HARBOR HEARTBEAT

October 2022

2022

Plus: An Insider's Guide To Visiting Baltimore's Mr. Trash Wheel Family!

Pictured Above - Volunteers set sail to plant oysters as part of the Great Baltimore Oyster Partnership

WATERFRONT PARTNERSHIP OF BALTIMORE

HEALTHY HARBOR

Photo Credit: B'More SUP

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About this Report

In 2010, the Waterfront Partnership of Baltimore launched the Healthy Harbor Initiative with the goal of making the Baltimore Harbor safe for swimming and fishing. Each year, the Harbor Heartbeat report tracks progress toward this goal by taking the pulse of the City's streams and Harbor.

The water quality data used within this report was gathered by Blue Water Baltimore in 2021 and analyzed by the Waterfront Partnership of Baltimore's Healthy Harbor Initiative.

Is the Harbor Swimmable?

We are thrilled to report that the water is much safer for recreation now than it was ten years ago. We have reached the point where, with regular monitoring, we can manage the Harbor as a recreational natural resource. As with any large body of open water, there are factors to consider before swimming in the Harbor:

1. The Baltimore Harbor has many uses including industrial ports and recreational marinas. Swimming should take place at a designated area that protects swimmers from boat traffic.

2. Like many urban waterways, the sediment at the bottom of the Harbor contains legacy pollutants that should not be stirred up. That means swimming should take place in an area where swimmers are kept away from the bottom, either by a barrier or in water deep enough to prevent swimmers from stirring up sediment.

3. Just like every public beach in Maryland, swimmers should avoid contact with the water for at least 48 hours after a heavy rainfall. This is because rain carries pollutants off the land and into the water where they take time to dissipate.

When and how to recreate in Baltimore waterways is a personal choice.

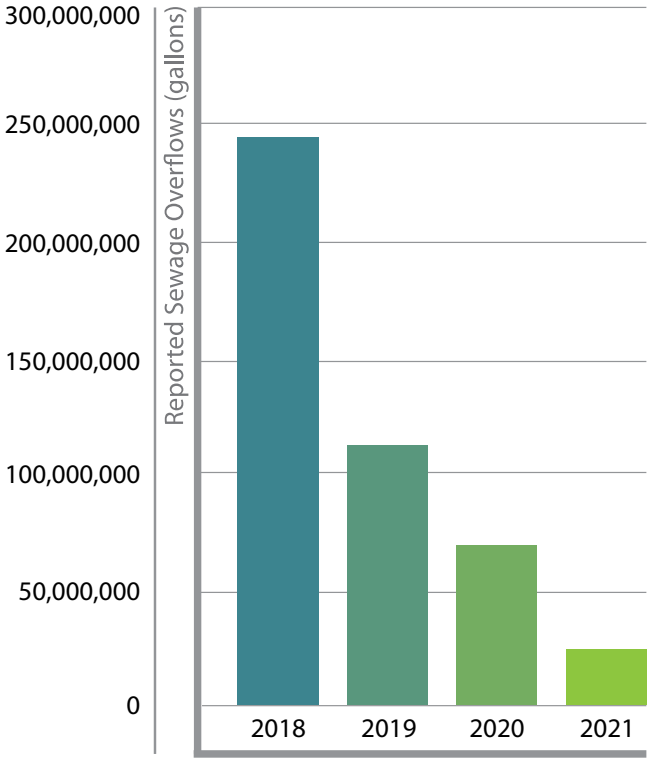
MAJOR EVENTS OF 2021

In December 2020, Baltimore completed a major sewer system upgrade known as the **Headworks Project.** The project's goal was to repair a large, misaligned sewer pipe carrying the City's waste to the Back River Wastewater Treatment Plant. The misalignment created a "bottle neck," which reduced the capacity of the City's sewer system, causing millions of gallons of sewage to overflow into Baltimore's streams and Harbor every year. Since completion, Baltimore waterways have seen an immediate reduction in sewer overflows.

In 2021,the Baltimore City Department of Public Works reported a 64% reduction in sewer overflows by volume.

While the "bottle neck" has been corrected, the full potential of the Headworks Project remains unrealized until settled materials can be removed from the sewer line. As much as 9,000 tons of material is estimated to have collected at the bottom of the 8-mile pipe, reducing its capacity to transport the City's sewage. Without that additional capacity, large rain events will continue to infiltrate the sewer system causing sewer overflows and basement backups.

Clean-out of the pipe is ongoing and is estimated to be completed by the end of 2023. To date, 700 tons of sediment have been removed and Baltimore City DPW reports that sewer overflows have dropped by an additional 90% during the first half of 2022.



Failing treatment plant hampers harbor progress

In spring 2021, water monitoring conducted by Blue Water Baltimore detected elevated bacteria levels coming from the Patapsco Wastewater Treatment Plant outfall located in the tidal Patapsco River near South Baltimore. The group notified the Maryland Department of the Environment, which promptly sent inspectors to the facility. The inspection uncovered major systemic problems at the plant resulting in partially treated sewage being discharged into the river. Additional inspections found similar problems at the Back River Wastewater Treatment Plant.

The pollution released by the Patapsco Treatment Plant increased bacteria levels and likely contributed to the worst phosphorus and chlorophyll levels ever recorded by Blue Water Baltimore at nearby monitoring stations. Additionally, Harbor water near the treatment planted tested safe for human-contact only 40% of the time, down from 100% in the prior year. The Maryland Department of the Environment and Maryland Environmental Services have stepped in to help bring the plant back into compliance and repairs are ongoing.

