

2023

HEALTHY HARBOR REPORT CARD



**WATERFRONT
PARTNERSHIP**
OF BALTIMORE



Planning a Swim IN BALTIMORE HARBOR!

For more than a decade, the Healthy Harbor Initiative has been championing the goal of a swimmable, fishable Baltimore Harbor.

During that time, a core group of non-profits, educational institutions, government officials, and business leaders have worked together to take action and cleanup our waterways. Today, we are proud to say that this work has produced significant results.

Collectively, we have invented new large-scale trash interception technology (Mr. Trash Wheel), Baltimore has invested over \$1 billion in sewer infrastructure upgrades, legislators have passed critical environmental laws, and scientists have conducted extensive water monitoring to identify issues and track progress. As a result, sanitary sewer overflows have been reduced by 97%, over 450 tons of litter and debris are removed from the water each year, and plastic bags and foam containers have been banned. Routine testing shows that the Baltimore Harbor now meets the Maryland water quality standard set for swimming beaches most of the time in dry weather. Just like any beach in the Chesapeake Bay, swimming in the Harbor should be avoided for 48 hours after a rainfall. This is because it takes time for pollution carried by rain to dissipate.



To receive Harbor Splash updates and be notified when registration opens, visit: www.HarborSplash.com

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About this Report

In 2010, the Waterfront Partnership launched the Healthy Harbor Initiative with the goal of making the Baltimore Harbor safe for swimming and fishing. Each year, the Healthy Harbor Report Card 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 2022 and analyzed by the Waterfront Partnership.

SEWAGE OVERFLOWS DOWN 97% SINCE 2018

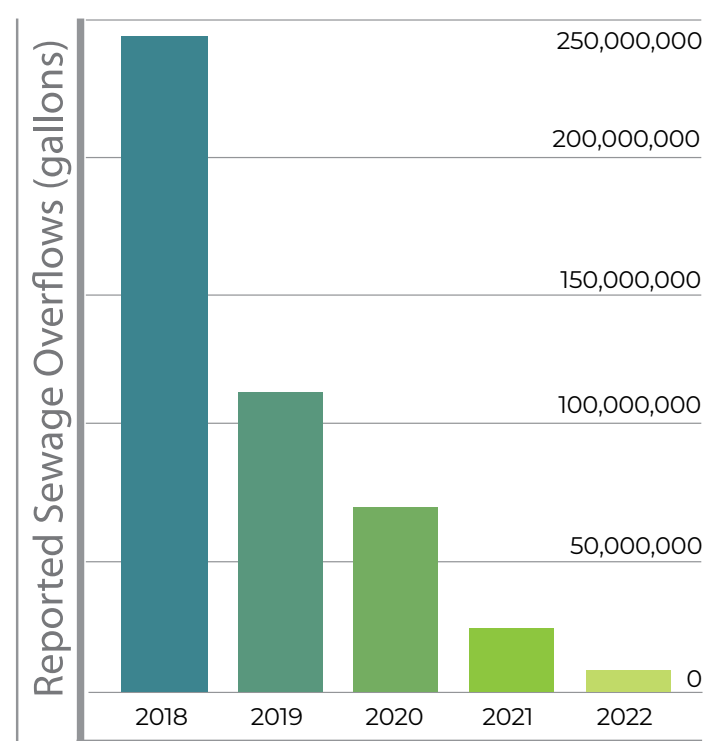


Chart Source: Maryland Department of the Environment




As early as 2019, we knew we were reaching a tipping point where, with routine monitoring, the Harbor could be safely managed as a recreational resource for the city and region. That is why we launched the Baltimore Blueway, a curated network of water trails and access points that promotes paddle sport recreation. And that is why we are now ready for the first Inner Harbor public swim event in over 40 years.

In 2024, we will host Harbor Splash, a plunge event that will be open to anyone who registers. We expect this first swim to be limited in size and scope. After generations of neglecting our streams and Harbor, we expect a healthy amount of skepticism too. But this is just the beginning. We want to see other events in the Harbor like triathlons, open water swimming, and stand-up paddleboard races. One day we may even have a beach.

