North Carolina
Salt Marsh Action Plan Roadmap:

A Roadmap to Implementation of the South Atlantic Salt Marsh Initiative's Regional Salt Marsh Plan in North Carolina

North Carolina Coastal Federation
Working Together for a Healthy Coast

SOUTH ATLANTIC SALT MARSH INITIATIVE

March 2026

Table of Contents

List of Tables

List of Figures

Acknowledgements

The North Carolina Salt Marsh Action Plan (NC SMAP) and the Roadmap were produced collaboratively by numerous professionals from the North Carolina Coastal Federation with support from the South Atlantic Salt Marsh Initiative (SASMI). In addition, members of the Salt Marsh Steering Committee (SMSC) and other staff from state and federal agencies, universities, and other organizations contributed information for the NC SMAP and Roadmap. All contributed extensive feedback, as well as support and guidance on key decision points. Every effort has been made to reflect the knowledge and expertise contributed by the SMSC. This would not have been possible without the assistance of all involved. Financial support for SASMI and the NC SMAP and Roadmap was provided by The Pew Charitable Trusts.

For more information on the NC SMAP and to read the full plan, visit
https://www.nccoast.org/salt-marsh/

Introduction

There are approximately one million acres of salt marsh along the South Atlantic coast extending from North Carolina through northeastern Florida. Persistent and emerging threats to current and future salt marshes are numerous, including degradation by incompatible land and water uses, boat wakes, and the increasing intensity and frequency of storms and sea level rise (SLR) resulting from climate change. Efficiently and effectively addressing these threats is essential to retain and restore ecosystem services that have already been impacted and to avert projected future losses that could fundamentally degrade and endanger fisheries and water quality, as well as the resiliency, economy, and cultural heritage of coastal communities.

In response to the urgent need for coordinated action, the South Atlantic Salt Marsh Initiative (SASMI) was formed in 2021 under the leadership and guidance of The Pew Charitable Trusts (Pew) and the Southeast Regional Partnership for Planning and Sustainability (SERPPAS). As a regional initiative, SASMI brings together more than 400 diverse partners, including leaders from federal, state, and local agencies, and stakeholders from academia, non-governmental organizations (NGOs), and coastal communities throughout the southeast. With the goal of preserving and enhancing the existing million acres of salt marsh within North Carolina, South Carolina, Georgia, and Florida, SASMI released Marsh Forward: A Regional Plan for the Future of the South Atlantic Coast's Million-Acre Salt Marsh Ecosystem (SASMI Plan) in May 2023 (SASMI 2023). The SASMI Plan includes strategies for protecting and restoring existing salt marshes and conserving marsh migration corridors.

While regional and national coordination is essential, much of the implementation of the SASMI Plan will occur at the state and local levels. The SASMI Plan's success depends on the continued and committed participation of the State Implementation Teams (SITs) in each state. These teams are responsible for developing and executing state-specific plans that prioritize actions tailored to local challenges and opportunities. The North Carolina Coastal Federation (Federation) led the development of the North Carolina Salt Marsh Action Plan (NC SMAP), released in May 2024, to effectively establish the SASMI Plan in North Carolina (NC SMAP 2024). North Carolina contains one of the largest and most productive estuarine systems in the United States. Its nearly 2.3 million acres of diverse coastal habitats support fish and wildlife, provide protection and socio-economic benefits to coastal communities, facilitate military readiness, and foster cultural and spiritual values and traditions. North Carolina has approximately 220,000 acres of salt marsh that provide a wide array of ecosystem services, including essential fish habitats, water quality enhancements, flood protection for adjacent communities, and climate mitigation by sequestering carbon. Their long-term protection and resilience require strong coordination between local, state, and regional efforts.

The North Carolina Salt Marsh Action Plan

In coordination with the SASMI Plan, the NC SMAP has three guiding strategies with objectives and actions that detail approaches to conserve, restore, and facilitate the migration of salt marshes in North Carolina (See NC SMAP for full list). It is intended to guide priority actions over the next five years, building upon projections of change to salt marsh extent, health, and function through the year 2050, driven by land use and climate change. The NC SMAP brings together local, state, and federal stakeholders from academia, governmental agencies, communities, and NGOs to prioritize actions and maximize the efficient use of available resources. The NC SMAP was developed through collaborative efforts and local expertise and is meant to complement other initiatives that aim to protect coastal environments and enhance the resilience of habitats and communities. The NC SMAP includes five key features. It:

1. Identifies current and emerging threats to salt marshes
2. Devises strategies that will effectively address identified threats relying upon the best available science and expertise
3. Promotes widespread and meaningful public understanding and demand for achieving the goals
4. Devises ways to engage stakeholders from all walks of life in taking ownership of advancing actions
5. Outlines a five-year guidance to support annual strategic planning, monitoring, evaluating success, and adapting as needed to address emerging challenges and needs

Current and Projected Status of North Carolina Salt Marsh

North Carolina currently has approximately 220,000 acres of salt marsh along its coast (Figure 1a). These marshes occur along the mainland side of the estuaries, as isolated marsh complexes within the open-water estuarine system, and behind the state's barrier islands. Projections generated from Warnell et al. (2022), which utilize elevation and SLR data, estimate that North Carolina is projected to lose approximately 92,000 acres of existing salt marsh and gain 270,000 acres of new salt marsh (net gain of about 180,000 acres) by 2050 under an intermediate SLR scenario (1.5ft rise), assuming a sustained level of development, no efforts to slow or impede salt marsh encroachment into agricultural or forested uplands, and no major ecological or geological changes (Figure 1b). These estimates show, however, that the gains and losses of the salt marsh will not be experienced equally along the coast. The southern coast, with its higher elevation and coastal development, will experience significantly more salt marsh loss than the lower-lying, less developed central and northern coasts with more potential marsh migration space (Figure 2). Current and future barriers to inland marsh migration play a key role in determining future marsh extent.

