

**FINAL
ASSESSMENT AND STRATEGY
OF THE
NORTH CAROLINA
COASTAL MANAGEMENT PROGRAM**

FY 2011-2015

**PERFORMED UNDER THE
COASTAL ZONE ENHANCEMENT GRANTS PROGRAM**

**SECTION 309
COASTAL ZONE MANGEMENT ACT**



FEBRUARY 10, 2011

This document consists of seven major sections: (I) Introduction, (II) Summary of FY 2006-2010 Section 309 Strategy, (III) Final Ratings of the 2010 Program Assessment, (IV) Program Enhancement Area Analysis, (V) Program Enhancement Strategy (FY 2011-2015), (VI) Budget Summary, and (VII) Summary of Public Involvement. It was prepared by the NC Division of Coastal Management based on guidance provided by the federal Office of Ocean and Coastal Resource Management (OCRM).

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I. INTRODUCTION

North Carolina's Coastal Zone Management Program

North Carolina's Coastal Zone Management Program was federally approved in 1978 in response to passage of the federal Coastal Zone Management Act in 1972, which provides funds to coastal states to develop and administer coastal zone management programs. The Division of Coastal Management (DCM) works to protect, conserve and manage North Carolina's coastal resources through an integrated program of planning, permitting, education and research.

DCM carries out the State's Coastal Area Management Act (CAMA), the Dredge and Fill Law and the federal Coastal Zone Management Act in 20 coastal counties, using rules and policies developed by the NC Coastal Resources Commission (CRC). The division serves as staff to the CRC. DCM is an agency within the NC Department of Environment and Natural Resources, which is responsible for managing and protecting the State's natural resources.

DCM is responsible for several programs, including:

- permitting and enforcement;
- CAMA land-use planning;
- public beach and waterfront access;
- North Carolina Coastal Reserves;
- coastal hazards; and
- ocean resources.

Section 309 Coastal Zone Enhancement Grant Program in North Carolina

Section 309 of the Coastal Zone Management Act (CZMA), as amended in 1990, provides for a voluntary Coastal Zone Enhancement Grants Program to encourage states to develop program changes in one or more on nine specified enhancement areas: public access, coastal hazards, ocean resources, wetlands, cumulative and secondary impacts, marine debris, special area management planning, energy and government facility siting, and aquaculture. Under this program, every five years coastal states conduct a detailed program Assessment of these nine enhancement areas and, as a result, identify high-priority areas for inclusion in a five-year strategic plan.

Historically, North Carolina's Section 309 Program was established in FY 1991-92 when DCM performed an initial assessment of North Carolina's Coastal Management Program pursuant to the CZMA. Since then, North Carolina has developed program assessments and strategies in 1997, 2001 and 2006.

For FY 2011-2015, DCM has completed its assessment of the State's coastal program and has developed its five-year strategic plan. Utilizing the CZMA Section 309 Program Guidance document finalized by OCRM in July 2009, the Program Assessment and Strategy document was developed by DCM staff with review and input provided by appropriate stakeholders (as needed). An initial draft Program Assessment was developed in March 2010. DCM then formed an internal Program Assessment and Strategy Review Team (consisting of the Director, both Assistant Directors, NCNERR Director, along with key staff and managers from DCM and NCNERR). In April, this team met to review the results of the Assessment, determine final program ratings, agree which programs should be included in the Strategy and identify specific program changes and/or outcomes. From that point, staff worked mainly to develop the Strategy document and provided several other draft iterations of the Assessment and Strategy that were reviewed by the Review Team. Ultimately, DCM submitted its first draft document to OCRM on June 30, 2010. This draft was revised according to OCRM comments received on September 3 and was re-submitted on November 1, 2010.

To solicit public input in the development of the FY2011-2015 Program Assessment and Strategy, DCM invited public review/comment and provided a link to its June 30, 2010 draft document. This information was widely distributed electronically through DCM's Interested Parties List, newsletter (CAMAgram) and blog (CAMALines), as well as DENR's Facebook and Twitter feeds. This distribution includes the majority of relevant stakeholders and private citizens with an interest in coastal management in the State (i.e., state, federal and local government agencies, academia, environmental groups, Coastal Resources Commission and Coastal Resources Advisory Council members, and citizens). It was also published in the summer newsletter of the NC Beach and Inlet Waterway Association (NCBIWA) and posted on DCM's web-page located at <http://www.nccoastalmanagement.net/>. The public comment period was from July 19, 2010 through August 31, 2010 (concurrent with OCRM's review of the same document). No comments were received from the public during this six week time period.

In addition, DCM's Strategic Planning Manager gave a presentation on the draft Program Assessment and Strategy to the NC Coastal Resources Commission and others at their meeting in Beaufort, NC on November 17, 2010. Several comments were received during that meeting and are summarized under Summary of Public Comments on page 120.

As a result of this process, DCM has identified two high priority enhancement areas for inclusion in its next five-year program enhancement strategy (FY 2011-2015): **Coastal Hazards and Ocean Resources**.

II. SUMMARY OF FY 2006-2010 SECTION 309 STRATEGY

North Carolina's current 309 Strategy implements three program changes in two program areas (Coastal Hazards and Ocean Resources): 1) rule and policy changes related to development in Ocean Erodible and Inlet Hazard Areas of Environmental Concern, 2) rule and policy changes related to the estuarine shoreline, and 3) rule and policy changes associated with ocean resources (primarily energy). The following is a summary of these program changes and related accomplishments.

COASTAL HAZARDS STRATEGY

In reviewing its regulatory and planning program for barrier island shoreline and estuarine shoreline development, DCM identified the need to re-assess the scientific and technical basis for some of its rules. Therefore, DCM designated two specific program changes to address issues in those areas. Upon completion of this Strategy, these program changes will enhance our ability to manage coastal hazards in North Carolina related to development of new oceanfront setback policies, revised inlet hazard area boundary delineations and rules, updated long-term erosion rates on the oceanfront, amendments to the Ocean Erodible Area; and better management of our estuarine shoreline through more effective siting and implementation of shoreline stabilization structures related to shoreline type.

PROGRAM CHANGE 1: Under the program change titled *“Update Boundaries, Policies and Rules Associated with the Ocean Erodible and Inlet Hazard Areas of Environmental Concern”*, numerous rule development and/or changes focusing on North Carolina’s oceanfront (including the Inlet Hazard Area and the Ocean Erodible Area) have been completed or currently are underway. It should be noted that the current strategy identified the following rules for review and/or revision: 15A NCAC 07H.0304, .0305, .0306, .0308, and .0310. Subsequent review of related rules required similar revisions so that newly adopted CRC policies (primarily related to oceanfront setbacks) were consistent or provided necessary guidelines for implementation (i.e., the static line exception rule procedures laid out in Subchapter 07J). Therefore, as a result of implementing DCM’s current 309 Strategy, the following rules were also revised: 15A NCAC 07H.0104, .0109, and 07J.1201-.1206. DCM has received OCRM concurrence on a Routine Program Change for 15A NCAC 7H .0306 General Use Standards for Ocean Hazard Areas and 15A NCAC 7J .1200 Static Line Exception Procedures. The 7J .1200 is a new rule. Routine Program Changes for the additional rule changes will be submitted as they become effective which is anticipated to be by the end of 2011 and early 2012.

15A NCAC 07H .0304 - Inlet Hazard Area

DCM worked with the Science Panel to draft revised Inlet Hazard Area (IHA) boundaries for the State’s 12 developed inlets and, as a result, presented a draft IHA report (which included methods and results) to CRC in May 2010. Four major methods were used to carry out this study: 1) shoreline statistics, 2) the creation of a hybrid shoreline (i.e., with few exceptions related to previous inlet locations, the landward-most position of shoreline at each shore-perpendicular transect in the DCM digital database), 3) the consideration of beach width, and 4) barrier island geomorphology. DCM worked with Science Panel to analyze risk factors inside these boundaries; and with the CRC to develop rule language related to development standards for the IHAs. DCM also worked with the CRC to address additional rule revisions regarding an updated oceanfront erosion rate and potential boundary changes to the IHAs for the State’s 12 developed inlets. The CRC has discussed the best approach to inlet policy review and revision and, at their September 2010 meeting, requested that DCM present a draft development strategy out to local governments for their input. These meetings with local governments occurred in October and November, and DCM reported the stakeholder comment results to the CRC in November 2010. Based on this input, the CRC instructed DCM to hold off on additional IHA

boundary and policy work until the oceanfront erosion rate (which will include inlets) is completed by summer 2011.

15A NCAC 07H.0104 – Oceanfront Setback Grandfathering

In May 2010, the CRC adopted rule changes to the grandfathering of oceanfront erosion rate setbacks for lots platted on or after June 1, 1979 (the effective date of the State's erosion rates used for setback determination). The new rule allows lots that do not meet the current erosion rate setback to use the erosion rate in place at the time the lot was platted provided that the development is at least 60 feet landward of the first line of stable and natural vegetation or the static line (whichever is applicable), the building is as far landward on the lot as feasible, the building is no further oceanward than the landward-most adjacent building, and the building has a total floor area not larger than 2,000 square feet. The effective date of this rule change was August 1, 2010. These rule changes will be submitted to OCRM for inclusion into the State's Coastal Zone Management Program in August 2011.

15A NCAC 07H .0304 - Ocean Erodible Area

In March 2010, the CRC approved for public hearing a rule amendment to change the Ocean Erodible Area (OEA) width formula from $60 \times \text{ER} + \text{SRR}$ to $(90 \times \text{ER}) + \text{SRR}$. Public hearings will occur during the spring of 2011 with a proposed effective date of June 1, 2011. If, and when, these rule changes become effective, they will be submitted to OCRM for inclusion into the State's Coastal Zone Management Program.

15A NCAC 7H .0305 - General Identification and Description of Landforms

This rule, which became effective on April 1, 2008, defines factors considered in setback determinations, including first line of stable and natural vegetation (FLS&NV), measurement line, and static vegetation line. The new rule contains a more objective definition of FLS&NV. Beach fill threshold volume that triggers a static vegetation line changed from 200,000 cubic yards at an average distribution of 50 cubic yards per linear foot to 300,000 cubic yards (or any US Army Corps of Engineers storm protection project). The original static vegetation lines for towns of Oak Island and Ocean Isle Beach were replaced with the vegetation lines defined by DCM from June 1998 aerial orthophotos. These rule changes have not yet been submitted to OCRM for inclusion into the State's Coastal Zone Management Program.

15A NCAC 7H .0306 - Oceanfront Setbacks

Changes were made to the rules governing development in ocean hazard areas, related specifically to the setback provisions. The amendments tie beachfront building setbacks to the size of the structure, not the use. The revisions include graduated setback factors for buildings greater than 10,000 square feet (thus increasing the maximum setback from 60 to 90 times the erosion rate), and do not allow for cantilevering oceanward of the setback line. A provision was also included for a static line exception that allows limited development on lots behind large-scale, long-term beach fill projects. This rule change underwent legislative review during the 2009 session of the NC General Assembly and became effective on August 11, 2009. These rule changes have been submitted to OCRM and were approved for incorporation into the State's federally approved Coastal Zone Management Program on July 2, 2010.

15A NCAC 07H.0308 – Sandbag Management along Oceanfront and Inlet Shorelines

Changes were made to the rule that defines sandbag placement along the oceanfront and inlet shoreline. Specific changes include:

- Removal of references to specific dates associated with the 2000 eight-year time extension for communities seeking nourishment projects.
- Allow sandbags to remain in place for eight years provided that they are located in an Inlet Hazard Area and the community is actively seeking an inlet relocation project.
- Should a structure again become imminently threatened due to the movement of the inlet, sandbags would be once again allowed provided that the community also commit to another inlet relocation project. Removes the once per property limitation for structures in inlet hazard areas.
- Clarifies the conditions under which sandbags are considered to no longer be necessary and are to be removed, including relocation or removal of the structure, construction of a storm protection project by the USACE, or a large-scale beach nourishment project. The amendments specify that, under the above conditions, the sandbags are to be removed regardless of the time limits originally imposed upon the temporary erosion control structure.
- Clarifies that swimming pools are not to be protected by sandbags.

These rule changes have not yet been submitted to OCRM for inclusion into the State’s Coastal Zone Management Program.

15A NCAC 7H .0309 - Use Standards for Ocean Hazard Areas: Exceptions

Specific to oceanfront setbacks, this rule, which became effective on June 2, 2010, provides new regulations for what had been referred to as “the single-family exception” as defined in part (b) of the rule. This is a pre-setback grandfather clause for lots platted prior to the first setback rules, which became effective on June 1, 1979.

- Structures on lots platted prior to June 1, 1979 that cannot meet the setback using current erosion rates may be permitted under the following conditions: 1) building is as far landward on lot as feasible, 2) building is no larger than 2,000 square feet TFA, 3) building is no further oceanward than the landward-most adjacent building, and 4) building is at least 60 feet landward of first line of stable and natural vegetation or static line (whichever is applicable).
- The pre-CAMA setback provision cannot be used on lots within an Inlet Hazard Area or Unvegetated Beach AEC.

Other non-setback changes to this rule address wind energy facility transmission lines and pier houses. These rule changes have not yet been submitted to OCRM for inclusion into the State’s Coastal Zone Management Program.

15A NCAC 07J .1201 – 1206 – Criteria for Static Line Exception

These rule changes, which became effective on March 23, 2010, are the administrative guidelines for how communities may apply for a static line exception. The criteria used by the CRC for granting a static line exception are defined in this section of the rules. The static line exception sunsets after five years from the effective date (at which point an eligible community must reapply). Currently, seven communities have applied for and received static line exceptions.

These rule changes have been submitted to OCRM and were approved for incorporation into the State's federally approved Coastal Zone Management Program on July 2, 2010.

PROGRAM CHANGE 2: Under the program change titled "*Update Policies and Rules Associated with the Estuarine and Ocean System AEC Categories*", several rules related to estuarine shoreline management were revised and adopted by the CRC. It should be noted that the approved strategy identified the following rules for review and/or revision: 15A NCAC 07H.0208 and .0209. Subsequent review of related rules required similar revisions so that newly adopted CRC policies were consistent or provided necessary guidelines for implementation. Therefore, as a result of implementing DCM's 309 Strategy, the following rules were also revised: 15A NCAC 07H .1100, .1400, .2100, and .2400.

The rule changes summarized below have not yet been submitted to OCRM for inclusion into the State's Coastal Zone Management Program. However, DCM intends to submit them as routine program changes in April 2011.

The CRC adopted minor changes to the following rules on January 13, 2010 which became effective on August 1, 2010:

T15A NCAC 07H .0208(b)(7) relevant to estuarine shoreline bulkheads

Changes include:

- Substitution of mean high water with Normal High or Normal Water Level as defined in 15A NCAC 07H .0106(2).
- Substitution of the phrase "significant adverse impacts" to be consistent with language used in CAMA and the NC State Environmental Policy Act to clarify that development shall not have "significant adverse impacts".
- Prohibit the siting of stormwater management systems in the Commission's 30' buffer area in accordance with existing rule 15A NCAC .07H .0209(d).
- Correction of vague or ambiguous language in accordance with APA guidelines.

T15A NCAC 07H .0208(b)(9) relevant to estuarine shoreline groins (wooden and riprap)

Changes include:

- Since the use standards are essentially the same for wooden and riprap groins, the distinction is being deleted from the title.
- Substitution of Mean High Water with Normal High or Normal Water Level as defined in 15A NCAC 07H .0106(2).
- Specifies that a structure longer than 25' must be justified by an individual who meets state occupational licensing requirements to be consistent with other Commission rules that involve engineering or engineering practices.
- Clarifies where the buffer is to be measured from on rock groins.

15A NCAC 7H .1100 - General Permit for Construction of Bulkheads and the Placement of Riprap for Shoreline Protection in Estuarine and Public Trust Waters and Ocean Hazard Areas
Section .1100 specifies how applicants prepare and submit permit applications, how the Division of Coastal Management (DCM) reviews the applications, fees to acquire the permit,

and use standards by which the structure needs to be constructed. The amendments are pursuant to the Coastal Habitat Protection Plan (CHPP) and its recommendation to encourage alternatives to vertical structures for shoreline stabilization. Specific changes, which became effective on July 1, 2009, include the following:

- On non-wetland shorelines, bulkheads are to approximate normal high water or normal water level (instead of an average of 2 feet) with a maximum of 5 feet waterward of normal high water or normal water level.
- On non-wetland shorelines, new bulkheads on manmade shorelines shall approximate an average of 2 feet with a maximum of 5 feet waterward of the normal high water or normal water level instead of an average of 5 feet with a maximum of 10 feet waterward of the normal high water or normal water level.
- On non-wetland shorelines, replacement bulkheads shall be a maximum of 2 feet waterward of the original alignment (instead of average of 2 feet) with a maximum of 5 feet waterward of normal high water or normal water level.
- On non-wetland shorelines, riprap placement shall be a maximum of 10 feet waterward of normal high water or normal water level (instead of only 10 feet maximum) when placed in front of a bulkhead
- Slope of riprap shall have a maximum flatness of 3 feet horizontal per one foot vertical and no steeper than 1.5 foot horizontal per 1 foot vertical.
- Increased permit fees from \$200 to \$400 to cover the costs associated with issuing the permit.

15A NCAC 7H .1400 - General Permit for Construction of Groins in Estuarine and Public Trust Waters and Ocean Hazard Areas

The main purpose of changes to this rule, which became effective on February 1, 2009, is to provide additional flexibility with the placement of the structures on individual properties. Revisions to the General Permit include:

- The way groin spacing is calculated has been revised. The allowable spacing is now two times the groin design length. The original design spacing was to allow two groins per 100 feet of shoreline.
- Additional wording changes were made to clarify how and where to measure the length of and distances between groins.

15A NCAC 7H .2100 - General Permit for Construction of Sheetpile Sills for Shoreline Protection in Estuarine and Public Trust Waters and Ocean Hazard Areas

The revisions, which became effective on February 1, 2009, mainly changed the terminology from "Marsh Enhancement Breakwater" to "Sheetpile Sill." This change was made to avoid future confusion because the term "sheetpile sill" more closely aligns to the structure that is permissible through the General Permit.

15A NCAC 7H .2400 - General Permit for Placement of Riprap Revetments for Wetland Protection in Estuarine and Public Trust Waters

The main purpose of changes to this rule, which became effective on February 1, 2009, is to provide additional flexibility with the placement of the structures on individual properties. Revisions to the General Permit include:

- The term “Riprap” has been changed to “Riprap Revetment” to be consistent with other rules.
- Changed the maximum distance waterward from 5 feet to 6 feet. This allows for the flattest slope to be used and extended to a height of 2 feet.
- Riprap slope requirements were added to allow a minimum slope of 3H:1V and a maximum slope of 1.5H:1V.

Estuarine Biological and Physical Processes Work Group

DCM convened and coordinated efforts of an Estuarine Biological and Physical Processes Work Group, consisting of estuarine system experts, to address issues related to shoreline stabilization methods and impacts to the environment. In August 2006, the work group developed a report entitled “*Recommendations for Appropriate Shoreline Stabilization Methods for the Different North Carolina Estuarine Shoreline Types.*” This report provides guidance on the use of the appropriate shoreline stabilization techniques as determined by shoreline type and maintenance of its original ecosystem function. This work was used by DCM to assess its estuarine shoreline stabilization rules and to develop a shoreline stabilization decision-tree that is designed to assist property owners in deciding which stabilization method is the most appropriate given the type of shoreline, shoreline/wave conditions, and location.

Estuarine shoreline mapping project

DCM developed a methodology to heads-up digitize (i.e., on-screen digitization by a person rather than an automated algorithm) in a spatial framework (ESRI ArcGIS) a contiguous estuarine shoreline of North Carolina; and is in the process of delineating the estuarine shoreline and structures, as well as attributing shoreline and structure type, for all 20 coastal counties (expected completion date December 2011). The shoreline will be used to evaluate DCM’s existing policies within its Estuarine and Ocean System Areas of Environmental Concern (AEC). Additionally, the shoreline (along with its attributes) will be used for numerous research endeavors including, but not limited to: creating inventories of shoreline and structure type, quantifying total shoreline mileage, studying ecosystem function, assisting with cumulative and secondary impact assessments, and for examining shoreline change. Also, shoreline data may be used to perform a more detailed analysis of modified portions of the shoreline and their resulting impacts on estuarine system services. Such a mapping effort has never been accomplished for North Carolina.

OCEAN RESOURCES STRATEGY

With new and pressing demands being placed on ocean waters adjacent to North Carolina, the State needed to be more proactive in understanding and responding to those issues to effectively ensure a balance between the use, protection and enhancement of ocean resources. Therefore, DCM devoted one program change to address this issue.

PROGRAM CHANGE 1: Under the program change titled *“Update Policies and Rules to Enhance Ocean Resource Management”*, valuable information related to current and emerging coastal and ocean issues were identified and recommendations/management strategies were developed as a result. This effort has led to the pending amendment to the CRC’s Coastal Energy Policies and has better prepared the State to address critical emerging issues related to alternative energy development and siting in estuarine, coastal and marine waters.

15A NCAC 7M .400 - Coastal Energy Policies

Issues involving alternative energy activities/facilities (identified in the Ocean Policy Report described below) continued to be a high priority of the CRC. Draft recommendations to the CRC’s Coastal Energy Policies (15A NCAC 7M.0400), General Use Standards (15A NCAC 07H .0208), and General Definitions for Areas of Environmental Concern (15A NCAC 07H.0106), were proposed to the CRC in October 2009, and approved for public hearing in January 2010. In addition, at the October 2009 meeting, the CRC made a declaratory ruling designating wind turbines as water dependent structures. The Coastal Energy Policies and General Use Standards for Areas of Environmental Concern were adopted in November 2011 with an anticipated effective date of February 1, 2011. If, and when, these rule changes become effective, they will be submitted to OCRM for inclusion into the State’s Coastal Zone Management Program.

Ocean Policy Report

DCM convened and coordinated efforts of an Ocean Policy Steering Committee, representing federal, state and local government, academics, non-profits and other stakeholders, to consider the State’s emerging ocean resource policy issues. The Committee produced a report in April 2009 entitled *“Developing a Management Strategy for North Carolina’s Coastal Ocean”* which contains recommendations addressing the following areas:

- sand resource management,
- ocean-based alternative energy,
- ocean outfalls,
- marine aquaculture, and
- comprehensive ocean management.

As a next step, DCM convened and coordinated efforts of a CRC Subcommittee to prioritize these recommendations (along with recommendations of the NC Beach Summit) for relevance and implementation. This effort led to amendments to the CRC’s Coastal Energy Policies (above).

III. FINAL PROGRAM RATINGS OF THE 2010 PROGRAM ASSESSMENT

As a result of this program assessment, DCM has identified two high priority enhancement areas for inclusion in its next five-year program enhancement strategy (FY2011-2015): ***Coastal Hazards and *Ocean Resources**. Though Public Access and Energy & Government Facility Siting also received “High” ratings, DCM determined that the pertinent issues associated with those programs could potentially be addressed through our Coastal Hazards and Ocean Resources programs. See Table 1 for a summary of the program assessment ratings compared to the previous assessment done in 2006.

Table 1.

Program Area	2006 Assessment Rating	2010 Assessment Rating
Wetlands	Medium	Medium
Coastal Hazards*	High	High*
Public Access	Medium	High
Marine Debris	Low	Medium
Cumulative/Secondary Impacts	Medium	Medium
Special Area Mgmt Planning	Low	Medium
Ocean Resources*	High	High*
Energy/Gov't Facility Siting	Low	High
Aquaculture	Low	Low

IV. PROGRAM ENHANCEMENT AREA ANALYSIS

WETLANDS

Prepared by Guy Stefanski

Section 309 Enhancement Objective

Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Please indicate the extent, status, and trends of wetlands in the coastal zone using the following:

Wetlands type	Estimated historic extent (acres)	Current extent (acres)	Trends in acres lost since 2006 (Net acres gained & lost)	Acres gained through voluntary mechanism since 2006	Acres gained through mitigation since 2006	Year and source(s) of Data
Tidal vegetated	262,000 ¹	228,965 ¹	34 lost ² 51 gained ^{3,4} (17 net acres gained)	38 ³	13 ⁴	¹ 1994 DCM, ² 2006-2010 DWQ & ACOE, ³ NCCF, ⁴ NCDOT, ⁵ Pocosin Lakes NWR, ⁶ Mitigation Banks, ⁷ EEP
Tidal non-vegetated	unknown	unknown	unknown	unknown	unknown	see #2 below
Non-tidal/freshwater	2,582,700 ¹	2,273,030 ¹	1638 lost ² 31,913 gained ^{3,4,5,6,7} (30,275 net acres gained)	*27,684 ^{3,5}	3229 ^{4,6,7}	

**Of the 27,684 acres gained through voluntary mechanisms, 27,492 acres of pocosin wetlands are being restored as part of a large hydrologic restoration project being conducted by the Pocosin Lakes National Wildlife Refuge (2008-2010).*

This table does not include impacts to tidal vegetated wetlands permitted by the Division of Coastal Management through its major and general permitting program. This data is currently being downloaded from DCM's permit files into DCM's permit tracking database (CDAITS) and, at this time, is not available for extraction and/or analysis. However, DCM expects this data to be available by late 2011 or early 2012.

In researching this information, there is noticeable data discrepancy regarding permitted impacts which appear inconsistent, sometimes inaccurate and in some cases, not even tracked. There seems to be accurate data on mitigation provided, particularly through the EEP and DOT- both these programs keep databases tracking mitigation provided on behalf of permittees associated

with permitted impacts. There is not a similar database for mitigation provided by banks or by permittees. There is a need to develop a central database for recording 404 and 401 permits similar to the CDAITS database being developed for CAMA permits.

2. If information is not available to fill in the above table, provide a qualitative description of information requested, including wetlands status and trends, based on the best available information.

Status of soft bottom habitat (tidal non-vegetated): Since standardized or comprehensive baseline mapping of soft bottom habitat has not been completed, and because sediments shift and move over time, it is currently not possible to quantify how the extent and condition of the habitat has changed through time.

3. Provide a brief explanation for trends.

The knowledge base, status information, and management of wetlands have changed somewhat since the 2005 Coastal Habitat Protection Plan (CHPP). The distribution of wetland types has also been quantified with the 2001 National Land Cover Dataset, indicating approximately 3 million acres in coastal draining river basins of North Carolina (excluding the Lumber River) and 5.1 million acres in the entire state. Pre-colonial estimates of wetland area for the entire state are approximately 7.2 million acres. Between 2001 and 2008, there were nearly 1,700 acres of permitted wetland impacts in coastal draining river basins. The Ecosystem Enhancement Program (EEP) currently has more than enough mitigation assets (restoration, enhancement, creation, and preservation) on the books to cover the permitted losses. The mitigation is tracked by three basic wetlands types: coastal, riparian, and non-riparian. Mitigation success criteria are also based on the three basic types. The NC Division of Water Quality (DWQ) is developing criteria for headwater wetlands, thus completing the hydrogeomorphic classes used to track gains and losses in wetlands acres. The present criteria indicate a success rate of 90% for EEP mitigation projects.

4. Identify ongoing or planned efforts to develop monitoring programs or quantitative measures for this enhancement area.

The NC Division of Water Quality (DWQ) is conducting several ongoing wetlands monitoring programs across the coastal plain according to wetlands types. These are long-term monitoring efforts looking at a subset of the following wetland types:

- headwater forests
- riverine swamp forests
- bottomland hardwood forests
- basin wetlands

In addition, DWQ is conducting an intensive monitoring/study of basin wetlands including some Carolina Bays and some isolated wetlands in Brunswick County. This study will continue for another two years. DWQ is participating in the National Wetland Condition Assessment which is looking at the quality of wetland conditions in 49 sites located in the coastal plain.

These are all freshwater type wetlands (no tidal/saltwater wetlands are included in this study). It will conclude in 2011.

DWQ is also planning to develop a long-term wetlands monitoring plan for the State, however, it currently lacks the funding and resources to get this effort underway.

5. Use the following table to characterize direct and indirect threats to coastal wetlands, both natural and man-made. If necessary, additional narrative can be provided below to describe threats.

Type of threat	Severity of impacts (H,M,L)	Geographic scope of impacts (extensive or limited)	Irreversibility (H,M,L)
Development/Fill	M	Extensive - coastwide	M
Alteration of hydrology	H	Limited - non-tidal	M
Erosion	M	Extensive - coastwide	M
Pollution (incl. nutrients)	M	Extensive - coastwide	M
Channelization	L	Limited - non-tidal	M
Nuisance or exotic species	L	Limited - non-tidal	M
Freshwater input	L	Limited - coastwide	M
Sea level rise/ change*	M	Extensive - coastwide	H
Other (please specify)			

* For the past 30 years, our policies and strategies have been based on a SLR rate of 1-foot to 1½-feet per century. However, based on the recommendation from the CRC's Science Panel on Coastal Hazards (March 2010), the NC Coastal Resources Commission has adopted a rise of 1 meter by 2100 for planning purposes. This accounts for an accelerated rise. A common thread regarding our SLR ratings throughout this document is that we are considering changing conditions over the long term. Therefore, it may be considered "moderate" or "low" in some areas and then "high" in others depending on the program area being evaluated (i.e., see Coastal Hazards Strategy, Program Change 3). At this time, SLR is considered a "moderate" threat to wetlands, but could become "high" with the results of future studies and data.

