Fiscal Year Summary

2021-2022

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 2021 - July 2022 to move towards that goal.

About The Program

What is "Heal Our Waterways"?

The Heal Our Waterways (HOW) Program is the branded implementation of the Bradley and Hewletts Creeks Watershed Restoration Plan, which was adopted by Wilmington City Council on September 4th, 2012. The plan focuses on installing voluntary 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) list as not meeting the established water quality standards for safe shellfish harvest. Banks Channel and downstream waterways have also had swimming advisories.

Problems

The Problem Lies in Polluted Stormwater Runoff

The Bradley and Hewletts Creeks Watershed Restoration Plan cites polluted stormwater runoff as the main driver for high bacteria levels in both creeks. As rain flows over impervious, or hard, surfaces, 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.

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 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 that help 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.

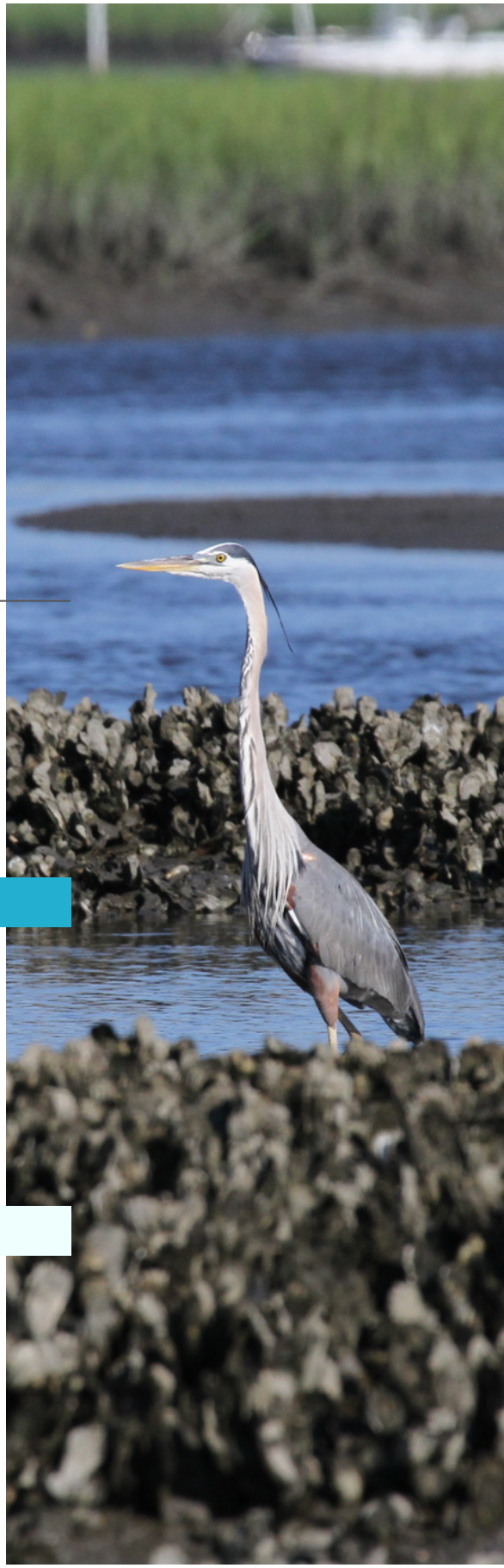
Rerouting downspouts into yards or SCMs such as rain gardens, bioretention areas, and wetlands where runoff can spread out helps to make infiltration easier, reduces erosion, and treats pollution.

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.

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

Key Highlights

01 HOWBMP

Heal Our Waterways has a partnership with New Hanover Soil and Water Conservation District to install SCMs on private properties. In FY22, 8 projects were installed for a total volume reduction of 326 cubic feet or 2,439 gallons.

02 Partnerships

Two EPA 319 grant partnerships are currently underway within the Bradley Creek Watershed. Installed projects so far are treating approximately 1,900 cubic feet, or 14,213 gallons, of stormwater runoff.

