


# Stormwater Watch

## 10 ways to help!

You can help protect lakes, creeks, rivers, wetlands and coastal waters by keeping common pollutants like pesticides, pet waste, grass clippings, and automotive fluids off the ground and out of storm drains.

- 1 Always pick up after your pet.
- 2 Wash your car on the grass or at a car wash.
- 3 Use pesticides and fertilizers sparingly; avoid using if the forecast calls for rain.
- 4 Use native plants which require less water, fertilizer and pesticides.
- 5 Compost yard waste or leave grass clippings on the lawn to provide nutrients. Or bag it for yard waste pickup service.
- 6 Put litter in the trash where it belongs.
- 7 Check your car, motorcycle, boat or other machinery for leaks and spills and repair them.
- 8 Properly dispose of hazardous chemicals; recycle used oil, antifreeze or other fluids.
- 9 Never dump anything into a storm drain, creek, or waterway.
- 10 Spread the word! Tell a friend or neighbor how they can help too!

 343-4777  
Stormwater Services

## Street Sweeper Building Goes "GREEN"

Stormwater Services has an aggressive street sweeping program that improves the cleanliness of streets, minimizes the amount of dirt and pollutants flowing into waterways, and helps prevent flooding.



Last year, city crews logged nearly 10,000 miles in keeping our streets clean! The city's 3-wheeled street sweepers mainly operate in the downtown area because they can maneuver around parked vehicles and tight corners.

In an effort to be closer to downtown, the 3-wheeled sweepers are housed in a newly renovated "green" building located at the corner of 17th & Marsteller streets. The facility features green technologies and environmentally-friendly building techniques.



**Site & Building Re-use** - The city is reusing a building it already owned. Much of the existing structure was also reused in construction, including the roof, steel, lumber and concrete slab.

**Solar Power** - Solar panels were installed on the roof to produce enough electricity to power the entire building, and there is also the potential to produce extra electricity for financial credit from the power company each month.

**Radiant Floor Heating** - Solar panels on the roof heat water that is pumped through tubing in the floor of the building to provide heat during the winter.

**Stormwater Runoff** - To capture runoff flowing from the site, several stormwater improvements were installed, including a bioretention area that treats runoff from the parking lot and rooftop. Also, a significant amount of asphalt that causes stormwater runoff was removed and a cistern was installed to capture runoff from the roof. The rainwater captured from the roof will be used to irrigate the surrounding landscape.



### Have you seen these signs?

All too often we see creeks and streams without realizing the interconnection between them. These signs were posted to create an awareness of Wilmington's watersheds. For example, if you live in the Hewletts Creek Watershed, runoff from your property will drain into Hewletts Creek, then eventually into the Intracoastal Waterway. If you want to know which watershed you live in, contact Stormwater Services at 343-4777, or check out the map on the inside page.

# City of Wilmington's Stormwater Watch

Public Services Department Stormwater Services

Summer 2009

## Inside

UNCW Surface Water Quality  
Annual Report

## Questions?

### Stormwater Services Division

Administration	343-4777
Maintenance	341-4646
Billing Questions	332-6550

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## What is stormwater?

Stormwater runoff is water from rain or irrigation that flows over land and into creeks, lakes, and larger waterways. Impervious (hard) surfaces, such as driveways, streets, parking lots, and rooftops, prevent stormwater runoff from naturally soaking into the ground. Instead, it picks up and transports pollutants such as pet waste, fertilizers, pesticides, auto fluids, yard debris, heavy metals, and litter through the drainage system and flows directly into our waterways. Stormwater runoff is the number one source of surface water pollution.



Stormwater runoff flows from a parking lot into a rain garden.

## What can we do to prevent stormwater pollution?

For several years, the city has been working in partnership with other agencies to improve the health of Burnt Mill Creek. According to the State, the creek is impaired and stormwater improvements need to be made to enhance its water quality. Such improvements include filtering stormwater naturally through rain gardens, wetlands or pervious pavement that allows water to drain through the ground.

Several stormwater improvements have already been installed in the area, including pervious pavement and rain gardens at the Wilmington Family YMCA, a stormwater wetland at Stonestrow Condominiums and a raingarden at Port City Java on Market Street.

## What can you do to help?

Bringing Burnt Mill Creek back to health will require additional stormwater improvements. Property owners in Burnt Mill Creek, such as those with large parking lots and commercial properties, could be eligible for grant funding to install stormwater improvements.

