

# A Patuxent Wastewater Primer



Signage at Patuxent River Park after a sewage spill.

By Fred Tutman, *Patuxent Riverkeeper*

The most persistent and commonplace question I get as Patuxent Riverkeeper from regular folks is: “Is the water better or worse?” The answer to that question most often falls into the category of “glass half-full or half-empty.” Different people look at very different things at different times hoping to get some perspective and an overall sense of whether water quality in the Patuxent is improving. Yet the reality is that whether you are looking at shellfish harvests, nitrogen data, or various other indicators of river health, the river generally reflects the synthesis of all of the many inputs that go into it. The myth that you can keep adding new construction permits and fresh burdens to any river infinitely, and yet somehow get the math to work such that you can reduce the amount of pollution flowing into it, is of course a fantasy.

Wastewater may well prove to be the defining activist problem on the Patuxent River. It was in fact wastewater treatment plants and the State of Maryland’s lack of regulation of them that sparked the Bernie Fowler Patuxent movement that eventually netted a slate of cleanups and reforms in State law, launched the Save the Chesapeake Bay movement, and garnered for the Patuxent the only legislatively created River Commission in the State of Maryland. In fact it was wastewater sludge that first pulled me into citizen activism when back in the 1980s the City of Bowie bought the farm next to mine and launched a plan to apply municipal sludge to



Discharge pipe at Wootons Landing Wetland Park on the Patuxent River.

the farm field for 20 years. The neighbors fought the project, and in the end Bowie abandoned it. But the activism landed me on the cover of a national magazine called *Progressive Farmer*. It made my own activism official.

## Patuxent Wastewater Basics

So here is some basic wastewater lore you should know. There are 36 wastewater treatment plants discharging into the Patuxent River. When I say “discharging,” I mean these are plants that collect the

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Jug Bay Wetlands Sanctuary is operated by the Anne Arundel County Department of Recreation and Parks. It was established in 1985 with the goals of wetlands research, environmental education, and protection. The Sanctuary is a limited-use park. Groups are requested to make a reservation by calling the office before planning a visit.

Jug Bay Wetlands Sanctuary is a component of the Maryland Chesapeake Bay National Estuarine Research Reserve, which along with 27 other Reserves around the country promotes scientific research, public education, resource management and stewardship in estuaries across the nation.

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Howard County's Little Patuxent Water Reclamation Plant.

waste products from homes, businesses, sewers, and various other sources, then pass them through a treatment process, removing the solids, and then chemically and biologically treating what's left so that the remaining water can be returned to a stream or river.

The State of Maryland classifies wastewater plants as either majors or minors. The majors discharge more than 1 million gallons a day into a nearby river or stream, and the minors discharge less than that. On the Patuxent there are six majors and the rest are all minors. Overall on the Patuxent, on any given day, it is rare that there is not at least some sort of mishap or violation at a wastewater plant that threatens public safety. There are chronic violators, occasional ones, and the odd plant that has a better than average record. But the key is to understand that there are millions of gallons of treated wastewater returned to this river each and every day. It is also important to consider that the Patuxent garners a D— in water quality according to the University of Maryland Center for Environmental Studies. In spite of slight gains here and there and the occasional uptick in water quality, the Patuxent continues to struggle under the weight of the proverbial death by 1,000 cuts.

Most of the minor wastewater plants

on the Patuxent are smaller plants owned by private operators who have a profit incentive to keep costs down. Municipally and publicly run plants also juggle this reality. The rhetorical sound of a “minor” plant suggests it could only be a minor problem at best, but there are two problems with that theory. One is the reality that if you are close to the discharge pipe, that minor discharge could be a major problem for you! The other problem is that there are far more minors than majors on the Patuxent, and thus the combined flow of all those weakly regulated minors presents a major problem as well.

Among the things that contribute to the decline of water quality in our rivers are of course the contribution of nitrogen and phosphorus that come into the river by way of wastewater treatment plants that strive to find a delicate balance between discharging water that is mostly and decidedly water—versus on a bad day, discharging wastewater that is mostly sewage. An important balance indeed! Moreover, there is an economic balance as far as what these facilities can afford to process and at what technical standard.