Our work is far from done. Sewer upgrades must continue, we need to give up single-use plastics, and we must keep monitoring to ensure our waters are safe. Polluted storm runoff is a growing issue and the impacts of climate change threaten to undo the progress that we have made. But it's important that we start swimming. It's a statement that we care about this watershed. It's a commitment to keep working to ensure that our ecosystem thrives and that swimming in the Harbor becomes a routine occurrence and not a one-off affair.

Is the Harbor Swimmable?

Routine monitoring has found that water in the Harbor meets the Maryland standard for swimming on most dry weather days. As with any large body of open water, there are important factors to consider before swimming:

-  **Boat Traffic** The Baltimore Harbor has many uses including industrial ports and recreational marinas. Swimming should take place during a coordinated event that ensures participants are kept safe from boat traffic.
-  **Polluted Sediment** Like many urban waterways (including those with swimming), the sediment at the bottom of the Harbor contains legacy pollutants that should not be stirred up. That means swimming only in areas deep enough to prevent contact with the bottom of the Harbor.
-  **Wet Weather** Just like every public beach in Maryland, swimmers should avoid contact with the water for at least 48 hours after a rain event. This is because rain carries pollutants off the land and into the water where they take time to dissipate.

Due to these concerns, it is recommended that swimming in the Harbor only take place at designated locations and during scheduled events like Harbor Splash.

Why are we seeing SO MUCH LIFE IN THE HARBOR?

Have you noticed anything different about the Harbor lately? Schools of menhaden swirling near Harbor East, diamondback terrapin in Fells Point, a dolphin off Harbor Point, and fishing charters traveling all the way from the Eastern Shore to fish the Inner Harbor. Anyone can walk up to the water's edge and see that something has changed. So, we posed the obvious question – why are we seeing so much life in the Harbor?

“What we see in the Harbor all starts with the weather,” says Charmaine Dahlenburg, Director of Field Conservation at the National Aquarium. “Typically, spring rains send freshwater into the Harbor and this year that didn’t happen.”

Instead, Baltimore experienced its driest spring in over a decade, meaning that salinity levels in the Harbor stayed unusually high. Dahlenburg says this kept one particular species from spreading as widely as it does in wetter years – the dark false mussel. This tiny mollusk reproduces quickly, colonizing every

underwater surface and crowding out other species. The lack of dark false mussel had a cascading effect, allowing

other species to colonize the piers and bulkheads around the waterfront. This in turn can shift the balance, attracting a different set of predators and organisms that feed on them in the Harbor.

Brody Pierce, a captain with Rock Hall Fishing Charters, has noticed the change as well. “I’ve been running fishing charters in the Bay for 11 years,” says Pierce, “and this is the first year we have ever come to the Inner Harbor.” Pierce isn’t alone, fishing charters have come from Kent Island and Chesapeake Beach as well. They are all following schools of rockfish that have been driven into the Harbor by dolphin pods moving up the Bay. “Five years ago, we never saw dolphins in the Bay,” he notes, attributing this change to an increase in food abundance and better water quality.

Pictures Top to Bottom

A dolphin swims in the Harbor near Harbor Point in September 2023

A juvenile diamondback terrapin found by magnet fishers in Fells Point in April 2023 (credit Brendan Felch)

Sea anomone (courtesy of Baltimore National Aquarium)

Turtles bask on a constructed turtle platform near Harbor East in April 2023

School of Menhaden, Inner Harbor



A fishing charter from Rock Hall, MD visits the Inner Harbor to catch rockfish in August 2023 (credit: Captain Brody Pierce)

Over the last five years, overflows from Baltimore’s sanitary sewer system have steeply declined. A Maryland Department of the Environment database shows sanitary overflows in the city have been reduced 97% in volume since 2018.