Given these pronounced regional differences, the NC SMAP divides the coastline into smaller, more manageable planning units for detailed analysis and management recommendations starting with coastal counties (Figure 3a). The analysis began with US Geological Survey 10-digit hydrologic unit code (HUC-10) watersheds directly connected to estuarine waters containing current or projected marsh by 2050 (Figure 3b). These were refined and consolidated into 38 Conservation Planning Units (CPUs) based on jurisdictional boundaries and ecological context (Figure 3c). Marsh projection data for 2050 were then clipped to each CPU, enabling calculation of total acreage gains and losses within each unit (Table 1; Figure 3d). This illustrates the magnitude and spatial distribution of projected salt marsh transformation across North Carolina.

Using projected changes in salt marsh extent through 2050 for each CPU, if no interventions or changes were to occur, 18 of the 38 CPUs are estimated to lose an average of 27% salt marsh (Table 1). The prospective loss of salt marshes in North Carolina carries multifaceted implications, impacting both the environment and human communities. With a 1.5ft rise in sea level, the coast of North Carolina will change dramatically. Much of the low-lying lands in the central and northern regions of the coast will become increasingly inundated until permanently submerged. The barrier islands will face more frequent overwash events and the creation of new inlets. These processes will lead to greater saltwater intrusion, driving the natural landward migration of salt marshes and shifts in coastal habitats. Regions along the coast with heavy shoreline armoring will be subjected to more destruction and loss of vital coastal habitats and vegetation. These unique coastal ecosystems provide a range of invaluable ecological services, and their decline could result in far-reaching consequences, such as increased erosion and storm damage, decreased carbon sequestration potential, and the collapse of crucial nursery and breeding grounds for ecologically and commercially significant wetland species. While these outlooks are projected to 2050, several areas are currently experiencing the negative effects of rising sea levels

and climate change. There is already evidence of marsh loss, increased saltwater intrusion, and marsh migration occurring throughout the Coastal Plain of North Carolina. This reinforces the immediate and urgent need for organized action. By enhancing existing marsh and bolstering its capacity for sediment accrual, the marsh can keep pace with SLR vertically. Simultaneously, facilitating marsh migration and establishing clear, protected migration corridors will allow the marsh to retreat horizontally, preserving the coastal protection and other benefits it provides.

Salt Marsh Steering Committee

The Federation leads the North Carolina SIT, which functions as the Salt Marsh Steering Committee (SMSC), and is structured to ensure diverse perspectives and the technical capacity needed to guide effective implementation. Implementation of the NC SMAP is designed to be a collaborative and complementary process. The SMSC aims to integrate NC SMAP actions into existing efforts and programs wherever possible and identify and pursue new opportunities for implementation and funding. This includes working collaboratively to identify priority locations, key partners, implementation pathways, and measurable success metrics to achieve the NC SMAP's objectives. It is also important to the SMSC to use and leverage existing tools for prioritization and decision-making. By leveraging existing resources and partnerships, the NC SMAP is additive and synergistic, building upon ongoing work to achieve shared conservation and resilience goals. The SMSC is composed of the following organizations:

- East Carolina University
- Duke University
- The University of North Carolina at Chapel Hill
- North Carolina Sea Grant
- North Carolina Division of Coastal Management
- North Carolina Division of Marine Fisheries
- North Carolina Wildlife Resources Commission
- North Carolina Coastal Reserve and National Estuarine Research Reserve
- United States Fish and Wildlife Service
- EA Engineering, Science, and Technology
- Environmental Defense Fund
- The Nature Conservancy
- Carolina Wetlands Association
- Audubon North Carolina
- Legacy Works
- National Oceanic and Atmospheric Administration

In recognition of the fact that understanding how communities are being impacted by changes to salt marsh extent and function requires robust engagement with diverse stakeholders, a Stakeholder Advisory Committee (SAC) was established. In September 2024, the Federation collaborated with the North Carolina Division of Coastal Management and the North Carolina Coastal Reserve and National Estuarine Research Reserve to host a Salt Marsh Stakeholder Advisory Committee (SAC) workshop aimed at facilitating informed contributions to the SMSC for the effective implementation of the NC SMAP and the SASMI Plan. The objectives of the workshop were to inform and engage stakeholders by presenting comprehensive background information on the NC SMAP and SASMI Plan and engage with stakeholders for feedback, knowledge sharing, and future collaborative efforts. During the workshop, stakeholders from across the state participated in an activity to identify and prioritize ongoing salt marsh efforts. Through the SMSC and SAC, the Federation has been able to partner with over 100 individuals from local government, state, and federal agencies, academia, and non-profit and private organizations (Table 2).

Implementation

The Roadmap further refines the NC SMAP to help achieve the overall goal to protect, restore, and facilitate the migration of salt marshes in North Carolina to minimize loss of function, benefits, and acreage through 2050 and beyond. High-level priority salt marsh areas for protection, restoration, and

migration were identified using projected changes in marsh extent through 2050 for each conservation planning unit with data sourced from Warnell et al. 2022 (Table 1). These priority areas should be used as a first step to help guide local planning efforts and investment decisions.

