Trees Please!

RECHARGES GROUNDWATER
REDUCES NOISE POLLUTION
PROMOTES PHYSICAL ACTIVITY
ABSORBS CARBON DIOXIDE FROM THE AIR
PROVIDES FOOD, SHELTER, AND HABITAT FOR WILDLIFE
INCREASES PROPERTY VALUE
PROVIDES RECREATIONAL OPPORTUNITIES
AIDS
PROVIDES CAMPS
CARVES AND SINKS RAINFALL
REDUCES RAINFALL
LOWERS HEATING AND COOLING COSTS
PRODUCES OXYGEN
PROMOTES PHYSICAL ACTIVITY
GIVE ME BREATHE
BEAUTIFIES THE COMMUNITY
REDUCES STRESS
REDUCES FLOODING BY SOAKING UP STORMWATER
REDUCES HEAT FROM URBAN AREAS
REDUCES SMOG

ECONOMIC ENVIRONMENTAL PHYSICAL
SOCIAL RECREATIONAL
AESTHETIC

Tree Benefits

Trees – a natural solution to stormwater pollution!

(i) wilmingtonnc.gov/stormwater

WILMINGTON
CITY OF
STORMWATER SERVICES

Trees: A Natural Solution to Stormwater Pollution

The City of Wilmington has grown substantially over the past few decades. New homes, apartments, businesses and pavement replace vegetated land—land that was once home to mature trees and ecosystems. Our area has also experienced significant tree loss from hurricanes in the last few years.

Trees are the environment's natural solution to water and air pollution and provide a number of benefits. Trees and soil function together to reduce stormwater runoff. Trees capture and absorb rainwater through the leaves, branches and trunk. Water then evaporates back into the atmosphere or soaks into the ground, reducing the total amount of stormwater runoff that must be managed in our urban area.

One acre of pavement releases 36 times more runoff than a forest

~ Penn State Extension

In addition, trees perform the critical function of absorbing air pollutants and converting carbon dioxide into the oxygen that we breathe. Trees also reduce air temperatures, provide fitness/recreational opportunities and mental health benefits, add natural beauty and greenspace, increase property values, and provide wildlife habitat.

As our community continues to grow and develop, water quality issues continue to increase. One of the easiest ways you can make a positive difference for water quality is by planting trees.

(i) https://www.wilmingtonnc.gov/departments/public-services/stormwater/publications-videos

Planting Trees: Right Tree, Right Spot

Choose native species of trees which are better suited to local weather and soil conditions and are beneficial to native wildlife. Avoid planting invasive species.

Depending on the species, a typical street tree can absorb between 750 – 4,000 gallons of rainfall annually in its crown!

Placement of a tree is also critical. Learn how large the tree, canopy, and root systems can get and assume they could get bigger. Also consider how trees will affect the existing landscape and structures. For example, make sure the tree won't shade flowers and bushes that need full sunlight, and be sure the canopy and roots won't impact utility lines.

Placed appropriately, deciduous trees offer summer shade and allow the winter sun to shine in, which can improve a building's energy efficiency. Evergreen trees provide cover and shade year-round and are effective barriers for wind and noise. These are also considerations for where to place a tree on your property.

There are many local and statewide resources that provide expert knowledge about trees, proper planting techniques, and native tree lists for our area. Check out the resources listed below.

TREE RESOURCES

Master Gardener Plant Clinic at the NHC Arboretum
M-F 10am–4pm • 910.798.7680

Visit our "Publications & Videos" page for Native Tree Lists, Proper Planting Techniques, Invasive Species ID, and more! See link on left.

Inside:
UNCW Surface Water Quality Annual Report

(?) **Questions?**

STORMWATER SERVICES DIVISION

Administration	343-4777
Drainage/Maintenance	341-4646
Billing Questions (CFPUA)	343-4777
Report Stormwater Pollution Hotline	341-1020

wilmingtonnc.gov/reportstormwaterpollution

City of Wilmington
Public Services Department
P.O. Box 1810
Wilmington, NC 28402

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(i) 910-343-4777
wilmingtonnc.gov/stormwater

WILMINGTON
CITY OF
NORTH CAROLINA

WILMINGTONNC.GOV/STORMWATER

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: https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications

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), fish and noncommercial shellfish consumption, fish/aquatic life propagation and survival, and wildlife.
Class SB Saltwaters used for primary recreation such as swimming, and all Class SC uses.
Class SA Saltwaters used for commercial shellfishing and all Class SC/SB uses. SA waters are also High Quality Waters (HQW) by supplemental classification.

