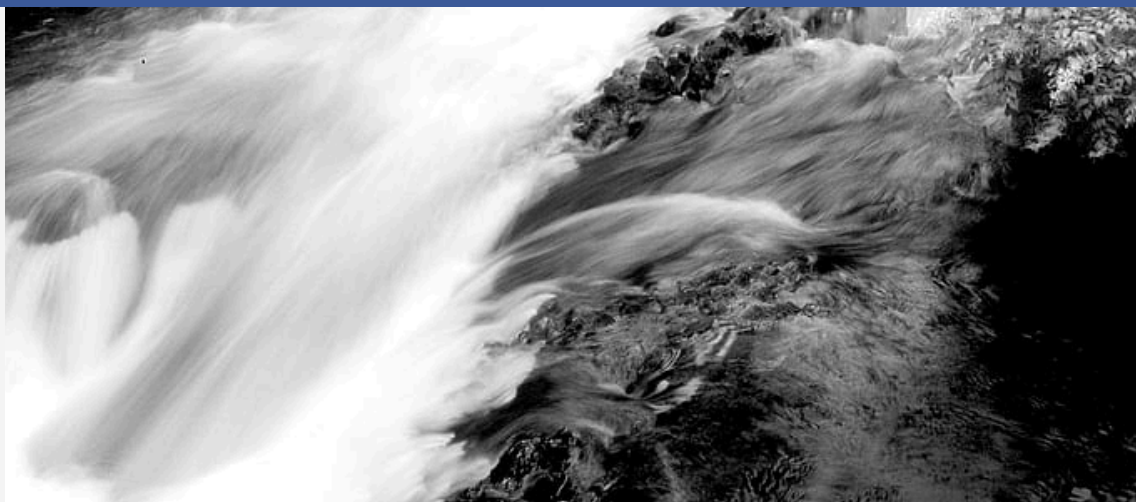




# WATERSHED OUTREACH GUIDEBOOK

CAPE FEAR RIVER BASIN

APRIL 2025  
NCSU ES 400



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# INTRODUCTION

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The Cape Fear River Basin is the largest in North Carolina—reaching communities from the Piedmont to the coast. The watershed impacts millions of residents and protecting it requires a empowered, informed, and united community.

This Watershed Community Outreach Guidebook is designed as a practical tool for local leaders, organizers, educators, and residents across the Cape Fear River Basin—and beyond. This guide can serve as a road map to help you identify local needs, access helpful resources, and connect with the many groups already making a difference.

As Environmental Science majors at NC State University, we developed this guidebook as part of our ES 400 capstone project. Our goal was to create a resource that reflects the real needs and goals of watershed advocates across the state.

To create this guide, we:

- Spoke with watershed educators and community leaders to learn about the barriers and opportunities they face in supporting their communities.
- Researched current programs, tools, and partnerships that could be shared or expanded across different areas.
- Compiled strategies and recommendations to support outreach, education, conservation, and engagement.

By listening, learning, and applying what we've gained through our coursework and community interactions, we hope this guide will serve as a meaningful starting point for anyone looking to protect and celebrate North Carolina's watersheds.

# CHAPTER 1: UNDERSTANDING WATERSHEDS

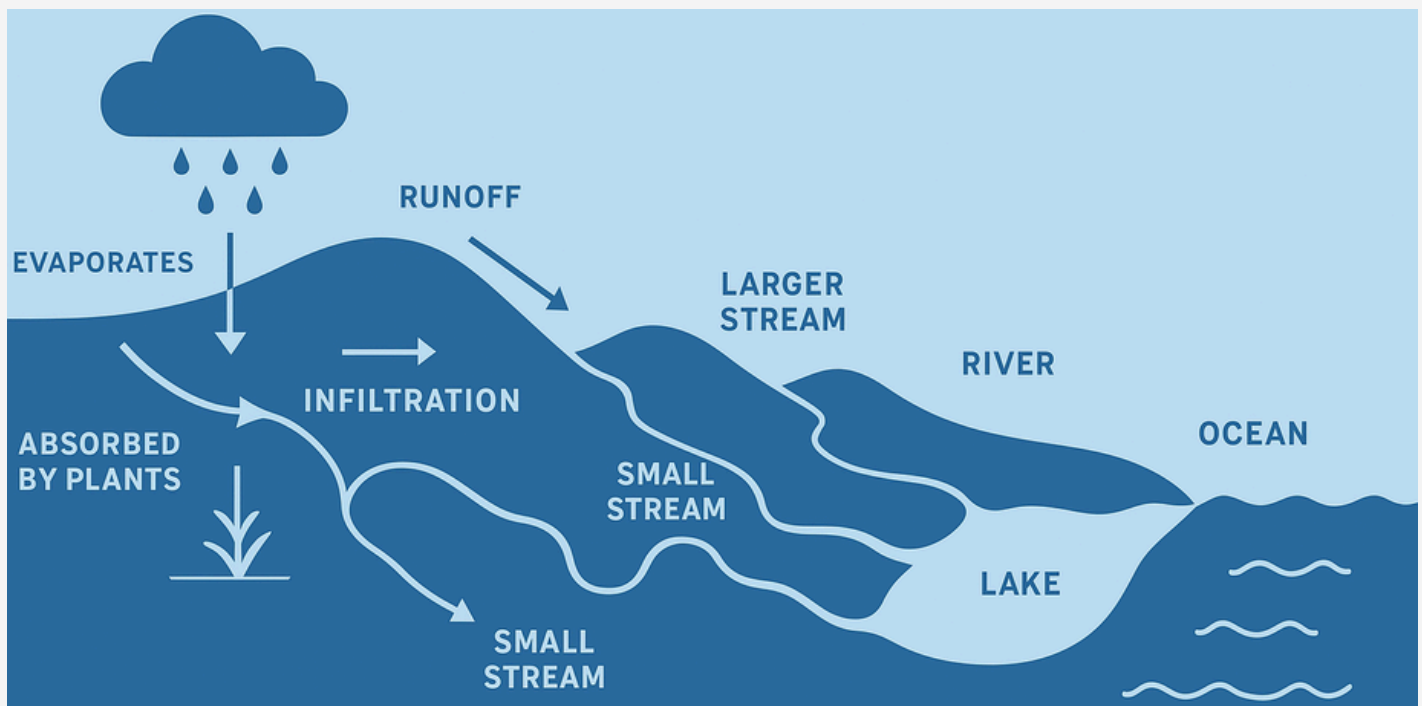
## WHAT IS A WATERSHED?

A watershed is an area of land where all water—whether from rain, melting snow, or everyday activities like watering lawns or washing cars—drains to a common point, such as a stream, river, lake, or ocean. You can think of a watershed like a giant natural funnel, collecting and channeling water across the landscape toward a shared destination.

## HOW DO WATERSHEDS WORK?

When precipitation falls, some of it is absorbed by plants or evaporates back into the atmosphere. The remaining water soaks into the ground (infiltration) or flows over the surface as runoff. Runoff follows the natural shape of the land, moving downhill through small streams, which merge into larger streams, then into rivers, and eventually flow into lakes or oceans.

For example, a creek near your home may be part of a small watershed that drains into a nearby river. This river may be part of a larger watershed that eventually empties into the Atlantic Ocean.





# CHAPTER 1: UNDERSTANDING WATERSHEDS

## WHY HEALTHY WATERSHEDS MATTER

A healthy watershed is essential for maintaining ecosystems and supporting communities. Watersheds provide:

- **Clean drinking water** – Many communities rely on local watersheds for their drinking water.
- **Irrigation for agriculture** – Farmers depend on watersheds to water crops and livestock.
- **Flood protection** – Healthy watersheds absorb excess water, reducing the risk of floods.
- **Wildlife habitats** – Rivers, forests, and other areas within watersheds support diverse plants, animals, and species.
- **Recreation and tourism** – Watersheds offer opportunities for fishing, boating, hiking, and other outdoor activities.

When a watershed becomes unhealthy due to pollution, deforestation, development without adequate stormwater management, or excessive water use, entire ecosystems—including humans—suffer. Protecting and restoring watersheds is crucial for sustaining clean water, preventing erosion, and preserving biodiversity.



# CHAPTER 2: MEET YOUR WATERSHED

## HOW WATERSHED ORGANIZATIONS WORK TOGETHER

Your watershed is protected by an intricate network of organizations, each playing a vital role in maintaining the health of local waterways. From non-profits to government agencies, these groups collaborate on research, policy enforcement, conservation projects, and public education.

By working together, they share resources, secure fundraising opportunities, and develop strategies for protecting and restoring local river basins. Understanding how these organizations interact can help you more effectively engage in watershed conservation and advocate for the health of your local waterways.



## HOW TO LOCATE YOUR WATERSHED

- 01 Use an Online Watershed Locator: Go to EPA's "[How's My Waterway](#)" or your state's environmental website and enter your address or ZIP code.
- 02 View the Map Results: The tool will show your location within a watershed boundary and provide the name of your watershed.
- 03 Explore Local Info: Click on your watershed to see details like water quality, nearby water bodies, and any local watershed organizations.

## Government Organizations

### THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

The Environmental Protection Agency (EPA) is a federal agency that is responsible for enforcing environmental laws such as the Clean Water Act (CWA). The CWA is the baseline for watershed protection across the country. The EPA provides guidance and oversight to state and local agencies and steps in when necessary to ensure compliance with national water quality standards. Additionally, the EPA has grant programs that support community-driven conservation efforts, helping fund water infrastructure, pollution control, and watershed restoration projects.



#### THREE RESOURCES PROVIDED BY ORGANIZATION

##### **01 - COMMUNITY ASSISTANCE:**

Funding for stormwater management, pollution control And infrastructure projects.

##### **02 - CLEAN WATER ACT ENFORCEMENT:**

Regulation of pollutants and protection of drinking water sources.

##### **03 - WATERSHED EDUCATION AND OUTREACH:**

Training programs, research publications and guidance on watershed management

# CHAPTER 2: MEET YOUR WATERSHED

## Government Organizations



### NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NC DEQ)

The North Carolina Department of Environmental Quality (NC DEQ) is the state's primary environmental agency, tasked with protecting North Carolina's natural resources. Within NC DEQ:

- The Division of Water Resources (DWR) manages water quality in surface and groundwater systems across the state. In addition to regulatory oversight, DWR administers funding for restoration projects, including Section 319 grants, which support nonpoint source pollution control.
- The Division of Mitigation Services (DMS) restores and protects watersheds through compensatory mitigation programs that offset environmental impacts from development. DMS also partners extensively with the NC Department of Transportation (NC DOT) on projects related to stream and wetland mitigation.

### THREE RESOURCES PROVIDED BY ORGANIZATION

#### 01 - WATER QUALITY MONITORING:

Regular testing and reporting of conditions .

#### 02 - WATER PROTECTION EDUCATION INITIATIVE:

Programs to promote conservation and sustainable practices.

#### 03 - GRANTS AND FUNDRAISING OPPORTUNITIES:

Financial support for community watershed conservation efforts.

# CHAPTER 2: MEET YOUR WATERSHED

## Government Organizations

### LOCAL MUNICIPAL AND COUNTY WATER MANAGEMENT DEPARTMENTS

Local Governments – your towns, cities, and counties – also play a critical role in watershed protection. Through stormwater and watershed management programs, local governments implement policies that directly influence water quality. Municipal departments manage infrastructure, reduce pollution, and prevent flooding across natural and developed areas. Many are required to comply with NPDES (National Pollutant Discharge Elimination System) stormwater permits, which mandate water quality protections under the Clean Water Act.



### THREE RESOURCES PROVIDED BY ORGANIZATION

**01 - STORMWATER MANAGEMENT AND FLOOD PREVENTION INITIATIVES:**  
Programs designed to reduce runoff pollution and manage urban water flow.

**02 - COMMUNITY ENGAGEMENT PROGRAMS:**  
Local events, volunteering opportunities and education outreach.

**03 - ENFORCEMENT OF LOCAL WATER QUALITY REGULATIONS:**  
Ensuring compliance with state and federal environmental laws.



## Non-Profit & Local Organizations

### RIVERKEEPERS AND CONSERVATION GROUPS

Riverkeepers are dedicated advocates for clean water. They monitor pollution, educate the public, support restoration projects, and work with communities to uphold environmental laws. Often operating through Waterkeeper Alliance-affiliated organizations, Riverkeepers serve as watchdogs, bringing attention to pollution violations and collaborating with government agencies and nonprofits for enforcement and outreach.

**In North Carolina, several notable organizations contribute to watershed protection, such as:**

- Cape Fear Riverwatch
- Neuse Riverkeeper Foundation
- Yadkin Riverkeeper

### THREE RESOURCES PROVIDED BY ORGANIZATION

#### 01 - WATER MONITORING:

Identify sources of pollution and work towards remediation.

#### 02 - COMMUNITY ADVOCACY:

Educating public and pushing for stronger environmental protections.

#### 03 - HABITAT RESTORATION EFFORTS:

Developing and working on projects to restore ecosystems.

## Community Groups

### COMMUNITY GROUPS

Local community groups are essential in bringing watershed protection to a grassroots level. They focus on education, data collection, and advocacy to engage residents in hands-on conservation efforts. By providing opportunities for people to get involved, these organizations help create a sense of shared responsibility for water quality.

#### **NC Stream Watch:**

This program encourages North Carolina residents to become "citizen scientists" by monitoring and reporting water quality in their local streams and rivers. This initiative allows community members to contribute valuable data while raising awareness of water quality issues.

#### THREE RESOURCES PROVIDED BY ORGANIZATION

##### **01 - LOCAL VOLUNTEER OPPORTUNITIES:**

Residents can engage in water quality monitoring or participate in clean-up efforts.

##### **02 - EDUCATION PROGRAM:**

Training sessions to help individuals participate in local watershed protection.

##### **03 - COMMUNITY ENGAGEMENT:**

Unite local residents through events, forums, and discussions.

# CHAPTER 3: GETTING INVOLVED

## PLACES TO GET INVOLVED

The Cape Fear Watershed is supported by various organizations that offer opportunities for community members to get involved in protecting and conserving the local environment. Whether through volunteer cleanups, water monitoring programs, or educational efforts, there are many ways you can contribute to the health of this vital water system.

Here are some key groups working to protect the Cape Fear Watershed and how you can get involved:

- **Cape Fear River Watch:** Focuses on education, advocacy, and conservation of the Cape Fear River. You can participate in cleanups, advocacy efforts, and educational programs.
- **North Carolina Coastal Federation:** Works on coastal and estuary conservation, including living shorelines and oyster restoration projects. Volunteer for hands-on conservation efforts or attend workshops.
- **The Nature Conservancy – NC Chapter:** Engages in watershed protection and habitat restoration throughout the state. Get involved in habitat restoration activities and conservation initiatives.
- **Haw River Assembly:** Focuses on protecting one of the Cape Fear River's key tributaries. Volunteer for local cleanup events or join their advocacy campaigns to protect the river.
- **NC Stream Watch:** A citizen science program where individuals or groups can adopt a stream and monitor its water quality. Participate by collecting water data and contributing to local conservation efforts.
- **NC Riverskeepers:** A network of watchdog organizations that monitor pollution and advocate for clean water. Join as a volunteer to help track water quality and engage in local advocacy.

# CHAPTER 3: GETTING INVOLVED

## LEVELS OF INVOLEMENT

**The Cape Fear Watershed offers a variety of opportunities for community members to get involved. Whether you have an hour, a weekend, or are ready for long-term commitment. See different levels of involvement below:**

### **1. One-Time Volunteering**

- Volunteer Cleanups: Participate in river or stream cleanups.
- Planting Events: Volunteering at tree planting or native species restoration projects.
- Educational Events: Attend or help with public events that teach others about watershed protection, such as community workshops or outreach programs.

### **2. Ongoing Participation**

- Water Quality Monitoring: Join programs like NC Stream Watch, where you can adopt a local stream or creek and monitor water quality over time.
- Regular Cleanups: Many organizations, such as Cape Fear River Watch, have ongoing cleanups that need consistent volunteers.
- Advocacy Efforts: Become a part of the conversation around local water policies by joining advocacy campaigns or attending town meetings.

# CHAPTER 3: GETTING INVOLVED

## LEVELS OF INVOLVEMENT

### **3. Leadership Roles**

- Start a Community Group: Build awareness and action within your local community.
- Become a Group Leader: If you already volunteer regularly, consider becoming a team leader for cleanups or other projects.
- Policy Advocacy: Take a more active role in pushing for policy changes.
- Organize Events: Coordinate educational workshops, meetings, and outreach efforts to engage more community members.

### **4. Long-Term Partnerships**

- Corporate or Institutional Partnerships: Partner with local businesses or schools to implement sustainability practices.
- Fundraising for Projects: Engage in long-term fundraising efforts for larger watershed projects such as stream restoration, habitat conservation, or stormwater infrastructure.
- Collaborate on Research: Collaborate with environmental scientists to monitor watershed health or provide valuable data.

**Whether you choose to volunteer for one day or take on a leadership role, your involvement plays a critical part in protecting the Cape Fear Watershed for future generations.**



### Volunteer



#### STREAM CLEANUPS

Volunteer to help remove trash and debris from local streams, rivers, and shorelines. Many organizations host regular cleanup events to improve water quality and reduce pollution.

#### COMMUNITY SCIENCE INITIATIVES

Get involved in citizen science projects, where you can help gather data or track local wildlife populations. Programs like NC Stream Watch or Riverkeeper are great for those interested in scientific research.



#### HABITAT RESTORATION PROJECTS

Participate in hands-on efforts such as planting native vegetation, building living shorelines, or restoring wetlands. Organizations like the North Carolina Coastal Federation and The Nature Conservancy offer volunteer opportunities.

#### SUPPORT LOCAL RESEARCH PROJECTS

Local colleges and universities, like UNC Wilmington, welcome volunteers to assist with ongoing watershed research projects. You can participate in data collection, lab work, or field studies.



# Volunteer

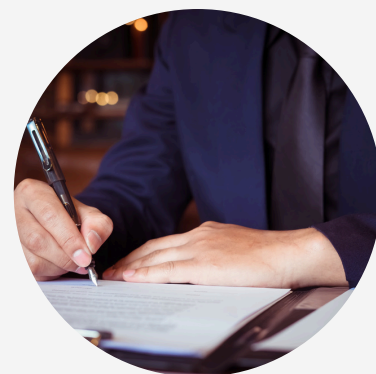


### FUNDRAISING AND EVENT PLANNING

Assist organizations with organizing fundraising events, social media outreach, or volunteer coordination. Fundraising helps ensure that conservation projects can continue to grow.

### ADVOCACY AND POLICY SUPPORT

Join advocacy groups like Cape Fear River Watch or NC Riverskeepers to help push for stronger environmental regulations. Volunteer to help with campaigns, lobbying efforts, or public testimony.



### EDUCATIONAL OUTREACH

Volunteer to help organize or lead community workshops, tours, or educational events focused on watershed protection. This is a great way to raise awareness and engage others in conservation efforts.

## STEPS FOR ORGANIZING A WATERSHED CLEANUP



### ORGANIZE A GROUP TO PLAN

This could be just you or a small group that is going to lead the cleanup.



### CHOOSE LOCATION, DATE, AND TIME

Select your cleanup site, as well as a date and time for the event



### FIND VOLUNTEERS

Register on Earth Day's website and publicize the cleanup



### GATHER DISPOSAL METHOD AND SUPPLIES

Set up a way to dispose of waste and obtain supplies like gloves



### BEGIN THE CLEANUP DAY!

Ensure the weather is suitable and take photos during the event



### SORT AND DISPOSE OF WASTE

Separate recyclables from trash and properly dispose of them



### CELEBRATE!

Appreciate your volunteers and share the results of the cleanup



# CHAPTER 4: OUTREACH TOOLKIT

**The American Rivers is another organization that promotes river cleanups and donates supplies to those who register their cleanup with them! They have a free guidebook on their website that goes through their recommendations to host a successful cleanup.**

## **Site Selection**

- Pick a place that is accessible for cars and a group. Avoid areas that have potential safety hazards, such as steep banks and hazardous pollution. Find an area that has a decent amount of litter that needs to be cleaned up. Pick a place that also has a restaurant, grocery store, or some other location for the volunteers to use the restroom.
- Are you going to clean along the shoreline or in boats? Will this be safe for all the volunteers? Avoid difficult-to-reach areas and busy roadways for safety, especially if some of the volunteers are going to bring children.
- Make sure that the land is public or private and how to gain permits or permission to clean up the areas. If the land is owned by a federal agency, they will fund some cleanup events or donate to help their areas be cleaned. If the owner is a private landowner, explain the situation and that you are planning to volunteer to clean their property for free.
- They also have a Site Selection Worksheet that helps you go through which site is the most beneficial for the cleanup effort.

## **Recruiting Volunteers**

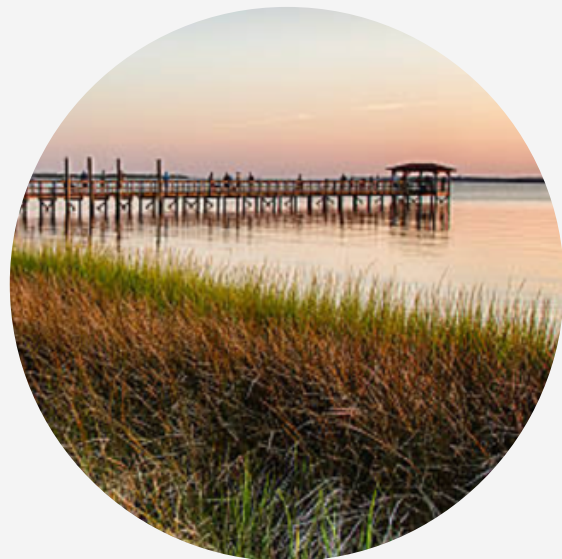
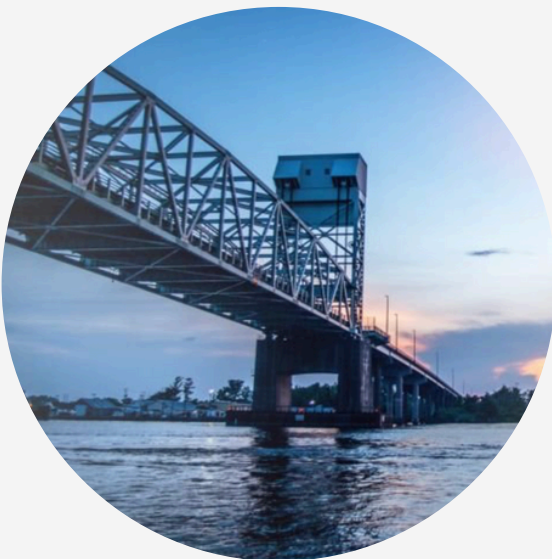
- Anyone can help, and that means kids as well! There are also many ways to get involved, by either participating in the cleanup, passing out supplies, or handling donated materials.
- Promote the event through friends, co-workers, family, and more. You can ask local bird-watching, hiking, climbing, and other outdoor activity groups to volunteer or spread the word about the event. You can also go on social media and ask friends to share it with their friends. You can post flyers in community spaces, farmers' markets, coffee shops, libraries, and others. Post on Nextdoor (an app that allows neighbors and communities to communicate with each other).
- Prepare the volunteers with the correct information on date, time, location, and weather attire. Make sure everyone has sunscreen, boots or sturdy shoes, clothes that can get wet, and water bottles.
- Ask local businesses to sponsor your event. Have them donate money to put their name on the event or to provide snacks, trash bags, or anything else they may donate. They also may encourage their employees to volunteer so that word-of-mouth can increase their business revenue. Also, make sure to thank sponsors during the event and whenever you are posting about it.
- You can invite elected officials to the event to gather more publicity.

