



# HARBOR HEARTBEAT

Tracking the vitals for a Healthy Harbor

**MAY  
2018**  
BALTIMORE,  
MARYLAND

## ABOUT THIS REPORT

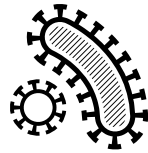
Harbor Heartbeat is a new report produced by the Waterfront Partnership of Baltimore as part of the Healthy Harbor Initiative. The report tracks annual progress being made toward the restoration of the Baltimore Harbor. It doesn't matter if you live in Baltimore City or Baltimore County, if you own land or rent an apartment or if you're a kid or an adult. We can all do something to protect our waterways.

What are you doing to help keep our water clean? Browse this report for ideas on how you can help.

Each year, Harbor Heartbeat takes the pulse of water quality in the Baltimore Harbor by tracking seven indicators of progress. Sometimes the indicators go up and sometimes they go down, but each is critical to the health of our communities, streams, Harbor and Bay. Contributors to this report include City and County governments, environmental nonprofits and businesses.



## 7 INDICATORS OF HARBOR HEALTH



Fecal Bacteria

**Page 3:** Fecal Bacteria levels answer one very basic question: is this water safe for swimming or any other human contact? Bacteria measurements help us determine the risk of getting sick if someone comes into contact with the water. Some common sources of bacteria are sewage overflows, broken sewer pipes and pet waste.



Sewer Repairs

**Page 6:** Baltimore City and County share a sewer system, but some sewer pipes are over 80 years old. When old pipes break or get clogged it can cause sewage to discharge into our streams and Harbor. Some common causes of sewer discharges are people putting grease down their drains, flushing wet wipes and other non-flushable items and too much rainwater entering the sewer system.



Pollution Tracking

**Page 8:** When sewage or other pollutants get into our streams and Harbor it's important to find the source. Government and nonprofits have tools and technology to help them find and eliminate sources of pollution.



Litter & Debris

**Page 10:** Trash in our streams and Harbor is harmful to birds, fish and crabs who might mistake it for food. Dirty streets and alleys make our communities unsightly. Some common sources of litter are trashcans and recycling bins without lids, illegal dumping and trash bags being ripped open by animals.



Restoration Projects

**Page 12:** When natural land cover is replaced with pavement and structures the ground loses its ability to slow down and filter rainwater. Restoring natural land cover with rain gardens, trees and native plants means that the ground can slow down and filter rainwater once again.



Ecosystem Health

**Page 15:** Scientists at Blue Water Baltimore monitor eight different water quality indicators at 49 sites throughout our streams and Harbor to determine how healthy they are for fish and other aquatic life.



Volunteers

**Page 16:** No one person can clean up the Harbor. It takes all of us. Did you volunteer with an environmental nonprofit last year? If so, you're probably represented here.



Photo credit:  
Blue Water  
Baltimore



## BACTERIA SCORES IMPROVE DRAMATICALLY, BUT WHY?

From May through September of 2017, Blue Water Baltimore monitored 49 sites for fecal bacteria. Sites receive a passing or failing score based on the State of Maryland’s swimming standard. Compared to 2016, scores improved at 32 sampling sites, some by as much as 100%. At many stations, bacteria scores were higher in 2017 than any other year since the current monitoring program began in 2013. This is an exciting result, but is it part of a larger trend?

It is important to note improvements in fecal bacteria scores were not evenly spread. The Jones Falls saw the greatest improvements, with seven out of thirteen sites posting scores of 80% or higher. The Gwynns Falls had only one site receive an 80% or higher. In the Baltimore Harbor, bacteria levels are higher closer to the City but improve dramatically in the mainstem of the Patapsco River and Chesapeake Bay.

At this time, these improvements cannot be attributed to any one cause. Water quality is often connected to rainfall. As rain carries pollutants off the land and into streams or flows into Baltimore’s aging sewer system it causes overflows. Scientists at Blue Water Baltimore conducted an analysis to determine if less rainfall during and around sampling dates could explain the improvement in fecal bacteria scores. The analysis concluded that rainfall during sampling was not significantly different from previous years. This means that these improvements are likely not due to changes in weather patterns. In spite of these encouraging results, only time and more data will tell us if they are a fluke or a lasting change.

Both the Baltimore City and Baltimore County Departments of Public Works have been implementing repairs to their sewer systems as required by the federal Clean Water Act, however, neither could attribute these improvements to any specific projects. In 2017, both City and County sewer systems discharged millions of gallons of untreated sewage into our streams and Harbor, showing

that there is still much work to be done. While the volume of sewer overflows is difficult to accurately estimate, the number of reported overflows has dropped 20% since 2015.

Simply put, there is no clear explanation for the improved fecal bacteria scores, nor an obvious reason to believe that these improvements will continue into 2018. It is, however, an exciting glimpse into a future when sewer overflows no longer plague our waterways and the Harbor is once again safe for swimming and fishing.

### How Can You Help?

Make yourself a F.O.G. Monster! F.O.G. stands for fats, oils and grease – all things you should never put down the drain. Store your F.O.G. in a can or jar and decorate it to look like a monster. That way, next time you need a place to put your grease, you will remember what to do.



F.O.G. Monsters are for storing your fats, oils and grease.

