South Carolina
Coastal Management Program
Assessment and Strategy

2026 to 2030

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Introduction

The National Coastal Zone Management Program, administered by the National Oceanic and Atmospheric Administration (NOAA), is a voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories authorized by the Coastal Zone Management Act (CZMA) of 1972 to address national coastal issues. The act provides the basis for protecting, restoring, and responsibly developing our nation's diverse coastal communities and resources. The South Carolina Coastal Zone Management Program (SCCZMP) was established under the guidelines of the national CZMA and was authorized in 1977 under SC's Coastal Tidelands and Wetlands Act (S.C. Code of Laws §48-39-110 *et seq*.) with the goal of achieving balance between the appropriate use, development, and conservation of coastal resources in the best interest of all citizens of the state. The South Carolina Department of Environmental Services Bureau of Coastal Management (SCDES BCM) is responsible for implementing the federally approved SCCZMP through the authorities specified in the Coastal Tidelands and Wetlands Act, the South Carolina Coastal Division Regulations, and the enforceable policies of the South Carolina Coastal Program Document. SCDES BCM has direct permitting authority for proposed activities within the state's critical areas, which are defined as coastal waters, tidelands, beaches, and the beach/dune system (S.C. Code Ann. Regs 30-1.D). SCDES BCM also has broader management authority over activities within the eight-county coastal zone through consistency certification of both federal and state permits, federal licenses, Outer Continental Shelf activities, and requests for federal funding assistance.

Under Section 309 of the national CZMA (the Coastal Zone Enhancement Program), state and territory coastal management programs are encouraged to pursue strategies aimed at improving their coastal programs. Every five years, states and territories review their programs and gather stakeholder feedback to identify high priority needs and opportunities for program enhancement. The programs then work with NOAA to develop multi-year improvement strategies that focus on one or more of the priority enhancement goals. A summary of South Carolina's current Section 309 strategies (2021-2025 cycle) is provided in the section below.

Summary of Recent Section 309 Achievements

SCDES BCM submitted a program change request in August 2024 in accordance with 15.CFR part 923, and the request was approved by NOAA on October 25, 2024. The program change incorporated minor, non-substantive changes to the SC Coastal Program resulting from Act 60 of the South Carolina 2023-2024 Legislative Session. Act No. 60 restructured the South Carolina Department of Health and Environmental Control (DHEC) into the South Carolina Department of Public Health (SCDPH) and the South Carolina Department of Environmental Services (SCDES) effective July 1, 2024. The Act added S.C. Code Section 48-6-20, which provides that all the functions, powers, and duties of the environmental divisions, offices, and programs of DHEC are vested within SCDES as of the law's effective date. As such, the former DHEC Office of Ocean and Coastal Resource Management transitioned to SCDES and became the Bureau of Coastal Management, which will continue to administer the SC Coastal Management Program.

Additional formal program change requests are anticipated for both statutory and regulatory changes, including the regulatory changes for living shorelines described below, implemented under the SC Coastal Management Program.

Living Shorelines (2016-2020 cycle)

Following extensive research performed by the South Carolina Department of Natural Resources (SCDNR) and stakeholder engagement with the South Carolina Living Shorelines Working Group, new living shoreline regulations were introduced to the South Carolina General Assembly during the 2021 legislative session. The regulations, which include a living shoreline definition and project standards, were approved and became effective May 28, 2021. Additionally, several outreach products associated with this 309 strategy were finalized in 2021, including an SCDES BCM Living Shoreline webpage, Clemson Extension's Living Shoreline website, and a South Carolina Living Shoreline Explorer application. In early 2024, a collaboratively developed Living Shorelines Training Program, hosted by Clemson Extension, was also launched in South Carolina. Clemson Extension developed multiple training tracks including a certification path geared toward professionals interested in offering living shoreline installation services in the state. This path included online course content, as well as an in-person field day. Clemson Extension also developed a non-certification track, which includes the online course content without the required field day. This path was designed for a non-professional audience interested in learning more about living shorelines, such as property owners. This track was also utilized internally by the SCCZMP to train staff, including project managers that are responsible for reviewing living shoreline permit applications, issuing living shoreline permits, and conducting compliance inspections on living shoreline installations. This training opportunity and registration information are featured on Clemson Extension's Living Shoreline website under Training & Education Opportunities.

Coastal Hazards (2021-2025 cycle)

The SCCZMP has successfully migrated Emergency Operations field data collection activities for Beachfront Structural Inventory and Post-Disaster Damage Assessment into ESRI ArcGIS Field Maps and Survey123. In 2022, new standard operating procedures were developed, staff were trained on the new field procedures, and teams were deployed with the ESRI applications for the first time. Since 2022, SCCZMP staff have built an internal application to streamline the processing of emergency operations field data. The application allows for field team monitoring, data review, flagging structures that require additional evaluation, and data summarization for internal and external reporting.

In late 2024, the SCCZMP released the first phase of a new tool to communicate beachfront structural inventory data (habitable structures, pools, and erosion control structures) with local and municipal government staff. The Local Government Dashboard will be expanded to include a second phase, which will feature event-specific, post-disaster damage assessment information collected by the SCCZMP.

Additionally, the SCCZMP's Beach Atlas product has been redesigned as an ESRI ArcGIS Story Map and expanded upon to capture a broader range of Coastal Program efforts, not just those associated with the beachfront. The rebranded South Carolina Coastal Atlas includes information on SCCZMP history, regulatory responsibilities, and programmatic initiatives. The public-facing Coastal Atlas also highlights data, tools, and services provided by the Coastal Program, as well as staff contact information. In early 2025, the SCCZMP's Coastal Atlas received a 2024 Notable State Documents Award from the South Carolina State Library.

Marine Debris (2021-2025 cycle)

In 2021, Coastal Program staff began engaging marine debris stakeholders and conducting in-depth research on planned efforts to pilot a vessel turn-in program (VTIP) and fiberglass vessel hull recycling in South Carolina. Staff gathered stakeholder feedback and guidance from states with operational (Texas)

and planned (Florida) VTIPs. In the fall of 2023, staff began developing outreach materials and identifying target locations for promotion. The team developed a rack card and one-page document to hand out at select locations and share with partners, as well as a webpage to feature the pilot program. Staff began promoting the pilot VTIP in January 2024 utilizing a "roadshow" technique. Between January and March, staff shared outreach materials at 174 locations including local government offices, libraries, hardware stores, seafood and grocery stores, bait/tackle/sporting goods stores, local parks, marinas, boat ramps, ferry terminals, and yacht clubs. During this time, staff also developed, released, and actively promoted an online ESRI ArcGIS Survey123 application for individuals interested in participating in the VTIP. As of late 2024, the SCCZMP had received 71 applications to dispose of boats through the pilot program. In June 2024, two VTIP contracts were awarded, and staff began working directly with contractors on VTIP planning and logistics. During this time, the SCCZMP was informed by one of its contractors that, after a thorough investigation of shredding equipment locally, nationally, and internationally, they were unable to locate equipment that could feasibly shred fiberglass to the required dimensions, at the time. As a result, an alternate disposal pathway was needed for fiberglass material resulting from the pilot project, and the SCCZMP issued a change order for landfilling fiberglass vessel hull material. Over the course of four weeks between late November and late December 2024, 13 approved VTIP vessels (approximately 260 linear feet) were accepted and destroyed as part of the pilot program. These vessels included 10 motorboats and three sailboats. The boats ranged from 13-27 feet in length. Additionally, three outboard motors were accepted and destroyed. In total, 35,440 pounds (17.7 tons) of material was disposed of in a landfill, while 5,854 pounds (2.9 tons) of metal was recycled. As part of the pilot effort 123 gallons of fuel/oil was also disposed of safely. In early 2025, the SCCZMP began analyzing costs associated with the pilot effort to determine next steps.

Also under this strategy, the SCCZMP has been working with Blue Urchin LLC, developers of the MyCoast application, to enhance South Carolina's MyCoast platform. Specifically, the Coastal Program is building a vessel database to illustrate vessels within the coastal zone that are currently under investigation by the state, as well as vessels that have been removed from the coastal zone. The SCCZMP is working closely with the South Carolina Department of Natural Resources (SCDNR), the primary state agency that handles vessel investigations. In early January 2025, the SCCZMP met with SCDNR Law Enforcement staff to demo a beta version of the database and gather feedback. Blue Urchin is currently implementing recommended improvements, and an enhanced beta version of the database will be released for internal testing with SCDES BCM and SCDNR Law Enforcement staff in the first quarter of 2025, prior to finalization and public release. The vessel database is intended to highlight the current state of the abandoned and derelict vessel (ADV) problem in the coastal zone and to reflect collaborative efforts to mitigate the problem. This project also aims to improve derelict vessel communication and coordination between the SCCZMP and partners by routing public MyCoast vessel reports to appropriate federal, state, and local contacts for review.

Stakeholder Engagement

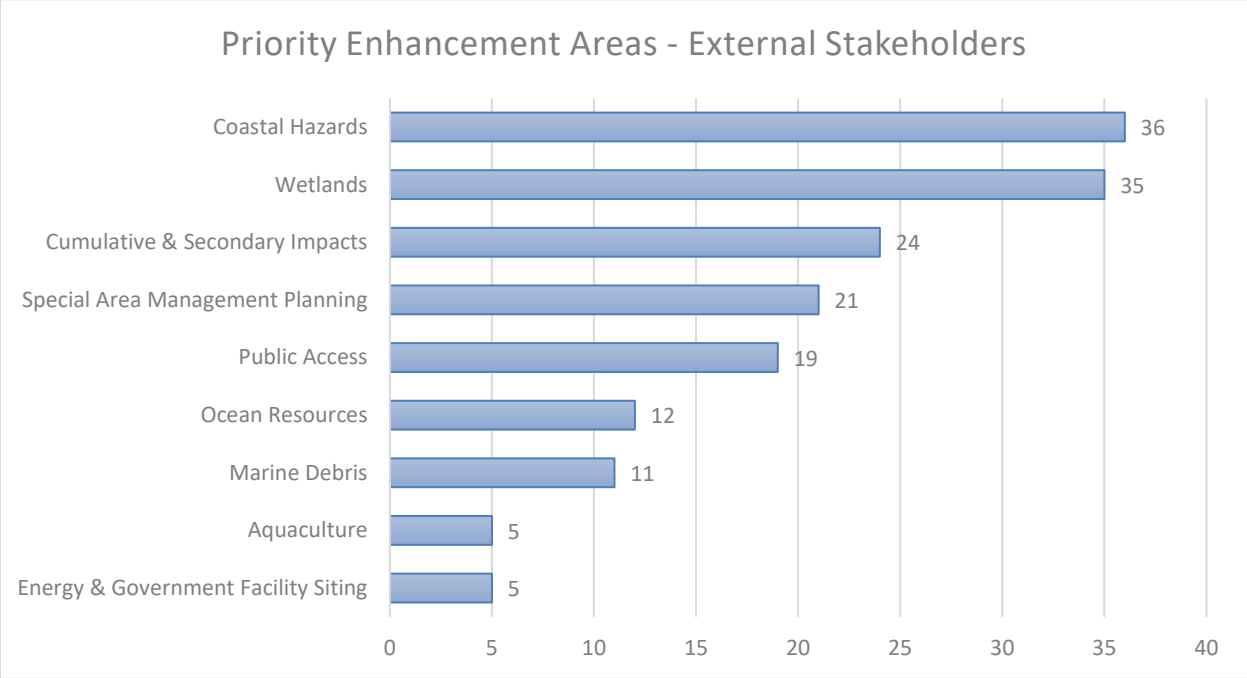
External Feedback

SCDES BCM shared an electronic form with stakeholders in August 2024 to gather feedback on priority focus areas for the SCCZMP. The form was distributed to approximately 200 external stakeholders, and 42 responses were received. Respondents represented federal, state, and local/county governments, non-government organizations, academia, and the private sector (with services including law, environmental/engineering, surveying, and real estate). Over half of the respondents (27) represented government organizations, with most responses representing state (15) and local/county (10)

governments. Non-government organizations, academia, and private sector respondents were equally represented with 5 responses each.

Stakeholders were presented with the nine enhancement areas and asked to choose the four areas they felt should be the highest priority for the SCCZMP. As shown in the figure below, Coastal Hazards and Wetlands were most frequently identified within the top four priority enhancement areas, with 36 and 35 respondents identifying these as priority areas, respectively.

Number of External Stakeholders that Identified Each Enhancement Within Their Top Four Priorities



Stakeholders were also asked to rank these four high-priority areas from most important (Priority #1) to least important (Priority #4). Twenty-one (21) respondents identified Wetlands as their highest priority area (Priority #1), followed by Coastal Hazards (8), and Cumulative & Secondary Impacts (7). Twelve (12) respondents identified Wetlands as their second highest priority area (Priority #2), followed by Coastal Hazards (11), and Cumulative & Secondary Impacts (5). Ten (10) respondents identified Coastal Hazards as their third highest priority area (Priority #3), followed by Public Access (8), and Cumulative & Secondary Impacts (5). Nine (9) respondents identified Special Area Management Planning as their fourth highest priority area (Priority #4), followed by Marine Debris (7), and Coastal Hazards (6).

For each priority enhancement area, stakeholders were also asked to identify the greatest associated needs and/or opportunities. For the Wetlands enhancement area, Mapping/GIS and Regulatory/Policy needs were most frequently identified. Several stakeholders mentioned the need for increased wetland protection at the state level, considering the Supreme Court's Sackett v. EPA ruling. Stakeholders mentioned the need to map/inventory wetlands and subsequently prioritize those with the greatest need for protection. Consideration of regulatory pathways for the use of thin-layer placement, beneficial use of dredged material, and other nature-based solutions in wetland areas were also suggested. Additional research and analysis related to marsh migration and erosion rates, given sea level rise projections, were also identified as needs and opportunities.

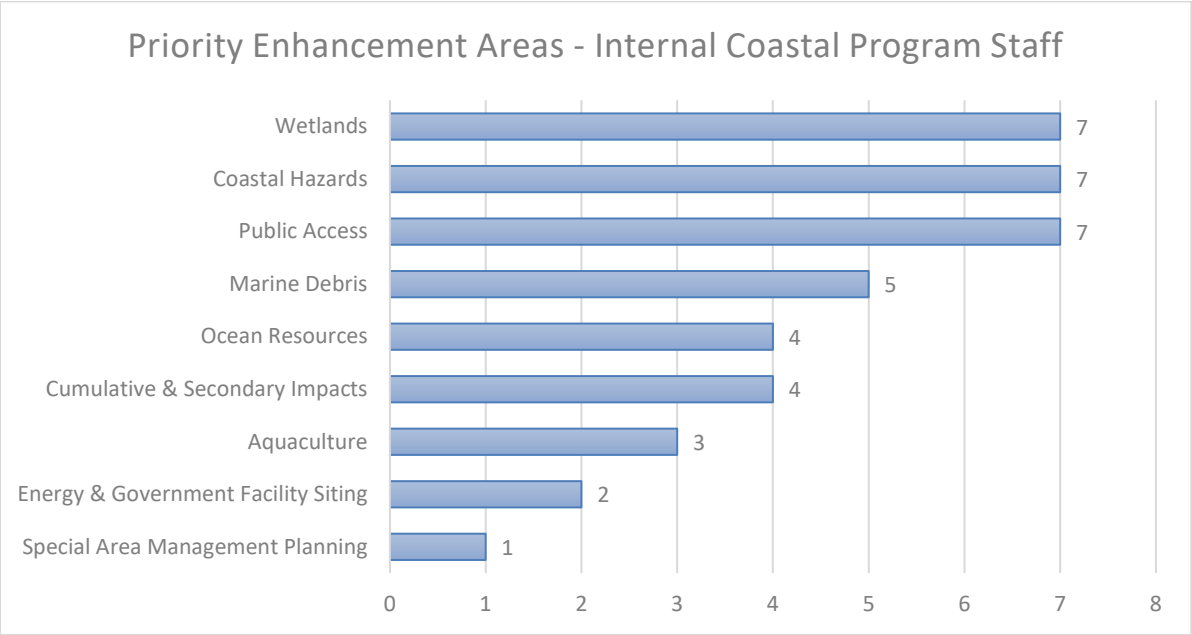
For the Coastal Hazards enhancement area, Regulatory/Policy, Communication & Outreach, and Decision-support Tools were identified as the greatest needs. Stakeholders identified Regulatory/Policy needs and Decision-support tools to aid the siting of infrastructure and to aid in permitting decisions, particularly at the local level. Some stakeholders emphasized the need to protect the state's beaches and beachfront properties, while others suggested the need for stronger limits on building on the beachfront. Nature-based solutions were mentioned as well, with a need for more research and permitting pathways. The need and opportunity for enhanced communication was also noted by several stakeholders to improve awareness of coastal hazards and the risk associated with living on the coast.

Stakeholders identified Regulatory/Policy, Research, and Communication & Outreach as the greatest needs related to Cumulative & Secondary Impacts. Many stakeholders identified the need for more research and better modeling and assessment for understanding the complexities around cumulative and secondary impacts from increased population growth and development along the coast. Also noted was the need for data management and decision-support tools to guide strategic growth and to better evaluate the implications of permitting actions. Several stakeholders suggested the need for improved communication and communication tools to increase understanding around cumulative and secondary impacts, as well as the value of natural resources and the potential for nature-based solutions.

Internal Feedback

The electronic feedback form that was provided to external stakeholders was also shared internally, with Coastal Program staff to gather input on priority enhancement areas. Ten (10) internal responses were received. As with external stakeholders, staff were presented with the nine enhancement areas and asked to choose the four areas they felt were the highest priority for the SCCZMP. As shown in the figure below, Coastal Hazards, Wetlands, and Public Access were most frequently identified within the top four priority enhancement areas, with each area being a top priority for seven (7) respondents. Following these enhancement areas, Marine Debris was the next area mentioned most frequently as a top priority, with five (5) respondents prioritizing this area.

Number of Internal Staff that Identified Each Enhancement Area Within Their Top Four Priorities



Staff also ranked their four high-priority areas from most important (Priority #1) to least important (Priority #4). Four (4) staff identified Coastal Hazards as their highest priority area (Priority #1), followed by Public Access (3), and Wetlands (2). Wetlands and Marine Debris were each identified by three (3) staff as their second highest priority area (Priority #2), followed by Coastal Hazards (2). Ocean Resources and Cumulative & Secondary Impacts were identified most frequently as the third highest priority (Priority #3). Three (3) staff identified Public Access as their fourth highest priority area (Priority #4), followed by Aquaculture and Cumulative & Secondary Impacts, each with two (2) responses.
For each priority enhancement area, staff were also asked to identify the greatest associated needs and/or opportunities. For the Wetlands enhancement area, Communication & Outreach, Mapping/GIS and Regulatory/Policy needs were most frequently identified. Staff mentioned the need for better data, and tools to help with decision-making. Staff noted that research to improve understanding of the status and trends of wetlands, as well as the implications of permitting activities in the wetlands critical area, could help inform regulatory/policy changes to improve wetlands management. The need for communication and outreach related to wetlands was also identified as a need.

For the Coastal Hazards enhancement area, Communication & Outreach, Data & Information Management and Regulatory/Policy were identified as the greatest needs. Staff identified the need for data, research, and analysis to better understand the potential threats to the coast and local communities to provide greater assistance to local governments. The need for outreach and education was also highlighted by staff.

Communication & Outreach and Regulatory/Policy were identified as the greatest needs related to the Public Access enhancement area. Improved public access to all coastal resources and creating more public access to resources in underserved regions were noted as priorities.

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.

   The following information and tables characterize the extent, status, and trends of wetlands in the South Carolina coastal zone. This information was obtained from NOAA's Land Cover Atlas and represents available data through 2016.

   Current state of wetlands in 2016 (acres): 1,988,800 acres (3,107.5 square miles)

   The overall trend shown in the Coastal Wetlands Status and Trends table on the following page is a net loss of wetlands (-22.5%) in coastal South Carolina between 1996 and 2016. There was a significantly greater loss to freshwater wetlands (-27.44%) than saltwater wetlands (-0.07%). There was also a net loss in wetlands from 2011 to 2016 (-1.01%), with a slightly greater loss to freshwater (-1.92%) than saltwater wetlands (-1.51%).