#### A Riddle With No Good Answer

When I started the job of Riverkeeper, some people laughingly explained to me that

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## Dear Friends,

Welcome to the spring 2022 issue of *Marsh Notes*.

Are you ready for spring? With only a couple of picturesque snow events this winter, I look forward to the renewal of spring. It has been reported that the staff continues clearing paths and trails of fallen trees. There are many great things to see and do at Jug Bay in the spring such as the marsh and bird hike. Programs and projects continue to be offered by the Jug Bay staff.

I would as always like to thank all the members of the Friends of Jug Bay (FOJB) for their support. Also, thanks to all the volunteers who make our wetlands a better place. Why do you continue to serve at the Sanctuary? I believe it is because as a wise friend once said “Jug Bay is special because it is more than a place. Jug Bay captures a spirit. It is the community of folks that make it special.” With that I challenge all of you to increase awareness, understanding and appreciation of our natural ecosystems and their conservation through outdoor education, research, stewardship, and volunteering, the mission of the FOJB.

The Friends of Jug Bay Board continue to serve with great distinction. We have a new challenge that needs your attention. The Friends are supporting the Sanctuary in the development of the Jug Bay Education, Research & Discovery Field Station. There are many opportunities for members and volunteers to help make this happen. The board is still shorthanded and would benefit greatly from your help. Once again, I want to acknowledge the members of our board who volunteer their time to make this all work: Al Tucker, Blythe Alexander, Anne Muecke, Darcy Herman, Elaine Friebele, and Gwen Brewer. We are in need of two officers, Treasurer and Vice President as well as an Advocacy and Outreach committee lead. In addition, you may still serve on or lead committees without joining the board. If you are interested in volunteering, please contact me at [tbjerkne@friendsofjugbay.org](mailto:tbjergkne@friendsofjugbay.org).

Remember, we are *all* the Friends of Jug Bay—any ideas, thoughts, or interest in joining the Board are welcome.

Tor Bjerknes, *FOJB President*

## We welcome new and returning FOJB members:

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Nancy Hwa

FOJB members continued on page 8



# The Colors of Jug Bay Streams and Ponds

By Patricia Delgado, *JBWS Superintendent*

Jug Bay Wetlands Sanctuary's streams and ponds constitute important habitat for many species of invertebrates, fish, and amphibians, including salamanders. As you walk along the Sanctuary trails sometimes a particular color in the stream or pond catches your eye and gives you the impression that perhaps something is not right. Well, not everything that looks odd means a bad thing. Let's find out what different colors in the stream mean for the stream and the creatures living there.

## Why does the water look so dark in that pond?

Sometimes, water accumulated in pools or slow moving areas may appear dark in color (like some of the Sanctuary's vernal pools). This is due to the decomposition of organic material including leaves and twigs. In a similar way a tea bag darkens the water in your cup while steeping, organic material releases tannins (yellowish-brown organic acid that is found in plant tissues) which can cause the water to turn a darker color. In addition, the release of manganese from sediments and rocks can also give water a dark color. These are natural processes and are not toxic to wildlife.



**Figure 1. Two Run Creek showing an orange color caused by iron-oxidizing bacteria. Photo by Patricia Delgado.**

## What is that orange color in the stream?

If you have walked by Two Run Creek of late you may have noticed an orange color in some sections of the stream. This is caused by a group of iron-oxidizing bacteria (*Sphaerotilus-Leptothrix*). This bacteria "feeds" on dissolved iron and oxidizes it (a process in which a chemical substance changes because of the addition of oxygen).

By being oxidized, iron becomes insoluble, forming iron-oxide deposits which give the water an orange color (Figure 1). This is also a common natural process and not harmful to the environment.