Chart Source: Maryland Department of the Environment

FISH BITES

Environmental Updates from the Waterfront

Turtle Island

In April 2022, Waterfront Partnership teamed up with the National Aquarium, Living Classrooms Foundation, and Clearwater Mills to install the Harbor's first Turtle Island. Turtles are cold-blooded and need to warm up to digest their food. Turtle Island provides places for turtles to bask, sleep, and forage. Dozens of turtles can be seen enjoying the island at a time – especially in the early spring when the Harbor is still very cold. You can find Turtle Island in the Lancaster Canal near the intersection of S. Caroline and Lancaster Streets.

Great Baltimore Oyster Partnership

Volunteer oyster gardeners in Baltimore City added over 100,000 spat (baby oysters) to the Chesapeake Bay in May 2022. The spat were first grown for nine months in the Inner Harbor inside cages that protect them from predators. When mature, the oysters were transplanted from their Harbor home to a sanctuary reef where they will provide habitat and filter water for the rest of their lives. The oysters are for restoration purposes only and not for consumption. The oyster gardens are taken care of by volunteers in partnership with the Waterfront Partnership and Chesapeake Bay Foundation.

Baltimore Blueway

In October 2021, Waterfront Partnership announced its plans to develop the Baltimore Blueway, a network of water trails connecting the Inner Harbor and Middle Branch of the Baltimore Harbor for recreational paddlers. After extensive public surveying and the creation of a planning advisory team, a master plan for the Baltimore Blueway is currently being developed for release in 2023. The plan will propose improvements to existing public access points as well as the creation of new public access points.

Baltimore Floatilla

After a three-year hiatus, the Baltimore Floatilla returned on Saturday, June 4th. Over 250 paddlers participated in this year's pirate-themed event, which launched from Canton Waterfront Park. Paddlers followed a treasure map to collect wooden doubloons and discover the hidden gems of the Inner Harbor – historic ships, floating wetlands, and two googly-eyed trash wheels. The event is co-hosted by Waterfront Partnership, Ultimate Watersports, and Baltimore City Recreation and Parks. The next Floatilla is scheduled for Saturday, June 10, 2023. Mark your calendars!

Baltimore Bans Plastic Bags

After a ten-month delay due to COVID-19, Baltimore City implemented its ban on plastic bags on October 1st, 2021. The ban impacts grocery stores, retailers, and restaurants and requires that they charge customers at least 5 cents per paper bag. Since 2014, Mr. Trash Wheel has collected nearly 900,000 plastic bags from the Jones Falls stream. That's enough plastic to cover M&T Bank Stadium in a layer of plastic 55 times. While a statewide ban is still needed, it is anticipated that the Baltimore ban will greatly reduce bag litter on our streets and in our Harbor.

Bug Hotels

Waterfront Partnership is working to make Baltimore Harbor a sanctuary for local wildlife. In spring, 2022, bug hotels were installed near conservation gardens in Pierce's Park and along the promenade in Harbor East. These bug hotels create habitat for local insects by replicating the environment they seek in the wild. They feature bamboo and wood for nesting bees, pine cones for lady bugs, and bark for beetles and spiders. The bug hotels were built by Baltimore city youth enrolled in the Living Classroom Foundation's Fresh Start program.

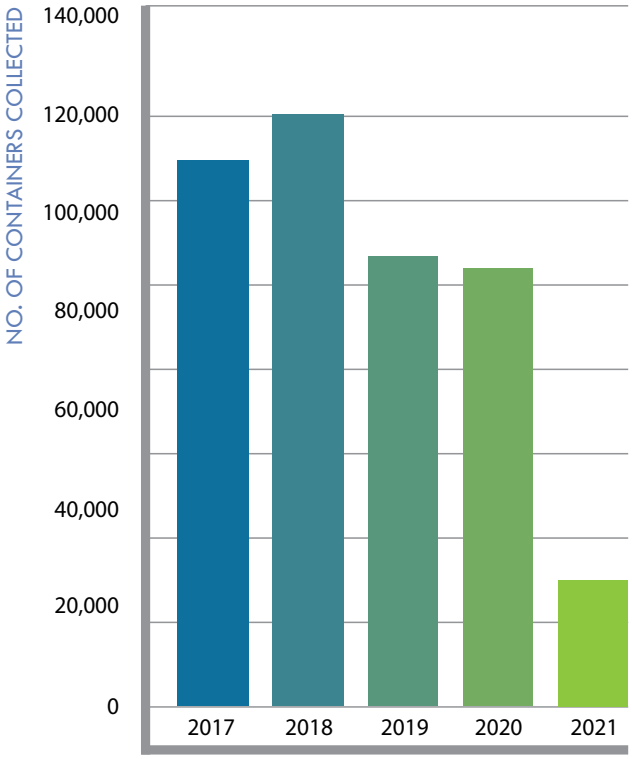
Photo by Saki

MR.TRASH WHEEL UPDATES

Maryland Foam Container Ban Has Huge Impact On Harbor Health

Prior to the implementation of a statewide ban on foam containers in October 2020, Mr. Trash Wheel routinely collected over 100,000 foam containers per year. Since the ban went into effect, Mr. Trash Wheel has seen an 80% reduction in the number of foam containers being pulled from the Jones Falls. This demonstrates the immediate and profound impact that using legislation to reduce our reliance on single-use plastics can have on the health of our waterways and the animals that call them home.

The chart to the right shows the impact of the City and State bans. The initial drop in foam containers in 2019 represents the impact of Baltimore City's foam ban. The 2021 drop represents the impact of the statewide ban. This is likely because the Jones Falls watershed extends into Baltimore County, which was not impacted by the initial Baltimore City ban.



