Healthy Harbor Report Card 2016

BALTIMORE WATER QUALITY SCORES INSIDE

MEET PROFESSOR TRASH WHEEL

OVER 250 PADDLERS RALLY FOR CLEAN WATER

2016 Overall Water Health

Healthy Harbor is an initiative of the Waterfront Partnership of Baltimore that brings together area businesses, nonprofits, neighborhoods and local government to support the goal of making the Baltimore Harbor safe for swimming and fishing. The report card helps us communicate this goal and track our progress.

Blue Water Baltimore conducts the monitoring for the report card program. Throughout 2016 Blue Water Baltimore logged over 300 volunteer hours to collect 587 samples from 49 sites resulting in 15,353 individual data points. Experts at Blue Water Baltimore then analyzed this data to produce the report card scores.

Tidal Waters

53 Baltimore Harbor — **F**

55 Tidal Patapsco

Streams

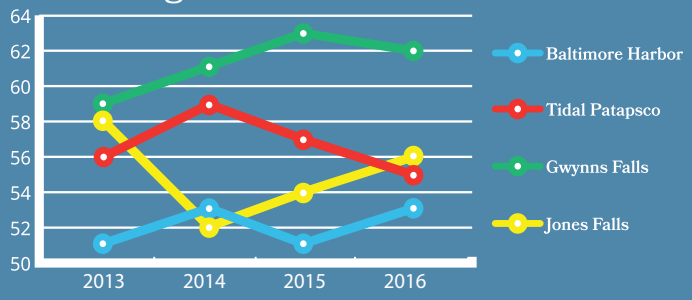
62 Gwynns Falls — **D-**

56 Jones Falls

Top 5 Water Quality Facts in 2016

1. **2016 had less rainfall than 2015 or 2014.** Less rain equates to fewer sewage overflows and less polluted stormwater runoff, which can lead to improved bacteria scores.
2. **Conductivity scores are dragging down our stream grades.** Stormwater runoff carries salts and other pollutants into our streams, raising the conductivity to unsafe levels for fish and other benthic wildlife. Many of our stream-health parameters are in the healthy range, but we'll continue to see failing grades until conductivity improves.
3. **Nitrogen and Phosphorous pollution feed algae blooms** in the Harbor, which can ultimately lead to anoxic dead zones and fish kills. High Chlorophyll levels are a signal of algae blooms.
4. **We need more years of data** to determine if the changes we see are part of a larger trend. It's tempting to see patterns from year to year, but we are just beginning to build the knowledge base we need 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 reducing stormwater runoff should be our top priorities.

Changes in Water Health Scores



What Do the Water Quality Indicators Mean?

Fecal bacteria is a human health indicator. 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.

Chlorophyll α tells us if there is too much algae in the water. Algae blooms are fed by excessive nutrients in stormwater runoff and sewage overflows. Too much algae can lead to low dissolved oxygen, which can ultimately cause fish kills.

Conductivity tells us if there are too many salts and chemicals in the streams that could harm fish and other organisms. Polluted stormwater runoff carries salts and other pollutants into our streams.

Dissolved Oxygen is important for all organisms that live in the water. Decaying algae blooms can deplete the oxygen in the water, which can cause fish and shellfish to suffocate.

Total Nitrogen and **Total Phosphorus** are nutrients that tell us how much sewage and stormwater pollution are coming from the land. Some common sources of nutrient pollution are fertilizers, waste water, urban runoff, and the burning of fossil fuels.

Turbidity and **Water Clarity** are important for fish and plants in the water. The water should be clear so that sunlight can reach underwater plants, and so that fish can see their prey. Sediment carried by untreated stormwater runoff makes our streams and rivers cloudy.

2016 Baltimore Harbor Health Grades

Based on UMCES EcoCheck protocol

To see the data behind the grades visit *HarborAlert.org*

Paddling for a Cause: The Baltimore Floatilla

By Casey Merbler, Waterfront Partnership of Baltimore

Photo credit: Jenny Morgan

Looking at the scores in this Report Card you may think it unwise to host a paddling party in Baltimore's Inner Harbor, but that's exactly what the team at Waterfront Partnership's Healthy Harbor Initiative did in June, 2016. Named the Baltimore Floatilla, over 250 experienced paddlers in kayaks, canoes, paddleboards and dragon boats paddled the 2.5 miles from Canton Waterfront Park to the Inner Harbor to raise awareness about the dire state of the city's marine environment and leaking sewer pipes.