   In the How Wetlands Are Changing table on the following page, development is identified as the primary land cover type that has replaced the area previously categorized as wetlands during both time periods. The development category includes high intensity development, low intensity development, and open space development.

[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).

Coastal Wetlands Status and Trends

Change in Wetlands	from 1996-2016	from 2011-2016
Percent net change in total wetlands (% gained or lost)*	-22.5 %	-1.01 %
Percent net change in freshwater (palustrine wetlands) (% gained or lost)*	-27.44 %	-1.92 %
Percent net change in saltwater (estuarine) wetlands (% gained or lost)*	-0.07 %	-1.51 %

How Wetlands Are Changing

Land Cover Type	Area of Wetlands Transformed to Another Type of Land Cover between 1996-2016 (Sq. Miles)	Area of Wetlands Transformed to Another Type of Land Cover between 2011-2016 (Sq. Miles)
Development	39.01	3.94
Agriculture	3.36	0
Barren Land	7.38	0.14
Water	14.65	2.93

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.

    As noted in the table above, there have been significant changes in wetland management since the previous assessment. During the 2016-2020 Section 309 enhancement cycle, the SCCZMP pursued a Wetlands strategy focused on living shorelines. The goal of the strategy was to allow for a more efficient authorization process for living shorelines, encouraging their use over hardened structures, and to help ensure a project's design would accomplish its intended goals. As noted above in the

Summary of Recent Section 309 Achievements section, new living shoreline regulations were approved by the South Carolina General Assembly and became effective in 2021. Building upon this strategy, staff recently enhanced the electronic Living Shoreline Permit Application form within the agency's ePermitting system to improve the permit request process for external applicants and to ensure the agency was collecting all the information needed to adequately review proposed living shoreline projects. Additionally, staff thoroughly analyzed internal processes related to living shoreline permit application reviews and compliance inspections, have built internal workflows within ePermitting, and are working toward the development of an internal Living Shorelines Standard Operating Procedures (SOP) document to outline processes and provide guidance to staff. New guidance materials will be utilized by administrative, permitting, and compliance staff with the goal of achieving consistency and efficiency in each respective area.

The SCCZMP also recently made extensive improvements to processes associated with Tidelands Critical Area Line requests, delineations, processing, and certifications. In 2023, SCDES BCM requested legislative funding to address a substantial backlog in processing Tidelands Critical Area Line (CAL) requests. Recurring state funding was awarded to the agency during the 2023 legislative session, allowing the SCCZMP to hire additional CAL staff and to focus on process improvements. As part of this effort, new internal field-based trainings were developed for CAL vegetation identification in both the tidelands and beachfront environments. This training has been broadly offered to staff as part of a capacity-building strategy. Additionally, the SCCZMP conducted an in-depth review of internal CAL procedures to look for opportunities for process improvement. In 2024, the SCCZMP released an internal Tidelands CAL SOP documenting existing and enhanced procedures for staff training, field work associated with site visits and delineations, processing external CAL requests, and certifying CALs. The SOP will be a valuable resource for existing staff to ensure consistency in processes but will also serve as a critical resource for training new staff joining the Critical Area Permitting section.

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.

In recent years, the SCCZMP has made great strides in saltwater wetland management through regulation promulgation and process improvements associated with the tidelands and coastal waters critical areas. However, Phase I Wetland Assessment results continue to show a net loss of wetlands in South Carolina's coastal counties. Both external stakeholders and internal staff ranked this enhancement area as a high priority, with mapping/GIS and regulatory/policy needs most frequently identified. Specifically, external stakeholders mentioned the need to map/inventory wetlands and subsequently prioritize those with the greatest need for protection. Internal staff mentioned the need for better data, and tools to help with decision-making.

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

    The table below characterizes the level of risk to the South Carolina coastal zone and coastal communities from various hazards. These general risk levels were determined based on the data and information presented in the following sections.

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)	Earthquake Risk: H Tsunami Risk: L
Shoreline erosion	H
Sea level rise	H
Land subsidence	H
Saltwater intrusion	M
Other (please specify)	

[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*

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.

Flooding: Data on the number of people and critical infrastructure facilities in the South Carolina Coastal Zone that are within the designated 100-year floodplain was gathered from NOAA's Coastal County Snapshots tool on Digital Coast. Information on flood insurance claims within the Coastal Zone was also collected from Coastal County Snapshots. This data is summarized in the table below.

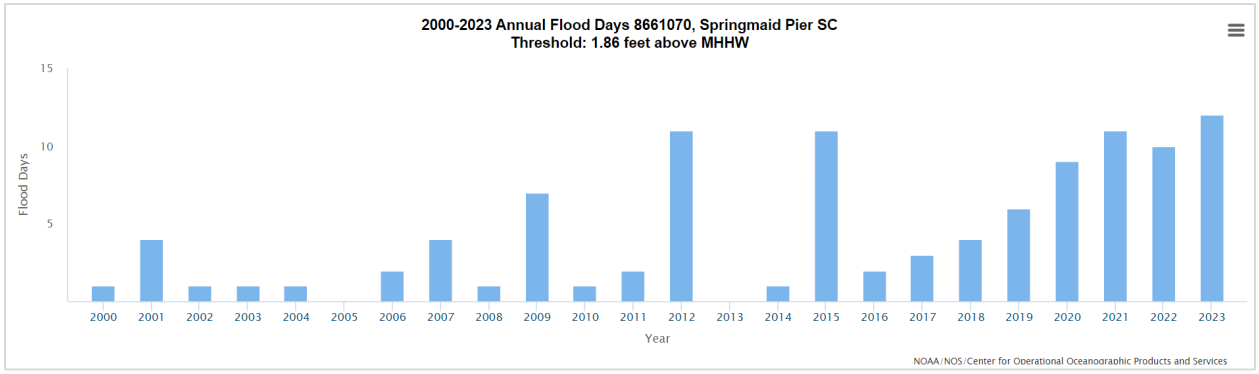
Number of people and critical infrastructure facilities in SC Coastal Counties located within the designated 100-yr floodplain	
Total Population in 100-year floodplain	1,389,893
Population in 100-year floodplain	396,837
Percentage of Population in 100-year floodplain	29%
Population over 65 in 100-year floodplain	80,149
Population in poverty in 100-year floodplain	49,076
Number of Schools in 100-year floodplain	35
Number of Police Stations in 100-year floodplain	8
Number of Fire Stations in 100-year floodplain	28
Medical Facilities in 100-year floodplain	8
Total Number of Critical Facilities in 100-year floodplain	79
Businesses in 100-year floodplain	9,800
Flood insurance claims in SC Coastal Counties	
Flood insurance claims (1991-2020)	23,844
Claim value in Millions (1991-2020)	$441
Claim value in Millions (2016-2020)	$323
Percentage of claims from most recent timeframe (2016-2020)	73.17%

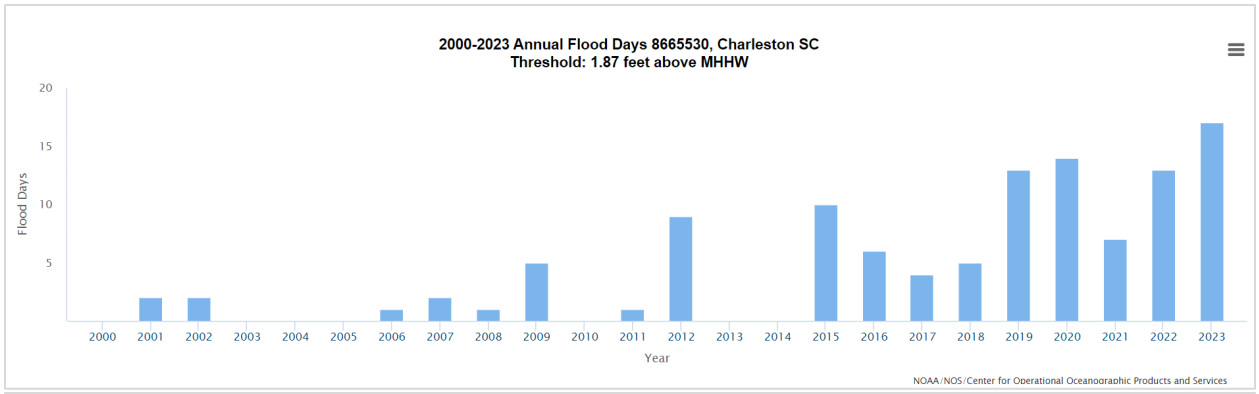
In addition to nearly one-third of the South Carolina coastal zone population residing in the floodplain, high tide flooding (HTF) is being observed at an increasing rate along the South Carolina coast. NOAA's 2021 State of U.S. High Tide Flooding and Annual Outlook report indicates that Charleston, SC experienced more than a 400% increase in high tide flooding frequency between 2000 (2 days) and 2020 (14 days).[4] During the 2023-2024 meteorological year, two of the three NOAA tide stations off the coast of South Carolina saw a record number of flood days with Charleston, SC experiencing 17 HTF days and Fort Pulaski, GA experiencing 18 HTF days. By 2050, NOAA projects 70 annual HTF days in the Charleston and Fort Pulaski areas, and 55 HTF days in the Springmaid Pier area, based on NOAA's intermediate sea level rise scenario. Historical annual flood days (2000-2023) for the three NOAA tide stations off the South Carolina coast are shown below,

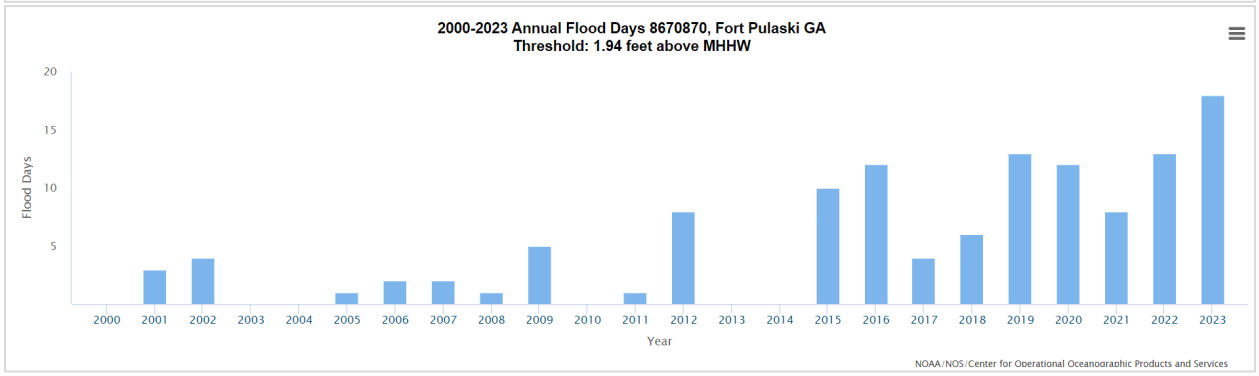
[4] https://tidesandcurrents.noaa.gov/publications/2021_State_of_High_Tide_Flooding_and_Annual_Outlook_Final.pdf

followed by figures illustrating NOAA observed/projected average annual high tide flooding days per decade (2000-2050) at these stations using the intermediate sea level rise scenario. [5]

Historical Annual Flood Days (2000-2023) at NOAA's Springmaid Pier, Charleston, and Fort Pulaski Tide Stations

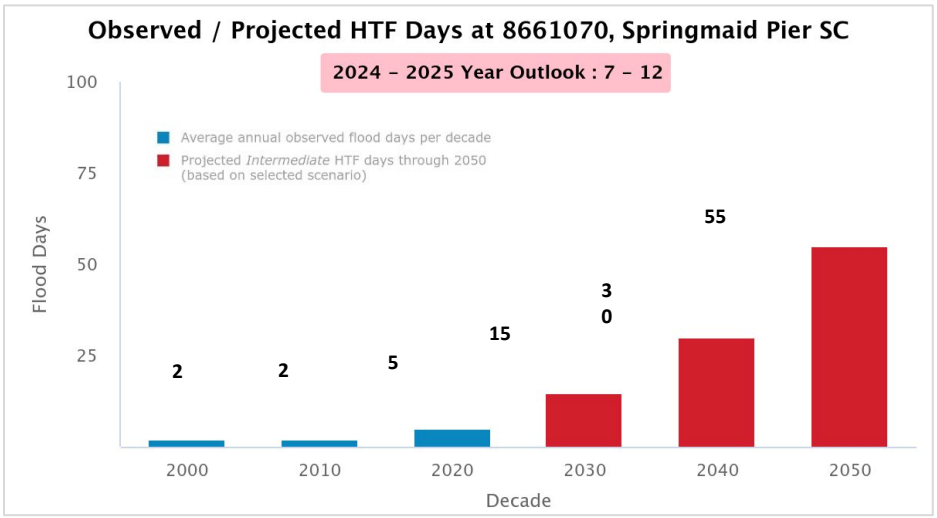


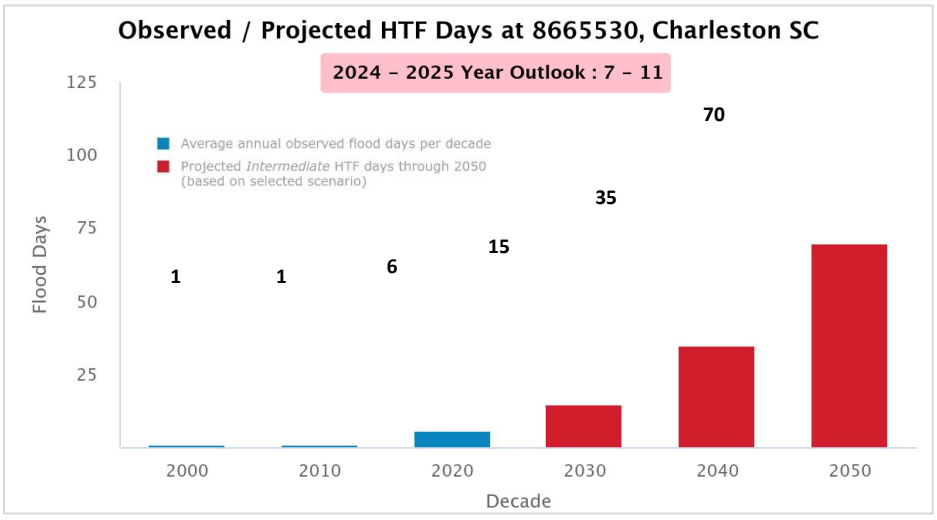


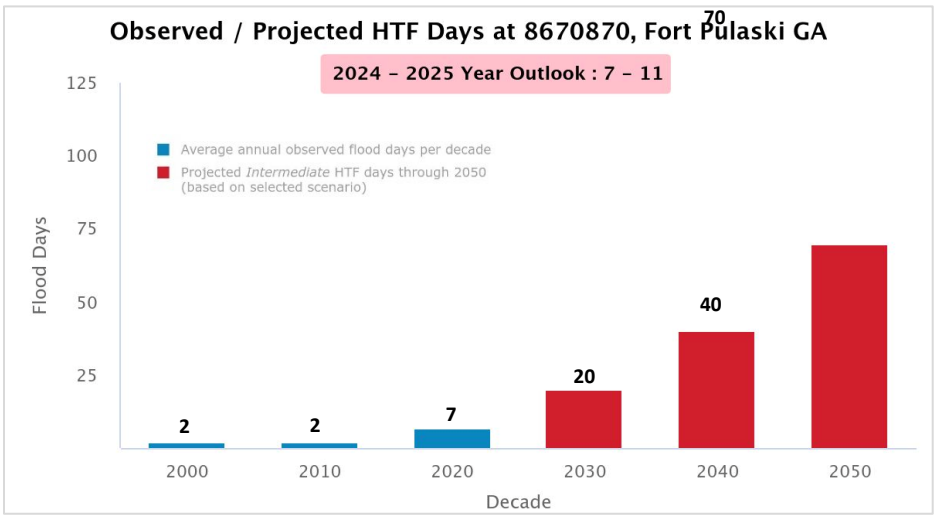


[5] https://tidesandcurrents.noaa.gov/high-tide-flooding/annual-outlook.html

Observed and Projected Average Annual High Tide Flooding Days per Decade (2000-2050) at Springmaid Pier, Charleston, and Fort Pulaski Tide Stations Using NOAA's Intermediate Sea Level Rise Scenario

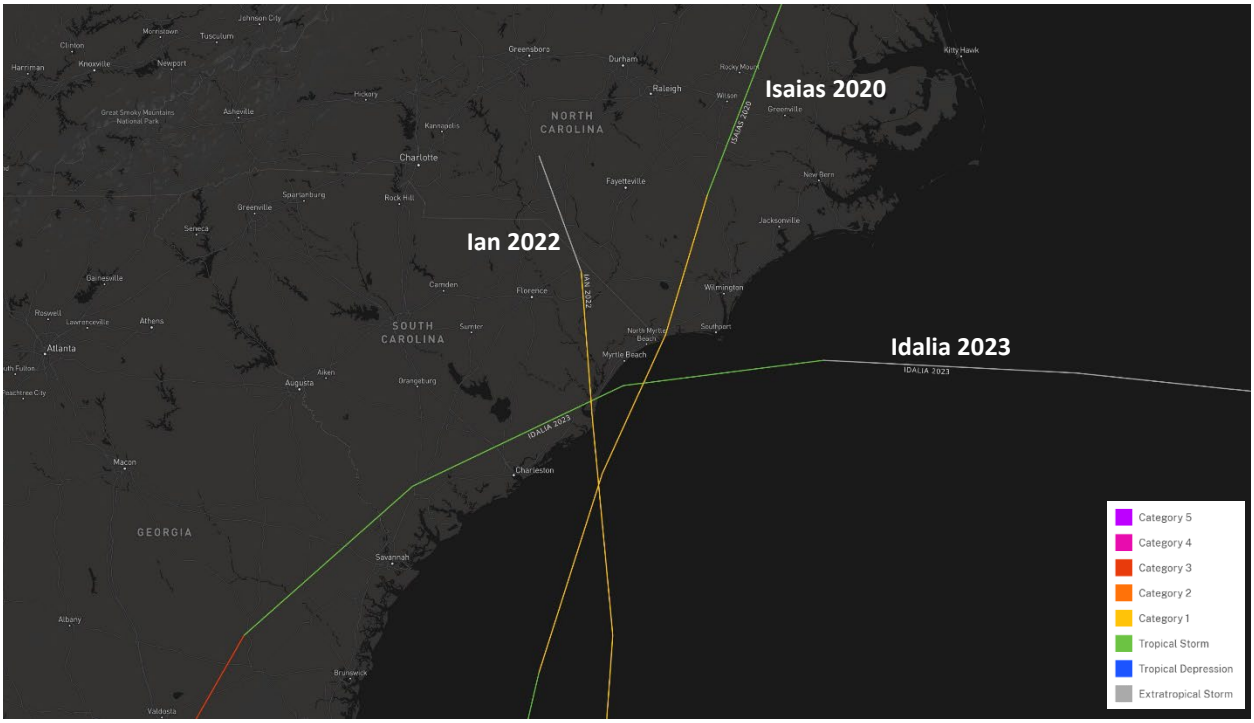






Coastal Storms: The SCCZMP has deployed field teams to conduct post-disaster damage assessment six times between 2020-2024. The figure below, from NOAA's Historical Hurricane Tracks,[6] highlights the paths of three of these hurricanes and tropical storms that prompted SCDES BCM to deploy field teams to assess damage to habitable structures, pools, and erosion control structures within the state's beachfront jurisdiction. At the time of this assessment, 2024 hurricane data was not incorporated into the historical hurricane tracking tool.

Coastal Storms Resulting in SCDES BCM Beachfront Structural Damage Assessment Deployments from 2020-2023 – NOAA Historical Hurricane Tracks



Short summaries of the six storm events triggering beachfront damage assessment along the SC coast between 2020-2024 are provided below.