Development/Fill: The increase of impervious surface in coastal North Carolina causes loss and degradation of both riparian and non-riparian wetlands. An analysis of a subset of DWQ's Section 401 certification records (1997-2003) indicated that upland development (including road construction) accounted for 33% of the wetland impacts in eastern North Carolina. Upland development includes residential lots, commercial facilities, utility cables/pipelines, wastewater treatment plants, schools, churches, and other activities converting wetland habitat to uplands or supporting upland development (i.e., construction of roads, highways, bridges, and culverts). Land use changes associated with population growth have been and continue to be the primary anthropogenic cause of wetland habitat loss. Wetland impacts due to development can be expected to increase dramatically as the population in coastal counties continues to grow.

Alteration of hydrology: The 1997-2003 trend in wetland loss showed water control projects as the major source of wetland impacts (36% of impacted acres). Water control includes the construction of impoundments, reservoirs, ditches, canals, water intakes, storm drains,

stormwater ponds, and other activities designed to alter water flows. Note: some water control projects are related to transportation.

Erosion: In addition to conversion caused directly by humans, wetlands are also being lost to erosion resulting from sea level rise and shoreline hardening. Not accounting for marsh migration/accretion, the combination of sea level rise and storm events causes erosion of wetlands at a rate of approximately 802 acres/year in North Carolina. However, the rate of erosion varies according to location along the estuarine shoreline. A 2008 study using satellite radar data from 1994 to 2006 on the Albemarle-Pamlico Peninsula indicated no significant losses on the north and south shorelines, and a significant landward migration of shoreline along the eastern portion of the peninsula. The rate of shoreline recession along the eastern shore peaked at 11 meters per year. Another 2008 study in the Neuse River estuary measured an average erosion rate of approximately 1 foot per year over a 40 year time period. Every shoreline type (i.e., marsh, beach, bluff) was eroding to some degree in the estuary. In some locations, erosion rates were greater than 10 feet per year. A very small amount of shoreline accretion occurred in upper tributary reaches of the Neuse estuary. The accretion in upper tributaries suggests their importance in maintaining wetlands coverage with sea level rise. Structures for shoreline stabilization (i.e., bulkheads, riprap, sills, and groins) were also mapped and found they covered 30% of the estuarine shoreline. The structures were located along the open estuarine shoreline of the river and not in the tributaries. As sea level rises, the impacts of more vertical structures on shallow nursery areas and narrow fringing wetlands will be exacerbated.

While the Albemarle-Pamlico Estuarine System is highly vulnerable to erosion due to the coast's low elevation, geomorphology, and erosion rates, shoreline erosion has also been documented in the southern portion of North Carolina. A study in the Topsail Sound area of Pender County, documented an 18.7% loss of marsh acreage and concurrent increase in open water, over a 49 year period. Concern over erosion has led many waterfront property owners to try to stop the loss of their property through shoreline stabilization, primarily bulkheading.

Pollution/water quality degradation: Of all the coastal habitats, wetlands are the most resilient to water quality degradation, due to their position both in and above the water column. Wetlands are also known for their water treatment capabilities. However, the effect of excess nutrients on fish use of wetlands could be problematic. Algal blooms in and around emergent vegetation can cause very low dissolved oxygen levels at night, resulting in fish kills. North Carolina has experienced water quality problems in some of its estuaries and has implemented nutrient management strategies to help mitigate those problems. However, in cases where marshes become eutrophied through large and chronic inputs of N and P, there has been a demonstrated reduction in root and rhizome production in *Spartina alterniflora* across a wide geographic range of sites along the Atlantic Coast of the USA. If this situation develops in North Carolina, marshes are less likely to maintain themselves in the face of accelerating rates of rising sea level (Mark Brinson, East Carolina University, personal communication).

Channelization/drainage: Channelization is the deepening and straightening of a natural stream. Ditching involves the creation of new channels for draining adjacent lands. These activities can affect the slope, depth, width and roughness of the channel, thus changing the dynamic equilibrium of the stream and associated wetlands. Channelized streams are deeper,

more variable in flow, and less variable in depth than natural streams. These differences affect primarily smaller fish species and life stages using wetlands and shallow stream margins, habitats that are reduced or made inaccessible by channelization. Channelization increases channel cross-section and flow capacity, thus reducing the frequency of overbank flow events that allow fish access to the wetlands. The remaining wetlands exist with an altered hydrology, relying more on overland flow from upland areas and groundwater discharge, and/or overbank flow from unchannelized stream segments nearby. These changes greatly reduce the natural beneficial functions of wetlands to filter pollutants and regulate water flow between uplands and coastal waters. Consequently, loading and movement of sediment and other nonpoint source pollutants are often greater in channelized streams than in natural streams, which can have negative effects on water quality and fish habitat downstream.

Although new channelization for flood control and drainage has greatly decreased, the existing alterations continue to alter flow and salinity patterns until natural stream morphology is restored. No new channelization projects have occurred since the 1970's. However, maintenance of existing channels is a recurring issue in permit decisions.

Nuisance or exotic species: A major non-native species issue concerning wetlands is the spread of *Phragmites* species (common reed) into salt/brackish marsh areas. Since the early 1900s, *Phragmites australis* has been replacing other salt/brackish marsh vegetation along the Atlantic coast at a rate of about 1% to 6% of the marsh surface per year. *Phragmites* forms dense, monotypic stands of vegetation that could alter fish use of the marsh. It is not clear how many acres of coastal marsh are impacted by this invasive plant and whether some areas of the coast are more vulnerable to invasion than others. More research is needed on the long-term impact of *Phragmites* invasions on estuarine fish use.

Freshwater input: Freshwater inputs to coastal, brackish wetlands are not considered to be a significant problem in North Carolina. In fact, the wetlands depend, in part, on the delivery of sediments from freshwater sources to contribute to the capacity of coastal wetlands to keep up with rising sea level. Coastal wetlands are exposed to a large range of salinities in North Carolina, and seasonal changes in salinity are a necessary part of the natural variation in our estuaries (Mark Brinson, East Carolina University, personal communication).

Sea Level Rise: Rising sea level is a threat to coastal and riparian wetlands in North Carolina. Analyses of data from tide gauge stations in Hampton, Virginia, and Charleston, South Carolina, from 1921 to 2000, show sea level rising along the Atlantic coast by about 3.35 mm per year (1.1 ft per 100 years). Gauge data specific to North Carolina are available only for 20 years, but suggest a slightly greater rate of approximately 4.57 mm per year (1.5 ft per 100 years). The Intergovernmental Panel on Climate Change Fourth Assessment Report estimated that global average sea levels will rise from 180 to 590 mm (0.59 - 1.92 feet) by the year 2100. The report did not include the potential for additional sea level rise caused by melting glaciers in Greenland and Antarctica.

Rising sea levels will inundate large areas of the Albemarle-Pamlico Peninsula, causing salt-intrusion into freshwater peats which could accelerate the collapse of peat lands. Rising sea levels not only cover low-lying areas, but also redistribute sediment as barrier islands attempt

to migrate landward in order to conserve mass through offshore and onshore sediment transport. The number and size of inlets will likely increase through time with sea level rise, causing potentially major changes in salinity distribution. Coastal marshes may keep pace with sea levels rise according to their rate of accretion, which is largely determined by depth of mean high water inundation, vegetation density, atmospheric CO₂ and total suspended solids in flood water. Marsh areas are lost if their accretion rate falls behind sea level rise. As the proportion of marsh declines relative to open water, tidal exchange increases such that sand deposition in tidal deltas and erosion of adjacent barrier islands are elevated.

5. (CM) Indicate whether the Coastal Management Program (CMP) has a mapped inventory of the following habitat types in the coastal zone and the approximate time since it was developed or significantly updated.

Habitat type	CMP has mapped inventory (Y or N)	Date completed or substantially updated
Tidal Wetlands	Y	1994
Beach and Dune	N	
Nearshore	Y	
	<ul style="list-style-type: none"> ❖ SAV Mapping¹ (Estuarine) ❖ Soft Bottom (Estuarine and Oceanfront) ❖ Shell Bottom (Estuarine) ❖ Hard Bottom (Estuarine and Oceanfront) 	<ul style="list-style-type: none"> ❖ 2008 ❖ 2010 ❖ 2010 ❖ 2001
Other (please specify)		

DCM mapped wetland types in 1994. No updates have occurred since that time. The NC Division of Marine Fisheries (and partners) have mapped inventories of the habitat types listed under the Nearshore category.

6. (CM) Use the table below to report information related coastal habitat restoration and protection. The purpose of this contextual measure is to describe trends in the restoration and protection of coastal habitat conducted by the State using non-CZM funds or non Coastal and Estuarine Land Conservation Program (CELCP) funds. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

¹ http://www.ncfisheries.net/habitat/miscdownloads/SAV_mapping_inventory_2008.pdf

Contextual measure	Cumulative acres for 2004-2010*
Number of acres of coastal habitat restored using non-CZM or non-Coastal and Estuarine Land Conservation Program (CELCP) funds	Total: 14,027 <ul style="list-style-type: none"> • NCCF - 11,000² • APNEP - 3,027
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	Total: 145,181 <ul style="list-style-type: none"> • TNC - 73,996³ • NCCF - 435 (2007)⁴ • APNEP - 29,423 • NC Coastal Land Trust - 41,327

*The cumulative acres represent totals from a combination of reports provided by the North Carolina Coastal Federation, Albemarle - Pamlico National Estuary Program, NC Coastal Land Trust and The Nature Conservancy of North Carolina (much of this work was supported with state funds provided by the NC Clean Water Management Trust Fund and the NC Natural Heritage Trust Fund). These groups often partner together on conservation efforts and/or provide this information to several databases, so it's possible that a portion of the cumulative acres have been duplicated in the table above. Queries were also made with several state agencies (i.e., State Property Office and Million Acres Initiative) and it was determined that North Carolina does not currently have a central, comprehensive database that contains this type of information in a reliable format (Kelly Williams, Ecosystem Enhancement Program, personal communication).

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the wetland management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Wetland regulatory program implementation, policies, and standards	Y	Y
Wetland protection policies and standards	Y	N
Wetland assessment methodologies (health, function, extent)	Y	Y
Wetland restoration or enhancement programs	Y	N
Wetland policies related public infrastructure funding	Y	N
Wetland mitigation programs and	Y	Y

² <http://nccoast.org/restoration-education/wetlands-restoration.asp>

³ Email Correspondence from Jodie LaPoint, Dated Friday, March 19, 2010

⁴ <http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=103240026619875863360.000475eaa7294add99682&z=10>

policies		
Wetland creation programs and policies	Y	N
Wetland acquisition programs	Y	N
Wetland mapping, GIS, and tracking systems	Y	N
Special Area Management Plans	Y	N
Wetland research and monitoring	Y	Y
Wetland education and outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

WETLAND REGULATORY PROGRAM IMPLEMENTATION, POLICIES & STANDARDS

Renewal of State General Permit for Impacts to Isolated and Other Non-404 Jurisdictional Wetlands and Waters

Characterization of Change: This General Permit is used by the NC Division of Water Quality to permit impacts to non-404 jurisdictional wetlands and/or waters. The limits for use of this General Permit include project impacts of less than one acre of non-404 jurisdictional wetlands and/or waters and/or less than 150 feet of non-404 jurisdictional streams. It became effective in November 2008.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: This allows the State to protect portions of non-404 jurisdictional wetlands and streams that may not have otherwise been covered under a separate permit/action.

Implementation of SL 2008-152, An Act to Promote Private Compensatory Mitigation by Private Mitigation Banks

Characterization of Change: The Division of Water Quality (DWQ) and Ecosystem Enhancement Program (EEP) work to implement this law which requires additional obligations on permit applicants before they can access the EEP In-Lieu Fee (ILF)-Program. The requirements of the law complement existing statutory and rule requirements, and will be applied to mitigation for streams, wetlands and isolated wetlands. The law does not apply to the State’s nutrient offset and buffer programs. Applicant- provided mitigation is still approvable by DWQ, when suitable, even when a private bank has credits available in the hydrologic unit. It is applicable to mitigation that is required for compliance associated with

violations. Mitigation banks developed by public entities are not subject to preferences expressed in the law for private mitigation banks.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: This act is being implemented and is a requirement for mitigation. The overall effects have not been determined at this time.

WETLAND ASSESSMENT METHODOLOGIES (HEALTH, FUNCTION, EXTENT)

North Carolina Wetland Assessment Method (NCWAM)

Characterization of Change: Traditionally, state and federal wetland regulatory agencies in NC have required wetland and stream mitigation based on acreage and stream length, respectively. However, there has been a recognized need for a consistent, agency-approved method to assess wetland and stream quality. Accordingly, the NC Department of Natural Resources (DENR) and US Army Corps of Engineers (USACE) have directed staff to develop a process whereby wetland and stream function is considered in addition to (or instead of) wetland acres and stream length. To this end, interagency teams have been working on a rapid Wetland Functional Assessment Method (NC WAM). Once the guidance on the NC WAM is finalized, after proper formal public notice and comment, the new wetland assessment method will be initiated.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: Although the NCWAM has not been fully implemented at this time, staff training is underway. Therefore, the effects are unknown.

WETLAND MITIGATION PROGRAMS AND POLICIES

NC General Assembly Session Law 2009-337

Characterization of Change: In July 2009, the NC General Assembly passed Session Law 2009-337 (Senate Bill 755, An Act to Promote the Use of Compensatory Mitigation Banks) which requires wetlands, stream, nutrient offset and buffer mitigation to take place within the same 8-digit hydrologic unit as the permitted impact. In addition, it establishes a preference for non-government entities seeking third party mitigation providers for mitigation banks over the State's existing in-lieu fee mitigation program when mitigation banks have credits available.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: Because the law was just passed in 2009, the effects are unknown at this time.

WETLAND MAPPING, GIS, AND TRACKING SYSTEMS

Mapping Geographically Isolated Wetlands.

Characterization of Change: Geographically isolated wetlands (GIW) are defined as wetlands with no surface hydrological connection to downstream waters. They are particularly vulnerable to impact because of varying amounts of regulatory protection. The NC Division of Water Quality (and partners) have developed maps of geographically isolated wetlands located in an eight county portion of the North and South Carolina Coastal Plain. These maps were prepared using a combination of GIS data layers such as National Wetland Inventory maps (or updated state versions), hydrography, LIDAR, and hydric soils.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: Before this effort, accurate and dependable GIW maps did not exist. These newly generated maps will aid the DWQ, and other regulators, to further identify and protect these unique wetland areas.

WETLAND RESEARCH AND MONITORING

Headwater Wetlands Study

Characterization of Change: Headwater wetlands provide important habitat for macroinvertebrates and amphibians, both of which are sensitive to stressors in their environment such as impacts to water quality and wetland habitat, and deforestation of the surrounding upland buffer. Maintaining the ecological integrity of these headwater wetland systems is necessary not only to protect wildlife habitat but also to protect the water quality of the entire downstream watershed. The NC Division of Water Quality (DWQ) conducted a study to “elucidate the differences and similarities among amphibians, macroinvertebrates and vegetation along a gradient of human disturbance within specific wetland types”. To meet this objective, a NC wetland monitoring program was begun with a focus on the monitoring of physical, chemical, and biological parameters of one type of wetland- headwater wetlands.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: DWQ conducted a monitoring effort on 11 Coastal Plain and 12 Piedmont headwater wetlands located along a disturbance gradient during a two year period. Findings indicate that headwater wetlands still maintain the ability to filter pollutants even when impacted by human disturbance. The biotic results of this study show there are significant differences between amphibian, macroinvertebrate, and plant communities located in headwater wetlands of variable quality. This study provides valuable information related to the occurrence and function of headwater wetlands.

3. **(CM)** Indicate whether the CMP has a habitat restoration plan for the following coastal habitats and the approximate time since the plan was developed or significantly updated.

Habitat type	CMP has a restoration plan (Y or N)	Date completed or substantially updated
Tidal Wetlands	Y	Completed 2005 - update in progress
Beach and Dune (includes intertidal zone of beach)	Y	Completed 2005 - update in progress
Nearshore	Y	Completed 2005 - update in progress
Other (please specify)		

The NC Coastal Habitat Protection Plan (CHPP), developed by the NC Division of Marine Fisheries, provides guidance for habitat restoration efforts in the context of habitat complexes and inter-relationships. The document also identifies management needs designed to improve overall habitat restoration efforts in coastal North Carolina. It meets the criteria identified in the CZMAPMS guidance (Scott Chappell, NC Division of Marine Fisheries, personal communication).

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the Coastal Management Program and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description <i>(Highest priorities based on the emerging needs identified in the 2009 CHPP wetlands section update)</i>	Select type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Improve siting of mitigation projects to correspond more closely with Targeted Local Watersheds and Local Watershed Plans.	regulatory/policy	H
Restore access to wetlands upstream of truncated Anadromous Fish Spawning Areas.	regulatory/policy	H
Consider the indirect impacts of engineered shoreline structures on wetlands, and any corresponding need for avoidance/mitigation.	regulatory/policy/data	H
Improve permit database(s) for tracking wetland impacts and mitigation at different spatial scales.	data	H
Re-map coastal plains wetlands using methods comparable to DCM wetland type mapping from 1994.	data	H
Predict changes in the spatial distribution of wetland types with sea-	data	H

level rise and climate change.		

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
 Medium X
 Low _____

Briefly explain the level of priority given for this enhancement area.

According to the Coastal Habitat Protection Plan (CHPP), it appears that “No Net Loss” of wetlands is being achieved by the wetland permitting programs in North Carolina, although the restored wetlands may not be of equivalent function or location to prevent localized impacts. Almost half of the management needs identified in the 2005 CHPP have advanced to some degree. There have been incremental improvements in the rules governing shoreline development and how it contributes to the unmitigated loss of wetlands. The effort to improve these rules continues. There are also numerous research, planning, and restoration efforts designed to address the unmitigated loss of wetlands with the interruption of natural shoreline migration processes during this period of rising sea level.

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

Yes _____
 No X

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

There is a significant level of regulation and oversight provided by the U.S. Army Corps of Engineers (ACOE), NC Division of Water Quality (DWQ), and NC Division of Coastal Management (DCM) related to wetlands management. Therefore, DCM does not consider this program area to be a part of the next program strategy. However, staff will continue to work closely with the ACOE and DWQ on issues related to wetland permitting and mitigation in the coastal region.

COASTAL HAZARDS

Prepared by Jeff Warren

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.

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize the level of risk in the coastal zone from the following coastal hazards: (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*)

Type of hazard	General level of risk (H,M,L)	Geographic Scope of Risk (Coast-wide, Sub-region)
Flooding	M (note: this category is addressed as flooding NOT associated with the “coastal storms” or “sea level rise” categories below)	Coast wide but primarily around river systems associated with estuaries
Coastal storms, including associated storm surge	H	Oceanfront (statewide)
Geological hazards (e.g., tsunamis, earthquakes)	L	All 20 coastal counties within agency jurisdiction
Shoreline erosion (including bluff and dune erosion)	H	Oceanfront and estuarine shorelines (statewide)
Sea level rise and other climate change impacts	M (not currently viewed as an immediate threat)	Oceanfront and estuarine shoreline (statewide, but hazard higher in the northern portion of State due to low elevation, low coastal plain gradient, and subsidence)
Great Lake level change and other climate change impacts	<i>Not Applicable</i>	
Land subsidence	M	Northern estuarine shoreline and coastal plain
Other (please specify)	<i>Not Applicable</i>	

2. For hazards identified as a high level of risk, please explain why it is considered a high level risk. For example, has a risk assessment been conducted, either through the State or Territory Hazard Mitigation Plan or elsewhere?

COASTAL STORMS and SHORELINE EROSION

Multiple agencies of state, local, and federal government continue to study and assess coastal storms and shoreline change. The results of these ongoing efforts continue to identify and justify the high degree of risk associated with the State’s oceanfront, inlet, and estuarine

shoreline. Examples of projects include: CRC ranking of priority issues on coast (sea level rise being highest), CRC Science Panel sea level rise assessment, CRC Science Panel inlet hazard study (in conjunction with DCM), DCM erosion rate update, NC Department of Environment and Natural Resources (DENR) Beach and Inlet Management Plan, DENR Coastal Habitat Protection Plan, DENR Strategic Plan (includes climate change as a key element to address), State Hazard Mitigation Plan (NC Emergency Management), and US Army Corps of Engineers Regional Sediment Management studies (Brunswick, Carteret, New Hanover, Pender, and Onslow counties with planned expansion northward into Hyde and Dare counties).

3. If the level of risk or state of knowledge of risk for any of these hazards has changed since the last assessment, please explain.

The “Flooding” category was re-classified from “High” to “Moderate” (2001-2006 Assessment) as the Division of Coastal Management now interprets this category to address flooding not associated with storm surge or sea level rise. Flooding in this category is related to rain events within the State and/or region that increase runoff and cause localized and/or regional flooding along the riverbanks associated with fluvial systems draining to the sounds. Prior to this assessment, the “flooding” category was considered when assessing hazards associated with episodic storm-surge events and longer-term sea level rise projections.

4. Identify any ongoing or planned efforts to develop quantitative measures of risk for these hazards.

The Division of Coastal Management, in conjunction with the NC Coastal Resources Commission (CRC) and the CRC’s Science Panel on Coastal Hazards, is responsible for identifying the appropriate scientific data to address the review, revision, and/or development of coastal policies to be considered for implementation by the CRC. Current studies include an analysis of inlet hazard areas and an update of the oceanfront and inlet shoreline erosion rates. The CRC Science Panel recently (March 2010) finished a sea level rise assessment for the oceanfront (to provide a general number for sea level increase during the next 100 years for planning purposes) and the NC Department of Emergency Management is completing an extensive \$5 million sea level rise study being funded by FEMA (of which DCM has been involved) that includes updating the storm inundation models for the entire oceanfront. The NC Beach and Inlet Management Plan is being completed and, in conjunction with the concepts in the plan, the US Army Corps of Engineers (USACE) continues to collaborate with DCM through its regional sediment management studies (including sediment budget analysis).

5. (CM) Use the table below to identify the number of communities in the coastal zone that have a mapped inventory of areas affected by the following coastal hazards. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Type of hazard	Number of communities that have a mapped inventory	Date completed or substantially updated
Flooding	Flooding not associated with	FEMA FIRM maps developed

	storm surge or sea level rise not used for Coastal Area Mgmt Act permitting along shoreline (but used by other municipal permitting agencies) is addressed by NC Division of Emergency Mgmt (NCDEM) for entire State and, therefore, all 20 coastal counties (100 city and county jurisdictions)	by NCDEM and National Weather Service for FEMA using SLOSH modeled storm surge released in phases - northern NC coast released 2006-07 and southern NC coast released in 2008.
Storm surge	Eight oceanfront counties which encompass the entire 326 miles of oceanfront shoreline (Brunswick, New Hanover, Pender, Onslow, Carteret, Hyde, Dare and Currituck) that include 32 communities (seven of which are unincorporated and in county jurisdiction and one, Camp LeJeune, is a military installation), four state parks, three Coastal Reserve sites, two national parks, and one National Wildlife Reserve.	FEMA FIRM maps (V zones) are used to establish the High Hazard Flood Area of Environmental Concern (AEC), which is part of the Ocean Hazard System of AECs.
Geological hazards (including Earthquakes, tsunamis)	None with mapped inventories	
Shoreline erosion (including bluff and dune erosion)	SAME AS STORM SURGE ABOVE. Estuarine shoreline mapping underway for the 20 coastal counties by DCM. Tyrrell, Currituck, Perquimans and Dare have been completed.	Current oceanfront erosion rates became effective in 2004 (an update study is underway to be completed in early 2011); Estuarine shoreline not previously mapped but project currently underway to be finished by late 2011
Sea level rise	Although numerous agencies have mapped (NOAA in partnership with ECU, UNC, Vanderbilt, USC, and NC DCM) or have begun mapping (NC Emerg Mgmt) sea level rise inundation, final products have not yet been used in policy or hazard mitigation	DCM continues to partner with research groups (e.g., NOAA, NCDEM) to develop appropriate inundation/hazard maps that can be used in hazard identification and mitigation to affect policy and planning efforts by the State and appropriate agencies

	DCM has obtained from NC DEM inundation map layers (1 to 20 feet) for all 20 coastal counties.	
Great lake level fluctuation	<i>Not Applicable</i>	
Land subsidence	Land subsidence issues (primarily in the northern portion of the coastal region) that play a role in relative sea level rise are addressed in the mapping efforts of the "Sea Level Rise" category above. To the best of our knowledge, no other subsidence mapping efforts have been initiated, endorsed, or used by DCM for hazard identification and mitigation efforts.	DCM continues to partner with research groups (primarily NOAA, ECU, and NCDEM) to integrate land subsidence into a better understanding of relative rates of sea level rise (particularly in northern portion of coastal region); separate from "sea level rise" and "flooding" categories listed above, no other mapping efforts (to the best of our knowledge) have been initiated, endorsed, or used for hazard identification and mitigation efforts
Other (please specify)		

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Building setbacks/ restrictions	Y	Y
Methodologies for determining setbacks	Y	Y
Repair/rebuilding restrictions	Y	N
Restriction of hard shoreline protection structures	Y	N* (see comments below)
Promotion of alternative shoreline stabilization methodologies	Y	Y
Renovation of shoreline protection structures	Y	N

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Beach/ dune protection (other than setbacks)	Y	Y
Permit compliance	Y	Y
Sediment management plans	Y	N* (see comments below)
Repetitive flood loss policies, (e.g., relocation, buyouts)	Y	N
Local hazards mitigation planning	Y	N
Local post-disaster redevelopment plans	Y	N
Real estate sales disclosure requirements	N	N* (see comments below)
Restrictions on publicly funded infrastructure	Y	Y
Climate change planning and adaptation strategies	N	N* (see comments below)
Special Area Management Plans	Y	N
Hazards research and monitoring	Y	Y
Hazards education and outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

BUILDING SETBACKS / RESTRICTIONS

Oceanfront Setback Policy

Characterization of Change: The CRC adopted a major set of setback reforms in September 2008 that became effective on August 11, 2009. These setback rules are defined in T15A NCAC 07H.0306. The oceanfront setback is now based on total floor area (TFA) rather than structure type (e.g., single-family, multi-family, commercial). The minimum setback remains 30 times the erosion rate (ER) or 60 feet landward of the first line of stable and natural vegetation, whichever is greater, for all structures <5,000 sq ft. Note that the CRC requires an ER of no less than two feet per year so the minimum setback is always the setback factor x 2. All structures with a TFA ≥5,000 sq ft (but < 10,000 sq ft) must be set back a minimum distance of 60 x ER. A graduated setback for larger development continues as follows:

- 65 x ER (≥10,000 but <20,000 sq ft)
- 70 x ER (≥20,000 but <40,000 sq ft)
- 75 x ER (≥40,000 but <60,000 sq ft)
- 80 x ER (≥60,000 but <80,000 sq ft)

85 x ER (≥80,000 but <100,000 sq ft)
90 x ER (≥100,000 sq ft)

Additional changes in the setback policy include removal of the provision that allowed larger development (>5,000 sq ft) in areas with ERs greater than 3.5 feet per year to use a modified setback formula of $30 \times \text{ER} + 105$ feet. The new formula is simply the appropriate setback factor (based on TFA) multiplied by ER. The new rules also state that no cantilevering or other type of projection oceanward of the appropriate setback shall be allowed. Further, linear infrastructure (e.g., roads, sewer, power lines, sidewalks) can use a minimum setback of $30 \times \text{ER}$ regardless of linear length or footprint of the infrastructure. To be consistent with the new maximum setback of $90 \times \text{ER}$ for structures 100,000 sq ft and greater, the CRC approved rule changes (T15A NCAC 07H.0304) in March 2010 to be sent to public hearing that change the formula of the Ocean Erodible Area (OEA) from $60 \times \text{ER} + 100\text{-yr Storm Recession Rate}$ to $90 \times \text{ER} + 100\text{-yr Storm Recession Rate}$. The OEA is the area inside of which the CRC has the authority to enforce oceanfront setback requirements.

