NC COASTAL RESOURCES COMMISSION
November 17-18, 2015
Hilton Double Tree
Atlantic Beach, NC

The State Government Ethics Act mandates that at the beginning of any meeting the Chair remind all the members of their duty to avoid conflicts of interest and inquire as to whether any member knows of any conflict of interest or potential conflict with respect to matters to come before the Commission. If any member knows of a conflict of interest or potential conflict, please state so at this time.

Tuesday, November 17th

1:00 COASTAL RESOURCES ADVISORY COUNCIL MEETING (TBD) — Debbie Smith, Chair

2:00 Commission Call to Order* (Atlantic-Hatteras Pamlico Rooms) — Frank Gorham, Chair
- Roll Call
- Chair's Comments

2:15 VARIANCES
- TJ's Land Development LLC - *(CRC-VR-15-06),* Beaufort Co., Pier width — Steve Trowell, Christine Goebel
- Town of Carolina Beach - *(CRC-VR-15-07),* Oceanfront setback — Robb Mairs, Christine Goebel
- The Riggings HOA- On Remand, *(CRC-VR-15-08),* Kure Beach, Sandbags — Robb Mairs, Christine Goebel

Wednesday, November 18th

9:00 Commission Call to Order* (Atlantic-Hatteras Pamlico Rooms) — Frank Gorham, Chair
- Roll Call
- Chair's Comments
- Approval of September 23, 2015 Meeting Minutes — Frank Gorham, Chair
- Executive Secretary's Report — Braxton Davis
- CRAC Report — Debbie Smith

9:30 Action Items
- Approval of Amendment to CRC Internal Operating Procedures – Article III Officers and Executive Secretary, Second Vice Chair *(CRC-15-25)* — Mary Lucasse
- Public Comment/Adopt 15A NCAC 7B State Guidelines for Land Use Planning; 15A NCAC 7L Local Planning & Management Grants *(CRC-15-26)* — Mike Lopazanski
- Approval of Fiscal Analysis for Amendments to Ocean Erodible AEC – Recession Line *(CRC-15-27)* — Mike Lopazanski
- Town of Topsail Beach LUP Certification *(CRC-15-28)* — Mike Christenbury

10:00 CRC Rule Development
- Grandfathering Provisions for Oceanfront Structures – Options for Amendments to15A NCAC 7H .0306 General Use Standards for Ocean Hazard Area *(CRC-15-29)* — Tancred Miller
- Sandbag Temporary Rules - 15A NCAC 7H .0308 Specific Use Standards for Ocean Hazard Areas; 15A NCAC 7H .1704 General Permit for Emergency Work – General Conditions; 7H .1705 Specific Conditions *(CRC-15-30)* — Mike Lopazanski

11:00 BREAK

11:15 Sea-Level Rise Report 2015 Update
- Public Comments & Next Steps *(CRC-15-31)* — Tancred Miller
- Commission Discussion

11:45 Public Input and Comment — Frank Gorham, Chair

12:00 LUNCH

1:30 PUBLIC HEARING

- Development Line - 15A NCAC 7H .0305; 7H .0306; 7J .1201; 7J .1301; 7J .1302; 7J .1303

2:00 2015 Coastal Habitat Plan (CHPP) Update

- Introduction, 2015 Update, Recommendations & Schedule for Adoption by Commissions *(CRC-15-35)* — Jimmy Johnson, DEQ
- Commission Discussion

2:45 BREAK

3:00 **CRC Rule Development

- 15A NCAC 7H .2700 GP for the Construction of Marsh Sills *(CRC-15-32)* — Daniel Govoni
- 15A NCAC 7H .1800 GP to Allow Post-storm Beach Bulldozing Below Mean High Water *(CRC-15-33)* — Ken Richardson

4:00 Old/New Business — Frank Gorham, Chair

- 2016 Commission Meeting Dates

4:15 Adjourn

Executive Order 34 mandates that in transacting Commission business, each person appointed by the governor shall act always in the best interest of the public without regard for his or her financial interests. To this end, each appointee must recuse himself or herself from voting on any matter on which the appointee has a financial interest. Commissioners having a question about a conflict of interest or potential conflict should consult with the Chairman or legal counsel.

**** Times indicated are only for guidance and will change. The Commission will proceed through the agenda until completed.***
***** These items may be heard on November 17th.***

N.C. Division of Coastal Management
www.nccoastalmanagement.net
Next Meeting: February 10-11, 2016; TBD

NC COASTAL RESOURCES COMMISSION (CRC)

September 23, 2015
New Hanover County Government Center
Wilmington

Present CRC Members
Frank Gorham, Chair

Neal Andrew
Gwen Baker
Larry Baldwin
Suzanne Dorsey
Marc Hairston
Greg Lewis
Jamin Simmons
Harry Simmons
Bill White

Present CRAC Members
Debbie Smith, Chair
Spencer Rogers, co- Vice Chair
Rudi Rudolph, co-Vice Chair
John Brodman
Jett Ferebee
Mike Moore
David Moye
Frank Rush
Ray Sturza
Dave Weaver
Lee Wynns

Present Attorney General's Office Members
Mary Lucasse
Christine Goebel

CALL TO ORDER/ROLL CALL

Frank Gorham called the meeting to order reminding the Commissioners of the need to state any conflicts due to Executive Order Number One and the State Government Ethics Act. The State Government Ethics Act mandates that at the beginning of each meeting the Chair remind all members of their duty to avoid conflicts of interest and inquire as to whether any member knows of any conflict of interest or potential conflict with respect to matters to come before the Commission. If any member knows of a conflict of interest or a potential conflict of interest, please state so when the roll is called.

Angela Willis called the roll. Renee Cahoon and John Snipes were absent. Harry Simmons disclosed that his company has a new client, Great Lakes Dredge and Dock Company. No conflicts were reported. Based upon this roll call Chairman Gorham declared a quorum.

Chairman Gorham stated that, in the event that neither he nor the Vice Chair, Renee Cahoon could make it to a meeting, a second Vice-Chair should be named. **Harry Simmons made a motion to name Neal Andrew as second Vice Chair. Jamin Simmons seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, H. Simmons, Gorham, Baker, Dorsey,**

Hairston, Lewis)(Andrew abstained). Mary Lucasse, CRC Counsel, stated the CRC's Internal Operating Procedures will be updated to reflect the new officer structure.

The Commission presented Bill Morrison, past Chair and 12 year member of the Coastal Resources Advisory Council, a Certificate of Appreciation for his years of service to the State of North Carolina and commitment to the Advisory Council and Commission.

MINUTES

Gwen Baker reported that she voted incorrectly on the third criterion in the North Topsail Beach variance request (CRC-VR-15-05) and requested that the minutes be amended to reflect voting against the motion that hardships did not result from actions taken by the Petitioner.

Larry Baldwin made a motion to approve the minutes of the July 16, 2015 Coastal Resources Commission meeting as amended. Harry Simmons seconded the motion. The motion passed unanimously (Gorham, Andrew, Baker, Baldwin, Dorsey, Hairston, Lewis, J. Simmons, H. Simmons, White).

EXECUTIVE SECRETARY'S REPORT

Braxton Davis, DCM Director, gave the following report:

I'd like to provide a brief update on Division activities, and then following the CRAC report I will also brief you on the new State Appropriations Act and other pending legislation that is relevant to the Commission.

On the Regulatory side of DCM, permit activity for the year continues to be up overall in comparison with past years. For example, DCM has issued approximately 20 more Major Permits to date in 2015 compared to the same time period in 2014. As I previously reported, on June 15th, a settlement was announced for the legal challenges relating to the construction of the Bonner Bridge over Oregon Inlet in Dare County. DCM has now completed all of our obligations under the settlement, and following a withdrawal by the plaintiffs of their appeal in the Office of Administrative Hearings, the CAMA permit for the Bonner Bridge was reinstated on August 14th. As I understand, NCDOT anticipates construction will begin on the replacement bridge within the next few months. DCM Policy staff are proceeding with the rulemaking process and fiscal analyses for several CRC rules involving the Development Line and amendments to the Static Line (7H .0305; .0306; 7J .1200; and 7J .1300). The fiscal analysis has been approved by DENR and is now being reviewed by OSBM, but we understand that only minor edits will be required before final OSBM approval, so we can proceed today with asking for your approval of the fiscal analysis. The legislatively-required Periodic Review Report for your 7B Land Use Planning Guidelines has received final approval from the Rules Review Commission and the Administrative Procedure Oversight Committee. The rule amendments have been posted in the NC Register with the public comment period running from September 15 – November 16, 2015. In order to adopt the rules at the November CRC meeting, a public hearing will be held on October 14th, 2015 at the Morehead City DCM office at the 5:00 pm. Planning staff will also be notifying local governments of the public comment period and public hearing date directly by email. If any Commissioners are interested and available to attend, we need a hearing officer or we need the Chairman to delegate Mike as the hearing officer. (It was necessary to have the public hearing outside of a Commission meeting so we can stay on schedule to adopt the 7B and 7L amendments at the November CRC meeting.) The proposed effective date of the re-written land use planning guidelines is January 1, 2016. The Coastal Reserve is continuing its work on the draft management plan update for the N.C. National Estuarine Research Reserve. This draft will be informed by comments received by Local Advisory

Committees and NOAA on the draft outline review earlier this year. Additional input will also be solicited on the full draft management plan from DENR, Local Advisory Committees, the Commission, and NOAA later this winter. A 30-day public comment period and public meetings on the final draft will be held prior to final publication sometime in 2016. The Coastal Reserve is inviting everyone to celebrate National Estuaries Week, Sept. 19-26. Community paddles, a clean-up, and informational booths will be held at Reserve sites and in the local communities throughout the week. Information on these events is available on the event calendar on the Reserve website. Also, fall student field trips are underway at the Rachel Carson and Masonboro Island Reserves. This fall marks the beginning of an expanded partnership for the Masonboro Island Explorer program, a partnership between the Coastal Reserve and Masonboro.org, to provide educational, science-based field trips for fifth grade students in New Hanover County and that now includes Duke Energy and Carolina Ocean Studies. Seven hundred students will participate in the program this year thanks to a $10,000 grant from Duke Energy to Masonboro.org. The Coastal Reserve and Carolina Ocean Studies developed the program curriculum, which was approved by the New Hanover County School System. Carolina Ocean Studies will be delivering the educational program to the students. This is a great partnership and it's great for the students.

Staff Updates

On August 1st, Heather Coats began work as one of DCM's assistant major permits coordinators. Heather has been a field representative in our Wilmington Regional Office since 2006. She also has, and will continue to, work with the Commission on various policy-related issues, such as the State Ports Inlet Management AEC presentation on your agenda later today. Heather will remain based in the Wilmington regional office, and will generally be handling projects in the southern portion of the state. We are in the process of filling Heather's vacant field representative position, and hope to have more news on this position at your next meeting. I am also pleased to announce that on August 24th, Ms. Courtney Spears began work as our second Assistant Major Permits coordinator in the major permits section. She has had strong coastal management experiences working with the NC Coastal Federation, the Louisiana Coastal Protection and Restoration Agency, and most recently with the Bald Head Island Conservancy. Courtney will be located in the DCM Morehead City office, and will generally be handling projects in the northern region of the coast. One additional staff update is Becky Burcham, who worked with DCM for 15 years in Raleigh and handled our IT and database management systems, retired in late July. We wish her the best of luck in retirement. We hope to refill that position in the Morehead City office and should be advertising that position soon. Finally, we are planning for the next Commission meeting to be held in Atlantic Beach on November 17-18.

Chairman Gorham stated that the public hearing for the amendments to Subchapters 7B and 7L is scheduled for October 14 at the DCM office in Morehead City and a hearing officer is needed. **Greg Lewis made a motion to delegate Mike Lopazanski as hearing officer for this public hearing in the event no Commissioners are available. Harry Simmons seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).**

CRAC REPORT

Debbie Smith, CRAC Chair, stated the consensus of the CRAC was that it is time to start over with a clean slate with sandbag rules. Proposed legislation has given us some direction. Our communities need to be involved with these temporary structures. If there are sandbags that are uncovered or unsightly then we need to be able to take action to litigate that. As for the size of sandbag structures,

one size does not necessarily fit all. In inlet locations we may need to handle these by variance. We all agreed that we need to preserve and protect public beach access.

LEGISLATIVE UPDATE

Braxton Davis stated the 2015 Appropriations Bill reduced the cost-share from 50% to 25% for tier-one counties and 33.4% for tier-two and tier-three counties for the Shallow Draft Navigation Fund, which was already in existence. The Bill also adds Hatteras Inlet to the definition of a Shallow Draft Inlet which makes it eligible for the fund. It adds three million dollars each fiscal year of 2015-2017 for Oregon Inlet and 150 thousand dollars to the Department of Administration to explore acquiring federal land adjacent to Oregon Inlet and reserves 250 thousand dollars to update the NC Beach and Inlet Management Plan by December 2016. The BIMP was first published in 2010. The law allows the Department to contract with the same contractor that did the original BIMP, Moffatt & Nichol. The Division of Water Resources will be the lead agency. A Deep Draft Navigation Channel Fund was created to be funded through appropriations, but there is not an initial funding stream setup. This part of the bill directs the State Ports Authority to enter into an MOA with the Corps of Engineers and directs DEQ to enter into a similar MOA for Oregon Inlet dredging. The bill also authorizes the Department of Administration to acquire federal land necessary for the maintenance of navigation access to the Morehead City port. The Cape Fear Estuarine Resource Restoration section of the bill has a finding that the New Inlet Dam, commonly referred to as The Rocks, impedes the natural flow of water between the Cape Fear River and the ocean and it is necessary to study the removal of the rocks. This section directs the Department (DEQ) to notify the Corps of the state's intent to study the removal of the southern portion of the New Inlet Dam and request NOAA approval to adjust the boundary of Zeke's Island Coastal Reserve and add acreage to the Reserve from the Fort Fisher State Recreational Area. If NOAA approves the boundary change, it directs the CRC to amend the Reserve Component Rule, however the Reserve rules are Department rules and not those of the CRC. A request for information is to be issued to identify firms capable of conducting the analysis and report to the Legislature by April 1, 2016. DCM will be the lead agency. The Appropriations Bill also addresses abandoned vessels and gives coastal counties authority to prohibit the abandonment of vessels in navigable waters by local ordinance. The bill directs the CRC to amend sandbag rules to allow sandbags even if there are no imminently threatened structures when an adjacent property has a sandbag structure, to allow contiguous sandbag structures from one shoreline boundary of a property to the other regardless of the proximity to an imminently threatened structure, define the termination date of all permits for contiguous sandbag structures on the same property to be the same and be the latest of the termination dates, allow the replacement, repair or modification of damaged sandbags legally placed with a current permit or an expired permit being litigated by the property owner. The CRC is directed to adopt temporary rules to incorporate these changes by December 31, 2015. The bill also raises the cap on terminal groin permits from four to six and specifies that two of the six permits may be issued only for the construction of a terminal groin at New River Inlet in Onslow County and Bogue Inlet between Carteret and Onslow counties. DMF and DCM have been directed, in consultation with representatives of conservation non-governmental organizations working on oyster restoration, to create a new permitting process instead of the current CAMA Major Permit. Until that is done, DMF's scientific or educational activity permit shall be utilized. This will require both CRC and MFC rule changes. We need to figure out the definition of an oyster restoration project. This report is due by May 1, 2016. DCM is also directed to study and develop a proposed strategy for preventing, mitigating and remediating effects of beach erosion. The study shall consider efforts by other states and countries to prevent beach erosion and ocean overwash and to sustain beaches and coastlines. This study is due February 15, 2016. Other changes in the bill included the renaming of DENR to the Department of Environmental Quality and DENR non-

regulatory programs (State Parks, Zoo, Aquariums, Museum, and Clean Water Management Trust Fund) were transferred to the Department of Natural and Cultural Resources. DENR and DNCR were also directed to study moving other DENR divisions and sections, including the Coastal Reserves and Marine Fisheries to the Department of Natural and Cultural Resources. This report is due by April 1, 2016. House Bill 44, Local Government Regulatory Reform, gives coastal cities authority to regulate, restrict or prohibit the placement, maintenance, location or use of uninhabitable structures that unreasonable restrict the public's right to use the state's ocean beaches, directs the EMC to examine ways to provide regulatory relief from impacts of riparian buffer rules on land parcels platted on or before the effective date of the rule, and in the Neuse and Tar-Pamlico River Basins, Zone 1 of a protective riparian buffer shall begin at the most landward limit of the normal high water line or normal water level, as appropriate. House Bill 765, Regulatory Reform Act, mandates coastal stormwater rule changes to eliminate triggers for 10,000 square feet of nonresidential and lowers the threshold for residential development from 12% to 24% impervious coverage. DENR is directed to study exempting linear utility projects from environmental regulations, including CAMA permits. DCM issues dozens of general permits per year under 7H .1600. This study report is due March 1, 2016.

ACTION ITEMS

Approval of Fiscal Analysis – Development Line and Static Line Amendments (CRC 15-24)
Ken Richardson

Ken Richardson stated the costs associated with the static vegetation line exception and the development line are equal except for the initial costs to adopt and the ongoing reporting costs for the static line exception. Communities without an exception can anticipate an average first-time cost of approximately $9,000 to assemble the required information to be submitted to the CRC for an approval. Communities seeking a static vegetation line exception reauthorization every five years can anticipate averages costs of $3,500. Based on cost estimates received from CB&I and Geodynamics, a development line would likely cost about $1,200 per mile or $4,000 per day to survey in. It is assumed that an average total cost to survey in a development line would be $5,000 based on the average length of current static vegetation lines. Requesting a development line or a static vegetation line exception is voluntary for communities, therefore these new rules do not require local governments to incur any additional expenditures unless they choose to do so. Private property owners may experience some loss of value or opportunity cost if the community in which their property is located has a static line and chooses not to apply for a static line exception or adopt a development line. The proposed amendments to the static line exception and new development line rules will benefit oceanfront property owners by allowing the potential utilization of a more favorable measurement line. There will be no impacts to NCDOT or DCM.

Harry Simmons made a motion to approve the fiscal analysis for 15A NCAC 07H .0305, 07H .0306, 07J .1201, 07J .1301, 07J .1302, and 07J .1303. Neal Andrew seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

CRAC Appointments
Daniel Govoni

Daniel Govoni stated the Coastal Resources Advisory Council (CRAC) was created by the Coastal Area Management Act of 1974. In 2013, Session Law 2013-360 vacated the membership of the CRAC and reduced the council to 20 members. The law gave the CRC the sole authority to appoint CRAC members. At the February 2014 CRC meeting in Nags Head, the CRC appointed 10 individuals to the CRAC. Since that time three additional members have been appointed. Terms for

all CRAC members expired on June 30, 2015. At the July CRC meeting the Council recommended two additional members for appointment, Johnny Martin and Beth Midgett. New terms will expire on June 30, 2017.

Chairman Gorham directed Debbie Smith, Chair of the CRAC, to begin each meeting with a disclosure of any conflicts by members of the CRAC.

Harry Simmons made a motion to reappoint the 13 members currently serving on the CRAC and appoint Johnny Martin and Beth Midgett with all terms expiring on June 30, 2017. Marc Hairston seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

Town of Pine Knoll Shores Land Use Plan Certification (CRC 15-16)
Mike Lopazanski
Mike Lopazanski stated this is an update to the Town of Pine Knoll Shores' CAMA Land Use Plan. The plan being considered for certification builds on the existing certified plan. Goals, objectives and policies remain based on the existing plan but further shape the Town's needs and vision for the future. DCM staff has reviewed the plan and has determined that the Town has met the substantive requirements outlined in the 7B land use planning guidelines and that there are no conflicts with either state or federal law or the State's coastal management program. Staff recommends certification.

Harry Simmons made a motion to certify the Town of Pine Knoll Shores' Land Use Plan. Larry Baldwin seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

City of Jacksonville Land Use Plan Amendment (CRC 15-17)
Mike Lopazanski
Mike Lopazanski stated this is an amendment to the City of Jacksonville's 2001 CAMA Land Use Plan. They are seeking this amendment to modify the Future Land Use Map designations on 39 parcels of land to reflect previously adopted rezoning requests since the Land Use Plan was last amended and certified by the CRC on August 30, 2012. Staff has reviewed the amendment and has determined that the City has met the substantive requirements outlined in the 7B land use planning guidelines and that there are no conflicts with either state or federal law or the State's coastal management program. Staff recommends certification.

Harry Simmons made a motion to certify the City of Jacksonville's Land Use Plan amendment. Larry Baldwin seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

Sandbag Rules and Policies (CRC 15-18)
Mike Lopazanski
Mike Lopazanski stated the history and evolution of the sandbag rules were reviewed with the Commission at the February meeting. The Outer Banks Erosion Task Force realized that property owners needed a temporary measure to protect their property for a short period of time until threatened structures could be relocated or until the effects of short-term erosion could be reversed. These temporary measures included beach nourishment, sandbags and beach bulldozing. Currently, sandbags can be used to protect an imminently threatened structure. A structure is considered to be

imminently threatened if its foundation or septic system is located less than 20 feet from the erosion scarp. Structures that are farther than 20 feet can be considered imminently threatened if there are site conditions such as a flat beach profile or accelerated erosion. This determination is made by the Division Director. Sandbags shall not extend more than 20 feet past the sides of the structure being protected and the landward side of the sandbag structure cannot be located more than 20 feet seaward of the structure being protected. Sandbags can remain in place for up to two years after the date of approval if they are protecting a building with a total floor area of 5,000 square feet or less and its associated septic system or for up to five years for a structure with a total floor area of more than 5,000 square feet. Sandbags can remain in place for up to eight years from the date of approval if they are located in a community that is actively pursuing a beach nourishment project or if they are located in an Inlet Hazard Area adjacent to an inlet for which a community is actively pursuing an inlet relocation or stabilization project. Sandbag structure dimensions are limited to 20 feet wide at the base and 6 feet high. The property owner shall be responsible for removal of the sandbags within 30 days of the end of the allowable time period. Sandbags are not required to be removed if they are covered with stable and natural vegetation. With the discussion of the State Ports AEC, discussions were had regarding expanded sandbag uses including protection of natural features, expansion of when a structure is considered imminently threatened, and the size of individual bags. The legislature has also directed the CRC to expand the use of sandbags through temporary rules. These temporary rules shall amend sandbag rules to allow sandbags even if there are no imminently threatened structures when an adjacent property has a sandbag structure, to allow contiguous sandbag structures from one shoreline boundary of a property to the other regardless of the proximity to an imminently threatened structure, define the termination date of all permits for contiguous sandbag structures on the same property to be the same and be the latest of the termination dates, and allow the replacement, repair or modification of damaged sandbags legally placed with a current permit or an expired permit being litigated by the property owner.

Braxton Davis stated the options for the Commission are to direct Staff to come back with rule language for a new approach to sandbags or to bring back rule language to implement these changes in the temporary rules and then look at sandbags holistically at a later date. We can get the legislative responsibilities out of the way and then the CRC can address the overall sandbag policy in terms of what property owners need and look at the recommendations of the Advisory Council.

Neal Andrew made a motion to address the legislative requirements and draft temporary rules and then come back at a future meeting to address a complete overhaul of the sandbag rules. Harry Simmons seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

Update on USACE & Carteret County MOA
Justin McCorkle, USACE

Justin McCorkle stated we want to discuss the potential Atlantic Beach MOA, the potential for a couple of long-term MOAs, and some relatively new news from the Corps regarding some model MOAs. These model MOAs are specific to issues we have brought up here in North Carolina. We have been able to move forward in the absence of an overarching MOA. When the federal government does federal projects we have a certain amount of money and a certain way that the projects are planned to be done and must be done. The MOAs have allowed us to leverage non-federal funds to do a job that we would not be able to afford or would not be able to do otherwise. The most impressive one we have, on a local and national level, is the Shallow Draft Navigation MOA done with the state of North Carolina. The Division of Water Resources was very forward

thinking as they saw the federal funding levels for shallow draft inlets decline. They jumped in and offered a mechanism to provide some non-federal funding. We are working with the Town of Atlantic Beach. When we dredge in Morehead City the Town would like to place the sand beyond the Circle. The Town has offered to be able to contribute funds to pay the extra money to place it where they want it. We have a model MOA approved. This is a step in the right direction. We could be able to have that happen as early as this winter. We are waiting on the State Ports about the inner harbor. We have been able to provide the Town a cost estimate. The MOA with the State is for four years. We have been asked to extend this MOA for an additional ten years with the funding provided in the State budget. Those of you from the northern part of the state are aware of what is going on at Hatteras Inlet. This is outside of the federal channel. We don't have any authority to dredge there. Our headquarters came through with a model MOA for work in local service facilities that would allow us to take funds from other sources, but use our dredges to allow this critical dredging to take place. This is another potential success story that I hope to report on this winter. As of the last CRC meeting, our working group met to discuss a long-term MOA for the Morehead City and Wilmington harbors with DENR, DWR and State Ports. DENR initially was concerned with not wanting to interfere with the state ports in those areas. The State Ports has not committed into entering into an MOA, but don't mind if DENR enters into an MOA for beneficial use. We may need to consider moving forward with separate MOAs. The next step is for a letter of intent to be sent to me requesting to pursue an MOA and outline the areas and activities involved.

Rudi Rudolph commented that the one time MOAs are good for us as a County because we can contribute. For the beneficial use part we need to approach the Governor and the Ports to see if they want a programmatic approach for beneficial use of the harbor. Since the beneficial use piece was taken out of the State Ports AEC language then we need to work on that more before we take that out. The model only takes money from local governments and the State isn't involved to contribute. The local governments are passing money through the State to contribute to the Corps. Internally we have been wrestling with local control over the projects.

After discussion, the Commission agreed to draft a letter to the State Ports and invite them to a meeting with the Corps, DEQ, and DWR to discuss this issue.

PUBLIC INPUT AND COMMENT

Mark Richard, of Carolina Beach, commented on his opposition to the Carolina Beach boardwalk extension. (written comments provided)

Donald Motsinger, of Carolina Beach, commented on his opposition to the Carolina Beach boardwalk extension. (written comments provided)

Robert Lewis, of Carolina Beach, commented on his opposition to the Carolina Beach boardwalk extension.

John Zachodzki, of Carolina Beach, commented on his opposition to the Carolina Beach boardwalk extension. (written comments provided)

Renee Lewis, of Carolina Beach, commented on her opposition to the Carolina Beach boardwalk extension.

Cathy Lane, of Caroline Beach, commented on her opposition to the Carolina Beach boardwalk extension. (written comments provided)

Sharon Lyons, of Carolina Beach, commented on her opposition to the Carolina Beach boardwalk extension.

Robert Broome, NC Association of Realtors, commented in support of the grandfathering of multi-family beachfront structures.

CRC RULE DEVELOPMENT

State Ports Inlet Management AEC – Sandbag Use & Boundaries (CRC 15-19)

Heather Coats

Heather Coats stated this will be a review of the rule language and the maps. At the last meeting the Commission asked that the beneficial use language be removed from the draft rule. The sandbag rules for this area were also discussed. Given recent legislation and the Commission's desire to change the sandbag rules in their entirety, does the Commission want to review the sandbag policies for this area? Chairman Gorham stated the sandbag portion for this AEC should be discussed when we look at all of the sandbag rules and advised the staff to move forward with this language, take into account the recent legislation, and any recommendations from the CRAC.

Amendments to Ocean Erodible AEC – Recession Line (CRC 15-20)

Mike Lopazanski

Mike Lopazanski stated the Ocean Erodible Area is a subclass of the Ocean Hazard AEC. The Ocean Erodible Area covers North Carolina's beaches and any other oceanfront lands that are subject to long-term erosion and significant shoreline change. The seaward boundary of the AEC is the mean low water line. The landward boundary of the AEC is measured from the first line of stable natural vegetation and is determined by adding a distance equal to 60 times the long-term average annual erosion rate for that shoreline to the distance of shoreline recession expected during a 100-year storm. The shoreline recession model has a minimum of 25 feet and a maximum of 330 feet. Because of the changes we have made to the ocean hazard area formulations since 2009, we need to change the setback factor of 60 feet to 90 feet. This will provide consistency with the setback rules in 7H .0306. Staff believes the use of the 100-year storm recession line may no longer be needed. An increase from 60 to 90 times the erosion rate will provide the necessary jurisdiction to implement the management objectives of the Ocean Hazard Area to reduce the loss of life and property due to hazards associated with the Atlantic shoreline. Coast-wide, there will be reduction of approximately 7,500 properties from the CRC's jurisdictional area. This is in addition to the 15,000 properties removed with the elimination of the High Hazard Flood Area AEC. Staff is requesting approval to change the setback factor from 60 to 90 feet and remove the reference to the recession line in 15A NCAC 07H .0304.

Harry Simmons made a motion to approve the proposed amendments to 15A NCAC 07H .0304 for public hearing. Neal Andrew seconded the motion. The motion passed unanimously (Baldwin, White, J. Simmons, Andrew, H. Simmons, Gorham, Baker, Dorsey, Hairston, Lewis).

Pile Supported Signs in Coastal Wetlands (CRC 15-21)

Tancred Miller

Tancred Miller stated this is a follow up from the variance request at the last meeting. The variance requested the installation of a sign within the AEC, but did not meet the definition of water dependent. The rules limit development in coastal wetlands to water dependent structures. This was an unusual case. The Commission requested that staff bring back a mechanism to make this allowable in the future. The coastal wetlands rule (7H .0205) defines coastal wetlands, their significance, management objectives and use standards. Conservation and management of coastal wetlands are the management objectives. The use standards require that in every instance development shall be consistent with 7H .0208 which states that uses which are not water dependent shall not be permitted in coastal wetlands. The rules also give examples of the types of development and uses that are considered water dependent. Proposed language has been added to 7H .0205 to allow pile supported signs by request from a local government. The staff has a number of questions

for the Commission. How big can the signs be, what are the criteria on the height, how many signs within the wetlands, who has access to the signs for repair or maintenance, and what is allowable content? The Commission determined that no action was necessary as this request is a rare occurrence.

CRC RULE & POLICY DISCUSSION

Minor Modifications to Major Projects (CRC 15-22)
Doug Huggett

Doug Huggett stated when an applicant receives a Major Permit the permit is active for three years from the date of issuance. There are multiple opportunities for renewals. When you factor in the complexity of development on the coast there is a lot of potential for change to the project over time. At least fifty percent of Major Permits request a change to the proposed development. When a proposed change comes in then a modification to the permit is needed. There are major and minor modifications. The CRC's rules are relatively silent on determining whether the change is major or minor. DCM factors in the scope and scale of the proposed modification in comparison to the original proposed project. We also coordinate with multiple state and federal agencies for any modifications with the agencies that reviewed the original Major Permit application. Public interest is also considered when determining whether a modification is major or minor. When a modification is determined to be major then a new application is required. When a modification is determined to be minor then it is circulated to the relevant agencies and adjacent property owners may need to be notified. Staff needs to balance the need for a thorough review and the needs of the applicant. Staff attempts to require adjacent property owner notification only in those cases where such notifications would appear to serve a valid purpose. If the adjacent property owner objected to the original application then they will be notified of modifications to the project. Chairman Gorham stated he is comfortable with the way the Division is handling modifications.

Grandfathering of Multi-family Structures
Steve Shuttleworth, Shuttleworth Realty

Steve Shuttleworth stated this is a follow up from a discussion with the Commission last December. This is a statewide issue, but has come to the forefront from some of our local associations, that there is a need for a rule amendment to grandfather multi-family structures. The current rules allow replacement of single family and duplex residential structures that meet certain criteria. This does not include multi-family units even if they meet the same criteria. This has caused a problem with financing and sales of property. In Carolina Beach and Kure Beach this affects 1090 properties. We are requesting a rule amendment to apply to all residential structures with a total floor area greater than 5,000 square feet, regardless of the number of attached units. This will not apply to structures built after August 11, 2009, will not allow construction of new residential structures in the ocean hazard setback area, and will not allow replacement of residential structures larger than the original footprint or square footage. This will allow these properties to go through the financing process.

Braxton Davis stated the current rule is consistent with specific legislation that was passed in 2011. Suzanne Dorsey asked about staff concerns with this proposal. Braxton replied that the initial thoughts are that the size of the building is what matters the most, not use. Grandfathering large structures and allowing them to go back into a hazardous area concerns the Division. Grandfathering would be more appropriate when there is a clear, demonstrated commitment by the community for long-term erosion control. We are interested in the Commission's feedback. Gwen Baker commented that the legislation in 2011 may have been bad legislation to grandfather homes without a long-term solution that would provide protection for these properties and adding these multi-family structures into this rule could add additional unprotected properties. There are two

standards right now and we should look at that, but we don't need to make a bad situation worse. Chairman Gorham asked staff to bring back rule language options that could address this issue and to quantify how many properties this would effect that do not have a long-term beach maintenance plan in place.

OLD/NEW BUSINESS

The Commission agreed on five meetings for 2016. One meeting should be scheduled in the Nags Head area, one meeting should be held in the Wilmington area, and the remaining three should be in the Morehead City area. A proposed schedule will be sent to the Commission soon.

With no further business, the CRC adjourned.

Respectfully submitted,

Braxton Davis, Executive Secretary

Angela Willis, Recording Secretary

INTERNAL OPERATING PROCEDURES OF THE COASTAL RESOURCES COMMISSION OF NORTH CAROLINA

Article I
Purpose

The purpose of the Commission shall be to fulfill the duties prescribed for it in Article 7, Chapter 113A, of the General Statutes of North Carolina.

Article II
Membership

The membership of this Commission shall be as set forth in North Carolina General Statute 113A-104.

Article III
Officers and Executive Secretary

Section 1. Officers of this Commission shall include a chairperson, Vice Chairperson, and Second Vice Chairperson.

(a). Pursuant to G.S. 113A-104(i), the Chairperson shall be designated by the Governor from among the members of the Commission.

(b). Pursuant to G.S. 113A-104(i), the Vice Chairperson shall be elected from and by members of the Commission and shall serve for a term of two years or until the expiration of the Vice-Chairperson's regularly appointed term.

(c). The Second Vice Chairperson shall be elected from and by members of the Commission and shall serve for a term of one year or until the expiration of the Second Vice-Chairperson's regularly appointed term.

Section 2. The Secretary of the Department of Environment and Natural Resources is hereby authorized to appoint a qualified employee of the State of North Carolina to serve as Executive Secretary for the Commission. Duties of the Executive Secretary shall include any services the Commission may deem necessary and proper; but in any case, such duties shall include the responsibility for secretarial and clerical functions incident to the proper and expeditious conduct of the Commission's business together with those duties prescribed by G.S. 113A-122(b). In addition, the Chairperson may designate as he or she sees fit, any member(s) of the Commission, or employee(s) of the Department of Environment and Natural Resources to serve as parliamentarian or in such other special capacity as may from time to time be required for the orderly conduct of the Commission's business.

Article IV
Meetings

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Amended November 17, 2015

Section l. The Commission shall meet at such times and places as necessary to discharge its statutory duties as set forth in Chapter 113A, Article 7, North Carolina General Statutes. The Chairperson shall set the dates and locations of regular meetings. Notice shall be provided to all members at least 20 days prior to each regular meeting.

Section 2. The Commission Chairperson may call special meetings if he or she determines it is necessary. Timely notice in advance of all special meetings must be given to each member of the Commission in accordance with the requirements of the North Carolina General Statutes. This notice requirement may be adequately discharged by mailings to the members of the Commission at their last known places of residences or by forwarding notice to the designated email address for each member of the Commission.

Section 3. A majority of duly qualified members of the Coastal Resources Commission shall constitute a quorum.

Section 4. Meetings of the Coastal Resources Commission shall be open to the public; provided, the Commission may hold executive sessions where allowed by G.S. 143-318.11.

Section 5. Each regular meeting may include public comment from any member of the public in attendance. Comments shall be limited to subjects falling within the jurisdiction of the Commission. Public comment shall not be directed to any quasi-judicial matter which is pending before the Commission. The chair will first recognize individuals or groups who have signed up to be heard and then may recognize others subject to the time available. The Chair may specify the time allotted to each speaker. If remarks are made that stray from the business of the Authority, exceed time constrains, or are beyond reasonable standards of courtesy, comments can be halted by the Chair or by motion.

Section 6. Official meetings of the Coastal Resources Commission may take place by conference telephone or other electronic means as allowed by G.S. 143-318 for the purpose of conducting hearings, participating in deliberations, or voting upon or otherwise transacting the public business within the jurisdiction, real or apparent, of the public body.

Article V
Record

Section 1. Minutes and other records of all Commission meetings shall be collected and maintained under the direction of the Executive Secretary, and be supplemented, where possible, by electronic recording.

Section 2. The Executive Secretary shall be responsible for filing all rules of the Commission in proper form as required by Chapter 150B of the North Carolina General Statutes.

Article VI
Standard Order of Business

The Coastal Resources Commission adopts the following as its Standard Order of Business; provided, that the order of business may be altered by the Chairperson in his or her discretion, by request from the Executive Committee, or by motion made by any member of the

Commission in order to more efficiently carry out the Commission's business or for the convenience of the public:

1. Call to order by Chairperson.
2. Ethics statement and members' disclosure of conflicts of interest
3. Roll call of Commissioners in attendance.
4. Approval of minutes of previous meeting.
5. Opening remarks or ceremonies.
6. Reports from Executive Secretary.
7. Reports from Chairperson of the Commission and CRAC Chairperson.
8. Discussion of matters relating to operation and procedures of the Commission.
9. Consideration of appeals, variance and rulemaking petitions, and declaratory rulings.
10. Comments from the public.
11. Direction by Chairperson to break into working committees, standing or special, to pursue the business of the Commission.
12. Action items
13. Public presentations by special speakers.
14. Public hearings.
15. Consideration of old and new business
16. Announcements.
17. Adjournment

Article VII
Notice Requirements

Section 1. In accordance with G.S. 113A, Article 7, the Secretary of the Department of Environment and Natural Resources or an appropriate designee shall be responsible for the timely issuance to those parties upon which G.S. 113A, Article 7, confers the right of legal notice of Commission hearings, meetings, decisions, and official actions.

Section 2. The Commission may adopt special notice procedures as it deems necessary, subject to the requirements of G.S. Chapter 113A, Article 7.

Article VIII
Committees

Section l. The Chairperson of the Commission shall appoint such committees, standing or special, as the Chairperson and Commission shall from time to time deem necessary. The Chairperson shall designate the Chairperson of each committee from among its members and shall be an ex officio member of all committees.

Section 2. Duly appointed committees may adopt at their discretion any internal procedures necessary to the discharge of their business; provided, no procedures adopted by any committee shall be inconsistent with these procedures or any other rules adopted by the Commission, or with any statutes applicable to the Commission.

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Amended November 17, 2015

Section 3. The Commission shall have an Executive Committee composed of the Commission Chairperson, the Commission Vice Chairperson and three additional members of the Commission. The three additional members appointed to the Executive Committee shall be selected by the Chairperson and shall represent the northern and southern CAMA counties as well as that area within the CAMA counties which includes inland waterways. The Chairperson of the Commission shall be Chairperson of the Executive Committee and the Vice Chairperson of the Commission shall be Vice Chairperson of the Executive Committee. The Chairperson of the Coastal Resources Advisory Council and the Commission's Executive Secretary shall be ex officio members of the Executive Committee. The Executive Committee shall carry out such administrative functions as the Chairperson may direct or such other functions as the Commission may direct. The Executive Committee may make recommendations to the full Commission on any matters it deems relevant to the Commission's work.

Article IX
Parliamentary Authority

Section 1. The rules contained in the current edition of *Robert's Rules of Order Newly Revised* shall govern the Commission in all cases to which they are applicable and in which they are not inconsistent with these procedures and any special rules of order the Commission may adopt, or with any statutes or rules applicable to the Commission.

Section 2. To the extent that the rules contained in the current edition of *Robert's Rules of order Newly Revised* conflict with any rules, regulations, or quasi-judicial procedure adopted by the Commission which establish special rules of procedure for certain meetings or types of meetings, the Commission's specifically adopted procedures shall be controlling.

Article X
Attendance

As directed by the General Assembly in G.S. 113A-104(1), regular attendance at Commission meetings is a duty of each member. Pursuant to this legislation the Commission may declare vacant any seat for which a member misses three consecutive meetings or fails to attend at least sixty percent of the meetings during any twelve-month period. Under extraordinary conditions the Chairperson has the authority to waive the attendance requirements. The Chairperson shall provide notice of this policy to any member who misses two consecutive meetings or who appears likely to fail to attend at least sixty percent of the meetings during any twelve-month period.

Article XI
Hearings

Section 1. For any Commission hearing, including public hearings on state guideline adoption and amendments pursuant to G.S. 113A-107, hearings on designation of areas of environmental concern pursuant to G.S. 113A-115, hearings regarding local land use plans and local implementation and enforcement programs, and any other hearings conducted by the Commission in carrying out its duties under the Coastal Area Management Act, dredge and fill law, and the Administrative Procedure Act, the Chairperson may at his or her discretion appoint any

Commission member or members or appropriate qualified employees of the Department of Environment and Natural Resources to serve as hearing officer. The hearing officer shall report the record of the hearing to the Commission prior to action on the matter that was the subject of the hearing.

Section 2. In appointing hearing officers, the Chairperson shall consider the geographic location of the hearing, the technical complexity of the matter being considered, the public interest in the matter and the necessity of impartiality on the part of the hearing officer or reporting member.

Section 3. Final decisions on all issues before the Commission, including but not limited to variances, rule-making and declaratory rulings, shall be by majority vote. In the event the Chairperson excuses himself or herself from participation in a final decision due to an actual or potential conflict of interest, the Vice-Chairperson shall serve as presiding officer.

Article XII
Conflict of Interest

The State Government Ethics Act, North Carolina General Statutes at Chapter 138A, sets forth the ethical standards applicable to the Coastal Resources Commission. In addition, any ethics opinions issued before the enactment of the State Government Ethics Act or advisory opinions issued by the State Ethics Commission after 2006 may be applicable to actions taken by the Coastal Resources Commission.

Article XIII
CRAC Appointments

The Commission shall appoint the twenty (20) members of the Coastal Resources Advisory Council (CRAC) by majority vote of the Commission. Appointments should be made for an initial term in accordance with § 113A-105 of the Coastal Area Management Act. Members may be reappointed at the discretion of the Commission. The Executive Secretary may, at least 45 days prior to the appointment, notify the CAMA counties and coastal cities that the Commission will be making appointments to the CRAC and solicit recommendations. If any council member appointed by the Commission is unable to serve their full term, the Commission may establish appropriate procedures to select a person to serve the unexpired portion of that term or may consider other nominations received within the preceding nominating period. The Commission may replace any CRAC member who fails to regularly attend CRAC meetings.

Article XIV
Amendments

These procedures may be amended at any regular meeting of the Commission by a vote of sixty percent of the duly qualified Commission members; provided that a written copy of the amendments has been mailed to each Commission member at least seven days prior to the adoption of the amendment or otherwise has been made available to each Commission member at least five days prior to the adoption of the amendment.

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Amended November 17, 2015

Article XV
Voting

Section 1. Except as otherwise specifically provided by other Articles of these Procedures, all Commission members shall be entitled to make motions, second, and vote on all matters coming before the Commission. The Chairperson may vote on all issues before the Commission.

Section 2. If there is a tie vote on a motion, the motion fails.

Section 3. The Executive Secretary shall record in the minutes each member's vote on all final decisions including but not limited to final decisions on variances, rule adoption, repeals, and amendments. Votes shall be recorded on any other matter when so requested by any member.

Section 4. Motions to call the previous question or otherwise limit debate shall be considered extraordinary measures and shall require the affirmative vote of three-fourths of those members present and voting.

Article XVI
Settlements and Other Decisions Related to CRC/CAMA Litigation

The Commission members of the Executive Committee are authorized to act on behalf of the full Commission to settle cases or decide whether to recommend an appeal in cases in which the Commission is a party pursuant to 15A NCAC 7J.0312(c).

Amended effective May 14, 2014

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Frank D. Gorham, III, Chairperson
Coastal Resources Commission

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Amended November 17, 2015

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

November 3, 2015

MEMORANDUM **CRC-15-26**

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Public Comment and Adoption of 15A NCAC 7B State Guidelines for Land Use Planning and 15A NCAC 7L Local Planning and Management Grants

At your December 2014 meeting, the Commission approved amendments to the 7B Land Use Planning Guidelines and the 7L Planning & Management Grant Program for public hearing. The 7B Planning guidelines have also gone through the legislatively-mandated Periodic Review and Expiration of Existing Rules process and were approved by the Rules Review Commission in August of this year.

The proposed amendments to these two sets of rules were in response to comments and input gathered at regional meetings in the coastal area, staff experience implementing the program, and a previous study by the Commission. The amendments have included input from local elected officials, local planning staff, consultants, and other interested stakeholders. DCM Planning Staff also specifically solicited comments on the draft amendments from local governments and stakeholders in October 2014.

The intent of the amendments is to provide increased flexibility for plan content and format, to clarify that updates and amendments are voluntary, to introduce a new process option for CAMA Major Permit Reviews, to facilitate streamlined plan approval, amendment, and update processes, and to promote integrated planning efforts. Specifically, the proposed amendments achieve the following major goals:

- Significantly reduce the regulatory burden on local governments while maintaining coastal management standards for local planning activities.
- Shift emphasis toward local-government-directed policy and implementation in support of coastal management goals and objectives while reducing data and analysis requirements.
- Institute shorter timelines for state review and certification to speed up the land use plan- and amendment-review process.

A public hearing was held on October 14, 2015 and only one comment was received (hearing record attached). The public comment period runs through November 16, 2015 and to date, no other comments have been received, which the Division attributes to the extensive involvement of local governments in developing the amendments. Staff is proposing one

change to the amendments regarding a provision in 15A NCAC 7B .0901(a)(3) which allows local governments with joint plans to retain authority to make changes to the plan which affect their jurisdiction. This provision was inadvertently deleted and local governments have indicated an interest in retaining the authority. Staff is recommend incorporating the provision as 15A NCAC 7B .0802(d) as follows:

15A NCAC 07B ~~.0801~~ 0802 PUBLIC HEARING AND LOCAL ADOPTION REQUIREMENTS

~~(a) Public Hearing Requirements. The local government shall provide documentation to DCM that it has followed the process required in G.S. 113A-110; and such notice shall include per .0802(b)(3), the disclosure of the public opportunity to provide written comment following local adoption of the Land Use Plan.~~

(a) Notice of Public Hearing. The local government shall provide the Secretary or his designee written notice of the public hearing for local adoption and a copy of the proposed land use plan or amendment no less than five business days prior to publication of a public hearing notice. The public hearing notice shall include, per 7B .0803(a)(2), disclosure of the public's opportunity to provide written comment to the Secretary following local adoption of the land use plan.

(b) Final Plan Content. The final ~~decision on local policies and all contents of the CAMA Land Use Plan consistent with the CAMA land use planning rules~~ land use plan or amendment shall be ~~made~~ adopted by the elected body of each participating local government.

(c) Transmittal to the ~~CRC.~~ Division for Certification. The local government shall provide the Executive Secretary of the CRC ~~with as many copies of~~ or his designee the locally adopted land use ~~plan as the Executive Secretary requests, and~~ plan, a certified statement of the local government adoption ~~action no earlier than 45 days and no later than 30 days prior to the next CRC meeting. If the local government fails to submit the requested copies of the locally adopted land use plan and certified statement to the Executive Secretary within the specified timeframe, the local government may resubmit documents within the specified timeframe for consideration at the following CRC meeting.~~ action, and documentation that it has followed the public hearing process required in G.S. 113A-110.

(d) For joint plans, originally adopted by each participating jurisdiction, each government retains its sole and independent authority to make amendments to the plan as it affects its jurisdiction.

History Note: *Authority G.S. 113A-107(a); 113A-110; 113A-124;*
Eff. August 1, 2002.
Amended Eff. January 1, 2016; January 1, 2007; February 1, 2006

Provided that no substantial comments are received by the November 16th deadline, staff is recommending adoption of the proposed amendments to the 7B State Guidelines for Land Use Plans and the 7L Local Planning and Management Grants.

Public Hearing Record
Subchapters 15A NCAC 07B and 15A NCAC 07L
October14, 2015 5:00 p.m.
DCM – Morehead City

Mike Lopazanski served as hearing officer for this public hearing. An overview of the rule amendments and fiscal analysis for 15A NCAC 07B and 07L was given. The public hearing was opened at 5:00 p.m.

Gene Foxworth, Carteret County Director of Planning, Development and General Services, commented that these were positive changes and make it easier for local governments.

No other comments were received. Public comments will be accepted until November 16, 2015. The public hearing was closed at 5:45 p.m.

includible, shall be counted in reserve beginning the first day of the month following the month the action is confirmed by the clerk of court.

Authority G.S. 108A-41; 108A-46; 143B-153.

10A NCAC 71P .0905 INCOME

(a) Eligibility Requirement. Eligibility shall be determined using the income rules governing the federal Supplemental Security Income Program (SSI) found in Title XVI of the Social Security Act which is hereby incorporated by reference including all subsequent amendments and editions. ~~Copies of this law may be obtained from the North Carolina Division of Social Services, Adult and Family Section, 325 N. Salisbury St., 2405 Mail Service Center, Raleigh, North Carolina 27699-2405, telephone number (919) 733-3677, at a cost of five cent ($0.05) per copy.~~ This law can be accessed free of charge through the federal Social Security website www.ssa.gov.

(b) Long term care insurance payments for claims on policies purchased on behalf of the beneficiary are considered income for State/County Special Assistance regardless of whether the payment is made to the provider or to the beneficiary or his/her representative.

Authority G.S. 108A-25; 108A-41; 143B-153.

10A NCAC 71P .0906 EVALUATION

Eligibility for State/County Special Assistance for Adults shall be determined based on verification that an evaluation has been completed using the Resident Assessment Instrument for Adult Care Homes and other supportive information which documents the need for care in an adult care home licensed under G.S. 131D-2, a combination home licensed under G.S. 131E, Article 6, Part A, or a facility licensed under G.S. 122C, Article 2.

Authority G.S. 143B-153; S.L. 1999-237.

TITLE 15A – DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Notice is hereby given in accordance with G.S. 150B-21.2 and G.S. 150B-21.3A(c)(2)g. that the Coastal Resources Commission intends to adopt the rules cited as 15A NCAC 07B .0801, .0804, amend the rules cited as 15A NCAC 07L .0102, .0502-.0504, repeal the rules cited as 15A NCAC 07L .0505-.0514, .0601-.0603, .0701-.0705, and readopt with substantive changes the rules cited as 15A NCAC 07B .0601, .0701, .0702, .0802, .0803

Link to agency website pursuant to G.S. 150B-19.1(c): *http://www.nccoastalmanagement.net/web/cm/proposed-rules*

Proposed Effective Date: *January 1, 2016*

Public Hearing:
Date: *October 14, 2015*
Time: *5:00 p.m.*

Location: *NC Division of Coastal Management, 400 Commerce Ave., Morehead City, NC 28557*

Reason for Proposed Action: *The Coastal Resources Commission (CRC) is proposing amendments to the CAMA Land Use Planning Program and the Planning & Management Grant Program. These amendments include increased flexibility for plan content and format, clarification that updates and amendments are voluntary, a new process option for CAMA Major Permit Review, streamlined plan approval, amendment, and update processes, and integrated planning efforts. The CRC is proposing new language for 7B .0801. Existing language and amendments to the current 15A NCAC 07B .0801 and 15A NCAC 07B .0802 have been renumbered to 7B .0802 and 7B .0803 respectively. Pursuant to G.S. 150B-21.3A, 15A NCAC 07B .0602 and 15A NCAC 07B .0901 expired effective September 1, 2015.*

Comments may be submitted to: *Braxton Davis, NC Division of Coastal Management, 400 Commerce Ave., Morehead City, NC 28557, email Braxton.davis@ncdenr.gov*

Comment period ends: *November 16, 2015*

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).

- ☐ **State funds affected**
- ☐ **Environmental permitting of DOT affected**
- **Analysis submitted to Board of Transportation**
- ☒ **Local funds affected**
- ☐ **Substantial economic impact (≥$1,000,000)**
- ☒ **Approved by OSBM**
- ☐ **No fiscal note required by G.S. 150B-21.4**
- ☐ **No fiscal note required by G.S. 150B-21.3A(d)(2)**

CHAPTER 07 – COASTAL MANAGEMENT

SUBCHAPTER 07B – STATE GUIDELINES FOR LAND USE PLANNING

SECTION .0600 – INTRODUCTION

15A NCAC 07B .0601 AUTHORITY

This Subchapter establishes the rules that local governments shall follow in developing and adopting a ~~Coastal Area Management Act (CAMA) Land Use Plan.~~ land use plan or comprehensive plan that meets the Coastal Resources Commission's (CRC) planning requirements.

Authority G.S. 113A-107(a); 113A-110; 113A-124.

SECTION .0700 – LAND USE PLANNING REQUIREMENTS

15A NCAC 07B .0701 PLANNING OPTIONS

(a) Each county within the coastal area may prepare and adopt a ~~CAMA~~ land use plan or comprehensive plan that meets the planning requirements adopted by the Coastal Resources Commission (CRC). The ~~CRC~~ Secretary shall prepare and adopt a ~~CAMA Land Use Plan~~ land use plan that meets the CRC's planning requirements for each county that chooses not to prepare and adopt a ~~CAMA Land Use Plan.~~ land use plan. Municipalities may develop individual ~~CAMA Land Use Plans~~ land use plans or comprehensive plans that meet the CRC's requirements if:

(1) the County delegates this authority to the municipality; or

(2) the ~~CRC~~ Secretary grants this authority upon application from a municipality that is currently enforcing its zoning ordinance, its subdivision regulations and the State Building Code within its jurisdiction.

~~(b) The minimum types of plans presumed for municipalities, based on population, growth rates and the presence of Areas of Environmental Concern (AECs) are illustrated in Figure 1. In addition, community characteristics other than those listed in Figure 1, such as extent of growth and resource protection issues (e.g., water quality concerns), shall be considered when determining the type of plan to be prepared.~~

~~Figure 1: TYPES OF CAMA PLANS PRESUMED FOR MUNICIPALITIES~~

		~~AREAS OF ENVIRONMENTAL CONCERN (AECs)~~		
~~POPULATION~~	~~GROWTH RATE*~~	~~OCEAN HAZARD AREAS~~	~~NON-OCEAN HAZARD AREAS**~~	~~DO NOT MEET STATUTORY THRESHOLD IN §113A-110 (e)***~~
~~≥ 5,000~~	~~N/A~~			
~~≥ 2,500~~	~~HIGH~~			
~~>1,000 and < 2,500~~	~~HIGH~~			
~~<1,000~~	~~HIGH~~			
~~≥ 2,500~~	~~MODERATE~~			
~~< 2,500~~	~~MODERATE~~			
~~≥ 2,500~~	~~LOW~~			
~~< 2,500~~	~~LOW~~			

~~Minimum Core Plan Presumed~~ ~~Core or Workbook plan~~ ~~Fold into County CAMA Land Use Plan~~

~~*GROWTH RATE (Source: Office of State Planning)~~
~~High ≥ 18.4%~~
~~Moderate > 9.2% and < 18.4%~~
~~*Low* ~~≤ 9.2%~~~~

~~**Estuarine Waters, Coastal Shorelines, Public Trust Areas, and Coastal Wetlands~~

~~***113A-110 (c) provides that municipalities may develop individual plans if (1) the County delegates this authority to the municipality or (2) the CRC grants this authority upon application from a municipality that is currently enforcing its zoning ordinance, its subdivision regulations and the State Building Code within its jurisdiction.~~

~~(c) Types of Plans~~

~~(1) Workbook plan: This is a simplified CAMA Land Use Plan that addresses the following elements:~~

~~(A) statement of community concerns, aspirations and vision;~~

~~(B) existing land use map;~~

~~(C) land suitability analysis;~~

~~(D) local growth and development policies addressing each Management Topic and applicable Areas of Environmental Concern; and~~

~~(E) future land use map.~~

~~The Division of Coastal Management (DCM) shall provide a workbook plan template to municipalities preparing this type of plan containing all required data and examples of policy alternatives.~~

~~(2) Core plan: This plan addresses all of the plan elements in Rule .0702 of this Section (Elements of CAMA Core and Advanced Core Land Use Plans) in a complete and thorough manner. This type of plan is the standard CAMA Land Use Plan required for all 20 coastal counties.~~

~~(3) Advanced core plan: The plan prepared by local governments that, due to consideration of specific local conditions, elect to exceed the core plan requirements in two or more areas. This plan also may be used to help meet the requirements of other planning programs, such as the Environmental Protection Agency's (EPA) Phase II Stormwater requirements or hazard mitigation plans, that address the CAMA goals, or to address issues of local concern, (i.e. location of a new industry or redevelopment after storm events.)~~

~~(d) Counties preparing a CAMA Land Use Plan shall prepare a core plan at a minimum.~~

~~(e) Municipalities that contain AECs may prepare a Workbook Plan, Core Plan, or Advanced Core Plan, depending on the presumptive type of plan shown in Figure 1. However, the type of plan to be prepared may change depending on needs that are identified in the scoping process described in 15A NCAC 07L. Municipalities with Ocean Hazard AECs that choose to plan shall prepare a minimum of a Core Plan. Municipalities with only Non-Ocean Hazard AECs that choose to plan shall prepare a Core Plan if they meet the population and growth rate thresholds as shown in Figure 1. Municipalities with only Non-Ocean Hazard AECs that choose to plan and are at or below the population and growth rate thresholds shown in Figure 1 may prepare a Core Plan or a Workbook Plan.~~

~~(f)~~(b) A County shall accept a municipality's locally adopted policies and implementation actions for inclusion in the County ~~CAMA Land Use Plan~~ land use plan for the municipality's jurisdiction if requested to do so by any municipality not preparing ~~an individual CAMA Land Use Plan.~~ its own land use plan. Inclusion of a municipality's adopted policies and implementation actions shall occur either at the time of County ~~CAMA Land Use Plan~~ land use plan preparation or a subsequent County ~~CAMA Land Use Plan~~ land use plan amendment. The municipality's policies and implementation actions are limited to its jurisdiction and may differ from the County's ~~policies.~~ policies and implementation actions.

~~(g)~~(c) Municipalities may seek ~~CRC~~ certification for these plans if all requirements found in 15A NCAC 07B and G.S. 113A-110 are met.

Authority G.S. 113A-107(a); 113A-110; 113A-124.

