The North Carolina Coastal Resources Law, Planning and Policy Center
North Carolina State University • Box 8605
Raleigh, North Carolina 27695-8605
919-515-1895 • www.nccoastallaw.org

A Partnership Between North Carolina Sea Grant, University of North Carolina School of Law, and UNC Department of City and Regional Planning

2007-2008 Annual Report of the North Carolina Coastal Resources Law, Planning and Policy Center

Introduction

The past year has been extremely active for the NC Coastal Resources Law, Planning and Policy Center (Center). During that time, the Center has begun work on several exciting projects, which are detailed later in this report. It also benefited from the work of six UNC law students who worked as research fellows.

Center Research Fellows

During the past year, Will Hendrick, Amy Dessel, Caroline Meek, Jamie Hovda, Jarryd Ritter and Meredith Ritchie have worked for the Center as research fellows. Hendrick and Dessel primarily worked on the ocean policy study in Summer 2007, and Ritter and Ritchie in summer 2008, but each has researched a variety of ocean and coastal law and policy issues, from tree ordinances to insurance issues. Hendrick, Dessel, Meek and Hovda have since moved on to other opportunities. For example, Will Hendrick is now editor of the North Carolina Law Review. Ritter and Ritchie have remained on staff with the Center since Summer 2008. These students have done tremendous work. We're pleased that Ritter and Ritchie chose to stay with the Center into the fall, and we will miss the other students and wish them the best.

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Center Projects: 2007-2008

Emerging Ocean Resources Policy Study

The Center has spent much of the year working with the North Carolina Division of Coastal Management to produce an ocean and coastal policy report. The purpose of the report will be to review North Carolina's ocean and coastal policy structure and to devise policy options that will better prepare the State to meet the challenges ahead, such as sand resources management, ocean and coastal-based renewable energy projects, comprehensive ocean management, marine aquaculture and open ocean outfalls.

This year, the Center and DCM convened a steering committee to help the Center identify the most salient emerging issues and to guide the Center's research. A list of the committee members is attached Appendix A. Kalo and Schiavinato are the co-chairs of the steering committee, which has met five times thus far. The committee will meet for a sixth, and final, time in December or January to approve the final report, which will then be presented to the Coastal Resources Commission.

Kalo and Schiavinato and the research fellows have research the aforementioned emerging issues, presented numerous memoranda before the committee for discussion. From these memos, additional research was directed, and the information obtained included in a draft report, along with draft recommendations from the committee. The manuscript for the project, including draft recommendations, that the Center provided as materials for the 2008 "Shape of the Coast" CLE program of the draft recommendations is attached as Appendix B. The draft report in its entirety will be posted to the Center's website very soon.

Once the committee's comments on the draft report are addressed, and a second draft obtains the committee's approval, the DCM and the Center will host three public meetings on the report to allow the public to comment. The meetings will be held in coastal locations later this fall. After the public meetings have taken place, a final report will be prepared. The final report will be presented to the CRC in early 2009.

NC Sea Grant, DCM and the UNC law school provided funding for this project. Two law student research fellows worked full-time for ten weeks on the project in 2007 and in 2008.

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UNC Coastal Sounds Wind Feasibility Study

In late summer 2008, the Center was approached by UNC to participate in a feasibility study for wind energy development in the coastal sounds. This study was authorized by the NC General Assembly this year in House Bill 2436 (see page 43). A report to the Board of Governors and legislative committees is requested by July 1, 2009. UNC will study the feasibility of establishing wind turbines in the Pamlico and Albemarle Sounds. Recently, the study has been expanded to include offshore oceans areas out to the 30 meter depth level, the outer boundary of which is 12-25 miles offshore.

The study will include an analysis of energy production potential (including the resulting benefits due to a reduction in dependence on fossil fuel combustion for generation of electricity), siting, ecological impacts, and statutory or regulatory barriers to construction and operation of one or more wind turbines and associated support and interconnection facilities in the coastal sounds. The study also will study the feasibility and potential synergistic benefits of co-siting wind turbines and artificial oyster reefs.

A team has been chosen to work on this project. The Center will conduct research on the legal and regulatory issues associated with wind energy development in the coastal sounds, while researchers such as Harvey Seim, Charles Peterson, Nick Travis and UNC Energy Services will conduct the scientific and engineering research. The Center's portion of the study will be provided to UNC by spring 2008, before the next session of the General Assembly begins.

The Center is to investigate and identify the legal barriers, state and federal, to water-based wind energy projects, to recommend appropriate changes to remove any state statutory or regulatory barriers, and to outline the existing state statutory and regulatory framework for such projects.

The NC General Assembly has provided funding for this project through the UNC General Administrationt. Funding includes partial funding for Schiavinato's effort and funding for research fellows.