"We often get in this chicken or egg debate," says Adam Lindquist, director of the Healthy Harbor Initiative, "which comes first: restoration or use?" Baltimore's Department of Recreation and Parks tracks over 10,000 paddling trips every year, so people are using Baltimore waterways. "These trips are spaced out throughout the season, so you may not see a lot of paddlers, but they're out there," says Lindquist. "And rather than tell people they shouldn't use the water, we work to inform them about the risks so they can make their own decisions. We've seen enough examples in other cities to know that unused waterways don't get the attention or funding they need."

> ***Now we need to make sure the water is safe***

In Boston, the Charles River Swimming Club began hosting swimming events in 2007, after a ten-year push to clean up a river that had long been the host of international rowing events. In Chicago, the Environmental Protection Agency mandated new water quality standards only after an increasing number of people began using the river stating, "a decade of investments in walkways, boat ramps and parks has provided people with access to the water – and now we need to make sure the water is safe."

The Floatilla is a way to bring the paddling community together to rally around a mutual desire for a clean and accessible waterfront. Participants made rally signs that read, "'F' is for fish, not fecal bacteria" and "E.coli is not a tourist attraction," while speakers from the Waterfront Partnership and Chesapeake Bay Foundation led the crowd in chants of "fix the pipes."

The event struck a chord with like-minded paddlers, selling out a month ahead of time and then amassing a waitlist of over a hundred. Baltimore Tree Trust employee Ted Martello joined the event to show support and to distribute potted ferns to fellow paddlers. "This event has huge potential to raise further awareness," said Martello. "Rallying beside other paddlers psyched me up for real!"

Baltimore native Dr. Gregory Pokrywka recalled stories of his dad crabbing and swimming in the Inner Harbor as a young man. "We all win when there is a clean Inner Harbor," says Pokrywka, after paddling in the Floatilla with the WatersEdge kayaking club. Even Baltimore's own world famous trash interceptor, Mr. Trash Wheel, got to join in the festivities, temporarily unmooring from his home in Harbor East to float alongside paddlers, googly eyes and all. Other participants included Chesapeake Kayak Adventures, the Baltimore Dragon Boat Club, Canton Kayak Club, Outdoor Afro, the Baltimore Rowing Club, Blue Water Baltimore, the National Aquarium, Biohabitats, Parks & People Foundation and Baltimore City Recreation and Parks.

The 2nd Annual Floatilla is scheduled for Saturday, June 10th, 2017 and organizers are hoping to get even more paddlers out on the water. "In 2010 a rally in Pittsburgh set a world record for having the most paddlers on the water at a single time," says Lindquist. "If Pittsburgh can do it, why not Baltimore?"

Photo credit: Carolina Lira

Photo credit: Casey Merbler

Professor Trash Wheel's First Day

By Malia Pownall, Chesapeake Conservation Corps

Sidewalk chalk advertisements guide patrons to a table where three young girls are stationed in their Canton neighborhood, determined to make a difference in Baltimore City. Eliza, Maddie and Parker agree that this scorching, sunny afternoon is the perfect day to sell their refreshing lemonade. Friends and neighbors alike come out to support the girls' efforts. A local business, Southern Provisions, even contributes $100 in exchange for a pitcher of their homemade beverage.

After several hours, the girls have made an impressive $534. The thing that sets this lemonade stand apart from others is that the proceeds will help keep hundreds of pounds of trash out of the Baltimore Harbor and the Chesapeake Bay. That is because Eliza, Maddie and Parker have chosen to donate their hard-earned money to fund the construction of Professor Trash Wheel, Baltimore's second solar and hydro-powered trash interceptor.

Since the installation of the world's first Trash Wheel, Baltimore's beloved Mr. Trash Wheel, in May 2014, the sustainably powered trash eating device has collected over a million pounds of trash from the Jones Falls near the Inner Harbor. Thanks to over 600 donations from individuals, businesses and foundations in 36 states and eight countries, Professor Trash Wheel was fully funded and installed at the mouth of the Harris Creek stream in December 2016. She received a warm welcome from over 200 enthusiasts, including newly-elected Mayor Catherine Pugh who thanked supporters including Eliza, Maddie and Parker, as they watched from a nearby bridge. The two Trash Wheels may look alike, but their designs have been adapted to address differences in their environments. While the Jones Falls stream, home to Mr. Trash Wheel, is part urban and part forested, the Harris Creek is completely piped beneath the streets of Baltimore. Clearwater Mills, the company that invented the devices, designed Mr. Trash Wheel for strength, necessary to collect the logs that can come down the Jones Falls. Professor Trash Wheel was built for speed so that she can quickly collect the smaller plastic bottles, bags and cigarettes that find their way into Harris Creek's network of storm drains. Despite operating at different speeds, both wheels efficiently collect tons of trash using only renewable energy.