Source: MrTrashWheel.com

Trash Wheels Adopted by Pompeian

Both Mr. Trash Wheel and Professor Trash Wheel are now sporting olive-green eyes as well as giant spinning olives on their water wheels. Why you ask? It's because both have been adopted by Pompeian, a Baltimore-based company since 1906 and America's largest national brand of olive oil.

Pompeian initially adopted the trash wheels in 2021, but extended their adoption for another year in 2022. The adoption helps to fund the removal of 250 tons of waste from the Baltimore Harbor each year.

"Pompeian has been integrated into the history of this city for over 115 years, so we love any opportunity to give back to the neighborhoods and people that have gotten us to where we are today," said Mouna Aissaoui, executive vice president and chief operating officer of Pompeian, Inc. "The harbor in particular is a lifeline for our business and critical to our daily transportation of high-quality olive oil."

Community Beautification Grants

In addition to adopting two trash wheels, Pompeian also sponsors $30,000 in community beautification grants distributed by the Waterfront Partnership.

In its first year of the program, Waterfront Partnership helped communities complete eleven projects. In the Milton Montford neighborhood, a gravel park was transformed into a more welcoming public space with the addition of native plants to attract birds and butterflies. In Middle East, funds brought neighbors together for dialogue around trash and to plant pots with native perennials. In McElderry Park, grant funds supported five monthly clean up events featuring live music to bring neighbors together around the theme of bettering their community.

The program goes beyond financial awards and engages awardees with workshops and boat trips on the Harbor where they learn about the Chesapeake Bay and the impacts of urban stormwater runoff.

TRASH WHEEL COLLECTION TOTALS (MAY 2014 THRU MAY 2022)

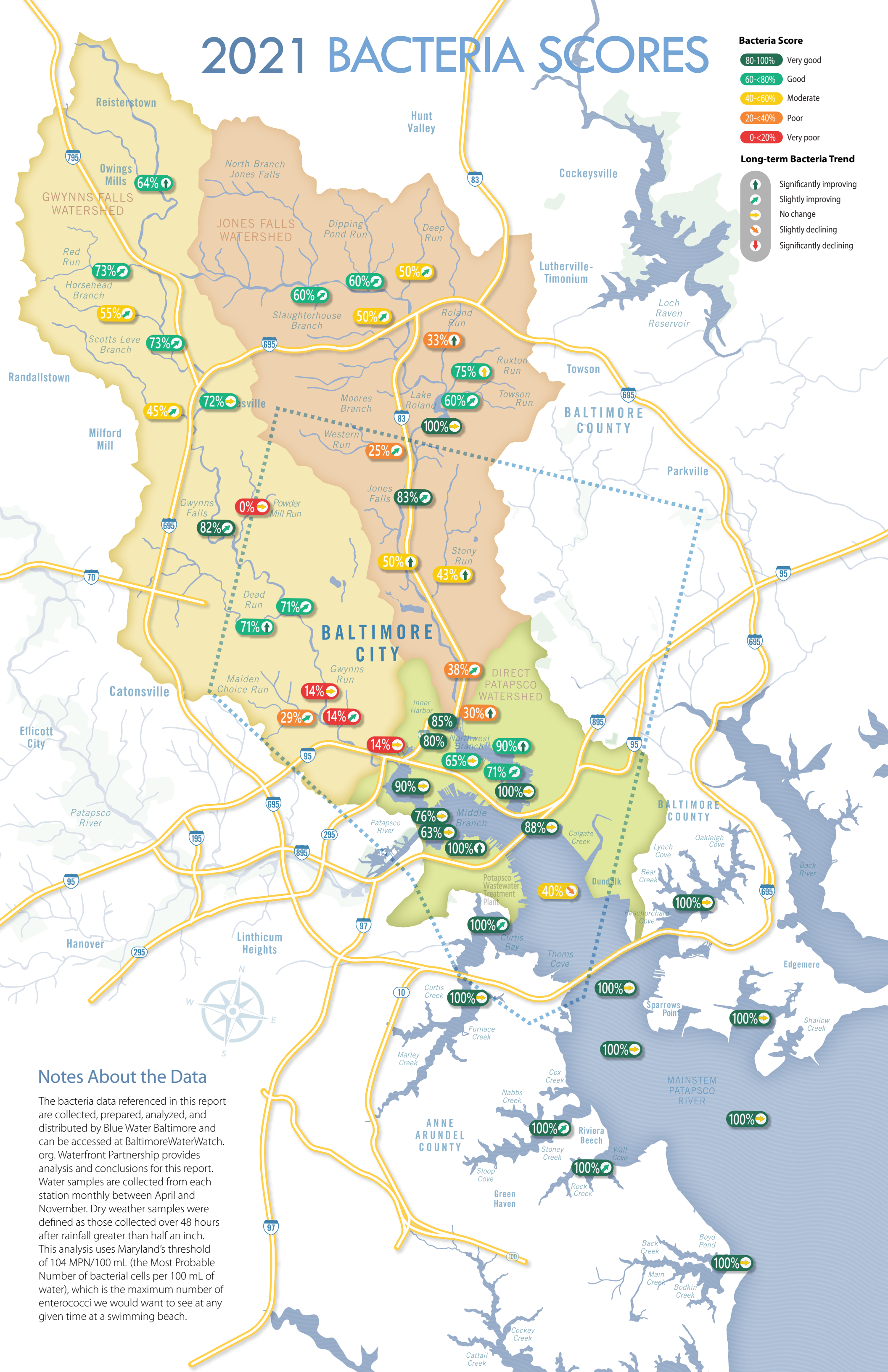
2,119 TONS COLLECTED

719 DUMPSTERS REMOVED

PLASTIC BOTTLES: 1,653,476
FOAM CONTAINERS: 1,367,897
CIGARETTE BUTTS: 12,797,698
PLASTIC BAGS: 899,423

The trash collage below is made from debris selected from Mr. Trash Wheel's dumpster. The art piece was constructed at the annual Trash Wheel Dumpster Dive hosted by Volunteering Untapped and the Baltimore Community Toolbank.