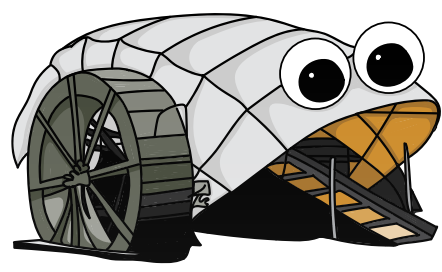
Another reason life appears to be returning to the Harbor is increased water clarity, says Lieutenant Josh Schaffer, Dive Team Coordinator with the Baltimore Fire Department. “Visibility used to be less than a foot,” says Schaffer, “now,

divers can routinely see up to six feet!” In fact, water clarity in the Harbor averaged five feet in May 2023, with some days having nearly 10 feet of visibility. Schaffer says, “this helps divers as they train for water rescues, but also provides a unique opportunity to view life beneath the surface.” His dive team reports seeing turtles, rockfish and even bottom-dwelling worms.

Determining if the amount of wildlife in the Harbor is truly increasing would require a scientific study, but the observations from scientists, fishermen, and novices are bringing attention to these changes. Periods of drought reduce the amount of fresh water entering the harbor, causing fewer sewer overflows, and carrying less pollution into waterways. The spring 2023 drought gave us a glimpse of what our Harbor would always be like with less pollution and properly managed stormwater runoff. But we don’t want to rely on droughts to keep our water clean. A clean and healthy Harbor is a more resilient Harbor, able to handle changes in weather and climate.



Maryland blue crab



A YEAR ON THE WHEEL! MR. TRASH WHEEL UPDATES

TRASH WHEEL FAN FEST • Hundreds of fans meet up at Peabody Heights Brewery to celebrate their trash wheel fandom. Over 50 works of trash wheel inspired art are displayed (and sold!).

09/22



SPONGEBOB ADOPTION • Gwynnda the Good Wheel of the West is officially sponsored by SpongeBob Squarepants: Operation Sea Change. The sponsorship funds a portion of trash collection for one year.

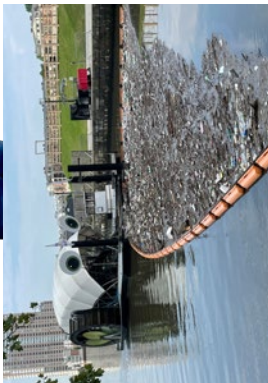


10/22

MTW FANS @ HALLOWEEN • Trash Wheel fans (and their pets) from around the region dress up as their favorite trash gobbling interceptor to celebrate Halloween.



934,000 lbs. of trash and debris removed from the harbor • 2022 was the first year that Baltimore had four continuously operational trash wheels! By the end of the year, the Trash Wheel family collected more litter and debris than in any prior year!



12/22

OIL SPILL IN THE JONES FALLS • After a warehouse fire caused a large amount of oil to spill into the Jones Falls, Mr. Trash Wheel gets to work. With supplies provided by the Maryland Department of the Environment, Mr. Trash Wheel keeps a vast majority of the oil out of the Harbor.



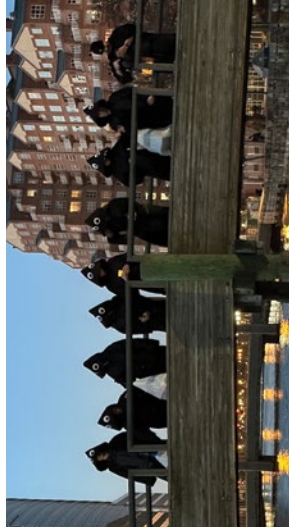
12/22

BALTIMORE COUNTY BAG BAN • Humans representing Mr. Trash Wheel testify about the importance of banning plastic bags to Baltimore County Council. *The Ban passed and went into effect November 1, 2023.*



1/23

ORDER OF THE WHEEL • Cloaked in black robes and adorned with googly-eyes, Mr. Trash Wheel's "Order of the Wheel" announce that they are recruiting new members. Over 1,000 people apply from all 50 states and commit to cleaning up their communities.



3/23

DUMPSTER DIVE • Over 200 local and international trash wheel fans join forces with Volunteering Untapped and the Baltimore Community Toolbank to dissect an entire trash wheel dumpster. Photos and data from the event are used to help pass legislation that reduces trash in our waterways.



4/23

EARTH DAY BIRTHDAY • Mr. Trash Wheel is 9 and feeling fine! Over 400 fans gather in the Inner Harbor to help celebrate Mr. Trash Wheel's birthday with a cake made of litter and a dance performance by Baltimore's own Fluid Movement.