# Cape Fear River Basin Policy Plan Overview

**The Cape Fear River Basin Water Resources Management Plan has not been updated since 2005, but a new policy plan is currently being developed for 2024/2025.**

### **Key Themes in the New Policy Plan:**

- Stormwater Runoff Control Programs
- Developing TMDLs (Total Maximum Daily Loads) to manage turbidity and fecal coliform bacteria
- Addressing land changes due to population growth
- Identifying and managing new impairments
- Developing TMDLs for the Jordan Reservoir





# Cape Fear River Basin TMDLs and Monitoring

A TMDL is the calculated total amount of a pollutant that can be safely present in a water body without causing harm to the environment or human activities. It involves both point and nonpoint sources of pollution. As of the latest report, several areas along the Cape Fear River, including the Haw River and Jordan Reservoir, were out of compliance. These areas require extensive TMDLs and implementation plans, including monitoring through the US Geological Survey.

### **Policy Plan Cycle for the Division of Water Resources (DWR):**

- Years 1-2: Monitoring and testing, identifying areas out of compliance, and conducting scientific studies to identify trends.
- Years 2-3: Analyzing data, retesting key areas, and working with local governments and the public to set goals.
- Years 4-5: Finalizing goals, issuing pollutant permits, and submitting proposals to the Environmental Management Commission. Ongoing testing continues to ensure implementation effectiveness.

## Water Classification Systems

**Water bodies are categorized as Impaired or Not Impaired. Impaired waters are subject to recommendations to improve their quality and safe use (e.g., recreation, supporting aquatic life).**

**For example, the Haw River was classified as needing no new pollution sources in 2000, but by 2005 it was classified as Supporting Aquatic Life and Not Rated for Recreation, due to high levels of fecal coliform bacteria.**

### Water Classification Systems:

- C and SC: Aquatic life protection/propagation, secondary recreation
- B and SB: Class C uses, primary recreation
- SA: Commercial shellfish harvesting
- WS: Water Supply watershed with five subclasses:
  - WS-I: Highest protection needed
  - WS-V: Least protection needed
  - Critical Area: Areas within a half-mile of a water supply intake

### Other Classifications:

- Sw: Swamp Water
- Tr: Trout Water
- HQW: High-Quality Waters (e.g., Native Trout Waters, WS-I, WS-II)
- ORW: Outstanding Resource Waters (no new discharges allowed)
- NSW: Nutrient Sensitive Waters

### Managing Pollution in Sensitive Areas:

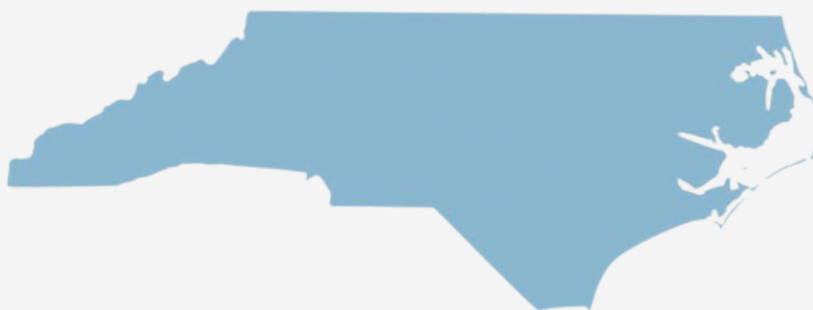
- New wastewater discharge facilities must address toxic substances and other pollutants, especially in NSW or HQW areas.
- Nonpoint source pollution near HQWs is managed with Sediment and Erosion Control Plans, which may include a 30-foot vegetated buffer between development and water.

## Ways to Learn

### Interested in Civic Engagement?

Several organizations within the Cape Fear River Basin offer civic engagement and environmental education programs that help community members participate in governmental processes.

- Cape Fear River Watch (CFRW): Water quality education programs are available for schools, developers, homeowner associations, and other organizations. They also provide stormwater management training for local government staff.
- Community Engagement Core (CEC): Based at NC State University, CEC helps Cape Fear River communities impacted by PFAS contamination build the knowledge to address and reduce exposure and related environmental health concerns.
- Cape Fear Community College (CFCC) Community Engagement: Community engagement programs related to environmental issues and civic participation.