## Is that an oil sheen in the water?

It is not uncommon to observe patches of what looks like oil in streams, ponds, or in the water around marshes. Very often these oil-like films are made by bacteria that are getting energy or conducting other life functions by transforming minerals in the water (such as iron, manganese, copper, and sulfur) to different chemical forms. These films are formed when bacteria attach themselves to the water surface, and their oily appearance results from sunlight reflecting off them (Figure 2). To test the difference between a bacterial film and oil floating on the water, break the film with a stick. If the film stays broken, it is a natural bacterial film. If it flows back into place it is petroleum.

Bacteria can produce films, coatings and slimes of different colors depending on



**Figure 2. Mark's Pond showing beautiful coloration, a result of bacteria's natural processes. Photo by Patricia Delgado.**

the mineral present. Bacteria that transform copper may form turquoise blue films. Green and purple may appear when sulfur is present, and white slimes occur in the presence of aluminum, sulfur, or calcium. Iron bacteria (see Figure 1). produce brown or orange-brown deposits.

## Is that foam in the stream healthy or harmful?

Unfortunately, it can be both. Natural foam (Figure 3) is usually found in water with high organic content; it has an off-white color and an "earthen/fishy" odor.



**Figure 3. Foam formation observed along the marsh boardwalk. Photo by Patricia Delgado.**

It forms from the decomposition of animals and plants, which releases dissolved organic carbon, which in turn causes air bubbles, reducing the surface tension of the water and allowing the formation of foam. Natural foam provides energy within the food chain and offers shelter for fish and other aquatic life. Human-made foam is white at the start and tends to be sticky to the touch, fragrant or bad smelling, and dissipates quickly and it is often found near a point of discharge. Human-made foam is often the result of chemical runoff and industrial discharge (household cleaning products, soap, paint, or pesticides), and it can be harmful to aquatic life.

## Calling All Spotters!

# Keep Watch for the Spotted Lantern Fly



**Adult Spotted Lanternfly (*Lycorma delicatula*) seen in Lancaster County, Pennsylvania. Photo by Caitlyn Johnstone/Chesapeake Bay Program.**

By Liana Vitali, *JBWS Citizen Science & Stewardship Coordinator*

It would be hard to miss catching a glimpse of a Spotted Lanternfly (*Lycorma delicatula*) within Jug Bay Wetlands Sanctuary. This planthopper insect native to China, India, and Vietnam hides striking red hind wings with white bands and a black tip

beneath gray-brown forewings. Seeing one on the ground or in the trees would be a most unwelcome sight at the Sanctuary, but it's less about *if* we will see then and more like *when*.

These bug invaders that first arrived on the scene in Pennsylvania in 2014 and Maryland in 2018 are highly damaging to our native trees in two ways. First, both the nymphs (newly hatched form) and adults

use their piercing mouthparts to feed voraciously on the leaves and stems of plants, stunting the plants' growth and even killing them in some circumstances. Second, spotted lanternfly excrete "honeydew," a sticky, sugary substance, onto plant bark and leaves that attracts ants and other insects along with mold that blackens plant tissue, disrupting the process of photosynthesis.

If you happen to spot one along your travels at Jug Bay or other parks in Anne Arundel County, please let a park staff member know. Consider taking a picture and emailing it to [dontbug.MD@maryland.gov](mailto:dontbug.MD@maryland.gov) with the date and location it was found. If you can, try to catch the bug, place it in a bag, and freeze it. We learned that they are quite easy to catch with an empty plastic water bottle. Just position the mouth of the bottle close over the top of the bug and its planthopper instincts cause it to hop right into the bottle! Once you're done, cap the bottle and place in the freezer overnight. Empty contents into the trash before recycling the water bottle.

