

# Stormwater 101

See it.  
Report it.

Stormwater  
Pollution  
910.341.1020

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



Stormwater pollution flows directly into where we fish, where we swim, and what we drink. Everything that goes into our storm drains—pet waste, fertilizer, litter, grass clippings, motor oil, etc.—makes its way straight to our waterways. You can help by making sure these things don't get in our storm drains, or by reporting stormwater pollution.

 910-341-1020  
[wilmingtonnc.gov/stormwater](http://wilmingtonnc.gov/stormwater)



CITY OF WILMINGTON

# Stormwater Watch

PUBLIC SERVICES DEPARTMENT STORMWATER SERVICES

Spring 2012

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**UNCW Surface Water  
Quality Annual Report**

 **Questions?**  
**Stormwater Services Division**

Administration 343-4777  
Drainage/Maintenance 341-4646  
Billing Questions (CFPUA) 332-6550

Stormwater Pollution  
Prevention Hotline 341-1020


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

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## “Green Street” helps clean Burnt Mill Creek

The city is leading the state in testing new stormwater clean up measures. With help from North Carolina State University, this winter the city installed three systems in the Bottom neighborhood that prevent stormwater runoff from draining directly into area creeks and streams.



areas that allow polluted stormwater runoff to soak into the ground, where it is filtered and cleaned by the soil. Regular pavement is so hard and dense, water cannot get through it, but rather runs off the hard surface untreated and eventually empties into area waterways.

In addition, two specially-outfitted tree planters that capture stormwater runoff and two rain gardens that filter stormwater through the soil have been installed.

This \$375,000 project was mostly funded through a federal grant.

The Bottom Neighborhood is a part of the Burnt Mill Creek watershed, which has poor water quality according to the Water Quality Report on the next page. “The Bottom”, one of the lowest points in the Burnt Mill Creek watershed, is bounded by 6th and 17th streets and Market and Castle streets.

“This is a pilot project to look at different ways to retrofit or construct new streets that would reduce the amount of polluted stormwater that runs into creeks like Burnt Mill,” said City Stormwater Services Manager David Mayes.

Three different clean-up measures have been installed, including parking

**“This is a pilot project to look at different ways to retrofit or construct new streets that would reduce the amount of polluted stormwater that runs into creeks like Burnt Mill.”**

- David Mayes, City Stormwater Services Manager

The NC Division of Water Quality 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 waterway. Listed below are the freshwater and saltwater classifications that apply to Wilmington's waterways. For more information, visit: <http://portal.ncdenr.org/web/wq/ps/csu>

### 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) and fish/aquatic life propagation and survival.

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

**Class SA** Saltwaters used for commercial shellfish harvesting, primary recreation such as swimming, and all Class SC/SB uses. SA waters are also High Quality Waters (HQW) by definition.

### Supplemental Classifications

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

### Outstanding Resource Waters (ORW)

Unique and special saltwaters with excellent water quality and/or having national, ecological, or recreational significance and outstanding fish habitat.

### State Status/Reason

Indicates whether or not a creek is supporting its State classification 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. Unfortunately, several of Wilmington's waterways are on the North Carolina 303(d) List because of pollution such as bacteria and nutrients.

