

CITY OF WILMINGTON Stormwater Watch

PUBLIC SERVICES DEPARTMENT

STORMWATER SERVICES

Spring 2015

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**UNCW Surface Water
Quality Annual Report**

? **Questions?**

Stormwater Services Division

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Drainage/Maintenance 341-4646

Billing Questions (CFPUA) 332-6550

Report Stormwater

Pollution Hotline 341-1020

or: wilmingtonnc.gov/reportstormwaterpollution

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Fire Station #9 helping to improve Bradley Creek

The Heal Our Waterways program is a community-wide effort to improve water quality in Bradley and Hewletts Creeks, by reducing the amount of polluted stormwater runoff flowing into them. Polluted runoff flows over impervious, or hard surfaces, like streets and driveways and carries bacteria, chemicals, toxins, and other pollution straight to our creeks.

The best way to prevent water pollution is to allow rainwater to soak in where it falls, instead of running off into the creeks, untreated.

Last fall, the City of Wilmington and North Carolina Cooperative Extension installed two “stormwater solution” projects at Fire Station #9 on Military Cut Off Road.

The first project is a man-made wetland that captures runoff from the roof of the firehouse. The moisture-loving plants in the wetland attract beneficial insects like bees and dragonflies, while also absorbing and removing pollutants and bacteria. The wetland also allows runoff to slowly soak into the ground replenishing groundwater, instead of running off into Bradley Creek.

The second project was the installation of a 1,100 gallon cistern. A cistern is a large tank that collects rainwater from the roof for later use. The firemen use the stored water to supply fire hydrants, irrigate the landscape and wash the fire trucks.

The fire station projects represent larger versions of stormwater solutions that residents and businesses can easily incorporate onto their own property. Smaller solutions include rain gardens, rain barrels, and rerouting downspouts to drain onto the yard, instead of running off pavement.



These projects have been entered into the “Creek Counter” which tracks the number of stormwater solutions that have been installed by residents and businesses.

If you have installed a stormwater solution on your property or you want to install one, please let us know! Be Counted!

For more information:



healourwaterways.org



healourwaterways@wilmingtonnc.gov

WILMINGTONNC.GOV/STORMWATER

Water Classifications

The State of Wilmi 2014 UNCW Surface

(Following is a summary of the condition of major creeks

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: <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 (HW) by definition.

Supplemental Classifications

High Quality Waters (HW) 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 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 report is based on the 2014 303(d) List, which is available for viewing at: <http://portal.ncdenr.org/web/wq/ps/csu/swstandards/303d>. Unfortunately, several of Wilmington's waterways are on the 303(d) list because of pollution, such as bacteria and nutrients, carried by stormwater runoff.

The State of Wilmington's Waterways 2014 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 2014 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.htm>



UNCW Results Summary: Fecal coliform bacterial contamination continues to be the number one pollutant impacting Wilmington's watersheds. All of the tidal creeks (which drain to the Intracoastal Waterway) in the City limits, are closed to shellfishing due to high fecal bacteria levels. Watersheds with the highest levels of development are also those that are most polluted, including Burnt Mill Creek, Greenfield Lake and Bradley Creek. The constructed stormwater wetland along the south branch of Hewletts Creek has considerably improved water quality in the upper part of the creek. A 4-year program sampling sediments in the watersheds found a strong relationship between built-upon land area and PAHs, which are toxic by-products of petroleum products and fossil fuels. Watersheds with highest sediment pollution levels were Burnt Mill Creek, Greenfield Lake, Smith Creek and Bradley Creek.

Wilmington's Waterways Water Quality Report

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



Cape Fear River

Watersheds that drain to Cape Fear River (CFR)

Smith Creek

Size of watershed: 13,896 acres

State classification/Use: C, Sw

State Status: Currently supporting use

Reason: Meets standards for Class C waters

UNCW Sampling Summary: One sampling station near Castle Hayne Road showed good dissolved oxygen levels, no excessive turbidity or algal blooms present, and high fecal coliform bacteria levels on two sampling occasions.