Trash in waterways is an especially troublesome issue for ports in urban areas. Identifying their potential to help clean the Port of Baltimore, the Maryland Department of Transportation's Port Administration (MPA) became a major contributor to both Trash Wheel projects. "A cleaner and healthier Harbor is so important to the quality of life for all of us who work and live in Baltimore," Shawn Kiernan, Strategic Planner at MPA states, "and that's why we are proud to be a key partner of Mr. Trash Wheel and also Professor Trash Wheel." In September 2016, MPA was honored for their role in bringing the Trash Wheels to life with a prestigious award from the American Association of Port Authorities.

Eliza, Maddie and Parker also acknowledge the benefits that the Trash Wheels provide to the environment. "We have seen trash in the water," Parker states confidently. "Down by the water, where we feed the ducks, sometimes the fishes eat it by mistake and can get sick," Maddie describes. "If we are helping the water, then we are helping the community. We can help the fish live to help us live," adds Eliza.

Though the girls know they cannot swim in the Harbor now, they dream of being able to leap from the docks on a hot summer day. Cleaning up our waterways requires entrepreneurs, philanthropists and dreamers alike. If Eliza, Maddie and Parker are any representation of what matters to children today, then the future of the Baltimore Harbor is in good hands.

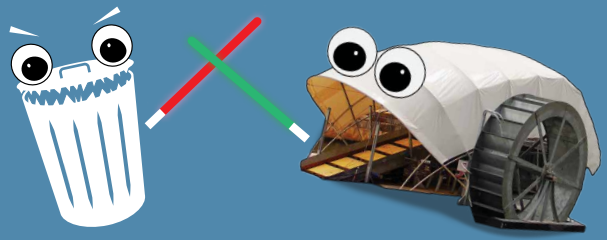
Photo credit: Vic Victoriano

Mr. Trash Wheel by the Numbers

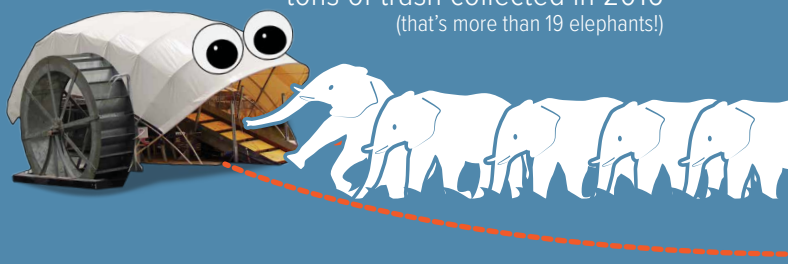
Trash collected by year:

2014	2015	2016
141 tons (beginning in May)	**239 tons**	**163 tons**

181,548
styrofoam containers collected
(that's enough to make a trash monster larger than 2 T-Rexes!)



162.46
tons of trash collected in 2016
(that's more than 19 elephants!)



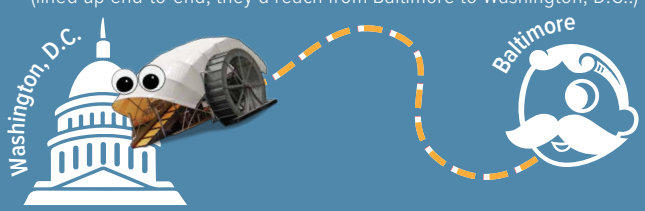
In 2016, Mr. Trash Wheel collected less total trash than in 2015.
Here's a few guesses as to why:

Street Sweeping
The City's implementation of near-citywide street sweeping

Trash Cans
The City's distribution of municipal trash cans to all residents

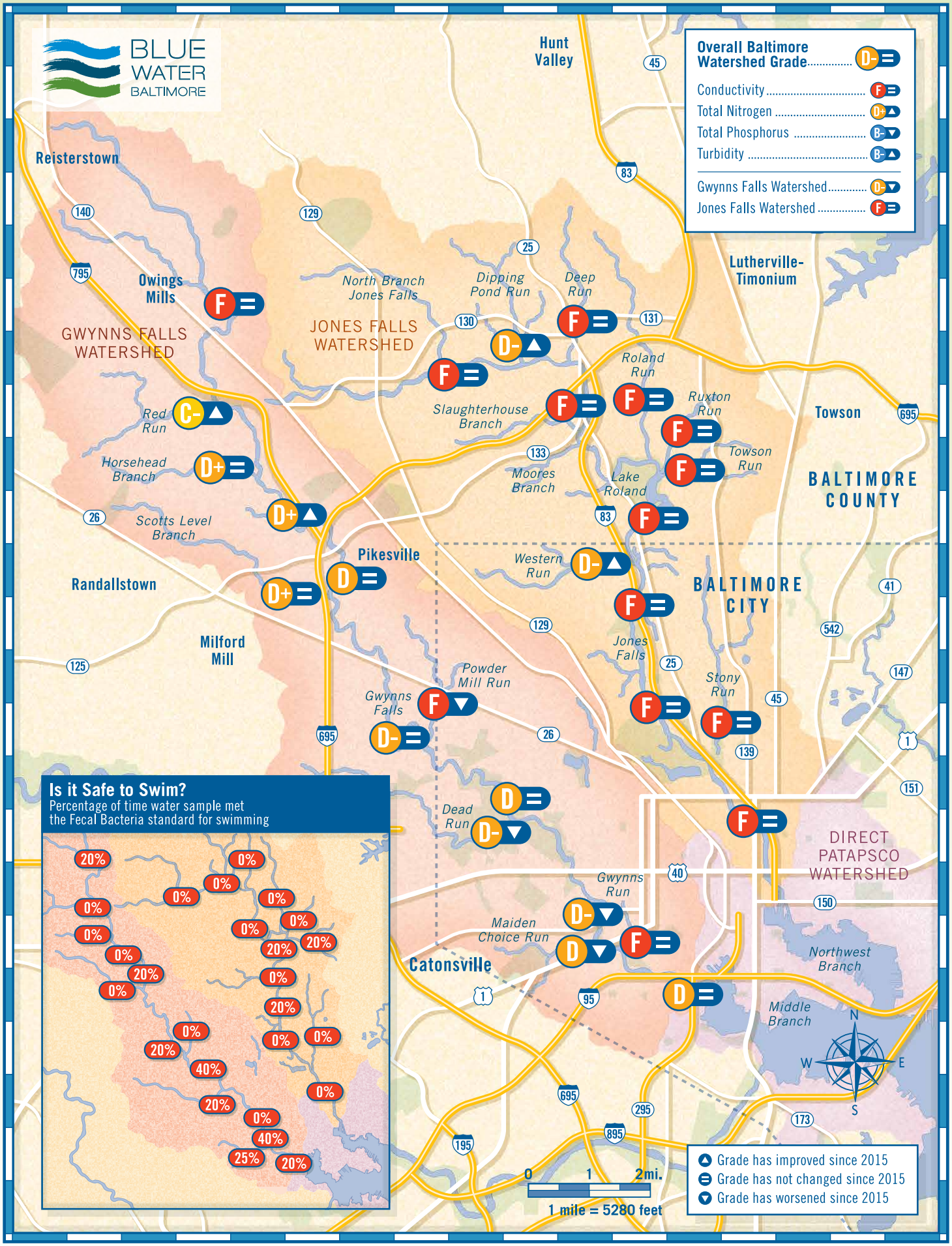
Weather Patterns
Changes in weather patterns resulting in less rain (less trash) and more flash flooding (making it harder to pick up trash)

1,919,600
cigarette butts collected in 2016
(lined up end-to-end, they'd reach from Baltimore to Washington, D.C.!)



2016 Baltimore Stream Health Grades

Based on UMCES EcoCheck protocol



To see the data behind the grades visit *HarborAlert.org*

2016 Tidal Patapsco Health Grades

Based on UMCES EcoCheck protocol

To see the data behind the grades visit *HarborAlert.org*

The Battle Beneath Our Streets

By Adam Lindquist, Waterfront Partnership of Baltimore *and Alice Volpitta,* Blue Water Baltimore

There is a war being waged beneath the streets of Baltimore. On one side, the City's aging network of sewer and stormwater pipes. On the other, an army of volunteers, nonprofits and staff at the Baltimore City Department of Public Works (DPW). This battle for the health of Baltimore's streams and residents is being fought against illegal sewer connections, broken pipes and polluted stormwater runoff.