- On the evening of September 26, 2024, Hurricane Helene made landfall in the Big Bend area of the FL Gulf Coast as a category 4 storm. Helene's greatest impacts were across the southern Appalachians. Most of the impacts in SC from Helene were seen away from coast, however, elevated water levels at high tide on September 27 prompted SCDES BCM to conduct a limited and targeted beachfront damage assessment for approximately 50 structures on Edisto Beach, Harbor Island, and Daufuskie Island on September 30.
- On August 5, 2024, Hurricane Debby made landfall in the Big Bend area of FL as a category 1 storm. Debby weakened to a tropical storm as it moved across southeastern GA and offshore before making another landfall along the central SC coast between Charleston and Georgetown. The storm then moved northwest to near the SC/NC border and weakened to a tropical depression before quickly becoming a non-tropical low-pressure system. Debby brought significant rainfall to SC. The

[6] https://coast.noaa.gov/hurricanes/#map=4/32/-80

highest total observed from 8 AM August 5 to 8 AM August 9 was 19.03" along the Waccamaw River in Horry County, SC.[7] On August 9, SCDES BCM deployed four teams to assess damage to over 250 beachfront structures located in Garden City, Sullivans Island, Isle of Palms, and Edisto Beach.

- On December 17, 2023, a low-pressure system that developed over the Gulf of Mexico tracked northeastward across the FL peninsula and along the southeast coast. Major coastal flooding occurred along the southern SC coast on December 17th, with the Charleston Harbor Tide Gage reaching 9.86 ft MLLW, the 4th highest tide on record. This tide also broke the record for the highest non-tropical high tide value. The nor'easter resulted in significant erosion along SC beaches and prompted the deployment of three field teams to assess damage to over 170 beachfront habitable structures, pools, and erosion control structures.
- On August 30, 2023, Hurricane Idalia made landfall at Keaton Beach, FL as a category 3 storm. Idalia weakened after landfall as it tracked across FL and southern GA. It became a tropical storm at 5 p.m. on August 30, just before the center crossed into SC. It then moved through coastal SC, causing heavy rainfall, damaging winds, storm surge, and tornadoes. In response to Tropical Storm Idalia, five field teams were deployed across more than 10 beaches and assessed damage to nearly 300 beachfront structures including habitable structures, pools, and erosion control structures.
- In 2022, after making landfall as a category 4 hurricane in southwest FL on September 28, Hurricane Ian re-emerged into the Atlantic and was downgraded to a tropical storm on September 29. Over open Atlantic waters, Ian was able to re-strengthen into a category 1 hurricane on September 30 before making landfall again near Georgetown, SC. The storm brought heavy rain, high winds, and flooding along the SC coast. After careful review of NOAA post-storm imagery, four damage assessment teams were deployed to the northern SC coast on October 3. Teams spent three days in the field assessing impacts to beachfront structures from Pawleys Island to North Myrtle Beach. Over 1,000 beachfront structures (including habitable structures, pools, and erosion control structures) were evaluated for damage.
- On August 3, 2020, Hurricane Isaias made landfall near the SC/NC border at Ocean Isle Beach, NC with maximum sustained winds near 85 mph. The National Weather Service reported the following impacts in SC: damaging storm surge occurred along the Horry County coastline during the evening high tide on August 3. The middle portion of the Sea Cabin Pier at Cherry Grove was destroyed. Homes in low lying areas near the beach were flooded and dune erosion was severe. Main Street between Ocean Blvd and Hillside Drive was closed due to flooding. Sea Mountain Highway (SC Highway 9) was covered with 12 to 18 inches of water up to four blocks in from the beach. In North Myrtle Beach water up to one foot deep reached about a block inland. Ocean Blvd in Myrtle Beach was closed due to flooding for a time, and in Garden City North Waccamaw Drive was flooded and closed during high tide.[8] Following Isaias, four damage assessment teams were deployed across eight South Carolina beaches to assess over 650 structures.

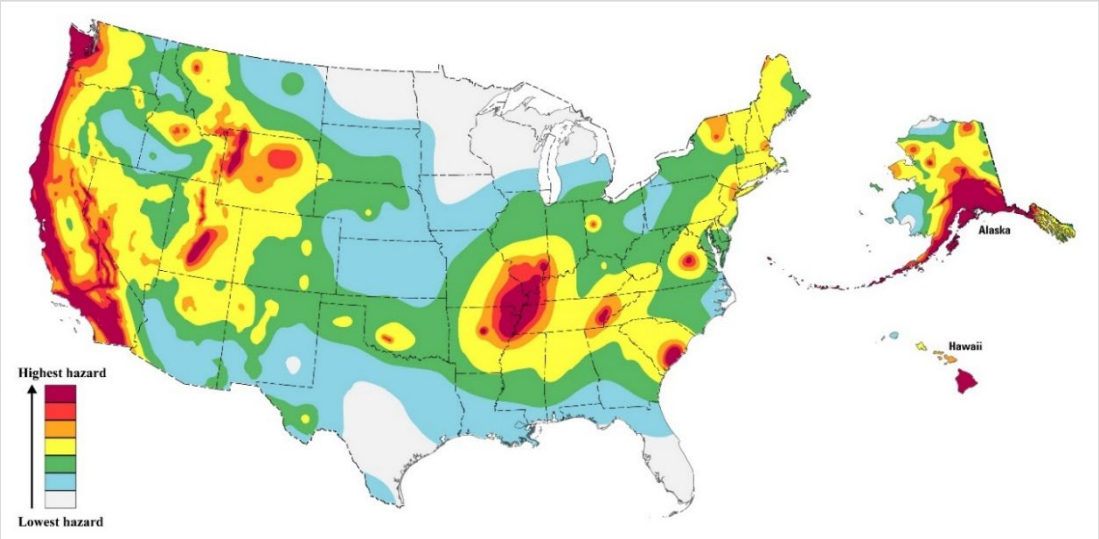
Earthquakes: In 2023, the U.S. Geological Survey (USGS) updated the U.S. National Seismic Hazard Models. The probabilistic hazard maps represent an assessment of the best available science in earthquake hazards and incorporate new findings on earthquake ground shaking, faults, seismicity, and geodesy. As illustrated in the figure below, a high-risk zone occurs in the central coast of South Carolina.[9]

[7] https://www.weather.gov/ilm/TropicalStormDebby2024

[8] https://www.weather.gov/ilm/HurricaneIsaias2020

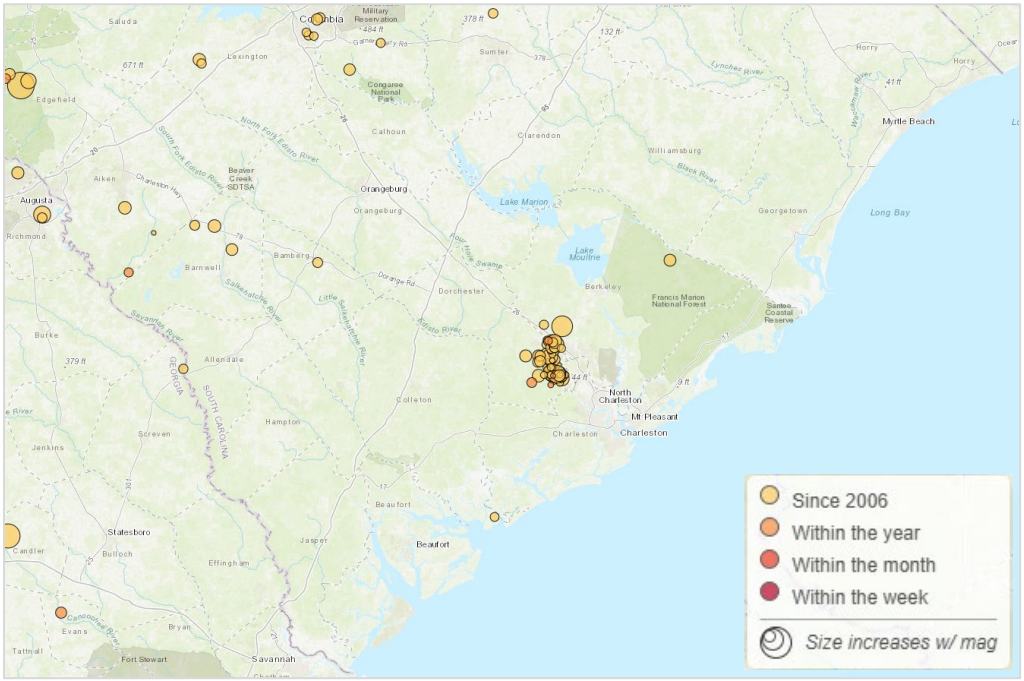
[9] https://www.usgs.gov/media/images/hazard-map-2023-50-state-update-national-seismic-hazard-model-project

Simplified hazard map (peak ground acceleration that has a 2% chance of being exceeded in 50 years) from the 2023 USGS National Seismic Hazard Mapping Project.



According to the SC Emergency Management Division (SCEMD), several areas of SC regularly experience earthquakes and have experienced strong earthquakes in the past. About 70% of all earthquakes in the state occur in the Coastal Plain with most clustered around three areas: Ravenel-Adams Run-Hollywood, Middleton Place-Summerville, and Bowman.[10] A map of recent earthquakes since January 2006, below, illustrates a cluster of activity just north of Charleston.[11]

Recent Earthquakes (since January 1, 2006) in or near South Carolina – SCDNR Geological Survey



[10] https://www.scemd.org/media/1009/sc-earthquake-guide.pdf

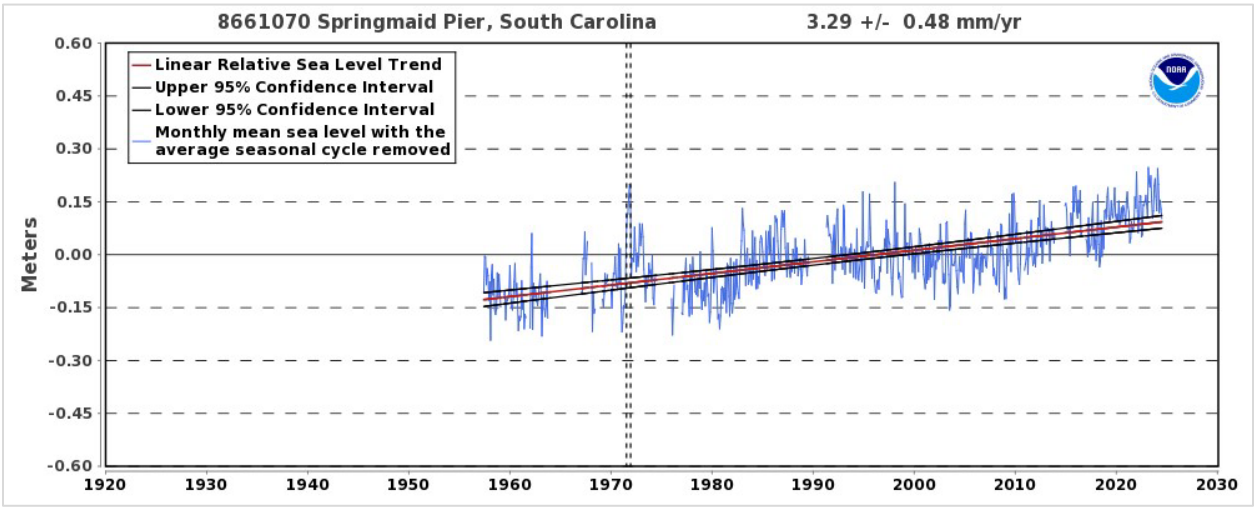
[11] https://www.dnr.sc.gov/geology/recent-earthquakes.html

Tsunamis: According to SCEMD's South Carolina Tsunami Response Plan, though the potential impact is high, the tsunami threat for South Carolina is extremely low, and any tsunamis would likely be small and inundate mostly the beaches. The tsunami threat in South Carolina will likely result from a distant seismic source and provide at least 2-4 hours lead time.[12]

Shoreline Erosion: The SCCZMP is not aware of any significant shoreline erosion data that has been released since the previous assessment. However, shoreline erosion was well documented in a 2017 report[13] focused on research and mapping of the state's oceanfront and estuarine shorelines. The SCCZMP's 2015-2020 Wetlands strategy focusing on living shorelines was established primarily in response to the interest from South Carolina property owners and other stakeholders to naturally stabilize shorelines in the estuarine environment.

Sea Level Rise: The three NOAA tide stations off the South Carolina coast, including Springmaid Pier (8661070), Charleston Harbor (866530), and Fort Pulaski (8670870), are experiencing relative sea level rise rates of 3.29, 3.48, and 3.61 millimeters/year (mm/yr), respectively. In comparison to relative sea level rise rates identified during the previous assessment, the rate at Springmaid Pier has decreased (previously 3.87 mm/yr), while the rates at Charleston Harbor and Fort Pulaski (previously 3.26 and 3.25 mm/yr, respectively) have increased.[14] Relative sea level trends (millimeters/year) for Springmaid Pier,[15] Charleston,[16] and Fort Pulaski,[17] based on monthly mean sea level data from 1901 to 2023, are shown in the following figures.

Relative sea level trends (millimeters/year) for Springmaid Pier based on monthly mean sea level data from 1901 to 2023



[12] https://www.scemd.org/media/1236/appendix-11-tsunami-plan.pdf

[13] https://des.sc.gov/sites/des/files/docs/HomeAndEnvironment/Docs/Jackson_SCShorelineReport122017.pdf

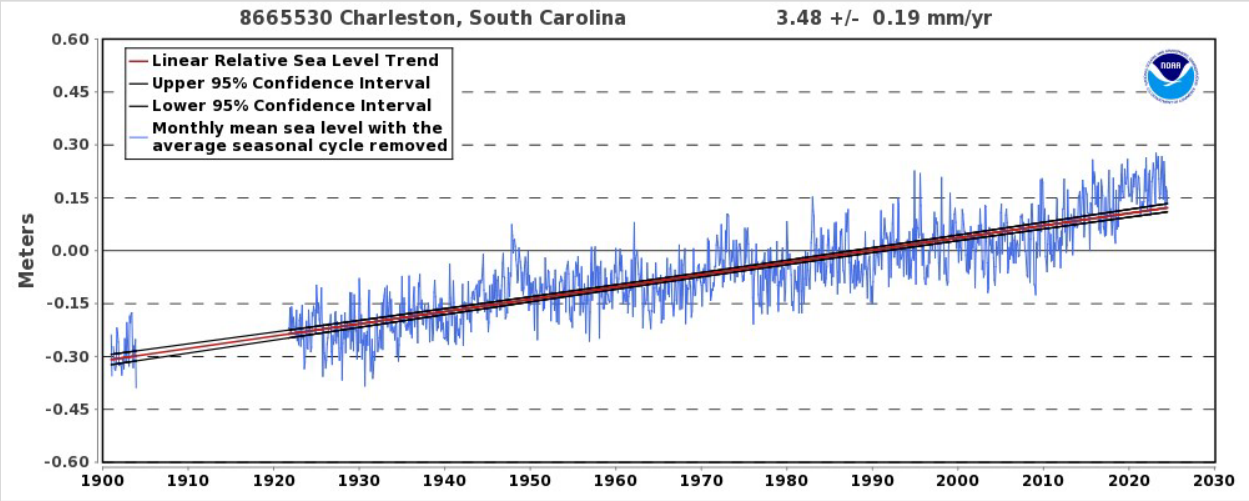
[14] https://tidesandcurrents.noaa.gov/sltrends/mslUSTrendsTable.html

[15] https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8661070

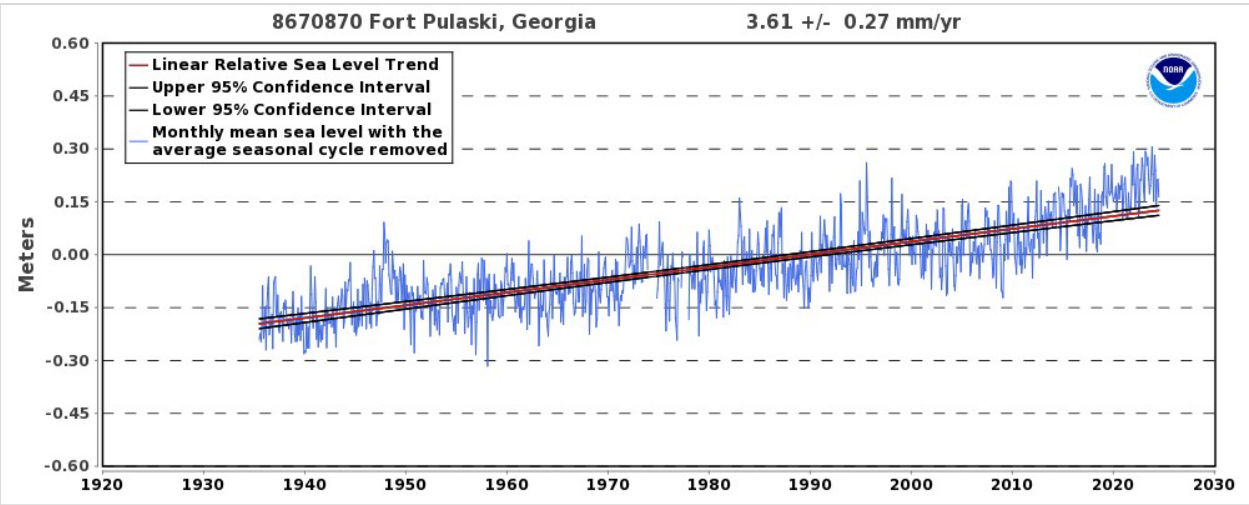
[16] https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8665530

[17] https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8670870

Relative sea level trends (millimeters/year) for Charleston Harbor based on monthly mean sea level data from 1901 to 2023

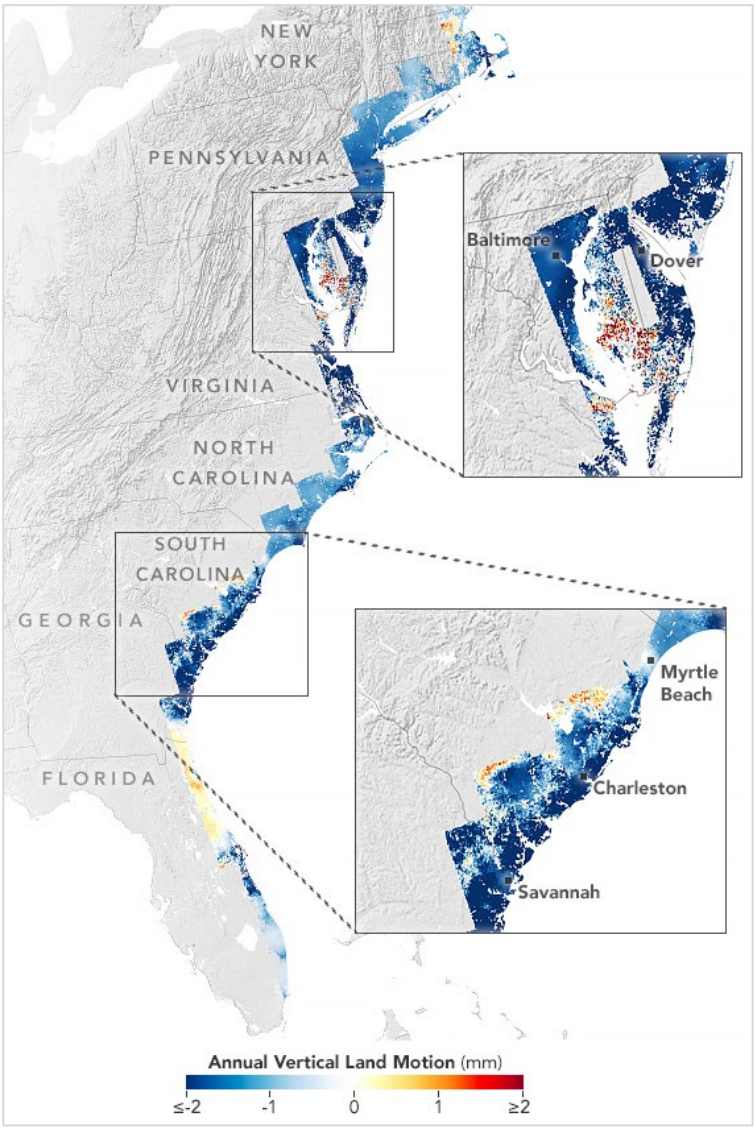


Relative sea level trends (millimeters/year) for Fort Puliaski based on monthly mean sea level data from 1901 to 2023