**Water bottle hack for capturing adult Spotted Lanternfly. Photo by Integrative Ecology.**





Jug Bay Wetlands  
Sanctuary Open Hours

**Sanctuary Proper & JBWS Visitor Center:**  
Wednesdays, Fridays, Saturdays, and (Mar-Nov)  
Sundays 9:00 am - 5:00 pm (staff, trails, programs)

**Glendening Nature Preserve:** Wrighton Road  
entrance daily, gate open 9:00 am - 5:00 pm;  
Plummer House entrance Monday to Saturday, gate  
open 9:00 am - 5:00 pm (trails, Butterfly Garden,  
dogs on leash)

**Patuxent Wetland Park:** daily, dawn to dusk (fishing,  
hand-carried boat launch)

**Wootons Landing Wetland Park:** daily, dawn to  
dusk (fishing, loop trail, hand-carried boat launch)

**JBWS Sanctuary Proper & Visitor Center park  
admission:** \$6/vehicle

- Free for current Friends of Jug Bay members, active  
volunteers, and active military and their immediate  
families.

- There are no fees to visit our other parks.

Visit [www.jugbay.org](http://www.jugbay.org) for directions, information and  
updates to our schedule.

**Registration is required for all programs.** Please  
call 410-222-8006 or e-mail [programs@jugbay.org](mailto:programs@jugbay.org) to  
register, or, in the case of ActiveNet programs, regis-  
ter online at <https://apm.activecommunities.com/aarecparks>.

All programs meet at the Wetlands Center at 1361  
Wrighton Road unless otherwise noted. An adult  
must accompany children under 13.

Visit [www.jugbay.org](http://www.jugbay.org)  
and follow links to  
public programs  
offered at JBWS.



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without wastewater there might not be much water in the Patuxent at all. Notably, among the wastewater plants on the Patuxent, none are below Prince George’s County to the south of the river. Southern Maryland has mostly found other water bodies to discharge and leak their sewage into. But the growth areas of the Patuxent are of course in the northern reaches (Prince George’s, Anne Arundel, Montgomery, and Howard) where most of the water treatment plants are, and where there seems to be virtually no end to the development and growth envisioned by the real estate investment community and the political establishment.

The riddle I cannot quite get my head around is the inherent myth of unlimited expansion, growth, and profits as the population of the watershed dances with a million people, 110 linear miles of river, 7 counties, and 36 wastewater sites with varying levels of compliance. How in the world can we reduce the onslaught of sewage impacts as long as these decisions are largely made on the basis of profits, politics, or expedience? It stands to reason that there is a natural tipping point beyond which a river that supplies finfish, shellfish, recreation, and other value has a finite carrying capacity that belies a “market-place” setting where nearly every single permitting jurisdiction along the river pretty much says “yes” to virtually every construction permit applied for that will ultimately pay fees and increase the taxable base. It just defies all reason and common sense that we could ever reduce wastewater or any other pollution without substantial change in how we manage and regulate these waters and the factors that ail them. The sewage plant upgrades have largely been counterbalanced by the increased sprawl that usually accompanies those technological advances and upgrades.

The renowned “flush tax” which charges residential homeowners on their tax bill a burden fee to help upgrade sewage plants has indeed upped the aspirations of the planning jurisdictions to develop more, build more, and to compete for various credits, grants, and other ways to inflict even more burdens on the river. Since the

Federal Clean Water Act regulatory scheme measures pollution in terms of total maximum daily loads (TMDLs) it is only logical to expect that every applicant seeks to maximize their permits and their loads—let’s say that again in case the reader missed the irony—the regulatory standards help applicants *maximize the amount of pollution they are allowed to put into the river*, and of course the leaks, spills, and accidents are a bonus on top of that quantum.

How Citizens Play a Vital Role

These realities have forced citizens to be more vigilant than ever on the Patuxent because the government(s) are slow moving to find solutions and also quite complicit in the shell game of moving nutrients around, trading them, mitigating them, and issuing fresh permits and renewals that drag the river’s water closer to perdition. The system is less effective at protecting the receiving waters because it is primarily caught up in protecting the competing interests that link protecting jobs, careers, political futures, profits, and local economies.