Local Coastal Government Authority: "Houses on the Beach"

One question important to local coastal governments and the DCM is whether local governments have the authority to limit public services (e.g., electricity, water, and sewer) to residential structures on the beach. In the age of sea level rise, this issue has become important to coastal managers at the state and local levels. Schiavinato and Kalo

will lead the project and will be assisted by a law research fellow. A report on the legal issue will be prepared, and DCM will have a chance to comment on it. A report or white paper will be provided to the public and to interested state agencies and local governments.

"Shape of the Coast" Continuing Legal Education Program

On October 26, 2007, the Center held a four-hour continuing legal education program entitled "The Shape of the Coast," which was held at the Riverfront Convention Center in New Bern. The program was as successful as the 2006 program, with approximately 100 people in attendance. The speakers included Dr. Stan Riggs, Dr. Courtney Hackney (past chair of the CRC), UNC Professor Richard Whisnant and Camilla Herlevitch (executive director of the NC Coastal Land Trust). A copy of the 2008 "Shape of the Coast" program brochure is attached as Appendix C.

Planned Projects

Oral History Project

The history of coastal zone management in North Carolina is an important legacy for the state. As those who were responsible for building the state's coastal management plan and enacting relevant laws retire, ensuring this history is documented would benefit the people of North Carolina. The oral history project will document this history of coastal management in the state by interviewing those integral in developing coastal management in the state and capturing their words through audio and / or video recordings. Schiavinato and Kalo will lead the project and will be assisted by a team of two to three law research fellows. Interviews will be transcribed, as well as recorded, and a report will be prepared documenting this history. The North Carolina Division of Coastal Management will be engaged in this project and will have the opportunity to comment on the report, and long-term employees of DCM may be interviewed as part of the project. The report and transcriptions will be available to the public.

Continuing Legal Education Program on Current Coastal Issues

With the successful completion of last October's continuing legal education program, the Center holding another four-hour continuing legal education program to be held in New Bern on October 24, 2008. Speakers include Dr. Stan Riggs, CRC Chair Bob Emory, Clark Wright, Justin McCorcle and Center co-directors Kalo and Schiavinato.

Law Review Article

The Center is planning to submit an article to the North Carolina Law Review the legal and policy issues associated with managing the State's sand resources, along with potential strategies to address the issue.

Other Projects

Whether the Center will undertake any additional projects over the next year depends on several factors: how the work on the ocean and coastal policy project progress, whether the General Assembly continues any study of waterfront access issues, and whether the Center identifies any other projects for which funding is available to pay for researchers and related costs.

Legal Tides

The Center continued to publish the *Legal Tides* newsletter. The Summer 2007 issue featured discussion of dockominiums, and the Spring / Summer 2008 issue featured an article the legal and regulatory framework for wind energy. Copies of both issues are attached as Appendix D. The Winter 2008 issue will include an article related to the "houses on the beach" project.

Professional Development and Leadership Roles of Center Co-Directors

2007 and 2008 were productive for the Center's co-directors on other levels. In September 2008, Kalo and Schiavinato spoke before the Coastal Resources Commission on the potential legal and regulatory barriers to wind energy development in NC's coastal waters. Kalo also discussed the public trust doctrine and regulatory authority of the Coastal Resources Commission at their April 2008 meeting.

Schiavinato presented on the Center's work on the emerging ocean resources policy study at The Coastal Society's 21st conference in Redondo Beach, CA. As a NC representative for the Extension Disaster Education Network (www.eden.lsu.edu), Schiavinato presented at the Galaxy III conference in Indianapolis on the community assistance Sea Grant has provided to Gulf of Mexico communities post-Hurricanes Katrina and Rita. Schiavinato presented about the Center at Wake Forest law school and at the Local Coastal Governments meeting in Pine Knoll Shore in April, at the request of Harry Simmons, mayor of Caswell Beach. The purpose of these presentations was to

familiarize more local coastal officials about the Center and our services and to engage more law school student participation in the Center's research law fellow program.

Schiavinato has guest-lectured in graduate school classrooms on the application of law and policy to coastal resource management, including lecturing to students at ECU and NCSU.

In Fall 2007, Schiavinato was elected to the Board of Directors of The Coastal Society. Her term began in January 2008 and will end in December 2010. In 2008, Schiavinato was invited to serve on the editorial board of the Sea Grant Law and Policy Journal.