To help ensure effective implementation of the NC SMAP, the Roadmap includes measurable five-year goals for each strategy. Spatial analysis and diverse expert input were leveraged to identify practical, evidence-based priority actions for each five-year goal that can be implemented across North Carolina through 2030 and beyond. The SMSC developed a set of prioritization criteria that helped guide prioritizing actions (Table 3). These priority actions are the product of multiple collaborative workshops and discussions with the SMSC, local partners, and other subject-matter experts. Key metrics for evaluating progress in North Carolina were identified for each five-year goal as well as reporting methods. Key metrics for evaluating progress were also identified for each strategy in the SASMI region (Appendix A). Key alignments were identified to help build upon ongoing work by integrating priority actions into existing efforts, partnerships, and/or resources. Initial key alignments include:

- North Carolina Coastal Habitat Protection Plan 2026 five-year update
- North Carolina Wetland Program Plan 2026 five-year update
- 2022-2026 Estuarine Shoreline Strategy, North Carolina Division of Coastal Management
- Guidance For Site Assessment and Monitoring of Thin Layer Projects in North Carolina Tidal Marshes, North Carolina Division of Coastal Management 2022
- Albemarle-Pamlico National Estuary Partnership Comprehensive Conservation and Management Plan 2025-2030
- NOAA Guidance for Considering the Use of Living Shorelines 2015
- Southeast Conservation Adaptation Strategy's Southeast Conservation Blueprint
- Manomet's Beneficial Use of Dredged Materials for Coastal Habitat Resiliency

As efforts transition into implementation, the SAC was reformed as the Salt Marsh Network (SMN) with over 100 members from local government, state, and federal agencies, academia, and non-profit and private organizations. The SMN's purpose is to provide high-level guidance and feedback on implementation, serving in an advisory capacity to the SMSC to help ensure inclusion of stakeholder and decision-maker engagement, guidance, and support.

Progress towards each strategy and goal in North Carolina will be evaluated by the SMSC and reported annually in the State of the Salt Marsh Annual Report and regionally in the SASMI Impact Report. This process will also include making regular updates to the Roadmap. The SMSC will monitor progress and adjust priorities if warranted. Engagement opportunities will be provided for other stakeholders, partners, and frontline communities throughout the time period. After the initial five-year period, the NC SMAP will be reevaluated, updated, and re-released based on annual monitoring, current needs, and funding to ensure alignment with the best available science and continue to meet the evolving needs of coastal North Carolina.

STRATEGY 1. Advance Salt Marsh Conservation And Restoration

Outlines the goals and priority actions to restore lost or degraded marsh, enhance existing marsh, and protect current and future marsh from further damage and threats.

Goal 1.1 - Protect and Restore 600+ Acres of Salt Marsh

5-Year Commitment: Protect a minimum of 600 acres of salt marsh statewide by 2030

- Metrics:

- Acres of salt marsh protected and/or restored through the completion of projects
- Number of salt marsh protection and/or restoration projects initiated

- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Complete comprehensive erosion analysis and a regional-scale study of salt marsh inventories in North Carolina's coastal system across temporal datasets to help further prioritize where to best focus resources of detailed erosion analysis capabilities across a regional scale
  2. Implement restoration projects through the Climate Pollution Reduction Grant (CPRG)
  3. Raise public and decision-maker awareness about the importance of salt marshes and their role in coastal resilience
  4. Encourage public support for policies and projects that promote marsh conservation through regular media stories, etc.

Goal 1.2 - Expand Use of Living Shorelines

5-Year Commitment: Expand the use of living shorelines as the preferred shoreline stabilization method installing a minimum of five miles of living shorelines in priority CPUs/Areas

- Metrics:
  - Linear feet of living shorelines constructed and/or enhanced to protect and create salt marsh
  - Number of living shoreline projects completed
  - Increase in living shoreline awareness and usage
  - Number of new contractors educated about living shorelines
  - Development of a living shoreline decision support tool
  - Development of a living shoreline model policy
  - Development of a living shoreline statewide guidance document
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Continue to site and design living shorelines based on current research and lessons learned
  2. Develop living shoreline model policy similar to other states
  3. Develop statewide living shoreline guidance document
  4. Develop and operationalize up-to-date decision support tools for living shorelines suitability
  5. Document the success of living shoreline projects each, both new and old, including their cost-benefits and resilience compared to other types of shoreline stabilization
  6. Maintain and enhance funding for cost-share programs to encourage the use of living shorelines and better establish private market demand
  7. Maintain consistent educational outreach about the merits of living shorelines

Goal 1.3 - Advance Beneficial Use of Dredged Material

5-Year Commitment: Support the US Army Corps of Engineers' (USACE) national goal of 70% beneficial use of dredge materials (beneficial use) through implementing beneficial use restoration projects in at least three priority CPUs/Areas

- Metrics:

- Number of beneficial use projects
- Percent of USACE dredge material used for salt marsh restoration
- Development of a beneficial use decision support tool

- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Support and collaborate with partnering agencies to develop a beneficial use plan for North Carolina for all areas where routine dredging is conducted by federal, state, local, and/or private entities
  2. Incorporate beneficial use in restoration projects
  3. Develop and operationalize up-to-date decision support tools for beneficial use

Goal 1.4 - Identify and Restore Compromised Salt Marsh Complexes

5-Year Commitment: Inventory and prioritize degraded salt marsh complexes statewide and initiate restoration in at least 10 high-erosion areas

