DRAFT North Carolina Coastal Management Program Assessment and Strategy

2026 to 2030

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Introduction

Coastal North Carolina and the *Division of Coastal Management*
Coastal North Carolina is known for its extensive natural resources, including 320 miles of ocean beaches, over 12,000 miles of estuarine shoreline, the second largest estuary in the nation, numerous coastal and estuarine protected areas, and over 100 miles of national seashore. From broad, shallow sounds such as the Albemarle and Pamlico, to narrow bodies of water such as Bogue and Masonboro sounds, North Carolina has 2.2 million acres of estuarine waters and 726,000 acres of coastal ocean waters.

The coastal region is a major tourism draw and some of the coastal counties are experiencing rapid growth. Approximately half of the oceanfront is developed, with more development projected in the near future. At the same time, some of the rural counties are experiencing population decline.

Managing a varied natural and socioeconomic coastal landscape presents a complex set of challenges, especially as rising sea levels, population growth, and increasing coastal hazards like erosion and flooding intensify the pressures on fragile environments. To that end, the Division of Coastal Management (DCM) works to protect, conserve and manage North Carolina's coastal resources through an integrated program of planning, permitting, education and research.

Section 309
This Section 309 Strategy and Assessment, performed every 5 years under guidance from the National Oceanic and Atmospheric Administration (NOAA), provides an opportunity to assess the current state of coastal resources, identify challenges and opportunities, and designate strategies that will assist DCM in successful management of the coastal region. Section 309 focuses on nine “enhancement areas” which include: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean and Great Lakes resources, energy and government facility siting, and aquaculture. The enhancement program was established under Section 309 of the Coastal Zone Management Act, as amended.

The assessment process follows guidance and specific templates provided by NOAA. The assessment consists of Phase I assessment, performed for every enhancement area. DCM also gathers stakeholder feedback during the Phase I process through surveys and partner meetings. At the end of Phase I process, each enhancement area is ranked as “high, medium, or low” priority based on identified issues and stakeholder feedback. Enhancement areas ranked as “high" priority are evaluated further under Phase II. At the end of Phase II assessment, DCM determines whether a strategy will be developed for that enhancement area. Strategies are developed in consultation with DCM staff and incorporate stakeholder feedback.

NOAA ‘s Office of Coastal Management (OCM) works closely with DCM during the process to provide feedback on priorities and strategies. DCM also solicits comments on the draft document during a public comment period and incorporates comments and recommendations before submitting the final document for NOAA OCM’s approval. OCM reviews and approves the Section 309 assessment and strategy document for each state and territory and, after approval, provides funding under Section 309 to help them carry out those strategies.

Summary of Recent Section 309 Achievements

North Carolina's 2021-2025 Section 309 Strategy identified three strategies (and accompanying program changes) as part of the coastal hazards and aquaculture enhancement areas. There were two coastal hazards program changes, which included: 1) Combined delineation of barrier island erosion hazards and 2) Technical assistance program to support local resiliency efforts. Aquaculture program change was focused on 3) Streamlining aquaculture leasing and permitting. In 2023/2024, after consultations with NOAA and amendments to the strategy document, a wetlands program change was added focusing on 4) Thin layer placement of sediment in wetlands. The following provides a summary of strategies and accomplishments.

Coastal Hazards Strategy

1. Combined delineation of barrier island erosion hazards

For this strategy, DCM proposed to review the best available methodologies for calculating ocean and inlet shoreline change rates. DCM has used the "end-point method" to calculate long-term average annual shoreline change rates since its first study in 1979. While the method has remained consistent, techniques used to map shorelines and calculate shoreline change rates have continually evolved with data accessibility and advances in mapping technology. DCM planned toreview other methodologies and the most appropriate methodology will be then used to update both the state's long-term annual oceanfront shoreline change rates and the inlet hazard area boundaries and erosion rates, as a single effort. The updated rates will be incorporated into the CRC's rules by reference to the final report.

Long term erosion rates are used to establish regulatory construction setbacks and to provide information to shoreline property owners about potential risk associated with shoreline change. New data, alternative statistical methodologies, and advanced mapping technology provide a better understanding of hazards along the oceanfront, more effective science-based policy, and more resilient development. Update also ensure that NC is compliant with FEMA requirements for Community Rating System and coastal property owners who participate in the National Flood Insurance Program are given points to maintain insurance rates at their current level.

As part of this strategy, DCM staff have successfully updated database pertaining to oceanfront and inlet shorelines. Staff have also conducted a comprehensive analysis of erosion rates along the oceanfront and inlets using both end-point and linear regression methodologies. Upon the recommendation of the Coastal Resources Commission's Science Panel and considering the significant enhancements in North Carolina's shoreline database, DCM evaluated erosion rates calculated using linear regression in order to compare setbacks calculated using both the end-point and Linear Regression methods. DCM is in the process of finalizing the associated report. The results of this comparison will undergo thorough examination and consideration by DCM staff, the NC Coastal Resources Commission, and its Science Panel. The final decision regarding the potential transition from the end-point to the linear regression method will be informed by these findings.

This update marks the first application of linear regression, which incorporates multiple shoreline data points. If approved, the rule-making process, including public hearings, is expected to begin in late spring or early summer 2025, and rule amendment to become effective late summer/early fall of 2025.

2. Technical assistance program to support local resiliency efforts

The goal of this strategy is to ensure that all coastal communities attain a minimum level of planning, preparedness, risk assessment, and recovery capability, and are able to use that capability to implement beneficial actions within their human and natural systems through the support of the Resilient Coastal Communities Program (RCCP). Local and regional authorities generally lack the expertise and resources to identify, prioritize, and advance green or hybrid projects to shovel-ready status. Without a strategic framework and appropriate planning, project selection is haphazard, and runs the risk of serving short-term, isolated recovery needs but failing to increase institutional capacity or build system-wide resilience. Building coastal community resilience requires improvements in both the built and natural environments, but little work has been done at the local level to date on green infrastructure status and vulnerability assessment, linkages between green and gray infrastructure, protection and restoration needs, and making projects shovel ready.

The RCCP guides communities through a formal vulnerability assessment and planning process that supports communities in completing vulnerability assessments and creating actionable plans and prioritized project lists featuring natural and hybrid infrastructure enhancement and restoration. Since communities are at different stages of preparedness, the program allows them to enter at the appropriate level and advance to the next phase. RCCP matches communities with contractors to aid in the preparation of necessary plans and to ensure capacity needs are met.

Through RCCP, DCM has worked with over 40 communities and has awarded local government grants for vulnerability assessments, community-based planning, project prioritization, engineering & design, and implementation. To date, through funding and technical assistance, DCM has supported:

- 15 communities and 8 service providers with work focused on risk and vulnerability assessment, community engagement, and the development of a portfolio including prioritized resilience projects as Phase I and II of RCCP
- 20 engineering and design projects through Phase III
- 5 implementation and construction projects through Phase IV of RCCP

DCM evaluated the effectiveness of the program by gathering feedback from stakeholders who participated in RCCP. DCM is implementing recommendations for edits to the Planning Handbook as well as additional trainings for contractors and creation of training resources for the public.

DCM is planning to continue this successful program. The state legislature, recognizing the need for building community resilience, has appropriated additional funds to the program in FY2023/2024. DCM is in the process of soliciting proposals for another round of RCCP funding to reach new communities. DCM is also integrating RCCP more closely with the Land Use Planning program by providing funding to incorporate resiliency into CAMA land use plan updates.

Aquaculture Strategy

3. Streamlining Aquaculture permitting process

As part of this strategy, DCM pursued program changes for shellfish aquaculture in order to remove unnecessary regulatory hurdles and barriers. Long standing permitting requirements were not aligned with the changes in aquaculture methods and the type of gear used for growing and harvesting shellfish, resulting in constraints imposed by “floating structures” rules and legislation. In particular, floating

upweller (FLUPSY) systems had to go through a lengthy major permit process as they were considered floating structures, even though they were not used for habitation purposes.

DCM pursued rule changes to how FLUPSYs are treated under the floating structures rule. The Coastal Resources Commission approved rule amendments that clarified that FLUPSYs may be permitted as a platform at a private docking facility or at a permitted marina, thus streamlining the process.

Recently, the North Carolina General Assembly excluded aquaculture as development therefore removing CAMA permits for aquaculture infrastructure.

Wetlands Strategy

4. Thin Layer Placement

DCM added the wetlands strategy focused on thin layer placement (TLP) in 2024, after consultation with NOAA. As part of this strategy, DCM plans to evaluate the feasibility of TLP for the purpose of coastal wetland restoration. Coastal wetlands are lost by short term processes such as erosion by storms, boat wakes, and tidal currents. Coastal wetlands can also be drowned by the longer-term process due to inadequate rates of sediment accretion.

Thin-layer placement (TLP) is an emerging technique in North Carolina for the purpose of coastal wetland restoration or as an enhancement strategy. During TLP, material (dredged sediment) is intentionally placed on a wetland to increase its elevation while maintaining the hydrology and inundation duration necessary for native wetland vegetation to persist. Traditionally, dredged material from routine navigational channel maintenance is placed in an approved upland or submarine disposal area. TLP would allow for this material to be beneficially used by increasing wetland elevation in areas that are not naturally accreting quickly enough.

As this amendment was approved in 2024, work on the TLP strategy is in the initial phases. DCM initiated the process of hiring a wetland specialist to support this work – however, the hiring process is on hold currently. Once hired, the wetland specialist will work with partners to devise a strategy and protocol to map areas within North Carolina where coastal wetlands are at risk of drowning and may be suitable candidate sites for TLP. Mapping suitable areas where TLP is appropriate will aid the DCM in working with permit applicants to increase the number of permitted TLP projects and will contribute to the success of coastal wetland restoration. DCM plans to continue work under this strategy as part of the 2026-2030 Section 309 strategy.

Phase I Assessment

Wetlands

Section 309 Enhancement Objective: Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. §309(a)(1)

Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328.3(b)]. See also pg. 14 of the CZMA Performance Measurement Guidance[1] for a more in-depth discussion of what should be considered a wetland.

Phase I (High-Level) Assessment: (Must be completed by all states.)
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. Using the tables below as a guide, provide information on the status and trends of coastal wetlands. Be as quantitative as possible using state or national wetland trend data.[2] The tables are information presentation suggestions. Feel free to adjust column and row headings to align with data and time frames available in your state or territory. If quantitative data is not available for your state or territory, provide a brief qualitative narrative describing wetlands status and trends and any significant changes since the last assessment.

   Current state of wetlands in 2021 (acres): 2,603,552 acres (4,068 sq miles)

Coastal Wetlands Status and Trends

Change in Wetlands	from 2001-2021
Percent net change in total wetlands (% gained or lost)*	.05%
Percent net change in freshwater (palustrine wetlands) (% gained or lost)*	Not available
Percent net change in saltwater (estuarine) wetlands (% gained or lost)*	Not available

[1] coast.noaa.gov/data/czm/media/czmapmsguide.pdf

[2] National data on wetlands status and trends include NOAA's Land Cover Atlas (coast.noaa.gov/digitalcoast/tools/lca.html), the U.S. Geological Survey's National Land Cover Database (usgs.gov/centers/eros/science/national-land-cover-database), and the U.S. Fish and Wildlife Service's National Wetland Inventory data (fws.gov/program/national-wetlands-inventory).

How Wetlands Are Changing

Land Cover Type	Area of Wetlands Transformed to Another Type of Land Cover between 2001-2021 (Sq. Miles)
Development	13.11
Agriculture	1.6
Barren Land	1.76
Water	8.69

Land cover data provided by USGS's Multi-Resolution Land Characteristics Consortium was used for wetland analysis as it provided most up-to-date data (up to 2021) among the sources recommended for the analysis by NOAA.

There are 20 coastal counties in NC encompassing over 13,000 square miles of total land area. Over 4,000 sq mi of that are wetlands. Coastal counties exhibited various amounts of wetland loss and gain during the 2001-2021 time period analyzed for this assessment. New Hanover and Dare counties had the greatest total amount of wetlands lost, at 2.25 sq mi (3.6% of county area) and 2.35 sq mi (0.74% of county area), respectively. Hyde and Craven counties had the greatest gain, at 1.33 sq mi (0.33% of county area) and 1.44 sq mi (0.49% of county area), respectively.

The source of wetland impacts has changed over time. According to the NC Coastal Habitat Protection Plan, 2021 Amendment, "the DWR permit data for the 20 coastal counties indicate that in the 1990s, most impacts were attributable to "boat-related and bulkheads", followed by dredging. Boat-related and bulkheads includes water dependent structures such as boat basins, marinas, docks, and bulkheads. From 2000 to 2010, there was a large increase in mining impacts. Since 2010, most impacts were associated with transportation."