15A NCAC 07B .0702 LAND USE PLAN ELEMENTS

(a) Organization of the Plan. ~~The elements in this Rule provide general direction for development of the CAMA Core and Advanced Core Land Use Plans. A detailed Table of Contents shall be included and if the local government does not follow the outline described in this Rule, a matrix shall be included~~ Include a matrix in the land use plan or comprehensive plan that shows the ~~exact~~ location of the ~~following~~ required elements.

(b) Community Concerns and ~~Aspirations:~~ Aspirations. The purpose of this element is to provide an understanding of the underlying planning needs and desires of the community.

(1) Significant existing and emerging conditions: ~~The plan shall include a description of~~ Describe the dominant growth-related conditions that influence land use, development, water quality, and other environmental concerns in the planning area.

(2) Key issues: ~~The plan shall include a description of~~ Describe the land use

and development topics most important to the future of the planning area. At a minimum, this description shall include public access, land use compatibility, infrastructure carrying capacity, natural hazard areas, water quality, and may also include local areas of concern as described in Subparagraph (d)~~(3)~~(2) (Land Use Plan Management Topics) of this Rule.

(3) A community vision: ~~This shall consist of a description of~~ Describe the general physical appearance and form that represents the local government's plan for the future. ~~The community vision shall include statements of general~~ Include objectives to be achieved by the ~~plan. These objectives shall serve as the foundation for more specific objectives and policies stated elsewhere in the CAMA Land Use Plan. The objectives shall include~~ plan and identify changes that ~~the local government feels are~~ may be needed to achieve the planning vision.

(c) ~~Analysis of~~ Existing and Emerging ~~Conditions within the planning jurisdiction.~~ Conditions. The purpose of this element is to provide a sound factual ~~and analytical~~ base ~~that is~~ necessary to support the land use and development policies included in the plan. ~~The analysis shall be based upon the best available data or mapping information from state, federal and local sources. This element shall describe~~ Describe the following:

(1) Population, Housing, and Economy. ~~The plan shall include an analysis and~~ Include discussion of the following data and trends:

(A) Population:

(i) Permanent population growth trends using data from the two most recent decennial Censuses;

(ii) Current permanent and seasonal population estimates;

(iii) Key population characteristics;

(iv) Age; ~~and~~

(v) ~~Income.~~ Income; and

(vi) Thirty year projections of permanent and seasonal population in five year increments.

(B) Housing stock: Estimate current housing stock, including permanent and seasonal units, tenure, and types of units (single-family, multifamily, and manufactured).

~~(i) Estimate of current housing stock, including permanent and seasonal units, tenure, and types of units (single-family, multifamily, and manufactured); and~~

~~(ii) Building permits issued for single family, multifamily, and manufactured homes since last plan update.~~

(C) Local economy: ~~Employment~~ Describe employment by major sectors and ~~description of~~ community economic activity.

~~(D) Projections. Short term (five and ten year) and long term (20 year) projections of permanent and seasonal population.~~

(2) Natural ~~systems analysis. The purpose of the natural systems analysis is to describe and analyze the~~ systems. Describe the natural features and discuss the environmental conditions of the planning ~~jurisdiction, and to assess their capabilities and limitations for development. This analysis shall~~ jurisdiction to include:

(A) ~~Mapping and analysis of natural~~ Natural features. ~~The 14-digit hydrological units delineated by the Natural Resources Conservation Service shall be used as the basic unit of analysis of natural features. Maps of the following natural features shall be developed with data provided by DCM or other state agencies for analysis and plan development. These maps may be reproduced and included in the CAMA Land Use Plan at the option of the local government. If the maps are not included in the plan, they shall be made available to the public:~~

(i) Areas of Environmental Concern (AECs);

(ii) Soil characteristics, including limitations for septic tanks, erodibility, and other factors related to development;

(iii) Environmental Management Commission (EMC) water quality classifications (SC, SB, SA, HQW, and ORW) and related use support designations, and Division ~~of Environmental Health (DEH)~~ of Marine Fisheries (DMF) shellfish growing areas and water quality conditions;

(iv) Flood and other natural hazard areas;

(v) Storm surge areas;

(vi) Non-coastal wetlands including forested wetlands, shrub-scrub wetlands and freshwater marshes;

(vii) Water supply watersheds or wellhead protection areas;

(viii) Primary nursery ~~areas, where mapped;~~ areas;

(ix) Environmentally fragile areas, such as, but not limited to wetlands, natural heritage areas, areas containing endangered species, prime wildlife habitats, or maritime forests; and

(x) Additional natural features or conditions identified by the local government.

~~(B) Composite map of environmental conditions.~~

~~(i) Composite map of environmental conditions: The plan shall include a map that shows the extent and overlap of natural features listed in Part (c)(2)(A) of this Rule and, based on the local government's determination of the capabilities and limitations of these features and conditions for development, shows the location of the following three categories of land:~~

~~(I) Class I land containing only minimal hazards and limitations that may be addressed by commonly accepted land planning and development practices;~~

~~(II) Class II land containing development hazards and limitations that may be addressed by methods such as restrictions on types of land uses; special site planning; or the provision of public services; and~~

~~(III) Class III land containing serious hazards for development or lands where the impact of development may cause serious damage to the functions of natural systems.~~

~~(ii) The CAMA Land Use Plan shall describe or list the features or conditions selected by the local government for inclusion in each class.~~

~~(C)~~(B) Environmental conditions. ~~The plan shall provide an assessment of the following environmental conditions and features and discuss their limitations or opportunities for development:~~

(i) Water quality:

(I) Status and changes of surface water quality, including impaired streams from the most recent N.C. Division of Water ~~Quality Basinwide Water Quality Plans,~~ Resources Basin Planning Branch Reports, Clean Water Act 303(d) ~~List~~ List, and other comparable data;

(II) Current situation and trends on permanent and temporary closures of shellfishing waters as determined by the Report of Sanitary Survey by the Shellfish Sanitation and Recreational Water Quality Section of the N.C. Division of ~~Environmental Health;~~ Marine Fisheries;

(III) Areas experiencing chronic wastewater

treatment system malfunctions; and

(IV) Areas with water quality or public health problems related to non-point source pollution.

(ii) Natural hazards:

(I) Areas subject to ~~storm hazards such as~~ recurrent flooding, storm surges and high winds; and

(II) Areas experiencing significant shoreline erosion as evidenced by the presence of threatened structures or public ~~facilities; and~~ facilities.

~~(III) Where data is available, estimates of public and private damage resulting from floods and wind that has occurred since the last plan update.~~

(iii) Natural resources:

(I) Environmentally fragile areas ~~(as defined in Part (e)(2)(A)(ix) of this Rule)~~ or areas where resource functions ~~may be~~ are being impacted as a result of development; and

(II) ~~Areas containing potentially valuable natural resources.~~ Valuable natural resource areas that are being impacted or lost as a result of incompatible development.

These may include, but are not limited to the following: ~~beach quality sand deposits,~~ coastal wetlands, protected open space, and agricultural ~~land, that may be impacted or lost as a result of incompatible development.~~ land.

(3) ~~Analysis of~~ Existing Land Use and Development. ~~The purpose of the analysis of land use and development is to describe and quantify existing patterns of land uses, identify potential land use and land use/water use conflicts, determine future development trends, and project future land needs. The plan shall include the following mapping and analysis of existing land use:~~ Include a map and descriptions of the following:

(A) ~~A map of land including the following:~~ Existing land use patterns, which may include the following categories: Residential, commercial, industrial, institutional, public, dedicated open space, vacant, agriculture, ~~forestry, confined animal feeding operations, and undeveloped;~~ and forestry. Land use descriptions shall include estimates of the land area allocated to each land use and characteristics of each land use category.

~~(B) The land use analysis shall include the following:~~

~~(i) Table that shows estimates of the land area allocated to each land use;~~

~~(ii) Description of any land use conflicts;~~

~~(iii) Description of any land use water quality conflicts;~~

~~(iv) Description of development trends using indicators. These development trends may include, but are not limited to the following: building permits and platted but un-built lots; and~~

~~(v) Location of areas expected to experience development during the five years following plan certification by the CRC and a description of any potential conflicts with Class II or Class III land identified in the natural systems analysis.~~

~~(C)~~(B) Historic, cultural, and scenic areas designated by a state or federal agency or by local government. ~~These areas and sites shall be located on either the existing land use map or a separate map; and~~

~~(D) Projections of future land needs. The analysis shall include short term (five and ten year) and long term (20-year) projections of residential land area needed to accommodate the planning jurisdiction's projected future permanent and seasonal population (population projections as defined in Part (e)(1)(D) of this Rule (Analysis of Existing and Emerging Conditions). The projections of land needs may be increased up to 50% to allow for unanticipated growth and to provide market flexibility. For local governments experiencing low or no growth (as shown in Figure 1 in 15A NCAC 07B .0701), the projections of land needs may consider economic strategies in the final calculations.~~

(4) ~~Analysis of~~ Community Facilities. ~~The purpose of the analysis of community facilities is to evaluate~~ Evaluate existing and planned capacity, location, and adequacy of ~~key~~ community facilities that serve the community's existing and planned population and economic base; that protect important environmental factors such as water quality; and that guide land development in the coastal area. ~~This analysis~~ These shall include:

(A) Public and private water supply and wastewater systems. ~~The analysis of water and sewer systems shall include a description and map(s) of~~ Describe existing public and private systems, including existing condition and ~~capacity; location of pipelines,~~ documentation of any capacity. Describe any documented overflows, bypasses, or other problems that may degrade water quality or constitute a threat to public ~~health; existing and planned service areas; and future needs based on population projections. If any required information is not available for private systems, the local government shall so state in the plan and this factor may be eliminated from the analysis.~~ health. Indicate future needs based on population projections. Map existing and planned service areas.

(B) Transportation systems. ~~The analysis of the transportation system shall include a map showing: the existing highway system; any~~ Map the existing and planned multimodal systems and port and airport facilities. Describe any highway segments deemed by the North Carolina Department of Transportation (NCDOT) as having unacceptable service ~~levels; highway~~ levels. Describe highway facilities on the current thoroughfare plan; ~~and~~ plan or facilities on the current transportation improvement ~~program. The analysis shall also assess the impact of planned highway or other transportation facilities on growth levels and development patterns.~~ plan. Describe the impact of existing facilities on land use patterns.

(C) Stormwater systems. ~~The analysis of public and permitted private stormwater systems shall include identification of existing drainage problems in the planning area; identification of~~ Describe the existing public stormwater management system. Identify existing drainage problems and water quality issues related to point-source discharges of stormwater ~~runoff, and an overview of potential stormwater system requirements for local governments subject to the EPA's Storm Water Phase II Final Rules.~~ runoff.

~~(D) Other facilities. The local government may include additional facilities and services such as solid waste and health and safety in the analysis.~~

~~(5) Land Suitability Analysis. The purpose of the land suitability analysis is to determine the planning area's supply of land suited for development based on the following considerations: natural system constraints, compatibility with existing land uses and development patterns, the existing land use and development criteria of local, state, and federal agencies and the availability and capacity of water, sewer, stormwater management facilities, and transportation systems. The analysis shall include a land suitability map showing vacant or under utilized land that is suitable for development. The following factors shall be considered to assess land suitability:~~

~~(A) Water quality;~~

~~(B) Land Classes I, II, and III summary environmental analysis;~~

~~(C) Proximity to existing developed areas and compatibility with existing land uses;~~

~~(D) Potential impact of development on areas and sites designated by local historic commissions or the North Carolina Department of Cultural Resources as historic, culturally significant, or scenic;~~

(E) Land use and development requirements of local development regulations, CAMA Use Standards and other applicable state regulations, and applicable federal regulations; and

(F) Availability of community facilities, including water, sewer, stormwater and transportation.

(6) Review of Current CAMA Land Use Plan. The purpose of the review of the current CAMA Land Use Plan is for the local governing body to review its success in implementing the policies and programs adopted in the plan and the effectiveness of those policies in achieving the goals of the plan. The review shall include consideration of the following factors:

(A) Consistency of existing land use and development ordinances with current CAMA Land Use Plan policies;

(B) Adoption of the land use plan's implementation measures by the governing body; and

(C) Efficacy of current policies in creating desired land use patterns and protecting natural systems.

(d) Plan for the Future. Future Land Use. This element of the plan is intended to guide the development and use of land in the planning jurisdiction in a manner that achieves its goals for the community and CAMA. Policies affecting AECs shall also be used in making CAMA permit decisions. The plan for the future includes the local government's goals, land use and development policies, and future land use map. the goals of the CAMA through local government land use and development policies, including a future land use map.

(1) Land use and development goals. The following shall be considered in the development of the plan's goals: Policies.

(A) Community concerns and aspirations identified at the beginning of the planning process; and Concerns and Aspirations and Existing and Emerging Conditions shall be considered in the development of local government land use plan policies as required in Paragraphs (b) and (c) of this Rule.

(B) Needs and opportunities identified in the analysis of existing and emerging conditions.

(2) Policies:

(A)(B) Policies included in the land use plan shall be consistent with the goals of the CAMA, shall address the CRC management topics for land use plans, and comply with all state and federal rules. The CAMA Land Use Plan shall demonstrate how the land use and development goals, policies and future land use map, as required in Subparagraph (d)(4) of this Rule, will guide the development and use of land in the planning jurisdiction in a manner that is consistent with the specific management goal(s), planning objective(s) and land use plan requirements of each Management Topic.

(B) The plan shall contain a description of the type and extent of analysis completed to determine the impact of CAMA Land Use Plan policies on the management topics; a description of both positive and negative impacts of the land use plan policies on the management topics; and a description of the policies, methods, programs and processes to mitigate any negative impacts on applicable management topics.

(C) The plan shall contain a statement that the governing body either accepts state and federal law regarding land uses and development in AECs or, that the local government's policies exceed the requirements of state and federal agencies. If local policies exceed the State and Federal requirements, the CAMA Land Use Plan shall identify which policies exceed these requirements and to what extent. If the governing body intends to rely on Federal and State laws and regulations it shall reference these in the plan. Policies that exceed use standards and permitting requirements found in Subchapter 07H of this Chapter, State Guidelines for Areas of Environmental Concern, shall be identified in the plan.

(3)(2) Land Use Plan Management Topics. The purposes of the CRC management topics are to insure that CAMA Land Use Plans ensure that land use plans support the goals of the CAMA, to define the CRC's expectations for the land use planning process, land use policies, and to give the CRC a substantive provide a basis for land use plan review and certification of CAMA Land Use Plans. certification. Each of the following management topics (Public Access, Land Use Compatibility, Infrastructure Carrying Capacity, Natural Hazard Areas, Water Quality, and Local Areas of Concern) include three components: a management goal, a statement of the CRC's planning objective, and requirements for the CAMA Land Use Plans: In addition to the management topics outlined below, plans may also include policies to address local areas of concern. Each

management topic includes two components: a management goal and planning objectives.

(A) Public Access:

(i) Management Goal: Maximize public access to the beaches and the public trust waters of the coastal region.

(ii) Planning ~~Objective: Develop comprehensive policies that provide beach and public trust water access opportunities for the public along the shoreline within the planning jurisdiction.~~ Objectives: Policies ~~shall~~ that address access needs and opportunities, ~~include~~ with strategies to develop public ~~access, and identify feasible funding options.~~ access and provisions for all segments of the community, including persons with disabilities. Oceanfront communities shall establish access policies for beach areas targeted for nourishment.

~~(iii) Land Use Plan Requirements: Land use plan policies on ocean and public waterfront access shall establish local criteria for frequency and type of access facilities. These policies shall contain provisions for public access for all segments of the community, including persons with disabilities, and shall establish access criteria for beach areas targeted for nourishment.~~

(B) Land Use Compatibility:

(i) Management Goal: Ensure that development and use of resources or preservation of land ~~minimizes direct and secondary environmental impacts,~~ balance protection of natural resources and fragile areas with economic development, avoids risks to public health, safety and ~~welfare~~ welfare, and ~~is~~ are consistent with the capability of the ~~land based on considerations of interactions of natural and manmade features.~~ land.

(ii) Planning ~~Objective:~~ Objectives: Policies that characterize future land use development patterns and establish mitigation criteria and concepts to minimize conflicts.

~~(I) Adopt and apply local development policies that balance protection of natural resources and fragile areas with economic development.~~

~~(II) Policies shall provide direction to assist local decision making and consistency for zoning, divisions of land, and public and private projects.~~

~~(iii) Land Use Plan Requirements:~~

~~(I) Establish building intensity and density criteria, such as floor area ratio and units per acre, consistent with the land suitability analysis for each land use designation on the Future Land Use Map.~~

~~(II) Establish local mitigation criteria and concepts. These may include, but are not limited to the following: cluster subdivision design, enacting local buffers, impervious surface limits, and innovative stormwater management alternatives.~~

(C) Infrastructure Carrying Capacity:

(i) Management Goal: Ensure that public infrastructure systems are appropriately sized, located and managed so the quality and productivity of AECs and

other fragile areas are protected or restored.

(ii) Planning ~~Objective: Establish level of service policies and criteria for infrastructure consistent with Part (e)(3)(D) (Projections of Future Land Needs) of this Rule.~~ Objectives: Policies that establish service criteria and ensure improvements minimize impacts to AECs and other fragile areas.

~~(iii) Land Use Plan Requirements:~~

~~(I) Identify/establish service area boundaries for existing and future infrastructure.~~

~~(II) Correlate future land use map categories with existing and planned infrastructure such as wastewater, water infrastructure and transportation.~~

(D) Natural Hazard Areas:

(i) Management Goal: Conserve and maintain barrier dunes, beaches, flood plains, and other coastal features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

(ii) Planning ~~Objective: Develop policies~~ Objectives: Policies that establish mitigation and adaptation concepts and criteria for development and redevelopment, including public facilities, and that minimize threats to life, property, and natural resources resulting from ~~development located in or adjacent to hazard areas, such as those subject to~~ erosion, high winds, storm surge, flooding, or ~~sea level rise.~~ other natural hazards.

~~(iii) Land Use Plan Requirements:~~

~~(I) Develop location, density, and intensity criteria for new, existing development and redevelopment including public facilities and infrastructure so that they can better avoid or withstand natural hazards.~~

~~(II) Correlate existing and planned development with existing and planned evacuation infrastructure.~~

(E) Water Quality:

(i) Management Goal: Maintain, protect and where possible enhance water quality in all coastal wetlands, rivers, streams and estuaries.

(ii) Planning ~~Objective: Adopt policies for coastal waters within the planning jurisdiction to help ensure that water quality is maintained if not impaired and improved if impaired.~~ Objectives: Policies that establish strategies and practices to prevent or control nonpoint source pollution and maintain or improve water quality.

~~(iii) Land Use Plan Requirements:~~

~~(I) Devise policies that help prevent or control nonpoint source discharges (sewage and storm water) such as, but not limited to the following: impervious surface limits, vegetated riparian buffers, natural areas, natural area buffers, and wetland protection.~~

~~(II) Establish policies and land use categories aimed at protecting open~~

shellfishing waters and restoring closed or conditionally closed shellfishing waters.

(F) Local Areas of Concern:

(i) Management Goal: Integrate local concerns with the overall goals of CAMA in the context of land use planning.

(ii) Planning Objective: Identify and address local concerns and issues, such as cultural and historic areas, scenic areas, economic development, downtown revitalization or general health and human services needs.

(iii) Land Use Plan Requirements: Evaluate local concerns and issues for the development of goals, policies and implementation strategies. These may include timelines and identification of funding options.

(4)(3) Future land use map. This map depicts application of Depict the policies for growth and development, and the desired future patterns of land use and land development with consideration given to natural system constraints and infrastructure. policies. The local government shall include such categories and Include designations with descriptions of land uses and development as are required to accurately illustrate the application of its policies. At a minimum, the map shall show the following: development.

(A) 14-digit hydrological units encompassed by the planning area;

(B) areas and locations planned for conservation or open space and a description of compatible land uses and activities;

(C) areas and locations planned for future growth and development with descriptions of the following characteristics:

(i) predominant and supporting land uses that are encouraged in each area;

(ii) overall density and development intensity planned for each area; and

(iii) infrastructure required to support planned development in each area.

(D) areas in existing developed areas for infill, preservation, and redevelopment;

(E) existing and planned infrastructure, including major roads, water, and sewer.

The local government may use additional or more detailed categories if required to depict its land use policies. If the future land use map shows development patterns or land uses that are not consistent with the natural systems analysis, or the land suitability analysis, then the plan shall include a description of the steps that the local government shall take to mitigate the impacts. In addition, the plan shall include an estimate of the cost of any community facilities or services that shall be extended or developed. The amount of land allocated to various uses shall be calculated and compared to the projection of land needs. The amount of land area thus allocated to various uses may not exceed projected needs as delineated in Part (c)(3)(D) of this Rule (Projections of Future Land Needs).

(e) Tools for Managing Development. This element of the plan provides a description of The purpose of this element is to describe the management tools that and actions the local government selects and the actions to be taken will use to implement the CAMA Land Use Plan. land use plan. It also includes a five-year schedule for implementation. This element shall include:

(1) Guide for land use decision-making. Describe the specific role and the status of the land use plan policies and policies, including the future land use plan map map, in local decisions regarding land use and development.

(2) Existing development program. Describe the community's existing development management program, including local ordinances, codes, plans and policies, state and federal laws and regulations, and the role that the existing management program plays in implementing the plan. This description shall also include the community's approach to coordinating these codes and rules to implement the land use and development policies. policies.

(3) Additional tools. Describe any of the following additional tools selected by the local government to implement the CAMA land use plan policies:

(A) Ordinances:

(i) Amendments or adjustments in existing development codes required for consistency with the plan;

(ii) New ordinances or codes to be developed;

(B) Capital improvements program. New, upgraded or expanded community facilities, such as but not limited to the following: water, sewer, stormwater, transportation, and other facilities, and

~~policies regarding connections to and extensions of community facilities;~~

~~(C) Acquisition program. Planned acquisition of property, easements, or rights of way; and~~

~~(D) Specific projects to reach goals.~~

~~(4)~~(3) Action ~~plan/schedule.~~plan and implementation schedule. Describe ~~the priority~~ actions that will be taken by the local government to implement ~~the CAMA Land Use Plan and specify~~ policies that meet the CRC's Management Topic goals and objectives. Specify the fiscal year(s) in which each action is anticipated to start and finish. ~~The document shall contain a description of~~ Describe the specific steps ~~that~~ the local government plans to take to ~~involve the public in monitoring implementation of the CAMA Land Use Plan,~~ implement the policies, including the adoption and amendment of local ~~ordinances that affect AECs.~~ ordinances, plans, and special projects. The action plan shall be used to prepare the implementation status report for the ~~CAMA Land Use Plan.~~ land use plan.

Authority G.S. 113A-102; 113A-107(a); 113A-110; 113A-111; 113A-124.

SECTION .0800 – LAND USE PLAN AND AMENDMENT REVIEW AND CERTIFICATION

15A NCAC 07B .0801 STATE REVIEW AND COMMENT ON DRAFT PLAN

Procedure for Agency Review and Comment. The Division shall review all draft land use plans for consistency with the CRC's requirements for land use plans prior to local adoption. The Division shall provide notice to the CRC, other State and Federal Agencies, and adjacent jurisdictions (including non-CAMA areas and if applicable, out of state areas) that the plan is available for review and comment. The review period shall be 30 calendar days. After the review period ends, comments shall be provided to the local government within 45 calendar days.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07B ~~.0801~~ .0802 PUBLIC HEARING AND LOCAL ADOPTION REQUIREMENTS

~~(a) Public Hearing Requirements. The local government shall provide documentation to DCM that it has followed the process required in G.S. 113A-110, and such notice shall include per .0802(b)(3), the disclosure of the public opportunity to provide written comment following local adoption of the Land Use Plan.~~

(a) Notice of Public Hearing. The local government shall provide the Secretary or his designee written notice of the public hearing for local adoption and a copy of the proposed land use plan or amendment no less than five business days prior to publication of a public hearing notice. The public hearing notice shall include, per Rule .0803(a)(2) of this Section, disclosure of the public's opportunity to provide written comment to the Secretary following local adoption of the land use plan.

(b) Final Plan Content. The final ~~decision on local policies and all contents of the CAMA Land Use Plan consistent with the CAMA land use planning rules~~ land use plan or amendment shall be ~~made~~ adopted by the elected body of each participating local government.

(c) Transmittal to the ~~CRC.~~Division for Certification. The local government shall provide the Executive Secretary of the CRC ~~with as many copies of~~ or his designee the locally adopted land use ~~plan as the Executive Secretary requests, and~~ plan, a certified statement of the local government adoption ~~action no earlier than 45 days and no later than 30 days prior to the next CRC meeting. If the local government fails to submit the requested copies of the locally adopted land use plan and certified statement to the Executive Secretary within the specified timeframe, the local government may resubmit documents within the specified timeframe for consideration at the following CRC meeting.~~ action, and documentation that it has followed the public hearing process required in G.S. 113A-110.

Authority G.S. 113A-107(a); 113A-110; 113A-124.

15A NCAC 07B ~~.0802~~ .0803 CERTIFICATION AND USE OF THE PLAN

~~(a) Re-Certification: If the CRC adopts new CAMA Land Use Plan rules, plans shall be updated within six years of the effective date of the new rules. If a scoping process is held, a summary shall be provided to the CRC along with the request for re-certification of the existing CAMA Land Use Plan.~~

~~(b)~~(a) ~~Committee Designated by CRC to Review Local~~ Secretary Certification of Land Use ~~Plans:~~ Plans and Amendments:

(1) The ~~appropriate DCM~~ Division District Planner shall submit a written report to the ~~committee designated by the CRC as to the type of plan being presented, highlight any unique characteristics of the plan, identify any land use conflicts with adjacent planning jurisdictions or other state/federal agencies, identify any inaccuracy or inconsistency of items in the plan, and recommend certification, conditional certification, or non-certification.~~ Secretary on the locally adopted land use plan or amendment and either recommend certification or identify how the plan or amendment does not meet the procedures and conditions for certification.

~~(2) The local government shall submit its draft Land Use Plan to the committee designated by the CRC.~~

~~(3)~~(2) The public shall have an opportunity to submit written ~~objections, comments, or statements of support prior to action by the committee designated by the CRC.~~ objections or comments on the locally adopted land use plan or amendment prior to action by the Secretary. Written objections shall be received by ~~DCM no less than 15 business days prior to the next scheduled CAMA Land Use Plan review meeting and~~ the Division no more than 30 calendar days after local adoption of the land use plan or amendment, shall be limited to the

criteria for ~~CRC~~ certification as defined in Subparagraph ~~(c)~~(3) (a)(3) of this ~~Rule. Written objections~~ Rule, and shall identify the specific plan elements that are opposed. ~~A copy of any~~ Written objections or comments shall be sent by the ~~DCM~~ Division to the local government submitting the ~~CAMA Land Use Plan~~ land use plan or amendment. Written objections shall be considered in the certification of the local land use plan or amendment.

~~(4)~~(3) ~~The local government may withdraw the submitted CAMA Land Use Plan from CRC consideration at any time before review.~~ The Secretary shall certify land use plans and amendments following the procedures and conditions specified in this Rule. The Secretary shall certify plans and amendments which:

(A) are consistent with the current federally approved North Carolina Coastal Management Program;

(B) are consistent with the Rules of the CRC;

(C) do not violate state or federal law; and

(D) contain policies that address each Management Topic.

(4) If the land use plan or amendment does not meet certification requirements the Secretary shall within 45 calendar days inform the local government how the plan or amendment does not meet the procedures and conditions for certification.

(b) Copies of the Plan. Within 90 calendar days of certification of the land use plan or an amendment the local government shall provide one printed and one digital copy of the land use plan to the Division. Amendments shall be incorporated in all copies of the plan. The dates of local adoption, certification, and amendments shall be published on the cover.

(c) Use of the Plan. Once certified, the land use plan shall be utilized in the review of CAMA permits in accordance with G.S. 113A-111. Local governments shall have the option to exercise their enforcement responsibility by choosing from the following:

(1) Local administration. The local government reviews CAMA permits for consistency with the land use plan.

(2) Joint administration. The local government identifies policies, including the future land use map and implementation actions that will be used by the Division for CAMA permit consistency reviews.

(3) Division administration. The Division reviews CAMA permits for consistency with the land use plan policies, including the future land use map and implementation actions.

(d) Plan updates and Amendments. Local governments shall determine the scope, timing, and frequency of plan updates and amendments.

~~(e) CRC Certification.~~

~~(1) The CRC shall certify the CAMA Land Use Plan following the procedures and conditions specified in this Rule.~~

~~(2) Provided the locally adopted land use plan has been received by the Executive Secretary no earlier than 45 days and no later than 30 days prior to the next CRC meeting, the CRC shall certify, conditionally certify or not certify the plan at that meeting or mutually agreed upon date. If the CRC fails to take action as specified above the plan shall be certified.~~

~~(3) The CRC shall certify plans which:~~

~~(A) are consistent with the current federally approved North Carolina Coastal Management Program;~~

~~(B) are consistent with the Rules of the CRC;~~

~~(C) do not violate state or federal law;~~

~~(D) contain policies that address each Management Topic. If a local government cannot meet any CAMA Land Use Plan requirement contained within Paragraphs (d) and (e) of 15A NCAC 07B .0702 the plan shall include a description of the analysis that was undertaken, explain the reason(s) the requirement could not be met, and the local government's alternative plan of action to address the CAMA Land Use Plan requirements. If such description(s) are not included in the plan, it shall not be certified; and~~

~~(E) contain a local resolution of adoption that includes findings which demonstrate that policy statements and the Future Land Use Plan Map (FLUP) have been evaluated, and determine that no internal inconsistencies exist.~~

~~(d) Non-Certification. If the plan is not certified the CRC shall within 30 days inform the local government as to how the plan might be changed so certification can be granted. Until the plan is certified, the pre-existing certified CAMA Land Use Plan shall remain in effect.~~

~~(e) Conditional Certification. If the plan is conditionally certified, the CRC shall within 30 days provide the local government with condition(s) that shall be met for certification. Until the condition(s) is met on a conditionally certified plan, the pre-existing certified CAMA Land Use Plan shall remain in effect. When the local government complies with all conditions for a conditionally certified plan, as determined by the Executive Secretary of the CRC, plan certification is automatic with no further action needed by the CRC.~~

Authority G.S. 113A-107(a); 113A-110; 113-111; 113A-124.

15A NCAC 07B .0804 REQUIRED PERIODIC IMPLEMENTATION STATUS REPORTS

(a) Jurisdictions with a locally adopted and certified land use plan shall submit an Implementation Status Report every two years from the date of initial certification. This report shall be based on implementation actions that meet the CRC's Management Topic goals and objectives, as indicated in the action plan. The Implementation Status Report shall also identify:

(1) All local, state, federal and joint actions that have been undertaken successfully to implement its certified land use plan;

(2) Any actions that have been delayed and the reasons for the delays;

(3) Any unforeseen land use issues that have arisen since certification of the land use plan; and

(4) Consistency of existing land use and development ordinances with current land use plan policies.

Authority G.S. 113A-112; 113A-124.

SUBCHAPTER 07L - LOCAL PLANNING AND MANAGEMENT GRANTS

SECTION .0100 - PURPOSE AND AUTHORITY

15A NCAC 07L .0102 PURPOSE

The purpose of the Rules in this Subchapter is to establish the criteria and procedures for funding the DENR program of grants for local ~~Coastal Area Management Act (CAMA)~~ land use plans or comprehensive plans and coastal planning and management projects within North Carolina's coastal area. These funds are made available to assist local governments in developing and implementing ~~CAMA~~ land use plans and management strategies for their coastal resources, as mandated and encouraged by the CAMA. Funds are to be used in refining and carrying out local land use planning and management programs by local governments within the 20 counties defined by the CAMA.

Authority G.S. 113A-112; 113A-124.

SECTION .0500 - GENERAL STANDARDS

15A NCAC 07L .0502 CONSISTENCY WITH PLANS AND RULES

All proposed projects must be consistent ~~with, CAMA,~~ with CAMA, state rules and standards implementing CAMA, certified local ~~CAMA~~ land use plans ~~certified by the Coastal Resources Commission (CRC),~~ and the state's federally approved coastal management program.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0503 PRIORITIES FOR FUNDING ~~CAMA~~ LAND USE PLANS AND IMPLEMENTATION PROJECTS

(a) In funding local planning and management grants, DENR shall follow the general priorities set out in 15A NCAC 07L .0503(b). Examples of the types of eligible projects are listed and have been placed in the appropriate priority category. ~~Any applications for project funding not specifically identified and placed in a priority category shall be assigned the appropriate priority category by DENR upon receipt of the application. Funding priorities and eligibility for the Sustainable Communities Component of the planning program are described in 15A NCAC 07L .0512.~~

(b) General priority categories for local planning and management grants are as follows:

(1) The highest priority includes projects directly mandated by statute, including initial and updated ~~CAMA~~ land use plans, local participation in projects initiated by DENR, and projects DENR indicates urgently need local attention in order to meet CRC management topics. ~~In general, grants for projects in this priority category, except CAMA Workbook land use plans, shall be funded for no more than 85 percent of the total project cost, although lower funding percentages may be awarded. The type of CAMA land use plan to be funded and the corresponding percentage of funding shall be based on community characteristics as determined during the scoping process described in 15A NCAC 07L .0505 to be held prior to project application.~~

(2) The second priority includes projects directly related to carrying out the explicit goals of CAMA, for which DENR indicates there is a high priority for local actions or projects which are coastally dependent (water-related) or projects to implement ~~the CAMA~~ a land use plan such as public facilities planning or land use regulations preparation. ~~Grants for projects in this category shall be for no more than 65 percent of the total project cost, although lower funding percentages may be awarded.~~

(3) The third priority includes projects related to improving local coastal management and land use management capabilities. ~~Grants for projects in this priority category shall be for no more than 50 percent of the total project cost, although lower funding percentages may be awarded.~~

(c) In addition, DENR shall take into consideration the following factors listed in order of importance to establish priorities for individual projects within the general priority categories:

(1) project's contribution towards meeting CRC management topics;

(2) the extent to which the project includes measures of environmental protection beyond Areas of Environmental Concern (AEC) standards;

(3) applicant's urgency of need;

(4) past history of applicant's implementation of CAMA planning and management activities;

(5) feasibility of successful completion of project by the applicant;

(6) past experience with this program as well as present management and administrative capabilities;

(7) potential applicability of the project to other coastal area municipalities and counties; and

(8) geographic distribution of applicants.

~~(d) In priority categories two and three, the proportion of the grant award to total project costs shall be the same for all similar projects. For example, if one waterfront access plan is funded at a 60 percent level, all waterfront access plans shall be funded at a 60 percent level. The only exception to this involves multi-year projects which may receive a lower level of funding within a given priority category after the initial year.~~

~~(e)~~(d) ~~Generally, available funds shall first be allocated to projects in priority category one; then, if there are funds remaining, grants shall be made to projects in priority category two; and then, if there are funds remaining, grants may be made to projects in priority category three. However, the factors listed in Paragraph (c) of this Rule shall also be considered in funding decisions. Sustainable Communities projects shall be funded as described in 15A NCAC 07L .0512.~~ The North Carolina Department of Commerce's Tier designations, as outlined by the Lee Act (G.S. 105-129.3) shall be used to determine the economic status of counties. Local government contributions for land use plan and implementation projects shall be at least 25 percent of the project costs except for Tier 1 designated counties and their respective municipalities which shall have a local government contribution of at least 10 percent of the project costs. At least one half of the local contribution shall be cash match; the remainder may be in-kind match.

~~(f)~~(e) Any local government whose ~~CAMA~~ land use plan is not certified ~~by the CRC~~ due to failure to meet the criteria listed in 15A NCAC 07B ~~.0803~~ or that has not submitted the most recent Required Periodic Implementation Status Report as described in 15A NCAC 07B, shall not receive further funding under this program until these inconsistencies are corrected.

~~(g) Any local government that is not implementing its certified CAMA land use plan shall not receive additional funding under this program. CAMA land use plan implementation shall be documented through periodic Implementation Status Reports provided to the Division of Coastal Management (DCM), as described in 15A NCAC 07L .0511 (Required Periodic Implementation Status Reports). A local government that is deemed by the DCM Planner to not have implemented its current CAMA land use plan may seek a review by the Director of the DCM to determine if the current CAMA land use plan implementation is acceptable to receive future funding.~~

~~(h) All funding decisions shall be based on availability and amount of state and federal appropriations.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0504 ELIGIBLE PROJECTS

(a) The lists in Paragraph (b) of this Rule constitute types of projects that will be considered for funding. Each type of project listed has been assigned to one of the priority categories described in 15A NCAC 07L .0503 (Priorities For Funding ~~CAMA~~ Land Use Plans and Implementation Projects.) These lists are not intended to be exhaustive or restrictive. Local governments may apply for funds for any related projects that will improve local planning and management capabilities.

(b) Examples of eligible projects and their associated priority category include:

(1) Priority Category-Type 1

(A) Those activities specifically designated by DENR on an annual basis, following consultation with the CRC and local governments, to be necessary to bring local plans into compliance with state rules for land use planning;

(B) Adopting, amending, or updating ~~CAMA~~ land use plans to reflect changed conditions (these may include, but are not limited to: necessary data collection, public participation, policy development).

(2) Priority Category-Type 2

(A) Adopting or amending ordinances to further secure compliance with state rules in AECs;

(B) Beach access plans and studies (these may include, but are not limited to: inventory and identification of sites, design of access improvements, acquisition plans and studies, legal studies necessary to determine the extent of public use rights);

(C) Erosion control plans and studies (these may include, but are not limited to: mapping, erosion rate measurement, design of protection strategies for public lands, cost-benefit analysis, relocation plans and strategies);

(D) Studies and planning leading to the nomination of new AECs as described in 15A NCAC 07H .0503, or locally significant environmental areas;

(E) Waterfront redevelopment and renewal plans and studies including feasibility studies, site design studies, and plans and studies for improving or enhancing water-front parks and public areas (these may include, but are not limited to: site design, use studies, cost analysis);

(F) Preparing, adopting, or amending ordinances necessary to carry out certified ~~CAMA~~ land use plans, state rules, and the state coastal zone management plan (including but not limited to regulations on or for zoning, subdivision, stormwater management, dune protection beyond AEC standards, sanitation, building, mobile homes, historic preservation, signs,

natural area protection, environmental impact ~~statements);~~ statements).

~~(G) Hazard mitigation plans.~~

(3) Priority Category-Type 3

(A) Initial water and sewer plans and studies;

(B) Land use related capital facilities programming;

(C) Base mapping as a management tool;

(D) Other planning, studies, and data acquisition supportive of coastal planning and management including but not limited to public education or involvement on coastal issues; solid waste planning; port planning; sport and commercial fishing studies;

(E) Enforcement of ordinances adopted to carry out certified ~~CAMA~~ land use plans;

(F) Coordination of local coastal management activities with other local management activities (these may include, but are not limited to: internal coordination, city-county coordination);

(G) Other coastally related management projects.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0505 SCOPING OF PLANNING NEEDS

~~(a) If a local government intends to request funding from DENR for the development or update of a CAMA land use plan a scoping meeting shall occur between the local government and the DCM. This meeting shall occur prior to the submission of a grant application. The scoping meeting shall determine the extent of planning needs and the type of plan to be produced and funded.~~

~~(b) The discussion and recommendations from the scoping meeting shall be presented at a regular meeting of the local governing board where action shall be taken to accept or modify the recommendations. Standard public meeting notification procedures common to the local government in question are sufficient public notice for these purposes, provided the notification specifically states that the scoping recommendations shall be discussed and acted upon. In addition, notification of the public meeting shall be provided to the DCM District Planner. Public input shall be accepted and considered at this meeting.~~

~~(c) Assuming federal and state appropriations remain at or close to the 2001-02 fiscal year appropriations, DENR intends to provide funds for local governments to update their CAMA land use plans every six years. In the case of existing plans, the scoping process shall take place during the fourth year after the last certification. The local government may request scoping before the fourth year if special circumstances are identified in the Implementation Status Report described in 15A NCAC 07L .0511 Required Periodic Implementation Status Reports.~~

~~(d) The community characteristics to be discussed during the scoping process to help determine the type of plan to be prepared shall include:~~

~~(1) The capacity of the local government to administer the planning process;~~

~~(2) Population growth rate as projected by the State Planning Office;~~

~~(3) Development trends, such as number and type of building permits issued, number of lots subdivided, number of CAMA permits issued since certification of the current CAMA land use plan, and new and proposed industry;~~

~~(4) Extent of AECs;~~

~~(5) Water quality considerations including: Division of Water Quality (DWQ) classifications (outstanding resource waters, high quality waters) and current conditions (as per Basinwide Water Quality Plans, Use Support Designations.); and Division of Marine Fisheries (DMF) primary nursery areas and current conditions (as per Coastal Habitat Protection Plans); and shellfishing waters and their current conditions;~~

~~(6) Natural and manmade hazards and other issues affecting land use; and~~

~~(7) Natural and environmental constraints (these may include, but are not limited to: hydric soils and well head protection areas) which affect land use.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0506 PUBLIC PARTICIPATION

~~(a) Local Governments receiving DENR funding for CAMA land use plan preparation shall be responsible for the development and implementation of a Citizen Participation Plan. Local governments shall employ a variety of educational efforts and participation techniques to assure that all socioeconomic segments of the community and non-resident property owners have opportunities to participate during plan development.~~

~~(b) Extent of Required Effort. Prior to the start of CAMA land use plan development, the local governing board shall develop and adopt a Citizen Participation Plan. Interested citizens shall have an opportunity to participate in the development of the CAMA land use plan through oral and written comments as provided for in the Citizen Participation Plan. Copies of informational CAMA land use plan materials shall be provided at all meetings of the planning group. The Citizen Participation Plan shall be available to the public throughout the planning process. At a minimum, the Citizen Participation Plan shall include the following:~~

~~(1) Designation of the principal local board, agency, department or appointed group that shall take the lead role in preparing or updating the CAMA land use plan, including a contact name, address, and telephone number.~~

~~(2) A specific date and time for an initial public information meeting or series of meetings.~~

(A) During the meeting(s) a local government updating its plan shall discuss the statements of local policy in the current CAMA land use plan, the effect of those policies on the community, and the ways the plan has been used to guide development during the past planning period. The local government shall explain the process by which it will report to the public and solicit the views of a wide cross-section of citizens in the development of updated policy statements.

(B) Written notice of the public information meeting(s) shall be published in a newspaper of general circulation in the planning jurisdiction twice prior to the public information meeting(s). The first notice shall appear not less than 30 days prior to the public information meeting(s). The second notice shall appear not less than 10 days prior to the meeting. Notice of the meeting shall also be conveyed to local Coastal Resources Advisory Council (CRAC) member(s) and to the appropriate DCM District Planner.

(C) The local government shall offer an opportunity for public comment during the public information meeting(s).

(D) The tools to be used to report planning progress to the public during CAMA land use plan development, such as newspaper reports, local government newsletters, radio or television announcements or other reporting methods shall be described at the initial public meeting. More than one means is required.

(3) A description of the methods and techniques that shall be used to solicit public participation and input, such as citizen surveys, questionnaires, informational brochures, community outreach, town meetings or other pro-active methods. The Citizen Participation Plan shall describe the results that are expected from the methods and techniques that are used. More than one means is required and at least one effort shall be made to solicit input from non-resident landowners.

(4) A general outline of the meeting schedule for the group developing the CAMA land use plan, as designated in Subparagraph (b)(1) of this Rule.

(c) All regular meetings of the designated planning group where the CAMA land use plan is discussed shall offer time on the agenda for public comment. A list of the names of speakers offering public comment and a copy of any written comments provided shall be kept on file by the local government and provided to the DCM staff for use in the CAMA land use plan review process.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0507 MINIMUM CAMA LAND USE PLANNING AND FUNDING REQUIREMENTS

(a) Each year DCM shall develop a list of local governments with whom DCM shall initiate a scoping process during the upcoming five years and the year in which DENR expects to have funds available for each local government desiring to seek DENR funding.

(b) To receive funding from DENR, counties shall, at a minimum, prepare a CAMA Core land use plan, as described in 15A NCAC 07B.

(c) To receive funding under this grant program for CAMA Core land use plan development, municipalities must have AECs within their jurisdiction and meet the population and growth rate thresholds as shown in Figure 1. To receive funding under this grant program, municipalities with Ocean Hazard AECs must, at a minimum, prepare a CAMA Core land use plan. Additionally, municipalities with non-Ocean Hazard AECs shall at a minimum prepare a CAMA Core land use plan if they meet the population and growth rate thresholds as shown in Figure 1. Municipalities with only non-Ocean Hazard AECs that are at or below the population and growth rate thresholds shown in Figure 1 may prepare a CAMA Core land use plan or a Workbook Plan as described in 15A NCAC 07B. In addition, community characteristics other than those listed in Figure 1, such as extent of growth and resource protection issues (such as water quality concerns) being addressed by the municipality, shall be considered during the scoping process described in 15A NCAC 07L .0505 when determining the final planning option to be funded.

(d) Municipalities that do not meet the minimum plan making authority of G.S. 113A-110(e) or those with no AECs within their planning jurisdiction shall not be funded for individual plans except under special circumstances and if funds are available. Examples of special circumstances include: the existence of non-AEC fragile areas (such as federally regulated wetlands, historic and cultural resources, critical wildlife habitats and scenic areas), land use compatibility problems or unexpected growth pressures, such as the relocation of major industry to the area.

(e) Figure 1 illustrates the criteria DENR shall use to determine the minimum types of plans that shall be expected and funded for municipalities.

Figure 1: PRESUMED MINIMUM FUNDING FOR MUNICIPAL CAMA LAND USE PLANS

		AREAS OF ENVIRONMENTAL CONCERN (AECs)		
POPULATION	GROWTH RATE*	OCEAN HAZARD AREAS	NON-OCEAN HAZARD AREAS**	AECs NOT PRESENT OR DO NOT MEET 113A-110 (e)***
≥ 5,000	N/A			
≥ 2,500	HIGH			
>1,000 and < 2,500	HIGH			
<1,000	HIGH			
≥ 2,500	MODERATE			
< 2,500	MODERATE			
≥ 2,500	LOW			
< 2,500	LOW			

Core Plan — Core or Workbook plan to be determined in the scoping process — No Funding

(f) CAMA Land Use Plans shall be funded as follows:

(1) The North Carolina Department of Commerce's Tier designations, as outlined by the Lee Act (G.S. 105-129.3), shall be used to determine the economic status of counties. Counties designated as Tier 1 and Tier 2 shall be considered economically distressed. Economically distressed counties that prepare a CAMA Core land use plan shall be funded at no more than 75 percent of the project costs, although lower percentages of funding may be provided. Counties that prepare a CAMA Core land use plan and do not have a Tier 1 or Tier 2 designation shall be funded at no more than 65 percent of the project cost, although lower percentages of funding may be provided.

(2) Municipalities preparing CAMA Core land use plans shall be funded at no more than 60 percent of the project cost, although lower percentages of funding may be provided.

(3) Counties and municipalities preparing CAMA Advanced Core land use plans, as described in 15A NCAC 07B, shall be funded at no more than 75 percent, except for Tier 1 and Tier 2 designated counties preparing CAMA Advanced Core land use plans. If so designated, these County plans shall be funded at no more than 85 percent, although lower funding percentages may be provided. Eligibility for funding to prepare a CAMA Advanced Core land use plan shall be determined during the scoping process and shall be based on the level of planning proposed by the local government. To be considered for funding to prepare a CAMA Advanced Core land use plan, the proposal must demonstrably maintain or improve local environmental conditions and advance the local government towards implementation of its currently certified CAMA land use plan.

(4) Municipalities preparing CAMA Workbook land use plans may receive no more than three thousand dollars ($3,000.00) for map preparation only.

(5) Local governments that choose to combine individual plans into joint or regional plans shall be eligible for funding not to exceed the amount that would have been provided for individual plans.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0508 STATE TECHNICAL ASSISTANCE, REVIEW AND COMMENT ON PRELIMINARY DRAFT PLAN

(a) Educating Local Officials: At the beginning of the planning process, DCM shall provide opportunities for educating local officials about the CAMA land use planning rules, through such means as workshops and training videos.

(b) Maps and Data: DCM shall provide maps and data to assist with developing the CAMA land use plan. This data may include population, natural resources, water quality, economic activity and transportation infrastructure for counties, and where available, for municipalities. Local governments may supplement this data with additional, or more recent, data from federal, state, local, and other sources.

(c) Procedures for Agency Review and Comment: DCM shall review all draft CAMA land use plans for technical accuracy and consistency with the CRC's requirements for CAMA land use plans and shall provide notice to the CRC and other State and Federal Agencies that the plan is available for review and comment.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0509 INTERGOVERNMENTAL COORDINATION

(a) Notification of Adjacent Jurisdictions (including non-CAMA areas, and if applicable, out of state areas): Each local government receiving funding for CAMA land use planning from DENR shall solicit comments on its preliminary draft CAMA land use plan or updates submitted for state review from adjacent jurisdictions and applicable regional planning entities. Solicitation shall be made in writing and a copy of the draft CAMA land use plan shall accompany the request. The review period shall be, at a minimum, 45 calendar days. After the review period ends, any comments from the adjacent planning jurisdictions and regional planning entities shall be provided to the local governing body and to the applicable DCM District Planner. Additionally, within 90 days after CRC certification of a CAMA land use plan, the local government shall provide one copy of its plan to each jurisdiction with which it shares a common border and with the regional planning entity.

(b) Coordination of Policies: Where watershed(s) that contain an AEC fall within more than one planning jurisdiction, the jurisdictions shall coordinate the development of land use policies affecting shared AECs to the greatest extent practical.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0510 PUBLIC HEARING AND LOCAL ADOPTION REQUIREMENTS

(a) Public Hearing Requirements For Local Governments Receiving Funding From DENR For Land Use Planning. Local adoption of the CAMA land use plan requires a public hearing. Notice of the hearing shall state the date, time, place, proposed action, and that copies of the document may be reviewed at a particular office in the county courthouse, county office building, or town hall during designated hours. Any other public facility where the document can be reviewed such as a library or community center shall be designated in the notice. The notice must appear at least twice in a newspaper of general circulation in the planning jurisdiction. The first notice must appear not less than 30 days prior to the hearing. The second notice must appear not less than 10 days prior to the hearing. Written notice of the public hearing shall be posted on the local government's principal bulletin board 30 days prior to the hearing or, if there is no such bulletin board, at the door of the governing body's usual meeting room. If possible, an electronic hearing notice shall be provided on the World Wide Web at the time of the original notice.

(b) 30 Day Local Review Period. Copies of the proposed CAMA land use plan or update (final draft) shall be available for public review at the time the first notice is provided and in the place(s) listed in the notice. At least one copy of the draft plan shall be available for checkout for a 24-hour period by residents and property owners of the planning jurisdiction.

(c) Minor editorial changes after the public hearing are acceptable without re-advertising the notice. Substantive changes such as re-wordings that alter the basic intent of policy statements or changes in timelines for actions in the original notice shall require a new public hearing. This notice shall be advertised in the same manner as the original.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0511 REQUIRED PERIODIC IMPLEMENTATION STATUS REPORTS

(a) To be eligible for future funding each local government engaged in CAMA land use planning shall complete a CAMA land use plan Implementation Status Report every two years as long as the current plan remains in effect. DCM shall provide a standard implementation report form to local governments. This report shall be based on the action plan and schedule provided in 15A NCAC 07B Tools for Managing Development.

(b) The Implementation Status Report shall identify:

(1) All local, state, federal, and joint actions that have been undertaken successfully to implement its certified CAMA land use plan;

(2) Any actions that have been delayed and the reasons for the delays;

(3) Any unforeseen land use issues that have arisen since certification of the CAMA land use plan;

(4) Consistency of existing land use and development ordinances with current CAMA land use plan policies; and

(5) Current policies that create desired land use patterns and protection of natural systems.

(c) Results shall be made available to the public and shall be forwarded to DCM.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0512 SUSTAINABLE COMMUNITIES COMPONENT OF THE PLANNING PROGRAM

(a) Sustainable Communities Component: Under conditions outlined in this rule, DENR may provide additional financial support for plans that exceed the minimum requirements of 15A NCAC 07B. This Rule establishes a Sustainable Communities Component of the planning program, which provides funds to selected communities to support actions to implement the CRC-certified CAMA land use plans of selected local governments.

(b) The Sustainable Communities Component brings current techniques in coastal management and sustainability to the North Carolina coast. Local governments designated as Sustainable Communities shall execute multi-year, land/water projects that are consistent with CRC management topics and the CRC-certified CAMA local land use plan. Examples of sustainable

projects include but are not limited to, oyster re-seeding projects; establishment of greenway systems, and eco-tourism projects.
(c) The CRC may identify priority issue areas and goals on which Sustainable Communities projects shall focus. These focus areas shall be provided in the Notice of Availability of Funds and Request for Proposals.
(d) The following factors shall be considered by DENR in the selection of Sustainable Communities: merit of proposal and its relevance to CRC management topics; proposed education and public participation throughout the life of the project; financial and administrative capacity of the local government to implement the project; and past history of CAMA land use plan implementation by that local government.
(e) DENR shall accept applications for the Sustainable Communities Component once every three years from counties and municipalities whose CAMA land use plans have been certified within the past three years. During the first year the Sustainable Communities Component is offered, local governments with CAMA land use plans older than three years will be eligible to apply. DENR shall make final selections of no more than four communities per funding cycle, based on recommendations of the CRC and the CRAC. Every effort shall be made to select local governments on an equitable geographic distribution throughout the coastal area.
(f) Selected communities shall document their methodology and progress throughout the length of the planning program and provide yearly progress reports to DENR.
(g) Sustainable Communities shall receive the following assistance: planning grant funds for the initial phase of the project and a local CAMA land use plan addendum for up to 80 percent of the project costs, not to exceed forty thousand dollars ($40,000); priority funding consideration for Planning and Management Grant Funds for related projects for two of the following three years, provided funds are available for priority two and priority three projects, for a maximum of twenty thousand dollars ($20,000) for each grant, and DCM support for all grant applications to other agencies for project funding.
(h) DCM will catalog, advertise and distribute summary reports on projects funded under this program to other local governments in the coastal area.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0513 PROJECT DURATION
(a) CAMA Core and Advanced Core land use plans may be funded over a two-year period. Funding during the first year will be to prepare background material, with second year funding primarily used for policy development.
(b) Other planning and management projects may be approved for up to three years. However, individual grants will usually be for a period of one year. Where the project exceeds one year, the annual grant application shall set forth annual objectives, products and budgetary requirements. If a project requires more than one year to complete, and is funded for its first year, this action does not commit DENR to subsequent funding throughout the estimated duration of the project, except that multi-year CAMA land use plans will be given priority funding for Phase II.
(c) In the event that any local planning and management funds remain or become available after the initial disbursement of funds, DENR may provide additional grants to local governments to supplement existing projects or to initiate new projects based on need and ability of the local government to initiate a new project. All previous unfunded applications will be considered for available supplemental funding. In addition, applications for supplemental funding may be submitted by local governments at specified times during the year.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0514 RELATION TO OTHER FUNDING
Applicants may combine these funds with other local, state, and federal funds to finance appropriate projects. However, these funds may not be used as "local matching funds" for other state or federal grants, except that Sustainable Community funds may be used for match if allowed by other state or federal programs.

Authority G.S. 113A-112; 113A-124.

SECTION .0600 - APPLICATION PROCESS

15A NCAC 07L .0601 APPLICATION FORM
(a) At least 30 days prior to each new land use planning and management grant period, DENR shall distribute to each eligible applicant a grant application form and notice of availability of funds.
(b) The grant application form shall request a project description, project objectives, project deliverables, project budget, consistency of the proposed project with the certified CAMA land use plan (if applicable), and other information as deemed necessary by DENR. A project narrative that more completely describes the proposed project may supplement the form. Incomplete, vague or inadequate applications may not be processed.
(c) The grant application form shall be signed by a person who has been authorized by the local government to enter into contracts relating to the implementation of CAMA.
(d) A separate application form shall be completed for each proposed project.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0602 ASSISTANCE IN COMPLETING APPLICATIONS AND SUBMITTAL
Local governments may contact the DCM offices for further assistance and information in completing grant applications. Completed applications shall be submitted to the appropriate office as described in the Notice of Availability of Funds and Request for Proposals.

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0603 PROCEDURE FOR APPROVAL OR DISAPPROVAL
(a) DENR shall, within 90 days after the deadline for receiving applications, notify all applicants as to the status of the application. If deemed necessary, DENR may request the

~~applicant to submit additional information or agree to a revised project proposal or project budget.~~
~~(b) No approval of a grant application shall be deemed to be final prior to execution of the contract agreement required by 15A NCAC 07L .0701.~~

Authority G.S. 113A-112; 113A-124.

SECTION .0700 - GRANT ADMINISTRATION

15A NCAC 07L .0701 CONTRACT AGREEMENT
~~(a) Prior to the disbursement of funds, the local government and DENR will become parties to the contract.~~
~~(b) DENR shall prepare the contract and submit it to the local government, following tentative approval of the grant application. The contract shall specify the amount of the grant, the work to be performed under the grant, and all terms and conditions of the grant. The contract must be executed by a person who is authorized by the local government to enter into contracts, and then returned to DENR. The contract is effective, and approval of the grant application final, when signed by the Secretary of DENR or the Secretary's designee.~~
~~(c) Subcontracts shall be reviewed and approved by DENR prior to execution by the local government. Past work history with DENR of the proposed subcontractor will be considered in reviewing the subcontract. No subcontracts may be made without the written approval of DENR.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0702 PROGRESS REPORTS AND GRANT MONITORING
~~(a) Specific requirements for progress reports will be set out in each contract with grantees.~~
~~(b) A progress report will be required of all grantees prior to the distribution of funds.~~
~~(c) DENR shall make such site visits and consultations as deemed necessary.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0703 PAYMENT
~~(a) Payment by DENR will be made periodically as specified in the contract upon the submittal of a requisition for payment and DCM certification that reasonable and satisfactory progress is being made on the project. Payments will be proportional to the work demonstrated by the grantee to have been completed.~~
~~(b) DENR may withhold payment at any time if the grantee is in violation of the terms of the contract or cannot demonstrate satisfactory progress towards completion of the project.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0704 PROJECT COMPLETION REPORT
~~(a) A project completion report shall be required for all projects. DENR shall transmit information concerning the content and format of this report to all grantees at least 60 days prior to the due date for the report.~~
~~(b) A draft project completion report shall be submitted to DENR with or prior to submission of the final requisition for payment. This report shall include an assessment by the local government of the consistency of the project with the certified CAMA land use plan and the rules of the CRC. If the project is found to be inconsistent by DENR, the local government shall include a satisfactory plan for creating consistency, including timelines for implementation. Final payment will not be made to the local government until this information is provided.~~

Authority G.S. 113A-112; 113A-124.