Supplemental Classifications

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 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 newsletter is based on the NC 303(d) List, which is available for viewing at: https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment/integrated-report-files. Unfortunately, several of Wilmington's waterways are on the 303(d) list because of pollution, such as bacteria and nutrients, which is washed from the land by stormwater runoff.

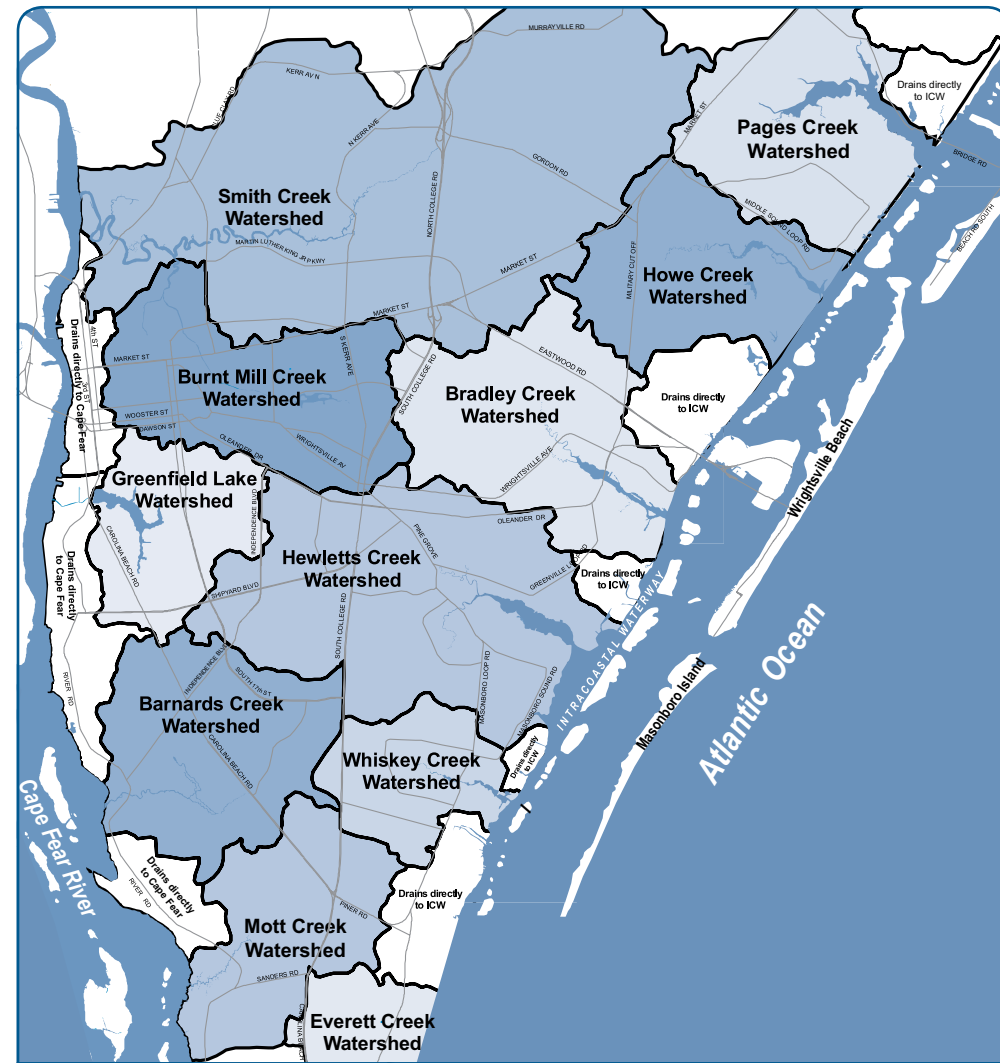The State of Wilmington's Waterways 2019 UNCW Surface Water Quality Report is a summary of the current health and condition of the major creeks and waterbodies that fall within Wilmington's city limits. UNCW water quality sampling information was provided by Dr. Michael Mallin of the UNCW Center for Marine Science and lead scientist for the Wilmington Watersheds Project. The water quality sampling summary is based on data collected between the months of January-June 2019 (6 months) 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.html

Cape Fear River

Watersheds that drain to the Cape Fear River (CFR)

Smith Creek
Size of watershed: 16,650 acres
State classification/Use: C, Sw
State Status: Currently supporting use
Reason: Meets standards for Class C waters
UNCW Sampling Summary: Dissolved oxygen levels were low on two of twelve sampling occasions. Turbidity was good and there were no major algal blooms. Fecal coliform bacterial concentrations were only high on one sampling occasion.