Photo credit: Adam Lindquist



# IS IT SAFE TO SWIM IN THE TIDAL PATAPSCO

Percentage of time water samples met the Fecal Bacteria standard for swimming from May through September 2017



To see the data behind the scores visit [HarborAlert.org](http://HarborAlert.org)



## CITY BREAKS GROUND ON MASSIVE PROJECT TO REDUCE 80% OF SEWER OVERFLOWS

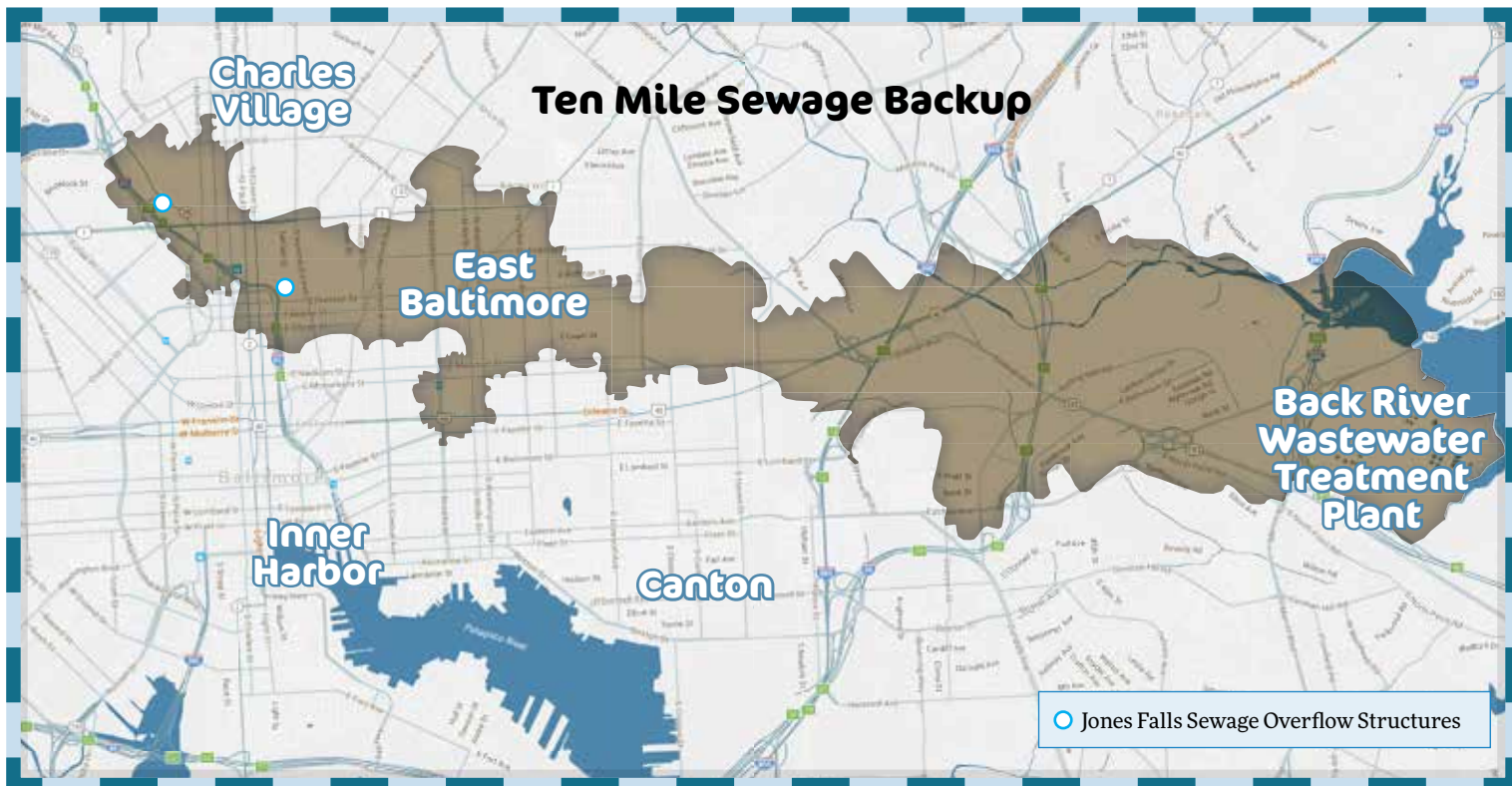
Photo credit:  
Adam Lindquist

On August 10, 2017, Governor Larry Hogan and Mayor Catherine Pugh joined other elected officials, business leaders and environmentalists to break ground on a \$430 million improvement project at the Back River Wastewater Treatment Plant. The project will relieve a continuous 10-mile backup of sewage beneath the streets of East Baltimore, greatly reducing sewer overflows and improving the health of waterways like the Jones Falls stream and the Baltimore Harbor.