Currently there are at least four wastewater plants in the Lothian vicinity that are going through operational problems that include accidental discharges, industrial accidents, missed reporting, and other issues, including what appears on video documentation (again submitted by vigilant citizens) to be raw sewage outbreaks from at least two of those sites. It has mostly been citizen reports that have brought these problems to light. The actual operators have generally not been submitting their required reports, resulting in significant fines and penalties at least in principle. In practice the Environmental Protection Agency after many months still cannot figure out who is liable! State and Federal regulators have tried to get to the bottom of the problem for over two years without much progress toward a solution. Along the way the whistleblower who brought public attention to the case is now being prosecuted by Anne Arundel County for “trespassing” in order to take water samples at one of the violating facilities in Lothian that had declined to submit its own required reports. In effect, the authorities have to date made more progress toward prosecuting a public-spirited advocate

who reported the sewage problems than they have holding the actual sewage violators accountable.

The truth is that sewage on the Patuxent is here to stay—and whatever the fate of this river in the future, we have to address the fact that wastewater management is a component attached to all its other problems—like stormwater, sediment and erosion control, forever chemicals like PFAS/PFOS and so forth—and that these rivers and the facilities on them need maintenance and protection and all sorts of advocacy that really cannot be contained by simply passing a law or levying a fine. It clearly requires at least some loving care, diligence, and support from the people in the communities around the river in order to make sure that attention is paid to the water quality issues that matter, the ones that literally set the stage for health and well-being of the various communities that rely on the Patuxent for their water supply and needs. The counties each appear to be using a different playbook with respect to how and when they notify the public of sewage spills. Activism from both the Patuxent River Commission and Patuxent Riverkeeper a few years ago included a working group to try to standardize county responses to spills with only moderate results. In the end you may or may not know precisely how much “doody” is in the water at any given time. It is a hot mess.

This past year Patuxent Riverkeeper received and investigated citizen complaints near the Patuxent headwaters of massive algae blooms for the first time historically in the freshwater sections of the river, this according to longtime observers in the north. It suggests contaminate runoff from nutrient sources in the chronic and increasingly dense growth area of the Patuxent near Patuxent River State Park. If ever there was a sign of a river in deep trouble—the Patuxent is presently up against the ropes, a relatively small river system crying out for relief in ways that only a river can: namely through diminishing fisheries, larger dead zones, contaminated beaches, and more of nature’s compelling signs that we need to change our paradigms about this river and how many cuts she can take. With Maglev high-speed rail projects, increasingly larger real estate



Maryland City Wastewater Treatment Plant, owned by Anne Arundel County.

*The myth that you can keep  
adding new construction permits  
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infinitely, and yet somehow get  
the math to work such that you  
can reduce the amount of  
pollution flowing into it,  
is of course a fantasy.*

ventures, enormous water allocations to power generators, and other industrial uses, generally the sky’s the limit for hardening and urbanizing this watershed on a steady course.

You should be concerned that the current State administration has thrown five of the most active and longest-serving citizens off the Patuxent River Commission and replaced them essentially with political loyalists for the next four years. Citizens are among the most important and independent voices on a Commission weighted

down with bureaucrats who generally have to toe the line of their employer’s position on most issues. It is a stunning blow to a Commission that has been the primary State forum for Patuxent water quality issues for almost 40 years. So now we need to be more vigilant than ever to report, lobby, and prosecute water quality issues, now that the State’s watchdog agency to address Patuxent water protection has announced its intention to literally stop looking at land use or controversy in the watershed as a part of its deliberations and fact finding. This nullifies the intent and the purpose of the Commission by narrowing which river problems it is even allowed to discuss!

The challenges facing this river are daunting. Its brightest moments and victories have largely come from citizen-inspired activism, because very few government promises of restoration and protection have ever materialized. But in the words of the recently departed (in late 2021, at age 97) Senator Fowler, “We should Never, Never, Never, Never, Never give up!”





## 2021 Year-in-Review

Here are some end-of-year totals to highlight what we have been up to this year at Jug Bay Wetlands Sanctuary.

### JBWS Visitors

82,850

The total number of visitors across all our properties: the Sanctuary Proper, Glendening Nature Preserve, Wootons Landing, Patuxent Wetland Park, and Waysons Corner Nature Preserve.



### Volunteer Hours

7,415

Between our ongoing citizen science projects, stewardship projects, education programs, and general maintenance throughout the year, our volunteers donate their time.