Volunteers blitz Baltimore outfalls

When it rains, water sweeps across Baltimore's streets, sidewalks and rooftops, collecting trash, animal waste, and chemical pollutants and carries them down storm drains. This runoff does not get cleaned or treated, it flows directly into our streams and Harbor. Additionally, raw sewage from clogged or broken pipes can get into storm drains and end up in our waterways instead of going to a treatment plant. Finding and eliminating these sources of pollution can be difficult but, thanks to an innovative partnership between Blue Water Baltimore, Ridge to Reefs and DPW, Baltimore's streams are being cleaned up, one outfall at a time.

Blue Water Baltimore's Outfall Screening Blitz program teaches volunteers to identify and report different types of pollution discharging from pipes into City waterways. Alongside Blue Water Baltimore staff, volunteers wade into streams and collect water samples to identify potentially contaminated outfalls. In 2016, Blue Water Baltimore trained 72 volunteers and manually surveyed 78 stormwater outfalls along twelve miles of the Stony Run, Western Run, Herring Run and Jones Falls streams. 24 samples were found to contain wash water, eight contained drinking water, and 13 contained sewage.

These findings were reported to DPW where, with the help of cutting-edge technology provided by Ridge to Reefs and funding from the Chesapeake Bay Trust, staff tracked down pollution sources more accurately than ever before. According to a DPW report, the agency carried out 71 pollution investigations resulting in the elimination of 26 sources in 2014. With help from Blue Water Baltimore, those numbers jumped dramatically in 2015, when 244 investigations resulted in the elimination of 90 pollution sources, and a further 103 pollution sources in 2016. By directing DPW to specific outfalls the City is able to reduce water pollution in the most cost effective way, freeing up resources for more pressing infrastructure issues.

DPW goes on the offense

The Baltimore Department of Public Works is becoming proactive in seeking out smaller problems before they become massive headaches and ensuring that repairs address underlying issues, not just their consequences. Such was the case with three large sinkholes that formed in West Baltimore and Mount Vernon when sections of a seven-foot sewer pipe collapsed, carrying away streets and utilities.

In the past, DPW would have done smaller repairs at each location. This time, however, DPW addressed the root of the cause by going both behind and ahead of the sinkholes to do a complete relining of the pipe; essentially building a new pipe within the old one. The project cost close to $20 million, but this fix will prevent more expensive sinkholes from forming in the future.

DPW also works to find sewage sources within the storm drain system. One such investigation led to a surprising discovery. During an east Harbor storm drain survey DPW pinpointed a manhole with a high concentration of bacteria. After extensive investigation and dye testing, an apartment building was identified as having a third of its sewer pipes improperly connected to the storm drain system. Instead of sending sewage into sewer pipes, it was sending sewage into storm drains that flow into the Harbor.

Though it is illegal, property owners often have no idea that their sewer pipes have been connected to the wrong system. In this case, DPW was able to work with the property owner to make repairs and correct the problem, removing one more major source of pollution from the Baltimore Harbor.

The campaign to eliminate pollution from Baltimore's streams and Harbor is well underway. With public and private partners working side-by- side in the trenches, sinkholes and streams of our City, the shift to a proactive strategy is having an impact. While there's still much work to be done, the tide in the battle for clean water is finally turning.

Photo credit: Jeff Hager/ABC2 News

Photo credit:Neil Dampier

From Toxic Tides to Stingray High-Fives

By Charmaine Dahlenburg, National Aquarium

They call it a "pistachio tide." When temperatures drop fast enough at night, water from the depths of Baltimore's Harbor surges to the surface, bringing with it sulfur that reacts with the sunlight by day to create an alarming neon green color. This past Labor Day Weekend, visitors from all over poured into downtown Baltimore only to be greeted by just such a display of glowing green waters, with a sulfuric rotten-egg stench to match. The phenomenon was so dramatic it made the news, with the media looking to environmental experts for answers.

Thanks to continuous water quality monitoring equipment installed at the Inner Harbor in the Spring of 2016, the National Aquarium was able to respond with sound science. The sensors – known as sondes – gather data on water conditions around the Aquarium's waterfront campus. Every 15 minutes, around the clock, core water quality parameters are recorded and transmitted to the Maryland Department of Natural Resources' Eyes on the Bay website. This data, along with that collected by Blue Water Baltimore for this report card, allows researchers to document significant water events as they occur, including their intensity, duration and impact on local wildlife.