The problem is that a 12-foot diameter pipe responsible for carrying the City and County's sewage to the treatment plant is chronically misaligned, preventing wastewater from flowing freely into the tanks at the plant. The pipe, known as an outfall interceptor, relies on gravity to keep wastewater moving and the misalignment

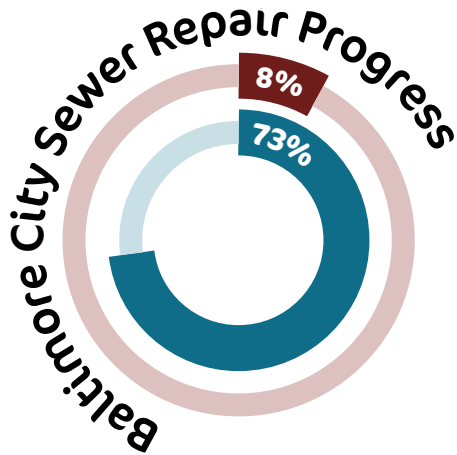
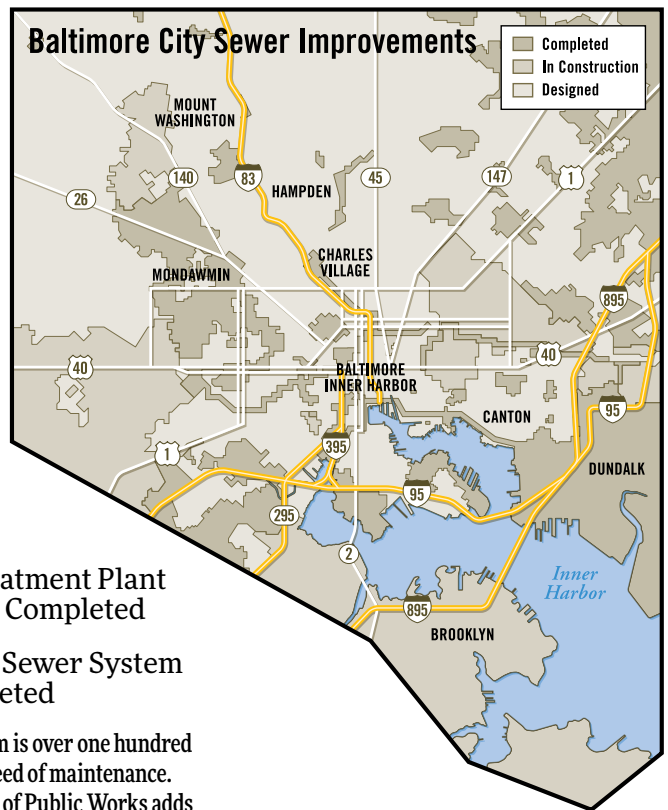
acts like a dam at the end of the pipe. The result is like trying to pour water into a glass that is already full. Since digging up and replacing the massive pipe would be too difficult, the plan is to use a series of hydraulic pumps and tanks to keep the wastewater flowing at all times.

The improvements at the Back River treatment plant are one major requirement of the consent decree, a legal settlement between the City, Maryland Department of the Environment and the U.S. Environmental Protection Agency. The other major requirement is that the City assess, repair or replace its 1,400 miles of sewer pipes. Together, these efforts will cost more than \$1 billion and are predicted to reduce sewer overflows in Baltimore City by 80% by the end of 2020.





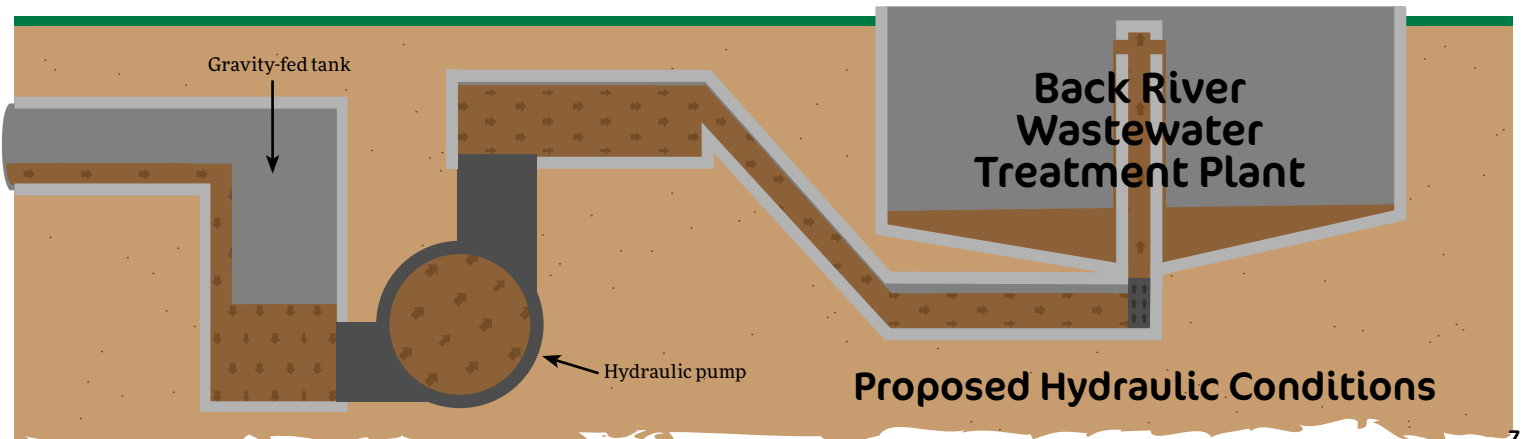
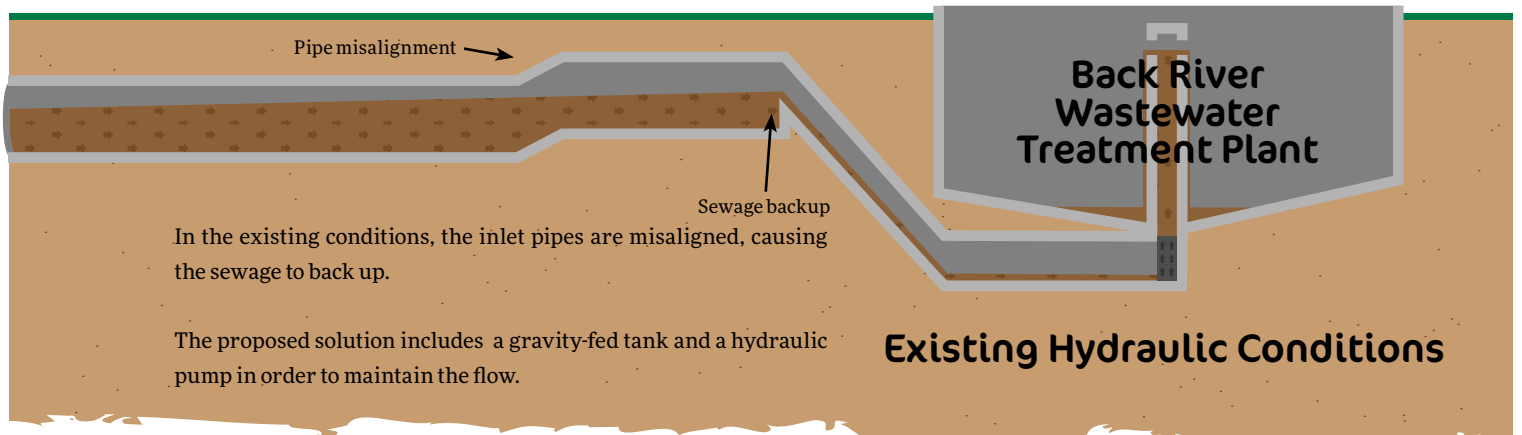
Source: Baltimore City Department of Public Works