Setback options for communities with large-scale, long-term beach fill. If a community has undergone large-scale beach fill (currently defined as a volume of 300,000 cubic yards or greater or any Corps of Engineers storm protection project), the first line of stable and natural vegetation prior to project construction becomes “static” in perpetuity, and the static vegetation line becomes the point from which the development setbacks are measured (unless the first line of stable and natural vegetation moves landward of the static line and, therefore, becomes more restrictive). For communities receiving a static vegetation line, , additional rule changes (T15A 07J.1200) provide an exception to the aforementioned setback rules (T15A NCAC 07H.0305) if the community has waited at least five years after the initial beach fill project, can demonstrate a 25-year beach fill plan is in place, and has identified the sand and financial resources to construct and maintain this plan over the 25+ year life of the beach fill project. The exception, which became effective on March 23, 2009, allows for all large-scale development (≥10,000 sq ft) to use a minimum setback of $60 \times \text{ER}$ and for small-scale development (2,500 sq ft or less) to be allowed as long as it cannot meet the appropriate setback using the static vegetation line, that it does meet the minimum setback from the first line of stable and natural vegetation, and that it is no farther oceanward than the landward-most adjacent structure. This “static line exception” sunsets after five years and may be granted again by the CRC if the community shows documentation of a long-term beach fill maintenance plan as well as the financial resources necessary to maintain that plan.

Driver of Change: Driven by DCM’s FY 2006-2010 Coastal Hazards Strategy, Program Change 1, and supported with Section 309 funds.

Characterization of Outcome: Because the rules have only been in place for six months, there is not yet a quantitative characterization in place of how well the rules have worked. The new setback rules lessen the risks to oceanfront development through one of two strategies: 1) the development is moved farther from the shoreline (i.e., greater setback distance) or 2) the shoreline is moved farther from the development (i.e., long-term, large-scale beach fill construction and maintenance). In addition, development that occurs using the static line exceptions receive further risk reduction due to the beach fill itself as well as realignment of

development with the landward-most adjacent buildings as well as re-development occurring under the exception provisions (i.e., replacement of decades old buildings currently on lots that are non-conforming solely because of the static vegetation line, which remains in place in perpetuity) benefiting from current building codes and new construction materials.

METHODOLOGIES FOR DETERMINING SETBACKS

Oceanfront and Inlet Setback Policies

Characterization of Change: In addition to the revisions to actual setback distances discussed above, the CRC has addressed several rule changes that address the methods for determination of setbacks. The first rule (T15A NCAC 07H.0305), which became effective on April 1, 2008, clarified and provided more objectivity for how the first line of stable and natural vegetation is determined. While this rule does not affect the setback per se, it does clarify a crucial definition of the first line of stable and natural vegetation, which is part of the method for setback determination. In addition, changes to 07H.0305 clarify definitions for the static vegetation line (how and when it is put in place) and also codifies the long-standing interpretation that the static line will no longer be used for setback determination at any location where the vegetation line is farther landward (i.e., more restrictive). Two grandfather provisions for exceptions to the setback currently exist in the CRC's rules – one for lots platted prior to June 1, 1979 (i.e., pre CAMA setback rules) and one set for lots platted after June 1, 1979. These rules are T15A NCAC 07H.0309 and 07H.0104, respectively. The first rule (T15A NCAC 07H.0309) was adopted by the CRC in January 2010 but is awaiting approval by the Rules Review Commission. The public hearing for the second rule (T15A NCAC 07H.0104) occurred at the CRC's March 2010 meeting and can be adopted at their May meeting. DCM considers these two grandfathering policies as methods for determining the appropriate setback for development (when the primary setback from the vegetation line cannot be achieved).

The pre-CAMA grandfather clause (T15A NCAC 07H.0309) currently allows development on lots platted prior to June 1, 1979 that cannot meet the appropriate oceanfront setback to be set back as far as feasible as long as a minimum setback of 60 feet is met. This policy places a limit on the building footprint at 1,000 sq ft or 10% of the lot size, whichever was greater. The proposed policy, currently awaiting approval by the Rules Review Commission, changes the size limit to a footprint of 1,000 sq ft (removes the reference to lot size) and also places a limit on total floor area of 2,000 sq ft. In addition, no portion of the building may be oceanward of the landward-most adjacent building.

The post-CAMA grandfather clause (T15A NCAC 07H.0104) currently requires development setbacks on the oceanfront to consider both the current erosion rates (ERs) as well as the ERs that were in place at the time the lot was platted and use of the higher of the two rates. DCM's recommendation to the CRC was to revise this policy to make the current ERs the primary setback determiner. In cases where development could not meet that setback, the ER in place at the time the lot was platted can be used as long as the development is no larger than 2,000 square feet and no portion of the building is oceanward of the landward-most adjacent building.

In addition to the information above, which addresses the setbacks for the Ocean Erodeable Area of Environmental Concern, DCM is also working with the CRC and their Science Panel on Coastal Hazards to review and revise rules associated with Inlet Hazard Areas (IHAs). The CRC has requested more input from the Science Panel on how erosion rates and setbacks could be determined inside the proposed IHAs. Although DCM has already made a set of recommendations that use traditional setback methods in addition to requiring development to be no farther oceanward than the landward-most adjacent structure, the Science Panel is developing a setback line within the proposed IHA boundaries that is based on current and historic vegetation locations as well as historical shoreline trends, standard deviation of those trends, erosion rate, and a 30-year multiplier (to be consistent with the CRC's minimum setback factor). At the November 2010 CRC meeting, the CRC instructed DCM to hold off on additional IHA boundary and policy work until the oceanfront erosion rate (which will include inlets) is completed by summer 2011.

Driver of Change: Driven by DCM's FY 2006-2010 Coastal Hazards Strategy, Program Change 1, and supported with Section 309 funds.

Characterization of Outcome: The revision of the definitions of vegetation line (and other terms associated with setback determination on the oceanfront) has been effective in clarifying and adding objectivity for permitting and enforcement. Because the grandfather rules are not yet effective, there is no way to establish how effective they might be (assuming they become effective). However, DCM and the CRC believe that the outcome of the overall effort, where the goal was to review and revise oceanfront development policy, has been and will be successful.

***RESTRICTION OF HARD SHORELINE PROTECTION STRUCTURES**

No significant change has occurred in this Management Category to date. However, numerous activities have occurred within the State addressing the issue, which may or may not lead to significant changes in Coastal Hazards portion of the NOAA Program Assessment. A synopsis of these activities is presented here.

Terminal Groin Study

Characterization of Change: The NC General Assembly enacted Session Law 2009-479 (House Bill 709) in 2009 to direct the Coastal Resources Commission (CRC), in consultation with the Division of Coastal Management (DCM), the Division of Land Resources (DWR), and the Coastal Resources Advisory Commission (CRAC), to study the feasibility and advisability of the use of a terminal groin as an erosion control device. The Session Law also mandated that the CRC develop recommendations to be presented to the Environmental Review Commission and the General Assembly by April 1, 2010.

Specifically, the CRC was directed to consider six focus areas:

- (1) Scientific data regarding the effectiveness of terminal groins constructed in North Carolina and other states in controlling erosion. Such data will include consideration of the effect of terminal groins on adjacent areas of the coastline.
- (2) Scientific data regarding the impact of terminal groins on the environment and natural wildlife habitats.

- (3) Information regarding the engineering techniques used to construct terminal groins, including technological advances and techniques that minimize the impact on adjacent shorelines.
- (4) Information regarding the current and projected economic impact to the State, local governments, and the private sector from erosion caused by shifting inlets, including loss of property, public infrastructure, and tax base.
- (5) Information regarding the public and private monetary costs of the construction and maintenance of terminal groins.
- (6) Whether the potential use of terminal groins should be limited to navigable, dredged inlet channels.

The language approved by the CRC in March 2010 to be sent to the General Assembly is provided here:

“The Commission has adopted rules that give preference to non-structural responses to erosion including relocation of threatened structures, beach nourishment, inlet relocation and the temporary use of sandbags for short-term shoreline stabilization. The Commission has recently amended its rules on the use of sandbags in Inlet Hazard Areas to allow the extended use of these structures as well as the repetitive use of sandbags in conjunction with channel realignment projects.

Terminal groins have been shown to be able to anchor the ends of barrier islands adjacent to inlets if associated with long-term beach maintenance. They can likely protect some property at risk but not all properties. The construction and maintenance of terminal groins is very expensive and removing them, if necessary, would be both expensive and disruptive to natural resources. Inlets allow for sediment to build up the backside of barrier islands, a vital function in the natural maintenance of these islands.

The General Assembly directed the CRC to conduct a study on the feasibility and advisability of the use of terminal groins as an erosion control device. The study determined that terminal groins, in combination with beach nourishment, can be effective at controlling erosion at the end of barrier islands. The individuality of inlets necessitates site-specific analysis. The study’s findings were mixed regarding the effects of terminal groins on wildlife habitat and marine resources.

If it is the desire of the General Assembly to lift some of the limitations specific to terminal groins, due to the individual nature of inlets, the following factors must be effectively met:

1. In light of the current policy favoring a non-structural approach to erosion control, the use of a terminal groin, should be allowed only after all other non-structural erosion control responses, including relocation of threatened structures, are found to be impracticable.
2. The effects of a terminal groin on adjacent beaches are variable and a primary concern. Any use of such a structure should include siting and construction that avoid interruption of the natural sand movement to downdrift beaches.

3. The nature of terminal groins and the potential effects on coastal resources adjacent properties necessitate a full environmental review. Any proposal for the construction of a terminal groin should be accompanied by an environmental impact statement that meets the requirements of the NC Environmental Policy Act (NC G.S. 113-4).
4. To ensure the adequacy of compliance with SEPA and the protection of the public interest, third-party review of all environmental documents should be required. The cost of third-party review should be borne by those responsible for the project. This third-party review should include all design, construction, maintenance and removal criteria.
5. Since a terminal groin may impact properties well beyond those adjacent to the structure, notification of property owners in areas with the potential to be affected by the terminal groin should be required. This notification should include all aspects of the project likely to affect the adjacent shoreline, including construction, maintenance and mitigation activities as well as post-construction effects.
6. As the post-construction effects of a terminal groin on coastal resources and adjacent properties are difficult to predict, financial assurance in the form of a bond, insurance policy, escrow account or other financial instrument should be required to cover the cost of removing the terminal groin and any restoration of adjacent beaches. Financial assurance should also be required for the long-term maintenance of the structure including beach nourishment activities. (Legislative authorization for requiring financial assurance would be necessary).
7. The use of a terminal groin would need an adequate monitoring program to ensure that the effects on coastal resources and adjacent properties does not exceed what would be anticipated in the environmental documents. All monitoring of impacts of a terminal groin on coastal resources and adjoining properties should be accomplished by a third-party with all cost borne by those responsible for the project.
8. As terminal groins are typically used in combination with a long-term shoreline management program, any proposal for use of a terminal groin in NC should be part of a large-scale beach fill project, including subsequent maintenance necessary to achieve a design life of no less than 25 years."

Driver of Change: Driven by non-CZM efforts. Limited DCM staff involvement was supported with Section 309 and 306 funds.

Characterization of Outcome: There is no outcome at this point to be characterized.

PROMOTION OF ALTERNATIVE SHORELINE STABILIZATION METHODOLOGIES

Estuarine Shoreline Policy

Characterization of Change: DCM has undertaken a project that will map the estuarine shoreline through heads-up digitizing of near-vertical aerial photography utilizing a Geographic Information System (GIS). The shoreline will be used to evaluate DCM's existing policy language within its Estuarine and Ocean System Areas of Environmental Concern

(AEC). Additionally, the shoreline will be used for numerous research needs including but not limited to: creating inventories of shoreline and structure type, quantifying shoreline mileage, studying ecosystem function and cumulative impacts, and for examining shoreline change. Also, shoreline data may be used to perform a more detailed analysis of modified portions of the shoreline and their resulting impacts on estuarine system services. Primarily, mapping work has been conducted by East Carolina University (ECU) through a series of DCM 309-funded contracts. Thirteen counties have been contracted out to ECU, while two counties are being completed in house at DCM. Five counties will be completed as monies and new aerial photography become available. This work will provide data and support DCM's efforts to develop and implement a sustainable estuarine shoreline policy for North Carolina.

In addition to DCM hosting an Estuarine Shoreline Mapping Summit in December 2007 that preceded the tasks described above, which was supported through Sections 306, 309 and 315 of the State's NOAA CZMA grant, additional workshops were also hosted by the NCNERR that addressed, at least in part, estuarine shoreline policies and issues, including "Getting to Know Wetlands: Values, Regulations, and Conservation" for local governments and state agencies (May and September 2009; funded through CZMA section 315) and "Coastal Development Rule Update Workshop for Marine Contractors" that dealt, in part, with estuarine shoreline stabilization issues (four workshops in winter 2007; funded through CZMA section 306). A "Living Shorelines Training" workshop was given in March/April 2009 for coastal regulators and resource agency staff. The workshop was funded by a grant received by the NC Coastal Federation. Information from this workshop is online:

<http://www.nccoastalmanagement.net/estuarineshoreline/living%20shorelines.html>

In 2002, the North Carolina Estuarine Biological and Physical Processes Work Group was formed. The Work Group was made up of experts in biology, ecology, engineering, estuarine processes, sea level rise, and erosion control. They set out to discuss the impacts (both biological and physical) related to stabilizing an estuarine shoreline. Shorelines were categorized into five major types for the purposes of these discussions: 1) Swamp Forest (Wetland Vegetation), 2) Marsh (Wetland Vegetation), 3) Sediment Bank, 4) Modified with Engineered Structures, and 5) Shorelines with SAV (Submerged Aquatic Vegetation), Mudflats, Oysters, and/or Woody Debris. The report was not completed with this first work group. In 2006, the Estuarine Shoreline Stabilization Subcommittee asked for the Work Group to be reformed and to finish the report in which they had started 2002. The report was completed in August 2006. The report, entitled "*Recommendations for Appropriate Shoreline Stabilization Methods for the Different North Carolina Estuarine Shoreline Types*" is available online:

<http://www.nccoastalmanagement.net/Hazards/EWG%20Final%20Report%20082106.pdf>.

General information regarding estuarine shoreline stabilization efforts by DCM, including the mapping initiative described above, as well as living shoreline training information, rule change initiatives, shoreline stabilization options and determination, and an ongoing marsh sill evaluation project is online:

<http://www.nccoastalmanagement.net/estuarineshoreline/estuarine.html>

Specific estuarine shoreline stabilization options are also available online:

http://www.nccoastalmanagement.net/Hazards/estuarine_stabilization%20options.htm

An interactive decision tree developed for determining the appropriate stabilization structure (or lack thereof) developed by DCM is online:

http://www.nccoastalmanagement.net/estuarineshoreline/decision%20tree/Index_Pathways.html

A link to the non-interactive (PDF) version of the decision tree entitled “Estuarine Shoreline Stabilization: Property Owner’s Guide to Determining the Most Appropriate Stabilization Method” is also online:

<http://www.nccoastalmanagement.net/estuarineshoreline/Decision%20tree%20Final%20071409.pdf>

The CRC adopted minor changes to the following rules on January 13, 2010 which then became effective on August 1, 2010.

T15A NCAC 07H .0208(b)(2) relevant to hydraulic dredging related to beach fill placement along the estuarine shoreline (an alternative to hardened shoreline protection). Changes include:

- Clarification of how dredged material may be used for beach nourishment in terms of location, technique and suitability.
- Mean High Water has more technical definitions accepted by surveyors for determining the extent of ownership of property. These are based on a 19-year average of high tides as measured by tide gauges located along the coast. The change to Normal High Water was recommended after an appellant court ruling on a CAMA permit appeal. The ruling determined that for the purposes of administering CRC rules, DCM could use conditions at a site that are reasonably good indicators of the high water mark. Normal High Water is defined in 15A NCAC 07H .0106(1) as “...the ordinary extent of high tide based on site conditions such as presence and location of vegetation, which has its distribution influenced by tidal action, and the location of the apparent high tide line.” Normal Water Level is defined in 15A NCAC 07H .0106(2) as “...the level of water bodies with less than six inches of lunar tide during periods of little or no wind. It can be determined by the presence of such physical and biological indicators as erosion escarpments, trash lines, water lines, marsh grasses and barnacles.”
- Correction of vague or ambiguous language in accordance with APA guidelines.

T15A NCAC 07H .0208(b)(8) relevant to beach nourishment along the estuarine shoreline (an alternative to hardened shoreline protection). Changes include:

- Clarification of how dredged material may be used for beach nourishment in terms of location, technique and suitability.
- Since the creation or maintenance of estuarine beaches is limited to areas where they are historically found, and that they are generally not found in areas with high erosion rates, the prohibition of beach nourishment or creation of beaches in these area is unnecessary.

T15A NCAC 07H .0208(b)(12) relevant to submerged lands mining for shoreline placement for beach fill (an alternative to hardened shoreline protection). These changes are also applicable

to the following section (BEACH/DUNE PROTECTION other than setbacks) as they deal with borrow site dredging. Changes include:

- Substitution of the phrase “significant adverse impacts” to be consistent with language used in CAMA and the NC State Environmental Policy Act to clarify that development shall not have “significant adverse impacts”.
- Specifies that the identification of significant benthic or biological communities is determined by the Division of Marine Fisheries or the Wildlife Resources Commission.
- Clarifies that the permit applicant is responsible for monitoring of the project.
- Clarifies that the Division of Coastal Management will determine if restoration is necessary and feasible.

T15A NCAC 07H .0208(b)(7) relevant to estuarine shoreline bulkheads (For more information on these rule changes, see SUMMARY OF FY 2006-2010 SECTION 309 STRATEGY on page 6).

T15A NCAC 07H .0208(b)(9) relevant to estuarine shoreline groins (wooden and riprap) (For more information on these rule changes, see SUMMARY OF FY 2006-2010 SECTION 309 STRATEGY on page 6).

Driver of Change: The primary driver of the estuarine shoreline initiatives is related to recommendations made by the NC Coastal Habitat Protection Plan and are also part of DCM’s Section 309 FY 2006-2010 Strategy, specific to shoreline mapping and rules/policy review.

Characterization of Outcome: Minor updates to the estuarine rules defined in T15A NCAC 07H.0208 have been approved by the CRC (January 13, 2010) and became effective on August 1, 2010. Additional updates to general estuarine shoreline policies have not yet occurred, but an overview of these efforts (and relevant documents) is available online :

http://www.nccoastalmanagement.net/Hazards/estuarine_rule%20update.htm.

At this time, there are no direct metrics to characterize the other changes related to estuarine shoreline stabilization efforts (primarily the decision tree to assist property owners determine what, if any, stabilization is necessary). Once in place, rule changes are considered to provide a net positive result in terms of clarifying existing policies and recommending alternative stabilization measures.

BEACH / DUNE PROTECTION (other than setbacks)

Beach Fill Sediment Compatibility Criteria

Characterization of Change: Beach fill is the placement of compatible sediment on public beaches for the purposes of habitat restoration, storm protection, and erosion mitigation. Dune repair and reconstruction and storm breach repair are not considered beach fill projects per CRC policy and are not covered by the new sediment compatibility rules (T15A NCAC 07H.0312). Under its rules prior to this change, specifically T15A NCAC 07H.0308(a)(3), the CRC required only that sediment for beach fill shall be compatible with the existing grain size and type. The term “compatible” was not defined, nor was the methodology for analyzing the sediments at the borrow site and the disposal site to determine compatibility. The new rule (T15A NCAC 07H.0312) corrects these deficiencies.

The CRC adopted an extensive set of technical standards for beach fill placement on oceanfront beaches (T15A NCAC 07H.0312; effective February 1, 2007). The only other policy that addresses beach fill sediment compatibility for the oceanfront is in T15A NCAC 07H.0308(a)(3) and was deemed subjective and ineffective by the CRC Science Panel and DCM. The limited language (which remains in place but is supplemented by the new rules which define compatible sediment) states: “sand used for beach nourishment shall be compatible with existing grain size and type; sand to be used for beach nourishment shall be taken only from those areas where the resulting environmental impacts will be minimal”. The major concern of the CRC and its Science Panel was the lack of an objective definition for “compatible” as well as “minimal environmental impact.”

The need for a more comprehensive rule with specific sampling protocols and compatibility standards became evident as three recent beach nourishment projects deposited incompatible dredged material on public beaches (i.e., mud, rocks, coarse shell hash) in three different communities. This proposed rule sets out technical standards intended to regulate industry practitioners, and were developed with their input. The standards contained within the rule were developed by DCM staff and the CRC-appointed Science Panel on Coastal Hazards. The proposed sampling protocols exceed what is required by the U.S. Army Corps of Engineers (USACE) because as with the existing State standards, the Corps’ requirements have proven inadequate for the protection of North Carolina beaches (two of the three “incompatible” beach fill projects were planned, designed, and constructed by the USACE).

Minor amendments have been made since their passage in February 2007 with the amended rule version becoming effective on April 1, 2008.

A forum hosted by DCM (309 staff in conjunction with the NCNERR- Section 315 of CZMA) took place in December 2008 and included DCM regulators, members of other government agencies, and contractors addressed the rules and identified potential issues that could be addressed in subsequent rule modifications. An additional workshop was hosted in September 2009 by DCM (309 staff in conjunction with the NC NERR - section 315 of CZMA) to train DCM permit and regulatory staff on how to review and enforce the sediment criteria rules.

Driver of Change: Original development of sediment criteria rules for beach fill was driven by DCM’s Section 309 FY 2001-2005 Strategy. Revisions were supported by Section 309 funds with support from other staff funded via Section 306 during the FY 2006-2010 program strategy period.

Characterization of Outcome: The sediment criteria have already identified numerous sites on numerous beach fill projects that were deemed incompatible with the native beach. Additionally, the sampling protocols defined in the sediment criteria have required additional data to be collected during numerous permit reviews for beach fill projects, that have provided additional detail on compatible sediment volume and location. In addition, based on the outcome of the workshops mentioned above, DCM is working on creating a beach fill data checklist as well as a revised permit application solely for beach fill projects to ensure that both DCM regulatory staff and permit applicants have a better understanding of the rule requirements and how the rule is applied.

PERMIT COMPLIANCE

Permit Enforcement and Penalties

Characterization of Change: One recommendation from the State's Coastal Habitat Protection Plan (CHPP) was to focus on compliance with existing rules and policies rather than continued development of additional regulations. To achieve this goal, the NC General Assembly funded four DCM compliance officers during the summer of 2007, one at each of DCM's regional offices (Wilmington, Morehead City, Washington, and Elizabeth City).

In addition, the CRC was granted the authority to increase civil penalties under an amendment to the Coastal Area Management Act (CAMA), § 113A-126(d) that became effective on December 01, 2006. The amendment provides for a civil penalty of not more than \$1,000 for minor development violations and not more than \$10,000 for major development violations. Previously, the maximum penalties were \$250 for minor development violations and \$2,500 for major development violations. The amended law also provides the CRC the authority to assess the costs of any investigation, inspection, or monitoring associated with the assessment of a civil penalty. The CRC's rule, 15A NCAC 7J.0409, was also revised to implement the provisions of the amended law. Changes to the existing rule include restructuring the procedures for assessing punitive and investigative costs associated with the enforcement action, the procedures for calculating the amount of civil penalty for both major and minor development violations, and addressing existing ambiguous rule language and procedures. The changes will result in an increased penalty of at least \$100 for each minor development violation, and at least \$400 for each major development violation. If current assessment and collection rates continue, the rule changes will result in an additional \$23,000 or more in DCM retentions per year, and an additional \$45,000 or more in remissions to the State's Civil Penalty & Forfeiture Fund. The CRC rule change became effective in January 2008.

It should be noted here that the additional enforcement positions and penalty fees apply to the entire jurisdiction of the CRC (i.e., Areas of Environmental Concern in all 20 CAMA counties).

Driver of Change: Driven by non-CZM efforts, although DCM staff, supported by Section 306 and 309 funds, assisted the regulatory side of the program as necessary.

Characterization of Outcome: Prior to 2007, the number of NOV's issued typically averaged at or near 150. Starting in 2007, when the permit compliance positions were put in place, 240 Notices of Violation (NOV's) were issued. In 2008, when the new civil penalty structure became effective, the number of NOV's dropped to 199 and dropped even further in 2009 to 159. Certainly, some of this initial increase was due to increased staff and subsequent falloff is related to the current economic downturn (i.e., less development leads to fewer permits leads to fewer NOV's). However, between the new four-member compliance staff whose objective is to be proactive in preventing violations that cause harm to the environment, and the increase in civil penalties, it appears that the objectives are being achieved due to the trend in number of annual violations. However, as stated above, it should be noted here that the additional enforcement positions and penalty fees apply to the entire jurisdiction of the CRC (i.e., Areas of Environmental Concern in all 20 CAMA counties) and not just the management categories

specific to Coastal Hazards. The NOV data provided herein are total NOVs and do not reflect those specific to coastal hazards

***SEDIMENT MANAGEMENT PLANS**

No significant change has occurred in this Management Category to date. However, numerous activities have occurred within the State addressing the issue, which may or may not lead to significant changes in Coastal Hazards portion of the NOAA Program Assessment. A synopsis of these activities is presented here.

NC Beach and Inlet Management Plan (BIMP)

Characterization of Change: The need for a North Carolina Beach and Inlet Management Plan was addressed in Section 13.9c of House Bill 1840 (June 30, 2000) and recommended in the Coastal Habitat Protection Plan (CHPP). The NC Division of Water Resources (DWR), in conjunction with DCM, used \$750,000 funding provided by the General Assembly and supplemented later by funding from DCM (\$31,700 from Section 306) to hire Moffatt & Nichol under contract to create the State's first comprehensive Beach and Inlet Management Plan (BIMP). While the BIMP continues to be finalized by DCM and the NC DENR Secretary's Office, pertinent information on the project are available online at www.ncbimp.net.

BIMP development was divided into five main tasks: (1) Identification, acquisition, and compiling of available relevant data, (2) Developing and defining beach and inlet management regions, (3) Identifying and contacting stakeholder groups and facilitating stakeholder meetings, (4) Developing draft management strategies, and (5) Producing a beach and inlet management report document.

Given the statewide nature of the BIMP, a broad-reaching transparent stakeholder process was used. Stakeholders brought their expertise, local knowledge, concerns, and passion for North Carolina's vast coastal resources to offer important insight into each section of the BIMP. Stakeholder input consisted of two main components; advisory groups and public information/input. An intradepartmental working group (DENR Technical Work Group) was established to share data, identify data needs and gaps, and facilitate collaboration. Additionally, a BIMP Advisory Committee was established to provide external input on what the plan should include. It was comprised of representatives of state and federal agencies as well as stakeholder groups.

The public was engaged, informed, and consulted throughout the process by means of press releases, a project website, comment email, questionnaires and two sets of public input meetings that were held at four coastal regions and in Raleigh. Stakeholder involvement provided information on the BIMP at its various stages of development, solicited feedback, and garnered data, ideas, and information on historical local practices. Input from stakeholders was encouraged and valued, and their voices heard.

In addition to the BIMP, the final report of the Ocean Policy Steering Committee, a committee developed by DCM, entitled "Developing a Management Strategy for North Carolina's Coastal Ocean" included discussions on beach and inlet management. While the report was accepted by the CRC in April 2009, no policy or program changes directly related to the Committee's recommendations to a Beach and Inlet Management Plan have occurred. The final report is

available online: <http://www.nccoastalmanagement.net/opscreport.pdf> and is discussed in more detail in the Ocean Resources Section on page 74.

Driver of Change: Driven primarily by non-CZM efforts as the majority of funds were provided to DWR through appropriations from the General Assembly. Additional 306 funds provided from DCM to supplement an additional study of long-term and stable funding ideas, along with ways to prioritize those funds. DCM staff involvement was supported by 309 and 306 funds.

Characterization of Outcome: With the exception of receiving input from numerous stakeholder groups, there is no outcome at this point to be characterized.

***REAL ESTATE DISCLOSURE REQUIREMENTS**

No significant change has occurred in this Management Category to date. However, several activities have occurred within the State addressing the issue, which may or may not lead to significant changes in Coastal Hazards portion of the NOAA Program Assessment. A synopsis of these activities is presented here.

Hazard Disclosure for Real Estate Transactions

Characterization of Change: Bill language has been introduced to the NC General Assembly twice during the past four years seeking to create a coastal hazards real estate disclosure law. This Bill is still under consideration in the House for the upcoming legislative short session (starting May 1, 2010). If passed, the law would require property sellers to provide buyers with a form that identified coastal hazards related to the property (e.g., erosion rate, 100-year storm recession rate, specific area of environmental concern in which property was included, etc.).

Driver of Change: Driven by non-CZM efforts. Because this is a proposed action in the General Assembly, DCM has had no involvement beyond limited input on agency resource requirements addressed in the original Bill language.

Characterization of Outcome: There is no outcome at this point to be characterized.

RESTRICTIONS ON PUBLICLY FUNDED INFRASTRUCTURE

Infrastructure Development involving Public Funds

Characterization of Change: The CRC developed 7H.0306(c) to minimize public expenditures for growth-inducing infrastructure in Ocean Hazard Areas of Environmental Concern (AECs), unless the development met one or more of four specified exceptions. In the time since this rule was first adopted in 1979, the CRC has seen a dramatic increase in the width of the Ocean Hazard AEC due to an increase in erosion rates (based on how DCM has updated the rates through time with additional data and more accurate GIS analysis), which now in some cases spans entire sections of developable barrier islands. This AEC expansion has produced the unwanted effect of making non-oceanfront (including some soundfront and sound-proximate) areas subject to what was intended to be oceanfront regulation. The CRC has found its permitting program inappropriately restrictive of development relating to public infrastructure in these non-oceanfront areas and has adjusted its policies to address this specific issue.