03 Reduce Stormwater Runoff (aka "Hydrograph")

Since the inception of the plan, the amount of runoff reduced:

- 698,564 cubic feet or 5,225,622 gallons reduced in Hewletts Creek
- 59,614 cubic feet or 445,944 gallons reduced in Bradley Creek

04 Outreach

The HOW Program was present at several outreach and guest speaking events throughout the year, such as the Wilmington Farmer's Market, the Native Plant Festival, and the Wilmington Earth Day Festival. Approximately 2,300 people were reached through outreach in FY22.

Program Overview

How Does the HOW Program Help?

The HOW Program actively works to achieve to achieve the goals within the Bradley and Hewletts Creeks Watershed Restoration Plan by funding, installing, and promoting infiltration-based Stormwater Control Measures (SCMs).

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 nature-based SCMs 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.

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:

Bradley Creek

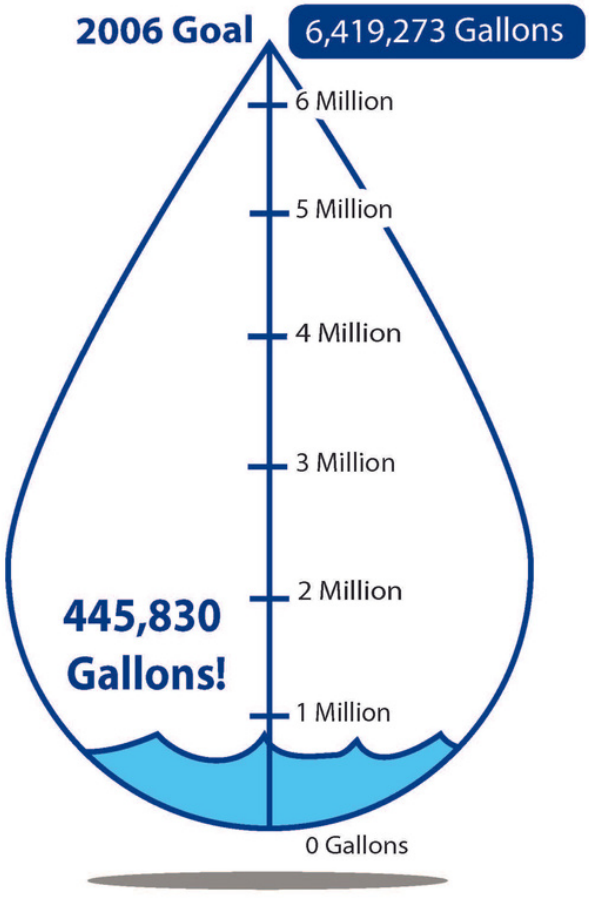
- 2010 Baseline Volume: 105,444,716 Gallons
- 2006 Reduction Goal: 99,025,889 Gallons
- Volume Reduced So Far: 445,944 Gallons
- Remaining To Goal: 5,973,329 Gallons

Hewletts Creek

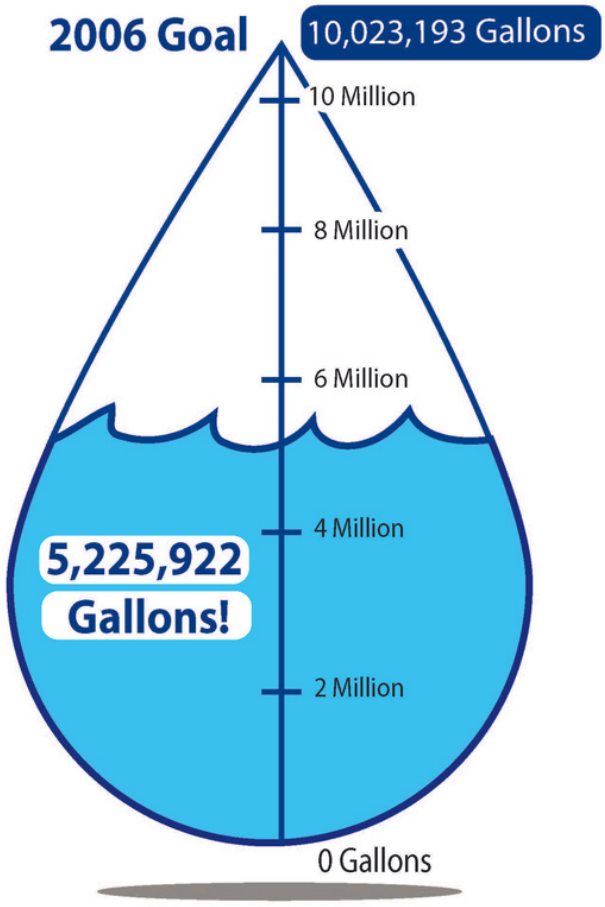
- 2010 Baseline Volume: 158,883,898 Gallons
- 2006 Reduction Goal: 148,861,404 Gallons
- Volume Reduced So Far: 5,225,622 Gallons
- Remaining To Goal: 4,797,571 Gallons

