Fiscal Year Report

2022-2023

HEAL OUR WATERWAYS

The Heal Our Waterways Program is a City-led initiative to improve water quality in Bradley Creek and Hewletts Creek by installing nature-based Stormwater Control Measures. This report displays the work that was done from June 2022 - July 2023 (FY23) to move towards that goal.

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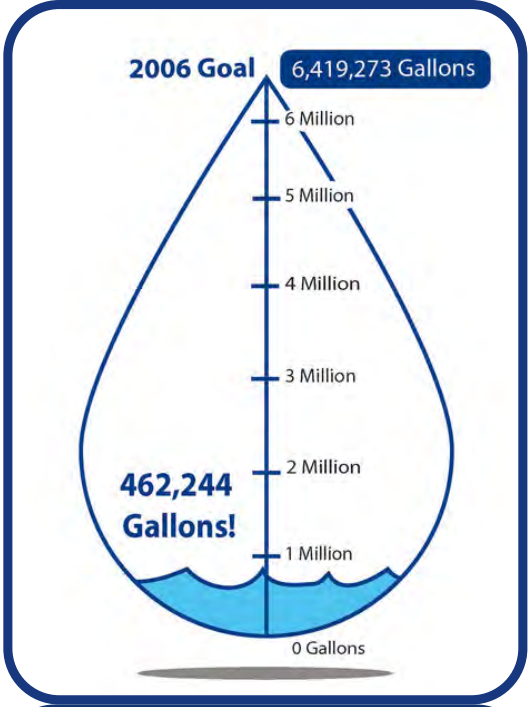
HEAL OUR WATERWAYS