- Back River Treatment Plant Improvements Completed
- Baltimore City Sewer System Repairs Completed

The Baltimore sewer system is over one hundred years old and in constant need of maintenance. Baltimore City Department of Public Works adds new projects as new needs are identified.

Source: Baltimore City Department of Public Works





**Pollution  
Tracking**



## **THE DIFFERENCE A PHONE CALL CAN MAKE**

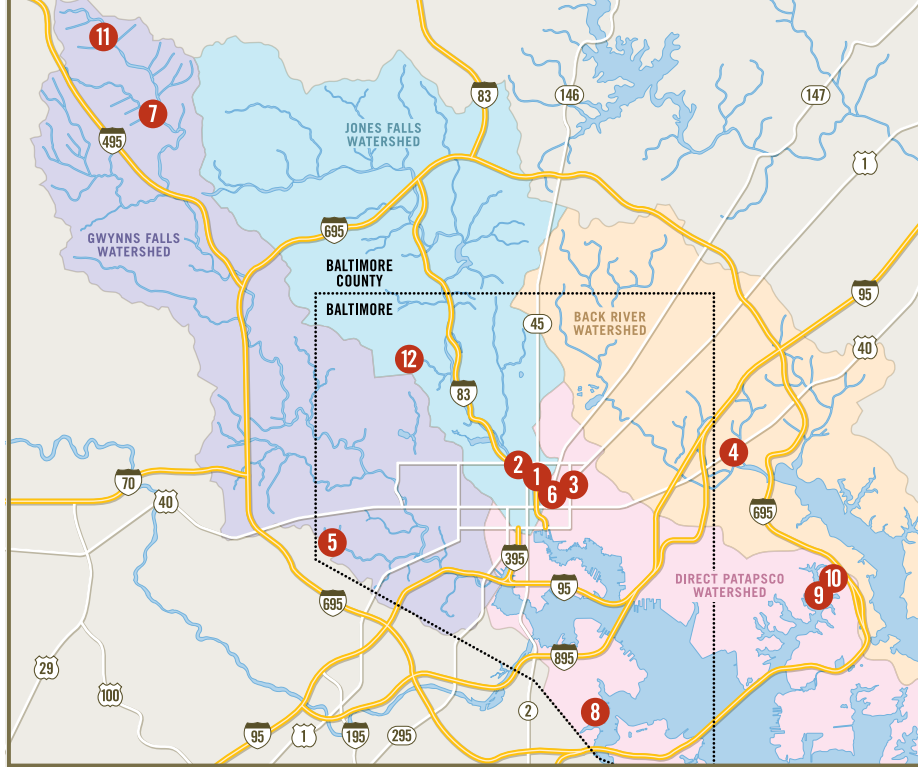
In 2017, Blue Water Baltimore received a tip on their pollution hotline from a concerned resident who witnessed a worker rinsing out a concrete truck into a storm drain at a local concrete facility in Baltimore City. After receiving the tip, the Waterkeeper team conducted a field investigation of the facility and looked up the facility's permit compliance history on the U.S. EPA permit violation database. They learned through their research that not only was the facility in Baltimore potentially not in compliance with their permit, but the same company owned six other facilities throughout Maryland that also appeared to potentially not be in compliance with their stormwater permits. Blue Water

Baltimore reached out to the Maryland Department of Environment's Enforcement Division to alert them about the possible violations and requested field investigations.

The Maryland Department of the Environment investigated and found all seven concrete facilities to not be in compliance with their stormwater permit requirements and initiated an enforcement action to bring them into compliance, reducing harmful industrial pollution from entering our waters. From just one simple phone call a community member made a significant impact on improving water quality not just in Baltimore's Inner Harbor, but in several areas throughout Maryland as well.