Land Subsidence: In January 2024, a NASA-funded team of scientists at Virginia Tech's Earth Observation and Innovation Lab published a study on subsidence rates on the U.S. East Coast. Researchers analyzed satellite data and ground-based GPS sensors to map the vertical and horizontal motion of coastal land from New England to Florida. The map at right illustrates the variability in the rising and falling of land across much of the East Coast. Areas shown in blue subsided between 2007 and 2020, with darker blue areas sinking the fastest. According to researchers, the high rates of subsidence in coastal Georgia, South Carolina, and North Carolina are likely influenced by the presence of dams that block sediment that would otherwise travel down several key rivers and replenish coastal lands, and the draining and compaction of peat soils. Charleston, South Carolina, is one of the fastest sinking cities (about 4 millimeters per year) in the eastern U.S., with a portion of that thought to be the result of human activities, including groundwater pumping.[18]

Annual Vertical Land Motion (2007-2020) Across U.S. East Coast



Saltwater Intrusion: Saltwater intrusion in South Carolina is an ongoing concern at coastal wells having water levels at or below sea level. A 2021 South Carolina water resources report highlights results from a groundwater-quality study of the Charleston and Gramling Aquifers in Berkeley, Charleston, and Dorchester counties. Increases in chloride concentrations were noted in both aquifers, likely due in part, to upconing, where higher saline groundwater from the base of the aquifer is reaching pump intakes, and from inter-aquifer transfer, whereby the deeper, more saline water from the Gramling aquifer is mixing with the fresher groundwater in the overlying Charleston aquifer.[19] Saltwater intrusion continues to be a problem in the Hilton Head area, where in 2023 the local Public Service District (PSD) was forced to take one of its Upper Floridan Aquifer wells out of

[18] https://earthobservatory.nasa.gov/images/152452/americas-sinking-east-coast#:~:text=Charleston%2C%20South%20Carolina%2C%20is%20among,human%20activities%2C%20including%20groundwater%20pumping.
[19] https://des.sc.gov/sites/des/files/DNR/Hydrology/pdfs/reports/Report_64_Charleston_Aquifer.pdf

production due to saltwater intrusion into the freshwater portion of the aquifer. The PSD noted it has now lost 10 drinking water wells to saltwater intrusion into the aquifer since 2000.[20]

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[21]	Y	Y	N
Management of development/redevelopment in other hazard areas	Y	Y	N
Sea level rise or Great Lakes level change	N	Y	N

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	N

*This is in reference to the updating of Local Comprehensive Beach Management Plans (LCBMPs)

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	N	N	N
Other hazards			

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

   The SCCZMP does not have a specific definition for "high-hazard areas" in statute or regulation. There are certain defined terms, however, that reflect high-hazard areas, including the following:

[20] https://hhpsd.com/hilton-head-psd-loses-another-well-to-saltwater-intrusion-2/

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

The term ***active beach*** is defined in SC statute and regulation as "that area seaward of the escarpment or the first line of stable natural vegetation, whichever first occurs, measured from the ocean."[22, 23]

On the beachfront, a structure is determined to be in ***imminent danger*** when the erosion comes within twenty (20) feet of that structure. If the Department determines that extenuating circumstances related to site conditions exist, the Department, at its discretion, may allow the use of emergency orders when erosion is beyond twenty (20) feet of the structure.[24]

The term ***beaches*** is defined in SC statute and regulation as "those lands subject to periodic inundation by tidal and wave action so that no nonlittoral vegetation is established."[25, 26]

The SCCZMP also classifies beachfront shorelines into the following erosion zones:

Inlet Erosion Zone - a segment of shoreline along or adjacent to tidal inlets which is directly influenced by the inlet and its associated shoals.[27]

- ***Unstabilized Inlets*** - inlets that have not been stabilized by jetties, terminal groins, or other structures.[28]
- ***Stabilized Inlets*** - inlets which are stabilized by jetties, terminal groins, or other structures.[29]

Standard Erosion Zone - a segment of shoreline which is subject to essentially the same set of coastal processes, has a fairly constant range of profiles and sediment characteristics, and is not directly influenced by tidal inlets or associated inlet shoals.[30]

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.

During the 2024 legislative session, the SCCZMP introduced proposed regulatory amendments for review by the South Carolina General Assembly. The regulations were primarily based on recommendations and key findings identified by the Beach Preservation Stakeholder Workgroup, convened by the SCCZMP in 2022 to provide input and diverse perspectives on beach preservation in South Carolina. The intent of the proposed regulations was to establish a regulatory definition for beaches and beach preservation, provide for a process and standards to permit pilot projects proposed

[22] S.C. Code of Laws § 48-39-270(13)

[23] S.C. Code Ann. Regs 30-1.D(2)

[24] S.C. Code Ann. Regs 30-15.H

[25] S.C. Code of Laws § 48-39-10(H)

[26] S.C. Code Ann. Regs 30-1.D(5)

[27] S.C. Code Ann. Regs 30-1.D(28)

[28] S.C. Code Ann. Regs 30-1.D(28)(a)

[29] S.C. Code Ann. Regs 30-1.D(28)(b)

[30] S.C. Code Ann. Regs 30-1.D(50)

within the beaches or beach/dune system critical areas, provide for clarity and consistency in the application of standards for activities across the beaches and beach/dune system critical areas, and to clarify regulations related to emergency orders and the use of sandbags seaward of the baseline. The regulatory amendments, which were not associated with a Section 309 strategy, were proposed to provide clarity for the regulated community, guidance for regulatory staff, and allow the Department to more effectively implement the state's beach preservation policy. The regulations were passed by the General Assembly and became effective in May 2024.

In 2024, the SCCZMP was awarded funding through the Bipartisan Infrastructure Law (BIL) to develop a Beachfront Explorer Tool. The purpose of the tool is to increase public awareness and understanding of the importance of South Carolina's beachfront environment, coastal risks and hazards, and permitting and regulatory requirements to enable and empower stakeholders to make informed decisions on the beachfront. The Beachfront Explorer will consolidate available beachfront information allowing users to evaluate data collectively within a single platform. It will also provide users with the ability to evaluate data cumulatively, which is critical to understanding the implications of additive events like beach nourishment or erosion. Users will be able to create individualized snapshot reports highlighting hazard-related information at the beach and/or parcel level, while also gaining a better understanding of relative risk by comparing hazards across areas. The collective, cumulative, and comparative analysis aspects of the Beachfront Explorer are intended to improve public awareness and understanding of the inherent risks associated with beachfront properties and to provide users with data and information necessary to inform their own individualized beachfront risk assessments and decisions. This five-year project will be implemented in a phased approach and will include stakeholder engagement, data development, and development of the Explorer Tool and Snapshot Reports.

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.

   Over the past several years, the SCCZMP has substantially improved emergency operations processes associated with preparedness and recovery functions. The Program's current Section 309 Coastal Hazards strategy has dramatically enhanced data collection and processing procedures, and recent regulatory promulgation efforts have sought to improve implementation of the state's policy of beach preservation. However, Phase I Assessment results illustrate the significant risks associated with coastal hazards in South Carolina, and both external stakeholders and internal staff continue to rank this enhancement area as a high priority. External stakeholders identified Regulatory/Policy needs and Decision-support tools to aid the siting of infrastructure and to aid in permitting decisions, particularly at the local level. The need and opportunity for enhanced communication was also noted by several stakeholders to improve awareness of coastal hazards and the risk associated with living on the coast.

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[31]	Changes or Trends Since Last Assessment[32] (↑, ↓, –, unknown)	Cite data source
Beach access sites	644	↑ 24	SC Beach Guide[33]
Shoreline (other than beach) access sites	unknown	unknown	N/A
Recreational boat (power or non-motorized) access sites	169	↑ 4	SC Department of Natural Resources[34] County Government Websites
Designated scenic vistas or overlook points	4 designated Scenic Rivers 16 Scenic Highways and Byways	- Scenic Rivers Scenic Highways and Byways not previously reported	SC Department of Natural Resources[35] SC Department of Transportation[36]

[31] 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.

[32] 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."

[33] https://gis.dhec.sc.gov/beachaccess/

[34] https://experience.arcgis.com/experience/2352618096134f5ca6d1acc363f2592f

[35] https://www.dnr.sc.gov/water/river/index.html

[36] https://scdot.maps.arcgis.com/apps/MapSeries/index.html?appid=0a5192983b2845c2b20fbc5d7a0372f9

Type of Access	Current number[31]	Changes or Trends Since Last Assessment[32] (↑, ↓, –, unknown)	Cite data source
Fishing access points (i.e. piers, jetties)	255	↑ However, the SC Public Fishing Access App was not previously available	SC Department of Natural Resources[37]
Coastal trails/ boardwalks *(Please indicate number of trails/boardwalks and mileage)*	186 (mileage: 1,327)	↑ 12 trails ↑ 59 miles	Data provided by Palmetto Trail
Acres of parkland/open space	3,603,250 acres Public Protected Lands 2,445,700 acres Public Access	↑ However, The Nature Conservancy's Conserved Land of South Carolina Dashboard was not previously available	TNC Conserved Land of South Carolina Dashboard[38]
Access sites that are Americans with Disabilities Act (ADA) compliant[39]	82 Beach Access Sites 49 Fishing Access Sites	- Beach Access Sites Fishing Access Sites was not previously reported	SC Beach Guide[40] SC Department of Natural Resources[41]
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,[42] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[43] and your state's tourism office.

   Analytics for SCDES BCM's Beach Guide app for 2024 are shown in the graph below. The graph illustrates a surge in app usage during the summer months, suggesting a demand for beach access

[37] https://experience.arcgis.com/experience/368c6b8ebc164f21877eda6aa3aa4fcf/page/fishing/?views=List-View

[38] https://tnc.maps.arcgis.com/apps/dashboards/e2214b443c65483091cb744b13fed253

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

[40] https://gis.dhec.sc.gov/beachaccess/

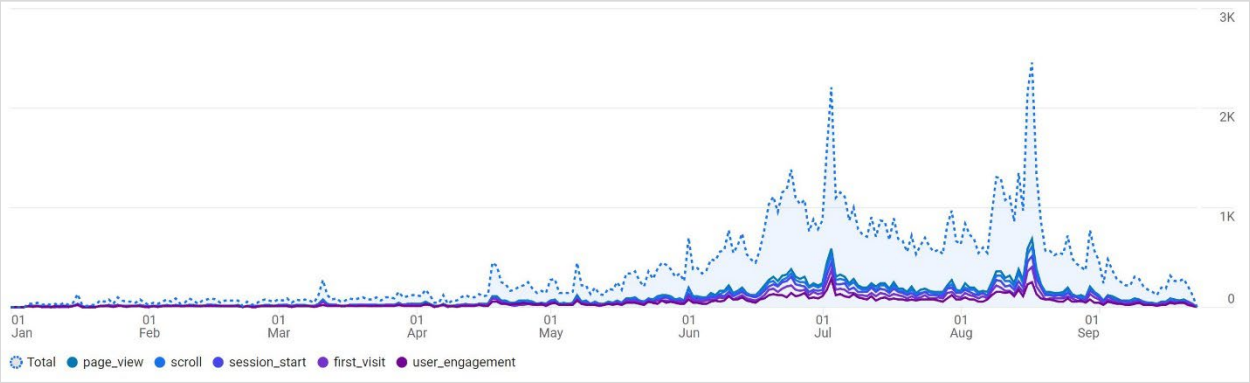
[41] https://experience.arcgis.com/experience/368c6b8ebc164f21877eda6aa3aa4fcf/page/fishing/?views=List-View

[42] 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.*

[43] 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.*

information during this peak time. Additionally, the population continues to grow in South Carolina's coastal counties, with the 2024 population estimate at 1,595,145, a 30% increase since 2010. The population projection for 2042 in the coastal zone is 2,043,484, which is a nearly 30% increase above the 2024 estimate.[44] Increasing population within the coastal zone is expected to increase the demand and need for public access to coastal resources.

Analytics Illustrating Usage of SCDES BCM's Beach Guide Application (2024)



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.

   No additional data or reports were found on the status or trends for coastal public access since the last assessment.

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	Y	Y	N
Acquisition/enhancement programs	Y	Y	Y

[44] https://rfa.sc.gov/data-research/population-demographics/census-state-data-center/estimates-projections-dashboard#:~:text=South%20Carolina%20is%20the%2023rd,5th%20fastest%20by%20numeric%20change

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 2023, the SCCZMP and partners helped secure $4.5M in grant funding through the Bipartisan Infrastructure Law to acquire 1,800 acres of floodplain along South Carolina's Black River, permanently conserving and preventing development of more than 575 acres of mature forested wetlands and 1,225 acres of pine woodlands in Williamsburg and Georgetown counties. The project contributes to a larger land preservation initiative (70 miles and more than 24,520 acres) that established the new Black River State Park. For this historically underserved area, the effort is protecting communities from flooding, all the while expanding access to public lands, boosting local economies, and providing recreational opportunities that include paddling, hiking, biking, and fishing.[45]

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?[46]

    South Carolina has a publicly available Beach Guide web application, which is mobile compliant. The application was released in 2014 and was last updated in 2022. SCDES BCM also partners with local municipalities through a Keep Off the Dunes cost-share program. Participating communities provide annual reports on local efforts to create, maintain, and enhance public access and in exchange receive Keep Off the Dunes signs at a significantly reduced cost.

Publicly Available Access Guide

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	N	Y	
Web address (if applicable)	N/A	https://gis.dhec.sc.gov/beachaccess/	Mobile compliant
Date of last update	N/A	2022	
Frequency of update	N/A	Periodic	

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.

[45] https://coast.noaa.gov/states/stories/black-river.html

[46] 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.

External stakeholders did not rank Public Access among the highest priority enhancement areas; however, it was one of the highest priorities for internal SCDES BCM staff. Preservation and enhancement of public access to coastal resources is, and will continue to be, an important component of the SCCZMP. SCDES BCM will continue to work with local governments to improve coastal access through various programmatic initiatives.

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**[47] (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (↑, ↓, –, unknown)
Beach/shore litter	M / H	All of the above	–
Land-based dumping	Unknown	All of the above	Unknown
Storm drains and runoff	Unknown	All of the above	Unknown
Land/Ocean-based fishing (e.g., fishing line, derelict gear)	M / H	All of the above	Unknown
Derelict vessels	M / H	All of the above	Unknown
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	Unknown	All of the above	Unknown
Hurricane/Storm	L	All of the above	Unknown
Tsunami	L	All of the above	–
Other (please specify)			

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.

   Beach/shore litter: The following table includes estimated volunteer hours and estimated weight of debris removed by volunteers participating in the SCCZMP's Adopt-a-Beach litter cleanup program. Data is available dating back to 2016 when the program was migrated to the MyCoast South Carolina platform, allowing for digital litter reporting. The most recent five years are shown in bold. This data indicates that while program participation waned in the 2020-2021 timeframe (which correlates with the COVID pandemic), the most recent three years of data show a considerable shift toward increasing participation in the program. While this data is not a direct representation of the amount of litter along the South Carolina shoreline, it does reflect an increase in public awareness and participation in the program.

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

South Carolina Adopt-a-Beach Program Data from MyCoast

Date Range	Est. Volunteer Hours	Est. Weight of Debris Removed (pounds)
July 1, 2016 - June 30, 2017	506	711
July 1, 2017 - June 30, 2018	1,652	2,499
July 1, 2018 - June 30, 2019	1,450	1,176
July 1, 2019 - June 30, 2020	**677**	**572**
July 1, 2020 - June 30, 2021	**544**	**886**
July 1, 2021 - June 30, 2022	**1,366**	**2,992**
July 1, 2022 - June 30, 2023	**2,884**	**4,723**
July 1, 2023 - June 30, 2024	**2,046**	**6,554**

Derelict Fishing Gear: In 2024, SCDNR's Molluscan Research and Monitoring Section completed a NOAA Marine Debris Program-funded project focused on intertidal and subtidal derelict crab traps (DCTs) in four targeted estuarine systems in coastal SC. [48] The study area included the South Santee River, the Ashley River, the Combahee River, and the Broad River. Researchers used both drone and side scan sonar to map representative intertidal and subtidal areas to detect and attempt to remove DCTs from the environment. The goal was to better understand the distribution and ecological impacts of DCTs in coastal SC. The number and type of bycatch species found in the traps was also documented. Preliminary findings suggest that DCTs are a common form of marine debris (ranging from at least 9-24 traps per square kilometer), with subtidal DCTs being more numerous than intertidal DCTs. Researchers also found that subtidal traps that have lost their marking buoys are very difficult to recover, while derelict subtidal traps that are unfished but retain their buoys are easier to recover, and generally appear to have more bycatch than subtidal DCTs. Bycatch was found to include multiple species, including commercially important species. At least six species of bycatch were recovered from subtidal DCTs, including: blue crab, common spider crab, Florida stone crab, Atlantic mud crab, purple marsh crab, and oyster toadfish.[49]

Derelict Vessels: The following table includes numbers of public boat reports received by the SCCZMP through the MyCoast SC application by year since the release of the reporting tool in 2015. The most recent five years are shown in bold. While this data is not a direct representation of the number of ADV present along the SC coast, it does illustrate public awareness of the boat reporting tool and participation in the program. Of note is the significant increase in reports received over the most recent timeframe.

As noted in the Summary of Recent 309 Achievements section above, the SCCZMP has been working with Blue Urchin LLC, developers of the MyCoast application, to enhance South Carolina's MyCoast platform. Specifically, the Coastal Program is building a vessel database to illustrate vessels within the coastal zone that are currently under investigation by the state, as well as vessels that have been removed from the coastal zone. The SCCZMP is working closely with the South Carolina Department of Natural Resources (SCDNR), the primary state agency that handles vessel investigations. This new product is expected to be available in 2025.

[48] https://marinedebris.noaa.gov/removal/removing-and-repurposing-derelict-crab-traps-south-carolina-coastal-waters

[49] Preliminary findings provided by SCNDR Molluscan Research and Monitoring Section

South Carolina Derelict Boat Reports from MyCoast

Date Range	Boat Reports
July 1, 2015 - June 30, 2016	13
July 1, 2016 - June 30, 2017	15
July 1, 2017 - June 30, 2018	21
July 1, 2018 - June 30, 2019	30
July 1, 2019 - June 30, 2020	**22**
July 1, 2020 - June 30, 2021	**23**
July 1, 2021 - June 30, 2022	**15**
July 1, 2022 - June 30, 2023	**28**
July 1, 2023 - June 30, 2024	**63**

Incidence of Litter in Estuarine and Open Water Habitats: The South Carolina Estuarine and Coastal Assessment Program (SCECAP), a partnership between federal and state government agencies, was established in 1999 to begin evaluating the overall health of the state's estuarine habitats on a periodic basis. The 2022 SCECAP report summarizes data related to the incidence of litter observed in trawls or on the banks for 250 meters on each side of survey stations for the 2019-2020 assessment period. During this survey period, litter was visible in 27% of the state's estuarine habitat and was present at the same proportion of stations in both tidal creek and open water habitats. When comparing data from previous SCECAP reports, visible litter hit its highest level at SCECAP stations (34%) in 2007-2008, its second highest level (27%) in 2019-2020, which was closely followed by 26% in the 2017-2018 survey period. For all other survey periods the percentage of estuarine habitat with visible litter was less than 20%.[50]

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	N
Marine debris removal programs	Y	Y	Y (addition of an ADV prevention pilot program)

[50] https://www.dnr.sc.gov/marine/scecap/surveyperiods/20192020TechnicalReport.pdf

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.

    As indicated above in the Summary of Recent Section 309 Achievements section, the SCCZMP is piloting a vessel turn-in program (VTIP) as an abandoned and derelict vessel (ADV) prevention strategy. Lessons learned from the pilot project will inform future ADV prevention efforts.

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.