- Metrics:
  - Readily available maps and data for prioritization and decision-making
  - Number of projects initiated in high-erosion areas
  - Estimated percentage of healthy salt marsh versus degraded
  - Completion of a salt marsh vulnerability assessment
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Complete updated salt marsh change analysis (Warnell et al. 2022) using NOAA's Coastal Change Analysis Program 1m resolution data once available for prioritization of short and long-term needs and compare to currently protected areas
  2. Map and inventory threatened, degraded, or eroded salt marsh complexes based on acreage and ecological and protective functions
  3. Complete a salt marsh vulnerability assessment
  4. Prioritize degraded salt marsh complexes statewide
  5. Identify potential restoration techniques

STRATEGY 2. Facilitate Salt Marsh Migration

Focuses on proactive adaptation and working collaboratively with communities to protect existing land uses where possible, while planning for strategic, orderly transitions as both groundwater and sea levels rise.

Goal 2.1 – Conserve Salt Marsh Migration Corridors

5-Year Commitment: Conserve 5,000 acres of priority salt marsh migration corridors

- Metrics:
  - Number of acres conserved and/or protected for salt marsh migration
  - Number of salt marsh migration areas inventoried and prioritized
  - Completed analysis and mapping of salt marsh migration corridors and barriers
  - Development of a salt marsh migration decision support tool

- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
    1. Conserve salt marsh migration corridors through land acquisitions and easements, securing necessary funding and resources, and updating planning and management practices
    2. Develop and operationalize up-to-date decision support tools for salt marsh migration prioritization
    3. Concentrate NRCS wetland protection and enhancement cost-share programs within salt marsh migration areas
    4. Use USDA federal farm bill conservation programs to secure conservation easements and undertake hydrology restoration on lands that are becoming marginally productive due to saltwater encroachment and flooding
    5. Work with state and federal land management agencies to ensure that their land management strategies are conducive to salt marsh migration needs and work to establish uniform policies
    6. Develop guidance and incorporate salt marsh migration into state policies including the Uniform Floodplain Management Policy and Flood Resiliency Blueprint

Goal 2.2 – Remove or Retrofit Hydrologic Barriers

5-Year Commitment: Identify and address five hydrologic barriers restricting salt marsh migration

- Metrics:
    - Number of physical barriers restricting salt marsh migration identified
    - Number of physical barriers restricting salt marsh migration addressed
    - Number of new physical barriers restricting salt marsh migration avoided
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
    1. Map and inventory existing hydrologic barriers to salt marsh migration
    2. Prioritize hydrologic barriers to address
    3. Identify methods to address hydrologic barriers
    4. Develop a decision-support tool for enlarging roadway tidal stream crossings to promote salt marsh migration
    5. Identify potential future barriers

Goal 2.3 – Integrate Salt Marsh Migration into Local Planning

5-Year Commitment: Integrate salt marsh migration considerations into at least four county or municipal land use plans

- Metrics:
    - Land management practices that are compatible with salt marsh migration
    - Number of communities engaged
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:

1. Encourage the inclusion of salt marsh migration as a priority in planning and investments in infrastructure, wetland restoration, and working lands to facilitate migration and improve management practices
2. Work with local governments to better manage for new development in low-lying areas near salt marshes to avoid blocking potential marsh migration corridors
3. Develop management and regulatory strategies to support avoiding blocking potential salt marsh migration corridors

Goal 2.4 – Secure Easements in High-Gain CPUs

5-Year Commitment: Secure at least 20 new conservation easements in projected high-gain CPUs

- Metrics:
  - Number of new conservation easements secured
  - Acres of habitat suitable for salt marsh migration restored or conserved through conservation easements and land acquisition
  - Number of land owners engaged
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Inventory and prioritize salt marsh migration areas based on specific strategies
  2. Identify for conservation the federally designated "prior converted cropland" located within known salt marsh migration corridors

STRATEGY 3: Incorporate Cross-Cutting Approaches

Emphasizes the key cross-cutting approaches essential for advancing all aspects of salt marsh protection, restoration, and migration planning.

Goal 3.1 – Complete Regulatory Gap Analysis

5-Year Commitment: Statewide regulatory framework summary with recommended policy adjustments

- Metrics:
  - Increased understanding of knowledge gaps and needs
  - Better/more informed public and decision makers
  - Number of new local, state, and federal policies and policy changes adopted
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Conduct a gap analysis of existing state, regional, and federal laws policies, and programs relevant to the protection and restoration of salt marshes and conservation of marsh migration corridors
  2. Collaborate with state and federal agencies to identify alternative NBS permitting strategies, provide regulatory guidance, and adjust management strategies to ensure that the most effective and environmentally beneficial project designs are consistently selected as part of permit processes
  3. Statewide regulatory framework summary with recommended policy adjustments
  4. Conduct research based on knowledge gaps identified

Goal 3.2 – Secure Sustainable Funding Streams

5-Year Commitment: Continue seeking and maximizing public and private funding opportunities to advance the goals and priority actions in the Roadmap

- Metrics:
  - Total public and private funding committed or invested in salt marsh conservation, restoration, and protection projects
  - Total in-kind contributions to salt marsh conservation, restoration, and protection projects
  - Number of new funding opportunities identified for implementation and research
- Reporting: State of the Salt Marsh Annual Report (North Carolina), SASMI Impact Report (Regional)
- Priority Actions:
  1. Identify and pursue funding to support salt marsh restoration, conservation, protection, and migration efforts and research
  2. Ensure appropriate decision-makers are kept informed of important information, progress, and needs
  3. Seek funding necessary to monitor salt marshes over time to determine status and trends and overall ecosystem health