Hydrograph Progress

Overall Progress Towards Meeting 2006 Hydrograph Milestone



Bradley Creek Total Runoff Reduced Since 2010



Hewletts Creek Total Runoff Reduced Since 2010

FY22 Progress

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 FY22 for both watersheds is in the table below. The specific projects contributing to the totals are listed at the end of this report.

FY22 Progress Towards Meeting Strategic Plan Performance Measures

Volume Reduction Goals	Goal (ac.ft)	Actual (gallons)	Actual (ac.ft.)	% Achieved
Bradley Creek FY22	0.15	46,502.84	0.1427	95.14
Hewletts Creek FY22	1.00	3,737.01	0.0105	1.05

FY22 Progress

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 gage 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 FY22 include (but are not limited to):

TREES PLANTED

RAIN BARRELS INSTALLED

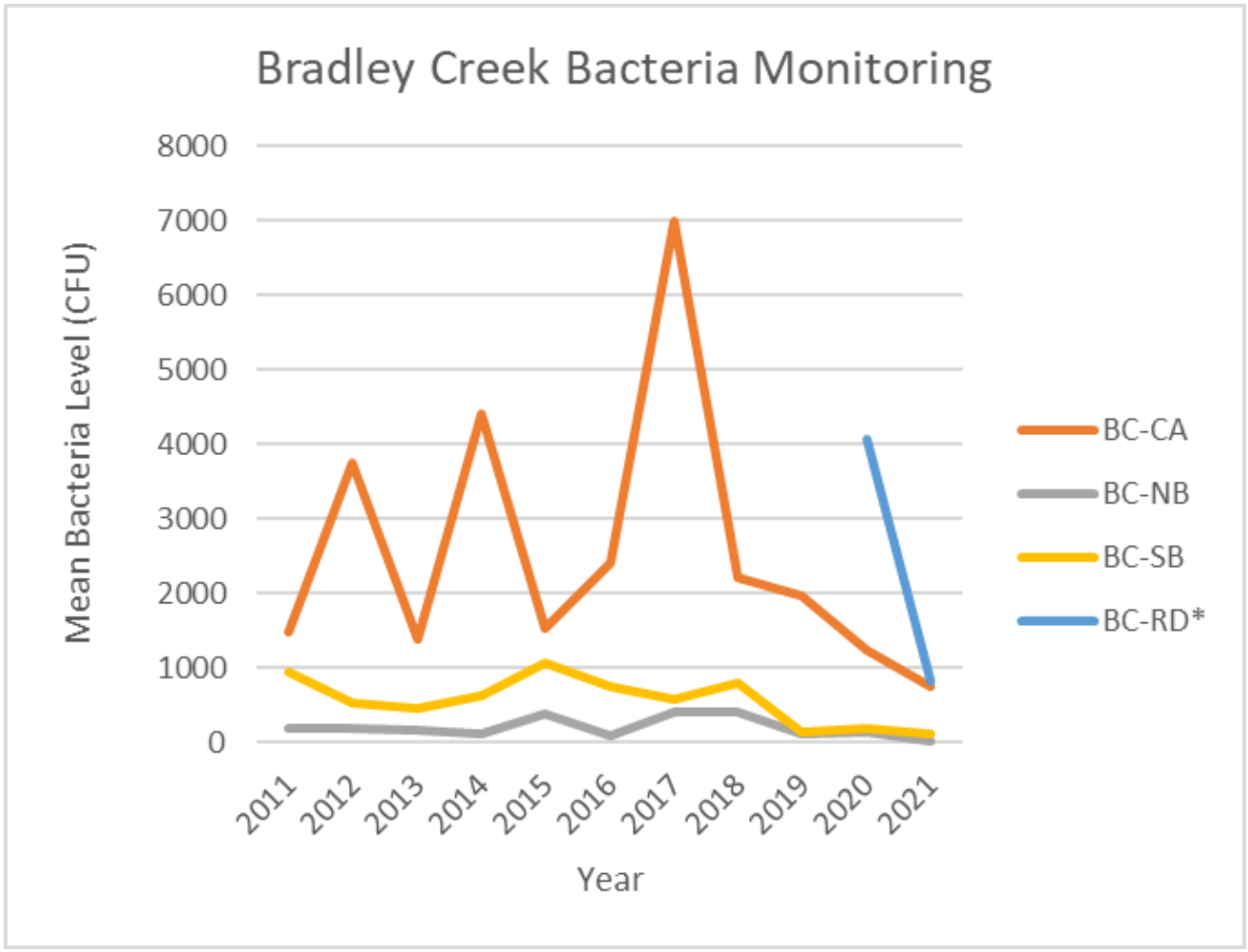
RAIN GARDENS PLANTED

In total, 16 projects were installed in the Bradley Creek Watershed and 32 projects were installed in the Hewletts Creek Watershed (tree plantings were grouped by location).