15A NCAC 07L .0705 ACCOUNTABILITY
~~Grantees will be subject to accounting techniques and procedures similar to those applicable to DENR as grantee of federal funds administered by the National Oceanic and Atmospheric Administration. The requirements of the General Statutes, OMB Circular A-102 and the National Oceanic and Atmospheric Administration's administrative grants standards shall be followed.~~

Authority G.S. 113A-112; 113A-124.

TITLE 21 – OCCUPATIONAL LICENSING BOARDS AND COMMISSIONS

CHAPTER 32 - MEDICAL BOARD

Notice is hereby given in accordance with G.S. 150B-21.2 that the North Carolina Medical Board intends to amend the rules cited as 21 NCAC 32B .1370, .1402; 32S .0202.

Link to agency website pursuant to G.S. 150B-19.1(c): *www.ncmedboard.org/about_the_board/rule_changes*

Proposed Effective Date: *January 1, 2016*

Public Hearing:
Date: *November 16, 2015*
Time: *10:00 a.m.*
Location: *North Carolina Medical Board, 1203 Front Street, Raleigh, NC 27609*

Reason for Proposed Action:
21 NCAC 32B .1370: *This rule change formally expands the reentry process to a three path system that better addresses individual applicants' reentry needs.*
21 NCAC 32B .1402: *To be consistent with 21 NCAC 32B .1303 the Board is including the Medical Council of Canada Qualifying Examination (MCCQE) so that Canadian graduates may obtain a training license in NC.*
21 NCAC 32S .0202: *The Board is changing the required number of recommendations from three to two in order to be consistent with what is required for physicians. Also, to clarify that applicants currently certified with the NCCPA will be considered in compliance with the CME portion of the rule.*

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

MEMORANDUM CRC- 15-28

To: Coastal Resources Commission

From: Michael Christenbury, Wilmington District Planner

Date: November 2, 2015

Subject: Certification of the 2015 Topsail Beach CAMA Land Use Plan

Recommendation:

Certification of the 2015 Topsail Beach CAMA Land Use Plan with the determination that the Town has met the substantive requirements outlined in the 15 NCAC 7B Land Use Plan Guidelines and that there are no conflicts with either state or federal law or the State's Coastal Management Program.

Overview

The Town of Topsail Beach is seeking certification of the 2015 Topsail Beach CAMA Land Use Plan (LUP). Topsail Beach is located in Pender County along the southern tip of Topsail Island. In 2014, the Town began the process to update the currently certified 2005 land use plan with the help of the Cape Fear Council of Governments and the town's Planning Board. The Town updated all demographic information and maps within the plan, as well as revised plan policies to reflect current desires of the Town regarding future growth and land use.

The Town of Topsail Beach held a duly advertised public hearing on September 9, 2015 and voted unanimously by resolution to adopt the 2015 Land Use Plan. DCM Staff reviewed the plan and has determined that the Town has met the substantive requirements outlined in the CRC's 15A NCAC 7B Land Use Plan Guidelines and that there are no conflicts with either state or federal law or the State's Coastal Management Program. As of the date of this memorandum, DCM has not received any comments from the public, written or otherwise regarding the plan. Staff recommends Certification of the 2015 Topsail Beach CAMA Land Use Plan.

The 2015 Topsail Beach Land Use Plan may be viewed at:

http://portal.ncdenr.org/web/cm/pender-county

Attachment: Resolution of Adoption

TOPSAIL BEACH TOWN COMMISSIONERS ADOPTION OF THE CAMA CORE LAND USE PLAN

WHEREAS, the Coastal Area Management Act (CAMA) Core Land Use Plan for the Town of Topsail Beach, North Carolina which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration; and

WHEREAS, from 2014 through 2015, the Town drafted a Land Use Plan with the assistance of the Cape Fear Council of Governments, under the leadership of the Town's Planning Board; and

WHEREAS, the Town Planning Board has recommended adoption of the draft CAMA Core Land Use Plan; and

WHEREAS, at the Regular Meeting on September 9th, 2015 the Topsail Beach Board of Commissioners considered the public comments presented and found the policies and maps in the draft CAMA Core Land Use Plan to be internally consistent with the Town's desired vision for the future, and unanimously approved to adopt the draft CAMA Core Land Use Plan as amended; and

WHEREAS, the adopted Plan will be submitted as required by state law to the Wilmington District Planner for the Division of Coastal Management under the North Carolina Dept. of Environmental and Natural Resources and forwarded to the Coastal Resources Commission; and

WHEREAS, a certified copy of the Town of Topsail Beach CAMA Core Land Use Plan will be forwarded to the Office of Ocean and Coastal Resource Management (OCRM) for federal approval.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of the Town of Topsail Beach , North Carolina, has approved the draft CAMA Core Land Use Plan; and

BE IT FURTHER RESOLVED that the Town Administrator of Topsail Beach, North Carolina is hereby authorized to submit the adopted CAMA Core Land Use Plan to the State for certification as described above.

Adopted this the 9th day of September, 2015.

Howard M. Braxton Jr.
Mayor

ATTEST:

Christina Watkins
Town Clerk

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-15-29

November 4, 2015

MEMORANDUM

TO: Coastal Resources Commission

FROM: Tancred Miller

SUBJECT: Grandfathering Provisions for Oceanfront Structures – Options for Amendments to 15A NCAC 07H .0306 General Use Standards for Ocean Hazard Areas

CRC & Oceanfront Setbacks

The Coastal Resources Commission first adopted the oceanfront setback rule in 1977; one of the first rules that the commission passed after its creation under the Coastal Area Management Act of 1974. The reasons for adopting setbacks were summarized by a staff memo[1] to the commission as follows:

(1) Mitigating losses to life and property resulting from storms and long term erosion;
(2) Preventing encroachment of permanent structures on the public beach area; and
(3) Reducing the public costs of poorly sited development.

The original oceanfront setbacks required that residential, commercial and institutional development be located landward of the frontal dune. Major public facilities that would be supported by state funds, such as roads and sewer lines, were not allowed in ocean hazard areas.

On June 1st 1979, the CRC began requiring setbacks utilizing oceanfront erosion rates calculated from aerial photography, and based upon studies completed in 1973[2] and 1978[3]. The commission revised its setback provisions such that new development following the effective date of the rule must be located behind whichever of the following was the furthest landward:

(1) 30x the long-term erosion rate with a 60-foot minimum;
(2) The rear toe of the frontal dune; or
(3) The rear crest of the primary dune

The commission allowed limited grandfathering for lots platted prior to June 1st 1979, if strict application of the new erosionrate-based setback rule would prevent placement of a permanent structure.

[1] Dave Owens, CRC-135, Reasons for and Impact of Oceanfront Setback Requirements, October 1980.
[2] H. E. Wahls, A Survey of North Carolina Beach Erosion, May 1973. Carteret County to SC state line.
[3] Dolan et al, A New Photogramatic Method for Determining Shoreline Erosion. Coastal Engineering, v.2 1978. Ocracoke Island to VA state line.

1983 Changes

The commission recognized that large structures are difficult or impossible to relocate or remove if they became threatened or damaged. A condominium "boom" along the barrier islands led the commission to consider in early 1983 increasing the setbacks for large structures[4]. After much discussion and public involvement, the commission amended the setback rule in September 1983 so that all commercial and multi-family residential structures (defined as including hotels, motels, condominiums and "moteliminiums") of more than four units or over 5,000 square feet, must use a setback of 60x the erosion rate (minimum of 120 feet). A further justification for the increased multi-family setback was that their "more complex ownership arrangements…might make them impractical, if not impossible, to relocate in advance of erosion."[5]

Single-family and other residential structures of less than four units were allowed to retain the 30x setback, possibly because of their smaller size and simpler ownership arrangements at the time. In response to staff's request for clarification, the CRC's Implementation & Standards (I&S) committee affirmed in 1989 that single-family residential structures should not be subject to large structure setback if they exceed 5,000 square feet[6].

A 1991 petition for rulemaking from Mr. Dave Dawson of Buxton caused staff and the commission to re-examine the rule. Mr. Dawson requested that the commission remove the 4-unit standard, so that multi-family structures under 5,000 square feet could use the smaller setback regardless of the number of units in the structure. As an alternative, staff introduced the concept of determining setbacks solely based on size; all structures over 5,000 square feet would use the 60x setback, regardless of use or ownership arrangement. After discussion, the commission decided simply to delete the 4-unit standard.

The rules were revised twice more over the next 18 years, primarily to update the erosion rates.

2009 Changes

Up until 2009, the commission's rules still required that only large (over 5,000 square feet) commercial and multi-family residential structures were subject to the 60x setback. Multi-family residential structures under 5,000 square feet, and single-family structures of any size were still subject to just the 30x setback.

Over time, the 30x setback resulted in numerous single-family structures over 5,000 square feet being sited closer to the water than commercial and multi-family structures of similar size. In 1999, the CRC Science Panel had recommended[7] that the commission revise its rules to increase setbacks for all structures that are not readily moveable (i.e. larger than 2,000 square feet), regardless of use, but this recommendation was not implemented.

From 2006-2008[8], staff worked with the commission on development of the graduated setbacks, through a lengthy rulemaking process, which far exceeded the statutory requirements for public involvement under the Administrative Procedures Act. Staff held six regional public hearings, made

[4] Preston Pate memo I&S-277, September 6, 1991.
[5] ibid
[6] ibid
[7] CRC Science Panel letter to Donna Moffitt, May 4, 1999.
[8] Jeffrey Warren memo CRC-06-04, June 7, 2006.

two NC Register publications with corresponding 60-day comment periods, and made numerous revisions based upon public input. Staff also made presentations at statewide conferences, and sent out 110 targeted letters requesting public input[9].
The major changes to the setback rules effective were:

(1) With few exceptions (e.g. parking lots and linear infrastructure), the distinction between structure size and use was eliminated, so that setbacks would be determined based only on structure size;
(2) Graduated setbacks were introduced, stepping up from a minimum of 30 times the erosion rate for structures under 5,000 square feet, to a maximum of 90 times the erosion rate for structures over 100,000 square feet;
(3) Ended the growing practice of cantilevering structures oceanward of the setback;
(4) Provided relief to the static line provisions through the static line exception; and
(5) Grandfathered structures 5,000 square feet or larger in areas with a static line exception.

Following the extended rulemaking process, the commission adopted the proposed changes in 2008 and forwarded the rule to the Rules Review Commission (RRC) for approval. Because the RRC received 10 letters objecting to the rule, it became subject to legislative review, where any member of the Assembly could introduce a bill to amend or disapprove the rule change. The Legislature, during their 2009 session, opted not to take action to amend or disapprove the rule, and it went into effect on August 11th 2009 with all of the changes that the CRC had adopted.

2012 Changes—House Bill 819

House Bill 819 (Session Law 2012-202), prohibited the CRC from denying development permits for the replacement of single-family and duplex residential structures over 5,000 square feet, for failure to meet the applicable oceanfront setback required by the commission's rules. The commission was directed to adopt or amend rules specifically to allow for replacement of these structures, subject to the following criteria:

(1) The structure was originally constructed prior to August 11, 2009.
(2) The structure as replaced does not exceed the original footprint or square footage.
(3) The structure as replaced meets the minimum setback required under 15A NCAC 07H .0306(a)(2)(A).
(4) It is impossible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under 15A NCAC 07H .0306(a)(2).
(5) The structure is rebuilt as far landward on the lot as feasible.

The commission adopted temporary rules to meet these criteria effective January 3rd 2013, and permanent rules effective September 1st 2013.

Grandfathering Request

At the commission's October 2014 meeting, Mr. Shane Johnson, Governmental Affairs Director with the Wilmington Regional Association of REALTORS® (WRAR), submitted a letter to the commission and staff titled, Request for Relief: Legal Non-Conforming Coastal Properties (October 23, 2014). A copy of the letter is attached. Mr. Johnson also addressed the commission at that meeting to elaborate

[9] Jeffrey Warren memo CRC-07-04, March 8, 2007.

upon the nature of their request, which was for grandfathering of multi-family residential structures larger than 5,000 square feet, but less than 10,000 square feet.

At your September 2015 meeting, Mr. Johnson and Mr. Robert Broome of the North Carolina Association of REALTORS® (NCAR) again addressed the commission. At that meeting, the WRAR distributed another letter to the commission and staff proposing to grandfather multi-family structures (attached). The WRAR amended their request from a year earlier, and is now seeking grandfathering for all residential, multi-family structures over 5,000 square feet with no restriction on maximum size.

The WRAR and NCAR contend that the commission's rule is unfair because non-conforming condominium structures over 5,000 square feet cannot be rebuilt under the commission's rules if they sustain damage exceeding fifty percent of their physical value, whereas similarly-sized single-family or duplex residential structures can be rebuilt under the 2013 grandfathering provisions. The WRAR and NCAR would therefore like to see an amendment to the CRC's rule that expands the current grandfathering provision to include any residential structures (but not commercial structures), regardless of size.

At the commission's direction, the WRAR and NCAR's request has been placed on your November agenda for discussion and further direction to staff. Staff has also prepared three alternatives as a starting point for discussion, as described below, and welcomes additional ideas.

Grandfathering Alternatives

Alternative 1
This alternative would amend 7H .0306 for the purpose requested by the WRAR, which is to expand the grandfathering privilege to multi-family residential structures over 5,000 square feet, and not to commercial structures of the same size. All residential structures over 5,000 square feet would then be grandfathered. Staff believes that if this request is granted, it is plausible that a request to grandfather commercial structures over 5,000 square feet will be made in the future.

Alternative 2
This alternative would amend 7H .0306 to extend grandfathering to all structures over 5,000 square feet. In keeping with the commission's decision in 2009 that a structure's size, not use, determines oceanfront risk, staff questions the justifications for grandfathering only residential structures that might be the same size or larger than adjacent commercial structures.

Alternative 3
This alternative would establish a new approach and a stronger state-local partnership in managing oceanfront development under CAMA. Over the last several meetings, the commission has been reviewing many of your oceanfront development policies, including setbacks, static lines and static line exceptions, the development line, erosion control strategies, beneficial use of dredged materials, and now grandfathering. A notable theme has been the recognition of the substantial efforts, investments, and progress that local governments have made in managing their shorelines, particularly as it pertains to comprehensive planning and a commitment to beach maintenance through long-term inlet management projects, beach nourishment programs, terminal groins, regional sediment management, the creation of regional beach commissions and local "sand management" staff positions, the establishment of new beach funding mechanisms, and local beachfront development ordinances.

The commission could consider establishing a voluntary local/regional beach management planning program for beach communities based at least in part on the current process established for Static Line Exceptions under 15A NCAC 07J.1200. The Static Line Exception already incentivizes communities to develop a long-term beach plan, including suitable sand sources for renourishment and financial assurances. Communities that develop this kind of beach management plan, with oversight and approval by the commission, could also be afforded other regulatory relief that would not be available to communities without approved beach plans. Staff recommend that grandfathering (as described under Alternative 2) and Static Line Exceptions are two examples of regulatory relief that might be more appropriate when a community has a State-approved beach management plan.

Staff has prepared draft rule language for consideration, and looks forward to the discussion on this important issue at your November meeting, and welcomes additional ideas for management of the state's beaches.

*** DRAFT ***

Grandfathering of multifamily residential and commercial properties greater than 5,000 square feet in the Ocean Hazard Areas AEC

Wilmington Regional Association of Realtors request in yellow highlight.

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's Rules shall be located according to whichever of the following is applicable:

(1) The ocean hazard setback for development is measured in a landward direction from the vegetation line, the static vegetation line or the measurement line, whichever is applicable. The setback distance is determined by both the size of development and the shoreline erosion rate as defined in 15A NCAC 07H .0304. Development size is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

(A) The total square footage of heated or air-conditioned living space;

(B) The total square footage of parking elevated above ground level; and

(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches and walkways are not included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

(2) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback is established based on the following criteria:

(A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(B) A building or other structure greater than or equal to 5,000 square feet but less than 10,000 square feet requires a minimum setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(C) A building or other structure greater than or equal to 10,000 square feet but less than 20,000 square feet requires a minimum setback of 130 feet or 65 times the shoreline erosion rate, whichever is greater;

(D) A building or other structure greater than or equal to 20,000 square feet but less than 40,000 square feet requires a minimum setback of 140 feet or 70 times the shoreline erosion rate, whichever is greater;

(E) A building or other structure greater than or equal to 40,000 square feet but less than 60,000 square feet requires a minimum setback of 150 feet or 75 times the shoreline erosion rate, whichever is greater;

(F) A building or other structure greater than or equal to 60,000 square feet but less than 80,000 square feet requires a minimum setback of 160 feet or 80 times the shoreline erosion rate, whichever is greater;

(G) A building or other structure greater than or equal to 80,000 square feet but less than 100,000 square feet requires a minimum setback of 170 feet or 85 times the shoreline erosion rate, whichever is greater;

(H) A building or other structure greater than or equal to 100,000 square feet requires a minimum setback of 180 feet or 90 times the shoreline erosion rate, whichever is greater;

(I) Infrastructure that is linear in nature such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(J) Parking lots greater than or equal to 5,000 square feet requires a setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(K) Notwithstanding any other setback requirement of this Subparagraph, a building or other structure greater than or equal to 5,000 square feet in a community with a static line exception in accordance with 15A NCAC 07J .1200 requires a minimum setback of 120 feet or 60 times the shoreline erosion rate in place at the time of permit issuance, whichever is greater. The setback shall be measured landward from either the static vegetation line, the vegetation line or measurement line, whichever is farthest landward; and

(L) Notwithstanding any other setback requirement of this Subparagraph, replacement of ~~single family or duplex~~ residential structures with a total floor area greater than 5,000 square feet shall be allowed provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;

(ii) the structure as replaced does not exceed the original footprint or square footage;

(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and

(v) the structure is rebuilt as far landward on the lot as feasible.

(3) If a primary dune exists in the AEC on or landward of the lot on which the development is proposed, the development shall be landward of the crest of the primary dune or the ocean hazard setback, whichever is farthest from vegetation line, static vegetation line or measurement line, whichever is applicable. For existing lots, however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but shall not be located on or oceanward of a frontal dune. The words "existing lots" in this Rule shall mean a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and which cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership.

(4) If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot on which the development is proposed, the development shall be set landward of the frontal dune or landward of the ocean hazard setback whichever is farthest from the vegetation line, static vegetation line or measurement line, whichever is applicable.

(5) If neither a primary nor frontal dune exists in the AEC on or landward of the lot on which development is proposed, the structure shall be landward of the ocean hazard setback.

(6) Structural additions or increases in the footprint or total floor area of a building or structure represent expansions to the total floor area and shall meet the setback requirements established in this Rule and 15A NCAC 07H .0309(a). New development landward of the applicable setback may be cosmetically, but shall not be structurally, attached to an existing structure that does not conform with current setback requirements.

(7) Established common law and statutory public rights of access to and use of public trust lands and waters in ocean hazard areas shall not be eliminated or restricted. Development shall not encroach upon public accessways, nor shall it limit the intended use of the accessways.

(8) Beach fill as defined in this Section represents a temporary response to coastal erosion, and compatible beach fill as defined in 15A NCAC 07H .0312 can be expected to erode at least as fast as, if not faster than, the pre-project beach. Furthermore, there is no assurance of future funding or beach-compatible sediment for continued beach fill projects and project maintenance. A vegetation line that becomes established oceanward of the pre-project vegetation line in an area that has received beach fill may be more vulnerable to natural hazards along the oceanfront. A development setback measured from the vegetation line provides less protection from ocean hazards. Therefore, development setbacks in areas that have received large-scale beach fill as defined in 15A NCAC 07H .0305 shall be measured landward from the static vegetation line as defined in this Section. However, in order to allow for development landward of the large-scale beach fill project that is less than 2,500 square feet and cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (1) and (2)(A) of this Paragraph, a local government or community may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback provisions defined in Part (a)(2)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner as well as the boundaries of the largescale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(2)(A) of this Rule;

(B) Total floor area of a building is no greater than 2,500 square feet;

(C) Development setbacks are calculated from the shoreline erosion rate in place at the time of permit issuance;

(D) No portion of a building or structure, including roof overhangs and elevated portions that are cantilevered, knee braced or otherwise extended beyond the support of pilings or footings, extends oceanward of the landward-most adjacent building or structure. When the configuration of a lot precludes the placement of a building or structure in line with the landward-most adjacent building or structure, an average line of construction shall be determined by the Division of Coastal Management on a case-by-case basis in order to determine an ocean hazard setback that is landward of the vegetation line, a distance no less than 30 times the shoreline erosion rate or 60 feet, whichever is greater;

(E) With the exception of swimming pools, the development defined in 15A NCAC 07H .0309(a) is allowed oceanward of the static vegetation line; and

(F) Development is not eligible for the exception defined in 15A NCAC 07H .0309(b).

(b) In order to avoid weakening the protective nature of ocean beaches and primary and frontal dunes, no development is permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon which would adversely affect the integrity of the dune. Other dunes within the ocean hazard area shall not be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes is allowed only to the extent permitted by 15A NCAC 07H .0308(b).

(c) Development shall not cause irreversible damage to historic architectural or archaeological resources documented by the Division of Archives and History, the National Historical Registry, the local land-use plan, or other sources with knowledge of the property.

(d) Development shall comply with minimum lot size and set back requirements established by local regulations.

(e) Mobile homes shall not be placed within the high hazard flood area unless they are within mobile home parks existing as of June 1, 1979.

(f) Development shall comply with general management objective for ocean hazard areas set forth in 15A NCAC 07H .0303.

(g) Development shall not interfere with legal access to, or use of, public resources nor shall such development increase the risk of damage to public trust areas.

(h) Development proposals shall incorporate measures to avoid or minimize adverse impacts of the project. These measures shall be implemented at the applicant's expense and may include actions that:

(1) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;

(2) restore the affected environment; or

(3) compensate for the adverse impacts by replacing or providing substitute resources.

(i) Prior to the issuance of any permit for development in the ocean hazard AECs, there shall be a written acknowledgment from the applicant to the Division of Coastal Management that the applicant is aware of the risks associated with development in this hazardous area and the limited suitability of this area for permanent structures. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development.

(j) All relocation of structures requires permit approval. Structures relocated with public funds shall comply with the applicable setback line as well as other applicable AEC rules. Structures including septic tanks and other essential accessories relocated entirely with non-public funds shall be relocated the maximum feasible distance landward of the present location; septic tanks may not be located oceanward of the primary structure. All relocation of structures shall meet all other applicable local and state rules.

(k) Permits shall include the condition that any structure shall be relocated or dismantled when it becomes imminently threatened by changes in shoreline configuration as defined in 15A NCAC 07H .0308(a)(2)(B). Any such structure shall be relocated or dismantled within two years of the time when it becomes imminently threatened, and in any case upon its collapse or subsidence. However, if natural shoreline recovery or beach fill takes place within two years of the time the structure becomes imminently threatened, so that the structure is no longer imminently threatened, then it need not be relocated or dismantled at that time. This permit condition shall not affect the permit holder's right to seek authorization of temporary protective measures allowed under 15A NCAC 07H .0308(a)(2).

*** DRAFT ***

Grandfathering of multifamily residential and commercial properties greater than 5,000 square feet in the Ocean Hazard Areas AEC

DCM staff alternative in blue highlight

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's Rules shall be located according to whichever of the following is applicable:

(1) The ocean hazard setback for development is measured in a landward direction from the vegetation line, the static vegetation line or the measurement line, whichever is applicable. The setback distance is determined by both the size of development and the shoreline erosion rate as defined in 15A NCAC 07H .0304. Development size is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

(A) The total square footage of heated or air-conditioned living space;

(B) The total square footage of parking elevated above ground level; and

(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches and walkways are not included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

(2) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback is established based on the following criteria:

(A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(B) A building or other structure greater than or equal to 5,000 square feet but less than 10,000 square feet requires a minimum setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(C) A building or other structure greater than or equal to 10,000 square feet but less than 20,000 square feet requires a minimum setback of 130 feet or 65 times the shoreline erosion rate, whichever is greater;

(D) A building or other structure greater than or equal to 20,000 square feet but less than 40,000 square feet requires a minimum setback of 140 feet or 70 times the shoreline erosion rate, whichever is greater;

(E) A building or other structure greater than or equal to 40,000 square feet but less than 60,000 square feet requires a minimum setback of 150 feet or 75 times the shoreline erosion rate, whichever is greater;

(F) A building or other structure greater than or equal to 60,000 square feet but less than 80,000 square feet requires a minimum setback of 160 feet or 80 times the shoreline erosion rate, whichever is greater;

(G) A building or other structure greater than or equal to 80,000 square feet but less than 100,000 square feet requires a minimum setback of 170 feet or 85 times the shoreline erosion rate, whichever is greater;

(H) A building or other structure greater than or equal to 100,000 square feet requires a minimum setback of 180 feet or 90 times the shoreline erosion rate, whichever is greater;

(I) Infrastructure that is linear in nature such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(J) Parking lots greater than or equal to 5,000 square feet requires a setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(K) Notwithstanding any other setback requirement of this Subparagraph, a building or other structure greater than or equal to 5,000 square feet in a community with a static line exception in accordance with 15A NCAC 07J .1200 requires a minimum setback of 120 feet or 60 times the shoreline erosion rate in place at the time of permit issuance, whichever is greater. The setback shall be measured landward from either the static vegetation line, the vegetation line or measurement line, whichever is farthest ~~landward; and~~ landward. Replacement of structures with a total floor area greater than or equal to 5,000 square feet, in a community with a static line exception, shall be allowed provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;

(ii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;

(iii) the structure as replaced meets the ocean hazard setback criteria required under Subparagraph (a)(2) to the maximum extent feasible, and no less than minimum setback required under Part (a)(2)(A) of this Rule;

(iv) the structure is rebuilt no further oceanward than the original footprint;

(v) the structure as replaced does not exceed the original footprint and square footage; and

(vi) the structure is located within the boundaries of the community's static line exception.

(L) Notwithstanding any other setback requirement of this Subparagraph, replacement of single family or duplex-residential structures with a total floor area greater than 5,000 square feet shall be allowed provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;

(ii) the structure as replaced does not exceed the original footprint or square footage;

(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and

(v) the structure is rebuilt as far landward on the lot as feasible.

(3) If a primary dune exists in the AEC on or landward of the lot on which the development is proposed, the development shall be landward of the crest of the primary dune or the ocean hazard setback, whichever is farthest from vegetation line, static vegetation line or measurement line, whichever is applicable. For existing lots, however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but shall not be located on or oceanward of a frontal dune. The words "existing lots" in this Rule shall mean a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and which cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership.

(4) If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot on which the development is proposed, the development shall be set landward of the frontal dune or landward of the ocean hazard setback whichever is farthest from the vegetation line, static vegetation line or measurement line, whichever is applicable.

(5) If neither a primary nor frontal dune exists in the AEC on or landward of the lot on which development is proposed, the structure shall be landward of the ocean hazard setback.

(6) Structural additions or increases in the footprint or total floor area of a building or structure represent expansions to the total floor area and shall meet the setback requirements established in this Rule and 15A NCAC 07H .0309(a). New development landward of the applicable setback may be cosmetically, but shall not be structurally, attached to an existing structure that does not conform with current setback requirements.

(7) Established common law and statutory public rights of access to and use of public trust lands and waters in ocean hazard areas shall not be eliminated or restricted. Development shall not encroach upon public accessways, nor shall it limit the intended use of the accessways.

(8) Beach fill as defined in this Section represents a temporary response to coastal erosion, and compatible beach fill as defined in 15A NCAC 07H .0312 can be expected to erode at least as fast as, if not faster than, the pre-project beach. Furthermore, there is no assurance of future funding or beach-compatible sediment for continued beach fill projects and project maintenance. A vegetation line that becomes established oceanward of the pre-project vegetation line in an area that has received beach fill may be more vulnerable to natural hazards along the oceanfront. A development setback measured from the vegetation line provides less protection from ocean hazards. Therefore, development setbacks in areas that have received large-scale beach fill as defined in 15A NCAC 07H .0305 shall be measured landward from the static vegetation line as defined in this Section. However, in order to allow for development landward of the large-scale beach fill project that is less than 2,500 square feet and cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (1) and (2)(A) of this Paragraph, a local government or community may petition the Coastal Resources Commission for a “static line exception” in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback provisions defined in Part (a)(2)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner as well as the boundaries of the largescale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(2)(A) of this Rule;
(B) Total floor area of a building is no greater than 2,500 square feet;
(C) Development setbacks are calculated from the shoreline erosion rate in place at the time of permit issuance;
(D) No portion of a building or structure, including roof overhangs and elevated portions that are cantilevered, knee braced or otherwise extended beyond the support of pilings or footings, extends oceanward of the landward-most adjacent building or structure. When the configuration of a lot precludes the placement of a building or structure in line with the landward-most adjacent building or structure, an average line of construction shall be determined by the Division of Coastal Management on a case-by-case basis in order to determine an ocean hazard setback that is landward of the vegetation line, a distance no less than 30 times the shoreline erosion rate or 60 feet, whichever is greater;
(E) With the exception of swimming pools, the development defined in 15A NCAC 07H .0309(a) is allowed oceanward of the static vegetation line; and
(F) Development is not eligible for the exception defined in 15A NCAC 07H .0309(b).

(b) In order to avoid weakening the protective nature of ocean beaches and primary and frontal dunes, no development is permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon which would adversely affect the integrity of the dune. Other dunes within the ocean hazard area shall not be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes is allowed only to the extent permitted by 15A NCAC 07H .0308(b).

(c) Development shall not cause irreversible damage to historic architectural or archaeological resources documented by the Division of Archives and History, the National Historical Registry, the local land-use plan, or other sources with knowledge of the property.

(d) Development shall comply with minimum lot size and set back requirements established by local regulations.

(e) Mobile homes shall not be placed within the high hazard flood area unless they are within mobile home parks existing as of June 1, 1979.

(f) Development shall comply with general management objective for ocean hazard areas set forth in 15A NCAC 07H .0303.

(g) Development shall not interfere with legal access to, or use of, public resources nor shall such development increase the risk of damage to public trust areas.

(h) Development proposals shall incorporate measures to avoid or minimize adverse impacts of the project. These measures shall be implemented at the applicant's expense and may include actions that:
(1) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;
(2) restore the affected environment; or
(3) compensate for the adverse impacts by replacing or providing substitute resources.

(i) Prior to the issuance of any permit for development in the ocean hazard AECs, there shall be a written acknowledgment from the applicant to the Division of Coastal Management that the applicant is aware of the risks associated with development in this hazardous area and the limited suitability of this area for permanent structures. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development.

(j) All relocation of structures requires permit approval. Structures relocated with public funds shall comply with the applicable setback line as well as other applicable AEC rules. Structures including septic tanks and other essential accessories relocated entirely with non-public funds shall be relocated the maximum feasible distance landward of the present location; septic tanks may not be located oceanward of the primary structure. All relocation of structures shall meet all other applicable local and state rules.

(k) Permits shall include the condition that any structure shall be relocated or dismantled when it becomes imminently threatened by changes in shoreline configuration as defined in 15A NCAC 07H .0308(a)(2)(B). Any such structure shall be relocated or dismantled within two years of the time when it becomes imminently threatened, and in any case upon its collapse or subsidence. However, if natural shoreline recovery or beach fill takes place within two years of the time the structure becomes imminently threatened, so that the structure is no longer imminently threatened, then it need not be relocated or dismantled at that time. This permit condition shall not affect the permit holder's right to seek authorization of temporary protective measures allowed under 15A NCAC 07H .0308(a)(2).

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124;*
Eff. September 9, 1977;
Amended Eff. December 1, 1991; March 1, 1988; September 1, 1986; December 1, 1985;
RRC Objection due to ambiguity Eff. January 24, 1992;
Amended Eff. March 1, 1992;
RRC Objection due to ambiguity Eff. May 21, 1992;
Amended Eff. February 1, 1993; October 1, 1992; June 19, 1992;
RRC Objection due to ambiguity Eff. May 18, 1995;
Amended Eff. August 11, 2009; April 1, 2007; November 1, 2004; June 27, 1995;
Temporary Amendment Eff: January 3, 2013;
Amended Eff. September 1, 2013.

FROM: SHANE JOHNSON 10/23/14 Wilmington Regional Association of Realtors

Wilmington Regional Association of REALTORS®
Request for Relief: Legal Non-Conforming Coastal Properties

October 23, 2014

Interest: On March 26, 2014, Julie Damron, a broker with Coastwalk Real Estate in Carolina Beach, contacted the Wilmington Regional Association of REALTORS® (WRAR) concerned about a Coastal Area Management Act (CAMA) rule changed in 2009 that was undermining the securitization of property transactions. In short, CAMA expanded certain setback restrictions that had been formerly applied to commercial properties only, now to include residential properties. As a result, Fannie Mae and Freddie Mac are not insuring loans on residential properties that are deemed "legal non-conforming"[1] nor any properties in the effected property's homeowners association (HOA), because the properties cannot be rebuilt if damaged over 50%. WRAR has an interest in mitigating or eliminating legitimate issues that interfere with property transactions.

Subject Regulation: CAMA rules limit building sizes within the 60' setback to "less than 5,000 square feet"[2] and within the 120' setback to "equal to 5,000 square feet but less than 10,000 square feet." along the ocean front.[3] Therefore, any oceanfront residential condominium exceeding 5,000 square feet could not be rebuilt if damage exceeded 50%.

Application/Issue: Carolina Beach, for instance, has many residential condominiums that are greater than 5,000 square feet with multiple units in each structure. When a condo owner attempts to sell one of these condos, they quickly discover that because the structure is "legal non-conforming" only cash buyers can be entertained, yet even cash buyers balk at the idea of purchasing a condo in a non-conforming building. Thereby, the property is sullied with unmarketability, as prospective buyers learn that the building cannot be rebuilt to the current configuration in spite of being in compliance with all Carolina Beach ordinances, and as a result, loans on the property become uninsurable.

Partial Remedy: In fact, the General Assembly recognized the problem created with the 2009 CAMA rule expansion, and passed legislation that became law in 2012 to address its concerns with the created transaction interference.[4] "[T]he Coastal Resources Commission shall not deny a development permit for the replacement of a single-family or duplex residential dwelling with a total floor area greater than 5,000 square feet based on failure to meet the ocean hazard setback required under 15A NCAC 07H .03.06(a)(2) if the structure meets the following criteria:

(1) The structure was originally constructed prior to August 11, 2009.
(2) The structure as replaced does not exceed the original footprint or square footage.

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[1] *See* Fannie Mae Form 1004/Freddie Mac Form 70, Uniform Residential Appraisal Report, prohibiting "projects that represent legal, but non-conforming, use of the land, if zoning regulations prohibit rebuilding the improvements to current density in the event of their partial or full destruction."
[2] General Use Standards for Ocean Hazard Areas, 15A NCAC 07H .0306 (2)(A) (Sept. 1, 2013).
[3] *Id.* at (2)(B).
[4] An Act to Study and Modify Certain Coastal Management Policies, Session Law 2012-202 House Bill 819, Sec. 3.(a). (2012)

(3) The structure as replaced meets the minimum setback required under 15A NCAC 07H .0306(a)(2)(A).
(4) It is impossible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under 15A NCAC 07H .0306(a)(2).
(5) The structure is rebuilt as far landward on the lot as feasible."[5]

This legislative "fix" alleviated the problem for single-family homes and duplexes over 5,000 square feet, but failed to provide a remedy for residential condominiums.

Result: Beyond the "legal non-conforming" stigma that makes the subject properties unsaleable, building owners may seek a variance to the rule through CAMA, but the hearing process is cumbersome and does nothing to provide relief to current buyers and sellers currently in the market pipeline. Where a homeowners association has multiple properties, a condo in a legally conforming structure also becomes uninsurable.

Request: There appears to be no public policy that would support the grandfathering of single-family and duplex properties, while excluding residential condos. Therefore we request CRC grandfather residential condominiums greater than 5,000 square feet and less than 10,000 square feet to mirror legislative action taken in 2012, and support any remedial legislation required to fully enact such law.

Final Comment: Failure to act could cause a significant drop in shorefront property values, which would have a devastating impact on coastal communities. We understand discussions are under way relating to the elimination of or amending exemptions to static lines in the determination of oceanfront setbacks for development. We have a high degree of interest in being involved in these and related discussions with the hope that we will be able to work together to resolve the present difficulties.

Cordially,

Tom C. Gale, Govt. Affairs Com. Chair
WRAR

Shane T. Johnson, Govt. Affairs Director
WRAR

[5] *Id.*

WILMINGTON REGIONAL ASSOCIATION of REALTORS®

Location
1826 Sir Tyler Drive, Suite 100
Wilmington, NC 28405
Phone (910) 762-7400
Fax (910) 762-9860

September 4, 2015

The Honorable Frank Gorham
NC Coastal Resources Commission
400 Commerce Avenue
Morehead City, NC 28557

RE: Grandfathering of Multifamily Structures

Dear Chairman Gorham:

On behalf of the 2,225 members of the Wilmington Regional Association of REALTORS®, I am writing to express our support for amending the General Use Standards for Ocean Hazard Areas as proposed by our association and the North Carolina Association of REALTORS®. The proposed change is scheduled for consideration at the Coastal Resources Commission meeting on September 23.

An oversight in the wording of the ocean hazard setback rules unfairly renders certain residential properties as “legal non-conforming” based upon the property’s number of individual units, rather than its use or size. This oversight causes tremendous difficulty for sellers and buyers of affected residential properties, as Fannie Mae and Freddie Mac will not insure mortgage loans on legal non-conforming residential property.

Part (a)(2)(L) of 15A NCAC 07H .0306 allows replacement of a single family or duplex residential structure with a total floor area greater than 5,000 square feet, provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;
(ii) the structure as replaced does not exceed the original footprint or square footage;
(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;
(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and
(v) the structure is rebuilt as far landward on the lot as feasible.

DENR legal counsel has opined that residential structures with more than two attached units – even though they meet the criteria in (i)-(v) above – do not qualify for the protections afforded by part (a)(2)(L) to other residential properties of the same total floor area and use.

Part (a)(2)(L) should be amended to apply to all residential structures with a total floor area greater than 5,000 square feet, regardless of the number of attached units. This proposed solution:

- **Does not** apply to any structures built after August 11, 2009;
- **Does not** allow construction of new residential structures in the ocean hazard setback area; and
- **Does not** allow replacement of residential structures larger than the original footprint or square footage.

The Wilmington Regional Association of REALTORS® urges you and your fellow commissioners to correct the inequity created by the omission of multifamily structures from the protections afforded to other residential property owners in 15A NCAC 07H .0306(a)(2)(L).

Thank you for your consideration of our comments.

Sherri Pickard, President

Will Leonard

Will Leonard, Chair
Govt. Affairs Committee

CARTERET COUNTY
Chamber of Commerce

September 11, 2015

The Honorable Frank Gorham
N.C. Coastal Resources Commission
400 Commerce Avenue
Morehead City, NC 28557

RE: Grandfathering of Multifamily Structures

Dear Chairman Gorham:

On behalf of Executive Committee of the Carteret County Chamber of Commerce, I am writing to express our support for amending the General Use Standards for Ocean Hazard Areas as proposed by the North Carolina Association of REALTORS and its local affiliates. We understand that the proposed change is scheduled for consideration at the Coastal Resources Commission meeting on September 23.

An oversight in the wording of the ocean hazard setback rules unfairly renders certain residential properties as "legal non-conforming" based upon the property's number of individual units, rather than its use or size. This oversight causes tremendous difficulty for sellers and buyers of affected residential properties, as Fannie Mae and Freddie Mac will not insure mortgage loans on legal non-conforming residential property.

Part (a)(2)(L) of 15A NCAC 07H .0306 allows replacement of a single-family or duplex residential structure with a total floor area greater than 5,000 square feet, provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;
(ii) the structure as replaced does not exceed the original footprint or square footage;
(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;
(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and
(v) the structure is rebuilt as far landward on the lot as feasible.

Legal counsel with the North Carolina Division of Environment and Natural Resources (NCDENR) contends that residential structures with more than two attached units – even though they meet the criteria in (i)-(v) above – do not qualify for the protections afforded by part (a)(2)(L) to other residential properties of the same total floor area and use.

Carteret County Chamber of Commerce · 801 Arendell St., Suite 1, Morehead City, NC 28557
(252) 726-6350 · (800) 622-6278 · Fax (252) 726-3505
www.nccoastchamber.com · cart.coc@nccoastchamber.com

Part (a)(2)(L) should be amended to apply to all residential structures with a total floor area greater than 5,000 square feet, regardless of the number of attached units.
This proposed solution:

- **Does not** apply to any structures built after August 11, 2009;
- **Does not** allow construction of new residential structures in the ocean hazard setback area; and
- **Does not** allow replacement of residential structures larger than the original footprint or square footage.

The Carteret County Chamber's Executive Committee urges you and your fellow commissioners to correct the inequity created by the omission of multifamily structures from the protections afforded to other residential property owners in 15A NCAC 07H .0306(a)(2)(L).

Thank you for your consideration of our comments.

Sincerely,

Michael A. Wagoner

Michael A. Wagoner
President

Carteret County Association of REALTORS®
121 N. 28th Street
P. O. Box 630
Morehead City, NC 28557
BrendaRoney@ccrealtors.org
www.ccrealtors.org

September 4, 2015

The Honorable Frank Gorham
N.C. Coastal Resources Commission
400 Commerce Avenue
Morehead City, NC 28557

RE: Grandfathering of Multifamily Structures

Dear Chairman Gorham:

On behalf of the 457 members of the Carteret County Association of REALTORS®, I am writing to express our support for amending the General Use Standards for Ocean Hazard Areas as proposed by the Wilmington Regional Association of REALTORS® and the North Carolina Association of REALTORS®. The proposed change is scheduled for consideration at the Coastal Resources Commission meeting on September 23.

An oversight in the wording of the ocean hazard setback rules unfairly renders certain residential properties as "legal non-conforming" based upon the property's number of individual units, rather than its use or size. This oversight causes tremendous difficulty for sellers and buyers of affected residential properties, as Fannie Mae and Freddie Mac will not insure mortgage loans on legal non-conforming residential property.

Part (a)(2)(L) of 15A NCAC 07H .0306 allows replacement of a single-family or duplex residential structure with a total floor area greater than 5,000 square feet, provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;
(ii) the structure as replaced does not exceed the original footprint or square footage;
(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;
(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and
(v) the structure is rebuilt as far landward on the lot as feasible.

DENR legal counsel has opined that residential structures with more than two attached units – even though they meet the criteria in (i)-(v) above – do not qualify for the protections afforded by part (a)(2)(L) to other residential properties of the same total floor area and use.

This proposed solution:

- **Does not** apply to any structures built after August 11, 2009;
- **Does not** allow construction of new residential structures in the ocean hazard setback area; and
- **Does not** allow replacement of residential structures larger than the original footprint or square footage.

The Carteret County Association of REALTORS® urges you and your fellow commissioners to correct the inequity created by the omission of multifamily structures from the protections afforded to other residential property owners in 15A NCAC 07H .0306(a)(2)(L).

Thank you for your consideration of our comments.

Sincerely,

Kathy Perry, 2015 President
Carteret County Association of REALTORS®

September 17, 2015

The Honorable Frank Gorham
N.C. Coastal Resources Commission
400 Commerce Avenue
Morehead City, NC 28557

RE: Grandfathering of Multifamily Structures

Dear Chairman Gorham:

On behalf of the Jacksonville Board of REALTORS members of the North Carolina Association of REALTORS®, I am writing to express our support for amending the General Use Standards for Ocean Hazard Areas as proposed by the Wilmington Regional Association of REALTORS® and the North Carolina Association of REALTORS®. The proposed change is scheduled for consideration at the Coastal Resources Commission meeting on September 23.

An oversight in the wording of the ocean hazard setback rules unfairly renders certain residential properties as "legal non-conforming" based upon the property's number of individual units, rather than its use or size. This oversight causes tremendous difficulty for sellers and buyers of affected residential properties, as Fannie Mae and Freddie Mac will not insure mortgage loans on legal non-conforming residential property.

Part (a)(2)(L) of 15A NCAC 07H .0306 allows replacement of a single-family or duplex residential structure with a total floor area greater than 5,000 square feet, provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;
(ii) the structure as replaced does not exceed the original footprint or square footage;
(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;
(iv) the structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and
(v) the structure is rebuilt as far landward on the lot as feasible.

DENR legal counsel has opined that residential structures with more than two attached units – even though they meet the criteria in (i)-(v) above – do not qualify for the protections afforded by part (a)(2)(L) to other residential properties of the same total floor area and use.

Part (a)(2)(L) should be amended to apply to all residential structures with a total floor area greater than 5,000 square feet, regardless of the number of attached units.

This proposed solution:

- **Does not** apply to any structures built after August 11, 2009;

- **Does not** allow construction of new residential structures in the ocean hazard setback area; and
- **Does not** allow replacement of residential structures larger than the original footprint or square footage.

The Jacksonville Board of REALTORS Association of REALTORS® urges you and your fellow commissioners to correct the inequity created by the omission of multifamily structures from the protections afforded to other residential property owners in 15A NCAC 07H .0306(a)(2)(L).

Thank you for your consideration of our comments.

Sincerely,

Kenneth Brandon

Kenneth Brandon
2015 President
XXX Association of REALTORS®

(CRC-15-30)

November 2, 2015

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Temporary Sandbag Rules

As you recall from the September CRC meeting, the NC General Assembly has directed the Commission to amend its rules for the use of temporary erosion control structures (sandbags) (S.L. 2015-241). Specifically, the Commission is directed to:

EROSION CONTROL STRUCTURES SECTION 14.6.(p) The Coastal Resources Commission shall amend its rules for the use of temporary erosion control structures to provide for all of the following: (1) Allow the placement of temporary erosion control structures on a property that is experiencing coastal erosion even if there are no imminently threatened structures on the property if the property is adjacent to a property where temporary erosion control structures have been placed. (2) Allow the placement of contiguous temporary erosion control structures from one shoreline boundary of a property to the other shoreline boundary, regardless of proximity to an imminently threatened structure. (3) The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date for any of the permits. (4) The replacement, repair, or modification of damaged temporary erosion control structures that are either legally placed with a current permit or legally placed with an expired permit, but the status of the permit is being litigated by the property owner. SECTION 14.6.(q) The Coastal Resources Commission shall adopt temporary rules to implement subsection (p) of this section no later than December 31, 2015. The Commission shall also adopt permanent rules to implement this section.

To address the legislative directive, Staff has prepared draft rule language (attached) that include the provisions of the Session Law. As noted during the September meeting, the legislation expands the use of sandbags by allowing sandbag structures on properties without imminently threatened structures provided that the adjoining property also has a sandbag structure. Under the current rules, sandbags are only allowed if the erosion scarp is within 20 feet of the foundation of a structure or in cases of accelerated erosion or flat beach profile. As there is a concern regarding the siting of sandbags on properties without imminently threatened structures, the proposed rule includes the caveats that the adjacent sandbag structure be in compliance with the Commission's rules and that the sandbags be aligned with and no farther oceanward than the most landward adjacent sandbag structure. The intention of the alignment provisions are to minimize the impact to the public's access and use of the beach.

A caveat has also been included in the provision allowing for the replacement, repair or modification of sandbag structures under litigation in that they can only be returned to their permitted dimensions. The intention is to restrict changes to the alignment or enlargement of a sandbag structure in litigation. Other changes include one termination date for the entire sandbag structure or contiguous sections (in the case of roads), allowing sandbags to span the property boundaries and other clarifying language.

Temporary rulemaking allows the Commission to enact a rule change with a shorter public comment period, faster review by the Rules Review Commission and no provision for developing a fiscal analysis. Temporary rulemaking is not usually pursued since the Commission must also follow the permanent rulemaking provisions of the NC Administrative Procedures Act (APA). The APA allows temporary rulemaking under specific criteria including when directed by the General Assembly. Once the temporary rule language is approved, the Commission is required to:

- Submit the rule language and notice of hearing to the Office of Administrative Hearing (OAH) at least 30 business days prior to adopting the rule;
- Notify interested parties of the Commission's intent to adopt a temporary rule;
- Accept public comment for at least 15 business days;
- Hold a public hearing on the proposed rule no less than five business days after the rule and notice have been published.

The RRC will review the temporary rule within 15 days of adoption and the temporary rules will expire 270 days after publication in the NC Register or upon the effective date of a permanent rule.

If approved by the CRC, the temporary sandbag rules will be filed with OAH on November 20th and the public comment period will end on December 22, 2015. A public hearing can be held in December and the CRC can adopt the temporary rule after the end of the public comment period.

I will discuss the provisions of the draft rule language and the schedule for the temporary rulemaking process at our upcoming meeting in Atlantic Beach.

15A NCAC 07H .0308 SPECIFIC USE STANDARDS FOR OCEAN HAZARD AREAS

(a) Ocean Shoreline Erosion Control Activities:

(1) Use Standards Applicable to all Erosion Control Activities:

(A) All oceanfront erosion response activities shall be consistent with the general policy statements in 15A NCAC 07M .0200.

(B) Permanent erosion control structures may cause significant adverse impacts on the value and enjoyment of adjacent properties or public access to and use of the ocean beach, and, therefore, unless specifically authorized under the Coastal Area Management Act, are prohibited. Such structures include bulkheads, seawalls, revetments, jetties, groins and breakwaters.

(C) Rules concerning the use of oceanfront erosion response measures apply to all oceanfront properties without regard to the size of the structure on the property or the date of its construction.

(D) All permitted oceanfront erosion response projects, other than beach bulldozing and temporary placement of sandbag structures, shall demonstrate sound engineering for their planned purpose.

(E) Shoreline erosion response projects shall not be constructed in beach or estuarine areas that sustain substantial habitat for fish and wildlife species, as identified by natural resource agencies during project review, unless mitigation measures are incorporated into project design, as set forth in Rule .0306(i) of this Section.

(F) Project construction shall be timed to minimize adverse effects on biological activity.

(G) Prior to completing any erosion response project, all exposed remnants of or debris from failed erosion control structures must be removed by the permittee.

(H) Erosion control structures that would otherwise be prohibited by these standards may be permitted on finding by the Division that:

(i) the erosion control structure is necessary to protect a bridge which provides the only existing road access on a barrier island, that is vital to public safety, and is imminently threatened by erosion as defined in provision (a)(2)(B) of this Rule;

(ii) the erosion response measures of relocation, beach nourishment or temporary stabilization are not adequate to protect public health and safety; and

(iii) the proposed erosion control structure will have no adverse impacts on adjacent properties in private ownership or on public use of the beach.

(I) Structures that would otherwise be prohibited by these standards may also be permitted on finding by the Division that:

(i) the structure is necessary to protect a state or federally registered historic site that is imminently threatened by shoreline erosion as defined in provision (a)(2)(B) of this Rule;

(ii) the erosion response measures of relocation, beach nourishment or temporary stabilization are not adequate and practicable to protect the site;

(iii) the structure is limited in extent and scope to that necessary to protect the site; and

(iv) any permit for a structure under this Part (I) may be issued only to a sponsoring public agency for projects where the public benefits outweigh the short or long range adverse impacts. Additionally, the permit shall include conditions providing for mitigation or minimization by that agency of any unavoidable adverse impacts on adjoining properties and on public access to and use of the beach.

(J) Structures that would otherwise be prohibited by these standards may also be permitted on finding by the Division that:

(i) the structure is necessary to maintain an existing commercial navigation channel of regional significance within federally authorized limits;

(ii) dredging alone is not practicable to maintain safe access to the affected channel;

(iii) the structure is limited in extent and scope to that necessary to maintain the channel;

(iv) the structure shall not adversely impact fisheries or other public trust resources; and

(v) any permit for a structure under this Part (J) may be issued only to a sponsoring public agency for projects where the public benefits outweigh the short or long range adverse impacts. Additionally, the permit shall include conditions providing for mitigation or minimization by that agency of any unavoidable adverse impacts on adjoining properties and on public access to and use of the beach.

(K) The Commission may renew a permit for an erosion control structure issued pursuant to a variance granted by the Commission prior to 1 July 1995. The Commission may authorize the replacement of a permanent erosion control structure that was permitted by the Commission pursuant to a variance granted by the Commission prior to 1 July 1995 if the Commission finds that:

(i) the structure will not be enlarged beyond the dimensions set out in the permit;

(ii) there is no practical alternative to replacing the structure that will provide the same or similar benefits; and

(iii) the replacement structure will comply with all applicable laws and with all rules, other than the rule or rules with respect to which the Commission granted the variance, that are in effect at the time the structure is replaced.

(L) Proposed erosion response measures using innovative technology or design shall be considered as experimental and shall be evaluated on a case-by-case basis to determine consistency with 15A NCAC 7M .0200 and general and specific use standards within this Section.

(2) Temporary Erosion Control Structures:

(A) Permittable temporary erosion control structures shall be limited to sandbags placed landward of mean high water and parallel to the shore.

(B) Temporary erosion control structures as defined in Part (2)(A) of this Subparagraph ~~shall~~ may be used to protect ~~only~~ imminently threatened roads and associated right of ways, and buildings and their associated septic systems. A structure is considered imminently threatened if its foundation, septic system, or right-of-way in the case of roads, is less than 20 feet away from the erosion scarp. Buildings and roads located more than 20 feet from the erosion scarp or in areas where there is no obvious erosion scarp may also be found to be imminently threatened when site conditions, such as a flat beach profile or accelerated erosion, increase the risk of imminent damage to the structure. Temporary erosion control structures may be used to protect properties that are experiencing erosion when there are no imminently threatened structures on the property if an adjacent property has an existing temporary erosion control structure that is in compliance with the Commission's rules. Temporary erosion control structures used to protect property without imminently threatened structures shall be sited to align with and be no further oceanward than the most landward adjacent temporary erosion control structure.

(C) ~~Temporary~~ Nothwithstanding Part (2)(B) of this Subparagraph, temporary erosion control structures shall be used to protect only the principal structure ~~,~~ and its associated septic system, but not appurtenances such as pools, gazebos, decks or any amenity that is allowed as an exception to the erosion setback requirement.

(D) Temporary erosion control structures may be placed seaward of a septic system when there is no alternative to relocate it on the same or adjoining lot so that it is landward of or in line with the structure being protected.

(E) ~~Temporary erosion control structures shall not extend more than 20 feet past the sides of the structure to be protected~~. The landward side of such temporary erosion control structures shall not be located more than 20 feet seaward of the structure to be protected or the right-of-way in the case of roads. If a building or road is found to be imminently threatened and at an increased risk of imminent damage due to site conditions such as a flat beach profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the structure being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or their designee in accordance with Part (2)(A) of this Subparagraph.

(F) Temporary erosion control structures may remain in place for up to two years after the date of approval if they are protecting a building with a total floor area of 5000 sq. ft. or less and its associated septic system, or, for up to five years for a building with a total floor area of more than 5000 sq. ft. and its associated septic system. Temporary erosion control

structures may remain in place for up to five years if they are protecting a bridge or a road. The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits. The property owner shall be responsible for removal of the temporary structure within 30 days of the end of the allowable time period.

(G) Temporary sandbag erosion control structures may remain in place for up to eight years from the date of approval if they are located in a community that is actively pursuing a beach nourishment project, or if they are located in an Inlet Hazard Area adjacent to an inlet for which a community is actively pursuing an inlet relocation or stabilization project in accordance with G.S. 113A-115.1 For purposes of this Rule, a community is considered to be actively pursuing a beach nourishment, inlet relocation or stabilization project if it has:

(i) an active CAMA permit, where necessary, approving such project; or

(ii) been identified by a U.S. Army Corps of Engineers' Beach Nourishment Reconnaissance Study, General Reevaluation Report, Coastal Storm Damage Reduction Study or an ongoing feasibility study by the U.S. Army Corps of Engineers and a commitment of local or federal money, when necessary; or

(iii) received a favorable economic evaluation report on a federal project; or

(iv) is in the planning stages of a project designed by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements and initiated by a local government or community with a commitment of local or state funds to construct the project and the identification of the financial resources or funding bases necessary to fund the beach nourishment, inlet relocation or stabilization project.

If beach nourishment, inlet relocation or stabilization is rejected by the sponsoring agency or community, or ceases to be actively planned for a section of shoreline, the time extension is void for that section of beach or community and existing sandbags are subject to all applicable time limits set forth in Part (F) of this Subparagraph. The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits.

(H) Once the temporary erosion control structure is determined by the Division of Coastal Management to be unnecessary due to relocation or removal of the threatened structure, a storm protection project constructed by the U.S. Army Corps of Engineers, a large-scale beach nourishment project, an inlet relocation or stabilization project, it shall be removed by the property owner within 30 days of official notification from the Division of Coastal Management regardless of the time limit placed on the temporary erosion control structure.

(I) Removal of temporary erosion control structures is not required if they are covered by dunes with stable and natural vegetation.

(J) The property owner shall be responsible for the removal of remnants of all portions of any damaged temporary erosion control structure.

(K) Sandbags used to construct temporary erosion control structures shall be tan in color and three to five feet wide and seven to 15 feet long when measured flat. Base width of the structure shall not exceed 20 feet, and the height shall not exceed six feet.

(L) Soldier pilings and other types of devices to anchor sandbags shall not be allowed.

(M) An imminently threatened structure may be protected only once, regardless of ownership, unless the threatened structure is located in a community that is actively pursuing a beach nourishment project, or in an Inlet Hazard Area and in a community that is actively pursuing an inlet relocation or stabilization project in accordance with (G) of this Subparagraph. Existing temporary erosion control structures located in Inlet Hazard Areas may be eligible for an additional eight year permit extension provided that the structure being protected is still imminently threatened, the temporary erosion control structure is in compliance with requirements of this Subchapter and the community in which it is located is actively pursuing a beach nourishment, inlet relocation or stabilization project in accordance with Part (G) of this Subparagraph. In the case of a building, a temporary erosion control structure may be extended, or new segments constructed, if additional areas of the building become imminently threatened. Where temporary structures are installed or extended incrementally, the time period for removal under Part (F) or (G) of this Subparagraph shall begin at the time the ~~initial~~ most recent erosion control structure is installed. For the purpose of this Rule:

(i) a building and septic system shall be considered as separate structures.

