slopes of the sides, and passed into the chamber of the canal." Those 375,000 cubic yards were hand-hauled out of the Deep Cut, then dragged up and over 90-foot embankments by ropes attached to wooden barrels, an example of which is on display.

"These and many other difficulties having been overcome," the plaque continues, "the water was introduced on

Museum exhibits explain that Augustine Herman introduced the idea of a canal to connect the Delaware and Chesapeake bays as early as 1661.

Two engines, one of which is shown here, flanked a large, bucket-bearing wheel that was used to raise the water level in the C&D Canal and lock until 1927.

Sailboats share the C&D Canal with a ship near Chesapeake City, MD. Sailboats are not allowed to sail through the canal; they have to be under power. All vessels must travel slowly.

the 4th of July, 1829, and the final accomplishment of this great National work was celebrated on the 17th of October of the same year at which time the navigation was opened."

Some salient facts are carved into the marble: Length 11.3 miles, width at waterline 66 feet; width at bottom 36 feet; depth of water 10 feet; depth of excavation at summit 76 ½ feet; length of Summit Bridge 247 feet — a covered bridge spanning the canal, itself an engineering marvel— and height above bottom of canal 90 feet; length of locks 100 feet; width of locks, 22 feet.

A copy of an original rules book lays out the fees: A hogshead of wine or rum or other spirits was $1.25, while a hogshead of tobacco or beer was $1; cider, rice or molasses 75 cents; every bushel of wheat, peas, beans or flaxseed a mere 4 cents; and barrel of pork, beef or fish 30 cents.

From the start, the canal had problems maintaining the depth of its channel, and in 1837 the first pump house at Chesapeake City was built to divert water into the canal from neighboring Back Creek. Even this proved inadequate, and in 1852 the engineers added a second building, installing a Merrick & Sons steam engine to run a massive cypress water wheel, designed by Merrick engineer Barnabas Bartols.

Two years later, they added a second engine, and this aggregate of machinery and engineering is the breathtaking heart of this place.

Still on their original foundations, the engines are in separate but conjoined buildings, with the enormous wheel poised in its own thick-walled chamber between them. Their "walking beams" — large, pivoting beams that apply force to the pumps — soar upward into the second story. Fluted columns hold up Herculean crossmembers, and the various connecting rods glisten with elegant precision. In their individual parts and as a symphonic whole, they are industrial artwork that, providing a combined 350 horsepower, operated until May 12, 1927, with only one recorded breakdown.

Between the engines and attached to each by a 13-inch-diameter iron axle, is the wheel. Plunging into a 22-foot deep well, the cypress wheel is 38 feet in diameter and 10 feet wide. Ten buckets built into its circumference are held by 12 segments of cast iron gear rings whose teeth link into the axle; each weighs 1,860 pounds.

Water from Back Creek was channeled into the well, where the wheel would lift 20,000, or 84.3 tons, of water per minute — 1.2 million gallons per hour. The wheel moved the water into an upper race which carried it into the canal about 960 feet east of the lock.

You don't have to be an engineer to geek out here. The physical presence of these enormous machines is like standing next to a locomotive, now silent but still emanating a raw power that permeates the very walls.

By 1906, President Theodore Roosevelt (who would also have a major influence on the completion of the Panama Canal) approved a study into expanding the C&D Canal and making it a fully sea level waterway. By 1927, this expansion was finished, and since then the canal has continued to be widened, lengthened and deepened to its present length of 14 miles, width of 450 feet and depth of 30 feet.

In one corner of the museum, a screen displays what the U.S. Army Corps of Engineers canal controllers, housed in a building next door, are checking as they monitor vessels on the canal. You can see what ships are en route, their estimated arrival time at Chesapeake City, their length, port of origin, destination and name.

You can also walk outside and, standing in front of the machinery and reflecting on dreams that harken back to 1661, watch as those ships pass by, with the dark, fast-flowing water of the C&D Canal barely changing with their passage.

The Chesapeake and Delaware Canal: Past & Present

The C&D Canal Museum in Chesapeake City, MD, is open 8 a.m. to 4 p.m. Monday to Friday, and 11 a.m. to 4 p.m. on weekends, April through October. Admission is free, tours are self-guided and there is plenty of parking. For information, call 410-885-5622.

From the museum, it's an easy to walk to Chesapeake City, a destination in and of itself, with waterfront restaurants, shops and bed-and-breakfasts. To make a weekend of it, spend a day in town and at the museum, and a second day on the northern side of the canal exploring the C&D Canal Recreational Trail. This newly finished waterfront trail is open for walking, bicycling and hiking for 17 miles, encompassing the length of the canal to its original eastern terminus in Delaware City, DE, where the only one of the original four locks is still in place. For information, visit:

- nap.usace.army.mil/Missions/Civil-Works/Chesapeake-Delaware-Canal/Canal-History
- chesapeakecity.com/cd-canal-recreational-trail
- chesapeakecity.com

STRUGGLE FROM PAGE 1

meeting difficult stormwater reduction requirements.

Montgomery County's shortcomings are notable because it has been widely considered a leader in Maryland in tackling polluted runoff. It was the first county in the state, for instance, to levy a stormwater cleanup fee on property owners. That "water quality protection charge" generated funds for retrofitting storm drains and other "best management practices" that would keep sediment and nutrients from washing off pavement and buildings into local streams and ultimately, the Bay.

But as state officials began figuring out how to comply with the "pollution diet" that the EPA had put the Bay on in 2010, they decided that they'd need to get Maryland's older urban and suburban communities to do more to reduce the amount of nutrients and sediment coming from streets and buildings constructed before stormwater controls were required. Their tool of choice was the "municipal separate storm sewer system" permit each large community must have to discharge runoff from storm drains into local water ways.

Montgomery officials call the runoff reduction goal set by their 2010 stormwater permit "very aggressive." It required doing twice as much as the county had been expected to do — and had achieved — in the previous five years. It called for capturing or treating runoff from 3,778 acres of the county's impervious surface area that was paved or built over before modern stormwater regulations went into effect. That's an area roughly three times the size of the city of Takoma Park, one of the municipalities in the county.

Complicating matters, environmental groups went to court to challenge the Montgomery permit, arguing it wasn't rigorous enough. They ultimately lost, but the litigation delayed the official start of the permit. Montgomery officials didn't wait, though, and began working toward the permit requirements even before the lawsuits were resolved.

"When we signed that permit, we took it very seriously," said Patty Bubar, the DEP's acting director. The county hired staff to ramp up planning and contracting out the work. It also increased the stormwater fee to cover the escalating costs of the growing number of projects. From an initial annual rate of $12 for a typical household, the fee has risen to $104.25, while some businesses with large buildings or parking lots pay thousands of dollars a year. The rising charges prompted other lawsuits from aggrieved property owners, two of which are still pending.

Well before the deadline rolled around, it was clear Montgomery was not going to reach its goal. By the time the permit expired in February 2015, the county was less than halfway there, having restored stormwater controls on just 1,774 acres. Two years later, that number had grown, but was still 25 percent short of the goal. State regulators could wait no longer, so they took enforcement action.

Rain gardens, bioswales and other green infrastructure, like this one on a residential Montgomery County street corner, capture runoff and reduce the flow of nutrient-laden stormwater to local streams. Environmental groups worry that as the county looks to cut costs, streams might suffer if small projects like this get dropped.(Montgomery County MD Department of Environmental Protection)

County officials say it was just too much to try to do in such a short time period. In some cases, they point out, community objections delayed projects, resulting in delays to redesign or relocate them.

"Could we have done better? Could we have done differently? Possibly," Dawson said, "but there was no lack of commitment and fortitude to meet these requirements, and we didn't get there. I don't know what we could have done differently to meet that 20 percent requirement in five years."

The county's difficulties prompted a searching internal review. As they reviewed what had been done so far, they discovered that the county's stormwater projects had actually treated runoff from a larger impervious area than previously thought. They also found that they hadn't accounted for stormwater control measures installed on new development. Together, those added 800 acres to the total needed.

Now, county officials say they are "very close" to achieving the 20 percent goal and, with 18 projects now in the works, hope to get the remaining 850 acres needed by the end of this year — roughly 18 months ahead of the consent decree deadline.

What happens next remains to be seen. With the discovery that they are closer to compliance than previously thought, county officials looked to scale back. Worried that political support for the cleanup was being worn down, County Executive Ike Leggett called for halting the annual increase in fees. He proposed reducing the number of projects and farming out management of the stormwater effort to the private sector.

That drew criticism from environmental groups. They worried that privatizing and cost cutting would lead to the abandonment of "green infrastructure" projects, such as rain gardens, green streets, created wetlands, tree plantings and other measures that allow rainfall to soak into the ground or be drawn off by vegetation. Those tend to cost more per acre than large rainfall retention ponds, but do more to maintain the ecological vitality of streams.

Critics also questioned the county's basis for scaling back its stormwater effort, noting that officials were projecting having to deal with runoff from just 5 percent of the county's impervious surface in the next state permit, which has yet to be issued. That's only a fourth of what Montgomery was required to do in its most recent permit.

"In this time when we're seeing a lot of progress, we don't think that now is the time to let up on any of our work," said Caitlin Wall, chair of the Stormwater Partners Network, a coalition of three dozen local, regional and national environmental and watershed groups. "We're obviously at a tipping point. We know the stormwater load is increasing across the region, and climate change is going to make things worse.

"Montgomery County has been a leader on clean water," added Wall, who is Maryland and District policy director for the Potomac Conservancy. "From where we sit, we feel like we've come too far to let it go to waste."

The County Council balked at approving Leggett's budget plans for scaling back and privatizing the stormwater effort, and they overrode his line-item veto of their changes. In July, the council struck a compromise, which still allows the county administration to farm out a portion of the stormwater work to private consultants or contractors. It also doesn't spell out how the county will pay for all of the $243 million in projects listed to be done.

Eliza Cava, with the Audubon Naturalist Society, said the compromise isn't perfect, but that environmental groups were pleased it included commitments for more green infrastructure.

The MDE, meanwhile, is still mulling over ways to help the other jurisdictions reach the 20 percent finish line, as well as what actions the department will require in the next round of stormwater permits, due to be issued next year.

"It's a challenging issue to deal with, with many trade-offs," said the MDE's Currey. While some localities appear to be on course, others are clearly struggling. And collectively, the state's localities are spending $300 million a year on the effort.

The EPA, in its recent midpoint assessment of states' Bay cleanup efforts, concluded that "while states have improved their regulatory programs, overall loads in this [stormwater] sector continue to increase due to population growth and development. Maryland and Pennsylvania committed to significant reductions … and will need to re-evaluate their strategies to meet the 2025 goals."

Faced with those challenges, state officials haven't decided how much impervious surface treatment to require in the next permits. To help those localities struggling now to get to 20 percent, Currey said they are considering allowing some water-quality trading. The state's trading regulations have yet to be finalized but, assuming they will be, localities might then apply nutrient and sediment reductions from another sector, such as wastewater, to cover gaps in stormwater reductions. Such trades would only be temporary, he stressed, giving them more time to complete the projects needed to reduce enough runoff pollution.

"This would allow them to achieve the equivalent water quality reductions to avoid that consent decree," he said, "but we still need to advance stormwater restoration in these urban areas.… There's still more work to be done."

Your donations help us to keep an eagle eye on Bay issues

Thanks to Bay Journal Fund contributors, we've increased our staff, expanded coverage, added pages and are better able to inform the public about issues affecting the Chesapeake and its watershed. Donations support the *Bay Journal* and other activities related to Bay Journal Media's mission to expand independent journalism that informs the public about environmental issues affecting the Chesapeake Bay and the mid-Atlantic region. This includes our Bay Journal News Service, which distributes articles and commentaries to newspapers throughout the region.

Please help us continue our success!