Management Characterization

1. Indicate any significant changes at the state or territory level (positive or negative) since the last assessment that could impact the future protection, restoration, enhancement, or creation of coastal wetlands.

Significant Changes in Wetland Management

Management Category	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

In June 2023, NC General Assembly revised the definition of wetlands to align with the federal definition, thus reducing protection for isolated and non-404 jurisdictional wetlands (wetlands not

considered part of Waters of the United States). According to the EPA, North Carolina has around 30,000 isolated wetlands that no longer have protection.

In February 2024, North Carolina Governor Roy Cooper issued Executive Order No. 305, which, among other things, set statewide goals for North Carolina public and private partners to collectively achieve, by 2040, permanent conservation of 1 million new acres of forests and wetlands and restoration of 1 million new acres of forests and wetlands. Executive Order 305 also set four specific tasks to the North Carolina Department of Environmental Quality: (1) feasibility of obtaining land cover data, (2) develop methodology to update wetland maps and determine Sackett Effect, (3) publish boundary maps of special wetlands, and (4) create a research project that outlines the values, costs, impacts of Natural and Working Lands, and benefits of conservation. EO 305 workgroup recently developed recommendations focused on the second task and published maps of special wetlands of interest on the Executive Order 305 Hub. These changes were not 309 driven, however DCM staff actively participated in the workgroup and contributed to the outcomes. The work done by the 305 workgroup lays the groundwork for further work by DCM.

In 2022, DCM and an interagency working group produced a "Guidance for Site Assessment and Monitoring of Thin-Layer Placement Projects in North Carolina Tidal Marshes". Thin-layer placement is a coastal wetland restoration or enhancement strategy whereby material (often dredged sediment) is intentionally placed on a wetland to increase its elevation while maintaining hydrology and inundation durations necessary for native wetland vegetation to persist. The primary goal of thin-layer placement should be the restoration of impaired or at-risk wetlands with measurable benefits expected from the addition of sediment. The guidance includes a range of site assessment and monitoring protocols that these agencies have identified as important for thin layer sediment placement projects on tidal marshes. Although the development of the guidance was not a 309 product, it has since led to the development of the 2021-2015 thin-layer placement strategy and will continue to guide future efforts around thin-layer placement.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

High	__x___
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Wetlands were ranked as the highest priority enhancement area in the stakeholder survey. Stakeholders highlighted several key themes including: threats from sea level rise and associated habitat loss; impacts from development; pollution; permitting and regulatory challenges; fragmentation and loss of wetland function; and need for public awareness and education. Issues related to wetlands were also brought up in open-ended responses for other priority areas, primarily coastal hazards and cumulative and secondary impacts. Protection of wetlands was also identified as a priority by partners who participated in in-depth discussion sessions.

Coastal wetlands face a number of challenges and threats. Understanding the current status of wetland, changes happening to the wetland habitat, and options to mitigate risks to wetlands is an ongoing effort

of DEQ, as well as many other groups. DCM plans to continue collaborating and contributing to these important efforts to further the protection and management of coastal wetlands.

Coastal Hazards

Section 309 Enhancement Objective: Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change. §309(a)(2)

Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e.g., tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; Great Lake level change; land subsidence; and saltwater intrusion.

Phase 1 (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The following resources may help assess the level of risk for each hazard. Your state may also have other state-specific resources and tools to consult. Additional information and links to these resources can be found in the "Resources" section at the end of the Coastal Hazards Phase I Assessment Template:

    - The state's multi-hazard mitigation plan
    - Coastal County Snapshots: Flood Exposure
    - Coastal Flood Exposure Mapper
    - Sea Level Rise Viewer/Great Lakes Lake Level Change Viewer

General Level of Hazard Risk in the Coastal Zone

Type of Hazard	General Level of Risk[3] (H, M, L)
Flooding (riverine, stormwater)	H
Coastal storms (including storm surge)	H
Geological hazards (e.g., tsunamis, earthquakes)	L
Shoreline erosion	H
Sea level rise	H
Great Lakes level change	NA
Land subsidence	M
Saltwater intrusion	M/H
Other (please specify) Extreme heat	M

2. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or risk assessment or plan may be a good resource to help respond to this question.

[3] Risk is defined as "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." *Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001*

Resilience Plans

NC has developed a number of resources and plans focused on resilience. In general, the plans show increase in sea level, intensity of hurricanes, precipitation, and temperature. Some of the coastal impacts linked to these stressors include increase in high tide flooding; increase in inland flooding; impacts to infrastructure and habitats due to flooding, hurricanes, and storm surge; reduction in habitat due to erosion; damage to wetlands and natural barriers that offer storm and surge protection; saltwater intrusion impacts to wetlands and other habitats.

Not all impacts are projected to occur equally along the coastal zone. Areas with extreme heat are concentrated in the southeastern part of the state. Sea level along the northeastern coast of North Carolina is rising about twice as fast as along the southeastern coast, averaging 1.8 inches per decade since 1978 at Duck, NC, and 0.9 inches per decade at Wilmington, NC, mainly due to different rates of land subsidence.

NC State Hazard Mitigation Plan

The Hazard Mitigation Plan was published in 2023. The plan describes that coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion, and flooding may occur more frequently and last for longer periods of time. “Clear sky” or “nuisance” flooding is brought on by high tidewaters infiltrating stormwater management systems, rather than storm or rain events.

North Carolina is highly susceptible to severe coastal flooding, and the Environmental Protection Agency reports that it has the third highest land area vulnerable to changing sea levels. Changing conditions such as intensifying coastal storm events are likely to exacerbate storm surge issues in Eastern NC, and impacts will be felt farther inland as the surface levels of estuarine system rise with increasing sea levels.

Weather extremes may negatively affect coastal erosion rates. If continuing extreme storms occur as predicted, shoreline imbalances may happen more frequently. These events impact erosion rates through increased tide and storm surge heights and loss of protective coastal marshes and reefs. Increased storm surges will erode shorelines, which in turn, will leave properties further at risk of flooding and storm damage. Furthermore, as population increases and more people move to coasts, erosion rates are likely to quicken. Erosion rates vary along the NC coast, but on average, the state is experiencing 1.6 feet per year of erosion based on studies at multiple locations conducted by the NC Department of Environmental Quality.

The built environment on the North Carolina Atlantic Coast and its estuarine sounds face the some of the greatest risks of erosion on the east coast of North America. Many coastal communities are affected by erosion every year, especially after severe winter storms and during hurricane season. Owners of beach front and sound front properties may be impacted more than others; in extreme circumstances, some homes have been relocated to prevent toppling into the ocean; others have fallen in before mitigation measures could be implemented. As development pressure continues to increase in coastal areas, the impacts of erosion may become even greater. Although coastal communities try to solve erosion issues by dredging sandbagging, or creation of hardened structures, these are often only temporary solutions that may exacerbate erosion issues father down shore.

North Carolina has an extensive hurricane history due to its coastal location. Because hurricanes can impact large areas at one time, all parts of the state are vulnerable to impact. Historical occurrences of hurricanes and coastal hazards show that North Carolina is likely to experience these types of events in the future. Additionally, intensity of the strongest hurricanes is likely to increase, causing greater losses to people, communities, the economy, and natural resources. Increase in sea level and intensity of coastal storms will result in an increase in storm surge flooding in coastal North Carolina. Increased storm surge will, in time, lead to eroded shorelines. This loss of land and natural buffer will ultimately leave properties further at risk of flooding and storm damage.

Disaster declarations

Since 2020, seven disaster declarations linked to hurricanes and tropical storms have been issued for areas encompassing parts of eastern North Carolina. These include:

- NC Severe Storms, Tornadoes, and Flooding (DR-4543-NC) – declared on May 8, 2020
- Hurricane Isaias (DR-4568-NC) - declared on Oct 14, 2020
- Tropical Storm Eta (4588-DR-NC) – declared on March 3, 2021
- Hurricane Ian (EM-3586-NC) – declared on Oct 1, 2022
- Tropical Storm Debby (EM-3608-NC) – declared on Aug 6, 2024
- Hurricane Helene (EM-3617-NC) – declared on Sep 26, 2024
- Potential Tropical Cyclone 8 (DR-4837-NC) – declared on Oct 19, 20224

Management Characterization

1. In the tables below, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment.

Significant Changes in Hazards Statutes, Regulations, Policies, or Case Law

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Elimination of development/redevelopment in high-hazard areas[4]	N	N	N
Management of development/redevelopment in other hazard areas	Y	Y	N
Sea level rise or Great Lakes level change	N	N	Y

[4] Use the state's definition of high-hazard areas.

Significant Changes in Hazards Planning Programs or Initiatives

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Hazard mitigation	Y	Y	Y
Sea level rise or Great Lakes level change	Y	Y	Y

Significant Changes in Hazards Mapping or Modeling Programs or Initiatives

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Sea level rise or Great Lakes level change	Y	Y	N
Other hazards – erosion rates	Y	Y	Y

2. Briefly state how "high-hazard areas" are defined in your coastal zone.

15A NCAC 7H .0301 defines "Ocean Hazard Categories" as natural areas along the Atlantic Ocean shoreline where, "because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage."

3. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Hazards Planning Programs or Initiatives

Resilient Coastal Communities Program
DCM partnered with the NC Office of Resilience and Recovery to develop a Resilient Coastal Communities Program (RCCP). Development of RCCP is tied to the 2016-2020 and 2021-2025 Section 309 strategies. Through RCCP, participating communities receive funding and technical assistance to facilitate a community-driven process for setting coastal resilience goals, assessing existing and needed local capacity, performing risk and vulnerability assessment, and identifying and prioritizing projects to enhance community resilience to coastal hazards. To date, 41 communities have participated as DCM has grown the program with additional state and grant funding. DCM is in the process of issuing requests for proposals for next round (2025/26) of RCCP funding.

RCCP creates a pipeline of resiliency projects for participating communities. Five projects have received RCCP implementation funding in the 2024/25 cycle, and a number of other projects have successfully applied for implementation funding from other sources. In 2024, DCM received funding from NFWF to

incorporate resiliency into the land use planning program, setting the stage for linking RCCP to holistic land use decision making. The RCCP was first started as a pilot program under Section 309 and staff continue to grow and expand the program as a critical component of DCM's work.

Draft North Carolina Flood Resiliency Blueprint
In 2024, DEQ published the Draft North Carolina Flood Resiliency Blueprint. The Blueprint is designed to bring together and build upon all the relevant existing resources and knowledge in the state to create one unified initiative to realize a more resilient North Carolina. The Blueprint will provide a statewide flood planning framework and a decision-support tool that enables state, tribal, regional, and local entities and their stakeholders to identify, prioritize, and direct resources to implement effective flood resilience strategies based on the best available science and understanding of likely future conditions. The Blueprint tool is undergoing stakeholder review and anticipated to become available in 2025. Engagement with the tool will help to build local flood resilience capacity in the long term.

Simultaneously, DEQ also developed a preliminary Draft Neuse River Basin Flood Resiliency Action Strategy (Neuse River Basin is partially situated within the coastal area and is fully contained within the state's borders). The state will next develop action strategies for five additional prioritized river basins, four of which are found in the coastal area. Through the development of the River Basin Action Strategies, DEQ and its partners will conduct detailed flood risk assessments for current and future conditions, prioritize resilience actions (projects), and identify funding strategies to support project implementation. This effort is not driven by Section 309 work but provides multiple opportunities for future collaboration to help address flooding in coastal communities.

Estuarine Shoreline Strategy
To update the original strategy developed in 2014, NC DCM developed the 2022-2026 Estuarine Shoreline Strategy document. The document identifies goals and objectives focused on trainings and outreach related to living shorelines; research and monitoring; regulatory updates; and coordination and implementation of projects. This was not a 309-driven effort. The document provides a roadmap for work along the 2.2 million acres of estuarine waters.

Managing Threatened Oceanfront Structures
In August 2024, DCM and the National Park Service's Cape Hatteras National Seashore (NPS CHNS) released a report titled Managing Threatened Oceanfront Structures: Ideas from an Interagency Work Group. The report is a result of work by local, state, and federal partners focused on identifying short-term and long-term ideas for management of structures imminently threated by oceanfront erosion. This collaborative effort between DCM and NPS was not driven by 309 but occurred in response to urgent need. The report will guide next steps as the state works to address threatened structures.