    Marine Debris was not identified as one of the highest priority enhancement areas by external stakeholders for the upcoming enhancement cycle. Marine Debris has been a high priority for the SCCZMP over the past decade. In 2016, the state's Adopt-A-Beach program was converted from a paper-based system to an electronic system on the MyCoast South Carolina platform, streamlining beach cleanups for volunteer participants. Recent 309 efforts (2021-2025) have focused on ADV, allowing the state to better understand and track the current state of the ADV problem on the South Carolina coast, improving communication and coordination among partners, and preventing boats from becoming abandoned. While the SCCZMP's Marine Debris strategy for 2021-2025 is ongoing, the intent is to better position South Carolina to manage the derelict vessel problem, potentially reducing the need to maintain a high focus on this issue.

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,[51] 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.

   The following table highlights data and trends in coastal population and housing units available through the National Ocean Economics Program.

Trends in Coastal Population and Housing Units

	2017	2021	Percent Change (2017-2021)
Number of people	1,422,592	1,503,086	5.66%
Number of housing units	703,922	685,152	6.77%

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.[52] The tables are a suggestion of how you could present the information. Feel free to adjust column and row headings 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.

   The following tables provide information on land cover changes and development trends from NOAA's Land Cover Atlas. As shown below, the greatest loss in land cover since 1996 was to forested areas (-120.55 square miles), followed by woody wetland areas (-133.82 square miles). The greatest land cover gain was to developed areas, which includes high intensity, low intensity, and open space developed. Forested and woody wetland land cover types lost the greatest area to development.

[51] *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.

[52] 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)*.

Distribution of Land Cover Types in Coastal Counties

Land Cover Type	Land Area Coverage in 2016 (Sq. Mi.)	Net Change Since 1996 (Sq. Mi.)
Developed, High Intensity	98.55	36.72
Developed, Low Intensity	327.18	65.22
Developed, Open Space	159.75	46.9
Grassland	149.43	8.27
Agriculture	508.45	-2.15
Forested	1,978.02	-120.55
Scrub/Shrub	417.93	27.27
Woody Wetland	2,322.51	-113.82
Emergent Wetland	784.99	25.72
Barren Land	76.14	11.6
Open Water	1,385.87	14.79

Development Status and Trends for Coastal Counties

	1996	2016	Percent Net Change
Percent land area developed	5.23%	7.04%	1.81%
Percent impervious surface area	1.52%	2.09%	0.57%

How Land Use Is Changing in Coastal Counties

Land Cover Type	Areas Lost to Development Between 1996-2024 (Sq. Mi.)
Agriculture	9.74
Barren Land	1.51
Emergent Wetland	1.87
Forested	75.12
Grassland	6.24
Scrub/Shrub	17.21
Woody Wetland	37.05
Open Water	0.6

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.

   From 2019 to 2024, the SCCZMP regulatory programs processed over 16,115 requests to alter the Critical Area, including direct critical area permit applications, direct critical area permit amendments, permit transfers and extensions, general permits, emergency authorizations, maintenance and repair notifications, beachfront notifications, emergency orders, and critical area line delineations.

   Along the beachfront, three SCDES BCM Critical Area Permits have been issued between 2019 and 2024 which resulted in the installation of new groins or substantial changes to existing groin

structures. At Hunting Island State Park, four new low profile sheet pile groins were installed in conjunction with a beach renourishment project. At Debidue Island, three new low profile sheet pile groins were installed in conjunction with a beach renourishment project. At Folly Beach, 12 existing derelict groins have been permitted to be replaced with rubble mound groin structures in conjunction with a beach renourishment project, but that groin replacement project has not yet started. In addition to the Critical Area Permits above, many Maintenance & Repair (M&R) authorizations have been granted for repairs to groins and shore-parallel erosion control structures on the beachfront. These M&Rs required the work to occur within the footprint and dimensions of the pre-existing structures, and therefore do not represent significant changes over the last five years.

From 2019 to 2023, the SCCZMP Coastal Zone Consistency (CZC) section issued 2,800 individual state CZC certifications and 1,310 general state CZC certifications. The majority of these were NPDES Stormwater permits, including wastewater and water supply, associated with various land development activities.

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.

   The South Carolina Estuarine and Coastal Assessment Program (SCECAP), a partnership between federal and state government agencies, was established in 1999 to begin evaluating the overall health of the state's estuarine habitats on a periodic basis. The 2022 SCECAP report summarizes data from 2019-2020 with results displayed in quality index scores (good, fair, poor) for water quality, sediment quality, biological condition (including benthic communities, as well as fish and large invertebrate communities), and overall habitat quality (which represents average numerical scores from the water quality, sediment quality, and biological condition indices). The habitat quality index for the 2019-2020 assessment period identified 87% of South Carolina's coastal estuarine habitat (tidal creek and open water habitats combined) was in good condition, 13% of the state's estuarine habitat was in fair condition, with none scoring in poor condition. When the habitats were considered separately, a greater percentage of the tidal creek habitat during the 2019-2020 survey was in fair to poor condition compared to open water, which is consistent with previous SCECAP surveys. The report notes that many of the monitoring stations that show a persistent historical pattern of degraded habitat quality have a history of industrial activity and/or high-density urban development that likely contributed to the degraded conditions of the areas. Results from 2019-2020 are also compared to those from previous SCECAP reports dating back to 1999. Figures from the report illustrating this data are included below.[53]

[53] https://www.dnr.sc.gov/marine/scecap/reports.html

Habitat Quality Index Data for South Carolina Coastal Waters (1999-2020) from the South Carolina Estuarine and Coastal Assessment Program

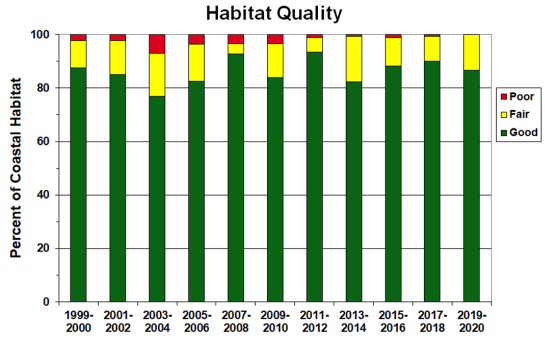


Figure 3.5.2. Percent of coastal waters corresponding to each Habitat Quality Index category by survey period. The Habitat Quality Index is calculated as the average of the Water Quality Index, Sediment Quality Index, and Biological Condition Index.

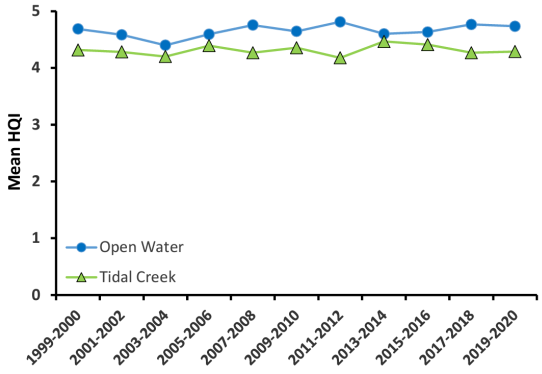


Figure 3.5.3. Habitat Quality Index scores observed by survey period and habitat type.

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	Y	N
Guidance documents	Y	Y	N
Management plans (including SAMPs)	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.

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.

   This enhancement area was the third highest ranked area by external stakeholders. The SCCZMP considers secondary and cumulative impacts when evaluating direct permitting and indirect certification project requests. Many of the secondary impacts from development are addressed through permitting programs outside of the Coastal Program's direct authority.

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
Dorchester County	Economic development zones and prioritization/designation of areas for conservation efforts
Northern Charleston County (Awendaw and McClellanville area)	Increase in residential development in areas historically more rural and less densely developed

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.

   No new data or reports are available on the status and trends of SAMPs since the last assessment.

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	Y	Y	N
SAMP plans	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.

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.

    In order to engage in the SAMP process, a local government must formally request that a SAMP be authorized by the S.C. General Assembly. At this time, the SAMP process has not been identified as a priority by either a local government or by stakeholders. The SCCZMP will continue to implement coastal planning efforts, primarily through the development of Local Comprehensive Beach Management Plans and technical assistance for local ordinance development.

Ocean 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),[54] 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.

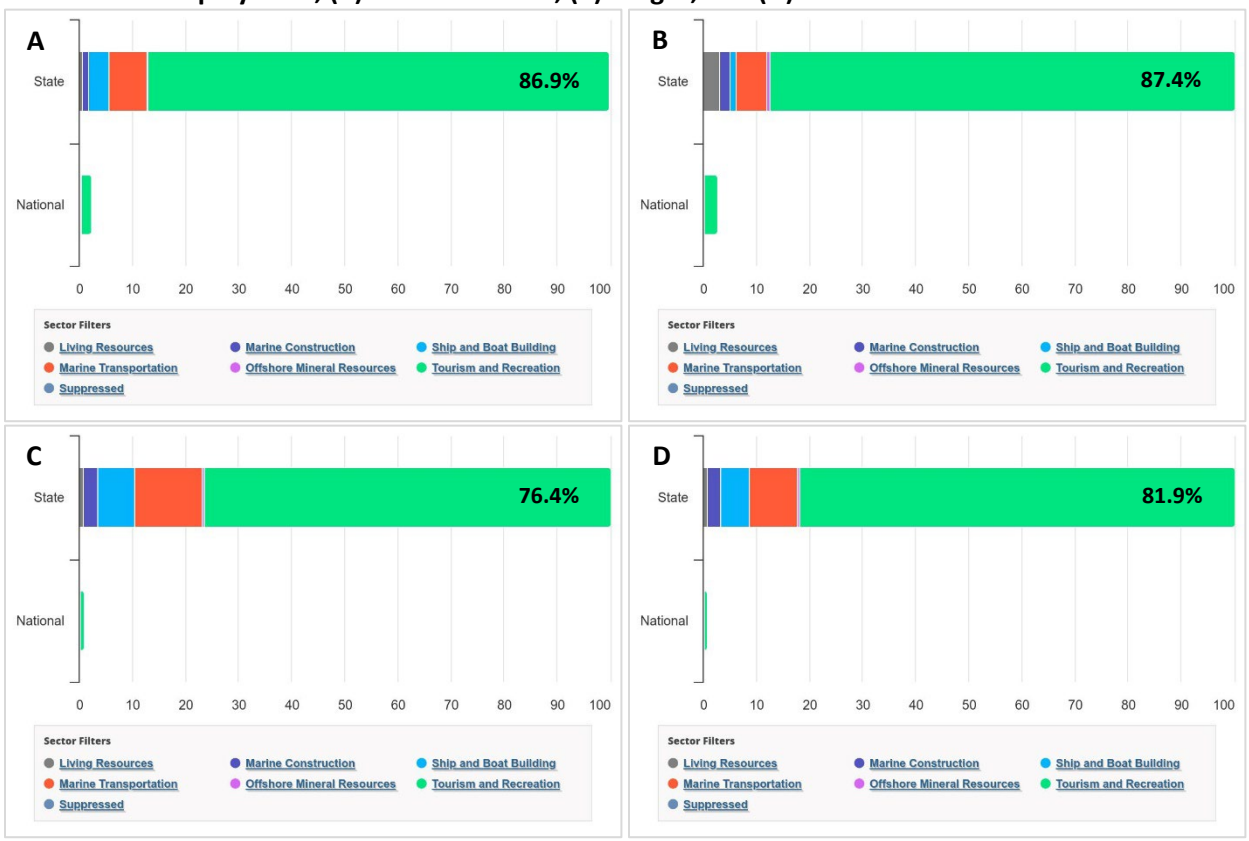
   The following table highlights the 2021 status of South Carolina's ocean economy, including the number of jobs, number of establishments, wages, and Gross Domestic Product (GDP) for various ocean sectors. As illustrated in the table and series of bar graphs provided below, the Tourism & Recreation sector represents the greatest portion of the state's total ocean economy.

Status of Ocean 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)	80,367	1,022	903	3,117	6,129	172	69,022
Establishments (#)	3,748	112	80	80	221	21	3,275
Wages	$2.5B	$17.4M	$65.9M	$176.1M	$314.7M	$9.2M	$1.9B
GDP	$5.6B	$45.8M	$135.9M	$305.8M	$504M	$23.2M	$4.6B

[54] *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.

Portion of South Carolina's 2021 Total Ocean Economy represented by each sector for (A) Employment, (B) Establishments, (C) Wages, and (D) Gross Domestic Product



Percentages shown above reflect the portion of SC's Total Ocean Economy associated with the Tourism & Recreation sector.

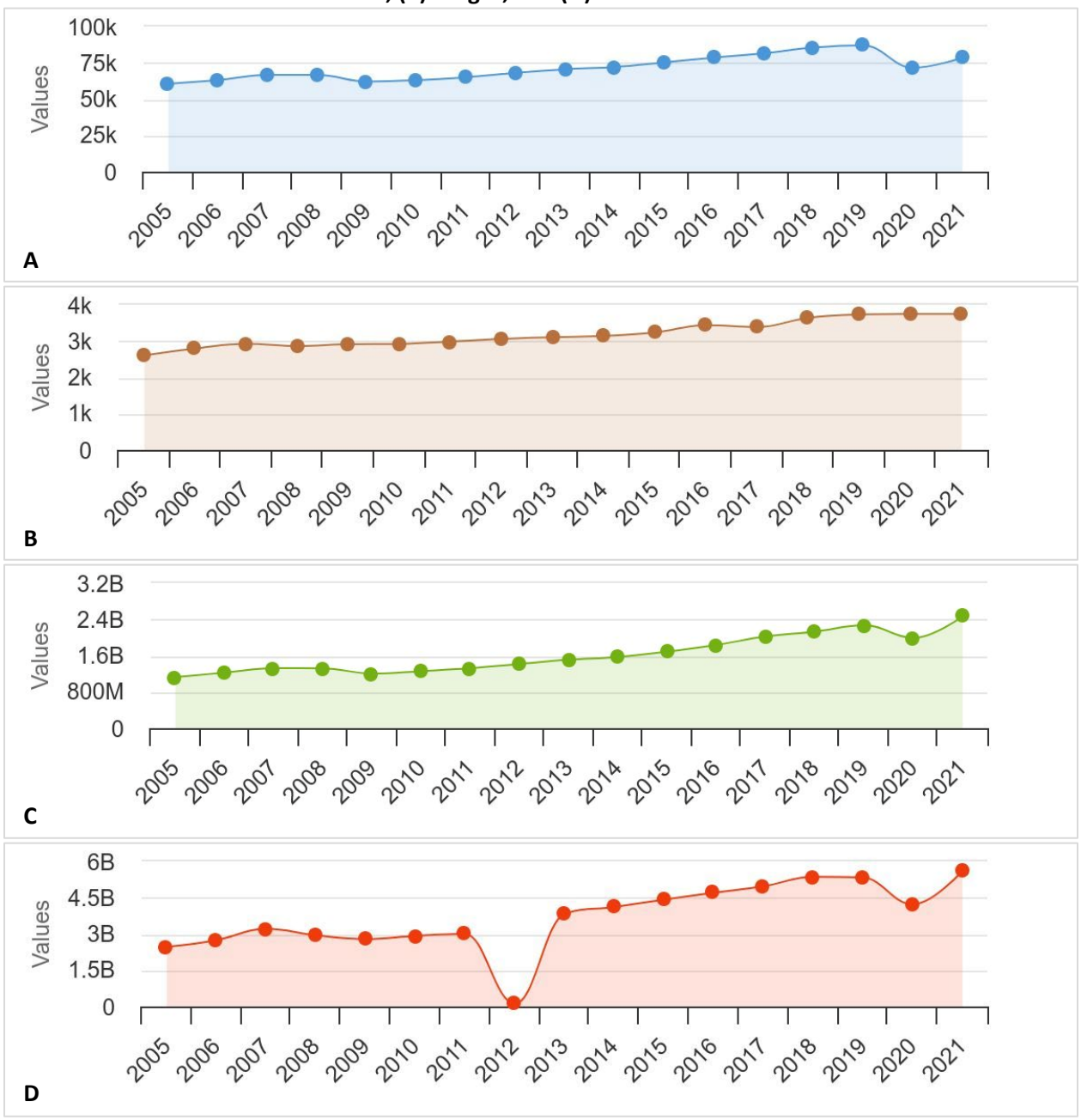
As shown in the table and series of graphs provided below, each element of South Carolina's coastal economy (employment, establishments, wages, and GDP) grew between 2005-2021 (except for the number of establishments associated with the Offshore Mineral Extraction sector). The Marine Construction sector saw the greatest employment growth (66.6% increase), while the Marine Transportation sector saw the greatest growth in number of establishments (76.8%). Wages and GDP increased the most within the Marine Construction sector, followed by the Living Resources sector.

Percent Change in Ocean Economy for Coastal Counties (2005-2021)[55]

	All Ocean Sectors	Living Resources	Marine Construction	Ship & Boat Building	Marine Transportation	Offshore Mineral Extraction	Tourism & Recreation
Employment (# of Jobs)	29.9%	13.4%	66.6%	16.6%	51.9%	19.4%	28.9%
Establishments (#)	43.9%	43.6%	8.1%	45.5%	76.8%	0.0%	45.5%
Wages	127.3%	228.3%	278.7%	84.2%	129.2%	104.4%	119.7%
GDP	124.0%	247.0%	255.8%	36.9%	107.3%	60.0%	142.1%

[55] 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.

Change in South Carolina's Ocean Economy between 2005-2021 for (A) Employment, (B) Establishments, (C) Wages, and (D) Gross Domestic Product



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,[56]

[56] *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,

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.

Uses within Ocean Waters

Type of Use	Number of Sites
Federal sand and gravel leases *(Completed)*	5
Federal sand and gravel leases *(Active)*	2
Federal sand and gravel leases *(Expired)*	0
Federal sand and gravel leases *(Proposed)*	1
Beach Nourishment Projects	24
Ocean Disposal Sites	10
Principle Ports *(Number and Total Tonnage)*	Number: 4 *(Includes Charleston, SC; Savannah, GA; Wilmington, NC; and Brunswick, GA)* Cumulative Tonnage: 65,440,238
Coastal Maintained Channels	15
Designated Anchorage Areas	5
Danger Zones and Restricted Areas	4
Other (please specify)	

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 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	↑
Transportation/navigation	↑
Offshore development[57]	↑
Energy production	↑
Fishing (commercial and recreational)	↑
Recreation/tourism	↑
Sand/gravel extraction	↑
Dredge disposal	↑
Aquaculture	↑
Other (please specify)	

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.

[57] 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 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)
Benthic habitat (including coral reefs)										x		
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	x		x		x			x			x	
Sand/gravel		x			x				x	x		
Cultural/historic	x	x										
Transportation/ navigation		x										
Offshore development[58]	x	x										
Energy production	x	x			x			x		x		
Fishing (commercial and recreational)	x	x	x	x	x	x	x	x	x	x	x	
Recreation/tourism	x		x	x								
Sand/gravel extraction		x										
Dredge disposal			x									
Aquaculture					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.

   In 2020, the SC Sea Grant Consortium released a report assessing South Carolina's ocean economy.[59] Expanding upon data available from NOAA (including establishments, employment, wages, and GDP associated with ocean economy sectors), the report examines additional indicators of economic activity attributable to coastal and ocean natural resources using data collected by SC state agencies and other entities and researchers through a variety of methods. The report includes the following highlights:

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

[59] https://www.scseagrant.org/wp-content/uploads/Assessing-South-Carolinas-Ocean-Economy-2020.pdf

- $38.68 billion worth of exports and $51.58 billion worth of imports passed through SC ports in 2019
- Visitors in SC's coastal counties spent $9.13 billion in 2018
- Marine recreational fishers in SC spent $779.93 million in 2017
- Commercial fishery dockside revenue in SC was $22.78 million in 2019
- Wetland habitats in SC are estimated to provide coastal protection benefits of over $3.9 billion per year

The report notes "the state's expansive system of open ocean, beaches, sand dunes, wetlands, tidal creeks, estuaries, and oyster reefs are of great economic importance. Given that coastal and ocean natural resources inherently underpin the economic activity associated with the ocean economy, maintaining the health of these resources will be important for sustaining and growing the ocean economy." The report highlights the importance of preserving and maintaining the activities and resources that contribute historic and cultural value to SC's ocean economy. The report concludes "with proper management and monitoring of ocean economy sectors, SC has the potential to benefit from a sustainable Blue Economy."

