

# STORMWATER WATCH

## CLEAR RUN BRANCH STORMWATER PROJECT UNDERWAY

Anyone who has been around Clear Run Branch in the rainy season knows the area is prone to flooding.

The upper section of Clear Run Branch is highly eroded and impaired due to years of excessive stormwater runoff from upstream development. In addition, surrounding roads are poorly drained and the road surface is in poor condition.

The Clear Run Branch Stormwater Improvement Project is the largest project that the City of Wilmington has undertaken to improve water quality, reduce chronic flooding, and enhance natural habitat.

Clear Run Branch is the upper reach of Bradley Creek, which is impacted by harmful levels of fecal coliform bacteria carried into the creek by stormwater runoff. All water that

flows into Bradley Creek eventually drains into the Intracoastal Waterway/Atlantic Ocean.

The first phase of the Clear Run Branch project will install pipes to convey stormwater under and along College Acres Drive and Mallard Street and add a sidewalk along College Acres Drive from Racine Drive to Oriole Drive. This phase includes major stream bank and floodplain restoration to increase flood storage capacity and improve the natural habitat of Clear Run Branch. The project's construction phase is slated to begin later this year.

The next phase of the project will involve the installation of large pipes to capture and convey floodwaters from the commercial business areas along



*Example of a stable streambank along Bradley Creek.*

South College Road and New Centre Drive. This phase of the project also includes incorporating as much “green infrastructure” as possible. Green infrastructure helps filter out pollutants like fecal coliform bacteria and reduces the amount of runoff flowing from impervious (hard) surfaces into Bradley Creek. ■

[wilmingtonnc.gov/stormwaterprojects](http://wilmingtonnc.gov/stormwaterprojects)

## STORMWATER POLLUTION: THE BIG PICTURE

### What's Wrong With This Picture?

When rain washes over the city, the runoff is called stormwater. Stormwater pollution results from bacteria, litter, and chemicals washing into storm drains from hard surfaces, such as rooftops, pavement, parking lots, and driveways. Because it's not filtered before entering ground or surface waters, it's contaminated by everything it picks up along the way. This runoff goes untreated through storm drains and ditches to the nearest water body. The pollution threatens clean drinking water and harms wildlife and their habitats. It can be a public health problem and close swimming and shellfishing waters. The impact is costly and the most cost-effective way to manage stormwater pollution is prevention. ■



**How many pollutants can you find in this picture? (Answers on back)**

Think about ways we can prevent the contamination of our waterways.

# THE STATE OF WILMINGTON'S WATERWAYS

## 2020 UNCW SURFACE WATER QUALITY REPORT

(Following is a summary of the condition of major creeks and waterways, not drinking water, within the City limits.)

The State of Wilmington's Waterways 2020 UNCW Surface Water Quality Report is a summary of the current health and condition of the major creeks and waterbodies that fall within Wilmington's city limits. UNCW water quality sampling information was provided by Dr. Michael Mallin of the UNCW Center for Marine Science and lead scientist for the Wilmington Watersheds Project. The water quality sampling summary is based on data collected between the months of January-December 2020 and is presented from a watershed perspective, regardless of political boundaries.

The summary describes each watershed by size, state classification, state status, reason for impairment, and UNCW sampling summary. For more information on the current health of Wilmington's waterways or to read Dr. Mallin's entire report, please visit:

<http://uncw.edu/cms/aelab/research.html>

### Water Definitions

**Algal Bloom** Rapidly occurring growth and accumulation of algae in a waterway resulting from excess nutrients that can lead to low dissolved oxygen levels and fish kills. (Sources: fertilizers, grass clippings, pet waste)