Hazards Mapping or Modeling Programs or Initiatives
DCM is in the process of updating ocean and inlet shoreline change rates. This work is being performed as part of the 2021-2025 Section 309 Strategy.

Enhancement Area Prioritization
1. What level of priority is the enhancement area for the coastal management program?

High	___x__
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Coastal hazards was the third highest ranking priority area identified in the stakeholder survey. Survey responders identified sea level rise, shoreline erosion and loss of coastal habitat, overdevelopment, and storm impacts as some of the key threats to the coastal region. Issues related to these and other hazards were also brought up during in-depth discussion sessions with partner organizations.

DCM actively engages in work related to coastal hazards, assisting communities in preparation, mitigation, and adaptation work. Coastal hazards is one of the priority focus areas for the division and DCM plans to continue to work on addressing coastal hazards through its core work and programs as well as through development of a 309 strategy.

Public Access

Section 309 Enhancement Objective: Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. §309(a)(3)

Phase 1 (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. Use the table below to provide data on public access availability within the coastal zone.

Public Access Status and Trends

Type of Access	Current number[5]	Changes or Trends Since Last Assessment[6] (↑, ↓, –, unknown)	Cite data source
Beach access sites	632	↑	DCM's Access Web Map
Shoreline (other than beach) access sites	260	↑	DCM's Access Web Map
Recreational boat (power or non-motorized) access sites	145	-	DCM's Access Web Map, NC WRC Boating Access Web Map
Designated scenic vistas or overlook points	201	↑	DCM's Access Web Map
Fishing access points (i.e. piers, jetties)	23 ocean piers	-	Google Earth
Coastal trails/ boardwalks *(Please indicate number of trails/boardwalks and mileage)*	Unknown	Unknown	N/A

[5] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

[6] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable or unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unknown."

Type of Access	Current number[5]	Changes or Trends Since Last Assessment[6] (↑, ↓, –, unknown)	Cite data source
Acres of parkland/open space	Unknown	Unknown	N/A
Access sites that are Americans with Disabilities Act (ADA) compliant[7]	245	↑	DCM's Access Web Map
Other (please specify)			

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties. There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[8] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[9] and your state's tourism office.

   The demand for public access is projected to increase in the coastal counties. Population in North Carolina's southeast counties is projected to increase by up to 35% by 2030, according to the Office of State Budget and Management (OSBM). OSBM also projects an increase in aging population, with one in five North Carolinians at least 65 years old by 2030, and by 2035 more older adults (ages 65+) than children (ages less than 18) by 2035.

   DCM administers the annual Beach and Waterfront Access Grants Program. Local governments from the 20 coastal counties apply for funds towards public access projects. Up to 2023, applications for funding have well exceeded the available funds. In 2023, additional funds have been allocated to the Program by the state, allowing for increased level of funding. Additional state funding is depended on annual allocations by the General Assembly. Funds are primarily directed towards improvements, with some acquisitions, and planned future emphasis of the Program includes greater focus on developing ADA accessible components.

[7] For more information on ADA see *ada.gov.*

[8] Most states routinely develop "Statewide Comprehensive Outdoor Recreation Plans", or SCROPs, that include an assessment of demand for public recreational opportunities. Although not focused on coastal public access, SCORPs could be useful to get some sense of public outdoor recreation preferences and demand. Download state SCROPs at.*recpro.org/resources--reports/scorp-resources.*

[9] The National Survey on Fishing, Hunting, and Wildlife Associated Recreation produces state-specific reports on fishing, hunting, and wildlife associated recreational use for each state. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing, and some coastal wildlife viewing that may be informative and compares 2016 data to 2011, 2006, and 2001 information to understand how usage has changed. The most recent survey was conducted for 2022 but due to a change in methodology, results cannot be compared to previous reports. See *fws.gov/program/national-survey-fishing-hunting-and-wildlife-associated-recreation-fhwar.*

3. If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.

   Every five years, NC publishes an Outdoor Recreation Plan, with the most current one covering 2020-2025. The plan identifies improving and replacing dated recreation facilities across the state, as well as more park land, as some of the most pressing demands. These needs are driven largely by the fast-growing population in North Carolina. Some of the other issues identified include diminished opportunities for protecting natural space, limited recreation opportunities in economically depressed areas, and public health issues.

   As part of gathering information for the plan, the North Carolina Division of Parks and Recreation conducted a public input survey to evaluate demand for, participation in, and perceptions of outdoor recreation. In total, the study yielded over 17,000 responses. Respondents were asked to identify the activities they or household members participate in or have participated in over the past five years. The most popular activity was visiting a beach or lake, with 69 percent participating. Although the survey was state-wide, it points to a high demand for coastal and water-based recreational activities.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Significant Changes in Public Access Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	N
Operation/maintenance of existing facilities	N	N	N
Acquisition/enhancement programs	Y	Y	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
   a. Describe the significance of the changes;
   b. Specify if they were 309 or other CZM-driven changes; and
   c. Characterize the outcomes or likely future outcomes of the changes.

3. Indicate if your state or territory has a publicly available public access guide. How current is the publication and how frequently it is updated?[10]

Publicly Available Access Guide

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	N	Y	N
Web address (if applicable)	N/A	Coastalaccess.nc.gov	N/A
Date of last update	N/A	Sep 2024	N/A
Frequency of update	N/A	Monthly/as needed	N/A

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium __x___
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Public access is ranked as a medium priority for the purposes of the Section 309 assessment. Public access ranked 4th in DCM's stakeholder survey. Respondents indicated the need for more access as population in coastal counties is increasing, as well as concerns due to impacts to access points from erosion and flooding. Public access is overall a high priority for DCM and is supported through other programs outside of the 309, particularly the Beach and Waterfront Access Program with annual grants provided to local communities through state appropriations.

[10] Note some states may have regional or local guides in addition to state public access guides. Unless you want to list all local guides as well, there is no need to list additional guides beyond the state access guide. You may choose to note that the local guides do exist and may provide additional information that expands upon the state guides.

Marine Debris

Section 309 Enhancement Objective: Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. §309(a)(4)

Phase 1 (High-level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best-available data.

Existing Status and Trends of Marine Debris in Coastal Zone

Source of Marine Debris	Significance of Source (H, M, L, unknown)	Type of Impact[11] (aesthetic, resource damage, user conflicts, other)	Change Since Last Assessment (↑, ↓, –, unknown)
Beach/shore litter	H	Aesthetic, resource damage, economic, accessibility	-
Land-based dumping	H	Aesthetic, resource damage, economic, accessibility	-
Storm drains and runoff	M	Aesthetic, resource damage, economic, accessibility	-
Land-based fishing (e.g., fishing line, gear)	M	Aesthetic, resource damage, economic, accessibility	-
Ocean/Great Lakes-based fishing (e.g., derelict fishing gear)	M	Aesthetic, resource damage	-
Derelict vessels	H	Resource damage, accessibility	↑
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	L	Aesthetic	-
Hurricane/Storm	H	Aesthetic, resource damage, economic, accessibility	↑
Tsunami			
Other (please specify)			

[11] You can select more than one, if applicable.

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.

Data from Ocean Conservancy's International Coastal Cleanup reports shows fluctuating numbers for total items collected during beach cleanups in NC. Trash collected decreased from 2020 to 2021, then increased in 2022 and 2023, and is decreasing in 2024. Due to COVID-19, there was a general increase in 2020 in single use plastics from food containers as well as personal protective equipment.

The NC Marine Debris Action Plan was published in 2020. The Plan is a coordinated effort of multiple partners to strategically address marine debris in North Carolina. The assessment performed during the development of the plan identified consumer debris, derelict fishing gear, abandoned and derelict vessels, and storm-generated debris as the main types of debris along the NC coast.

The Coastal Federation, one of the organizations leading the efforts on marine debris cleanup, reports that over 85% of the debris removed from North Carolina's estuaries between 2019-2022 was the result of damaged and/or lost docks, piers, boat houses, and similar structures.

Management Characterization

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.

Significant Changes in Marine Debris Management

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Marine debris statutes, regulations, policies, or case law interpreting these	Y	Y	Y
Marine debris removal programs	Y	Y	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes and likely future outcomes of the changes.

In July 2020 legislative language under Section 2.1 of SL 2019-224 allowed the NC Wildlife Resource Commission to inspect, investigate, and remove abandoned and derelict vessels. Vessels that have been identified as abandoned or derelict are maintained on a state database and prioritized for removal. The General Assembly also appropriated funds in 2021 and 2022 to address and remove abandoned and derelict vessels across the North Carolina coast, with approximately 200 vessels removed.

The state General Assembly enacted a ban on unencapsulated polystyrene, effective as of Jan 1, 2025 (Section 143-215.74P). This ban prohibits the sale of unencapsulated polystyrene from being used in the construction of floating docks. Several coastal towns have also passed ordinances banning the use of unencapsulated polystyrene in floating docks.

Under House Bill 600 (SL2023-137), residential docks built along the coast have to comply with the state's building code. This will help ensure that docks are built in a way that will make them more resilient to damage during extreme storms.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

   High _____
   Medium ___x__
   Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders ranked this as one of the lower priorities (7th priority on the survey). DCM ranked it as a medium priority for the purposes of the 309 assessment as there are multiple ongoing efforts to address marine debris and DCM participates in workgroups and projects focused on removal of marine debris.

Cumulative and Secondary Impacts

Section 309 Enhancement Objective: Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources. §309(a)(5)

Phase 1 (High-level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. Using National Ocean Economics Program Data on population and housing,[12] please indicate the change in population and housing units in the state's coastal counties between 2017 and 2021. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970), but at a minimum, please show change over the most recent five-year period data is available (2017-2021) to approximate current assessment period.

Trends in Coastal Population and Housing Units

	2017	2021	Percent Change (2017-2021)
Number of people	1,062,395	1,082,581	1.9%
Number of housing units	563,389	579,048	2.8%

There are 20 coastal counties in NC. Projected growth is primarily concentrated in the southeast and northeast coastal counties. The NC Office of State Budget and Management (NC OSBM) projects the following increase by 2030 for the fastest growing counties: Brunswick (35%), Currituck (42%), New Hanover (14%), Onslow (12%), Pender (21%).

Brunswick and Currituck Counties are some of the fastest growing counties in the state. According to the 2010 Census, population in Brunswick County was 73,143 while in 2020 it rose to 136,693. Population in Brunswick County is projected to increase to over 266,000 by 2050 by the NC OSBM. Population of Currituck County was 23,547 as of the 2010 census and rose to 28,100 as of the 2020 census. It is projected to grow to over 70,000 by 2050 according to the NC OSBM.

2. Using the tables below as a guide, provide information on land cover changes and development trends. Be as quantitative as possible using state or national land cover data.[13] The tables are a suggestion of how you could present the information. Feel free to adjust column and row headings

[12] *www.oceaneconomics.org/*. Enter "Population and Housing" section and select "Data Search" (near the top of the left sidebar). From the drop-down boxes, select your state. Select the year (2021) then select "coastal zone counties." The default comparison year will be 2017 so no need to select a comparison year.

[13] National data on wetlands status and trends include NOAA's Land Cover Atlas (*coast.noaa.gov/digitalcoast/tools/lca.html*) and the U.S. Geological Survey's National Land Cover Database (*usgs.gov/centers/eros/science/national-land-cover-database)*.

to align with data and time frames available in your state or territory. If quantitative data on land cover changes and development trends are not available, provide a brief qualitative narrative describing changes in land cover, especially development trends, including significant changes since the last assessment.

Distribution of Land Cover Types in Coastal Counties

Land Cover Type	Land Area Coverage in 2016 (Sq Miles)	Gain/Loss Since 1996 (Sq Miles)
Developed, High Intensity	78.17	19.67
Developed, Low Intensity	311.97	36.43
Developed, Open Space	162.07	38.03
Grassland	230.37	73.98
Scrub/Shrub	477.01	14.51
Barren Land	177.22	12.7
Open Water	4593.49	19.66
Agriculture	1999.87	-0.49
Forested	2017.43	-138.13
Woody Wetland	3296.76	-159.1
Emergent Wetland	649.56	82.77

Development Status and Trends for Coastal Counties

	1996	2016	Percent Net Change
Percent land area developed	3.27%	3.94%	0.67
Percent impervious surface area	0.93%	1.12%	0.19

How Land Use Is Changing in Coastal Counties

Land Cover Type	Areas Lost to Development Between 1996-2016 (Sq Miles)
Barren Land	1.96
Emergent Wetland	0.52
Woody Wetland	10.9
Open Water	0.31
Agriculture	27.5
Scrub/Shrub	16.43
Grassland	5.64
Forested	31.54

NOAA's C-CAP data was used to analyze changes in land use. The current dataset provides data up to 2016.

