CITY OF WILMINGTON

Stormwater Watch

PUBLIC SERVICES DEPARTMENT STORMWATER SERVICES Spring 2016

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Questions?

Stormwater Services Division

Administration	343-4777
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or: wilmingtonnc.gov/reportstormwaterpollution

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CITY OF WILMINGTON NORTH CAROLINA

Litter: A Problem for Wilmington's Waterways

Litter is found on our streets, parking lots, school grounds, parks and private property. When it rains, litter washes off the land, into the stormwater drainage system, then directly into our creeks. It impacts people, animals, fish, and plants and is a significant problem for Wilmington's creeks and waterways.

A sea turtle has a straw removed from its nostril. Photo credit: Leatherback Trust

Animals

The impact of litter on our waterways and the animals that live there is undeniable. Birds, marine life, and land animals often mistake litter for food or feed it to their young. Many animals become entangled in fishing line or plastic bags, which can result in injury or death.

Staff Time

City Parks and Stormwater Services crews that maintain public spaces and drainage areas spend precious time collecting litter, which takes away from regular maintenance activities like mowing and ditch cleaning that help reduce flooding. Litter can also damage costly equipment like slope mowers.

Litter in a creek that flows into the Cape Fear River

Environment

Littered items take time to degrade and many will never fully disappear from the planet. For instance, plastic bottles may break down into smaller bits and pieces, but they persist in the environment indefinitely. Recent research studies have found these plastic bits inside ocean-dwelling fish and seafood.

Organizations making a difference

Several organizations in the Wilmington-area are making a difference. The Surfrider Foundation, Plastic Ocean Project, and WB Keep it Clean are leading an effort to recognize local restaurants for their efforts to curb single-use plastics such as straws, which are only offered upon request.

Cape Fear River Watch, a local non-profit, hosts volunteer clean-ups of area creeks on the second Saturday of each month.

While all of these efforts are extremely important for reducing litter in our community, the ultimate solution starts at the source - with all of us. Please protect the places you live and love by properly disposing of your trash. Educate your friends and neighbors too. ***Together, we can make a difference!***

Get Involved!

Cape Fear River Watch:
www.cfrw.us

Cape Fear Surfrider Foundation:
https://capefear.surfrider.org/

Plastic Ocean Project:
www.plasticoceanproject.org/

The State of Wilmi
2015 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: **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.

