

CITY OF WILMINGTON

Stormwater Watch

PUBLIC SERVICES DEPARTMENT

STORMWATER SERVICES

Spring 2014

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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

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Pollution Hotline 341-1020

or: wilmingtonnc.gov/reportstormwater-pollution

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WILMINGTON
CITY OF
NORTH CAROLINA

Stormwater Pollution - You're the Solution!

Everyone can reduce the pollution that stormwater carries into our waterways. We can all make a difference by making small changes in our everyday lives.

Pet Waste contains bacteria that can make humans and other animals sick and shut down waterways to swimming and shellfishing.

- Always clean up after your pet on any public property, carry a bag for clean up at all times, and dispose of pet waste in a closed trash can. It's the law! (**\$250 fine**)
- Pick up pet waste in your own backyard too.

Vehicle fluids and soaps are harmful to fish and other aquatic life.

- Wash your car on the grass - the soapy, dirty water will be cleaned naturally by the soil and it won't harm the grass!
- Use a commercial car wash - the dirty water is sent to the wastewater treatment plant or recycled onsite.
- Dispose of batteries, motor oil and other fluids at an auto parts store or the NHC Landfill.

Sediment creates muddy water, buries fish eggs and harms aquatic life.

- Re-seed or add mulch to exposed soil.
- Install vegetation to hold soil in place.
- Collect dirt off of paved surfaces; don't hose it down the driveway.

Litter is ugly and preventable. Wildlife mistake litter for food or can become entangled in it.

- Properly dispose of trash and cigarette butts - toxic chemicals that are in the butts leach into waterways.
- Reduce, reuse, recycle, repurpose.

Fertilizers contain nutrients that cause harmful algae, which can reduce oxygen and cause fish kills.

- Leave grass clippings on the lawn - they conserve moisture and fertilize naturally.



- Keep fertilizer off sidewalks and driveways and don't fertilize before rain.
- Save time and money! Learn the exact nutrients your lawn needs by getting a soil test from New Hanover County Cooperative Extension.

Pesticides can be harmful to humans, animals and beneficial insects.

- Install native plants - they naturally resist pests and diseases.
- Use natural methods to control pests/weeds, such as weeding by hand, adding mulch and using good bugs to control pests.
- Use pesticides as a last resort and never before rain; they'll just wash away.

Yard waste clogs drainage pipes and pollutes waterways.

- Keep yard waste out of streets, storm drains, ditches and waterways. It's the law! (**\$250 fine**)
- Compost yard waste for the garden/landscape.
- Put yard waste in bags or containers for City pick up.

According to the EPA, polluted stormwater runoff is the #1 cause of water pollution in the United States.

WILMINGTONNC.GOV/STORMWATER

Water Classifications

The State of Wilmi 2013 UNCW Surface

(Following is a summary of the condition of major creeks

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 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