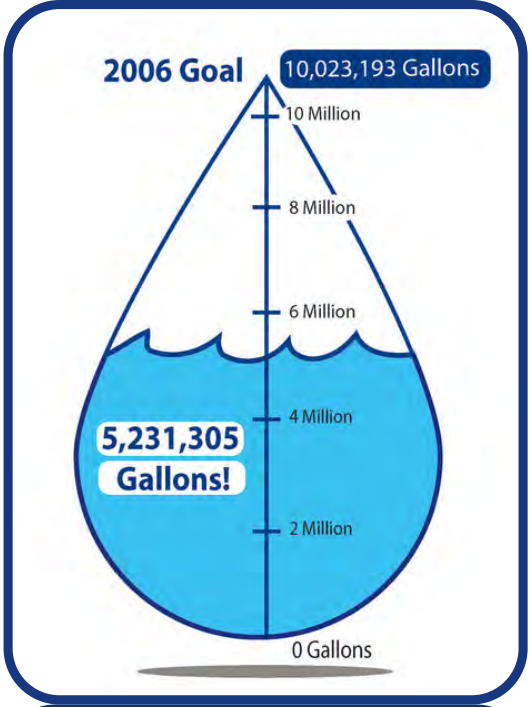
Year In Review

Fiscal Year 2022-2023

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

2 GRANT PARTNERSHIPS IN BRADLEY CREEK

7 RAIN GARDENS PLANTED

21,797

GALLONS OF STORMWATER TREATED

COMMUNITY MEMBERS INSTALLED CREEK-FRIENDLY PRACTICES

TREES PLANTED

Bradley Creek

13 PROJECTS INSTALLED

16,414 GALLONS TREATED

Hewletts Creek

31 PROJECTS INSTALLED

5,383 GALLONS TREATED

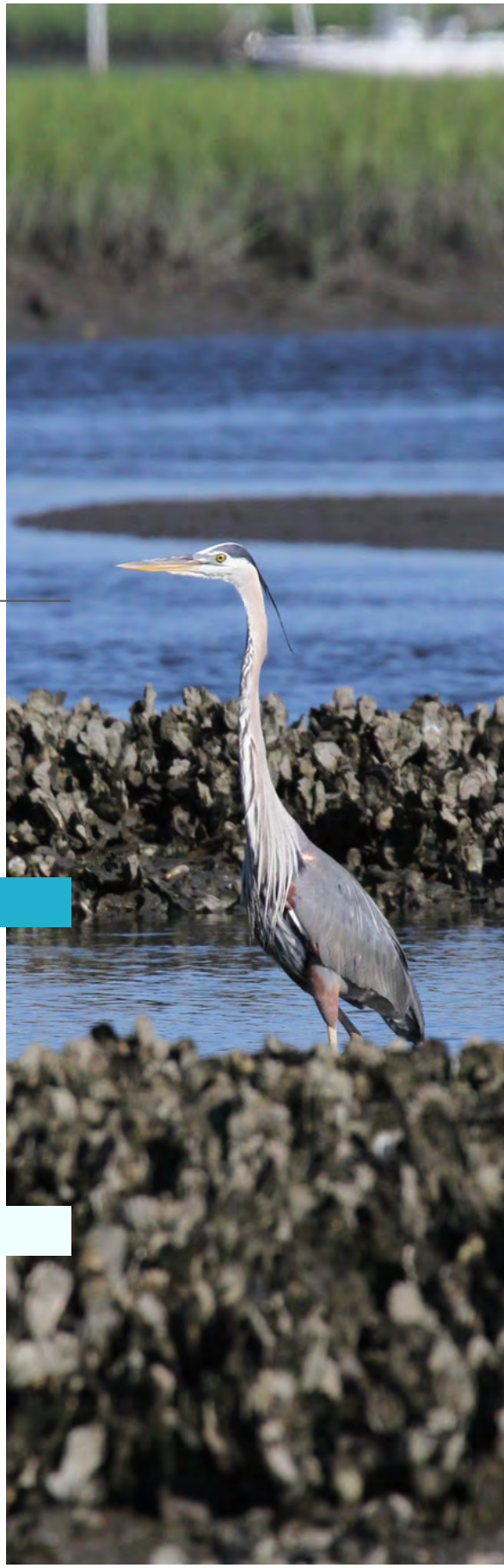
About The Program

What is Heal Our Waterways?

The Heal Our Waterways (HOW) Program is the branded implementation of the voluntary Bradley and Hewletts Creeks Watershed Restoration Plan, which was adopted by Wilmington City Council on September 4th, 2012. The main goal of the plan is to install nature-based Stormwater Control Measures (SCMs) to reduce the volume of stormwater runoff that can transport 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 SCMs

04

Connect with the community through existing and new outreach programs that encourage simple solutions for stormwater pollution

Problems

The Problem Lies in Polluted Stormwater Runoff

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 and flows directly to local waterways.

Impervious Surfaces

As more impervious surfaces are created (houses, roads, driveways, parking lots, etc.), more stormwater runoff is generated each time it rains as there are fewer opportunities for it to soak in.

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 can easily wash bacteria from unmanaged pet waste to local waterways.

Traditional Treatment is Difficult

Most traditional stormwater treatment practices (wet and dry ponds) focus on water quantity versus water quality. Any "clean" runoff is also at risk of recontamination after it is released back onto the landscape.

Solutions

Stormwater Solutions Focus on Runoff Reduction

The HOW Program actively promotes and installs nature-based practices to reduce the total volume of stormwater runoff and potential pollutants washing into Bradley Creek and Hewletts Creek.

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 SCMs 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 several residential rain gardens.

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.

Hydrograph Progress

Bradley Creek and Hewletts Creek Hydrograph Snapshot

The first milestone to meet within the Bradley and Hewletts Creeks Watershed Restoration Plan is to reduce the baseline 2010 hydrographs for both creeks to the estimated levels seen in 2006. Hydrographs show 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 intensity increases as more stormwater runoff is generated. To reduce the hydrograph, therefore, more infiltration-based practices are required to soak in stormwater runoff before it can flow into local waterways.

In addition to the goals within the plan, the City of Wilmington established annual performance measures within its Strategic Plan to incrementally work towards the goals in the plan. Below are visual summaries for progress towards both goals.

The total volume of stormwater runoff in 2010 was set as a baseline. Incrementally, the goal is to reduce the volume to "turn back the clock" and replicate how much infiltration occurred in years with less impervious surface coverage. The progress towards the 2006 milestone so far is as follows:

<u>Bradley Creek</u>

- 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: 462,244 Gallons**
- **Remaining To Goal: 5,956,865 Gallons**