In the case of the momentous Labor Day Weekend "Pistachio Tide" information collected from the sondes indicated that intense algal blooming 15 times above the average at the end of August, combined with the "thermal inversion" of rising bottom water brought on by the dramatic temperature drop, was the cause of a significant fish kill in the Inner Harbor. A massive die-off of algae that ensued consumed much of the oxygen needed to sustain life, leading to a "dead zone" lasting 10 consecutive days, with dead fish reported along the Canton waterfront. This series of events was no accident. Pollution, created by humans, is carried off of the land by rain and into the Harbor. This pollution causes nitrogen and phosphorus levels in the water to raise, which in turn can lead to these harmful algal blooms.

As water quality recovered during mid-September, common visitors, including striped bass, menhaden and blue crabs, returned, offering a clear reminder of how our native aquatic populations depend on water quality for survival. The most unique visitors to the Inner Harbor in 2016 were a community of cownose stingrays, most commonly found in saltier waters of the Chesapeake Bay. It was surprising and delightful to see their pectoral fins break the surface as they explored the City.

It is believed that they were likely females being pursued by males as part of a mating behavior.They were spotted periodically throughout the summer, peaking in June. Water quality reported by the sondes showed salinity and dissolved oxygen well within a comfortable range for the rays, encouraging an extended visit. The cownose ray was the 18th animal to be photo documented by the National Aquarium in 2016 as part of the Maryland Biodiversity Project.

The National Aquarium and partners continue to conduct scientific research in an effort to better understand life in the Harbor and how water quality is the driving factor for diversity. Understanding the science behind major water quality events is a critical step in learning how to lessen their impact on wildlife. All watershed occupants, including businesses and community residents, play a key role in protecting the Harbor. The National Aquarium invites the public to learn more about their work to restore the Harbor on their website, aqua.org/care.

Pumpkinseed fish, photo credit: Alice Volpitta

American Shad, photo credit: Charmaine Dahlenburg

Blue crab, photo credit: Alice Volpitta

Cownose rays, photo credit: Tom Giebel

Photo credit: New Lens

Patterson Park Turns Green Alley Blue

By Malia Pownall, Chesapeake Conservation Corps

> ***Alleys are an opportunity for community building and beautification***

A discarded plastic grocery bag skids along the drab, gray concrete. It skips over a pile of illegally dumped trash bags whose sides have been gnawed by rats, exposing the contents that have been strewed across the ground. Though the sun is out and the weather is warm, kids' toys remain motionless in the fenced-in backyards. Another neglected alley, another forgotten space.

Too often alleys become havens for trash, pests and crime, but throughout Baltimore more of these lost corridors are coming back to life thanks to Healthy Harbor's Alley Makeover program. Robbyn Lewis, an active community leader and recently elected State Delegate for District 46, resides on a Patterson Park alley between North Curley Street and North Potomac Avenue. A shared space among forty-eight homes, the residents had made headway in beautifying their outdoor living space with funding from a Baltimore Community Foundation grant that paid for recycling bins, street trees and alley lights. They called it their "green alley" and it was a great start, but they wanted to do more.

Lewis and her neighbors teamed up with Leanna Wetmore, Community Coordinator for the Healthy Harbor Initiative, led by the Waterfront Partnership of Baltimore. "I work in the neighborhoods of East Baltimore that sit atop Harris Creek," explains Wetmore. "It's a historic stream that is now completely piped, but it still flows beneath the streets of seventeen communities."

Residents elected to turn their green alley blue as a visual reminder of the invisible stream running under their feet and of their community's connection to the Baltimore Harbor. "It was crazy, but we've done crazier things," Lewis says. "We believed we could live in this neighborhood and make it great – that was crazy too, but we did it." The neighbors proposed to paint the entire alley—something that neither Wetmore, nor Baltimore City, had ever seen before. For the 4,800 square foot alley, this was no small feat.

By partnering with Healthy Harbor, residents gained access to funding for alley beautification that addressed trash and litter issues and transformed the space with water-themed artwork. On June 18th, 2016, eighty volunteers came out to participate including kids, owners, renters and neighbors. To prep the alley, volunteers swept, power-washed and cleaned. Local artists Adam Stab, Bridget Cimino and John Collins collaborated to paint the many murals it would take to cover the entire alley. The alley surface itself was turned into a flowing stream meandering around manholes, utilities and one fierce looking turtle and ending on a beach scene.