### 2017's Worst Sewer Overflow Locations

In 2017, 12 locations had a total of 54 reported sewer overflows releasing an estimated 18.2 million gallons of sewage. Locations are numbered in order of estimated volume. This accounts for the vast majority of reported sewage overflows; however, reporting has been historically incomplete. More accurate measurement and reporting of overflows is needed to gauge pollution improvement.



Source: Maryland Department of the Environment



Photo Credit:  
Damon Meledones

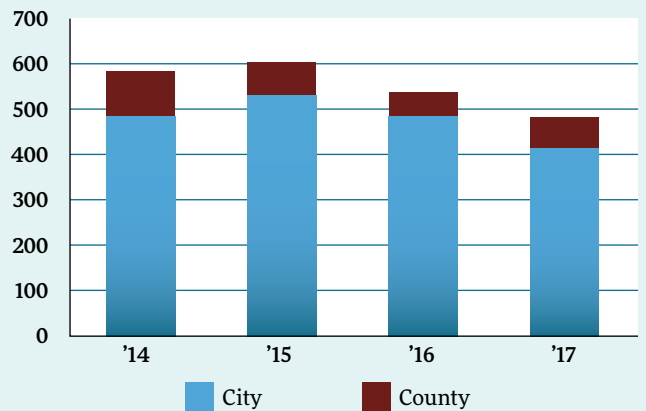
## WHAT IS THE BALTIMORE HARBOR WATERKEEPER?

The Baltimore Harbor Waterkeeper is a program of Blue Water Baltimore that uses science, policy and the law to fight for clean water and hold polluters accountable. The Waterkeeper team also leads free "Pollution 101" classes to train community members on how to spot and report pollution and maintains a pollution hotline phone number for concerned members of the public to report any pollution concerns.

### How Can You Help?

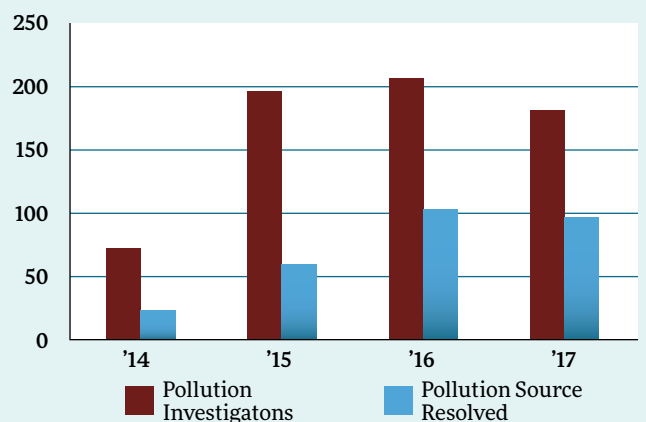
You can make a difference! If you see what you believe to be pollution, contact Blue Water Baltimore's Waterkeeper team at: 443.908.0696. Visit [BlueWaterBaltimore.org](http://BlueWaterBaltimore.org) to learn about how to sign up for a free Pollution 101 training.

### BALTIMORE CITY AND COUNTY NUMBER OF REPORTED SEWER OVERFLOWS



Source: Maryland Department of the Environment

### BALTIMORE CITY POLLUTION SOURCE INVESTIGATIONS



Source: Baltimore City Department of Public Works



Photo credit:  
Michel Anderson  
Blue Water Baltimore



Litter &  
Debris

## BALTIMORE BANS FOAM CONTAINERS

One cold Tuesday morning this February, the lawn outside City Hall held an unusual sight. Over 100 students carrying signs and artwork made out of foam school lunch trays gathered with environmental organizations and city council members to echo one clear message: “No more foam.”

After the rally came the main event: a City Council hearing discussing the proposed ban on expanded polystyrene (foam) food service products. There were so many students taking civic action that the hearing floor and balcony were filled. Students even spilled into an overflow room.

Since 2013, environmental groups have repeatedly tried to use legislation to stop foam containers from flowing into Maryland’s streams, Harbor and Bay. Foam is problematic because it is particularly hazardous and difficult to recycle or clean up. Once Councilman John Bullock proposed the ban, the campaign was on. Organizations including Trash Free Maryland, Blue Water Baltimore, Waterfront Partnership and the student-led Baltimore Beyond Plastic were determined to make this year different. A huge turning point came when Council President Jack Young announced his support after a meeting with students.

This is not the first success for Baltimore Beyond Plastic. Earlier this year, the group led a movement

to switch lunch trays in City schools from foam to compostable. Baltimore’s Mr. Trash Wheel has also done his part by collecting over 700,000 foam containers since his installation in May 2014. Volunteers counted foam containers collected by the Trash Wheel at a “dumpster dive” hosted by Healthy Harbor and the Baltimore Community Toolbank last November. The shocking photos and data collected helped build the case for banning foam.