Goal 3.3 – Publish "State of the Salt Marsh Annual Report"

5-Year Commitment: Publish State of the Salt Marsh Annual Report for North Carolina reporting progress on strategies and goals that is aligned with the regional SASMI Impact Report

- Metrics:
  - Progress towards each strategy and goal in the Roadmap and SASMI Plan
  - Number of engagement opportunities provided
  - SASMI metrics aligned
- Priority Actions:
  1. Engage the SMSC and SMN to convey the work being done through the Roadmap
  2. Review target audiences reached by past communication efforts and identify any new or changed priorities regarding audiences to reach
  3. Ensure alignment with regional SASMI metrics
  4. Support development of an online resource with updates on the ongoing status of implementation

Next Steps

Implementation of the NC SMAP through the Roadmap is a dynamic and evolving process. As conditions change and new information becomes available, ongoing collaboration, adaptation, and refinement of strategies will be essential to meet the challenges facing North Carolina salt marshes. The SMSC meets regularly to share updates, coordinate efforts, and track progress. To facilitate Roadmap implementation in 2026, strategies and goals will be further refined to include annual targets, leads, key partners (current and potential), and refined metrics of success and key alignments.

For more information on the NC SMAP and to read the full plan, visit
https://www.nccoast.org/salt-marsh/

References

North Carolina Salt Marsh Action Plan (NC SMAP). (2024). https://www.nccoast.org/wp-content/uploads/2024/05/NC-Salt-Marsh-Action-Plan-2024.pdf

South Atlantic Salt Marsh Initiative (SASMI). (2023). Marsh Forward: A Regional Plan for the Future of the South Atlantic Coast's Million-Acre Salt Marsh Ecosystem. https://marshforward.org/media/4bvhppi3/sasmi-plan.pdf

Warnell, K., Olander, L., and Currin, C. (2022). Sea level rise drives carbon and habitat loss in the U.S. mid-Atlantic coastal zone. PLOS Clim 1(6): e0000044. https://doi.org/10.1371/journal.pclm.0000044

Tables

Table 1. Priority marsh areas for protection, restoration, and marsh migration and the best pathways or methods to restore, protect, and/or conserve these areas.

#	CPU Watershed	Current Acreage	2050 Acreage	Difference	Gain or Loss	Percent Change	Priority Action
1	Lower Cape Fear River	7,371	6,761	-610	Loss	-8%	Protection & Restoration
2	Shallotte River	2,367	1,839	-528	Loss	-22%	Protection & Restoration
3	Little River	2,605	1,245	-1,360	Loss	-52%	Protection & Restoration
4	Alligator River	3,568	86,523	82,955	Gain	2325%	Facilitate Migration
5	North River Game Land	4,302	15,324	11,022	Gain	256%	Facilitate Migration
6	Hatteras Island	93	98	5	Gain	6%	Protection & Restoration
7	Northern Outer Banks	14	21	7	Gain	49%	Protection & Restoration
8	Currituck Sound	21,315	15,581	-5,734	Loss	-27%	Both
9	Upper Pamlico River	625	3,113	2,489	Gain	398%	Facilitate Migration
10	Middle Pamlico River	1,967	3,755	1,788	Gain	91%	Facilitate Migration
11	Pungo River	10,357	39,802	29,446	Gain	284%	Facilitate Migration
12	Lower Pamlico River	8,336	13,758	5,422	Gain	65%	Facilitate Migration
13	Lake Mattamuskeet	22,887	53,914	31,027	Gain	136%	Both
14	Core Sound	13,983	11,384	-2,599	Loss	-19%	Both
15	Lower Trent River	49	24	-25	Loss	-51%	Protection & Restoration
16	Upper Broad Creek	547	1,092	545	Gain	100%	Facilitate Migration
17	Neuse River-Cherry Point	1,221	1,390	169	Gain	14%	Facilitate Migration
18	Lower Neuse River-Cedar Island	26,655	25,346	-1,309	Loss	-5%	Both
19	Bay River-Jones Bay	11,065	14,724	3,659	Gain	33%	Both
20	White Oak River	919	664	-255	Loss	-28%	Protection & Restoration
21	Queen Creek-Bogue Sound	5,445	2,926	-2,520	Loss	-46%	Protection & Restoration
22	Newport River	4,847	5,831	985	Gain	20%	Both
23	North River	4,375	4,967	592	Gain	14%	Both
24	New River	2,042	1,287	-755	Loss	-37%	Protection & Restoration
25	North Topsail Beach	3,059	1,926	-1,133	Loss	-37%	Protection & Restoration
26	Topsail Beach	5,971	3,736	-2,235	Loss	-37%	Protection & Restoration
27	Wrightsville Beach	5,056	3,569	-1,487	Loss	-29%	Protection & Restoration
28	Pasquotank River	121	1,551	1,430	Gain	1187%	Facilitate Migration
29	Croatan-Roanoke Sound-Kitty Hawk Bay	9,552	14,448	4,896	Gain	51%	Both
30	Croatan Sound-Stumpy Point Bay	3,146	12,189	9,043	Gain	287%	Facilitate Migration
31	Roanoke Sound-Oregon Inlet	8,610	6,022	-2,588	Loss	-30%	Protection & Restoration
32	Long Shoal River-Hyde Co Airport	9,194	25,954	16,760	Gain	182%	Facilitate Migration
33	Pamlico Sound-Hatteras Island	1,974	1,670	-303	Loss	-15%	Protection & Restoration
34	Pamlico Sound-Ocracoke Inlet	4,342	3,915	-427	Loss	-10%	Protection & Restoration
35	Lockwoods Folly River	3,009	3,311	303	Gain	10%	Both
36	Upper Cape Fear River	741	581	-161	Loss	-22%	Protection & Restoration
37	Bogue Sound	2,861	2,408	-453	Loss	-16%	Protection & Restoration
38	Neuse River-Minnesott Beach	3,418	3,864	447	Gain	13%	Facilitate Migration

Table 2. Partners from state and federal agencies, academia, and non-profit and private organizations.