2021 BACTERIA SCORES

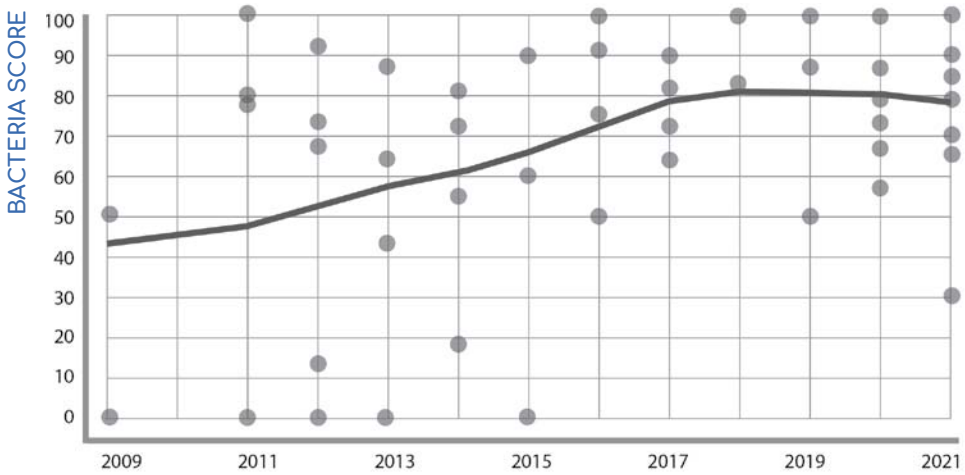


Notes About the Data

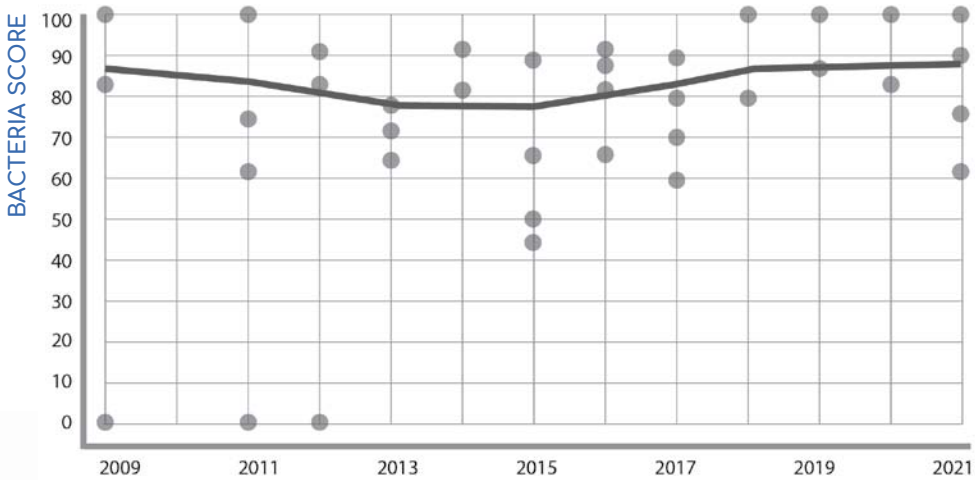
The bacteria data referenced in this report are collected, prepared, analyzed, and distributed by Blue Water Baltimore and can be accessed at BaltimoreWaterWatch.org. Waterfront Partnership provides analysis and conclusions for this report. Water samples are collected from each station monthly between April and November. Dry weather samples were defined as those collected over 48 hours after rainfall greater than half an inch. This analysis uses Maryland's threshold of 104 MPN/100 mL (the Most Probable Number of bacterial cells per 100 mL of water), which is the maximum number of enterococci we would want to see at any given time at a swimming beach.

2021 BACTERIA SCORES

Inner Harbor Bacteria Trends (2009-2021)



Middle Branch Bacteria Trends (2009-2021)



80% Of Sampling Sites Show Improvement or Consistently High Scores

While bacteria scores vary greatly by location, we are excited to see that the long-term positive trends first identified in 2020 continue at many sampling sites throughout the Harbor and streams. Of the 50 sites analyzed, 80% are either improving (meaning less harmful bacteria was found) or consistently scoring very high.

There are three sites (all in the Gwynns Falls watershed) that consistently score very low and show no signs of improvement. In 2021, only one sampling site was found to have a long-term declining trend. That sampling site is located near the outfall of the Patapsco Wastewater Treatment Plant and the decline is related to ongoing maintenance and operational issues identified at the plant. Baltimore City, which owns and operates the plant, is aware of these issues and working alongside the Maryland Department of the Environment to ensure they are corrected as quickly as possible.

Long-Term Trends are Up, Short-Term Trends are Down

Many sampling sites in the Jones Falls and Gwynns Falls streams received lower bacteria scores in 2021, while still showing improving long-term trends (see map, page 8). However, the year-over-year trends for both streams are down (see charts, page 11). While long-term bacteria scores in streams are still showing improvement, 2021 was a down year. This is despite

Baltimore City DPW reporting a 64% reduction in sewer overflow volume. These inconsistent findings sometimes happen in sampling programs. Additional years of data will show if these declines are part of a new trend. Ideally, as sewer repairs continue and the issues at the Patapsco Wastewater Treatment Plan are resolved, bacteria scores will continue to improve.