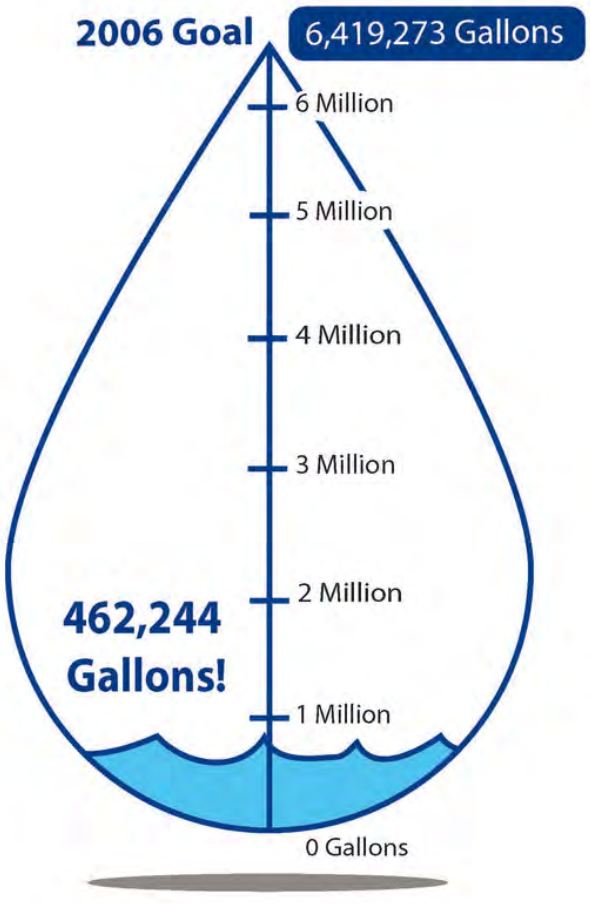
<u>Hewletts Creek</u>

- 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: 5,231,305 Gallons**
- **Remaining To Goal: 4,791,879 Gallons**

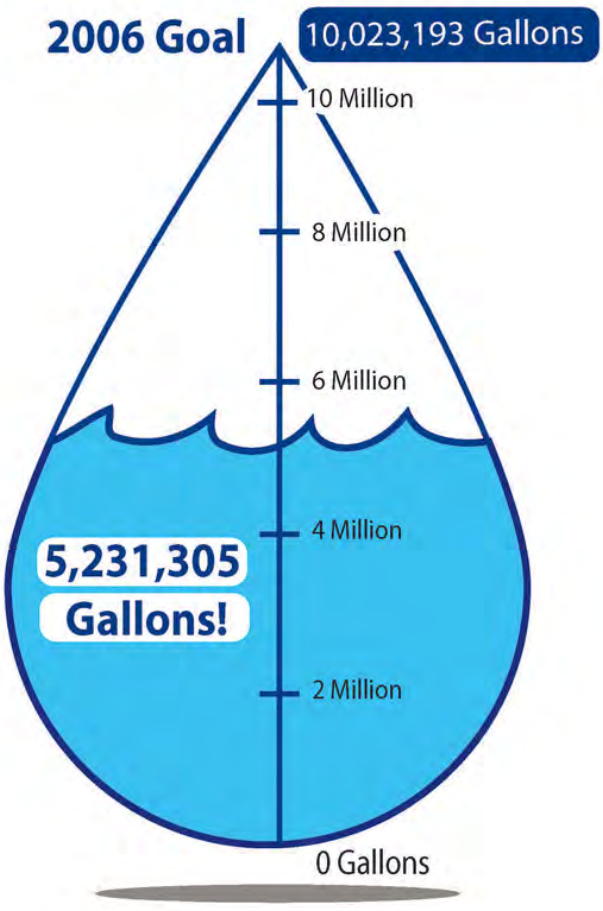
The "volume reduced so far" values are also displayed on the following page.

