

Fiscal Year Report

2023-2024



The Heal Our Waterways Program is a City of Wilmington initiative to improve water quality in Bradley Creek and Hewletts Creek through nature-based stormwater solutions. This report displays the work that was done from July 2023 - June 2024 (FY24) to move towards that goal.

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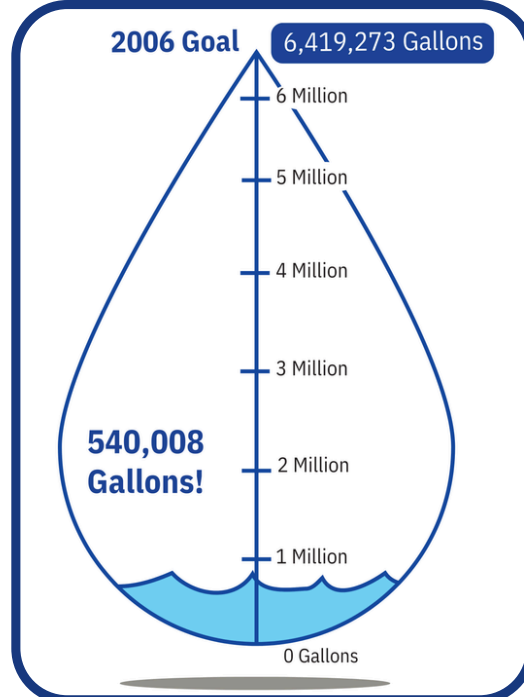
HEAL OUR WATERWAYS



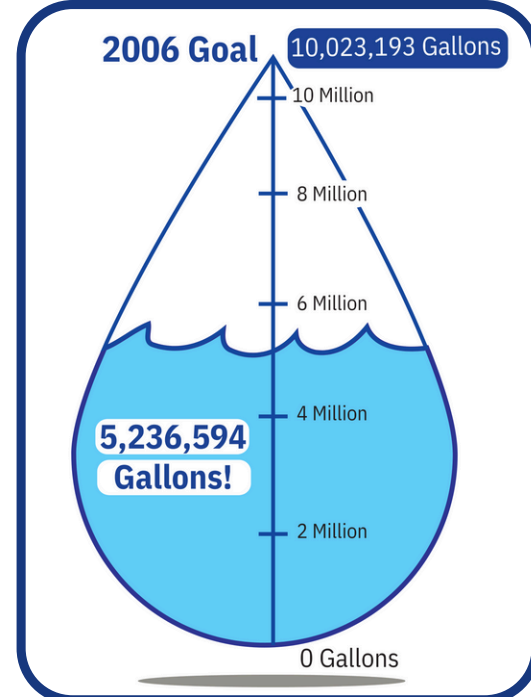
Year In Review

Fiscal Year 2023-2024

The Heal Our Waterways Program is a City-led initiative to reduce the volume of stormwater runoff entering Bradley and Hewletts Creeks and improve water quality.



Bradley Creek Total Runoff Reduced Since 2010



Hewletts Creek Total Runoff Reduced Since 2010



RAIN BARRELS INSTALLED



7 RAIN GARDENS PLANTED



COMMUNITY MEMBERS INSTALLED CREEK-FRIENDLY PRACTICES



2 GRANT PARTNERSHIPS IN BRADLEY CREEK



83,273

GALLONS OF STORMWATER TREATED



TREES PLANTED

Bradley Creek

12 PROJECTS INSTALLED

77,764 GALLONS TREATED

Hewletts Creek

30 PROJECTS INSTALLED

5,509 GALLONS TREATED

About The Program

What is Heal Our Waterways?

The Heal Our Waterways (HOW) Program is a City of Wilmington program to implement the voluntary Bradley and Hewletts Creeks Watershed Restoration Plan that was adopted by City Council on September 4th, 2012. Guided by the plan, the HOW Program works to install and encourage nature-based Stormwater Control Measures (SCMs) that reduce the volume of stormwater runoff transporting pollutants, namely bacteria, to Bradley Creek and Hewletts Creek. Hewletts Creek and shellfishing waters influenced by Bradley Creek are listed on the Clean Water Act's 303(d) impaired waterways list for not meeting the established water quality standards for safe shellfish harvest. Banks Channel, influenced by Bradley Creek, has also experienced swimming advisories from high bacteria levels.

Mission

Striving to heal Bradley & Hewletts Creeks and soak in polluted stormwater runoff through community engagement and simple solutions.

Goals

01

Restore shellfish and swimming water quality impaired by unacceptable levels of bacteria in Bradley Creek and Hewletts Creek

02

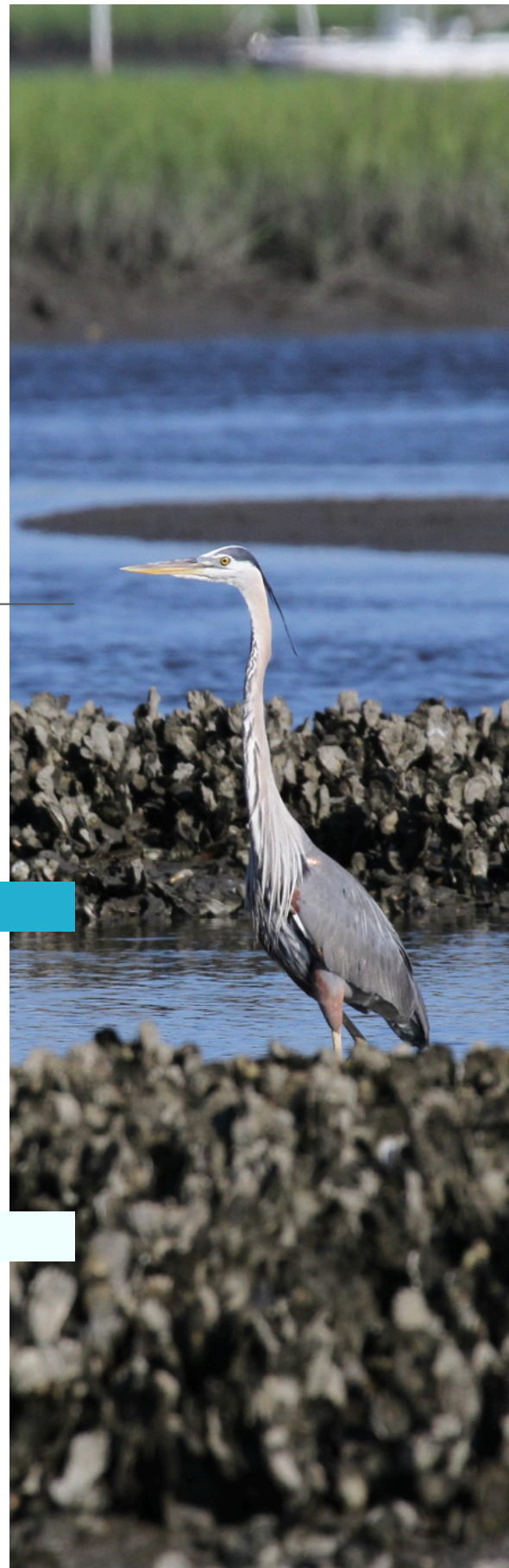
Reduce the transport of bacteria from land to water by reducing the volume of stormwater runoff

03

Form and maintain local partnerships to carry out the watershed restoration plan and install nature-based stormwater solutions

04

Connect with the community through existing and new outreach programs that encourage nature-based stormwater solutions



Problems - Why?

Stormwater Runoff Transports Pollution

The Bradley and Hewletts Creeks Watershed Restoration Plan cites polluted stormwater runoff as the main driver behind high bacteria levels in both creeks. As rain flows over impervious, or hard, surfaces like parking lots, rooftops, and driveways, it picks up pollutants, like bacteria, and washes them into waterways. Stormwater runoff does not get treated after it flows into storm drains and ditches – it flows directly to local waterways.

Impervious Surfaces

As more impervious surfaces (houses, roads, driveways, parking lots, etc.) replace natural spaces, there are fewer opportunities for rain to soak in and more stormwater runoff is generated.

Pet Waste Pollutes

Pet waste can contain **23 million bacteria** in a single gram, making it a major contributor of bacteria to the environment. Stormwater runoff easily washes bacteria from unmanaged pet waste to local waterways.

Water Quantity vs Water Quality

Traditional stormwater treatment practices (wet and dry ponds) focus on managing flooding over water quality. Any "clean" runoff is at risk of recontamination after it is released back onto the landscape.



Solutions - HOW?



Nature-Based Stormwater Solutions Reduce Runoff

The HOW Program actively promotes and installs nature-based stormwater solutions to reduce the total volume of stormwater runoff that can wash pollutants into Bradley Creek, Hewletts Creek, and downstream shellfish waters in the Intracoastal Waterway.



Slow it down.

Practices like rain barrels and cisterns help to slow down and capture the "first flush" of stormwater runoff flowing from downspouts and rooftops.



Spread it out.

Rerouting downspouts into yards or practices such as rain gardens, bioretention areas, and wetlands where runoff can spread out helps to make infiltration easier, reduces erosion, and treats pollution.



Soak it in.

Installing practices that infiltrate stormwater runoff is the best method to prevent it from washing pollutants into local waterways. Bioretention, permeable materials, drainage swales, and tree plantings are all great examples.

Program Overview



HOW Does the Heal Our Waterways Program Help?

The HOW Program actively works to achieve the goals within the Bradley and Hewletts Creeks Watershed Restoration Plan by funding, installing, and promoting nature-based Stormwater Control Measures (SCMs), also referred to as "stormwater solutions". This happens both within the community and internally at the City of Wilmington through interdepartmental partnerships.

The HOW Program provides funds and educational resources to help incentivize project installations and educate local stakeholders about stormwater solutions. More information about the programs below can be found at www.healourwaterways.org.



Funding & Installation

The HOW Program looks for opportunities to install projects on City-owned properties where feasible and contribute matching funds toward grant projects for additional volume reduction. The HOW Program also partners with New Hanover Soil and Water Conservation District to install rain gardens, cisterns, wetlands, and tree plantings.



Community Engagement

The HOW Program is also focused on empowering the community to implement stormwater solutions on private properties. Hosting workshops, giving talks, participating in events, and providing resources through an educational website are just some of the ways that the HOW Program engages with the community throughout the year.





The Heal Our Waterways Program offers raffles for residents to win rain barrels at events, such as the Earth Day Festival and Farmer's Markets.

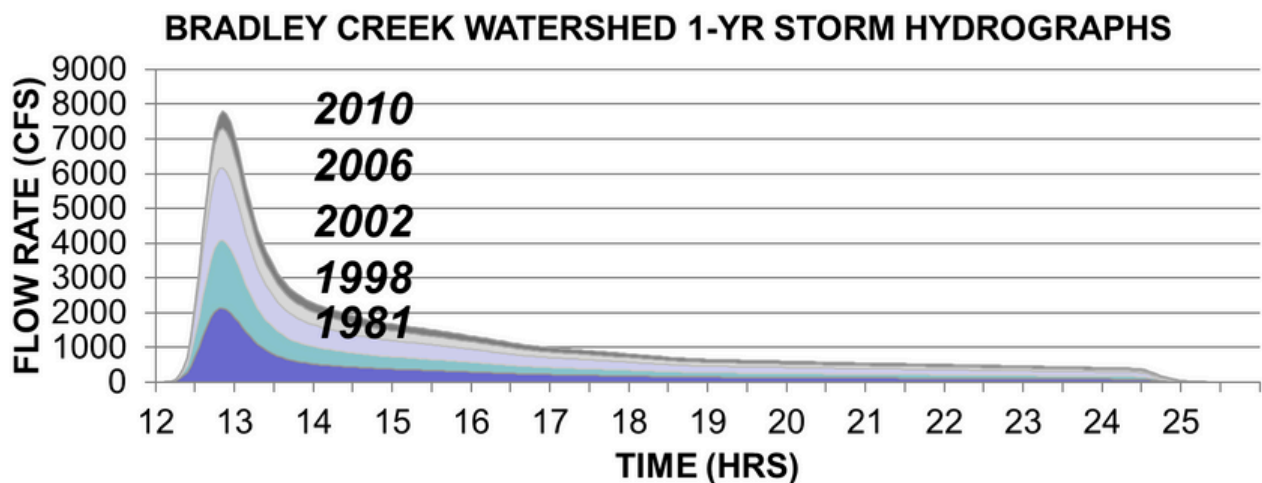


Measuring Plan Progress

Using Hydrographs To Measure Stormwater Improvements

The goals within the Bradley and Hewletts Watershed Restoration Plan are based on the hydrographs of both creeks. A hydrograph shows how quickly and how much stormwater runoff flows over the land and enters the receiving waterbody. As more impervious surfaces cover an area, the hydrograph curve spikes higher as more stormwater runoff accumulates in a short amount of time. The higher and steeper the curve, the more stormwater runoff is quickly flowing into local waterways. The main way to “flatten the curve” of the hydrograph is to create more spaces for stormwater to slow down and soak in. Nature-based stormwater solutions can help achieve these goals.

The original hydrographs are based on the coverage of impervious surfaces from 2010, during the development of the restoration plan. This established a baseline volume of stormwater runoff entering both creeks. From there, the goal is to reduce the baseline volume of stormwater runoff to the flow rates seen in years when water quality supported open shellfish harvest and swimming areas. The volume of stormwater runoff was lower in those years as there were more areas for stormwater to soak in. The overall volume reduction needed was then broken into smaller year milestones – i.e., the total volume of stormwater runoff seen in 2006, 2002, etc. The Bradley Creek hydrograph below shows this breakdown.



Currently, the HOW Program is working to reduce the 2010 baseline stormwater volume to the levels that were flowing into Bradley Creek and Hewletts Creek in 2006, when there were fewer impervious surfaces. Overall progress towards that goal is included below.

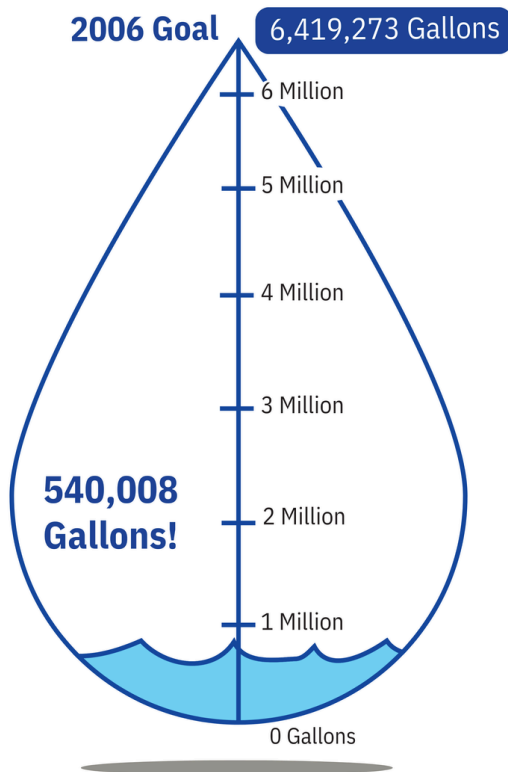
Overall Progress Towards 2006 Hydrograph Reduction Goals

Bradley Creek

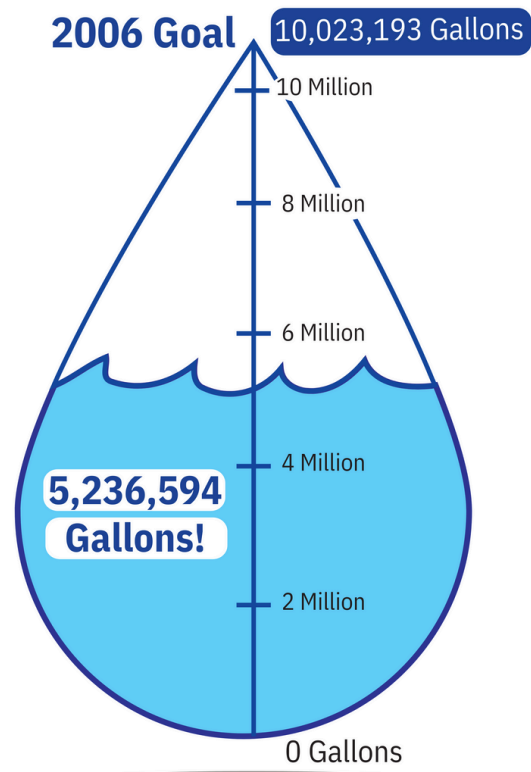
- 2010 Baseline Volume: 105,444,716 Gallons
- 2006 Reduction Goal: 99,025,889 Gallons
- Reduction Needed To Goal: 6,419,273 Gallons
- **Volume Reduced So Far: 540,008 Gallons**
- **Remaining To Goal: 5,879,265 Gallons**

Hewletts Creek

- 2010 Baseline Volume: 158,883,898 Gallons
- 2006 Reduction Goal: 148,861,404 Gallons
- Reduction Needed to Goal: 10,023,193 Gallons
- **Volume Reduced So Far: 5,236,594 Gallons**
- **Remaining To Goal: 4,786,600 Gallons**



Bradley Creek Total Runoff Reduced Since 2010



Hewletts Creek Total Runoff Reduced Since 2010

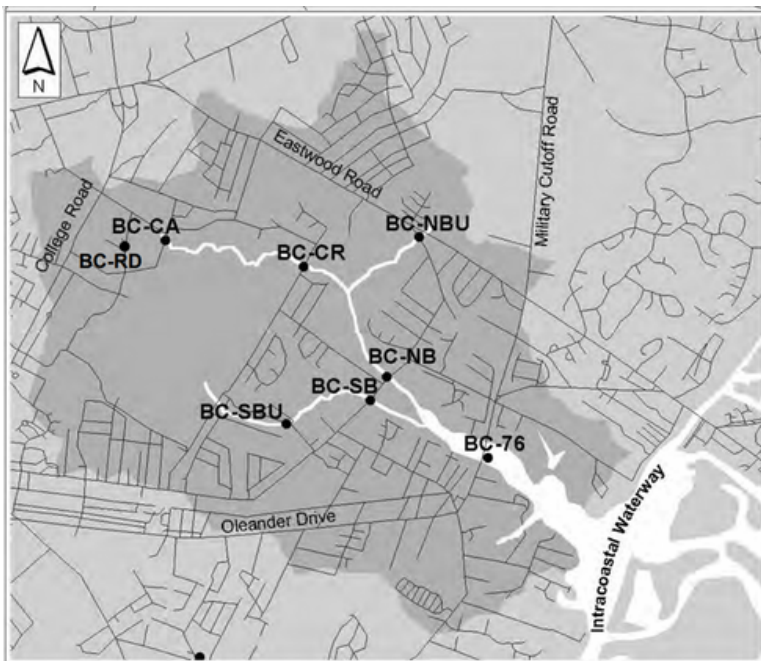
Monitoring Water Quality Trends

While the reduction of stormwater runoff is the main metric of the watershed restoration plan, water quality is also important to measure. In-stream bacteria levels will determine if swimming advisories and shellfish harvest closures continue to happen. While improvements are hard to see on a short-term basis, long-term water quality trends can highlight areas where projects are successful or indicate "hot spot" locations that require more attention. The Aquatic Ecology Lab at University of North Carolina-Wilmington monitors water quality in creeks across the City of Wilmington to help track these trends.



The maps below show the locations of monitoring stations in the Bradley Creek and Hewletts Creek Watersheds. The City of Wilmington works with UNCW to determine which stations to monitor based on available funding and priorities. Note that not all stations on these maps are currently being monitored.

Bradley Creek Stations

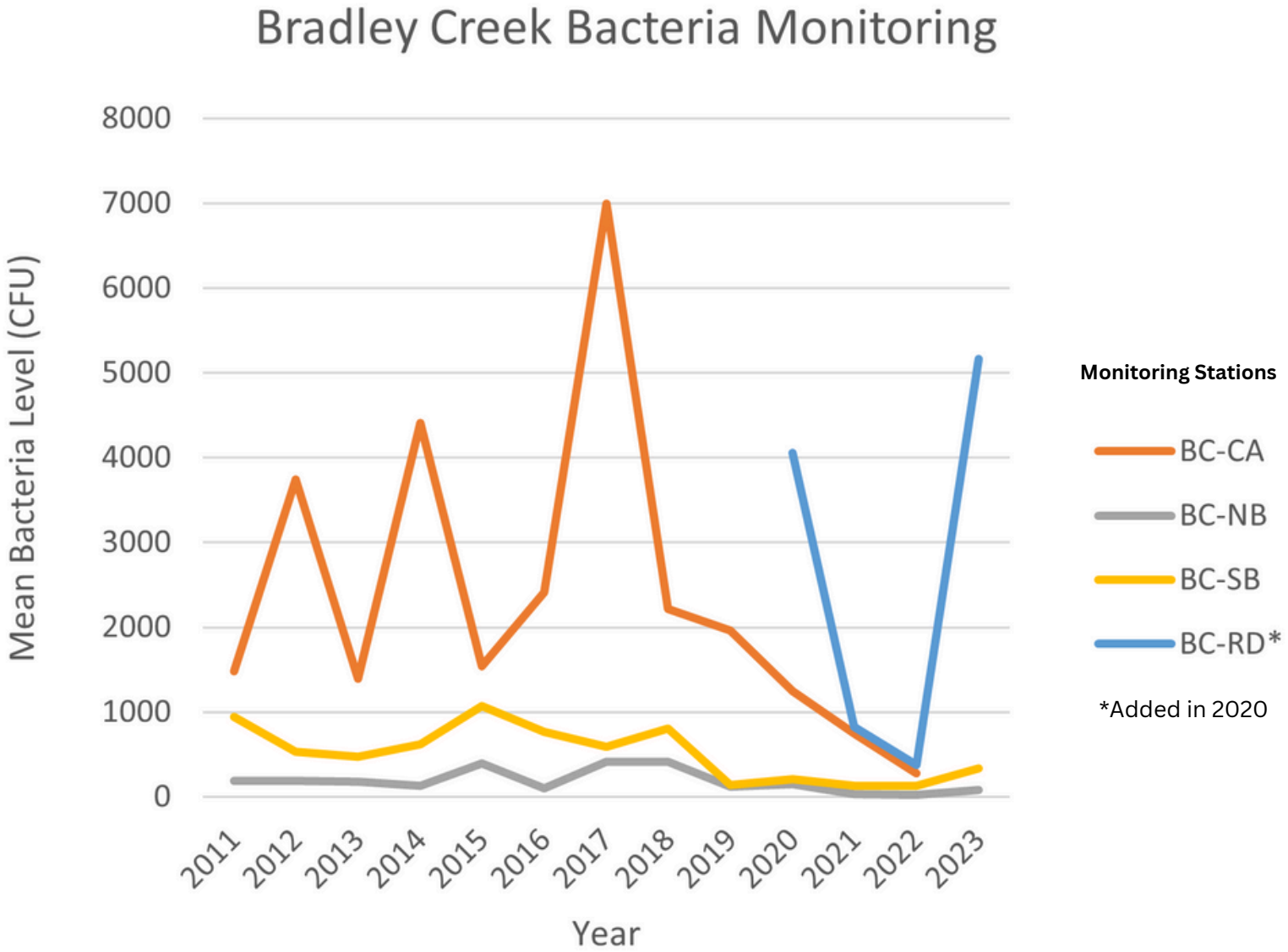


Hewletts Creek Stations



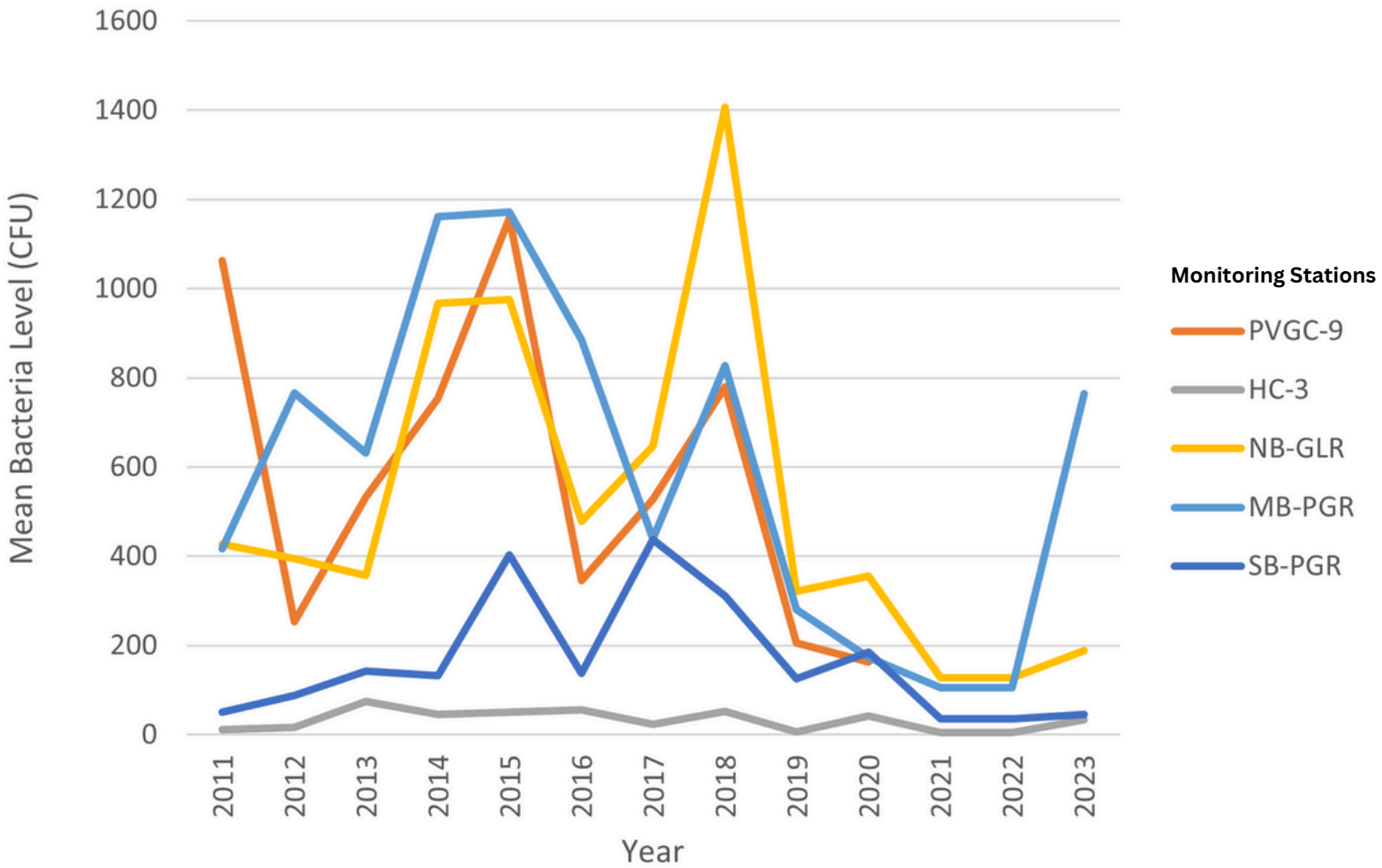
The 2023 monitoring report showed some upticks in bacteria levels. Researchers noted that the Bradley Creek BC-RD monitoring site had greater amounts of uncollected pet waste nearby, which could have potentially contributed to the increase. MB-PGR in Hewletts Creek is downstream of many neighborhoods, a golf course, veterinary hospital, and businesses, so continued outreach and engagement in this area will be important. These trends are shown in the graphs on pages 11 and 12.

Bradley Creek Bacteria Trends



Hewletts Creek Bacteria Trends

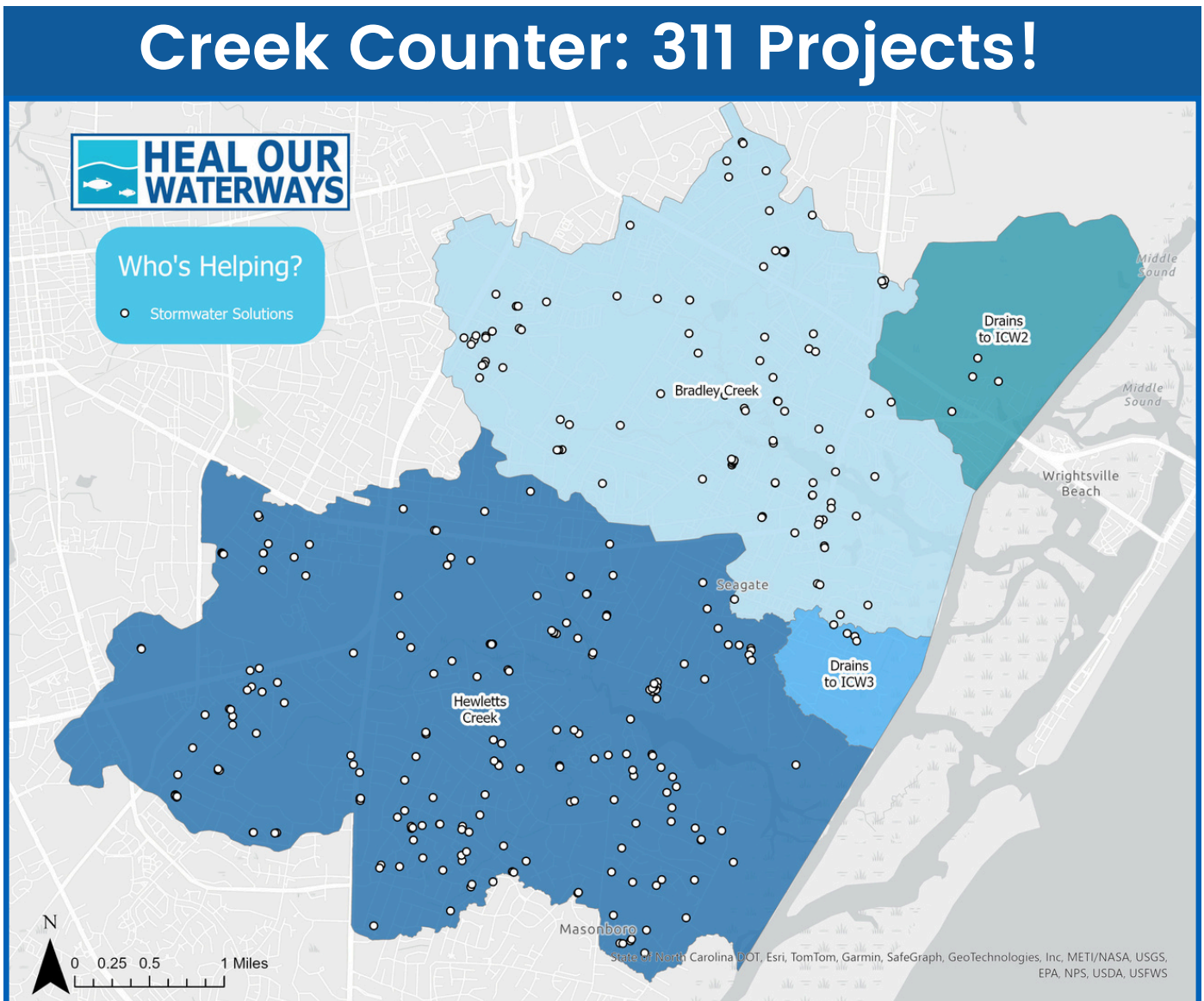
Hewletts Creek Bacteria Monitoring



Tracking Nature-Based Stormwater Solutions

The HOW Program tracks the number of projects that have been installed by stakeholders within the Bradley Creek, Hewletts Creek, and areas that drain directly to the Intracoastal Waterway. These projects consist of nature-based stormwater solutions that work to slow down and soak in stormwater runoff. The volume that each project provides is recorded and counted towards achieving the 2006 hydrograph reduction goals (provided on page 9). Projects often range in size and treatment capabilities, so tracking the total number of projects shows the commitment from all stakeholders that are working to improve water quality.

The map below shows all projects that have been installed and count towards the volume reduction goals within the watershed restoration plan. 311 total projects have been installed as of June 30, 2024.





The HOW Program continues to work with local partners to install nature-based stormwater solutions within the community. Pictured above is a tree planting collaboration with Cape Fear Public Utility Authority at a well site in the Hewletts Creek Watershed.

Pictured below is a before and after of a bioretention cell grant project in the Bradley Creek Watershed that was coordinated by NC State University and supported by the HOW Program.



FY24 Results

The following section provides details for the projects and total volume reduction that were achieved from July 1, 2023 - June 30, 2024. These results are included in the overall summaries that were provided in the previous sections.

Stormwater runoff volume reduction is the main metric used in the Bradley and Hewletts Creeks Watershed Restoration Plan as it is the main vehicle that transports bacteria to both waterways.

The number and breakdown of installed projects begins on page 18.

Volume Reduction

To help encourage progress towards the stormwater volume reduction goals identified within the Bradley and Hewletts Creeks Watershed Restoration Plan, the City of Wilmington's Strategic Plan includes annual performance measures (goals) to meet for both watersheds:

- Bradley Creek -- Reduce 0.15 acre feet, or 48,878 gallons, of stormwater annually
- Hewletts Creek -- Reduce 1.0 acre feet, or 325,851 gallons, of stormwater annually

These performance measures were estimated and established before having consistent volume reduction data, so there have been some challenges with reaching the annual goal for Hewletts Creek over the years. The HOW Program is working to re-evaluate the goal to make sure that the performance measures within the Strategic Plan are attainable.

The summary of progress made in FY24 for both watersheds is in the table below. The specific projects contributing to the totals are listed at the end of this report.

FY24 Progress Towards Strategic Plan Performance Measures

Watershed	Achieved (Gallons)	Goal (Gallons)	Achieved (Acre Feet)	Goal (Acre Feet)	Number of Projects	Percent Achieved
Bradley Creek	77,764	48,878	0.239	0.050	12	117.53%
Hewletts Creek	5,509	325,851	0.017	1.000	30	1.69%



The HOW Program contracts with New Hanover Soil and Water Conservation District to install nature-based stormwater solutions, such as these cisterns and rain gardens that were installed in FY24.



Projects Installed

Since some projects offer only a small amount of volume reduction, it is important to review the total number of projects to truly gauge the reach of and participation in the HOW Program's progress. Not all projects were funded by the HOW Program, but all were still located within the Bradley Creek or Hewletts Creek Watersheds. Several property owners reported self-installed SCMs, including rain barrels purchased through the monthly rain barrel sale. Some highlights from FY24 include (but are not limited to):



**TREES
PLANTED**



**RAIN BARRELS
INSTALLED**



**RAIN GARDENS
PLANTED**

In total, 12 projects were installed in the Bradley Creek Watershed and 30 projects were installed in the Hewletts Creek Watershed. The 22 trees are included in the summary as a single project because they were all planted in the same location.



Project Types



Projects counted towards the HOW Program goals can be installed by any resident, business, or agency, as long as the project falls within the boundaries of the restoration plan. The funding sources and agencies that installed projects in FY24 include:

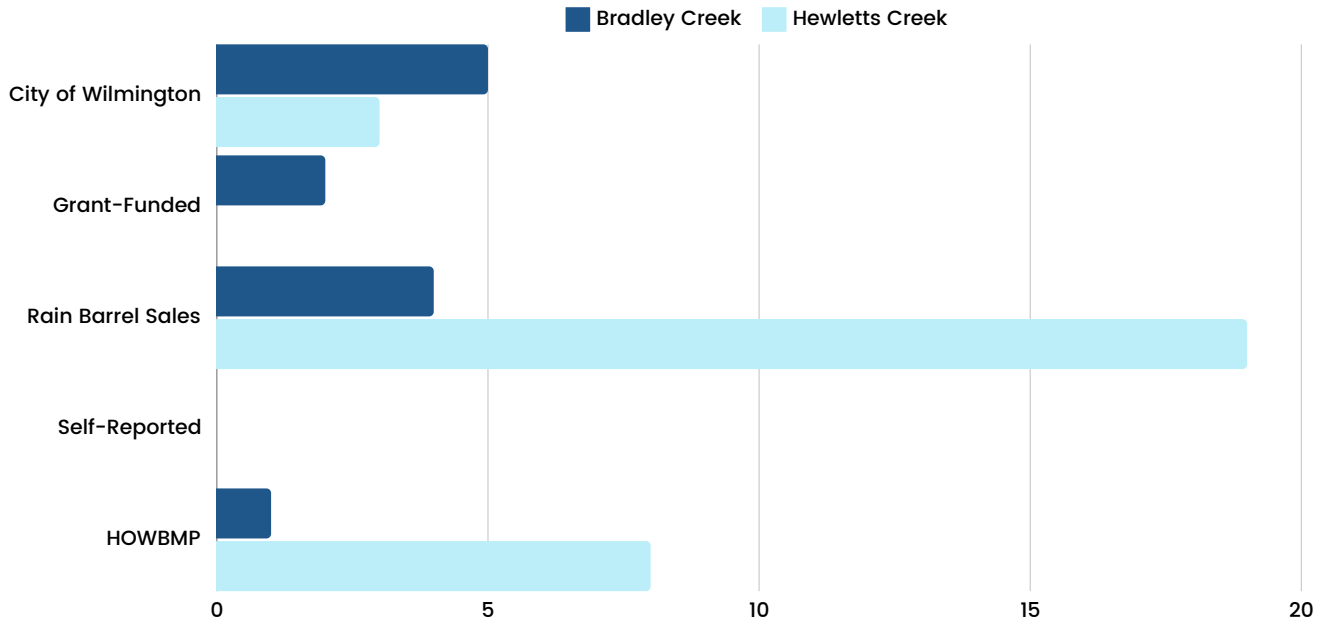
- **City of Wilmington** -- any projects that were funded by the City of Wilmington are grouped into this category, with exception of the City-funded HOWBMP Program.
- **Grant-funded** -- any projects that were installed as part of a grant partnership are included in this category. Currently, the North Carolina Coastal Federation, UNCW, and the HOW Program 319 grant was the only one that installed a project this fiscal year.
- **Rain Barrel Sales** -- New Hanover Soil and Water Conservation District holds monthly rain barrel sales. Data is collected during every sale to track where rain barrels are being installed. This category includes all sales that indicated either Bradley Creek or Hewletts Creek as the final location for the rain barrels.
- **Self-Reported** -- Property owners may also install SCMs using their own funds and resources. This category includes any projects that were reported using the "Take Action" form through the HOW Program website, were identified during site visits, or were otherwise shared with the HOW Program.
- **HOWBMP** -- Any projects that were installed through the "HOWBMP" contract with New Hanover Soil and Water Conservation District are reported in this category.

Bradley Creek
12 PROJECTS INSTALLED
77,764 GALLONS TREATED

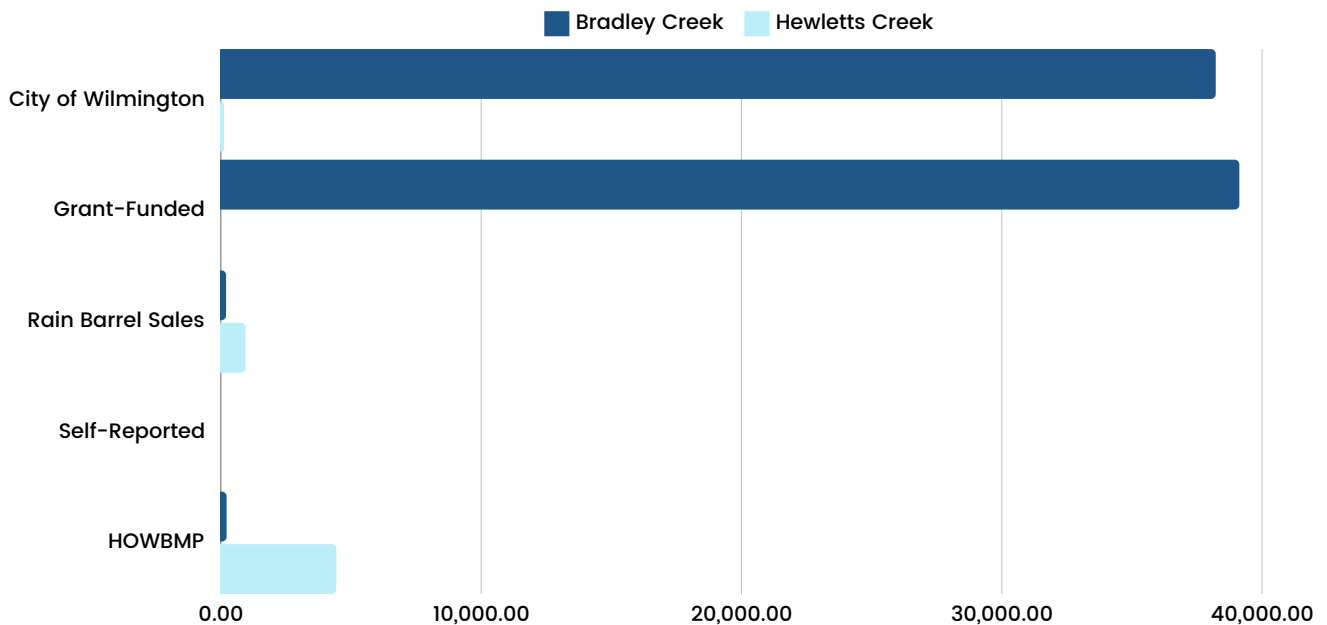
Hewletts Creek
30 PROJECTS INSTALLED
5,509 GALLONS TREATED

Project Summaries

FY24 Number of Projects Installed Per Funding Source



FY24 Gallons of Stormwater Reduced Per Funding Source



Bradley Creek FY24 Projects

Watershed	Funding Source	Property Type	SCM Type	Gallons
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	50
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	50
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	50
Bradley Creek	City of Wilmington	Municipal	Stream Restoration	38018.44
Bradley Creek	City of Wilmington	Residential	Rain Barrel Raffle	50.00
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Garden	50.00
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Bradley Creek	HOWBMP	Residential	Cistern	220.00
Bradley Creek	Grant-funded	Commercial	Bioretention Area	19226.17
Bradley Creek	Grant-funded	Commercial	Wetland	19899.46

Hewletts Creek FY24 Projects

Watershed	Funding Source	Property Type	SCM Type	Gallons
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50.00
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50.00
Hewletts Creek	City of Wilmington	CFPUA	Trees	24.09
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50.00
Hewletts Creek	HOWBMP	Residential	Cistern	220.00
Hewletts Creek	HOWBMP	Residential	Cistern	220.00
Hewletts Creek	HOWBMP	Residential	Rain Garden	748.10
Hewletts Creek	HOWBMP	Residential	Rain Garden	748.10
Hewletts Creek	HOWBMP	Residential	Rain Garden	748.10
Hewletts Creek	HOWBMP	Residential	Rain Garden	329.16
Hewletts Creek	HOWBMP	Residential	Rain Garden	1084.75
Hewletts Creek	HOWBMP	Residential	Rain Garden	336.65

Thank You

We can't do this work without you!

We look forward to continued progress towards water quality improvements. Every small change makes a difference and these changes would not be possible without a supportive community. Visit our website or social media to learn more about the projects within this report and how to get involved!



Heal Our Waterways



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