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Appendix A

2008 North Carolina Emerging Ocean Resources Steering Committee

Dr. Jim Bennett
Title: Environmental Assessment Branch Chief
Affiliation: Minerals Management Service
Interest area: Alternative Energy and Minerals Allocation
Contact: jfbennett@mms.gov

Dr. Larry Cahoon
Title: Professor
Affiliation: University of North Carolina-Wilmington
Interest area: Oceanography
Contact: cahoon@uncw.edu

Dr. Michelle Duval
Title: Executive Assistant For Councils
Affiliation: North Carolina Division of Marine Fisheries
Interest area:
Contact: michelle.duval@ncmail.net

Dr. John Fear
Title: Research Coordinator
Affiliation: North Carolina Division of Coastal Management, North Carolina National Estuarine Research Reserve
Interest area: Ecology
Contact: john.fear@ncmail.net

Donna Girardot
Title: Executive Officer
Affiliation: Wilmington-Cape Fear Home Builders Association
Interest area: Beach nourishment and coastal policy
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Joseph Kalo (Co-Chair)
Title: Graham Kenan Professor of Law
Affiliation: University of North Carolina-Chapel Hill School of Law
Interest area: Ocean and Coastal Policy
Contact: jjkalo@email.unc.edu

Dr. Len Pietrafesa
Title: Professor
Affiliation: North Carolina State University
Interest areas: Physical oceanographic processes
Contact: len_peitrafesa@ncsu.edu

Matt Matthews
Title:
Affiliation: North Carolina Division of Water Quality
Interest area: Water quality, storm water
Contact: matt.matthews@ncmail.net

Dr. Stan Riggs
Title: Distinguished Professor of Geology
Affiliation: East Carolina University
Interest Area: Coastal geology
Contact: riggss@ecu.edu

Rudi Rudolph
Title: Shore Protection Manager
Affiliation: Carteret County Shore Protection Office
Interest Area: Beach nourishment, allocation of sand resources
Contact: rudi@carteretcountygov.org

Dr. Raphael Sagarin
Title: Assistant Research Professor
Affiliation: Duke University, Nicholas Institute for Environmental Policy Solutions
Interest Area: Ecology, coastal zone management, environmental law and policy
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Lisa Schiavinato (Co-Chair)
Title: Coastal Law Policy, and Community Development Specialist
Affiliation: North Carolina Sea Grant
Interest area: Ocean and coastal law and policy, land use planning, natural hazards
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Jim Stephenson
Title: Policy Expert and Liaison to the NC Legislature
Affiliation: North Carolina Coastal Federation
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Dr. Laura Taylor
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North Carolina Division of Coastal Management Staff

Scott Geis – Ocean and Coastal Policy Analyst (scott.geis@ncmail.net)
Mike Lopazanski – Policy Analysis Manager (mike.lopazanski@ncmail.net)
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Appendix B

The Forthcoming Recommendations Of the Emerging Ocean Resources Advisory Committee

Joseph J. Kalo, Graham Kenan Professor of Law, *UNC School of Law*
Lisa C. Schiavinato, Coastal Law, Policy and Community Development Specialist, *North Carolina Sea Grant*

Background

Within the last ten years, many of the issues facing North Carolina's coastal ocean have changed, and new issues have come to the forefront. For example, there is a greater interest in offshore sand resources as beach nourishment has become more critical to addressing shoreline erosion. There is greater focus on marine protected areas, or as they might be referred to in state waters, Critical Habitat Protection areas. There is a new and evolving interest in wind energy generation in state coastal waters and in federal waters and in large-scale marine aquaculture production. Coastal ocean observing systems are rapidly developing and may be an important part of North Carolina's emerging management information system. Recently, there has been renewed interest in lifting the moratorium on oil and gas exploration in the ocean waters off North Carolina's coast. These changing needs, along with heightened awareness and new challenges given to ocean issues by the U.S. Commission on Ocean Policy report, signal a crucial time for North Carolina to review its ocean policy structure and to devise policy options that ensure we are prepared to meet the challenges of today.

On June 24, 2004, Governor Easley, in his comments on the report from the U.S. Commission on Ocean Policy, recognized the importance of properly managing ocean resources. Governor Easley stated that protecting coastal and ocean resources means protecting an integral part of North Carolina's economy and culture.

In December 2005, the North Carolina Department of Environment and Natural Resources Division of Coastal Management (DCM) identified protecting ocean resources as a high priority in its current five-year strategy, to be supported by CZMA Section 309 Enhancement Grant funds from the U.S. Department of Commerce. The DCM expressed

interest in using part of this funding to work with North Carolina Sea Grant and the North Carolina Coastal Resources Law, Planning and Policy Center (Center) to review and update the state's policy regarding ocean resources and ocean use. The Center is an inter-institutional partnership between NC Sea Grant, the UNC School of Law and the UNC Department of City and Regional Planning. Professor Joseph Kalo, UNC School of Law, and Lisa Schiavinato, North Carolina Sea Grant, co-direct the Center. Currently in the planning and development stage, the Center serves as a research, advisory and educational entity that provides informational support to state agencies, state advisory groups, local governments, the legal community, and community organizations in their efforts to address ocean, coastal, and development issues.

This study began in Summer 2007, and the study will be complete in Winter 2008 / 2009. The end product of the study will be a final report, which identifies North Carolina's most pressing emerging ocean resource issues, provides background on these issues and puts forth policy recommendations to address them. Once complete, the final report will be presented to the Coastal Resources Commission (CRC), which will decide on which actions, if any, to take.