Hydrograph Progress

Overall Progress Towards 2006 Hydrograph Reduction Goal



Bradley Creek Total Runoff Reduced Since 2010

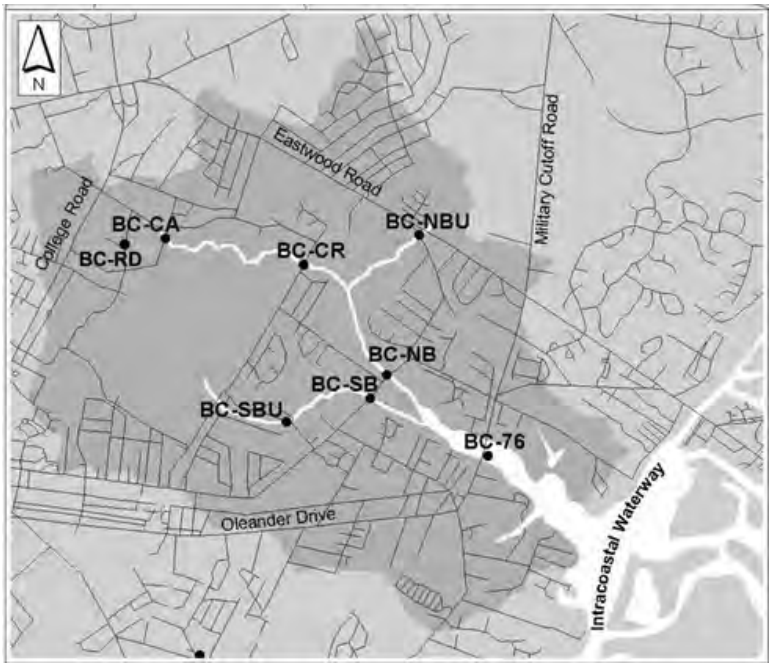


Hewletts Creek Total Runoff Reduced Since 2010

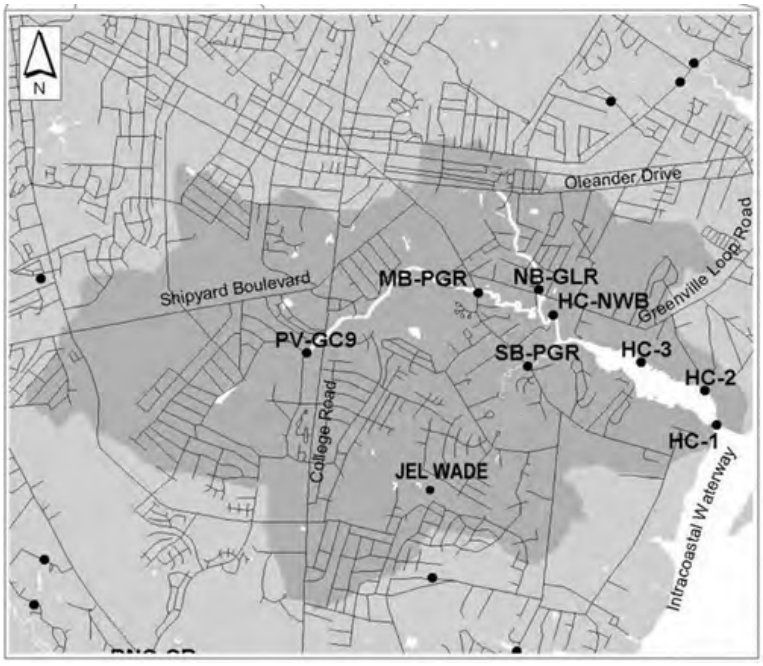
Monitoring Water Quality

In the end, water quality will be the main determinant for whether or not swimming advisories and shellfish harvest closures will continue to happen. While improvements can be difficult to see on a short-term basis, long-term water quality trends can help highlight areas where projects are successful or indicate "hot spot" locations that require more attention. Heavy rain events (i.e. hurricanes) or Sanitary Sewer Overflows can sometimes contribute to major spikes in bacteria levels, but stormwater runoff is the chronic contributor of bacteria to our waterways. As can be seen in the following graphs from stations monitored by UNCW in both creeks, there has been an overall downward trend in average bacteria levels since 2018. Continued monitoring will be important to see if the average bacteria levels continue to decrease or begin to rise again.