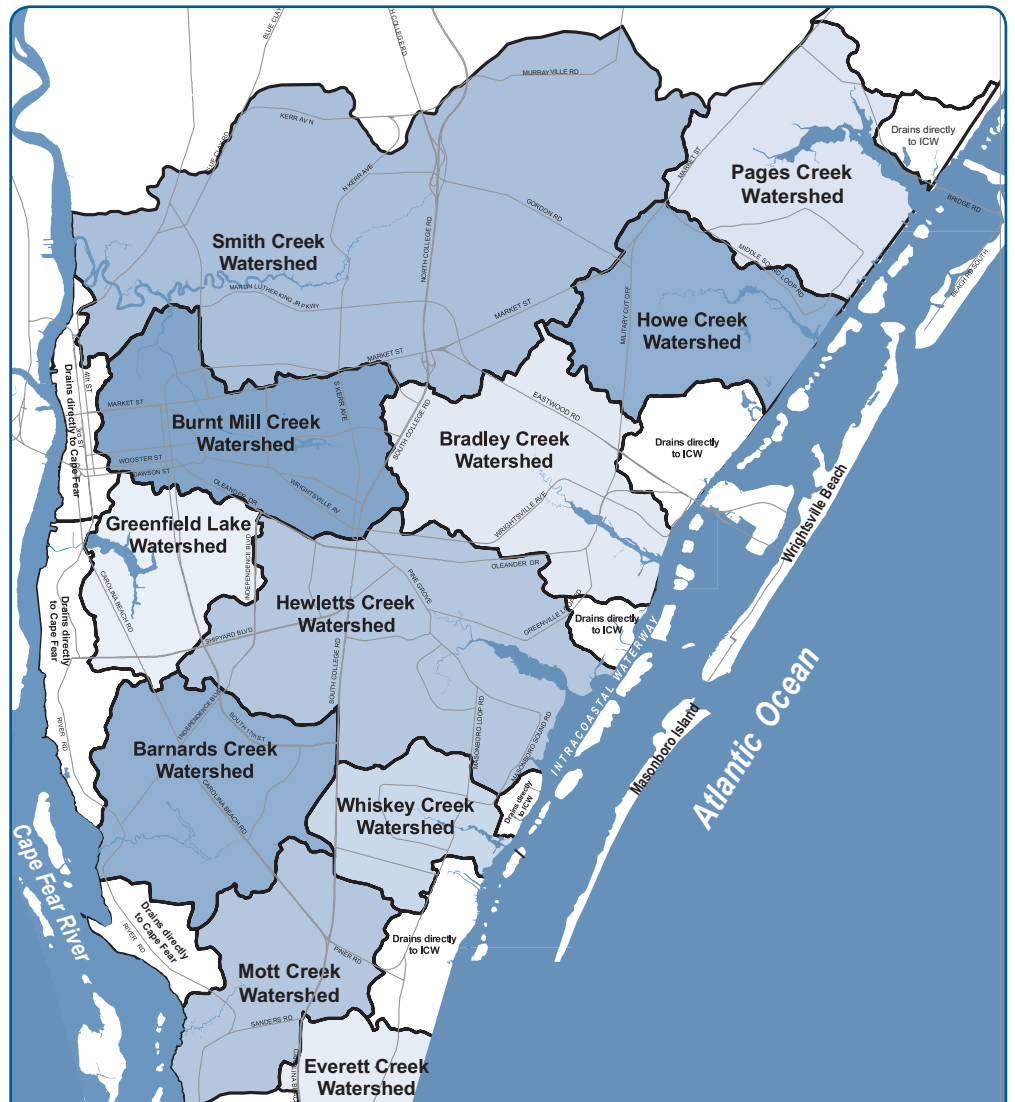
Section 303(d) of the Clean Water Act requires states to develop and frequently update a list of waters that do not meet water quality standards or have impaired uses. This report is based on the draft 2014 303(d) list, which is available for review at: <http://portal.ncdenr.org/web/wq/ps/mtu/assessment>. Unfortunately, several of Wilmington's waterways are already on 303(d) list because of pollution, such as bacteria and nutrients, carried by stormwater runoff.

The State of Wilmington's Waterways 2013 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 2013 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:

uncw.edu/cms/aelab/



UNCW Results Summary: Fecal coliform bacterial contamination continues to be the number one problem impacting Wilmington's waterways, but was even more excessive than usual in 2013. All of the tidal creeks (which drain to the Intracoastal Waterway) in the city limits are closed to shellfishing due to high fecal coliform bacteria levels. Watersheds with the highest levels of development are also those that are the most polluted, including Burnt Mill Creek, Greenfield Lake, Bradley Creek and Hewletts Creek. For example, high chlorophyll a conditions, representing algal blooms, have led the State to place Greenfield Lake on the 303(d) Impaired List.

Wilmington's Waterways Water Quality Report

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

Water Definitions



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 was in good condition in terms of sufficient dissolved oxygen, acceptable turbidity, and lack of algal blooms. However, it had excessive fecal coliform levels with 33% of the samples exceeding the NC standard for human contact.

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 suffered from excessive fecal coliform bacteria levels in the upper and lower portion of the creek, poor dissolved oxygen levels in the lower creek, and periodic algal blooms.

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: The lake hosted major algal blooms on 28% of the occasions sampled. Additionally, 5 of the 7 sampling stations had excessive fecal coliform bacteria levels, and the tributary streams into the lake had poor dissolved oxygen levels.

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.

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.



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: The two stations sampled showed excessive algal blooms on 25% of occasions sampled. The creek also had excessive fecal coliform bacteria levels on 67% of occasions sampled.

Bradley Creek

Size of watershed: 4,631 acres
State classification/Use: SC, HQW
State Status: Currently supporting use
Reason: Meets standards Class SC waters
UNCW Sampling Summary: There were no problems with algal blooms or low dissolved oxygen, but the creek had excessive fecal coliform bacteria counts in all areas sampled.

Hewletts Creek

Size of watershed: 7,435 acres
State classification/Use: SA, HQW
State Status: Impaired. On 303(d) List; closed to shellfishing
Reason: Fecal coliform bacteria
UNCW Sampling Summary: The creek did not have problems with algal blooms or low dissolved oxygen; however, high fecal coliform bacteria levels occurred in all upper areas of the creek.

