



Optimizing Floating Treatment Wetland Deployment to Improve Water Quality

FUNDING SOURCE & AMOUNT

NC Land & Water Fund (CWMTF)
\$100,000 grant funding

TIMEFRAME

Awarded February 2021
2-year grant

GRANT ADMINISTRATOR

NC State University

GRANT PARTNERS

City of Wilmington -Stormwater Services
BeeMats

SUMMARY / DESCRIPTION

Greenfield Lake (GFL) suffers from green and blue-green algal blooms (aka cyanobacteria), bottom-water hypoxia, fish kills, and high fecal coliform bacterial counts. The lake was placed on the NC 303(d) list in 2014 for excessive chlorophyll a.

Nitrogen and phosphorus are nutrients that are essential for plant growth. Fertilizers that contain both are used extensively in residential and commercial landscapes. However, when these nutrients enter Greenfield Lake via stormwater runoff, they can cause pollution problems that contribute to algae and aquatic weed growth. FTWs are aquatic systems that use vegetated floating mats to absorb nutrients from water.

As the plants on the Floating Wetlands grow, nutrients in the water are taken up by the plant roots and stored in the tissues. Periodic harvesting of the mature plants prevents the sequestered nutrients from re-entering the water when the plants die and decompose. In addition to absorbing nutrients, FTWs are quickly becoming a popular retrofit because they do not interrupt rainfall flow or require heavy equipment to install. They also provide improved habitat and biodiversity in a waterbody.

The project area receives runoff from a 173- acre watershed draining to Greenfield Lake via Squash Branch. The 41.7% impervious watershed land use is a mix of single- and multi-family residential, institutional, and commercial.

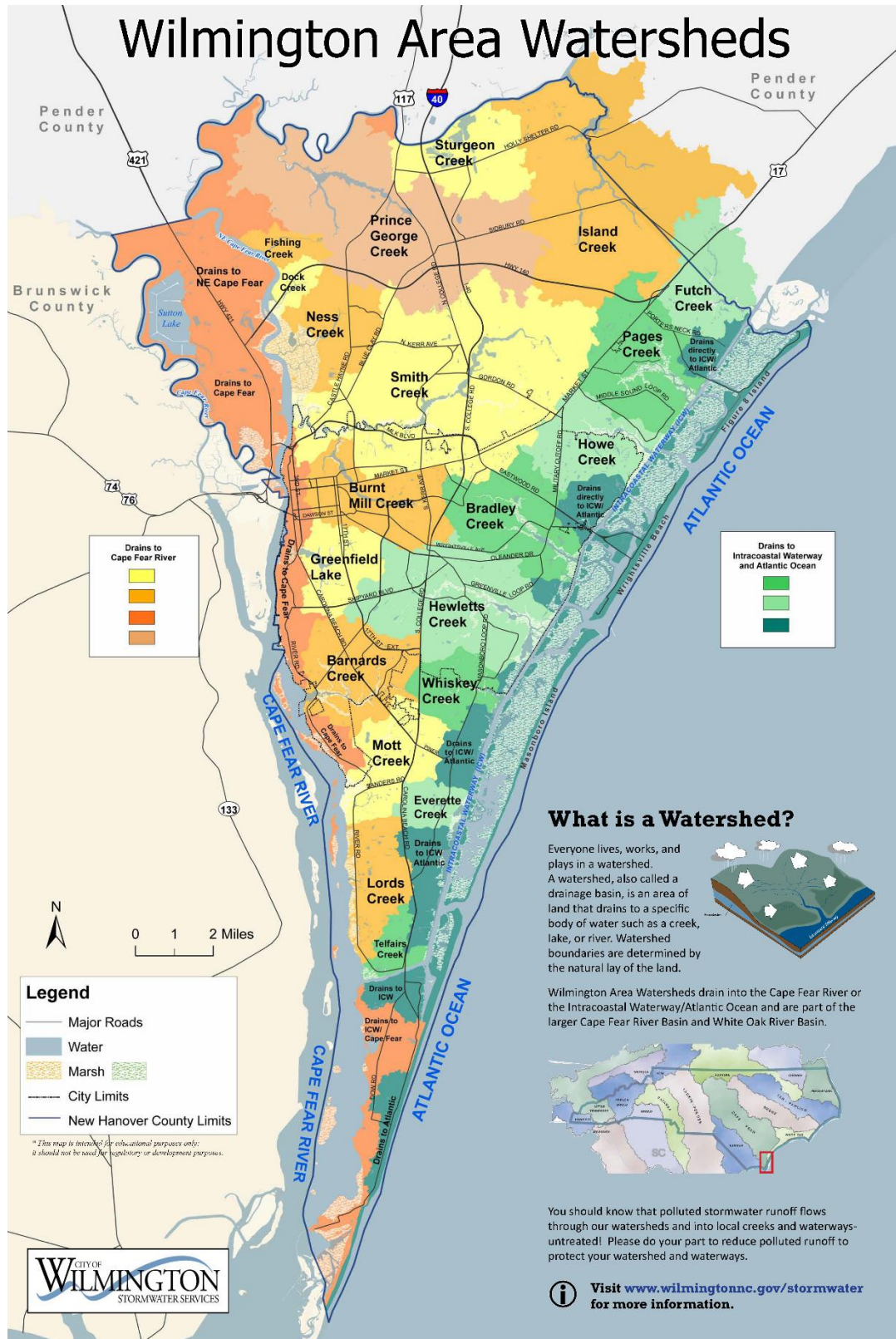
The NC Land & Water Fund, formerly known as the Clean Water Management Trust Fund, provided funds to purchase, install, and monitor the efficacy of the FTWs and water quality in Squash Branch.

GRANT GOAL(S)

Improve water quality through modification of wet ponds, a common and widespread stormwater control device. Specifically:

- Test the effectiveness of placing floating wetlands at the inlet arm of a lake with samples occurring before water flows through the islands and after,
- Assess wetland plant biomass for root depth, density, and nutrient uptake, and
- Close the knowledge gaps with FTWs to the extent necessary to potentially revise nutrient removal credit guidance for the NC DEQ SCM Credit Document.

Wilmington Area Watersheds



Drains to Cape Fear River

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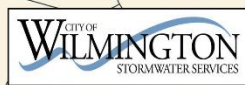
Drains to Intracoastal Waterway and Atlantic Ocean

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Legend

- Major Roads
- Water
- Marsh
- City Limits
- New Hanover County Limits

* This map is intended for educational purposes only; it should not be used for regulatory or development purposes.



What is a Watershed?

Everyone lives, works, and plays in a watershed. A watershed, also called a drainage basin, is an area of land that drains to a specific body of water such as a creek, lake, or river. Watershed boundaries are determined by the natural lay of the land.



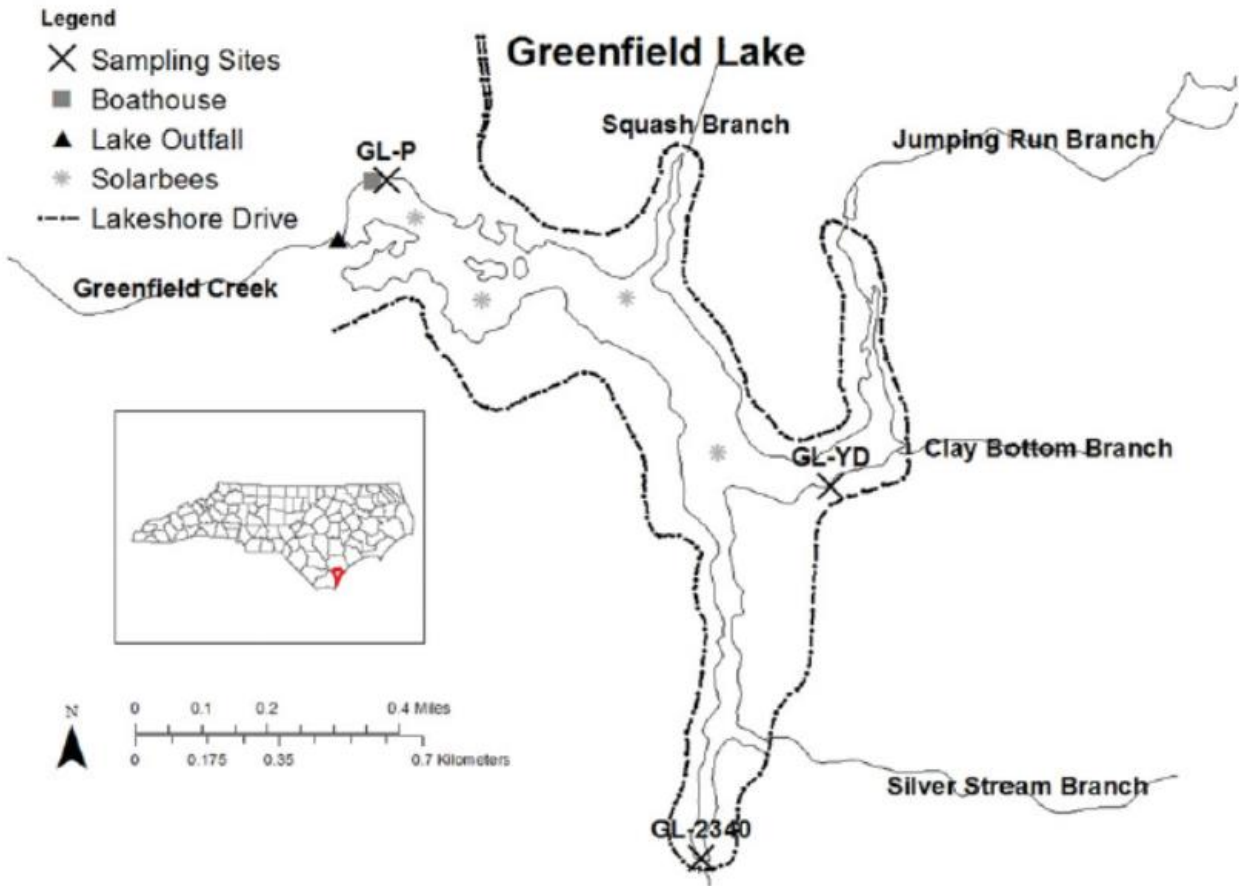
Wilmington Area Watersheds drain into the Cape Fear River or the Intracoastal Waterway/Atlantic Ocean and are part of the larger Cape Fear River Basin and White Oak River Basin.



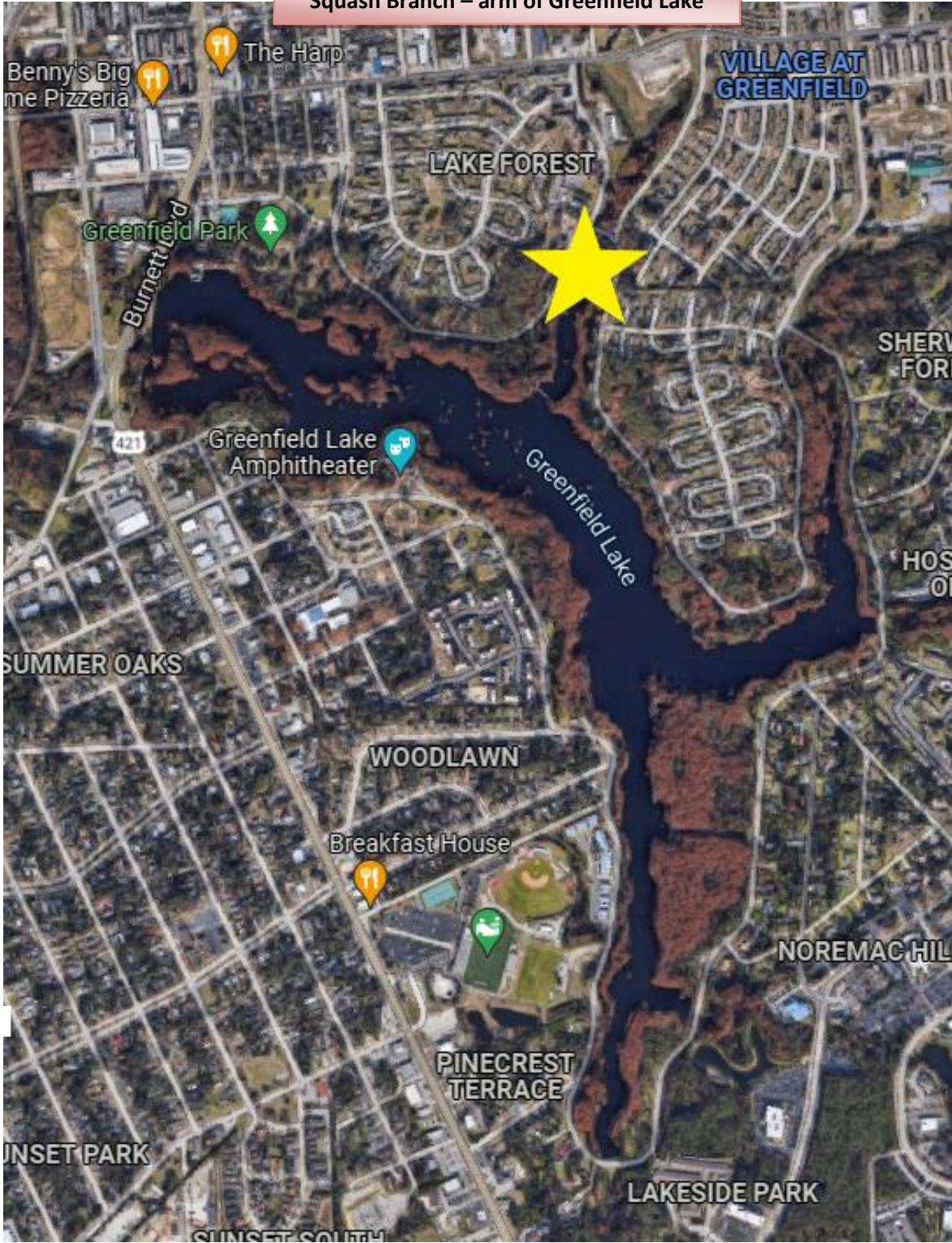
You should know that polluted stormwater runoff flows through our watersheds and into local creeks and waterways-untreated! Please do your part to reduce polluted runoff to protect your watershed and waterways.

i Visit www.wilmingtonnc.gov/stormwater for more information.

Greenfield Lake, showing UNCW water quality sampling stations, major tributaries into the lake, the road circling the lake, and locations of Solarbee mixers. Map Credit: Mike Mallin, UNCW



Squash Branch – arm of Greenfield Lake



Floating Treatment Wetlands (FTW)