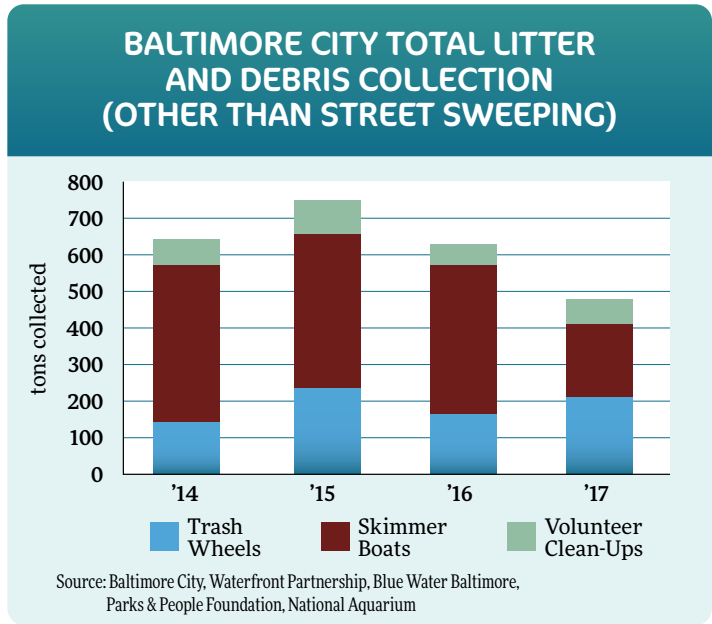
### BALTIMORE CITY AND COUNTY TOTAL LITTER AND DEBRIS COLLECTION



Source: Baltimore City, Baltimore County, Waterfront Partnership, Blue Water Baltimore, Parks & People Foundation, National Aquarium

The business community also showed it was ready for a change. Some businesses, including MOM's Organic Market, even showed up to testify in support. Many more businesses responded to surveys that showed an increasing willingness to switch from foam to alternatives because of environmental concerns and pressure from consumers. When organizations asked restaurants to sign on in support of the bill, the response was overwhelmingly positive.

City Council unanimously passed the bill, and on Thursday, April 19th, Mayor Catherine Pugh signed it into law. Baltimore joins Montgomery and Prince George's Counties in banning foam containers. Advocates are hopeful that State government will follow suit and ban foam statewide in 2019.



## How Can You Help?

Give up single-use plastic whenever you can. While recycling is good, an estimated 91% of plastic is never recycled. So, skip the straw, carry a reusable water bottle and grocery bags and, if you are really committed, carry your own set of utensils so you never need a plastic spoon, fork or knife ever again.

### Mr. Trash Wheel picks up trash after a storm

Photo credit: Casey Merbler





## Restoration Projects

# ENVIRONMENTAL RESTORATION MAKING HEADLINES IN BALTIMORE

Urban restoration projects recreate the natural environment to help filter pollution from the water. These projects include rain gardens, tree plantings, asphalt removal, stream restoration, native plantings and even oyster reefs.

### **New study links restoration projects with water quality improvements:**

Stormwater restoration projects designed to slow down and reduce polluted rain water by allowing it to filter naturally into the ground appear to be making an impact. A stormwater project may include rain gardens, bioswales or retention ponds.

A recent study of Baltimore's Gwynns Falls stream conducted by Blue Water Baltimore, the United States Geological Survey and the Cary Institute of Ecosystem Studies found that an increase in the area treated by these projects is consistent with reductions in some key pollutants. Specifically phosphorus, phosphate and sulfate pollution measured in the water. Blue Water Baltimore views this as strong evidence that these restoration projects should result in cleaner water and a healthier ecosystem.

For more information visit, [BlueWaterBaltimore.org](http://BlueWaterBaltimore.org).

### **Baltimore City tree canopy bucks the trend:**

Studies throughout the United States have repeatedly shown that communities are losing tree canopy due to a wide range of threats. New data analyzed by the U.S. Forest Service in collaboration with the City of Baltimore and the University of Vermont show that Baltimore's urban tree canopy actually increased from 27 percent to 28 percent between 2007 and 2015.

Tree canopy change is more complicated than a single statistic. The one percent increase reflects both substantial gains and losses in tree canopy cover. The gains totaled 1,500 acres, while the losses totaled 1,300 acres, for a net gain of 200 acres.

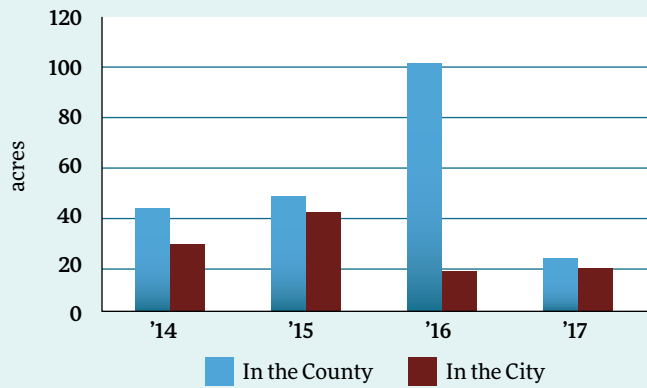
### **Baltimore's oyster reef in 'excellent condition':**

Over the last five years the Great Baltimore Oyster Partnership has planted over 600,000 oysters at the Fort Carroll sanctuary reef, located just seven miles from downtown Baltimore, near the Francis Scott Key Bridge. Baby oysters (known as spat) are grown from piers and docks around the Baltimore Harbor October through June.

Volunteers with the Chesapeake Bay Foundation and Waterfront Partnership tend to the oysters for nine months until they are old enough to survive on their own. Spat grown in this manner have an 80% survival rate, compared to a 1% survival rate in the wild. Recent monitoring of the Fort Carroll reef performed by the Chesapeake Bay Foundation shows that it is in 'excellent condition'.