### Education Programs

334

All public education programs led by Staff and Volunteers, including 22 virtual school field trips, 6 summer camps, 23 paddle trips, and hikes for a total of 2,761 participants reached. Not bad for a COVID year!



### Pounds of Trash

1,760

Across all JBWS properties, Staff and Volunteers removed and properly disposed of trash that would have otherwise polluted the soil and waterways.



### Pounds of Invasives

900+

Across JBWS properties, Staff and Volunteers removed numerous invasive species that degrade the health and resiliency of native habitats.



### Natives Planted

10,000

Across all JBWS properties, Professionals, Staff and Volunteers planted native species as part of reforestation and rehabilitation projects that are ongoing. Included were 50 American Chestnut trees. These plantings will support native wildlife and help reestablish the areas as productive, healthy habitats!



### Offspring Counted

190

During our Citizen Science monitoring projects, Staff and Volunteers visited our vernal pools and counted 151 salamander larvae. They also counted 39 successfully fledged bluebirds in our nest boxes!



### Research Projects

We worked with 7 different organizations this year to begin projects that study various JBWS habitats and inhabitants:

1. Monitoring of the Southern Pine Beetle at Glendening.
2. Documentation of the bee and moth fauna of the Glendening sand barrens.
3. Creek monitoring by the Anne Arundel DPW Bureau of Watershed Restoration and Protection.
4. Tracking of Blue Catfish in the Patuxent River.
5. Distribution and variability of carbon stocks in mid-Atlantic tidal marsh soils.
6. Creek fish sampling/monitoring.
7. Reintroduction of the bee *Protandrena adominalis*.



FOJB members continued from page 3

Elle and Bryan Irby  
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Jessica and Victor Jones  
Julius and Melissa Kassovic  
Victoria and Martin Keithline  
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Brian Yermal  
Larry Yore  
Ben Youngkin  
Mike Younkens  
Tiffany Yowell

## Welcome New JBWS Education Coordinator Beth Sieglinger!

Beth is a fierce advocate for the environment and loves helping others find ways to become better stewards of our beautiful planet. She holds an M.A. in Conservation Biology from Miami University's Project Dragonfly, and she is a certified teacher with the State of Maryland in both Biology and Special Education. She is currently an Anne Arundel County Watershed Stewards Academy candidate and serves as chair for her community's Environmental Committee. Having started her

teaching journey in Anne Arundel County, she has come full circle after 17 years of exploring the world with her military husband, two boys, and two (indoor only) cats. In her free time, she enjoys photography, gardening, running, and learning all sorts of new things.



Jug Bay's new Education Coordinator, Beth Sieglinger.

Explore our volunteer opportunities online at [www.jugbay.org/volunteer](http://www.jugbay.org/volunteer).

For more information, call 410-222-8006 or e-mail Volunteer & Program Coordinator Debra Gage at [rpgage00@aacounty.org](mailto:rpgage00@aacounty.org)

Winter donations: Colin and Valerie Rees: 9' tall Christmas tree.

## Moment in Nature



Snowy mist at the Sanctuary. Photo by Beth Sieglinger.

## Snowy Factoids

By Beth Sieglinger, JBWS Education Coordinator

While gazing out my office window at the fresh blanket of snow, hoping to spot a fox or rabbit, I contemplated snow's benefits and I realized I didn't know much about the white stuff. After a brief dive into all that is snow I gathered a few of my favorite factoids and want to share them with you.

- Snowflakes form around a single particle of dust or pollen, sleet is frozen rain, and hail is sleet that collects more water as it falls.
- Water creates a 6-armed crystal when it freezes, and a snowflake's shape is dependent upon temperature and humidity.
- Snow isn't white, it's translucent. It appears white because it reflects white light. In some places, pollution and cold-loving freshwater algae influence the hues to black, orange, and blue.
- Snow is a great insulator because it is 90–95% trapped air. This is why animals burrow into the snow to hibernate.
- The Inuits have roughly 50 different words for snow while the Scots have 421!
- Yodels won't cause an avalanche!
- Snow can fall between 1 and 9 miles per hour, and it takes about an hour for a flake to reach the ground after leaving its cloud.