4/23

POMPEIAN PANCAKE CHALLENGE • Baltimore-based Pompeian, America's largest national brand of olive oil, announces a third year of adopting both Mr. Trash Wheel and Professor Trash Wheel. Chyno, the Baltimore Foodie, makes a Mr. Trash Wheel shaped pancake to celebrate.



4/23

FLOATILLA • Local rock band Thrillkiller perform from a floating stage on Mr. Trash Wheel to an audience of hundreds of kayakers during Waterfront Partnership's annual Baltimore Floatilla.



6/23

Trash Wheel Count

2,576

Tons Collected

872

Dumpsters Removed

951,862

Plastic Bags

13,254,508

Cigarette Butts

1,397,168

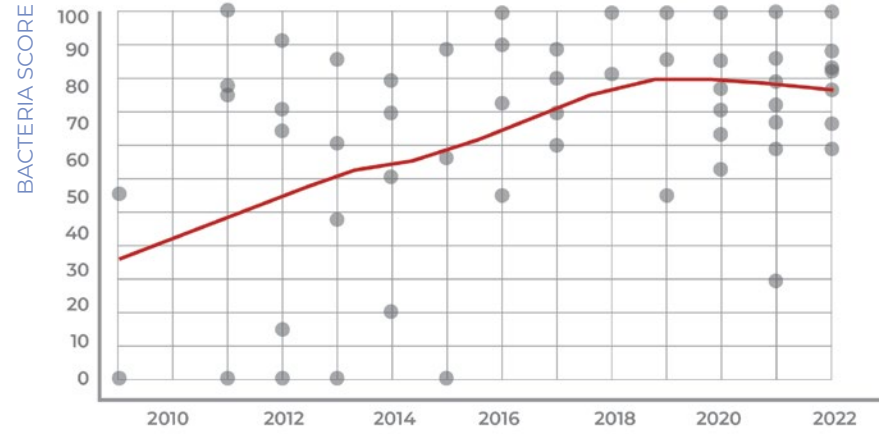
Foam Containers

1,978,386

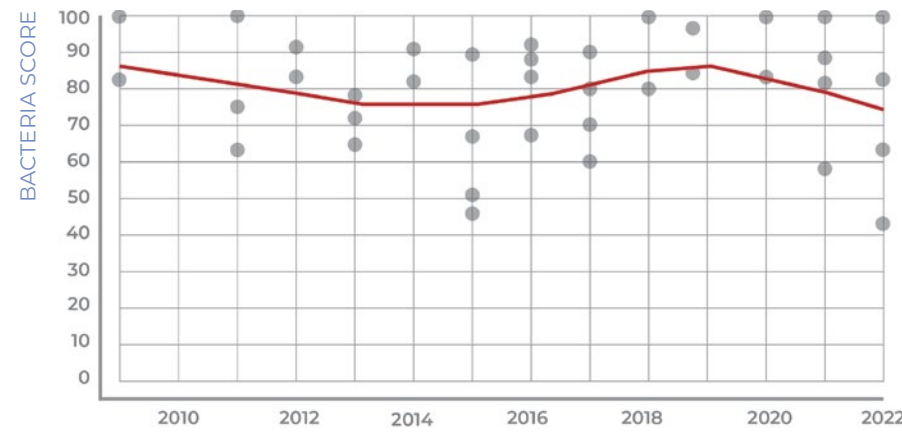
Plastic Bottles

2022 BACTERIA SCORES

INNER HARBOR BACTERIA TRENDS (2009-2022)



MIDDLE BRANCH BACTERIA TRENDS (2009-2022)



● Each dot equals the annual dry-weather bacteria score at one sampling site
 — Short-term Bacteria Trend

Headworks: Reaching its Full Potential

Since the completion of Baltimore's major sewer system upgrade known as the Headworks Project in 2021, Baltimore waterways have seen an immediate and continuing reduction in sanitary sewer overflows. The goal of the Headworks Project was to repair a large, misaligned sewer pipe carrying the City's waste to the Back River Wastewater Treatment Plant. The misalignment created a "bottleneck," which reduced the ability of the City's sewer system to bring sewer flow to the Back River Wastewater Treatment Plant, causing millions of gallons of sewage to reach area waterways.