Similar to the discussion provided for population growth, the "area of land developed" and "area lost to development" varies across coastal counties. As would be expected, coastal counties with biggest population growth have seen the biggest increases in development. Currituck County has seen a 29% increase in area of land developed from 1996 to 2016, with primary conversion of agricultural land. Brunswick County has increased by 35% in land developed from 1996 to 2016, with

primarily forested, scrub/shrub, and wooded wetlands converted. Onslow County has seen a 32% increase in land developed from 1996 to 2016, with primarily forested and agricultural land converted.

3. Briefly characterize how the coastal shoreline has changed in the past five years due to development, including potential changes to shoreline structures such as groins, bulkheads and other shoreline stabilization structures, and docks and piers. If available, include quantitative data that may be available from permitting databases or other resources about changes in shoreline structures.

   Estuarine shoreline armoring in NC has been increasing. As reported in the North Carolina Coastal Habitat Protection Plan's 2021 Amendment, "in 2012 DCM delineated the shoreline and stabilization and docking structures. Bulkheads were the dominant type of stabilization structure. Of 10,658 miles of shoreline, the study identified approximately 500 miles of bulkheaded shoreline directly abutting surface waters, 75 miles with bulkheads with some amount of marsh waterward of the structure, and 17 miles of bulkhead with sediment bank waterward of the structure. Riprap was the next most common structure with 182 miles. As of 2012, there were roughly 815 miles of armored shoreline and only 4.9 miles of marsh sill, the term for living shorelines in rule. In the time since, the amount of shoreline armoring in NC has increased to 1,100 miles."

4. Briefly summarize the results of any additional state- or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality, shoreline hardening, and habitat fragmentation, since the last assessment.

   It is expected that more property owners will be looking at options to protect their homes in the near future. Increasing development on the coast coupled with increased inundation are expected to increase demand for shoreline stabilization. According to the North Carolina Coastal Habitat Protection Plan, "more than 48,000 properties valued at $13 billion are predicted to become chronically inundated by 2100 under relatively conservative SLR estimates values."

Management Characterization

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources, since the last assessment.

Significant Changes in Management of Cumulative and Secondary Impacts of Development

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N	N
Guidance documents	Y	N	N
Management plans (including SAMPs)	Y	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

    High ___x__
    Medium _____
    Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Cumulative and secondary impacts was the second highest ranking priority identified through the stakeholder survey. It was also identified as a high priority during discussions with partner organizations. Stakeholders brought up issues related to overdevelopment, environmental degradation, flooding and stormwater management, habitat loss and coastal erosion, pollution and water quality, and regulatory challenges. DCM views understanding of cumulative and secondary impacts as a high priority. At the same time, the topic is a challenging one to analyze and DCM is attempting to evaluate how to best engage in a meaningful approach through some of the existing programs.

Special Area Management Planning

Section 309 Enhancement Objective: Preparing and implementing special area management plans for important coastal areas. §309(a)(6)

The Coastal Zone Management Act defines a special area management plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

Phase 1 (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a SAMP. This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.

Geographic Area	**Opportunities for New or Updated Special Area Management Plans** Major conflicts/issues
Wetlands (specifically isolated wetlands and/or salt water marshes)	Development, drowning, nonpoint pollution
Estuarine shorelines	Development, shoreline hardening
Outer banks	Development, erosion, storms

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of SAMPs since the last assessment.

The CRC relies on statutory framework of Areas of Environmental Concern (AEC) to guide development in sensitive areas. The AECs effectively function as SAMP. Permits are required for development that impacts an AEC.

Management Characterization

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could help prepare and implement SAMPs in the coastal zone.

Significant Changes in Special Area Management Planning

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
SAMP policies, or case law interpreting these	N	N	Y
SAMP plans	N	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Jockey's Ridge, the tallest living sand dune on the Atlantic Coast, has been designated as an Area of Environmental Concern since 1984 but in 2023 the designation was removed by the Rules Review Commission. The Coastal Resources Commission voted in November 2024 to approve a permanent rule identifying Jockey's Ridge as a unique geologic feature area of environmental concern. The rule will need to go before the Rules Review Commission before it can be reinstated. This was not a 309-driven change. The outcome of the review will inform next steps regarding efforts to reinstate the AEC.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

    High _____
    Medium __x___
    Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders selected this as one of the lower priorities (6th priority on the survey). DCM relies on the existing framework of Areas of Environmental Concern to guide development in sensitive areas. At this time, this is not a priority enhancement area for DCM.

Ocean and Great Lakes Resources

Section 309 Enhancement Objective: Planning for the use of ocean [and Great Lakes] resources. §309(a)(7)

Phase 1 (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. Understanding the ocean and Great Lakes economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW),[14] indicate the status of the ocean and Great Lakes economy as of 2021 (the most recent data) in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data are not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.

Status of Ocean and Great Lakes Economy for Coastal Counties (2021)

	All Ocean Sectors	Living Resources	Marine Construction	Ship & Boat Building	Marine Transportation	Offshore Mineral Extraction	Tourism & Recreation
Employment (# of Jobs)	53,791	4,019	735	2,460	2,472	102	44,001
Establishments (# of Establishments)	3,423	244	101	66	121	18	2,873
Wages (Millions of Dollars)	$1.3 B	$80.2	$39.0	$123.6	$106.6	$3.4	$975.9
GDP (Millions of Dollars)	$4.0 B	$344.2	$73.9	$1.1B	$187.5	$12.2	$2.3B

[14] *coast.noaa.gov/digitalcoast/tools/enow.html*. If you select any coastal county for your state, you are directed to various data displays for that county. In the upper left of the screen, click the "State" box, to the left of the county box so that the state name will be highlighted. Now the data will reflect statewide data for all of the state's coastal counties. Make sure "2021" is selected for the year (top right corner). You can then click through the sector types by selecting the icons along the top and the type of economic data (employment, wages, GDP, etc.), by clicking through the icons on the left.

Change in Ocean and Great Lakes Economy for Coastal Counties (2005-2021)[15]

	All Ocean Sectors	Living Resources	Marine Construction	Ship & Boat Building	Marine Transportation	Offshore Mineral Extraction	Tourism & Recreation
Employment (# of Jobs)	10,513	790	-178	-2,059	183	-12	11,789
Establishments (# of Establishments)	1,140	81	13	-11	35	1	1,021
Wages (Millions of Dollars)	$635.4	$55.6	$11.7	-$30.1	$24.3	$.058	$573.8
GDP (Millions of Dollars)	$2,447	$198	$13	$757	-$2.9	$3.9	$1,478

There was an overall growth in all categories for most sectors. There was a small dip in 2020 for all categories.

Ship and boat building underwent a small decline from 2005 to 2008, then a significant dip in 2009. There has been limited growth since then.

2. Understanding existing uses within ocean and Great Lakes waters can help reduce use conflicts and minimize threats when planning for ocean and Great Lakes resources. Using Ocean Reports,[16] indicate the number of uses within the ocean or Great Lakes waters off of your state. To avoid duplication, energy uses (including pipelines and cables) are reported under "Energy and Government Facility Siting" in the following template. However, feel free to include energy uses in this table as well if listing all uses within ocean and Great Lakes waters in one place is preferred. Add additional lines, as needed, to include additional uses that are important to your state. Note: The Ocean Reports tool does not include data for the Great Lakes states. Great Lakes states should fill in the table as best they can using other data sources.

[15] Trend data is available at the bottom of the page for each sector and type of economic data. Mouse over the data points for 2005 and 2021 to obtain the actual values and determine the change by subtracting 2005 data from 2021.

[16] *coast.noaa.gov/digitalcoast/tools/ort.html*. Select the "view quick reports" button and enter the name of your state or territory in the search bar. Some larger states may have the "quick reports" for their state waters broken into several different reports. Click on the "state waters" reports to view. Note the Ocean Reports tool also generates "quick reports" for national estuarine research reserve boundaries in your state. These reports are just a subset of the "state waters" report(s) so you can ignore the reserve "quick reports." Use the icons on the left hand side to select different categories: general information, energy and minerals, natural resources and conservation, oceanographic and biophysical, transportation and infrastructure, and economics and commerce. Scroll through each category to find the data needed to complete the table. The top six categories in the table above are in the "energy and minerals" section while the other information to complete the table can be found under the "transportation and infrastructure" section.

Uses within Ocean or Great Lakes Waters

Type of Use	Number of Sites
Federal sand and gravel leases *(Completed)*	2
Federal sand and gravel leases *(Active)*	1
Federal sand and gravel leases *(Expired)*	0
Federal sand and gravel leases *(Proposed)*	1
Beach Nourishment Projects	39
Ocean Disposal Sites	160
Principle Ports *(Number and Total Tonnage)*	2 ports; 8,212,759 tonnage
Coastal Maintained Channels	47
Designated Anchorage Areas	2
Danger Zones and Restricted Areas	6, around 7% coverage
Other - Coastal Barrier Resource Areas	20

3. In the table below, characterize how the threats to and use conflicts over ocean and Great Lakes resources in the state's or territory's coastal zone have changed since the last assessment.

Significant Changes to Ocean and Great Lakes Resources and Uses

Resource/Use **Change in the Threat to the Resource or Use Conflict**	**Since Last Assessment** (↑, ↓, –, unknown)
Benthic habitat (including coral reefs)	-
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	↑
Sand/gravel	↑
Cultural/historic	unknown
Transportation/navigation	-
Offshore development[17]	-
Energy production	↑
Fishing (commercial and recreational)	↑
Recreation/tourism	↑
Sand/gravel extraction	↑
Dredge disposal	↑
Aquaculture	↑
Other (please specify)	

[17] Offshore development includes underwater cables and pipelines, although any infrastructure specifically associated with the energy industry should be captured under the "energy production" category.

4. For those ocean and Great Lakes resources and uses in the table above that had an increase in threat to the resource or increased use conflict in the state's or territory's coastal zone since the last assessment, characterize the major contributors to that increase. Place an "X" in the column if the use or phenomenon is a major contributor to the increase.

Major Contributors to an Increase in Threat or Use Conflict to Ocean and Great Lakes Resources

	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Commercial and Recreational)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Other (Specify)
Living marine resources		x	x	x	x	x	x	x				
Sand/gravel	x								x			
Energy production					x		x	x				
Fishing		x	x	x		x						
Recreational/tourism	x		x	x		x						
Sand/gravel extraction												
Dredge disposal												
Aquaculture	x		x				x					

5. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of ocean and Great Lakes resources or threats to those resources since the last assessment to augment the national data sets.

Living marine resources face a number of threats. The NC Division of Marine Fisheries (NCDMF) directly develops fishery management plans for fourteen stocks and partners with other agencies to manage at least another twenty-four interjurisdictional fisheries. The 2023 Fishery Management Plan Review points to some stocks being overfished.

Polluted runoff has a wide impact on other resources. The Nonpoint Source Planning Branch of the Division of Water Resources leads state efforts on addressing nonpoint source pollution. Nonpoint source pollution, or polluted runoff, occurs when water picks up pollutants from surfaces like rooftops, roads, constructions sites, and farms, then carries them into groundwater, lakes, rivers, and estuaries. This pollution, which can include sediments, nutrients, and metals, is the leading cause of water quality degradation in North Carolina and nationwide, affecting waters used for fishing, swimming, and drinking. The Nonpoint Source Planning Branch leads the development and oversight of nutrient strategies to restore key waters like the Tar-Pamlico and Neuse Estuaries.

Aquaculture faces threats but at the same time, increase in aquaculture activities is seen as conflicting with other resources. Aquaculture affects recreational fishing, boating, and other recreational activities. For example, in Sep 2024, two coastal counties (Onslow and Pender) have passed resolutions asking the North Carolina Department of Environmental Quality to stop issuing new leases for oyster farms.

Existing moratoriums in waters north and south of those two counties are driving up demand for aquatic business activities in Onslow and Pender.

Management Characterization

1. Indicate if the approach is employed by the state or territory and if any significant state- or territory-level changes (positive or negative) in the management of ocean and Great Lakes resources have occurred since the last assessment?

Significant Changes to Management of Ocean and Great Lakes Resources

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	N
Regional comprehensive ocean/Great Lakes management plans	N	-	-
State comprehensive ocean/Great Lakes management plans	N	-	-
Single-sector management plans	Y	N	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

In January 2025, the Mid-Atlantic Planning Area of the Outer Continental Shelf was permanently withdrawn from oil and gas leasing by President Biden under section 12a of the Outer Continental Shelf Lands Act.

