

# CITY OF WILMINGTON Stormwater Watch

PUBLIC SERVICES DEPARTMENT

STORMWATER SERVICES

Spring 2019

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UNCW Surface Water  
Quality Annual Report

## Questions?

### STORMWATER SERVICES DIVISION

Administration 343-4777

Drainage/Maintenance 341-4646

Billing Questions 343-4777  
(CFPUA)

Report Stormwater 341-1020  
Pollution Hotline

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

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WILMINGTONNC.GOV/STORMWATER

## Pet Waste Pollutes. Be a Good Neighbor.

We love our pets; they bring us joy and give us unconditional love. However, pet waste is a serious water quality issue and can impact our health.

Leaving pet waste on the ground, instead of picking it up, allows harmful pollutants to wash into waterways when it rains.

These are the same waterways we use for swimming, drinking, fishing, boating, kayaking, paddleboarding, etc. The results are obvious: all of our tidal creeks in the city limits are closed to shellfish harvest because of bacterial pollution.

**1 GRAM OF PET WASTE  
CONTAINS AN AVERAGE OF 23 MILLION  
FECAL COLIFORM BACTERIA!**

Consider this: in 2018, there were 38,000 registered dogs in New Hanover County. Each dog produces an average of  $\frac{3}{4}$  to 2 lbs. of waste per day.

Using the most conservative estimate, 14.25 TONS of dog waste is generated EVERY DAY in NHC. This waste figure doesn't include unregistered dogs.

Pathogens in pet waste are a health hazard for anyone, especially our most vulnerable residents. While you won't see a pile of pet waste floating into the nearest storm drain, the pollutants are finding their way into your nearby creek.

Diseases and infections that can be transmitted to humans include:

**Salmonellosis**– Common bacterial infection transmitted to humans by other animals. Symptoms include fever, muscle aches, diarrhea, headache, vomiting, abdominal cramps and even death.

**Campylobacteriosis**– Bacterial infection carried by dogs and cats that causes diarrhea, cramping, abdominal pain and fever in humans.

**Toxoplasmosis**– Parasite carried by cats that causes birth defects such as mental retardation and blindness if a woman becomes infected during pregnancy.

**Toxocariasis**– Infection caused by parasitic roundworms that can cause blindness or temporary vision loss, rash, fever, cough, and pneumonia.

Fortunately, there is an easy solution. We can - and should - dispose of pet waste properly. It's part of being a responsible pet owner and a good neighbor. It's also the law.



- Clean up after pets on any public property.
- Always carry a bag or pooper scooper. Be able to show it to a Code Enforcement Officer.
- Dispose of pet waste in a trash can. Do not flush.
- Fines are \$250 for not complying with these steps.

Questions? Call Wilmington Stormwater Services at 910.341.0092

## PET WASTE RESOURCES

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

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

Pet Waste Management Toolkits are available for HOAs & Apartment Complexes by request



# The State of Wilmington 2018 UNCW Surface

(Following is a summary of the condition of major creeks

## 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.

The State of Wilmington's Waterways 2018 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. Each water quality sampling summary is based on data collected between the months of January-

December 2018 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 and to read Dr. Mallin's entire report, please visit:

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



**UNCW Results Summary:** Excessive fecal coliform bacteria counts were prevalent throughout Wilmington Watersheds and particularly poor in Burnt Mill Creek, upper Bradley Creek, upper Hewletts Creek, Motts Creek, and the Greenfield Lake tributaries. A number of algal blooms occurred, especially in Greenfield Lake, Burnt Mill Creek, and upper Howe and Hewletts Creeks. The worst problems with low dissolved oxygen were in the Greenfield Lake tributaries, upper Burnt Mill Creek, and upper Bradley Creek.

There were a number of late season (October-November) algal blooms at several locations including Howe Creek, upper Hewletts Creek, Burnt Mill Creek and Greenfield Lake. We suspect these blooms were caused by nutrient (nitrogen and phosphorus) loading from the excessive stormwater runoff from Hurricane Florence, as well as possible localized sewage issues from the storm.

# Wilmington's Waterways Water Quality Report

(and waterways, not drinking water, within the City limits.)



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:** Smith Creek was free of algal blooms and had generally low turbidity, but there were several incidents of low dissolved oxygen. Fecal coliform bacteria counts exceeded standards on 4 sampling occasions.

### 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) and Chlorophyll a

**UNCW Sampling Summary:** Fecal coliform bacteria levels were excessive in the upper and lower creek, dissolved oxygen was poor in the lower creek, and algal blooms occurred in the middle and lower creek.

### 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 main lake had a massive blue-green algal bloom, which led to excessive biochemical oxygen demand (BOD) and suspended solids loading. Excessive fecal coliform bacterial counts impacted all of the tributary streams. There were two fish kills: one in the spillway of 600+ fish in August, and a massive one following Hurricane Florence in Sept.

### 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:** The sampling site on Barnards Creek had two algal blooms and fecal coliform counts were somewhat elevated on 2 sampling occasions.

### 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:** The sampling site had excessive fecal coliform bacterial counts on several occasions, plus it had an algal bloom in late October.



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 the creek is also impaired for dissolved oxygen

**UNCW Sampling Summary:** The upper creek had relatively high fecal coliform bacteria levels and algal blooms on 3 sampling occasions. The middle creek had better water quality, but still had algal blooms. Dissolved oxygen was good throughout.

### 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:** There were no algal blooms, however, fecal coliform bacteria counts were excessive throughout the year in the upper creek and south branch, as well as on 3 occasions in the north branch. There were some low dissolved oxygen problems as well, but not severe ones.

### 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 had two algal blooms in the upper middle branch and south branch; there were some mild low dissolved oxygen problems too. There were excessive fecal coliform bacterial counts all year in all four upper creek sampling sites; only the lowest creek in the main body was in relatively good condition microbiologically.

### 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:** Fecal coliform counts were somewhat high on three occasions, but not severe. There were no algal blooms, and dissolved oxygen levels were good.

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

## 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 levels 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)

**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.

# Community Programs

## Heal Our Waterways

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

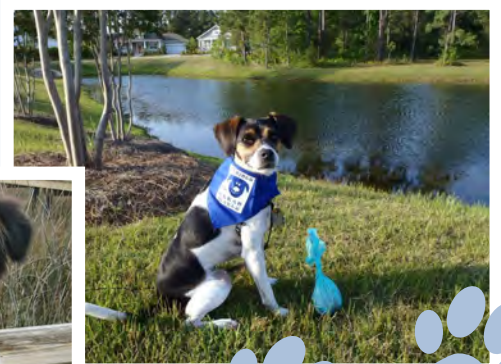
Slow it down. Spread it out. Soak it in.  
Learn more at [healourwaterways.org](http://healourwaterways.org)



## Canines for Clean Water

Sign the Pet Waste Pledge.  
Get free stuff.  
We'll feature your pup in our Canines Photo Gallery!

[www.wilmingtonnc.gov/canines](http://www.wilmingtonnc.gov/canines)



*Remember, YOU are the solution to stormwater pollution!*