However, the Headworks Project, along with a host of other sewer repairs have contributed to the overall reduction of sanitary sewer overflows. From 2021 to 2022, DPW reported a 75% reduction in the volume while the number of sewer overflows has dropped by an additional 94% from 2021 through the first half of 2023.

DPW is working to maximize the full potential of the Headworks Project by removing deposited materials in the sewer system upstream of the previous bottleneck. As much as 9,000 tons of material is estimated to have settled to the bottom of the eight-mile-long pipe, reducing its ability to effectively transport the City's sewage. Over 700 tons of sediment have been removed and this work is now estimated to be completed by the end of 2024.



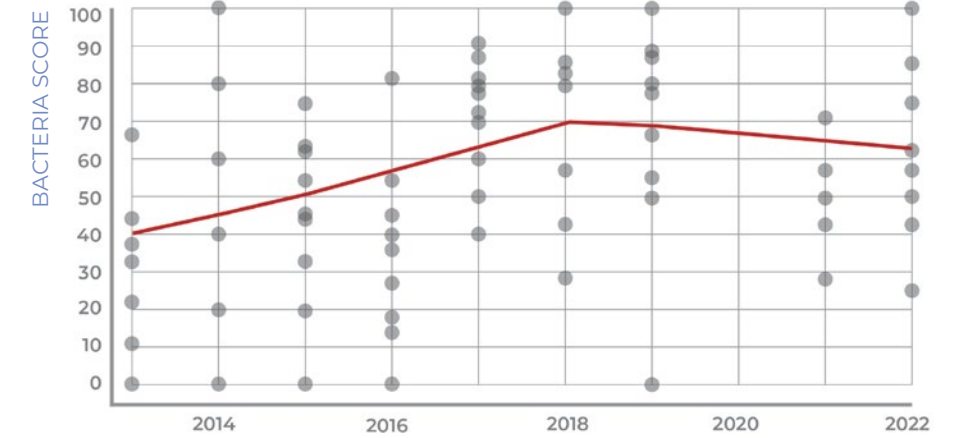
What Do the Scores Tell Us?

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.

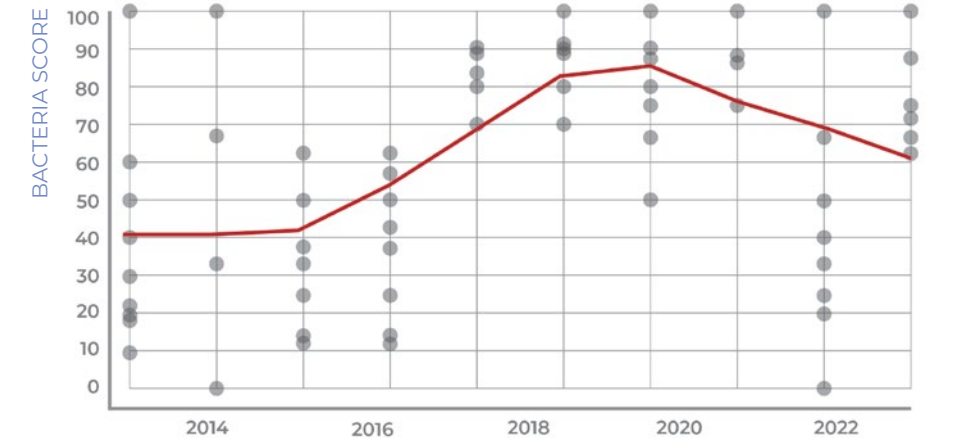
If the Score is 100%, is it Safe to Swim?

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 (2013-2022)



JONES FALLS WATERSHED BACTERIA TRENDS (2013-2022)



Average Bacteria Scores Improve by 10 Points or More

We are excited to see the positive trends first identified in 2020 continue at many sampling sites throughout the Harbor and streams. Of the 50 sites analyzed, 82% are either improving (meaning less fecal indicator bacteria was found) or consistently scoring very high. The largest improvements were seen in the Jones Falls watershed, with a 16 point improvement on average compared to 2021. The Gwynns Falls watershed was close behind with a 14 point average improvement. There are a few sites in these watersheds that consistently score low, but this is a great sign overall as it pertains to harmful bacteria in our streams, rivers, and harbor.