3. Indicate if your state or territory has a comprehensive ocean or Great Lakes management plan.

Comprehensive Ocean/Great Lakes Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	N	N
Under development (Y/N)	N	N
Web address (if available)	-	-
Area covered by plan	-	-

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__x___
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders ranked this as a medium priority (5th priority on the survey). DCM also ranked this as a medium priority for the purposes of this assessment. DCM collaborates with other divisions on various aspects of ocean resources management to address issues on ongoing basis.

Energy and Government Facility Siting

Section 309 Enhancement Objective: Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance. §309(a)(8)[18]

Phase 1 (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the state's or territory's coastal zone based on best-available data. If available, identify the approximate number of facilities by type. For ocean-facing states and territories (not Great Lakes states), Ocean Reports[19] includes existing data for many energy facilities and activities.

[18] CZMA § 309(a)(8) is derived from program approval requirements in CZMA § 306(d)(8), which states:

> "The management program provides for adequate consideration of the national interest involved in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program."

NOAA regulations at 15 C.F.R. § 923.52 further describes what states need to do regarding national interest and consideration of interests that are greater than local interests.

[19] *coast.noaa.gov/digitalcoast/tools/ort.html.* Select the "view quick reports" button and enter the name of your state or territory in the search bar. Some larger states may have the "quick reports" for their state waters broken into several different reports. Click on the "state waters" reports to view. Note the Ocean Reports tool also generates "quick reports" for national estuarine research reserve boundaries in your state but this is just a subset of the "state waters" report(s) so you can ignore the reserve "quick reports." Click on the wind turbine icon on the left ("energy and minerals") for information on energy production. While outside your coastal zone, you may also want to consider facilities/activities in "federal waters" that may have effects on your coastal zone.

Status and Trends in Energy Facilities and Activities in the Coastal Zone

Type of Energy Facility/Activity	Exists in Coastal Zone (# or Y/N)	Change in Existing Facilities/Activities Since Last Assessment (↑, ↓, –, unknown)	Proposed in Coastal Zone (# or Y/N)	Change in Proposed Facilities/Activities Since Last Assessment (↑, ↓, –, unknown)
Pipelines	Y	-	N	-
Electrical grid (transmission cables)	Y	-	Y	↑
Ports	Y	-	N	-
Liquid natural gas (LNG)	N	N/A	N	-
Electric Power Facilities (Oil)	Y	-	N	-
Electric Power Facilities (Gas)	Y	-	N	-
Electric Power Facilities (Coal)	N	-	N	-
Electric Power Facilities (Nuclear)	Y	-	N	-
Electric Power Facilities (Wave)	N	N/A	N	-
Electric Power Facilities (Tidal)	N	N/A	N	-
Electric Power Facilities (Current.ocean, lake, river)	N	N/A	N	-
Electric Power Facilities (Hydropower)	N	N/A	N	-
Electric Power Facilities (Ocean thermal energy conversion)	N	N/A	N	-
Electric Power Facilities (Solar)	Y	↑	Y	↑
Electric Power Facilities (Biomass)	Y	-	N	-
Other (please specify) -				

2. If available, briefly list and summarize the results of any additional state- or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment.

Solar capacity in NC has significantly increased in the past two decades. North Carolina currently ranks 4th in the national solar capacity ranking, according to the Solar Energy Industries Association.

Land-based wind has increased. First land-based wind facility in the state opened in 2016/2017 in the coastal county of Perquimans. The facility has 208 megawatts (MW) of generating capacity from 104 turbines. It was the first coastal wind farm in the Southeast. A second facility, located in coastal Chowan

County, is under construction. It is planned for 45 turbines and capacity of 189 MW, and scheduled to fully commence operations in 2024/2025.

Offshore wind energy generation is managed by the Bureau of Offshore Energy Management (BOEM). There are three Wind Energy Areas designated by BOEM for wind leases - Kitty Hawk North and Kitty Hawk South, located off the northern coast, and Wilmington East off the southern coast.

3. Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[20] in the state's coastal zone since the last assessment.

There are five active military installations located along the coast. There has not been any significant change in the status or trends of these facilities or activities over the past five years.

In 2022, North Carolina Coastal Federation received a grant to complete final design for three living shoreline installations at two military bases to protect their critical estuarine-side infrastructure from storm-based erosion.

Management Characterization

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) that could facilitate or impede energy and government facility siting and activities have occurred since the last assessment.

Significant Changes in Energy and Government Facility Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpretations	Y	N	Y
State comprehensive siting plans or procedures	N	N/A	N/A

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

In January 2025, the Mid-Atlantic Planning Area of the Outer Continental Shelf was permanently withdrawn from oil and gas leasing by President Biden under section 12a of the Outer Continental Shelf Lands Act. Also in January 2025, all areas of the Outer Continental Shelf were temporarily withdrawn

[20] The CMP should make its own assessment of what government facilities may be considered "greater than local significance" in its coastal zone, but these facilities could include military installations or a significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if any at all) mention).

from any new or renewed offshore wind leases by an Executive Order of President Trump. The EO also requires review of existing leasing and permitting practices.

None of these changes were driven by Section 309.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

High	____
Medium	_____
Low	___x__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders ranked this as one of the lower priorities, (8th priority on the survey)
Siting of transmission lines have been brough up by some stakeholders in one-on-one engagements as an area where DCM should have greater focus.

Aquaculture

Section 309 Enhancement Objective: Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. §309(a)(9)

Phase 1 (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization

1. In the table below, characterize the existing status and trends of aquaculture facilities in the state's coastal zone based on the best-available data. Your state Sea Grant Program may have information to help with this assessment.[21]

Status and Trends of Aquaculture Facilities and Activities

Type of Facility/Activity	Number of Facilities[22]	Approximate Economic Value	Change Since Last Assessment (↑, ↓, –, unknown)
Bottom	294	See below	Increase (224 in 2019)
Water column	155	See below	Increase (79 in 2019)
Franchises	47	See below	Decrease (51 in 2019)

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.

   According to the NC Extension, the value of North Carolina's aquaculture is approximately $60 million per year. Coastal plain provides appropriate conditions for growth of warm-water fish and shellfish.

   The shellfish aquaculture industry has experienced significant growth. The North Carolina Division of Marine Fisheries (DMF) administers the Shellfish Lease and Franchise Program for the purposes of shellfish cultivation, aquaculture and mariculture within the State of North Carolina. DMF provides information on number and type of applications per year. Since 2010, here has been a steady increase in applications, increasing from 2 in 2010 to over 100 in 2019. For 2023, the most current year reported, there have been 55.

[21] While focused on statewide aquaculture data rather than just within the coastal zone, the *Census of Aquaculture* (*agcensus.usda.gov/Publications/Census_of_Aquaculture/)* may help in developing your aquaculture assessment. The census is conducted every 10 years and the last report was released in 2018. The report provides a variety of state-specific aquaculture data to understand current status and recent trends.

[22] Be as specific as possible. For example, if you have specific information of the number of each type of facility or activity, note that. If you only have approximate figures, note "more than" or "approximately" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

According to the NC State Extension's analysis presented in The Economic Impact of North Carolina's Shellfish Mariculture Industry, NC's shellfish industry provided over $27 million in economic impact and 532 jobs in the state in 2021. Until 2016, this sector's impact was primarily due to the harvest of wild clams and oysters. More recently, wild harvests have declined and cultivated oysters now represent over half of the total economic impact of shellfish in the state. The Economic Impact of North Carolina's Oyster Mariculture Industry report estimates that in 2022, farmed oysters contributed over $14 million to state GDP and provide over 280 jobs. The oyster industry has become the most important component of the shellfish sector in the state. Growing inland consumer demand for oysters, especially from restaurants, is increasing the economic impact of the industry across the state.

Management Characterization

1. Indicate if the approach is employed by the state or territory and if there have been any state- or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone.

Significant Changes in Aquaculture Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Aquaculture comprehensive siting plans or procedures	N	N	N
Other aquaculture statutes, regulations, policies, or case law interpreting these	Y	N	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

In 2019, Senate Bill 648 was passed to provide support to the shellfish aquaculture industry and resulted in significant increase of aquaculture activities. DCM and DMF streamlined their aquaculture permitting process as part of the 2021-2025 Section 309 Strategy.

In 2024, Senate Bill 607 amended GS 113A-103 by excluding from the definition of development, as that term is used in the Coastal Area Management Act, floating structures used primarily for aquaculture associated with an active shellfish cultivation lease area or franchise in an area of environmental concern; also excludes uses related to aquaculture and aquaculture facilities associated with an active shellfish cultivation lease area or franchise from development. This impacts DCM's ability to engage on aquaculture issues.

As discussed in the Ocean Resources section, the increase in aquaculture have led to proposed moratoriums as counties work to understand and address resource conflicts.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal management program?

   High _____
   Medium __x___
   Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Stakeholders ranked this as one of the lower priorities (9th priority on the survey). DCM ranked this as a medium priority as the recent rule changes have removed aquaculture from DCM's regulatory purview.

Phase II Assessment

Wetlands

In-Depth Resource Characterization

Purpose: To determine key problems and opportunities to improve the CMP's ability to protect, restore, and enhance wetlands.

1. What are the three most significant existing or emerging physical stressors or threats to wetlands within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout your coastal zone, or are there specific areas that are most threatened? Stressors can be development/fill; hydrological alteration/channelization; erosion; pollution; invasive species; freshwater input; sea level rise/Great Lakes level change; or other (please specify).

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Development/population growth	Throughout but greater in the south
Stressor 2	Drowning	Throughout
Stressor 3	Sediment supply	Throughout

2. Briefly explain why these are currently the most significant stressors or threats to wetlands within your coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

Wetlands were identified as a top priority in the stakeholder survey administered by DCM. Respondents emphasized loss of habitat from both sea level rise and development. Respondents were also concerned about pollution from stormwater runoff and agricultural practices. Permitting and regulatory challenges were also brought up as areas of concern, especially in the wake of recent federal and state regulatory changes that removed protection from isolated wetlands.

The two main themes of various wetland-focused planning documents are protection of existing wetlands and facilitation of marsh migration. As discussed in Phase I assessments, coastal counties are experiencing a rapid population growth. The associated development, wetland filling, and other stressors such as pollution in stormwater runoff lead to direct wetland loss and impact the health of wetlands. The NC Salt Marsh Action Plan states that "wetland loss rates can be significantly higher in areas of high population growth and development in coastal zones because of the indirect effects of adjacent development and working lands. Namely, increases in impervious surfaces that accompany development and its supporting infrastructure dramatically increase the quantity and velocity of stormwater reaching estuarine systems, including salt marshes." Other threats to wetlands identified in the plan include pollution, ditching and draining, boat wake-generated shoreline erosion, marine debris, invasive species, and sea level rise.

Sea level rise and marsh migration are a significant focus within the NC Salt Marsh Action Plan. As discussed in the Plan, "projections utilizing elevation and SLR data estimate that North Carolina could see a net gain of about 180,000 acres of salt marsh by 2050 under an intermediate SLR scenario, assuming no major developmental or geological changes." The Plan also specifies that the availability of potential marsh migration space differs dramatically between the northern and southern portions of the coast, stating that "under intermediate SLR projections for 2050 (+0.46m relative to 2010), North Carolina is projected to lose approximately 92,000 acres of existing salt marsh and gain more than 270,000 acres of new marsh. Yet, most net gains in salt marsh acreage are projected to occur within

mainland watersheds in the northern and central coast, while the majority of losses are observed along the barrier islands and southern coast."

The Plan also states that "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."

Similar themes and recommendations are echoed through other plans. The Natural and Working Lands Action Plan offers recommendations for coastal habitats that include facilitation of migration of coastal habitats through protection of migration corridors and prioritizing adaptation to sea level rise in coastal habitat restoration planning. The NC Wetland Program Plan proposes monitoring and assessments to "seek improvements for wetland predicative mapping" and "assess changes in the quantity and quality of coastal wetlands (e.g., sea level rise, wetland migration, general data, hotspots, landowners, and constitutional, financial, and legal implications)". The Coastal Habitat Protection Plan 2021 Amendment offers multiple recommendations focused on updated mapping and assessments, identifying, prioritizing, and protecting critical wetlands and migration corridors, determining parameters for thin layer sediment placement, and using living shorelines and other nature-based solutions, among others.