A pair of eagles share a loblolly pine along the Blackwater River in Maryland. (Dave Harp)

Philanthropist

Roy Hock
Williamsburg, VA

Chesapeake Bay Trust
Annapolis, MD

Champion

Charlie Conklin
Glen Arm, MD

Booster

Michael & Dana Wheeler
Virginia Beach, VA

Advocate

Lee & Carol Jacobsen
Lancaster, VA

Arthur & Katherine Long
Forest Hill, MD

Benefactor

Walter & Mary Ellen Boynton
Prince Frederick, MD

Leroy & Carol Jacobsen
Lancaster, VA

Frederick Millhiser
Annapolis, MD

Mike & Cheryl Smith
GreenSmith PR
Chantilly, VA

Sponsor

Curtis Badger
Melfa, VA

Nick & Margaret Carter
Greensboro, MD

Mr. & Mrs. John G. Combs
Rockville, MD

Dr. McKay Jenkins
Baltimore, MD

In Honor of Thomas F. Thomas, Jr.
Robin Thomas
Rosemont, PA

Anthony & Susan Kar
Carlisle, PA

Sarah & Charles Lex
Farnham, VA

J.C. Rodgers
Piney Point, MD

Julian Shepard
Binghamton, NY

Ann & Eric Swanson
Annapolis, MD

Supporter

Jim Burch
Phoenix, MD

Bill Burleigh Fuquay
Varina, NC

Carol & Eli Buskirk
Harrisburg, PA

Paul Bystrak
Salisbury, MD

Jean Campbell
Glen Arm, MD

Linda & Chuck Carlisle
Denver, CO

Glenn Carper
Manassas, VA

Beebe & Jack Castro
Shady Side, MD

In Honor of Charlie Byrd
from Rebecca Byrd
Annapolis, MD

Jody & Chad Couser
Annapolis, MD

David & Christie Crane
Parksley, VA

Matthew & Diane Creme
Lancaster, PA

John S. Davis
Cooperstown, NY

Gary Davis
Bel Alton, MD

Rosemary Dawley
Lubsy, MD

Glenn Dawson
Baltimore, MD

Ginny Deise
Essex, MD

Edwin Demoney
Arlington, VA

Elaine Dickinson
Neavitt, MD

Paul W. Dillingham, Jr.
Rock Hall, MD

Michele Dobson
Bel Air, MD

Carol & Bill Durr
Pasadena, MD

Charles Dykema
Norfolk, VA

Terry Edwards
Willow Street, PA

Jinny C. Estell
Heathsville, VA

Frank H. Felbaum
Ligonier, PA

Thomas Filip
Ocala, FL

Ingeborg Fisher
Charles City, VA

Paul & Diane Ford
Street, MD

George & Nancy Forlifer
Corriganville, MD

In Honor of Sandy
from Capt. Francis Michael Gambacorra (Ret.)
Smithfield, VA

J. Matthew Gambrill
Solomons, MD

James Garner
Roanoke, VA

Ruann Newcomer George
Boonsboro, MD

William Gibbs
Westminster, MD

David Godfrey
Taneytown, MD

Susan & Albert Goetze
Peru, VT

Marcy Goldberg
Reading, PA

Ken Goldsmith
Raleigh, NC

Geraldine Gramp
Springfield, VA

Michael D. Grimes
Owings Mills, MD

Kathleen & John Groutt
Eden, MD

Dwayne & Edie Haines
Upper Marlboro, MD

Barbara Hale
Cambridge, MD

Ridgway Hall
Washington, DC

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

Enclosed is my tax-deductible gift of $_____

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

Card # _____ Expires: _____ Security Code: _____

Name(s):_____

Address:_____

City, State, Zip Code:_____

Is this a memorial? Write name here:_____

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

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

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

Please mail your donations to The Bay Journal Fund, P.O. Box 222, Jacobus, PA 17407-0222

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

Continued on page 28

CONTINUED FROM PAGE 35

Joseph A. Hankins
Shepherdstown, WV

Paul Harvey
Carrollton, VA

Frederick J. Heagy
Middletown, PA

In Honor of Margaret Lorenz
from Kevin Heanue
Alexandria, VA

Fredrick Heider
Kensington, MD

Paul Helsey
Drumore, PA

James J. Hill
Bowie, MD

Richard R. Hinch
Sarasota, FL

Diane Hines
Germantown, MD

Ed & Kathie Hoeck
Heathsville, VA

Diane Hoffman
Annandale, VA

Edward Holland
Arlington, VA

Beverly Holmberg
North, VA

Joseph Homburger
Cooperstown, NY

Tom Horton
Salisbury, MD

Valli M. Hoski
York Springs, PA

Frank Howard
Annapolis, MD

John Joyce
Annapolis, MD

Christina Kaminski
Wilmington, DE

Pat & Jim Kelly
Towson, MD

George Kennett
Avenue, MD

Mary Kilbourne
Upper Marlboro, MD

In Honor Of Bud Harding
from Cindy King
Worton, MD

Ronald J. Klauda
Prince Frederick, MD

In Memory of Mary Pat Kyle
from Amy D. Kyle
San Francisco, CA

Margaret L'Hommedieu
Deale, MD

Neal & L. Leatherman
Glen Rock, PA

Ernest Lehman
Alexandria, VA

Gene Lepley
Richmond, VA

A great egret at Blackwater National Wildlife Refuge near Cambridge, MD, patiently waits for dinner to swim by. (Dave Harp)

Richard Lewis
Nashville, TN

In Honor of Shawn Long
from Lorraine Long
Baltimore, MD

Rodney Lorence
Lynchburg, VA

Lowell & Marilyn Martin
Solomons, MD

Joan Matthews
Bryans Road, MD

Dave & Judy Mauriello
Severna Park, MD

Lloyd Mcallister
Salisbury, MD

David & Kathryn McCorkle
Lemoyne, PA

James & Laura McGowan
Onancock, VA

In Memory of Tom Thomas, Jr.
Trip Thomas
Wallingford, PA

Steven Miller
Saint Augustine, FL

William Miller
Cochranville, PA

Kathleen & Owen Moe
Annville, PA

Dennis Morris
Petersburg, VA

Henry Mortimer
Sherwood Forest, MD

David Moulsby
Baltimore, MD

Muddy Run Recreational Park
Holtwood, PA

Stephen & Alina Muther
Annapolis, MD

Anne Nielsen
Centreville, MD

George Nitzel
White Marsh, MD

Wilson Nobles, Jr.
Hallieford, VA

John O'Boyle
Arbutus, MD

Gertrude O'Leary
Ambler, PA

Philip Olsen
Thurmont, MD

John Pancake
Rockbridge Baths, VA

Steve Patten
Annapolis, MD

Timothy J. Peck
Parkville, MD

Paulding Phelps
Kennett Square, PA

Harriette Phelps
Greenbelt, MD

Potapskut Sailing Association
Pasadena, MD

David Power
Timonium, MD

Thomas & Sally Price
Sperryville, VA

Bill Reilly
West Chester, PA

James Rhodes
Arlington, VA

Charles & Ann Robbins
Bel Air, MD

Elizabeth Rosborg
Arnold, MD

Roberta Schaff Ross
Alexandria, VA

Steven Russo
Midlothian, VA

Peggy Sale
Fredericksburg, VA

Jay Sandler
Pipersville, PA

Michael Schaffer
Lewes, DE

Joan & Richard Schmidt
Bowie, MD

Lawrence Schneider
Bethany Beach, DE

Walt & Mary Sechrist
Airville, PA

Gary Sergott
Westminster, MD

Frank Sharpe
Burtonsville, MD

O. Shreaves
West Point, VA

Winston Sibert
Salisbury, MD

Eric Silberhorn
Ellicott City, MD

Smalley Family
Hilton, NY

Ellen Smith
Glenville, PA

Mr. & Mrs. Robert P. Solem
Laurel, MD

In Honor of Daniel Siebenhaar
from Dan Siebenhaar
Glen Burnie, MD

Darcel Stephan
Virginia Beach, VA

A. G. Stifel
Glyndon, MD

Donnan M. Stoicovy
Warriors Mark, PA

Marvin & Andrea Storey
Laurel, MD

Walter Stracke
Rockville, MD

Robert Strand
Falls Church, VA

Charles Sydnor
Heathsville, VA

Neil Tague
Tunkhannock, PA

William Tanger
Roanoke, VA

In Memory of Tom Thomas, Jr.
Trip Thomas
Wallingford, PA

Sally Hornor & Thomas J. Caperna
Arnold, MD

Mr. & Mrs. William W. Thompson
Carlisle, PA

Harriett Tinker
New Freedom, PA

Susan & Robert Trice
Annapolis, MD

David Trubey
Baltimore, MD

Randy Turner
Thurmont, MD

Bruno & Dorothy Vasta
Lusby, MD

Elizabeth Volmer
Joppa, MD

J. R. Walker
Glen Burnie, MD

William Walters
Cobbs Creek, VA

Gerald Wiggen
Mechanicsville, MD

Bruce Wiggins
Harrisonburg, VA

Carolyn Williams
Fairfax, VA

In Honor of Kenneth & Edna Wilson
from Jan Wilson
Annapolis, MD

In Honor of David Harp
from Terry Winter
Baltimore, MD

Ron Wisniewski
Ruther Glen, VA

Ruth Young
Horseheads, NY

CONTINUED ON PAGE 29

Thank You To These Philanthropic Donors

THE CURTIS AND EDITH MUNSON FOUNDATION

CHESAPEAKE BAY FUNDERS NETWORK

CBTRUST Chesapeake Bay Trust

ORC

THE CAMPBELL FOUNDATION

Chesapeake Bay Program
A Watershed Partnership

NOAA CHESAPEAKE BAY

WYE HALL
plant a tree, leave a legacy

Virginia Environmental Endowment

Chesapeake Conservancy
EXPLORE. CONNECT. CONSERVE.

RAUCH FOUNDATION

SHARED EARTH FOUNDATION

The Sumner T. McKnight Foundation

Continued from page 28

Frances & Richard Younger
Lusby, MD

Edward Joell & Yvonne Irvin
Indian Head, MD

Vincent Zabrucky
Boonsboro, MD

Dr. & Mrs. Lawrence C. Zacharias
Richmond, VA

In Memory of Dianne Raff
from Mark Zadrozny
McKees Rocks, PA

Joseph A. Zinner
Perry Hall, MD

Becky Robinson & Nick DiPasquale
Chestertown, MD

Nancy Wottrich & Bruce McNaught
New Milford, PA

George & Marion Brewington
Milford, DE

Kyle Woodley & Ingrid Velasquez
Gaithersburg, MD

Arthur Smith & Betsy Mccaul
Baltimore, MD

Friend

Tom & Vickie Carter
Newark, DE

Margo Bloxom
Chincoteague Island, VA

Mark M. Getz
Fleetwood, PA

Tim Goodfellow
Gaithersburg, MD

Karl Huber
Richmond, VA

Mr. & Mrs. Marc Imlay
Bryans Road, MD

Frank Mastro
North Abington Township, PA

Margaret Robinson
Marydel, MD

Fran & Fred Adams
Virginia Beach, VA

Robert Filippi
Baltimore, MD

Earle Hatton
Delmar, MD

Mr. & Mrs. Robert Jones
Cambridge, MD

David Leathery
Stevensville, MD

Alfred Petruccy
Severna Park, MD

Ann Ray
Shady Side, MD

Greg Rider
Severna Park, MD

Dawn L. Vangrin
Chestertown, MD

Paul Amtower
Kensington, MD

Kenny Beach
Newark, DE

Capt. John Beach
Chesapeake Beach, MD

John Beckner
Colonial Beach, VA

Janet & Harold Butler
North East, MD

Tanya Cohen
York, PA

Sandra Collins
Kingstowne, VA

Edward Crizer
Dundalk, MD

Bob & Peggie Cunningham
Gore, VA

Tom Dulz
Artemas, PA

This placid scene at Two Johns Landing on the Choptank River, with daylilies adding a splash of color to an overall green palette, was taken just moments before an otter suddenly appeared and bit the elbows of the photographer in his kayak. (Dave Harp)