The Inner Harbor averaged an 8 point improvement thanks in part to a return to normal at the sampling site nearest the outfall of the Patapsco Wastewater Treatment Plant. Last year, we saw this site only passing 40% of the time and it has returned to a 100% passing rate for 2022.

The Middle Branch sampling sites have not followed this improving trend. Down 16 points on average compared to last year, we have noticed a higher frequency of failing scores at the Ferry Bar Park sampling site. Baltimore Department of Public Works has been informed of the anomaly and is looking into potential bacteria sources in the area.



Bacteria levels can change rapidly from 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.





Building the BALTIMORE BLUEWAY

In 2021, Waterfront Partnership announced plans to build a network of public access points and water trails throughout the Baltimore Harbor to be called the Baltimore Blueway.

After 16 months of outreach, planning, and stakeholder engagement, the Baltimore Blueway Master Plan was released on August 3, 2023. The plan highlights existing access points and suggests curated paddling routes based on attractions and user skill levels. The plan also proposes twelve new access points and improved amenities.

The goals of the Blueway are to provide water access for the diverse communities of Baltimore, connect to regional trails, enhance economic activity, and promote the recreational use of regional waterways.

For the release of the plan, Baltimore Mayor Brandon Scott arrived by kayak alongside Daryl Anthony, executive director of outdoor recreation for the Maryland Department of Natural Resources. A group of students from the Baltimore YouthWorks program attended the event and several tried kayaking for the first time.

Two new public kayak launches will soon be available in the Baltimore Harbor. A new ADA accessible public launch will replace the old Canton Kayak Club launch in Fells Point while an Inner Harbor kayak launch will be installed at Rash Field Park. Currently, paddlers must make a 5-mile round trip to visit the Inner Harbor from the closet public access point in Canton. Having new access points will make experiencing the Inner Harbor from paddle craft far more accessible.

“Nowhere else in the Chesapeake Bay can you find such a diverse range of awe-inspiring paddling experiences within a 3-mile radius,” said Adam Lindquist, Vice President of the Healthy Harbor Initiative. “By combining the marketing power of our waterfront attractions with outdoor recreation, the Baltimore Blueway will spur tourism and revitalization, bring together communities, and promote healthy lifestyles.”

Learn more about the Baltimore Blueway at www.BaltimoreBlueway.com.