Emerging Ocean Resources Advisory Committee

In the summer of 2007, the Center and DCM began preliminary work on the study. Throughout the summer, the Center identified potential emerging issues and produced memoranda on the state of the law regarding these issues. During this phase, the need was clear for an advisory committee to be convened and assist in identifying emerging issues and guiding the Center's research. In Fall 2007, the DCM appointed members of the advisory committee. The committee, chaired by Center co-directors Kalo and Schiavinato, has assisted the Center in the ways described, by honing in on the emerging issues, provided relevant historical, scientific and policy background, guiding research and working with the Center in developing draft recommendations. The following are the members of the committee, who have donated their time and expertise.

- Dr. Jim Bennett, U.S. Minerals Management Service
- Dr. Larry Cahoon, University of North Carolina-Wilmington
- Dr. Michelle Duval,
- Dr. John Fear, NC National Estuarine Research Reserve
- Donna Girardot, Executive Officer, Wilmington-Cape Fear Homebuilders Association
- Joseph Kalo, University of North Carolina School of Law
- Dr. Len Pietrafesa, North Carolina State University

- Matt Matthews, NC Division of Water Quality
- Dr. Stan Riggs, East Carolina University
- Gregory "Rudi" Rudolph, Carteret County Shore Protection Office
- Dr. Raphael Sagarin, Duke University Nicholas Institute for Environmental Policy Solutions
- Lisa Schiavinato, North Carolina Sea Grant
- Jim Stephenson, North Carolina Coastal Federation
- Dr. Laura Taylor, North Carolina State University

The emerging ocean resource issues identified as most critical to North Carolina by the committee are: (1) sand resources management; (2) ocean-based renewable energy; (3) comprehensive ocean management; (4) ocean outfalls and alternative water treatement methods; and (5) marine aquaculture. A total of six meetings of the committee have been planned, and the committee has met five times thus far. As a result of these meetings, a lengthy draft report that includes preliminary recommendations has been produced. The public will have the opportunity to comment on this draft report during a series of three public meetings, all of which will be held in coastal location in November and December 2008. A copy of the draft report is available at the Center's website at www.nccoastallaw.org.

Preliminary Recommendations of the Committee

Although the draft report is too lengthy to be included in its entirety in the materials for the "Shape of the Coast" CLE Program, a list of the preliminary recommendations has been included below. Please note that all recommendations are tentative and subject to change for the final report.

Chapter 1: Sand Resources Management

Development of State Comprehensive Plan to Protect Beaches and Inlets

The committee supports the State's efforts to develop a comprehensive beach and inlet preservation plan. The State currently has an initiative in place to draft a beach and inlet management plan (BIMP). The BIMP project is a joint initiative by the DCM and the Division of Water Resources (DWR).[1] The DCM and DWR have established an advisory

[1] North Carolina Division of Coastal Management, N.C. Beach and Inlet Management Plan," *at* http://dcm2.enr.state.nc.us/bimp.htm (last accessed July 23, 2008).

committee to provide input on the content of the plan. The BIMP advisory committee is comprised of representatives from federal and state agencies and stakeholder groups.[2] Further assisting the DCM and DWR in this effort is the engineering firm Moffatt and Nichol. Together, DCM, DWR and Moffatt and Nichol will: (1) provide data identification and acquisition; (2) define beach and inlet management regions; (3) develop draft management strategies; (4) hold and facilitate stakeholder meetings; and (5) produce a final BIMP report.[3] The DCM anticipates that a draft version of the BIMP will be available in 2009.

The committee supports the work of the DCM and DWR in its goal to develop a BIMP and believes it is critical that the State understands the sand resources it has. The BIMP would be key in inventorying the State's sand resources, particularly mapping sources on the cape shoals. The committee believes the cape shoals are not adequately mapped, and that the physical processes by which they were established and are maintained are not fully understood. An inventory of sand resources also would include resources offshore, and then tying these numbers to projects already in place or that already have been completed.

Identification of Available Sand Sources

The State should conduct additional studies to determine where acceptable sand sources are located and the amount of sand available from each source. In particular, further evaluations should be conducted of the sand in the shoal structures of the capes of North Carolina, which are significant sources of beach-quality sand available to meet the long-term needs of North Carolina's coastal communities. Furthermore, the committee recommends that DCM manage the cape shoals system under the CRC's submerged lands mining regulations at 15A NCAC 07H.0208(12). Currently, the NC Mining Commission does not require permits for the mining of beach sand, deferring permitting authority to the DCM instead. Therefore, the committee also recommends that the NC Mining Commission to begin to require a permit to mine beach sand to ensure mining requirements are met. Coalition of environmental groups has asked them to do this a while ago, but they prefer to take a hands-off approach to mining sand for beach nourishment.

[2] *Id.*
[3] *Id*.