Except for very limited portions of the oceanfront shoreline (e.g., extreme northern Currituck County), the CRC believes that the areas in which they intend this rule to apply are not of

sufficient quantity to justify the hardship imposed upon non-oceanfront areas. The CRC is comfortable that other aspects of its permitting program, such as development setbacks and impervious surface cover limitations, are adequate to manage growth and public expenditures in the Ocean Hazard AEC. The CRC has deleted section (c) of 7H.0306, a change that became effective on April 1, 2007. The rule language that was deleted follows:

(c) In order to avoid public expenditures for maintaining public safety, construction or placement of growth-inducing public facilities to be supported by public funds shall be permitted in the ocean hazard area only when such facilities:

- (1) are of public benefit,*
- (2) shall not increase existing hazards or damage natural buffers,*
- (3) shall be safe from flood and erosion-related damage,*
- (4) shall not promote growth and development in ocean hazard areas.*

Such growth-inducing facilities include sewers, waterlines, roads, and bridges.

Driver of Change: Primarily driven through actions by the Coastal Resources Commission with DCM staff supported with Section 309 funds from FY 2006-2010 Strategy, 306 funds, and state appropriations.

Characterization of Outcome: Although no metrics were established to characterize the outcome of this specific rule change, at least two towns (Ocean Isle Beach and Topsail Beach) supported the rule change so that sewer system renovation and construction could occur in the OEA and Inlet Hazard Area.

***CLIMATE CHANGE PLANNING AND ADAPTATION STRATEGIES**

No significant change has occurred in this Management Category to date. However, numerous activities have occurred within the State addressing the issue, which may or may not lead to significant changes in Coastal Hazards portion of the NOAA Program Assessment. A synopsis of these activities is presented here.

Climate Change and Sea Level Rise

Characterization of Change: The NC Department of Environment and Natural Resources (DENR) 2009-2013 Strategic Plan includes a section on Climate Change. The goal in this section is to “address climate change in North Carolina in a comprehensive way, using mitigation efforts and adaptation strategies to increase the resilience of our State’s resources to these complex changes.” Additional sections may also affect how DCM handles its mission (e.g., Organization Effectiveness, Growing DENR’s Visitor Attractions and Nurturing North Carolina’s Natural Resources, More Effective Environmental Regulation, Conserving Natural Areas and Sustaining Working Lands, and Growing a Green Economy). The Plan is online: http://portal.ncdenr.org/c/document_library/get_file?uuid=42ff6a91-b342-48e2-b941-2bdc0b430e98&groupId=17388.

The CRC Science Panel on Coastal Hazards, at the request of the CRC, recently completed a study entitled “North Carolina Sea-Level Rise Assessment Report”, which is available online: <http://www.nccoastalmanagement.net/slr/NC%20Sea-Level%20Rise%20Assessment%20Report%202010%20-%20CRC%20Science%20Panel.pdf>.

The CRC Science Panel on Coastal Hazards was invited by DCM staff to provide input into DCM’s sea-level rise (SLR) initiative. The Science Panel offered to prepare a report, based on a

review of the published literature, of the known state of Sea Level Rise (SLR) for North Carolina. The CRC and DCM asked the Science Panel to provide the best available information on the following needs:

1. An explanation of how SLR is measured: globally, and at the state and regional scales
2. Relative SLR ranges for different sections of the North Carolina coast, as appropriate to account for regional differences
3. Relative SLR ranges for North Carolina expressed in time slices for the years 2025, 2050, 2075, and 2100
4. Relative SLR rate curves for North Carolina through 2100
5. A discussion of the confidence level or margin of error for the reported ranges and rate curves
6. Recommendations as to what needs to be done for improved SLR monitoring in the State of North Carolina
7. Recommendations as to how frequently the State of North Carolina should update its projected SLR ranges and rates

The Science Panel has completed this report in response to the CRC's request, and has included a recommendation regarding what SLR rate the CRC should be planning for by 2100. This report was researched and prepared by the Science Panel and six additional individuals who were selected because of their relevant expertise. This report synthesizes the best available science on SLR as it relates specifically to North Carolina. The study of sea level change is inherently more accurate in revealing historic changes than in making predictions of the future. The intent of this report is to provide North Carolina's planners and policy makers with a scientific assessment of the amount of SLR likely to occur in this century. The report does not attempt to predict a specific future rate or amount of rise because that level of accuracy is not considered to be attainable at this time. Rather, the report constrains the likely range of rise and recommends an amount of rise that should be adopted for policy development and planning purposes by 2100. This report was a capstone effort to the CRC- and DENR-sponsored forum on sea level rise that was held in Raleigh in January 2010 (forum agenda and presentations online: <http://www.nccoastalmanagement.net/slr.html>). Preceding the forum, an online survey was designed and executed by DCM staff in the fall of 2009.

The North Carolina Office of Geospatial and Technology Management Floodplain Mapping Program (NCFMP) received a \$5 million grant from FEMA to comprehensively study the change in risk to built and living systems, and to develop science-based mitigation and adaptation strategies that will pro-actively reduce future risk. The North Carolina Sea Level Rise Risk Management Study (NC SLRRMS) was initiated in February of 2009 and is expected to conclude in June 2011. The overarching goal of this study is to inform state and federal policy makers on the subject of the sea-level rise impacts and foster development of risk management policy. NC SLRRMS will evaluate the potential changes in coastal flooding hazards due to sea-level rise and changes in storm frequency and intensity on a system-wide basis, considering built and living systems, and inclusive of societal and economic impacts. This assessment will include future vulnerability to both temporary and permanent flooding, land loss, and account for dynamic interactions and feedback between receptor systems. DCM staff have contributed data and participated in working groups. Furthermore, the study is

reviewing and considering the recent final report from the CRC Science Panel regarding sea level rise rates (discussed above). Particulars about this study, which is not yet complete, are online: <http://www.ncsealevelrise.com/>.

Driver of Change: Driven by the NC Coastal Resources Commission which identified sea level rise as a focus area for future policy. Further, DENR has incorporated climate change into its strategic plan (2009-2013). DCM staff working on the SLR effort were funded by Section 306 and 309 funds from FY 2006-2010 Strategy. Money for the CRC SLR Forum was provided from reprogrammed Section 306 funds associated with our annual NOAA grant.

Characterization of Outcome: With the exception of compiling and disseminating data and concepts, there is not yet a significant policy outcome to be characterized, although that work is underway.

HAZARDS RESEARCH AND MONITORING

Oceanfront and Inlet Shoreline Trend Analysis

Characterization of Change: Numerous DCM projects including studies related to Inlet Hazard Areas and the Ocean Erodible Area have been completed or currently are underway as part of DCM's Five Year 309 Program Enhancement Strategy. Specific to inlets, DCM has worked with the CRC Science Panel to revise the Inlet Hazard Area (IHA) boundaries for the State's 12 developed inlets. The final methods and results report, while presented to the CRC, has not officially been accepted for inclusion in the rule until related development standards for the IHAs is complete. The report is available online:

Adobe PDF

[http://www.nccoastalmanagement.net/CRC/INLET%20HAZARD%20AREA%20BOUNDARY%20UPDATE%20draft%20report%20\(5October2009\).pdf](http://www.nccoastalmanagement.net/CRC/INLET%20HAZARD%20AREA%20BOUNDARY%20UPDATE%20draft%20report%20(5October2009).pdf)

Microsoft Word format

[http://www.nccoastalmanagement.net/CRC/INLET%20HAZARD%20AREA%20BOUNDARY%20UPDATE%20draft%20report%20\(5October2009\).doc](http://www.nccoastalmanagement.net/CRC/INLET%20HAZARD%20AREA%20BOUNDARY%20UPDATE%20draft%20report%20(5October2009).doc)

Rule changes related to development inside these proposed boundaries were presented by DCM to the CRC in July 2007, but the CRC requested additional information from their Science Panel. Final findings from this study should be completed by summer 2010 and presented to the CRC for review and consideration.

For oceanfront monitoring issues, DCM is currently updating the CRC's oceanfront erosion rates. For the first time, this update is expected to also include inlet-specific rates (as opposed to the use of adjacent oceanfront rates mandated by the current CRC rules). DCM expects this shoreline change analysis study to be completed in line with its CZMA Section 309 five-year strategy (ending June 30, 2011). This effort has benefited from an earlier study completed by DCM as part of a NOAA CSC Fellowship Program (2005-2007) that established a high level of confidence using elevation-derived shorelines (i.e., mean high water from LiDAR) in conjunction with traditional shorelines (wet/dry lines from aerial photographs), which allows additional shorelines to be used in this study (i.e., not all shorelines in DCM database are from

aerial photos, some are from MHW surveys from LiDAR). A final erosion rate report will be vetted by the Science Panel and presented to the CRC for inclusion into its oceanfront development rules upon completion.

Driver of Change: Driven by DCM’s FY 2006-2010 Coastal Hazards Strategy, Program Change 1, and supported with Section 309 funds.

Characterization of Outcome: Although numerous policy recommendations have been made to the CRC regarding inlets and oceanfront jurisdictional boundaries and development policies, no final rules have been adopted by the CRC. Additional analysis of the oceanfront shoreline (specific to the calculation/update of the State’s oceanfront erosion rate) is currently underway and will not be finalized until fall/winter 2010. Therefore, at this time, there have been no final policy outcomes realized (but many are expected by completion of the fifth year of the 309 five-year strategy that ends on June 30, 2011).

3. (CM) Use the appropriate table below to report the number of communities in the coastal zone that use setbacks, buffers, or land use policies to direct development away from areas vulnerable to coastal hazards. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

For CMPs that use numerically based setback or buffers to direct development away from hazardous areas report the following:

Contextual measure	Number of communities
Number of communities in the coastal zone required by State law or policy to implement setbacks, buffers, or other land use policies to direct development away from hazardous areas.	All areas along oceanfront shoreline require setbacks, including eight counties (Brunswick, New Hanover, Pender, Onslow, Carteret, Hyde, Dare, & Currituck); 32 communities (seven of which are unincorporated and in county jurisdiction and one, Camp LeJeune, which is a military installation); four state parks, three Coastal Reserve sites, two national parks, and one National Wildlife Reserve along the entire 326 miles of oceanfront shoreline. All development along estuarine and riverine shoreline (within CRC/CAMA jurisdiction inside 20 coastal counties) require buffers (there are 12 non-oceanfront, coastal counties requiring buffers that contain approximately 68 communities)

<p>Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct development away from hazardous areas that are more stringent than State mandated standards or that have policies where no State standards exist.</p>	<p>None (although some communities have height and size restrictions for barrier island development, these are criteria not addressed by the CRC). Currituck County currently is considering a ban on sandbag placement along the oceanfront (a practice currently allowed by the CRC and permitted by DCM).</p>
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For CMPs that do not use state-established numerical setbacks or buffers to direct development away from hazardous areas, report the following:

Contextual measure	Number of communities
<p>Number of communities in the coastal zone that are required to develop and implement land use policies to direct development away from hazardous areas that are approved by the State through local comprehensive management plans.</p>	<p>All local and/or county governments in the 20 coastal counties (100 total city and county jurisdictions) are required by CAMA to have Land Use Plans, which address hazard mitigation. In addition, the NC Dept of Emergency Management requires all local and/or county governments in the State to have Hazard Mitigation Plans in place.</p>
<p>Number of communities that have approved State comprehensive management plans that contain land use policies to direct development away from hazardous areas.</p>	<p>All local and/or county governments in the 20 coastal counties (100 total city and county jurisdictions) are required by CAMA to have Land Use Plans, which address hazard mitigation. In addition, the NC Dept of Emergency Management requires all local and/or county governments in the state to have Hazard Mitigation Plans in place. Multiple counties (Craven, Chowan, Pamlico) and communities (Edenton and Manteo) have estuarine shoreline buffers more stringent than those required by CAMA, however, they are for water quality purposes and not related to coastal hazard mitigation.</p>

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Digitization and rectification of historical shoreline aerial photos along oceanfront and estuarine shoreline for continued shoreline change analysis.	data	High (oceanfront) High (estuarine)
Continued acquisition of digital orthophotography along oceanfront and estuarine shoreline and elevation datasets (e.g., LiDAR) encompassing all 20 CAMA counties. Although the current strategy addresses acquiring the first digital shoreline, additional shorelines are necessary to develop a time series to better understand historical and future trends of shoreline change.	data	High (oceanfront) High (estuarine) High (all other non-shoreline areas that might have future inundation from rising sea level)
Installation of water level stations (e.g., tide gauges) and salinity gauges in sounds, creeks/ rivers, and wetlands to monitor sea level rise because currently there are none and the existing tidal gauge stations are solely on the oceanfront.	Data, outreach, policy	High
Continued study and dissemination of data amongst stakeholders regarding sea level rise may lead to additional policy changes regarding SLR (since the only policy change that occurred during the current strategy is related to consideration of SLR in land use planning, which does not address specific use standard rules that might be applied for shoreline development).	data, outreach, policy	High
Continued study and dissemination of data amongst stakeholders regarding offshore/ onshore energy development	data, outreach, policy	High

<p>potential (wind, hydrocarbon, other) and the impacts associated with those alternative energy sources as it relates to the placement of these structures, and the connection of those offshore facilities to onshore facilities across the sea bottom, may lead to additional policy changes regarding energy resources and potential energy development. Moreover, a better understanding of potential development (primarily infrastructure but also changes in land use patterns and ocean resource planning and utilization) may lead to additional policies and development standards for energy-related development in the coastal zone.</p>		
<p>Continued study and dissemination of data amongst stakeholders regarding financial and sand resources related to beach and inlet management overall (e.g., beach fill, inlet dredging, retreat) may lead to additional policy changes regarding regional planning and regional management/regulation / permitting of beach fill activities, sand resources, conflicts between sand resources and other uses (fishing, boating, energy), inlet relocation, and development relocation and/or removal. Regional efforts may decrease conflicts in resource utilization, provide justification for long-term and dedicated state and local funding for beach and inlet management projects, and streamline permitting and monitoring efforts.</p>	<p>data, outreach, policy</p>	<p>High</p>
<p>Continued study and dissemination of data associated with the State's first digital estuarine shoreline developed during FY 2006-2010 Strategy, including total shoreline length, shoreline types, development associated with estuarine shoreline types (e.g., erosion control measures, number of docks and piers, etc.), and a review of appropriate coastal</p>	<p>data, outreach, policy</p>	<p>High</p>

management rules and/or policies associated with the estuarine shoreline.		
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Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
 Medium
 Low

Briefly explain the level of priority given for this enhancement area.

Due to the length and complexity of North Carolina’s oceanfront (326 miles) shoreline, barrier island inlets (19 active inlet complexes), and extensive estuarine shoreline (>10,000 linear miles) and associated management issues, coastal hazards continues to be a HIGH priority for DCM. Numerous major rule and policy changes have been significant during the past five years. Additional policy discussions and studies that are ongoing, primarily related to sea level rise, estuarine shoreline delineation, and general beach and inlet management issues, also have significant potential to affect rules and policies governing oceanfront development relative to coastal hazards considerations for at least the next five years.

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

Yes X
 No

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

Coastal hazards should be addressed on both the oceanfront and estuarine shorelines and include a sea level rise component. The development of the first statewide BIMP identified several recommendations and numerous datasets that will be integrated into coastal management practices on a statewide level. Statewide implementation of the BIMP through the State’s CZM Program (CZMP) will create a regional-based framework that integrates an objective, scientific approach to coastal planning and hazard mitigation. This regional approach will provide the structure necessary for beach and inlet management strategies, primarily rule and policy review, revision, and/or development. Specifically, the need to develop a stable, long-term financing plan to support the shoreline management projects, within these regions, is imperative. There is also a need to develop objective criteria for prioritization of state funding once a dedicated fund has been established. Also, with a better understanding of the coastal datasets provided by the BIMP, the State has the ability to create a regional plan for overall beach and inlet management strategies. The CRC’s priority given to sea level rise necessitates ongoing work to incorporate sea level rise (and sea level rise adaptation) into CAMA land use plans. The CRC’s Science Panel’s 2010 sea level rise assessment report to the CRC should be

considered in developing management strategies during the next five years and should also be updated with new data and forecasts during the next strategy (i.e., a five-year update). The successful development of digital delineation of the State's complete estuarine shoreline, including shoreline type and structure type attributes developed during the FY 2006-2010 Strategy, requires analysis and consideration for potential management applications.

PUBLIC ACCESS

Prepared by John Thayer

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

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize threats and conflicts to creating and maintaining public access in the coastal zone:

Type of threat or conflict causing loss of access	Degree of threat (H,M,L)	Describe trends or provide other statistics to characterize the threat and impact on access	Type(s) of access affected
Private residential development (including conversion of public facilities to private)	M	Traditional and historic access is generally not accounted for in local development approvals. Commercial docking and temporary mooring facilities are being converted to dedicated facilities for adjacent residential development or subdivisions. Downturn in the coastal, state and national economy has taken the pressure off such conversions, which is the basis for a rating of 'moderate' threat and not a 'high' rating.	Pedestrian and non-motorized boat fishing water and access. Motorized boating access and launching Downturn in the economy has actually provided some opportunities for acquisition only limited by public resources available.
Non-water dependent commercial/industrial uses of the waterfront (existing or conversion)	L	Similar to residential development, traditional and historic access is generally not accounted for in local development approvals. Commercial docking and temporary mooring facilities are less often being converted to dedicated facilities for adjacent non-residential development.	Pedestrian and non-motorized boat fishing water and access.

		<p>Redeveloped sites and the design often limit convenient public access.</p> <p>Similar to water dependent conversions, the downturn in the coastal, state and national economy has taken the pressure off, which is the basis for a rating of 'Low' threat.</p>	
Erosion	H	<p>Oceanfront erosion and the temporary prolific use of sand bags have compromised lateral beach access in areas most notably on the Outer Banks.</p> <p>Limited local resources or public unwillingness to fund beach nourishment as demonstrated by failed local ballot initiatives up and down the oceanfront.</p> <p>Availability of adequate sand resources limits options along significant portions of the oceanfront for renourishment strategies.</p> <p>It can be estimated that over 90% of the non-publically controlled lands adjacent to the ocean beach is developed which impacts the ability of public access to migrate w/a receding shoreline.</p>	Beach pedestrian water and fishing access.
Sea level rise	M	<p>"Moderate" risk rating is based on slow historic trend and slow rise projected at 4.27mm a year per the CRC's Science Panel's Metrics Report on SLR. Rates are expected to increase over time and potentially be 1 meter by 2100.</p> <p>Risk is higher within estuarine areas in Pamlico and Albemarle Sound areas due to the low topography and susceptibility to even minor SLR increases.</p>	Loss of all forms of existing access both oceanfront and estuarine shoreline areas.
Natural disasters	H	<p>Rating is based on trend of many oceanfront communities having difficulty in either or both funding beach nourishment and or the limited availability of useable sand resources.</p> <p>Within estuarine areas, especially the sound areas due to the low</p>	Loss of all forms of existing access both oceanfront and estuarine shoreline areas especially resulting from significant erosion.

		topography and susceptibility to stronger storms associated w/SLR.	
National security	L	The State understands there are no current plans, programs or policies expected to further remove or limit public access either oceanfront or estuarine areas under military control.	Public access in military controlled areas is limited and where available on to military personnel and their guests.
Encroachment on public land	M	Off road vehicles on the oceanfront and exceptionally high holiday visitor rates on estuarine sensitive managed lands that are also sensitive habitat areas. Balancing managing joint use especially on state and federally controlled lands along the oceanfront has been difficult.	Some limitations to off road vehicle access primarily in oceanfront areas. Consideration of limitations on intensity of day/overnight pedestrian use on State Estuarine Reserve areas.
Other			

2. Are there new issues emerging in your state that are starting to affect public access or seem to have the potential to do so in the future?

The more notable emerging issue associated with public access is “accelerated sea level rise”, both along the barrier islands adjacent to the Atlantic Ocean and more particularly the counties adjacent to the Albemarle and Pamlico Sounds. This is demonstrated by the rising watertable already damaging adjacent forested areas.

3. (CM) Use the table below to report the percent of the public that feels they have adequate access to the coast for recreation purposes, including the following. If data is not available to report for this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.

Contextual measure	Survey data
Number of people that responded to a survey on recreational access	Not available
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	Not available
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	Not available
What was the geographic coverage of the survey?	Not available
In what year was the survey conducted?	Not available

Approach to Attaining Unavailable Data: Two types of survey approaches will be conducted. Both will probe local and regional perceptions of different forms of current public access in the

coastal zone as well as drawing out public access needs for oceanfront as well as estuarine areas. The first survey mechanism will be an online survey targeting responses statewide using a media and interest groups out-reach approach. The second survey mechanism will be interviews with local officials similarly attempting to characterize perceptions of availability as well as needs. This effort will be targeted towards the fall of 2011. No additional funding resources are expected to be needed. Strategy includes partnering with coastal universities' student study efforts.

4. Briefly characterize the demand for coastal public access within the coastal zone, and the process for periodically assessing public demand.

The only assessment that occurs relates to the DCM City and County Beach and Waterfront Access Grant requests received annually. This allows the local government to express their individual needs in grant applications for funds to assist with new sites as well as to maintain existing locations. The trend for the past five years has been an increase in the number of requests as well as for larger dollar amounts most notably for estuarine shoreline access improvements.

5. Please use the table below to provide data on public access availability. If information is not available, provide a qualitative description based on the best available information. If data is not available to report on the contextual measures, please also describe actions the CMP is taking to develop a mechanism to collect the requested data.

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
(CM) Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	Not available	Not available	
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Not available	Not available	
Number of State/County/Local parks and number of acres	Not available	Not available	
Number of public beach/shoreline access sites	374	50	State GIS, NC WRC & local government
Number of recreational boat (power or non-power) access sites	76	5	DCM Access contracts & NC WRC
Number of designated scenic vistas or overlook points	Not available	Not available	

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	Not available	Not available	
Number of fishing access points (i.e. piers, jetties)	Not available	Not available	
Number and miles of coastal trails/boardwalks	2500 miles of both foot and paddle trails	Not available	NCTrails/NCParks & Rec.
Number of dune walkovers	Not available	Not available	
Percent of access sites that are ADA compliant access	60%	+10%	Estimate DCM Contracts & WRC
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	230 sites*	10 additional*	Shellfish Sanitation Division
Average number of beach mile days closed due to water quality concerns	*	*	

(*) The program is one of providing alerts and advisories and not formal closures. Since the last assessment there have been 121 such notices covering collectively 1,263 days.

Approach to Attaining Unavailable Data: Several approaches will be used to obtain and enhance the data needed for the above table, more particularly the two “CM” items. The State’s “7B Land Use Plan Guidelines” and its “Technical Manual” can be updated to require information on a jurisdictional basis. The updates can require formal local inventories to address above data needs as well as to also identify areas that can also be classified as non-governmental access, whether traditional, historic, or commercial and accessory to areas locally identified as working waterfront areas. Due to needed 7B rule changes required, DCM is not expected to start receiving results from Land Use Plan updates until 2015 through 2018. In the nearer term 2012-2013, DCM can consult with other state and federal agencies that have public access facilities for applicable inventory information. Such information can be aggregated into the State’s Public Beach & Estuarine Access interactive website. An effort will also be made to simultaneously calculate the length of shoreline and acres associated with public access.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutory, regulatory, or legal system changes that affect public access	Y	N
Acquisition programs or policies	Y	Y
Comprehensive access management planning (including GIS data or database)	Y	N
Operation and maintenance programs	N	N
Alternative funding sources or techniques	Y	N
Beach water quality monitoring and pollution source identification and remediation	Y	N
Public access within waterfront redevelopment programs	Y	Y
Public access education and outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a. Characterize significant changes since the last assessment;
- b. Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c. Characterize the outcomes and effectiveness of the changes.

ACQUISITION PROGRAMS OR POLICIES

Amendments to the Public Beach and Estuarine Access Program

Characterization of Change: The CAMA Shoreline Policies associated with the State's Public Beach & Estuarine Access Program were amended effective in February of 2009. The change reduced the matching requirements for land acquisition and for improvements for state grants targeting the more rural estuarine areas where communities are categorized by the State as low-growth and economically challenged communities. Additional adjustments to the rules also occurred to enhance opportunities to partner with other state and federal agencies towards providing public access.

Driver of Change: Driven primarily by DCM's Land Use Planning Program to promote public access within coastal communities. No federal monies are used in the State's grant program and likewise the State's grants are not used to match DCM's federal 306 funds. District Planners (supported by Section 306 funds) serve as contract administrators for the State grant program.

Characterization of Outcome: Since the policy changes have become effective there has been a 20% increase in grant requests and awards to the qualifying communities classified as economically distressed.

PUBLIC ACCESS WITHIN WATERFRONT REDEVELOPMENT PROGRAMS

Working Waterfront Access Study Committee

Characterization of Change: The face of North Carolina's coast is changing. Increased private development is leading a shift from traditional working waterfront communities, which support commercial and recreational fishing and public access, to condominiums and housing developments. The loss of working waterfronts, including the subsequent economic, cultural, and historical changes, coupled with the loss of public access to public trust waters, led the North Carolina General Assembly to take action. In 2006, the General Assembly created the Waterfront Access Study Committee (WASC) and charged the Committee with examining the changing nature of North Carolina's coast and recommending ways for the State to manage these changes. The Assembly's actions included the extension of present use value taxation to working waterfront properties, the creation of an Advisory Committee for the Coordination of Waterfront Access to oversee future waterfront access work, and the establishment of the Waterfront Access and Marine Industry Fund (WAMI). The WAMI will have distributed \$20 million for working waterfront and public access projects throughout the State.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: DCM's Public Access Program rules changes have facilitated the partnering of funding with WAMI in its land acquisition efforts towards maintaining working waterfronts and enhancing estuarine pedestrian and boating access. About \$1 million in DCM access grant funds have been used to assist WAMI funded projects towards land acquisition.

2. Indicate if your state or territory has a printed public access guide or website. How current is the publication and/or how frequently is the website updated? Please list any regional or statewide public access guides or websites.

DCM maintains the following interactive public access website:

<http://www.nccoastalmanagement.net/Access/sites.htm>

The site is updated annually to reflect both new and enhanced beach and estuarine access facilities. The sites goal is to include both state and local sites.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Identification of traditional & historical use access locations, as well as areas that may be considered working waterfronts.	Regulatory, data	H

Currently the State does not have an inventory of traditional and historical access sites that are not owned or managed by public agencies. Additionally existing areas funded for access associated with working waterfronts, or may qualify for future designation, are not recognized in local Land Use Plans. The State’s 7B Land Use Plan Guidelines need to be amended to ensure that such locations are documented during local LUP updates to facilitate disclosure and avoidance of loss for local development approvals. Additionally coastal permit rules will need to be reviewed, as well, to incorporate avoidance of loss during the State’s consistency and permitting process.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
 Medium
 Low

Briefly explain the level of priority given for this enhancement area.

Public access to the State’s waterways is important to the State and local government’s economies as well as central to cultural and historic character of the coastal area. In addition to the development pressures that have resulted in the loss of access opportunities, the emerging trend of accelerated sea level rise demonstrates the need to ensure historic and traditional access locations are not prematurely lost due to either development or possibly sea level rise. Likewise, it is recognized that many other publicly maintained access sites are at risk from long term sea level rise. Strategies need to be developed to either enhance these locations’ ability to migrate with rising sea levels, or to identify opportunities for relocation sites that can be promoted.

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

Yes

No

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

A specific strategy to document existing historical use or traditional access locations and working waterfront areas for public access will not be formally pursued during the next five year period. We need to accomplish other program strategies before moving forward with strategy on public access. Additional background data and information generated through our Coastal Hazards Strategy will support future changes/amendments identified by our Public Access Program. Development of a State sea level rise policy along with amendments to the 7B Land Use Planning Guidelines (Coastal Hazards Strategy, Program Change 3) are necessary to ensure both local inventories of sites can be accomplished during the next LUP updates. Likewise efforts to adjust LUP rules associated with sea level rise will be running parallel. LUP updates are not expected to begin to provide available information until 2015.

MARINE DEBRIS

Prepared by Mike Lopazanski

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

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the significance of marine/Great Lakes debris and its impact on the coastal zone.

Source of marine debris	Extent of source (H,M,L)	Type of impact (aesthetic, resource damage, user conflicts, other)	Significant changes since last assessment (Y or N)
Land Based - Beach/Shore Litter	H	aesthetic, resource damage, economic	N
Land Based - Dumping	H	aesthetic, resource damage, economic	N

Source of marine debris	Extent of source (H,M,L)	Type of impact (aesthetic, resource damage, user conflicts, other)	Significant changes since last assessment (Y or N)
Land Based – Storm Drains and Runoff	H	aesthetic, resource damage	N
Land Based – Fishing Related (e.g. fishing line, gear)	L	aesthetic, resource damage	N
Ocean Based – Fishing (Derelict Fishing Gear)	L	aesthetic, resource damage	N
Ocean Based – Derelict Vessels	L	aesthetic, resource damage, economic	N
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	L	aesthetic, resource damage	N
Hurricane/Storm	L	aesthetic, resource damage, economic	N

2. If information is not available to fill in the above table, provide a qualitative description of information requested, based on the best available information.