# The State of Wilmington's Waterways 2011 UNCW Surface Water Quality Report

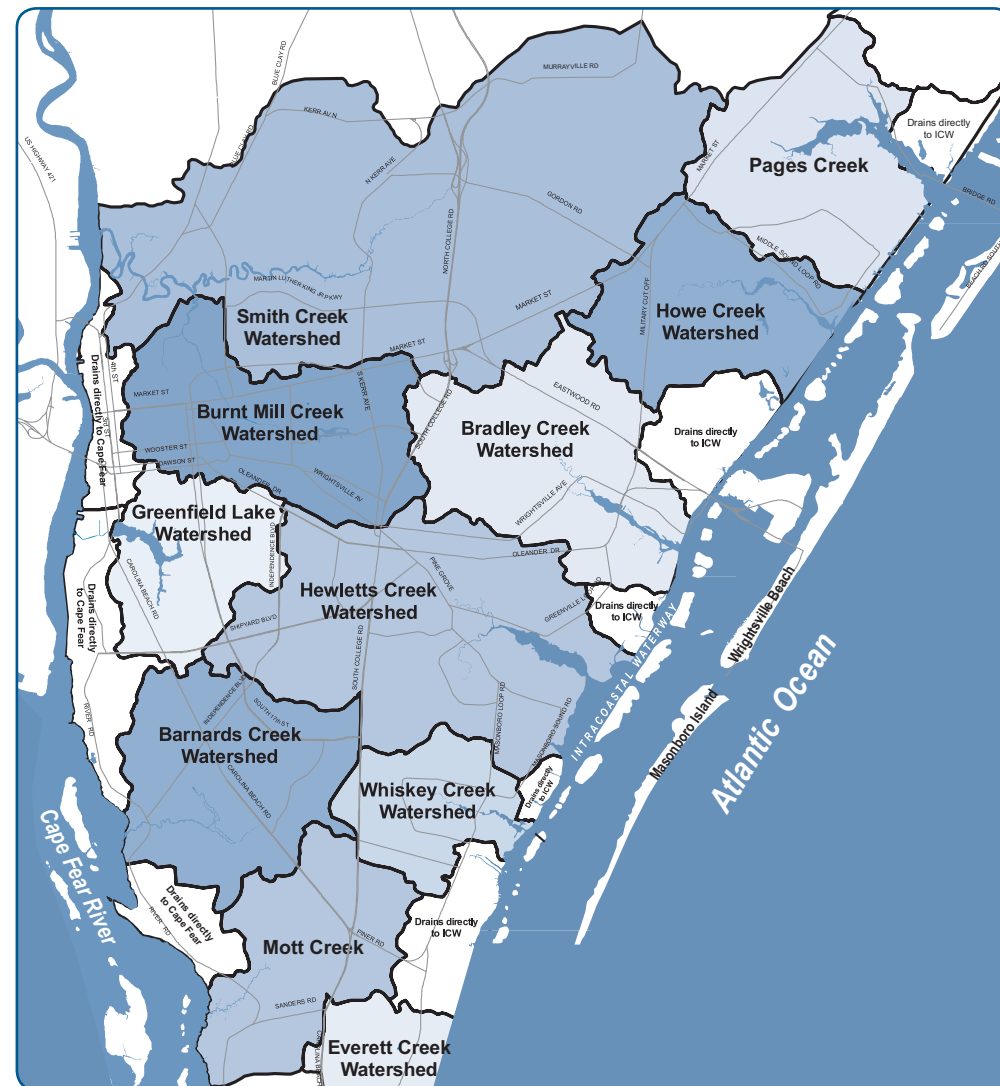
(Following is a summary of the condition of major creeks and waterways, not drinking water, within the City limits.)

The State of Wilmington's Waterways 2011 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 2011 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:

[www.uncw.edu/cmsr/aquaticecology/laboratory](http://www.uncw.edu/cmsr/aquaticecology/laboratory)



Tidal creeks which drain to the Intracoastal Waterway, such as Hewletts, Howe and Whiskey Creek, are closed to shellfishing due to high bacteria counts. Fecal coliform bacteria continues to be the number one pollutant impacting Wilmington's waterways. North Carolina has listed all surface waters in the state as impaired for mercury, due to high levels found in the tissues of several fish species.



Cape Fear River

## Watersheds that drain to Cape Fear River

### Smith Creek

**Size of watershed:** 13,896 acres  
**State classification/Use:** C, Sw  
**State Status:** Currently supporting use  
**Reason:** Meets standards for ecological/biological integrity, fecal coliform and aquatic life.  
**UNCW Sampling Summary:** UNCW sampled one station in 2011 on Castle Hayne Road, conditions worsened from 2010 with periodic low dissolved oxygen and high fecal coliform counts on four occasions.