3. Are there emerging issues of concern but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Loss of protection for isolated wetlands	Assessment and mapping, outreach and education

In-Depth Management Characterization

Purpose: To determine the effectiveness of management efforts to address identified problems related to the wetlands enhancement objective.

1. For each additional wetland management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

Significant Changes in Wetland Management

Management Category	Employed By State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Wetland assessment methodologies	Y	N	N
Wetland mapping and GIS	Y	N	N
Watershed or special area management plans addressing wetlands	N	N	Y
Wetland technical assistance, education, and outreach	Y	Y	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

The NC Salt Marsh Action Plan was published in 2024. The plan details a five-year strategy to protect, restore, and allow for the migration of salt marshes in coastal North Carolina. The plan aligns with the regional South Atlantic Salt Marsh Initiative. The strategies outlined in the plan are focused on: advancing marsh conservation and restoration; facilitating marsh migration; and incorporating cross-cutting approaches. The plan was not driven by section 309, but it contains multiple recommendations that can guide DCMs work towards accomplishing broader goals of wetland protection.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in protecting, restoring, and enhancing coastal wetlands since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?

A 2024 report from the North Carolina Surface Elevation Table Community of Practice shows that most of North Carolina's coastal wetlands are not keeping pace with sea level rise. Of 132 surface elevation tables (SETs) installed across North Carolina, 33 recorded net losses in elevation over the entire record of measurement. Among the 99 SETs that recorded positive elevation change, 79 (80%) did not build elevation fast enough to keep pace with the average rate of sea level rise over the past 30 years.

A study by Gundreson et.al. examined the vulnerability of coastal wetlands to rising sea levels and estimated long-term soil accretion rates. Various wetland types within the Albemarle-Pamlico Peninsula, an area experiencing high rates of sea level rise, were evaluated. Of the 16 sites sampled, only one site had a vertical accretion rate higher than the local rate of sea level rise. The results show that most wetlands in the area are vulnerable to future inundation due to current rates of sea level rise.

Identification of Priorities

1. Considering changes in wetlands and wetland management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively respond to significant wetlands stressors. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Identify strategies to mitigate "coastal squeeze" and wetland drowning
   Description: Existing coastal wetlands are threatened by a combination of factors, including drowning and barriers to wetland migration, such as hardened shorelines. Inadequate sediment and detritus supply can also cause marshes to be unable to keep up with rising sea levels, resulting in conversion from wetlands to mud flats. DCM is interested in strategies to mitigate squeeze and drowning, including expanded use of living shorelines, restoration, thin layer sediment placement, and preserving migration/transgression opportunities.

   Management Priority 2: Facilitate marsh migration corridors

   Description: Significant marsh migration is expected in the future. The availability of land and feasibility of marsh migration varies along the coast. Complementing many existing plans and efforts, DCM is interested in furthering research, planning, and assessment towards successful marsh migration.

   Management Priority 3: Updated status and trends assessments of distribution, size, and functionality

   Description: The types and impacts of stressors need to be better understood, along with updated georeferenced data on losses and gains. Wetland functions—ecosystem and socioeconomic services— also need to be better understood.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Identification of wetlands where thin layer placement can be utilized, success of living shoreline projects
Mapping/GIS	Y	Updated maps on wetland distribution; mapping of isolated wetlands, mapping of barriers to marsh migration
Data and information management	Y	Georeferenced data on losses and gains. Quantification of wetland functions—ecosystem and socioeconomic services.
Training/capacity building	N	Training on living shorelines and other natural strategies

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Decision-support tools	Y	Best places for living shorelines; Suitability analysis; identification and prioritization of protection, restoration, and migration areas.
Communication and outreach	Y	Use of living shorelines over hardened structures
Other (specify)		

Enhancement Area Strategy Development

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes ___x___
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

Wetlands in North Carolina face a wide range of threats and stressors. DCM is well positioned to work with partners to implement strategies towards wetland protection, as well as contribute to state-wide efforts towards assessing and quantifying the scope of wetland changes taking place.

Coastal Hazards

In-Depth Resource Characterization

Purpose: To determine key problems and opportunities to improve the CMP's ability to prevent or significantly reduce coastal hazard risks by eliminating development and redevelopment in high-hazard areas and managing the effects of potential sea level rise and Great Lakes level change.

1. Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards[23] within your coastal zone? Also indicate the geographic scope of the hazard, i.e., is it prevalent throughout the coastal zone, or are there specific areas most at risk?

	Type of Hazard	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Hazard 1	Flooding (sunny day flooding, storm related)	Throughout
Hazard 2	Coastal storms/wind	Throughout
Hazard 3	Erosion	Throughout, Outer banks

2. Briefly explain why these are currently the most significant coastal hazards within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

Coastal hazards enhancement area was identified as one of the top three priorities in the stakeholder survey. Respondents were concerned about effects of flooding, stormwater management, shoreline erosion, and habitat loss. The increasing frequency and severity of storms are cited as key threats to coastal communities. Erosion, particularly along ocean and estuarine shorelines, is a significant concern. This includes the loss of natural storm buffers like wetlands and dunes, as well as infrastructure impacts on houses that fall into the ocean. Respondents stress the importance of managing erosion sustainably and protecting coastal habitats to maintain resilience against storms and flooding.

NC Resilient Coastal Communities Program

The NC Resilient Coastal Communities Program (RCCP) provides funding and technical assistance to coastal local governments to support resiliency planning and project implementation. It was first started as a pilot program in 2017 with vulnerability assessments for five communities. A coast-wide needs assessment survey was conducted in 2017, prior to the start of the pilot phase of Resilient Coastal Communities Program (RCCP), and flooding and stormwater management were identified as the most common issues faced by local governments.

Since 2021, RCCP has provided funding for over 40 coastal communities to perform risk and vulnerability assessments and identify projects to address these vulnerabilities (Phase I and II). This has led to further funding of 30 priority engineering and design projects (Phase III), and funding for implementation of five (5) resiliency projects (Phase IV).

During the 2020-2021 vulnerability assessments, the majority of identified strategies were focused on addressing risks from flooding (including precipitation-linked, storm surge, and riverine flooding), associated stormwater management, and to a lesser extent, erosion. In the engineering and design

[23] See list of coastal hazards on pg. 27 of this assessment template.

phase, 95% of projects addressed flooding and stormwater management. Implementation projects funded during the 2024/2025 grant cycle focus on various aspects of stormwater management. Local communities plan to implement projects such as wetland restoration to improve function of the wastewater treatment plant; low impact development demonstration site that features nature-based and hybrid stormwater installations; and three (3) projects planning to install of a series of nature-based solutions to improve stormwater management near flood-prone roadways.

The State legislature, recognizing the urgent need for resiliency projects, appropriated $10 million in FY2023/2024 for implementation of RCCP projects.

Science Panel Update
The NC Coastal Resources Commission's (CRC) Science Panel provides periodic updates to the Commission on a variety of coastal hazards. Over the current Strategy period the Science Panel has been working with staff to re-delineate Inlet Hazard Areas of Environmental Concern and calculate corresponding long term average annual erosion rates for the first time. The Panel is also working to update the State's oceanfront erosion rates using a new methodology and updated aerial imagery. Results are due in 2025, to be followed by rulemaking to incorporate the updated boundaries and erosion rates by rule into the NCCMP.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Groundwater impacts	Assessment
Sand supply for beach nourishment	Identification/inventory of sources,

In-Depth Management Characterization
Purpose: To determine the effectiveness of management efforts to address identified problems related to the coastal hazards enhancement objective.

1. For each coastal hazard management category below, indicate if the approach is employed by the state or territory and if there has been a significant change since the last assessment.

Significant Changes in Coastal Hazards Statutes, Regulations, and Policies

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Shorefront setbacks/no build areas	Y	Y	Y
Rolling easements	N	N	N
Repair/rebuilding restrictions	Y	Y	N
Hard shoreline protection structure restrictions	Y	Y	N
Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green infrastructure)	Y	Y	N

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Repair/replacement of shore protection structure restrictions	Y	Y	N
Inlet management	Y	Y	Y
Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	Y	Y	N
Repetitive flood loss policies (e.g., relocation, buyouts)	N	N	N
Freeboard requirements	Y	N	N
Real estate sales disclosure requirements	N	N	N
Restrictions on publicly funded infrastructure	N	N	N
Infrastructure protection (e.g., considering hazards in siting and design)	N	N	N
Other (please specify)			

Significant Changes to Coastal Hazard Management Planning Programs or Initiatives

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Hazard mitigation plans	Y	N	N
Sea level rise/Great Lake level change or adaptation plans	N	Y	Y
Statewide requirement for local post-disaster recovery planning	N	N	N
Sediment management plans	Y	Y	N
Beach nourishment plans	Y	Y	N
Special Area Management Plans (that address hazards issues)	N	N	N
Managed retreat plans	N	N	N
Other (please specify)			

Significant Changes to Coastal Hazard Research, Mapping, and Education Programs or Initiatives

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
General hazards mapping or modeling	Y	Y	Y
Sea level rise mapping or modeling	N	N	N
Hazards monitoring (e.g., erosion rate, shoreline change, high-water marks)	Y	Y	Y
Hazards education and outreach	Y	Y	N
Other (please specify)			

2. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in addressing coastal hazards since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?

There are a number of ongoing efforts that should help evaluate the effectiveness of management efforts – however, all of these are in the initial phases.

Since the last assessment, DCM (in partnership with NC Office of Resiliency and Recovery) has provided support to communities through the Resilient Coastal Communities Program (RCCP). DCM has partnered with University of North Carolina to conduct an external evaluation of the program – the evaluation is in the initial phases. DCM has conducted internal evaluation of the program through surveys and targeted interviews and has identified updates to the handbook and improvements to the process to better assist the communities.

State agencies provide annual reports to summarize progress made towards goals and objectives of the Resilience Strategy outlined in the Resilience Plan. Much of the work is ongoing and as such, there are no clear conclusions that can be drawn yet.

Cape Hatteras National Seashore recently commissioned a study to evaluate the effects of several adaptation strategies related to transportation and resource management challenges on Ocracoke Island in Outer Banks, home to the National Seashore. This multi-year study will look at transportation adaptation and mitigation strategies to improve transportation reliability and management of natural barrier island processes. Additionally, model scenarios will simulate various management approaches. The cooperative agreement for the study was signed in 2024. The study results will provide useful and much-needed information regarding erosion of barrier islands and management measures.

Identification of Priorities

1. Considering changes in coastal hazard risk and coastal hazard management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively address the most significant hazard risks. *(Approximately 1-3 sentences per management priority.)*

Management Priority 1: Update oceanfront and inlet shoreline change rates

Description: Every 5 years, DCM updates erosion rates based on the latest available data and evolving environmental conditions. This ensures that the most accurate and up-to-date information is consistently integrated into risk assessments. Updated erosion rates are critical for guiding the planning and placement of new construction projects, enabling them to be appropriately sited to minimize exposure to erosion-related risks.

Management Priority 2: Continuation of technical assistance program for communities

Description: DCM has successfully implemented the Resilient Coastal Communities Program (RCCP), with over 40 communities participating to date. The RCCP provides communities with means to directly address flooding and other coastal hazards. The RCCP is poised to expand work and engage additional communities in the risk assessment and project identification phases, building upon lessons learned from the first round of work. In the next round of RCCP, DCM plans to provide additional trainings to contractors to better assist communities through the process, and also increase focus on economically disadvantaged communities.

Management Priority 3: _____

Description:

2. Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above. The needs and gaps identified here should not be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Management approaches for barrier islands
Mapping/GIS/modeling	Y	Erosion rates, update estuarine shoreline structure inventory
Data and information management	Y	Incorporating data and tools developed by the Flood Resiliency Blueprint. Continuing to upload past permits into new e-permit system, analysis of permits for impacts
Training/Capacity building	Y	Living shorelines trainings, capacity support for communities to engage on resiliency issues and planning
Decision-support tools	Y	Tools to: improve decision-making for development type and location in support of enhanced resilience; determine community vulnerability and risk exposure; and perform cost-benefit analyses.
Communication and outreach	Y	Continued outreach to homeowners on living shoreline options; update guides and handbooks, resiliency outreach and education for coastal residents.
Other (specify)		

Enhancement Area Strategy Development

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes __x____
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

Building resiliency to coastal hazards is a major need of coastal communities in North Carolina, especially with the projected increase in flooding and storm impacts. DCM can build upon existing programs and tools to further resilience efforts in the coastal region and help the communities plan and prepare for changing conditions and impacts. DCM is planning to develop a strategy focused on updating inlet and shoreline erosion rates to ensure communities have access to the most reliable and current information. DCM is planning to continue support for the RCCP through state funding and other funds outside of Section 309.