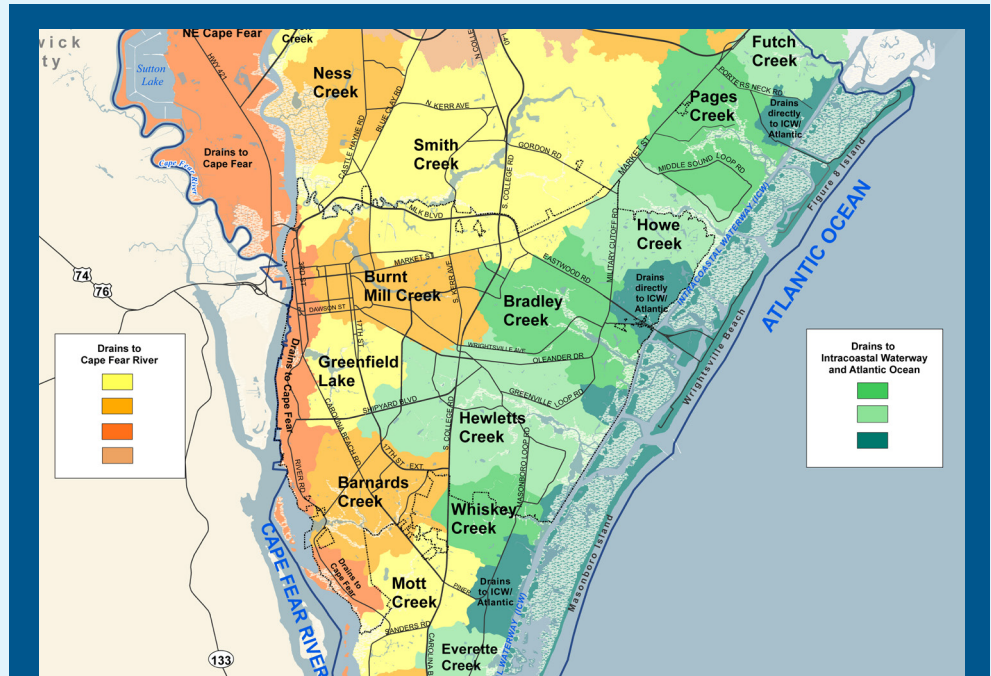
**Biological Integrity** The ability of an ecosystem to support and maintain a balanced and indigenous community of organisms.

**Best Management Practice (BMP)** An action or landscape modification that reduces the amount of pollution and/or the quantity of stormwater flowing into waterways. BMPs can be actions, such as picking up after your pet, or on-the-ground practices, such as rain barrels and rain gardens.

**Chlorophyll a** Allows plants to photosynthesize and gives plants their green color. Waters that have high chlorophyll a levels are typically high in nutrients (phosphorus and nitrogen), which cause algae to grow or bloom. When algae die, it depletes oxygen from the water and can cause fish kills.

**Dissolved Oxygen (DO)** The amount of oxygen available in water. Fish and aquatic organisms require adequate levels of DO to survive.

**Fecal Coliform Bacteria** Bacteria present in the intestines and feces of warm-blooded animals. High counts of fecal coliform bacteria in a waterway indicate the presence of other disease-causing pathogens which can cause sickness and disease in humans and animals. (Sources: pet/animal waste, sewer overflows, septic system failure)



**UNCW Results Summary:** Some shifts in water quality sampling were initiated in 2020. Some sites that had been sampled for years (Howe, Whiskey, Motts and Barnards) were shifted to focus on upper Bradley Creek. The Clear Run Branch section of Bradley Creek is slated for stream rehabilitation and more data was needed on pollutants in the creek. Rainfall causes especially high fecal bacteria counts in this area, which collects drainage from across South College Rd.

Overall, high fecal coliform bacteria counts continue to impact Bradley Creek, Burnt Mill Creek, Hewletts Creek and much of the Greenfield Lake system. Blue-green algal blooms continue to impact Greenfield Lake and cause problems for dissolved oxygen in the lake.

Water quality sampling is now occurring monthly at Greenfield Lake, as UNCW continues to partner on an EPA grant project to reduce nutrients and algal blooms in the lake by modifying the Willard Street pond/wetland.

**Hypoxia** Low dissolved oxygen levels in a waterway which can result in fish kills.

**Nutrients** Substances (i.e. nitrogen and phosphorous) needed by plants and animals for growth; however, excessive nutrients in a waterway can lead to harmful aquatic weed and algae growth, low DO levels and fish kills. (Sources: fertilizers, yard waste, pet waste)

**Pathogens** Disease-causing organisms such as bacteria and viruses. (Sources: pet waste)

**PAHs (Polycyclic Aromatic Hydrocarbons)** Toxic by-products of petroleum and fossil fuels, which can be harmful to humans and aquatic life and can persist in the environment for a long time. (Sources: auto exhaust, motor oil, parking lot sealcoats, roofing tars, coal power plants)

**Sediment** Particles of silt, clay, dirt, or sand that wash into waterways caused by land-disturbing activities or natural weathering. Sediment can settle to the bottom or remain suspended in water. (Sources: construction sites with failing/

erosion control, eroding streambanks, and exposed soil)

**Tidal Creek** A saltwater creek that is influenced by tides. Many tidal creeks have oyster reefs along their shorelines.