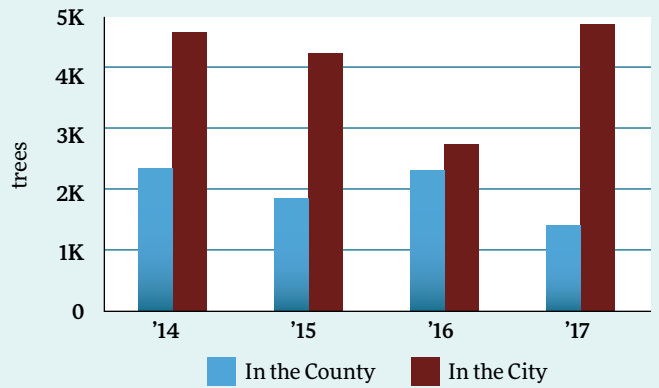
To volunteer for the Great Baltimore Oyster Partnership, visit [HealthyHarbor.org](http://HealthyHarbor.org).

## ACRES OF LAND IMPROVED BY RESTORATION PROJECTS



Source: Baltimore City, Baltimore County, Blue Water Baltimore, Civic Works, Parks & People Foundation,

## TREES PLANTED



Source: Baltimore City, Baltimore County, Blue Water Baltimore, Civic Works, Parks & People Foundation, Baltimore Tree Trust, TreeBaltimore

Baltimore City DPW stream restoration project on the lower Stony Run stream.

Photo credit: Adam Lindquist

## How Can You Help?

Beautify your space by adding native plants wherever you can – potted on your balcony or planted in your yard or tree pit. Native plants reduce runoff and provide habitat for birds, insects and other wildlife. In 2017, Baltimore had 31 new wildlife habitats certified by the National Wildlife Foundation and 6 certified as Bay-friendly by the University of Maryland Extension Bay-Wise program.



# WHERE ARE RESTORATION PROJECTS HAPPENING IN THE BALTIMORE REGION?



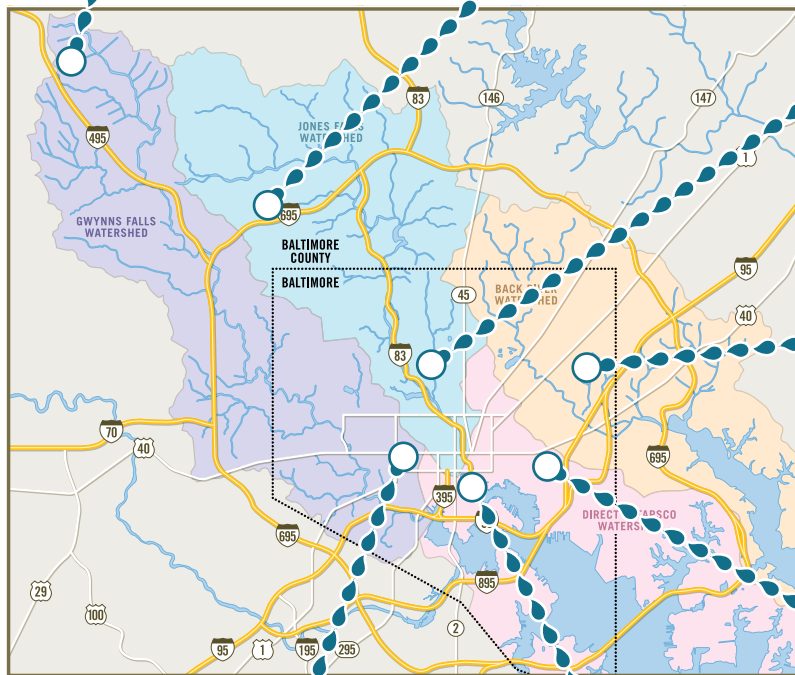
**Type:** Stream Restoration  
**Location:** Gwynns Falls Tributary  
**Project by:** Baltimore County



**Type:** Bioretention and rain gardens  
**Location:** Chizuk Amuno Synagogue  
**Project by:** Blue Water Baltimore



**Type:** Stream Restoration  
**Location:** Lower Stony Run  
**Project by:** Baltimore City DPW



**Type:** Asphalt replacement and bioretention  
**Location:** St. Anthony of Padua  
**Project by:** Blue Water Baltimore



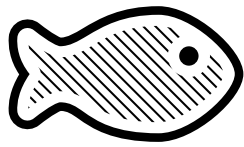
**Type:** Bioretention and asphalt removal  
**Location:** Harlem Park  
**Project by:** Baltimore City DPW



**Type:** Butterfly garden  
**Location:** Inner Harbor  
**Project by:** Patterson Park Audubon Center



**Type:** Bioretention/rain garden  
**Location:** Highlandtown  
**Project by:** Blue Water Baltimore



# Ecosystem Health

Blue Water Baltimore is home to the Baltimore Harbor Waterkeeper whose team of scientists collect rigorous water quality data in Baltimore’s streams, rivers and Harbor throughout the year. Experts at Blue Water Baltimore analyze the data to produce the annual scores displayed here. More detailed information about the scores can be found online at HarborAlert.org.