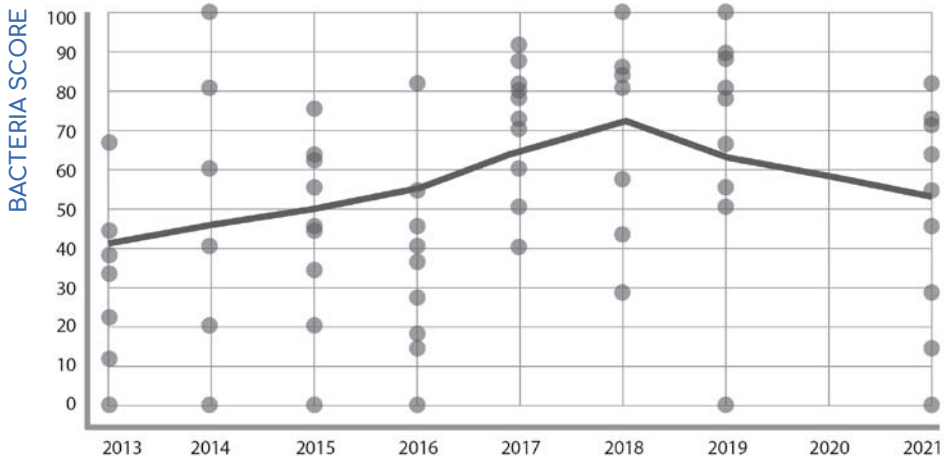
What Do the Scores Tell Us?

These bacteria scores tell us how often dry-weather water samples met Maryland's safety standard for direct, full-body contact. In other words, the scores indicate the frequency of compliance. For example, a score of 90% means 90% of samples that year fell within the state's safety threshold. That threshold is measured by the amount of fecal indicator bacteria enterococcus. Only samples collected at least 48 hours after heavy rain were included to control for varying amounts of rain between years and because recreation is discouraged during and after rain.

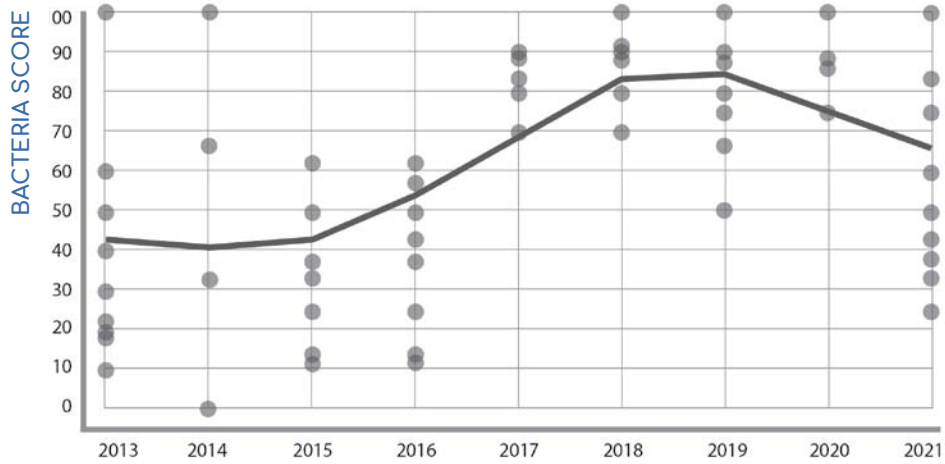
If the Score is 100% is it Safe to Swim?

As with other everyday activities, swimming in an open body of water requires a personal assessment of risk and benefits. Bacteria standards can greatly reduce but never eliminate risk. A score of 100% means there is a low risk of becoming sick from swimming, though this can vary. Individuals with compromised or suppressed immune systems are at higher risk of stomach or respiratory illness, and those with open wounds are at much greater risk of skin infection.

Gwynns Falls Watershed Bacteria Trends (2013-2021)



Jones Falls Watershed Bacteria Trends (2013-2021)



Each dot equals the annual dry-weather bacteria score at one sampling site

Short-term Bacteria Trend

Bacteria levels can change rapidly day to day

When it rains, bacteria levels can change rapidly by time and distance. Fecal bacteria levels may increase dramatically within just a few hours due to sewer overflows and stormwater runoff. Yet, once that input is reduced, fecal bacteria levels can drop just as dramatically in a few days.

Once bacteria are in open water, they can be dispersed by currents, settle into sediment, or be killed by environmental factors such as UV rays, temperature, or salinity. This explains why the Jones Falls outlet (a major source of Inner Harbor pollution) can have a very poor score in the same year that the water by Fort McHenry can have a very good score. You should always avoid contact with water near a known pollution source, as well as any open water during and shortly after rainfall.

An Insider's Guide To Visiting

BALTIMORE'S TRASH WHEELS

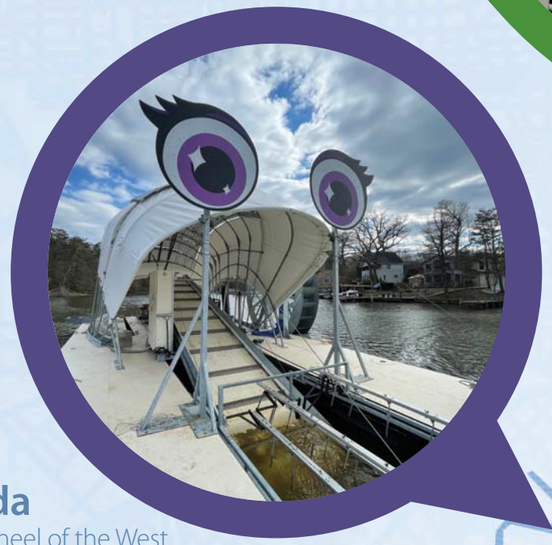
Can you visit all four of Baltimore's Trash Wheels in a single day? You bet you can and, with this special Insider's Guide, it won't even be that hard! Take a selfie with all four and share them by tagging @MrTrashWheel on social media.