Bill Enselman
Falls Church, VA

Ralph Eshelman
Lusby, MD

Michael Gardner
Harrisonburg, VA

Richard W. Gilpin
Baltimore, MD

Paul Gormley
Baltimore, MD

Janet Griffith
Reston, VA

Lew Gross
Owings Mills, MD

William Hartzell
Orrtanna, PA

Elizabeth & James Heim
Catonsville, MD

Patricia Holobaugh
Greenbelt, MD

John D. Humphreys
Eastville, VA

John Jensen
Aylett, VA

Bob Jones
Washington, DC

Richard C. Karney
Vineyard Haven, MA

Joseph J. Lentz, Jr.
Catonsville, MD

Marie Lerch
Kensington, MD

Brian MacElroy
Pottstown, PA

Bill Mattimore
Easton, MD

Karen Mayne
Norfolk, VA

Jim McMahon
Burtonsville, MD

Holly Meyer
Silver Spring, MD

Clyde A. Miller
Falls Church, VA

Ben Miller
Annapolis, MD

Glenn Morrson
Quarryville, PA

Clifford & Miranda Nelson
Berryville, VA

Evelyn Petery
Lewisburg, PA

Thomas H. Pheiffer
Annapolis, MD

Kathleen Phillips
Selbyville, DE

Bonnie & Phillip Pierce
Falls Church, VA

David A. Prescott
Boiling Springs, PA

Terry P. Reck
Dover, PA

Tom & Karen Riley
Ocean View, DE

Edward Ruskowsky
Hollywood, MD

John Sawyer
Locust Grove, VA

Mr. & Mrs. Paul Schuette
Silver Spring, MD

Robert Stewart
Onancock, VA

Harry Stokes
Gettysburg, PA

John Streb
Pasadena, MD

Heather Supeck
Pasadena, MD

Dean & Peggy Troyer
Norfolk, VA

Leo J. Vollme
Kennedyville, MD

Barry Williams
Pasadena, MD

David Adamson
Gloucester, VA

Clara J. Ailes
Springfield, VA

Patti & John Alli
Catonsville, MD

Dennis Allison
Hampton, VA

Philip Anderson
Church Creek, MD

Asmare Atalay
Hopewell, VA

Miriam Avins
Baltimore, MD

Freeman G. Bagnall
Arnold, MD

Larry Baker
Culpeper, VA

Denah Barbe
Fort Washington, MD

Felix Bashinsky
Mahanoy Plane, PA

In Honor of Mike Burke
from Brenda R. Beazley
Palmyra, VA

Thomas R. Bender, Jr.
Bellefonte, PA

Nancy Bernhardt
Media, PA

Steve Blanks
Roanoke, VA

Bernard & Josephine Bodt
Churchville, MD

Gretchen Boeren
Roanoke, VA

George & Peggy Bogdan
Baltimore, MD

In Memory of Francesca Borrelli
from Dr. & Mrs. Niel Borrelli
Westminster, MD

In Memory of Paul Brooks
from Paul R. Brooks
Cambridge, MD

Marilyn Brown
Pensacola, FL

Warren Lee Brown
Annapolis, MD

Gary & Susan Bryde
Hockessin, DE

Richard & Vicki Budden
Chestertown, MD

Bob Burns
Bethesda, MD

Rita Buschman
Glen Rock, PA

Arthur Bussiere
Virginia Beach, VA

Phil Capron
Hunt Valley, MD

Vicente & Karen Carag
Rising Sun, MD

Cindy Carmichael
Ellicott City, MD

In Memory of Victor Liscinsky
from F. Jean Capets
Monroeville, PA

Sarah P. Carr
Tunkhannock, PA

Jeffrey Catts
Washington, DC

Dave Cavanaugh
Alexandria, VA

Carl F. Cerco
Clinton, MS

Jack Chesser
Upper Marlboro, MD

Tom Christovich
Catonsville, MD

Jonathan Clarke
Adelphi, MD

Mr. & Mrs. William P. Cleveland
Alexandria, VA

John & Bette Coursey
Thurmont, MD

Kitty Cox
King William, VA

Robert & Mary Crafton
Grasonville, MD

Peggy Brosnan & Dave Linthicum
Lothian, MD

Norman Dean
Berkeley Springs, WV

George Dean
Montross, VA

Richard Dempster
Lago Vista, TX

Pat Devlin
Dillsburg, PA

Alice F. Dorshow
Catonsville, MD

Betsy Sener Durham
Church Hill, MD

In Memory of Kilby Joe Edwards, Sr.
from Dot Edwards
Locust Hill, VA

Bart Elfman
Newport News, VA

In Memory of William H. Ellett
from Kathleen Ellett
Annapolis, MD

Tilly Jo Emerson
Morristown, NJ

Becky Farmer
Mount Airy, MD

Beverly Feig
Owings Mills, MD

Theodore Feitshans
Raleigh, NC

Rachel & Craig Flanagan
Lusby, MD

Sharon Foley
Mount Crawford, VA

John & Susan Ford
Maryland, NY

Peter L. Freeman
Catonsville, MD

Carl Fritz
Camp Hill, PA

Forum

Commentary • Letters • Perspectives

Flood of 10 million trees could help offset impact of future PA deluges

By Harry Campbell

The Susquehanna was a swollen, chocolate-colored torrent after rainstorms in late July. (Pavoncello Media)

Veteran newspaper photographer John Pavoncello has been eye-to-eye with all kinds of human drama.

In the short time his drone imaging business has been up and running, Pavoncello has gone above and beyond to record traumas faced by fire and law enforcement first responders.

But it was the sight of nature's powerful force that he called "crazy."

Pavoncello was contracted by the Chesapeake Bay Foundation to fly his camera over a portion of the lower Susquehanna River after a week of relentless rainstorms in late July.

Pavoncello has seen the river at its beautiful best in spring, and bulging with damaging ice flows in winter. But never like this. The Susquehanna was an angry, swollen, chocolate-colored torrent.

"You just don't get the perspective standing along the bank," Pavoncello said, thinking back on the magnitude of roiling, brown water.

This aerial perspective of the deluge of runoff illustrates powerfully the urgency that more solutions must be found on the ground.

It just so happens that one of the most ambitious and challenging efforts to reduce the pollutant payload that flows into the Susquehanna and other commonwealth waterways is taking root.

The Keystone 10 Million Trees Partnership is a collaborative effort, coordinated by the CBF, to add 10 million trees to Pennsylvania's landscape before the end of 2025.

Trees alongside streams and streets are among the most cost-effective tools for cleaning and protecting waterways. The canopy and deep roots allow rain to soak into the soil, stabilizing streambanks, improving soil quality and keeping streams cool for fish like brook trout.

The partnership, launched in April, has galvanized national, regional, state and local agencies, conservation organizations, watershed groups, conservancies, outdoors enthusiasts, businesses and individuals.

In the partnership's first month, about 1,500 volunteers and the CBF's restoration specialists planted 31,000 trees at more than 50 locations.

The Arbor Day Foundation, along with Pennsylvania Departments of Agriculture, Conservation and Natural Resources, and Environmental Protection, are among the partners.

The commonwealth is significantly behind in meeting its pollution-reduction commitments and the Keystone 10 Million Tree Partnership can jump-start efforts to close the gap.

Roughly 19,000 miles of Pennsylvania's rivers and streams are impaired by polluted runoff and the legacy of coal mining.

The commonwealth's Clean Water Blueprint calls for about 95,000 acres of forested buffers to be planted in Pennsylvania's portion of the Chesapeake Bay watershed. Adding 10 million new trees alongside streams, streets and other priority landscapes would accelerate the Keystone State toward its clean water goals, achieving as much as two-thirds of the 95,000-acre goal.

Special emphasis has been placed on planting trees in the southcentral Pennsylvania counties of Lancaster, York, Adams, Cumberland and Franklin. All are thriving agricultural regions, which contribute the greatest amount of pollutants that flow into the Bay.

Response to the spring season of tree plantings has been encouraging. Additional groups in and out of Pennsylvania's portion of the Bay watershed have been asking to join the partnership.

That's good, as planting 10 million trees by the end of 2025 will take many hands.

Between planting seasons, summer months were for maintaining trees already planted.

Partners in Pequea Park, Lancaster County were successful, losing just three of 200 larger trees planted.

Conodoguinet Creek Watershed volunteers maintained their plantings by carrying water to seedlings during a heat wave.

The effort's partners will add more trees from September through November.

In 2019, the partnership hopes to nearly double its impact. That means that 50 planting partners will engage at 100 planting sites, 3,000 volunteers will be mobilized and 50,000 trees will go into the ground next spring.

Benefits from the trickle-down effect of so many plantings extend beyond the cleaner water that flows from them.

The need for so many trees, tubes, stakes and other supplies has also provided an economic boost to nurseries and other companies that can supply them.

As for the mighty, muddy Susquehanna, there may not be enough trees to withstand such an unusual force of nature as seen through John Pavoncello's lens. But the lasting images should be a reminder that consequences downstream could be less "crazy" if more trees are working upstream.

To learn about the Keystone 10 Million Trees Partnership, visit TenMillionTrees.org.

Harry Campbell is the Chesapeake Bay Foundation's Pennsylvania executive director.

Chesapeake Challenge

Answers to Sharp as a needle? This bald cypress quiz is for you on page 38.

1. D 2. D 3. C 4. D 5. C 6. A 7. C 8. D 9. D 10. Amphibians / Use for spawning or nursery grounds; Catfish / Take refuge amid submerged roots; Squirrels / Eat the seeds; Wood ducks / Nest in the trunk

Bay Buddies

Answers to Bald Cypress on page 38

1. Swamp 2. Knees 3. Redwood 4. Hummock 5. Cones 6. Widen 7. Heartwood 8. Sweet gum 9. Persimmon 10. Ovenbird

Forum

Commentary • Letters • Perspectives

Whether they're coming or going, all Chesapeake islands have a tale to tell

By Tom Horton

The essential landform around the Chesapeake Bay is peninsular, from Virginia's Northern Neck between the Potomac and Rappahannock to virtually all of Calvert County, MD, and the Broadneck and Mayo peninsulae of Anne Arundel. And there's the mother of them all, Delmarva.

And yet the "*insulae*" — the Bay islands — are what intrigue us most, even if they are insignificant acreages compared to the "*pen*" (from Latin for "almost") islands. Perhaps it's their historic isolation/insulation from the wider world that ensorcels us. Something interesting, different, mysterious *must* be going on out there.

So it is that my colleagues at Salisbury University and I choose every year to cap our monthlong summer kayak class by paddling and camping with students through Bay islands from Poplar, in sight of the Bay Bridge, to Tangier, across the Virginia line.

Being islands, they all have their unique stories. Lessons attached to an island are more memorable. Just getting to islands is an attainment.

Monday was Poplar, a pleasant 3-mile paddle from the Talbot county main. By the 1990s, Poplar had eroded to 5 acres — from nearly 2,000 in the early 1600s. Reclaiming it was unthinkable, some said, and would have cost a billion bucks.

And then, Maryland banned the dumping of the silt removed constantly from shipping channels to the Port of Baltimore back into the Bay. What to do with mountains of dredged spoil? Poplar beckoned — a massive spoil containment dike and a federal-state project to restore it for wildlife has resulted.

Construction began 17 years ago and won't stop until the island reaches about 3 square miles, close to what John Smith sailed by in 1608. We paddled in through a curious landscape: lush wetlands, barren uplands where a forest will eventually grow, giant cranes adding massive boulders to the dikes, construction equipment rumbling past ecologists measuring the success of this summer's nesting of diamondback terrapins (hugely successful).

Poplar's past is interesting enough, a thriving community, even a retreat for U.S. presidents. Around 1847, it was the site of a black cat farm destined to supply the Chinese fur demand. That didn't work out. The Bay froze and the cats, cut off from their supply of fish from the mainland, scampered off across the ice.

Poplar Island's restored salt marshes, including this low marsh, are starting to attract wildlife. (Leo Miranda / U.S. Fish & Wildlife Service)

But it is the island's future that is truly remarkable: I call it "creation" biology, as opposed to more conventional restoration or conservation biology. We're starting with a clean slate, choosing what landscapes to make and which creatures to favor. Playing God just a bit. And that can be complicated. Great horned owls, consummate predators, have had to be "controlled" from flying over from the mainland and snacking on other bird species that managers are trying to jump-start on Poplar.

All of this hasn't cost a billion bucks — yet. But it'll end up close. And given Baltimore's never-ending dredging needs, there are plans to "Poplarize" more eroding Bay islands, starting with James, at the mouth of the Little Choptank; and after that, Barren, off Upper Hoopers Island.

Tuesday, we launched from lower Dorchester County and made about 12 miles before thunderstorms forced us to hunker down for the night on the last remnant of Holland Island. Holland's last people left about a century ago. The last old remaining house went under the waves just a few years back. Saltwater intrusion assured us plenty of dead trees for our campfire.

Chesapeake Born

We slogged through the salt marsh to pay our respects at the only cemetery that hasn't gone in the Bay yet. Marble and granite stones spoke of a prosperous community, but it would have taken a Poplar-scale effort to hold back the Bay that was their livelihood and their ending.

Wednesday, we reached Smith Island, where a freshly baked eight-layer chocolate cake and luscious third-of-a-pound crab cakes awaited us at the Drum Point Market in Tylerton, the southernmost town in this cluster of islands. I always joke to the owner that he runs the world's best store in a town of 42 people.

And that, as much as erosion and sea level rise, is Smith's problem. Its people are dying, leaving — and it's not so simple as clean up the Bay and they'll stay, though fishing's their livelihood. A lot of what's reduced the islandwide population to less than 200 is simply people seeking a broader margin for their lives.

Federal and state government, ironically, have just put tens of millions of bucks into holding off erosion here for a while longer — a good thing, but meanwhile you can count on your fingers the little kids growing up here.

By Friday, we were headed into Tangier Island, the last stop of our little paddling semester. Trump flags were flapping in the breeze beneath Old Glory on several homes and crab shanties. A year ago, the president famously called Tangier's mayor and assured him the island's future was secure.

But assurances haven't turned into money for rock, which Tangier's 400–500 people need desperately to stave off erosion that could end them within another couple of decades. Still, their community is holding together better than those of Smith Island, and it's clear that a lot of the younger crowd will try to remain islanders.

Some of them have heard of Poplar Island: "It's a good thing to do for wildlife … but $700 million there and nothing for us?"

Faith in Trump, for whom most of Tangier voted, remains strong. But a woman who has worked long and hard for a Tangier seawall confessed she'd begun thinking something truly unthinkable: "I wish I was a Marylander … at least they are willing to spend to keep their islands there."

Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books. He lives in Salisbury, where he is a professor of Environmental Studies at Salisbury University.

Forum

Commentary • Letters • Perspectives

We can't improve the Bay's water quality without addressing manure

By Lynton S. Land

Despite decades of concern, beginning seriously with the passage of the Clean Water Act in 1977, water quality improvement in the Chesapeake Bay after 40 years is disappointingly small.

Most of the action has been focused on reducing urban point-source pollution. The reason water quality has not improved significantly is simple. The largest source of pollution, inefficient crop fertilization, has never been meaningfully addressed. That conclusion applies to water bodies worldwide, including the Great Lakes and the Gulf of Mexico.

Farmers, supported by the powerful agricultural lobby, seek to maximize their harvest (profit) without paying for the pollution they cause. Society benefits from the cheap food they produce. Most of the grain produced in the Bay watershed feeds animals raised for meat, not humans.

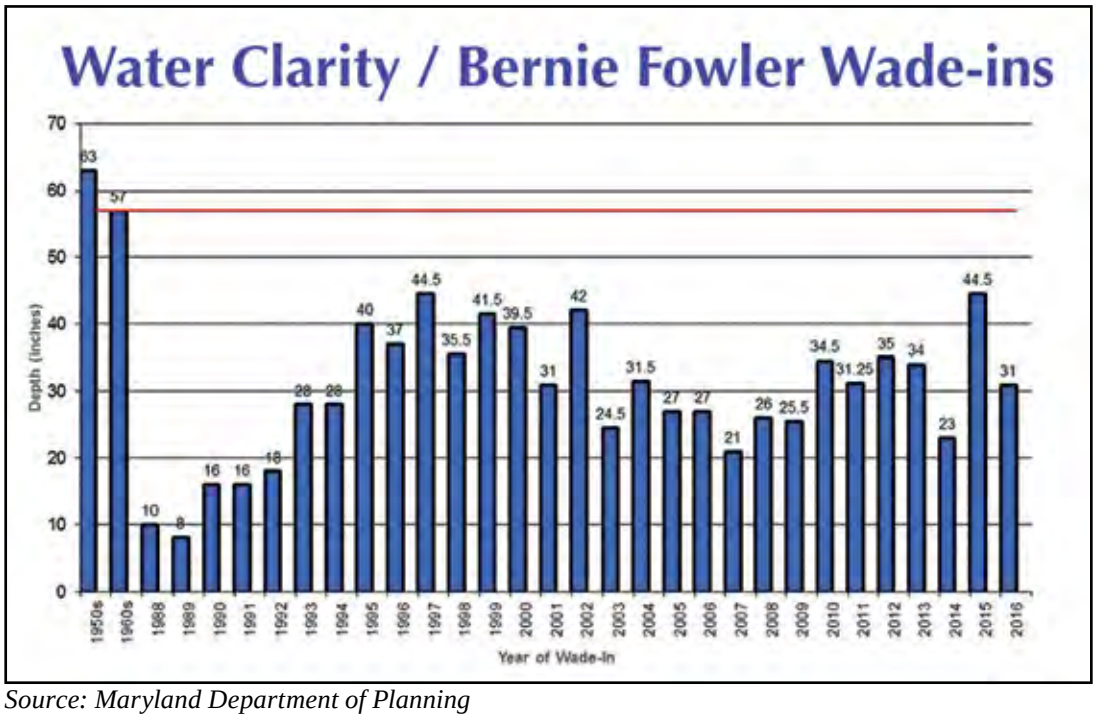
At least four metrics can be used to gauge Bay water quality.

≋ *Sea Grass Abundance:* Recently, seagrass — submerged vegetation, or SAV — beds exceeded 100,000 acres, as was reported with great glee.

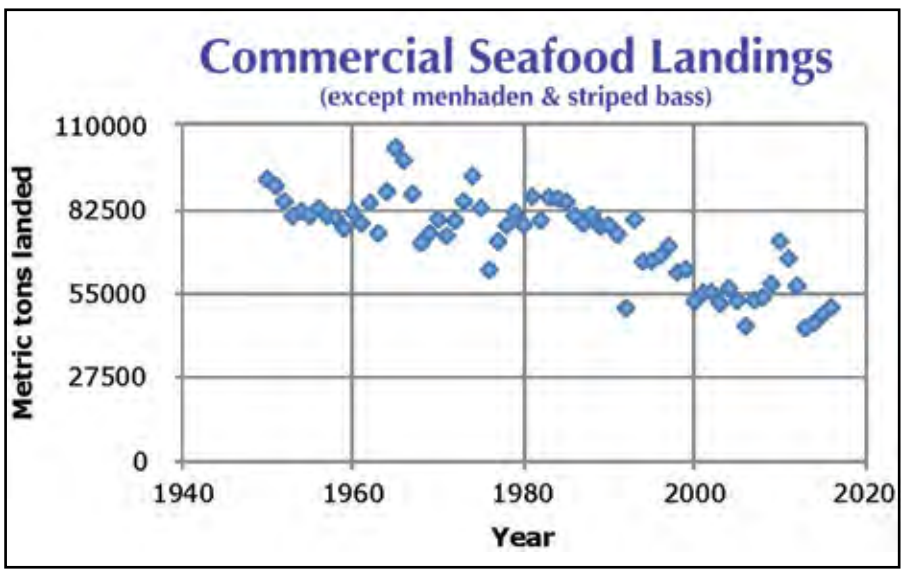
But we need to be realistic. Some believe the Bay once had about 600,000 acres of SAV. In the mid-1980s, acreage had declined to less than 40,000, which has now slightly more than doubled.

We can never "restore" 600,000 acres of SAV because the Bay can never revert to its original forested condition that supported a few native communities. Improvement is possible, but not restoration. Use of the word "restoration" should always raise the red flag of unrealistic expectations.

Plus, nobody is certain that the recent improvement in SAV acreage is permanent; SAV acreage has flip-flopped in the past. Additionally, most of the recent SAV increase is from low– or intermediate-salinity species, while eelgrass — the most critical species in the Lower Bay — continues to decline. A 2017 paper in the journal *Global Change Biology* stated, "eelgrass area has declined 29 percent in total since 1991, with wide-ranging and severe ecological and economic consequences. Declining clarity has gradually reduced eelgrass cover the past two decades, primarily in deeper beds where light is already limiting. In shallow beds, however, reduced visibility exacerbates the physiological stress of acute warming, leading to recent instances of decline approaching 80 percent."



Source: Maryland Department of Planning



Source: National Marine Fisheries Service, Lynton Land, Ph.D.

≋ *Water Clarity:* The famous "Bernie Fowler Wade-In" or "sneaker index" — the depth in inches below the surface where his white sneakers can no longer be seen — may not seem very scientific, but has been heralded by National Aeronautics and Space Administration as being a reasonably accurate yardstick. (See *NASA scientists deem Fowler's wade-in data out of this world*, June 2017.) Meanwhile, increased water clarity is unproven.

≋ *Volume of the Dead Zone:* A 2011 study concluded "Evaluation of a 60-year record of hypoxic volumes demonstrated significant increases in early summer hypoxia (low oxygen), but a slight decrease in late summer hypoxia." A small decrease in the volume of anoxic water in late summer was confirmed in a 2018 study. But the volume of the dead zone remains huge in summer, and the improvement, if it persists, is small.

≋ *Commercial Seafood Landings:* National Marine Fishers Service data show landings for all commercial species, excepting striped bass and menhaden because they are regulated, to be steadily decreasing after the initiation of data collection in 1950.

A similar, albeit anecdotal, argument can be made for recreational fishing. Decreasing fish populations reflect changes in benthic and pelagic food sources, including more harmful algal blooms caused by nutrient overload. Most menhaden are now being caught offshore and fewer are caught in the Bay. One can argue that the same water quality issues that cause reduced commercial landings of other species in the Bay also apply to menhaden in the Bay, and are not the result of overfishing.

Two of the four metrics seem to document slight improvement in water quality. This is hardly surprising based on all of the money that has been spent to reduce nutrient pollution. It demonstrates that reducing nutrient pollution does result in water quality improvement. But we are a very long way from where we need to be.

What must be done to ensure that all of the metrics improve significantly, indisputably and permanently? The answer is the same worldwide — fertilize more efficiently so crops use more of the applied nutrients, thus reducing environmental nitrogen and phosphorus pollution.

All scientific publications stress that continued nutrient reduction is necessary if additional Bay water quality improvement is to be realized. Reduced nutrient pollution cannot continue to focus on urban areas. That low-hanging (expensive) fruit has already been picked.

Reducing pollution from chemical crop fertilization is necessary,

MANURE CONTINUES ON PAGE 33

Forum

Commentary • Letters • Perspectives

Manure from page 32

although many complex issues are involved. How many people know that conventional chemical fertilization efficiency is typically no better than about 65 percent when the fertilizer is applied at the time of planting?

Fertilizer application should closely match plants' needs throughout the growth cycle. This has been expressed as the "4 Rs" – apply fertilizer from the Right source at the Right rate, at the Right time and in the Right place.

That is easier said than done. Applying fertilizer in increments as the plants grow is more efficient than a single-application at the time of planting. Controlled- (timed-, delayed-, stabilized-, encapsulated- or slow-) release fertilizers can significantly increase fertilization efficiency, but they are more expensive. Could they be subsidized?

Chemical crop fertilization will always be "leaky," but it can be made much more efficient. Modern encapsulated fertilizer, on-the-go variable rate applicators and strains of grain that scavenge nutrients and use less water can raise fertilization efficiency considerably. Rotating a variety of crops, producing biofuels from perennial crops instead of corn as well as requiring riparian buffers can also considerably reduce nutrient pollution.

The *2005 Virginia Cooperative Extension On-Farm Corn Test Plots Report* documents an average yield of 174 bushels of grain per acre using 192 pounds of nitrogen fertilizer for an efficiency of 64 percent. In the 2015 report, yields increase to 214 bushels per acre using only 168 pounds of nitrogen fertilizer for an efficiency of 89 percent. The extent to which these "test plots" reflect average fields is unknown, but the data show conclusively that a significant increase in chemical fertilization efficiency is possible. The fertilization efficiency of small grain test plots also increased over the same decade, from 57 percent to 76 percent.

If the efficiency of chemical fertilization can be improved and point source pollution has been reduced nearly as much as is reasonable, the massive pollution from the disposal of manure by land application remains. Manure is an extremely inefficient fertilizer because the nutrients nitrogen and phosphorus must be released from organic compounds by microbes in order to be available to the crop. Nothing can be done to change that or to increase the efficiency of the fertilizer. When sewage sludge is applied to land in Virginia, it is assumed that 30 percent of the nitrogen will be available to the crop. Most of the remaining 70 percent of the nitrogen causes pollution, amounting to hundreds of pounds of nitrogen per acre.

The phosphorus "cap" is astronomical, so all of the phosphorus is disposed whether the crop needs it or not. Lawmakers are obviously more concerned with the profits of the manure producers and a very few farmers than they are about water quality. They need to be held accountable.

Current permissive and complex regulations that permit phosphorus disposal in excess of crop needs are merely excuses for cheap waste disposal and should be replaced by something simple, like "The land application of poultry litter, sludge and manure shall be limited to supplying the phosphorus needs of the crop, based on a soil analysis for phosphorus."

This waste can be a source of methane (natural gas) that will not contribute to global warming, even from a properly designed landfill. An excellent example is the District of Columbia's gigantic Blue Plains Advanced Wastewater Treatment Plant, where methane produced from sludge provides a third of their power.

Phosphorus must be recovered from the waste rather than squandered and cause pollution because the nation's phosphorus reserves will be exhausted within the lifetimes of children being born today. Land application is currently the cheapest way to dispose of manure, but only because the cost of pollution is not accounted for.

Urban areas bear most of the burden of Bay nutrient reduction because wastewater and stormwater are regulated. Bay water quality can only improve significantly when the largest source of pollution, crop fertilization, becomes much more efficient.

The easiest way to advance that goal is to limit the disposal of manure by land application to the phosphorus needs of the crop. Disposing of phosphorus in excess of crop needs guarantees pollution while protecting the profits of the manure producers.

Every study concludes that the worth of a healthier Bay based on the value of seafood, recreation and property far exceeds the worth of the most highly polluting agricultural entities. Anyone, including nongovernmental organizations and elected officials, who wants real improvement in Bay water quality should actively advance the strategy to ban manure.

Unless there is a groundswell of focused opposition to the most easily addressed source of substantial Bay pollution, the land application of manure will continue for the usual political reasons, and improvements in Bay water quality will remain small.

Lynton S. Land, Ph.D., lives in Ophelia, VA. His website is VABayBlues.org.

Virginia's anthropogenic nitrogen pollution
(millions of pounds)

	1985	2009	2017
Wastewater	38	23	13
Developed Land	7	10	11
Septic	1	2	2
Agriculture – chemical	12	10	10
Agriculture – manure	12	10	10
Natural	14	13	12
Total	84	68	58

Based on the EPA's and author's estimates, nutrient pollution from agriculture can be traced equally between chemical fertilization and the land application of organic fertilizers (poultry litter, animal manure, sewage sludge). Nutrient pollution from wastewater treatment plants has decreased significantly and is responsible for nearly all of the reduction to date. Crop fertilization remains responsible for most of actionable nutrient pollution in Virginia and has changed little in the last three decades.

Letter to the Editor

Time to take out the trash

Returning to Port Deposit on May 25 after a week on the Chesapeake Bay, we were met by the inevitable river of mud. After all, it had rained a lot in the preceding week throughout the Susquehanna watershed, and now the river flow was observable far into the Bay itself.

What was not inevitable — nor should it be — is that the river of mud included trash: more trash than I have ever seen outside of a landfill.