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Establishment of a System of Legal Rights to State-Owned Sand Resources

Either as a component of a comprehensive plan or independently, the State should develop a system and rules for granting to public entities easements to ocean, inlet and sound state-owned sand deposits. Establishment of such a system would assure both the permitting authority and communities that the sand necessary would continue to be available for a permitted long-term beach nourishment project at a specified location and at projected costs. Such a system should be developed by the State after it has determined a set of priorities for sand resources. Developing a system and rules afterwards may avoid the scenario of adjoining beach town competing for sand resources and may open the door to discussion of relocation strategies in instances when it would be prudent.

When establishing this system, the State should explicitly prohibit the acquisition of such rights by private, for-profit entities. Easements should be granted only to governmental entities and only for use in connection with beach nourishment projects in which the governmental entity is an identified sponsor. The concern of the steering committee is that, as beach quality sand becomes scarcer and more valuable, private entities may attempt to acquire legal rights to sand sources in state waters for the purpose of selling the sand, at a profit, to communities engaged in beach nourishment projects. It is the steering committee's view that sand, as a state-owned public trust resource, should not be mined by private entities but preserved and utilized as a public resource for the protection and preservation of North Carolina beaches at cost.

The terms of the easement should allow for modification of its terms and potential relocation of the sand source available when unexpected storm and other events create emergency needs for a particular beach community and the state determines that it is in the best interest of the state to allow the affected community immediate access to the easement sand source.

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Coastal Vulnerability Index

The committee recommends that North Carolina create a coastal vulnerability index (CVI) to provide an understanding of current and future coastal conditions. The natural course for many areas along the North Carolina coast is that, without nourishment, some areas will not exist in the future if sea level continues to rise. The problem could be exacerbated by storm events, such as hurricanes and nor'easters. A CVI would be a prudent course of action to inform property owners of the potential dangers of oceanfront living. Both the U.S. Geological Survey (USGS) and North Carolina Geological Survey (NCGS) have created CVIs. For instance, the USGS has a coastal vulnerability index for the Atlantic seaboard. A similar study was conducted by the NCGS, which is based on a study of nearshore geomorphology of the fore-island dune system.[4] The NCGS study parameters include tidal range (which contributes to inundation), offshore wave height from buoys, background erosion rates, geomorphology and historic relative sea level rise and subsidence. Economics and infrastructure investments currently are not parameters in the NCGS CVI, however. The NCGS index began as a pilot study with limited data sets available. A more comprehensive CVI, particularly one that would include economics data, would be beneficial to provide a clearer picture of the particular areas of vulnerability along the coast.

A majority of communities are engaging in beach nourishment projects along the coast and the associated cost, and the likelihood that nourishment will continue to be a method for coastal communities to protect their beaches from erosion and coastal storms. A CVI can be used as a tool to evaluate beach nourishment projects. Designations of areas according to their level of vulnerability could be accompanied by a set of options, from beach nourishment to relocation. If there were a comprehensive CVI for North Carolina, the next issue would be developing policy based on it. The question is whether the emphasis will be to invest money for beach nourishment in the most vulnerable areas, or whether should sand allocation be advocated for areas with the lowest vulnerability and create an incentive for development in those areas and perhaps a disincentive for development in highly vulnerable areas. This likely will be an issue with which the State will grapple in the future because of limited State funds. The BIMP will address the idea of a CVI, as a tool for coastal communities to use as they make decisions on their options for managing shoreline erosion. In addition, a CVI could be a tool used to address other concerns, such as managing multiple uses of coastal-ocean waters.

[4] North Carolina Geological Survey, A Pilot Study to Assess Relative Risk to Oceanside Overwash Along the North Carolina Coastal Barrier Island System (December 2006).

As part of the BIMP, the State should determine a set of priorities for sand resource allocation, with the input of stakeholders. A determination should be made of which barrier islands, or portions of barrier islands, are most vulnerable to damage from storm events, which are most likely to be adversely impacted by sea level rise, and which are most likely to need nourishment projects during the next 50-100 years. The comprehensive plan should establish a set of priorities for allocation of the limited State-owned sand resources for use in beach nourishment projects. The system of priorities should take into consideration the economic costs and benefits and scientific feasibility of long-term protection of affected areas. The plan should take into account the fact that, under the federal CZMA Consistency requirement, the priorities established would also apply to the leasing by MMS, and utilization of sand located in federal waters.[5] Allocations would not be permanent. Planning horizons should be long-term, and lease would be dependent on beach nourishment cycles to allow for flexibility in any sand allocation plan. Leases should include flexibility because of the need to account for emergency conditions, e.g., hurricane.