(ii) a road or highway shall be allowed to be incrementally protected as sections become imminently threatened. The time period for removal of each contiguous section of sandbags shall begin at the time that the most recent section is installed in accordance with Part (F) or (G) of this Subparagraph.

(N) Existing sandbag structures may be repaired or replaced within their originally permitted dimensions during the time period allowed under Part (F) or (G) of this Subparagraph. Existing sandbag structures that were legally placed but have expired permits may be replaced, repaired or modified within their permit dimension, if the status of the permit is being litigated by the property owner in state or federal court.

(3) Beach Nourishment. Sand used for beach nourishment shall be compatible with existing grain size and in accordance with 15A NCAC 07H .0312.

(4) Beach Bulldozing. Beach bulldozing (defined as the process of moving natural beach material from any point seaward of the first line of stable vegetation to create a protective sand dike or to obtain material for any other purpose) is development and may be permitted as an erosion response if the following conditions are met:

(A) The area on which this activity is being performed shall maintain a slope of adequate grade so as to not endanger the public or the public's use of the beach and shall follow the pre-emergency slope as closely as possible. The movement of material utilizing a bulldozer, front end loader, backhoe, scraper, or any type of earth moving or construction equipment shall not exceed one foot in depth measured from the pre-activity surface elevation;

(B) The activity shall not exceed the lateral bounds of the applicant's property unless he has permission of the adjoining land owner(s);

(C) Movement of material from seaward of the mean low water line will require a CAMA Major Development and State Dredge and Fill Permit;

(D) The activity shall not increase erosion on neighboring properties and shall not have an adverse effect on natural or cultural resources;

(E) The activity may be undertaken to protect threatened on-site waste disposal systems as-well as the threatened structure's foundations.

(b) Dune Establishment and Stabilization. Activities to establish dunes shall be allowed so long as the following conditions are met:

(1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.

(2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.

(3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas shall be immediately replanted or temporarily stabilized until planting can be successfully completed.

(4) Sand used to establish or strengthen dunes shall be of the same general characteristics as the sand in the area in which it is to be placed.

(5) No new dunes shall be created in inlet hazard areas.

(6) Sand held in storage in any dune, other than the frontal or primary dune, may be redistributed within the AEC provided that it is not placed any farther oceanward than the crest of a primary dune or landward toe of a frontal dune.

(7) No disturbance of a dune area shall be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.

(c) Structural Accessways:

(1) Structural accessways shall be permitted across primary dunes so long as they are designed and constructed in a manner that entails negligible alteration on the primary dune. Structural accessways shall not be considered threatened structures for the purpose of Paragraph (a) of this Rule.

(2) An accessway shall be conclusively presumed to entail negligible alteration of a primary dune provided that:

(A) The accessway is exclusively for pedestrian use;

(B) The accessway is less than six feet in width;

(C) The accessway is raised on posts or pilings of five feet or less depth, so that wherever possible only the posts or pilings touch the frontal dune. Where this is deemed impossible, the structure shall touch the dune only to the extent absolutely necessary. In no case shall an accessway be permitted if it will diminish the dune's capacity as a protective barrier against flooding and erosion; and

(D) Any areas of vegetation that are disturbed are revegetated as soon as feasible.

(3) An accessway which does not meet Part (2)(A) and (B) of this Paragraph shall be permitted only if it meets a public purpose or need which cannot otherwise be met and it meets Part (2)(C) of this Paragraph. Public fishing piers shall not be deemed to be prohibited by this Rule, provided all other applicable standards are met.

(4) In order to avoid weakening the protective nature of primary and frontal dunes a structural accessway (such as a "Hatteras ramp") shall be provided for any off-road vehicle (ORV) or emergency vehicle access. Such accessways shall be no greater than 10 feet in width and shall be constructed of wooden sections fastened together over the length of the affected dune area.

(d) Building Construction Standards. New building construction and any construction identified in .0306(a)(5) and 07J .0210 shall comply with the following standards:

(1) In order to avoid danger to life and property, all development shall be designed and placed so as to minimize damage due to fluctuations in ground elevation and wave action in a 100-year storm. Any building constructed within the ocean hazard area shall comply with relevant sections of the North Carolina Building Code including the Coastal and Flood Plain Construction Standards and the local flood damage prevention ordinance as required by the National Flood Insurance Program. If any provision of the building code or a flood damage prevention ordinance is inconsistent with any of the following AEC standards, the more restrictive provision shall control.

(2) All building in the ocean hazard area shall be on pilings not less than eight inches in diameter if round or eight inches to a side if square.

(3) All pilings shall have a tip penetration greater than eight feet below the lowest ground elevation under the structure. For those structures so located on or seaward of the primary dune, the pilings shall extend to five feet below mean sea level.

(4) All foundations shall be adequately designed to be stable during applicable fluctuations in ground elevation and wave forces during a 100-year storm. Cantilevered decks and walkways shall meet this standard or shall be designed to break-away without structural damage to the main structure.

History Note: *Authority G.S. 113A-107(a); 113A-107(b); 113A-113(b)(6)a.,b.,d.; 113A-115.1; 113A-124;*
Eff. June 1, 1979;
Filed as a Temporary Amendment Eff. June 20, 1989, for a period of 180 days to expire on December 17, 1989;
Amended Eff. August 3, 1992; December 1, 1991; March 1, 1990; December 1, 1989;
RRC Objection Eff. November 19, 1992 due to ambiguity;
RRC Objection Eff. January 21, 1993 due to ambiguity;
Amended Eff. March 1, 1993; December 28, 1992;
RRC Objection Eff. March 16, 1995 due to ambiguity;
Amended Eff. April 1, 1999; February 1, 1996; May 4, 1995;
Temporary Amendment Eff. July 3, 2000; May 22, 2000;
Amended Eff. May 1, 2013; July 1, 2009; April 1, 2008; February 1, 2006; August 1, 2002;
Temporary Amendment Eff. December 31, 2015.

15A NCAC 07H .1704 GENERAL CONDITIONS

(a) Work permitted by means of an emergency general permit shall be subject to the following limitations:

(1) No work shall begin until an onsite meeting is held with the applicant and a Division of Coastal Management representative so that the proposed emergency work can be delineated. Written authorization to proceed with the proposed development may be issued during this visit.

(2) No work shall be permitted other than that which is necessary to reasonably protect against or reduce the imminent danger caused by the emergency, to restore the damaged property to its condition immediately before the emergency, or to re-establish necessary public facilities or transportation corridors.

(3) Any permitted erosion control projects shall be located no more than 20 feet waterward of the imminently threatened structure or the right-of way in the case of ~~roads.~~ roads, except as provided under 15A NCAC 07H .0308. If a building or road is found to be imminently threatened and at increased risk of imminent damage due to site conditions such as a flat beach profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the structure being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or designee.

(4) Fill materials used in conjunction with emergency work for storm or erosion control shall be obtained from an upland source. Excavation below MHW in the Ocean Hazard AEC may be allowed to obtain material to fill sandbags used for emergency protection.

(5) Structural work shall meet sound engineering practices.

(6) This permit allows the use of oceanfront erosion control measures for all oceanfront properties without regard to the size of the existing structure on the property or the date of construction.

(b) Individuals shall allow authorized representatives of the Department of Environment and Natural Resources to make inspections at any time deemed necessary to be sure that the activity being performed under authority of this general permit is in accordance with the terms and conditions in these Rules.

(c) Development shall not jeopardize the use of the waters for navigation or for other public trust rights in public trust areas including estuarine waters.

(d) This permit shall not be applicable to proposed construction where the Department has determined, based on an initial review of the application, that notice and review pursuant to G.S. 113A-119 is necessary because there are unresolved questions concerning the proposed activity's impact on adjoining properties or on water quality, air quality, coastal wetlands, cultural or historic sites, wildlife, fisheries resources, or public trust rights.

(e) This permit does not eliminate the need to obtain any other state, local, or federal authorization.

(f) Development carried out under this permit must be consistent with all local requirements, CAMA rules, and local land use plans, storm hazard mitigation, and post-disaster recovery plans current at the time of authorization.

History Note: *Authority G.S. 113-229(cl); 113A-107(a),(b); 113A-113(b); 113A-118.1;*
Eff. November 1, 1985;
Amended Eff. December 1, 1991; May 1, 1990;
RRC Objection due to ambiguity Eff. May 19, 1994;
Amended Eff. May 1, 2010; August 1, 1998; July 1, 1994;
Temporary Amendment Eff. December 31, 2015.

15A NCAC 07H .1705 SPECIFIC CONDITIONS

(a) Temporary Erosion Control Structures in the Ocean Hazard AEC.

(1) Permittable temporary erosion control structures shall be limited to sandbags placed landward of mean high water and parallel to the shore.

(2) Temporary erosion control structures as defined in Subparagraph (1) of this Paragraph ~~shall~~ may be used to protect ~~only~~ imminently threatened roads and associated right of ways, and buildings and their associated septic systems. A structure is considered imminently threatened if its foundation, septic system, or, right-of-way in the case of roads, is less than 20 feet away from the erosion scarp. Buildings and roads located more than 20 feet from the erosion scarp or in areas where there is no obvious erosion scarp may also be found to be imminently threatened when the Division determines that site conditions, such as a flat beach profile or accelerated erosion, increase the risk of imminent damage to the structure. Temporary erosion control structures may be used to protect properties that are experiencing erosion when there are no imminently threatened structures on the property if an adjacent property has an existing temporary erosion control structure that is in compliance with the Commission's rules. Temporary erosion control structures used to protect property without imminently threatened structures shall b*e sited to align with and be no* farther oceanward than the most landward adjacent temporary erosion control structure.

(3) ~~Temporary~~ Notwithstanding Part (a)(2) of this Subparagraph, temporary erosion control structures shall be used to protect only the principal structure and its associated septic system, but not appurtenances such as pools, gazebos, decks or any amenity that is allowed as an exception to the erosion setback requirement.

(4) Temporary erosion control structures may be placed seaward of a septic system when there is no alternative to relocate it on the same or adjoining lot so that it is landward of or in line with the structure being protected.

(5) ~~Temporary erosion control structures shall not extend more than 20 feet past the sides of the structure to be protected.~~ The landward side of such temporary erosion control structures shall not be located more than 20 feet seaward of the structure to be protected or the right-of-way in the case of roads. If a building or road is found to be imminently threatened and at increased risk of imminent damage due to site conditions such as a flat beach profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the structure being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or designee in accordance with Subparagraph (1) of this Paragraph.

(6) Temporary erosion control structures may remain in place for up to two years after the date of approval if they are protecting a building with a total floor area of 5,000 square feet or less and its associated septic system, or for up to five years for a building with a total floor area of more than 5,000 square feet and its associated septic system. Temporary erosion control structures may remain in place for up to five years if they are protecting a bridge or a road. The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits. The property owner shall be responsible for removal of the temporary structure within 30 days of the end of the allowable time period.

(7) Temporary sandbag erosion control structures may remain in place for up to eight years from the date of approval if they are located in a community that is actively pursuing a beach nourishment project, or if they are located in an Inlet Hazard Area adjacent to an inlet for which a community is actively pursuing an inlet relocation or stabilization project in accordance with G.S. 113A-115.1 For purposes of this Rule, a community is considered to be actively pursuing a beach nourishment, inlet relocation or stabilization project if it has:

(A) an active CAMA permit, where necessary, approving such project; or

(B) been identified by a U.S. Army Corps of Engineers' Beach Nourishment Reconnaissance Study, General Reevaluation Report, Coastal Storm Damage Reduction Study, or an ongoing feasibility study by the U.S. Army Corps of Engineers and a commitment of local or federal money, when necessary; or

(C) received a favorable economic evaluation report on a federal project; or

(D) is in the planning stages of a project designed by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements and initiated by a local government or community with a commitment of local or state funds to construct the project and the identification of the financial resources or funding bases necessary to fund the beach nourishment, inlet relocation or stabilization project.

If beach nourishment, inlet relocation or stabilization is rejected by the sponsoring agency or community, or ceases to be actively planned for a section of shoreline, the time extension is void for that section of beach or community and existing sandbags are subject to all applicable time limits set forth in Subparagraph (6) of this Paragraph. The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits.

(8) Once the temporary erosion control structure is determined by the Division of Coastal Management to be unnecessary due to relocation or removal of the threatened structure, a storm protection project constructed by the U.S. Army Corps of Engineers, a large scale beach nourishment project, an inlet relocation or stabilization project, it shall be removed by the permittee within 30 days of official notification by the Division of Coastal Management regardless of the time limit placed on the temporary erosion control structure.

(9) Removal of temporary erosion control structures is not required if they are covered by dunes with stable and natural vegetation.

(10) The property owner shall be responsible for the removal of remnants of all portions of any damaged temporary erosion control structure.

(11) Sandbags used to construct temporary erosion control structures shall be tan in color and 3 to 5 feet wide and 7 to 15 feet long when measured flat. Base width of the structure shall not exceed 20 feet, and the height shall not exceed 6 feet.

(12) Soldier pilings and other types of devices to anchor sandbags shall not be allowed.

(13) Excavation below mean high water in the Ocean Hazard AEC may be allowed to obtain material to fill sandbags used for emergency protection.

(14) An imminently threatened structure may be protected only once regardless of ownership, unless the threatened structure is located in a community that is actively pursuing a beach nourishment project, or in an Inlet Hazard Area and in a community that is actively pursuing an inlet relocation or stabilization project in accordance with Subparagraph (7). Exi0sting temporary erosion control structures may be eligible for an additional eight year permit extension provided that the structure being protected is still imminently threatened, the temporary erosion control structure is in compliance with requirements of this Subparagraph and the community in which it is located is actively pursuing a beach nourishment, an inlet relocation or stabilization project in accordance with Subparagraph (7) of this Paragraph. In the case of a building, a temporary erosion control structure may be extended, or new segments constructed, if additional areas of the building become imminently threatened. Where temporary structures are installed or extended incrementally, the time period for removal under Subparagraph (6) or (7) shall begin at the time the ~~initial~~ most recent erosion control structure is installed. For the purpose of this Rule:

(A) a building and septic system shall be considered as separate structures.

(B) a road or highway shall be allowed to be incrementally protected as sections become imminently threatened. The time period for removal of each contiguous section of sandbags shall begin at the time that the most recent section is installed in accordance with Subparagraph (6) or (7) of this Rule.

(15) Existing sandbag structures may be repaired or replaced within their originally permitted dimensions during the time period allowed under Subparagraph (6) or (7) of this Rule. Existing sandbag structures that were legally placed but have expired permits may be replaced, repaired or modified within their permit dimensions, if the status of the permit is being litigated by the property owner in state or federal court.

(b) Erosion Control Structures in the Estuarine Shoreline, Estuarine Waters, and Public Trust AECs. Work permitted by this general permit shall be subject to the following limitations:

(1) No work shall be permitted other than that which is necessary to reasonably protect against or reduce the imminent danger caused by the emergency or to restore the damaged property to its condition immediately before the emergency;

(2) The erosion control structure shall be located no more than 20 feet waterward of the imminently threatened structure. If a building or road is found to be imminently threatened and at increased risk of imminent damage due to site conditions such as a flat shore profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the structure being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or designee. Temporary erosion control structures may be used to protect properties that are experiencing erosion when there are no imminently threatened structures on the property if an adjacent property has an existing temporary erosion control structure that is in compliance with the Commission's rules. Temporary erosion control structures used to protect property without imminently threatened structures shall be sited to align with and be no further oceanward than the most landward adjacent temporary erosion control structure.

(3) Fill material used in conjunction with emergency work for storm or erosion control in the Estuarine Shoreline, Estuarine Waters and Public Trust AECs shall be obtained from an upland source.

(c) Protection, Rehabilitation, or Temporary Relocation of Public Facilities or Transportation Corridors.

(1) Work permitted by this general permit shall be subject to the following limitations:

(A) no work shall be permitted other than that which is necessary to protect against or reduce the imminent danger caused by the emergency or to restore the damaged property to its condition immediately before the emergency;

(B) the erosion control structure shall be located no more than 20 feet waterward of the imminently threatened structure or the right-of-way in the case of roads. If a public facility or transportation corridor is found to be imminently threatened and at increased risk of imminent damage due to site conditions such as a flat shore profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the facility or corridor being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or designee in accordance with Subparagraph (a)(1) of this Rule. Temporary erosion control structures may be used to protect properties that are experiencing erosion when there are no imminently threatened structures on the property if an adjacent property has an existing temporary erosion control structure that is in compliance with the Commission's rules. Temporary erosion control structures used to protect property without imminently threatened structures shall be sited to align with and be no further oceanward than the most landward adjacent temporary erosion control structure;

(C) any fill materials used in conjunction with emergency work for storm or erosion control shall be obtained from an upland source except that

dredging for fill material to protect public facilities or transportation corridors shall be considered in accordance with standards in 15A NCAC ~~7H .0208;~~ 7H .0208; and

(D) all fill materials or structures associated with temporary relocations which are located within Coastal Wetlands, Estuarine Water, or Public Trust AECs shall be removed after the emergency event has ended and the area restored to pre-disturbed conditions.

(2) This permit authorizes only the immediate protection or temporary rehabilitation or relocation of existing public facilities. Long-term stabilization or relocation of public facilities shall be consistent with local governments' post-disaster recovery plans and policies which are part of their Land Use Plans.

History Note: Authority G.S. 113-229(cl); 113A-107(a),(b); 113A-113(b); 113A-115.1; 113A-118.1;
Eff. November 1, 1985;
Amended Eff. April 1, 1999; February 1, 1996; June 1, 1995;
Temporary Amendment Eff. July 3, 2000; May 22, 2000;
Amended Eff. May 1, 2013; May 1, 2010; August 1, 2002.Temporary Amendment Eff. July 3, 2000; May 22, 2000;
Temporary Amendment Eff. December 31, 2015.

TITLE 15A – DEPARTMENT OF ENVIRONMENTAL QUALITY

Notice is hereby given in accordance with G.S. 150B-21.2 that the Coastal Resources Commission intends to adopt the rules cited as 15A NCAC 07J .1301-.1303 and amend the rules cited as 15A NCAC 07H .0305, .0306; and 07J .1201.

Link to agency website pursuant to G.S. 150B-19.1(c): *http://www.nccoastalmanagement.net/web/cm/proposed-rules*

Proposed Effective Date: *April 1, 2016*

Public Hearing:
Date: *November 18, 2015*
Time: *1:30 p.m.*
Location: *DoubleTree by Hilton, 2717 W. Fort Macon Rd., Atlantic Beach, NC 28512*

Reason for Proposed Action: *The Coastal Resources Commission proposes the Development Line Procedures and amendments to current rules collectively allowing local government to have less restrictive management options following a large-scale beach fill project. 15A NCAC 07J .1300 (.1301, .1302, and .1303) creates procedures for requesting, approving, and managing an oceanfront Development Line, and establishes an alternative to the Static Vegetation Line Exception (15A NCAC 07J .1200) for oceanfront communities receiving a large-scale beach fill project. Amendments to the General Use Standards for Ocean Hazard Areas (15A NCAC 07H .0306) and Static Vegetation Line Exception Procedures (15A NCAC 07J .1200) are proposed for the purpose of easing requirements by eliminating the mandatory 5-year waiting period and the 2,500 maximum square footage limit on structures.*

Comments may be submitted to: *Braxton Davis, 400 Commerce Avenue, Morehead City, NC 28577, phone (252) 808-2808*

Comment period ends: *January 2, 2016*

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).
- ☒ **State funds affected**
- ☐ **Environmental permitting of DOT affected**
  Analysis submitted to Board of Transportation
- ☒ **Local funds affected**
- ☐ **Substantial economic impact (≥$1,000,000)**
- ☒ **Approved by OSBM**
- ☐ **No fiscal note required by G.S. 150B-21.4**

CHAPTER 07 – COASTAL MANAGEMENT

SUBCHAPTER 07H - STATE GUIDELINES FOR AREAS OF ENVIRONMENTAL CONCERN

SECTION .0300 – OCEAN HAZARD AREAS

15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This section describes natural and man-made features that are found within the ocean hazard area of environmental concern.

(1) Ocean Beaches. Ocean beaches are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either:
  (A) the growth of vegetation occurs, or
  (B) a distinct change in slope or elevation alters the configuration of the landform, whichever is farther landward.

(2) Nearshore. The nearshore is the portion of the beach seaward of mean low water that is characterized by dynamic changes both in space and time as a result of storms.

(3) Primary Dunes. Primary dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. The primary dune extends landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the dune trough).

(4) Frontal Dunes. The frontal dune is deemed to be the first mound of sand located landward of the ocean beach having sufficient vegetation, height, continuity and configuration to offer protective value.

(5) Vegetation Line. The vegetation line refers to the first line of stable and natural vegetation, which shall be used as the reference point for measuring oceanfront setbacks. This line represents the boundary between the normal dry-sand beach, which is subject to constant flux due to waves, tides, storms and wind, and the more stable upland areas. The vegetation line is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment. The Division of Coastal Management or Local Permit Officer shall determine the location of the stable and natural vegetation line based on visual observations of plant composition and density. If the vegetation has been planted, it may be considered stable when the majority of the plant stems are from continuous rhizomes rather than planted individual rooted sets. The vegetation may be considered natural when the majority of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring. In areas where there is no stable natural vegetation present, this line may be established by interpolation between the nearest adjacent stable natural vegetation by on ground observations or by aerial photographic interpretation.

(6) Static Vegetation Line. In areas within the boundaries of a large-scale beach fill project, the vegetation line that existed within one year prior to the onset of initial project construction shall be defined as the static vegetation line. A static vegetation line shall be established in coordination with the Division of Coastal Management using on-ground observation and survey or aerial imagery for all areas of oceanfront that undergo a large-scale beach fill project. Once a static vegetation line is established, and after the onset of project construction, this line shall be used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In all locations where the vegetation line as defined in this Rule is landward of the static vegetation line, the vegetation line shall be used as the reference point for measuring oceanfront setbacks. A static vegetation line shall not be established where a static vegetation line is already in place, including those established by the Division of Coastal Management prior to the effective date of this Rule. A record of all static vegetation lines, including those established by the Division of Coastal Management prior to the effective date of this Rule, shall be maintained by the Division of Coastal Management for determining development standards as set forth in Rule .0306 of this Section. Because the impact of Hurricane Floyd (September 1999) caused significant portions of the vegetation line in the Town of Oak Island and the Town of Ocean Isle Beach to be relocated landward of its pre-storm position, the static line for areas landward of the beach fill construction in the Town of Oak Island and the Town of Ocean Isle Beach, the onset of which occurred in 2000, shall be defined by the general trend of the vegetation line established by the Division of Coastal Management from June 1998 aerial orthophotography.

(7) Beach Fill. Beach fill refers to the placement of sediment along the oceanfront shoreline. Sediment used solely to establish or strengthen dunes shall not be considered a beach fill project under this Rule. A large-scale beach fill project shall be defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the U.S. Army Corps of Engineers. The onset of construction shall be defined as the date sediment placement begins with the exception of projects completed prior to the effective date of this Rule, in which case the award of contract date will be considered the onset of construction.

(8) Erosion Escarpment. The normal vertical drop in the beach profile caused from high tide or storm tide erosion.

(9) Measurement Line. The line from which the ocean hazard setback as described in Rule .0306(a) of this Section is measured in the unvegetated beach area of environmental concern as described in Rule .0304(4) of this Section. Procedures for determining the measurement line in areas designated pursuant to Rule .0304(4)(a) of this Section shall be adopted by the Commission for each area where such a line is designated pursuant to the provisions of G.S. 150B. These procedures shall be available from any local permit officer or the Division of Coastal Management. In areas designated pursuant to Rule .0304(4)(b) of this Section, the Division of Coastal Management shall establish a measurement line that approximates the location at which the vegetation line is expected to reestablish by:

(A) determining the distance the vegetation line receded at the closest vegetated site to the proposed development site; and

(B) locating the line of stable natural vegetation on the most current pre-storm aerial photography of the proposed development site and moving this line landward the distance determined in Subparagraph (g)(1) of this Rule.

The measurement line established pursuant to this process shall in every case be located landward of the average width of the beach as determined from the most current pre-storm aerial photography.

(10) Development Line. The line established in accordance with 15A NCAC 07J .1300 by local governments representing the seaward-most allowable location of oceanfront development. In areas that have approved development lines, the vegetation line or measurement line shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of Rule .0306(a)(2) of this Section.

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined 15A NCAC 07I .0500, a readily identifiable land area within which the ocean hazard areas occur. This designated notice area must include all of the land areas defined in Rule .0304 of this Section. Natural or man-made landmarks may be considered in delineating this area.

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's Rules shall be located according to whichever of the following is applicable:

(1) The ocean hazard setback for development is measured in a landward direction from the vegetation line, the static vegetation line or the measurement line, whichever is applicable. ~~The setback distance is determined by both the size of development and the shoreline erosion rate as defined in 15A NCAC 07H .0304. Development size is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:~~

~~(A) The total square footage of heated or air-conditioned living space;~~

~~(B) The total square footage of parking elevated above ground level; and~~

~~(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.~~

~~Decks, roof-covered porches and walkways are not included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.~~

(2) In areas with a development line, the ocean hazard setback line shall be set at a distance in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established below the mean high water line.

(4) The setback distance is determined by both the size of development and the shoreline erosion rate as defined in Rule .0304 of this Section. Development size is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

(A) The total square footage of heated or air-conditioned living space;

(B) The total square footage of parking elevated above ground level; and

(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches and walkways are not included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

~~(2)~~(5) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback is established based on the following criteria:

(A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(B) A building or other structure greater than or equal to 5,000 square feet but less than 10,000 square feet requires a minimum setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(C) A building or other structure greater than or equal to 10,000 square feet but less than 20,000 square feet requires a minimum setback of 130 feet or 65 times the shoreline erosion rate, whichever is greater;

(D) A building or other structure greater than or equal to 20,000 square feet but less than 40,000 square feet requires a minimum setback of 140 feet or 70 times the shoreline erosion rate, whichever is greater;

(E) A building or other structure greater than or equal to 40,000 square feet but less than 60,000 square feet requires a minimum setback of 150 feet or 75 times the shoreline erosion rate, whichever is greater;

(F) A building or other structure greater than or equal to 60,000 square feet but less than 80,000 square feet requires a minimum setback of 160 feet or 80 times the shoreline erosion rate, whichever is greater;

(G) A building or other structure greater than or equal to 80,000 square feet but less than 100,000 square feet requires a minimum setback of 170 feet or 85 times the shoreline erosion rate, whichever is greater;

(H) A building or other structure greater than or equal to 100,000 square feet requires a minimum setback of 180 feet or 90 times the shoreline erosion rate, whichever is greater;

(I) Infrastructure that is linear in nature such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

(J) Parking lots greater than or equal to 5,000 square feet requires a setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;

(K) Notwithstanding any other setback requirement of this Subparagraph, a building or other structure greater than or equal to 5,000 square feet in a community with a static line exception in accordance with 15A NCAC 07J .1200 requires a minimum setback of 120 feet or 60 times the shoreline erosion rate in place at the time of permit issuance, whichever is greater. The setback shall be measured landward from either the static vegetation line, the vegetation line or measurement line, whichever is farthest landward; and

(L) Notwithstanding any other setback requirement of this Subparagraph, replacement of single-family or duplex residential structures with a total floor area greater than 5,000 square feet shall be allowed provided that the structure meets the following criteria:

(i) the structure was originally constructed prior to August 11, 2009;

(ii) the structure as replaced does not exceed the original footprint or square footage;

(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph ~~(a)(2)~~ (a)(5) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part ~~(a)(2)(A)~~ (a)(5)(A) of this Rule; and

(v) the structure is rebuilt as far landward on the lot as feasible.

~~(5)~~(6) If a primary dune exists in the AEC on or landward of the lot on which the development is proposed, the development shall be landward of the crest of the primary ~~dune or~~ dune, the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line or measurement line, whichever is applicable. For existing lots, however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but shall not be located on or oceanward of a frontal ~~dune.~~dune or the development line. The words "existing lots" in this Rule shall mean a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and which cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership.

~~(4)~~(7) If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot on which the development is proposed, the development shall be set landward of the frontal ~~dune or landward of the~~ dune, ocean hazard ~~setback~~ setback, or development line, whichever is farthest from the vegetation line, static vegetation ~~line~~ line, or measurement line, whichever is applicable.

~~(5)~~(8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot on which development is proposed, the structure shall be landward of the ocean hazard ~~setback.~~ setback or development line, whichever is more restrictive.

~~(6)~~(9) Structural additions or increases in the footprint or total floor area of a building or structure represent expansions to the total floor area and shall meet the setback requirements established in this Rule and 15A NCAC 07H .0309(a). New development landward of the applicable setback may be cosmetically, but shall not be structurally, attached to an existing structure that does not conform with current setback requirements.

~~(7)~~(10) Established common law and statutory public rights of access to and use of public trust lands and waters in ocean hazard areas shall not be eliminated or restricted. Development shall not encroach upon public accessways, nor shall it limit the intended use of the accessways.

~~(8)~~(11) Beach fill as defined in this Section represents a temporary response to coastal erosion, and compatible beach fill as defined in 15A NCAC 07H .0312 can be expected to erode at least as fast as, if not faster than, the pre-project beach. Furthermore, there is no assurance of future funding or beach-compatible sediment for continued beach fill projects and project maintenance. A vegetation line that becomes established oceanward of the pre-project vegetation line in an area that has received beach fill may be more vulnerable to natural hazards along the ~~oceanfront.~~ oceanfront if the beach fill project is not maintained. A development setback measured from the vegetation line ~~provides~~ may provide less protection from ocean hazards. Therefore, development setbacks in areas that have received large-scale beach fill as defined in 15A NCAC 07H .0305 shall be measured landward from the static vegetation line as defined in this ~~Section.~~ Section unless a development line has been approved by the Coastal Resources Commission. ~~However, in order to allow for development landward of the large-scale beach fill project that is less than 2,500 square feet and cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (1) and (2)(A) of this Paragraph, a local government or community may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback provisions defined in Part (a)(2)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner as well as the boundaries of the large-scale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:~~

~~(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(2)(A) of this Rule;~~

~~(B) Total floor area of a building is no greater than 2,500 square feet;~~

~~(C) Development setbacks are calculated from the shoreline erosion rate in place at the time of permit issuance;~~

~~(D) No portion of a building or structure, including roof overhangs and elevated portions that are cantilevered, knee braced or otherwise extended beyond the support of pilings or footings, extends oceanward of the landward-most adjacent building or structure. When the configuration of a lot precludes the placement of a building or structure in line withthe landward-most adjacent building or structure, an average line of construction shall be determined by the Division of Coastal Management on a case-by-case basis in order to determine an ocean hazard setback that is landward of the vegetation line, a distance no less than 30 times the shoreline erosion rate or 60 feet, whichever is greater;~~

~~(E) With the exception of swimming pools, the development defined in 15A NCAC 07H .0309(a) is allowed oceanward of the static vegetation line; and~~

~~(F) Development is not eligible for the exception defined in 15A NCAC 07H .0309(b).~~

(12) In order to allow for development landward of the large-scale beach fill project that cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (1) and (5) of this Paragraph, a local government, group of local governments involved in a regional beach fill project, or qualified owner's association defined in G.S. 47F-1-103-(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one mile of ocean shoreline, may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback

provisions defined in Part (a)(2)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner as well as the boundaries of the large-scale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;

(B) Development setbacks are calculated from the shoreline erosion rate in place at the time of permit issuance;

(C) No portion of a building or structure, including roof overhangs and elevated portions that are cantilevered, knee braced or otherwise extended beyond the support of pilings or footings, extends oceanward of the landward-most adjacent building or structure. When the configuration of a lot precludes the placement of a building or structure in line with the landward-most adjacent building or structure, an average line of construction shall be determined by the Division of Coastal Management on a case-by-case basis in order to determine an ocean hazard setback that is landward of the vegetation line, a distance no less than 30 times the shoreline erosion rate or 60 feet, whichever is greater;

(D) With the exception of swimming pools, the development defined in Rule .0309(a) of this Section is allowed oceanward of the static vegetation line; and

(E) Development is not eligible for the exception defined in Rule .0309(b) of this Section.

(b) In order to avoid weakening the protective nature of ocean beaches and primary and frontal dunes, no development is permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon which would adversely affect the integrity of the dune. Other dunes within the ocean hazard area shall not be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes is allowed only to the extent permitted by 15A NCAC 07H .0308(b).

(c) Development shall not cause irreversible damage to historic architectural or archaeological resources documented by the Division of Archives and History, the National Historical Registry, the local land-use plan, or other sources with knowledge of the property.

(d) Development shall comply with minimum lot size and set back requirements established by local regulations.

(e) Mobile homes shall not be placed within the high hazard flood area unless they are within mobile home parks existing as of June 1, 1979.

(f) Development shall comply with general management objective for ocean hazard areas set forth in 15A NCAC 07H .0303.

(g) Development shall not interfere with legal access to, or use of, public resources nor shall such development increase the risk of damage to public trust areas.

(h) Development proposals shall incorporate measures to avoid or minimize adverse impacts of the project. These measures shall be implemented at the applicant's expense and may include actions that:

(1) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;

(2) restore the affected environment; or

(3) compensate for the adverse impacts by replacing or providing substitute resources.

(i) Prior to the issuance of any permit for development in the ocean hazard AECs, there shall be a written acknowledgment from the applicant to the Division of Coastal Management that the applicant is aware of the risks associated with development in this hazardous area and the limited suitability of this area for permanent structures. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development.

(j) All relocation of structures requires permit approval. Structures relocated with public funds shall comply with the applicable setback line as well as other applicable AEC rules. Structures including septic tanks and other essential accessories relocated entirely with non-public funds shall be relocated the maximum feasible distance landward of the present location; septic tanks may not be located oceanward of the primary structure. All relocation of structures shall meet all other applicable local and state rules.

(k) Permits shall include the condition that any structure shall be relocated or dismantled when it becomes imminently threatened by changes in shoreline configuration as defined in 15A NCAC 07H .0308(a)(2)(B). Any such structure shall be relocated or dismantled within two years of the time when it becomes imminently threatened, and in any case upon its collapse or subsidence. However, if natural shoreline recovery or beach fill takes place within two years of the time the structure becomes imminently threatened, so that the structure is no longer imminently threatened, then it need not be relocated or dismantled at that time. This permit condition shall not affect the permit holder's right to seek authorization of temporary protective measures allowed under 15A NCAC 07H .0308(a)(2).

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

SUBCHAPTER 07J -PROCEDURES FOR PROCESSING AND ENFORCEMENT OF MAJOR AND MINOR DEVELOPMENT PERMITS, VARIANCE REQUESTS, APPEALS FROM PERMIT DECISIONS, DECLARATORY RULINGS, AND STATIC LINE EXCEPTIONS

SECTION .1200 - STATIC VEGETATION LINE EXCEPTION PROCEDURES

15A NCAC 07J .1201 REQUESTING THE STATIC LINE EXCEPTION

(a) Any local ~~government~~government, group of local governments involved in a regional beach fill project, qualified owner's association defined in G.S. 47F-1-103-(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one mile of ocean shoreline, or permit holder of a large-scale beach fill project, herein referred to as the petitioner, that is subject to a static vegetation line pursuant to 15A NCAC 07H .0305, may petition the Coastal Resources Commission for an exception to the static line in accordance with the provisions of this Section.

(b) A petitioner is eligible to submit a request for a static vegetation line exception after five years have passed since the completion of the initial large-scale beach fill project(s) as defined in 15A NCAC 07H .0305 that required the creation of a static vegetation line(s). For a static vegetation line in existence prior to the effective date of this Rule, the award-of-contract date of the initial large-scale beach fill project, or the date of the aerial photography or other survey data used to define the static vegetation line, whichever is most recent, shall be used in lieu of the completion of construction date.

(c) A static line exception request applies to the entire static vegetation line within the jurisdiction of the petitioner including segments of a static vegetation line that are associated with the same large-scale beach fill project. If multiple static vegetation lines within the jurisdiction of the petitioner are associated with different large-scale beach fill projects, then the static line exception in accordance with 15A NCAC 07H .0306 and the procedures outlined in this Section shall be considered separately for each large-scale beach fill project.

(d) A static line exception request shall be made in writing by the petitioner. A complete static line exception request shall include the following:

(1) A summary of all beach fill projects in the area for which the exception is being requested including the initial large-scale beach fill project associated with the static vegetation line, subsequent maintenance of the initial large-scale projects(s) and beach fill projects occurring prior to the initial large-scale projects(s). To the extent historical data allows, the summary shall include construction dates, contract award dates, volume of sediment excavated, total cost of beach fill project(s), funding sources, maps, design schematics, pre-and post-project surveys and a project footprint;

(2) Plans and related materials including reports, maps, tables and diagrams for the design and construction of the initial large-scale beach fill project that required the static vegetation line, subsequent maintenance that has occurred, and planned maintenance needed to achieve a design life providing no less than ~~25~~ 30 years of shore protection from the date of the static line exception request. The plans and related materials shall be designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for said work;

(3) Documentation, including maps, geophysical, and geological data, to delineate the planned location and volume of compatible sediment as defined in 15A NCAC 07H .0312 necessary to construct and maintain the large-scale beach fill project defined in Subparagraph (d)(2) of this Rule over its design life. This documentation shall be designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for said work; and

(4) Identification of the financial resources or funding sources necessary to fund the large-scale beach fill project over its design life.

(e) A static line exception request shall be submitted to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. Written acknowledgement of the receipt of a completed static line exception request, including notification of the date of the meeting at which the request will be considered by the Coastal Resources Commission, shall be provided to the petitioner by the Division of Coastal Management.

(f) The Coastal Resources Commission shall consider a static line exception request no later than the second scheduled meeting following the date of receipt of a complete request by the Division of Coastal Management, except when the petitioner and the Division of Coastal Management agree upon a later date.

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

SECTION .1300 – DEVELOPMENT LINE PROCEDURES

15A NCAC 07J .1301 REQUESTING THE DEVELOPMENT LINE

(a) Any local government, group of local governments involved in a regional beach fill project or qualified owner's association with territorial jurisdiction over an area that is subject to ocean hazard area setbacks pursuant to 15A NCAC 07H .0305, may petition the Coastal Resources Commission for a development line for the purposes of siting oceanfront development in accordance with the provisions of this Section. A qualified owner's association is an owner's association defined in G.S. 47F-1-103-(3) that has authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline.

(b) A development line request applies to the entire large scale project area as defined in 15A NCAC 07H .0305(a)(7), and at the petitioner's request may be extended to include the entire oceanfront jurisdiction or legal boundary of the petitioner.

(c) The petitioner shall utilize an adjacent neighbor sight-line approach, resulting in an average line of structures. In areas where the seaward edge of existing development is not linear, the petitioner may determine an average line of construction on a case-by-case basis. In no case shall a development line be established seaward of the most seaward structure within the petitioner's oceanfront jurisdiction.

(d) An existing structure that is oceanward of an approved development line can remain in place until damaged greater than 50 percent in accordance with Rule .0210 of this Subchapter; and can only be replaced landward of the development line, and must meet the applicable ocean hazard setback requirements as defined in 15A NCAC 07H .0306(a).

(e) A request for a development line or amendment shall be made in writing by the petitioner and submitted to the CRC by sending the written request to the Director of the Division of Coastal Management. A complete request shall include the following:

(1) A detailed survey of the development line using on-ground observation and survey, or aerial imagery along the oceanfront jurisdiction or legal boundary; any local regulations associated with the development line; a record of local adoption of the development line by the petitioner; and documentation of incorporation of development line into local ordinances or rules and regulations of an owner's association.

(2) The survey shall include the development line and static vegetation line.

(3) Surveyed development line spatial data in a geographic information systems (GIS) format referencing North Carolina State Plane North American Datum 83 US Survey Foot, to include Federal Geographic Data Committee (FGDC) compliant metadata.

(f) Once a development line is approved by the Coastal Resources Commission, only the petitioner may request a change or reestablishment of the position of the development line.
(g) A development line request shall be submitted to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. Written acknowledgement of the receipt of a completed development line request, including notification of the date of the meeting at which the request will be considered by the Coastal Resources Commission, shall be provided to the petitioner by the Division of Coastal Management.
(h) The Coastal Resources Commission shall consider a development line request no later than the second scheduled meeting following the date of receipt of a complete request by the Division of Coastal Management, except when the petitioner and the Division of Coastal Management agree upon a later date.

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

15A NCAC 07J .1302 PROCEDURES FOR APPROVING THE DEVELOPMENT LINE

(a) At the meeting that the development line request is considered by the Coastal Resources Commission, the following shall occur:
(1) A representative for the petitioner shall orally present the request described in Rule .1301 of this Section. The Chairman of the Coastal Resources Commission may limit the time allowed for oral presentations.
(2) Additional persons may provide written or oral comments relevant to the development line request. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

(b) The Coastal Resources Commission shall approve a development line request if the request contains the information required and meets the standards set forth in Rule .1301 of this Section. The final decision of the Coastal Resources Commission shall be made at the meeting at which the matter is heard or in no case later than the next scheduled meeting. The final decision shall be transmitted to the petitioner by registered mail within 10 business days following the meeting at which the decision is reached.
(c) The decision to authorize or deny a development line is a final agency decision and is subject to judicial review in accordance with G.S. 113A-123.

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

15A NCAC 07J .1303 LOCAL GOVERNMENTS AND COMMUNITIES WITH DEVELOPMENT LINES

A list of development lines in place for petitioners and any conditions under which the development lines exist, including the date(s) the development lines were approved, shall be maintained by the Division of Coastal Management. The list of development lines shall be available for inspection at the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557.

Authority G.S. 113A-107; 113A-113(b)(6), 113A-124.

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

November 4, 2015

MEMORANDUM **CRC-15-35**

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Draft 2015 Coastal Habitat Protection Plan

The NC Fisheries Reform Act (GS.143B-279.8) requires three of the state's regulatory commissions - the Marine Fisheries, Environmental Management, and Coastal Resources Commissions - to adopt a plan to protect and restore resources critical to North Carolina's fisheries. The Department of Environmental Quality (DEQ) developed a Coastal Habitat Protection Plan (CHPP) through a cooperative, multiagency effort. The CHPP was written by DEQ staff, adopted by the three commissions in 2004, and updated in 2010.

As part of the five year review of the Coastal Habitat Protection Plan (CHPP), the CHPP Steering Committee, comprised of representatives of the three commissions (Larry Baldwin and John Snipes for CRC) has met over the past several months to review the update and revision of the CHPP. These revisions reflect changes in the implementation goals and recommendations as the result of accomplishments, new information based on scientific studies as well as adding new areas of focus or "Priority Habitat Issues". These areas of focus include oyster restoration and living shorelines. The goals and revisions are designed to achieve the CHPP's goal of the "long-term enhancement of coastal fisheries associated with each coastal habitat."

In addition, the Commissions will next develop two-year implementation plans containing action items to facilitate the CHPP goals:

(1) Improve effectiveness of existing rules and programs protecting coastal fish habitats;

(2) Identify and delineate strategic habitats;

(3) Enhance and protect habitat from physical impacts; and

(4) Enhance and protect water quality

Attached is the Draft 2015 CHPP (Executive Summary). The CHPP Reference Document can be downloaded at (http://portal.ncdenr.org/c/document_library/get_file?uuid=eba493ab-536a-44fe-96eb-f53805d7396b&groupId=38337).

Jimmy Johnson, the Department's CHPP Coordinator, will present the revisions at the upcoming meeting in Beaufort. The intention of the CHPP Steering Committee is to have the draft revisions approved by the commissions for presentation at a series of public meetings this December to receive comment on the draft CHPP update. Commissioners Snipes and Baldwin, along with DCM Staff, are recommending several additional edits to the current CHPP Draft, as well as a proposed statement to clarify that the Reference Document was prepared by DEQ staff and to clarify the obligations of the Commissions. DEQ staff intend to incorporate these and other recommended edits from the commissions in the draft documents that will be sent out for public comment. After the public comment meetings, the revised Plan will be brought back to each commission for approval in February 2016. Following approval, the involved agencies will begin preparing 2-year implementation plans.

Draft
2015 North Carolina Coastal Habitat Protection Plan

Draft version presented to the Environmental Review Commission, Coastal Resources Commission, and Marine Fisheries Commission

November 2015

By

North Carolina Department of Environmental Quality

The 2015 North Carolina Coastal Habitat Protection Plan

North Carolina's approximately 2.3 million acres of estuarine waters comprise the largest estuarine system of any state along the Atlantic seaboard. Located at the confluence of warm southern and cool northern currents, North Carolina's waters support a high diversity of aquatic species and six distinct, but interdependent, marine habitats. These waters are vital not only for the state's important fish species, but also to fish that migrate along the East Coast.

North Carolina, with its billion dollar commercial and recreational fishing industries, ranks among the nation's highest seafood producing states. Aquatic species important to these industries depend on sufficient quality and quantity of habitats in our rivers, sounds, and ocean waters. From shellfish beds in the lower estuary, to swamps in the upper estuary, fish habitats are at risk. Activities causing habitat loss and degradation threaten more than the fishing industry vital to North Carolina's economy. They also threaten coastal tourism, outdoor recreation, and residential development.

Recognizing the critical importance of healthy fish habitat, the NC General Assembly passed the Fisheries Reform Act (GS.143B-279.8), requiring three of the state's regulatory commissions - the Marine Fisheries, Environmental Management, and Coastal Resources commissions - to adopt a plan to protect and restore resources critical to North Carolina's fisheries. The Department of Environmental Quality (DEQ) developed a Coastal Habitat Protection Plan (CHPP) through a cooperative, multiagency effort. The CHPP was written by DEQ staff, adopted by the three commissions in 2004, and updated in 2010.

The CHPP is a guidance document that provides the latest science on North Carolina's coastal fish habitats, their ecological functions, value, threats, goals, and recommendations to protect, enhance, and restore fish habitat.

By adopting the revised plan, the commissions are committing to implement these goals and recommendations. To do this, each DEQ division develops a biennial implementation plan that includes tangible and achievable actions to progress forward.

In this 2015 plan, information is presented on past implementation progress, updated recommendations, and priority issues to focus actions. Background on the six fish habitats, their status, and influencing threats is also included. Full details are included in the 2015 CHPP Source Document. A key to acronyms is provided at the end of this document.

Value of NC's coastal fish habitats: *

- 2013 Economic impact of North Carolina's fisheries: commercial - $305 million; recreational - $1.7 billion.
- Submerged aquatic vegetation produces food and improves water quality. In Bogue Sound, NC, pollution removal services valued at $3,000/ac/yr. Ecosystem services of seagrass and algae: ~ $7,700/ac/yr.
- Oyster reefs remove pollutants, increase oyster and fish production, and stabilize shorelines – ecosystem services estimated at $2,200 - $40,200/ac/yr, excluding value of oyster fishery.
- Coastal wetlands provide storm protection valued at $25.6 billion per year.
- Property values adjacent to unpolluted shellfish harvest waters are higher than next to polluted waters.
- NC hard bottom fishery generated more than $4.2 million average annually for each of three years between 2011-2013.
- For every $1 invested in land conservation in North Carolina, there is estimated $4 return in economic value from natural resource goods and services.

* Refer to the Source Document for details and literature references.

Water Column | Shell Bottom | Submerged Aquatic Vegetation | Wetlands | Hard Bottom | Soft Bottom

EXECUTIVE SUMMARY

This document is intended as a resource and guide for implementation of the goals and recommendations of the Coastal Habitat Protection Plan.

GS. 143B-279.8 requires that a Coastal Habitat Protection Plan (CHPP) be drafted by the Department of Environmental Quality, formerly Department of Environment and Natural Resources, and reviewed every five years. The purpose of the plan is to recommend actions to protect and restore habitats critical to enhancement of North Carolina's coastal fisheries. This is the third iteration of the plan. The Marine Fisheries, Coastal Resources, and Environmental Management Commissions are required to approve of the plan recommendations.

The 2015 Coastal Habitat Protection Plan summarizes the economic and ecological value of coastal fish habitats to North Carolina, their status, and potential threats to their sustainability. Goals and recommendations to protect and restore fish habitat, including water quality, are included. The appended Source Document, compiled by staff of the Department of Environmental Quality, provides the science to support the need for such recommendations. Throughout the plan, there are references to the chapter of the source document where more details and references can be found.

The 2015 plan and source document describe many of the accomplishments that have occurred since the first iteration of the plan in 2005. Most have been non-regulatory, collaborative efforts across divisions. While a lot has been accomplished, there is still work to be done. Continued progress will require cooperation across additional agencies, including the Departments of Commerce, Transportation, Agriculture & Consumer Services, Cultural and Natural Resources.

2015 Goals and Recommendations

Goal 1. Improve effectiveness of existing rules and programs protecting coastal fish habitats.

Includes 5 recommendations regarding enhancement of compliance, monitoring, outreach, coordination across commissions, and management of invasive species.

Goal 2. Identify and delineate strategic coastal habitats.

Includes 2 recommendations regarding mapping and monitoring fish habitat, assessing their condition, and identifying priority areas for fish species.

Goal 3. Enhance and protect habitats from adverse physical impacts.

Includes 8 recommendations on expanding habitat restoration, managing ocean and estuarine shorelines, protecting habitat from destructive fishing gear and dredging and filling impacts.

Goal 4. Enhance and protect water quality.

Includes 8 recommendations to reduce point and non-point sources of pollution in surface waters through encouragement of Best Management Practices, incentives, assistance, outreach, and coordination. This applies not only to activities under the authority of the Department of Environmental Quality, such as development and fishing, but for all land use activities, including forestry, agriculture and road construction.

CHPP Implementation

The overarching goal of the CHPP is to enhance fisheries by protecting and restoring important coastal habitats. The plan includes ***recommendations*** that fall under four broad goals and address issues such as minimizing habitat impacts from fishing gear and channel dredging as well as reducing water quality impacts from point and nonpoint sources.

To fulfill these recommendations, each DEQ division and department develops biennial ***implementation plans*** that include tangible achievable actions. Implementation actions have varied over time based on needs and changing priorities. Implementation actions are carried out by DEQ, the Marine Fisheries Commission (MFC) and Division of Marine Fisheries (DMF), the Coastal Resources Commission (CRC) and Division of Coastal Management (DCM), the Environmental Management Commission (EMC) and Division of Water Resources (DWR), the Sedimentation Control Commission (SCS) and Division of Energy, Mineral, and Land Resources (DEMLR), and other partnering agencies. Implementation progress is tracked on a regular basis (Ch. 1).

In the 2015 CHPP, four ***priority habitat issues*** were selected for the focus of implementation plans. Suggested implementation actions for these issues were developed and are included in the plan. The four issues are **oyster restoration, living shorelines, sedimentation, and developing metrics to assess habitat trends and management effectiveness** (Ch. 12).

Department of Environmental Quality

DEQ is the lead stewardship agency for the preservation and protection of North Carolina's outstanding natural resources. The organization, which has offices from the mountains to the coast, administers programs designed to protect and enhance water quality, aquatic resources, public health, fish, wildlife, and wilderness areas.

The department is responsible for drafting the habitat plan. The CHPP Team, consisting of staff from DEQ divisions, draft the plan with guidance from the department.

DEQ implementation actions include those of the Albemarle-Pamlico National Estuary Partnership, Office of Land and Water Stewardship, and Division of Mitigation Services. Other participating state agencies include the Division of Soil and Water Conservation, NC Forest Service, Wildlife Resources Commission, and the Department of Agriculture and Consumer Services.

CHPP Steering Committee

The CHPP Steering Committee consists of two commissioners from each of the three commissions specified in the Fisheries Reform Act - MFC, CRC, and EMC. Their role is to review and approve of the draft plan, be an advocate for the plan to their full commission, meet regularly as a committee to discuss solutions for difficult and cross-cutting habitat and water quality issues, and review implementation progress to ensure that the plan is implemented.

CHPP Implementation

The primary divisions responsible for implementing CHPP recommendations are the Division of Marine Fisheries, Division of Coastal Management, Division of Water Resources, and Division of Energy, Minerals, and Land Resources (Ch. 1).

Division of Marine Fisheries

The division, under the rulemaking authority of the MFC, manages the commercial and recreational fisheries in North Carolina's estuarine and ocean waters. The division protects habitats through fishing gear rules, planning, research, and enhancement activities. The division's mission is to ensure sustainable marine and estuarine fisheries for the benefit of the people of North Carolina.

Division of Coastal Management

Under the rulemaking authority of the CRC, this division establishes policies and adopts rules for enforcing the NC Coastal Area Management Act and the NC Dredge and Fill Law. The DCM works to protect, conserve, and manage North Carolina's coastal resources through an integrated program of planning, permitting, education, and research.

Division of Water Resources

The DWR's mission is to protect, preserve, enhance, and manage North Carolina's surface water and groundwater resources for the health and welfare of the citizens of North Carolina and the economic well-being of the state. This division functions under the rulemaking authority of the EMC.

Division of Energy, Mineral, and Land Resources

The division, under the rulemaking authority of the SCC and the EMC, manages and provides technical assistance related to sediment and erosion control, stormwater management, mining, dams, and energy. The mission of DEMLR is to promote the wise use and protection of North Carolina's land and geologic resources.

Implementation Progress

Substantial implementation progress has been made over the past ten years, with some positive habitat signs evident. In addition, some fishery species' populations have rebounded or are showing strong signs of recovery. Examples include spotted sea trout, red drum, gag, black sea bass, oysters, and bay scallops. While this advancement cannot be directly or solely related to habitat improvement, it is a positive indication for management overall. Some examples of implementation success are below (Ch. 1).

Mapping and assessing habitat condition

- Since 2005, much progress has been made in submerged aquatic vegetation (SAV) mapping. Through a coordinated partnership of APNEP, DMF, DCM, DWR, and other agencies, the entire coast was mapped in 2007-2008, and portions were repeated in 2013 and 2015. A monitoring plan was developed to improve mapping methods in low salinity waters and allow repeat mapping to evaluate change over time (Ch. 4).
- DMF accelerated estuarine shellfish bottom mapping (to a maximum water depth of 15 ft). Mapping is now over 95% complete (Ch. 3).
- DCM mapped the coastal estuarine shoreline and shoreline structures such as bulkheads and piers (Ch.8).
- DMF has developed and begun a process to identify a subset of strategic habitats, based on their condition and location. This will allow conservation measures to focus on priority areas (Ch. 13).

Oyster restoration

- Since 2005, oyster sanctuary development has greatly expanded. DMF has constructed 13 oyster sanctuaries in the Pamlico Sound system, each ranging from 5 - 60 acres of permitted area, and totaling 159 acres of developed reef (Ch. 3 & 12).
- Creation of an oyster shell recycling program provided additional shell material to supplement the division's shell planting activities. Recycled and purchased shell and rock material was used to create additional oyster reef habitat that supports the oyster fishery and provides fish habitat. The area of oyster reef created annually through shell planting varies based on funding and availability of material. Despite budget cuts, efforts continue through partnerships, grant funding, and mitigation contract work (Ch. 3 & 12).

Improving strategies to reduce nonpoint runoff

- EMC adopted coastal stormwater rules to reduce further degradation of receiving waters (Ch. 14).
- DWR and DEMLR incorporated low impact development techniques as acceptable Best Management Practice options for controlling runoff from development (Ch. 14).

Implementation Progress

Managing shorelines

- DCM developed sediment criteria for beach nourishment and a Beach and Inlet Management Plan that provides guidelines for ocean beach nourishment to minimize ecological impacts and address socioeconomic concerns (Ch. 8).
- DCM has taken several actions to encourage greater use of living shorelines for estuarine shoreline stabilization. Working with DMF, DWR, and other agencies, DCM surveyed existing living shorelines for success, and agencies worked to simplify the permitting process. Outreach to multiple audiences through workshops, written material, and websites continues (Ch. 8).

Coordination and compliance

- Regular CHPP Steering Committee meetings and CHPP quarterly permit reviewer meetings have greatly improved collaboration among divisions and problem solving on cross-cutting issues. New compliance positions were established in several divisions through appropriated funds, allowing greater assessment of compliance. Many of these positions have been cut in recent years due to budget shortfalls (Ch. 1).

Research and outreach

- Coastal Recreational Fishing License Funds were awarded as grants to research topics that will expand our understanding of the link between habitat condition and fish use and will help implement recommendations of the CHPP (Ch. 1).
- The National Estuarine Research Reserve has produced educational materials on the value of different fish habitats and environmentally friendly shoreline stabilization techniques. The Reserve also held workshops to promote living shorelines (Ch. 14).
- Several educational kiosks and displays on the value of fish habitat were constructed at a variety of museums and public access locations using Coastal Recreational Fishing License funds (Ch. 14).

Restoring fish passage

- In 2012, a rock ramp fish passage was constructed around Lock and Dam #1 on the Cape Fear River by the US Army Corps of Engineers to allow anadromous fish to migrate further upstream to spawn. The work was done collaboratively with DMF, Wildlife Resources Commission, and other partners (Ch. 9).

Goals and Recommendations

GOAL 1:

IMPROVE EFFECTIVENESS OF EXISTING RULES AND PROGRAMS PROTECTING COASTAL FISH HABITATS

North Carolina has a number of programs already in place to protect coastal fisheries and the natural resources that support them. The Marine Fisheries Commission has adopted rules addressing the impacts of certain types of fishing gear and fishing practices that may damage fish habitats. The Coastal Resources Commission regulates development impacts on certain types of critical habitat, such as saltwater marshes and primary nursery areas. The Environmental Management Commission has issued water quality standards that address pollution of all waters from direct discharges and wetland dredge and fill impacts. The Division of Energy, Mineral, and Land Resources addresses erosion and sediment control from land development or mining, and regulates energy activities. The Coastal Habitat Protection Plan identifies strategies that could continue to improve rule compliance, coordination of environmental monitoring, and outreach, which in turn will result in greater success in protecting critical fish habitats (Ch. 15).

RECOMMENDATIONS:

1. Continue to ensure compliance with Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and Marine Fisheries Commission (MFC) rules and permits.
2. Coordinate and enhance:
    a. monitoring of water quality, habitat, and fisheries resources (including data management) from headwaters to the nearshore ocean.
    b. assessment and monitoring of effectiveness of rules established to protect coastal habitats.
3. Enhance and expand educational outreach on the value of fish habitat, threats from land use and other activities, and explanations of management measures and challenges.