Clearly, this was trash that had accumulated behind the Conowingo Dam, and now it was free to go wherever or be ingested by whatever.

Apparently, the dam operators push this trash aside as it accumulates at the dam from upstream sources.

While this is not trash that Exelon produces, the opportunity to remove it from the river while it is trapped behind the dam exists.

If removing trash buildup behind the dam is not part of the dam's operating agreement, it should be.

If it is part of that plan, then it wasn't — and perhaps isn't — being carried out.

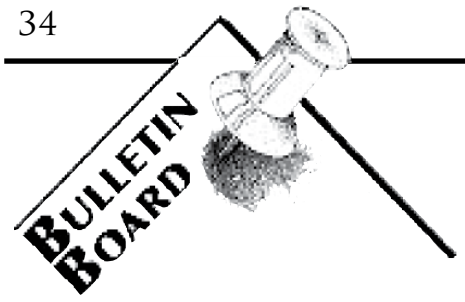
Karl L. Huber
Richmond, VA

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

Report stranded marine life

Since 1990, Maryland's Stranding Response Program has documented strandings of 25 marine mammal species and four sea turtle species. On average, 40–70 protected marine animals are found each year in the Bay and its tributaries as well as the Atlantic coast. Anyone who comes upon a stranded marine mammal or sea turtle should call the *Marine Mammal and Sea Turtle Stranding Hotline* at 800-628-9944. Once biologists find and collect the specimen, staff gather data that helps inform policies on the conservation and protection of these animals. All marine mammals — dolphins, manatees, porpoises, seals and whales — are federally protected under the Marine Mammal Protection Act, which prohibits the interaction, feeding and harassment of live animals, as well as interaction and collection of parts from dead, stranded animals. Additionally, sea turtles, whales and manatees are listed as either threatened or endangered under the Endangered Species Act. Violating these laws can result in fines, imprisonment and confiscation of property.

Howard County Conservancy

The Howard County Conservancy in Woodstock and Elkridge, MD, needs adult volunteers to lead groups of elementary and secondary students on hikes around the conservancy grounds and assist them in hands-on activities. Field trips usually take place from 9 a.m. to early afternoon Monday through Friday. Elementary training sessions take place 9 a.m. to 12:30 p.m. Sept. 12, 19 & 26; the secondary training session runs 9 a.m. to 12:30 p.m. Sept. 11. Preregistration is recommended but drop-ins are fine. You need not attend all of the sessions. Info: 410-465-8877, volunteer@hcconservancy.org.

CBL Visitor Center

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

Bull Run stream cleanup

Help the Merrimac Farm Master Naturalists, Friends of the Square and Keep Prince William Beautiful 9 a.m. to 12 p.m. Oct. 13 as they clean up the stream behind the Manassas (VA) Costco that flows into Bull Run. Student community service hours are available. Light refreshments will be served. Volunteers should wear shoes (boots preferable) that can get dirty. Registration required. Info: 571-379-8213, waterquality@pwswcd.org.

Adopt-a-Stream program

The Prince William Soil & Water Conservation District in Manassas, VA, wants to ensure that stream cleanup volunteers have all of the support and supplies they need for trash removal. Participating groups receive an Adopt-A-Stream sign from the PWC Public Works Department in recognition of their stewardship. To learn more, adopt a stream or get a proposed site, visit waterquality@pwswcd.org.

Occoquan River cleanup

Join Friends of the Occoquan for a *Fall Lower Occoquan River Cleanup* 9 a.m. to noon Oct. 13. Boaters are needed to help assist at sites along waterways. Bring a refillable water bottle. Contact 703-624-7124. Here are the contacts for those who wish to register at a particular location:

- *Lake Ridge Marina in Lake Ridge:* Renate Vanegas, 703-674-6659.
- *Town of Occoquan:* Julie Little, 703-491-2168.
- *Bull Run Marina in Clifton:* German Vanegas, 703-624-7124.
- *Fountain Head Park in Fairfax Station:* Sonia Monson, 703-581-5487.
- *Occoquan Regional Park in Lorton:* John Houser, 703-690-2121.

North Fork Broad Run

Help to monitor the water quality of North Fork Broad Run 10:30 a.m. to 1:30 p.m. Sept. 15 at Links Pond Circle in Gainesville, VA. Info: Veronica Tangiri at Waterquality@pwswcd.org.

York County (PA) Parks

Upcoming volunteer opportunities at York County, PA, parks include:

- *Raab Park, Seven Valleys:* 9 a.m.–12 p.m. Sept. 22. Trail work.
- *Nixon Park, York:* 9–11:30 a.m. & 2:30–4 p.m. Oct. 6. Habitat tree plantings.

Preregistration is required. Contact: parks@yorkcountypa.gov, 717-840-7440.

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 September, October and November at Little Paint Branch Park in Beltsville. Learn about native plants. Sign in for a safety orientation. Gloves and tools are provided. Info: Marc Imlay at 301-442-5657, Marc.Imlay@pgparks.com.

Cromwell Valley Park

Cromwell Valley Park near Towson, MD, needs volunteers for:

- *Habitat Restoration Team / Weed Warrior Days:* 2–4 p.m. Sept. 15, 22 & 26; Oct. 3, 13 & 20. All ages, 12 & younger w/adult. Help remove invasive species, plant natives and maintain restored habitat. Service hours are available. Meet at Sherwood House parking lot. No registration. Info: Laurie Taylor-Mitchell at ltmitchell4@comcast.net.
- *Hawk Watch Weekend:* 9 a.m. Sept. 15 & 16. Willow Grove Hawk Watch Site. All ages. Help to count broad-winged hawks as they migrate through the valley. No registration.
- *Drop in Gardening:* 9 a.m.–12 p.m. Sept. 22 & 29. Children's Garden. Individuals/families, ages 13+ Gloves, tools, water provided. Bring a hat, sunscreen. No registration. Info: 410-887-2503, info@cromwellvalleypark.org.

Magruder Woods

Help Friends of Magruder Woods 9 a.m. to 1 p.m. the third Saturday in September, October and November remove invasive plants in the forested swamp in Hyattsville, MD. Meet at the farthest end of the parking lot. Info: Marc Imlay at Marc.Imlay@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.–12 p.m. Wednesdays. All ages (16 & younger w/ adult) are welcome. Training, tools and water are provided. Preregistration is required. Info: 410-414-3400, acltweb.org, landmanager@acltweb.org.

Prince William Ploggers

Join the Prince William (VA) Ploggers, a volunteer corps of joggers who pick up litter. Contact: Lynda Kummelt at 571-285-3772; lkummelt@kpwb.org.

Snap a stream selfie

Water quality in 80 percent of U.S. streams is unknown. Volunteers can help bridge the information gap by taking a selfie from their backyard or nearby stream. Info: iwla.org/streamselfie.

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 September, October and November remove invasive plants at Ruth Swann Park in Bryans Road. Meet at Ruth Swann Park-Potomac Branch Library parking lot. Bring lunch. Info: Marc Imlay at 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., return at 5 p.m. Carpool contact: Laurel Imlay at 301-277-7111.

Adopt-a-Stream program

The Prince William Soil & Water Conservation District in Manassas, VA, wants stream cleanup volunteers to have all of the support and supplies they need. Participating groups receive an Adopt-A-Stream sign from PWC Public Works Department to recognize of their stewardship. To learn more, adopt a stream or get a proposed site, email waterquality@pwswcd.org.

VA Master Naturalist training

The Prince William County (VA) Master Naturalist Merrimac Farm Chapter needs volunteers interested in the stewardship of natural areas, trail & stream rehabilitation, and water quality monitoring. Volunteers can lead educational programs or assist scientists in plant and animal surveys. Training covers ecology, geology, soils, native flora & fauna and habitat management. The fee is $200; a scholarship is available. Volunteers commit to 40 volunteer hours a year. Info: merrimacfarmvmn.weebly.com/.

Floatable monitoring program

The Prince William Soil & Water Conservation District in Manassas, VA, needs volunteers to help assess and trace trash in streams as part of an effort to reduce nonpoint source pollutants in urbanized and industrialized areas in relation to the County's Municipal Separate Storm Sewers (MS4) permit. Cleanup supplies are provided. Info: waterquality@pwswcd.org.

Anita Leight Estuary Center

Anita Leight Estuary Center in Abington, MD, needs volunteers for:

- *Plankton Monitoring Studies:* 10 a.m.–12 p.m. Sept. 12, 19 & 26. Adults. Help collect, identify, analyze plankton samples. Call the center for training.
- *Invasinators:* 2:30–4:30 p.m. Sept. 22. Ages 14+ Help to remove invasive plants, plant native species. Wear sturdy shoes, long sleeves, work gloves. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

WORKDAY WISDOM

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

Events near water require closed-toe shoes and clothing that can get wet or muddy.

Always bring water. Sunscreen and an insect repellent designed to repel both deer ticks and mosquitoes help.

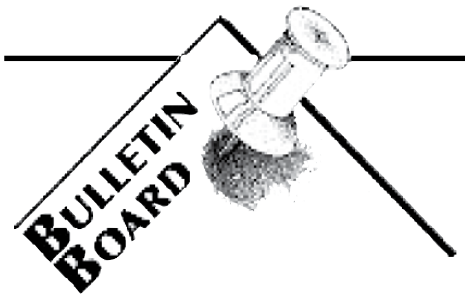
Lastly, most organizers ask that volunteers register ahead of time. Knowing how many people are going to show up ensures that they will have enough tools and supervisors. They can also give directions to the site or offer any suggestions for apparel or gear not mentioned here.

RESOURCES

5 MD libraries offer fishing gear

The Maryland Department of Natural Resources' Aquatic Resources Education

BULLETIN CONTINUES ON PAGE 35



Bulletin from page 34

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 goal is to foster the next generation of anglers by cultivating a passion for outdoor recreation as well as an appreciation for nature. These libraries, which are in close proximity to public fishing areas, have partnered with local fishing clubs to ensure proper inventory levels and maintenance of the equipment.

The Bay Backpack

Provided by the Chesapeake Bay Program's Education Workgroup, the *Bay Backpack* is an online resource for educators with information about funding opportunities, field studies, curriculum guides and lesson plans related to the Chesapeake. Info: baybackpack.com.

Calvert County water trail guide

The Maryland Department of Natural Resources and Calvert County Parks and Recreation have produced a water trails map and guide for county waterways and public water access sites for boaters and paddlers. *Water Trail Adventures in Calvert County: Discover the Charm of the Chesapeake* is printed on waterproof / tear-proof paper and features color maps, locations of launch sites & support facilities, and information on cultural, historic & natural resources. It depicts six paddling routes along approximately 29 miles of waterways. The water trail map is available at the department's Outdoor Store, Calvert County Parks and Recreation and other locations, including Jefferson Patterson Park and Museum, and the towns of North Beach, Chesapeake Beach and Solomons Island. The cost is $3.

Virginia river atlases

The Virginia Canals & Navigations Society publishes river atlases designed for river research and recreation. Each includes large-scale river maps annotated with historic riverbed sites. Most have a river mileage system so that historic and pollution sites can be located scientifically. Atlases for the Bay watershed include the Shenandoah, Goose Creek/ Little River, Rappahannock/ Hazel, Dragon Swamp, Chickahominy, Appomattox, the James and its other branches, and the Dismal Swamp waterways. Visit www.vacanals.org, click on VC &NS Online Store.

MD weekly fishing report

Learn what fish are biting where in Maryland through summaries written by experts at news.maryland.gov/dnr/tag/weekly-fishing-report.

National water resource surveys

The U.S. Environmental Protection Agency partners with states and tribes to conduct surveys that assess the quality of the nation's lakes, wetlands, rivers & streams, and coastal waters. The most recent assessment reports are available at epa.gov/national-aquatic-resource-surveys.

Turf / lawn programs

For information on the Prince William Soil & Water Conservation District's *12 Steps to a Greener Lawn / Building Environmental Sustainable Turf BEST Lawns Programs*, low-cost, research-based programs for lawn education, call 703-792-4037 or email bestlawns@pwcgov.org.

Emerald ash borer program

The Virginia Department of Forestry's Emerald *Ash Borer Cost-Share Program* helps landowners and organizations (nonprofits, schools, homeowner associations, municipalities) treat ash trees to prevent emerald ash borer from killing them. Info: Meredith Bean at 434-220-9034, meredith.bean@dof.virginia.gov. To learn about the borer, visit emeraldashborer.info. To participate in free webinars, visit emeraldashborer.info/eabu.php.

Watershed Capsule

Prince William Conservation District Watershed Capsules, tools for students to learn about the important role of the watersheds, are available on a first-come, first-served basis. Info: pwswcd.org/educators.html, education@pwswcd.org.

VA water monitoring test kits

The Virginia Department of Environmental Quality is distributing a limited number of water monitoring kits to test for dissolved oxygen, pH, turbidity and temperature. These kits are available for free to schools and organizations that do not have water monitoring equipment. The DEQ requests that participants use these kits as part of the EarthEcho Water Challenge (formerly known as World Water Monitoring Challenge. See worldwatermonitoringday.org). Groups with their own monitoring equipment can also participate in the event. Teachers, or those who work with a large number of students, can request a free kit. Info: Stuart Torbeck at charles.torbeck@deq.virginia.gov and provide a mailing address, the number of monitoring locations, the total number of participants from the organization or school expected to participate in the EarthEcho Water Challenge. This information helps to determine how many kits a group needs. The Virginia Water Monitoring Council provided the kits for this effort.

Bilingual educator resources

Bilingual lessons are available in English and Spanish for Interstate Commission on the Potomac River Basin educational programs. Info: potomacriver.org/resources/educator-resources/bilingualmaterials.

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.
- **October issue: September 11**
- **November issue: October 11**

Stormwater site visits

Businesses and nonprofits interested in landscaping and turf management, stormwater pond management, wildlife concerns, recommendations for maintaining landscapes, protecting water quality and pollution prevention can call 703-792-6285 to schedule a free site visit.

Marine debris toolkit

The National Oceanic and Atmospheric Administration's Office of National Marine Sanctuaries and the NOAA Marine Debris Program have developed a toolkit for students and educators in coastal and inland areas to learn more about marine debris and monitor their local waterways. This toolkit is a collaborative effort to reduce the impact on marine ecosystems through hands-on citizen science, education and community outreach. Info:

- sanctuaries.noaa.gov/news/aug17/toolkit-helps-students-and-teachers-fight-against-marine-debris.html.
- marinedebris.noaa.gov/curricula/marine-debris-monitoring-toolkit educators;marinedebris.noaa.gov/sites/default/files/publications-files/MarineDebrisMonitoringToolkitForEducators.pdf.

Forums / Workshops

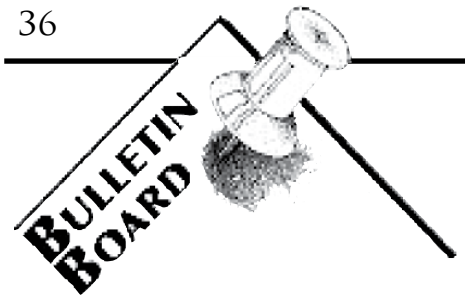
Eastern Native Grass symposium

The *11th Eastern Native Grass Symposium, Form & Function: Grasslands and Meadows in the Converging Landscape,* takes place Sept. 17–19 at the Bayfront Convention Center in Erie, PA. The biennial symposium brings together stakeholders and academics from the United States and Canada to share best practices, as well as emerging markets and trends in the use of native grasses and forbs (flowering plants) in diverse applications. On Sept. 17, attendees may attend two field tours from four options: Getting Seeds from Field to Freight: A Tour of Ernst Conservation Seeds; Wine Country Connection: Streambank Vegetation Projects and Vineyards Using Natives as Cover Crops, Erosion & Sedimentation Solutions; Native Grasses, Wetland Plants and the Sand Barrens of Presque Isle; and Establishment of Native Grasses & Forbs on State Game Lands. The evening of Sept. 17, Dave Boughton, maritime education specialist with Pennsylvania Sea Grant, will present *Shipwrecks of Lake Erie.* Sessions offered Sept. 18–19 include native grasses and forbs in commercial & residential landscapes; site preparation, seed selection, establishment, maintenance & expectation management; erosion & sedimentation plans; steep slopes/disturbed sites; public health & safety applications; native grasslands for livestock forage, biofuels & sustainable fiber production; restoration of native grassland communities; natives for wildlife & pollinator habitat; and the role of natives in conservation agriculture. The event offers continuing education credits, (see website). Registration is $250 (plus $30 for those who attend Sept. 17 field trips). Info: EasternNativeGrassSymposium.com, info@EasternNativeGrassSymposium.com, 800-873-3321 (ask for Randy Ferguson).

Water monitoring call for papers

Organizers of the *24th Annual Maryland Water Monitoring Council: Science, Stewardship and Citizen Involvement,* which takes place 7:30 a.m. to 4:30 p.m. Dec. 7 in Linthicum, are issuing a call for presenters and posters as well as nominations for the 12th Annual Carl S. Weber Award. Topics include: forests & water quality; urban ecology; promoting stewardship; environmental reporting; stream restoration monitoring; sewage infrastructure; citizen monitoring; and toxic contaminants. The deadline for abstracts is Oct. 19. In addition, the event is also soliciting submissions for

Bulletin continues on page 36



BULLETIN FROM PAGE 35

the seventh Annual Maryland Water Monitoring Council Student Poster Award, which is open to junior high, high school and college undergraduate students. First place receives $200, second place $100. The Weber Award is presented to an individual (or individuals) involved in water monitoring in Maryland. The council will also present the Above and Beyond Award to recognize contributions of an up-and-coming individual who has volunteered time and energy toward monitoring the state's waters and has made a significant contribution to increasing watershed awareness, advocacy, education and stewardship. Nominations must be submitted by Oct. 12. Visit dnr.maryland.gov/streams/Pages/MWMC/conference.aspx for submission details, opportunities for vendors and sponsors, and conference updates.

EVENTS / PROGRAMS

Stream monitoring classes

The Audubon Naturalist Society at Woodend Sanctuary, in Chevy Chase, MD, invites citizen science volunteers or team leaders, aquatic resource biologists, fly fishermen and anyone, ages 10 & older, interested in monitoring and understanding stream health, to a series of introductory classes on stream monitoring. The schedule is:

Know Your Invasive Plants: 9:30 a.m.–12 p.m. Sept. 15. Invasive plants that kill or bring down mature trees can seriously alter stream health and ecosystem function. Learn to identify nonnative invasive plants at Woodend and in nearby Rock Creek.

Introduction to Stream Science Series/ Healthy Stream Biology (classroom): 7–9:30 p.m. Sept. 20. Learn how benthic macroinvertebrates — organisms that live in the bottom of streams — help to assess a waterway's health. Learn how to identify these organisms to the taxonomic level of order.

Introduction to Stream Science Series / Ten Mile Creek, Boyds, MD, (field workshop): 9:30 a.m.–12 p.m. Sept. 22. Visit a healthy stream to practice monitoring techniques, collect, identify benthic macroinvertebrates.

Introduction to Stream Science Series / How to Read Your Stream: 7–9:30 p.m. Sept. 27. Learn about the influence of land uses on streams, stream character & dynamics, bank erosion, bar formation, substrate composition, different velocity-depth regimes as well as the importance of riffles and riparian vegetation. Practice assessing stream habitat using photographs of streams and the forms that monitors fill out in the field. This class is for anyone who plans to participate in the ANS water quality-monitoring program and is a refresher on habitat assessment for experienced monitors.

Classes are $25 and require preregistration. Info: anshome.org/stream-science-classes/ or cathy.wiss@anshome.org.

Prince William Recycles Day

Prince William Recycles Day takes place 10 a.m.–2 p.m. Oct. 13 at the Prince William County Landfill in Manassas, VA. The recycling education and community outreach includes games, waste reduction, reuse & recycling techniques, a recycling magic show, music, free refreshments and tours of the landfill. Info: Deborah Campbell at 703-792-5328 or dcampbell@pwcgov.org.

Fishing contest celebrates reefs

The Chesapeake Bay Foundation and the Coastal Conservation Association, MD, invite anglers of all ages to celebrate oyster reefs in the Bay at the second annual *Rod & Reef Slam Fishing Tournament* Sept. 22 in Sherwood, MD. In recognition of how oyster reefs provide habitat for fish, the event will allow anglers to fish on six sanctuary reefs normally off-limits to harvesting. The event includes an after-party, as well as powerboat, kayak and youth divisions. Registration required. Info: cbf.org/slam.

RIVERFest 2018

RIVERFest 2018 takes place 11 a.m.–4 p.m. Sept. 15 on the grounds of St. Bride's Episcopal Church in Chesapeake, VA. The free environmental festival celebrates the restoration of the Elizabeth River and includes a native plant sale, meet the Chesapeake Mermaid, aquariums with river creatures, wildlife rehabbers and live music. Dogs on a leash are welcome. Info: elizabethriverfest.org

Horn Point Open House

The University of Maryland Center for Environmental Science's Horn Point Laboratory invites the public to its *Sustainable Solutions through Science Open House* 10 a.m. to 3 p.m. Oct. 13. Hands-on exhibits will help visitors learn about the lab and its impact on the health of the Chesapeake as well as how marshes, oysters, sediment, zooplankton and computer models help restore the Bay. The free event, which takes place rain or shine, also includes exhibits and a children's scavenger hunt. Children receive a free T-shirt. Info: 410-221-8408 or cstarr@umces.edu.

Corsica River Day

The Corsica River Conservancy, Corsica River Yacht Club and Queen Anne's County Dept. of Parks invites the public to learn about preservation efforts at *Corsica River Day* 12–4 p.m. Sept. 16 at the Corsica River Yacht Club in Centreville, MD. Free family entertainment includes water and environmental activities, live music, exhibits, the Fishmobile, pony rides, petting zoo, Scales & Tails, and children's crafts. Food, drinks and beer will be available for sale. Call Queen Anne's County Office of Tourism at 410-604-2100 or visit corsicariverconservancy.org.

Patuxent River Appreciation Days

Patuxent River Appreciation Days takes place 10 a.m. to 5 p.m. Oct. 6–7 at the Calvert Marine Museum in Solomons, MD. The PRAD Inc. committee is seeking participants for the annual parade, which starts at 2 p.m. Oct. 7. Nonprofit organizations are welcome. Prizes are awarded for best floats. First prize is $300, second is $200 and third is $100. School bands receive a stipend for participation. Info: Randy Geck at rgeck@xecu.net.

Mount Harmon Plantation

Upcoming events at Mount Harmon Plantation in Earleville, MD, include:

National Revolutionary War & Colonial Festival: 10 a.m.–4 p.m. Sept. 15 & 10 a.m.–3 p.m. Sept. 16. Re-enactment features British, Rebel encampments & battle, colonial marketplace. Admission: $5, ages 12 & younger are free.

Bull & Oyster Roast: 5–9 p.m. Oct. 13. Benefit also includes silent, live auctions; manor house tours; live bluegrass music. Advanced tickets: $65. Reserved table for eight is $500.

Info: info@mountharmon.org, mountharmon.org, 410-275-8819.

Chesapeake Bay Maritime Museum

The Chesapeake Bay Maritime Museum in St. Michaels, MD, invites the public to view Chesapeake Bay sailing log canoe races along the Miles River while aboard the 1920 buyboat, Winnie Estelle. The two-hour cruises depart 9:30 a.m. Sept. 16 or 9:30 a.m. & 1:30 p.m. Sept. 15. Cruises include commentary from CBMM's docents, crew. Fee: $35. Registration required. Info: cbmm.org/onthewater.

Calvert Marine Museum

Upcoming events at the Calvert Marine Museum in Solomons, MD, include:

Fossil Field Experience: 9 a.m. Sept. 15, Oct. 20. Ages 8+ (Children must be w/adult.) Meet at Cove Point Lighthouse. Learn how to find, identify fossils, then search for them on beach until 11:30 a.m. Bring a bag lunch or eat at a local restaurant. Program resumes at 1 p.m. at the museum where participants discuss finds, explore the Paleontology Hall. Fee of $20 includes museum admission. Preregistration required. Info: bit.ly//FossilFieldExperience or Melissa McCormick at 410-326-2042 x41.

Dee of St. Mary's Public Sails: 2:30–4:30 p.m. Sept. 16 & 29; Oct. 14. Tickets: $25/ages 13+ and $15/ages 5–12. Ages 5 & younger not permitted. Advance reservations taken till noon the Friday prior to each sail. Remaining tickets are at admissions desk the day of the sail. Info: 410-326-2042 x41.

Paradise Creek Nature Park

Upcoming events at Paradise Creek Nature Park in Portsmouth, VA, include:

Clear-Bottom Kayak Paddles on Paradise Creek: 9–11 a.m. Sept. 22. No experience necessary. Trip includes kayaks, paddles, life jackets, guide. Learn about park's history, ecology. Fee: $40. Registration required at least two business days prior to paddle. Contact 757–392-7132, kfish@elizabethriver.org.

The Great Migration Bird Walk: 8 a.m.–10 a.m. Sept. 29. All skill levels welcome. Ages 8+ (8–12 w/adult) Tour the park to look for birds visiting during their fall migration. Bring binoculars or borrow a pair. The walk, presented by the Elizabeth River Project is free, but donations will help support river education and restoration. Preregistration required. Info: rdunbar@elizabethriver.org, 757-399-7487.

Senior Rangers at Patapsco

Maryland's Patapsco Valley State Park invites citizens, ages 60 & older, to take part in *Senior Rangers*. The six-session program meets 2–3:30 p.m. The schedule is:

Parks, Park Rangers & Volunteering: Oct. 4. Hilton Area Shelter 201, Catonsville. Learn about the parks, volunteer opportunities, first aid, how parks operate.

Planet Earth: Oct. 11. Hilton Area Shelter 201, Catonsville. Geology & tour of Soldiers Delight's chromium mines.

Plants: Oct. 18. Hilton Area Shelter 201, Catonsville. Walk the sensory trail. Learn to ID trees using bark; discuss leaves; make Sunprint images using leaves.