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	N	N
Regional comprehensive ocean/Great Lakes management plans	N	N	N
State comprehensive ocean/Great Lakes management plans	Y	N	N
Single-sector management 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.

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

Comprehensive Ocean Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	Y* Ocean Action Plan for Offshore Energy Development and RSM, 2015 (Revised 2017 and 2018)	N
Under development (Y/N)	N	N
Web address (if available)	N/A	N/A
Area covered by plan	State Jurisdictional Waters and Certain Activities in Federal Water	N/A

* Additional Reports:
SC Ocean Report: A Foundation for Improved Management and Planning in South Carolina, 2012
State Ocean Management Plans and Policies: Synthesis Report, 2006

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.

This enhancement area was not ranked high by external or internal stakeholders for the upcoming enhancement cycle. Currently, there is some ocean planning occurring at the State-level with the regional sediment management group, comprised of federal and state regulatory and resource agencies, however, there have been no formal policy or planning-type actions to date.

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)[60]

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[61] includes existing data for many energy facilities and activities.

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

[60] 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.

[61] *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.

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[62]	unknown	Y[63]	unknown
Electrical grid (transmission cables)	Y	↑	Y	↑
Ports	1	-	N	-
Liquid natural gas (LNG)	2[64]	unknown	Y[65]	unknown
Electric Power Facilities (Oil)	6	-	N	-
Electric Power Facilities (Gas)	9	-	N	-
Electric Power Facilities (Coal)	7	-	N	-
Electric Power Facilities (Nuclear)	1	-	N	-
Electric Power Facilities (Wave)	0	-	N	-
Electric Power Facilities (Tidal)	0	-	N	-
Electric Power Facilities (Current. ocean, lake, river)	0	-	N	-
Electric Power Facilities (Hydropower)	2	-	N	-
Electric Power Facilities (Ocean thermal energy conversion)	0	-	N	-
Electric Power Facilities (Solar)	8	↑	Y	↑
Electric Power Facilities (Biomass)	10	-	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.

[62] https://www.energy.gov/sites/default/files/2021-09/South%20Carolina%20Energy%20Sector%20Risk%20Profile.pdf
[63] https://scdailygazette.com/2024/03/27/the-oil-and-gas-industrys-questionable-sc-plans-for-new-pipeline/
[64] https://www.energy.gov/sites/default/files/2021-09/South%20Carolina%20Energy%20Sector%20Risk%20Profile.pdf
[65] https://scdailygazette.com/briefs/sc-senators-seek-to-slow-down-bill-that-fast-tracks-new-gas-fired-power-plant/#:~:text=by%20Jessica%20Holdman%2C%20SC%20Daily,represented%20in%20the%20regulatory%20process.

3. Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[66] in the state's coastal zone since the last assessment.

   Since the last assessment, there has been an increase in activity associated with transmission cables and solar facilities. During the 2025 legislative session, the South Carolina General Assembly passed an energy bill (signed into law as the South Carolina Energy Security Act), which aims to create more energy power plants along with infrastructure like power lines to address future production needs as the state's population continues to grow.

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	N
State comprehensive siting plans or procedures	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.

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.

   This enhancement area was ranked as one of the lower priorities by stakeholders for the upcoming enhancement cycle. At the State-level, however, there has been an importance placed on increased capacity and reliability of the energy infrastructure associated with the increased development and

[66] 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).

proposed data centers. This emphasis has led to increased project proposals for new transmission lines, solar farms, and improvements to existing electric power facilities.

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.[67]

Status and Trends of Aquaculture Facilities and Activities

Type of Facility/Activity	Number of Facilities[68]	Approximate Economic Value	Change Since Last Assessment (↑, ↓, –, unknown)
Mariculture Farms (Bottom Gear)	25		↓
Mariculture Farms (Floating Gear)	9		↑
		Mariculture Oysters 2019 $999,795.12 2020 $728,294.50 2021 $954,717.36 2022 $1,309,867.74 2023 $1,494,684.90	
		Mariculture Clams 2019 $192,124.44 2020 $184,988.28 2021 $306,422.12 2022 $354,635.93 2023 $444,705.18	

Economic value provided by SC Sea Grant Consortium

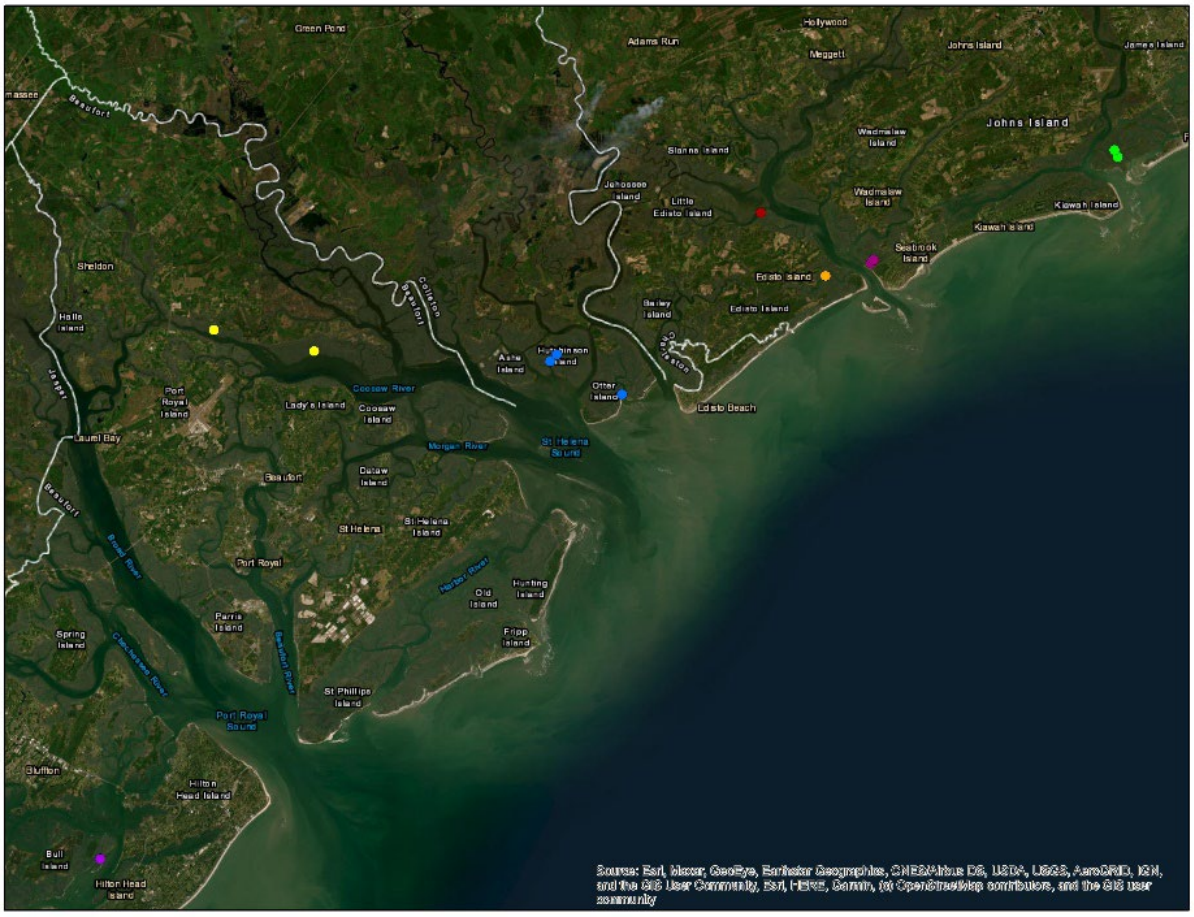
[67] While focused on statewide aquaculture data rather than just within the coastal zone, the *Census of Aquaculture* (*agcensus.usda.gov/Publications/Census_of_Aquaculture/)* may help in developing your aquaculture assessment. The census is conducted every 10 years and the last report was released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

[68] 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.

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.

   The state's first oyster mariculture permit was issued in 2012; since then, 8 more applicants have been permitted, for a total of 9 statewide. Of these 9 permits, only two of them are fully built out; the remaining ones have room in their permits to expand the number of cages. The permits range in size from 164 to over 1600 cages, with site areas between 1 and 31 acres. Several of the permits have multiple sites as seen in the figure below. Oyster mariculture is proving to be a growing industry; on average, there is one new farm being added per year in coastal South Carolina. Limiting factors include market costs and resources. Some of the challenges of managing this industry include conflicts between resource use (e.g. recreational uses, navigation, docks, and viewsheds), impacts from storms, and limited ideal siting options.

Floating Oyster Cage Sites - Colors represent different permittees



   In 2022, the SC Sea Grant Consortium released a report that highlights the total demand for mariculture oysters in South Carolina far exceeds the total supply produced in-state. The study estimates that only one out of every five mariculture oysters purchased by consumers in South Carolina is produced in South Carolina. This reveals a significant potential demand for additional

local production that is not currently being satisfied. The report details a return-on-investment analysis for different scenarios of shellfish hatchery development in the state.[69]

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	Y	Y	Y
Other aquaculture statutes, regulations, policies, or case law interpreting these	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.

    The SC Department of Natural Resources (SCDNR) has developed a Mariculture Siting Map application[70] as a service to give potential mariculture applicants an understanding of potential locations where applications for sites might be accepted. Areas of exemption or concern regarding siting are featured on the map. SCDNR's Office of Fisheries Management updates the displayed boundaries annually to include new and updated mariculture areas. SCDNR, in collaboration with the SCCZMP and partners, have also released Site Selection Guidance for Mariculture Applicants[71] and a flowchart illustrating the Applicant Process for Multi-agency Shellfish Mariculture Permitting[72] to offer general information regarding site selection and permitting for the public and potential mariculture applicants.

Enhancement Area Prioritization

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

    High _____
    Medium __X__
    Low _____

[69] https://www.scseagrant.org/wp-content/uploads/Benefits-of-Increased-Shellfish-Mariculture-Production.pdf
[70] https://scdnr.maps.arcgis.com/apps/webappviewer/index.html?id=d7cce8c8272b4a36a8324fb5cc1833a7
[71] https://www.dnr.sc.gov/marine/shellfish/pdf/siteapplications_2021.pdf
[72] https://www.dnr.sc.gov/marine/shellfish/pdf/flowchart-2021.pdf

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

   Of the nine enhancement areas, aquaculture was ranked as one of the lower priorities by stakeholders, however, given the growth of mariculture in the state, the SCCZMP will continue to engage with partners on new developments within this industry.

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/Fill	Freshwater wetlands throughout the coastal zone
Stressor 2	Erosion	Saltwater wetlands throughout the coastal zone
Stressor 3	Lack of ability for marsh migration	Throughout most of the coastal zone, with greatest concern in developed areas

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.

   Stressor 1 - Development/Fill: The South Carolina coast, and its coastal resources, are facing significant challenges, including a rapidly expanding population. According to NOAA, over 1.3 million South Carolinians (27% of the state's population) live along the coast.[73] In 2021, the Charleston Regional Development Alliance found regional growth within the Charleston metro area equated to 33 new residents moving into the area per day.[74] Rapid population growth and development in the state's Coastal Zone results in greater pressure and stress on both freshwater and saltwater wetlands, and Phase I Wetland Assessment results continue to show a net loss of wetlands in South Carolina's coastal counties.

   Stressor 2 - Erosion: SCDES BCM contracted with Georgia Southern University in 2017 for a coastal shoreline study in South Carolina. The study, entitled Mapping Coastal Erosion Hazards along Sheltered Coastlines in South Carolina 1849 to 2015,[75] provided detailed shoreline mapping for more than 8,000 miles of estuarine shoreline over multiple timeframes from the 1800s to 2015. The study mapped shoreline type, including over 1300 hardened structures (e.g. bulkheads). It also showed that over half (57%) of all marsh shorelines showed net erosion, an average of -1.1 feet/year. An increasing number of hardened structures, combined with long-term erosion and rising sea levels, lead to pressure on marshes and limits its ability to migrate.

   Stressor 2 – Lack of ability for marsh migration: Rapid growth and development along the coast also impact the ability of saltwater wetlands to migrate landward as sea levels rise. As noted in the Phase I Coastal Hazards Assessment, the three NOAA tide stations off the South Carolina coast,

[73] https://coast.noaa.gov/states/south-carolina.html

[74] https://www.crda.org/news/2021-exactly-how-many-people-move-into-the-charleston-region-each-day/

[75] https://des.sc.gov/sites/des/files/docs/HomeAndEnvironment/Docs/Jackson_SCShorelineReport122017.pdf

including Springmaid Pier, Charleston Harbor, and Fort Pulaski, have experienced relative sea level rise rates of 3.29, 3.48, and 3.61 millimeters/year (mm/yr), respectively, based on monthly mean sea level data from 1901 to 2023. However, according to 2023 research published in *Nature Communications*, sea level rise has accelerated drastically along the U.S. Southeast coast since 2010 and is now more than 10 mm/year, approximately triple the global rate.[76, 77] When marshes are unable to shift inland and keep pace with rising seas, due to physical barriers (e.g., bulkheads, roads, buildings, etc.), marsh habitat is ultimately lost.

As noted in the Stakeholder Engagement section above, 50% of stakeholder respondents identified Wetlands as their highest priority enhancement area. Specifically, several stakeholders mentioned the need for increased wetland protection at the state level, considering the Supreme Court's Sackett v. EPA ruling. Stakeholders mentioned the need to map/inventory wetlands and subsequently prioritize those with the greatest need for protection. Stakeholders also suggested consideration of regulatory pathways for the use of thin-layer placement, beneficial use of dredged material, and other nature-based solutions in wetland areas. Additional research and analysis related to marsh migration and erosion rates, given sea level rise projections, were also identified as needs and opportunities.

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
South Carolina's current oyster layer is approximately 20 years old and needs to be updated to continue to support resource management.	Need for comprehensive mapping of South Carolina's intertidal oyster reefs for resource management.

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.

[76] https://www.nature.com/articles/s41467-023-37649-9

[77] https://yaleclimateconnections.org/2023/07/how-fast-are-the-seas-rising/

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	Y	Y
Wetland mapping and GIS	Y	Y	Y
Watershed or special area management plans addressing wetlands	Y	Y	N
Wetland technical assistance, education, and outreach	Y	Y	Y
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.

    As noted in the Phase I Wetlands assessment above, new state regulations for living shorelines were approved and effective May 2021. Additionally, several outreach and education products associated with this 309 strategy (2016-2020) were finalized in 2021, including an SCDES BCM Living Shoreline webpage, Clemson Extension's Living Shoreline website, and a South Carolina Living Shoreline Explorer application. In early 2024, a collaboratively developed Living Shorelines Training Program, hosted by Clemson Extension, was also launched in South Carolina. This training opportunity and registration information are featured on Clemson Extension's Living Shoreline website under Training & Education Opportunities.

    Building on 309-based public education and outreach efforts, SCDES BCM released a short-format video featuring South Carolina's Coastal Waters and Tidelands Critical Areas in 2023. The educational video highlights the ecosystem services and cultural significance of the salt marsh, plant and animal species inhabiting these environments, challenges and threats to the salt marsh, and how the SCCZMP manages these important resources.

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?

    In July 2020, the SCCZMP established metrics for tracking wetland impacts and mitigation efforts within ePermitting. The following tables highlight Coastal Zone Consistency data illustrating proposed wetland impacts, allowed wetland impacts, and required wetland mitigation by area between July 2020 and the end of 2024.

Summary of wetland impacts (acres) proposed between 2020-2024

Year	Sum of Wetland Impact - Federally Jurisdictional Proposed	Sum of Wetland Impact - Isolated (non-jurisdictional) Proposed	Sum of Wetland Impact - Total Proposed Impacts
2020	79.0	10.3	89.3
2021	363.0	36.5	399.5
2022	140.7	26.0	166.6
2023	145.6	72.2	217.8
2024	267.9	33.4	301.3
Total	996.2	178.4	1,174.6

Summary of wetland impacts (acres) allowed between 2020-2024

Year	Sum of Wetland Impact - Federally Jurisdictional Allowed	Sum of Wetland Impact - Isolated (non-jurisdictional) Allowed	Sum of Wetland Impact - Total Allowed
2020	79.0	10.3	89.3
2021	354.3	36.5	390.8
2022	140.4	23.6	164.0
2023	145.0	71.0	216.0
2024	263.9	34.9	298.8
Total	982.6	176.3	1,158.9

Summary of wetland mitigation (acres) between 2020-2024

Year	Sum of Wetland Mitigation - Upland Buffers	Sum of Wetland Mitigation - Preservation	Sum of Wetland Mitigation - Restoration
2020	16.4	258.9	4.3
2021	738.9	3,541.2	654.7
2022	255.0	2,194.4	286.1
2023	83.6	10,605.5	1,279.4
2024	520.4	2,256.8	8.1
Total	1,614.2	18,856.8	2,232.5

Over the same period, projects also provided mitigation through the purchase of credits from an approved mitigation bank. Those credits totals are 358.79 (2020), 2158.71 (2021), 1152.5 (2022), 1230.41 (2023), and 2195.72 (2024).

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: Develop a new intertidal oyster reef layer for South Carolina.

   Description: Approximately 20 years ago, the SC Department of Natural Resources (SCDNR) and collaborators successfully developed a GIS oyster reef layer by classifying intertidal oyster reefs from

low-tide aerial imagery. This product has been widely used by state government agencies, NGOs, and private restoration practitioners to inform management and restoration activities in South Carolina. Updating this oyster layer would support SCDES BCM regulatory decision-making and programmatic initiatives.

Management Priority 2: Enhance decision-support tools available to SCDES BCM Coastal Zone Consistency and Critical Area Permitting sections.

Description: SCDES BCM regulatory and compliance sections currently share a single web-based GIS application to review spatial data. Daily map customizations result in significant delays for project managers. SCDES BCM has prioritized the development of custom web applications for CZC and CAP to achieve greater efficiency and to improve the sections' ability to ensure projects within the Coastal Zone are consistent with the state's Coastal Division Regulations and the South Carolina Coastal Program Document.

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	Research and analysis related to marsh migration and health, given sea level rise projections
Mapping/GIS	Y	Capture imagery of the state's coastal waters and tidelands at low tide and comprehensive mapping of the state's coastal resources
Data and information management	Y	SCDES BCM has a large amount of historic data (11 TB), including historic imagery, LiDAR, and topos. This data is currently stored on CDs, DVDs, and aging external harddrives. At least one of the CDs has already failed, resulting in the loss of irreplaceable data. This information is critical for permitting reviews, long-term planning, and other programmatic efforts. BCM does not currently have a plan for long-term stable storage or accessibility.
Training/capacity building	Y	Develop a *South Carolina Tidelands and Beaches Critical Areas Field Guide* to augment existing staff training related to delineation of critical areas.
Decision-support tools	Y	Develop custom regulatory review web application to enhance regulatory reviews
Communication and outreach	Y	Develop a Living Shorelines StoryMap
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.

As noted in the Stakeholder Engagement section above, 50% of stakeholder respondents identified Wetlands as their highest priority enhancement area. This enhancement area was also prioritized by internal, SCCZMP staff. Specifically, there is a need to update South Carolina's intertidal oyster reef dataset, which is approximately 20 years old. Updates to existing and new SCDES BCM decision-support tools and associated internal training development are also high priority needs.

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[78] 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	Shoreline Erosion	throughout the coastal zone, but highest erosion rates have been shown to occur along oceanfront and inlet facing shorelines
Hazard 2	Sea Level Rise and Coastal Flooding	throughout the coastal zone, with greatest impacts in low-lying areas and poorly draining areas
Hazard 3	Coastal Storms	throughout the coastal zone, with greatest impacts immediately adjacent to the coastline

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.

   Hazard 1 - Shoreline Erosion: Significant rates of erosion have been documented across South Carolina shorelines. An extensive 2017 coastal erosion mapping effort, led by the SCCZMP in collaboration with Georgia Southern University, found that 48% of the studied oceanfront/inlet shoreline transects were erosional.[79] In a 2018 SCCZMP-led review of shoreline change rates associated with beachfront and inlet shoreline transects, 52% were identified as erosional, with a mean shoreline change rate of -1.48 ft/year.