## Top 5 water quality facts in 2017

- 1. 2017 had less rainfall than 2016, 2015 or 2014.** Less rain can mean fewer sewer overflows and less pollution being carried by rainwater into storm drains, which flow directly into our streams and harbor.
- 2. Conductivity continues to be the worst performing indicator.** When it rains, salts and other pollutants are carried into our streams, raising the conductivity to unsafe levels for fish and other wildlife.
- 3. Nitrogen and Phosphorus pollution feed algae blooms in the Harbor.** After these algae blooms naturally die off, decomposing bacteria can suck up all the available oxygen in the water, resulting in low-oxygen dead zones and fish kills.
- 4. We need more years of data** to determine if the changes we are seeing are part of a larger trend. It’s tempting to see patterns from year to year, but with only five years of consistent data at each location, Blue Water Baltimore is only now building the knowledge needed to see long-term trends.
- 5. Much of Baltimore’s poor water quality is the result of storm-induced pollution problems.** Fixing our pipe infrastructure and restoring natural landcover should be our top priorities as these problems will only continue to worsen with climate change.

## WHAT DO THE WATER QUALITY INDICATORS MEAN?

**Chlorophyll  $\alpha$**  tells us if there is too much algae in the water. Some algae blooms are toxic to fish and harmful to human health. Too much algae can ultimately lead to low dissolved oxygen in the water, which can harm organisms living in Baltimore’s waters.

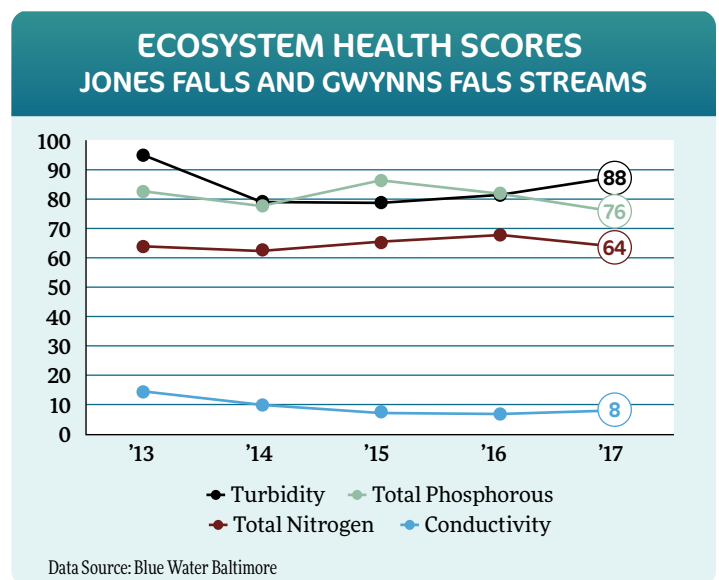
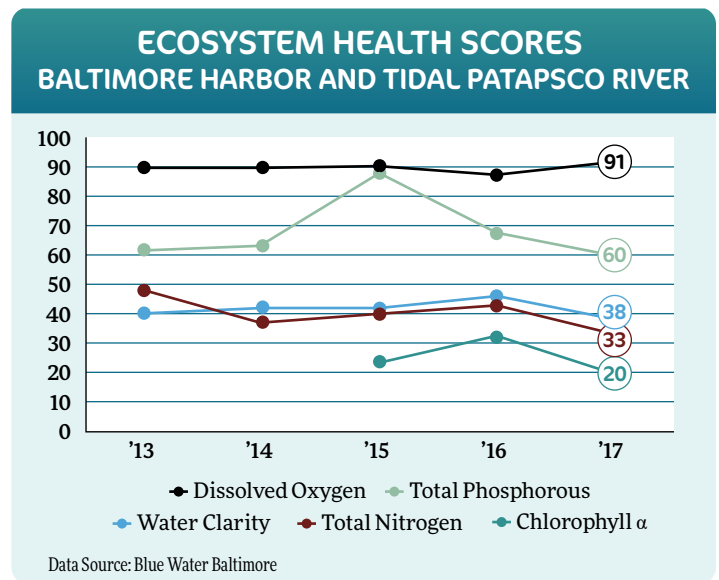
**Conductivity** tells us if there are too many salts and chemicals in the streams that could harm fish and other

organisms. Fresh-water animals can’t survive in an environment that’s too salty. Over-application of road salts, polluted stormwater runoff and sewage overflows all contribute to dangerously high conductivity levels.

**Dissolved Oxygen** is important for all organisms that live in the water. Fish, shellfish and other life need oxygen to breathe and thrive.

**Total Nitrogen** and **Total Phosphorus** are nutrients that tell us how much stormwater pollution is coming from the land. These nutrients feed naturally-occurring phytoplankton, which can lead to algae blooms. Some common sources of nutrient pollution are fertilizers, sewage, urban stormwater runoff and burning of fossil fuels.

**Turbidity** and **Water Clarity** are important for fish and plants in the water. The water must be clear enough for fish to see and find their prey and underwater plants need light to grow. Too much sediment in the water from poor construction practices and stormwater runoff can degrade water clarity.





Volunteers with the Great Baltimore Oyster Partnership plant spat at Lighthouse Point Marina.

Photo Credit: Casey Merbler

In 2017, over 14,300 people volunteered for projects that helped to restore Baltimore's waterways. Were you one of them?

# HealthyHarbor

A Waterfront Partnership Initiative

This report was made possible with input from the following partners:

The Healthy Harbor Initiative is supported by: