

## **N.C. Coastal Resilience Community of Practice Meeting**

Tuesday, January 21, 2025

**Purpose of the COP:** Bring together diverse coastal stakeholders to focus on how ecosystem resilience can build local community resilience. We don't necessarily have to have a "thing" to work on but will take on projects as appropriate and mutually agreed on. Website: <https://deq.nc.gov/coastal-resilience-cop>

### **In attendance:**

- Abby Williams, NC Coastal Reserve
- Alison Flynn, North Carolina Coastal Federation
- Brandon Puckett, NOAA National Centers for Coastal and Ocean Research
- Bree Charron, North Carolina Coastal Federation
- Cat Bowler, Audubon North Carolina
- Claire Rapp, North Carolina Coastal Federation
- Dawn York, Moffatt and Nichol
- Eryn Futral, NC Emergency Management
- Forest Shepherd, NC Division of Water Resources
- Giancarlo Richardson Villenas, Albemarle Pamlico National Estuary Partnership
- Jacob Boyd, North Carolina Coastal Federation
- Joe Heard, Town of Duck
- Kasen Wally, NC Division of Coastal Management
- Keith Larick, NC Farm Bureau
- Kendall Paramore, Southeast Drainage Office
- Kiera O'Donnel, Duke University
- Lee Duncan, Pender County
- Lisa Williams, Mid-East Commission
- Margeaux Kerr, North Carolina Coastal Federation
- Nicole Goddard, NC Office of Recovery and Resilience
- Mackenzie Todd, NC Division of Coastal Management
- Michelle Raquet, NC Division of Water Resources
- Rachel Love-Adrick, NC Division of Coastal Management
- Riley Lewis, Coastal Carolina Riverwatch
- Robbie Fearn, Audubon North Carolina
- Robin Hoffman, NC Division of Water Resources
- Sandra Snipes, Town of Vandermeer
- Sara Marschauser, Audubon North Carolina
- Sarah Spiegler, North Carolina Sea Grant
- Stacey Feken, Albemarle Pamlico National Estuary Partnership
- Steve Bevington, NC Land and Water Fund
- Steven Richter, East Carolina University
- Whitney Jenkins, NC Coastal Reserve

**Overview of drainage districts and their governance** –Kendall Paramore, Southeast Drainage Office (SEDO)

\*Kendall did not send his slides, if you have questions contact him at [sedrainagedistrict@gmail.com](mailto:sedrainagedistrict@gmail.com)

- Historically, farmers and landowners got together cut ditches and canals / drain property out to nearest tributary / given jurisdiction by the court systems / tax to pay for it
- Channels only designed to meet 2–5-year storms / get water off property
- Piedmont / Eastern NC have many drainage districts, not many in mountains
- SEDO Est 1994 as non-profit to help drainage districts with their management
- SEDO only entity of its kind in NC / helps 13 drainage districts / run by appointed drainage commissioners / clerk of court in each county appoints
  - 452 miles of drainage canal in 13 dist. / 18,350 parcels
- Picture of typical agricultural drainage canal / backside of canal allow to grow, travel way with easement to access to pull debris out of / beaver mgmt. / keep mowed
- River basins: mainly works in Chowan, Tar Pamlico, and Neuse
- Roles of SEDO
  1. Assist drainage districts w/maintenance scheduling and work bids / commissioners have say who get the job
  2. Prepare tax assessments for drainage districts, work with county tax offices so drainage districts receive funds
  3. Prepare and manage grants for drainage districts, grant project management
  4. Prepare yearly budget for drainage districts to be approved by commissioners
  5. Assist w/ financial mgt and planning
  6. Work with legislation on behalf of the drainage districts / need extra funds during hurricane recovery etc.
  7. Assist drainage districts in review of plans by municipalities
- SEDO partnerships: NC DEQ / Neuse advisory group blueprint, NC farm bureau
- Maintenance: mowing spraying beaver mgt erosion control, culvert mgt (pipes under canals), work with DOT / culverts inside canals / inspections/ aquatic weeds such as alligatorweed, etc.
- Why have drainage districts? Pic taken not too far from his office after hurricane Floyd / devastating storm to eastern NC / drainage canal choke points, backed up, flood town
- Pic after; drainage districts assist with recovery, and maintenance
- Flooding affects everyone:
  1. Rainfall intensity and impervious surfaces have increased
  2. Financial burdens big issue for drainage districts / do not want to tax landowners to death/ work with state/ may have x miles of canal but only a few landowner
  3. Beaver management important
  4. Development impacts, seeing in encroachment in drainage district easements
  5. Reduced river capacity / elevations at different heights / rivers spread out / backs up into canals and onto landowners
  6. Satellite annexations / downstream impacts / smaller pieces of property with more impervious surface / an unnamed storm flooded homes with 6 inches of water
- Solutions:
  - Farmland preservation
  - Updated flood plain studies
  - Recurring funding for drainage district maintenance
  - Sediment management / canals sediment builds up

- Landscape buffers/ vegetation between homes and property / soak up and absorb water/ help ecosystem
- Water storage and farming, where to locate

### Q&A with Kendall

- Whitney: Is there a list of NC drainage districts somewhere? No
- Stacey: Are there drainage districts in Chowan/Pasquotank river basins? There are, here just focused on the basins he works with the most
- Whitney: non-profit, how do those partnership come about? Do they elect to join? Clerks of court help get districts involved, some didn't want to at first, have grown from 8 to 13 districts.
- Eryn: mapping portion of floodplains/ state of NC / tackling studying areas FEMA floodplain maps / shows mapping process / [Map - Advisory Flood](#)
- Keith: flood resilience blueprint / drainage districts have their role / folks don't know about them / resilience projects / flood mitigation / good chance work takes place within drainage districts

### Engaging Drainage Districts in the Implementation of the Lake Mattamuskeet Watershed Restoration Plan –

Alyson Flynn, Margaux Kerr & Bree Charron, North Carolina Coastal Federation (NCCF) – [See Slides](#)

- Engaging drainage districts in the implementation of the Lake Mattamuskeet Watershed Restoration plan
  - Lake Mattamuskeet is the largest “natural” lake with alterations / Hyde County / extremely flat
  - Heavily modified over 200 years / logging and agricultural drainage, reduce size from 110,000 to 40,000 acres / average depth 4 ft
- Five drainage districts: dotted black line watershed ([see slide](#)), canal networks from early 1900s still there, move water off low-lying landscape
  - Canals, reduce lake's natural water flow and filtering capacity, serve farming operations, lake use to naturally drain to north, decline in water quality and ecological health of lake
  - Impact on water quality and submerged aquatic vegetation (SAV) coverage / split by Highway 94 / SAV gone by 2016 / placed on state's 303d list of impaired waters
- Established a partnership to develop a watershed restoration plan: core stakeholders, principal agencies. The plan was adopted in 2019 / facilitated by NCCF / Hyde County, US Fish & Wildlife Service, NC Division of Water Resources
- Plan goals:
  - Protect the way of life in Hyde County
  - Actively manage the lake water level
  - Restore water quality and clarity, including remove from 303d list and prevent a Total Maximum Daily Load designation (TMDL)
- How? Priority actions identified:
  - Perform hydrologic study of the watershed
  - Engineering firm determined nine different options to move water in watershed
  - Evaluated cost effectiveness of each
  - Stakeholders prioritized two options for moving water
- Design engineering plans for active water management

- Current projects:
  - Pat Simmons: NW corner of the lake / local private landowner not in a drainage district, maintain with private pumps / example other property owners can follow / wetland restoration 1000 acres, this is the area where SAV started to die off / redirect flood waters to a constructed wetland, ultimately drain to ICWW
  - Burrus canal project / natural historical drainage to north towards the Alligator River
    - Purpose is to revive the ecosystem and water quality of the lake by redirecting water to the north by installing drainage infrastructure, reduce drainage to lake
  - Swan quarter living shoreline: 4,506 linear feet, small portion has been installed, Hyde County Soil and Water Conservation District and private property owners

### Q&A with Alyson, Margaux & Bree

- Whitney: how were the drainage districts involved?
  - Natural partnership based on type of work / partnership created between different stakeholders when the lake was put on 303d list/ benefit/ looking at infrastructure improvements, still using some 1950s infrastructure / stakeholder group as diverse as possible, includes as many people as possible around lake
- Brandon: restoration projects priority restoration goals, how are you monitoring the projects?
  - The funding requires outcomes analysis, using National Fish and Wildlife Foundation methods, worked with ECU on a comprehensive monitoring plan that includes nutrients, sediment, Phys/chem properties, flow in and out of lake / pre- and post-restoration monitoring

### Round robin – members share what they are working on related to resilience

- NCORR: Helene Wetherington and Holly White not in attendance, emailed their update: Community Disaster Resilience Zone (CDRZ) Resource Coordination meeting is scheduled for February 11<sup>th</sup> from 10am-12pm virtually. Everett is finalizing the agenda now and should be able to forward it to you by the end of the week. Placeholder on the agenda for partners to share news with the CDRZ communities that may be of interest.
- Nicole: NC Resilient Communities Planning Guide released today/ hosting a webinar on February 20
  - <https://www.rebuild.nc.gov/nc-resilient-planning-guide>
- Steve Bevington: NC Land and Water Fund open grant period right now through March 1
- Jacob: EPA Climate Pollution Reduction Grant (CPRG) funds have been obligated / NCCF working on 5-year game plan for projects
- Mackenzie: DCM was selected to be host next round of NOAA fellows' coastal management fellowship, they will create a GIS hub for RCCP projects. Received grant to sponsor another round of Phase 1-2 or the Resilience Coastal Communities Program.
- Stacey: VA Southern Rivers Roundtable / river basins that flow into Albemarle Sound convened by Crater Planning District Commission. APNEP also working on a project with VA NHP / Giancarlo talk more about mapping Tribal communities, Hampton Roads Planning District Commission is hosting Climate Action Plan Webinar, [www.hrpdcva.gov/climate](http://www.hrpdcva.gov/climate).
- Giancarlo: mapping historic reservations, incorporating old maps
- Sarah Spiegler—Downeast Resilience Network Meeting Jan 30

**Next meeting in April**, Whitney will send a meeting poll

- Next meeting topics –
  - Salt marsh impacts/migration, marsh migration corridor mapping
  - SASMI – final conservation plan – Amanda (coordinator), connection to NC stakeholders (already heard about NC Salt Marsh Plan from Claire at NC Coastal Federation)
  - Coastal Carolina Riverwatch: community organizing in North River – Riley Lewis, White Oak Waterkeeper with the Coastal Carolina Riverwatch
    - Study on public policy students, protecting wetlands in Carteret County with public policy changes – Riley
  - UNC, ECU drone mapping of SAV. Susan Cohen/ UNC talk more about if interested – Robbie
    - Also, NERR drone mapping/monitoring of oyster reefs and salt marshes
  - Don Hornstein – UNC CH – environmental topics
  - Jacob – CPRG funding, will send more info (Climate pollution reduction grant)
  - Wetlands Watch – king tides and other observation projects



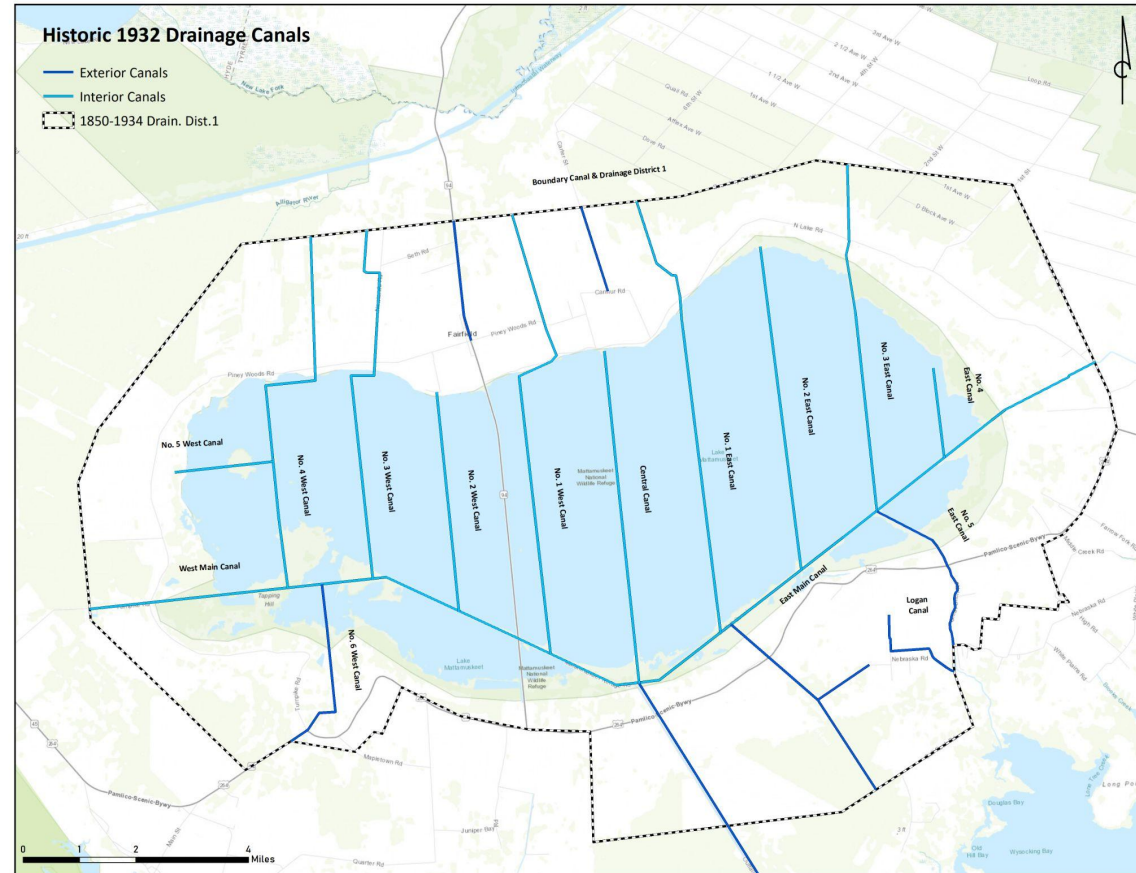
North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*

# North Carolina Coastal Federation

*Engaging Drainage Districts in the Implementation of the  
Lake Mattamuskeet Watershed Restoration Plan*

# Lake Mattamuskeet: *The Largest “Natural” Lake with Alterations*

- Located in the heart of Hyde County
- heavily modified over 200 years for logging and agricultural drainage, reducing its size from 110,000 to 40,000 acres
- Average depth of 4-feet

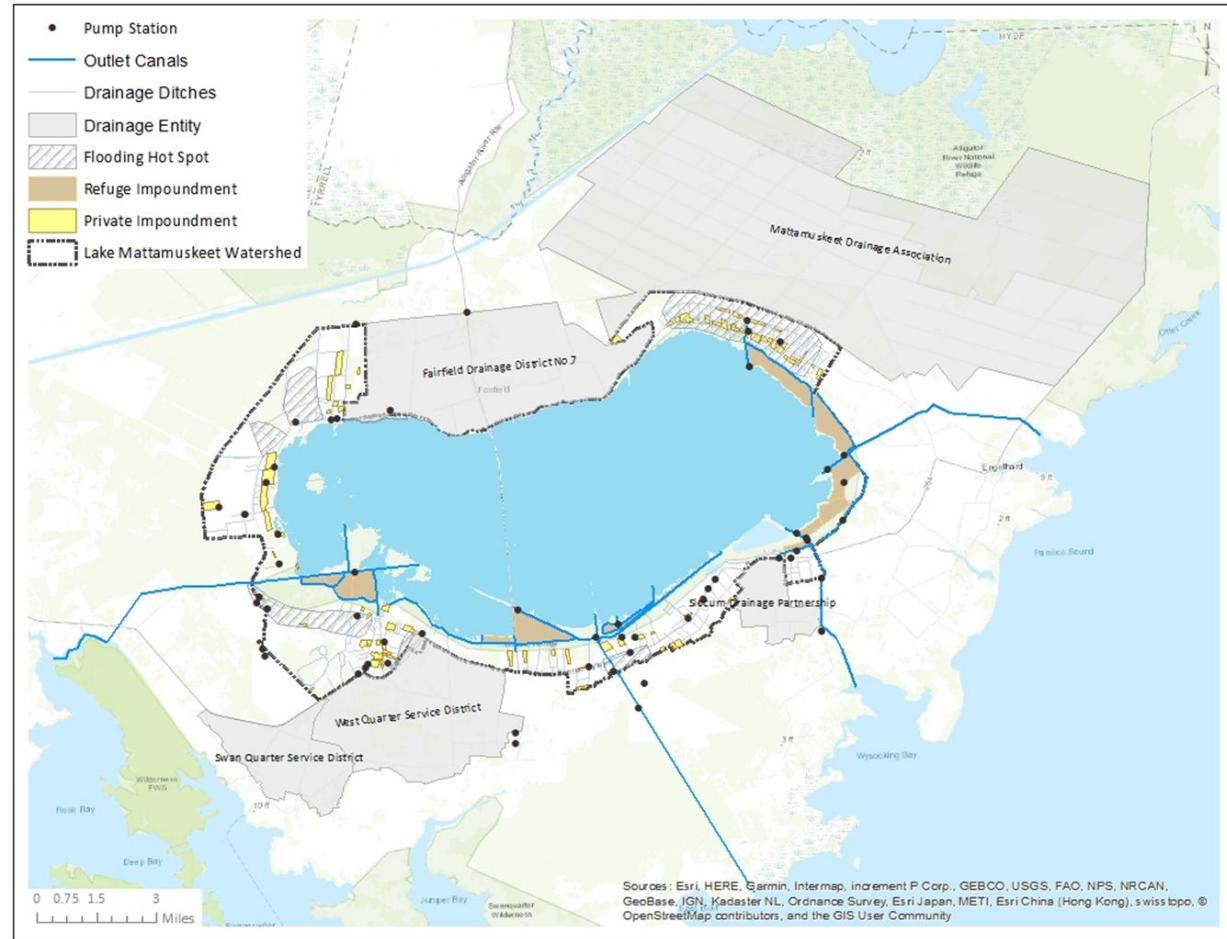


- **5 Drainage Districts:**

- Manage canal networks to move water off low-lying landscape

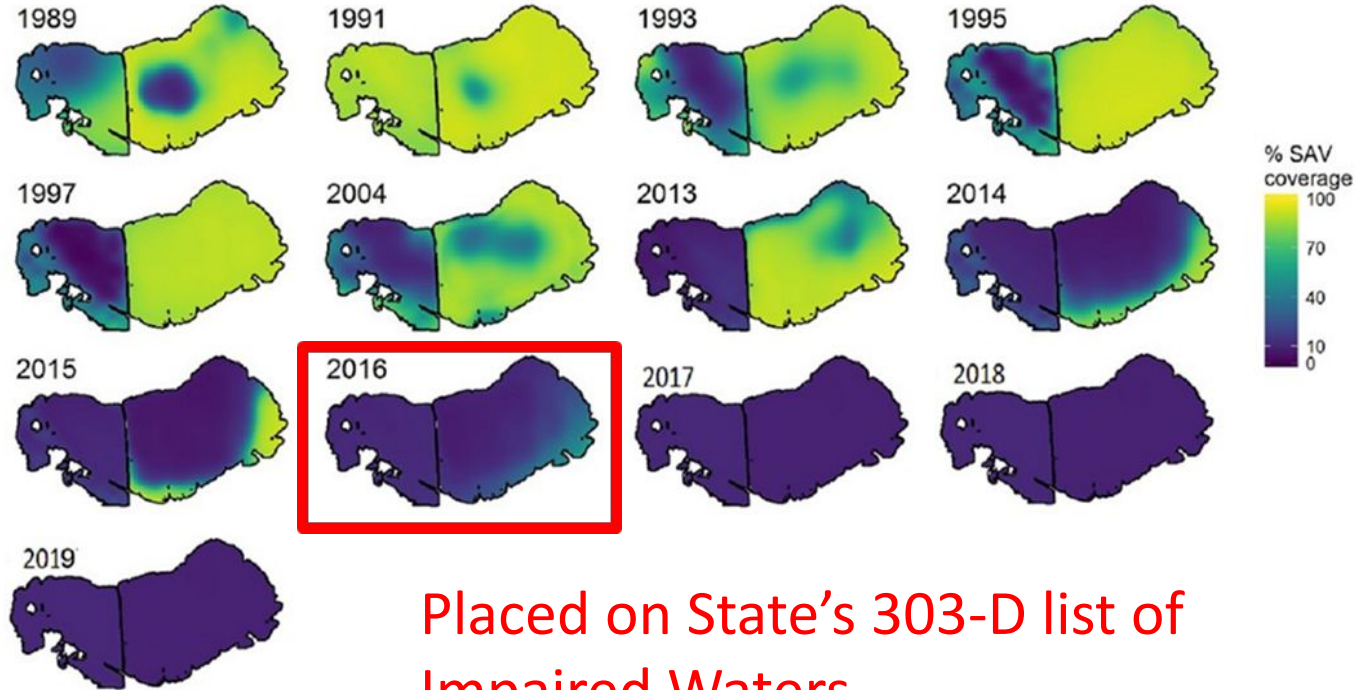
- **Canals:**

- Serve farming operations
- Reduce the lake's natural water flow and filtering capacity



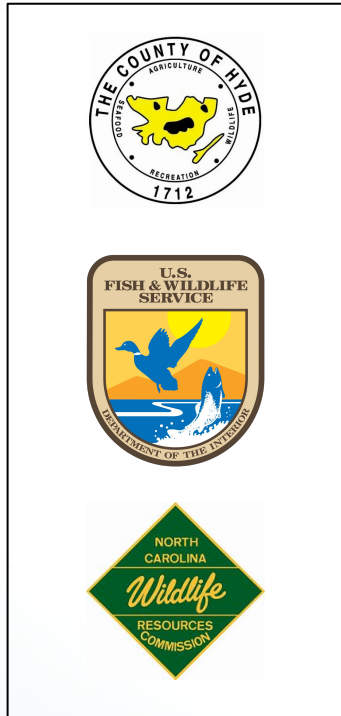


# Impact on Water Quality & SAV Coverage



Placed on State's 303-D list of Impaired Waters

# Partnership Formed to Develop a Watershed Restoration Plan (2016 - 2018)



*Principal Agencies*

1. Hyde County Soil and Water
2. NC Cooperative Extension
3. **Fairfield Drainage District**
4. **Mattamuskeet Association**
5. Farming Community
6. Residential Community
7. Waterfowl Impoundment Owners
8. Hospitality Business Owners

*Core Stakeholder Team*



*Facilitator*

# PLAN GOALS

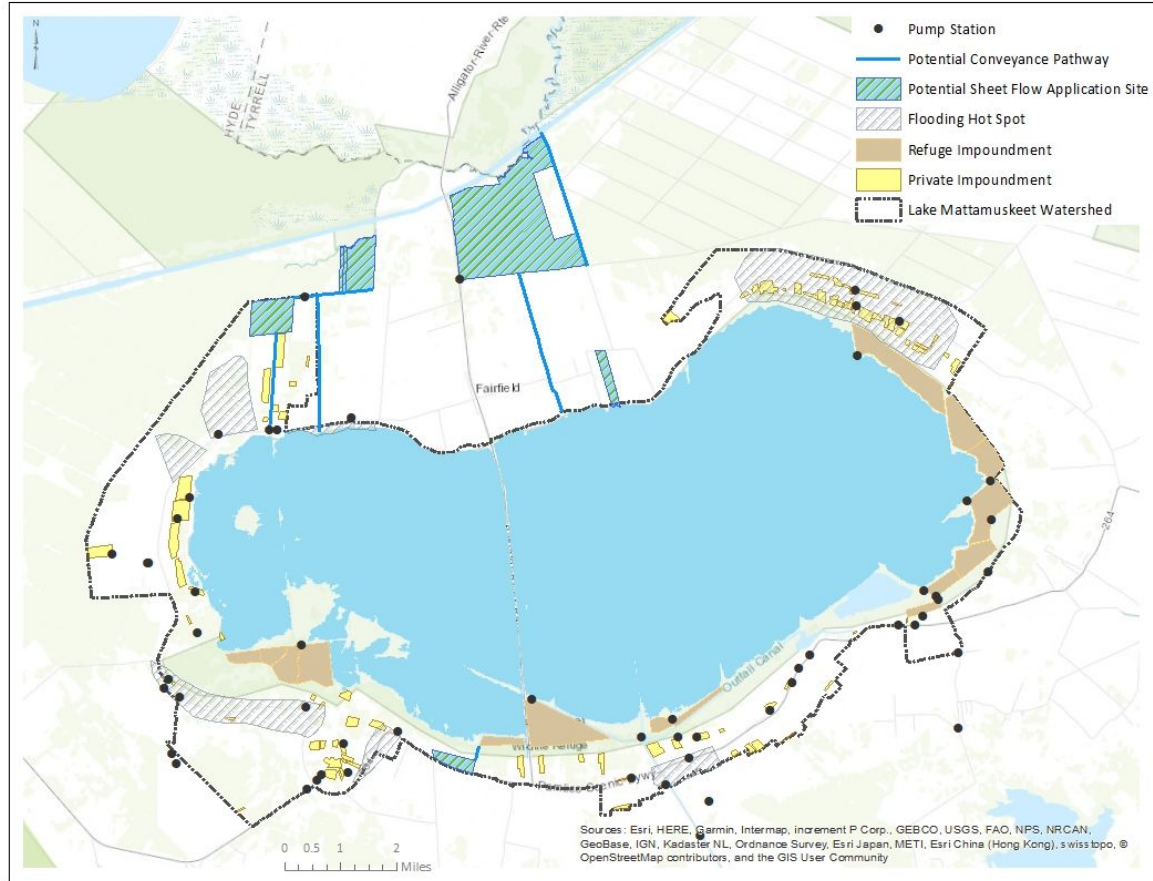
1. Protect the way of life in Hyde County
2. Actively manage the lake water level
3. Restore water quality and clarity.



**Remove  
lake from  
303-D list**

# How? Priority Actions Identified

1. **Perform hydrologic study of the watershed**
  - a. Modeled 9 options for moving water in watershed
  - b. Evaluated costs and effectiveness for each
  - c. Stakeholder team prioritized 2 options for moving water
2. **Design engineered plans for active water management within the watershed**



## Multiple Sheet Flow Sites



Selection of 2 priority projects presented to BOC in 2021:

1. Sheet flow sites
2. Gravity drainage to the drainage districts

Before progressing to a permit-level plan, one big question:

1. What funding strategies exist?

## Gravity-drained Canals



## Lake Mattamuskeet Watershed Restoration Plan Timeline

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025 - 2029
<b>Development Phase</b>	Lake placed on 303D list of impaired waters	Partnership formed to develop a watershed restoration plan	Draft restoration plan presented to the public	NC DEQ officially approves plan  Funding secured to implement priority actions						
<b>Implementation Phase</b>					ECU: preliminary engineering and cost estimates for 3 conceptual plans  Geosyntec creates a watershed model and explore 9 options for moving water in the watershed	Two priority projects to Hyde County BOC 1. sheet flow sites & 2. gravity drainage to drainage districts  Hyde County BOC: want more info on funding solutions and Outfall Canal first!	2022 - 2024: Hyde County receives a \$1 million from the NC General Assembly, Federation contracted to continue leading effort (UNC-SOG, Geosyntec, & GPI)  2024: NRCS awards \$16.8M (RCP) to NCCF to advance priority projects to construction in the surrounding watershed			
<b>Permitting &amp; Construction Phase</b>										RCP funds push projects through construction



# Implementation

- Regional Conservation Partnership Program (RCPP) Grant
- Awarded in 2024 for \$16.8 M
- Proposed Projects and Funding Goal
  1. Fairfield Drainage District Improvements
  2. Wetland Restoration
  3. Living Shoreline
  4. EQIP Program - cost-share program
  5. Oyster Restoration- cost-share program
- Timeline: 4 years (with a one-time 1 year extension allowed)



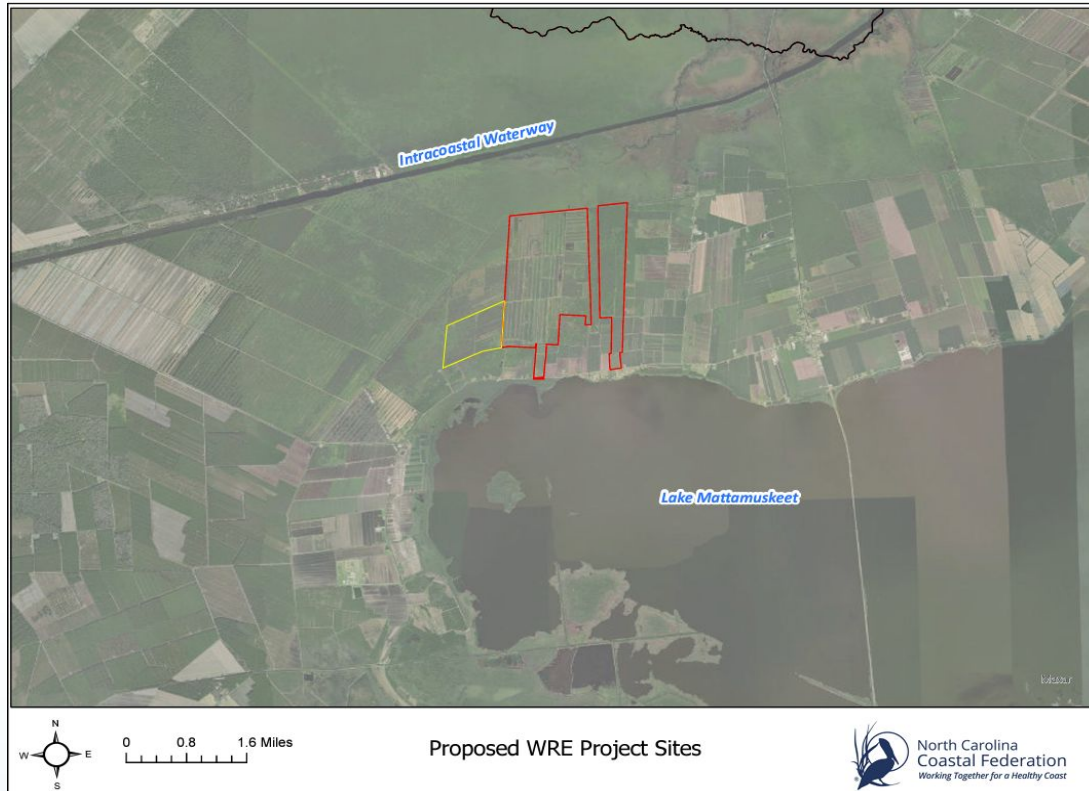
# Current Projects

- Pat Simmons Project
- Burrus Canal Project / Fairfield Drainage District
- Swan Quarter Living Shoreline
- Mattamuskeet Drainage Association - Lux Farms

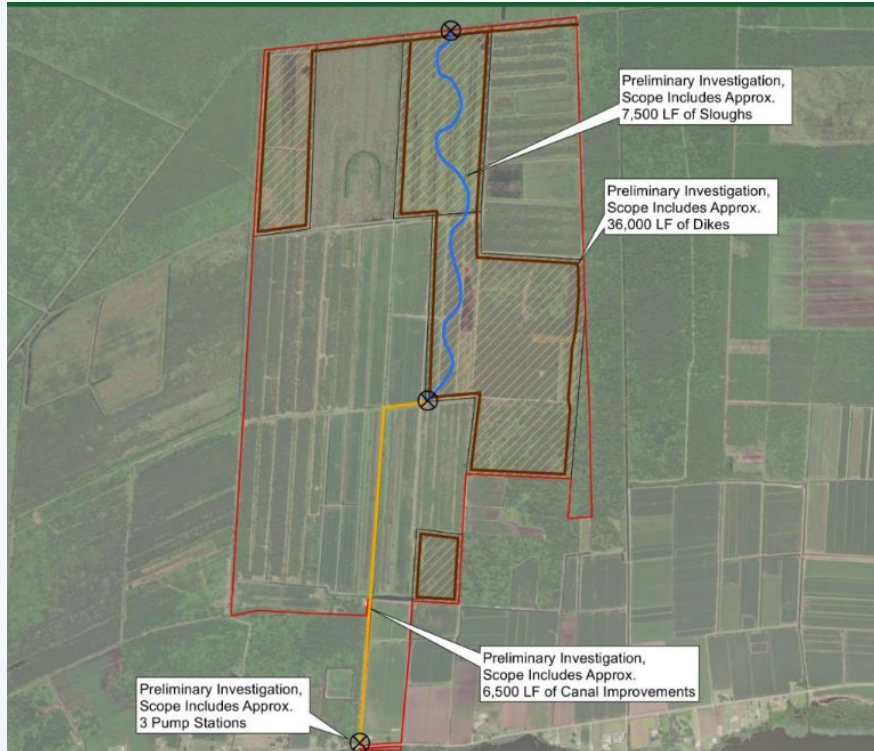




# Pat Simmons Project



# Pat Simmons Project



- Pat Simmons
- Private Property Owner
- Existing conditions
- Purpose of project
- Wetland Restoration 1,000 acres
- WRE Program
  - What is WRE?