Bradley Creek Stations

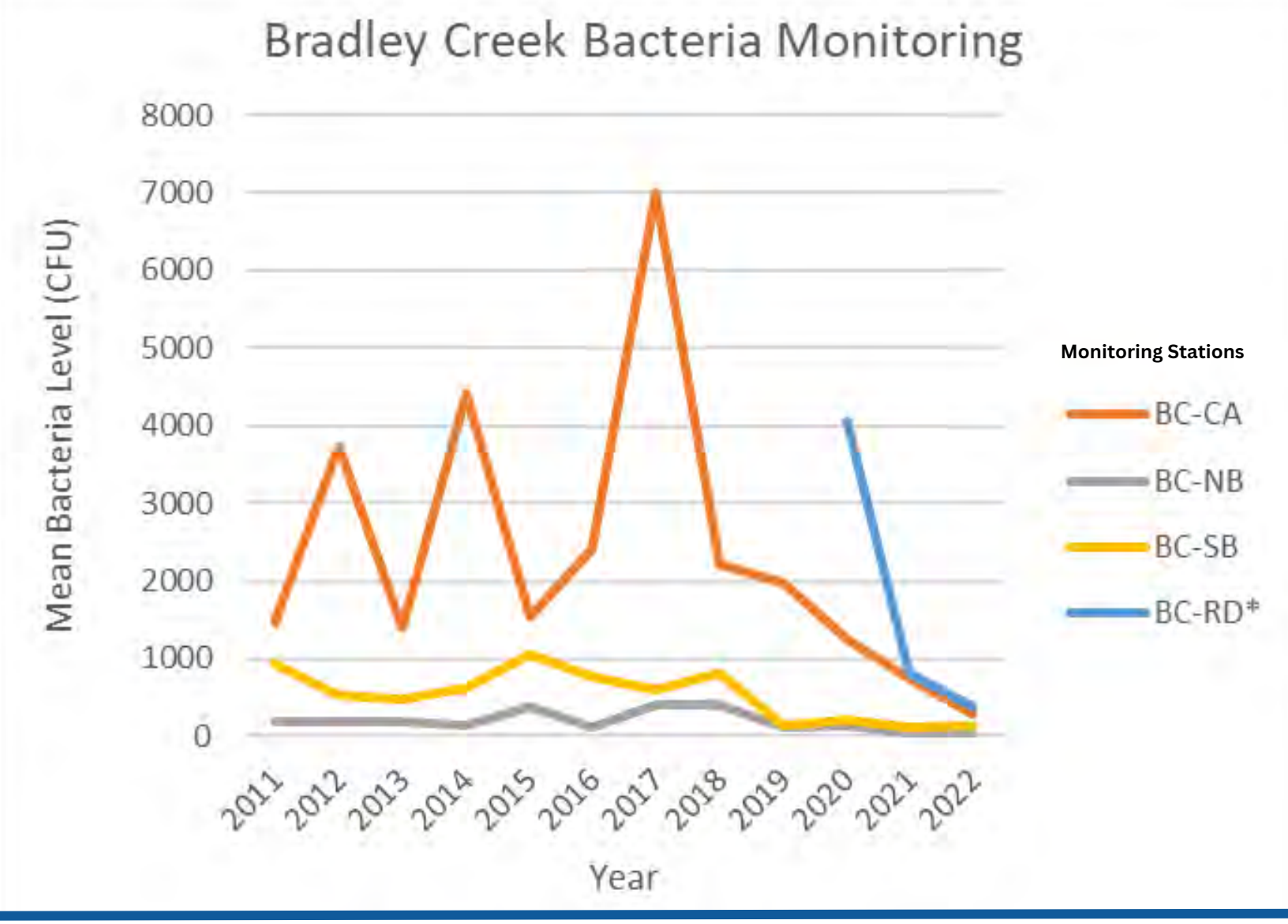


Hewletts Creek Stations



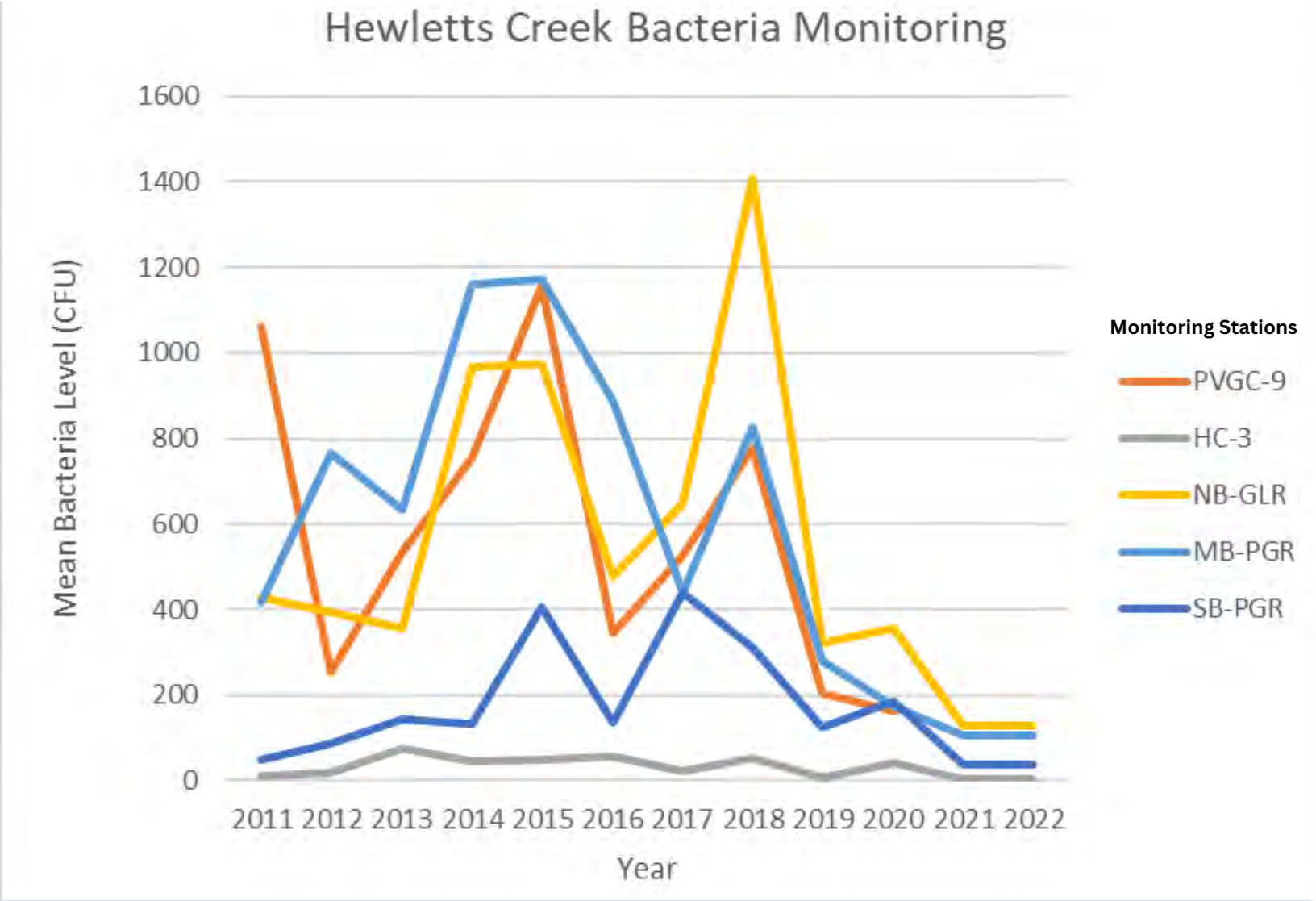
Water Quality Results