   Hazard 2 - Sea Level Rise and Coastal Flooding: As noted in the Phase I Coastal Hazards Assessment, the three NOAA tide stations off the South Carolina coast, including Springmaid Pier, Charleston Harbor, and Fort Pulaski, have experienced relative sea level rise rates of 3.29, 3.48, and 3.61 millimeters/year (mm/yr), respectively, based on monthly mean sea level data from 1901 to 2023. However, according to 2023 research published in *Nature Communications*, sea level rise has accelerated drastically along the U.S. Southeast coast since 2010 and is now more than 10 mm/year, approximately triple the global rate.[80, 81] High tide flooding (HTF) is also being observed at an increasing rate along the South Carolina coast. Charleston, SC experienced more than a 400% increase in high tide flooding frequency between 2000 (2 days) and 2020 (14 days).[82] During the 2023-2024 meteorological year, two of the three NOAA tide stations off the coast of South Carolina saw a record number of flood days with Charleston, SC experiencing 17 HTF days and Fort Pulaski, GA experiencing 18 HTF days. By 2050, NOAA projects 70 annual HTF days in the Charleston and Fort

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

[79] https://des.sc.gov/sites/des/files/docs/HomeAndEnvironment/Docs/Jackson_SCShorelineReport122017.pdf

[80] https://www.nature.com/articles/s41467-023-37649-9

[81] https://yaleclimateconnections.org/2023/07/how-fast-are-the-seas-rising/

[82] https://tidesandcurrents.noaa.gov/publications/2021_State_of_High_Tide_Flooding_and_Annual_Outlook_Final.pdf

Pulaski areas, and 55 HTF days in the Springmaid Pier area, based on NOAA's intermediate sea level rise scenario.

Hazard 3 - Coastal Storms: Coastal storms continue to be a significant hazard and concern for South Carolina. As noted in the Phase I Coastal Hazards Assessment, the SCCZMP deployed post-disaster damage assessment teams to the beachfront on six separate occasions over the last five years. In 2023 and 2024, teams were deployed to assess damage to beachfront structures twice each year. According to NOAA, the 2024 hurricane season set new records. Hurricane Beryl was the earliest Atlantic basin Category-5 hurricane on record. Preliminary data indicate that Hurricane Helene was the deadliest hurricane to affect the continental U.S. since Katrina in 2005, with more than 150 direct fatalities, the majority of which occurred in North Carolina and South Carolina. Hurricane Helene marked the first time ever that NOAA's National Hurricane Center forecasted a system to become a major hurricane before it became a tropical depression or tropical storm. Hurricane Milton's rate of rapid intensification was among the highest ever observed, with a 90-mile-per-hour increase in wind speed during the 24-hour period from early October 6 to early October 7.[83]

As noted in the Stakeholder Engagement section above, 36 of 42 stakeholder respondents included Coastal Hazards in their top four priority enhancement areas. Some stakeholders emphasized the need to protect the state's beaches and beachfront properties, while others suggested the need for stronger limits on building on the beachfront. Nature-based solutions were mentioned as well, with a need for more research and permitting pathways. The need and opportunity for enhanced communication was also noted by several stakeholders to improve awareness of coastal hazards and the risk associated with living on the coast.

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.

[83] https://www.noaa.gov/news-release/atlantic-hurricane-season-races-to-finish-within-range-of-predicted-number-of-named-storms

Emerging Issue	Information Needed
New Beachfront Jurisdictional Lines Review and Establishment Cycle	Field collection of beachfront vegetation lines and dune measurements
	Review of current and historic imagery and identification/digitization of wet/dry lines
	Update long-term erosion rates for all oceanfront land that is developed or potentially could be developed
	Establish beachfront jurisdictional lines for the current establishment cycle
	Identify all habitable structures, pools, and erosion control structures that are wholly or partially within the state's beach/dune system critical area
Digitization of historic beachfront jurisdictional lines	Need to digitize original 1991 beachfront jurisdictional lines to complete the digital historical record
Education and outreach needs focused on local government stakeholders	Need to improve stakeholder awareness and understanding of the state's beachfront jurisdiction and authorization requirements. Need to develop a framework for local government partner discussion, information sharing, and collaboration to address common coastal issues.

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 and/or no build areas	Y	Y	N
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	Y

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	N
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	Y	N
Freeboard requirements	N	N	N
Real estate sales disclosure requirements	Y	Y	N
Restrictions on publicly funded infrastructure	Y	Y	N
Infrastructure protection (e.g., considering hazards in siting and design)	N	Y	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	Y	Y*
Sea level rise/Great Lake level change or adaptation plans	N	Y	N
Statewide requirement for local post-disaster recovery planning	N	Y	N
Sediment management plans	N	Y	N
Beach nourishment plans	N	Y	N
Special Area Management Plans (that address hazards issues)	N	Y	N
Managed retreat plans	N	N	N
Other (please specify)			

*In reference to updated Local Comprehensive Beach Management Plans (LCBMPs).

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	N
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	Y^
Other (please specify)			

*In reference to updated beach profile data collection.
^In reference to the South Carolina Coastal Atlas StoryMap.

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?

   Since the previous assessment, the following projects have occurred on South Carolina beaches:

   - Pawleys Island renourishment project (2020)
   - Hunting Island renourishment project (2020)
   - DeBordieu Colony renourishment project (2022)
   - The Peninsula, Litchfield Beach renourishment project (2022)
   - Seabrook Island sand transfer project (2024)
   - Various federal U.S. Army Corps of Engineers beach renourishment projects or beneficial use of dredge material projects.

   The following emergency orders have been authorized since the previous assessment:
   - 2020: 8 emergency orders for sand scraping, minor beach renourishment, or sandbags
   - 2021: 43 emergency orders for sand scraping, minor beach renourishment, or sandbags
   - 2022: 14 emergency orders for sand scraping, minor beach renourishment, or sandbags
   - 2023: 22 emergency orders for sand scraping, minor beach renourishment, or sandbags
   - 2024: 13 emergency orders for sand scraping, minor beach renourishment, or sandbags

   Additionally, the SCCZMP is developing a Beachfront Explorer Tool to increase public awareness and understanding of 1.) the importance of South Carolina's beachfront environment 2.) coastal risks and hazards, and 3.) permitting and regulatory requirements to enable and empower stakeholders to make informed decisions on the beachfront. The Beachfront Explorer will consolidate available beachfront information allowing users to evaluate data collectively within a single platform. It will also provide users with the ability to evaluate data cumulatively, which is critical to understanding the additive implications of a particular activity, like beach nourishment. Users will be able to create individualized snapshot reports highlighting hazard-related information at the beach and/or parcel level, while also gaining a better understanding of relative risk by comparing hazards across areas. The collective, cumulative, and comparative analysis aspects of the Beachfront Explorer are intended to improve public awareness and understanding of the inherent risks associated with

beachfront properties and to provide users with data and information necessary to inform their own individualized beachfront risk assessments and decisions. This multi-year project aims to address the high priority need to increase public awareness among property owners and sellers, potential buyers, local communities, and beachfront residents and visitors.

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: Support the review and re-establishment of the state's beachfront jurisdictional lines and long-term erosion rate calculations associated with the current review cycle. Following the establishment of new beachfront jurisdictional lines, identify structures wholly or partially within the beach/dune system critical area, and update SCDES BCM's inventory database of beachfront structures.

   Description: South Carolina Code of Laws §48-39-280 requires SCDES BCM to establish and periodically review two beachfront jurisdictional lines - the baseline and the setback line – every 7-10 years. These lines delineate the extent of the state's direct permitting authority for activities proposed within the beach/dune system critical area. The jurisdictional lines enable SCDES BCM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems within this critical area.

   Upon adoption of revised beachfront jurisdictional lines, SCDES BCM must re-evaluate habitable structures, pools, and erosion control structures that are wholly or partially within the beach/dune system critical area. Upon identification, these structures must be incorporated into SCDES BCM's database of beachfront structures, which are inventoried in the field annually. These field activities are associated with SCDES BCM's Emergency Preparedness Plan and prepare the agency for the potential need to evaluate damage to beachfront structures following a disaster along the South Carolina coast in accordance with the state's Coastal Division Regulations.

   Management Priority 2: Digitize the original baseline and setback line established in 1991.

   Description: The current jurisdictional lines review cycle (which began in 2024) represents the fifth cycle since the passage of the Beachfront Management Act in 1988. The original lines were established in 1991, and subsequently in 1999, 2008-2012, and 2016-2018. Digital versions of the state's historical jurisdictional lines are available to view in GIS software platforms and web applications for all review and establishment cycles except for the original set of lines established in 1991. The original lines are only available on hard-copy maps, which were scanned in 2023. There is a need to georeference the 1988 aerial imagery and digitize the 1991 lines to complete the historical record.

   Management Priority 3: Internal and external outreach and engagement to increase knowledge and awareness of critical areas, permitting and regulatory requirements, and coastal hazards and risks.

Description: Need to increase stakeholder awareness and understanding of South Carolina's beachfront critical areas, state permitting and regulatory requirements within these critical areas, as well as coastal hazards and the inherent risks associated with owning property in or adjacent to these areas. This enhanced awareness is particularly needed amongst prospective beachfront property buyers but is also important for property sellers, to satisfy real estate disclosure requirements. This outreach is also critically important for local government partners and beachfront residents and visitors to foster environmental stewardship and coastal community resilience.

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/ Mapping/GIS/modeling	Y	Needs described above related to the new Beachfront Jurisdictional Lines Review and Establishment Cycle including beachfront data collection, review of aerial imagery and shoreline data digitization, calculation of long-term erosion rates, establishment of new beachfront jurisdictional lines, and identification of structures within or partially within the beach/dune system critical area.
Data and information management	Y	SCDES BCM has a large amount of historic data (11 TB), including historic imagery, LiDAR, and topos. This data is currently stored on CDs, DVDs, and aging external hard drives. At least one of the CDs has already failed, resulting in the loss of irreplaceable data. This information is critical for permitting reviews, long-term planning, and other programmatic efforts. BCM does not currently have a plan for long-term stable storage or accessibility.
Training/Capacity building	Y	Develop a *South Carolina Tidelands and Beaches Critical Areas Field Guide* to augment existing staff training related to vegetation identification in critical areas.
Decision-support tools	Y	Need to increase public awareness and understanding of the beachfront critical areas, permitting and regulatory requirements, as well as coastal hazards and the inherent risks associated with owning property in or adjacent to these areas. The target audience includes property owners and sellers, potential buyers, local communities, and beachfront residents and visitors. This need is currently being met with the development of the Beachfront Explorer Tool described in detail above.
Communication and outreach	Y	Need to update *How to Build a Dune* guide Need to develop a *Beachfront Permitting* course for local governments, to improve awareness and understanding of

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
		the state's beachfront jurisdiction and authorization requirements. Need to establish a Coastal Local Government Network to provide trainings, garner local input and needs, strengthen partnerships and create a platform for collaborative problem solving with local government partners.
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.

As noted above, the Coastal Hazards enhancement area was identified as a high priority by both internal and external stakeholders for the upcoming enhancement cycle. SCDES BCM has a number of high priority needs related to this enhancement area, including reestablishment of the state's beachfront jurisdictional lines and updating the state's inventory of beachfront structures. Additional outreach and education needs have been identified, as well.

Strategy: Wetlands

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
- ☐ 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):*

☐ 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,

◉ 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:*** The primary goals of this strategy are to 1) review existing aerial imagery of coastal South Carolina to identify areas collected at or near low tide, 2) utilize an unmanned aerial vehicle (UAV) to collect new imagery to ground truth and supplement existing imagery in high-priority areas, 3.) use existing and new aerial imagery to refine the state's current oyster reef data layer in select locations, 4.) integrate this improved oyster data into new and existing decision-support tools for state regulatory and resource management programs, 5.) develop related guidance documents and resource training for SCCZMP staff, and 6.) the SCCZMP will build on previous public outreach and education efforts using the ESRI ArcGIS StoryMaps platform.

C. Description

South Carolina's intertidal zone, the area alternately inundated and exposed during semi-diurnal tides, supports nearly 350,000 acres of salt marsh connected to nearly 5,000 acres of intertidal oyster reefs, creating an expansive habitat that is physically and economically critical to the region. This habitat provides for culturally and economically important commercial and recreational species, buffers storms and erosion, filters sediment and pollutants to improve water quality, provides aesthetic and recreational value, bolsters a strong coastal tourism economy, and supports a nearly $25M annual seafood industry.

Approximately 20 years ago, the SC Department of Natural Resources (SCDNR) and collaborators successfully developed a GIS oyster reef layer by classifying intertidal oyster reefs from low-tide aerial imagery. This product has been widely used by state government agencies, NGOs, and private restoration practitioners to inform management and restoration activities in South Carolina. However, the usefulness of this product decreases with age, and updating this oyster layer will support SCDES BCM regulatory decision-making and programmatic initiatives. SCDES BCM's Coastal Zone Consistency (CZC) section assesses development impacts to state wetland resources, including oysters, one of the state's major commercial and recreational coastal resources. To support science-based decisions, CZC staff require accurate shellfish data including location, size, and distribution of oyster reefs at a landscape scale. SCDES BCM's Critical Area Permitting (CAP) section reviews proposed alterations within the tidelands/marsh and coastal waters critical areas. An accurate shellfish layer is also an essential dataset for CAP staff when reviewing critical area permit applications, including those for living shorelines.

As part of this strategy, the SCCZMP will review existing aerial imagery to identify areas flown at or near low tide. South Carolina's semi-diurnal tides expose oyster reefs at low tide, so imagery collected at this tidal stage is critical for identification of reefs. The review will include the South Carolina Revenue and Fiscal Affairs Office's statewide imagery from 2020, 2023, and 2026. Using this imagery and a digital quarter-quarter quadrangle grid file, an overlay analysis will be performed, and the imagery associated with each grid cell will be classified as low tide, mid tide, or high tide (or a mix of tide stages). Based on the overlay analysis, as well as oyster presence, use, development, and accessibility, select high priority areas will be identified for additional aerial imagery collection at low tide using in-house unmanned aerial vehicles (UAVs). The UAV-collected imagery will be used to supplement existing statewide low tide imagery. The combined low tide imagery will then be used to update the state's oyster reef layer. Depending on the spatial extent of the low tide imagery, the methodology used to update the oyster layer may vary. If the area is large, Department staff and/or partners may apply an automated technology to identify oyster reefs (e.g., ESRI Deep Learning). If automated technology is used, additional UAV flights will be flown to ground truth the results. If the overall spatial extent of low tide imagery is small, staff will manually digitize oyster reef boundaries.

SCDES BCM's existing regulatory web application used to support internal critical area permit application reviews will be updated to include the new oyster layer, following its completion. SCDES BCM will also coordinate with The Nature Conservancy, to update the oyster layer currently displayed in South Carolina's Living Shoreline Explorer Application. This app, part of SCDES BCM's Section 309 Wetlands Strategy for 2016-2020, was designed to help coastal property owners visualize energy conditions along the state's estuarine shorelines.

A new SCDES BCM custom regulatory review web application will be developed specifically to aid CZC reviews. Currently, all SCDES BCM regulatory and compliance sections share a single web-based GIS application to review spatial data. As a result, all GIS layers needed by all sections are included together within the application. Some of the data needed by the CAP and compliance sections are not needed by CZC, and vice versa. Before each daily use, staff must 'customize' the map for their specific needs, turning layers on and off and symbolizing as needed. This manual, daily customization results in delays for CZC reviews. A custom web application will allow CZC project managers to immediately begin work without any manipulation of the app required. Additionally, the CZC section currently uses two separate applications to complete the spatial data review. The custom web application will combine the tools and capabilities of both applications into one seamless tool, increasing efficiency. In conjunction with development of the new custom web application for CZC, the current regulatory web application utilized by regulatory staff will be streamlined and tailored to the needs of permitting and compliance staff.

The new CZC web application will be developed in two phases. Phase I, expected to be developed and finalized in Year 1 of the strategy, will involve customization to include specific data layers relevant to CZC reviews including freshwater wetlands, threatened and endangered species, archaeological and cultural resources, coastal regulatory boundaries, land disturbance area, area management plans, land cover, dock master plans, historical permits, streams, navigable waters, active mines, protected lands, streets, parcels, current and historic aerial imagery, and LiDAR. Year 1 will include acquisition of new data for incorporation into the application including new stream and LiDAR data, as well as new aerial imagery. Additionally, NOAA anticipates releasing an updated 1-meter C-CAP Land Cover layer in 2025, which will be incorporated into the new web application. Phase II of the custom web application will involve automation of CZC's standard GIS review, which is one part of the consistency review process. Planning efforts will begin in Year 2 and include project scoping, design, and close coordination with end users in the CZC section. Phase II web application development is expected to begin in Year 3, with beta testing in Year 4, and oyster layer incorporation and finalization of the application in Year 5. SCDES BCM will also develop internal guidance documents and training to ensure staff have the resources needed to navigate and utilize the new web application for future project reviews. Years 4 and 5 of the strategy will be used to develop guidance materials and training for staff.

As part of this strategy, the SCCZMP will also build on previous public outreach and education efforts using the ESRI ArcGIS StoryMaps platform. In 2025, SCDES BCM released its first StoryMap, the South Carolina Coastal Atlas. This outreach product, which allows the public to explore the history, tools, and initiatives of the SCCZMP, was created as part of SCDES BCM's Section 309 Coastal Hazards Strategy for 2021-2025. Following the success of the Coastal Atlas, SCDES BCM will begin building a SCCZMP StoryMap collection. ESRI StoryMap collections allow for grouping related stories together and sharing as a cohesive, easily navigable set. A *Living Shorelines* StoryMap will be developed and added to the new SCCZMP StoryMap collection. The product will highlight the latest research, tools, and regulatory information for living shorelines in South Carolina, as well as the achievements from SCDES BCM's Section 309 Wetlands Strategy (2016-2020). This effort will include collaboration with partners involved in previous Living Shoreline efforts, including SCDNR, and the final product is expected to be available at the close of Year 2 with a focus on promotion in Year 3.

III. Needs and Gaps Addressed

The current intertidal oyster reef data used in South Carolina is approximately 20 years old. While this product has been widely used to inform management and restoration activities in the past, its usefulness has decreased with age. To support science-based decisions, CZC staff require accurate shellfish data including location, size, and distribution of oyster reefs at a landscape scale. An accurate shellfish layer is also an essential dataset for CAP staff when reviewing critical area permit applications, including those for living shorelines.

Additionally, development of a custom web application will address the critical, internal need to enhance the tools and processes available to the CZC section, to decrease the current backlog of project reviews. SCDES BCM's CZC section saw a 168% increase in project reviews between 2014 and 2022, which is correlated with the rapid increase in population and development occurring within the South Carolina Coastal Zone. While state funding was awarded to SCDES BCM in the 2024 legislative session to support the CZC section, additional opportunities exist to enhance data, tools, and processes to achieve greater efficiency and to improve the section's ability to address cumulative and secondary impacts within the Coastal Zone. The new web application, tailored specifically to the needs of CZC staff, is anticipated to allow staff to efficiently and accurately identify potential impacts to resources.

IV. Benefits to Coastal Management

Intertidal oyster reefs in South Carolina play a key role in coastal community resilience by providing shoreline and marsh stabilization and improving water quality. The oyster fishery in South Carolina supports a Blue Economy of tens of thousands of residents through commercial harvesting and subsistence fishing. Commercial harvesting of oysters totaled $3.9M in ex-vessel value in 2023. Intertidal reefs also provide essential fish habitat which is critical for commercial crab, finfish, and shrimp populations. In 2023, the total ex-vessel value for all species which oyster reefs support totaled $24.8M.

This strategy will result in a SCCZMP program change by introducing new procedures that will result in meaningful improvements in coastal resource management. The enhanced oyster layer associated with this strategy will be incorporated into CZC and CAP reviews, ensuring the best available data for regulatory decision-making. New tools will be developed, customized for CZC and CAP, to streamline the GIS analysis portion of permit reviews and support SCDES BCM coastal resource management and decision-making. SCCZMP partners also have a vested interest in the development of a new oyster layer for the state. Intertidal oyster reef data is critically important for SCDNR's oyster resource management. While not associated with this strategy, SCDNR plans to utilize the updated data layer to assess statutory oyster ground husbandry and fee requirements for commercial shellfish permit holders. This data will also support SCDNR's outreach, education, and restoration programs focused on public benefits that extend to disadvantaged communities. Accurate oyster data is critical to continue proper management, protection, and economic use of this resource.