NO SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT.

3. Provide a brief description of any significant changes in the above sources or emerging issues.

Recreational boaters and commercial fishermen have reduced the amount of waste they are discharging overboard. Beach goers have reduced some of the waste attributed to them, most likely due to increased public awareness, public educational efforts such as the annual Big Sweep, and local and regional efforts at making recycling easier (per NC Big Sweep 2009).

4. Do you use beach clean-up data? If so, how do you use this information?

Beach clean-up information is used for education, tracking and reporting purposes.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Employed by local governments (Y, N, Uncertain)	Significant changes since last assessment (Y or N)
Recycling requirements	Y	Y	N
Littering reduction programs	Y	Y	N
Wasteful packaging reduction programs	Y	Y	N
Fishing gear management programs	Y	N	N
Marine debris concerns in harbor, port, marine, & waste management plans	Y	Y	N
Post-storm related debris programs or policies	Y	Y	N
Derelict vessel removal programs or policies	N	N	N
Research and monitoring	N	N	N
Marine debris education & outreach	Y	U	N
Other (please specify)			

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

NO SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Insufficient law enforcement	Regulatory	L
Assessment of habitat impacts, spatial	Data	M

trends, density		
Develop/implement mitigative and removal strategies	Regulatory and Policy	M

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium X
Low _____

Briefly explain the level of priority given for this enhancement area.

Marine debris continues to be an issue for coastal North Carolina. The primary challenges with marine debris include: determining its various origins and extent of its impacts on coastal habitats; developing and implementing mitigative approaches; and removal, especially of large items such as derelict vessels. Marine debris poses specific challenges at most of the Division’s Coastal Reserve sites due to its potential impact on habitats, visitor experience and safety, and field research. The Reserve sites often conduct cleanups of marine debris and at some sites, debris is categorized and weighed to address some of the above challenges.

Increased public awareness of the problems marine debris poses to habitats, wildlife and to human enjoyment of the shore, and improved State regulation of solid waste and marine debris, combined with the efforts of North Carolina Big Sweep, have led to a reduction in the volume of marine debris recorded along North Carolina’s beaches over the past four years.

In 1987, 1,000 volunteers were involved in Big Sweep. In 2008, there were over 18,000 volunteers. NC Big Sweep continues to be the largest statewide waterway cleanup effort in the country. North Carolina is making progress in reducing its waste stream and in getting the public to recycle. The education and outreach efforts of the NC Clean Marina Program are also assisting in changing boaters attitudes towards trash in the marine environment. During 2007, the NC Clean Marina Program received funding to hire a full-time program coordinator. During that year, the Clean Marina Program held two workshops hosting over 50 marinas. In addition, the Program produced A Boater’s Guide To Protecting North Carolina’s Coastal Resources with the funding support from the NC Coastal Nonpoint Source Pollution Program (Section 310 funds). This guide provided information on the impacts associated with recreational boating including marine debris. Approximately 10,000 of these guides were distributed to boaters in the coastal area during the assessment period.

Research is underway by NOAA’s Center for Coastal Fisheries and Habitat Research to assess the impacts marine debris has on salt marsh habitats. As part of this study, a survey was conducted on the Rachel Carson Reserve to determine public knowledge and perceptions of marine debris. An additional survey was conducted focusing on commercial fishermen and derelict fishing gear.

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

Yes _____
 No X

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

The Division will not develop a strategy to reduce marine debris along North Carolina’s coast at this time. However, the Division will continue to participate in the national and state efforts at reducing marine debris and making the public more aware of the problem and potential solutions. The Division will also continue to collect data on sources, types and abundance of marine debris at select Coastal Reserve sites.

CUMULATIVE AND SECONDARY IMPACTS

Prepared by Bonnie Bendell

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.

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify areas in the coastal zone where rapid growth or changes in land use require improved management of cumulative and secondary impacts (CSI) since the last assessment. Provide the following information for each area:

Geographic area	Type of growth or change in land use	Rate of growth or change in land use (% change, average acres converted, H,M,L)	Types of CSI
Pasquotank, Currituck, Brunswick, New Hanover, and Pender Counties	Population growth rate	High Growth Greater than 19.6%	Increase of necessary infrastructure to support increasing growth rates
Camden, Perquimans, Gates, Dare, and Onslow Counties	Population growth rate	Medium Growth Between 9.8% and 19.6%	Increase of necessary infrastructure to support increasing

			growth rates
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+Population Growth Data from Office of State Budget and Management's State Data Center Website (2000-2008)

2. Identify sensitive resources in the coastal zone (e.g., wetlands, waterbodies, fish and wildlife habitats, critical habitat for threatened and endangered species) that require a greater degree of protection from the cumulative or secondary impacts of growth and development. If necessary, additional narrative can be provided below to describe threats.

Sensitive resources	CSI threats description	Level of threat (H,M,L)
Fisheries Nursery Areas	Point and nonpoint source pollution, shoreline hardening, algal blooms and hypoxia	H
Anadromous Fish Spawning Areas	Nonpoint source pollution, dredge and fill activity from permitted and unpermitted development, shoreline hardening, channelization, algal blooms and hypoxia	H
Outstanding Resource Waters	Point and nonpoint source pollution, algal blooms and hypoxia	H
Shellfish Beds	Point and nonpoint source pollution, sedimentation and hypoxia	M
Wetlands and Shallow Water Habitats	Nonpoint source pollution, dredge and fill activity from permitted and unpermitted development, shoreline hardening, algal blooms and hypoxia	H
Small Embayments	Point and nonpoint source pollution, shoreline hardening, algal blooms and hypoxia	M
Submerged Aquatic Vegetation	Dredging of navigation channels, increased nutrient loading, recreational activities	H
Natural Beach/Barrier Island Processes & Habitats	Beach bulldozing, beach nourishment, development	M
Coastal Water Supply Aquifers	Water withdrawals for various uses	M
Water Supply Recharge Areas	Removal of water supplied to aquifer	M
Maritime Forests	Development	M
Natural Heritage Areas	Nonpoint source pollution; encroaching development & agricultural/forestry activities	M
Aquatic Recreation Areas	Point and nonpoint source pollution	M
Non-tidal Wetlands	Filling and clearing of vegetation for development, fragmentation, nonpoint	H

	source pollution, shoreline hardening	
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Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management Categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Regulations	Y	Y
Policies	Y	N
Guidance	Y	Y
Management Plans	Y	N
Research, assessment, monitoring	Y	Y
Mapping	Y	N
Education and Outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

REGULATIONS

Stormwater Rule Changes

Characterization of Change: The Coastal Stormwater Rule is a water quality rule originally adopted in the late 1980s. Administered and implemented by the Division of Water Quality, this rule is intended to regulate new development activities in the 20 coastal counties so that the stormwater run-off from new development does not pollute and degrade the public trust surface waters of coastal North Carolina.

In 2005, DWQ performed a comprehensive review of the effectiveness of the existing Coastal Stormwater Rule. DWQ staff concluded that the existing rule was outdated and ineffective in protecting the water quality of the coastal environment. Although DWQ’s study included a thorough analysis of many years of statewide water quality and fisheries data, the dramatic increase in closed shellfishing waters in areas such as New Hanover County best demonstrates

the ineffectiveness of the current rule. At present, over 56,000 acres of NC's shellfishing waters are permanently closed to commercial shellfish harvesting. More than 90 percent of these permanent closures are attributable to stormwater runoff. The steady decline of North Carolina's commercial shellfishing industry has a variety of causes, but closure of shellfishing waters by stormwater run-off plays a major role.

On October 1, 2008, new coastal stormwater rules became effective. Under the changes to the coastal stormwater rule, there are major alterations of the low density threshold, the amount of stormwater that would need to be controlled and treated by stormwater BMPs, the threshold for coverage, and the vegetative setback. The magnitude of the change is dependent upon the location of a development because the proposed changes are different for projects located within a half-mile of waters that have been designated for shellfish harvesting. About 10 percent of the land area within the 20 coastal counties is within a half-mile of shellfish harvesting waters. Furthermore, the rule change will not allow any wetlands that are located within the project site to be included in the calculation used to determine the impervious surface density. In effect, this change will mean more sites with wetlands in the project area will be considered high density and will require stormwater controls. This change was proposed because coastal wetlands and marshes are a very unique and diverse ecosystem, and the new rules must prevent these valuable resources from becoming stormwater treatment devices. Finally, residential projects that disturb more than 10,000 square feet, but less than one acre, will be required to implement one of the provisions as specified in the ratified bill.

Driver of Change: Driven by non-CZM efforts

Characterization of Outcome: This rule is intended to regulate new development activities in the 20 coastal counties of North Carolina so that the stormwater run-off from new development does not pollute and degrade the public trust surface waters of coastal North Carolina.

GUIDANCE

NC DENR SEPA Guidance Document

Characterization of Change: In 2008, the NC Department of Environment and Natural Resources (NCDENR) completed a document titled, "State Environmental Policy Act Guidance on Evaluating Secondary and Cumulative Impacts". This document seeks to improve the adequacy of the DENR SEPA process while assisting applicants and other stakeholders when preparing and reviewing SEPA documents.

Driver of Change: Driven by non-CZM efforts

Characterization of Outcome: This guidance document helps to identify and describe the potential for secondary and cumulative impacts associated with a proposed project or permitted action.

RESEARCH, ASSESSMENT, MONITORING

Coastal Development Activity and Impact Tracking System

Characterization of Change: The Coastal Development Activity and Impact Tracking System (CDAITS) is a geospatial information management system that was implemented in 2005 to support DCM’s coastal management program by giving decision-makers greater access to data related to permits issued by the Division of Coastal Management, and incorporates a geographical location for each of those activities. With CDAITS, the permitting process is more accurately tracked and better environmental resource and disturbance location data is recorded for each project. The system tracks permitting and impact data for each proposed project from application to permitting/ denial to post-issuance transactions such as modifications, transfers, and/or renewals. Reporting is more efficient as CDAITS is web accessible for DCM staff. CDAITS currently contains over 45,000 individual permit records dating back to 1983.

Since the implementation of CDAITS in 2005, over 12,000 new permit records have been entered into the system, staff have completed countless data requests through the query builder and database staff have fulfilled many custom data requests. The supplied data has been used to fill a variety of business needs that includes simple permit inquiries to fulfilling data requirements for performing fiscal impact analyses, as mandated when changes are made to State administrative rules. The system has been enhanced and modified to accommodate alterations in the permitting process such as changes to rules, fees, and activities. CDAITS was adapted to support data feeds for DENR in support of a Departmental decision support system. DCM staff continues to improve CDAITS with new reports and functionality as needs dictate.

Driver of Change: Initially driven by a combination of Section 306 and 309 funds during DCM’s FY 2001-2005 Strategy. However, Section 306 funds have supported it since 2005.

Characterization of Outcome: The database allows for extensive querying of information collected through the DCM permitting program. No cumulative and secondary impact studies or evaluations have been completed to date, but will be possible once CDAITS is fully operational by late 2011 or early 2012.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Cumulative and secondary impacts data (including nonpoint source pollution data) and the development of criteria in which to evaluate threats to resources (defining thresholds)	Data	M

Integration of cumulative and secondary impacts into DCM's coastal development permitting program.	Policy and Regulatory	M
Comprehensive database. There is not a central database that combines all the information necessary for thorough CSI assessments. Individual agencies maintain their own databases which potentially can be used for incremental cumulative and secondary impacts assessments.	Data	M

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
 Medium X
 Low _____

Briefly explain the level of priority given for this enhancement area.

DCM has included cumulative and secondary impacts as part of its Program Enhancement Strategy from 1992 through 2005. Still today, there is not a unified approach to cumulative and secondary impact assessment. Debates remain regarding definitions, emphasis, methodology, and whether or not we know enough about ecosystem behavior to develop a systematic and comprehensive analytical model for assessing cumulative impacts. While more work is needed to understand and manage cumulative and secondary impacts, DCM believes that steady progress has been made due to recent DENR, DCM and stakeholder initiatives/added focus (discussed above) toward CSI issues. We consider this a medium priority within the agency.

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

Yes _____
 No X

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

As it relates to the explanation provided above, DCM does not prefer to devote additional time and resources toward this program area. However, DCM will continue to work on projects/issues that help to better manage cumulative and secondary impacts, but will not include this program area in its next five-year strategy.

SPECIAL AREA MANAGEMENT PLANNING

Prepared by John Thayer

Section 309 Enhancement Objective

Preparing and implementing special area management plans for important coastal areas

The Coastal Zone Management Act (CZMA) 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.”

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Identify geographic areas in the coastal zone subject to use conflicts that can be addressed through Special Area Management Plans (SAMP). Also include areas where SAMP have already been developed, but new issues or conflicts have developed that are not addressed through the current plan. If necessary, additional narrative can be provided below.

Geographic Area	Major conflicts	Is this an emerging or a long-standing conflict?
Ocean Hazard & Inlet Areas	Coastal development, storm hazards; sudden and chronic shoreline changes; land alteration affecting the barrier island system	Long standing issue being influenced by potential accelerated sea level rise.
Coastal & Freshwater Wetlands	Coastal development, physical alteration; nonpoint source pollution, effects of shoreline hardening	Long standing issue being exacerbated by sea level rise especially in the Albemarle and Pamlico Sound areas.
Estuarine Waters	Coastal development, point & nonpoint pollution	Long standing issue likely being exacerbated by sea level rise adjacent areas with soils having poor permeability characteristics.
Public Trust Waters	Competition from residential, industrial, commercial interests for access to and use of public trust resources	Long standing issue likely being influenced by sea level rise adjacent areas with soils having poor

		permeability characteristics especially in the Albemarle and Pamlico Sound areas.
Estuarine Shorelines	Damage to their functions as natural barriers to shoreline erosion and capacity to buffer adjacent waters from runoff.	Long standing issue likely being influenced by sea level rise adjacent areas with soils having poor permeability characteristics especially in the Albemarle and Pamlico Sound areas.
Closed, highly productive shellfish waters	Uncontrolled development or development with high densities/intensities resulting in major or irreversible damage	Long standing issue likely to be exacerbated by sea level rise.
Public Water Supplies	Uncontrolled development within watershed or well field boundaries. Salt water intrusion due to overdraft.	Long standing issue likely being influenced by sea level rise.
State Ports & Surrounding Areas	Multiple jurisdictions affecting natural resources and the use of public trust areas absent coordinated land use planning	Long standing issue likely being enhanced by potential long-term sea level rise.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Identify below any special management areas in the coastal zone for which a SAMP is under development or a SAMP has been completed or revised since the last Assessment:

There are no known SAMPs in progress or have been completed or revised in the coastal zone since the last Assessment. However, DCM discussed the possibility of conducting a SAMP on the planning for sea level rise, but determined this would be addressed as part of the Coastal Hazards Strategy (Program Change 3).

SAMP title	Status (new, revised, or in progress)	Date approved or revised
NA		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment (area covered, issues addressed and major partners);
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

NO SIGNIFICANT CHANGES SINCE LAST ASSESSEMENT.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy).

The following gaps/needs will be addressed as part of the Coastal Hazards Strategy (Program Change 3) and not through specific development of a SAMP.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Formalization of state and CRC policy and regulatory authority related to sea level rise (SLR)	Regulatory, policy	H
Inclusion of SLR in local land use planning, public infrastructure and hazard mitigation planning	Regulatory, data,	H
Enhanced interagency state & local coordination & public education-outreach related to SLR	Policy, communication	H
Lack of state & local SLR Risk Assessment of public and other institutional infrastructure/ sustainability (Ex: roads, sewer, water, drainage, public access, rail, schools, hospitals, fire, fuel and energy transmission, storage, waste and ports, etc)	Data, communication, outreach	H
Lack of state & local SLR Risk Assessment of coastal resources sustainability	Data	H

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
Medium M
Low _____

Briefly explain the level of priority given for this enhancement area.

Though the level of priority of the gaps/needs identified in the table above is “High”, North Carolina is taking steps to plan and prepare for sea level rise and does not believe that the SAMP process is the most appropriate or preferred mechanism to address it. Therefore, the overall rating of conducting a SAMP for sea level rise is “Medium”. This topic overlaps with many of the other objectives that are currently part our CMP as the traditional approaches of looking to the recent past towards future trends is not a sustainable strategy for addressing climate change/sea level rise issues.

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

Yes _____
No X

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

A SAMP will not be developed for sea level rise during FY2011-2015. As indicated above, sea level rise will be addressed under the Coastal Hazards Strategy (Program Change 3) related to developing policies on sea level rise, as well as amending the land use planning guidelines to require local governments to begin planning for sea level rise. The State’s 7B Land Use Planning Guidelines can be one of the best strategies towards ensuring the 100 local jurisdictions incorporate sea level rise considerations in risk assessments and policy development, as well as managing, planning, engineering, operating and maintaining public infrastructure and services.

OCEAN RESOURCES

Prepared by Scott Geis

Section 309 Enhancement Objective

Planning for the use of ocean resources

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Characterize the level of existing and future threats or use conflicts to Ocean resources.

Resource or use	Threat or use conflict	Degree of threat (H,M,L)	Anticipated threat or use conflict
Fisheries	Commercial and Sport fishing; Shoreline Alteration; Adjacent land-use	H	Habitat loss; Over fishing; Resource depletion; By-catch; Threats to estuarine nurseries & juvenile fish habitats; Water quality degradation
Hard Mineral Mining (Sand, gravel, phosphate)	Mining: Dredging for beach renourishment; Inlet maintenance dredging	H	Habitat loss & alteration; Physical impacts to living and non-living resources; User competition for limited resources
Outer Continental Shelf (OCS) Oil & Gas Exploration	Oil and gas exploration surveys, platform/facility construction and daily operations, and transmission to onshore facilities.	H	Threat to OCS benthic habitats & organisms; Potential user conflicts including fishery interest; Threats to offshore marine life; Increased spill potential related to hurricanes; User conflicts and application to Regional Marine Spatial Planning efforts
Alternative Energy Facility Research and Development (Wind, wave, tidal, etc.)	Resource potential surveys, platform/facility construction and daily operations, and transmission to onshore facilities.	H	Threat to OCS benthic habitats & organisms; Potential user conflicts including fishery interest; Threats to offshore marine life; Increased spill potential related to hurricanes; User conflicts and application to Regional Marine

			Spatial Planning efforts
Ocean Outfalls & Ocean Waste Disposal	Uploading of nutrients and waste materials into coastal waters	M	Marine pollution; Habitat degradation; Potential recreational impacts
Recreational Uses	User Conflicts	M	Increase in demand leading to greater conflict in uses

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

Since the last assessment, significant interest in energy exploration in marine waters has grown both nationally and within the State of North Carolina. As a result of both federal and state actions surrounding offshore energy exploration, the threat level for “*Outer Continental Shelf (OCS) Oil & Gas Exploration*” has been increased to high, and a new resource category for “*Alternative Energy Facility Research and Development (wind, wave, tidal, etc.)*” has been added to the above table. Federal and state actions pertaining to both OCS oil and gas exploration and alternative energy facility development are discussed briefly in this section in terms of threats to these resources, while federal and state actions related to specific types of energy facilities are discussed in the Energy and Government Facility Siting section (see pg. 81).

In addition, in April 2009 DCM published an Ocean Policy Report representing the culmination of a two year long effort to better understand the emerging issues for North Carolina’s coastal and ocean waters. The goal of the study was to identify emerging challenges to the use of and access to the State’s ocean and coastal resources and to recommend appropriate policies and strategies to address these challenges. The report, entitled “*Developing a Management Study for North Carolina’s Coastal Ocean,*” outlines five emerging resource policy issue areas and provides recommendations for changes to State policy to ensure North Carolina will be responsive with adaptive rule language as the ocean and coastal climate continues to experience technological, social and economic change. In addition, these revisions to State policy will ensure consistency between state and federal rules when new technologies are employed in federal waters adjacent to North Carolina's waters.

The five emerging ocean resource issues identified in the Ocean Policy Report are: Sand Resource Management; Ocean-Based Alternative Energy Development; Ocean-Outfalls; Marine Aquaculture; and Comprehensive Ocean Management. The report and its recommendations were presented to the CRC in April 2009, and have since been referred to a CRC sub-committee responsible for their examination and implementation. As a result, minor investigations have gone into each of the resource or use categories in the table above, and specific actions have been taken with regard to alternative energy facility siting. The changes to CRC policies regarding alternative energy facility siting (wind turbines) are discussed in the section on Energy and Government Facility Siting (see pg. 82 under WIND).

OUTER CONTINENTAL SHELF (OCS) OIL & GAS EXPLORATION

Federal Activity

Since 2006, the interest in understanding state and nationwide resource potentials for energy production has come to the forefront of political debate. At the federal level, the Energy Policy Act of 2005 served as a starting point for much of this debate, as the Act changed national views on OCS oil and gas energy production. The Act changed U.S. energy policy by providing tax incentives and loan guarantees for energy production of various types. Furthermore, the Act delegates to Minerals Management Service (MMS) new responsibilities for renewable energy and related OCS uses and activities. Despite the impact felt by the Energy Policy Act, the focus on OCS oil and gas resources significantly increased in 2008 when President George W. Bush lifted the presidential moratorium on OCS drilling for oil and natural gas (first issued in 1990). Following suit, Congress later lifted a similar moratorium (enacted 1982) on OCS energy development of oil and gas resources. The expiration of the congressional moratorium, coupled with President Bush's decision to lift the Executive Withdrawal on OCS oil and gas leasing operations, marks a dramatic shift in U.S. domestic energy policy with regard to production, in turn causing state governments to scrutinize the potential for offshore leasing activities in federal waters. In April 2010, President Barack Obama endorsed oil and natural gas drilling off the East Coast from Delaware to central Florida, plus in the northern waters of Alaska. Exploration could begin at least 50 miles off the Outer Continental Shelf of Virginia by 2012.

State Activity

The debate to allow oil and gas exploration and production is occurring throughout North Carolina although, at this time, there are no plans for development in State waters or neighboring OCS waters. Both NC's Governor and Secretary of DENR wrote letters of support for MMS' new five year lease strategy (2011-2015) in September 2009.

DCM has made significant progress to update the State's Coastal Energy Policies (15A NCAC 07M .0400) however, these revisions mainly focus on addressing the State's ability to permit energy facility siting for a variety of resource extraction technologies, as previous rule language focuses primarily on OCS oil and gas production. Further discussion of these revisions is provided in the Energy & Government Facility section (see pg. 81).

In response to increased interests in offshore oil and gas exploration, the NC Legislative Research Commission on Offshore Energy Exploration Advisory Subcommittee was created. The actions of this Subcommittee are discussed in more detail in the Government and Energy Facility Siting Section (see pg. 86).

In addition to the actions taken by the Offshore Energy Exploration Advisory Subcommittee, North Carolina Governor Perdue has convened a Science Panel on Offshore Energy to further promote the study of NC's coastal and offshore resources.

ALTERNATIVE ENERGY FACILITY RESEARCH AND DEVELOPMENT (WIND, WAVE, TIDAL, ETC.)

Federal Activity

At the federal level, the Energy Policy Act of 2005 served as a starting point for much of this debate, as the Act delegates to MMS new responsibilities for renewable energy and related OCS uses and activities. These include uses and activities that produce or support the production, transportation, or transmission of energy from sources other than oil and gas, that is, alternative energy. Consequently, the Energy Policy Act adds considerably to the breadth of MMS responsibilities. Additionally, the Energy Policy Act authorizes subsidies for wind and other alternative energy producers, and adds ocean energy sources including wave and tidal power for the first time as separately identified, renewable technologies. The Act authorizes the U.S. Department of the Interior to grant leases for activities that involve the production, transportation or transmission of energy on OCS lands from sources other than gas and oil (Section 388 of the Energy Policy Act). MMS expects that most, if not all, alternative energy projects and activities in the foreseeable future will focus on portions of the MMS OCS Atlantic and Pacific Regions. These are “frontier areas” with no ongoing alternative energy operations. Lastly, in 2009 President Obama’s campaign focused on a comprehensive plan to chart a new energy policy for the United States by embracing alternative and renewable energy, ending U.S. dependence on foreign oil, and addressing global climate issues.

Additionally, various alternative energy projects around the country are in the beginning phases of permitting and Environmental Impact Statement (EIS) approval. The highest profile example of alternative energy facility siting is the Cape Wind Project, which proposes to install 130 wind turbines in a shallow area of water toward the center of Nantucket Sound called Horseshoe Shoal. The Cape Wind project is undergoing a comprehensive environmental permitting process by seventeen federal and state agencies, under the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act. In November 2004, these agencies released a draft EIS reporting numerous project benefits that would result in minimal environmental impact. In February 2007, Cape Wind filed a Final Environmental Impact Report with the Commonwealth of Massachusetts. The Minerals Management Service (MMS) was granted by Congress the authority to review and approve offshore wind projects including Cape Wind in the Energy Policy Act of 2005. The MMS issued Cape Wind a favorable DEIS in January 2008 and a favorable Final EIS in January, 2009. A Record of Decision from MMS is expected in the near future.

State Activity

Initiative #1: Development of a Wind Energy Permitting Program in NC

Senate Bill 3 (Session 2007-397) provided the EMC with the authority to evaluate renewable energy technologies and establish environmental standards to ensure that renewable energy facilities do not cause adverse effects to the environment. Consistent with that authority, legislative staff counsel of the Environmental Review Commission requested that the EMC provide recommendations to the General Assembly on the development of a wind energy permitting program. During a nine-month period, the EMC’s Renewable Energy Committee heard numerous presentations, evaluated other state programs, and convened a stakeholder advisory group. The final report, titled “Development of a Wind Energy Permitting Program in

North Carolina,” was approved by the Committee on March 11 and by the full EMC on March 12, 2009. Draft legislative language was included in the report’s recommendations, which required the Committee to consider numerous policy decisions including thresholds for State permitting, permitting framework, local government authority, the Mountain Ridge Protection Act (NCGS 113-205 et seq.), water dependent structures, State Environmental Policy Act (SEPA) applicability, and public notice requirements. Two bills were introduced in the General Assembly incorporating EMC recommendations from this report (S1068 and H809). Moreover, the CRC has acted on one of the EMC’s recommendations; amendments to 15A NCAC 07H.0309 that will allow the permitting of electric transmission lines from offshore energy producing facilities. This CRC action addresses similar recommendations from the Ocean Policy Steering Committee (see Initiative #3 below).

Initiative #2: Coastal Wind – Energy for North Carolina’s Future

At the request of the General Assembly, the University of North Carolina conducted a nine-month study to assess the feasibility of siting wind turbines in the sounds and off the coast of North Carolina. The request specified that the assessment include an analysis of the spatial distributions of available wind power, ecological risks and synergies, use conflicts affecting site selection, foundation systems and their compatibility with sound and ocean bottom geology and associated geologic dynamics, electric transmission infrastructure utility statutory and regulatory barriers, the legal context, carbon reduction potential, and economics. The study concluded that North Carolina is well positioned to develop utility scale wind energy production and that the State should pursue it aggressively. The findings were presented to the House Committee on Energy and Energy Efficiency and the Senate Committee on Agriculture/Environment/Natural Resources on June 30, 2009 in a report entitled “Coastal Wind – Energy for North Carolina’s Future.” A provision was put in both the Senate and House budget bills (Section 9.14) to allow for a second phase of this study with the possibility of a wind turbine pilot/demonstration project on the coast. The budget provision (Session Law 2009-451) allocates \$300,000 to UNC to contract with a third party to design, permit, and develop up to three demonstration turbines and supporting facilities. In October 2009, UNC partnered with Duke Energy to develop a pilot project in Pamlico Sound.

Initiative #3: Ocean Policy Report

The development of the Ocean Policy Steering Committee (OPSC) was a joint effort between DCM, North Carolina Sea Grant, and the North Carolina Coastal Resources Law, Planning, and Policy Center at UNC Chapel Hill. An Ocean Policy report entitled “*Developing a Management Strategy for North Carolina’s Coastal Ocean*” was delivered to, and accepted by, the CRC in April 2009. The report included a chapter devoted to ocean-based alternative energy development (wind, waves, currents, and tides). Two major recommendations of the study were 1) the development of rules addressing easements of public trust lands, and the associated water and air columns for alternative energy projects; and 2) the review/amendment of existing CRC rules affecting the siting of alternative energy facilities in state and federal waters. Specific examples on how to achieve these recommendations were included in the Report, and the CRC has already acted on similar recommendations made by the EMC (see Initiative #1 above). Specifically, the CRC created an implementation subcommittee to address the recommendations of the OPSC. Since the implementation of the subcommittee, marine-based wind energy facility siting and development has become a CRC priority and several actions

have been taken to promote and allow for development of these facilities in state waters. Revisions to the CRC's Coastal Energy Policies are discussed in the section on Energy and Government Facility Siting (see pg. 82).