Organization	Acronym
Albemarle-Pamlico National Estuary Partnership	APNEP
Audubon North Carolina	ANC
Cape Lookout National Seashore	CLNS
Carolina Wetlands Association	CWA
Chowan University	CU
Duke Marine Lab	DML
Duke University	Duke
EA Engineering, Science, and Technology	EA
East Carolina University	ECU
East Carolina University - Coastal Studies Institute	ECU-CSI
Eastern North Carolina Sentinel Landscapes Partnership	ENCSLP
Environmental Defense Fund	EDF
Gullah-Geechee COAST	GG
Legacy Works	LW
Manomet Conservation Sciences	MCS
National Oceanic and Atmospheric Administration	NOAA
National Park Service	NPS
Native Shorelines	NS
Natrx	Natrx
North Carolina Aquariums	NCA
North Carolina Coastal Reserve and National Estuarine Research Reserve	NCCR-NERRS
North Carolina Department of Environmental Quality	NCDEQ
North Carolina Department of Natural and Cultural Resources	NCDNRC
North Carolina Department of Transportation	NC DOT
North Carolina Division of Coastal Management	NCDCM
North Carolina Division of Marine Fisheries	NCDMF
North Carolina Division of Mitigation Services	NCDMS
North Carolina Division of Natural and Cultural Resources	NCDNCR
North Carolina Division of Parks and Recreation	NCDPR
North Carolina Division of Soil and Water Conservation	NCDSWC
North Carolina Division of Water Infrastructure	NCDWI
North Carolina Division of Water Resources	NCDWR
North Carolina Land and Water Fund	NCLWF
North Carolina Natural Heritage Program	NCNHP

North Carolina Sea Grant	NCSG
North Carolina State Parks	NCSP
North Carolina State University	NCSU
North Carolina Wildlife Resources Commission	NCWRC
Quible and Associates	QA
Sandbar Oyster Company	SOC
Sea and Shoreline	SS
South Atlantic Salt Marsh Initiative	SASMI
Southeast Regional Partnership for Planning & Sustainability	SERPPAS
The Nature Conservancy	TNC
The Pew Charitable Trusts	Pew
United States Army Corps of Engineers	USACE
United States Department of Agriculture	USDA
United States Department of Defense	USDOD
United States Fish and Wildlife Service	USFWS
United States Geological Survey	USGS
University of Georgia Institute for Resilient Infrastructure Systems	UGAIRIS
University of North Carolina - Chapel Hill	UNC-CH
University of North Carolina - Institute for Marine Science	UNC-IMS
University of North Carolina - Wilmington	UNC-W

Table 3. Prioritization criteria developed to help guide prioritizing actions.

Prioritization Criteria	
Type	**Methods**
Spatial	● Geographically stratified ● Habitat trade-offs resulting from conversion of upland habitats to salt marsh ● What are we trying to protect (i.e., key infrastructure)?
Temporal	● Prioritize things that take the most time to get done/started first ● Have completed/well-established process: short- (2025), medium- (2027), and long-term (2029 and beyond) ● Implementation readiness: this kind of action has been conducted before in NC, and programs/partnerships needed to implement exist ● Short and long-term scale efforts. Short-term needs: lots of GIS/modeling to look at where needs are and also where there are sediment sources and where they could be used
Marsh Condition/ Status	● Room for migration, relative SLR, elevation, adjacent land ownership, erosion rate (low vs high), projection (low vs high loss) ● These can help inform both spatial and temporal prioritization
Social and Cultural	● Evaluating differences between urban and rural communities and their needs ● Should focus our efforts towards underserved communities
Policy and funding triggers	● Allocate efforts where there are opportunities to influence funding and policy ● Help communities incorporate marsh actions into Land Use Plans and through the RCCP ● Short vs long session years for the NCGA
Feasibility	● Feasible to complete in 5 years with constraints (i.e., politics, budgetary, statutory) ● What are potential challenges/constraints? ● Land ownership (i.e., private, public) ● Decision maker (i.e., political, regulatory, landowners, local municipalities)
Supporting Efforts	● Integration with other plans, policies, efforts, etc., and identifying gaps ● Shouldn't duplicate efforts and use/borrow the best parts ● Ensure we are leveraging existing prioritization tools ● Could borrow from other prioritization tools and where there is overlap
Method	● Living shorelines, beneficial reuse (i.e., thin layer, island creation), etc.
Ecosystem Services	● WQ, fisheries, carbon sequestration, resilience
Funding	● Where individual resources aren't enough but by leveraging resources we can ● Project focused