Animals: Oct. 25. Soldiers Delight NEA Auditorium, Owings Mills. Scales & Tales program features MD's native raptors, snakes, turtles.

People: Nov. 1 Avalon Area Shelter 104, Halethorpe. Hike with park historian.

Conservation: Nov. 8 Hollofield Area Shelter 300, Ellicott City. Learn about Leave No Trace principles, living sustainably, conserving energy & other resources, reduce/reuse/recycle, alternative energy exploration

Each day also includes a half hour of physical fitness: croquet, hiking, bocce ball or the like. The fee for the six-week program is $10; preregistration is required. Info: 410-461-5005, Jamie Petrucci at jamie.petrucci@maryland.gov.

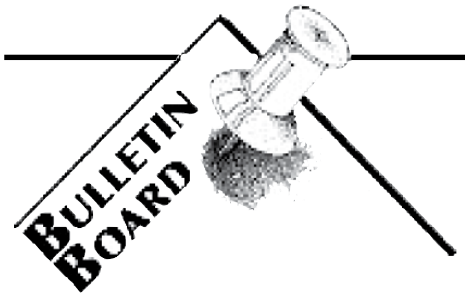
Manada Conservancy

The Manada Conservancy in Hummelstown, PA, invites the public to these events:

Take a Walk on the Wild Side / Plants: 2–3 p.m. Sept. 16. Hershey Public Library, Hershey. Grades K–5 w/parent. Learn why the library's and other riparian buffers are important. Discover these buffers' plants during a walk. Event takes place rain or shine. Free.

Third Annual Music Over the Mountains Celebration: 4–8 p.m. Sept. 23. Wind in the Willows, Grantville. Benefit's venue offers a view of Blue Mountain, central to Manada's preservation efforts. Live music, barbecue, beer. Tickets of $50 include music, barbecue, 3 beers. Advance tickets are required and are sold at:

BULLETIN CONTINUES ON PAGE 37



Bulletin from page 36

atmanada.org/music-over-the-mountains.

A Few Small Things...of the Kittatinny Corridor: 7 p.m. Sept. 26. Dauphin County Ag & Natural Resources Center, Dauphin. Ages 10+ Learn about easily overlooked species in this corridor. Free.

2018 Annual Walk in Penn's Woods: 1 p.m. Oct. 7. DeHart Dam, Tower City. Guided 1.5 mile walk explores DeHart Dam & Reservoir in Clarks Valley. Event highlights drinking water from raindrop to the tap, water stewardship. A field expert will help identify wildlife, flowers, invasives and discuss forest & tree health along the way. Terrain may be uneven and there are moderate inclines. Wear well-fitting sturdy shoes or boots. Meet in the gravel parking lot at the dam's entrance. Parking is limited; carpooling is recommended. Free.

Preregistration is required for all programs. Info: office@manada.org, 717-566-4122.

Patuxent Research Refuge

Upcoming events at the Patuxent Research Refuge's National Wildlife Visitor Center [C] and North Tract [T] in Laurel, MD, include:

Family Fun / Migration: 10 a.m.–1 p.m. Sept. 14 & 15 [C] All ages. Learn about bird migration through hands-on games, activities, crafts for everyone. No registration, drop-in program: come & leave when you wish.

Owl Eyes: 12:15–12:45 p.m. Sept. 15 & 22 [C] All ages. Learn about owls. No registration.

Bird Walk: 8–10 a.m. Sept. 15 [C] All ages. Search for, identify birds on walk around Cash Lake. Binoculars, water bottle recommended. No strollers. Event is weather-dependent.

Tiny Tots: 10:30–11:15 a.m. Sept. 16 & 17 [C] Ages 18–48 months w/parent participation. Learn about wildlife through interactive songs, stories, activities.

Pollinator Festival: 10 a.m.–2 p.m. Sept. 22 [T] All ages. Watch monarch butterfly tagging. Learn how domestic and native bees sustain the environment. Take home free milkweed seeds or plants while supplies last. Take a guided nature walk. No registration.

Raptors Reign: 1–3 p.m. Sept. 29 [C] All ages. Licensed falconer Rodney Stotts discusses, shares up-close encounters with birds of prey. No registration.

North Tract Bicycle Ride: 1–3:30 p.m. Sept. 30. Ages 10+ Learn how to reduce one's footprint, leave no trace on 12-mile ride. See local wildlife, plants, historical sites. Bring bike, energy bar/snack, water bottle, helmet. Ride is weather-dependent.

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.

Cromwell Valley Park

Upcoming programs at Cromwell Valley Park's Willow Grove Nature Center [N] or Primitive Technology Laboratory [T] near Towson, MD, include:

Autumn Solstice Bonfire & S'mores: 7:30–9 p.m. Sept. 21 [N] Ages 5+ Fee: $5.

Bees Wax Bowls: 1–2:30 p.m. Sept. 22 [N] Ages 8+ Learn about honey bees, craft a small bowl from their wax. Fee: $5.

A Walk in the Park / Nature Quest Hike: 11 a.m. Sept. 23 [N] All ages. Hike to Nature Quest markers. Free. No registration.

Polliwog Preschool Club: 10:30–11:30 a.m. Tuesdays, Sept. 25–Oct. 30 or Wednesdays, Sept. 26–Oct. 31. [N] Ages 2–5 w/adult. Explore the natural world through hands-on activities, nature play, stories, crafts. Non-mobile siblings only, parent/guardian must be an active participant. Dress for outdoors. Fee: $30 for 6 sessions. Register for ***one*** series only.

Monarch Madness: 1–2:30 p.m. Sept. 29 [N] Ages 5+ Learn about, help tag this migratory butterfly. Fee: $5.

Apple Press & Prints: 1–2:30 p.m. Sept. 30 [N] Ages 2–10. Learn about Johnny Appleseed, then squeeze cider at the apple press. Use apples to make hand-printed craft to take home. Fee: $5.

Night Out with Nature / Game Wardens - The Thin Green Line: 7–9 p.m. Oct. 5. This event takes place at Sherwood House. Adults. What happens to game wardens when they are out in the field? Officer Loren Lustig of PA will present true stories, some humorous, some ridiculous, some tragic. Dessert included. Fee: $10.

Hiking Sticks: 1–3 p.m. Oct. 6 [P] Adults. Make a hiking stick. Fee: $4.

Fall Harvest Festival: 10 a.m.–4 p.m. Oct. 13 (rain date: 10/14) [N-Farm] All ages. Pony & hay rides, music, earth oven cooking, apple pressing, apple butter-making, beekeeping, family games & crafts, Native American activities, food, 4-H animals. No registration. Suggested donation: $5/car.

Ages 12 & younger must be accompanied by an adult. Except where noted, preregistration is required for all programs. Info: info@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 events at Oregon Ridge Nature Center in Cockeysville, MD, include:

Shoots & Letters: 10–11 a.m. Sept. 13 (*Life Underwater*); Sept. 20 (*Monarch Butterflies*); Sept. 27 (*Honeybees*); Oct. 4 (*Birds of Prey*); Oct. 11 (*Autumn Leaves*); Oct. 18 (*Animal Camouflage*). Ages 3+ Stories, crafts, adventures explore nature. Fee: $2/child. No registration.

Bookworm Story Time: 11–11:45 a.m. Oct. 5. Toddlers to age 6. Nature story w/activity (animal encounter, puppets or craft). Dress for brief outdoor experience. Free. No registration.

Morning Bird Walks: 8:30–10 a.m. Sept. 14, Oct. 12, Nov. 9. Adults. Bring binoculars, wear hiking shoes. Free. Preregistration appreciated.

Homeschool Nature Days / Insects: 10–11:30 a.m. Sept. 14, 21, 28 & Oct. 5. Ages 6–13. No siblings (parents may stay). Fee: $20 for the series.

35th Annual Honey Harvest Festival: 11 a.m.–4 p.m. Oct. 6 & 7. All ages. Learn about honeybees. Activities include open honeybee hive demonstrations, honey extractions, mead making, honey ice cream-making, food trucks, puppet shows, animal encounters, local honey product sales. Free admission; minimal charge for some activities. No registration.

Monarch Magic: 1–3 p.m. Sept. 15 & 16. Ages 5+ Learn about this butterfly's migration. Help to capture, tag, release monarchs. Fee: $2.

Oregon Ridge Nature Center Council Speaker Series - Wild Bees that Live in your Backyard - You can Make a Difference: 7–8:30 p.m. Sept. 17. Adults. Did you know that mowing kills more bees than pesticides? Sam Droege, wildlife biologist at the USGS Patuxent Wildlife Research Center will discuss the benefits of wild bees and how to reverse the decline in their population. Adults. Free, donations appreciated. No registration.

A Walk in the Park: 11 a.m.–12 p.m. Sept. 23. Ages 5+ Easy/moderate hike. Wear sturdy shoes, bring water bottle. Leave pets at home. Free.

Family Camp Out: 6 p.m. Sept. 22 through 9 a.m. Sept. 23. All ages. Bring tent, camping gear. Hike, campfire, s'mores, light breakfast provided. A limited number of tents can be rented. No alcohol, pets. Fee: $10/person; $25/family.

Autumn Scents: 1–3 p.m. Sept. 29 & 30. Use your senses on hike while collecting items to create a potpourri. Fee: $5.

Ages 12 & younger must be accompanied by an adult. Except where noted, preregistration is required for all programs. Info: 410-887-1815, info@OregonRidgeNatureCenter.org. Programs are designed for individuals and families; groups can call the park to arrange a program. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTD/Deaf), giving as much notice as possible.

Eden Mill Nature Center

Upcoming events at Eden Mill Nature Center in Pylesville, MD, include:

Preschool Nature Series: 10–11:15 a.m. Sept. 18 (*Monarchs on the Move*); Sept. 25 (*Harvest Party*) Oct. 9 (*Everything Apple*) Ages 2–5 w/adult. Nature activities, story, craft, hike. Fee: $10 per date.

Still Life Drawing / Crunchy Leaves: 5:30–7:30 p.m. Sept. 18. Teens, adults. All skill levels. Learn to view plants with an artistic naturalist's eye. Draw from a choice of displays. Fee: $9.

Nature Storybook Art: Three-session program meets 12:30–2:30 p.m. Oct. 3, 10 & 17. Ages 6-12. Parents do not attend. Participants learn about books, illustrators, art techniques. Fee: $44.

Hunting the Haunted: 7–9 p.m. Oct. 13. Ages 10+ (Minors must be accompanied by a paying adult.) Storyteller, local historian tell true ghost stories supported by paranormal evidence from the mill. Take a guided ghost hunt of the mill, cemetery, weather permitting. Fee: $15.

Sunrise/Sunset Canoe Trips: 9–11:30 a.m. Saturdays or 5:45–8:15 p.m. Thursdays through Oct. 13. Ages 6+ (all minors w/adult) Explore Deer Creek. The emphasis is on environmental education, interpretation provided by naturalist guide. Fee: $8.

Preregistration is required for all programs. Info: 410-836-3050, edenmillnaturecenter@gmail.com.

Anita Leight Estuary Center

Programs at the Anita C. Leight Estuary Center in Abingdon, MD, include:

Paddle Palooza Canoe Trip: 10 a.m.–1 p.m. Sept. 15. Ages 8+ Join ACLEC and the Izaak Walton League of America for a naturalist-led introduction to canoeing, guided paddle. Fee: $12.

Reading Bones: 2–3:30 p.m. Sept. 15. Ages 6+ Discover clues to who eats who while looking over bones, skulls of different animals. Free.

National Estuaries Day - Paddles & Pumpkinseeds Canoe Trip: 9:30 a.m.–2 p.m. Sept. 22. Ages 8+ Learn about the recreational, environmental benefits of the Bay's upper reaches in this combination canoe/fish seining program. Fee: $12.

Champion Tree Hike: 2–3:30 p.m. Sept. 22. Ages 6+ Meet at Rock Grist Mill of Susquehanna State Park in Havre de Grace to see some of Maryland's award-winning Champion Trees. Fee: $3.

Spectacular Sunset Paddle / Kayak Trip: 5:30–8 p.m. Sept. 22. Ages 8+ Camera recommended. Fee: $12.

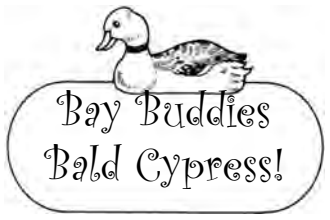
Kayak Cruising on the Creek: 10 a.m. –12:30 p.m. Sept. 27. Adults. Explore Otter Point Creek, upper Bush River. Fee: $12.

Mushroom March: 1–2:30 p.m. Sept. 29. Ages 5+ Identify mushrooms, craft a mushroom inspired by nature. Bring a camera or smartphone. Fee: $3.

Date Night Dinner Cruise: 5:30–7 p.m. Sept. 29. Adults. Dine as the sun slips below the horizon. Fee: $15.

Crabby Crafts: 2–3:30 p.m. Sept. 30. Ages 4–12. Decorate a crab shell. Participate in the crab walk relay. Fee: $5.