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: There were no problems with algal blooms or low dissolved oxygen; however, the creek had fecal coliform bacteria levels that slightly exceeded the state standard on 50% of occasions sampled.

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

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 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, yard waste, pet 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)

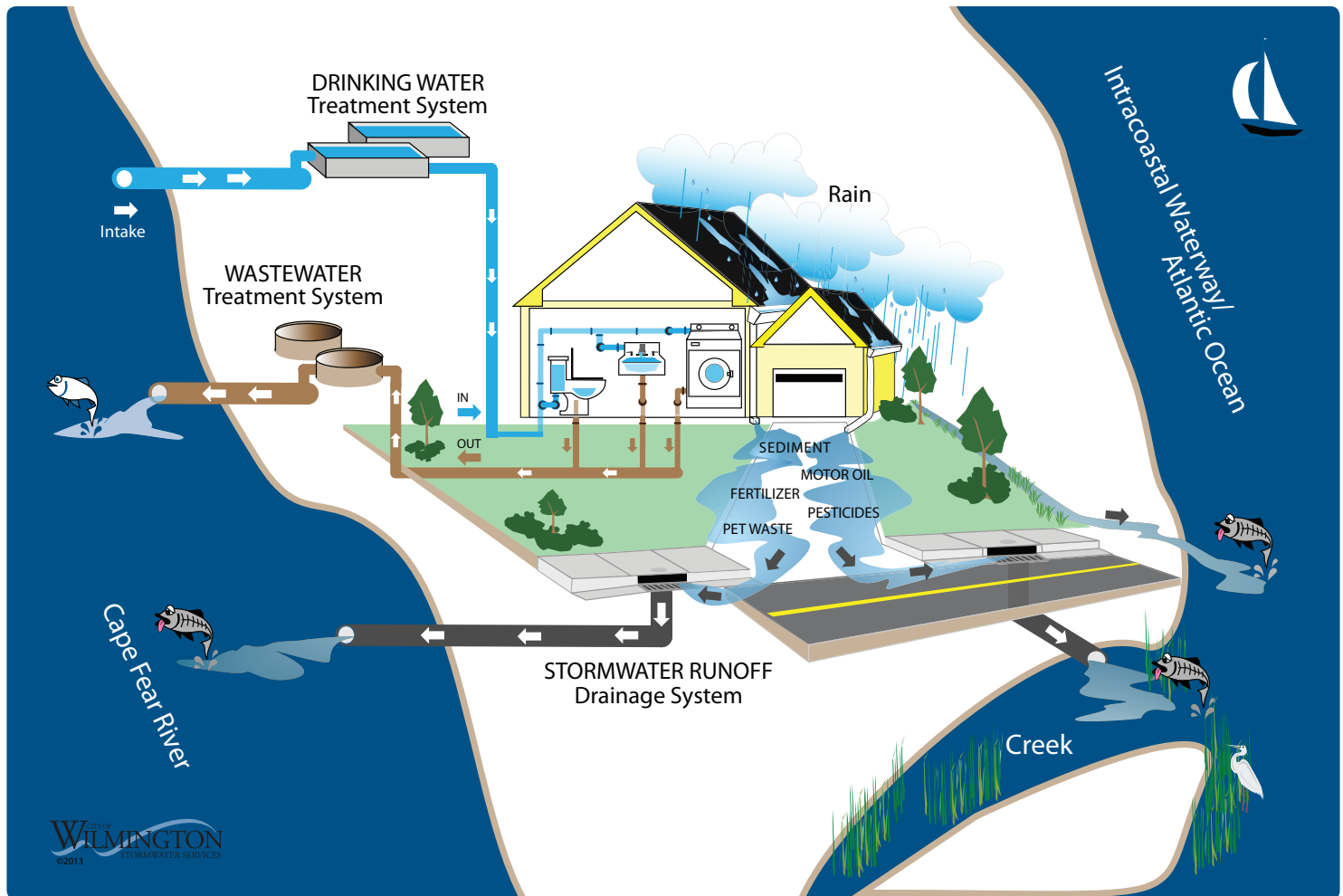
Sediment Particles of silt, clay, dirt, or sand that wash into waterways caused by land-disturbing activities or natural weathering. Sediment can settle to the bottom or remain suspended in water. (Sources: construction sites with failing/erosion control, eroding streambanks, and exposed soil)

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.

Do you know how your water flows?



- Drinking water is treated before it reaches your home. Wastewater is treated after it leaves your home. Stormwater runoff is not treated and flows directly into creeks and waterways.
- Understanding where stormwater goes, and the pollution it carries, is the key to protecting our waterways.

Remember, YOU are the solution to stormwater pollution!



wilmingtonnc.gov/stormwater

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