4. Continue to coordinate among commissions and agencies on coastal habitat management issues.
5. Enhance management of invasive species with existing programs. Monitor and track status in affected waterbodies.

Goals and Recommendations

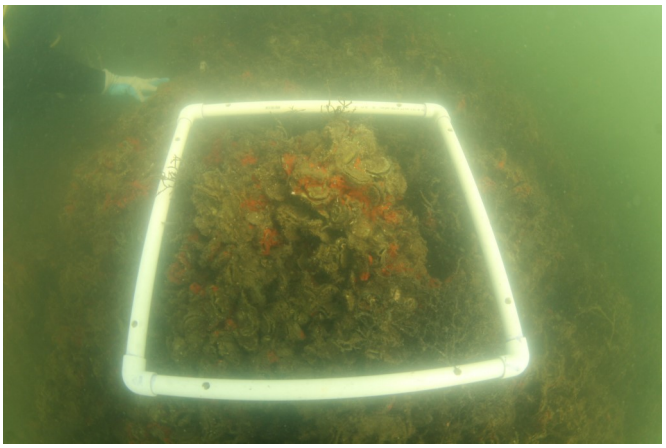
GOAL 2:

IDENTIFY AND DELINEATE STRATEGIC COASTAL HABITATS

Maintaining healthy coastal fisheries requires consideration of the entire ecosystem and the way different types of fish habitats work together. For example, coastal marshes help prevent erosion of shallow soft bottom habitat, which provides a food source and corridor for juvenile finfish. Shell bottom reduces sediment and nutrients in the water column, which enhances conditions for submerged aquatic vegetation. Together these habitats provide different functions for fish and protective stepping stones for their migration through coastal waters. Fragmenting these habitats, or damaging one of a series of interrelated habitats, makes it more difficult for aquatic systems to support strong and healthy coastal fisheries. The Marine Fisheries Commission identified a need to locate strategic habitats. These areas are a subset of all coastal habitats and consist of strategically located complexes of fish habitat that provide exceptional ecological functions or are particularly at risk due to vulnerability, rarity, or an imminent threat. These areas merit special attention and should be given high priority for conservation (Ch. 15).

RECOMMENDATIONS:

1. Support assessments to classify habitat value and condition by:
    a. coordinating, completing, and maintaining baseline habitat mapping (including seagrass, shell bottom, shoreline, and other bottom types) using the most appropriate technology.
    b. selectively monitoring the condition and status of those habitats.
    c. assessing fish-habitat linkages and effects of land use and other activities on those habitats.
2. Continue to identify and field groundtruth strategic coastal habitats.



Goals and Recommendations

GOAL 3:

ENHANCE AND PROTECT HABITATS FROM ADVERSE PHYSICAL IMPACTS

The CHPP identifies a number of ways in which fish habitats can be damaged by direct physical impacts. Some examples include filling of wetlands, dredging of soft bottom habitat, destruction of shell bottom and hard bottom areas, damage to submerged aquatic vegetation by use of certain types of fishing gear, and physical obstructions that block fish movement to and from spawning areas. While large impacts can directly contribute to the loss of habitat functions, the accumulation of many small impacts can make a habitat more vulnerable to injuries from which it might otherwise recover quickly. In some cases, historic damage to a habitat can be mitigated through the creation of sanctuaries where the resource can recover. One such program involves creation of protected oyster reefs. In other cases, the cumulative impacts of multiple projects can be more effectively managed through comprehensive planning (Ch. 15).

RECOMMENDATIONS:

1. Expand habitat restoration in accordance with restoration plan goals, including:
    a. creating subtidal oyster reef sanctuaries.
    b. re-establishing riparian wetlands and stream hydrology.
    c. restoring SAV habitat and shallow soft bottom nurseries.
    d. developing a mitigation process to restore lost fish habitat function.
2. Sustain healthy barrier island systems by maintaining and enhancing ecologically sound policies for ocean and inlet shorelines and implement a comprehensive beach and inlet management plan that provides ecologically based guidelines to protect fish habitat and address socioeconomic concerns.
3. Protect habitat from adverse fishing gear effects through improved compliance.

Goals and Recommendations

GOAL 3:

ENHANCE AND PROTECT HABITATS FROM ADVERSE PHYSICAL IMPACTS

RECOMMENDATIONS:

4. Improve management of estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of site specific conditions and advocate for alternatives to vertical shoreline stabilization structures.
5. Protect and restore habitat for migratory fishes by:
    a. incorporating the water quality and quantity needs of fish in water use planning and management.
    b. restoring fish passage through elimination or modification of stream obstructions, such as dams and culverts.
6. Ensure that energy development and infrastructure is designed and sited to minimize negative impacts to fish habitat, avoid new obstructions to fish passage, and, where possible, provide positive impacts.
7. Protect and restore important fish habitat functions from damage associated with activities such as dredging and filling.
8. Develop coordinated policies including management adaptations and guidelines to increase resiliency of fish habitat to ecosystem changes.

Seasonal restrictions on navigational dredging are an effective means of protecting fish during critical times of their lives, such as during spawning periods or when early juvenile fish are growing in nursery areas.

Goals and Recommendations

GOAL 4:

ENHANCE AND PROTECT WATER QUALITY

Clean water is essential to coastal fisheries. Water conditions necessary to support coastal fish include the right combination of temperature, salinity, and oxygen, as well as the absence of harmful pollutants. Achieving and maintaining good water quality for purposes of fish productivity requires management of both direct discharges to surface waters and nonpoint runoff from land activities. While there have been great improvements to water quality management, support through funding and technological advances is needed to sustain water quality as coastal uses increase. The CHPP recommends strategies to address water quality impacts by maintaining rule compliance through inspections, local government incentives, and developing new technology to reduce point and nonpoint pollution through voluntary actions. Maintaining the water quality necessary to support vital coastal fisheries will benefit not only the fishing industry but also a large sector of the entire coastal economy that is built around travel, tourism, recreational fishing, and other outdoor activities (Ch. 15).

RECOMMENDATIONS:

1. Reduce point source pollution discharges by:
    a. increasing inspections of wastewater discharges, treatment facilities, collection infrastructure, and disposal sites.
    b. providing incentives and increased funding for upgrading all types of discharge treatment systems and infrastructure.
    b. developing standards and treatment methods that minimize the threat of endocrine disrupting chemicals on aquatic life.
2. Address proper reuse of treated wastewater effluent and prohibit new wastewater discharges (excluding reverse osmosis and nanofiltration effluent).
3. Prevent additional shellfish closures and swimming advisories through:
    a. conducting targeted water quality restoration activities.
    b. prohibiting new or expanded stormwater outfalls to coastal beaches and to coastal shellfishing waters (EMC surface water classifications SA and SB) except during times of emergency (as defined by the Division of Water Resource's Stormwater Flooding Relief Discharge Policy) when public safety and health are threatened.
    b. continuing to phase out existing outfalls by implementing alternative stormwater management strategies .
4. Enhance coordination with, and provide financial/technical support for, local government/private actions to effectively manage stormwater, stormwater runoff, and wastewater.

Goals and Recommendations

GOAL 4:

ENHANCE AND PROTECT WATER QUALITY

RECOMMENDATIONS:

5. Continue to improve strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat through voluntary actions, assistance, and incentives, including:
    a. improving methods to reduce pollution from construction sites, agriculture, and forestry.
    b. increasing on-site infiltration of stormwater.
    c. documenting and monitoring of small but cumulative impacts to fish habitats from approved, unmitigated activities.
    d. encouraging and providing incentives for implementation of low-impact development practices.
    e. increased inspections of onsite wastewater treatment facilities.
    f. increasing use of reclaimed water and recycling.
    g. Increasing voluntary use of riparian vegetated buffers for forestry, agriculture, and development.
    h. increasing funding for strategic land acquisition and conservation.
6. Maintain effective regulatory strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat, including use of vegetated buffers and established stormwater controls.
7. Maintain adequate water quality conducive to the support of present and future mariculture in public trust waters.
8. Reduce nonpoint source pollution from large-scale animal operations by the following actions:
    a. Ensuring proper oversight and management of animal waste management systems.
    b. Ensuring certified operator compliance with permit and operator requirements and management plan for animal waste management systems.

For every $1 invested in land conservation in NC, there is estimated to be a $4 return in economic value from natural resource goods and services alone, without considering other economic benefits.

Priority Habitat Issue - *Oyster Restoration*

Oyster populations in NC have declined by as much as 90% from their historic levels. Historical overfishing, habitat destruction, disease, and pollution have contributed to the significant decline and slow recovery rates of oyster reefs. Recognized as an ecosystem engineer, oyster reefs are critical economically for the seafood industry and ecologically for improving water quality and providing fish habitat. For 100 years, the DMF has been "planting" oyster shell in open harvest areas to provide additional hard substrate for oyster recruitment. The planted shell soon becomes a living oyster reef, enhancing the oyster fishery and providing fish habitat. Since 1998, DMF has constructed 13 subtidal oyster sanctuaries where shellfish harvest is not allowed. Oysters growing in the protected sanctuaries serve as broodstock, providing larvae that recruit onto other hard substrate in surrounding waters. Despite these efforts, oyster populations remain well below historic levels, fishing pressure increases, and water quality declines. Lack of additional funding to purchase and deploy hard material and conduct research limits the ability to expand oyster restoration activities. The CHPP Steering Committee considers this one of the most important activities that could be done to improve habitat and water quality in NC's coastal waters (Ch. 12).

Proposed Implementation Actions

Cultch Planting

- ◊ Increase spending limit per bushel of shell to compete with other states.
- ◊ Develop a cooperative public/private, self-sustaining shell recycling program by providing financial incentives in exchange for recycled shell.
- ◊ Work with the shellfish industry to institute an "oyster use fee" to help support the cultch planting program.
- ◊ Identify alternative substrates for larval settlement in intertidal and subtidal reefs, including a cost-benefit analysis.
- ◊ Establish long term monitoring program to support future decision making.
- ◊ Utilize new siting tools and monitoring protocols to maximize reef success.

Hatchery Oyster Seed Production

- ◊ Explore options for increasing funds to support UNCW oyster hatchery.
- ◊ Identify regional genetic variability within NC.
- ◊ Improve availability of seed oysters genetically suited to respective regions.

Oyster Sanctuaries

- ◊ Identify alternative substrates for larval settlement in intertidal and subtidal reefs, including a cost-benefit analysis.
- ◊ Identify the size and number of sanctuaries needed.
- ◊ Develop reefs that are resistant to poaching.
- ◊ Utilize new siting tools to maximize reef success.
- ◊ Explore options for in situ sampling protocol to incorporate alternative construction materials.

Priority Habitat Issues - *Living Shorelines*

Living shorelines is the term used for a type of designed shoreline stabilization technique that incorporates live components such as marsh plants, frequently in combination with rock or oyster sill structure. Wetland and shell bottom habitat along the shoreline have declined in many areas due to natural erosion and vertical shoreline hardening with bulkheads. Living shorelines offer an effective alternative for protecting waterfront property, while restoring fish habitat and ecosystem services. Since 2005 progress has been made to better understand the benefits and limitations of living shorelines. Research in NC has found that living shorelines supported a higher diversity and abundance of fish and shellfish than bulkheaded shorelines, effectively deterred erosion, and survived storm events well. Outreach efforts have been done to increase awareness of this technique to the public and contractors. Nonprofit organizations and DCM have constructed several demonstration projects. However, despite these efforts, only approximately 60 living shorelines have been permitted coastwide, in contrast to 93 miles of bulkheads (based on 2012 DCM mapping). The CHPP Steering Committee requested that efforts continue to focus on encouraging living shorelines as a win-win-win solution: protecting property, restoring shoreline habitat, and improving water quality (Ch. 12).

Proposed Implementation Actions

Outreach

- ◊ Seek funding and partnerships to increase the number of highly visible demonstration projects.
- ◊ Develop case studies that property owners can relate to that discuss site conditions, initial and ongoing costs, and performance of the structure.
- ◊ Actively engage with contractors, realtors, and homeowners associations in the design and benefits of living shorelines.
- ◊ Enhance communications, marketing, and education initiatives to increase awareness of and build demand for living shorelines among property owners.

Research

- ◊ Examine the effectiveness of natural and other structural materials for erosion control and ecosystem enhancement.
- ◊ Examine the long-term stability of living shorelines and vertical structures, particularly after storm events.
- ◊ Map areas where living shorelines would be suitable for erosion control.
- ◊ Investigate use of living shorelines as a BMP or mitigation option.

Permitting

- ◊ Continue to simplify the federal and state permitting process for living shorelines.

Priority Habitat Issue - *Sedimentation*

Sedimentation in creeks, particularly in nursery areas, is a continuing concern. While a moderate amount of sediment input is necessary to maintain shallow soft bottom habitat that supports wetlands, excessive amounts can silt over existing oyster beds and submerged aquatic vegetation, smother invertebrates, clog fish gills, reduce survival of fish eggs and larvae, reduce recruitment of new oysters onto shell, and lower overall diversity and abundance of marine life. Pollutants such as toxins, bacteria, and nutrients bind to sediment particles and are transported into estuarine waters, where they can accumulate in the sediment and impact aquatic organisms. Sediment enters the upper estuary via runoff and ditching due to land clearing activities associated with agriculture, forestry, and development. Shoreline erosion, tidal inflow, and dredging also contribute sediment in the lower estuary. Studies done in NC indicate that relatively high sedimentation has occurred in the past. The effect on estuarine productivity is uncertain. More assessment on the extent and effect of sedimentation in NC coastal creeks and rivers is needed, along with current rates of sediment inputs, to determine the best way to address sedimentation (Ch. 12).

Proposed Implementation Actions

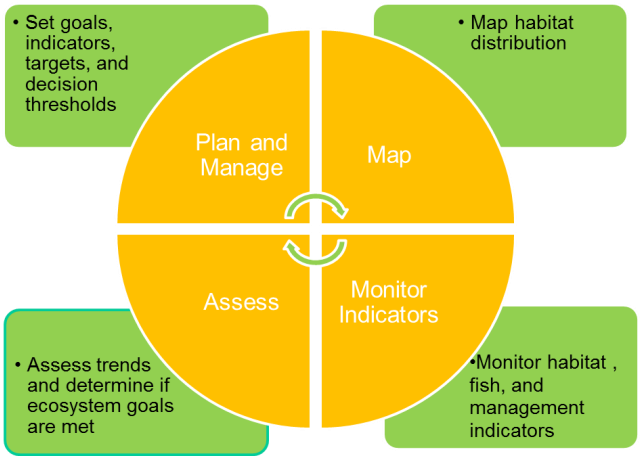
- ◊ Determine magnitude and change in sedimentation rates and sources over time at sufficiently representative waterbodies and regions.
- ◊ Determine the effect of sedimentation in the upper estuaries on primary and secondary productivity and juvenile nursery function.
- ◊ Encourage research for innovative and effective sediment control methods in coastal river basins.
- ◊ Encourage expanded use of voluntary stormwater BMPs and low impact development (LID) to reduce sediment loading into estuarine creeks.
- ◊ Partner with NC Department of Transportation to retrofit road ditches that drain to estuarine waters.
- ◊ Improve effectiveness of sediment and erosion control programs by:
  - ♦ Encouraging development of effective local erosion control programs to maintain compliance and reduce sediment from reaching surface waters.
  - ♦ Enhancing monitoring capabilities for local and state sediment control programs (e.g., purchase turbidity meters and train staff to use them).
  - ♦ Continuing to educate the public, developers, contractors, and farmers on the need for sediment erosion control measures and techniques for effective sediment control.
  - ♦ Provide education and financial/technical support for local and state programs to better manage sediment control measures from all land disturbing activities.

In 2014, 6,290 acres were impaired by turbidity for the aquatic life use support classification in coastal subbasins (DWR 2014 Integrated Report).

Priority Habitat Issue - *Developing Metrics*

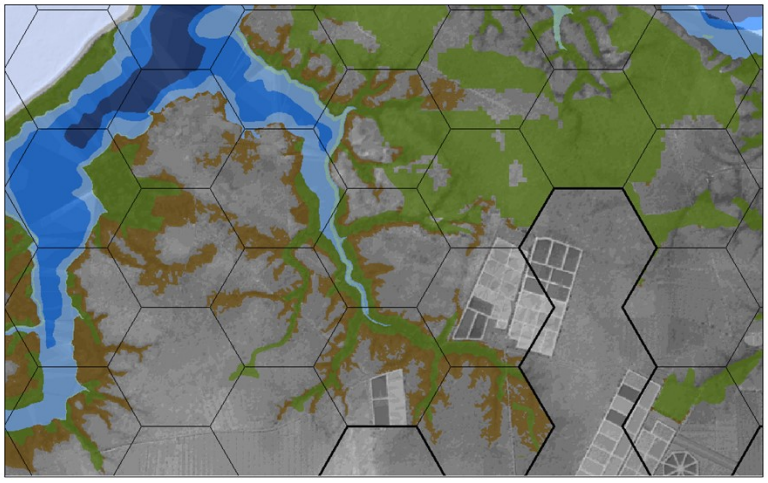
Developing metrics to assess habitat trends and management effectiveness is the cornerstone of habitat protection and restoration. Without them, needed habitat conservation initiatives are unknown. Ecosystem-based management is the process where monitoring of ecosystem indicators is done to assess the condition of the resource and the effectiveness of management strategies; management actions are modified based on monitoring results. This process requires mapping all habitat to assess trends in distribution, developing and monitoring representative indicators to assess habitat condition, monitoring fish use of habitats in priority areas, and developing management performance criteria for measuring success of management actions. The DEQ has already initiated mapping and monitoring of some habitats but has not established continual monitoring of habitat to evaluate management effectiveness. The Albemarle-Pamlico National Estuary Partnership established ecosystem indicators in 2012 to help determine the status of that system. The DMF has identified strategic coastal habitats in most of the coastal waters that are high priority for protection so that fish populations are sustained. More work is needed to establish a cyclic process to monitor, assess, and successfully and efficiently manage NC's coastal resources.

The lack of quantified trends in habitat condition and success of management actions was identified as a priority concern of the CHPP Steering Committee (Ch. 12).



Proposed Implementation Actions

- ◊ Develop indicator metrics for monitoring the status and trends of each of the six habitat types within North Carolina's coastal ecosystem (water column, shell bottom, SAV, wetlands, soft bottom, hard bottom).
- ◊ Establish thresholds of habitat quality, quantity, or extent similar to limit reference points or traffic lights, which would initiate predetermined management actions.
- ◊ Develop indicators for assessing fish utilization of strategic coastal habitats.
- ◊ Develop performance criteria for measuring success of management decisions.



"When one tugs at a single thing in nature, he finds it attached to the rest of the world."

John Muir

NC Coastal Habitats

North Carolina's coastal fish habitats provide important functions for the plants and animals living in them. This diversity of interconnected habitats provides food, shelter, and places to reproduce and grow for a tremendous variety of fish, shellfish, and crustaceans. Protecting and restoring these habitats is essential to the survival of North Carolina's fisheries.

While poor water quality puts the ability of habitats to function and support fish populations at risk, physical damage caused by humans is also a serious threat. Conversion of wetlands by draining, filling, and water control projects are the major sources of wetland loss in eastern North Carolina. Shell bottom habitat along our coast has been decimated by a century of excessive mechanical harvests and diseases. More recently, dredging for navigation channels and marinas, as well as damage from bottom-disturbing fishing gear, threatens remaining shell bottom and submerged aquatic vegetation habitat and impedes establishment of those habitats. Submerged aquatic vegetation is also vulnerable to uprooting by boat propellers and to shading by docks and piers. These and other types of physical impacts affect the ability of fish habitats to sustain fisheries and increase their vulnerability to water quality problems (Ch. 2-7).

The CHPP identifies six fish habitats that need protection or enhancement:

- Water Column
- Shell Bottom
- Submerged Aquatic Vegetation (SAV)
- Wetlands
- Soft Bottom
- Hard Bottom

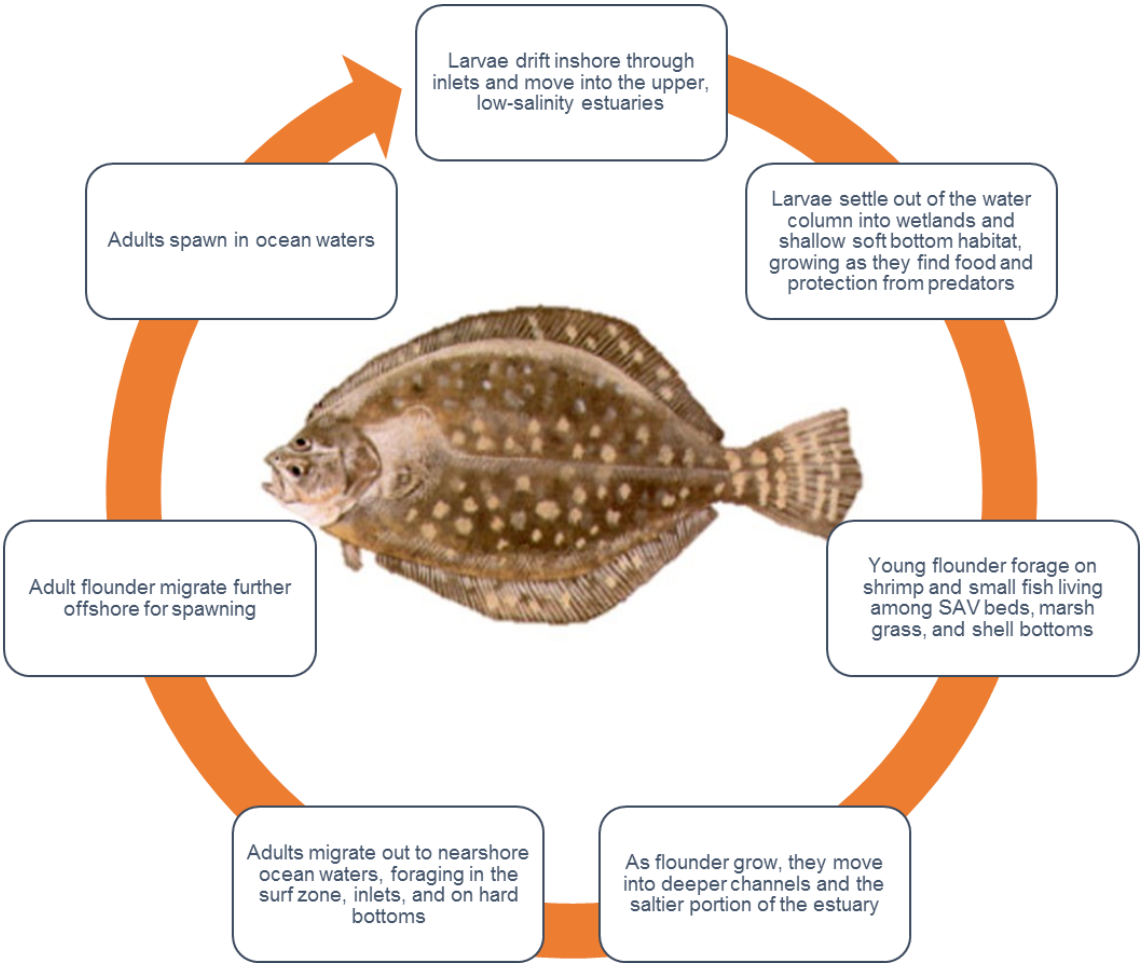
Habitats provide important functions for fish species.

Refuge:	shelter for fish at various life stages and a place for plants and animals to attach
Nursery:	refuge and foraging habitat suitable for development of juvenile life stages of fish, shellfish, and crabs
Spawning:	conditions that allow adults to reproduce
Foraging:	presence and accessibility of food sources
Corridor:	connectivity for safe passage among foraging, spawning, and refuge areas

Habitat: "a place, or set of places, in which a fish or fish population finds the physical, chemical, and biological features needed for life."

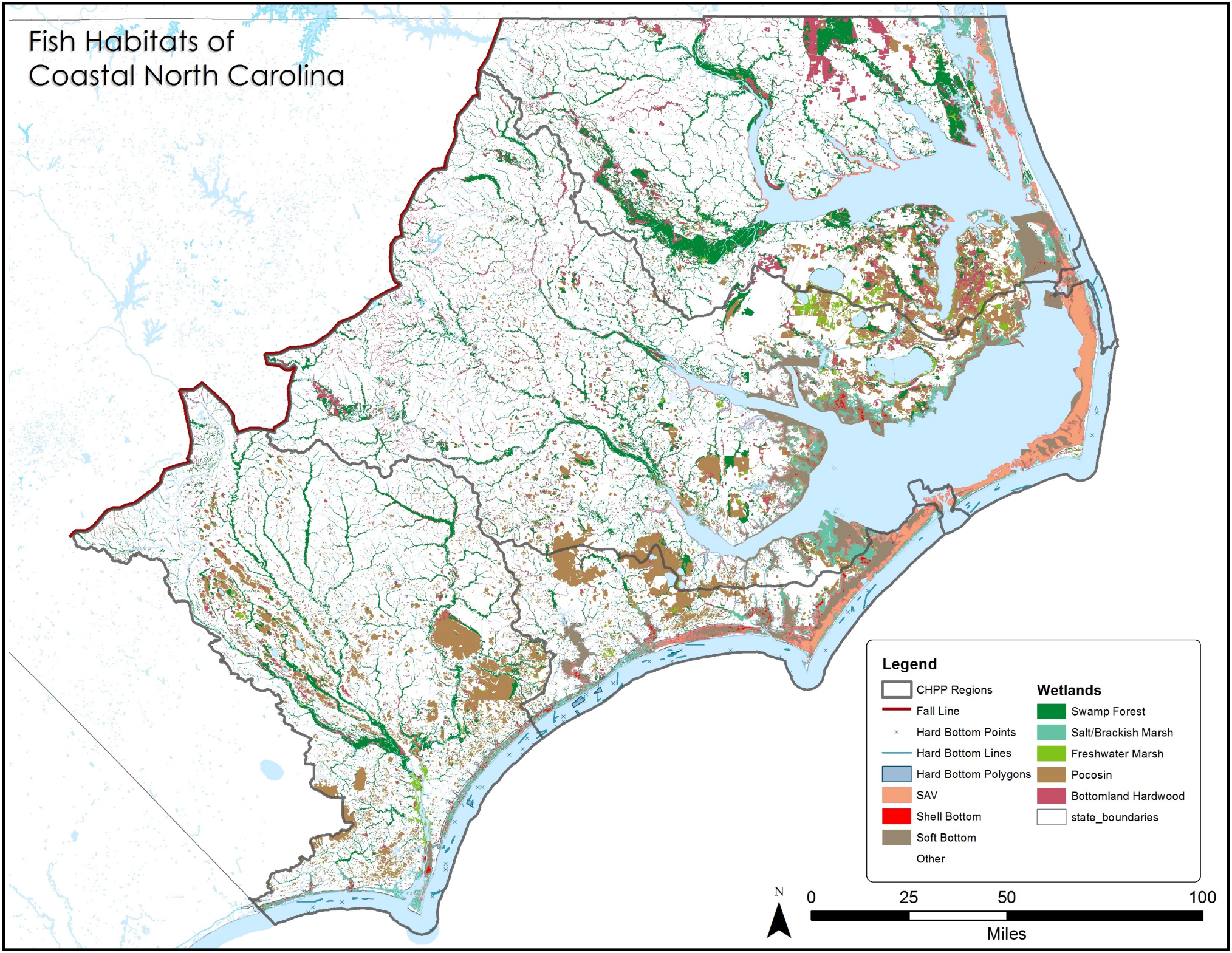
NC Coastal Habitats

All fish habitats are integral components of the entire aquatic ecosystem because species require use of multiple habitats throughout their life history; the water column connects them all. Organisms occupy specific areas or habitats that meet their needs for each particular life stage. Certain areas, such as nursery areas, are especially important to fish production, and some, such as shallow grass beds are particularly vulnerable to human impacts. To maintain a healthy coastal ecosystem that provides all the ecological functions necessary for NC's coastal fish populations, it is more effective to address the entire system of interdependent habitats, rather than a single habitat type (Ch. 2-7).



The relationship between habitat conditions and populations of fishery species is complex. In the past, the decline of a particular fish stock was often attributed to overfishing. We know now that the quality and quantity of fish habitats is important to healthy fish populations. Habitat loss and degradation make fish populations more susceptible to overfishing and can cause a delay in recovery even after management actions have successfully reduced fishing pressures. River herring and shortnose sturgeon are examples of species that have not recovered despite lengthy fishing moratoriums. Thus, the status of fisheries can be an indicator of impacts to fish habitats. Successful implementation of the CHPP recommendations is a necessary component to sustaining productive fisheries for future generations.

Fish Habitats of Coastal North Carolina



Water Column - *The Most Essential Habitat*

Water column is the medium through which all aquatic habitats are connected and affects all other habitats and the distribution and survival of fish. The water column includes riverine, estuarine, lacustrine, palustrine, and marine systems. Properties affecting fisheries resources and distribution include: temperature, salinity, dissolved oxygen (DO), total suspended solids (TSS), nutrients (nitrogen, phosphorus), chlorophyll a, pollutants, pH, velocity, depth, movement, and clarity. Within a river basin, these properties change as you move from the headwaters to the ocean (Ch. 2).

Fish **distribution** in the water column is often determined by salinity and proximity to inlets. The potential **productivity** of fish and invertebrates begins with energy and nutrient production at the base of the food chain. Productivity in the water column comes from phytoplankton, floating plants, macroalgae, benthic microalgae, and detritus.

Economic Benefits

U.S. commercial and recreational saltwater fishing generated more than $199 billion in sales in 2012, according to the Fisheries Economics of the United States. In North Carolina, the recreational and commercial fishery generated $1.87 billion in 2011.

Habitat Functions and Fish Use

The corridor between freshwater creeks or rivers and estuarine/marine systems is important to all fish, particularly species whose life spans more than one system, such as species that must migrate upstream to spawn (anadromous) or marine-spawning estuarine-dependent species.

Water column provides **nursery habitat** for juvenile pelagic species, such as kingfish and pompano in the surf zone. Optimum physical and chemical properties, such as currents, temperature and salinity determine survival and settlement of larvae. The water column is a food source for all size organisms, supporting microscopic plants and animals (phytoplankton and zooplankton), and prey species of all sizes.

The ability of the water column to provide predatory refuge varies relative to area, depth, water quality, and vegetation. Juvenile fishes are protected in shallow areas that larger fish cannot access. Turbidity and DO can provide refuge for pelagic species by excluding predators that feed visually or are not tolerant of low DO.

FACT: 76,927 acres of coastal water column are designated as Primary Nursery Areas. 82,000 acres are designated as Secondary or Special Secondary Nursery Areas.

Habitat Profile

Water Column Functions

- Connects all habitat types
- Allows fish to move among habitats
- Surrounds and supports aquatic animals and habitats

How Fish Use the Water Column

- Transports eggs, larvae, and oxygen
- Nursery area for all fish species
- Foraging area for all fish species
- Spawning area for all fish species

Water Column - The Most Essential Habitat

Status and Trends

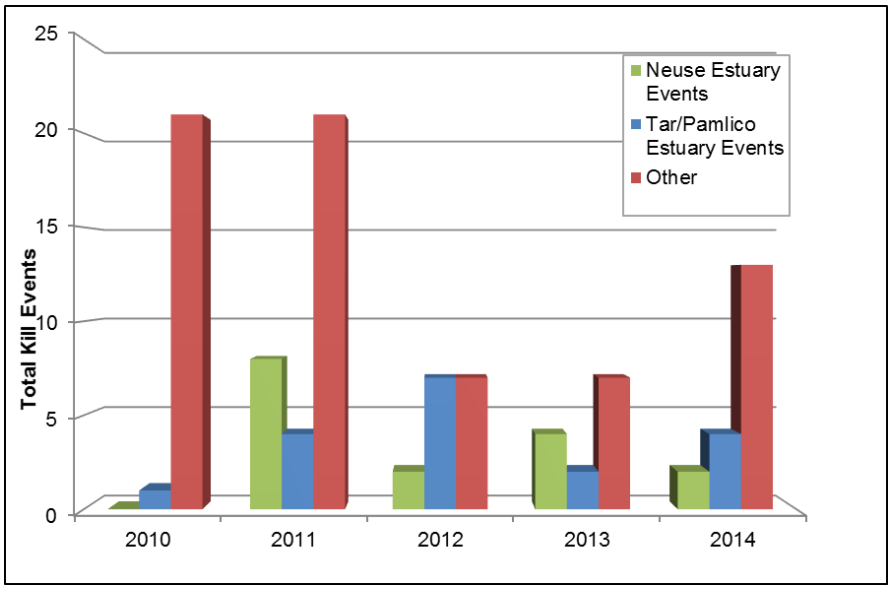
The condition of the water column is described by physical and chemical properties, pollution indicators, and the status of pelagic fisheries. However, evaluating the status and trends of water column characteristics is difficult. The number of monitoring agents, monitoring site distribution, frequency of data collection, and parameters measured are not conducive to comprehensive water quality assessments. Monitoring for microbial contamination of shellfish harvesting waters remains the most abundant measurement of estuarine water quality. Data collected from monitoring stations within the CHPP area include those from ±1,020 shellfish growing area stations, 240 recreational water quality stations, and ±256 DWR ambient stations. Change in water quality at selected stations throughout the coast are shown in the CHPP source document.

The health of pelagic fishery species can be an indicator of water quality. Kingfish and menhaden are positive examples of species with improving or stable populations.

FACT: As of March 2014, over 442,106 acres of shellfish harvesting waters, or 20% of classified shellfish waters, were closed in North Carolina due to high levels of fecal coliform or the potential risk of bacterial contamination. As an adaptive measure to reduce permanent closures, 55,628 acres are conditionally opened and closed based on rainfall and sampling.

Threats to Water Column

Whether certain species will thrive and reproduce is strongly affected by conditions such as water clarity, DO, and nutrient levels. Fish kills and harmful algal blooms during the 1980s and 1990s were visible signs of coastal water quality problems. Most frequently reported species in fish kills are Atlantic menhaden, spot, flounder, and croaker. Large fish kills and algal blooms have diminished somewhat in recent years, but many coastal waters remain impaired. Excess sediment loading is the largest cause of impairment.



Human activities often change the chemistry of the water, reducing water quality. These changes can originate from point sources, such as industrial or wastewater discharges, or from non-point runoff from construction or industrial sites, development, roads, agriculture or forestry. Any number of sources can result in pollutants and sediment entering surface waters. It is apparent when excess sediment clouds the water and fills a waterway, but beneath the water's surface, these particles also clog fish gills and bury plants, shellfish, and other aquatic species.

All coastal habitats are connected by water. Clean water is essential to aquatic life.

Shell Bottom - Building Reefs & Cleaning Water

Shell bottom is unique because it is the only coastal fish habitat that is also a fishery species (oysters). Shell bottom is estuarine intertidal or subtidal bottom composed of surface shell concentrations of living or dead oysters, hard clams, and other shellfish. Oysters, the primary shell-building organism in North Carolina estuaries, are found throughout the coast, from southeast Albemarle Sound to the South Carolina border. The protection and restoration of living oyster beds is critical to the restoration of numerous fishery species, as well as to the proper functioning and protection of surrounding coastal fish habitats. Historically, restoration was managed for oyster fishery enhancement. Current efforts mix fishery and ecosystem enhancement with sanctuary development (Ch. 3).

Habitat Profile

Shell Bottom Functions

- Provides structure, shelter, and food source
- Filters pollutants and other particles from water
- Protects shoreline by slowing wave energy

How Fish Use Shell Bottom

- Place for oysters and other shellfish to attach
- Nursery area for blue crab, sheepshead, and stone crab
- Foraging area for drum, black sea bass, and southern flounder
- Spawning area for hard clams, toadfish, and goby
- Refuge for goby, grass shrimp, and anchovy

Economic Benefits

Conservatively, restored and protected oyster reefs provide up to $40,200 per acre per year (2012 dollars) in ecosystem benefits, including water filtration and sediment stabilization. The dollar benefit of the nitrogen removal service provided by oyster reefs was estimated to be $3,167 per acre per year (2014 dollars).

Habitat Functions and Fish Use

Shell bottom is widely recognized as **essential fish habitat** (EFH) for oysters and other reef-forming mollusks and provides critical fish habitat for ecologically and economically important finfish, mollusks, and crustaceans. In North Carolina, over 40 species of fish and crustaceans have been documented to use natural and restored oyster reefs, including American eel, Atlantic croaker, Atlantic menhaden, black sea bass, sheepshead, spotted seatrout, red drum, and southern flounder. Oysters are **ecosystem engineers** that alter current and flows, protect shorelines, and trap and stabilize large quantities of suspended solids, reducing turbidity by building high relief structures. The interstitial spaces between and within the shell matrix of oyster reefs are critical **refuges** for the survival of recruiting oysters and other small, slow-moving macrofauna, such as worms, crabs, and clams. Shell bottom is also valuable **nursery** habitat for juveniles of commercially and recreationally important finfish, such as black sea bass, sheepshead, gag, and snappers. Additionally, shell bottom is important **foraging** ground for many economically and ecologically important species. The **proximity** and **connectivity** of oyster beds enhances the fish utilization of nearby habitats, especially SAV. Shell bottom contributes primary production indirectly from plants on and around it, but it is more important for its high secondary productivity contribution from the biomass of oysters and other macroinvertebrates living among the shell structure. This in turn supports a high density of mobile finfish and invertebrates, which were found to be more than two times higher than in marshes, soft bottom, and SAV.

Shell bottom areas include reefs made of living oysters or shells, located in the subtidal or intertidal zone of sounds and estuaries

Shell Bottom - Building Reefs & Cleaning Water

Status and Trends

North Carolina oyster stocks were declining for most of the twentieth century. Poor harvesting practices led to initial degradation and loss of shell bottom habitat in the Pamlico Sound area. After 1991, oyster stocks and harvests began to collapse from disease mortalities and low spawning stock biomass. Harvests began to rise again around 2002, and the trend has continued. Between 2000 and 2013, oyster dredging trips have risen substantially with increasing harvest, as have hand harvest trips. A trend of stable or increasing spatfall coastwide is indicative of increasing larval availability, connectivity, and recruitment potential to restored and existing reefs. As of January 2015, there were 13 established oyster sanctuaries, with an additional two proposed.

Fact: Oyster beds were once so abundant that they were considered a navigation hazard.

Threats to Shell Bottom

Shell bottom is occasionally susceptible to diseases and microbial stressors. Neurotoxic Shellfish Poisoning (NSP), also called **"Florida red tide,"** is a disease caused by consumption of molluscan shellfish contaminated with brevetoxins produced by the dinoflagellate, *Karenia brevis*. Blooms of *K. brevis* occur frequently along the Gulf of Mexico, but the largest reported outbreak of NSP in the US occurred in North Carolina beginning in 1987. The protozoan pathogen *Perkinsus marinus*, also called **"dermo"** has been responsible for major oyster mortalities in North Carolina. Monitoring of dermo disease by DMF shows a declining trend in heavy prevalence, with an increasing trend in overall infection.

Boring sponge, sponges belonging to the genus *Cliona*, are found in North Carolina shell bottom habitats. Boring sponges compromise the integrity of shells and are linked to reduced oyster gamete viability and possibly increased oyster mortality rates. Two North Carolina oyster sanctuaries experienced dramatic population declines since 2012, coinciding with increasing percent cover of marine boring sponge. *Cliona* is endemic to North Carolina but has recently become more pervasive, especially on limestone marl rocks. To improve reef design in high salinity waters, DMF is conducting research on alternative substrates to identify materials that maximize oyster recruitment, growth, and survival, while offering high resistance to environmental stressors, such as Cliona boring sponge.

The protection and restoration of living oyster beds is critical to the restoration of numerous fishery species, as well as to the proper functioning and protection of surrounding coastal fish habitats. Historically, restoration was managed for oyster fishery enhancement. Current efforts mix fishery and ecosystem enhancement with sanctuary development.

Shell bottom is considered to be one of the most threatened habitats because of its greatly reduced extent.

SAV - Underwater Gardens

Submerged aquatic vegetation (SAV) is a fish habitat dominated by one or more species of underwater vascular plants that occur in patches or extensive beds in shallow estuarine waters. The presence and density of SAV varies seasonally and inter-annually. A key factor affecting distribution is adequate light penetration; therefore, SAV occurs in shallow clear water. Sediment composition, wave energy, and salinity are also determining factors (Ch. 4).

Habitat Profile

SAV Functions

- Provides refuge for fish and other aquatic animals
- Serves as food for fish and waterfowl
- Produces dissolved oxygen
- Reduces wave energy and limits erosion
- Uses nutrients and traps sediments

How Fish Use SAV

- Nursery area for blue crab, pink shrimp, and red drum
- Foraging area for spotted sea trout, gag, and flounder
- Spawning area for spotted sea trout, grass shrimp, and bay scallop
- Refuge for bay scallop and hard clam

Economic Benefits

SAV habitat has a very high economic value due to the ecosystem services it provides. The estimated value of SAV and algal beds combined is $7,700/acre/year. This estimate takes into account services such as seafood production, wastewater treatment, climate regulation, erosion control, recreation, and others. The value of SAV for denitrification services (wastewater treatment) is estimated at $3,000/acre/year compared to approximately $400/acre/year for subtidal soft bottom. With North Carolina having the second largest expanse of SAV on the east coast, protection and enhancement of this valuable resource should be a high priority for the state.

Habitat Functions and Fish Use

Submerged aquatic vegetation is recognized as **essential fish habitat** because of five interrelated features – **primary production**, **structural complexity**, **modification of energy regimes**, **sediment and shoreline stabilization**, and **nutrient cycling**. Water quality enhancement and fish utilization are especially important ecosystem functions of SAV relevant to the enhancement of coastal fisheries. Seagrasses produce large quantities of organic matter. Many fish species occupy SAV at some point in their life for **refuge**, **spawning**, **nursery**, **foraging**, and **corridors**. SAV is considered essential fish habitat for red drum, shrimp, and species in the snapper-grouper complex. Spotted seatrout are also highly dependent on SAV, and bay scallops occur almost exclusively in SAV beds.

Due to its stringent water quality requirements, SAV presence is considered a barometer of water quality.

SAV - Underwater Gardens

Status and Trends

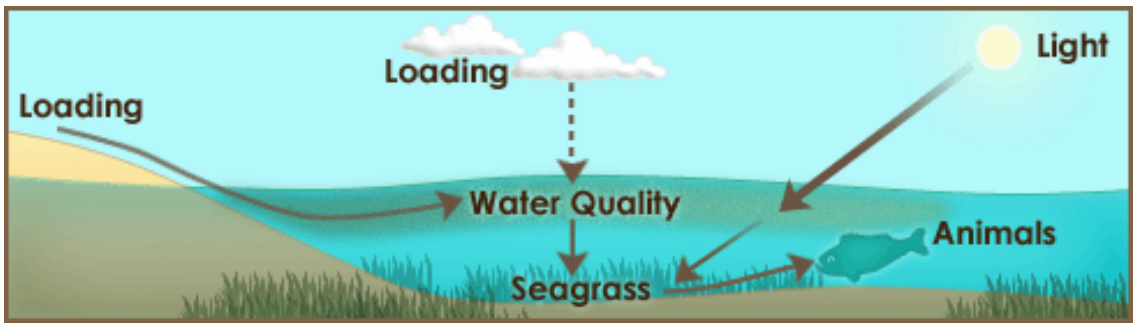
There has been a global and national tend of declining SAV habitat, with seagrasses disappearing at rates similar to coral reefs and tropical rainforests. In North Carolina, SAV loss has not been quantified, but anecdotal reports indicate that the extent of SAV may have been reduced by as much as 50%, primarily on the mainland side of coastal sounds. Mapping of SAV has been done by several entities since the 1980s, but often with different methods and not coastwide. Comprehensive mapping of SAV habitat in coastal North Carolina was initiated in 2007 by a joint effort of federal and state agency and academic institutions. In 2013, mapping protocols for high and low salinity areas was developed so that mapping can be repeated approximately every five years on a rotational basis among five coastal areas. This mapping, in combination with sentinel sampling, will allow trends to be assessed. In 2013 high salinity SAV from Currituck Sound to Bogue Sound were mapped using aerial photography and field groundtruthing. In Albemarle Sound and Tar-Pamlico River SAV was mapped in 2014-15 using a newly developed method for low salinity turbid waters using side scan data and low light underwater photography for groundtruthing. In 2015, SAV south of Bogue Sound was mapped.

Fact: Over 196,000 acres of SAV have been mapped in coastal North Carolina.

While a quantified change analysis is not yet available, preliminary review of core areas of SAV, such as behind the Outer Banks in Pamlico Sound and Core Sound, did not detect large changes since previous imagery for those areas in 2004. Expansion of SAV has been observed in Albemarle Sound and south of Bogue Inlet. Bay scallop abundance in the southern area is increasing in areas of increasing SAV.

Threats to SAV

Major threats to SAV habitat are channel dredging and water quality degradation from excessive nutrient and sediment loading. Natural events, human activities, and an ever-changing climate influence the distribution and quality of SAV habitat. Natural events include shifts in salinity due to drought and excessive rainfall, animal foraging, storm events, temperature, and disease. Submerged vegetation is vulnerable to water quality degradation, in particular, suspended sediment and pollutant runoff. Large amounts of algae and sediment make the water so cloudy that sufficient light cannot reach the plants, reducing their growth, survival, and productivity. Dredges and boat propellers can also have a direct effect on SAV habitat by uprooting and destroying the plants.



Wetlands - *Nature's Nurseries*

Wetlands are essential breeding, rearing, and feeding grounds for many species of fish and wildlife. They provide critical ecosystem services that contribute to healthy ecosystems and fisheries habitat. Coastal wetlands cover 40 million acres in the continental United States, with 81% in the Southeast. Wetlands require the presence of water at or near the surface and vegetation adapted to wet soils. Wetlands occupy low areas, often marking the transition between uplands and submerged bottom, in areas subject to regular or occasional flooding by tides, including wind tides. Wetlands are vegetated with marsh plants such as cordgrass and black needle rush, or forested wetland species like sweet gum, cypress, and willows (Ch. 5).

Habitat Functions and Fish Use

The services provided by wetlands include improving the quality of habitats through water control and filtration; protecting upland habitats from erosion; providing abundant food and cover for finfish, shellfish, and other wildlife; and contributing to the economy. By storing, spreading, and slowly releasing waters, wetlands are linked to reduced risk of flooding, and wetland loss has been linked to increased hurricane flood damage. Wetland communities are among the most productive ecosystems in the world. The plant matter decays into detritus, where it is exported to other waters and provides food for numerous organisms. Additionally, wetlands provide food, ideal growing conditions, and predator refuges for larval, juvenile and small organisms.

Economic Benefits

As the saying goes, "No wetlands, no seafood." It is estimated that over 95% of the finfish and shellfish species commercially harvested in the United States, and over 90% in North Carolina, are wetland-dependent. Consequently, wetlands significantly contribute to the productivity of North Carolina's seafood and fishing industries.

Habitat Profile

Wetland Functions

- Provide refuge and food for fish and other animals
- Filter pollutants
- Trap sediments
- Shoreline erosion control
- Hold and slowly release flood waters

How Fish Use Wetlands

- Nursery area for blue crab, shrimp, and southern flounder, spot, and croaker
- Foraging area for spotted sea trout, red drum, and flounder
- Spawning area for river herring, killifish, and grass shrimp
- Refuge for blue crab and grass shrimp

The economic benefit of wetlands in providing flood control, stabilizing shorelines, and trapping and filtering pollutants has been extensively studied. By providing flood control and reducing shoreline erosion, wetlands protect coastal property. Wetlands also protect property by deterring shoreline erosion. Studies have shown that even narrow (7-25m) marsh borders reduce wave energy by 60-95%. These services explain why wetland habitat has been linked to reducing hurricane damage. One study estimated that the loss of 1 acre of coastal wetlands could result in a $13,360 loss in gross domestic product ($14,759 in 2014 dollars), and that U.S. coastal wetlands could provide as much as $23.2 billion/year (25.63 billion/year in 2014 dollars) in storm protection services.

Wetlands - Nature's Nurseries

Status and Trends

The 2015 CHPP Source Document summarizes wetlands within the CHPP region based on two data sources, the National Land Cover Dataset (NLCD) and the National Wetlands Inventory (NWI). According to the 2011 NLCD, there were ±3,759,729 acres of woody and emergent herbaceous wetlands within the CHPP regions. This represents a 2.7% decrease in woody wetlands and an 18.9% increase in emergent herbaceous wetlands since 2001. During the same time and area, developed land increased approximately 30%. The US Fish and Wildlife Service (FWS) has produced a NWI since the mid 1970s. The distribution of these wetlands is presented in Table 5.1 of the 2015 CHPP Source Document. Populations of spotted sea trout and red drum, two wetland-dependent species, have shown great improvements in the past few years.

Fact: It has been estimated that over 95 percent of the United States' commercially harvested finfish and shellfish are wetland dependent.

Threats to Wetlands

In the late 1800s and early 1900s, large amounts of wetland loss resulted from ditching and draining for agriculture and forestry. Over the years, wetland loss has also occurred due to ditching — conversion to deep-water habitat for boat basins and navigation channels — followed by upland development, erosion, and shoreline hardening.

Statewide wetlands losses/gains and compensatory mitigation during FY 2012/13, 2013-14, and 2014-15. Data reflect permitting by DEQ and compensatory mitigation by Division of Mitigation Services.

	Permitted gains and losses		
Linear feet of streams	**2012-13**	**2013-14**	**2014-15**
Losses	81,473.0	117,694.0	59,498.9
Gains	48,712.0	78,024.0	22,620.0
Net change	-32,761.0	-39,670.0	-36,878.9
Acres of wetlands			
Losses	203.6	98.9	102.1
Gains	197.8	59.9	104.5
Net change	-5.8	-39.0	2.4
Acres of riparian buffers			
Losses	75.6	48.0	56.1
Gains	37.9	21.2	18.2
Net change	-37.8	-26.9	-37.9

*Data provided by DWR and DMS

Wetland impacts are now regulated by numerous federal and state laws including the US River and Harbors Act, the US Clean Water Act, the NC Coastal Area Management Act (CAMA), and the NC Dredge and Fill Law, among others. Wetland filling for development and wetland loss due to erosion and rising water levels are currently the primary threats. Changes in legislation in the past few years that increase the threshold for permitted allowable impacts will likely contribute to increased wetland impacts. Mitigation is required for larger wetland impacts. Offsetting historic wetland loss may now be possible through opportunities such as wetland restoration on conservation lands, rebuilding marsh islands, and constructing living shorelines.

Coastal wetlands are critical nursery areas and serve as the primary buffer between land and water-based impacts.

Soft Bottom - *The Dynamic Habitat*

Soft bottom is unconsolidated, unvegetated sediment that occurs in freshwater, estuarine, and marine systems. Mud flats, sand bars, inlet shoals, and intertidal beaches are specific types of soft bottom. Grain size distribution, salinity, DO, and flow characteristics affect the condition of soft bottom habitat and the type of organisms that use it. Soft bottom covers approximately 1.9 million acres. North Carolina's coast can be divided into geologically distinct northern and southern provinces. In the northern province (north of Cape Lookout), the seafloor consists of a thick layer of unconsolidated mud, muddy sand, and peat sediments. The low slopes of the bottom result in an extensive system of drowned river estuaries, long barrier islands, and few inlets. The southern province has a thin and variable layer of surficial sands and mud, with underlying rock platforms, a steeper sloping shoreline with narrow estuaries, short barrier islands, and numerous inlets (Ch. 6).

Habitat Functions and Fish Use

Soft bottom is important as a storage reservoir of nutrients, chemicals, and microbes in coastal ecosystems, allowing for both deposition and resuspension of nutrients and toxic substances. The surface of soft bottom supports benthic microalgae, contributing substantial primary production to the coastal system. Estuarine soft bottom supports over 400 species of benthic invertebrates in North Carolina. Juvenile stages of species such as summer and southern flounder, spot, Atlantic croaker, and penaeid shrimp use the shallow unvegetated flats, which larger predators cannot access, as important **nursery** habitat. As fish get larger, they will venture out of protective cover to forage in soft bottom. Fishery independent data from shallow creeks and bays in Pamlico Sound documented 78 fish and invertebrate species. Eight of those — spot, bay anchovy, Atlantic croaker, Atlantic menhaden, silver perch, blue crab, brown shrimp, and southern flounder — comprised > 97% of the total nekton abundance. Soft bottom between structured habitat (SAV, wetlands, shell bottom) acts as a barrier to **connectivity**, which can be beneficial to small invertebrates by reducing predation risk. Fish and invertebrates that commonly occur in this habitat, including hard clams, flatfish, skates, rays, and other small cryptic fish such as gobies, avoid predation by burrowing into the sediment, thus camouflaging themselves from predators. Ocean soft bottom, particularly in the surf zone and along shoals and inlets, serves as an important **feeding ground** for fish that forage on benthic invertebrates. These predators generally have high economic value as recreational and commercial fisheries, and include Florida pompano, red drum, kingfish, spot, Atlantic croaker, weakfish, Spanish mackerel, and striped bass. Many demersal and estuary-dependent fish **spawn** over soft bottom habitat in North Carolina's coastal waters.

Habitat Profile

Soft Bottom Functions

- Stores and recycles nutrients, chemicals
- Is a source of sand for other habitats
- Provides an area for marine animals to burrow

How Fish Use Soft Bottom

- Nursery area for blue crab, flounder, and croaker
- Foraging area for sea trout, red drum, and flounder
- Spawning area for shrimp, sturgeon, and kingfish
- Refuge area for hard clam, shrimp, and flounder

Soft bottom includes features such as mud flats, inlets, shoals, channel bottoms, and ocean beaches.

Soft Bottom - *The Dynamic Habitat*

Economic Benefits

Soft bottom benefits the economy by providing habitat for critical food sources, cycling nutrients, burying pollutants, and dampening wave energy. Beaches are extremely valuable for tourism and recreation, including surf fishing, surfing, and beach going. One study, averaging data from seven beaches in North Carolina, found the net economic benefits of a day at a North Carolina beach ranged from $14 to $104 for single day trips and $14 to $53 for users that stay onsite overnight.

Status and Trends

Comprehensive mapping of soft bottom habitat has not been completed. The loss of more structured habitat, such as SAV, wetlands, and shell bottom, has undoubtedly led to gains in soft bottom habitat. The quality of soft bottom habitat is a better indicator of soft bottom status than quantity. The best available information on sediment quality comes from EPA's latest National Coastal Condition Report (NCCR IV). The report rated the coast from North Carolina to Florida at 3.6 (fair) overall, while sediment quality was rated 2 (fair to poor), which was lower than in previous reports. Sediment quality is based on toxicity, contaminants, and total organic carbon (TOC). The percentage of area determined to be in poor condition was 13%. The primary reason for the low rating was sediment toxicity. The quality of soft bottom habitat can affect species abundance and diversity. Sediments in soft bottom habitat can accumulate both chemical and microbial contaminants, potentially affecting benthic organisms and the community structure. Tidal creeks are sensitive to various aspects of human development, but sensitivity depends on the size and location of the creeks. Because tidal creeks are the nexus between estuaries and land-based activities, the potential for contamination is great. Smaller intertidal creeks closer to headwaters demonstrate greater concentrations of nonpoint source contamination than larger systems closer to the mouth. The degree of contamination also depends on the amount of impervious cover surrounding the land.

Fact: Soft bottom covers about 2.1 million acres of estuarine and ocean bottom within state waters.

Threats to Soft Bottom

Inadequate information is available to determine the current condition of soft bottom. Many human activities aimed at enhancing the "coastal experience" can inadvertently degrade this habitat. The ecological functions provided by soft bottom can be altered by activities such as dredging for channels or marinas, shoreline stabilization, water churning in marinas, and use of certain types of fishing gear. Along the oceanfront, jetties form barriers to the movement of sand, altering the natural sediment cycle. Excess nutrient concentrations in coastal rivers, in combination with certain environmental conditions, can lead to no or low oxygen levels near the bottom, killing the benthic organisms in the sediment, which reduces food availability for larger invertebrates and fish. Sediment contaminated with toxins can affect reproduction and growth of shellfish and other aquatic animals. Soft bottom habitat is relatively resistant to a changing environment.

Soft bottom strongly influences the water column by the constant cycling of nutrients and sediments.

Hard Bottom - Rocks, Reefs, and Wrecks

Hard bottom habitat, also referred to as live bottom or reef, consists of exposed areas of rock or consolidated sediments that may or may not be characterized by a thin veneer of live or dead biota and is generally located in the ocean rather than in the estuarine system. Natural hard bottom is colonized to a varying extent by algae, sponges, soft coral, hard coral, and other sessile invertebrates. In South Atlantic waters, hard bottom can consist of exposed rock ledges or outcrops with vertical relief or can be relatively flat and covered by a thin veneer of sand.

Artificial reefs are structures constructed or placed in waters for the purpose of enhancing fishery resources. Because artificial reefs become colonized by algae, invertebrates, and other marine life, they provide additional hard bottom habitat and serve similar ecological functions for fish. Some of the materials used in artificial reef construction are vessels, concrete pipe, or prefabricated structures such as reef balls. The DMF Artificial Reef Program is responsible for deployment and maintenance of artificial reef sites in state and federal waters. There are 50 DMF-managed artificial reefs of varying construction in North Carolina, of which 29 are located in federal ocean waters, 13 in state ocean waters, and eight in estuarine waters (Ch. 7).

Habitat Functions and Fish Use

Exposed hard substrate provides stable attachment surfaces for **colonization** by numerous marine invertebrates and algae. This productive three-dimensional habitat is often the only source of structural **refuges** in open shelf waters and a source of concentrated food. Most reef fish spend almost their entire life cycle on hard bottom, which serves as nursery, spawning, and foraging grounds. The presence of ocean hard bottom off North Carolina, along with appropriate water temperatures, allows for the existence of a temperate-to-subtropical reef fish community and a snapper-grouper fishery. Because of their importance for spawning, nursery, and foraging, all of the nearshore hard bottoms off North Carolina have been federally designated as Habitat Areas of Particular Concern for the snapper-grouper complex.