Mr. Trash Wheel

Installed: May 9, 2014
Location: Jones Falls stream, Inner Harbor
Nearest Street Address: 700 Aliceanna Street, Baltimore, MD
GPS Coordinates: 39°16'60"N, 76°36'12"W

Best Approach: Mr. Trash Wheel spends his life between the Pier Six Concert Pavilion and the Baltimore Marriott Waterfront Hotel. That means he gets to see a ton of amazing shows and receive visitors from around the world. The best way to get to Mr. Trash Wheel is on foot by following the Inner Harbor promenade. If driving, there is ample metered street parking in Harbor East as well as a number of nearby parking lots and garages.

Best Things To Do: Grab a bite to eat at a nearby restaurant in Harbor East while enjoying the view or take in a show at Pier Six to get that rare port-side selfie with Mr. Trash Wheel.



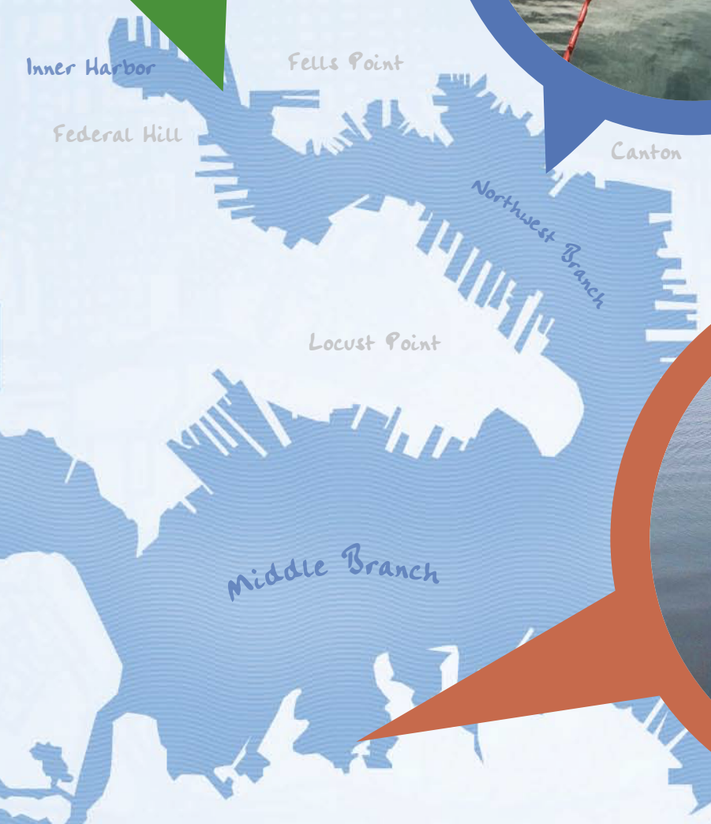
Gwynnda

The Good Wheel of the West

Installed: June 3, 2021
Location: Gwynns Falls stream, West Baltimore
Nearest Street Address: 1801 Annapolis Road, Baltimore, MD
GPS Coordinates: 39°16'10.3"N, 76°37'51.4"W

Best Approach: Gwynnda is located in the least hospitable location. She lives beneath an I-95 interchange, next to the City's waste-to-energy plant. But those intrepid explorers who venture forth will be rewarded with the rarest of trash wheel selfies. Parking can be a challenge, but this section of Annapolis Road is actually part of the Gwynns Falls Trail, which means you could ride your bike. There is ample sidewalk, but be mindful of the garbage trucks that use this road heavily. If this is the last trash wheel you visit, you'll end your journey with the pungent smell of Baltimore City waste. How appropriate!

Best Things To Do: Leave promptly and seek out nearby Middle Branch or Carroll Park. Middle Branch Park offers amazing waterfront views and is home to the Baltimore Rowing Club and the City's kayak fleet. Carroll Park features amenities for all sorts of outdoor recreation as well as the Mount Clare House, a National Historic Landmark and museum offering tours to the public.



Professor Trash Wheel

Installed: December 4, 2016
Location: Harris Creek, Boston Street Pier Park, Canton
Nearest Street Address: 2515 Boston Street, Baltimore, MD
GPS Coordinates: 39°16'46.25"N, 76°34'49.6"W

Best Approach: Professor Trash Wheel gobbles garbage coming down Harris Creek, a historic stream that is now completely piped beneath the streets of East Baltimore. She's smaller than Mr. Trash Wheel because Harris Creek doesn't produce the same size and quantity of debris as the Jones Falls. The best way to get to Professor Trash Wheel is to follow the Inner Harbor promenade until you find Boston Street Pier Park. There is also parking nearby.