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Comprehensive ocean management plan or system of Marine Protected Areas	N	Y
Regional comprehensive ocean management program	N	Y
Regional sediment or dredge material management plan	N	Y
Intra-governmental coordination mechanisms for Ocean management	Y	Y
Single-purpose statutes related to ocean resources	N	Y
Comprehensive ocean management statute	Y	N
Ocean resource mapping or information system	N	N
Ocean habitat research, assessment, or monitoring programs	Y	N
Public education and outreach efforts	Y	N

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

COMPREHENSIVE OCEAN MANAGEMENT PLAN OR SYSTEM OF MARINE PROTECTED AREAS

Ocean Policy Report

Characterization of Change: While a comprehensive ocean management plan is not currently employed by NC, significant studies have gone into the development of such a plan in recent years. Specifically, DCM developed an ocean policy report for the State. The Ocean Policy

report, which was released in April 2009, utilizes some of the ideas presented by the 2004 reports from the U.S. Commission on Ocean Policy and the Pew Oceans Commission. These reports encouraged all levels of government to take a fresh look at ocean resource issues. In response to this challenge, North Carolina began to review and update its existing policies on ocean uses. In 1994, the North Carolina Sea Grant College Program and DCM released a study on ocean policy and management entitled "North Carolina's Ocean Stewardship Area: A Management Study." The 1994 study, which was a follow-up to a 1984 study entitled "North Carolina and the Sea: An Ocean Policy Analysis," focused on issues such as ocean jurisdiction, extraction of solid minerals, oil and gas activities and marine pollution. This 2009 Ocean Policy report is an update to the 1994 study and focuses on North Carolina's emerging policy issues related to ocean and coastal resources. DCM partnered with North Carolina Sea Grant and the North Carolina Coastal Resources Law, Planning and Policy Center (Center) to complete the Ocean Policy report. The goal of this study was to identify emerging challenges to the use of and access to ocean and coastal resources and to recommend appropriate policies and strategies to address these challenges. A steering committee was convened to provide technical expertise and to work with the Center to formulate policy recommendations. An Ocean Policy Steering Committee (OPSC), comprised of fourteen members from federal and state agencies, local government, academia and the private sector, was convened to assist in this task. Five emerging ocean resources issues for North Carolina were identified: Sand resource management; Ocean-based alternative energy development; Ocean outfalls; Marine aquaculture; and Comprehensive ocean management. The OPSC worked throughout 2008 and early 2009 to fully research these emerging issues and develop policy recommendations for North Carolina.

Additionally, the Ocean Policy Report represents the CRC's initial discussion of a State-level Coastal and Marine Spatial Planning (CMSP) application. The idea of CMSP has been a topic of discussion at both the federal and state level and DCM has participated on various conference calls related to the development on the Interim Report of the National Interagency Ocean Policy Task Force.

Driver of Change: Driven by DCM's FY 2006-2010 Ocean Resources Strategy, Program Change 1, and supported with Section 309 funds.

Characterization of Outcome: The April 2009 Ocean Policy Report was submitted to the CRC and in turn has been passed onto a CRC subcommittee responsible for addressing the implementation of the recommendations. Specific rule language changes have been proposed by the subcommittee as a result of this report, and current CRC actions focus on rule language revisions to the State's Coastal Energy Policies.

REGIONAL COMPREHENSIVE OCEAN MANAGEMENT PROGRAM

Governors' South Atlantic Alliance

Characterization of Change: While a regional comprehensive ocean management program presently does not exist for the State, in October 2009 the Governors of four southeastern states (NC, SC, GA & FL) signed an agreement to work together to better manage and protect ocean and coastal resources, ensure regional economic sustainability and respond to disasters such as

hurricanes. The agreement establishes a South Atlantic Alliance among North Carolina, South Carolina, Florida and Georgia. The Alliance is a state-led partnership leveraging resources from the public and private sectors, business and industry communities, local governments, federal agencies, academic institutions, and non-governmental organizations to address regional priorities. The Alliance has identified four priority issue areas: Healthy Ecosystems; Working Waterfronts; Clean Coastal and Ocean Waters; and Disaster-Resilient Communities. In January 2010, preliminary workshops were held involving representatives from all four coastal states to finalize the Alliance's action plan and to initiate implementation plans.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: The Alliance has only just begun meeting so outcomes and the plans effectiveness cannot be reported on.

REGIONAL SEDIMENT OR DREDGE MATERIAL MANAGEMENT PLAN

NC Beach and Inlet Management Plan (BIMP)

Characterization of Change: As was mentioned in the Coastal Hazards assessment, DCM has undertaken a Beach and Inlet Management Plan (BIMP), which was identified as a priority by the NC General Assembly under House Bill 1840 in 2000 (see Coastal Hazards Section, pg. 38 for more information on the BIMP).

Driver of Change: See Coastal Hazards Section pg. 38 for more information on the BIMP.

Characterization of Outcome: See Coastal Hazards Section pg. 38 for more information on the BIMP.

INTRA-GOVERNMENTAL COORDINATION MECHANISMS FOR OCEAN MANAGEMENT

North Carolina Coastal Habitat Protection Plan (CHPP)

Characterization of Change: Since the approval of the CHPP, the CRC has taken significant steps towards meeting the recommendations of the CHPP. The most notable of these accomplishments are listed below.

- DENR allocated a position with primary responsibility for coordinating implementation of the CHPP.
- Enhanced habitat education through the "Estuary Live" web-based learning program.
- NC General Assembly funded several CHPP implementation initiatives including: four positions and operations for DCM permit compliance review; funding to begin development of a coastal beach and inlet management plan; and funding to begin removal/retrofitting of municipal stormwater outfalls to coastal waters.
- CRC granted authority to raise the maximum CAMA penalties to \$1,000 for a minor development violation and \$10,000 for a major development violation. The Commission also received authority to assess the costs of any investigation, inspection, or monitoring that results in the assessment of a civil penalty (see pg. 37).

- Progress was made in addressing actions to protect fish habitat. The CRC adopted beach nourishment sediment compatibility standards (Technical Standards to Beach Fill Projects: 15A NCAC 7H.0312). The new rules provide an objective definition of sediment compatibility for beach fill projects, and outlines specific protocols for sampling both the beach scheduled to receive nourishment and the proposed borrow site, in order to correctly characterize the material found there. These methods will help ensure that future beach fill projects will closely mimic the native characteristics of North Carolina beaches (see pg. 35).
- DCM completed a methodology for delineating the estuarine shoreline and inventorying man-made structures. East Carolina University is under contract with DCM to digitize the estuarine shoreline for 17 of the 20 CAMA counties (see pg. 32).
- The CRC proposed rule changes to its General Permit for shoreline stabilization that will reduce the distance waterward in which bulkheads encroach into public trust areas, by promoting the benefits of living shorelines (see pg. 6).
- DCM's N.C. National Estuarine Research Reserve (NERR) received a Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) grant for a proposal entitled "Sustainable estuarine shoreline stabilization: Research, education and public policy in N.C.," which will study the effects of various shoreline stabilization techniques on ecosystem services of shorelines, and include construction of demonstration projects and educational outreach.
- N.C. NERR and the Albemarle-Pamlico National Estuary Program produced a Newspaper in Education insert for the Raleigh News and Observer in November 2007 about coastal fish habitat.
- DCM is participating in the EPA's Coastal Elevations and Sensitivity to Sea Level Rise study.
- In an effort to determine the impacts associated with the construction of marsh sills, DCM is partnering with UNC Institute of Marine Sciences and NOAA's Center for Coastal Fisheries and Habitat Research to survey approximately 30 sills that have been constructed along the estuarine shoreline. The survey will be incorporated as part of the CICEET sills project studying the effects of various shoreline stabilization techniques on ecosystem services of shorelines.

Driver of Change: Driven by non-CZM efforts as the CHPP was an outcome of the Fisheries Reform Act of 1997 legislated by the NC General Assembly. During the initial years of its development, DCM funded a two year long public participation component to the project using Section 310 funds. DCM staff, participating on the CHPP Steering Committee, are supported with Section 306 and 309 funds.

Characterization of Outcome: Specific accomplishments are listed above.

SINGLE-PURPOSE STATUTES RELATED TO OCEAN RESOURCES

Ocean Policy Report and Revisions to CRC Coastal Energy Policies

Characterization of Change: As was mentioned under the Alternative Energy Facility Research and Development (wind, wave, tidal, etc.) Category (see page 73), the Ocean Policy Report suggested revisions to existing State coastal policies with respect to wind energy. Discussions

on revisions to the State’s Coastal Energy Policies, and legislation focusing on marine-based wind turbines are provided on pages 82 and 84 respectively.

Driver of Change: The Ocean Policy Report and revisions to CRC Coastal Energy Policies were driven by DCM’s FY 2006-2010 Ocean Resources Strategy, Program Change 1, and supported with Section 309 funds. The legislation introduced concerning wind facility siting originated from the North Carolina General Assembly.

Characterization of outcome: Accomplishments related to these initiatives are listed under the Alternative Energy Facility Research and Development (wind, wave, tidal, etc.) Category (see pg. 73) and in the Energy and Government Facility Siting Section (see WIND pg. 82).

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need Description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Development of a Statewide Approach to the management of coastal resources (CMSP)	Regulatory, policy, communication and outreach	H
Continued participation in Statewide and Regional Alliances geared towards CMSP	Communication, outreach, policy and data	H
Management and Sharing of Data	Data	H

The release of the Ocean Policy Report has stimulated renewed interest in emerging ocean issues and has resulted in several initiatives by the State to discuss such pertinent topics as alternative energy facility development, coastal and marine spatial planning and the regional coordination of comprehensive ocean resource efforts and statutes. The federal government’s U.S. Ocean Action Plan calls for ecosystem-based approaches to managing coastal and marine ecosystems. A state-level ecosystem-based approach to ocean management will require further investigation of the legal and policy issues associated with the use and development of ocean resources. For example, the CHPP has increased inter-agency coordination in dealing with the protection and enhancement of coastal fisheries and resources. The CHPP could be utilized to address the marine resources of the coastal ocean since it contains recommendations that provide the impetus for reviewing administrative rules and policies as they pertain to ocean resources. Specifically, the CHPP could serve as a foundation for a state-level CMSP effort, that could later be coordinated with regional efforts like the Governors’ South Atlantic Alliance, and with the national efforts and strategies outlined by the U.S. Interagency Ocean Policy Task

Force. Inherent in this approach is a continuous need for data, as well as the management and distribution of that data among various levels of government.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
Medium
Low

Briefly explain the level of priority given for this enhancement area.

There has been significant progress in DCM’s efforts to evaluate and develop specific policies and administrative rules relevant to North Carolina’s coastal ocean. For example, the NC Ocean Policy Report and the work of the CRC Subcommittee on the report’s recommendations could serve as the driver for a state-level CMSP application. Additionally, the CHPP has potential to serve as a foundation for a steering committee on CMSP. There is a need to capitalize on all that has been invested thus far on this issue and still a need to achieve an ultimate outcome of a comprehensive coastal and marine spatial plan. Many of the State’s administrative rules and policies require revisions to address the authority to deal with the comprehensive management of coastal resources. Significant coordination between federal, state and local government agencies charged with the protection, enhancement and development of ocean resources is needed to ensure that data development and authority concerns are addressed by a larger advisory committee before they are employed in a state-level CMSP application.

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

Yes X
No

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

A strategy will be developed for the ocean resources enhancement area to assist in the development of a comprehensive coastal and marine spatial plan. This project will require significant coordination with various state and federal agencies, as well as with neighboring states interested in regional approaches, to analyze the challenges associated with CMSP.

The NC Division of Coastal Management is particularly interested in developing a strategy for a comprehensive CMSP initiative as CMSP-related issues (such as renewable energy siting; the leasing of state-owned, submerged, marine lands; the utilization of both state and outer continental shelf resources; and beach compatible sand materials for re-nourishment activities) have been a focus of the NC Coastal Resources Commission for several years. Furthermore, CMSP has gained national momentum through the U.S. Interagency Ocean Policy Task Force, and DCM has attempted to partner with groups like NOAA CSC, The Governor’s South

Atlantic Alliance, and The Nature Conservancy on CMSP initiatives. As such, DCM’s current efforts, and the existing initiatives at the federal and regional level for CMSP, support DCM’s proposed 309 Strategy on ocean resources enhancement. The strategy will be developed to address policy, communication, outreach and data gaps associated with ocean resource management.

ENERGY & GOVERNMENT FACILITY SITING

Prepared by Scott Geis

Section 309 Enhancement Objectives

Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and energy-related activities.

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the types of energy facilities in your coastal zone (e.g., oil and gas, Liquefied Natural Gas (LNG), wind, wave, Ocean Thermal Energy Conversion (OTEC), etc.) based on best available data. If available, identify the approximate number of facilities by type.

Type of Energy Facility	Exists in CZ (# or Y/N)	Proposed in CZ (# or Y/N)	Interest in CZ (# or Y/N)	Significant changes since last assessment (Y or N)
Oil and gas facilities	N	N	Y	Y
Pipelines	N	N	Y	Y
Electric transmission cables	N	Y	Y	Y
LNG	N	N	N	N
Wind	N	Y	Y	Y
Wave	N	N	N	N
Tidal	N	N	N	N
Current (ocean, lake, river)	N	N	N	N
OTEC	N	N	N	N
Solar	N	N	N	N

2. Please describe any significant changes in the types or number of energy facilities sited, or proposed to be sited, in the coastal zone since the previous assessment.

OIL AND GAS FACILITIES

While there are currently no oil or gas facilities located within North Carolina waters, the expiration of the congressional moratorium (October 1, 2008), coupled with President Bush's decision to lift the Executive Withdrawal on oil and gas leasing operations on the OCS (July 14th, 2008), marks a dramatic shift in U.S. domestic energy policy with regard to oil and gas production on the OCS. In April 2010, President Barack Obama endorsed oil and natural gas drilling off the East Coast from Delaware to central Florida, plus in the northern waters of Alaska. Exploration could begin at least 50 miles off the OCS of Virginia by 2012.

PIPELINES

While there are currently no pipelines located within North Carolina waters, the significant change reflected here is in response to renewed interests in oil and gas exploration and the assumption that pipelines would be necessary if oil and gas production were to occur.

ELECTRIC TRANSMISSION CABLES

While there are currently no new electric transmission cables proposed for North Carolina's coastal waters, there is the assumption that the pilot project to install three marine-based wind turbines in Pamlico Sound will likely employ electric transmission cables to an onshore facility. The specifics of this project are discussed under the Ocean Resources section, Alternative Energy Facility Research and Development (Wind, wave, tidal, etc.) category, and specifically under the State Level actions Initiative #2: Coastal Wind - Energy for North Carolina's Future (see pg. 74).

WIND

While there are currently no wind turbines in North Carolina's coastal waters, a pilot project is underway to develop up to three turbines in Pamlico Sound. Revisions have been proposed to the State's Coastal Energy Policies (15A NCAC 07M .0400), General Use Standards for Estuarine and Ocean System Areas of Environmental Concern (15A NCAC07H .0208) concerning the addition of wind turbines to coastal waters, and General Definitions for Areas of Environmental Concern (15A NCAC 07H.0106) adding wind turbines as a water-dependent structure, in an attempt to update the State's Coastal Energy Policies to cover more than just oil and gas exploration. Draft amendments to these rules were provided to the CRC at its October 2009 meeting. In developing the amendments, DCM staff used the recommendations of the EMC and draft bill S1068 as a guide. Following the October meeting, staff circulated the draft language to DENR agencies and other stakeholders to ensure the amendments are adequate in addressing relevant environmental concerns. Comments were received from the Department of Defense, NC Wildlife Resources Commission, NOAA Coastal Fisheries and Habitat Research Center, and the Carteret County Shore Protection Office. The CRC sent these revisions to public hearing at its January 2010 meeting.

In addition, at the October 2009 meeting, the CRC made a declaratory ruling designating wind turbines as water dependent structures.

3. Does the state have estimates of existing in-state capacity and demand for natural gas and electric generation? Does the state have projections of future capacity? Please discuss.

The majority of North Carolina's natural gas is supplied by the Transcontinental Gas Pipeline Co. that traverses the State from the Gulf Coast to major population centers in the northeast. The industrial sector is the leading natural gas-consuming sector, although consumption by residential and commercial users is also substantial. Approximately one-fourth of North Carolina households use natural gas for home heating.⁵

North Carolina's electricity production is high. Coal-fired power plants primarily account for about three-fifths of the State's electricity generation, and nuclear power typically accounts for about one-third. Hydroelectric and natural gas-fired powered plants produce most of the remainder. With three nuclear power plants, North Carolina is a major nuclear power producer. Hydroelectric power plants located along several rivers in central and western North Carolina produce substantial amounts of electricity. North Carolina's electricity consumption is among the highest in the nation. As is typical in the south, more than one-half of North Carolina households use electricity for home heating.⁶

North Carolina possesses about five percent of the nation's net summer capacity for wind energy production and ranks among the top ten states with the highest net summer capacity for wind power. In August 2007, North Carolina adopted a renewable energy and energy efficiency portfolio standard requiring electric utilities to meet 12.5 percent of retail electricity demand through renewable energy or energy efficiency measures by 2021. Electric membership corporations and municipalities that sell electric power within the State must meet a 10-percent standard by 2018.⁷

One study which has shed significant light on the State's ability to connect alternative energy facility generators to the national grid was the UNC Wind Study commissioned by the NC General Assembly in 2008. The UNC Wind Study involved a high-level review of utility transmission infrastructure in eastern North Carolina. The review suggests some capacity to accommodate additional offshore energy generation, but that electrical grid upgrades may be required and further study is needed. A high-level economic screening also suggests the levelized cost of generation for either inshore or offshore development is in the \$101-106 per MWh range. The study concluded that North Carolina is well positioned to develop utility scale wind energy production.

Estimates of wind power potential in coastal North Carolina from AWS Truewind were evaluated using existing wind observations and atmospheric models including publicly-available weather data, NC State Observation of Wind (SOW) meteorological towers, and privately collected over-water wind data from the Sounds. In addition, limited deployments of a Sound Direction and Range (SODAR) system owned by UNC Chapel Hill collected vertical wind profiles. In general, there is a rapid increase in wind energy potential as one moves from land over water and offshore. Wind power class abruptly transitions from 1-2 over land to 4 or greater over water. Wind power class 6 is common offshore and may reach class 7 in the

⁵ http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=NC

⁶ Id.

⁷ Id.

vicinity of Cape Hatteras. Within the sounds wind power class 5 is likely in eastern Pamlico Sound and less elsewhere.

4. Does the state have any specific programs for alternative energy development? If yes, please describe including any numerical objectives for the development of alternative energy sources. Please also specify any offshore or coastal components of these programs.

Typically the State’s Utility Commission regulates the development of energy facilities, but early in 2008 the question arose regarding the Utility Commission’s ability to regulate marine-based facilities, as well as CRC’s ability to regulate these facilities. The CRC does have enforceable Coastal Energy Policies (15A NCAC 07M.0400), first adopted in 1979, however these policies have traditionally dealt with the development of oil and gas facilities (specifically dealing with consistency issues surrounding OCS oil and gas facility development). The revisions to the State’s Coastal Energy Policies seek to update these policies to deal with marine-based alternative energy facility siting.

5. If there have been any significant changes in the types or number of government facilities sited in the coastal zone since the previous assessment, please describe.

There have been no significant changes in the types or number of government facilities sited in the coastal zone since the previous assessment.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Does the state have enforceable policies specifically related to energy facilities? If yes, please provide a brief summary, including a summary of any energy policies that are applicable to only a certain type of energy facility.

The CRC does have enforceable Coastal Energy Policies (15A NCAC 07M.0400), however these policies have traditionally dealt with the development of oil and gas facilities (specifically dealing with consistency issues surrounding OCS oil and gas facility development). The revisions to the State’s Coastal Energy Policies seek to update these policies to deal with marine-based alternative energy facility siting.

2. Please indicate if the following management categories are employed by the State or Territory and if there have been significant changes since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutes or regulations	N	Y
Policies	Y	Y
Program guidance	N	N

Comprehensive siting plan (including SAMPs)	N	N
Mapping or GIS	Y	Y
Research, assessment or monitoring	Y	N
Education and outreach	Y	N

3. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.
 - a) Characterize significant changes since the last assessment;
 - b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and
 - c) Characterize the outcomes and effectiveness of the changes.

STATUTES, REGULATIONS AND POLICIES

Legislation Update

Characterize of Change: The expiration of the congressional moratorium, coupled with President Bush’s July 2008 decision to lift the Executive Withdrawal on oil and gas leasing operations on the OCS, and President Obama’s recent decision to consider offshore drilling along the east coast and in the northern waters of Alaska, marks a dramatic shift in U.S. domestic energy policy with regard to production. At the same time, continued calls by President Obama for a federal Renewable Portfolio Standard (RPS) have increased pressures on states to develop alternative energy facility siting policies. As a result North Carolina has experienced significant activity in regards to updating State energy policies.

The North Carolina General Assembly, the CRC, and various state agencies and commissions, have made significant attempts to update and address the State’s ability to permit energy facility siting for a variety of resource extraction technologies since the last assessment. These efforts and changes to State policy reflect a response to both federal and state level interests in renewed exploration of oil and gas resources, as well as a desire to develop and expand alternative energy portfolios.

In the summer of 2008, the North Carolina General Assembly requested and commissioned the University of North Carolina to conduct a Wind Study on the Feasibility of Wind Turbines in the Pamlico and Albemarle Sounds and in Ocean Waters off the North Carolina Coast (S.L. 2008-107, s. 9.12). The General Assembly’s request specified that the assessment include an analysis of the spatial distributions of available wind power, ecological risks and synergies, use conflicts affecting site selection, foundation systems and their compatibility with sound and ocean bottom geology and associated geologic dynamics, electric transmission infrastructure, utility statutory and regulatory barriers, the legal context, carbon reduction potential, and economics. Discrete work components were addressed by a project team that drew upon expertise within the University as well as consultants. The final report was presented to the General Assembly on July 1, 2009. Since the delivery of the final report, the NC General Assembly included a 2009 budget provision for UNC to continue its study and to partner with a third party on a pilot project in Pamlico Sound (Senate Bill 963). On October 9, 2009, UNC and

Duke Energy signed a contract to place up to three demonstration wind turbines in the Pamlico Sound. These demonstration turbines may be the first turbines placed in water in the U.S., providing UNC with a valuable opportunity for ongoing research about issues raised in its coastal wind study.

Additionally, during the 2009 legislative session the NC Senate introduced a Bill (SB1068) delegating authority to DCM to permit wind turbines in areas of the 20 coastal CAMA counties. While SB1068 was never ratified, several of the conditions presented in the Bill were considered and acted upon by the CRC in an effort to update the CRC's Coastal Energy Policies and to allow for the possibility of permitting alternative energy facility development in coastal waters where previous policies would have expressly forbid them. This was also done in an effort to ease the transition of future NC General Assembly actions regarding wind energy development with respect to the CRC's ability to carry out the General Assembly's mandates.

In response to increased interests in offshore oil and gas exploration, the NC Legislative Research Commission on Offshore Energy Exploration Advisory Subcommittee pursuant to North Carolina General Statute 120-19.6 (a1), the President Pro Tempore of the Senate, Marc Basnight, and the Speaker of the House of Representatives, Joe Hackney, established the Offshore Energy Exploration Study Committee on January 16, 2009. On February 11, 2009, the members of the Committee were re-appointed to the Legislative Research Commission Advisory Subcommittee on Offshore Energy Exploration. On April 28, 2009, Senator Basnight and Speaker Hackney extended the duration of this Subcommittee to the filing of its final report or on the convening of the 2010 Regular Session of the 2009 General Assembly, whichever occurred first. At that time, in addition to studying petroleum exploration and development, the Subcommittee received the authority to study the potential impacts of alternative offshore energy projects on the nation's energy supply, including energy generated from wind, waves, ocean currents, the sun, and hydrogen production. Since its creation, the Subcommittee has held four meetings.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: On August 20, 2007, with the signing of Session Law 2007-397 (Senate Bill 3), North Carolina became the first state in the southeast to adopt a Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Under this new law, investor-owned utilities in North Carolina will be required to meet up to 12.5% of their energy needs through renewable energy resources or energy efficiency measures. Rural electric cooperatives and municipal electric suppliers are subject to a 10% REPS requirement. Although the new law sets forth a number of details, these electric power suppliers may comply with the REPS requirement in a number of ways, the use of renewable fuels in existing electric generating facilities, the generation of power at new renewable energy facilities, the purchase of power from renewable energy facilities, the purchase of renewable energy certificates, or the implementation of energy efficiency measures. On February 29, 2008, the Utility Commission issued an order adopting final rules implementing Senate Bill 3.

Amendments have been proposed to the State's Coastal Energy Policies (07M .0400), General Use Standards for Areas of Environmental Concern (07H .0208), and General Definitions for

Areas of Environmental Concern (15A NCAC 07H.0106), in an attempt to update them to cover more than just oil and gas exploration. Amendments to these policies have been proposed primarily in response to the growing interest across the State and throughout the nation, concerning the need to expand the country's renewable energies portfolio. In North Carolina, this interest has been supported by several studies related to the availability of wind energy within and along the State's coastal waters. Additionally, amendments to CRC rule 15A NCAC 07H.0309 that will allow the permitting of electric transmission lines from offshore energy producing facilities across the dry sand beach were adopted by the CRC at its January 2010 meeting. As a result of the CRC's actions to update its Coastal Energy Policies, wind turbines were declared water-dependent structures at the CRC's October 2009 meeting.

MAPPING OR GIS

UNC Wind Study

Characterization of Change: The UNC Wind Study (previously mentioned in this section) included the generation of a number of data layers which were incorporated into a GIS format and used to model a least coast scenario for the placement of wind turbines in Pamlico Sound.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: The UNC Wind Study was presented to the NC General Assembly in June 2009, and is available (along with resource maps) online at <http://www.climate.unc.edu/coastal-wind>.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Understanding of agency responsibilities as they relate to the development of marine-based alternative energy facilities	Policy, communication and outreach	M

While HB1068 was not passed during the 2010 legislative session, it raised several questions on the permitting authority for wind turbines. Coordination between the CRC, the EMC and the NC Utilities Commission is necessary to fully understand the permitting of these facilities as well as the generation and distribution of energy produced by these facilities to the national grid. The NC Ocean Policy Report finalized in 2009 assessed existing state policies and administrative rules regarding the siting of these facilities and has outlined additional concerns

and needs such as siting authority and issues surrounding leases and or easements for alternative energy facilities sited within state waters.

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
Medium
Low

Briefly explain the level of priority given for this enhancement area.

While existing infrastructure is seen as a limitation to the siting of wind and other alternative energy generating facilities in the coastal area, the State’s coastal and offshore waters have received particular attention from the windfarm industry. This interest in wind energy has come to the forefront of State policy as the UNC/Duke Energy pilot project will install up to three wind turbines in Pamlico Sound. As a result, DCM is reviewing current policies and rules to allow for the siting of such a facility in state waters. This policy analysis encompasses other ocean issues in an effort to address the recommendation contained in the Pew and the U.S. Commission on Ocean Policy reports, particularly with regard to regional planning initiatives. A comprehensive review of North Carolina's consistency program has been very effective in implementing the State's coastal policies with regard to federal actions.

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

Yes
No X

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

A strategy will not be developed specifically for this enhancement area as activities focused on alternative energy development and enhancement will be integrated within the Ocean Resources Program Enhancement Area. The development of policies related to energy and government facility siting applies to a larger management framework for the State’s coastal resources. The Ocean Resources Program Enhancement Area necessitates the need for CMSP efforts to better understand the extent of the spatial and temporal constraints that may be placed on the State’s coastal resources. The development of CMSP planning documents will be incorporated under the Ocean Resources Strategy and will address revisions to CRC development policies in an effort to promote a comprehensive review process that minimizes user conflict and protects ocean resources, which may be used for energy production.

AQUACULTURE

Prepared by Bonnie Bendell

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

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Generally characterize the private and public aquaculture facilities currently operating in your state or territory.

Type of existing aquaculture facility	Describe recent trends	Describe associated impacts or use conflicts
*Division of Marine Fisheries (DMF) Aquaculture Operation Permits (shellfish leases and land based hatchery facilities)	There has been a slight increase in the amount of permits issued (on average) during the last assessment period. Although there has been an increase in the overall permits, there has been a decrease in shellfish lease permits and an increase in fish hatchery (land based) facilities.	Commercial shellfish fisherman cannot fish in the leased areas. Navigation, public access and use cannot be restricted by the lessee. Aesthetic concerns have been documented.
+Department of Agriculture (DOA) Aquaculture Permits (freshwater operations including flow through culture, pond culture and indoor recirculation systems)	There are 314 individuals in NC licensed for aquaculture by the NC Dept. of Ag and Consumer Services. The overall trend for the last five years has resulted in increased production. Most of this increase has been due to more efficient production not an increase in the number of producers. Over the last couple of years, trout production has been down due to drought issues. The only significant increase in number of producers has been with freshwater prawn.	Freshwater aquaculture takes place on private property. In the eastern part of the State some environmental groups are concerned with the effluent from some pond aquaculture operations. Several operations have entered into an agreement with the State to reduce their impacts on water quality and meet the State standards.
*DMF Under Dock Oyster Culture Program	The program was started in 2006 and has seen an increase in permits every year. In 2009, 29 permits were issued.	Only private dock owners can apply. Dock cannot be in prohibited/polluted shellfish harvest area.