Burnt Mill Creek
Size of watershed: 4,207 acres
State classification/Use: C, Sw
State Status: Impaired. On NC 303(d) List
Reason: Does not meet standards for Class C waters, specifically for biological integrity for benthos (bottom dwelling organisms) and Chlorophyll a
UNCW Sampling Summary: Water quality was poor, with elevated fecal coliform counts and algal blooms. Dissolved oxygen levels were fair.

Greenfield Lake
Size of watershed: 2,465 acres
State classification/Use: C, Sw
State Status: Impaired. On NC 303(d) List
Reason: Does not meet standards for Class C waters, specifically for Chlorophyll a
UNCW Sampling Summary: The tributary streams of the lake suffered from high fecal coliform bacterial counts and low dissolved oxygen. The main lake had good dissolved oxygen and fecal coliform counts, but were impacted by blue-green algal blooms in late spring and early summer.

Barnards Creek
Size of watershed: 4,173 acres
State classification/Use: C, Sw
State Status: Currently supporting use
Reason: Meets standards for Class C waters
UNCW Sampling Summary: Barnards Creek is sampled at one station. Sampling showed good dissolved oxygen levels and low fecal coliform counts, but had moderately high nutrient levels and an algal bloom.

Mott Creek
Size of watershed: 3,342 acres
State classification/Use: C, Sw
State Status: Currently supporting use
Reason: Meets standards for Class C waters
UNCW Sampling Summary: The sampling site had generally good dissolved oxygen levels, no algal blooms, and moderate fecal coliform counts.

Intracoastal Waterway

Watersheds that drain to the Intracoastal Waterway (ICW)

Howe Creek
Size of watershed: 3,516 acres
State classification/Use: SA, ORW
State Status: Impaired. On NC 303(d) List; closed to shellfishing
Reason: Does not meet standards for Class SA waters, specifically for fecal coliform bacteria; a portion of the creek is also impaired for dissolved oxygen
UNCW Sampling Summary: Sampling of the upper and middle creek showed it was mildly impacted by low dissolved oxygen and suffered from a large algal bloom, but fecal coliform counts were relatively low.

Bradley Creek
Size of watershed: 4,583 acres
State classification/Use: SC, HQW
State Status: Currently supporting use
Reason: Meets standards for Class SC waters
UNCW Sampling Summary: Bradley Creek had elevated fecal coliform bacterial counts, and one minor algal bloom. Dissolved oxygen levels were good.

Hewletts Creek
Size of watershed: 7,478 acres
State classification/Use: SA, HQW
State Status: Impaired. On NC 303(d) List; closed to shellfishing
Reason: Does not meet standards for Class SA waters, specifically for fecal coliform bacteria
UNCW Sampling Summary: Hewletts Creek did not have algal bloom problems and dissolved oxygen levels were good. However, there were excessive fecal coliform bacterial counts at three of the five sampling stations.

Whiskey Creek
Size of watershed: 2,078 acres
State classification/Use: SA, HQW
State Status: Impaired. On NC 303(d) List; closed to shellfishing
Reason: Fecal coliform bacteria
UNCW Sampling Summary: Fecal coliform counts and dissolved oxygen levels were good, and there were no algal blooms at the one station sampled.

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

UNCW Results Summary: 2019 sampling occurred during spring and early summer, but did not include the hotter summer months. Excessive fecal coliform bacterial counts occurred in several Wilmington watersheds, particularly in Burnt Mill Creek, upper Bradley Creek, upper Hewletts Creek and the Greenfield Lake tributaries. A number of algal blooms occurred, in Greenfield Lake, Burnt Mill Creek, and upper Howe Creek. Dissolved oxygen problems primarily occurred in the tributaries of Greenfield Lake. In summer 2019, several dogs died of toxic algae poisoning after swimming in a private stormwater retention pond in Wilmington. UNCW researchers suggest that humans and pets stay out of retention ponds as they may contain algal blooms, fecal bacteria, and chemicals.

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 from the water 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 counts of fecal coliform bacteria in a waterway indicate the presence of other disease-causing pathogens which can cause sickness and disease in humans and animals. (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.