V. Likelihood of Success

There is a high likelihood of attaining the strategy goal and program change. For the oyster layer refinement, the 2020 and 2023 statewide aerial imagery already exists, and the 2026 imagery is currently on track for collection. While it is unknown how much of this existing imagery was collected at low tide, by utilizing three years of data, it is expected that, combined, some

percentage of the coast was likely captured at a tidal stage sufficient to identify oyster reef. Additionally, SCDES BCM has a UAV, as well as staff qualified to fly the unit and process the data to supplement any existing low tide imagery found during the aerial imagery review. While the magnitude of refinements to the oyster layer depends on a variety of factors, this strategy will allow SCDES BCM to initiate efforts and test methodologies that can be applied in the future, should additional funding and resources become available for broader imagery collection and oyster layer refinement.

SCDES BCM's Coastal Services section will manage efforts related to the new and refined regulatory review web applications. SCDES BCM's in-house GIS Manager currently maintains the existing regulatory review web app and has successfully developed and enhanced several internal and external web apps in recent years. The new CZC web app and refined CAP web app will be developed internally and customized by working directly with SCDES BCM regulatory staff. Coastal Services staff have also been highly successful building and improving upon internal regulatory processes, which has included developing guidance documents and offering internal training to staff. As part of this strategy, Coastal Services staff will develop guidance and training materials to ensure regulatory staff have the resources to navigate and utilize the new and refined web apps for future project reviews.

The SCDES BCM Coastal Services team will also manage development efforts for the Living Shorelines StoryMap. This team led the creation of the Coastal Atlas StoryMap, which was successfully released in early January 2025 and received the State Library's Notable Document's award in March 2025. This experience indicates a high likelihood of success with future products.

VI. Strategy Work Plan

Strategy Goal:
Total Years: 5
Total Budget: $1,050,926

Year 1: July 2026 – June 2027
Description of activities:

- Consider methodologies for classifying grid cells based on tidal stage (using imagery), oyster presence, use, development, and accessibility.
- Begin grid cell overlay analysis for tidal stage (using 2020 and 2023 imagery) and additional classifications.
- Acquire updated GIS data layers, including NOAA C-CAP, streams, LiDAR, and aerial imagery.
- Initiate development of custom CZC web app (Phase I) and refinement of existing web app for CAP.
- Begin development of new internal guidance materials and training associated with new and refined web apps (Phase I).
- Begin coordination with SCDNR to plan for Living Shorelines StoryMap.

Major Milestone(s):

- Grid cell classification methodology established.
- Finalize custom CZC web app (Phase I) and refinement of existing web app for CAP.

- Finalize new internal guidance materials and roll-out internal training associated with new and refined web apps (Phase I).
- Outline developed for collaborative Living Shorelines StoryMap.

Budget: $191,498

Year 2: July 2027 – June 2028
Description of activities:

- Continue grid cell overlay analysis for tidal stage (using 2020 and 2023 imagery) and additional classifications.
- Begin grid cell overlay analysis for tidal stage (using 2026 imagery).
- Combine completed analyses of grid cells to determine high priority areas for additional aerial imagery collection at low tide.
- Begin UAV low tide imagery collection at select high priority areas.
- Initiate planning discussions with CZC for development of custom CZC web app (Phase II).
- Begin building Living Shorelines StoryMap.

Major Milestone(s):

- Grid cell overlay analysis complete for all classifications.
- List of high priority areas for additional aerial imagery collection at low tide.
- New UAV low tide imagery collected at select high priority areas.
- Plan and design established for custom CZC web app (Phase II).
- Living Shorelines StoryMap completed.

Budget: $187,103

Year 3: July 2028 – June 2029
Description of activities:

- Continue UAV low tide imagery collection at select high priority areas.
- Consider methodologies for oyster reef digitization based on spatial extent of low tide imagery available.
- Begin digitization of oyster reef and refinement of the state's oyster layer.
- Initiate development of custom CZC web application (Phase II).
- Promote Living Shorelines StoryMap through media, web, partner networks, and at relevant conferences and meetings.

Major Milestone(s):

- New UAV low tide imagery collected at select high priority areas.
- Oyster reef digitization methodology established.
- Initial framework created for new web app (Phase II).

Budget: $221,261

Year 4: July 2029 – June 2030
Description of activities:

- Conduct UAV ground truthing, as needed.
- Continue UAV low tide imagery collection at select high priority areas.
- Continue digitization of oyster reef and refinement of the state's oyster layer.
- Continue developing and begin beta testing custom CZC web app (Phase II).
- In coordination with CZC Manager, initiate planning for new internal guidance materials and training associated with new web app (Phase II).

Major Milestone(s):

- Complete new UAV low tide imagery collected at select high priority areas.
- Preliminary custom CZC web app (Phase II) ready for beta testing.
- Plan developed for new internal guidance materials and training associated with custom web app (Phase II).

Budget: $216,219

Year 5: July 2030 – June 2031

Description of activities:

- Continue UAV ground truthing, as needed.
- Continue digitization of oyster reef and refinement of the state's oyster layer.
- Update custom CZC web app (Phase I) by incorporating refined oyster layer.
- Consider other tools and applications for incorporating refined oyster layer.
- Continue beta testing and refinement of custom CZC web app (Phase II).
- Begin development of guidance materials and internal training on custom CZC web app (Phase II).

Major Milestone(s):

- Oyster reef digitization and state oyster layer refinements complete.
- Refined oyster layer incorporated into other relevant tools and applications.
- Custom CZC web app (Phase II) finalized and ready for implementation.
- Finalize new internal guidance materials and roll-out internal training associated with custom CZC web app (Phase II).

Budget: $234,845

VII. Fiscal and Technical Needs

A. Fiscal Needs:

CZMA Section 309 funds should be sufficient to carry out the proposed program change.

B. Technical Needs:

SCDES BCM possesses the technical knowledge, skills, and equipment to carry out the proposed strategy. If automated classification of imagery is identified as the best methodology, SCDES BCM would look to collaborate with SCDNR partners, provided available funding.

VIII. Projects of Special Merit (Optional)

Develop a *South Carolina Tidelands and Beachfront Critical Areas Field Guide* to augment existing staff training related to delineation of boundaries associated with the tidelands and beaches critical areas.

Strategy: Coastal Hazards

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
- ◙ 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

D. 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,
- ☐ 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.

E. ***Strategy Goal:*** The primary goals of this strategy are to 1.) complete the current review and establishment cycle for South Carolina's beachfront jurisdictional lines, including the adoption of average annual erosion rates, 2.) perform an analysis of structures to identify those that are wholly or partially within the beach/dune system critical area for incorporation into the state's beachfront structural inventory database, 3.) digitize the state's first set of jurisdictional lines (baseline and setback line), established in 1991, and incorporate these lines into publicly available web applications to complete the digital historical record, 4.) build on previous public outreach and education efforts using the ESRI ArcGIS StoryMaps platform, and 5.) establish a Coastal Local Government Network, designed to provide trainings, garner local input and needs, strengthen partnerships and create a platform for collaborative problem solving with local government partners.

F. Description

South Carolina Code of Laws §48-39-280 requires SCDES BCM to establish and periodically review two beachfront jurisdictional lines - the baseline and the setback line - which delineate the extent of the state's direct permitting authority for activities proposed within the beach/dune system critical area. The jurisdictional lines enable SCDES BCM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems within this critical area.

The jurisdictional lines create a state jurisdictional area for the beach/dune system critical area, where activities associated with habitable structures, pools, erosion control structures, renourishment, landscaping, fencing, decks, service lines, and others are reviewed through authorization and permitting processes. Repairs, reconstruction, and new construction are allowed under certain conditions and with authorization by SCDES BCM.

South Carolina law requires SCDES BCM to establish and review the position of the beachfront jurisdictional lines every seven (7) to ten (10) years. The average annual erosion rate for all oceanfront land that is developed or potentially could be developed is also reviewed during this time frame. The current jurisdictional lines review cycle began in January 2024 and must be completed no later than May 2028 to comply with statutory requirements. While the current jurisdictional lines review cycle is already underway, this strategy aims to complete the review and establishment of South Carolina's beachfront jurisdictional lines, adopt long-term erosion rates, and to determine habitable structures, pools, and erosion control structures that are wholly or partially within the beach/dune system critical area.

The line review is being conducted in three phases. Phase I covers the southernmost portion of the South Carolina coast, from Daufuskie Island to Harbor Island. Phase II covers the central coast, from Edisto Beach to Dewees Island. And Phase III will cover the most northern portion of the coast, from Debidue Beach to Waties Island.

The jurisdictional lines review process includes field data collection and GIS analysis, public outreach and education, data and information sharing through web applications, and legislative engagement. Field data collection involves capturing shoreline and dune data using mapping and survey-grade GNSS (Global Navigation Satellite System) units. GIS analysis, using ESRI's ArcPro, will examine current and historic data to identify a proposed baseline and setback line and calculate average annual erosion rates. Once data collection and analysis are complete, the proposed lines and average annual erosion rates will be reviewed and approved by an internal panel of SCDES BCM staff and management. BCM staff will then work with GIS staff to update the Beachfront Jurisdictional Lines web application to release the proposed lines and rates to the public. Reports for each beach will also be added to the web app, as well as the data that was used. There will be a period of public comment and engagement, and the Department will hold public hearings, and modify the lines if appropriate based on feedback.

Following establishment of the beachfront jurisdictional lines, the SCCZMP must identify all habitable structures, pools, and erosion control structures that are wholly or partially within the state's beach/dune system critical area. The identification of structures will begin with a desktop-based GIS analysis to identify structures within a few feet of the setback line. An aerial imagery analysis will then be performed using best available high-resolution imagery to classify structures

as seaward of the setback line and those that need additional review. For structures needing additional review, field survey data will be collected to determine the location of the structures relative to the setback line. These structures identified as wholly or partially within the state's beach/dune system critical area will then be included in SCDES BCM's beachfront structural inventory database to be included in any post-disaster recovery efforts.

Additionally, this strategy aims to digitize the original baseline and setback line established in 1991 following passage of the South Carolina Beachfront Management Act in 1988. Since initial establishment, the state's beachfront jurisdictional lines have been reviewed and reestablished three times, in 1999, 2008-2012, and 2016-2018. The current line review cycle represents the fifth cycle since the lines were originally set in 1991. Digital versions of the state's historical jurisdictional lines are available to view in GIS software platforms and web applications for all review and establishment cycles except for the original set of lines established in 1991. The original lines are only available on hard-copy maps, which were scanned in 2023. As part of this strategy, SCDES BCM will georeference the original statewide 1988 orthoimagery and digitize the 1991 jurisdictional lines for inclusion in publicly available web applications to complete the digital historical record.

Following updates to the beachfront jurisdictional lines, this strategy provides an ideal opportunity to engage with local governing partners on the state's beachfront jurisdiction and authorization requirements. It is also a chance to strengthen partnerships and problem solving by better understanding local needs and challenges. This strategy aims to establish a Coastal Local Government Network, with the goal of providing trainings, garnering local input and needs, strengthening partnerships and creating a framework for collaborative problem solving with local government partners. As part of this network, SCDES BCM will work with existing partners to develop a *Beachfront Permitting* course tailored for local governments, including planning, zoning and engineering, permitting, and administrative staff.

Finally, building on previous success with the ESRI ArcGIS StoryMaps platform, SCDES BCM will begin building a SCCZMP StoryMap collection. ESRI StoryMap collections allow for grouping related stories together and sharing as a cohesive, easily navigable set. As part of this strategy, a *How to Build a Dune* StoryMap will be developed and added to the new SCCZMP StoryMap collection. The Department originally developed this guide in hard copy format, which featured photographs, charts, and schematics, making it well-suited for a StoryMap.

III. Needs and Gaps Addressed

This strategy addresses the SCCZMP's priority need to complete the review and reestablishment of the state's beachfront jurisdictional lines and long-term erosion rate calculations associated with the current review cycle. This priority aligns with NOAA's Section 309 Guidance for 2026-2030, specifically the Coastal Hazards legislative objective which includes preventing or significantly reducing threats to life and destruction of property by managing development in hazardous areas. SC's beachfront jurisdictional lines enable SCDES BCM to implement laws and regulations that support the state's beachfront management goals, guiding development away from high hazard areas, and protecting vulnerable shorelines and natural ecosystems within the beachfront critical areas. A second priority is to identify structures wholly or partially within the beachfront critical areas and incorporate those areas into SCDES BCM's database of beachfront structures, following the establishment of new beachfront jurisdictional lines. Maintenance of SCDES BCM's database of beachfront structures allows the agency to implement emergency preparedness and recovery

functions outlined in SC's Coastal Division Regulations, including assessment of damage to beachfront structures resulting from disasters (e.g., hurricanes). As noted in the Coastal Hazards Phase II Assessment, SCDES BCM has recognized a need among local government partners to improve awareness and understanding of the state's beachfront jurisdiction and authorization requirements associated with alteration and use of the beachfront critical areas. SCDES BCM has also identified common challenges among this stakeholder group (including coastal flooding, erosion, storm protection, and public access) and the need to establish a framework for group discussion, information sharing, and collaborative partnerships to address common coastal issues. Development of the Coastal Local Government Network and *Beachfront Permitting* training will address these emerging needs. A final priority in this strategy is to develop a *How to Build a Dune* StoryMap, which will be added to the new SCCZMP StoryMap collection. Roughly 20 years ago, the SCCZMP published a *How to Build a Dune* hard copy booklet. This guide was a popular resource for many years, but at 20 years old, it now requires significant updates.

IV. Benefits to Coastal Management

This strategy will result in a SCCZMP program change by updating the state's beachfront jurisdictional baseline and setback line, which enable SCDES BCM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems within the beach/dune system critical area. SC's beachfront jurisdictional lines guide development away from high hazard areas to prevent or significantly reduce threats to life and destruction of property. Additionally, long-term erosion rates that will be adopted as part of the strategy are required by SC real estate disclosures laws. These rates also provide guidance for the future use and management of coastal shorelines. This strategy will result in updates to SCDES BCM's Emergency Operations Structural Inventory database, which will help facilitate accurate and efficient implementation of recovery efforts following emergency events. Additionally, this strategy will promote resilient coastal communities by building a network of informed and engaged local government partners equipped with the knowledge and tools to face the state's growing challenges on the coast. Finally, the development of a StoryMap for dune building will support coastal residents and contractors interested in promoting the development of new dunes along the SC coast.

V. Likelihood of Success

There is a high likelihood of attaining the strategy goal. SCDES BCM has already begun the current jurisdictional lines review cycle. While Phase I is expected to be complete before the strategy begins, completion of Phase II and III will be captured under the strategy. The strategy will also support the application of the revised lines to SCDES BCM's Emergency Operations Program, specifically updating the state's inventory database of beachfront structures. SCDES BCM's Coastal Services team, in collaboration with regulatory staff, is currently leading the field data collection and GIS analysis, public outreach and education, and data and information sharing associated with the current jurisdictional lines review cycle. SCDES BCM's Coastal Services team has also recently performed a pilot test, and successfully georeferenced the 1988 orthoimagery and digitized the original 1991 jurisdictional lines for a small section of the coast.

SCDES BCM has developed strong partnerships with many local beachfront communities and organizations over the years. This strategy will build on those connections to establish the Network and *Beachfront Permitting* training. SCDES BCM's Coastal Planner and Outreach &

Communication Project Manager, within the Coastal Services Section, are well-positioned to support this strategy.

The SCDES BCM Coastal Services team will also manage development efforts for a *How to Build a Dune* StoryMap. This team led the creation of the Coastal Atlas StoryMap, which was released in early January 2025, and received the SC State Library's Notable Document's award in March 2025. This experience indicates a high likelihood of success with future products.

VI. Strategy Work Plan

Strategy Goal:
Total Years: 5
Total Budget: $679,074

Year 1: July 2026 – June 2027
Description of activities:

- Conclude public engagement for Phase II beaches, and final adoption of lines and erosion rates.
- Conclude field work for establishing jurisdictional lines for Phase III beaches and begin Phase III jurisdictional line analysis.
- Begin planning and partner engagement for Beachfront Permitting course.
- Begin stakeholder engagement for Coastal Local Government Network.

Major Milestone(s):

- Adopted jurisdictional lines and erosion rates for Phase II beaches and updates web application.
- Partnerships established, and outline created for the Beachfront Permitting course.
- Identify the key partners and goals for the Coastal Local Government Network.

Budget: $154,502

Year 2: July 2027 – June 2028
Description of activities:

- Conclude Phase III jurisdictional line analysis, including documentation.
- Announce preliminary draft jurisdictional lines for Phase III beaches.
- Conduct public engagement for Phase III beaches.
- Final adoption of jurisdictional lines and erosion rates for Phase III beaches and update web application.
- Perform buffer analysis to begin determining habitable structures and pools that are within the beach/dune system critical area, for Phase III beaches.
- Development of Beachfront Permitting course content.
- Plan and coordination for kickoff meeting for the Coastal Local Government Network.

Major Milestone(s):

- Adopted jurisdictional lines and erosion rates for Phase III beaches.
- List developed of habitable structures and pools identified as "intersect" (which require survey data collection) based on buffer analysis, for Phase III beaches.
- Finalized Beachfront Permitting course content.
- Host a kickoff meeting for the Coastal Local Government Network.

Budget: $158,897

Year 3: July 2028 – June 2029
Description of activities:

- Collect survey data on habitable structures and pools flagged during buffer analysis, for Phase III beaches.
- Habitable structures and pools determined to be wholly or partially within the beach/dune system critical area are added to SCCZMP Beachfront Structural Inventory, for Phase III beaches.
- Begin planning for development of How to Build a Dune StoryMap.
- Work with partner(s) to launch Beachfront Permitting course.
- Summarize key findings, issues, and needs from the kickoff meeting for the Coastal Local Government Network. Determine the frequency and goals for future meetings.

Major Milestone(s):

- Delivering Beachfront Permitting 101 course.
- Outline created for How to Build a Dune StoryMap.
- Beachfront Structural Inventory database updated.
- The Coastal Local Government Network is established, including partners, goals, and framework for meetings.

Budget: $124,739

Year 4: July 2029 – June 2030
Description of activities:

- Begin developing How to Build a Dune StoryMap.
- Begin georeferencing 1988 statewide aerial imagery.
- Using 1988 georeferenced imagery, digitize original beachfront jurisdictional lines that were established in 1991.

Major Milestone(s):

- How to Build a Dune StoryMap completed.
- 1988 aerial imagery georeferenced and original 1991 beachfront jurisdictional lines digitized.

Budget: $129,781

Year 5: July 2030 – June 2031
Description of activities:

- Promote How to Build a Dune StoryMap through media, web, partner networks, and at relevant conferences and meetings
- Incorporate original 1991 beachfront jurisdictional lines into long-term data management and storage platforms, and relevant GIS software platforms and web applications.

Major Milestone(s):

- Data management and storage and GIS software platforms and web applications updated to include 1991 jurisdictional lines.

Budget: $111,155

VII. Fiscal and Technical Needs

A. Fiscal Needs:

CZMA Section 309 funds should be sufficient to carry out the proposed program change.

B. Technical Needs:

SCDES BCM possesses the technical knowledge, skills, and equipment to carry out the proposed strategy.

VIII. Projects of Special Merit (Optional)

Develop a *South Carolina Tidelands and Beachfront Critical Areas Field Guide* to augment existing staff training related to delineation of boundaries associated with the tidelands and beaches critical areas.

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
Wetlands	309	$191,498	$187,103	$221,261	$216,219	$234,845	$1,050,926
Coastal Hazards	309	$154,502	$158,897	$124,739	$129,781	$111,155	$679,074
Total Funding		$346,000	$346,000	$346,000	$346,000	$346,000	$1,730,000

Summary of Stakeholder and Public Comment

Stakeholder feedback is summarized in the Stakeholder Engagement section above.