Habitat Profile

Hard Bottom Functions

- Provides a place for sponges, algae, and coral to attach
- Offers refuge for reef fish
- Supplies new sand through erosion

How Fish Use Wetlands

- Nursery area for grouper, snapper, and black sea bass
- Foraging area for king mackerel, gag, and snapper
- Spawning area for black sea bass, grouper, and tropicals
- Refuge area for gag and black sea bass

Economic Benefits

Between 2011 and 2013, the North Carolina commercial snapper-grouper fishery harvested an annual average of 1,638,434 lbs of fish (total of 5,015,570 lbs) with an annual market value of over $4.2 million (total for 3 years - $12,567,964). During that same time period, recreational fisherman (private boats, charter boats, and head boats) harvested an average of 568,146 lbs of fish in the snapper-grouper complex/year, for a total of 1,204,439 lbs. Economic benefits also include revenue from the dive industry, since hard bottom reefs are popular dive sites.

Hard Bottom - Rocks, Reefs, and Wrecks

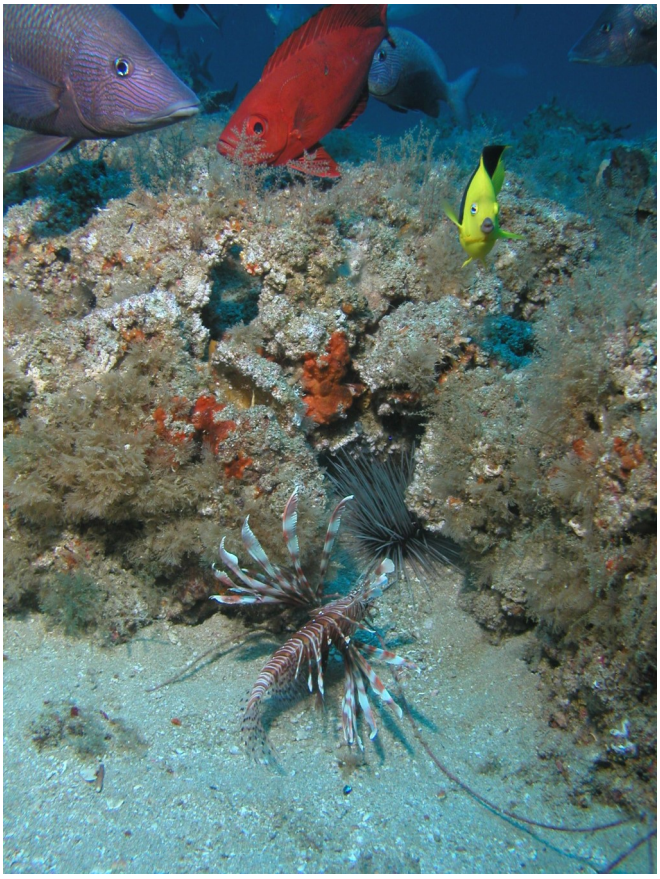
Status and Trends

The condition of shallow hard bottom in North Carolina state territorial waters is of particular importance to the health and stability of estuary-dependent snapper-grouper species that utilize this habitat as "way stations" or protective stopping points as they emigrate offshore. Because of market value, high recreational participation and the associated fishing tackle industry, the offshore snapper-grouper complex supports productive commercial and recreational fisheries. The South Atlantic Fishery Management Council reported that nearshore hard bottoms in the South Atlantic were considered to be in "good general" condition overall in 2002. Although adequate information exists on the distribution of hard bottom off the North Carolina coast, little information is available to evaluate the status and trends of hard bottom habitat in state territorial waters. The black sea bass populations north and south of Cape Hatteras and gag grouper have improved in the past few years.

Fact: 50 artificial reefs are located in ocean waters along North Carolina's coast and 8 are located in estuarine waters. In addition, there are numerous shipwrecks along the coast providing habitat for reef-dwelling species.

Threats to Hard Bottom

Threats to nearshore hard bottom habitat in North Carolina include beach nourishment, certain fishing gear, and water quality degradation. Sand from nourished beaches can also cover hard bottom structures. Some areas have already been lost to the effects of beach nourishment, such as hard bottom habitat off the coast of Wrightsville Beach, NC. Boat anchors and bottom trawls can uproot coral and tear loose chunks of rock. Poor water quality can affect growth or survival of the invertebrates living on hard bottom structure. A growing threat to hard bottom is the impact of the highly invasive Pacific lionfish on the reef community. This species has rapidly expanded in range from more southerly waters to NC and has exhibited extremely high predation rates on snapper and grouper species. Ocean acidification is another concern. More acidic ocean water over time is expected with increasing carbon dioxide levels and can cause calcium based organisms like corals and sponges to disintegrate.



The hard bottom habitat of the North Carolina coast is considered crucial spawning and foraging habitat for many commercially important species of grouper and snapper.

Habitat Threats

There are many activities that can impact coastal fish habitats. These impacts can be positive or negative. Negative impacts are considered threats. Threats can alter the physical structure, modify flows that are critical to sustaining fish functions, or degrade water quality through point and nonpoint sources. Some threats may have a severe impact when they occur but occur rarely or to a small area. Others may be minor but ubiquitous and frequent. The extent and severity of all threats in an area affect the cumulative impact to the ecosystem. The CHPP Source Document provides the science regarding known threats to each habitat. The table below is a subjective rating of threat categories by habitat (Ch. 8-11).

Threat category	Source and/or impact	Water column	Shell bottom	SAV	Wetlands	Soft bottom	Hard bottom
Physical threats/ hydrologic modifications	Boating activity						
	Channelization						
	Dredging (navigation channels, boat basins)						
	Fishing gear impacts						
	Infrastructure						
	Jetties and groins						
	Mining						
	Obstructions (dams, culverts, locks)						
	Shoreline stabilization						
	Upland development						
	Water withdrawals						
Water quality degradation — sources	Land use and nonpoint sources						
	Water dependent development (marinas and docks)						
	Point sources						
Water quality degradation — causes	Marine debris						
	Microbial contamination						
	Nutrients and eutrophication						
	Saline discharge						
	Suspended sediment and turbidity						
	Toxic chemicals						
Disease and microbial stressors							
Nonnative, invasive or nuisance species							
Weather events							

APNEP:	Albemarle-Pamlico National Estuary Partnership
BMPS:	Best Management Practices
CAMA:	NC Coastal Area Management Act
CHPP:	Coastal Habitat Protection Plan
CRC:	Coastal Resource Commission
CRFL:	Coastal Recreational Fishing License
DACS:	Department of Agriculture and Consumer Services
DCM:	Division of Coastal Management
DEMLR:	Division of Energy, Mineral, and Land Resources
DENR:	Department of Environment and Natural Resources
DEQ:	Department of Environmental Quality (formerly DENR)
DMF:	Division of Marine Fisheries
DMS:	Division of Mitigation Services
DO:	Dissolved Oxygen
DOT:	Department of Transportation
DSWC:	Division of Soil and Water Conservation
DWR:	Division of Water Resources
EBM:	Ecosystem-Based Management
EFH:	Essential Fish Habitat
EMC:	Environmental Management Commission
EPA:	US Environmental Protection Agency
FWS:	US Fish and Wildlife Service
LID:	Low Impact Development
MFC:	Marine Fisheries Commission
NCCR:	National Coastal Condition Report
NCFS:	NC Forest Service
NLCD:	National Land Cover Database
NSP:	Neurotoxic Shellfish Poisoning
NWI:	National Wetlands Inventory
SAFMC:	South Atlantic Fishery Management Council
SAV:	Submerged Aquatic Vegetation
SCC:	Sedimentation Control Commission
SCH:	Strategic Coastal Habitats
SWCC:	Soil and Water Conservation Commission
TOC:	Total Organic Carbon
TSS:	Total Suspended Solids
USACE:	US Army Corps of Engineers
WRC:	Wildlife Resources Commission

For more information or to download the plan, go to www.portal.ncdenr.org/web/mf/

Albemarle - Pamlico National Estuary Program

NORTH CAROLINA MARINE FISHERIES

DWR Division of Water Resources

NC DIVISION OF COASTAL MANAGEMENT

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-15-31

November 4, 2015

MEMORANDUM

TO: Coastal Resources Commission
FROM: Tancred Miller
SUBJECT: Sea-Level Rise Public Comments and Next Steps

The public comment period for the 2015 Sea-Level Rise Assessment report will come to an end on December 31st. Staff sent commissioners an email on July 30th with copies of all of the public comments that had been received as of that date, and we have not received any more public comments since that time. Copies of the comments are attached.

Staff also sent the public comments to the Science Panel for their review. The panel has not met since March, when they completed the draft report for the commission. The panel has reviewed the comments, and is prepared to respond to them if the commission requests it.

A few of the comments are technical in nature, while most are not. Should the commission decide to request a response from the Science Panel, it might be more appropriate to ask them to respond to the technical comments.

The commission will need to finalize the report at your February 2016 meeting, so that it can be delivered to the General Assembly by the March 1st deadline. Staff will prepare a package for your approval at that meeting, including the final draft report, public comments, the panel's response to comments (if requested), and a transmittal letter for the chairman's signature. You will recall that the commission decided at your April meeting that an economic and environmental cost-benefit analysis of developing, or not developing, sea-level regulations and policies was not feasible and would not be conducted.; a statement to this effect will be included in the letter.

Staff will review this information with the commission in November, and will request further instructions for us and for the Science Panel.

Sea Level Rise, etc.

From: Clyde Hunt, Jr <chuntjr@chemstation.net>
To: Miller, Tancred tancred.miller@ncdenr.gov; mike@thenewstimes.com; willokelly@gmail.com; 'Gail Grady' <gail@nc-20.com>
Sent: Thu 6/4/2015 11:09 AM

If I read the results of the recent meeting in Manteo correctly, concerning decisions on how the state should or should not respond to the estimated future sea level rise, please accept my appreciation for your overall involvement **and** the apparent decision to allow more local autonomy on this. And, for your rejection of the estimated/guess of 39" and 55" sea level rise.

We (the Hunt Family) have had four ocean-front nice rental houses at Ocean Isle since the mid '60's. I have been directly involved with several projects beneficial to not only the Ocean Isle property owners but ultimately every citizen of North Carolina. I've never hesitated to explain this to my more inland friends and associates here in Greensboro and elsewhere…ie…North Carolina coastal tourism is a huge revenue generator, supporting thousands of local businesses, tens of thousands of jobs, and accounting for millions of tax dollars for NC. Why do tourists from not only NC but dozens of other states and some foreign countries come to our coast? For the **beaches**! For the developed beaches. If we do not retain our developed beaches, no one will come. But obviously, any responsible person recognizes we must **responsibly** develop and maintain our magnificent beaches.

It appears most recognized the 39" (and 55") sea level rise estimates are apparently way out of line, just as the hope of **no** sea level rise is equally untenable, unrealistic. I guess the bottom line is….(a) We cannot move everything and everybody 50 miles inland based on a projected, estimated, guess that 39" is absolute….(b) So, let's locally keep a keen eye on what the rise is (or is not) each year or so, and based on several criteria…eg…past history, present 5, 10, 15 year trends, other coastal area trends, etc., make appropriate decisions. Duck has very different "challenges" than our Brunswick county beaches, and therefore very different solutions would apply.

Importantly, let's not put our heads in the sand, totally ignoring the possibility of sea level rise, **and** let's not over-react to scare tactics of those with a total anti-development/abandon the coast agenda.

Hope you fellows continue to give this most important topic the attention and consideration it deserves. And that your decisions are based on the very best scientific analysis, and not on emotion. A great deal of North Carolina's future depends on it.

Comments to the CRC April 29, 2015.

By Dave Burton
www.sealevel.info
www.NC-20.com
http://www.sealevel.info/burtonvita.html

This is one of those glass half-empty or half-full situations. This draft report is much, much better than the 2010 Report. That Report showed no actual tide gauge graphs; this one does. That Report ignored the differences between local rates of sea-level change in different parts of the State; this one analyzes them. That Report made an erroneous central claim that SLR has accelerated in response to global warming; this one does not make that error. That Report relied heavily on a discredited paper by Stefan Rahmstorf; this one does not.

However, I still have concerns.

One is that this draft report does not acknowledge any of the errors in the previous report, not even the mistaken claim that SLR accelerated due to global warming. I think we have a responsibility to do our best to undo the confusion which was caused by that error.

Another concern is the Report's exclusive reliance on sources from one end of the scientific opinion spectrum, primarily global sea level rise predictions from the most recent U.N. Intergovernmental Panel on Climate Change's 5th Assessment Report (AR5).

I was an Expert Reviewer of that IPCC Report, and I'm here to tell you that it's not a firm foundation. Their so-called expert review process was a sham. Their accelerated SLR scenarios are not credible. Even their low emission scenario projects over twice the current global rate of sea-level rise, 5.3" vs 2.2" for 30 years. That's ridiculous.

The next 30 years will probably see only about 70 additional ppmv CO2, which, because of its logarithmically decreasing effect, will have much less effect than the last 100 ppmv – and that hasn't caused any acceleration in SLR at all. It is absurd for the IPCC to predict that global SLR will double in response to a small forcing, when it didn't increase at all in response to a much larger forcing.

This draft report praises the IPCC and notes the 50,000 comments they received on their Report. But those comments were often ignored, and that praise is misplaced.

To balance the IPCC, I recommended that our Science Panel use the relevant sections of the reports from the Nongovernmental International Panel on Climate Change (NIPCC)

and the U.S. Senate's Environment and Public Works Committee's Republican staff reports on climate change, but they did not.

The most important fact that everyone needs to understand about sea-level rise is that it has not accelerated at all in response to human greenhouse gas emissions.

The vast majority of human GHG emissions have been since the 1940s. Since then, we've driven up CO2 from about 300 ppm to 400 ppm – yet the rate of sea-level rise hasn't increased at all.

This fact is a huge problem for the models that the IPCC relies on. Dr. Steven Koonin was undersecretary for science in the Energy Department during President Obama's first term. After he left that position, he finally felt at liberty to tell the inconvenient truth. He said, *"Even though the human influence on climate was much smaller in the past, the models do not account for the fact that the rate of global sea-level rise 70 years ago was as large as what we observe today."*

And yet, the IPCC still relies on those models. They just can't accept the empirical fact that anthropogenic CO2 has very little effect on sea-level rise. They still base their sea-level projections on hypothetical extreme acceleration scenarios, which they claim will be caused by CO2 emissions.

This Report is much better than the last one, but the Science Panel erred by basing so much of their work on the flawed projections of the UN IPCC's 5th Assessment Report, and by not examining more credible sources, like the Nongovernmental International Panel on Climate Change.

# # #

Unsolicited Public Comment on the Draft NCDENR Sea-Level Rise Study Update

From: George Mears <ghmears@gmail.com>
To: Miller, Tancred <tancred.miller@ncdenr.gov>
Sent: Mon 4/13/2015 3:22 PM

My undergraduate (U of Wisconsin) was in geology and my Masters is in Environmental Engineering Old Dominion University). I've also been a project manager for several coastal engineering projects over the past decade.

I am very skeptical of the agenda driven IPCC reports--and especially the Executive Summary section of each report which has been proven many times over to distort or actually refute the claims and actual conclusions of the actual authors of sections of the full report. The use of a global average SLR metrics is a farce to start with because local conditions dictate coastal conditions which are far more driven by coastal dynamics, urban stormwater hydrology, and coastal sediment consolidation and compression over time which has little to do with SLR.

At the risk of coming off as an alarmist loon, I have personally come to the conclusion that the political left wants to create a Climate Caliphate and to declare climate jihad against anyone smart enough to understand that none of their climate models have proven predictive, not one of their apocalyptic predictions has been proven true, and—given that the average global temperature hasn't risen over the past 18 years while carbon dioxide in the atmosphere has increased by
8 percent, CO2 clearly isn't driving global temperatures! Even with constant NOAA and NASA cherry picking of data points and after hundreds of weather station temperature data "adjustments" in North America and around the world, they still haven't been able to force a trend that can be statistically defended or justified. And they don't have a substitute herring to blame so they play whack-a-mole with global warming, ocean acidification, SLR, biodiversity and species extinction--almost all with cherry picked data, annecdotal evidence, improper statistices (Mann-made Hockey Stick) all with little to no government QA, taking unpaid volunteers years to study and refute.
And most for increased budgets, political influence, and academic one-upsmanship.

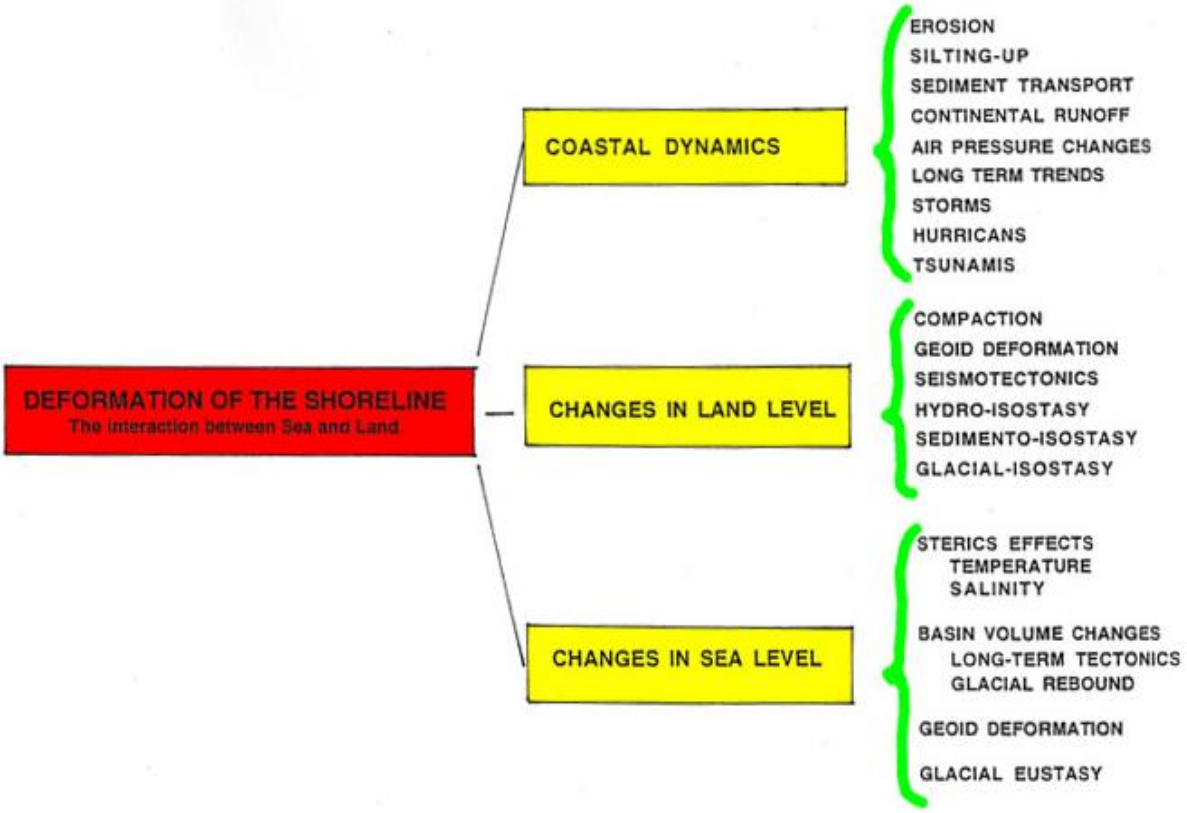
Before becoming an engineer I had over 5,800 flight hours that included several years of flying scientific research missions with John Hopkins, Scripps and Woods Hole, Naval Oceanographic Office scientists studying extreme north and south latitude ice reconnaissance, deep ocean eddy current data collection, and worldwide vector magnetic survey all over the globe. I also helped train NOAA aircrews to take over the hurrican penetration missions from the Navy during the late 1970s.

These are becoming desperate times for desperate minions committed to overthrowing capitalist economies and redistributing wealth using any garbage scientific rationale they can come up with for our media to run with without questioning!

Thank you,

George H. Mears ME, MBA, PMP
Hydrologist/Environmental Engineer
4304 Ainslie Court South
Suffook, VA 23434

The entire Sea Level Rise mantra is misunderstood by politicians and most in the public, and I dare say, most scientists. Please note the figure below that depicts where Sea Level Rise plays in the overall process of what the environmental left and the media loves to blame on SLR but is much more related to Coastal Dynamics, urban stormwater hydrology, and coastal sediment consolidation and compression over time. As shown, SLR is limited to steric impacts, eustatic changes in sea level, glacial isostacy-eustacy, and basin geoid deformation and resulting volume change—most of which are literally drowned out by dominant coastal and hydrologic factors that have little relationship to SLR.



Professor Nils-Axel Mörner of Stockholm University was the former President of the INQUA Commission on Neotectonics (1981-1989) and President of the INQUA Commission on Sea Level Changes and Coastal Evolution (1999-2003). In 2000, he launched an international research project on sea level in the Maldives. In 2008, at an international meeting on sea level in Portugal, Professor Mörner was awarded the Golden Chondrite of Merit from the University of the Algarve "for his irreverence and his contribution to our understanding of sea-level change". He has argued for years that global sea levels are not rising significantly or dangerously. In a recent paper (the 547th in his 42-year career) he continued his arguments and a fellow researcher summarized his main points for those outside the oceanographic community below:

- At most, global average sea level is rising at a rate equivalent to 2-3 inches per century. It is probably not rising at all.
- Sea level is measured both by tide gauges and, since 1992, by satellite altimetry. One of the keepers of the satellite record told Professor Mörner that the record had been interfered with to show sea level rising, because the raw data from the satellites showed no increase in global sea level at all.

- The raw data from the TOPEX/POSEIDON sea-level satellites, which operated from 1993-2000, shows a slight uptrend in sea level. However, after exclusion of the distorting effects of the Great El Niño Southern Oscillation of 1997/1998, a naturally-occurring event, the sea-level trend is zero.
- The GRACE gravitational-anomaly satellites are able to measure ocean mass, from which sea-level change can be directly calculated. The GRACE data show that sea level fell slightly from 2002-2007.
- These two distinct satellite systems, using very different measurement methods, produced raw data reaching identical conclusions: sea level is barely rising, if at all.
- Sea level is not rising at all in the Maldives, the Laccadives, Tuvalu, India, Bangladesh, French Guyana, Venice, Cuxhaven, Korsør, Saint Paul Island, Qatar, etc.
- In the Maldives, a group of Australian environmental scientists uprooted a 50-year-old tree by the shoreline, aiming to conceal the fact that its location indicated that sea level had not been rising. This is a further indication of political tampering with scientific evidence about sea level.
- Modeling is not a suitable method of determining global sea-level changes, since a proper evaluation depends upon detailed research in multiple locations with widely-differing characteristics. The true facts are to be found in nature itself.
- Since sea level is not rising, the chief ground of concern at the potential effects of anthropogenic "global warming" – that millions of shore-dwellers the world over may be displaced as the oceans expand – is baseless.
- We are facing a very grave, unethical "sea-level-gate".

How much of the current SLR argument is hype to justify more government regulations and to advance the radical environmentalist agenda? As a hydrogeologist and an environmental engineer, I suspect, most of it. Is flooding increasing? Absolutely! But is this related to sea level rise, or climate change? Unlikely and only at the margins and if there was any cost effective way to alter that in any measurable way, we still wouldn't notice any difference in the nuisance flooding because SLR isn't a major factor in it. The primary cause involves that have been well understood by urban hydrologists for decades. As areas become more urbanized--more developed—areas increasingly loose surface stormwater retention sites as building activity continues. This turns fields and lowlands into impermeable rooftops and pavement and fewer places to contain stormwater following rains. The result is a vastly reduced Time of Concentration—the time it takes for a raindrop to fall on the outer edge of a watershed and travel to the lowest spot where flooding starts. At this point, cue crickets and glazing over of eyes of media, politicians, and climate zealots since this means thinking—which certainly doesn't support their activist agendas.

Most people recognize the impact of a large business or a parking lot when it comes to increased runoff. Unfortunately, the state of municipal planning and environmental oversight is such that if the developers can divert any increase in runoff away from their building site, many believe the problem has "gone away" when all they have managed to do is push the problem into other low areas within the same watershed. But even singular construction sites can increase the flooding problem as long as local inspectors consider it OK to allow increased runoff to leave the property where the increase is generated. Every time we build larger houses, provide parking for an extra vehicle, or level and pave what was undisturbed land before, we potentially increase storm runoff unless we insist upon Best Management Practices (BMPs)—engineering solutions to capture, use, or retain the increased runoff to prevent it from leaving the property. So, am I arguing for ceasing development as do many of the radical environmentalists? No. But I would argue that they who develop, build, or alter land be responsible for the consequences of their own activity in the external environment. Regulators should hold developers, builders, and even individual property owners to a standard that does not make it permissible to allow increased runoff to exit that property. Allow prudent development

but require developers –and even individual property owners--capture and deal with any increase in site runoff due to improvements to the property that they are making.

Too few builders or even municipal planning and building officials seem to understand the impact of developing or expanding impermeable surfaces at the single lot level—business or residential. Federal regulations naturally focus on large areas of developmental impact but this shouldn't mean that the municipalities shouldn't be concerned with individual building sites when dealing with neighborhoods. There is a legal concept that when you do something to your property that impacts mine, you should be held accountable. But that requires me to sue you over something neither of us know much about. I'd suggest that the municipalities exist to protect the liberty and property rights of its citizens. So the municipality is in the best position to insist that each building permit is issued with a land disturbance permit that insists requires the land owner, builder, or developer to be responsible for dealing with any increased runoff generated by building or site modification activities.

More often than not, the best building lots in a community are chosen first and developed early on in the history of the neighborhood. As area populations grow, the best lots disappear and individuals start buying and trying to develop less desirable building lots—and in so doing, making only the improvements that municipality or community building inspectors mandate. These lost are likely to be smaller, lower topographically, and subject to more frequent flooding, overgrown and costlier to develop, or near areas of heavy traffic, business, or industrial activity. So as properties that were formerly low areas that captured and contained stormwater are filled in and converted to building lots, the increase in runoff is often disproportionate to the sizes of the infill lots being developed. The low lands disappear and are replaced with fill, rooftops, and pavement. Areas that used to capture stormwater now shed it into the neighborhoods surrounding them. And this is by far the greatest single contributor to increased area flooding in both urban and suburban areas. Ranking well below development comes local subsidence since most of the Atlantic Coastal Plain consists of 10,000 to 15,000 vertical feet of consolidating sediment. This is a geological reality and as sediment compacts, land sinks. And as municipalities, businesses, and residential homeowners use groundwater pumps to supply their needs, subsidence only increases. So the real problem is reduced Time of Concentration as rain runoff that used to stay within an area, no longer does. Sea level rise and climate change is just a convenient red herring that advances the agenda of the bigger government environmentalists. But if you really want to reduce local flooding, start paying attention to the increase in runoff from properties following construction by insisting on pre-and post-development hydrographs generated by a neutral arbiter. I've suggested for years that where local or regional colleges with hydrology departments and students who need to learn are available, this could be a win-win, with the work funded by the developers but executed by folks who aren't paid for the result the developer is hoping to find. This will only work with the cooperation of reputable professors who are available and willing to supervise their students closely to maintain standards.

Frank Gorham, Chair NCDENR CRC June 16, 2015

Comments on 2015 NC Sea Level Rise Assessment Report

The Science Panel report on sea level rise (SLR) is clearly written and is an improvement over the previous (2010) document. It does a particularly good job on explaining the differences in SLR within North Carolina.

In this note we wish to comment on only one problem, the value used for the current sea level rise rate. This parameter does not depend on complicated projections of future behavior; rather it depends only on past and current physical measurements of sea level. It is also the most important single parameter in the report.

The Panel chose an admirable goal of only using publicly documented data and literature in this report. There is little literature written specifically on the SLR along the coast of North Carolina, but the detailed tidal gauge data from the five stations along the NC coast are available on the NOAA website [1]. This data can be used directly to determine the recent SLR rate at each location, and the long term average values for each are given on the NOAA site.

An alternative approach, the one chosen by the Panel, is to use the extensive literature on the world wide average SLR rates. Specifically the Panel used the value from the last IPCC report [2]. Currently the tide gauges for the measurement of SLR have an uneven distribution around the world's oceans, and older tide gauges had a much more limited coverage. This data must be manipulated to account for the limited distribution in space and time to calculate the world average rate. This calculation introduces many sources of possible errors.

The resulting world average rate must then be adjusted to account for local conditions at any specific site which introduces more opportunities for errors. The need for this last step can be illustrated by the fact that US tide gauge data shows that the average SLR rate on the US East coast is over three times the value for the US West Coast (excluding Alaska)[3]. The Panel uses the local NC tide gauge measurements to estimate the correction needed for the world sea level rate. This introduces the circular reasoning of using local sea level rise rates measured by tide gauges to correct the world sea level rise rate with the objective of finding the local sea level rise rate.

We believe the CRC should directly use the data from the local tide gauges to determine the current local SLR rate. This procedure introduces much less opportunity for error. We will discuss the two approaches and show that the procedure of going through the world wide average value gives results that are clearly incorrect for the North Carolina sites.

First the procedures used by the panel are discussed. The referenced IPCC result is then shown to have been questioned in the literature. Finally, the Panel's projections of SLR are compared to NC tide gauge data and shown to be clearly inconsistent.

The use of IPCC reports to project future acceleration of SLR rates is not discussed in this comment. However the Appendix lists a number of references provided by John Droz which discuss the subject.

Science Panel procedure and the IPCC SLR rate

The Science Panel chose the Fifth IPCC report [2] as its primary source of documentation on the projected SLR due to future warming from current and potential future increases in greenhouse gases. The IPCC document reports the calculated impact of a range of future emission scenarios in order to capture a range of potential sea level rises. The Panel referenced the IPCC summary, Table A11.7.7, shown below.

Table AII.7.7 | Global mean sea level rise (m) with respect to 1986–2005 at 1 January on the years indicated. Values shown as median and *likely* range; see Section 13.5.1.

Year	SRES A1B	RCP2.6	RCP4.5	RCP6.0	RCP8.5
2007	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]
2010	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]
2020	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.11]
2030	0.12 [0.09 to 0.16]	0.13 [0.09 to 0.16]	0.13 [0.09 to 0.16]	0.12 [0.09 to 0.16]	0.13 [0.10 to 0.17]
2040	0.17 [0.13 to 0.22]	0.17 [0.13 to 0.22]	0.17 [0.13 to 0.22]	0.17 [0.12 to 0.21]	0.19 [0.14 to 0.24]
2050	0.23 [0.17 to 0.30]	0.22 [0.16 to 0.28]	0.23 [0.17 to 0.29]	0.22 [0.16 to 0.28]	0.25 [0.19 to 0.32]
2060	0.30 [0.21 to 0.38]	0.26 [0.18 to 0.35]	0.28 [0.21 to 0.37]	0.27 [0.19 to 0.35]	0.33 [0.24 to 0.42]
2070	0.37 [0.26 to 0.48]	0.31 [0.21 to 0.41]	0.35 [0.25 to 0.45]	0.33 [0.24 to 0.43]	0.42 [0.31 to 0.54]
2080	0.44 [0.31 to 0.58]	0.35 [0.24 to 0.48]	0.41 [0.28 to 0.54]	0.40 [0.28 to 0.53]	0.51 [0.37 to 0.67]
2090	0.52 [0.36 to 0.69]	0.40 [0.26 to 0.54]	0.47 [0.32 to 0.62]	0.47 [0.33 to 0.63]	0.62 [0.45 to 0.81]
2100	0.60 [0.42 to 0.80]	0.44 [0.28 to 0.61]	0.53 [0.36 to 0.71]	0.55 [0.38 to 0.73]	0.74 [0.53 to 0.98]

This table only gives the sea levels at future dates in meters (which the Panel converted to inches). The associated SLR rates are not apparent from this table. The Panel just incorporates the SLR values for the years 2015 to 2045 in their report without ever discussing the underlying SLR rates. It can be seen that the change in SLR by 2050 between the different cases is not significant, only 0.03m (1 inch). Of much greater importance, Table A11.7.7 assumes the initial global average SLR rate in 2010 is 4.0mm/y.

If the Panel had used the figures from the section of the IPCC report where this table originated (Section 13.5.1), then this hidden assumption would have been apparent. This can be seen in the frames below on the right where the black lines represent the total value of the SLR rates. It can be seen that in both cases the rates are assumed to start at 4.0mm/y.

Dave Burton and Jim Early both tried to point out the importance of this hidden assumption to the Panel. Whether from the press of time, inertia, miscommunication or some other reason, the Panel never addressed the problem.

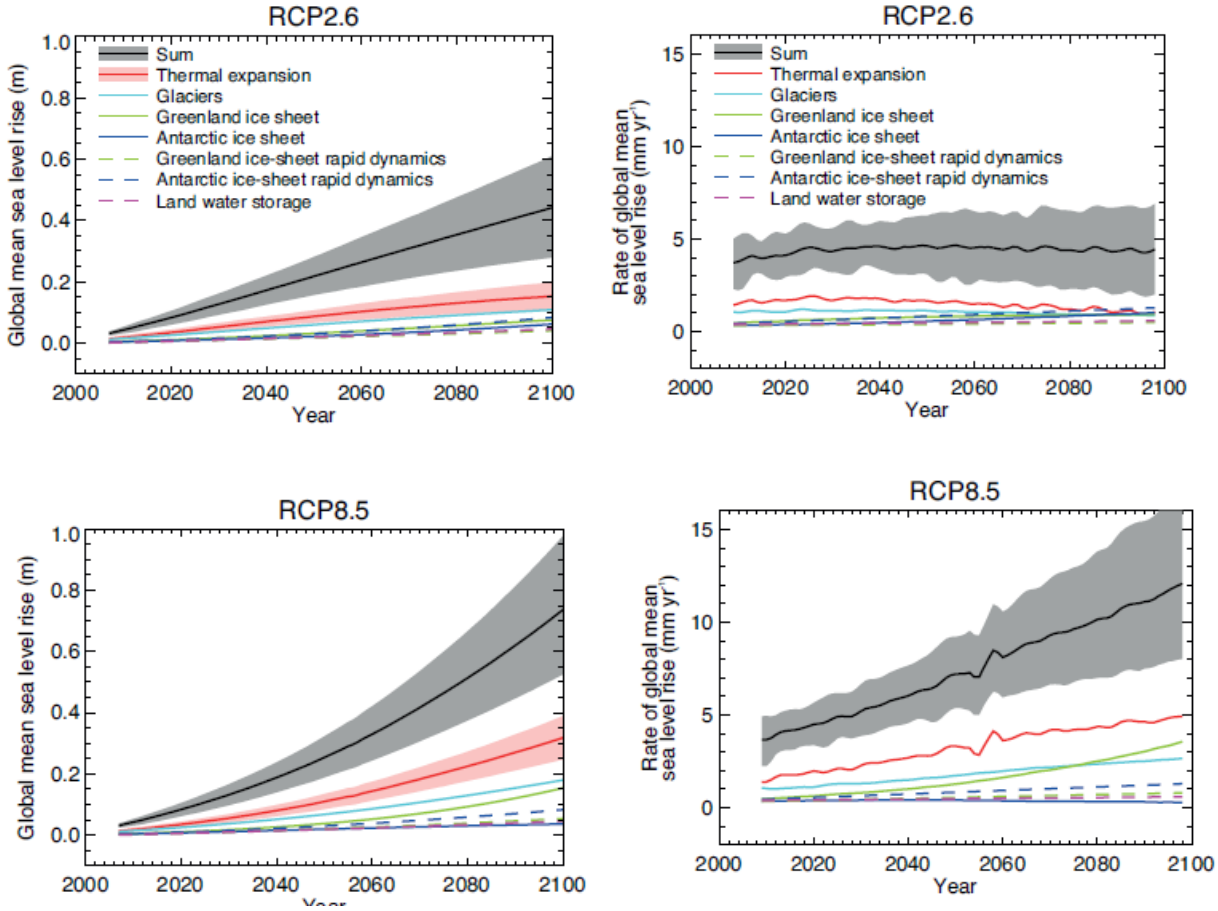


Figure 13.11 | Projections from process-based models of (a) global mean sea level (GMSL) rise relative to 1986–2005 and (b) the rate of GMSL rise and its contributions as a function of time for the four RCP scenarios and scenario SRES A1B. The lines show the median projections. For GMSL rise and the thermal expansion contribution, the *likely* range is shown as a shaded band. The contributions from ice sheets include the contributions from ice-sheet rapid dynamical change, which are also shown separately. The time series for GMSL rise plotted in (a) are tabulated in Annex II (Table AII.7.7), and the time series of GMSL rise and all of its contributions are available in the Supplementary Material. The rates in (b) are calculated as linear trends in overlapping 5-year periods. Only the collapse of the marine-based sectors of the Antarctic ice sheet, if initiated, could cause GMSL to rise substantially above the *likely* range during the 21st century. This potential additional contribution cannot be precisely quantified but there is *medium confidence* that it would not exceed several tenths of a metre of sea level rise.

Critique of IPCC current SLR rate

The IPCC report does not provide a detailed explanation of the source of the 4.0mm/y SLR rate. It references the work of Church and White [4] which gives a value of 2.8mm/y based on tide gauges and 3.2mm/y based on satellites. The world-wide average of tide gauge data requires complicated statistics to offset the uneven tide gauge distribution in space and time. The satellite data also requires adjustments for instrument calibrations. Both procedures are thus vulnerable to systematic errors.

Morner [5] shows the statistical distribution of tide gauge data (Figure 1) for SLR rates from a world-wide NOAA database of 204 tide gauges. The wings of the distribution represent locations where the land is either subsiding or rising. Clearly the average or median rate is between 1 to 2 mm/y.

The satellite (sa) value of 3.2mm/y and the IPCC value of 4.0mm/y are outside of any reasonable reading of the data. A review of the British data base of 1000 world-wide tide gauges by Beenstock et.al.[6] indicates an average of 0.4-1.1mm/y. They note that the spatial distribution of the older tide gauge distribution was much narrower with most of those tide gauges located in harbors served by European commerce (ie, Northeastern US, the Baltic, the European Atlantic, and the Mediterranean). Much of this group is located in areas with known land subsidence which strongly biased the older data. The author suggests that the efforts to weigh the world wide average has not adequately accounted for the distribution bias, and this problem has led to the strange discrepancy between data from current tide gauges and the "adjusted" values of the IPCC and satellites. A recent analysis of US coastal gauges [3] points to this same conclusion.

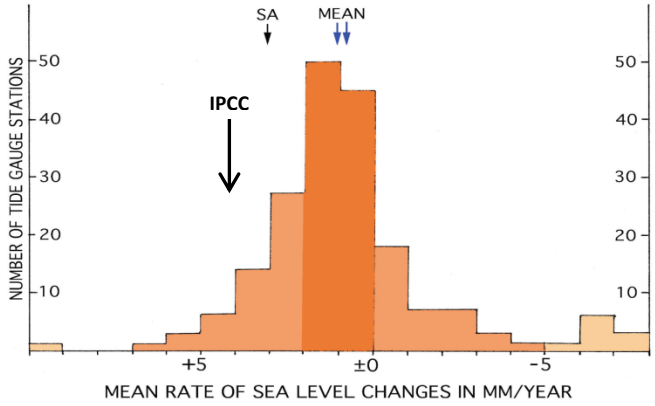
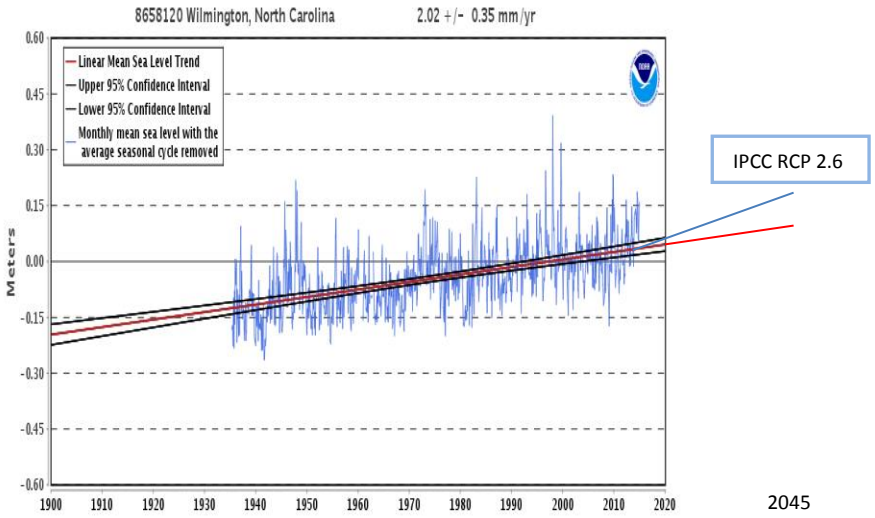


Figure 1. SLR rate distribution of 204 world wild tide gauges used by NOAA [*Morner,N. 2013,Energy & Environment, 24,509-536*.]

Comparison of IPCC SLR rate and NC tide gauge data

In the IPCC case RCP2.6 the SLR rate is relatively constant, rising to only 4.7mm/y by 2045. This means they are projecting very little change from the current SLR rate within the next 30 years for that scenario. This case can be compared with a simple linear extrapolation of the NC tide gauge.

Figure 2 shows the NOAA tide gauge data with a linear extrapolation for thirty years shown by the red line. By comparison the blue line shows the IPCC RCP 2.6 case with the Panel values for local adjustments added. The IPCC case requires a change in the rate of SLR which is not supported by the data nor discussed in the report.



Wilmington tide gauge (NOAA)

Figure 2. Comparison of thirty year SLR for IPCC case RCP2.6 versus simple linear projections

Recommended Procedure

We would recommend that the CRC use the linear projection of the local NC tide gauges at each location as the best measure of the current local SLR rates. It can be seen from the plots of tide gauge data that the local rates fluctuate over short time scales, but that there is no evidence of any change in the local rates over the time scale of the measurements. The advantage of this procedure is the direct relation to published experimental data. No complex or questionable manipulation of data sets for remote locations would need to be justified. Both simplicity and clarity would recommend this procedure.

To account for future increase in the SLR rates, the IPCC report could be used as a documented estimate. Simply take the thirty year changes in SLR rates estimated in the two IPCC cases, and add these changes to the current rate obtained from the tide gauges. Since case RCP2.6 shows almost no change in SLR rate, we would drop that case and use the linear extrapolation as the low SLR estimate. Case RCP8.5 could then be used as the basis for the increase in SLR rate for the conservative or high SLR case. Table ES1 in the assessment would become:

Table ES1. Two relative sea level rise (RSLR) scenarios by 2045 using published NC tide gauges (NOAA 2014a) and IPCC scenario projection RCP 8.5 (Church et al. 2013). The linear projection of the tide gauge data representing the lowest scenario and the sea level rise acceleration from RCP 8.5 added to the tide gauge projection representing the highest warming scenario.

Station	Tide Gauge Projections		Tide Gauge + IPCC RCP 8.5 Projections	
	RSLR in 30 years (inches)		RSLR in 30 years (inches)	
	Mean	Range	Mean	Range
Duck	5.4	4.4-6.4	6.7	5.7-7.9
Oregon Inlet	4.3	2.7-5.9	5.6	4.0-7.3
Beaufort	3.2	2.8-3.6	4.5	2.4-5.2
Wilmington	2.4	2.0-2.8	3.7	3.3-4.4
Southport	2.4	1.9-2.8	3.7	3.3-4.4

References:

1. NOAA Mean Sea Level Trends, http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.htm?gid=1237
2. IPCC Fifth Assessment Report (AR5), Climate Change 2013-The Physical Science Basis,Chapter 13 http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter13_FINAL.pdf
3. Parker, A. and C. Ollier, *Discussion of a Modelling Study of Coastal Inundation Induced by Storm Surge, Sea-level Rise, and Subsidence in the Gulf of Mexico: The US Average Tide Gauge is not Accelerating Consistently with the Worldwide Average,* Physical Science International Journal 7(1): XX-XX, 2015, Article no.PSIJ.2015.057, ISSN: 2348-0130
4. Church, J. A., and N.J. White, 2011. Sea-level rise from the late 19th to the early 21st century *Surveys in Geophysics* , 32(4-5), 585–602. doi:10.1007/s10712-011-9119-1.
5. Morner,N. 2013,Energy & Environment, 24,509-536.
6. Beenstock, Michael, Daniel Felsenstein, Eyal Frank, and Yaniv Reingewertz. "Tide gauge location and measurement of global sea level rise." *Environmental and Ecological Statistics* (2014): 1-28.

James Early, Kitty Hawk, NC; retired engineer from DOE Lawrence Livermore National Laboratory, . Doctorate in engineering from Stanford University

S. Stanley Young, Doctorate in Statistics and Genetics from NC State University
Fellow of the American Statistical Association and the AAAS

John Droz, jr. Morehead City, NC Physicist

Appendix

The intention of this Commentary is to achieve two objectives:

a) a timely response to the NC 2015 SLR Report that is technically significant & accurate, *as well as*

b) a response to the NC SLR Report that is understandable by the public, and our NC legislators.

To simultaneously achieve both goals, is a substantial challenge. The *Appendix* was setup to separate out some of the more technical parts of this complex subject — which the casual reader can just peruse, and still hopefully get the point. [BTW: here is a good layman's overview of SLR measurements.]

The key issue with this Report is the authors' adulation with the IPCC (Intergovernmental Panel on Climate Change). Yes, on the surface the IPCC seems like a credible, objective source — *but is it really?*

Let's start with this **insightful synopsis** that's a good overview of IPCC issues. Here's another. As mentioned in those analyses, there is a significant and fundamental problem with the IPCC that needs to be clearly understood:

> Many people believe that the IPCC objectively and scientifically looked at the whole climate situation — and then concluded that human factors were dominant. Subsequent to that presumed scientific assessment, the IPCC focused on the human related climate change elements.

However, that is **not the case**. Read what their charter said:

> "The role of the IPCC is to assess on a comprehensive, objective, open and trans-parent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk **of human-induced climate change**, its potential impacts and options for adaptation and mitigation. The IPCC does not carry out research, nor does it monitor climate related data **or other relevant parameters**."

I've put the key parts in red. What this says is that the IPCC, by *statute*, is forced to **ONLY** consider human related climate changes. No other climate related changes — *no matter how important* — are seriously analyzed.
Science is a **Process** that involves a *comprehensive*, *objective*, *transparent* and *empirical* analysis of a technical issue.

Understanding the IPCC's directive makes it clear why their reports focus on human related climate change: *not that it's necessarily so important, but rather that this is what their charter had mandated them to do*. So, no matter how many scientists work with the IPCC, or how much "peer-review" there is, or how polished their methodology seems, the IPCC's charter **is fundamentally contrary to how real Science works!**

On January 2nd, 2015, a request was sent to several SLR experts — asking that they

review the Version 4 draft of the CRC advisory Panel SLR Report. Below is a brief summary of some of the more applicable studies received to date, in response:

1 - There was a well-known Australian Report ("South Coast Regional Sea Level Rise Policy and Planning Framework": summary here) that basically regurgitated the IPCC conclusions. That is of interest, as this is essentially the same position taken by the NC CRC's technical advisory Panel. There were two detailed critiques of the Australian Report, and arguments against the IPCC very much apply to the NC situation:

a - NIPCC Commentary (authored by 11 scientists). There is **considerable** information here about the veracity of the IPCC and satellite SLR data.

b - Dr. John Happs Commentary (sent by the author)

2 - US Congressional testimony (2/26/14) by Dr. Patrick Michaels and Dr. Paul Knappenberger. They have a section in that worthwhile document that deals with SLR, and the IPCC's models. Their point appears to be: if the IPCC can't get the temperatures right, how can they accurately forecast SLR?

3 - US Congressional testimony (2/26/14) by Dr. Randy Randol. He pointedly objects to the IPCC scenarios — noting that none of them have been calibrated. He has a particularly worthwhile section ("VI") on SLR.

4 - US Congressional testimony (5/29/14) by Dr. Daniel Botkin. His very reasoned discussion is about the accuracy of IPCC models, which is a key matter here.

5 - State of the Climate Debate (9/16/14) by Dr. Judith Curry. She likewise discusses the IPCC process and the accuracy of its assumptions.

6 - Understanding The IPCC AR5 Climate Assessment (10/13) by Dr. Richard Lindzen. He writes that "the IPCC report ... is a political document, and as George Orwell noted, 'is designed to make lies sound truthful.'"

7 - The IPCC AR5 Report: Facts -vs- Fictions (10/13) by Dr. Don Easterbrook, concludes that: "the IPCC report must be considered the grossest misrepresentation of data ever published." See also this critique.

8 - Sea Level Changes in the 19, 20th and 21st Centuries (10/14) by Dr. Nils-Axel Mörner. He cites considerable empirical records, concluding that: "This data set is in deep conflict with the high rates proposed by the IPCC."

9 - German Review: Sea Level Rise Way Below Projections – No Hard Basis For Claims Of Accelerating Rise (1/23/14) by Dr. Sebastian Lüning. This very detailed analysis concludes that the IPCC projections are "unscientific."

10-IPCC AR5: Unprecedented Uncertainty (10/13) by Dr. Euan Mearns. He concludes that "The IPCC has become confused... The consensus is broken."

11-A strong critique (7/16/14) by Larry Hamlin concludes: "IPCC AR5 claims of increasing rates of sea level rise from 1971 to 2010 are unsupported." That, in turn, undermines the veracity of their proposed scenarios.

12-Multi-scale dynamical analysis (MSDA) of sea level records versus PDO, AMO, and

NAO indexes (5/14) by Dr. Nicola Scafetta. He concludes that SLR predictions (like IPCC's) are inaccurate as their basic methodology is flawed.

13-Ethics and Climate Change Policy (12/15/14) by Dr. Peter Lee. Although a bit more general, he analyzes the IPCC and its methodology. There is a subsequent discussion of this insightful paper on Dr. Curry's site.

14-Regional Climate Downscaling: What's the Point? (1/31/12) by Dr. Roger Pielke. This well-researched paper discusses the differences and limitations between short term weather predictions, and long term climate predictions.

15-Twentieth-Century Global-Mean Sea Level Rise (6/13) by Gregory, et al. "Semi-empirical methods for projecting GMSLR depend on the existence of a relationship between global climate change and the rate of GMSLR, but the implication of the authors' closure of the budget is that such a relationship is weak or absent during the twentieth century."

16-Secular and Current Sea Level Rise (2014) by Dr. Klaus-Eckart Puls is mostly about how satellite readings have diverged from tidal gauges. However, he strongly criticizes the IPCC saying: "IPCC forecasts do not have much to do with objective science any more."

17-Evidence for Long-term Memory in Sea Level (8/5/14) by Dangendorf, et al observes that "natural variations could be playing a large role in regional and global sea level rise than previously thought."

18-Stop Climate Fear Mongering (12/23/14) by Dr. William Gray. His conclusion about the IPCC scenarios: "The science behind these CO_2 induced warming projections is very badly flawed and needs to be exposed."

19-Video Link to Sea-Level Rise Reality by Dr. Tom Wysmuller. He wrote me: "the NC SLR report treats the Glacial Isostatic Adjustment rather poorly (as does the University of Colorado and the IPCC)." [Ref page 7 of the Report.]

20-Statistical analysis of global surface air temperature and sea level using cointegration methods (2012) by Dr. Torben Schmith, et. al. They conclude that "the number of years of data needed to build statistical models that have the relationship expected from physics, exceeds what is currently available by a factor of almost ten."

Frank Gorham, Chair NCDENR CRC
Margery Overton, Chair NCDENR CRC Science Panel

April 29, 2015

The Science Panel report on sea level rise (SLR) is clearly written and is a major improvement over the previous (2010) document. I wish to comment on only one problem, the value used for the current global sea level rise rate.

In the preliminary Panel meetings the Panel seemed committed to using the Church & White (2011) paper for recent past and current global sea level rise data and to using the IPCC document for future sea level acceleration projections. In the later drafts the Panel chose to also use the IPCC document as the source for the current global sea level rise rate.

The single **most important** number in this entire report is the value assumed for the current SLR rate. It is much more important than the small accelerations projected by the two IPCC cases. The Panel inserts the IPCC value of 4.0mm/y into its calculations with no mention or discussion. The Panel only presents and discusses the time integral of the sea level rise rates which hides the actual rates used. The panel takes this value without question or comment from the IPCC report.

This sea level rise rate is higher than global tide gauge values from NOAA or the questionable satellite values as can be seen in figure 1. It is also higher than tidal gauge data from the CW paper. More importantly, this value is incompatible with the tidal gauge data from Wilmington where the land is known to have a low subsidence rate or even may be rising (figure 2).

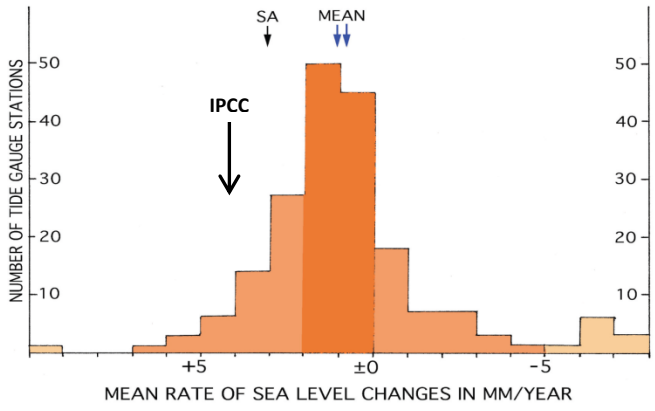


Figure 1. SLR rate distribution of 204 world wild tide gauges used by NOAA
[*Morner,N. 2013,Energy & Environment, 24,509-536*.]

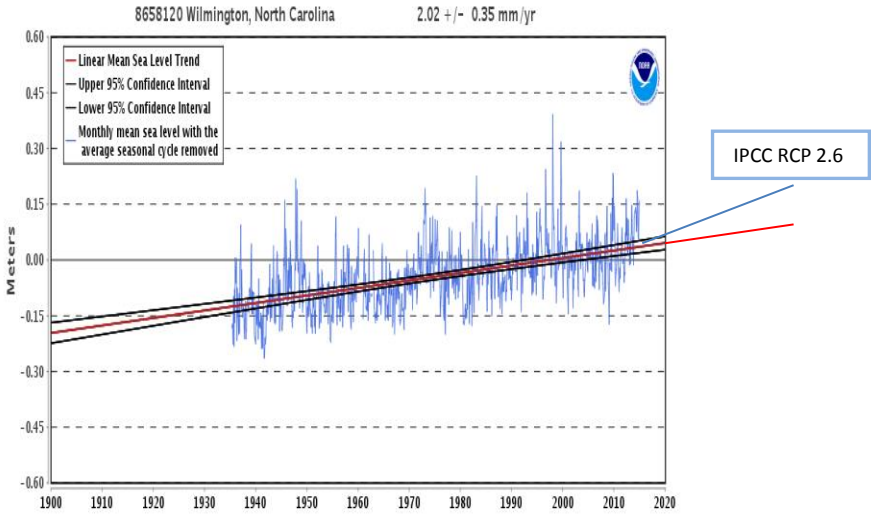


Figure 2. Wilmington tide gauge (NOAA)

As I have stated at previous meetings, you cannot simply ignore any discussion of the current SLR rate which you use. This report will be of little value and no credibility without such a discussion. The best approach would be to simply use the NC tide gauge data as the best measure of the current local sea level rise rates. The IPCC document could then be used to estimate the future increases in the sea level rise rate. This was the procedure that the Panel initially discussed. It would base the estimates of current rates on real local scientific data. Using the value from the IPCC document for a current local measurable rate is simply an appeal to authority rather than science.

James Early
Kitty Hawk, NC
Retired engineer from DOE Lawrence Livermore National Laboratory
(Doctorate in engineering from Stanford University)

June 23, 2015

Mr. Tancred Miller
Division of Coastal Management
North Carolina Department of Environment and Natural Resources
1601 Mail Service Center, Raleigh, NC 27699-1601
tancred.miller@ncdenr.gov

Comments re: March 31, 2015, Draft of "North Carolina Sea-Level Rise Assessment Report: 2015 Update to the 2010 Report and 2012 Addendum"

Dear Mr. Miller,

As researchers working on the risks posed by sea-level rise and climate change to coastal communities, infrastructures, and ecosystems, we appreciate the opportunity to comment upon the March 31, 2015, draft of the 2015 update to the 2010 North Carolina Sea-Level Rise Assessment Report and 2012 Addendum.

As background, we attach our paper "Past and future sea-level rise along the coast of North Carolina, USA," which is currently in press at *Climatic Change* (Kopp et al., 2015)[1]. A version of this paper is publicly available from arXiv at http://arxiv.org/abs/1410.8369.

The current draft of "North Carolina Sea-Level Rise Assessment Report: 2015 Update to the 2010 Report and 2012 Addendum" makes a fundamental error in interpreting the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Nowhere does the IPCC estimate sea-level change beyond what it calls the 'likely' range (67% probability range; i.e., the 17th–83rd percentiles). The current report mistakenly describes these as "*5-95% uncertainty ranges*" (p. 18) and then uses these ranges as the basis for constructing its uncertainty estimates for regional sea-level rise. (Note that these mistakenly construed 90% confidence intervals subsequently turn into 95% confidence intervals on page 19.)

Consistent with the IPCC estimates upon which they are based, the ranges of the current projections should be viewed as bracketing the central 67% of the probability distribution. As such, there is a 17% probability that sea-level rise will exceed the 'high' projections.

The current draft includes "no quantification of oceanographic effects … in the sea level projections."

This is not a tenable strategy, given the observed history of dynamic sea level off of North Carolina over the last three decades. It is also not a tenable strategy when trying to quantify uncertainty in projections of future sea-level change. Kopp et al. (2014)[2] and Kopp et al. (2015) estimate that oceanographic factors are responsible for about 80% of the variance in sea-level rise projections for Wilmington in the 2040s.

As discussed in the background paper, ocean dynamics (likely associated with either a long-term shift or multidecadal variability in the Gulf Stream) caused a sea-level deceleration off parts of North Carolina

[1] R. E. Kopp, B. P. Horton, A. C. Kemp and C. Tebaldi (2015). Past and future sea-level rise along the coast of North Carolina, United States. *Climatic Change*, arXiv:1410.8369, doi:10.1007/s10584-015-1451-x.
[2] R. E. Kopp, R. M. Horton, C. M. Little, J. X. Mitrovica, M. Oppenheimer, D. J. Rasmussen, B. H. Strauss, and C. Tebaldi (2014). Probabilistic 21st and 22nd century sea-level projections at a global network of tide gauge sites. *Earth's Future* 2: 287–306, doi:10.1002/2014EF000239.

over the last ~30 years. Relative sea-level rise in Wilmington from 1980-2010 was 0.7 ± 0.9 mm/y, compared to a 20th century average of 2.1 ± 0.5 mm/y. When projecting future sea-level rise for Wilmington (and other locations in North Carolina), one of two assumptions must be made. (1) The sea-level rise that was suppressed over 1980-2010 will not be recovered. This is the implicit assumption made in the report by using IPCC projections for 2015 as a baseline. (2) Alternatively, the suppressed sea-level rise represents natural variability that will be recovered, in which case projected sea-level rise should be measured from an earlier baseline.

Bound up in this issue is the report's use of 2015 as a baseline. Sea-level trends generally do not refer to year-to-year variability, which can be quite significant. At Wilmington for example, the difference between annual mean sea level and 20-year average sea level has a standard deviation of ~8 cm (~3 inches). Therefore, in an average 20-year interval, one year will experience an annual average sea level 5 inches above the 20-year mean, and another will experience an annual average sea level 5 inches below the 20-year mean. For this reason, it is commonplace to use a multi-decadal average as the baseline for sea-level projections. The IPCC uses 1986-2005 as its baseline; Kopp et al. (2014) take 19-year running averages of dynamic sea level, so their baseline is effectively 1991-2009.

In light of these concerns, the purported precision of the draft report should be viewed skeptically.

The practical need for localized sea-level rise estimates that cover more of the range of possible futures led Kopp et al. (2014) to develop a framework for generating self-consistent, probabilistic projections of localized sea-level rise.

Below, we present percentiles of the Kopp et al. (2014, 2015) sea-level rise projections for Wilmington and Duck from 2015 (i.e., the 2006-2024 average) to 2045 (the 2036-2054 average) under two different assumptions. The first set of assumptions (labeled 'a') follow the practices used in the current draft report, where 2015 is used as a baseline and the suppressed sea-level rise caused by ocean dynamic changes during the last ~30 years is not be recovered. In the second set of assumptions (labeled 'b') we assume that the suppressed sea-level rise is recovered over the next ~30 years. This difference in interpretation results in a ~2-4 inch difference between projections.

We highlight the 17th-83rd percentile projections, as these should be most comparable to the mistakenly construed '95% confidence intervals' in the draft report. For Wilmington, under RCP 8.5 and assumption a, we find a 67% probability interval of 5.9-10.2 inches, which compares to 4.3-9.3 inches in the draft report. For Duck under RCP 8.5 and assumption a, we find a 67% probability interval of 7.9-12.6 inches, which compares to 5.5-10.6 inches in the draft report. These differences of less than 2.5 inches arise both from the inclusion of ocean dynamic effects and from modestly higher global projections that arise in the self-consistent probabilistic framework employed by Kopp et al. (2014). As noted previously, a different assumption about the nature of dynamic sea-level variability over the last ~30 years (assumption b) would amplify these projections by 2-4 inches. Neither assumption is necessarily correct; rather, these should be taken as guides to one source of uncertainty that arise in projecting sea level, and should be judged appropriately in risk analysis.

More generally, we note that the 97.5th percentile (the upper bound of the central 95% probability interval), is ~2.3-3.5 inches higher at Wilmington than the 83rd percentile. Similarly, the 2.5th percentile (the lower bound of the central 95% probability interval) is ~2.0-3.2 inches lower at Wilmington than the 17th percentile. This indicates the extent to which the high and low estimates in the draft report must be extended if the goal is to offer a 95% probability interval. We also note that a 95% probability interval may not be the only relevant probability window for sea-level rise projections. The 1% average annual probability flood level, for example, is often used to define the flood plain, which suggests the 99th

percentile projection merits some attention. Under RCP 8.5, this reaches 14-19 inches at Wilmington and 17-22 inches at Duck.

By construction of the Kopp et al. (2014) framework, the estimates of the 99.9th percentile under RCP 8.5 align with other estimates of the maximum physically possible sea-level rise and may also be of interest. Over 2015-2045, this maximum possible level is 24 inches at Wilmington and 26 inches at Duck.

Based on the concerns described above, we urge that the draft report be revised to (1) give appropriate attention to the role of ocean dynamics, (2) correctly describe the probability intervals it is presenting, and (3) span a broader range of probability intervals than the 67% interval used, so as to better inform risk analysis.

Thank you for your consideration of these suggestions. We would be happy to be of further assistance as you revise the draft.

Sincerely,

Robert Kopp
Associate Professor, Department of Earth & Planetary Sciences
Associate Director, Rutgers Energy Institute
Rutgers University

Benjamin P. Horton
Professor, Department of Marine & Coastal Sciences
Rutgers University

Andrew C. Kemp
Assistant Professor, Department of Earth & Ocean Sciences
Tufts University

Claudia Tebaldi
Project Scientist III, Climate and Global Dynamics Laboratory
National Center for Atmospheric Research

Affiliations are provided for identification purposes only. The opinions expressed herein are solely those of the authors, and not necessarily of our respective institutions.

Sea-Level Projections for Wilmington, NC and Duck, NC

after Kopp et al. (2014, 2015)

Wilmington (inches of sea-level rise, 2015-2045)

	Percentile										
	1%	**2.5%**	**5%**	**16.7%**	**50%**	**83.3%**	**95%**	**97.5%**	**99%**	**99.5%**	**99.9%**
RCP 8.5a	3.1	3.9	4.7	5.9	7.9	10.2	11.8	12.6	13.8	15.4	20.1
RCP 8.5b	3.5	4.7	5.9	7.9	11.0	14.2	16.5	17.7	19.3	20.1	24.4
RCP 2.6a	2.4	3.1	3.5	5.1	7.1	9.1	10.6	11.4	12.6	13.8	18.5
RCP 2.6b	3.1	4.3	5.1	7.1	9.8	12.6	15.0	16.1	17.7	18.9	22.8

Duck (inches of sea-level rise, 2015-2045)

	Percentile										
	1%	**2.5%**	**5%**	**16.7%**	**50%**	**83.3%**	**95%**	**97.5%**	**99%**	**99.5%**	**99.9%**
RCP 8.5a	4.7	5.5	6.3	7.9	10.2	12.6	14.2	15.4	16.5	17.7	22.8
RCP 8.5b	3.9	5.5	6.7	9.1	12.6	15.7	18.5	20.1	21.7	22.8	26.4
RCP 2.6a	3.9	4.7	5.1	6.7	9.1	11.0	13.0	13.8	15.4	16.5	20.9
RCP 2.6b	3.5	4.7	5.9	7.9	11.4	14.6	17.3	18.5	20.1	21.7	24.8

RCP 8.5: High emissions pathway, consistent with continued fossil-fuel intensive economic growth
RCP 2.6: Low emissions pathway, consistent with a rapid transition away from fossil fuels
Assumption a: Sea-level rise suppressed by ocean dynamics over last two decades is not recovered
Assumption b: Sea-level rise suppressed by ocean dynamics over last two decades is recovered

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Past and future sea-level rise along the coast of North Carolina, USA

Robert E. Kopp, Benjamin P. Horton, Andrew C. Kemp and Claudia Tebaldi

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Abstract We evaluate relative sea level (RSL) trajectories for North Carolina, USA, in the context of tide-gauge measurements and geological sea-level reconstructions spanning the last ∼11,000 years. RSL rise was fastest (∼7 mm/yr) during the early Holocene and slowed over time with the end of the deglaciation. During the pre-Industrial Common Era (i.e., 0–1800 CE), RSL rise (∼0.7 to 1.1 mm/yr) was driven primarily by glacio-isostatic adjustment, though dampened by tectonic uplift along the Cape Fear Arch. Ocean/atmosphere dynamics caused centennial variability of up to ∼0.6 mm/yr around the long-term rate. It is extremely likely (probability $P = 0.95$) that 20th century RSL rise at Sand Point, NC, (2.8 ± 0.5 mm/yr) was faster than during any other century in at least 2,900 years. Projections based on a fusion of process models, statistical models, expert elicitation, and expert assessment indicate that RSL at Wilmington, NC, is very likely ($P = 0.90$) to rise by 42–132 cm between 2000 and 2100 under the high-emissions RCP 8.5 pathway. Under all emission pathways, 21st century RSL rise is very likely ($P > 0.90$) to be faster than during the 20th century. Due to RSL rise, under RCP 8.5, the current '1-in-100 year' flood is expected at Wilmington in ∼30 of the 50 years between 2050-2100.

1 Introduction

Sea-level rise threatens coastal populations, economic activity, static infrastructure, and ecosystems by increasing the frequency and magnitude of flooding in low-lying areas. For example, Wilmington, North Carolina (NC), USA, experienced nuisance flooding ∼2.5 days/yr on average between 1938 and 1970, compared to 28 days/yr between 1991 and 2013 (Ezer and Atkinson, 2014). However, the likely magnitude of 21st century sea-level rise – both globally and regionally – is uncertain. Global mean sea-level (GMSL) trends are driven primarily by ocean heat uptake and land ice mass loss. Other processes, such as ocean dynamics, the static-equilibrium 'fingerprint' effects of land ice loss on the height of Earth's geoid and surface, tectonics, and glacio-isostatic adjustment (GIA), are spatially variable and cause sea-level rise to vary in rate and magnitude between regions (Milne et al, 2009; Stammer et al, 2013). Sound risk management necessitates that decision-makers tasked with creating resilient coastal ecosystems, communities, and economies are informed

R. E. Kopp
Department of Earth & Planetary Sciences, Rutgers Energy Institute, and Institute of Earth, Ocean, & Atmospheric Sciences, Rutgers University, New Brunswick, NJ, USA. E-mail: robert.kopp@rutgers.edu

B. P. Horton
Sea Level Research, Department of Marine & Coastal Sciences and Institute of Earth, Ocean, & Atmospheric Sciences, Rutgers University, New Brunswick, NJ, USA and Earth Observatory of Singapore and Asian School of the Environment, Nanyang Technological University, Singapore

A. C. Kemp
Department of Earth & Ocean Sciences, Tufts University, Medford, MA, USA

C. Tebaldi
National Center for Atmospheric Research, Boulder, CO, USA

by reliable projections of the risks of regional relative sea-level (RSL) change (not just GMSL change) on policy-relevant (decadal) timescales (Poulter et al, 2009).

The North Carolina Coastal Resources Commission (CRC)'s Science Panel on Coastal Hazards (2010) recommended the use of 1 m of projected sea-level rise between 2000 and 2100 for statewide policy and planning purposes in North Carolina. Since the CRC's 2010 assessment, several advances have been made in the study of global and regional sea-level change. These include new reconstructions of sea level in the U.S. generally and North Carolina in particular during the Holocene (the last ∼11.7 thousand years) (Engelhart and Horton, 2012; van de Plassche et al, 2014) and the Common Era (the last two millennia) (Kemp et al, 2011, 2013, 2014), estimates of 20th century GMSL change (Church and White, 2011; Ray and Douglas, 2011; Hay et al, 2015), localized projections of future sea-level change (Kopp et al, 2014), and state-level assessments of the cost of sea-level rise (Houser et al, 2015).

Political opposition led to North Carolina House Bill 819/Session Law 2012-202, which blocked the use of the 1 m projection for regulatory purposes and charged the Science Panel on Coastal Hazards to deliver an updated assessment in 2015 that considered *"the full range of global, regional, and North Carolina-specific sea-level change data and hypotheses, including sea-level fall, no movement in sea level, deceleration of sea-level rise, and acceleration of sea-level rise"* (North Carolina General Assembly, 2012). Here, we assess the likelihood of these trajectories with respect to past and future sea-level changes in North Carolina.

2 Mechanisms for global, regional, and local relative sea-level changes

Relative sea level (RSL) is the difference in elevation between the solid Earth surface and the sea surface at a specific location and point in time. Commonly, it is time-averaged to minimize the influence of tides and is compared to the present as the reference period (Shennan et al, 2012). RSL averaged over all ocean basins yields an estimate of GMSL.

GMSL rise is driven primarily by (1) increases in ocean mass due to melting of land-based glaciers (e.g., Marzeion et al, 2012) and ice sheets (e.g., Shepherd et al, 2012) and (2) expansion of ocean water as it warms (e.g., Gregory, 2010). Changes in land water storage due to dam construction and groundwater withdrawal also contributed to 20th century GMSL change (e.g., Konikow, 2011). RSL differs from GMSL because of (1) factors causing vertical land motion, such as tectonics, sediment compaction, and groundwater withdrawal; (2) factors affecting both the height of the solid Earth and the height of Earth's geoid, such as long-term GIA and the more immediate 'sea-level fingerprint' static-equilibrium response of the geoid and the solid Earth to redistribution of mass between land-based ice and the ocean; and (3) oceanographic and atmospheric factors affecting sea-surface height relative to the geoid, such as changes in ocean-atmospheric dynamics and the distribution of heat and salinity within the ocean (e.g., Kopp et al, 2014, 2015)

Along the U.S. Atlantic coast, the principal mechanism for regional departures from GMSL during the Holocene is GIA, which is the ongoing, multi-millennial response of Earth's shape and geoid to large-scale changes in surface mass load (e.g., Clark et al, 1978) (Figure 1e). Growth and thickening of the Laurentide ice sheet during the last glaciation caused subsidence of land beneath the ice mass (Clark et al, 2009). A compensating outward flow in the mantle created a peripheral bulge around the ice margin in the U.S. mid-Atlantic region. In addition to uplifting the solid Earth in the U.S. mid-Atlantic region, these flows also increased the regional height of the geoid and reduced the global volume of the ocean basin. These latter two factors led to a rising sea-surface height in the U.S. mid-Atlantic region and thus a total RSL fall less than the regional uplift (Farrell and Clark, 1976). As the Laurentide ice sheet shrunk, mantle flow back toward the center of the diminishing ice sheet caused subsidence and progressive inward migration of the peripheral forebulge. One commonly used physical model of GIA (ICE-5G-VM2-90) yields contributions to 20th century sea-level rise of ∼1.3 mm/yr at New York City and ∼0.5 mm/yr at Wilmington, NC (Peltier, 2004), but exact values depend upon assumptions regarding ice-sheet history and mantle viscosity.

Along much of the U.S. Atlantic coast, the tectonic contribution to RSL change is assumed to be negligible over timescales of centuries to millennia (e.g., Rowley et al, 2013), but parts of the North Carolina coastal plain are underlain by the Cape Fear Arch (Sheridan, 1976) (Figure 1b). Geologic and geomorphic data suggest that uplift of the crest of the Cape Fear Arch began during the Pliocene (Wheeler, 2006) and is ongoing (Brown, 1978). Late Holocene rates of uplift (RSL fall) have been estimated at $\sim 0.2 \pm 0.2$ mm/yr (e.g., Marple and Talwani, 2004; van de Plassche et al, 2014).

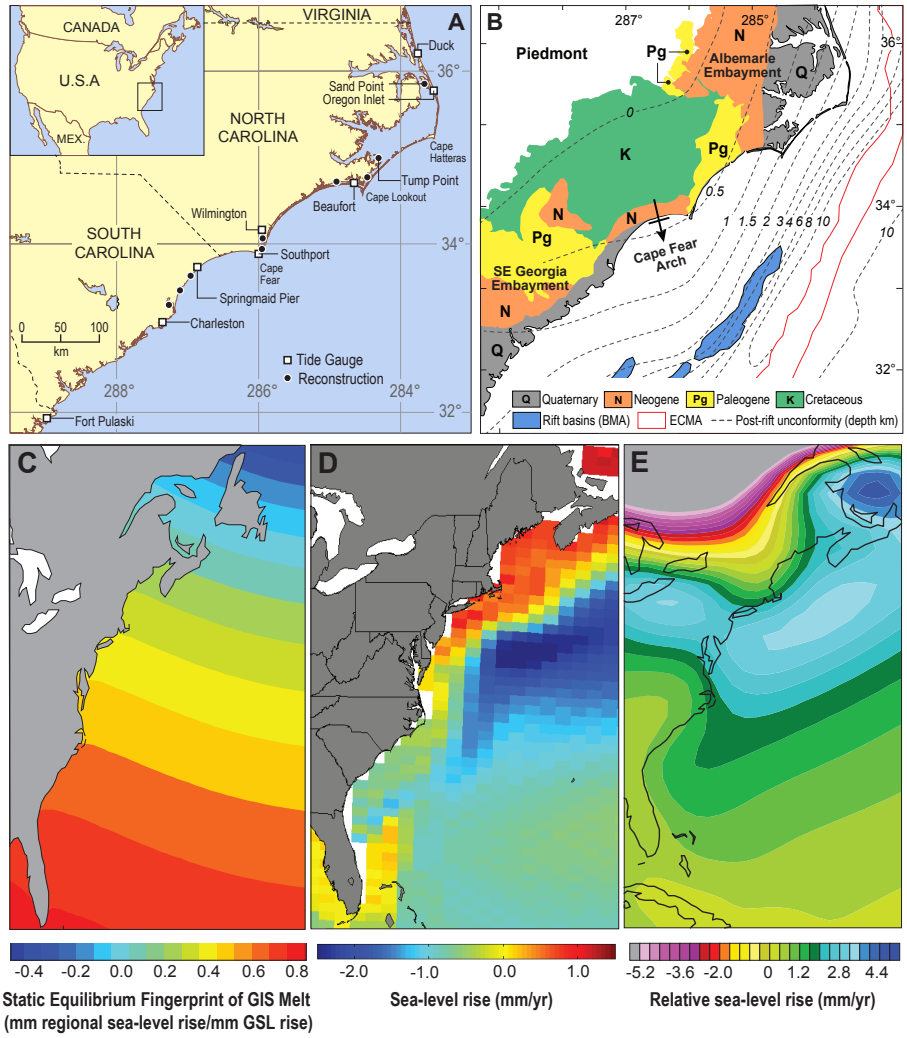

Fig. 1 (A) Location map. (B) Map of regional shallow subsurface geology, post-rift unconformity, and large-scale structural geology (Dillon and P., 1988; Gohn, 1988; Grow and Sheridan, 1988; North Carolina Geological Survey, 2004). (C) Static-equilibrium fingerprint of RSL change from uniform melting of the Greenland Ice Sheet (Mitrovica et al, 2011), in units of mm RSL rise per mm GMSL rise. (D) Ocean dynamic contribution to RSL over 2006-2100 in the Community Earth System Model RCP 8.5 experiment from the Coupled Model Intercomparison Project Phase 5 (Taylor et al, 2012). (E) GIA contribution to RSL under the ICE-6G VM5b model (Engelhart et al, 2011)

The static-equilibrium 'fingerprint' contribution to RSL changes arises from the immediate response of Earth's geoid, rotation, and elastic lithosphere to redistribution of mass between land ice and the ocean (Clark and Lingle, 1977; Mitrovica et al, 2011). As the mass of an ice sheet or glacier shrinks, sea-level rise is greater in areas geographically distal to the land ice than in areas close to it, primarily because the gravitational attraction between the ice mass and the ocean is reduced. Greenland Ice Sheet (GrIS) mass loss, for instance, generates a meridional sea-level gradient along the U.S. Atlantic coast (Figure 1c), where Maine experiences ∼30% of the global mean response, compared to ∼60% in North Carolina and ∼80% in south Florida. Melting of the West Antarctic Ice Sheet (WAIS), by contrast, causes a nearly uniform rise along the U.S. Atlantic coast (including North Carolina), which is about 20% higher than the global average due primarily to the effect of WAIS mass loss on Earth's rotation (Mitrovica et al, 2009). Though the magnitude of sea-level fingerprints proximal to a changing ice mass is sensitive to the internal distribution of that mass, this sensitivity diminishes with distance. For example, at the distance of North Carolina, assumptions about the distribution of mass lost from GrIS have only an ∼10% effect on the fingerprint (i.e., a RSL effect equal to ∼6% of the global mean) (Mitrovica et al, 2011).

Oceanographic effects change sea-surface height relative to the geoid (e.g., Kopp et al, 2010). They include both global mean thermal expansion and regional changes in ocean-atmospheric dynamics and in the distribution of heat and salinity within the ocean. For example, changes in the Gulf Stream affect sea level in the western North Atlantic Ocean (e.g., Kienert and Rahmstorf, 2012; Ezer et al, 2013). As observed by satellite altimetry, the dynamic sea-surface height off of New Jersey averages ∼60 cm lower than the height off of Bermuda. By contrast, off the North Carolina coast, the dynamic sea-surface height averages ∼30 cm lower than off Bermuda, and this difference diminishes much more quickly off shore than it does north of Cape Hatteras, where the Gulf Stream separates from the U.S. Atlantic coast and turns toward northern Europe (Yin and Goddard, 2013). Ocean modeling shows that a slower Gulf Stream, which can be caused by a weaker Atlantic Meridional Overturning Circulation or by shifting winds, would reduce these sea-level gradients, increasing sea level along the U.S. Atlantic coast north of Cape Hatteras (Figure 1d). A northward shift in the position of the Gulf Stream, which could result from a migration of the Intertropical Convergence Zone (ITCZ), would similarly raise mid-Atlantic sea levels. In contrast, sea-surface height in coastal regions south of Cape Hatteras is less influenced by changes in the Gulf Stream (Yin and Goddard, 2013).

Locally in North Carolina, RSL also changes in response to sediment compaction (Brain et al, 2015), groundwater withdrawal (Lautier, 2006), and tidal-range shifts. North Carolina is partly located within the Albemarle Embayment (Figure 1b), a Cenozoic depositional basin (Foyle and Oertel, 1997) stretching from the Norfolk Arch at the North Carolina/Virginia border to southern Pamlico Sound at the Cape Lookout High. The embayment is composed of ∼1.5 km thick post-rift sedimentary rocks and Quaternary unconsolidated sediments (e.g., Gohn, 1988), currently undergoing compaction (e.g., van de Plassche et al, 2014).

The influence of local factors on regional RSL reconstructions is minimized by using proxy and instrumental data from multiple sites. For example, Kemp et al (2011) concluded that local factors were not the primary driving mechanisms for RSL change in North Carolina over the last millennium, because the trends reconstructed at two sites located >100 km apart in different water bodies closely agree.

3 Methods

3.1 Historical reconstruction

Tide gauges provide historic measurements of RSL for specific locations (Figure 1a). In North Carolina, there are two long-term tide-gauge records: Southport (covering 1933-1954, 1976-1988, and 2006-2007) and Wilmington (covering 1935 to present). Both have limitations: Southport has temporal gaps in the record, while the Wilmington record was influenced by deepening of the navigational channels, which increased the tidal range (Zervas, 2004). There are also shorter records from Duck (1978 to present), Oregon Inlet (1977 and 1994 to present), and Beaufort (1953-1961, 1966-1967, and 1973 to present), which we also include in our analysis.

Geological reconstructions provide proxy records of pre-20th century RSL. Our database of Holocene RSL reconstructions from North Carolina includes 107 discrete sea-level constraints from individual core samples collected at a suite of sites (Horton et al, 2009; Engelhart and Horton, 2012; van de Plassche et al, 2014). It also includes two continuous Common Era RSL reconstructions, from Tump Point (spanning the last ∼1000 years) and Sand Point (spanning the last ∼2000 years), produced using ordered samples from cores of salt-marsh sediment (Kemp et al, 2011) (Figure 1a). Salt marshes from the U.S. Atlantic Coast provide higher-resolution reconstructions than other sea-level proxies (in North Carolina, < 0.1 m vertically and $\pm$ 1 to $\pm$ 71 y geochronologically). The combination of an extensive set of Holocene sea-level index points, multiple, high-resolution Common Era reconstructions, and tide-gauge measurements makes North Carolina well suited to evaluating past sea-level changes.

We fit the proxy and tide-gauge observations to a spatio-temporal Gaussian process (GP) statistical model of the Holocene RSL history of the U.S. Atlantic Coast. The model is similar to that of Kopp (2013), though with a longer temporal range and with geochronological uncertainty accommodated through the noisy-input GP method of McHutchon and Rasmussen (2011). To provide regional context, the fitted data also include records from outside of North Carolina, in particular salt-marsh reconstructions from New Jersey (Kemp et al, 2013) and Florida (Kemp et al, 2014) and all U.S. Atlantic Coast tide-gauge records in the Permanent Service for Mean Sea Level (2014) database with >60 years of data. To aid comparison with the proxy reconstructions, tide-gauge measurements were incorporated into the analysis as decadal averages. The GP

model represents sea level as the sum of spatially-correlated low-frequency (millennial), medium-frequency (centennial) and high-frequency (decadal) processes. Details are provided in the Supporting Information. All estimated rates of past RSL change in this paper are based on application of the GP model to the combined data set and are quoted with 2σ uncertainties.

3.2 Future projections

Several data sources are available to inform sea-level projections, including process models of ocean and land ice behavior (e.g., Taylor et al, 2012; Marzeion et al, 2012), statistical models of local sea-level processes (Kopp et al, 2014), expert elicitation on ice-sheet responses (Bamber and Aspinall, 2013) and expert assessment of the overall sea-level response (Church et al, 2013; Horton et al, 2014). Kopp et al (2014) synthesized these different sources to generate self-consistent, probabilistic projections of local sea-level changes around the world under different future emission trajectories.

Combined with historical records of storm tides, RSL projections provide insight into the changes in expected flood frequencies over the 21st century. We summarize the RSL projections of Kopp et al (2014) for North Carolina and apply the method of Tebaldi et al (2012) and Kopp et al (2014) to calculate their implications for flood-return periods.

Note that the projections of Kopp et al (2014) are not identical to those of the expert assessment of the Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report (Church et al, 2013). The most significant difference arises from the use of a self-consistent framework for estimating a complete probability distribution of RSL change, not just the likely (67% probability) GMSL projections of the IPCC. Kopp et al (2014) and the IPCC estimate similar but not identical likely 21st century GMSL rise (under RCP 8.5, 62–100 cm vs. 53–97 cm, respectively; under RCP 2.6, 37–65 cm vs. 28–60 cm).

4 Holocene sea-level change in North Carolina

RSL rose rapidly during the early and mid-Holocene, increasing in central North Carolina from -30.1 ± 1.8 m at 9000 BCE to -4.1 ± 0.7 m at 2000 BCE (Fig. 2a). The rate of RSL rise decreased over time, as a result of declining input from shrinking land ice reservoirs and slowing GIA (Peltier, 2004; Milne and Mitrovica, 2008), from a millennially-averaged rate of 6.8 ± 1.2 mm/yr at 8000 BCE to 0.8 ± 1.0 mm/yr at 2500 BCE. A declining GIA rate with increasing distance from the center of the Laurentide ice sheet (Engelhart et al, 2009), along with a contribution from tectonic uplift along the Cape Fear Arch (van de Plassche et al, 2014), caused spatial variability in the rate of Common Era RSL rise along the U.S. Atlantic coast and within North Carolina (Fig. 3a). At Sand Point in northern North Carolina, RSL rose from -2.38 ± 0.06 m at 0 CE to -0.37 ± 0.05 m by 1800 CE, an average rate of 1.11 ± 0.03 mm/yr. In the Wilmington area, the estimated average rate of RSL rise from 0 to 1800 CE was 0.8 ± 0.2 mm/yr (Fig. 3a-b; Table S-1).

Century-average rates of RSL change varied around these long-term means. For example, between 1000 and 1800 CE at Sand Point, century-average rates of RSL change ranged from a high of 1.7 ± 0.5 mm/yr (in the 12th century) to a low of 0.9 ± 0.5 mm/yr (in the 16th century) (Figure 2b). Synchronous sea-level changes occurred in southern NC over the same period of time (Kemp et al, 2011). However, the sign of the North Carolina RSL rate changes contrasts with that reconstructed at sites further north in New Jersey (Kopp, 2013) (Figure 2c). This contrast suggests a role for changes in ocean and atmosphere circulation, such as a shift in the position or strength of the Gulf Stream, in explaining these variations. A strengthening of the Gulf Stream (the opposite of the pattern depicted in Figure 1d) would be consistent with the observations. The absence of similarly timed variations in Florida (Kemp et al, 2014) excludes a significant contribution from the static-equilibrium fingerprint of GrIS mass changes (Figure 1c).

5 Twentieth-century sea-level changes in North Carolina

The most prominent feature in the North Carolina Common Era sea-level record is the acceleration of the rate of rise between the 19th and 20th centuries (Figure 2b-c). At Sand Point, the average rate of RSL rise over the 19th century (1.0 ± 0.5 mm/yr) was within the range of previous Common Era variability and close

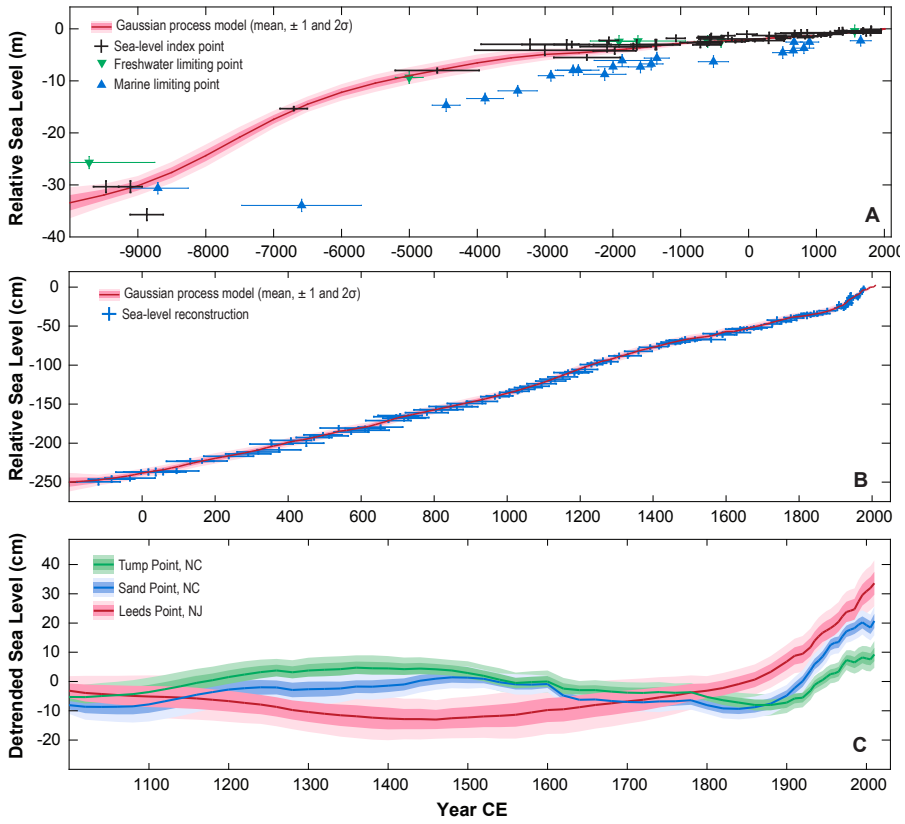

Fig. 2 (a) Holocene RSL in North Carolina, showing a representative GP estimate for central North Carolina (*red*), as well all index points (*crosses*), marine limiting points (*blue upward triangles*), and freshwater limiting points (*green downward triangles*) from North Carolina. Index/limiting points shown with 2σ error bars. (b) RSL over the Common Era at Sand Point, North Carolina. (c) RSL detrended with respect to the 1000-1800 CE average rate for North Carolina (NC) and New Jersey (NJ). GP estimates are shown with 1σ (*dark shading*) and 2σ (*light shading*) errors.

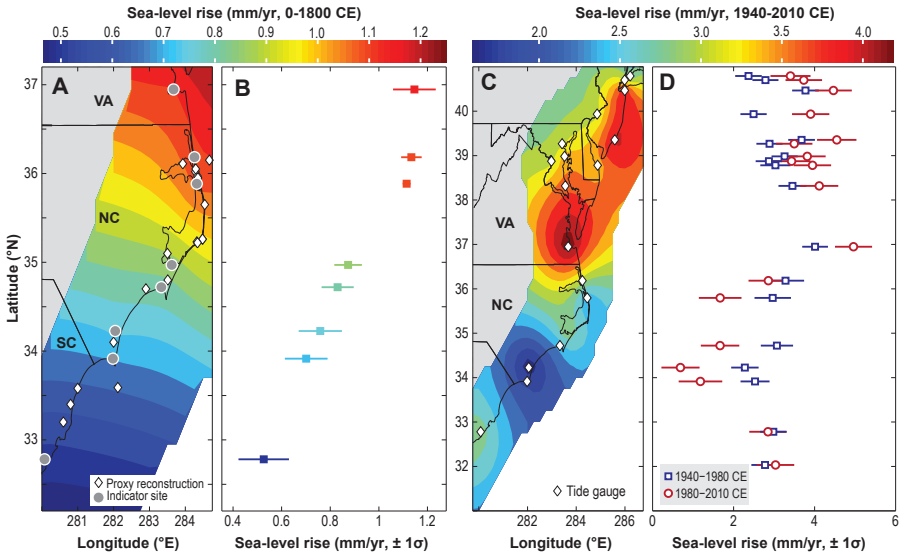

Fig. 3 (a) Pre-Industrial Common Era rate of RSL rise (0-1800 CE; mm/yr). Diamonds: proxy sites; grey circles: selected tide gauges and continuous proxy records (as in Tables S-1 and S-2). Uncolored areas have 1σ uncertainty >0.15 mm/yr. (b) shows estimates at indicated tide-gauge and continuous proxy record sites (1σ errors). (c) 1940-2010 rate of RSL rise. Diamonds: tide-gauge locations with >60 years of data. Uncolored areas have 1σ uncertainty >0.5 mm/yr. (d) 1940-1980 (blue squares) and 1980-2010 (red circles) rates of RSL rise at tide-gauge sites.

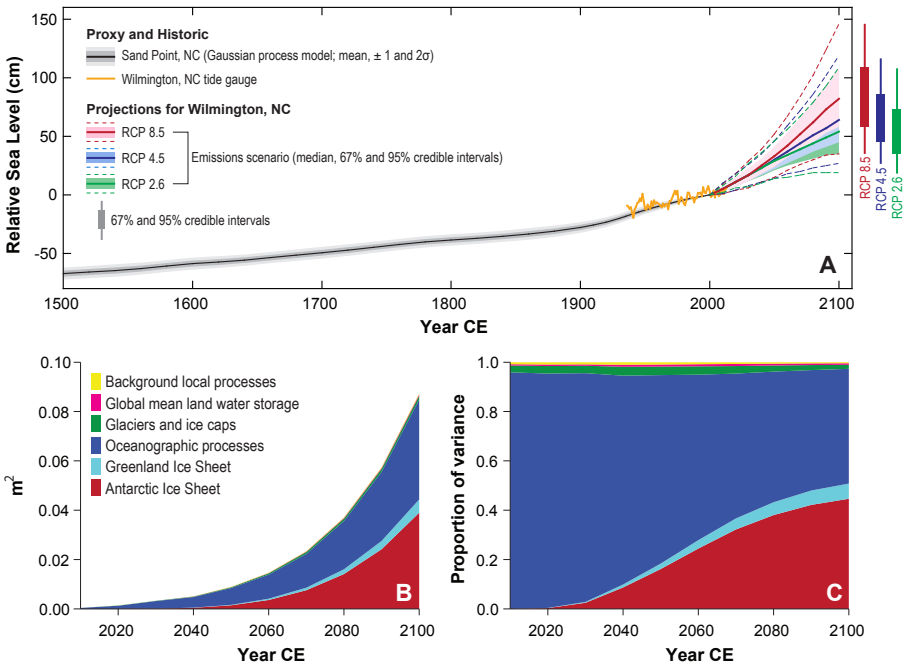

Fig. 4 (a) GP estimate of sea-level at Sand Point (*black*), annual Wilmington tide-gauge data (*orange*), and Kopp et al (2014) projections for RCP 8.5 (*red*), 4.5 (*blue*), and 2.6 (*green*). Shading/dashed lines = 67%/95% credible intervals. Bars and whiskers represent 67% and 95% credible intervals of 2100 CE projections. All heights relative to 2000 CE. (b-c) Sources of uncertainty in RCP 8.5 20-year-average sea-level rise projection at Wilmington, shown in units of (b) variance and (c) fractional variance as in Kopp et al (2014).

to the long-term average. By contrast, it is extremely likely ($P = 0.95$) that the 2.7 ± 0.5 mm/yr experienced in the 20th century was not exceeded in any century since at least the 10th century BCE (which had a rate of 1.2 ± 1.6 mm/yr). Average 20th century RSL rates range from 2.1 ± 0.5 mm/yr at Wilmington to 3.5 ± 0.3 mm/yr at Tump Point (Table S-1).

Spatial patterns of sea-level variability are detectable at higher temporal frequencies in the tide-gauge record (Kopp, 2013; Yin and Goddard, 2013) (Figure 3c-d; Table S-2). From 1940 to 1980 CE, sea-level rise in both North Carolina and the U.S. mid-Atlantic region exceeded the global mean. At Wilmington and Duck, the average rates were 2.3 ± 0.7 mm/yr and 3.3 ± 0.9 mm/yr, respectively, compared to 2.8 ± 0.6 mm/yr at New York City and a GMSL rise of 0.8 ± 0.8 mm/yr (Hay et al, 2015). This pattern changed over the interval from 1980 to 2010 CE, when the rate of GMSL rise increased to 2.5 ± 0.5 mm/yr while rates of RSL rise south of Cape Hatteras remained stationary or decreased (1.7 ± 1.0 mm/yr at Beaufort, 0.7 ± 0.9 mm/yr at Wilmington, and 1.2 ± 1.1 mm/yr at Southport). In contrast, sites north of Cape Hatteras experienced a significant increase in rate; at New York City, for example, RSL rose at 3.7 ± 0.9 mm/yr.

Several recent papers identified this regional phenomenon in the northeastern U.S. as a "hot spot" of sea-level acceleration (Sallenger et al, 2012; Boon, 2012; Ezer and Corlett, 2012; Kopp, 2013). Less attention has been paid to its counterpart in the southeastern U.S., which might be regarded as a "hot spot" of deceleration, especially when considered in the context of the GMSL acceleration occurring over the same interval. The pattern of a sea-level increase north of Cape Hatteras and sea-level decrease south of Cape Hatteras is consistent with a northward migration of the Gulf Stream (Yin and Goddard, 2013; Rahmstorf et al, 2015). It is also consistent with the dominant spatial pattern of change seen in the North Carolina and New Jersey proxy reconstructions from the 16th through the 19th century (Figure 2c). Dredging has, however, contaminated some North Carolina tide gauges, rendering a simple assessment of the ocean dynamic contribution during the 20th century challenging.

Table 1 Projected sea-level rise in North Carolina under RCP 8.5 and RCP 2.6

cm	RCP 8.5					RCP 2.6			
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
DUCK, NC									
2030	23	16–29	12–33	6–39	43	22	17–28	12–32	7–38
2050	41	31–51	24–59	15–72	83	37	28–46	22–53	13–66
2100	100	73–129	54–154	29–214	304	70	50–93	36–113	17–181
2150	160	124–206	103–255	76–425	627	99	71–136	56–184	39–357
2200	225	166–304	134–394	99–715	1055	131	80–196	58–287	33–607
WILMINGTON, NC									
2030	17	12–23	8–27	3–33	36	17	12–21	9–25	4–30
2050	33	24–42	18–48	10–61	75	29	21–36	16–42	9–55
2100	82	58–109	42–132	20–194	281	54	36–74	24–94	8–162
2150	135	101–180	81–230	57–395	596	77	48–113	34–161	16–334
2200	194	136–273	105–364	74–678	1016	101	50–166	27–257	3–575

Values represent two-decade averages and are in cm above 1990–2010 ('2000') mean sea level.
Columns correspond to different projection probabilities. For example, the "5-95" columns correspond to the 5th to 95th percentile; in IPCC terms, the 'very likely' range.
The RCP 8.5 99.9th percentile corresponds to the maximum level physically possible.

6 Future sea-level projections for North Carolina

The integrated assessment and climate modeling communities developed Representative Concentration Pathways (RCPs) to describe future emissions of greenhouse gases consistent with varied socio-economic and policy scenarios (Van Vuuren et al, 2011). These pathways provide boundary conditions for projecting future climate and sea-level changes. RCP 8.5 is consistent with high-end business-as-usual emissions. RCP 4.5 is consistent with moderate reductions in greenhouse gas emissions, while RCP 2.6 requires strong emissions reductions. These three RCPs respectively yield likely ($P = 0.67$) global mean temperature increases in 2081-2100 CE of 3.2–5.4°C, 1.7–3.2°C, and 0.9–2.3°C above 1850-1900 CE levels (Collins et al, 2013).

A bottom-up assessment of the factors contributing to sea-level change (Kopp et al, 2014) indicates that, regardless of the pathway of future emissions, it is virtually certain ($P > 0.998$) that both Wilmington and Duck will experience a RSL rise over the 21st century and very likely ($P > 0.90$) that the rate of that rise will exceed the rate observed during the 20th century. Below, we summarize the bottom-up projections of Kopp et al (2014) for Wilmington and Duck, NC, which bracket the latitudinal extent and degree of spatial variability across the state (Tables 1, S-3, S-4, S-5).

Under the high-emissions RCP 8.5 pathway, RSL at Wilmington will very likely ($P = 0.90$) rise by 8–27 cm (median of 17 cm) between 2000 and 2030 CE and by 18–48 cm (median of 33 cm) between 2000 and 2050 CE (Figure 4a). Projected RSL rise varies modestly across the state, with a very likely rise of 12–33 cm (median 23 cm) between 2000 and 2030 CE and of 24–59 cm (median of 41 cm) between 2000 and 2050 CE at Duck. Because sea level responds slowly to climate forcing, projected RSL rise before 2050 CE can be reduced only weakly (∼3-6 cm) through greenhouse gas mitigation.

It is important to consider these numbers in the context of the background variability in annual-mean and decadal-mean RSL. Relative to 20-year-mean RSL, annual-mean RSL as measured by the Wilmington tide gauge has a standard deviation of ∼8 cm, so the median projection for 2030 CE is only slightly above twice the standard deviation. It would therefore not be surprising to see an isolated year with RSL as high as that projected for 2030 CE even in the absence of a long-term trend. However, consecutive years of that height would be unexpected, as decadal-mean RSL has a standard deviation of ∼1 cm. Given the magnitude of decadal variability, however, differences in projections of $<\sim$4 cm should not be viewed as significant.

Reductions in greenhouse gases over the course of the 21st century can significantly affect sea-level rise after 2050 CE. Under the high-emissions RCP 8.5 pathway, RSL at Wilmington is very likely to rise by 42–132 cm (median of 82 cm) between 2000 and 2100 CE, while under the low-emissions RCP 2.6 pathway, it is very likely to rise by 24–94 cm (median of 54 cm). The maximum physically possible 21st century sea-level rise is significantly higher (∼280 cm), although the estimated probability of such an outcome is extremely low ($P \approx 0.001$) (Kopp et al, 2014). Projected RSL rise varies modestly across the state, with a very likely rise of 54–154 cm (median of 100 cm) under RCP 8.5 and 36–113 cm (median of 70 cm) under RCP 2.6 at Duck, a difference from Wilmington of ∼12–22 cm.

Uncertainty in projected RSL rise in North Carolina stems from two main sources: the (1) oceanographic and (2) Antarctic ice sheet responses to climate change. The former source dominates the uncertainty through most of the century, with the Antarctic response coming to play a roughly equal role by the end of the century (Figure 4b-c). At Wilmington, under RCP 8.5, ocean dynamics is likely ($P = 0.67$) to contribute -9 to +17 cm (median 5 cm) to 21st century sea-level rise. The dynamic contribution increases to the north, with -9 to +25 cm (median 8 cm) likely at Duck. These contributions are less than those in the northeastern United States; for example, at New York, ocean dynamics are likely to contribute -6 to +35 cm (median 14 cm).

The GrIS contribution to uncertainty in North Carolina RSL change is smaller than the Antarctic contribution because of two factors. First, GrIS makes a smaller overall contribution to GMSL uncertainty, because GrIS mass change is dominated by surface mass balance, while the behavior of WAIS is dominated by more complex and uncertain ocean/ice sheet dynamics. Second, the GrIS contribution to North Carolina RSL change and to its uncertainty is diminished by the static-equilibrium fingerprint effect to about 60% of its global mean value.

7 Implications of sea-level rise for flood risk and economic damages

Based on historical storm tides, the '1-in-10 year' flood (i.e., the flood level with a probability of 10% in any given year) at the Wilmington tide gauge is 0.60 m above current mean higher high water (MHHW). In the absence of sea-level rise, one would expect three such floods over a 30-year period. Assuming no increase in the height of storm-driven flooding relative to mean sea level and accounting for the probability distribution of projected sea-level rise as in Kopp et al (2014), seven similar magnitude floods are expected between 2000 and 2030 (regardless of RCP). Between 2000 and 2050, the expected number of years experiencing a flood at 0.60 m above current MHHW increases from 5 to 21. After 2050, regardless of RCP, almost every year is expected to see at least one flood at 0.60 m above current MHHW. Similarly, the expected number of 0.93 m '1-in-100 year' floods will increase with projected sea-level rise. The '1-in-100 year' flood is expected about 1.6–1.8 times between 2000 and 2050 (rather than the 0.5 times expected in the absence of sea-level rise). During the second half of the century, '1-in-100 year' flooding is expected in 29 of 50 years under RCP 8.5 and 17 of 50 years under RCP 2.6.

Houser et al (2015) characterized the costs of projected sea-level rise and changes in flood frequency using the Risk Management Solutions North Atlantic Hurricane Model, which models wind and coastal flood damage to property and interrupted businesses caused by a database of tens of thousands of synthetic storm events. Under all RCPs, projected RSL rise in North Carolina would likely ($P = 0.67$) place >$4 billion of current property below MHHW by 2050 and >$17 billion by 2100. Statewide (assuming fixed distribution and value of property), average annual insurable losses from coastal storms will very likely ($P = 0.90$) increase by 4-17% between 2011 and 2030 and by 16-75% between 2011 and 2050 (regardless of RCP). By 2100, they are very likely to increase by 50-160% under RCP 8.5 and 20-150% under RCP 2.6 (Houser et al, 2015). Projected increases in the intensity of tropical cyclones under RCP 8.5 (Emanuel, 2013) may amplify the increase in losses by ∼1.5x by 2050 and ∼2.1x by 2100. These cost estimates assume a fixed distribution and valuation of property; intensification of development along the coastline will increase exposure and therefore cost, while protective measures will decrease exposure and cost.

8 Concluding remarks

North Carolina Session Law 2012-202/House Bill 819 requires assessment of future sea-level change trajectories that include "sea-level fall, no movement in sea level, deceleration of sea-level rise, and acceleration of sea-level rise." Geological and historical records indicate that, over the last 11,000 years, North Carolina experienced periods of RSL deceleration and acceleration, but no periods of RSL stasis or fall.

- Millennially-averaged RSL rise in central North Carolina decelerated from 8000 BCE (6.8 ± 1.2 mm/yr) until 2500 BCE (0.8 ± 1.0 mm/yr).

- From 0 to 1800 CE, average RSL rise rates within North Carolina varied from 1.11 ± 0.03 mm/yr in northern North Carolina to 0.8 ± 0.2 mm/yr in southern North Carolina (in the vicinity of the Cape

Fear Arch, and farther away from the peripheral bulge). Century-average rates of sea-level change varied around these long-term means. Comparison of records along the U.S. Atlantic coast indicate that pre-Industrial Common Era sea-level accelerations and decelerations had a spatial pattern consistent with variability in the strength and/or position of the Gulf Stream.

– It is extremely likely ($P = 0.95$) that the accelerated rate of 20th century RSL rise at Sand Point, NC, (2.7 ± 0.5 mm/yr) had not been reached in any century since at least the 10th century BCE.

– Between 1940-1980 and 1980-2010, sea level in North Carolina decelerated relative to the global mean and possibly in absolute terms (at Wilmington, from 2.3 ± 0.5 mm/yr to 0.7 ± 0.9 mm/yr; at Southport, from 2.5 ± 0.7 mm/yr to 1.2 ± 1.1 mm/yr), while sea-level rise accelerated north of Cape Hatteras. The spatial pattern and the magnitude of change are consistent with Gulf Stream variability.

– It is virtually certain ($P = 0.99$) that RSL rise at Wilmington between 2000 and 2050 will exceed 2.2 mm/yr, nearly three times the 0-1800 CE average rate. It is extremely likely ($P = 0.95$) that it will exceed 3.2 mm/yr, in excess of the 20th century average of 2.2 ± 0.6 mm/yr. Under the high-emissions RCP 8.5 pathway, RSL is very likely to rise by 42–132 cm, and under the low-emissions RCP 2.6 pathway RSL is very likely to rise by 24–94 cm between 2000 and 2100.

– Storm flooding in North Carolina will be increasingly exacerbated by sea-level rise. After 2050, the current '1-in-10 year' flood is expected to occur in Wilmington almost every year and the '1-in-100 year' flood is expected to occur in about 17–29 years. Assuming the current distribution of property and economic activity, average annual insurable losses statewide would very likely increase by 50-160% under RCP 8.5 and 20-150% under RCP 2.6.

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Supporting Information: Spatio-temporal statistical model

The spatio-temporal sea-level field $f(\mathbf{x}, t)$ is modeled as a sum of Gaussian processes (Rasmussen and Williams, 2006) with different characteristic spatial and temporal scales.

$$f(\mathbf{x}, t) = l(\mathbf{x}, t) + m(\mathbf{x}, t) + h(\mathbf{x}, t) \tag{S-1}$$

Each field has a prior mean of zero and spatially and temporally separable prior covariances given by

$$k_l(\mathbf{x}_1, t_1, \mathbf{x}_2, t_2) = \sigma_l^2 \cdot C_{\frac{3}{2}}(|t_2 - t_1|, \tau_l) \cdot C_{\frac{5}{2}}(r(\mathbf{x}_1, \mathbf{x}_2), \gamma_l) \tag{S-2}$$

$$k_m(\mathbf{x}_1, t_1, \mathbf{x}_2, t_2) = \sigma_m^2 \cdot C_{\frac{3}{2}}(|t_2 - t_1|, \tau_m) \cdot C_{\frac{1}{2}}(r(\mathbf{x}_1, \mathbf{x}_2), \gamma_m) \tag{S-3}$$

$$k_h(\mathbf{x}_1, t_1, \mathbf{x}_2, t_2) = \sigma_h^2 \cdot C_{\frac{3}{2}}(|t_2 - t_1|, \tau_h) \cdot C_{\frac{1}{2}}(r(\mathbf{x}_1, \mathbf{x}_2), \gamma_m) \tag{S-4}$$

$$\tag{S-5}$$

where $C_\nu(r, \lambda)$ is a Matérn covariance function with scale λ and smoothness parameter ν. Here σ_i^2 are the amplitudes of the prior variances, τ_i are characteristic time scales, γ_i are characteristic length scales, and $r(\mathbf{x}_1, \mathbf{x}_2)$ is the angular distance between $\mathbf{x}_1$ and $\mathbf{x}_2$.

The observations $y(\mathbf{x}, t')$ are modeled as

$$y(\mathbf{x}, t') = f(\mathbf{x}, t + \epsilon_t) + w(\mathbf{x}, t') + \epsilon_y + y_0(\mathbf{x}), \tag{S-6}$$

where t' is the true age of the observation, t the mean observed age, w a process that captures sea-level variability at a sub-decadal level (which we treat here as noise), ϵ_t and ϵ_y are errors in the age and sea-level observations, and y_0 is a site-specific datum offset. For tide gauges, ϵ_t is zero and ϵ_y is estimated during a smoothing process (see below) in which annual data are assumed to have uncorrelated, normally distributed noise with standard deviation 3 mm. For proxy data, ϵ_t and ϵ_y are treated as independent and normally distributed, with a standard deviation specified for each observation based on the original publication. The sub-decadal and datum offset processes are modeled as Gaussian processes with mean zero and prior covariances given by

$$k_w(\mathbf{x}_1, t_1, \mathbf{x}_2, t_2) = \sigma_w^2 \delta(t_1, t_2) \delta(\mathbf{x}_1, \mathbf{x}_2) \tag{S-7}$$

$$k_0(\mathbf{x}_1, \mathbf{x}_2) = \sigma_0^2 \delta(\mathbf{x}_1, \mathbf{x}_2), \tag{S-8}$$

where $\delta(\mathbf{x}_1, \mathbf{x}_2)$ is the Kronecker delta function. Geochronological uncertainties are incorporated using the noisy-input Gaussian process method of McHutchon and Rasmussen (2011):

$$y(\mathbf{x}, t') \approx f(\mathbf{x}, t') + \epsilon_t f'(\mathbf{x}, t') + w(\mathbf{x}, t) + \epsilon_y + y_0(\mathbf{x}). \tag{S-9}$$

The low-frequency process $l(\mathbf{x}, t)$ (physically corresponding to GIA, tectonics, long-term sediment compaction, and long-term GMSL change), medium-frequency process $m(\mathbf{x}, t)$, and high-frequency process $h(\mathbf{x}, t)$ all have Matérn temporal covariance functions with smoothness parameter $\nu = 1.5$, implying a functional form in which the first derivative is everywhere defined. The low-frequency process is assumed to vary smoothly over space ($\nu = 2.5$), while the medium- and high-frequency process are allowed to vary more roughly ($\nu = 0.5$). The length scale γ_m is required to be equal for the medium- and high-frequency processes, as both are expected to reflect similar oceanographic processes operating on different timescales.

The hyperparameters $\mathbf{\Theta} = \{\sigma_l, \sigma_m, \sigma_h, \sigma_w, \sigma_0, \tau_l, \tau_m, \tau_w, \gamma_l, \gamma_m\}$ are set through a three-step optimization process. First, the hyperparameters of a simplified model, in which a linear term replaces the low-frequency process, are globally optimized through simulated annealing to maximize the marginal likelihood $\mathcal{L}(\mathbf{\Theta}|\mathbf{y}_1)$, where $\mathbf{y}_1$ is the set of post-1000 BCE observations. Second, the hyperparameters of $m(\mathbf{x}, t)$, $h(\mathbf{x}, t)$ and $w(\mathbf{x}, t)$ are fixed. The remaining hyperparameters of the full model – the amplitude, scales, and spatial roughness of the low-frequency process, as well as the datum offset – are globally optimized so as to maximize the marginal

likelihood $\mathcal{L}(\boldsymbol{\Theta}|\mathbf{y}_2)$, where $\mathbf{y}_2$ is the complete data set . Finally, all the hyperparameters are locally optimized to maximize the marginal likelihood $\mathcal{L}(\boldsymbol{\Theta}|\mathbf{y}_2)$. This multi-step process improves performance relative to globally optimizing all hyperparameters simultaneously and is guided by the recognition that the long-term, low-resolution data provide the greatest insight into the lowest-frequency processes while the salt-marsh and tide-gauge data provide the greatest insight into the medium-frequency and high-frequency processes. The optimized time scales of the high-, medium- and low-frequency processes are respectively $\tau_l = 14.5$ kyr, $\tau_m = 296$ years and $\tau_h = 6.3$ years; other hyperparameters are shown in Table S-6.

Annual mean tide-gauge data are decadally averaged prior to incorporation into the analysis. To accommodate data gaps estimate the covariance of the decadal averages, we fit each annual record $y_j(t)$ separately with the model

$$y_j(t) = \alpha_j(t - t_0) + d_j(t) + y_{0,j}, \tag{S-10}$$

where α_j is a slope, t_0 a reference time period, and $d_j(t)$ a Gaussian process with prior mean zero and a prior Matérn covariance. Hyperparameters are optimized on a site-by-site basis to maximize their marginal likelihood. Decadal averages, including their covariances, are then taken from the interpolated process $y_j(t)$.

References

Hay CC, Morrow ED, Kopp RE, Mitrovica JX (2015) Probabilistic reanalysis of 20th century sea-level rise. Nature 517:481–484, doi:10.1038/nature14093

McHutchon A, Rasmussen C (2011) Gaussian process training with input noise. In: Advances in Neural Information Processing Systems, vol 24, pp 1341–1349

Rasmussen C, Williams C (2006) Gaussian processes for machine learning. MIT Press, Cambridge, MA

Table S-1 Common Era sea-level rates (mm/yr)

Site	Lat	Long	0-1800	1000-1500	1500-1800	1800-1900	1900-2000
GMSL							1.3 ± 0.2
New York, NY	40.7	-74.0	1.69 ± 0.18	1.5 ± 0.5	1.9 ± 0.7	2.1 ± 0.7	2.9 ± 0.3
Leeds Point, NJ	39.5	-74.4	1.52 ± 0.09	1.2 ± 0.2	1.7 ± 0.4	2.4 ± 0.8	3.8 ± 0.5
Cape May, NJ	39.1	-74.8	1.46 ± 0.10	1.2 ± 0.2	1.5 ± 0.3	2.2 ± 0.6	3.7 ± 0.5
Sewell's Point, VA	37.0	-76.3	1.15 ± 0.18	1.2 ± 0.5	0.9 ± 0.6	1.6 ± 0.9	4.2 ± 0.5
Duck, NC	36.2	-75.8	1.13 ± 0.08	1.4 ± 0.3	1.0 ± 0.4	1.2 ± 0.6	3.1 ± 0.6
Sand Point, NC	35.9	-75.7	1.11 ± 0.03	1.4 ± 0.1	1.0 ± 0.2	1.0 ± 0.5	2.7 ± 0.5
Oregon Inlet, NC	35.8	-75.6	1.11 ± 0.07	1.4 ± 0.2	1.0 ± 0.3	1.1 ± 0.6	2.6 ± 0.5
Tump Point, NC	35.0	-76.4	0.87 ± 0.11	1.2 ± 0.2	0.7 ± 0.2	1.4 ± 0.4	3.5 ± 0.3
Beaufort, NC	34.7	-76.7	0.83 ± 0.13	1.2 ± 0.3	0.7 ± 0.4	1.2 ± 0.7	2.9 ± 0.5
Wilmington, NC	34.2	-78.0	0.76 ± 0.18	1.0 ± 0.5	0.7 ± 0.6	0.9 ± 1.0	2.1 ± 0.5
Southport, NC	33.9	-78.0	0.70 ± 0.18	0.9 ± 0.5	0.6 ± 0.6	0.9 ± 1.0	2.3 ± 0.6
Charleston, SC	32.8	-79.9	0.53 ± 0.21	0.6 ± 0.6	0.4 ± 0.7	1.1 ± 1.1	2.9 ± 0.5
Fort Pulaski, GA	32.0	-80.9	0.47 ± 0.19	0.5 ± 0.5	0.3 ± 0.7	1.0 ± 1.1	2.7 ± 0.5
Nassau, FL	30.6	-81.7	0.41 ± 0.05	0.5 ± 0.2	0.4 ± 0.3	0.7 ± 0.8	1.9 ± 0.4

Errors are $\pm 2\sigma$. GMSL from Hay et al (2015).