Figures

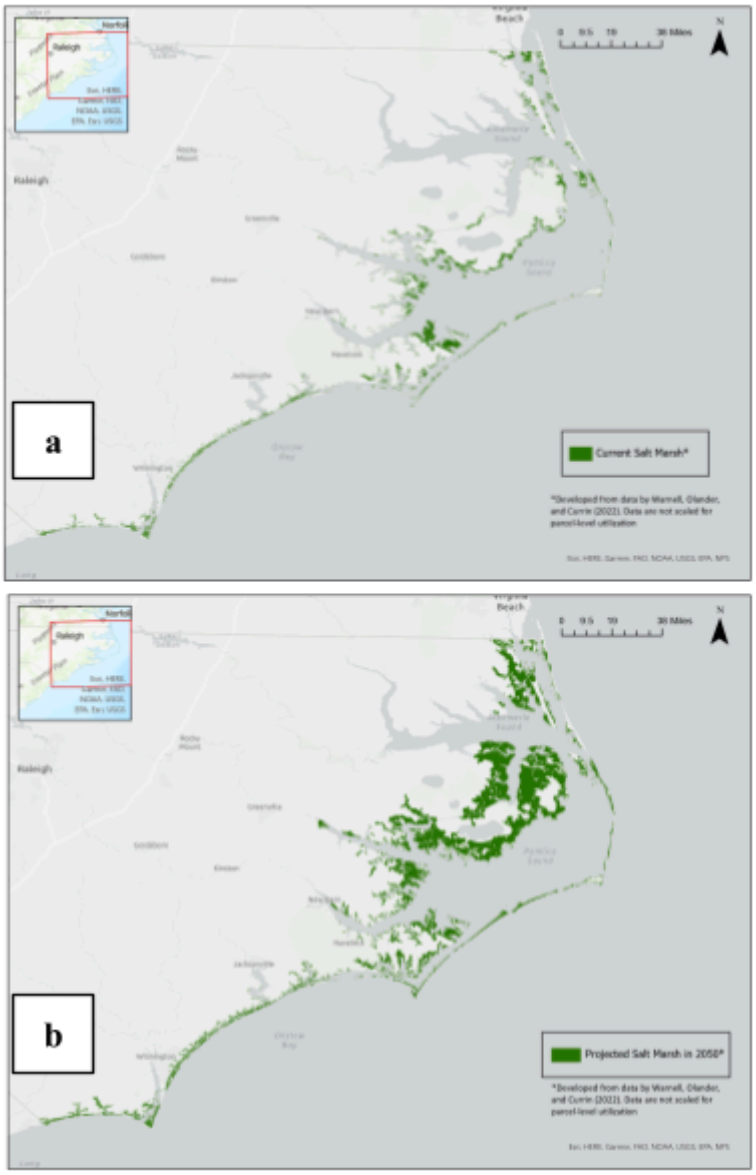

Figure 1. Current (a) and 2050 projections (b) of salt marsh throughout North Carolina under an intermediate (1.5ft) sea level rise scenario, assuming no major geological, ecological, or developmental changes.

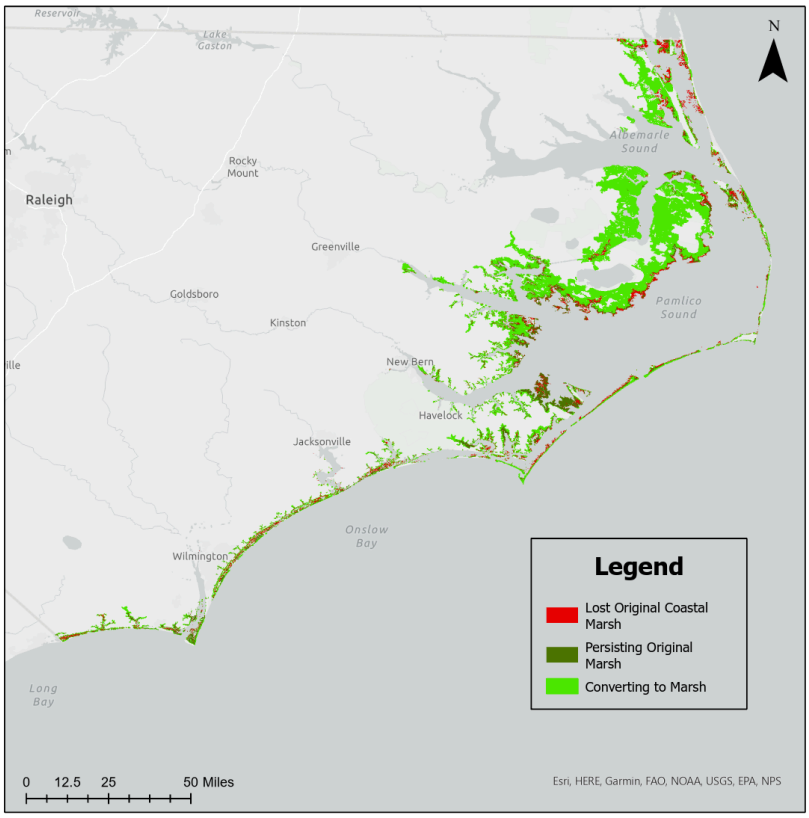

Figure 2. Salt marsh projections through 2050 including lost original marsh, persisting original marsh, and converting to marsh.