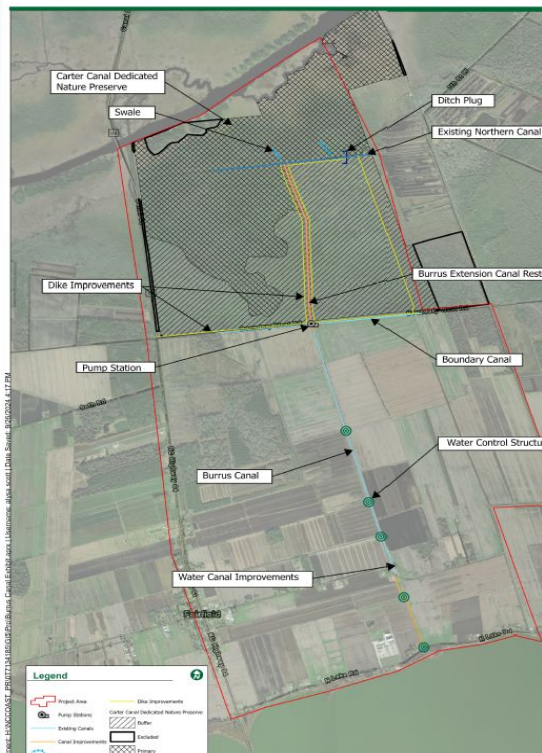


# Burrus Canal Project



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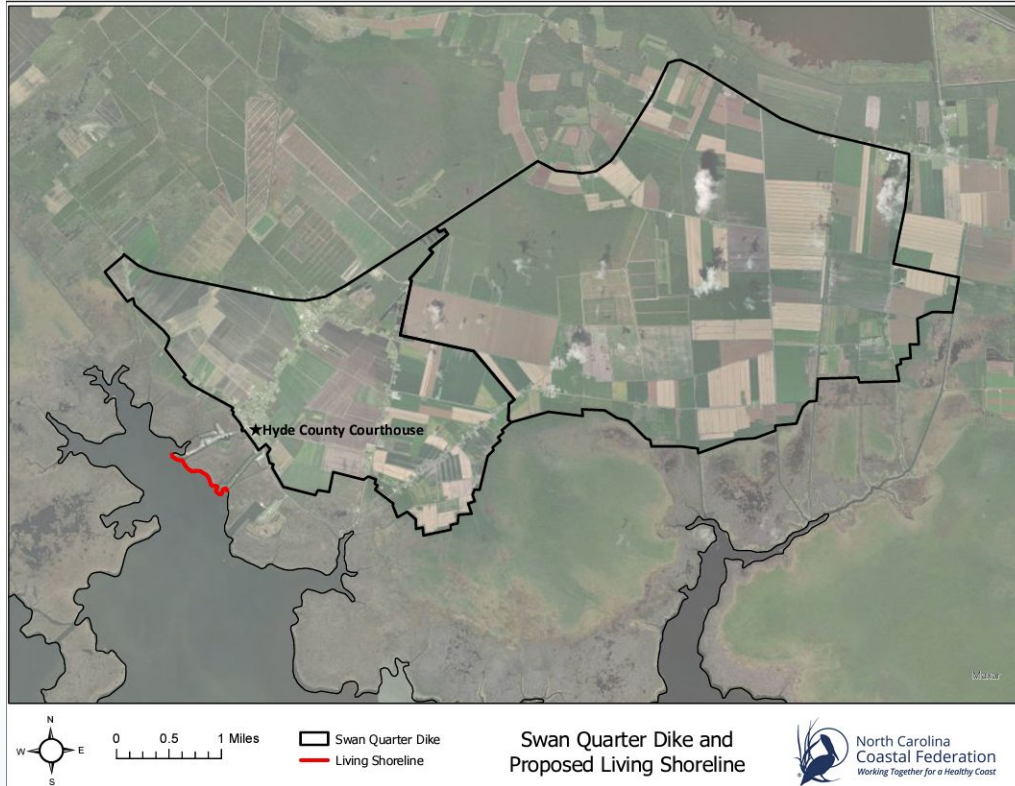
# Burrus Canal Project



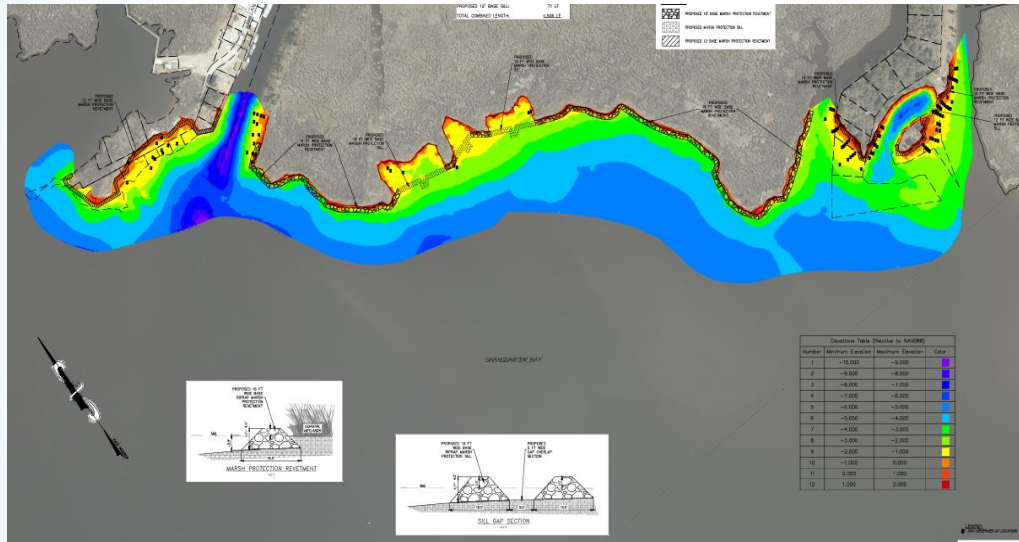
- Purpose of project
- Partnerships
  - Fairfield Drainage District
  - WRC
  - Hyde County
- Benefits
- Continuing project implementation