Ages 12 & younger must be accompanied by an adult. 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.



This month's *Bay Naturalist* column, on the back page, is all about the bald cypress. How much do you know about this tree? Here are 10 scrambled words related to the bald cypress, along with a clue to their identities. Stuck? All of the information you need is in *Bay Naturalist*. Or, you can look up the answers on page 30.

1. WSPAM _____
This is the type of habitat where bald cypress are found.

2. SNEEK _____
Instead of growing down, these unusual roots help to anchor the bald cypress by growing upward.

3. DOWERDO
_____
The bald cypress is a member of this family of trees.

4. KUMCHOM
_____
This little piece of land sticks out of the water and remains moist. Bald cypress seeds must land on one of these if they are to sprout and grow.

5. ONCE _____
This is the part of the bald cypress that bears flowers and seeds.

6. EWIND _____
The trunk of the bald cypress does this near the bottom of the tree to help support it.

7. OWARDHETO
_____
This is the hard interior of a tree's trunk. The bald cypress' is valued because it remains strong, even when exposed to soil or water.

8. STEWE MUG
_____
This is another water-tolerant tree that sometimes grows near bald cypress. It has hard, spiky fruit.

9. REMOMSNIP
_____
This tree, found in the same habitat as bald cypresses, bears yellowish orange to reddish orange fruit that creates a dry sensation in the mouth when eaten.

10. DOVERBIN
_____
This songbird, found in the same habitat as the bald cypress, builds a domed nest, woven from plants, on the ground.

— Kathleen A. Gaskell

Bald cypress rise from the water at Trap Pond State Park near Laurel, DE. (Dave Harp)

Sharp as a needle? This bald cypress quiz is for you

This month's *Bay Naturalist* column, on the back page, is about the bald cypress. How much do you know about this tree? Answers on page 30.

1. The tallest known bald cypress, at 145 feet, is found near which Virginia city?
A. Newport News
B. Norfolk
C. Virginia Beach
D. Williamsburg

2. The Chesapeake watershed is home to the northernmost stand of bald cypress in the United States. Where is this stand?
A. Big Cypress Memorial Park in Delaware
B. Lost Swamp State Par in Delaware
C. Needles & Nobs State Park in Delaware
D. Trap Pond State Park in Delaware

3. The crowns of young bald cypress have a distinct shape. What is it?
A. Hourglass
B. Oval
C. Pyramid
D. Rectangle

4. Bald cypress drop all of their needles during the fall. Trees that do this are called:
A. Anadromous
B. Autumnal
C. Coniferic
D. Deciduous

5. While the bald cypress can live for more than 1,000 years, approximately how long is their usual lifespan?
A. 300 years
B. 450 years
C. 600 years
D. 750 years

6. The bald cypresses is monoecious. What does this mean?
A. Each tree contains separate male and female flowers.
B. Each tree contains flowers that have both male (stamen) and female (ovary) parts.
C. Each tree has either male or female flowers.
D. Each tree bears female flowers in the first 200 years or so of its life, and then bears male flowers in the later years of its life.

7. Young bald cypress cones do not resemble typical conifer cones, though they do become woodier as autumn goes on. What do this tree's cones look like?
A. Clusters of small (about a half inch), smooth deep red berrylike orbs
B. White, papery, 2-inch catkins
C. Tough, green, scaly balls about an inch in diameter
D. Feathery brown 1-inch pods that grow redder as autumn approaches winter

8. Bald cypress were once heavily lumbered for their rot-resistant wood. Why is this not the case today?
A. There are fewer bald cypress to harvest.
B. Most of remaining bald cypresses are in not easily accessed wetlands.
C. They are too slow-growing for agroforestry.
D. All of the above.

9. Why are bald cypress growing along or in watery areas beneficial for the Bay's water quality?
A. They absorb pollutants.
B. They take up floodwater and slowly disperse it.
C. They prevent erosion along the banks of the river or stream.
D. All of the above

10. Match the animal with the benefit it receives from the bald cypress.

Species	*Benefit*
Amphibians	Eat the seeds
Catfish	Nest in the trunk
Squirrels	Use for spawning or nursery grounds
Wood ducks	Take refuge amid submerged roots

— Kathleen A. Gaskell

Local birders tickled pink when roseate spoonbill showed up here

By Mike Burke

Apparently, it all started on June 17 when Mikey Lutmerding spotted the unlikely pink visitor flying off into some nearby trees. It was pretty far away and only in view briefly, but Mikey knew he had just seen an extremely rare Chesapeake visitor: a roseate spoonbill.

Lutmerding entered his sighting into the popular eBird mobile birding app, making it the first record of a spoonbill in Calvert County, MD, and just the fourth record of the bird in the state. Mikey's not just any birder, he's a pro: a wildlife biologist for the incomparable U.S. Geological Survey's North American Breeding Bird Survey, which is headquartered at the Patuxent Research Refuge in Laurel. Besides, he had the pictures to prove it, posting them on the popular Maryland birders Facebook page.

The young spoonbill was an immediate sensation. Birders from near and far, equipped with cameras, binoculars and spotting scopes, descended on the tiny hamlet of North Beach to see for themselves. Evidently, the spoonbill liked the attention, hanging around for the next three weeks, giving birders hundreds of opportunities to snap its picture.

Matt Felperin, a naturalist at Patuxent River Park, was one of the many who made the trip. His photos of the striking spoonbill accompany this column. Ironically, when the spoonbill finally departed North Beach on July 6, it flew a few miles to the north where its was spotted at Jug Bay/Patuxent River Park on July 8. A spoonbill was spotted on the C&O Canal on Aug. 15 After that, there were no additional sightings in Maryland.

This photo highlights the black edges of this immature roseate spoonbill's flight feathers. Juveniles also have a white head with a blue-gray patch about the eyes. (Matt Felperin / FelperinFoto)

Roseate spoonbills (*Patalea ajaja*) are tropical birds. In the United States, they are usually confined to south Florida, Louisiana marshes and parts of the Texas coast. Typically, they are found even farther south in the Caribbean, Mexico and down the coasts of Central and South America.

The roseate spoonbill's most notable characteristic is its eponymous bill, a long, spatula-like affair. The roseate is the only spoonbill found in this hemisphere. (Matt Felperin)

A medium-size wading bird (it stands about 30 inches tall), the spoonbill is pink and white, quite unlike anything else in the Americas except perhaps a flamingo. But the striking color is not even its most notable characteristic. That distinction goes to the bird's eponymous bill, a long, spatula-like affair. The roseate is the only spoonbill found in this hemisphere.

As Felperin's photos show, immature spoonbills have black edges to their flight feathers. They have a white head with a blue-gray patch about the eyes. Unmistakable even as young birds, spoonbills are even more distinctive as adults.

Many men are familiar with the phenomenon of premature baldness. Spoonbills take that to the extreme. In a little more than a year, the bird will lose its head feathers, leaving a bald, greenish pate. And that's just the start.

By the time spoonbills reach full maturity at age 3, they will have lost the black wing tips, become pinker, and the bluish eye patch will transform into a large black splotch surrounding a red eye. Mature birds will also show a bright carmine streak on the fold of the wings. The tail will become tawny, almost orange. Even the black legs will take on a reddish tinge.

The oddly shaped bill is quite functional. Spoonbills feed by walking through shallow water, swinging their bills back and forth, searching for food. The outside of the bill is leathery, but inside it is lined with sensitive nerve endings. When the spoonbill feels prey touch the inside of its slightly agape mouth, it clamps down, capturing crustaceans, tiny fish and the like. Its diet is rich in carotinoids — organic yellow, orange, or red fat-soluble pigments found in plants, algae, bacteria and fungi — which give the bird its colors.

As their diets suggest, spoonbills seek habitats abundant in shallow water and tiny creatures. Typically, that means marshes, estuaries and mangrove islands.

Like most wading birds, spoonbills nest in colonies, often in mixed flocks of ibises, egrets, herons and storks. They build stick nests and produce a single brood annually, typically laying three to four eggs. For a variety of reasons ranging from weather to predators, an average of just one bird from each brood survives into adulthood.

So what was this spoonbill doing so far from home?

After nesting season is complete and young birds are independent, it's time to roam. Parents may range beyond their typical territory in mid to late summer, but it is the younger birds that often wander the farthest from home. Even so, the case of the North Beach bird was extreme, as its record-breaking appearance made clear.

Had the youngster come to the Chesapeake because of the Bay's improving health? After all, clearer, well-oxygenated water will host the abundant tiny aquatic life essential to the spoonbill's diet. More ominously, perhaps it is an early signal of the disruptions caused by a warming planet. Or is it simply a one-off, a serendipitous occurrence that carries no greater significance?

I'll resist my usual urge to find deeper meaning here. Instead, I'll simply take delight that a strange and wonderful creature came to share a few days of its fascinating life with us. And after all, isn't that enough?

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

SEPTEMBER/2018 VOLUME 28 NUMBER 6

CHESAPEAKE BAY JOURNAL

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

www.bayjournal.com

THE BAY JOURNAL
P.O. Box 222
Jacobus, PA 17407-0222

NONPROFIT ORG.
U.S. POSTAGE
PAID
DULLES VA
PERMIT # 510

Remnants of bald cypress swamps grace Chesapeake watershed

BY KATHY RESHETILOFF

Towering over coffee-colored waters, a majestic tree, the bald cypress (*Taxodium distichum)*, dominates isolated swamps of the Chesapeake Bay watershed.

Although more common to swamps in the Southeast, stands of bald cypress can still be found in parts of Virginia, Maryland and Delaware, where it inhabits areas too wet for many other trees, catching attention with its odd knobby "knees" and buttressed trunk.

Although it is a member of the redwood family and has needles and cones, the bald cypress is not an evergreen. This deciduous tree's needles turn brown in autumn and fall off by winter, and is the source of its common name, bald cypress.

Its featherlike appearance is produced by flattened needles. The reddish brown to gray bark is stringy and flakes away from wood, peeling off in strips. Flowers are borne on round cones.

Growing up to 150 feet high, very old bald cypress trees may reach a diameter of 10 feet or more. More often, though, they approach 120 feet high and 3–5 feet in diameter.

Adapted to swamp life, bald cypress trunks widen at the base to provide additional support in the soft, wet soil. Shallow roots spread out from the base of the trunk. Where water stands during part of the year, roots develop into elongated "knees" that grow above the mud and correspond to the high-water level. The knees help to anchor the tree. Hollow, the knees usually die if the water is permanently drained.

Because they do not produce seeds every year, bald cypress trees must be long-lived to reproduce. Conditions must be just right for a seed to develop into a tree. Seeds must set down on a hummock, a knoll of land that remains moist, but not flooded, for three to five years before the sprout can grow into a thriving seedling. Seeds are dispersed by wind and water.

Bald cypress wood is valued for both interior and exterior building materials. The heartwood is durable even when it comes in contact with the soil or is exposed to the elements. Bald cypress wood is also very resistant to most insects and rot. Because of the wood's durability, large tracts of cypress swamps, from Virginia south to Texas, have been logged.

Bald cypress swamps are one of the breeding habitats for the prothonotary warbler, above. (USFWS)

The Pocomoke River forested swamp is located near Snow Hill, MD. (Dan Murphy / USFWS)

Bald cypress often share the swampy landscape with other water-tolerant tree species such as black gum, sweet gum, red maple, and a variety of oaks and hickories. In the understory, look for persimmon, sweet pepper bush, swamp azalea and southern arrowwood. Lichens and mosses may add a soft coat to trunks and logs. Open water supports both floating and submerged plants

These forested swamps provide homes for wading birds, like herons and egrets, and waterfowl. Many songbirds, like the Kentucky warbler, hooded warbler, prothonotary warbler, yellow-throated warbler, ovenbird, Louisiana waterthrush and yellow-breasted chat, depend on these swamps for migratory and breeding habitat. Cavity nesters, like wood ducks, woodpeckers and owls, are right at home here.

Temporary pools are excellent breeding grounds for frogs, toads and salamanders. Snakes and turtles take advantage of both aquatic and terrestrial environments. Even fish find both food and refuge among the twisted submerged roots. Muskrat, raccoons and otter are a few of the mammals that live in these forested wetlands. Seeds are eaten by wild turkey, wood ducks, evening grosbeak, wading birds, waterfowl and squirrels.

Bald cypress swamps, like other types of wetlands, play an important role in the landscape. Their floodplains help to disperse and slowly release floodwater. In addition, they trap sediments and other pollutants, improving the health of nearby rivers.

The Chesapeake Bay watershed still supports some of these unique bald cypress swamps. Explore and enjoy!

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office in Annapolis.

Where to See Bald Cypress

- *Trap Pond State Park* near Laurel, DE
- *Pocomoke State Park* near Snow Hill, MD
- *Battle Creek Cypress Swamp* near Prince Frederick, MD
- *First Landing State Park* near Virginia Beach, VA
- *Great Dismal Swamp National Wildlife Refuge* near Suffolk and Chesapeake in Suffolk and Chesapeake counties, VA. Not all of these site are in the Bay watershed, but they are definitely worth the visit!