## CHAPTER 6: SUCCESS STORIES

**While science, policy, and funding are critical, much of the real, lasting change across the Cape Fear watershed has come from local leaders, everyday citizens, students, and volunteers. This chapter highlights inspiring efforts that show what's possible when people come together to protect their water.**

### **GREEN INFRASTRUCTURE IN FAYETTEVILLE**

Faced with repeated flooding and water quality challenges, Fayetteville partnered with NC State's stormwater research team to:

- Install rain gardens and permeable pavement in key neighborhoods
- Retrofit schools and public buildings with green roofs
- Involve local youth in data collection and planting efforts

This project reduced runoff and became a model for mid-sized cities in the Southeast.

### **STUDENT STREAM WATCHERS – HARNETT COUNTY SCHOOLS**

A group of high school students launched a stream monitoring program on a tributary of the Cape Fear River. With guidance from NCDEQ:

- They tested pH, turbidity, and nitrate levels monthly
- Presented findings to local commissioners
- Helped inspire a local ordinance to protect buffer zones along waterways

PFAS: Brunswick, Bladen, and New Hanover Counties started to change the water filtration systems that helped change the water system.

## CHAPTER 6: SUCCESS STORIES

### **CLEAN UP CLINTON (SAMPSON COUNTY)**

After community members raised concerns about litter and flooding in local ditches:

- A rotating group of churches, businesses, and scout troops began quarterly cleanups
- The town added better storm drain signage and bins
- Flooding along two streets dropped significantly after year one

### **Bald Head Island:**

The community built a live Oyster Reef that was incorporated into the Cape Fear River.

- Built oyster reef sanctuaries using recycled shell
- Restored marine habitat and improved water clarity
- Promoted sustainable shellfish practices

These reefs now support coastal resilience and fisheries in Brunswick and New Hanover counties.

### **FARM-FRIENDLY BUFFER ZONES (JOHNSTON & SAMPSON COUNTIES)**

In partnership with NC State Cooperative Extension, local farmers voluntarily installed:

- Riparian buffers to reduce runoff from fields
- Cover crops and no-till practices to keep soil in place
- Fencing to keep livestock out of streams

These efforts protect water quality while maintaining agricultural productivity.



## Cape Fear Watershed Frequently Asked Questions FAQ



### What is a watershed?

A watershed is all the land that drains into a common body of water—like a river, lake, or ocean. The Cape Fear Watershed covers over 9,000 square miles of central and southern eastern North Carolina and drains into the Atlantic Ocean near Southport.



### Where does the Cape Fear River start and end?

The river begins at the confluence of the Deep and Haw Rivers near Greensboro, NC, and flows southeast through Fayetteville and Wilmington before reaching the coast. It's the only major river in NC that flows directly into the ocean.



### Why is the Cape Fear Watershed important?

It provides drinking water for over 1.3 million people—supports agriculture, fishing, and industry, and contains some of the most diverse ecosystems in the state. It's also vital for flood control and recreational use.



### Is the river safe for swimming and fishing?

In some places—yes. But water quality can vary due to bacteria, pollution, and algal blooms. Always check with NC DBD or your local health department for current advisories before swimming or fishing.



### How is climate change affecting the watershed?

We're seeing more heavy rain events, increased flooding, and saltwater intrusion along the coast. These changes threaten homes, infrastructure, water quality, and ecosystems throughout the basin.



### Does pollution from my yard really matter?

Yes! Even small actions—like over fertilizing your lawn, not picking up pet waste, or washing your car in the driveway—can send pollutants into storm drains that feed into local streams and rivers.



### Can I help protect the watershed?

Absolutely. You can.

- Volunteer for stream cleanups or monitoring
- Install rain gardens or rain barrels
- Use fewer chemicals on your lawn
- Volunteer for stream cleanups or monitoring
- Install rain gardens or rain barrels
- Use fewer chemicals on your lawn
- Support local environmental groups

## MEET THE TEAM



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