# Swan Quarter Drainage District

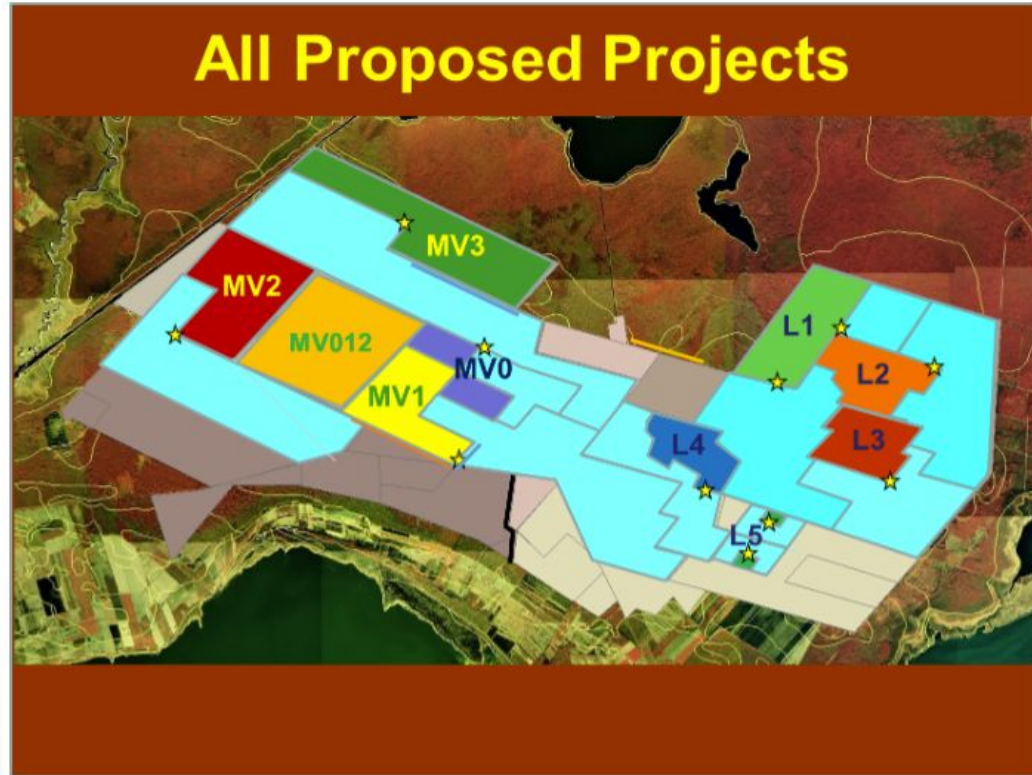


# Swan Quarter Living Shoreline

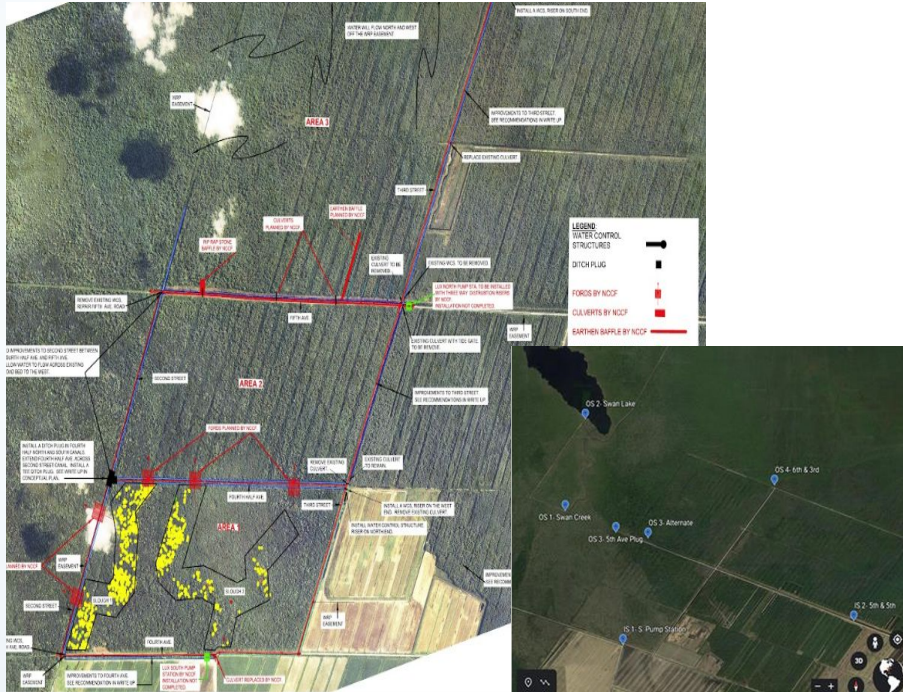


- Purpose of project
- Swan Quarter Drainage District
- NRCS Swan Quarter Dike
- 4,506 LF living shoreline
- Small portion has been installed
- Hyde County Soil and Water Department

# Mattamuskeet Drainage Association



# Mattamuskeet Drainage Association - Lux Farms



- Purpose
- Partnership with Mattamuskeet Drainage Association, NC State, and Stakeholders
- Land and Water Fund
- Water Quality Sampling continued at 6 sample sites



# Questions?

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