Sea Level Rise Component to CAMA Land Use Plans

According to the Intergovernmental Panel on Climate Change (IPCC), climate change will impact across the globe. North Carolina's coast will see some of these impacts. Sea level rise is one such impact, although it is difficult to calculate exactly how much sea level rise the North Carolina coast will see over a number of years. However, North Carolina's coast is not only vulnerable to sea level rise, but also to coastal storms such as hurricanes that exacerbate shoreline erosion and put life and property in danger. Sandy beaches play an important role when tropical systems bombard the coast, as the beaches can absorb wave energy, even as the strong waves erode the shoreline. Moreover, the State's coastal system is highly dynamic, and shoreline erosion is a part of a natural process of "short- and long-term coastal evolution."[6] Beach nourishment projects along the coast are numerous and will continue to be for the foreseeable future, as the coast continues to recede. This, in turn, will put a strain the State's supply of beach-quality sand to use to nourish beaches.

[5] Provided these standards are approved as enforceable policies by the NOAA Office of Ocean and Coastal Resource Management.
[6] Riggs, Stanley R. and Dorothea Ames, *Drowning the North Carolina Coast: Sea Level Rise and Estuarine Dynamics*, 2003, pg. 15.

Given the complex factors that come into play regarding shoreline erosion, the importance of the State's coast on the ecosystem and to communities and recognizing that beach-quality sand is not a limitless resource, the committee recommends that DCM adds a sea level rise component to its CAMA land use plan guidelines. If such a component became a part of local CAMA land use plans, provisions for buyout programs, relocation and other adaptations to sea level rise could be discussed by local governments and included.[7]

Disclosure of Natural Hazards When Purchasing Coastal Real Estate

One of the major concerns for coastal communities in North Carolina is the threat from natural hazards. However, one issue is ensuring property owners are knowledgeable of the risk they take on when they purchase coastal real estate. Disclosure of natural hazards for real property is not required in North Carolina, despite legislative attempts to make disclosure a requirement. The most recent attempt was in 2007 with H.B. 1628. This bill called for "reasonable notice" of coastal hazards by prospective purchasers of coastal property prior to acquisition. The bill would have required the CRC to file with the clerk of court in each county that includes areas designated as AECs a notice that includes a description of coastal hazards in that county. The bill also would have required sellers of coastal real estate[8] to prepare a coastal hazards disclosure statement (form to be provided by the CRC at no cost to the seller) to each prospective purchaser of the real property. The committee recommends that the General Assembly reconsiders this bill or considers a similar bill.

Management of Inlet Tidal Delta Sand Sources

Inlet tidal deltas are important to the health of the barrier island system. At the same time, the large qualities of sand located in the ebb tide deltas are attractive, lower cost sand sources for beach nourishment projects. Allowing excessive mining of inlet tidal flood deltas destabilizes the associated inlet and diminishes the quantity of sand available to the backside of barrier islands. These impacts result in increased barrier island erosion and increased thinning of the barrier island itself. It is the committee's recommendation

[7] Similar issues are addressed peripherally in the hazards requirement for land use plans (*see* 15A NCAC 07B .0702), but the committee recommends that sea level rise should be a stand-alone section in CAMA land use plans. Relevant issues that the land use plans could address are where to go if there is a need to retreat, i.e., transition from barrier island to mainland.

[8] The bill would apply to all properties adjacent to an ocean shoreline, as defined in G.S. 113A-115.1(a)(1), and all properties located along shorelines in areas designated inlet hazard areas.

that, for the health of the barrier islands, additionally study of inlet ebb tide deltas should be conducted, and rule language concerning where excavation may occur within the delta and limits to the total volume of sand removed, i.e., no more than 5% of the total delta volume, should be discussed.

Preventing Loss to Barrier Sand System of Sand in Inlet Channels

Due to the scarcity of beach-quality sand, the committee supports all efforts of the State to assure that none of this valuable resource is lost to the barrier island system. The committee also notes that dredged sand re-deposited in federal waters, is no longer regarded as state-owned sand. Rather, the ownership and control of the sand passes to the federal government. The BIMP committee is also addressing the issue, and this committee supports this effort.

Amendment To Rules Regarding Dredging Around High-Bottom Areas

The committee recommends that CRC rules concerning dredging around high-bottoms areas be amended. The committee recommends changes to NCAC 07H.0208(b)(12)(A)(iv) for governing submerged lands. The rule should be expanded to include not only high-relief areas, but also all hard-bottom areas whether ephemeral in nature or not. The rationale for this recommendation is the foraging distance of reef-associated fish species and other marine life is the "halo" of transport of re-suspended matter.