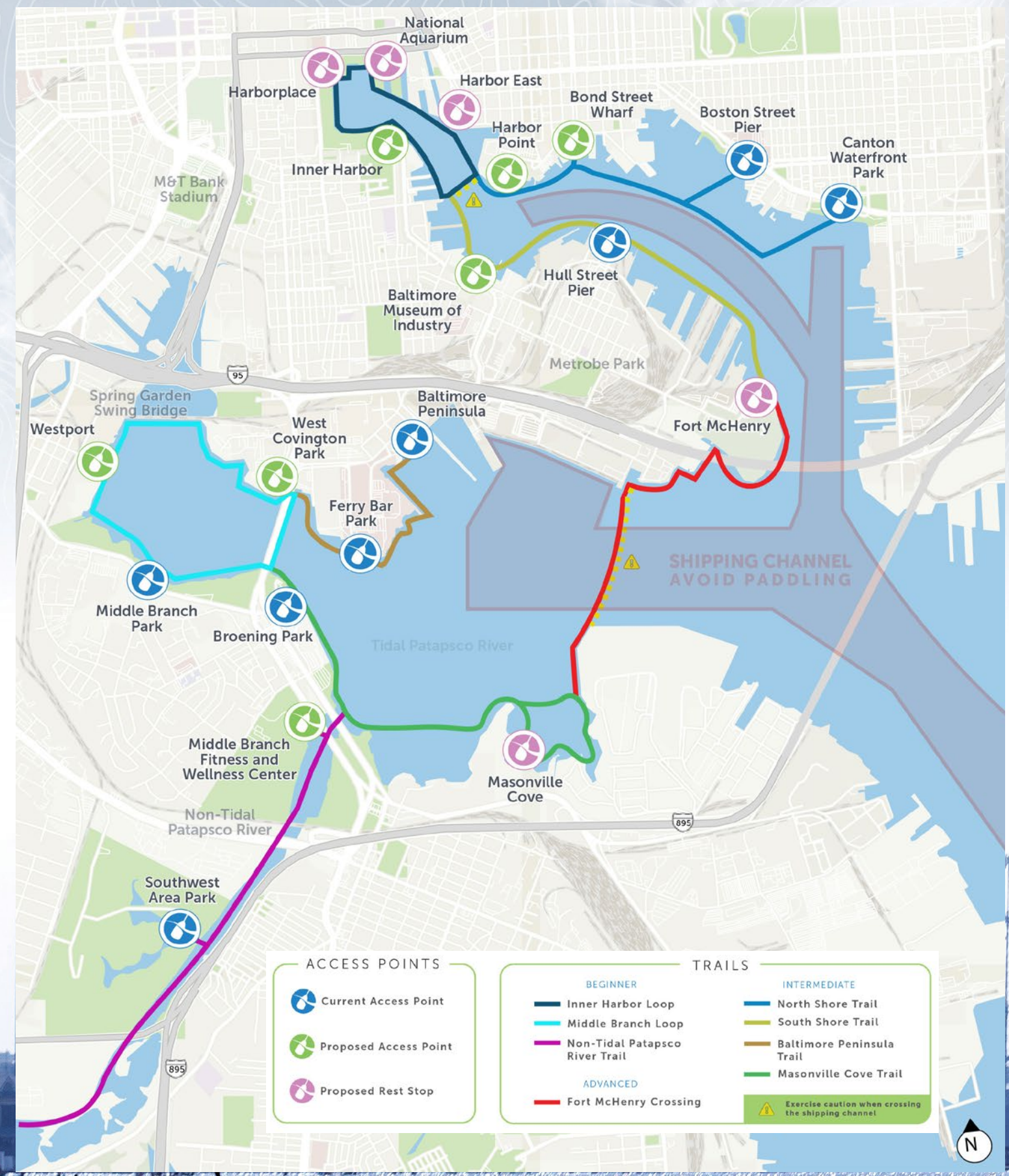
Pictures Top to Bottom

Kayakers, Inner Harbor

Mayor Brandon Scott and members of YouthWorks

Baltimore Floatilla ThrillKiller concert on Mr. Trash Wheel, Inner Harbor

Baltimore Blueway Plan



BALTIMORE

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.



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 a

Chlorophyll a 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

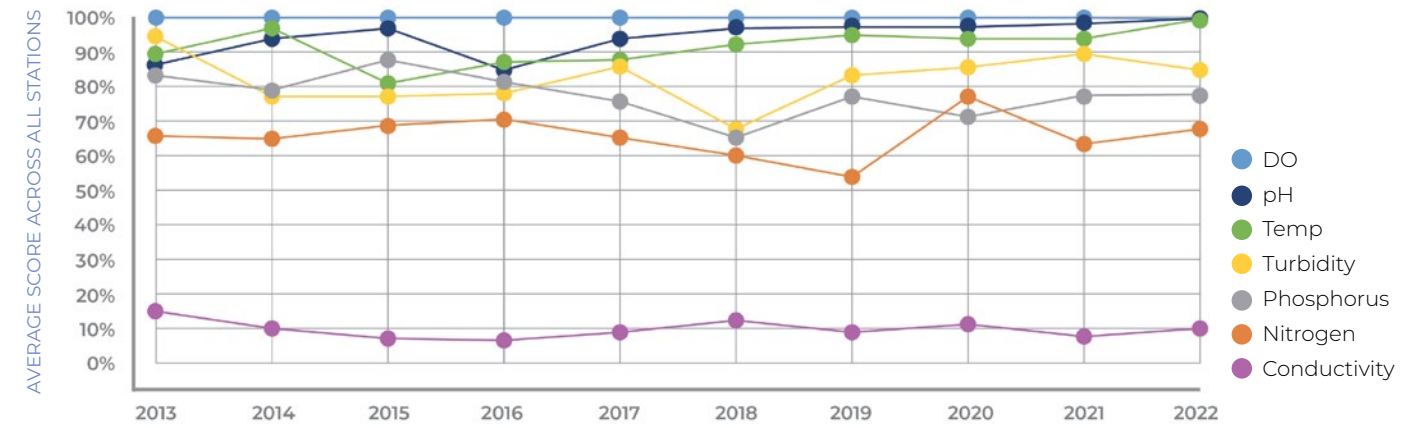
Conductivity tells us if there are too many salts and chemicals in the streams that could harm fish and other organisms. Freshwater plants and animals cannot survive in an environment that is too salty. Over-application of road salts, polluted stormwater runoff, and sewage overflows all contribute to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