If you're interested in having your property considered for grant funding contact:

Jennifer Butler (910) 343-4777  
jennifer.butler@wilmingtonnc.gov  
or  
Christy Perrin (919) 515-4542  
Christy\_perrin@ncsu.edu

## What goes in here...



## ...ends up here.



**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, pesticides, litter, yard debris, dirt, etc. — makes its way straight to our waterways. You can help by not putting these items in storm drains. **Be part of the solution to stormwater pollution!**

[www.wilmingtonnc.gov/publicservices/stormwater](http://www.wilmingtonnc.gov/publicservices/stormwater)



# The State of Wilmington's Waterways 2008 UNCW Surface Water Quality Report

(a summary of the current health and condition of major creeks, not drinking water, within the City limits)

## Water Classifications

The State of North Carolina applies classifications to waterways which define the best uses to be protected within those waters (i.e. swimming, fishing, drinking water supply). 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 river, 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 classifications that apply to Wilmington's waterways. For more information, visit <http://h2o.enr.state.nc.us/csu/>.

### State Classifications

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

**Class SA** Waters used for shellfishing and marketing purposes, and all SB and SC uses. All SA waters are also High Quality Waters (HQW) by definition.

**Class SB** Surface waters that are used for primary recreation such as swimming.

**Class SC** All tidal salt waters protected for secondary recreation, wildlife and aquatic life propagation and survival.

### Supplemental Classifications

**Swamp Waters (Sw)** Waters with low flow, low pH, and low dissolved oxygen.

**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 with excellent water quality and/or having national, ecological, or recreational significance.

### Status

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

Section 303(d) of the Clean Water Act requires states to develop and update a list of waters that do not meet water quality standards or which have impaired uses. Unfortunately, many of Wilmington's waterways are on this list because of factors such as bacteria, sediment, and nutrients found in stormwater runoff.

Entire stormwater quality report can be read at:

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



Cape Fear River

## Watersheds that drain to Cape Fear River

### Smith Creek

**Size of Watershed:** 13,649 acres

**State Classification:** C, Sw

**Status:** Impaired

**Reason:** Poor biological integrity

#### UNCW Sampling Summary:

Problems with low DO and high turbidity which can reduce the abundance and diversity of the animals living on the creek bottom.

### Burnt Mill Creek

**Size of Watershed:** 4,223 acres

**State Classification:** C, Sw

**Status:** Impaired

**Reason:** Poor biological integrity

#### UNCW Sampling Summary:

This creek has very poor water quality, with low DO and high fecal coliform bacteria levels and large algal blooms in the lower portion of the creek. Creek sediments are polluted by PAHs at levels known to be harmful to aquatic life.

### Greenfield Lake

**Size of Watershed:** 2,448 acres

**State Classification:** C, Sw

**Status:** Impaired

**Reason:** Nutrients entering lake, aquatic weeds/algae

#### UNCW Sampling Summary:

Tributaries into the lake had problems with severe low DO. The main lake had problems with algal blooms and high fecal coliform bacteria, but had mostly good DO levels.

### Barnards Creek

**Size of Watershed:** 4,143 acres

**State Classification:** C, Sw

**Status:** Currently supporting use

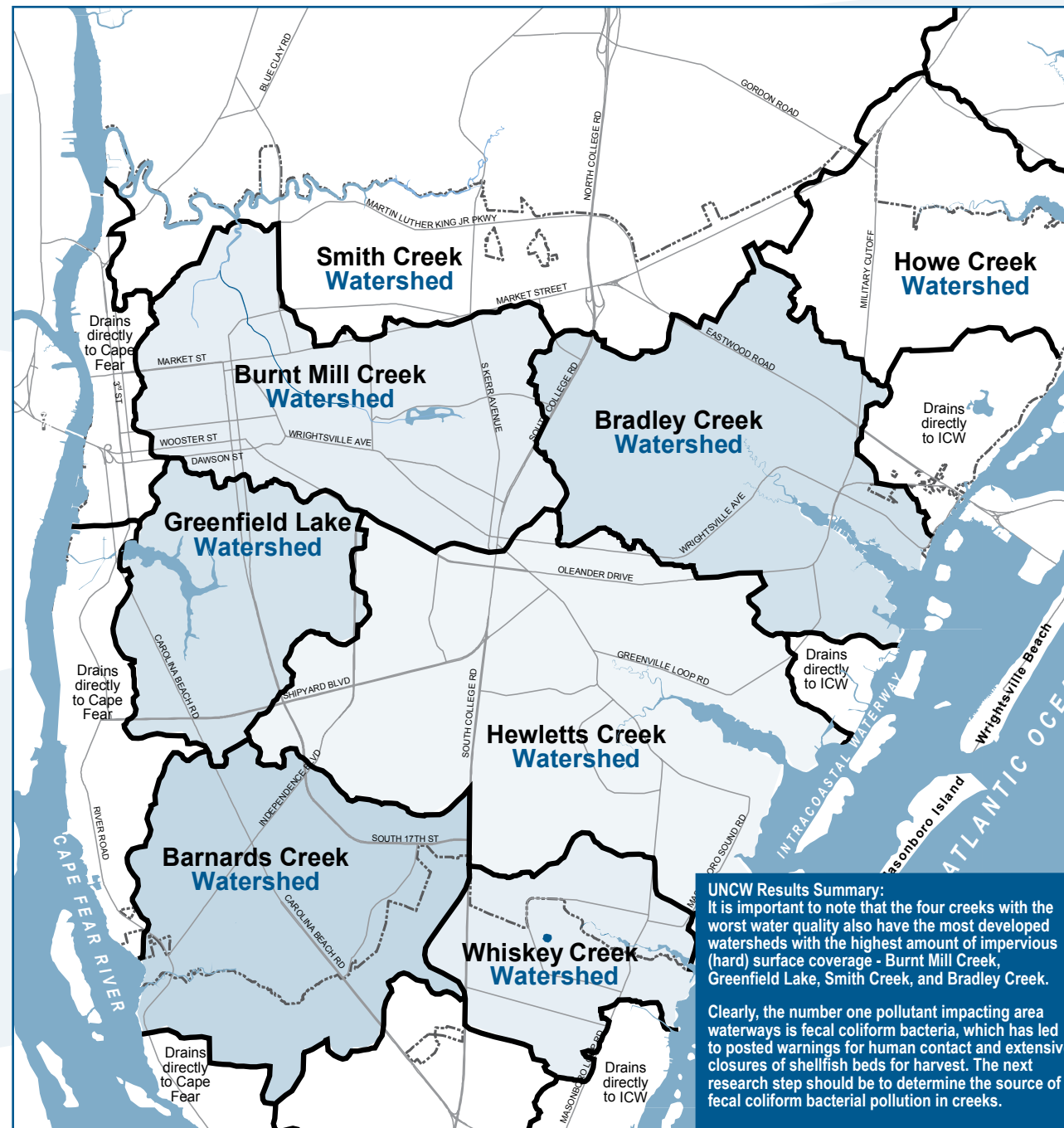
#### UNCW Sampling Summary:

No real problems with turbidity, algal blooms, or DO, however high fecal coliform bacteria levels impact this creek.

The State of Wilmington's Waterways, 2008 UNCW Surface Water Quality Report is a summary of the current health and condition of major creeks falling within Wilmington 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 2008 and is presented from a

watershed perspective, regardless of political boundaries. This map shows the watersheds located in the city of Wilmington. The summary describes each watershed, by size, classification, status, reason and 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/).



## Water Definitions



Intracoastal Waterway

## Watersheds that drain to Intracoastal Waterway

### Howe Creek

**Size of Watershed:** 3,343 acres

**State Classification:** SA, ORW

**Status:** Impaired. Closed to shellfishing.

**Reason:** Fecal coliform bacteria

#### UNCW Sampling Summary:

Problems with algal blooms, low DO, and fecal coliform bacteria. Fecal bacteria pollution in stormwater runoff has resulted in shellfish bed closures in this creek.

### Bradley Creek

**Size of Watershed:** 4,470 acres

**State Classification:** SC

**Status:** Currently supporting use

#### UNCW Sampling Summary:

Some problems with fecal bacteria, algal blooms and total suspended solids upstream, and DO downstream. It is noted that construction activity has been ongoing upstream in this creek.

### Hewletts Creek

**Size of Watershed:** 7,124 acres

**State Classification:** SA, HQW

**Status:** Impaired. Closed to shellfishing.

**Reason:** Fecal coliform bacteria

#### UNCW Sampling Summary:

Minor problems with low DO, but no major algal blooms occurred. High levels of fecal coliform bacteria pollute this creek. Problems in this creek have come about from polluted stormwater runoff and sewer leaks and spills.

### Whiskey Creek

**Size of Watershed:** 1,854 acres

**State Classification:** SA, HQW

**Status:** Impaired. Closed to shellfishing.

**Reason:** Fecal coliform bacteria

#### UNCW Sampling Summary:

Limited sampling; some problems with low DO on occasion, but no problems with turbidity, fecal coliform, or algal blooms at the site sampled.

**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)** A practice or landscape technique that reduces the amount of pollution and/or the quantity of stormwater flowing into waterways. BMPs can be structural, such as rain barrels or buffers, or non-structural, such as picking up after your pet.

**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 can 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** Very low DO levels. Can result in fish kills.

**Nutrients** Substances needed by plants and animals for growth (i.e. nitrogen and phosphorus); 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, parking lot sealcoats, roofing tars, coal power plants, fireplace and cigarette smoke)

**Sediment** Particles of silt, clay, dirt, or sand that wash into waterways as a result of land-disturbing activities or natural weathering. Sediment is the #1 water pollutant in NC and can settle to the bottom or remain suspended in water. (Sources: construction sites with failing sediment/erosion control, eroding streambanks, and exposed soil)

**Tidal Creek** A creek that is affected 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.