"The following morning" Lewis said, "I went out back and just sat in my garden with the gate open. I'd never done that before." She hopes that the project will cause a ripple effect throughout the community. "Alleys are an opportunity for community building and beautification, for connection and for hope," said Wetmore. "When neighbors work together to makeover their alleys, they make a lasting change that reaches beyond their yards by inspiring surrounding communities and reducing the amount of trash that ends up in the Baltimore Harbor."

The Alley Makeover project is funded in part by the Rauch Foundation, the Baltimore Community Foundation and the Clayton Baker Trust.

North Avenue's Leafy Legends

By Alice Volpitta Blue Water Baltimore

North Avenue had trees once – trees so massive they arched over the street and touched over the median, until the City came and cut the trees down, or so the legend of Baltimore's tree canopy goes.

Though the belief is widely held among Baltimore residents, the myth of a mass cull of Baltimore's trees is just that. The story goes that a dwindling tax base following the 1968 riots led to the decision to cut down most of the City's street trees rather than pay for their upkeep. The truth, according to Gary Letterton of the Baltimore City Department of Recreation and Parks Forestry Division, is far less scandalous and a lot more mundane. "During the 60's and 70's, Dutch elm disease was rampant and cities were rushing to keep up with dead elms; they were burning elms on pyres to stop the spread of the disease. I believe that's where the tales of mass tree cuttings came from."

Whatever the reason, the result is the same – major thoroughfares like North Avenue that, as recently as 1970, were lined with trees are now all asphalt and concrete. But thanks to a street tree reforestation project funded by the Maryland Department of Natural Resources, Blue Water Baltimore is doing its part to make sure our City returns to its former leafy glory.

Already, almost 16,000 square feet of concrete surface has been removed and 370 trees planted along North Avenue and in the Druid Heights and Mondawmin neighborhoods, from Linden to Warwick Avenues. The next phase of the project will see another 180 trees planted along North Avenue all the way to Hilton Street. "North Avenue is the main artery running through the City, but we really want to be able to create green veins into the surrounding neighborhoods," says Elise Victoria, Field Operations Manager at Blue Water Baltimore. In total, nine neighborhoods and 450 homes have been directly "greened" by this project so far.

The benefits are hard to overstate. Planting trees helps to mitigate the "heat island" effect, in which urban cities tend to be hotter than surrounding areas because they are covered in so much hard, impervious surface. The trees also act as a filter for rain that would otherwise carry pollution into nearby storm drains and out to Baltimore's streams and Harbor. Air quality, too, is improved in the neighborhoods that are reforested, which not only lowers the City's carbon footprint but also provides health benefits for its residents.

"We bought a weed whacker so we can keep our two pits neat and cut," says Butch Johnson, General Manager of the Standard Auto shop on North Avenue. "We even keep the pit at the bus stop clean too!" Like Johnson, other residents on North Avenue are beginning to reap the benefits of the new trees but are quick to point out that a maintenance plan will be key to the project's long-term success. "They look good, but only if they are free of weeds," says Johnson. "You need a plan to keep them neat."

In response, Blue Water Baltimore has launched a new program that is focused primarily on long-term maintenance. Sustainability is key to the whole endeavor. When concrete is removed, large chunks are recycled locally, and the tree pits have been resupplied with organic topsoil from local vendors. This process should help make the tale of Baltimore's trees one that lasts, rather than a legend about all that was lost.

Photo credit: Blue Water Baltimore

WATERFRONT PARTNERSHIP OF BALTIMORE

HealthyHarbor
A Waterfront Partnership Initiative

BLUE WATER BALTIMORE

BALTIMORE HARBOR WATERKEEPER®
A PROGRAM OF BLUE WATER BALTIMORE

Above: Residents of Darley Park came out for a paint day while artist William Judge installed Heron with Fish. This facade is one of a series of nine storage garages that serve as a backdrop for a larger park revitalization project to come. Photo credit: Leanna Wetmore

Left: Artist Bridget Cimino's large scale mural depicts a vibrant bay habitat near Baltimore's Northeast market. The C.A.R.E community had a contest to name the birds featured in the mural and chose Majesty and Serenity. Photo credit: Adam Lindquist

Cover photo: Skyview Photo Students at The Crossroads School

Editor in chief: Adam Lindquist, Director, Healthy Harbor Initiative

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