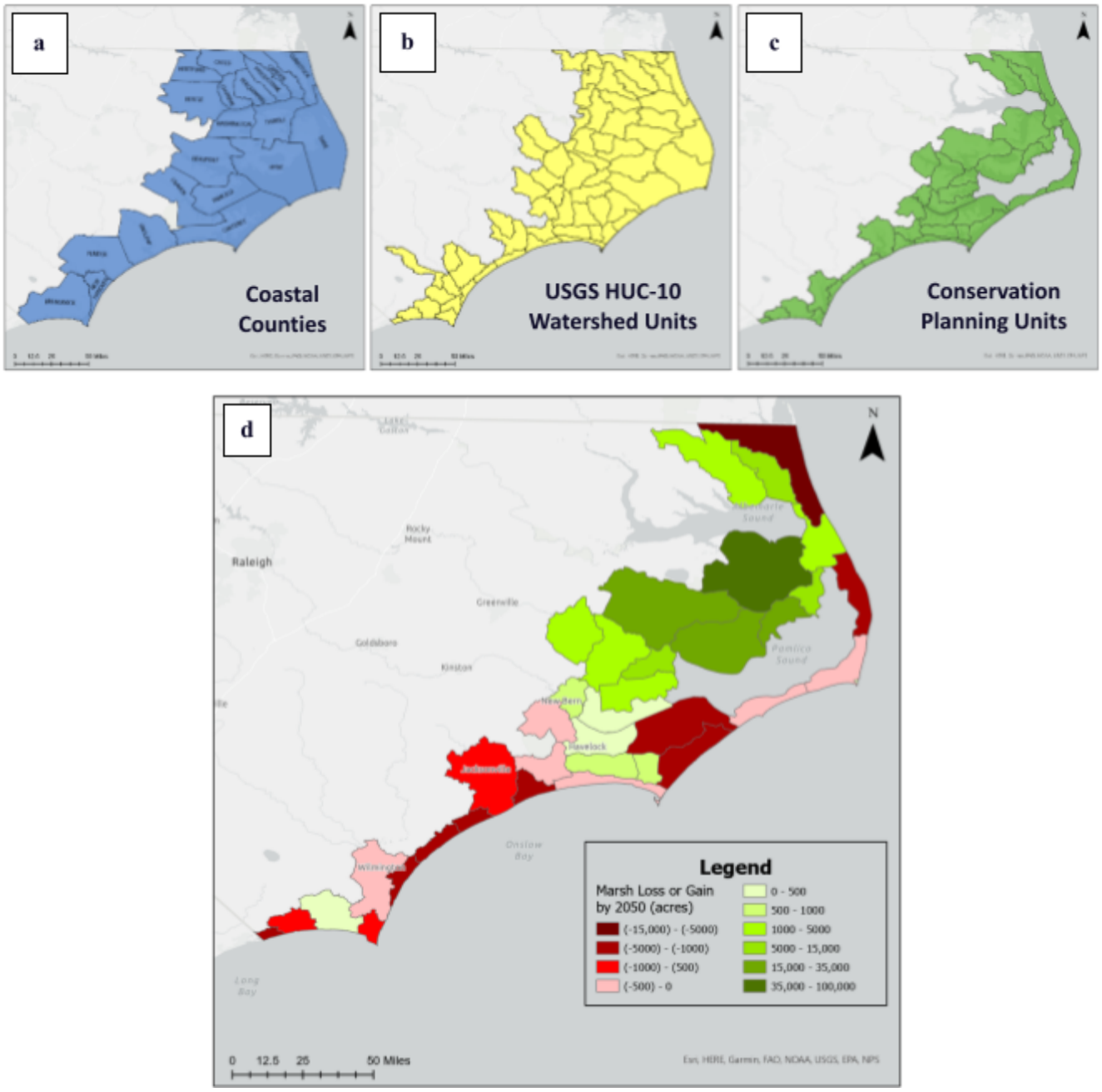

Figure 3. The coast of North Carolina (a) divided into smaller segments based on the US Geological Survey's 10-digit hydrologic unit code (HUC-10) watershed units connected to estuarine surface waters (b) in which salt marsh is currently present or is projected to exist by 2050 under intermediate sea level rise (SLR) predictions of approximately 1.5 feet and amended into conservation planning units (CPU) based on jurisdictional and ecological needs (c). Projected net salt marsh acreage change between present and 2050 under an intermediate SLR scenario of 0.46m relative to 2010 (d) with the color fill of each CPU corresponding with projected net change, barring no major developmental or geological changes.

Appendix A. South Atlantic Salt Marsh Initiative's Regional Metrics

Strategy 1: Protect and restore the health and functions of existing salt marshes

1. Number of salt marsh protection and/or restoration projects initiated.
2. Linear feet of living shorelines constructed and/or enhanced to protect and create salt marsh.
3. Acres of salt marsh protected and/or restored through the completion of projects.

Strategy 2: Conserve marsh migration corridors and remove or retrofit barriers to ensure salt marshes can shift as sea levels rise

4. Acres of habitat suitable for marsh migration restored or conserved through conservation easements and land acquisition.
5. Number of physical barriers to marsh removed or avoided within marsh migration corridors.

Cross-cutting Approach: Funding

6. Total $ of public and $ of private funding committed or invested in SASMI projects.
7. Total $ of in-kind contributions to SASMI projects.

Cross-cutting Approach: Culture and Community

8. Number of SASMI engagement events offered to cultural groups, coastal businesses, communities, school groups, and local partners.

Cross-cutting Approach: Policy

9. Number of new local, state, and federal policies and policy changes adopted that support the implementation of the SASMI Plan.
10. Number of local, state, and federal planning documents referencing SASMI.

Cross-cutting Approach: Communication, Education, and Engagement

11. Number of SASMI Coalition members.
12. Number of media pieces and SASMI partner communications materials published that reference SASMI.