Bradley Creek



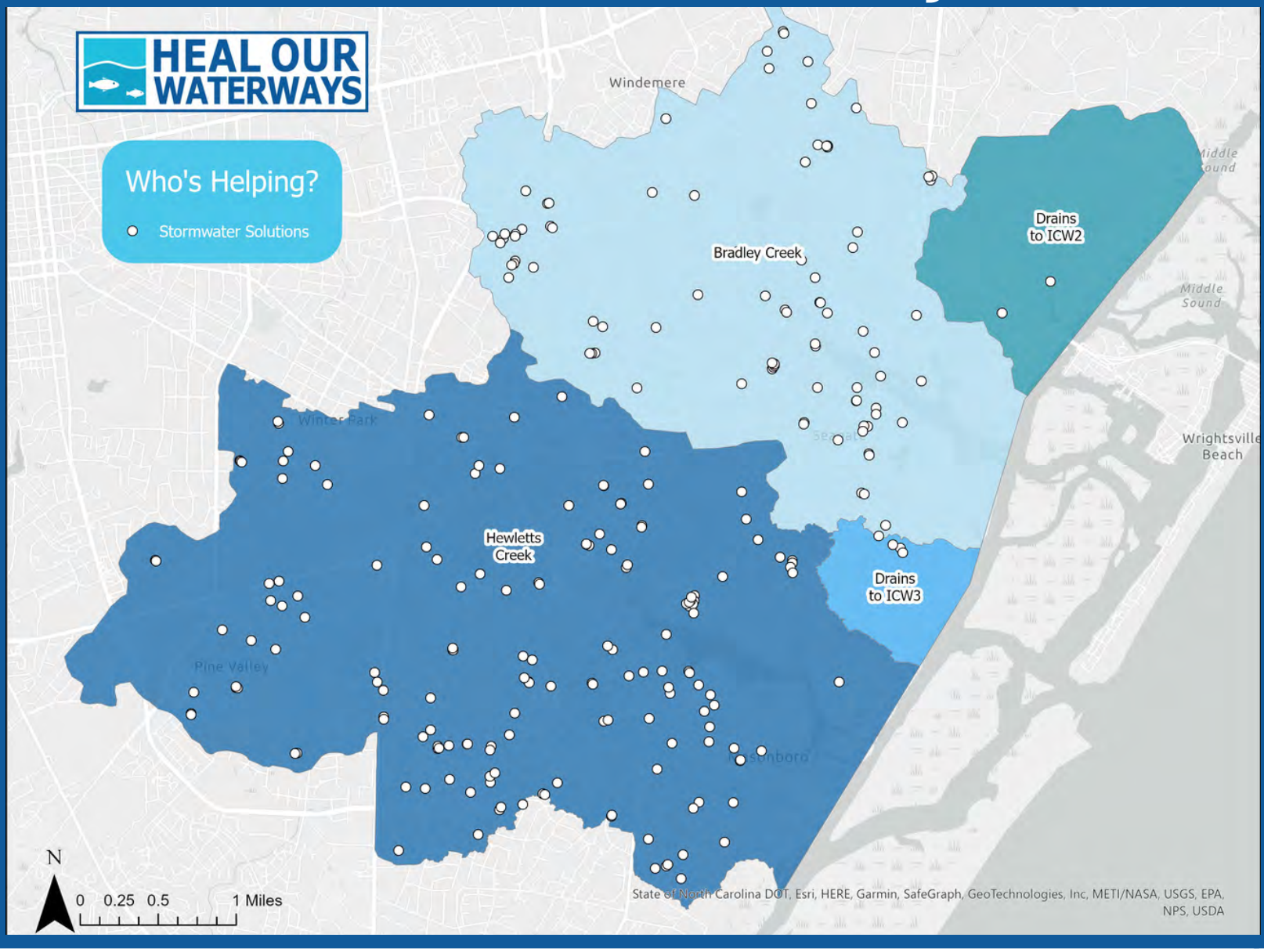
Water Quality Results

Hewletts Creek



Project Tracking

Creek Counter: 270 Projects!