**Turbidity** A cloudy condition in water caused by suspended sediment.

**Watershed** An area of land that drains into a specific body of water such as a creek, lake, or river.

### Water Classifications

The NC Division of Water Resources applies classifications to waterways which define the best uses to be protected within those waters (i.e. swimming, fishing, drinking water supply, aquatic life). These classifications have an associated set of water quality standards to protect their designated uses. These standards may be designed to

protect water quality, fish and wildlife, the free flowing nature of a stream, or other special characteristics. In addition, there may be a **supplemental classification** applied to protect several different uses or special characteristics within the same waterbody. Listed below are the freshwater and saltwater classifications that apply to Wilmington's waterways. For more information, visit: <https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications>

#### **Freshwater Classifications**

**Class C** Waters protected for secondary recreation (fishing, boating and other activities involving minimal and infrequent skin contact), wildlife, agriculture, biological integrity, and fish/aquatic life propagation and survival.

#### **Supplemental Classification**

**Swamp Waters (Sw)** Waters that naturally have low flow and other characteristics which differ from creeks draining land with steeper topography.

#### **Saltwater Classifications**

**Class SC** Saltwaters protected for secondary recreation (such as fishing, boating, and other activities involving minimal skin contact), fish and noncommercial shellfish consumption, fish/aquatic life propagation and survival, and wildlife.

**Class SB** Saltwaters used for primary recreation such as swimming, and all Class SC uses.

**Class SA** Saltwaters used for commercial shellfishing and all Class SC/SB uses. SA waters are also High Quality Waters (HQW) by supplemental classification.

#### **Supplemental Classifications**

**High Quality Waters (HQW)** Waters rated excellent based on biological, physical, and chemical characteristics and having primary or functional nursery areas.

#### **Outstanding Resource Waters (ORW)**

Unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance.

#### **State Status/Reason**

Indicates whether or not a creek is supporting its State classification/use and the reason why.

#### **NC 303(d) List of Impaired Waters**

Section 303(d) of the Clean Water Act requires states to develop and frequently update a list of waters that do not meet water quality standards or have impaired uses. This newsletter is based on the NC 303(d) List, which is available for viewing at: <https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment/integrated-report-files>.

Unfortunately, several of Wilmington's waterways are on the 303(d) list because of pollution, such as bacteria and nutrients, which is washed from the land by stormwater runoff.



*Cape Fear River*

## **Watersheds that drain to the Cape Fear River (CFR)**

### **Smith Creek**

**Size of watershed:** 16,650 acres

**State classification/Use:** C, Sw

**State Status:** Currently supporting use

**Reason:** Meets standards for Class C waters

**UNCW Sampling Summary:** Dissolved oxygen levels were low on one of eleven sampling occasions. Turbidity was good and there were no issues with algal blooms. Fecal coliform bacteria was high on one sampling occasion.

### **Burnt Mill Creek**

**Size of watershed:** 4,207 acres

**State classification/Use:** C, Sw

**State Status:** Impaired. On NC 303(d) List

**Reason:** Does not meet standards for Class C waters, specifically for biological integrity for benthos (bottom dwelling organisms)

**UNCW Sampling Summary:** Water quality was poor with elevated fecal coliform counts and had some incidents of low dissolved oxygen. Algal blooms were not a problem in 2020.

### **Greenfield Lake**

**Size of watershed:** 2,465 acres

**State classification/Use:** C, Sw

**State Status:** Impaired. On NC 303(d) List

**Reason:** Does not meet standards for Class C waters, specifically for Chlorophyll a

**UNCW Sampling Summary:** The tributary streams that flow into Greenfield Lake experienced high fecal coliform bacterial counts and low dissolved oxygen. The main lake had good dissolved oxygen and low turbidity but had high fecal coliform counts at some sampling stations. The lake suffered from blue-green algal blooms and high biochemical oxygen demand (BOD) in summer and early fall.