Best Things To Do: Walk out on the pier for a phenomenal selfie with the Professor and then check out the local wildlife that call this small stretch of shoreline home. In the park, you will also find a large rain garden that helps clean stormwater from Boston Street before it enters the Harbor.

photo by: Living Classrooms Foundation

Captain Trash Wheel

Installed: June 5, 2018
Location: Masonville Cove Environmental Education Center
Nearest Street Address: 1000 Frankfurst Avenue, Baltimore, MD
GPS Coordinates: 39°14'39.8"N, 76°35'42.6"W

Best Approach: The Masonville Cove Environmental Education Center is a hidden gem of Baltimore City. Located in South Baltimore, it's the nation's first Urban Wildlife Refuge. Admission and onsite parking are free and once there you'll find hiking trails, a nature center, and of course Captain Trash Wheel. Check the Center's hours before you go. When you arrive, sign in, and then follow the ramp from the nature center down to the small stream running through the site. Follow the path on either side of the stream until you find the Captain.

Best Things To Do:
Check the event calendar at www.MasonvilleCove.org to combine your visit with other fun activities like a guided nature walk, family fishing, or a shoreline cleanup.

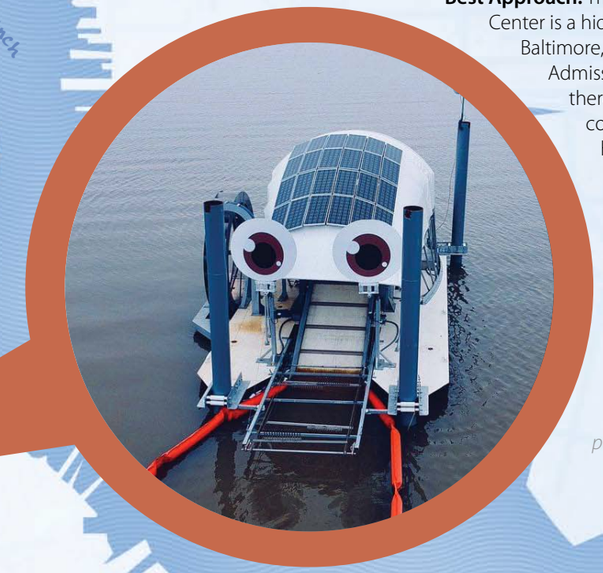


photo by: Maryland Port Administration

MrTrashWheel MrTrashWheel MrTrashWheel MrTrashWheel

BALTIMORE

ECOSYSTEM HEALTH

What do the water quality indicators mean?

Temperature

Temperature is an important measure for stream health, as many aquatic animals can only tolerate a certain temperature range. Rapid and extreme fluctuations caused by runoff, sewer overflows, or lack of shading plants can be harmful. Warmer air temperatures also cause stream temperatures to rise, lowering the amount of dissolved oxygen the water can hold.

Dissolved Oxygen

Dissolved oxygen is important for all aquatic animals. Just like animals that live on land, fish, shellfish, and even zooplankton need sufficient oxygen in order to survive.

Chlorophyll α

Chlorophyll tells us if there is too much algae in the water due to excess nutrient pollution. Algal blooms may be toxic to fish and humans and may block sunlight to underwater plants. Dead zones can also be created when the algae die and are eaten by microbes that use up most of the oxygen in the water, leaving little or none for aquatic animals.

Turbidity and Water Clarity

Turbidity and water clarity are different measurements to gauge clear water, which is necessary for underwater plants to receive enough light to grow and provide food and habitat for animals. Clear water is also important for animals that rely on sight to forage or hunt for prey. Too much sediment from poor construction practices, stormwater runoff, and erosion can cause poor water clarity.

pH

pH can tell us if the water is too acidic or too basic to be suitable habitat for most organisms. Abnormal pH levels are often a sign of pollution. Increasing carbon dioxide in the air also causes increasing acidity.

Conductivity

Conductivity tells us if there are too many salts and chemicals in the streams that could harm fish and other organisms. Freshwater plants and animals cannot survive in an environment that is too salty. Over-application of road salts, polluted stormwater runoff, and sewage overflows all contribute to dangerously high conductivity levels.

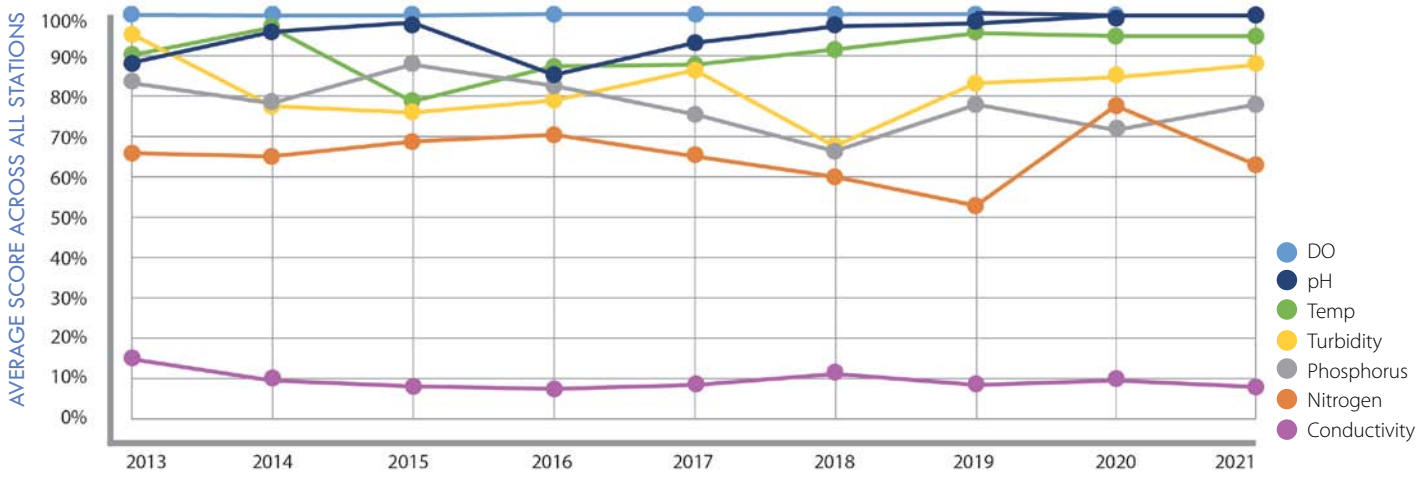
Nitrogen and Phosphorus

Nitrogen and phosphorus are nutrients that all living things need to grow. However, when excess nutrients from human activity end up in the water, they cause algae to grow too rapidly, creating harmful algal blooms. Common sources of nutrient pollution are fertilizer, sewage, stormwater runoff, and air pollution from the burning of fossil fuels.