This map shows all projects that have been installed in the Bradley Creek and Hewletts Creek Watersheds and count towards the volume reduction goals within the watershed restoration plan. 270 total projects have been installed as of June 30, 2023.

The HOW Program continues to partner with local grant initiatives. Pictured above are monitoring stations installed by NC State University to monitor the inefficiency of an outdated wet pond. Pictured below are UNCW volunteers planting trees funded by the HOW Program to support the ongoing grant partnership between UNCW and North Carolina Coastal Federation. Both grants will benefit Bradley Creek.

FY23 Results

There are three main criteria that are used to evaluate progress for the HOW Program goals:

- Hydrograph Improvements/Total Volume of Stormwater Reduced
- Number of Projects
- Water Quality Results

Volume reduction is the main metric used in the Bradley and Hewletts Creeks Watershed Restoration Plan as stormwater runoff is the main vehicle that transports bacteria to both waterways. This avenue also addresses all potential sources of bacteria (and other pollutants).

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 established prior to consistent implementation of the restoration plan, 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 FY23 for both watersheds is in the table below. The specific projects contributing to the totals are listed at the end of this report.

FY23 Progress Towards Strategic Plan Performance Measures

Volume Reduction Goals	Goal (ac.ft)	Gallons	Actual (ac.ft.)	% Achieved
Bradley Creek FY23	0.15	16,413.81	0.0504	33.58
Hewletts Creek FY23	1	5,382.82	0.0165	1.65

The HOW Program contracts with New Hanover Soil and Water Conservation District to install Stormwater Solutions, such as these cisterns and rain gardens that were installed in FY23.

Number of Projects

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 FY23 include (but are not limited to):

In total, 13 projects were installed in the Bradley Creek Watershed and 31 projects were installed in the Hewletts Creek Watershed (tree plantings were grouped by location).

Projects Installed

Projects counted towards the HOW Program goals can be installed by any resident, business, or agency, as long as the project falls within the Bradley Creek or Hewletts Creek Watersheds. The funding sources and agencies that installed projects in FY23 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 and the City of Wilmington partner on a monthly rain barrel sale. 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