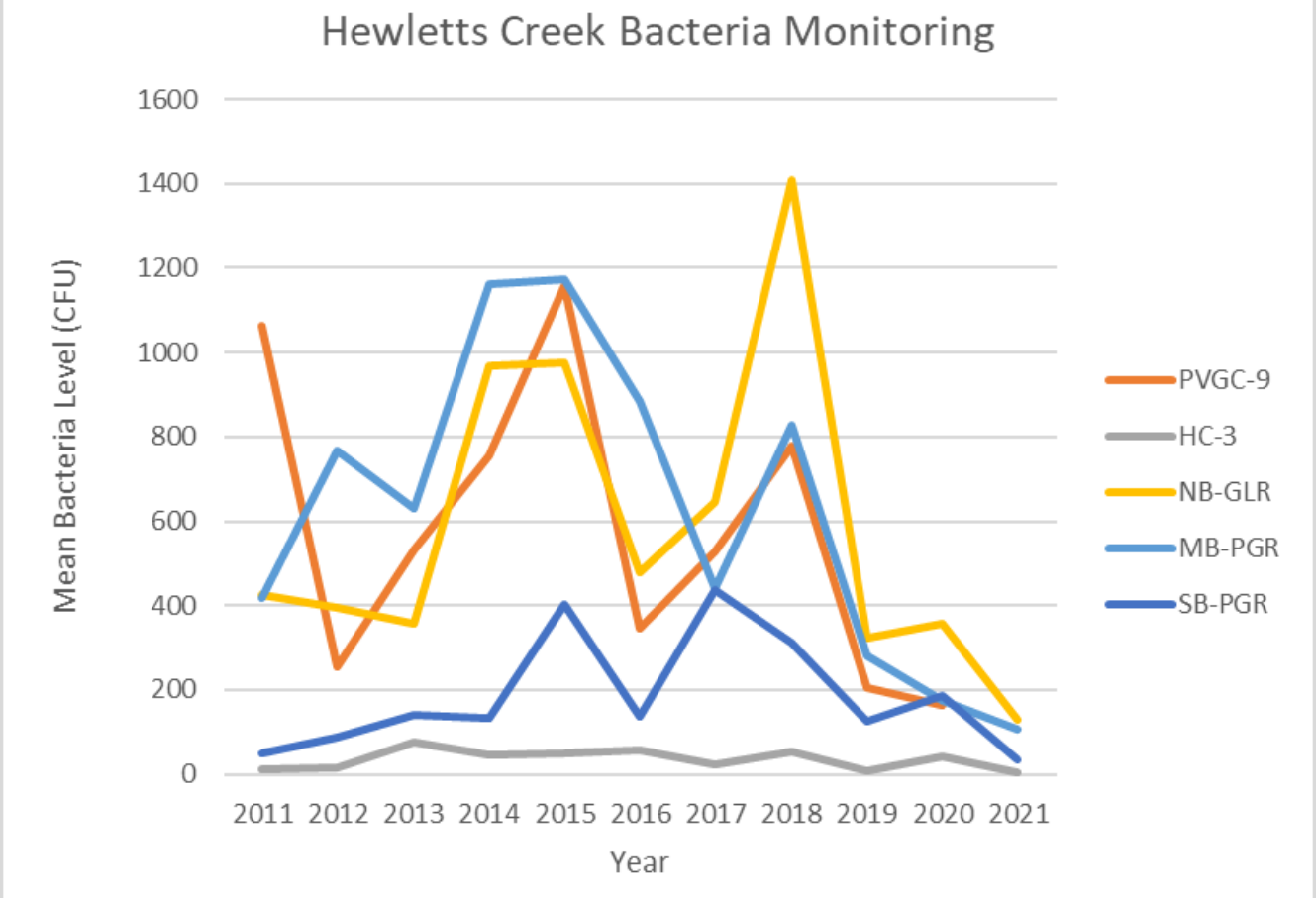
Water Quality

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 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. As can be seen in the following graphs from various monitoring stations in both creeks, there has been an overall downward trend in average bacteria levels since 2018. Major spikes seen in previous years can typically be attributed to heavy rain events (i.e. hurricanes) or Sanitary Sewer Overflows. Continued monitoring will be important to see if the average bacteria levels continue to decrease or begin to rise again.

FY22 Progress



FY22 Progress



FY22 Installed Projects

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 FY22 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