Burnt Mill Creek

Size of watershed: 4,252 acres

State classification/Use: C, Sw

State Status: Impaired. On 303(d) List

Reason: Exceeds standards for Class C waters, specifically biological integrity (benthos) and Chlorophyll a

UNCW Sampling Summary: This creek had very poor water quality, suffering from frequent high fecal coliform bacteria levels with occasional algal blooms and incidents of low dissolved oxygen.

Greenfield Lake

Size of watershed: 2,551 acres

State classification/Use: C, Sw

State Status: Impaired. On 303(d) List

Reason: Exceeds standards for Class C waters, specifically Chlorophyll a

UNCW Sampling Summary: Tributaries into the lake had problems with severe low dissolved oxygen and high fecal coliform bacteria counts. The main lake had problems with algal blooms and high fecal bacteria, but only minor dissolved oxygen issues.

Barnards Creek

Size of watershed: 4,161 acres

State classification/Use: C, Sw

State Status: Currently supporting use

Reason: Meets standards for Class C waters

UNCW Sampling Summary: Not sampled in 2014.

Mott Creek

Size of watershed: 3,328 acres

State classification/Use: C, Sw

State Status: Currently supporting use

Reason: Meets standards for Class C waters

UNCW Sampling Summary: Not sampled in 2014.

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



Intracoastal Waterway

Watersheds that drain to Intracoastal Waterway (ICW)

Howe Creek

Size of watershed: 3,518 acres

State classification/Use: SA, ORW

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

Reason: Fecal coliform bacteria, portion of creek impaired for dissolved oxygen

UNCW Sampling Summary: There were minor algal blooms, but the primary problem continues to be high fecal coliform bacterial pollution in the middle and upper part of Howe Creek.

Bradley Creek

Size of watershed: 4,631 acres

State classification/Use: SC, HQW

State Status: Currently supporting use

Reason: Meets standards for Class SC waters

UNCW Sampling Summary: There were no problems with algal blooms in the creek in 2014, but high fecal bacteria counts impacted all three sampling stations, and there were minor dissolved oxygen problems.

Hewletts Creek

Size of watershed: 7,435 acres

State classification/Use: SA, HQW

State Status: Impaired. On 303(d) List; closed to shell fishing

Reason: Fecal coliform bacteria

UNCW Sampling Summary: There were some problems with low dissolved oxygen, but no major algal blooms occurred. However, high levels of fecal coliform bacteria polluted four out of five sampling stations in the creek. Water quality in the south branch tributary of Hewletts Creek has improved since the JEL Wade constructed stormwater wetland was completed in 2009.

Whiskey Creek

Size of watershed: 2,095 acres

State classification/Use: SA, HQW

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

Reason: Fecal coliform bacteria

UNCW Sampling Summary: The one station sampled near Masonboro Loop Rd. had generally good water quality except for high fecal bacteria levels.

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 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. (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 phosphorus) 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)