Cumulative and Secondary Impacts

In-Depth Resource Characterization

Purpose: To determine key problems and opportunities to improve the CMP's ability to address cumulative and secondary impacts of coastal growth and development.

1. What are the three most significant existing or emerging cumulative and secondary stressors or threats within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone, or are there specific areas that are most threatened? Stressors can be coastal development and impervious surfaces; polluted runoff; agriculture activities; forestry activities; shoreline modification; or other (please specify). Coastal resources and uses can be habitat (wetland or shoreline, etc.); water quality; public access; or other (please specify).

	Stressor/Threat	**Coastal Resource(s)/Use(s) Most Threatened**	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Coastal development	Habitat, wetlands, public access	Throughout
Stressor 2	Stormwater runoff	Habitat, water quality, aquaculture	Throughout
Stressor 3	Estuarine shoreline hardening/development	Habitat (marsh corridors), public access	Throughout

2. Briefly explain why these are currently the most significant cumulative and secondary stressors or threats from coastal growth and development within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

   Stakeholders participating in the section 309 survey ranked cumulative and secondary impacts (CSI) as the second most important priority for DCM. Multiple respondents identified development, population increase, flooding, stormwater runoff, pollution, water quality, and stormwater infrastructure as some of the most pressing issues. Respondents also talked about the complexity of this topic and the interconnectedness of these issues with other enhancement areas.

   Coastal counties are experiencing a high level of growth, with some of the counties projected to grow up to 35% by 2030 (NC OSBM). Coastal development is one of the primary stressors and is also directly linked to the other stressors of stormwater and shoreline hardening. Development results in conversion of land as well as increase in impervious surfaces from buildings, parking lots, roadways, and other structures. Along the coast, increased development also results in increase in hardened or protected shorelines.

   As discussed in the NC Hazard Mitigation Plan, the degree of vegetative clearing and creation of impervious surfaces resulting from development contributes to the severity of a flooding event. Urbanization increases the magnitude and frequency of floods by increasing the number of impermeable surfaces, increasing the rate of collection and discharge, reducing the carrying capacity of the land and occasionally overwhelming storm water and sanitary sewer systems by infiltration and inflow.

As discussed in the Coastal Hazards phase II, flooding and stormwater management are major concerns for coastal communities. Strategies and implementation projects proposed as part of the Resilient Coastal Communities Program (RCCP) are largely focused on management of stormwater and reduction of flooding impacts.

Stormwater also impacts water quality and aquatic habitats and wildlife. In the Oyster Blueprint's draft recommendations for water quality strategy, water quality was identified as the greatest threat to oysters in the next 5 to 10 years. "In many areas where the landscape has been modified by development and drainage ditches and pipes, shellfish waters are closed after moderate and severe rains due to runoff that contains high bacteria levels. About 34 percent of all coastal waters are permanently closed to shellfish harvest because of pollution, and many more areas are temporarily closed more frequently as a result of more polluted runoff. In our prime shellfish growing waters, it's imperative that the volume and rate of runoff resemble levels that occurred naturally before adjacent land uses occurred."

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed

In-Depth Management Characterization

Purpose: To determine the effectiveness of management efforts to address identified problems related to the cumulative and secondary impacts (CSI) enhancement objective.

1. For each additional cumulative and secondary impact management category below that is not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

Significant Changes to Management of Cumulative and Secondary Impacts of Development

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Methodologies for determining CSI impacts	Y	N	N
CSI research, assessment, monitoring	Y	N	N
CSI GIS mapping/database	N	N	N
CSI technical assistance, education and outreach	N	N	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in addressing cumulative and secondary impacts of development since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state and territory's management efforts?

DCM is not aware of studies that evaluate the effectiveness of management efforts in addressing cumulative and secondary impacts of development. There has been some additional guidance prepared by agencies on how to implement the evaluations that are required, but no comprehensive evaluations.

CSI analysis is a component in certain existing permitting and environmental analysis processes within state agencies. During 2001 and through 2002 the N. C. Department of Environment and Natural Resources (DENR) established and guided a Cumulative and Secondary Impact Working Group, which also included input from DCM staff. The CSI Working Group undertook the task of identifying, drafting, and developing a system and protocol for ensuring that cumulative and secondary impacts are adequately addressed for projects subject to review under the N. C. State Environmental Policy Act (SEPA). The group developed a CSI Mitigation Measures guidance document. The main focus was the protection of wildlife resources and their habitat through mitigating impacts of development and stormwater runoff on stream and river water quality. DENR produced an additional guidance document on SCI analysis as it pertains to SEPA as "staff and consultants have struggled with practical application of (SCI) concepts."

The 401 Certification rules and Isolated Wetland Permit Program require an examination of cumulative impacts in terms of their impact on downstream water quality standards and their associated designated uses. Division of Water Quality (DWQ), which issues 401 Certifications and Isolated Wetlands Permits, published an internal guidance on Cumulative Impacts Policy for the 401 and Isolated Wetland

Permitting Program in 2004. Internal policy provided direction to staff and regulated public on how to implement the rule.

Identification of Priorities

1. Considering changes in cumulative and secondary impact threats and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve the effectiveness of its management effort to better assess, consider, and control the most significant threats from cumulative and secondary impacts of coastal growth and development. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Determine appropriate CSI approach and DCM's role

   Description: CSI are intertwined with many of the other issues and difficult to analyze without a focused approach. Given the complexity of the topic, DCM needs to investigate the feasibility of managing cumulative impacts and put forth recommendations for the division. A comprehensive and stakeholder-focused process would help determine which aspects of CSI are best addressed by DCM, what are the information and data gaps, how to integrate or built upon any existing tools and efforts from DEQ, and how to further integrate CSI considerations into DCM's future work.

   Management Priority 2: Assess cumulative contribution of impervious surfaces to flooding

   Description: Flooding is a major issue in the coastal communities and there are efforts underway, such as the RCCP, to help communities prepare for and mitigate flooding. However, the cumulative impacts of impervious surfaces and future land use planning to minimize flooding are not well integrated into the current processes.

   Management Priority 3: Assess the extent of hardened shoreline structures in estuarine shoreline

   Description: As population in coastal counties keeps growing, development along the estuarine shoreline is projected to increase as well, leading to increased implementation of shoreline protection structures. DCM last mapped the estuarine shoreline in 2009, at which time hardened structures along the shoreline were identified. Another mapping effort would allow DCM to analyze changes in the estuarine shoreline, assess potential habitat impacts, evaluate the extent of living shoreline implementation, and help direct DCM's future work on estuarine shorelines.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Examples/models of CSI work
Mapping/GIS	Y	Estuarine shoreline types, shoreline protection structures,

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Data and information management	Y	Centralization of data, guidance on data availability and use
Training/Capacity building	Y	Staff and community training on CSI, Flood Resiliency Blueprint and other tools
Decision-support tools	Y	
Communication and outreach	Y	Community outreach on CSI, Flood Resiliency Blueprint and other tools
Other (specify)		

Enhancement Area Strategy Development

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes _____
   No ___x__

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

At this point, DCM will not develop a stand-along strategy for this topic. DCM may incorporate CSI considerations into other strategies.

Cumulative and secondary impacts encompass a broad range of stressors and issues. Some of these are being addressed, to an extent practicable, through other efforts within DCM and other agencies. For example, coastal development and growth are considered in land use plan updates. Many of the land use plans are at a point where they need to be updated. Stormwater runoff is a contributor in flooding events and is directly tied to development and the amount of impervious surfaces. DEQ's Flood Resiliency Blueprint is a recent initiative that leads the state's engagement on development of updated models and guides decision making, and supports implementation of projects. The Green Growth Toolbox from the NC Wildlife Resources Commission is designed to help communities conserve high quality habitats and plan for growth in a way that will conserve natural assets. The goal of DCM is to work with these existing efforts to broaden the conversation and CSI and assist communities in incorporating solutions.

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Strategy 1: Ocean Erodible Areas and Inlet Hazard Areas of Environmental Concern (AEC) Boundary Updates

I. Issue Area(s)

A. The proposed strategy or implementation activities will *primarily* support the following high-priority enhancement area(s) *(check no more than two):*

☐ Aquaculture
☐ Energy and Government Facility Siting
X Coastal Hazards
☐ Ocean/Great Lakes Resources
☐ Special Area Management Planning
☐ Cumulative and Secondary Impacts
☐ Wetlands
☐ Marine Debris
☐ Public Access

B. The proposed strategy or implementation activities will also support the following enhancement areas *(check all that apply)*:

☐ Aquaculture
☐ Energy and Government Facility Siting
☐ Coastal Hazards
☐ Ocean/Great Lakes Resources
☐ Special Area Management Planning
☐ Cumulative and Secondary Impacts
☐ Wetlands
☐ Marine Debris
☐ Public Access

II. Strategy Description

A. The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

X A change to coastal zone boundaries;
X New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
☐ New or revised local coastal programs and implementing ordinances;
☐ New or revised coastal land acquisition, management, and restoration programs;
☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
☐ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. ***Strategy Goal: Ocean Hazard Area Erosion Rates, Setbacks & Areas of Environmental Concern (AEC) Boundary Updates***.

The objective is to update oceanfront and inlet shoreline change rates, which will, in turn, be used to update construction setbacks and Ocean Erodible Areas and Inlet Hazard Areas of Environmental Concern (AEC) boundaries based on current data. These two AEC boundaries account for most of NC's Ocean Hazard Areas

C. Description

Measuring short-term changes rates can be difficult given the constant influences that wind and tide have on a shoreline's position. Without attention given to the variability a shoreline's position at any given hour or day, the potential exists for introducing a large degree of error. For this reason, a long-term method is used on the oceanfront to reduce measurement error by averaging it over the total time interval of the study. The longer the time interval between the early dates and most recent dates, the less error there is in the erosion rate. A fifty-year time interval was initially chosen as optimum because it is long enough to provide an acceptable level of data accuracy (+/-1 foot), and short enough to reflect significant changes both regional and local.

DCM uses erosion rates for two purposes: 1) construction setbacks based on erosion rates and measured from the vegetation line, and; 2) defines the landward boundary of the Ocean Erodible Area of Environmental Concern by multiplying the setback factor times ninety, and measured landward from the vegetation line; and similarly, defines the landward boundary of the Inlet Hazard Area by multiplying the erosion rate times ninety, but measured from a hybrid-vegetation line that represents the landward-most position of historic vegetation lines. Since 1979, erosion rate updates have generally occurred once every five years.

III. Needs and Gaps Addressed

The primary need is continued commitment to a recurring process of updating erosion rates based on the latest available data and evolving environmental conditions. This ensures that the most accurate and up-to-date information is consistently integrated into risk assessments. These updated erosion rates are critical for guiding the planning and placement of new construction projects, enabling them to be appropriately sited to minimize exposure to erosion-related risks. By leveraging current data, this approach supports more informed decision-making, enhances resilience, and reduces the potential for costly future impacts caused by outdated or inaccurate risk evaluations.

IV. Benefits to Coastal Management

Regularly updating erosion rates based on current data and conditions offers significant benefits to coastal management, including:

- Improved Risk Assessment: Accurate and up-to-date erosion data helps identify areas most vulnerable to coastal erosion, enabling more precise risk assessments for communities, infrastructure, and ecosystems.
- Proactive Planning and Development: By understanding the current erosion dynamics, coastal managers can make informed decisions about where to site new construction, avoiding areas with high erosion risks and reducing potential damage and costs.
- Enhanced Resilience: Incorporating updated erosion data into coastal management plans helps build resilience against impacts from rising sea levels and increased storm intensity, by allowing for adaptive strategies based on real-time conditions.
- Protection of Natural Habitats: Accurate erosion data can inform strategies to protect and restore critical habitats, such as dunes, wetlands, and mangroves, which act as natural buffers against coastal erosion.
- Cost Savings: Preventing construction in high-risk areas reduces the need for costly repairs, relocations, or emergency measures, saving resources in the long term.

- Support for Regulatory Compliance: Regularly updated data ensures that coastal management practices align with evolving regulations and policies, fostering sustainable development and environmental protection.
- Community Safety and Awareness: Providing communities with current information about erosion risks enhances public awareness and promotes safer land use practices, reducing the potential for loss of life and property damage.