*Data from the Division of Marine Fisheries Resource Enhancement Section

+Data from North Carolina Department of Agriculture and Consumer Services, Division of Marketing

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. For each of the management categories below, indicate if the approach is employed by the state or territory and if significant changes have occurred since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Aquaculture regulations	Y	Y
Aquaculture policies	Y	N
Aquaculture program guidance	Y	Y
Research, assessment, monitoring	Y	Y
Mapping	Y	Y
Aquaculture education & outreach	Y	N
Other (please specify)		

2. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) Characterize significant changes since the last assessment;
- b) Specify if it was a 309 or other CZM driven change (specify funding source) or if it was driven by non-CZM efforts; and
- c) Characterize the outcomes and effectiveness of the changes.

AQUACULTURE REGULATIONS

Under Dock Oyster Culture Program

Characterization of Change: In 2006, a new permit program was implemented to allow private dock owners to grow oysters in containers under the docks for personal consumption. The docks must be in an area approved for the harvest of shellfish. The applicant must review an educational package and pass a test. The size and area of containers is limited. Sale of oysters cultured under this program will not be permitted. In 2006, 14 permits were issued. In 2009, 29 permits were issued (19 renewal permits and 10 new permits).

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: This program hopes to increase the spawning stock biomass and public awareness of environmental benefits of a healthy oyster population.

AQUACULTURE PROGRAM GUIDANCE

Ocean Policy Report

Characterization of Change: In April 2009, a report by the NC Coastal Resources Law, Planning and Policy Center titled “*Developing a Management Strategy for North Carolina’s Coastal Ocean*” (pg. 73) was released and contained guidance on Marine Aquaculture. The report provided a technical assessment of the feasibility of marine aquaculture in North Carolina’s coastal-ocean waters and recommended that the NC Division of Coastal Management should monitor the progress of the National Offshore Aquaculture Act of 2007 or similar future bill.

Driver of Change: Driven by DCM’s FY 2006-2010 Ocean Resources Strategy, Program Change 1, and supported with Section 309 funds.

Characterization of Outcome: The Ocean Policy Report was released in April 2009 and as such we do not know what the outcome of the report recommendations will be. Initial focus has been on alternative energy issues being addressed through DCM’s Coastal Energy Policies. Revisions to these policies are discussed in the Energy and Government Facility Siting Section as it relates to wind turbines in coastal waters (pg. 82).

RESEARCH, ASSESSMENT, MONITORING

JLCSA Study

Characterization of Change: During the 2008 legislative session, the General Assembly passed H.B. 2431, which authorizes the Joint Legislative Commission on Seafood and Aquaculture (JLCSA) to study the feasibility of increasing the production, processing, and marketing of aquaculture products in the State, which includes (among other things) an analysis of the current and potential economic impact of the aquaculture industry in the State; the current and potential environmental impacts of the aquaculture industry; regulatory changes that may be necessary to increase the production, processing and marketing of aquaculture products; and recommend levels of funding necessary to increase the production, processing, and marketing of aquaculture products. In response, the JLCSA released a request for proposals (RFP) for a consultant to assist in this study, and applications were due in February 2009. The RFP includes marine aquaculture as part of the JLCSA’s planned study.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: It is unknown what the outcome of this Study will be since it has not yet been completed.

MAPPING

GIS mapping of DMF permitted shellfish leases

Characterization of Change: DMF is mapping the location/boundaries of shellfish bottom leases in a GIS format. DMF currently has 74 leases mapped and are mapping leases as they are renewed.

Driver of Change: Driven by non-CZM efforts.

Characterization of Outcome: The maps will be beneficial in the administration of the leases, in enforcement for the marine patrol, and other agencies in reference to projects and permits in proximity to the leases.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Public understanding of programs, requirements, and impacts	Outreach	L
Training for applicants	Training	L
Communication between agencies	Policy/communication	L

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
 Medium _____
 Low X

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

Yes _____
 No X

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

The NC Division of Marine Fisheries, Wildlife Resources Commission, and Department of Agriculture have primary regulatory oversight and responsibility related to aquaculture activities in the State, therefore, DCM will not be developing a strategy for aquaculture at this time.

V. PROGRAM ENHANCEMENT AREA STRATEGY (FY 2011-2015)

Introduction. This strategy represents efforts to better understand and manage North Carolina's coastal and marine resources on three major fronts: (1) oceanfront shoreline, (2) estuarine shoreline, and (3) coastal and ocean environment. Four program changes are proposed to achieve this strategy in support of two program enhancement areas: Coastal Hazards and Ocean Resources. Through this strategy, DCM will develop the information and tools necessary to provide program changes related to new or revised regulations, authorities, guidelines, procedures, policy documents and memoranda of agreement that will result in meaningful improvements in coastal resource management.

Strategy Title: COASTAL HAZARDS

Program Change 1: *Implementation of a Statewide, Regional-based Beach and Inlet Management Plan for North Carolina.*

I. Issue Area

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (check all that apply):

- | | |
|--|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) 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. Description: Development of a Beach and Inlet Management Plan (BIMP) was addressed in Section 13.9c of House Bill 1840 (June 2000) and subsequently recommended in the Coastal Habitat Protection Plan (CHPP) adopted in December 2004 and the final report of the Ocean

Policy Steering Committee (OPSC) in April 2009. The NC Division of Water Resources (DWR) received two appropriations from the NC General Assembly (\$750,000 total) supplemented by the Division of Coastal Management (DCM; \$31,700 from CZMA Section 306 funds) to hire a contractor to assist the State in creation of the first comprehensive BIMP. The BIMP has been under review by DCM and the Department during the last year and is scheduled to be released in March 2011.

BIMP development divided the scope of work (provided by DCM and DWR) into five main tasks: (1) Identification, acquisition, and compiling of available relevant data, (2) Developing and defining beach and inlet management regions, (3) Identifying and contacting stakeholder groups and facilitating stakeholder meetings, (4) Developing draft management strategies, and (5) Producing a beach and inlet management report document. Development of stakeholder groups and subsequent integration of stakeholder input into the BIMP was included in the FY 2006-2010 Section 309 Program Enhancement Strategy.

Statewide implementation of the BIMP through the State's CZM Program (CZMP) will create a regional-based framework that integrates an objective, scientific approach to coastal planning and hazard mitigation. This regional approach (i.e., four clearly defined BIMP regions and five subregions) will provide the structure necessary for beach and inlet management strategies, primarily rule and policy review, revision, and/or development. A regional approach recognizes the unique shoreline geometry of the North Carolina coast which is defined by three major capes and associated cape shoals separating distinct coastal embayments whose orientations and oceanographic settings are significantly different.

The need to develop a stable, long-term financing plan to support the shoreline management projects, within these regions, is imperative. The BIMP supports this need to develop a stable funding mechanism to support the State's shoreline management and beach restoration programs. The BIMP funding chapter is divided into four subsections. The first subsection describes the economic value of North Carolina beaches; subsection B, is an evaluation of North Carolina's existing shoreline and beach funding programs; subsection C are funding program recommendations, and subsection D are factors to be considered for funding prioritization.

These chapters will be used to develop the framework necessary for a long-term stable funding foundation. In particular, policy and program development will be vetted with numerous stakeholder groups around the concepts and approaches to create a more flexible, predictable and stable program to support beach restoration and shoreline management projects in North Carolina, and the factors that should be considered for prioritization of state funding once a dedicated fund has begun.

The five-year strategy work plan will include developing new and/or revising CRC rules to implement new regional-based BIMP policies (15A NCAC 07M); development of a set of policies and programs addressing project funding (including minimum requirements necessary to receive state funding for beach and inlet management projects); development of objective criteria for prioritization of beach and inlet management projects based on potential public funding limitations; and a regional approach to beach and inlet management specific to the four discrete BIMP regions.

III. Need(s) and Gap(s) Addressed

The overall goal of this program change is to establish a foundation for effective, continuing management of North Carolina's beaches and inlets by:

- Improving coordination between the state, federal, and local agencies responsible for managing North Carolina's beaches and inlets.
- Presenting the current state of knowledge regarding beach and inlet processes (both biological and physical).
- Identifying data gaps and research needs related to beach and inlet management.
- Establishing management regions; identifying viable management strategies considering the economics and ecology of these regions; and addressing the need for long-term funding that is both predictable and stable.
- Recommending a long-term implementation strategy to address other major beach and inlet management issues, such as sea-level rise, land conservation, recreational beach access, and local, state and federal regulation of beach and inlet management activities.
- Recommending ways to maximize the beneficial use of dredged material within sediment management regions, assessing the availability, accessibility, and compatibility of inlet and offshore sand sources.
- Establishing a method for prioritizing projects for funding.

IV. Benefit(s) to Coastal Management

North Carolina's oceanfront beaches and inlets are a vital part of the heritage, economy, environment, and culture of the people of the State. However, without effective planning and management, the future of the State's coastal communities and a significant part of the State's economic base could be adversely affected by storms, sea-level rise, shifting shorelines, and erosion. The North Carolina Department of Environment and Natural Resources, in part through the DCM, is committed to the long-term conservation and management of the State's beaches and inlets. The CHPP, the NC General Assembly, and most recently the OPSC, have all identified a need to develop and incorporate strategic beach and inlet management to guide coastal management along North Carolina's 326 miles of barrier island oceanfront shoreline.

Potential benefits to the creation of a long-term, stable and predictable financial foundation:

- Identification of public funding needs and sources (both immediate and long-term) for beach and inlet management strategies would benefit coastal management.
- A stable source of funding for coastal communities could help to facilitate long-term planning and establish a predictable local match. Establishing project priorities should be vested at the local level, and coastal communities should have the flexibility to

provide the required match in a manner best suited to local needs and priorities.

- Establishment of such a fund would reduce financial uncertainties at the local level that often contribute to project delays, cost increases, and the disruption of local planning efforts. A program of reliable and predictable state funding would better position coastal communities in allocating new or existing sales or property tax revenues to coastal projects, knowing the State was committed to a share of the project.

Potential benefits for regional-based management:

- A regional management approach addresses the entire coastal environment, accounting for natural coastal processes and the effect of human activities, while balancing environmental and economic needs specific to each region.
- Planning projects regionally allows for an “efficiency of scale,” which can reduce the costs associated with individual projects. For projects in the same region, there is the potential to save time and reduce costs if the environmental, geotechnical, and monitoring studies for similar projects are combined. In addition to reducing costs, a regional approach avoids individual local governments competing for the same resource, and allows for better management of cumulative and secondary impacts, facilitating greater environmental protection.
- Implementation of a regional approach could be facilitated through the use of regional authorities. These entities could serve as integrated, decision-making bodies with authority to coordinate beach and inlet management strategies within each region, and could simplify project coordination between the State and local levels. The regional authority would also have the flexibility to coordinate raising local funds in the manner most appropriate to the region.

Overall, a dedicated State fund to support beach and inlet projects, coupled with empowered and financially capable regional authorities, would allow North Carolina to protect, restore and maintain one of the most beautiful coastlines and waterway networks in America.

V. Likelihood of Success

Prioritizing actions and balancing competing management objectives at all levels of decision-making is essential, especially in the midst of shifting budgets. The critical first steps to development of a statewide beach and inlet management plan have already occurred, including enabling legislation and BIMP funding provided by the State legislature; as well as recommendations from the CHPP and the OPSC made to and supported by the CRC.

A few of the recommendations stated within the BIMP (regionalization of the coast and regional funding) are already being discussed and acted upon by some of our local government partners. The Bogue Banks (BIMP Region 2c) Regional Environmental Impact Statement 30-year Master Plan, partially supported with state funds, and regional planning efforts ongoing in New

Hanover County (BIMP Region 2a) are examples of existing support and interest in regional management.

The fact that these actions are occurring is a clear indication that there's value to the concept and related strategies. The success of the BIMP philosophy requires moving from the shared ideas of regional approaches and dedicated funding to a program that involves shared commitment and shared responsibility. Adopting a business as usual approach is not an option if future generations are to continue to benefit from North Carolina's coastal resources.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$877,149

Final Outcome(s) and Products: New and/or revised CRC rules dealing with regional-based BIMP policies (15A NCAC 07M); development of a set of policies and programs addressing project funding (including minimum requirements necessary to receive state funding for beach and inlet management projects); development of objective criteria for prioritization of beach and inlet management projects based on potential public funding limitations; and a regional approach to beach and inlet management specific to the four discrete BIMP regions.

Year: 1 (July 2011 – June 2012)

Description of activities:

- Create stakeholder groups for each BIMP Region 1-3 and meet with individual communities and other relevant stakeholders one-on-one to address dataset availability, data gaps, and prioritization of new data acquisition, potential region-specific implementation strategies, a dedicated state funding source and criteria for prioritization of beach and inlet management projects.
- Allow a region-specific forum for public comment for each BIMP Region 1-3 during a full CRC meeting during Year 1.

Outcome(s):

- Report out to CRC documenting the stakeholder meetings specific to BIMP Regions 1-3.

Budget: \$184,265

Year: 2 (July 2012 – June 2013)

Description of activities:

- Create stakeholder group for BIMP Region 4 and meet with individual communities and other relevant stakeholders one-on-one to address dataset availability, data gaps, and prioritization of new data acquisition, potential region-specific implementation strategies, a dedicated state funding source and criteria for prioritization of beach and inlet management projects.
- Allow a region-specific forum for public comment for BIMP Region 4 during a full CRC meeting during Year 2.
- Begin work with CRC and other relevant State and local bodies to address beach and inlet management project funding including development of a set of

requirements for communities to receive State funding for beach and inlet management activities

- Begin to develop an objective set of criteria for prioritization of beach and inlet management projects based on potential funding limitations
- Begin to discuss with CRC the potential for revisions to their policies that will include a regional-based management approach for beaches and inlets.

Outcome(s):

- Report out to CRC documenting the stakeholder meetings specific to BIMP Region 4.

Budget: \$173,221

Year: 3 (July 2013 – June 2014)

Description of activities:

- Summarize the findings from all BIMP regions from stakeholder meetings and incorporate into framework for Policy language.
- Continue work with CRC and other relevant State and local bodies to address beach and inlet management project funding including development of a set of requirements for communities to receive State funding for beach and inlet management activities
- Continue to develop an objective set of criteria for prioritization of beach and inlet management projects based on potential funding limitations
- Continue to discuss with CRC the potential for revisions to their policies that will include a regional-based management approach for beaches and inlets.

Outcome(s):

- Report out to CRC summarizing Year 3 activities.

Budget: \$173,221

Year: 4 (July 2014 – June 2015)

Description of activities:

- Continue to work with CRC and other relevant State and local bodies to address beach and inlet management project funding including development of a set of requirements for communities to receive State funding for beach and inlet management activities
- Continue to develop an objective set of criteria for prioritization of beach and inlet management projects based on potential funding limitations
- Continue to discuss with CRC the potential for revisions to their policies that will include a regional-based management approach for beaches and inlets.

Outcome(s):

- Draft policies and rules related to regional-based beach and inlet management, project funding (including minimum requirements necessary to receive state funding for beach and inlet management projects), and development of objective criteria for prioritization of beach and inlet management projects based on potential public funding limitations.

Budget: \$173,221

Year: 5 (July 2015 – June 2016)

Description of activities:

- Finalize CRC policies (15A NCAC 07M) and rule language/recommendations related to regional-based beach and inlet management, project funding (including minimum requirements necessary to receive state funding for beach and inlet management projects), and development of objective criteria for prioritization of beach and inlet management projects based on potential public funding limitations.
- Provide to CRC for adoption.
- Education and outreach of BIMP in partnership with NC National Estuarine Research Reserve (NCNERR) staff.

Outcome(s):

- Final CRC policies (15A NCAC 07M) and related rules related to regional-based beach and inlet management, project funding (including minimum requirements necessary to receive state funding for beach and inlet management projects), and development of objective criteria for prioritization of beach and inlet management projects based on potential public funding limitations as adopted by CRC.
- Development and dissemination of appropriate education and outreach materials (e.g., fact sheets, web-based databases, press releases, etc.).

Budget: \$173,221

VII. Fiscal and Technical Needs

A. Fiscal Needs: CZM Section 309 funds will be sufficient to carry out the proposed program changes. However, DCM may consider supplementing the effort through application of a NOAA CSC Fellowship to assist with the fine-tuning and regional application of the BIMP and assist in its implementation. Other DCM staff, as well as those from the NCNERR, will also help to accomplish this program change. Further, the BIMP effort was supported primarily through state-appropriated funds. If the economic climate improves, the NC General Assembly may direct additional funds to assist in BIMP implementation.

B. Technical Needs: The State does possess the technical knowledge, skills, and/or equipment to carry out the proposed program changes related to BIMP implementation via statewide, region-specific coastal management strategies. However, additional data acquisition and analysis of coastal processes research may be justified in revising (or supplementing) the BIMP. Therefore, DCM will continue its ongoing relationships with other government agencies, academic institutions, and private contractors to identify data or data needs.

VIII. Projects of Special Merit (Optional)

To be determined.

Program Change 2: *Development of New and Revised Estuarine Shoreline Management Rules.*

I. Issue Area

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|--|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) 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. Description: The confluence of coastal development, estuarine shoreline erosion, continued rising sea levels, changing estuarine ecosystems, and new data availability have created a pressing need for a re-evaluation of current approaches to estuarine shoreline management regulations in North Carolina. As a result of the Estuarine Shoreline Mapping Project (ESMP), a digital representation of the State's estuarine shoreline attributed by shoreline type, as well as an inventory of previously permitted commercial, recreational and erosion control structures, has become available for analysis. When this data is combined with ongoing initiatives/studies regarding the estuarine shoreline, such as those by the N.C. NERR, the UNC-CH Institute of Marine Sciences, DCM and other partners, there is significant potential for a shift in management strategies, as well as the development of rule language pertaining to the CRC's management of the estuarine shoreline. This Strategy seeks to: 1) analyze this new shoreline data, specifically with reference to how shoreline stabilization structures are permitted; 2) evaluate potential habitat changes associated with shoreline development; 3) examine how the data may be used to influence sea-level rise policies for the State; and 4) revise the CRC's rules and policies related to estuarine shoreline development in an effort to promote alternatives to vertical structures. This Strategy will involve a comprehensive review of the Estuarine Waters,

Public Trust Areas and Coastal Shorelines Areas of Environmental Concern (AEC) categories. The estuarine shoreline management rules that could be affected include those governing shoreline stabilization, as well as those for erosion control and recreational structure permitting guidelines and practices.

In order to review and revise the CRC's estuarine shoreline management rules, DCM will conduct analyses and utilize the ESMP data (created during the FY 2006-2010 Strategy and highlighted as a need on page 46), and three studies that are scheduled for completion during the FY2011-2015 Strategy time period. Those three studies are entitled:

- "Sustainable Estuarine Shoreline Stabilization: Research, Education, and Public Policy in North Carolina" (herein after referred to as the "NCNERR Bulkhead Study"). This study looks at the potential impact of bulkheads on marsh environments along North Carolina's estuarine system, and is being conducted through a partnership between the DCM, the N.C. National Estuarine Research Reserve, the NOAA-Center for Coastal Fisheries and Habitat Research, the University of North Carolina at Chapel Hill - Institute of Marine Sciences and the University of North Carolina at Wilmington. This project was started in September 2008 with an expected completion date of August 2011.
- "Fisheries Habitat Impacts of Marsh Sills (Living Shorelines) as a Shoreline Stabilization/Restoration Alternative to Bulkheads" (herein after referred to as the UNC Living Shorelines Study). This study is a functional assessment of marsh sills in North Carolina, and is being conducted by the University of North Carolina at Chapel Hill - Institute of Marine Sciences. This project was started in May 2010, with an expected completion date of July 2012.
- "DCM Marsh Sills Evaluation Project" (MSEP). This study provides a field assessment conducted by DCM, the N.C. National Estuarine Research Reserve, and other resource agencies to evaluate whether marsh sills previously permitted along the estuarine coastline are performing according to their original design. This project started in June 2010 with an expected completion date of July 2011.

Based upon these three studies, analysis of the ESMP data, and coordination of additional state initiatives on cumulative and secondary impacts, and sea-level rise, DCM plans to evaluate the CRC's current rules, policies and strategies for estuarine shoreline management. The integration of ESMP datasets with DCM's permit tracking system will allow for an accurate count of commercial, erosion control and recreational structures that have been permitted and/or constructed. This data will support potential revisions to State rule language to minimize the impacts associated with shoreline development. These revisions may result in a shift in DCM's permitting operations and provide a better understanding of the cumulative nature of development impacts associated with shoreline stabilization.

III. Need(s) and Gap(s) Addressed

The primary need that will be addressed in this Strategy focuses on an in-depth analysis of the ESMP data created during the FY2006-2010 Strategy along with the results of the three shoreline/structures studies referred to above. The ESMP created the first digital delineation of North Carolina's estuarine shoreline, attributed that shoreline with associated shoreline type, and delineated commercial, recreational and erosion control structures associated with the shoreline, in a GIS-based spatial framework. The ESMP established a baseline dataset for previous shoreline position and a count of previously permitted shoreline associated structures, which DCM and other government agencies, institutions and organizations can use when assessing anthropogenic impacts to estuarine resources. In the FY2011-2015 Strategy, DCM plans to evaluate and analyze the ESMP data, to identify regional development trends along the shoreline and to fully understand the distribution of coastal structures and natural resources. Statistics will be generated for: the percentage of shoreline hardened by shoreline stabilization structures; the total length of each shoreline type; the distribution of shoreline types; the total square footage of public trust waters occupied and shaded by docks and piers; and the identification of various shoreline development trends since the creation of the ESMP dataset. These analyses will help DCM determine which estuarine shoreline management rules require revision in order to minimize habitat loss and develop mechanisms for tracking cumulative and secondary impacts.

IV. Benefit(s) to Coastal Management

With new scientific studies and data, comes a better understanding of what is happening along the coast and more effective science-based policy changes can be developed. Additionally, the historic nature of estuarine shoreline analysis has been to look at site specific projects with a limited understanding of the cumulative effects of estuarine shoreline development practices. The projects identified in this Strategy will benefit DCM's understanding of the cumulative effect estuarine shoreline management practices have on estuarine habitats. Revisions will be made to improve the rules and strategies governing coastal development to lessen the impact to North Carolina's coastal resources, while allowing for sustainable growth.

V. Likelihood of Success

Revisions to the estuarine shoreline management rules have been an ongoing process. The Division and the CRC are committed to this effort and anticipate new data, resulting from projects already funded and underway, in order to conduct analyses that will evaluate our permitting program and lead to any additional rule changes that are deemed appropriate. Also, many resource agencies have supported the need for estuarine shoreline management rule revisions and anticipate being involved. DCM will be working in consultation with the North Carolina Estuarine Biological and Physical Processes Work Group and the CRC's Estuarine Shoreline Stabilization Subcommittee to analyze the results of related studies/projects to develop new estuarine shoreline management rules and/or revisions. The Marsh Sills General Permit Review Committee will assist to potentially modify the conditions related to the Marsh Sills General Permit. DCM will also convene the Estuarine Shoreline Mapping Analysis Team

to help guide the Division's analyses of the estuarine shoreline mapping data. These committees will be composed of resource agencies and stakeholders. Through these committees, as well as outreach and education efforts, DCM will continue to build support for revised estuarine shoreline management.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$361,109

Final Outcome(s) and Products: Analyses of ESMP data, modified General Permit for Marsh Sills, new and/or revised shoreline management rules and strategies, public education, and outreach.

Year: 1 (July 2011 – June 2012)

Description of activities:

Estuarine Shoreline Mapping Project

- Begin internal analyses of the ESMP data

DCM Marsh Sills Evaluation Project (project completed July 2011)

- Finalize DCM Marsh Sills Evaluation Project's Report of Findings
- Provide update to CRC on final results

NCNERR Bulkhead Study (study completed August 2011)

- Review results and findings of the NCNERR Bulkhead Study
- Participate in workshops conducted by the NCNERR on the results of the Bulkhead Study

Outcome(s):

- Results/findings of the DCM Marsh Sills Evaluation Project
- Update provided to CRC on results of DCM Marsh Sills Evaluation Project
- Results/findings of the NCNERR Bulkhead Study

Budget: \$90,929

Year: 2 (July 2012 – June 2013)

Description of activities:

UNC Living Shorelines Study (study completed July 2012)

- Review final results of the UNC Living Shorelines Study

Estuarine Biological and Physical Processes Workgroup

- Convene the Estuarine Biological Processes Workgroup to discuss results/findings of the DCM Marsh Sills Evaluation Project, NCNERR Bulkhead Study, UNC Living Shorelines Study and Estuarine Shoreline Mapping Project.
- Develop recommendations to present to the CRC's Estuarine Shoreline Stabilization Subcommittee in year 3 related to overall findings of these

projects. Use these recommendations to help determine rule revisions in years 3-5.

- Provide update to CRC related to this effort.

Marsh Sills General Permit Review Committee

- Convene the Marsh Sills General Permit Review Committee to discuss results/findings of the DCM Marsh Sills Evaluation Project, NCNERR Bulkhead Study, UNC Living Shorelines Study and Estuarine Shoreline Mapping Project and recommendations from the Estuarine Biological and Physical Processes Workgroup.
- Develop recommendations to modify the General Permit for Marsh Sills. Potentially use the recommendations to help determine rule revisions in years 3-5.
- Provide update to CRC related to this effort.

Estuarine Shoreline Mapping Project

- Convene the Estuarine Shoreline Mapping Analysis Team of resource agencies and stakeholders to help guide and provide input on the estuarine shoreline mapping analyses.
- Collaborate with resource agencies and stakeholders to identify how they can analyze and use ESMP datasets, as well as identifying/obtaining additional datasets from partnering resource agencies to strengthen the ESMP and our knowledge of estuarine shoreline resource management.
- Conduct analyses on Estuarine Shoreline Mapping Project data.
- Provide update to CRC on the ongoing analysis.

Outcome(s):

- Results/findings of the UNC Living Shorelines Study
- Recommendations from the Estuarine Biological and Physical Processes Workgroup related to findings from the four major studies/projects.
- Modified General Permit for Marsh Sills
- Presentation(s) to CRC regarding modified General Permit for Marsh Sills
- Presentation (s) provided to CRC on the results of the Estuarine Shoreline Mapping Project.

Budget: \$67,545

Years: 3 (July 2013-June 2014)

Description of activities:

Estuarine Shoreline Mapping Project

- Continue to conduct analyses on the Estuarine Shoreline Mapping Project data (as needed).
- Convene the Estuarine Shoreline Mapping Analysis Team to discuss the results of the estuarine shoreline mapping effort completed thus far. Once completed, use the results in the process for updating the estuarine shoreline management rules and strategies.
- Finalize analyses on Estuarine Shoreline Mapping Project data.

New or revised estuarine shoreline management rules and strategies

- Convene the CRC's Estuarine Shoreline Stabilization Subcommittee to discuss results/findings of the DCM Marsh Sills Evaluation Project, NCNERR Bulkhead Study, UNC Living Shorelines Study, results of the Estuarine Shoreline Mapping Project analyses and other relevant information. Form estuarine shoreline management rules and strategy revision recommendations to present to the CRC.

Outcome(s):

- Recommendations for rule revisions based upon input from the CRC's Shoreline Stabilization Subcommittee presented to the CRC.
- Results from the analyses of the Estuarine Shoreline Mapping Project data and a list of potential projects and partners.

Budget: \$67,545

Year(s): 4-5 (July 2014 - June 2016)

Description of activities:

New or revised estuarine shoreline management rules and strategies

- Develop draft rules and/or amendments related to estuarine shoreline management and present to CRC for adoption.
- Work with NCNERR staff to create educational materials and provide outreach to the public, resource agencies, and other stakeholder groups on new or revised estuarine shoreline management rules and strategies.

Outcome(s):

- New and/or revised rules and strategies adopted by CRC related to estuarine shoreline management.
- Public education and outreach materials/activities
- Presentation(s) made to CRC regarding the activities above.

Budget: \$135,090

VII. Fiscal and Technical Needs

A. Fiscal Needs: Federal Section 309 funds provided to support this program change will be sufficient for the efforts and projects proposed. Other DCM staff, as well as those from the NCNERR, will also help to accomplish this program change. No additional fiscal needs outside 309 funds are foreseen at this time.

B. Technical Needs: DCM possesses the technical knowledge, skills, and equipment to carry out the proposed program change. No technical needs outside usual partners and stakeholders are foreseen at this time. If additional needs are identified, from a technical standpoint, the NC Department of Environment and Natural Resources employs a large technical staff that could provide support.

VIII. Projects of Special Merit (Optional)

To be determined.