The ecosystem health data referenced in this report are collected, prepared, analyzed, and distributed by Blue Water Baltimore and can be accessed at BaltimoreWaterWatch.org. Waterfront Partnership provides analysis and conclusions for this report.

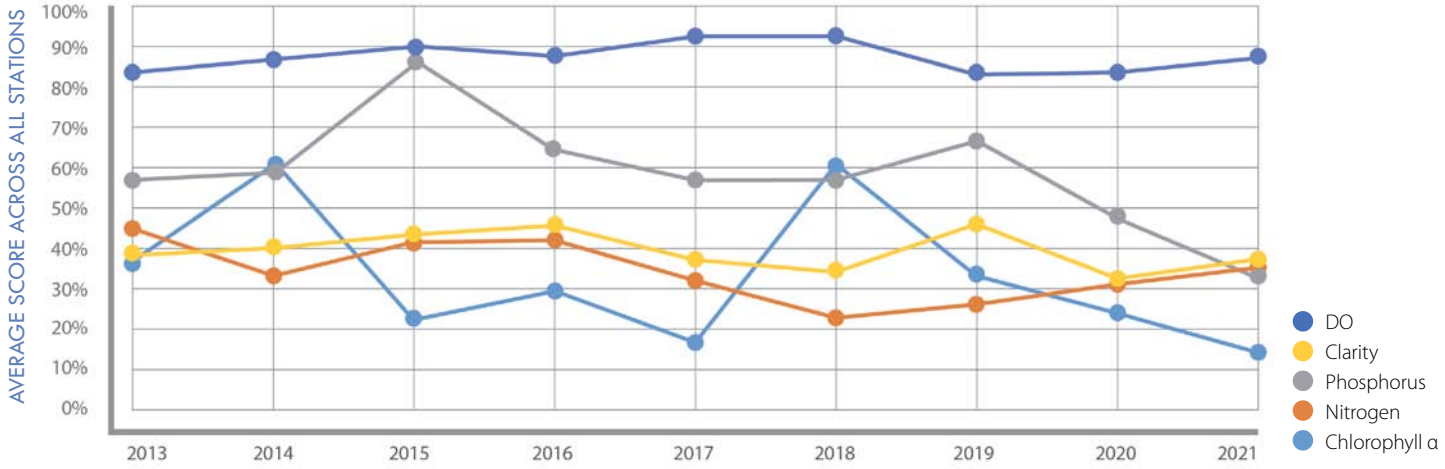
Jones Falls & Gwynns Falls Streams

ECOSYSTEM HEALTH SCORES (2013-2021)



Baltimore Harbor & Tidal Patapsco River

ECOSYSTEM HEALTH SCORES (2013-2021)



Major Ecosystem Health Findings in 2021

In 2021, phosphorus and chlorophyll in the Harbor received their lowest scores since monitoring began. This is due to maintenance and operational issues at the Patapsco Wastewater Treatment Plant. The plant was found to be releasing partially treated sewage, which contained high levels of phosphorus. Algae fed on the phosphorus, causing an increase in harmful algal blooms, which caused a corresponding increase in chlorophyll.

The results for other ecosystem indicators were a mix of good and poor scores. The streams have exhibited consistently high scores for dissolve oxygen, pH, and temperature, three parameters that are considered "vital signs" for the basic health of a stable freshwater ecosystem. In contrast, the Harbor's only indicator that is consistently good is dissolved oxygen. This does not eliminate the possibility of temporary low oxygen events caused by algal blooms, but it is a good sign that we have not seen a large fish kill due to low oxygen in the Harbor since 2014.

photo by: Blue Water Baltimore

Unfortunately, the rest of the story is far less rosy. Stream conductivity routinely scores in the single digits, impacting the suitability for plants and animals. Both streams and the Harbor have received increasing amounts of excess nutrients over time, causing a variety of algae to bloom and discolor the Harbor too frequently. And there is still too much sediment flowing into the Harbor from stormwater and constant stream erosion.

These generalizations do not apply evenly across our city, and some areas face different challenges than others. But overall, we can easily see that we need to drastically reduce the amount of nutrients, salts, and sediment in our waterways to create truly healthy and robust ecosystems.

Calling All Baltimore City School Teachers Grades 3rd-6th

Engage your students in solving real environmental problems in the Chesapeake Bay Watershed through hands-on, outdoor science investigations.

Harbor Scholars is an exciting professional development opportunity for 3rd-6th grade teachers in Baltimore City. Participants will learn how to deliver effective Meaningful Watershed Educational Experiences (MWEEs), in which students investigate and take action on a real local environmental issue.

Teachers who complete the program will be eligible to receive

- **3 CPD credits**
- **3 AU credits or a stipend**
- **Action project funding**
- **Free student supplies**

Learn more at: towson.edu/harborscholars

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www.waterfrontpartnership.org

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