13 PROJECTS INSTALLED

16,414 GALLONS TREATED

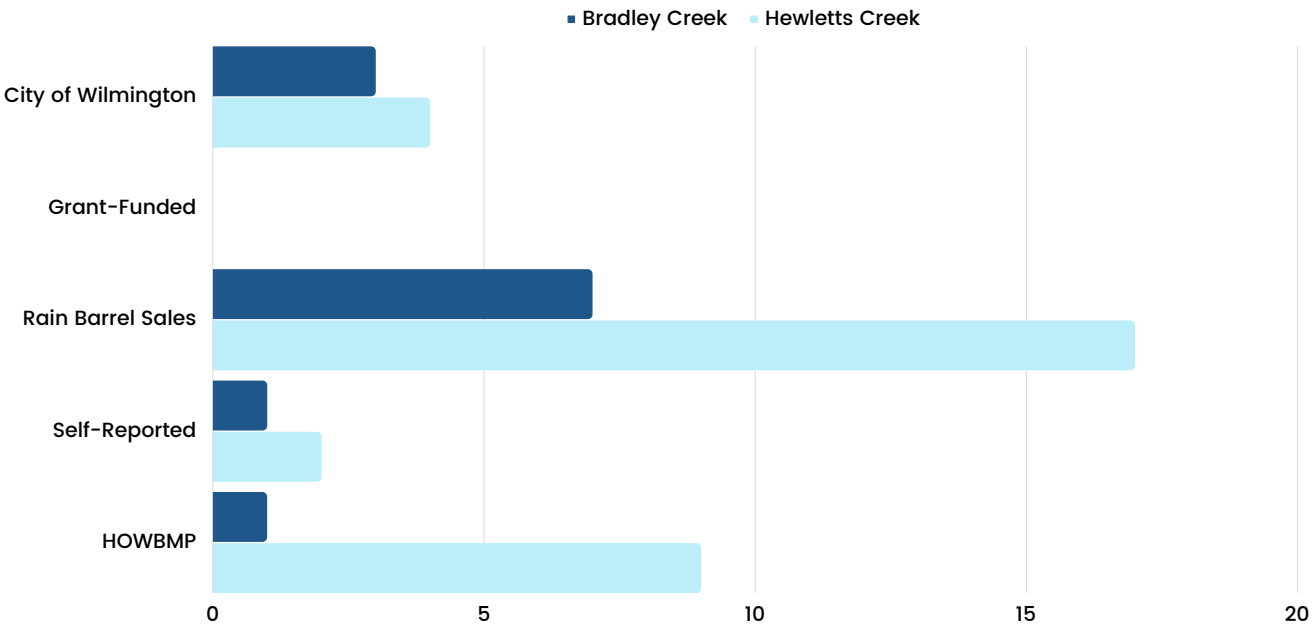
Hewletts Creek

31 PROJECTS INSTALLED

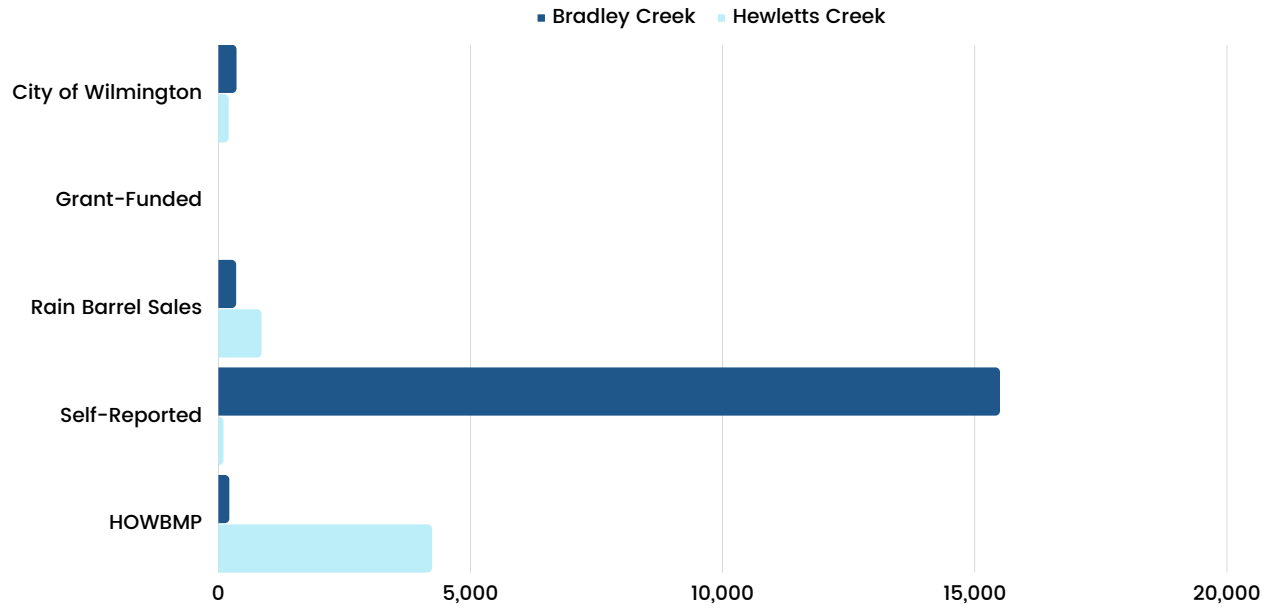
5,383 GALLONS TREATED

Project Summaries

FY23 Number of Projects Installed Per Funding Source



FY23 Gallons of Stormwater Reduced Per Funding Source



Bradley Creek FY23 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	UNCW	Tree	8
Bradley Creek	City of Wilmington	UNCW	Tree	65
Bradley Creek	City of Wilmington	UNCW	Tree	26
Bradley Creek	City of Wilmington	UNCW	Tree	13
Bradley Creek	City of Wilmington	UNCW	Tree	69
Bradley Creek	City of Wilmington	UNCW	Tree	23
Bradley Creek	HOWBMP	Residential	Cistern	217
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Bradley Creek	Self-Reported	UNCW	Bioretention Area	15,493

Hewletts Creek FY23 Projects

Watershed	Funding Source	Property Type	SCM Type	Gallons
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50
Hewletts Creek	City of Wilmington	Residential	Rain Barrel Raffle	50
Hewletts Creek	HOWBMP	Residential	2 Rain Gardens	666
Hewletts Creek	HOWBMP	Residential	Cistern	220
Hewletts Creek	HOWBMP	Residential	Cistern	220
Hewletts Creek	HOWBMP	Residential	Rain Garden	838
Hewletts Creek	HOWBMP	Residential	Rain Garden	898
Hewletts Creek	HOWBMP	Residential	Rain Garden	494
Hewletts Creek	HOWBMP	Residential	Rain Garden	434
Hewletts Creek	HOWBMP	Residential	Rain Garden	464
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
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Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Rain Barrel Sale	Residential	Rain Barrel	50
Hewletts Creek	Self-Reported	Residential	Rain Barrel	50
Hewletts Creek	Self-Reported	Residential	Rain Barrel	50
ICW3	Rain Barrel Sale	Residential	Rain Barrel	50

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 @HealRWaterways

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