Jug Bay is one of the three components in the Chesapeake Bay National Estuarine Research Reserve, Maryland. The purpose of CB-NERR is to manage protected estuarine areas as natural field laboratories and to develop a coordinated program of research and education as part of a national program administered by National Oceanic and Atmospheric Administration (NOAA).

#### STAFF

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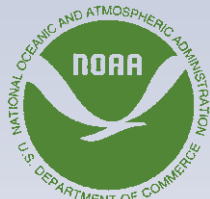
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**Website:**  
<http://dnr2.maryland.gov/waters/cbnerr>



Check out the  
CBNERR-MD web page at  
[www.http://dnr2.maryland.gov/waters/cbnerr](http://dnr2.maryland.gov/waters/cbnerr)

## News from Around the NERRs

By Jennifer Raulin, *Reserve Manager, CBNERR-MD*

*Exciting times to be part of the National Estuarine Research Reserve (NERR) System! We are growing, both as a system and with additional resources to achieve our collective vision of “resilient estuaries and coastal watersheds where human and natural communities thrive.”*

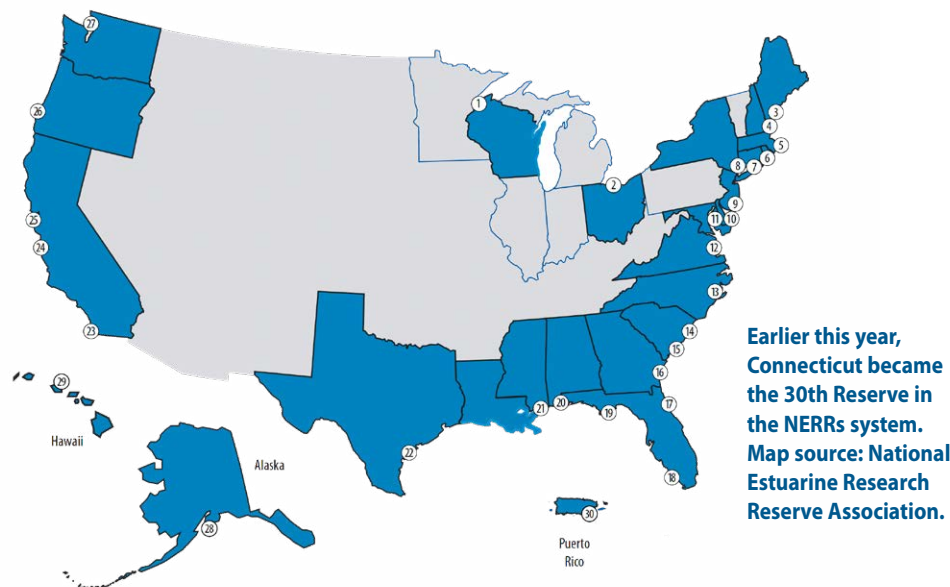
### Welcome to the family, Connecticut!

On January 14, 2022, the National Oceanic and Atmospheric Administration and the State of Connecticut proudly announced the designation of the Connecticut National Estuarine Research Reserve, making it the 30th Reserve in the system. The University of Connecticut will serve as the lead state partner for the

Reserve, which encompasses over 52,000 acres located in the southeastern part of the state. Connecticut, along with the He'eia Reserve in Hawaii (designated 2017), and two additional Reserves in the designation process are part of the Research Reserve's growth strategy to include estuarine habitats that are not currently represented in the system.