Program Change 3: Development of a Sea Level Rise Policy, Land Use Planning Guidelines, and Updated Assessment Report

I. Issue Area

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|--|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) 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. Description: The North Carolina Department of Environment and Natural Resources (DENR) and the North Carolina Coastal Resources Commission (CRC) will pursue a program change to implement a focused approach to preparing for sea level rise (which will be linked to any new or revised estuarine shoreline management rules to be achieved under the Coastal Hazards Strategy, Program Change 2).

The CRC, through its Science Panel on Coastal Hazards, has released a sea level rise assessment report for the State (March 2010). The report utilizes tide gauge measurements and reconstructions from geologic data to produce a picture of historic sea levels, and reviews of published literature to constrain likely water levels by 2100. The Science Panel's report gives a range of 0.4 - 1.4 meters of rise above present level by 2100, and goes on to recommend that the CRC adopt a rise of one meter by 2100 as a planning level. The report represents a secure foundation upon which the CRC can proceed to pursue program changes in this issue area, and is to be updated every five years, or less if indicated by the emergence of compelling new data.

The Science Panel's report is ready to be translated into policy, and a CRC Subchapter 7M policy for sea level rise will be prepared and adopted as the enabling mechanism for changes to the regulatory program. The regulatory program change (to be achieved under this initiative) will be to the CRC's Subchapter 7B Land Use Planning Guidelines, which will be revised to require local governments to begin planning for the approaching impacts of accelerated sea level rise.

III. Need(s) and Gap(s) Addressed

Sea level rise is a ubiquitous coastal threat, confined neither to oceanfront nor estuarine shorelines, and is equally menacing to the natural and built environments. Nearly all aspects of the coastal program are intimately linked to their location in, or their proximity to water. Human activity along the constantly changing interface between land and water has been well managed over the life of the program, but the threat of a rapidly rising ocean, dramatically altered shorelines, and forced abandonment of low-lying lands poses a new set of challenges.

The program's approach to this issue was to first establish that there is a scientific imperative that requires a management response. The Science Panel's assessment report confirmed the scientific imperative, and went on to highlight additional gaps in data gathering, understanding of the threat, and predictive modeling. These gaps will be addressed through ongoing work of the Division, the Science Panel, and the larger scientific community.

Having the scientific justification leads to an examination of the existing policy and regulatory framework within which the program can respond. Several of the CRC's existing program components, such as oceanfront setbacks, hazard area delineations, erosion response, and shoreline stabilization policies allow for limited adaptation to rising seas. There is, however, not yet any unifying policy guidance that requires sea level rise to be explicitly taken into account in land use planning and development decisions. Such guidance is essential if the State is to be fully diligent in its decision-making about where to site public infrastructure and private development along shorelines that stand to change more rapidly in the future than they have in the past.

Along with a policy framework, the program will require an integrated set of mechanisms through which the policy will be implemented. The available mechanisms include the CRC's regulations, with its local land use planning requirements being a logical place to start. As the CRC continues to update its oceanfront and estuarine management strategies, sea level rise can be incorporated as a discrete element (where appropriate).

IV. Benefit(s) to Coastal Management

It is incumbent upon the coastal program, given the warnings from the larger scientific community and the CRC's own Science Panel, to implement a management response to sea level rise. The program needs to devise a meaningful sea level rise policy, supported by the best available science, and implemented through the appropriate mechanisms. The full scope of the threat remains to be calculated, but the program change is a necessary first step in pointing

the State in the direction of minimizing potentially enormous losses of property, economic value, habitat, and ecosystem services.

V. Likelihood of Success

There is tremendous momentum in the State that would indicate a strong likelihood of success for this program change. The CRC and DENR have both identified planning for sea level rise adaptation as top strategic priorities. Both entities have already begun taking steps towards this goal. The N.C. Division of Emergency Management is engaged in a federally funded, multi-year sea level rise risk assessment that is complementary to the work of the CRC and DENR. The N.C. Legislative Commission on Global Climate Change concluded a 5-year study on climate change and potential responses in May 2010, and released a report containing draft legislation for mitigation and adaptation. A bill to advance research on and preparation for sea level rise has already been introduced in the State legislature as a result of that report. The N.C. Museum of Natural Sciences in Raleigh is planning a permanent, interactive exhibit on climate change and sea level rise, as well as a traveling exhibit to take to schools and museums across the State. The Renaissance Computing Institute (RENCI), a consortium of public and private universities in the State, has made climate change and sea level rise a focal area. RENCI operates a network of engagement centers that feature wall-sized, visualization screens that allow researchers and students to interactively visualize the possible impacts of various climate change scenarios.

The Governor of North Carolina last year signed a Memorandum of Understanding with the governors of South Carolina, Georgia and Florida to create the South Atlantic Alliance (SAA). One of the SAA's four priority topics is working across state lines to improve community resilience to natural disasters, including sea level rise. The coastal program is partnering with federal programs such as NOAA's National Climatic Data Center and its Center for Sponsored Coastal and Ocean Research to develop data-to-management applications and tools. All of these efforts show great commitment on the State's part, and they are increasingly working in concert as momentum builds.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$209,140

Final Outcome(s) and Products: 1) Subchapter 7M policy on sea level rise; 2) Subchapter 7B Land Use Planning Guidelines requiring local governments to begin planning for sea level rise; and 3) An updated Sea Level Rise Assessment Report from the CRC Science Panel on Coastal Hazards.

Year(s): 1-2 (July 2011 - June 2013)

Description of activities:

- Convene a focus group of experts to scope principles for, and then outline a comprehensive sea level rise policy
- Draft a sea level rise policy within DCM for review by the expert focus group, the CRC, and the Coastal Resources Advisory Council (CRAC)
- Revise the draft policy as necessary and solicit public comment

- Revise the draft policy as necessary and present to the CRC for adoption

Outcome(s): Subchapter 7M policy on sea level rise

Budget: \$52,616

Year(s): 2-3 (July 2012 – June 2014)

Description of activities:

- Convene a joint CRC-CRAC subcommittee to work with DCM on identifying appropriate sea level rise planning requirements for Subchapter 7B
- Convene an expert working group to translate planning requirements into management topics
- Draft 7B rule language for CRC review
- Revise the draft rule language as necessary and solicit public comment
- Revise the draft rule language as necessary and present to the CRC for adoption

Outcome(s): Subchapter 7B Land Use Planning Guidelines requiring local governments to begin planning for sea level rise

Budget: \$67,082

Year(s): 4-5 (July 2014 – June 2016)

Description of activities:

- Perform internal needs assessment to determine whether to request any changes from the Science Panel in the updated report
- Convene Science Panel and other selected experts to devise an approach for updating the assessment, including a review of the original assessment to identify data gaps
- Review literature published since the Science Panel's May 2010 report, including the IPCC's Fifth Assessment Report and other journal articles
- Retrieve updated data from state tide gauges
- Convene Science Panel and other selected experts to discuss new data, literature, and needs assessment, and prepare an outline for the update
- Science Panel drafts report and submits it for internal review
- Convene Science Panel and other selected experts to finalize report and present it to the CRC to use as appropriate for future program changes
- Work with NCNERR to develop public education and outreach products and opportunities.

Outcome(s): Updated Sea Level Rise Assessment Report from the CRC Science Panel on Coastal Hazards, development and dissemination of appropriate education and outreach materials (e.g., fact sheets, web-based materials, press releases, etc.).

Budget: \$89,442

VII. Fiscal and Technical Needs

A. Fiscal Needs: Federal Section 309 funds provided to support this program change will be sufficient for the efforts and projects proposed. It is envisioned that other DCM staff, as well as

those from the NCNERR, will also help to accomplish this program change. No additional fiscal needs outside 309 funds are foreseen at this time.

B. Technical Needs: DCM staff possess the technical knowledge, skills, and equipment to carry out the proposed program change. No technical needs outside usual partners and stakeholders are foreseen at this time. If additional needs are identified, from a technical standpoint, the NC Department of Environment and Natural Resources employs a large technical staff that could provide support.

VIII. Projects of Special Merit (Optional)

To be determined.

Strategy Title: OCEAN RESOURCES

Program Change 1: *Development of a Coastal and Marine Spatial Planning Memorandum of Agreement and Recommendations Report to Better Manage North Carolina's Coastal and Marine Resources.*

I. Issue Area

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|---|---|
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Cumulative and Secondary Impacts |
| <input checked="" type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input checked="" type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. Program Change Description

A. The proposed strategy will result in, or implement, the following type(s) 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. Description: Competing uses, sensitive and valuable marine resources, and overlapping jurisdictions complicate management decision-making in the marine environment. In response, states are developing coastal and marine spatial planning (CMSP) capacity as a decision-making tool, particularly as demand for ocean space and resources continues to grow. Although CMSP has been underway internationally for nearly 30 years, many efforts in the US are relatively new.

CMSP is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process.⁸ Interest in CMSP has increased noticeably over the past year, motivated by President Obama's charge to the White House Council on Environmental Quality's Interagency Ocean Policy Task Force (June 12, 2009) to prepare a national framework for CMSP. The development of CMSP capacity requires two types of authority: (1) authority to plan for CMSP; and (2) authority to implement CMSP. While North Carolina's existing Coastal Management Plan (CMP) is designed to address the challenges of regulating coastal development and protecting the natural environment, significant authority does not exist solely with the N.C. Coastal Resources Commission or DCM to plan for and implement CMSP.

However, the CRC and DCM began laying the foundation for CMSP development during North Carolina's FY 2006 – 2010 309 Program Enhancement Strategy. During this time period, DCM facilitated an Ocean Policy Steering Committee (OPSC) that examined emerging issues specific to North Carolina's coastal waters, and prepared a final policy document⁹ to strengthen the State's CMP and ensure consistency of federal activities in adjacent waters of the Atlantic Ocean. This report provided recommendations as to how the State should address future activities related to CMSP. The OPSC also represents an assemblage of critical stakeholders invested in the development, enhancement and protection of the State's coastal resources. Additionally, DCM's CMSP goals are leveraged in the existing framework of the Coastal Habitat Protection Plan (CHPP) which represents a multi-agency cooperative aimed at enhancing state coastal resources to the benefit of state fisheries.

During the FY 2011-2015 Strategy, DCM intends to build off the work initiated during the 2006-2010 Strategy, and will work towards establishing an appropriate stakeholder group to analyze the challenges associated with CMSP. The end goal of the stakeholder group will be to address issues surrounding the authority to plan for and implement CMSP. This overarching stakeholder group (hereafter referred to as the CMSP Advisory Committee) will be established to address resource management, authority and data issues, with the end goal of generating a Memorandum of Agreement (MOA) between state agencies and divisions involved in coastal resource management. The MOA will establish a working agreement between state resource managers, as well as participating federal agency representatives, that state-level CMSP must be developed for the future management of the State's coastal and ocean resources.

⁸ Ehler and Douvere 2009

⁹ <http://www.nccoastalmanagement.net/opscreport.pdf>

After the MOA has been generated, the CMSP Advisory Committee will begin work on a CMSP recommendations report to guide future activities. The goal of the recommendations report will be to prioritize resource development and conservation within state waters, as well as to promote a vested policy and management interest in ocean resources and activities in areas of the Atlantic Ocean extending from the shore seaward to the toe of the continental margin. The recommendations report will be generated through the work of the CMSP Advisory Committee and through input generated from public meetings. The recommendations report will aim to provide guidance to single-sector decision-makers so that the sum of all agency decisions is oriented toward integrated, ecosystem-based management of ocean resources. The recommendations report will include a discussion of CMSP authority and oversight, regional partnerships, maps composed of existing/available datasets and GIS layers (no new data collection at this time), and Areas of Particular Concern for ocean-based energy facilities and regionalized sand resource management. Additionally, DCM will review the remaining recommendations of the OPSC for ways in which their implementation may benefit the recommendations report as well as general ocean resource program enhancement needs. Once the MOA and recommendations report have been developed, DCM feels the appropriate authority for planning a State CMSP capacity will be established. Pre-existing statutes dealing with coastal resource management, which are dispersed throughout various state agencies and DENR divisions, will provide the foundation for CMSP planning authority. The MOA and recommendations report will not represent the finalized coastal and marine spatial plan for the State, but will instead serve as guidance for the development of a CMSP implementation plan. From here, the secondary authority that must be addressed is the authority to implement CMSP.

In examples from other states, implementation of CMSP capacities has been successful when implementation is facilitated by existing management authorities responsible for a single sector concern or activity. In 2008, the Commonwealth of Massachusetts developed an Oceans Act based on pre-existing single-sector management authorities, which now provides a comprehensive authority for CMSP related to marine-based alternative energy facility development. In this example, legal status of CMSP outputs is derived from the respective new legislation, and the Act itself calls for the development of new areas designated as suitable for alternative energy development, while maintaining additional resource concerns, such as fisheries, under pre-existing single-sector management regimes. DCM will utilize this model, the work of the CMSP Advisory Committee, and recommendations of the United Nations Educational, Scientific and Cultural Organization's guide, " Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-based Management¹⁰," to determine the best method for CMSP implementation and its incorporation into the State's CMP.

A comprehensive coastal and marine spatial management plan will not be generated under this strategy. Instead, the supporting MOA, recommendations report and eventual authority to begin CMSP implementation will be developed under this Strategy to assist in the development of the comprehensive plan during DCM's FY 2016 – 2020 309 Program Enhancement Strategy or other means.

¹⁰ <http://www.unesco-ioc-marinesp.be/uploads/documentenbank/d87c0c421da4593fd93bbee1898e1d51.pdf>

III. Need(s) and Gap(s) Addressed

The Ocean Resources and Energy and Government Facility Siting program enhancement areas of DCM's FY 2011 – 2015 Program Assessment represent an abundance of potential advancements and activities that are likely to characterize North Carolina's future efforts in coastal management. Recent activities around the nation related to oil and gas development, alternative energy development and CMSP suggest significant action is needed by states to understand their role in ocean resource management, conservation and development. North Carolina's goal of developing a recommendations report for CMSP is hampered by a lack of resource data, and both federal and state policy guidance on CMSP development. As new data and studies become available, and as energy facilities are developed in coastal waters, North Carolina's CMP will need to be revised to assist the CRC in its management of coastal resources. Specific needs related to this program change include identification of research gaps and data development, increased recruitment and involvement of stakeholders, additional funding for new datasets, analysis and storage, and additional coordination with federal agencies to ensure a seamless transfer between state and federal data inventories. This need was highlighted in the 2009 OPSC Report, which recommends, "Updates to North Carolina's Coastal Ocean Resources Maps." DCM anticipates addressing this need by working with participating agencies, through the CMSP Advisory Committee, to assess existing data sets and data gaps necessary to compile a working CMSP web portal. It is likely additional data will be required to achieve a comprehensive marine spatial management plan. Data needs will be discussed by the CMSP Advisory Committee.

The State's participation in a CMSP initiative will require significant coordination with various state and federal agencies and local governments, as well as with neighboring states interested in regional approaches. The CRC and DCM lack specific authority to plan and/or implement CMSP within State waters. As a result, significant resources will be devoted towards enhancing coordination and developing partnerships in the form of a Memorandum of Agreement (MOA) between key stakeholders. The end goal of the Ocean Resources Strategy will be the development of a recommendations report highlighting the need for policies aimed at reducing user-conflict while providing for a GIS-integrated approach to better manage ocean and coastal resources.

IV. Benefit(s) to Coastal Management

The benefit to coastal management through: 1) CMSP; and 2) potential rule language regarding APCs for offshore energy production and sand resource extraction is that all of these efforts, and the efforts described under the coastal hazards program strategy, seek the same goal. Specifically, a CMSP document will outline the marine resources available, including a characterization of what the resources are, where they are located, and the extraction/harnessing potential associated with each resource (including a detailed analysis of how industries are poised to take advantage of them). CMSP allows for a digital, spatial comparison of current and even proposed activities, highlighting potential user conflicts as well as areas of particular concern that will require greater coordination among stakeholders. CMSP will provide an essential tool to resource managers interested in reducing user-conflicts and preserving marine resources.

V. Likelihood of Success

The initial steps of developing a comprehensive marine spatial management plan are already underway. DCM has participated in a number of meetings aimed at presenting the CRC's/DCM's idea for CMSP and how this could transcend into a state-level policy. Though North Carolina is in the initial stages of CMSP development, significant data exists in the form of ongoing and past projects that can contribute and evolve into a more formal process. Current ocean resource planning activities center on permitting marine-based wind turbines and on characterization of potential sand resources for beach nourishment projects. Both the CRC and DCM have begun looking at how information from these activities can be leveraged with additional data from academics, non-profits and other federal and state resource agencies to contribute to a more comprehensive process based on CMSP principles. Additionally, North Carolina has entered into the South Atlantic Alliance, a multi-state initiative aimed at implementing science-based policies and solutions that enhance and protect the value of coastal and ocean resources of the southeastern United States. The effort is designed to support the region's culture and economy now and for future generations. DCM has two staff members assigned to the Issue Area Technical Teams, which were established under the Alliance to develop and implement issue area goals, objectives, strategies and schedules to address priority issues within each issue area.

The CHPP and OPSC have potential for use as a model for the formation of a CMSP Advisory Committee. The CHPP is a multi-agency cooperative that brings together staff from the various environmental resource agencies housed within the North Carolina Department of Environment and Natural Resources. The CHPP calls for enhanced agency coordination to implement programs and strategies to better protect North Carolina's important coastal habitats. Therefore, a similar committee based on multi-agency coordination, or a sub-committee of the CHPP, could be established to begin discussions on CMSP. The stakeholders participating in the CHPP will be integral to the development of a CMSP recommendations report. Additional stakeholders will be involved in the CMSP Advisory Committee as authority-related issues will need to be discussed and a MOA focusing on the intent and goals of the CMSP recommendations report will need to be established between all state agencies involved in coastal resources management. Based on previous levels of cooperation between state agencies involved in the CHPP and OPSC, and given the increased importance placed on CMSP at the federal level, it is likely that enough support will be generated to develop the MOA. Several divisions within DENR have already begun discussing CMSP, including the Division of Marine Fisheries.

An inventory of available data that could support CMSP is already underway at DCM. In addition, various state universities have launched several projects characterizing resource potential for state waters. The most notable achievement is the University of North Carolina Wind Energy Study, commissioned by the North Carolina General Assembly, which outlines the potential for large-scale wind energy development in Pamlico Sound (University of North Carolina at Chapel Hill 2009). All of the above activities will significantly benefit and increase the likelihood of success for the development of a CMSP recommendations report.

The CMSP effort will draw data from numerous state agencies and will therefore not be solely dependent on any one initiative. Based on the amount of data that will be needed to undertake this initiative there is the potential the Ocean Resources Strategy will require additional funding for servers or data storage. One issue that may arise is that currently DENR IT is planning to consolidate DCM servers, and combine them under a DENR level data storage system. DENR IT will then charge DCM for use of the servers. There is no estimate at this time of a potential increase in cost to DCM for server usage and data storage. One area where DCM may find support is through NOAA CSC, which has expressed interest in the development of web-portals designed to help states with CMSP by providing a web supported tool that allows states to seamlessly upload data to a federal website. A NOAA maintained CMSP portal that allows the State to periodically upload data would be of great benefit to North Carolina's CMSP effort.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$355,802

Final Outcome(s) and Products: 1) MOA, 2) CMSP Recommendations Report, and 3) Changes to ocean resource regulations

Year: 1 (July 2011 – June 2012)

Description of activities:

- 1) MOA: convene MOA parties, conduct series of introductory meetings
- 2) Recommendations Report: research and discussion of issues associated with CMSP (i.e. data availability, gaps and needs, authority issues and resource priorities)

Outcomes:

- Introductory meetings and presentation of CMSP components
- Presentation of past projects to be included in a CMSP recommendations report (i.e. Estuarine Shoreline Mapping Project, Beach and Inlet Management Plan, UNC Wind Energy Study, etc.)

Budget: \$86,550

Year: 2 (July 2012 – June 2013)

Description of activities:

- 1) MOA: advisory committee formed, further discussion of MOA, series of meetings
- 2) Recommendations Report: address primary issues of authority, coordination and data, draft list of APCs, review of state regulations

Outcome(s):

- List of regulatory requirements for CMSP implementation
- Finalized list of available data sets
- List of APCs for consideration

Budget: \$67,313

Year: 3 (July 2013 – June 2014)

Description of activities:

- 1) MOA: finalize MOA between stakeholders on CMSP

- 2) Recommendations Report: formulate research questions and develop goals and policy objectives for CMSP, draft recommendations report including recommendations

Outcome(s):

- Final MOA with signatures of agency directors
- List of state research priorities, goals and policy objectives for CMSP
- Draft CMSP recommendations report approved by advisory committee

Budget: \$67,313

Year: 4 (July 2014 – June 2015)

Description of activities:

- 1) Recommendations Report: provide draft document for public review/input

Outcome(s):

- Draft CMSP recommendations report including public comments
- Public meetings on draft CMSP recommendations report

Budget: \$67,313

Year: 5 (July 2015 – June 2016)

Description of activities:

- 1) Recommendations Report: finalize recommendations report based off of public input, and presentation of report to the Governor and General Assembly
- 2) Potential ocean resource rule changes incorporating relevant MOA and recommendations report information
- 3) Final CMSP recommendations report presented to CRC for review and adoption
- 4) Education and outreach of CMSP project in partnership with North Carolina National Estuarine Research Reserve (NCNERR) staff

Outcome(s):

- Final CMSP recommendations report
- List of recommendations on rule changes provided to the CRC
- Acceptance of CMSP recommendations report by Governor and General Assembly
- CRC review and adoption of ocean resource rule changes
- Development and dissemination of appropriate education and outreach materials (e.g., fact sheets, web-based information, press releases, etc.)

Budget: \$67,313

VII. Fiscal and Technical Needs

A. Fiscal Needs:

Additional funding may be needed for data acquisition, analysis and storage. DCM anticipates working with the NOAA Coastal Services Center, and the Multipurpose Marine Cadastre, to address the potential for seamless data transfers with NOAA facilitated CMSP web/data portals. If the ability to share data acquisition and storage responsibilities does not develop with federal partners, DCM will require funding to maintain and/or upgrade its existing servers. At this time DCM is not allowed to purchase new servers. Currently, DENR plans

involve the consolidation of state servers, meaning DCM would then be charged for use or rental of DENR IT servers. Therefore, it is difficult to calculate funding requirements that would be needed at this time. Most of the data that would be involved in a GIS-type CMSP project would be vector data which is generally smaller and does not have high storage volume requirements. It is envisioned that other DCM staff, as well as those from the NCNERR, will also help to accomplish this program change.

B. Technical Needs:

Though North Carolina possesses the technical knowledge and skills to undertake the proposed strategy, there may be some additional equipment and/or temporary staffing needs. Through the process of developing an MOA with stakeholders and state agencies, additional resources may be needed. DCM will continue its ongoing relationships with other government agencies, academic institutions, and private contractors to identify available data and/or data needs. DCM may need to re-evaluate the project’s staff and equipment requirements and potentially apply for additional support and funding through a project of special merit.

VIII. Projects of Special Merit (Optional)

Through the course of the first year of the Ocean Resources Strategy concerted efforts will be made to convene interested stakeholders and to develop a MOA for parties integral to establishing CMSP within the State. Through a series of introductory meetings, the development of research questions and consideration of issues associated with CMSP, additional staff, data and equipment needs may be revealed. As a result, DCM would potentially apply for additional funds under a Project of Special Merit to meet these needs through the employment of temporary staff, the development of research projects to address data gaps, and/or purchase of additional equipment for data storage.

VI. 5-YEAR BUDGET SUMMARY BY STRATEGY

The following budget table summarizes the anticipated Section 309 expenses by strategy for each year:

Strategy Title	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Coastal Hazards	\$305,450	\$285,487	\$285,487	\$285,487	\$285,487	\$1,447,398
Ocean Resources	\$ 86,550	\$ 67,313	\$ 67,313	\$ 67,313	\$ 67,313	\$ 355,802
Total Funding	\$392,000	\$352,800	\$352,800	\$352,800	\$352,800	\$1,803,200

Funding includes costs related to Personnel (salaries, fringe, indirect), Travel, Supplies, Contracts and Other budget categories. The Other budget category provides funds to support costs associated with the various meetings and workshops identified in the strategy. Funding also includes the administrative costs involved in overseeing and implementing each strategy. If new computers are needed, they will be purchased under the Supplies budget category as NOAA considers any individual equipment-related purchase under \$5000 as Supplies. No equipment purchase greater than \$5000 has been included in this budget.

During FY2006-2010, DCM received \$392,000 of Section 309 funds to support its strategy on an annual basis. The budget table above assumes that same level of funding during FY2011-2015. However, beginning in FY2012 (year 2), OCRM anticipates awarding a portion of Section 309 funds to CMPs based on an annual evaluation and ranking of Projects of Special Merit (PSM). It is anticipated that approximately 10% of Section 309 funds will be set aside for PSM. The intent of PSM competition is to offer CMPs the opportunity to develop innovative projects that further approved enhancement area strategies and focus on national coastal priorities. OCRM is working on final guidance regarding the PSM.

(VII). SUMMARY OF PUBLIC INVOLVEMENT

As part of the public involvement process (see page 2), DCM invited public review and comment on its Draft FY2011-2015 Program Assessment and Strategy by providing a notice and link to its June 30, 2010 document (see copy of notice below). This information was widely distributed electronically and reached the majority of relevant stakeholders with an interest in coastal management in the State. The public comment period was from July 19, 2010 through August 31, 2010 (concurrent with OCRM's review of the same document).

NOTICE: OPPORTUNITY FOR PUBLIC REVIEW and COMMENT

Draft Program Assessment and Strategy
NC Coastal Management Program
FY 2011-2015
Public Review

The NC Division of Coastal Management invites you to review and provide comments on the draft document titled [“Assessment and Strategy of the North Carolina Coastal Management Program”](#). This document represents the most recent program assessment of nine specific coastal zone enhancement areas and the next five-year program enhancement strategy (FY 2011-2015).

Section 309 of the Coastal Zone Management Act (CZMA) establishes a voluntary coastal zone enhancement grants program to encourage states to develop program changes in one of the following nine coastal zone enhancement areas:

- public access,
- coastal hazards,
- ocean resources,
- wetlands,
- cumulative and secondary impacts,
- marine debris,
- special area management planning,
- energy and government facility siting,
- aquaculture.

Under this program, the Secretary of Commerce is authorized to make awards to states to develop and submit for federal approval program changes that support attainment of the objectives of one or more of enhancement areas (above). Every five years, states conduct a detailed program assessment of the nine enhancement areas and, as a result, identify high priority areas for inclusion in a five-year strategic plan.

The Division of Coastal Management has completed its draft assessment with regard to the nine coastal zone enhancement areas and (as a result) has identified two high priority enhancement areas for inclusion in its next five-year strategic plan (FY2011-2015): **COASTAL HAZARDS and OCEAN RESOURCES**. Through this Strategy, DCM will develop the information and tools necessary to provide for new and /or revised regulations, authorities, guidelines, procedures, policy documents and memoranda of agreement that will result in meaningful improvements in coastal resource management on three major fronts: oceanfront shoreline, estuarine shoreline and coastal/ocean environment.

This draft was submitted to NOAA on June 30, 2010 and is currently being reviewed by their staff. We will be conducting a public review period concurrently with NOAA's review of this document. Please send all written comments related to this document to Guy Stefanski, NC Division of Coastal Management, 1638 Mail Service Center, Raleigh, NC 27699-1638 or by email at guy.stefanski@ncdenr.gov. **All public comments are due by August 31, 2010.** The final document is due to NOAA by November 1, 2010.

In addition, DCM's Strategic Planning Manager (Guy Stefanski) was scheduled to make a presentation to the NC Coastal Resources Commission and others at their meeting in Beaufort, NC on September 16, 2010. However, due to the overall length of the meeting, this presentation was not made and was rescheduled for the CRC during their next meeting on November 17, 2010.

SUMMARY OF PUBLIC COMMENTS

There were no public comments (written or verbal) received during the initial six-week public comment period (July 19 – August 31). However, the floor was open for public comments on the proposed strategy at the November 17, 2010 CRC meeting. These are summarized below:

- CRC Chairman Emory asked about potential involvement by DCM and others in Ocean Resources Strategy. Stefanski responded that an advisory group would be formed to begin the process by convening relevant agencies necessary to develop and implement coastal and marine spatial planning in North Carolina waters (e.g., CRC and DCM may be working in areas where they do not have authority). Emory further asked what “spatial planning” was. Stefanski gave examples of defining potential offshore sand resources, better understanding/identification of commercial shipping lanes, and defining potential sites of offshore energy resources and infrastructure. In short, “spatial planning” is an opportunity to look at potentially conflicting uses that might occur in the coastal zone and oceans and design a strategy or overall plan to minimize conflicts while maximizing resource use.
- Commissioner Carter asked if previous North Carolina studies on wind energy would fit into any of the NOAA strategic enhancement categories. Stefanski reviewed the nine program enhancement areas as provided by NOAA in the Program Assessment-development process, and specifically cited that wind energy issues would be considered in the Ocean Resources Strategy.