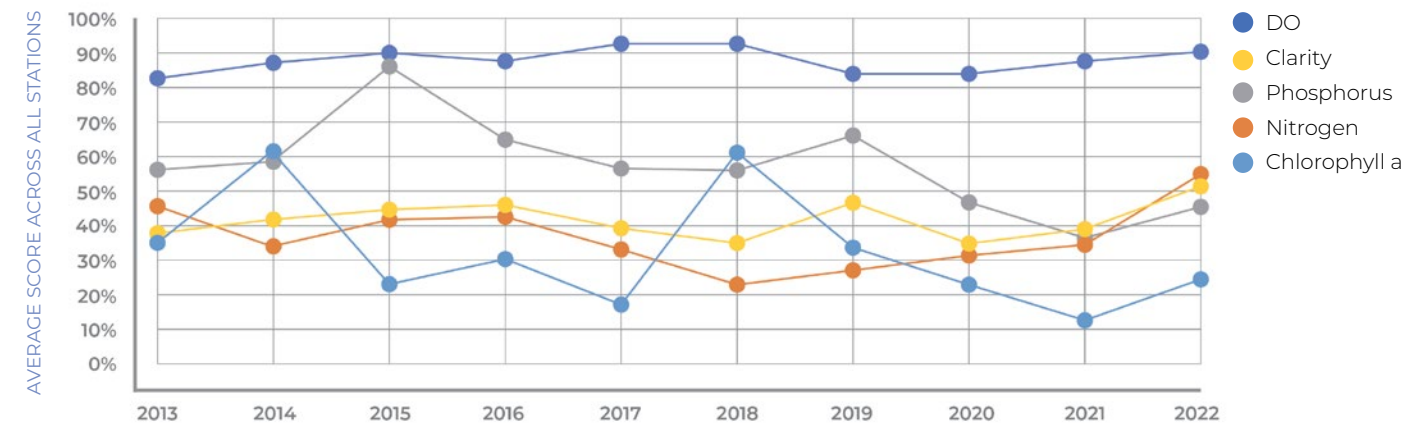
JONES FALLS & GWYNNNS FALLS STREAMS

ECOSYSTEM HEALTH SCORES (2013-2022)



BALTIMORE HARBOR & TIDAL PATAPSCO RIVER

ECOSYSTEM HEALTH SCORES (2013-2022)



Small Improvements in Ecosystem Health with Big Challenges Still Remaining

For the first time since monitoring began, every ecosystem indicator showed improvement in the Baltimore Harbor. The improvements for phosphorus and chlorophyll scores could be the result of repairs completed at the Patapsco Wastewater Treatment Plant,

which was found to be releasing partially treated sewage into the Patapsco River in 2021.

The streams have exhibited consistently high scores for dissolved 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.

Unfortunately, the rest of the story is far less rosy. Stream conductivity scores hover around ten percent, impacting a stream's 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.



WATERFRONT PARTNERSHIP is planning the FIRST PUBLIC SWIM in the Baltimore Harbor IN OVER 40 YEARS!

Date and location to be announced next year. Sign up to be the first to know when registration opens.

VISIT: WWW.HARBORSPLASH.COM

The Healthy Harbor Initiative is supported by:



ANONYMOUS