### NATIONAL ESTUARINE RESEARCH RESERVES



#### Great Lakes

1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

#### Northeast

3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island
7. Connecticut

#### Mid-Atlantic

8. Hudson River, New York
9. Jacques Cousteau, New Jersey
10. Delaware

11. Chesapeake Bay, Maryland
12. Chesapeake Bay, Virginia

#### Southeast

13. North Carolina
14. North Inlet-Winyah Bay, South Carolina
15. ACE Basin, South Carolina
16. Sapelo Island, Georgia
17. Guana Tolomato Matanzas, Florida

#### Gulf of Mexico

18. Rookery Bay, Florida
19. Apalachicola, Florida
20. Weeks Bay, Alabama
21. Grand Bay, Mississippi
22. Mission-Aransas, Texas

#### West

23. Tijuana River, California
24. Elkhorn Slough, California
25. San Francisco Bay, California
26. South Slough, Oregon
27. Padilla Bay, Washington
28. Kachemak Bay, Alaska

#### Pacific

29. He'eia, Hawaii

#### Caribbean

30. Jobos Bay, Puerto Rico

#### PROPOSED

- Bay of Green Bay, Wisconsin

## Infrastructure Investment and Jobs Act

When you think of infrastructure, what comes to mind? Buildings, roads, utilities? What about stream restoration or land conservation? The Infrastructure Investment and Jobs Act (IIJA) that was passed in late 2021 includes the incorporation of “green” infrastructure along with the traditional “gray” infrastructure that might first come to mind. And green is good for the NERRs and our coastal communities! Over the next 5 years, \$77 million will be competitively available for habitat restoration; habitat restoration planning, engineering, and design; and ecosystem conservation (acquisition). The first round of proposals are due in spring 2022 and CBNERR-MD staff have already been working with Sanctuary staff to explore opportunities to protect and restore habitat in and around Jug Bay. In addition to competitive funding for projects, the IIJA also includes funding to



Projects such as shoreline restoration (above), stream restoration, and land acquisition are examples of eligible green infrastructure projects under the Infrastructure Investment and Jobs Act. Photo by M. Paolisso.

support capacity needs at Reserves. These funds will hopefully put some additional “boots” on the ground to assist with the

identification, planning, and implementation of these projects. Stay tuned for more updates!

## 2021 Jug Bay Post Turkey 5K Trail Run...And our Winners Are...?



Participants in the 2021 Jug Bay Post Turkey 5K Trail Run, which took place at our Glendening Nature Preserve.

By Patricia Delgado, *JBWS Superintendent*

This past November, it was a pleasure to again host the Annual Jug Bay Post Turkey 5K Trail Run. We had 34 runners who braved the cold weather and joined us for the event—we even had a “dogo” in the group! We would like to thank everyone for their participation and congratulate our winners. Thanks to everyone's registration fees we were able to achieve a fundraising goal and buy an additional kayak for our fleet, which we use for our outdoor paddle exploration programs. Please come back and bring your friends to our 2022 Post Turkey Run; we will surprise you with a different running route!

Congratulations to the 2021 winners of the Jug Bay Post Turkey 5K Trail Run!

Results	Female Category	Male Category
First Place	Katharine Egan (Annapolis)	Noah Wood (Dares Beach)
Second Place	Anne-Liese Ethertan (Upper Marlboro)	Ryan Butler (Oakland, CA)
Third Place	Samantha Scheff (New Carrollton)	Philippe Hensel (Silver Spring)



# SPRING 2022



ANNE ARUNDEL COUNTY  
DEPARTMENT OF RECREATION AND PARKS

**Jug Bay Wetlands Sanctuary**  
1361 Wrighton Road  
Lothian, MD 20711  
410-222-8006



Put your **paddling skills to the test this summer** by joining Jug Bay Wetlands Sanctuary and Patuxent River Park for a 4.2-mile or 8-mile paddle down the Patuxent River, Maryland's longest river. The shorter paddle will begin and end at Emory Waters Nature Preserve (EWNP). The longer paddle will begin at Queen Anne Canoe launch and end at EWNP.

## PATUXENT PADDLE-A-THON

SAVE  
THE  
DATE

RAIN DATE: SAT. JUNE 11TH

**SATURDAY  
JUNE 4TH**

Challenge yourself  
with a single day,  
multi-mile paddle  
on Maryland's  
River with  
proceeds  
supporting the  
Friends of Jug Bay!