16 PROJECTS INSTALLED

46,503 GALLONS TREATED

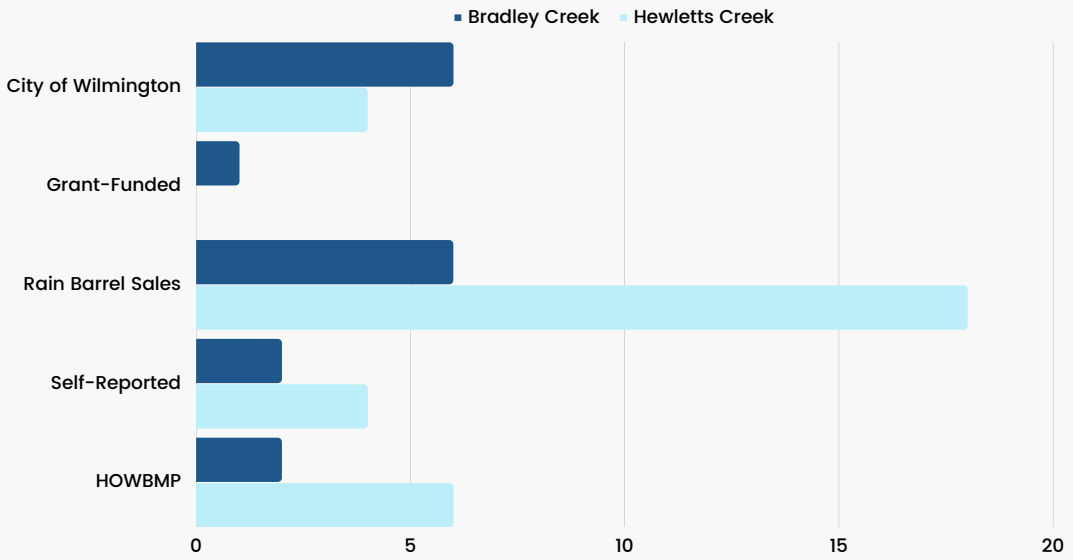
Hewletts Creek

32 PROJECTS INSTALLED

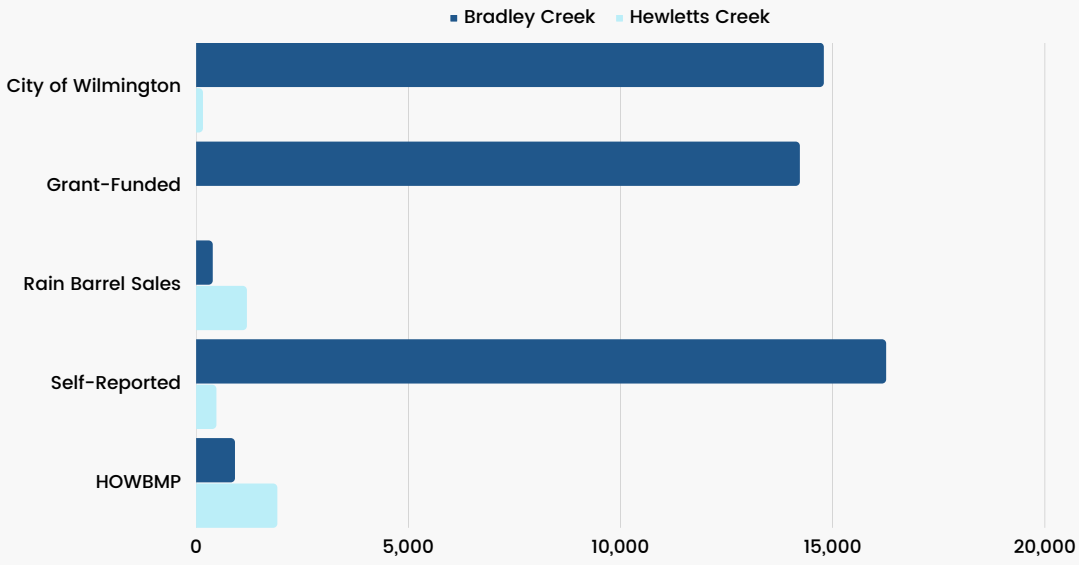
3,737 GALLONS TREATED

Project Summaries

FY22 Number of Projects Installed Per Funding Source



FY22 Gallons of Stormwater Reduced Per Funding Source



Bradley Creek Projects

Watershed	Funding Source	Property Type	SCM Type	Gallons
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	80.00
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	60.00
Bradley Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	50.00
Bradley Creek	City of Wilmington	Residential & Municipal	Tree Planting	74.95
Bradley Creek	City of Wilmington	Municipal	Tree Planting	31.04
Bradley Creek	City of Wilmington	Municipal	Infiltration Basin	14,488.42
Bradley Creek	Grant-Funded	UNCW	Rain Garden	14,212.99
Bradley Creek	HOWBMP	Residential	Rain Garden	471.27
Bradley Creek	HOWBMP	Residential	Rain Garden	441.35
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Bradley Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Bradley Creek	Self-Reported	UNCW	Bioretention Area	16,202.81
Bradley Creek	Self-Reported	Residential	Rain Barrel	50.00

Hewletts Creek Projects

Watershed	Funding Source	Property Type	SCM Type	Gallons
Hewletts Creek	City of Wilmington	Municipal	Tree	5.61
Hewletts Creek	City of Wilmington	Municipal	Tree	15.71
Hewletts Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	80.00
Hewletts Creek	City of Wilmington	Residential	Rain Barrel (Raffle)	60.00
Hewletts Creek	HOWBMP	Residential	Rain Garden	403.95
Hewletts Creek	HOWBMP	Residential	Rain Garden	396.47
Hewletts Creek	HOWBMP	Residential	Wetland	179.53
Hewletts Creek	HOWBMP	Residential	Rain Garden	261.82
Hewletts Creek	HOWBMP	Residential	Rain Garden	403.95
Hewletts Creek	HOWBMP	Residential	Rain Garden	261.82
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
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Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
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Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	50.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	80.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	60.00
Hewletts Creek	Rain Barrel Sales	Residential	Rain Barrel	60.00
Hewletts Creek	Self-Reported	Residential	Rain Garden	471.27
Hewletts Creek	Self-Reported	Residential	Tree	2.17
Hewletts Creek	Self-Reported	Residential	Tree	3.14
Hewletts Creek	Self-Reported	Residential	Tree	1.57

Thank You

If you participated -- you rock!

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

Telephone
(910) 765-0629

Email
healourwaterways@wilmingtonnc.gov

Website
www.healourwaterways.org