By integrating these updates into coastal management strategies, stakeholders can ensure more sustainable, resilient, and effective management of coastal zones

V. Likelihood of Success

Based on the availability of readily accessible data, modern efficiencies in mapping and data analysis technology, and staff expertise, it is anticipated that this goal will be achieved as planned.

I. Strategy Work Plan

Because the Division has started using least-squares regression (linear regression) to calculate erosion rates, multiple shorelines are included in the analysis to capture more short-term variations in shoreline position. It is anticipated that most of the timeline will be dedicated to data collection followed by the analyses and rule amendment process in the fourth and fifth years.

Strategy Goal: Ocean Hazard Areas Erosion Rates, Setbacks & Areas of Environmental Concern (AEC) Boundary Updates.
Total Years: 5 years
Total Budget: Staff time **$650,000**

Year(s): 1-3 years
Description of activities: In years 1-3, activities will be focused on data collection to capture oceanfront and inlet shorelines and vegetation lines. These datasets are primarily derived through the interpretation of aerial imagery. Oceanfront shorelines are delineated based on the visible wet-dry line, while vegetation lines are digitized using the seaward extent of stable coastal vegetation. As new aerial imagery becomes available, it is processed and digitized to update and enhance the Division's spatial database. While currently not as common, oceanfront shorelines may be derived from topographic data mean high water (MHW) interpretations
Major Milestone(s): ongoing coordination with federal, state, local governments and academia for data sharing purposes.
Budget:
Year 1: $130,000
Year 2: $130,000
Year 3: $130,000
Total Years 1-3: $390,000

Year(s): 4-5 years
Description of activities: Once data collection is complete, the next phase will focus on analyzing the data and preparing technical reports to summarize the findings.

For the oceanfront, long-term average annual erosion rates are calculated using least squares regression analysis. The resulting raw erosion rates are then statistically grouped into shoreline sections, or "blocks," with similar erosion characteristics. These blocked erosion rates serve as the basis for the North Carolina Coastal Resources Commission's (CRC) determination of oceanfront development setbacks, which are adjusted according to both the erosion rate and the size of proposed structures.

Additionally, the landward boundary of the Ocean Erodible Area of Environmental Concern (AEC) is updated by multiplying the blocked erosion rate by 90, representing a 90-year planning horizon. This calculated distance is then measured landward from the vegetation line, pre-project vegetation line, or designated measurement line, depending on the applicable reference feature.

For Inlet Hazard Areas of Environmental Concern, the methodology is similar but incorporates a hybrid-vegetation line. This line represents the landward-most extent of vegetation observed over the study period and accounts for the significant variability in inlet shoreline position caused by natural cycles of erosion and accretion. The use of a hybrid-vegetation line provides a more stable and conservative basis for measuring the landward AEC boundary in these dynamic environments.

Upon completion and approval of the studies and accompanying reports by the CRC, regulatory amendments are initiated to formally incorporate the updated erosion rates and AEC boundaries into state coastal management rules.

Major Milestone(s): 1) completion of the report, 2) get NC CRC's approval, 3) Final adoption of rule amendments.
Budget:
Year 4: $130,000
Year 5: $130,000
Total Years 4-5: $260,000

VI. Fiscal and Technical Needs

A. Fiscal Needs: Historically, funds have been sufficient to achieve this goal.

B. Technical Needs: Since 2002, the Division has had sufficient staff with access to necessary mapping technology to achieve this goal.

VII. Projects of Special Merit (Optional)

To be determined

Strategy 2: Wetland Mapping and Assessment for Strategies that Mitigate and Address Impacts from Erosion and Drowning

II. Issue Area(s)

A. The proposed strategy or implementation activities will *primarily* support the following high-priority enhancement area(s) *(check no more than two):*

☐ Aquaculture
☐ Energy and Government Facility Siting
☐ Coastal Hazards
☐ Ocean/Great Lakes Resources
☐ Special Area Management Planning
☐ Cumulative and Secondary Impacts
X Wetlands
☐ Marine Debris
☐ Public Access

B. The proposed strategy or implementation activities will also support the following enhancement areas *(check all that apply)*:

☐ Aquaculture
☐ Energy and Government Facility Siting
☐ Coastal Hazards
☐ Ocean/Great Lakes Resources
☐ Special Area Management Planning
x Cumulative and Secondary Impacts
☐ Wetlands
☐ Marine Debris
☐ Public Access

III. Strategy Description

A. The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

☐ A change to coastal zone boundaries;

☐ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;

☐ New or revised local coastal programs and implementing ordinances;

☐ New or revised coastal land acquisition, management, and restoration programs;

☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,

X New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. **Strategy Goal:** Map areas within North Carolina where coastal wetlands are at risk of drowning and erosion and identify site-specific protection strategies

C. Description

DCM places a high value on coastal wetlands due to their ecosystem and resilience services. While coastal wetlands are protected by law and regulation in North Carolina, coastal wetlands still experience losses due to erosion and drowning. Coastal wetlands are lost by short term processes such as erosion by storms, boat wakes, and tidal currents. Coastal wetlands can also be drowned by longer-term

processes due to inadequate rates of sediment accretion. Increased development and resulting human-made barriers can impact the ability of coastal wetlands to move further inland, resulting in coastal squeeze of wetlands.

DCM is interested in strategies to mitigate squeeze and drowning, including thin layer sediment placement, expanded use of living shorelines, restoration, and preservation of migration/transgression opportunities. Potential strategies need to be evaluated for site suitability and feasibility given various environmental and economic constraints.

One of the primary focus areas of this strategy will be continued work on thin layer placement (TLP). TLP is an emerging technique in North Carolina for the purpose of coastal wetland restoration or as an enhancement strategy. TLP is when material (dredged sediment) is intentionally placed on a wetland to increase its elevation while maintaining the hydrology and inundation duration necessary for native wetland vegetation to persist. Traditionally, dredged material from routine navigational channel maintenance is placed in an approved upland or submarine disposal area. TLP would allow for this material to be beneficially used by increasing wetland elevation in areas that are not naturally accreting quickly enough.

In 2022, the NCCMP published a guidance document regarding TLP, highlighting site assessment protocols and monitoring plans that are important for project scoping, interagency permitting reviews, and future outcome evaluations (https://www.deq.nc.gov/nc-thin-layer-project-guidance/open). The document explains that TLP projects should establish quantitative objectives, assess the suitability of the site, and develop a monitoring plan with success criteria before proceeding. Additionally, the 2022 guidance document recommends that TLP should be considered only if the likelihood of wetland restoration success is high, and that project's primary purpose should be to restore or enhance a degraded marsh, not simply for the convenient disposal of dredged material.

Work towards mapping of thin layer placement (TLP) locations was initiated under the previous 309 strategy, however, due to capacity limitations, work under the previous strategy has not advanced as far as planned. DCM will continue TLP work while also incorporating efforts for assessment and evaluation of other strategies, as feasible. This work will also incorporate and draw upon efforts undertaken by the EO 305 workgroup. DCM will also continue collaborations focused on identifying appropriate locations for, and use of, living shorelines in wetland protection.

IV. Needs and Gaps Addressed

Currently, the DCM does not have spatial data to support siting decisions for TLP projects, such as marsh health, threats, and likelihood of TLP success. In addition, the DCM's rules do not allow filling of coastal wetlands through direct permitting. If an application is submitted to use TLP, that application will be denied, and the applicant has the option to apply for a variance from the Coastal Resources Commission. Mapping suitable areas for TLP will aid in permit review of TLP projects through a variance.

DCM encourages communities to include solutions such as living shorelines in the Comprehensive Land Use Plans, as well as to incorporate nature-based features into the design of water access sites to applying for funding from the Beach and Waterfront Access Grant program. Updated mapping will allow the communities to easily determine where such features are feasible and facilitate incorporating them into their plans.

V. Benefits to Coastal Management

This program change will improve decision making around projects that restore and enhance existing coastal wetlands, allowing for informed decisions making around mitigation for environmental changes occurring to wetlands from the various stressors. This program change will also allow for beneficial use of good quality dredged material through use of TLP. As discussed, coastal wetlands are important for their ecosystem services and resilience benefits. Protection and restoration of coastal wetlands improves their resilience, which in turn provides socioeconomic and ecological benefits to adjacent communities. Mapping of areas suitable for TLP and other strategies will allow for better decision-making by DCM, communities, and other partners.

VI. Likelihood of Success

The likelihood of success is high. DCM has already been engaging on many aspects of wetland mapping and assessment and this work will build upon ongoing efforts. DCM has guidance in place for thin layer placement as well as a strategy for living shorelines, and has been engaging with partners on the various approaches. Mapping work will build upon work that has been performed by the wetlands working group under EO 305.

VII. Strategy Work Plan

VIII.

Strategy Goal: Map areas within North Carolina where coastal wetlands are at risk of drowning and may be suitable candidate sites for protection strategies
Total Years: 5
Total Budget: $650,000

Year(s): 1-3
Description of activities: In years 1-3, activities will be focused on stakeholder engagement, development of workplan, and data collection. DCM has cooperative relationships with NOAA wetlands ecologists at the NOAA NCCOS Beaufort Laboratory, and with scientists at the U.S. Fish and Wildlife Service, as well as the U.S. Geological Survey. DCM will be using data from surface elevation tables, LiDAR, and aerial imagery, and exploring tools like USGS' Unvegetated to Vegetated Ratio (UVVR) decision support tool. Activities will include:

- Stakeholder engagement
- Creation of a technical working group
- Identification of proper techniques to map at-risk wetlands
- Development of a strategy and workplan
- Data collection
- Mapping and assessment of areas where wetlands are most at risk
- Identification of areas suitable for wetland protection and restoration strategies

Major Milestone(s):

- Hire a permanent coastal wetland specialist
- Form a technical working group
- Develop strategy and workplan
- Finalize appropriate mapping methodologies
- Prioritize areas of coastal wetlands that will be mapped

Budget:

Year 1: $130,000
Year 2: $130,000
Year 3: $130,000
Total Years 1-3: $390,000

Year(s): 4-5

Description of activities: Activities in years 4-5 will focus on developing and updating products and disseminating information. Activities will include:

- Development of maps, tools and products to share information
- Update guidance documents, including the 2022 TLP guidance
- Ongoing coordination with other organization to facilitate implementation of wetland strategies

Major Milestone(s):

- Maps published
- TLP guidance updated

Budget:

Year 4: $130,000
Year 5: $130,000
Total Years 4-5: $260,000

IX. Fiscal and Technical Needs

A. Fiscal Needs: Historically, funds have been sufficient to achieve this goal.

B. Technical Needs: DCM has had sufficient staff with access to necessary mapping technology to achieve this goal.

X. Projects of Special Merit (Optional)

DCM may pursue projects of special merit focused on planning and facilitating salt marsh migration.

5-Year Budget Summary by Strategy

Strategy Title	Anticipated Funding Source (309 or Other)	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Ocean Erodible Areas and Inlet Hazard AEC Boundary Updates	309	$130,000	$130,000	$130,000	$130,000	$130,000	$650,000
Wetland mapping and assessment	309	$130,000	$130,000	$130,000	$130,000	$130,000	$650,000
Administration	309	$125,000	$125,000	$125,000	$125,000	$125,000	$625,000
Total Funding	309	$385,000	$385,000	$385,000	$385,000	$385,000	$1,925,000

Summary of Stakeholder and Public Comment

DCM developed a stakeholder survey to gather input on priority enhancement areas and issues impacting the coastal zone. The survey was shared with DCM's contacts from various ongoing programs, including Resilient Coastal Communities Program and Public Access Grants Program. Contact list was supplemented with additional publicly available contacts for county, municipal, and non-profit entities. Survey link was also shared at the Coastal Resources Advisory Group meeting, Coastal Resources Commission meeting, and posted on the DEQ website. Coastal Review published an online article about the availability of the survey - https://coastalreview.org/2024/10/online-survey-to-help-guide-coastal-management-strategies/.

DCM received 37 responses to the survey. The respondents selected wetlands, coastal hazards, and cumulative and secondary impacts as the top three most important priority areas. Within these topics, some of the most common issues identified by respondents included sea level rise, flooding, overdevelopment and development impacts , and habitat loss.

In addition, DCM organized focused 309 input sessions with staff and conducted in-depth conversations with key partners who are familiar with DCM's core mission and work, including staff from The Nature Conservancy, Coastal Federation, NC Office of Resiliency and Recovery, and NC Sea Grant. These

conversations focused on discussing major issues impacting the coastal region as well as needs connected to addressing various challenges.

The draft Section 309 Assessment and Strategy document will be posted for public comment and this section will be updated with feedback received during the public comment period.