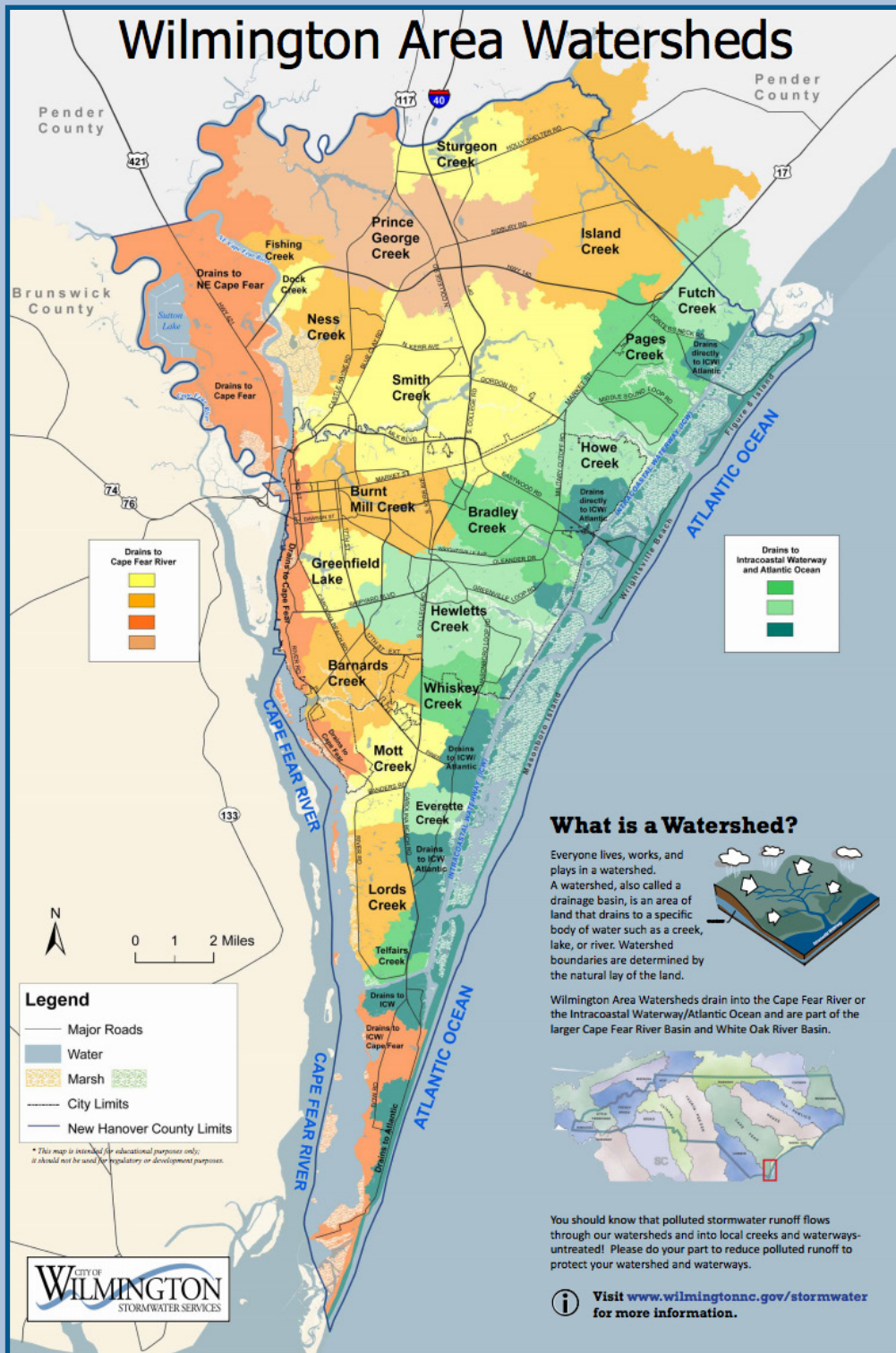
Sediment Particles of silt, clay, dirt, or sand that wash into waterways caused by land-disturbing activities or natural weathering. Sediment can settle to the bottom or remain suspended in water. (Sources: construction sites with failing/erosion control, eroding streambanks, and exposed soil)

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.

Which watershed do you live in?



Everyone lives in a watershed. A watershed is an area of land that drains to a specific waterbody, such as a creek, lake, river, or ocean.

Stormwater runoff picks up pollution and flows through watersheds, draining directly into creeks and waterways - untreated.

Your actions and how you treat the land in your watershed impact the health of our waterways.

Learn which watershed you live in and how to protect it at: www.wilmingtonnc.gov/watersheds or obtain a full-color map by calling **910.341.5895**. Limited quantities available.

Remember...
YOU are the solution to stormwater pollution!