"Worst-Case Scenario" Planning Document

The committee recommends that the CRC recommends to the State that it prepare a set of coastal barrier island maps showing which particular areas of the barrier islands will be endangered by various predicted levels of sea level rise and by coastal storms (e.g., a Category 5 hurricane) and to prepare a set of policies as to which endangered areas will be eligible for beach fill projects or other measures to protect the coastal infrastructure (placement of fill on a beach does not protect the shoreline; the shoreline will continue to exists whether there is fill or not) when sea level reaches a predetermined level. This would be an effort that includes the expertise and input of multiple agencies, such as the DENR, DOA and the Department of Transportation. These maps would be similar to those used by the federal government in the administration of the Coastal Barrier Resources Act. In the event sea level rise progresses at a rate that would make it unwise and uneconomical to continue to maintain certain areas and infrastructure on threatened barrier islands or a Category 5 hurricane were to cause catastrophic damage to the coast,

the document would establish general policies and guidelines identifying which areas and what infrastructure may no longer be supported through public funds. In the alternative, a coastal hazards mitigation fund could be established to provide grants to cover some part of a buyout.

Chapter 2: Ocean-Based Renewable Energy

Enactment of Comprehensive Statute And Promulgation of Rules Addressing Granting of Easements and Leases of State-Owned Submerged Lands and Associated Water Column and Air Space for Renewable Energy Projects

In addition to any necessary CAMA or other state agency permits, in order to site alternative energy projects in state waters, the developers of such projects will need easements and leases from the state to occupy of state-owned submerged lands and associated water column and air space. In light of limitations in existing statutes, the committee recommends the enactment of a comprehensive statute designed for renewable energy projects. This statute could be modeled after N.C. Gen. Stat. § 146-12, the easements to riparian owners statute. Factors a comprehensive statute and implementing regulations could address include:

- Identification of areas that could be occupied;
- Include submerged lands, water column and air space;
- Establishing qualification criteria to be an acceptable applicant
- Duration of the easement or lease;
- Rights of the lease or easement holder;
- Maintenance and decommissioning obligations;
- Performance bonds or other security;
- Compensation to the State;
- Identify other permitted uses in the area;
- Authorize granting of easements for transmission cables; and
- Require all of the above to be subject to CAMA, EMC and Utilities Commission permit requirements.
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In addition, a set of comprehensive rules for the siting of renewable energy facilities in coastal or state ocean waters should be developed by the EMC or CRC or jointly. These rules could be modeled after the regulations being written by the MMS for alternative renewable energy facilities proposed for siting in federal waters.

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Review and Amendment of Existing CAMA Rules Affecting Renewable Energy Facilities Sited in State and Federal Waters

Until a comprehensive set of rules addressing the siting in state waters of renewable energy facilities is developed, the committee recommends that:

- The CRC and DCM staff should review 15A NCAC 07M.0400 on coastal energy policies to ensure it adequately covers renewable energy development and is updated to address new technologies. Currently, the regulation focuses on oil and gas development and LNG facilities;
- The CRC adopt a rule creating an exception to the requirement that structures placed in state waters be water dependent, and allow, under appropriate circumstances the siting of non-water dependent renewable energy facilities and infrastructure in state waters; and
- The present rules prohibiting the placement in state waters or across or under the beach and ocean dunes of transmission lines from renewable energy facilities be reviewed and modified to permit such activity under appropriate circumstances and conditions.

Additional Committee Recommendations

Wind energy development in North Carolina, particularly along the coast and in the sounds is currently subject to much discussion in the State. The committee recommends that the CRC, EMC and Utilities Commission clarify their respective roles in the development of rules to be applied to renewable energy projects proposed for siting in state waters.

In 2008, the General Assembly authorized the University of North Carolina to study the feasibility of wind energy development in Albermarle and Pamlico Sounds. The committee recommends that DCM monitor the progress of this feasibility study.

In light of studies being conducted on the feasibility of wind energy in coastal waters and the sounds, the committee recommends that the CRC review its policy defining wind turbines as non-water dependent structures. Instead of changing the water dependency requirement to allow wind turbines in coastal waters, the CRC could craft an exception for water-based wind turbines and develop a new rule for wind energy projects. Such a rule, for instance, could address project size, analogous to the dock and pier rules; permissible sites; and transmission lines.

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Chapter 3: Comprehensive Ocean Management

Map North Carolina's Coastal-Ocean Resources

As North Carolina considers addressing such issues as sand resources management, a beach and inlet management plan, and renewable energy development in its sounds and coastal ocean, a comprehensive plan for managing uses in states waters could be beneficial to the State and its communities. A recent bill was passed in the General Assembly, authorizing a study of wind energy development in the sounds. Wind energy investors are becoming interested in developing projects in state waters and potentially in federal waters. The MMS has released proposals rules for an alternative energy development in the OCS, projects that could impact North Carolina's coast. Exploring the idea of having a comprehensive plan in place to address various use issues, providing mapping of ocean resources and providing an atmosphere of regulatory certainty will afford the State an opportunity to develop sound development practices that will promote wise use of its resources and that will benefit North Carolina's coastal communities and various user groups. Coastal states such as Massachusetts, Oregon, California and Rhode Island can serve as models from which North Carolina can learn.