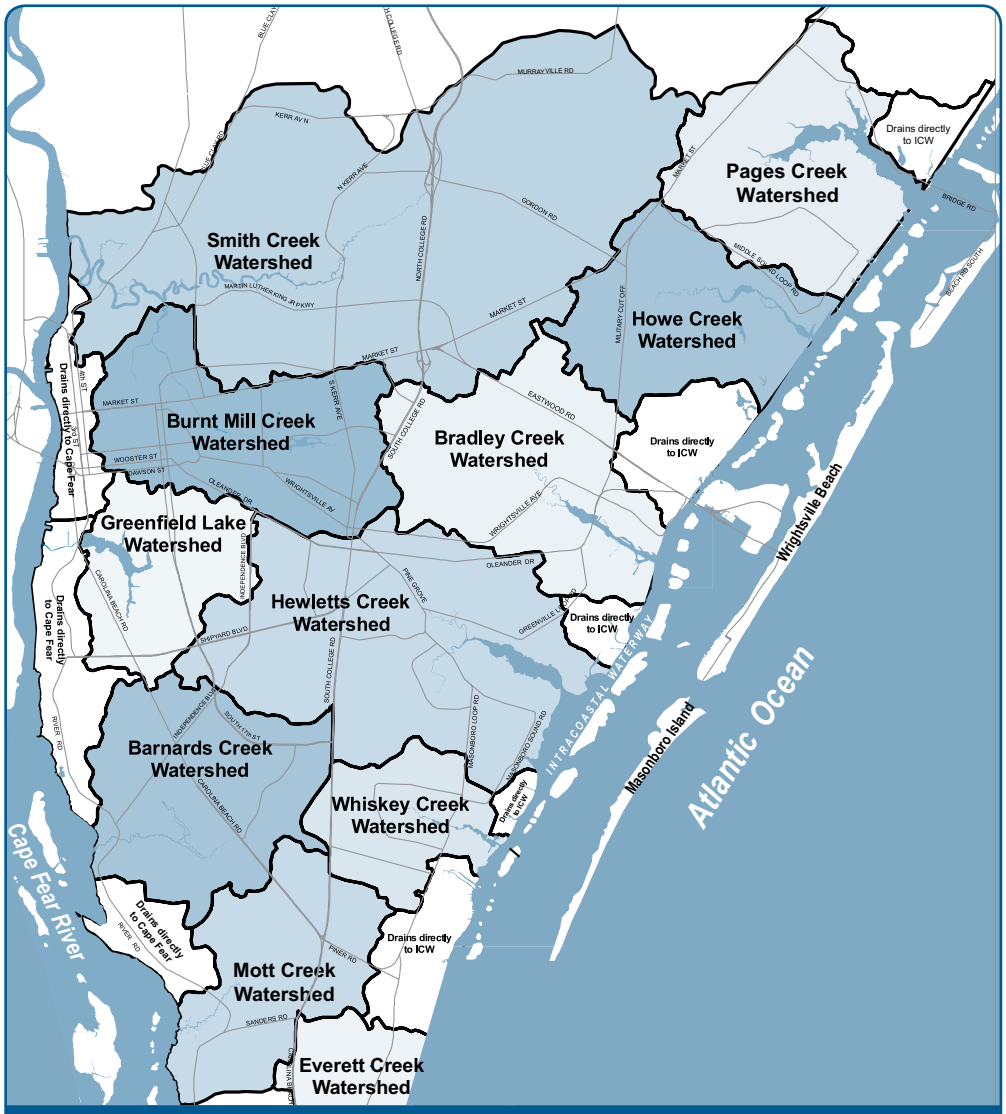
NC 303(d) List of Impaired Waters

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 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 of Wilmington's Waterways 2015 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 2015 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: The Wilmington creek system was particularly polluted by fecal bacteria in 2015, with 86% of the sampling stations considered to have poor bacteriological water quality. Sampling sites with particularly poor water quality were: the south branch of Bradley Creek; upper Bradley Creek at College Acres; upper Burnt Mill Creek; the upper north and middle branches of Hewletts Creek; the Jumping Run Branch of Greenfield Lake; and upper Howe Creek. While heavy rains exacerbated the situation, it is clear that better water quality protection practices (i.e. wetlands, rain gardens, bioinfiltration) need to be installed.

ngton'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: A sampling station near Castle Hayne bridge indicated fecal bacteria pollution, exceeding the State standard 1/3 of the time sampled. Otherwise the creek was in good condition with sufficient dissolved oxygen levels, low turbidity, and no algal blooms seen.

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 for benthos or bottom dwelling organisms and Chlorophyll a
UNCW Sampling Summary: Upper Burnt Mill Creek near Kerr Avenue showed by high fecal bacteria pollution; these levels dropped greatly below Ann McCrary Pond, then increased to high levels again at Princess Place Drive. The Princess Place section of the creek also suffers from low dissolved oxygen levels 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: Greenfield Lake continues to be impacted by thick algal blooms. Some of the main lake and most of the tributaries into the lake are polluted by high fecal bacteria levels. These tributaries also show low 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 in 2015.

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 2015.

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: Dissolved oxygen levels were good, but the creek hosts some algal blooms. Fecal bacteria levels also continue to be high at the uppermost sampling station near the headwaters of the 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 excessive algal blooms and dissolved oxygen levels were fair to good. However, there were excessive fecal bacteria levels throughout the upper creek.

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: Dissolved oxygen levels were good to fair in Hewletts Creek, and algal blooms were at low levels. However, all upper areas of the creek were polluted by high fecal bacteria levels.

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: Dissolved oxygen levels were generally good and there were no problematic algal blooms. However, there were some high fecal bacteria levels in the mid section of the creek.

***All waters in the State of North Carolina are impaired for mercury, due to 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 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 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.

This is litter too...

Cigarette butts are the #1 littered item in the world!

According to Keep America Beautiful, about 95% of cigarette butt filters are composed of cellulose acetate, a form of plastic that does not break down quickly and stays in the environment for a very long time. Cigarette butts are easily carried by stormwater runoff to local creeks, where they leach toxins and are often mistaken as food by wildlife.

Cigarette litter is costly to clean up and creates unattractive areas within our community. Smokers should dispose of cigarette butts responsibly by carrying a pocket ashtray, using an ashtray or cup in vehicles, and using ash receptacles outside restaurants and buildings.

Remember, YOU are the solution to stormwater pollution!

wilmingtonnc.gov/stormwater

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STORMWATER SERVICES