### Burnt Mill Creek

**Size of watershed:** 4,252 acres  
**State classification/Use:** C, Sw  
**State Status:** Impaired, on 303(d) list  
**Reason:** Poor ecological and biological integrity  
**UNCW Sampling Summary:** This creek had very poor water quality, with large algal blooms in the lower portion of the creek, incidents of low dissolved oxygen and frequent high fecal coliform levels. Creek sediments are polluted by PAHs at levels known to be harmful to aquatic life.

### Greenfield Lake

**Size of watershed:** 2,551 acres  
**State classification/Use:** C, Sw  
**State Status:** No current rating  
**Reason:** Inconclusive data from State  
**UNCW Sampling Summary:** Tributaries into the lake had problems with severe low dissolved oxygen. The main lake had problems with algal blooms and high fecal coliform bacteria, but had generally good to fair DO levels.

### Barnards Creek

**Size of watershed:** 4,161 acres  
**State classification/Use:** C, Sw  
**State Status:** Currently supporting use  
**Reason:** Meets standard for ecological and biological integrity.  
**UNCW Sampling Summary:** Bottom sediments were sampled at three sites. The River Road site showed one toxin, a polycyclic aromatic hydrocarbon called Benzo(a)pyrene, as elevated.

### Mott Creek

**Size of watershed:** 3,328 acres  
**State classification/Use:** C, Sw  
**State Status:** No current rating  
**Reason:** Not currently monitored by State  
**UNCW Sampling Summary:** Not sampled by UNCW in 2011.



Intracoastal Waterway

## Watersheds that drain to Intracoastal Waterway

### Howe Creek

**Size of watershed:** 3,518 acres  
**State classification/Use:** SA, ORW  
**State Status:** Impaired. On 303(d) list and closed to shellfishing  
**Reason:** Fecal coliform bacteria  
**UNCW Sampling Summary:** On occasion there were minor problems with algal blooms and low dissolved oxygen, but the primary problem continues to be high fecal coliform bacteria pollution in the upper and middle creek.

### Bradley Creek

**Size of watershed:** 4,631 acres  
**State classification/Use:** SC  
**State Status:** No current rating  
**Reason:** Not currently monitored by State  
**UNCW Sampling Summary:** There were problems with algal blooms in the south branch of the creek, high fecal bacteria counts impacted all three sampling stations, and there were minor dissolved oxygen problems. Creek bottom sediments were sampled and elevated copper and arsenic were found at the marina, and high concentrations of toxic polycyclic aromatic hydrocarbons (PAHs) were found in the upper north branch and the creek station on College Acres Dr.

### Hewletts Creek

**Size of watershed:** 7,435 acres  
**State classification/Use:** SA, HQW  
**State Status:** Impaired. On 303(d) list and closed to shellfishing  
**Reason:** Fecal coliform bacteria  
**UNCW Sampling Summary:** There were only minor problems with low dissolved oxygen and only one major algal bloom occurred. High levels of fecal coliform bacteria polluted four of five stations in this creek. Problems in this creek have resulted from polluted stormwater runoff and sewer leaks/spills.

### Whiskey Creek

**Size of watershed:** 2,095 acres  
**State classification/Use:** SA, HQW  
**State Status:** Impaired. On 303(d) list and closed to shellfishing  
**Reason:** Fecal coliform bacteria  
**UNCW Sampling Summary:** One station was sampled on Masonboro Loop Rd. There were minor problems with low DO, but otherwise good water quality.

**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)

**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 non-structural such as picking up after your pet, or structural such as rain barrels or rain gardens.

**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. (Sources: pet waste, sewer overflows, septic system failure)

**Hypoxia** Low dissolved oxygen levels in a waterway which can result in fish kills. (Source: excess nutrients, algal blooms)

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

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

**PAHs (Polycyclic Aromatic Hydrocarbons)** Chemicals that are produced by burning fossil fuels, which can be toxic 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 as a result of land-disturbing activities or natural weathering. Sediment can settle to the bottom or remain suspended in water. Other pollutants may attach to sediment particles. (Sources: construction sites with failing sediment/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.