Therefore, the committee recommends that North Carolina map its ocean resources. This information is critical to an understanding of the resources the State has in its coastal waters in order to effectively manage their uses. Mapping also will be critical in the event North Carolina decides to engage in comprehensive ocean management. If the State were to follow this recommendation for mapping ocean resources, then this could lead to a couple of different administrative scenarios – the State mandating the each agency with responsibility over ocean and coastal resources work together to implement the plan according to their jurisdictions; or the State expanding the authority of a commission like the CRC or department like DENR to have primary authority to implement the plan. The latter scenario would require legislative expansion of the CRC's or DENR's current authority, while the former would not require any such expansion. We have seen examples of both situations. In Massachusetts, authority for plan implementation was placed in the Department of Energy and Environmental Affairs. In Oregon, there is incorporation of the plan into each relevant agency. Furthermore, coordination among the agencies is mandated, rather than vesting authority in one agency.

The NC Critical Habitat Protection Plan (CHPP), which was approved in December 2004, has received strong support from the committee. The goal of the CHPP is to protect and restore resources critical to North Carolina's commercial and recreational

fisheries. The committee believes the CHPP can play an important role in any ocean mapping and any ocean management or planning the State may do in the future.

Chapter 4: Ocean Outfalls and Alternative Water Treatment Methods

The committee supports the recommendation in the CHPP that there should be no new or expanded ocean outfalls, whether the outfalls are for wastewater or for stormwater. The committee recommends decommissioning existing stormwater outfalls by using a phase-out process. This would include source reduction to existing outfalls, use of best management practices to clean discharge as needed and retrofitting existing outfalls in the interim. Reasons the committee cites for its recommendation include costs to reach deep water and to monitor, the public perception of outfalls near swimming areas and risk of spills caused by damage to infrastructure in exposed habitats.

Due to increased development along the North Carolina coast and the increased need for freshwater, the committee recommends that the State examine the potential for alternative water treatment methods, such as water reclamation and reuse facilities. This recommendation also echoes a recommendation from the CHPP, the rationale for which stated:

> As the coastal population continues to grow, there will be an increasing demand for local governments and the state to evaluate alternative wastewater treatment and disposal methods, including ocean outfall. Currently, there are several studies underway in the central coastal region to recommend wastewater disposal strategies. A major concern regarding ocean outfalls, along with other sewage treatment alternatives that may remove constraints to development, is the cumulative and sec increasing development (North Carolina Ocean Resources Task Force 1995). For example, the extent o onshore development could impact estuarine and ocean resources through associated nonpoint sources of pollution, degrading coastal water quality. Given the role of public infrastructure (i.e., sewage treatment capacity) in coastal development, the siting process for infrastructure should consider restriction from areas that would impact sensitive fish habitats and supporting areas.[9]

[9] North Carolina Division of Marine Fisheries, North Carolina Critical Habitat Protection Plan 114 (February 2005).

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Chapter 5: Marine Aquaculture

Technical Assessment

The committee recommends that the State conduct a technical assessment to research the feasibility of marine-based aquaculture in North Carolina's coastal-ocean waters.

According to Dr. Marc Turano, mariculture and blue crab specialist with NC Sea Grant, an assessment would be beneficial to study the feasibility of aquaculture operations in state coastal waters, which is debatable. Marine-based aquaculture requires certain water depth, and coastal waters in North Carolina may not be deep enough. Sufficient water depth may require going many miles off the coast (15 miles or more), which would be in federal waters.[10] Furthermore, a suitable location would need to be where wave action is not too rigorous and offer some protection from tropical systems.[11] Dr. Turano estimates water depth of at least 140 feet would be needed for submerged cages to protect them from tropical systems, and it is difficult to find areas in state coastal waters that have a depth of even 100 feet. For these reasons, it is debatable whether North Carolina's coastal waters provide a suitable environment for marine-based aquaculture. For example, an experimental marine aquaculture project off the coast of Mississippi was unsuccessful due to the finfish cage frequently breaking away, necessitating researchers to place a GPS device on the cage.[12] Furthermore, during a hurricane in the early 2000s, the cage broke away and was temporarily lost.[13] One of the reasons the cage broke away was because it was located in open water and not near any area that offered protection from tropical storms.[14]

Such anecdotes highlight the need for a technical assessment for marine aquaculture in North Carolina's coastal waters. Another issue is whether Congress passes a national offshore aquaculture bill. Will North Carolina want to amend the enforceable policies of its coastal management plan if a law is passed authorizing a permitting program for aquaculture in federal waters? The committee recommends that DCM continue to monitor the progress of the National Offshore Aquaculture Act of 2007, or similar future bill. If a bill is passed, then the committee recommends the State implement relevant policies as part of its coastal management plan for CZMA Consistency purposes.

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[10] Interview with Marc Turano, mariculture and blue crab specialist, North Carolina Sea Grant (July 31, 2008).
[11] *See id.*
[12] *See id.*
[13] *See id.*
[14] *See id.*