### **Barnards Creek**

**Size of watershed:** 4,173 acres

**State classification/Use:** C, Sw

**State Status:** Currently supporting use

**Reason:** Meets standards for Class C waters

**UNCW Sampling Summary:** Not sampled in 2020.

### **Mott Creek**

**Size of watershed:** 3,342 acres

**State classification/Use:** C, Sw

**State Status:** Currently supporting use

**Reason:** Meets standards for Class C waters

**UNCW Sampling Summary:** Not sampled in 2020.



*Intracoastal Waterway*

## **Watersheds that drain to the Intracoastal Waterway (ICW)**

### **Howe Creek**

**Size of watershed:** 3,516 acres

**State classification/Use:** SA, ORW

**State Status:** Impaired. On NC 303(d) List; closed to shellfishing

**Reason:** Does not meet standards for Class SA waters, specifically for fecal coliform bacteria; a portion of Howe Creek is also impaired for dissolved oxygen

**UNCW Sampling Summary:** Not sampled in 2020.

### **Bradley Creek**

**Size of watershed:** 4,583 acres

**State classification/Use:** SC, HQW

**State Status:** Currently supporting use

**Reason:** Meets standards for Class SC waters  
**UNCW Sampling Summary:** In 2020, a stronger focus was placed on sampling upper Bradley Creek, known as Clear Run Branch. Sampling sites at College Acres and Racine Drive had low dissolved oxygen, elevated turbidity, and very high fecal coliform bacteria counts, especially after rain events. High fecal coliform counts were also found downstream in the creek.

### **Hewletts Creek**

**Size of watershed:** 7,478 acres

**State classification/Use:** SA, HQW

**State Status:** Impaired. On NC 303(d) List; closed to shellfishing

**Reason:** Does not meet standards for Class SA waters, specifically for fecal coliform bacteria  
**UNCW Sampling Summary:** Hewletts Creek did not have algal bloom, turbidity, or dissolved oxygen problems. However, all 5 sampling stations had excessive fecal coliform bacterial problems.

### **Whiskey Creek**

**Size of watershed:** 2,078 acres

**State classification/Use:** SA, HQW

**State Status:** Impaired. On NC 303(d) List; closed to shellfishing

**Reason:** Fecal coliform bacteria

**UNCW Sampling Summary:** Not sampled in 2020.

*\*All waters in the State of North Carolina are impaired for mercury, based on high levels found in the tissues of several fish species.*



## EMPLOYEE SPOTLIGHT

Polluted stormwater runoff poses a major threat to the health of the city’s water bodies. Compliance Officers play a vital role in addressing a wide variety of stormwater pollution violations in the community such as blowing yard waste and debris into storm drains and ditches, failing to clean up pet waste, and detecting and eliminating illicit discharges.

Public Services Compliance Officers are the city’s front-line defense for keeping our city clean and preventing pollution. They work to keep trash off the city’s streets and sidewalks by enforcing recycling and trash ordinances and upholding stormwater regulations to protect our creeks and waterways. ■

### Did You Know?

An illicit discharge is anything other than rainwater that enters the stormwater system. Illicit discharges include:



- Pouring oil and chemicals into storm drains
- Construction site issues
- Restaurant cooking grease spills

Fines for stormwater violations range from \$250 to \$10,000.

**Report Stormwater Pollution:**  
[wilmingtonnc.gov/reportstormwaterpollution](http://wilmingtonnc.gov/reportstormwaterpollution)

## City Installs 1000-Gallon Cisterns at Fire Stations

The Heal Our Waterways program is partnering with the Fire Department to install cisterns at all fire stations within the Bradley Creek and Hewletts Creek Watersheds.



A cistern is a “stormwater solution” that is connected to a roof downspout to capture natural rainwater. This prevents rainwater from running off hard surfaces and washing pollutants like bacteria into local creeks. The resulting washwater is collected, treated, and cleaned, preventing it from impacting the creeks.

Three 1000-gallon cisterns have been installed and another is slated for installation this summer. ■

**Learn more at [healourwaterways.org](http://healourwaterways.org)**

## Answer Key for Stormwater Activity



## CONTACT

### Stormwater Services Division

Administration ..... 910.343.4777  
 Drainage/Maintenance ..... 910.341.4646  
 Billing Questions..... 910.343.4777 (CFPUA)

### Report Stormwater Pollution Hotline

910. 341.1020  
[wilmingtonnc.gov/reportstormwaterpollution](http://wilmingtonnc.gov/reportstormwaterpollution)

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