Table S-2 Industrial era sea-level rates (mm/yr)

Site	Lat	Long	1860-1900	1900-1940	1940-1980	1980-2010
GMSL				1.2 ± 1.1	0.8 ± 0.8	2.5 ± 0.5
New York, NY	40.7	-74.0	2.5 ± 0.7	2.7 ± 0.7	2.8 ± 0.6	3.7 ± 0.9
Atlantic City, NJ	39.4	-74.4	3.0 ± 1.1	3.7 ± 0.9	3.7 ± 0.7	4.6 ± 1.0
Cape May, NJ	39.1	-74.8	2.8 ± 1.0	3.4 ± 0.9	3.4 ± 0.8	4.4 ± 1.1
Sewell's Point, VA	37.0	-76.3	2.3 ± 1.3	3.9 ± 1.1	4.0 ± 0.6	5.0 ± 0.9
Duck, NC	36.2	-75.8	1.7 ± 1.1	3.2 ± 1.0	3.3 ± 0.9	2.9 ± 1.0
Sand Point, NC	35.9	-75.7	1.4 ± 1.0	3.0 ± 0.9	3.0 ± 0.8	2.0 ± 1.1
Oregon Inlet, NC	35.8	-75.6	1.5 ± 1.0	3.0 ± 0.9	3.0 ± 0.9	1.7 ± 1.1
Tump Point, NC	35.0	-76.4	2.0 ± 0.9	4.0 ± 0.8	3.7 ± 0.7	2.0 ± 1.1
Beaufort, NC	34.7	-76.7	1.7 ± 1.1	3.5 ± 1.0	3.1 ± 0.8	1.7 ± 1.0
Wilmington, NC	34.2	-78.0	1.3 ± 1.3	2.5 ± 1.2	2.3 ± 0.7	0.7 ± 0.9
Southport, NC	33.9	-78.0	1.4 ± 1.4	2.5 ± 1.2	2.5 ± 0.7	1.2 ± 1.1
Charleston, SC	32.8	-79.9	1.7 ± 1.5	2.8 ± 1.1	3.0 ± 0.7	2.9 ± 0.9
Fort Pulaski, GA	32.0	-80.9	1.5 ± 1.4	2.4 ± 1.2	2.8 ± 0.7	3.0 ± 0.9
Fernandina Beach, FL	30.7	-81.5	1.2 ± 1.3	1.5 ± 0.7	1.9 ± 0.7	2.3 ± 0.9

Errors are $\pm 2\sigma$. GMSL from Hay et al (2015).

Table S-3 Projected sea-level rise in North Carolina by decade under RCPs 8.5 and 2.6

cm	RCP 8.5					RCP 2.6			
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
DUCK, NC									
2010	7	5–9	4–10	1–12	13	7	5–9	3–11	1–13
2020	14	11–18	8–21	4–25	27	15	11–18	9–21	5–24
2030	23	16–29	12–33	6–39	43	22	17–28	12–32	7–38
2040	31	24–39	18–45	11–53	60	30	22–37	17–43	10–51
2050	41	31–51	24–59	15–72	83	37	28–46	22–53	13–66
2060	52	40–65	32–74	20–93	120	44	33–57	25–66	13–85
2070	64	49–80	39–92	24–118	158	51	38–65	28–77	15–103
2080	76	57–95	45–111	27–146	201	57	43–74	32–87	17–125
2090	88	66–112	51–132	30–179	250	63	46–83	34–100	18–151
2100	100	73–129	54–154	29–214	304	70	50–93	36–113	17–181
2150	160	124–206	103–255	76–425	627	99	71–136	56–184	39–357
2200	225	166–304	134–394	99–715	1055	131	80–196	58–287	33–607
WILMINGTON, NC									
2010	5	3–7	2–8	0–10	11	5	4–7	2–8	1–10
2020	11	8–15	5–17	1–21	22	11	8–14	6–16	4–18
2030	17	12–23	8–27	3–33	36	17	12–21	9–25	4–30
2040	25	18–31	13–36	6–44	51	23	17–29	12–34	6–42
2050	33	24–42	18–48	10–61	75	29	21–36	16–42	9–55
2060	42	31–53	24–62	13–80	107	34	25–44	18–52	9–70
2070	52	39–66	29–78	17–103	142	39	28–51	20–61	9–88
2080	62	46–79	35–94	19–130	183	44	31–58	23–71	10–111
2090	73	53–94	40–113	21–162	229	49	34–66	24–82	10–135
2100	82	58–109	42–132	20–194	281	54	36–74	24–94	8–162
2150	135	101–180	81–230	57–395	596	77	48–113	34–161	16–334
2200	194	136–273	105–364	74–678	1016	101	50–166	27–257	3–575

Values represent two-decade averages and are in cm above 1990–2010 ('2000') mean sea level.
Columns correspond to different projection probabilities. For example, the "5-95" columns correspond to the 5th to 95th percentile; in IPCC terms, the 'very likely' range.
The RCP 8.5 99.9th percentile corresponds to the maximum level physically possible.

Table S-4 Projected sea-level rise in North Carolina by decade under RCP 4.5

cm	RCP 4.5			
	50	17–83	5–95	0.5–99.5
DUCK, NC				
2010	7	5–9	3–11	1–13
2020	14	11–18	8–21	4–25
2030	22	17–27	13–31	8–36
2040	30	24–37	19–42	13–50
2050	39	30–47	23–54	15–67
2060	47	36–59	28–68	17–86
2070	56	42–71	32–82	18–108
2080	64	48–82	37–96	21–130
2090	72	54–93	41–110	23–158
2100	81	60–105	45–126	25–188
2150	121	84–164	60–209	30–374
2200	160	101–232	67–315	24–618
WILMINGTON, NC				
2010	5	3–7	1–9	-1–11
2020	11	7–14	5–17	1–20
2030	17	12–21	9–24	5–29
2040	23	17–29	13–33	8–40
2050	30	22–37	17–43	10–55
2060	37	27–47	20–55	11–72
2070	44	32–56	24–66	12–91
2080	51	37–66	27–78	14–114
2090	57	41–75	30–91	16–140
2100	64	45–86	33–105	16–170
2150	96	62–137	40–182	14–344
2200	128	71–199	39–282	0–581

Values in cm above 1990–2010 mean sea level.
Columns correspond to different probability ranges.

Table S-5 Projected contributions to sea-level rise at Wilmington, NC, in 2100 CE

cm	RCP 8.5					RCP 2.6			
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
Oc	41	23–61	10–74	-10–93	100	21	8–34	-1–44	-15–57
GrIS	9	5–16	3–25	2–44	60	4	2–7	2–11	1–20
AIS	4	-8–18	-12–38	-15–109	180	7	-4–20	-8–40	-11–111
GIC	16	12–19	10–21	6–25	25	10	8–13	6–15	3–18
LWS	5	3–7	2–8	0–11	10	5	3–7	2–8	0–11
Bkgd	5	3–6	2–8	0–10	10	5	3–6	2–8	0–10
Sum	82	58–109	42–132	20–194	280	54	36–74	24–94	8–162

Oc: Oceanographic. GrIS: Greenland ice sheet. AIS: Antarctic ice sheet.
GIC: Glaciers and ice caps. LWS: Land water storage. Bkgd: Background.
All values are cm above 1990–2010 CE baseline. Columns correspond to probability ranges.

Table S-6 Optimized hyperparameters

Low frequency			
amplitude	σ_l	19.1	m
time scale	τ_l	14.5	kyr
length scale	γ_l	25.0	degrees
Medium frequency			
amplitude	σ_m	119	mm
time scale	τ_m	296	yr
length scale	γ_m	3.0	degrees
High frequency			
amplitude	σ_h	13.7	mm
time scale	τ_h	6.3	y
length scale	γ_m	3.0	degrees
White noise	σ_w	4.2	mm
Datum offset	σ_0	45	mm

NC Sea Level Rise Report Is Biased High

From: Michael OBrian <michael_obrian@msn.com>
To: Miller, Tancred <tancred.miller@ncdenr.gov>
Sent: Wed 4/8/2015 5:36 PM

Hi,

The sea level rise report released at the end of March is biased high. There is no scenario for steady or declining global sea temperatures which may be likely if we experience a grand minimum in solar activity over the next 30 years. There are scientists predicting a global temperature drop of 1 to 1.5 degrees Celsius over the forecast horizon of the NC Sea Level Rise Study. Currently solar cycle 24 is showing significantly reduced sun spot activity with cycle 25 forecast at grand minimum levels.

By using the UN's climate study as the only likely outcomes for global sea temperatures, the study appears political rather than scientific. It is hard to find a more political organization than the UN.

The Commission should revise its study to include at least one scenario of falling ocean temperatures.

Best regards,

Mike

greetings

From: Mike Hayes <mhayes@pinn.net>
To: Miller, Tancred <tancred.miller@ncdenr.gov>
Sent: Fri 4/10/2015 9:46 PM

Subsidence Subsidence

The Atlantic Ocean is expanding from the Mid Atlantic Ridge. The shore lines are being moved away from the MARidge. The shorelines have been eroding the whole time. There are no natural phenomena to add materials to the ever moving shorelines other that river carried materials to replace what is eroded away by normal ocean activity. The ocean has not been rising. The shorelines are eroding. Additionally Ocean level rises at the same rate on every inch of shoreline equally. This has been true for the past 18K years. Every body of water on the globe with depths over 420 feet has an escarpment at 420 feet deep that is a remnant of the end of the last Ice Age which ended 18K years ago. That's every ocean has an old historic beach displayed by a level plateau area at the depth of 420 feet. Yes, a beach, now 420 feet deep in the ocean.

So, ocean rises at different levels at different locations on The NC shoreline. NOT and NEVER. I think the sky is falling. Let's get that fixed first.

Show me where the Ocean is rising anywhere!

Mike Hayes.....NC Outer Banks resident and former Virginia Beach resident of the Pungo Ridge, an older outer banks dune ridge, ranging from the Chesapeake Bay to the Atlantic Ocean in southern NC that is 125K old when the ocean level was 20 feet higher that it is right now. Show me how stupid you are by proving me wrong without using CO_2. If you are interested I can show you that less CO_2 leaves North America into the Atlantic than comes off the Pacific into North America. Read the previous sentence carefully! Geeze the CO_2 disappeares

Self-appointed amateur marine geologist.....Mike Hayes

greetings from the Outer Banks, and please enjoy, and good luck

From: Mike Hayes <mhayes@pinn.net>
To: Miller, Tancred <tancred.miller@ncdenr.gov>
Sent: Sat 4/11/2015 7:37 AM

How can I respond in any other way than idiotic, when your science is so idiotic. I tried otherwise but just couldn't get it done. Why are you people getting paid to do this? Are you not glad I had nothing else to do this morning April 11, 2015. I will be referencing my representative to reference this from you! Enjoy the humor.

****

How about calling it what it is: Subsidence by linear erosion. It is impossible for the ocean to NOT rise equally on every inch of shoreline. It is also impossible for the ocean to NOT drop equally on every inch of shoreline. Remember, there is a substantial tide that causes the ocean to rise and fall unequally on every inch of shoreline. Be careful when you measure. Don't create another hockey stick scam. Call it what it is, and stop with the snake oil campaign. Borrow a government laser measuring device (satellite) that is used to measure a submerged submarine wake on the ocean surface when the sub is running in stealth mode 1000 feet deep, and then measure ocean level rise and you will find out that the ocean level might be falling right now! This satellite system is accurate beyond 1/100 of an inch. It might be all the submarines that cause the next epic of ocean rise? No that wont work because the subs are not actually adding water to the ocean.

What might be fun is to take you scientists to the Netherlands. How in this world did the Dutch gather vast amounts of land from the North Sea that in some cases is 22 feet below seal level? What is that all about? Plus, those ingenious people are sequestering the CO2 from their Shell Refinery and pumping this CO2 into the greenhouses in their massive greenhouse industry that grows vegetables for the markets in Europe. You know that CO2 fertilizer, grows great vegetables.

****

The Scientist's Mantra: "Lie so we can get funded"

****

"Sea-Level Rise Study Update"

"The Coastal Resources Commission's Science Panel is working to update its 2010 report on sea-level rise in North Carolina, as required by Session Law 2012-202. The CRC's charge to the panel is to conduct "a comprehensive review of scientific literature and available North Carolina data that addresses the full range of global, regional and North Carolina specific sea-level change." The CRC

further directed the panel to limit the scope of the study to a 30-year rolling time table, to be updated every five years.

The panel's initial draft report was completed in December 2014, and forwarded to a technical peer review group for comment.

The draft report and all comments were submitted to the CRC and released for public comment on Mar. 31:"

****

Subsidence Subsidence

The Atlantic Ocean is expanding from the Mid Atlantic Ridge. The shore lines are being moved away from the MARidge. The shorelines have been eroding the whole time. There are no natural phenomena to add materials to the ever moving shorelines other that river carried materials to replace what is eroded away by normal ocean activity. The ocean has not been rising. The shorelines are eroding. Additionally Ocean level rises at the same rate on every inch of shoreline equally. This has been true for the past 18K years. Every body of water on the globe with depths over 420 feet has an escarpment at 420 feet which is a remnant of the end of the last Ice Age which ended 18K years ago. That's every ocean has an old historic beach displayed by a level plateau area at the depth of 420 feet. Yes, a beach, now 420 feet deep in the ocean.

****

So ocean rise is at different levels at different levels at different locations on The NC shoreline. NOT. I think the sky is falling. Let's get that fixed first.

Show me where the Ocean is rising!

****

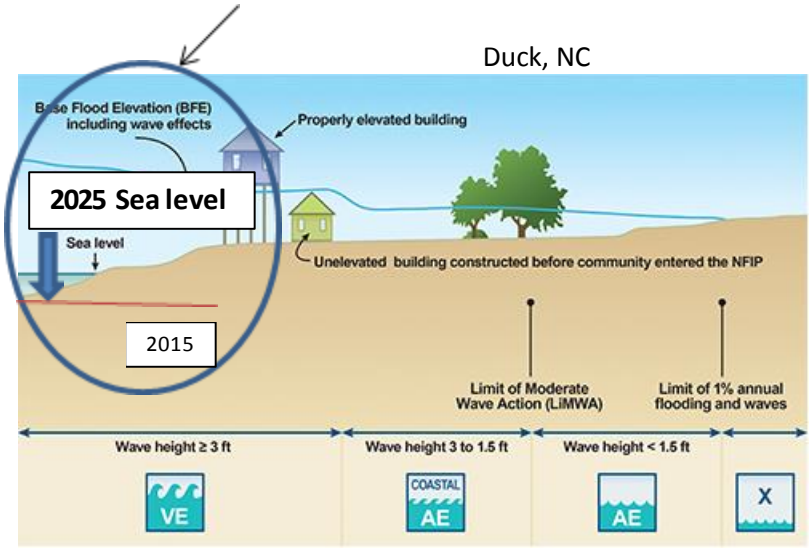
Mike Hayes.....NC Outer Banks resident and former Virginia Beach resident of the Pungo Ridge, an older outer banks dune ridge, ranging from the Chesapeake Bay to the Atlantic Ocean in southern NC that is 125K years old when the ocean level was 20 feet higher that it is now. Show me how stupid you are by proving me wrong without using CO2. If you are interested I can show you that less CO2 leaves North America into the Atlantic than comes on to North America off the Pacific Ocean. Read the previous sentence carefully! Wow, that's bad for your conspiracy theory!!!!!

Self-appointed amateur, marine geologist, climatologist, skeptic, and conspiracy theorist .....Mike Hayes

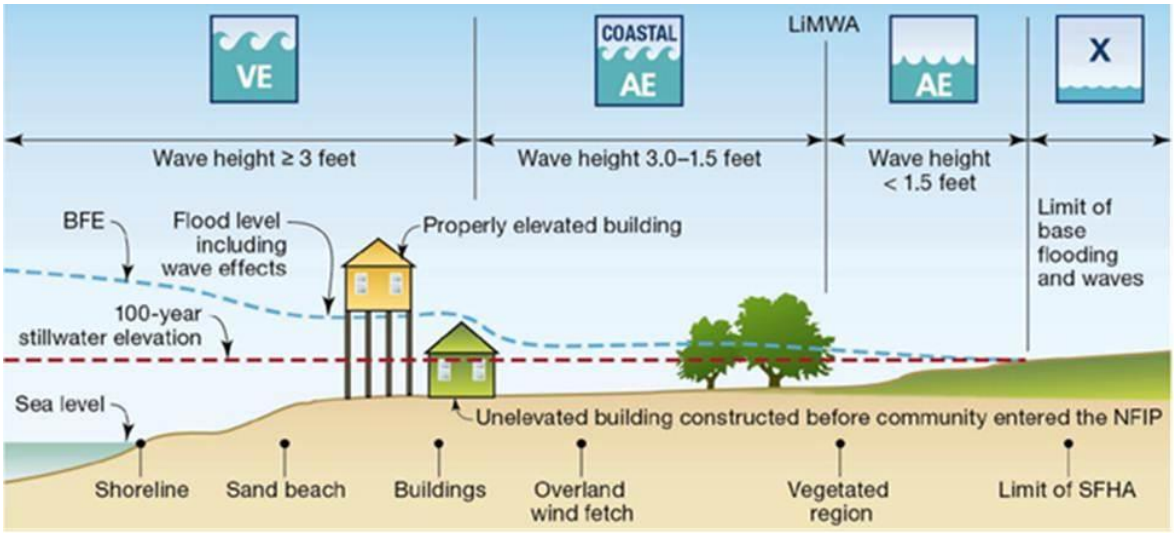
Sea-Level Rise Study Update – Comment
From: Perry, Neil L <nlperry@ncdot.gov>
To: Miller, Tancred <tancred.miller@ncdenr.gov>
Sent: Mon 4/6/2015 4:18 PM

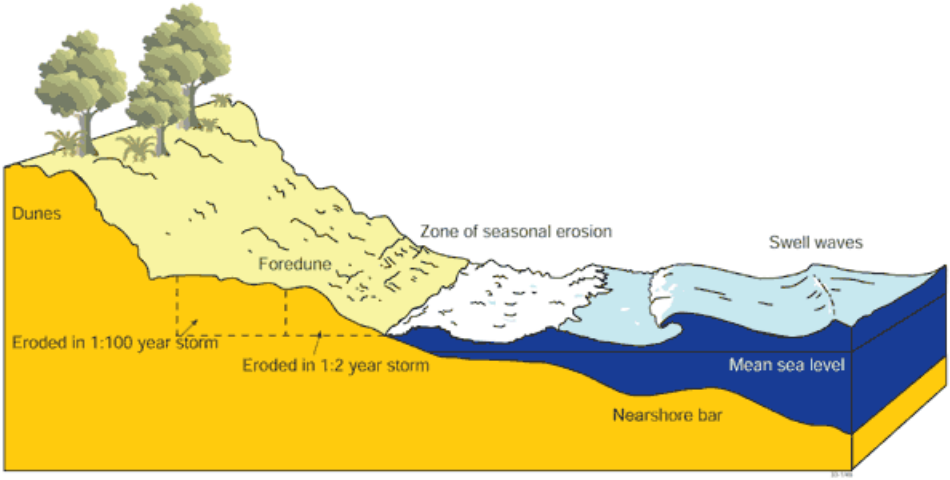
I've read through the updated report and wanted to provide a general comment.
You are **NOT** telling your story in a manner that the general public and general assembly will understand.
The most important information that you are trying to get across needs to be disseminated pictorially. See below.
FYI, I'm a former student of Dr. Overton's at NC State. BSCE 1995. I grew up in Virginia Beach and along the northern Outer Banks (Kill Devil Hills, NC). I'm very familiar with this issue and surrounding politics.

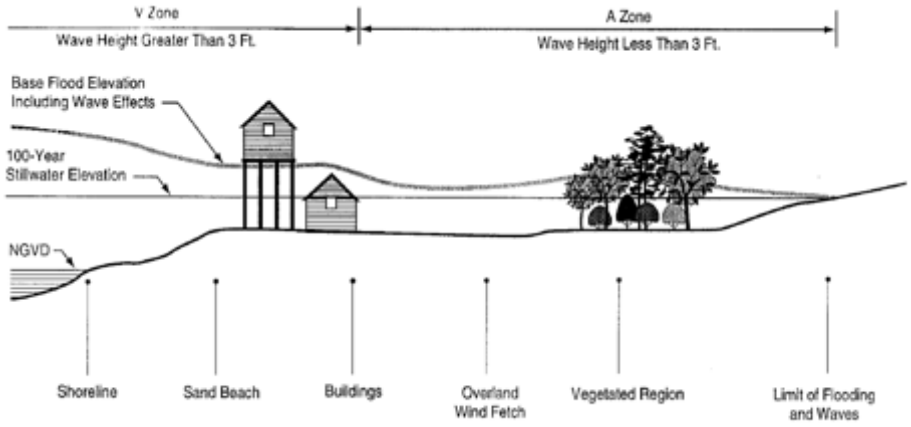
Duck, NC

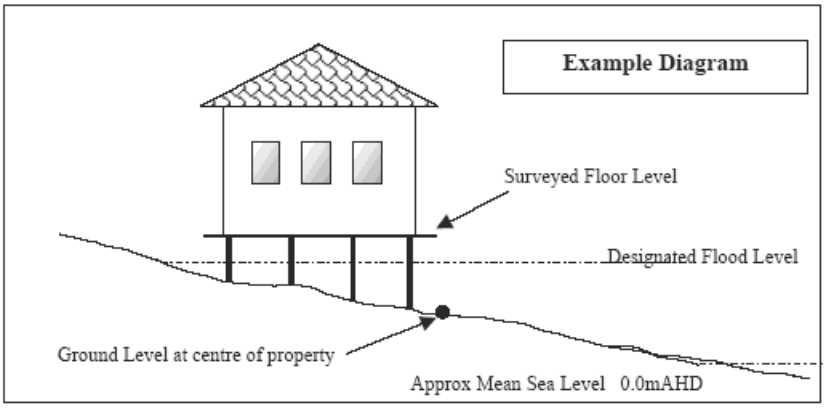


Or use one of the diagrams below or create your own. Point is you HAVE to tell this story pictorially or much of your work will be misunderstood.









Neil L. Perry, PE, PTOE, PTP, LEED BD+C
Rail Planning Manager
NCDOT Rail Division

Planning & Development Branch
1553 Mail Service Center
Raleigh, NC 27699-1553
Direct: 919-707-4711
Main Office: 919-707-4700

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-15-32

November 3, 2015

MEMORANDUM

TO: Coastal Resources Commission
FROM: Daniel Govoni
SUBJECT: Amendments to 15A NCAC .2700 GP for the Construction of Marsh Sills

DCM has undertaken substantial efforts to advance marsh sills and other forms of living shorelines as alternatives to traditional bulkheads for estuarine shoreline stabilization in North Carolina. Living shorelines include a suite of options for shoreline erosion control that maintain existing connections between upland, intertidal, estuarine, and aquatic areas which are necessary for maintaining water quality, ecosystem services, and habitat values. Unlike vertical stabilization measures such as bulkheads, living shoreline techniques typically use native materials such as marsh plants, oyster shells, and occasionally minimal amounts of structural materials (e.g. stone) to stabilize estuarine shorelines, minimize erosion, and enhance habitats.

Over the past several years, DCM developed a strategy, in cooperation with the Division of Marine Fisheries (DMF), to facilitate the use of living shorelines. This "Living Shorelines Strategy" includes outreach, public awareness, financial incentives, monitoring and short and long-term implementation actions, which have included several training courses, a marsh sill evaluation effort, and development of an Estuarine Shoreline Stabilization Guide/Handbook for property owners. DCM has also held numerous coordination meetings with other Department agencies to revise the General Permit (15A NCAC 7H .2700) for marsh sills in an effort to streamline the permitting of these structures.

General Permit (15A NCAC 7H .2700)

During the 2003 legislative session, the North Carolina Legislature approved House Bill 1028, a bill which authorized the Coastal Resources Commission to adopt temporary and permanent rules to establish a general permit for the construction of "riprap sills." This was implemented as a temporary rule in 2004, and became a permanent rule on April 1st, 2005. Significant discussions on the relative merits of this general permit were discussed during its development, including important issues such as the distance offshore that sill structures could be built, the consequences of trading one type of habitat (shallow bottom) for another (marsh protected by riprap), navigational and public trust concerns, the suitability of such structures, and the permitting requirements of other agencies such as the U.S. Army Corps of Engineers (USACE) and the Division of Water Resources. Due to these concerns, the current General Permit for the construction of marsh sills requires coordination with the DMF, the Division of Water Resources

(DWR), and the USACE before issuance. This process can take more time than normally associated with other CAMA General Permits. Since its inception, there has been an ongoing effort to modify the marsh sill general permit to remove the more time-consuming conditions. Since several marsh sill studies have been concluded and numerous sills have been constructed, DMF has agreed that there is no longer a need for DMF review of each potential marsh sill general permit. Also, DWR has revised and re-issued their General Water Quality Certification, which no longer requires written concurrence for marsh sill projects that receive a CAMA General Permit. The currently-proposed amendments would remove these agency coordination requirements, and would also remove conditions pertaining to fill for wetland plantings and other redundant or unnecessary conditions.

The attached draft revision to the existing General Permit is provided below for consideration by the Commission. Staff recommends that the Commission approve the rule revisions for the public hearing. I look forward to discussing these amendments at our upcoming meeting.

Attachment:

SECTION .2700 – GENERAL PERMIT FOR THE CONSTRUCTION OF MARSHRIPRAP SILLS ~~FOR WETLAND ENHANCEMENT IN ESTUARINE AND PUBLIC TRUST WATERS~~

15A NCAC 7H .2701 PURPOSE

A general permit pursuant to this Section shall allow for the construction of marsh~~riprap~~ sills for wetland enhancement and shoreline stabilization in estuarine and public trust waters as set out in Subchapter 7J .1100 and according to the rules in this Section. Marsh sills are generally shore-parallel structures built in conjunction with existing, created, or restored wetlands. This general permit shall not apply within the Ocean Hazard System AECs or waters adjacent to these AECs with the exception of those portions of shoreline within the Inlet Hazard Area AEC that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Eff. June 15, 2004;
Eff. April 1, 2005.

15A NCAC 07H .2702 APPROVAL PROCEDURES

(a) An applicant for a General Permit under this Subchapter shall contact the Division of Coastal Management and request approval for development. The applicant shall provide information on site location, dimensions of the project area, and applicant name and address.

(b) The applicant shall provide:

(1) confirmation that a written statement has been obtained signed by the adjacent riparian property owners indicating that they have no objections to the proposed work; or

(2) confirmation that the adjacent riparian property owners have been notified by certified mail of the proposed work. The notice shall instruct adjacent property owners to provide any comments on the proposed development in writing for consideration by permitting officials to the Division of Coastal Management within 10 days of receipt of the notice, and, indicate that no response will be interpreted as no objection.

(c) DCM staff shall review all comments and determine, based on their relevance to the potential impacts of the proposed project, if the proposed project can be approved by a General Permit.

(d) No work shall begin until an on-site meeting is held with the applicant and a Division of Coastal Management representative to review the proposed development. Written authorization to proceed with the proposed development shall be issued if the Division representative finds that the application meets all the requirements of this Subchapter. Construction shall be completed within 120 days of the issuance of the general authorization or the

authorization shall expire and it shall be necessary to re-examine the proposed development to determine if the general authorization may be reissued.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Adoption Eff. June 15, 2004;
Eff. April 1, 2005;
Amended Eff. October 1, 2007.

15A NCAC 7H .2703 PERMIT FEE

The applicant shall pay a permit fee of two hundred dollars ($200.00). This fee shall be paid by check or money order made payable to the Department.

History Note: *Authority G.S. 113A-107; 113A-118.1; 113A-119.1;*
Temporary Eff. June 15, 2004;
Eff. April 1, 2005
Amended Eff. September 1, 2006

15A NCAC 7H .2704 GENERAL CONDITIONS

(a) Structures authorized by a permit issued pursuant to this Section shall be marsh~~riprap or stone~~ sills conforming to the standards in these Rules.
(b) Individuals shall allow authorized representatives of the Department of Environment and Natural Resources (DENR) to make periodic inspections at any time deemed necessary in order to insure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed in these Rules.
(c) The placement of marsh~~riprap or stone~~ sills authorized in these Rules shall not interfere with the established or traditional rights of navigation of the waters by the public.
(d) This permit shall not be applicable to proposed construction where the Department has determined, based on an initial review of the application, that notice and review pursuant to G.S. 113A-119 is necessary because there are unresolved questions concerning the proposed activity's impact on adjoining properties or on water quality, air quality, coastal wetlands, cultural or historic sites, wildlife, fisheries resources, or public trust rights.
(e) This permit does not eliminate the need to obtain any other required state, local, or federal authorization.
(f) Development carried out under this permit shall be consistent with all local requirements, AEC Guidelines as set out in Subchapter 7H. 0200, and local land use plans current at the time of authorization.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Eff. June 15, 2004;
Eff. April 1, 2005.

15A NCAC 7H .2705 SPECIFIC CONDITIONS

(a) A general permit issued pursuant to this Section shall be applicable only for the construction of marsh~~riprap or stone~~ sill structures built in conjunction with existing, created or restored wetlands. Planted wetland vegetation shall consist only of native species.
~~(b) This general permit shall not apply within the Ocean Hazard System Areas of Environmental Concern (AEC) or waters adjacent to these AECs with the exception of those portions of shoreline within the Inlet Hazard Area AEC that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.~~
(~~b~~c) ~~On shorelines where no fill is proposed,~~ tThe landward edge of the sill shall be positioned no more than 5 feet waterward ~~of the waterward depth contour~~ of locally growing wetlands ~~or to mid-tide depth contour, whichever is greater~~. Where no wetlands exist, in no case shall the landward edge of the sill be positioned greater than 30 feet waterward of the ~~mean high water or~~ normal high water or normal water line.
~~(d) On shorelines where fill is proposed, the landward edge of the sill shall be positioned no more than 30 feet waterward of the existing mean high water or normal high water line.~~
(c~~e~~) The permittee shall maintain the authorized sill including wetlands and tidal inundation ~~and existing or planted wetlands~~ in conformance with the terms and conditions of this permit, or the remaining sill structures shall be removed within 90 days of notification from the Division of Coastal Management.

(df) The height of sills shall not exceed ~~six~~ twelve inches above ~~normalmean~~ high water, normal water level, or the height of the adjacent wetland substrate, whichever is highergreater.
(eg) Sill construction authorized by this permit shall be limited to a maximum length of 500 feet.
~~(h) Sills shall be porous to allow water circulation through the structure.~~
(gi) The sills shall have at least one five-foot ~~drop-down or~~ opening every 100 feet and may be staggered or overlapped or left open as long as the five-foot ~~drop-down or~~ separation between sections is maintained. Overlapping sections shall not overlap more than 10 feet. Deviation from these ~~drop-down~~opening requirements shall be allowable following coordination with the N.C. Division of Coastal Management ~~the N.C. Division of Marine Fisheries and the National Marine Fisheries Service.~~
(hj) The sill~~riprap~~ structure shall not exceed a slope of a one and a half foot rise over a one ~~two~~ foot horizontal distance and a minimum slope of a one ~~and a half~~ foot rise over a ~~one~~ two foot horizontal distance. The width of the structure on the bottom shall be no wider than ~~15~~ 12 feet.
~~(k) For the purpose of protection of public trust rights, fill waterward of the existing mean high water line shall not be placed higher than the mean high water elevation.~~
~~(l) The permittee shall not claim title to any lands raised above the mean high or normal water levels as a result of filling or accretion.~~
(jm) For water bodies ~~more~~ narrower than 150 feet, no portion of the structures shall ~~not~~ be positioned offshore more than one sixth (1/6) the width of the waterbody.
(kn) The sill shall not be within a navigation channel or associated setbacks marked or maintained by a state or federal agency.
(lo) The sill shall not interfere with leases or franchises for shellfish culture.
(mp) All structures shall have a minimum setback distance of 15 feet between any parts of the structure and the adjacent property owner's riparian access corridor, unless either a signed waiver statement is obtained from the adjacent property owner or the portion of the structure within 15 feet of the adjacent riparian access corridor is located no more than 25 feet from the normal~~mean~~ high or normal water level. The riparian access corridor line is determined by drawing a line parallel to the channel, then drawing a line perpendicular to the channel line that intersects with the shore at the point where the upland property line meets the water's edge. Additionally, the sill shall not interfere with the exercise of riparian rights by adjacent property owners, including access to navigation channels from piers, or other means of access.
~~(q) The sill shall not interfere with the exercise of riparian rights by adjacent property owners, including access to navigation channels from piers, or other means of access.~~
(nr) Sills shall be marked at 50-foot intervals with yellow reflectors extending at least three feet above normal~~mean~~ high water or normal water level.
(os) If the crossing of wetlands with mechanized construction equipment is necessary, temporary construction mats shall be utilized for the areas to be crossed. The temporary mats shall be removed immediately upon completion of the construction of the sill~~riprap~~ structure. Material used to construct the sill shall not be stockpiled directly on existing wetlands or in open water unless fully contained in a containment structure supported by construction mats.
(pt) Sedimentation and erosion control measures shall be implemented to ensure that eroded materials do not enter adjacent wetlands or waters.
(qu) No excavation or filling, other than that necessary for the construction and proper bedding of the sill structure, is authorized by this general permit ~~of any native submerged aquatic vegetation is authorized by this general permit~~.
(v) No excavation of the shallow water bottom or any wetland is authorized by this general permit
~~(w) No more than 100 square feet of wetlands may be filled as a resulted of the authorized activity.~~
~~(x) Backfilling of sill structures may be utilized only for the purpose of creating a suitable substrate for the establishment or reestablishment of wetlands. Only clean sand fill material may be utilized.~~
(ry) The sill~~riprap~~ material shall consist of clean rock, marl, oyster shell, or masonry materials such as granite or broken concrete or other materials that are approved by the N.C. Division of Coastal Management. Sill~~Riprap~~ material shall be free of loose sediment or any pollutant, including exposed rebar. The sill material ~~structures~~ shall be of sufficient size and slope to prevent its movement from the approved alignment ~~site~~ by wave or current action.
~~(z) If one or more contiguous acre of property is to be graded, excavated or filled, an erosion and sedimentation control plan shall be filed with the Division of Land Resources, Land Quality Section, or appropriate government having jurisdiction. The plan must be approved prior to commencing the land-disturbing activity.~~
~~(aa) In order to ensure that no adverse impacts occur to important fisheries resources, the Division of Marine Fisheries shall review and concur with the location and design of the proposed project prior to the issuance of this general permit.~~

~~(bb) Prior to the issuance of this general permit, Division staff shall coordinate with the Department of Administration's State Property Office to determine whether or not an easement shall be required for the proposed activity.~~

(~~s~~ee) Following issuance of this general permit, the permittee shall contact the ~~N.C. Division of Water Quality~~ and the U.S. Army Corps of Engineers to determine any additional permit requirements. Any such required permits, or a certification from the U.S. Army Corps of Engineers ~~appropriate agency(s)~~ that no additional permits are required, shall be obtained and copies provided to the Division of Coastal Management prior to the initiation of any development activities authorized by this permit.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Eff. June 15, 2004;
Eff. April 1, 2005.

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

November 4, 2015

MEMORANDUM **CRC-15-33**

TO: Coastal Resources Commission

FROM: Ken Richardson

SUBJECT: Beach Bulldozing General Permit Rule Modification to Allow Bulldozing within the Ocean Hazard AEC, and Oceanward of MHWL

Beach bulldozing is a method of oceanfront erosion management that moves beach sand from areas seaward of the first line of stable and natural vegetation (FLSNV) to repair or stabilize an existing dune damaged by erosion, or to create a protective berm for an imminently threatened structure. This activity can be authorized through the Coastal Area Management Act (CAMA) permit process. Impacts from the recent storm and effects of Hurricane Joaquin have raised a number of inquiries into how beach bulldozing is authorized, including what options are available to individual property owners for dune repair and construction. Below is an overview of authorizations for beach bulldozing as well as staff's recommendation for individual property owners and local governments wanting to undertake activities beyond what is currently allowed by the CAMA General Permit.

Beach Bulldozing General Permit

Current CAMA General Permit (GP) rules (15A NCAC 07H.1800) only allow the bulldozing of sand from the beach area between Mean High Water Line (MHWL) and the FLSNV within the Ocean Hazard Area of Environmental Concern (AEC), and does not apply within the boundaries of a designated Inlet Hazard AEC. To minimize adverse impacts to nesting sea turtles, bulldozing within the period of May 1 through November 15 requires approval from the Division of Coastal Management, in coordination with the N.C. Wildlife Resources Commission, U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers (15A NCAC 07H.1805(f).

If a project exceeds the conditions specified within the General Permit rules, or if the activity requires movement of sand from the area between the Mean Low Water Line (MLWL) and the MHWL, a CAMA Major Permit is required (15A NCAC 07H.0308(a)(4)).

CAMA Major Permit – Local Governments

Historically, local governments have pursued CAMA Major Permits for beach bulldozing activities in the aftermath of major storms or other significant weather events. A Major Permit can authorize beach grading activities for the purpose of dune rehabilitation within the Ocean Hazard and Inlet Hazard AECs, or new dune construction within the Ocean Hazard AEC, and is usually authorized for the local government's entire jurisdiction. Presently, four (4) local governments (Wrightsville Beach, Figure Eight, Surf City, and North Topsail Beach) have active CAMA Major Permits for beach bulldozing.

If a local government has an active beach bulldozing CAMA Major Permit, property owners can coordinate with the town to request a minor modification to the local government's permit from the Division of Coastal Management, provided that the property is within the town's legal jurisdiction, and has received an authorized agent form from the local government. If approved by the Division, the property owner(s) could then bulldoze under the same conditions specified in the local government's Major permit. Although additional conditions can be specified, the following are current use standards and general conditions associated with a beach bulldozing CAMA Major Permit for the purpose of dune repair and stabilization (15A NCAC 07H.0308(a)(4):

- The project should maintain a slope similar to normal conditions. The slope, or grade, of the project must not be so steep that it endangers the public or interferes with public use of the beach.
- The beach profile may not be lowered more than one foot as measured from the existing surface elevation.
- Beach bulldozing must not extend past the lateral boundary of your property, unless you have permission from the neighboring landowner.
- Beach bulldozing must not significantly increase erosion on neighboring properties or adversely affect important natural or cultural resources.
- The activity may be undertaken to protect threatened on-site waste disposal systems as-well as the threatened structure's foundation.

Imminently Threatened Structures

All of the above permits are issued to property owners to repair existing dunes and dune systems following an erosion event. The Coastal Area Management Act exempts beach bulldozing from the permit process when it is done to protect imminently threatened structures through the creation of protective sand dunes. A structure is considered imminently threatened if its foundation, septic system, or right-of-way in the case of roads, is less than 20 feet away from the erosion scarp. Property owners who believe their structure is imminently threatened must contact a CAMA representative for consultation and a site visit prior to beginning work. Although a permit is not required, bulldozing under the exemption is subject to the above listed conditions, and any work performed below the Mean High Water Line still needs federal authorization from the U.S. Army Corps of Engineers.

Dune Creation and Stabilization Projects

Bulldozing sand from the beach may facilitate dune recovery following a storm event, or create new dunes. Dunes serve as a natural buffer against the erosive forces of wind, water and waves. Dune establishment and stabilization projects must be thoughtfully planned and carried out to avoid damaging the beach and dune system. There are two types of dunes defined in the CRC's rules: 1) Primary Dunes are the first mounds of sand located landward of the ocean beach having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet, and extends landward to the lowest elevation in the depression behind that same mound of sand

commonly referred to as the dune trough (15A NCAC 7H.0305(a)(3)), and; 2) a Frontal Dune is deemed to be the first mound of sand located landward of the ocean beach having sufficient vegetation, height, continuity and configuration to offer protection value (15ANCAC7H.0305(a)(4)).

Dune creation and stabilization projects must meet the general rules for Ocean Hazard AECs as well as the following standards (15A NCAC 7H.0308(b)):

- Man-made dunes must be aligned with existing adjacent dune ridges and be of similar shape.
- Existing primary and frontal dunes may not be broadened or extended oceanward, except during beach nourishment projects or emergency situations authorized by the Division of Coastal Management.
- Dune building must not damage existing vegetation. You must immediately replant or otherwise stabilize the dunes if vegetation is harmed.
- Sand used to create dunes must be similar in quality and grain size to existing sand, so it will improve potential stability of the existing sand and build stable dunes and be compatible with the existing environment.
- New dunes may not be created in Inlet Hazard AECs.
- Sand in any dune other than the frontal or primary dune may be redistributed within the AEC if it is not placed farther oceanward than the crest of the primary dune or landward of the toe of the frontal dune.

Recommendation:

The US Army Corps of Engineers (USACE) has a General (Regional) Permit (GP 198000048) that is available to the general public authorizing emergency construction of primary dunes and any associated excavation waterward of the MHW elevation contour under special and general conditions. However, in order to minimize impacts to the beach and adjacent properties, beach bulldozing under the CAMA General Permit has been limited to above the MHW line, and only within the period of April 1 through November 15, is coordination with the USACE required. Staff is recommending modifications to the CRC's beach bulldozing general permit rules to also allow bulldozing below the MHWL but landward of MLWL (Attachment A). An additional option available to property owners is to seek authorization under the local government's CAMA Major Permit as described above. The Minor Modification process of the local government's permit could allow the activity in a matter of days making it a reasonable option after a significant erosion event.

ATTACHMENT A

SECTION .1800 - GENERAL PERMIT TO ALLOW BEACH BULLDOZING ~~LANDWARD OF THE MEAN HIGH WATER MARK~~ IN THE OCEAN HAZARD AEC

15A NCAC 07H .1801 PURPOSE

This permit will allow beach bulldozing needed to reconstruct or repair frontal and/or primary dune systems. For the purpose of this general permit, beach bulldozing is defined as the process of moving natural beach material from any point seaward of the first line of stable vegetation to repair damage to frontal and/or primary dunes ~~caused by a major storm event~~. This general permit is being developed according to the procedures outlined in Subchapter 7J .1100 and will apply only to the Ocean Erodible AEC. This general permit shall not apply to the Inlet Hazard AEC.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987.

15A NCAC 07H .1802 APPROVAL PROCEDURES

(a) The applicant ~~must~~ shall contact the Division of Coastal Management ~~or local permit officer (LPO)~~ and complete an application ~~form~~ requesting approval for development. The applicant shall provide information on site location, dimensions of the project area, and ~~his~~ their name and address.

(b) The applicant must provide:

(1) confirmation that a written statement has been obtained signed by the adjacent riparian property owners indicating that they have no objections to the proposed work; or

(2) confirmation that the adjacent riparian property owners have been notified by certified mail of the proposed work. Such notice should instruct adjacent property owners to provide any comments on the proposed development in writing for consideration by permitting officials to the Division of Coastal Management within ten days of receipt of the notice, and, indicate that no response will be interpreted as no objection. DCM staff will review all comments and determine, based on their relevance to the potential impacts of the proposed project, if the proposed project can be approved by a General Permit. If DCM staff finds that the comments are worthy of more in-depth review, the applicant will be notified that he must submit an application for a major development permit.

(c) No work shall begin until an on-site meeting is held with the applicant and ~~appropriate LPO or~~ a Division of Coastal Management representative so that the existing first line of stable natural vegetation can be appropriately marked and recorded on the application. Written authorization to proceed with the proposed development may be issued during this visit. All bulldozing must be completed within 30 days of the date of permit issuance or the general authorization expires.

History Note: *Authority G. S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Amended Eff. January 1, 1990.

15A NCAC 07H .1803 PERMIT FEE

The applicant shall pay a permit fee of four hundred dollars ($400.00) by check or money order payable to the Department.

History Note: *Authority G.S. 113-229(c1); 113A-107; 113A-113(b); 113A-118.1; 113A-119; 113A-119.1;*
Eff. December 1, 1987;
Amended Eff. September 1, 2006; August 1, 2000; March 1, 1991.

15A NCAC 07H .1804 GENERAL CONDITIONS

~~(a) Any future setback determinations which may be required shall be made using the first line of stable natural vegetation established prior to the bulldozing activity.~~

(a)~~(b)~~ Individuals shall allow authorized representatives of the Department of Environmental Quality ~~Environment and Natural Resources~~ to make periodic inspections at any time deemed necessary to ensure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed herein.

(b)~~(c)~~ This permit will not be applicable to proposed construction where the Department has determined, based on an initial review of the application, that notice and review pursuant to G.S. 113A-119 is necessary because there are unresolved questions concerning the proposed activity's impact on adjoining properties or on water quality; air quality; coastal wetlands; cultural or historic sites; wildlife; fisheries resources; or public trust rights. If a shipwreck is unearthed, all work shall stop and both the ~~Division of Archives and History~~ Department of Natural and Cultural Resources and Division of Coastal Management shall be contacted immediately.

(c)~~(d)~~ This permit does not eliminate the need to obtain any other required state, local or federal authorization.

(d)~~(e)~~ Development carried out under this permit must be consistent with all local requirements, ~~AEC~~ Commission rules, and local Land Use Plans current at the time of authorization.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Amended Eff. May 1, 1990;
RRC Objection due to ambiguity Eff. May 19, 1994;
Amended Eff. August 1,1998; July 1, 1994.

15A NCAC 07H .1805 SPECIFIC CONDITIONS

(a) The area in which this activity is being performed must maintain a slope ~~of adequate grade so as to not endanger the public or the public's use of the beach and should follow~~ that follows the pre-emergency slopes as closely as possible so as not to endanger the public or the public's use of the beach. The movement of material by a bulldozer, front-end loader, backhoe, scraper or any type of earth moving or construction equipment shall not exceed ~~1~~ one (1) foot in depth measured from the pre-activity surface elevation.

(b) The activity must not exceed the lateral bounds of the applicant's property unless ~~he has~~ the written permission of the adjoining ~~landowner(s)~~ property owner(s) is obtained.

(c) Movement of material from seaward of the mean ~~high~~ low water line is not authorized.

(d) The activity must not ~~demonstratively~~ increase erosion on neighboring properties.

(e) Adding sand to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The fill areas will be immediately replanted or temporarily stabilized until planting can be successfully completed.

(f) In order to minimize adverse impacts to nesting sea turtles, no work shall occur within the period of ~~May~~ April 1 through November 15 of any year, without the ~~prior~~ approval of the Division of Coastal Management, in coordination with the North Carolina Wildlife Resources Commission, the United States Fish and Wildlife Service and the United States Army Corps of Engineers, that the work can be accomplished without adversely impacting sea turtle nests or suitable nesting habitat.

(g) If one contiguous acre or more of oceanfront property is to be excavated or filled, an erosion and sedimentation control plan must be filed with the Division of Energy, Mineral, and Land Resources, or appropriate local government having jurisdiction. This plan must be approved prior to commencing the land disturbing activity.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Temporary Amendment Eff. September 2, 1998;
Amended Eff. August 1, 2012 (see S.L. 2012-143, s.1.(f)); August 1, 2000.

SECTION .2500 - EMERGENCY GENERAL PERMIT, TO BE INITIATED AT THE DISCRETION OF THE SECRETARY OF THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES FOR REPLACEMENT OF STRUCTURES, THE RECONSTRUCTION OF PRIMARY OR FRONTAL DUNE SYSTEMS, AND THE MAINTENANCE EXCAVATION OF EXISTING CANALS, BASINS, CHANNELS, OR DITCHES, DAMAGED, DESTROYED, OR FILLED IN BY HURRICANES OR TROPICAL STORMS, PROVIDED ALL REPLACEMENT, RECONSTRUCTION AND MAINTENANCE EXCAVATION ACTIVITIES CONFORM TO ALL CURRENT STANDARDS

15A NCAC 07H .2501 PURPOSE

Following damage to coastal North Carolina due to hurricanes or tropical storms, the Secretary may, based upon an examination of the extent and severity of the damage, implement any or all provisions of this Section. Factors the Secretary may consider in making this decision include, but are not limited to, severity and scale of property damage, designation of counties as disaster areas, reconnaissance of the impacted areas, or discussions with staff, state or federal emergency response agencies. This permit shall allow for:

(1) the replacement of structures that were located within the estuarine system or public trust Areas of Environmental Concern and that were destroyed or damaged beyond 50 percent of the structures value as a result of any hurricane or tropical storm,

(2) a one time per property fee waiver for the reconstruction or repair by beach bulldozing of hurricane or tropical storm damaged frontal or primary dune systems, and

(3) a one time per property fee waiver for maintenance dredging activities within existing basins, canals, channels, and ditches. Structure replacement, dune reconstruction, and maintenance excavation activities authorized by this permit shall conform with all current use standards and regulations. The structural replacement component of this general permit shall only be applicable where the structure was in place and serving its intended function at the time of the impacting hurricane or storm, and shall not apply within the Ocean Hazard System of Areas of Environmental Concern (AEC) or waters adjacent to these AECs with the exception of those portions of shoreline that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Adoption Eff. October 2, 1999;
Temporary Adoption Expired on July 28, 2000;
Eff. April 1, 2001.

15A NCAC 07H .2505 SPECIFIC CONDITIONS

(a) The replacement of a damaged or destroyed structure shall take place within the footprint and dimensions that existed immediately prior to the damaging hurricane or tropical storm. No structural enlargement or additions shall be allowed.

(b) Structure replacement, dune reconstruction, and maintenance excavation authorized by this permit shall conform to the existing use standards and regulations for exemptions, minor development permits and major development permits, including general permits. These use standards include, but are not limited to:

(1) 15A NCAC 07H .0208(b)(6) for the replacement of docks and piers;

(2) 15A NCAC 07H .0208(b)(7) for the replacement of bulkheads and shoreline stabilization measures;

(3) 15A NCAC 07H .0208(b)(9) for the replacement of wooden and riprap groins;

(4) 15A NCAC 07H .1500 for maintenance excavation activities; and

(5) 15A NCAC 07H .1800 for beach bulldozing in the Ocean Hazard AEC. ~~landward of the mean high water mark.~~

(c) The replacement of an existing dock or pier facility, including associated structures, marsh enhancement breakwaters or groins shall be set back 15 feet from the adjoining property lines and the riparian access dividing line. The line of division of riparian access shall be established by drawing a line along the channel or deep water in front of the property, then drawing a line perpendicular to the line of the channel so that it intersects with the shore at the point the upland property line meets the water's edge. Application of this Rule may be aided by reference to the approved diagram in 15A NCAC 07H .1205(q), illustrating the rule as applied to various shoreline configurations. Copies of the diagram may be obtained from the Division of Coastal Management. When shoreline configuration is such that a perpendicular alignment can not be achieved, the pier shall be aligned to meet the intent of this Rule to the maximum extent practicable. The setback may be waived by written agreement of the adjacent riparian owner(s) or when the two adjoining riparian owners are co-applicants. Should the adjacent property be sold before replacement of the structure begins, the applicant shall obtain a written agreement with the new owner waiving the minimum setback and submit it to the Division of Coastal Management prior to initiating any construction of the structure.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Adoption Eff. October 2, 1999;
Temporary Adoption Expired on July 28, 2000;
Eff. April 1, 2001.

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

MEMORANDUM **CRC – Information Item**

TO: Coastal Resources Commission

FROM: Charlan Owens, AICP, DCM Elizabeth City District Planner

SUBJECT: Town of Windsor Land Use Plan (LUP) Implementation Status Report

DATE: November 4, 2015

Background

Local governments submit an implementation status report every two (2) years following the date of LUP certification per the following:

> **15A NCAC 07L .0511 REQUIRED PERIODIC IMPLEMENTATION STATUS REPORTS**
> (a) To be eligible for future funding each local government engaged in CAMA land use planning shall complete a CAMA land use plan Implementation Status Report every two years as long as the current plan remains in effect. DCM shall provide a standard implementation report form to local governments. This report shall be based on the action plan and schedule provided in 15A NCAC 07B - Tools for Managing Development.
> (b) The Implementation Status Report shall identify:
> (1) All local, state, federal, and joint actions that have been undertaken successfully to implement its certified CAMA land use plan;
> (2) Any actions that have been delayed and the reasons for the delays;
> (3) Any unforeseen land use issues that have arisen since certification of the CAMA land use plan;
> (4) Consistency of existing land use and development ordinances with current CAMA land use plan policies; and
> (5) Current policies that create desired land use patterns and protection of natural systems.
> (c) Results shall be made available to the public and shall be forwarded to DCM.

The Town of Windsor implementation status report is available on DCM's Land Use Planning web page at: http://www.nccoastalmanagement.net/web/cm/bertie-county. It is not provided in the CRC packet.

Discussion

The implementation status report does not require approval by the CRC, but must be made available to the public and forwarded to DCM. The report is based on the LUP Action Plan and identifies activities that the local government has undertaken in support of the LUP's policies and implementation actions. Staff has reviewed the submitted report and finds that the community has met the minimum requirements.

State of North Carolina | Environmental Quality
1367 US Hwy 17 South | Elizabeth City, NC 27909
252-264-3901 | 252-264-3723 [fax]

TOWN OF WINDSOR

Windsor, North Carolina 27983

128 South King Street
Post Office Box 508
(252) 794-3121
(252) 794-2331
(252) 794-5909 (fax)
www.windsornc.com

October 16, 2015

Ms. Charlan Owens, AICP
Elizabeth City District Planner
NCDENR - Division of Coastal Management
1367 U.S. Hwy. 17 South
Elizabeth City, NC 27889

Dear Ms. Owens:

Attached is the Land Use Plan Status Report for the Town of Windsor as required by the CAMA Local Planning and Management Grant guidelines. The Town has provided the status of all implementing strategies.

If you have any questions regarding the report, please feel free to contact me.

Sincerely,

L. Allen Castelloe
Town Administrator

Att.

Town of Windsor

CAMA Core Land Use Plan Implementation Status Report

I.1 The Town will consider applying for public access funding to extend the riverwalk located along the Cashie River.

The Town has increased Cashie River shoreline access with the Cashie Memorial Park on King Street (local funding) but has not applied for public access funding.

I.2 The Town will consider applying for public access funding to improve boat ramp facilities on the Cashie River.

The Town has increased Cashie River shoreline access with the Cashie Memorial Park on King Street (local funding) but has not applied for public access funding.

I.3 Windsor desires the Cashie River to be a navigable river. The Town will look for resources to assist with debris removal, and channel depth maintenance.

The Town has continued to support the Cashie River as a navigable river.

I.4 The Town will consider adoption of a riverfront zoning district if it is deemed necessary to protect this valuable resource within the town.

The Town has not adopted a riverfront zoning district. Such a district has not yet been deemed necessary for protection of the shoreline.

I.5 The town will consider increasing signage related to the Livermon Park and the Roanoke/Cashie River Center in an effort to increase awareness about these facilities.

The Town has increased signage at the Roanoke/Cashie River Center.

I.6 Windsor will pursue funding under the North Carolina CAMA Shoreline Access funding program for other eligible projects that provide access for its citizens. (15A NCAC 7M, Section .0300, Shorefront Access Policies).

The Town has not pursued additional shoreline access funding.

I.7 The Town will continue to cooperate with the Clean Water Management Trust Fund in an effort to acquire/reserve additional property along the Cashie River as open space.

The Town has not acquired or reserved additional property along the Cashie River with Clean Water Management Trust Funds.

I.8 The Town will compile and maintain a list of dilapidated and/or substandard houses within the planning jurisdiction.

The Town has continued to prioritize and pursue building code enforcement against substandard structures.

I.9 The Town will apply for grant funding to rehabilitate substandard houses and clear dilapidated houses for low to moderate income persons and the elderly. Some sources for this funding are: Community Development Block Grant funding, North Carolina Housing Finance Agency funding, and United States Department of Agriculture funding.

Because of the decline in available housing rehabilitation funds, the Town has not applied for housing rehabilitation grant funds.

I.10 The Town will prepare a pedestrian access study that identifies the locations of current sidewalks, the need for sidewalk additions, and the need for walking/hiking trails. This study will focus on tying together the town's various recreational facilities.

The Town prepared a Parks and Recreation Master Plan in 2013 which included a Windsor Greenway Pedestrian Trail.

I.11 Windsor will apply for funding to implement actions determined necessary in the sidewalk study.

The Town has received NCDOT 2015 funding for preparation of a town-wide pedestrian/bicycle plan.

I.12 Windsor will allow the reconstruction of any residential structures demolished by natural disasters when the reconstruction complies with all applicable local, state, and federal regulations.

The Town has continued to support reconstruction.

I.13 Windsor will consider expanding the Central Business District towards Sterlingworth Street and to include more of US Highway 17 Business (from NC Highway 130 to NC Highway 130).

The Town did not expand the Central Business District mixed use land use sector. However, the Town did establish a mixed use overlay which allows for greater land use flexibility in and around the mixed use sector.

I.14 The Town will consider amending the zoning ordinance to include guidelines regarding the location and appearance (finish/façade) of metal buildings.

The Town has not revised the ordinance to include façade design criteria.

I.15 The Town will enforce its zoning regulations for type and location of commercial and industrial development.

The Town has continued to enforce its zoning ordinance to regulate building appearance.

I.16 Windsor will rely on its zoning ordinance and the CAMA permitting program, if required, with regard to new industrial development and expansion of existing industrial facilities.

The Town has continued to use zoning and the CAMA permitting program to regulate industrial development.

I.17 Windsor will continue to seek grant funding from the NC Main Street Program to be utilized for façade improvements in conjunction with the town's downtown revitalization program.

The Town has not pursued NC Main Street Program funding.

I.18 The Town will endeavor to educate the public about environmentally sensitive areas and what actions they can take to help do their part in preservation. Education may be done through public service announcements or through programs run within the Roanoke/Cashie River Center.

The Town has supported educational programs at the Roanoke/Cashie River Center.

I.19 The Town will meet with appropriate agencies to discuss marketing the Town as a tourist destination because of its natural resources.

The Town has continued to market the Cashie River and other natural resources as tourist destinations.

I.20 The Town will strive to protect Windsor's fragile areas from inappropriate, unplanned, or poorly planned development through the following:

(1) Limit certain land uses in the vicinity of historic sites and natural heritage areas through enforcement of the Windsor zoning ordinance.

The Town has continued to rely on its zoning ordinance to protect historic sites and natural heritage areas.

(2) Coordinate all housing code enforcement/ redevelopment projects/public works projects with the NC Division of Archives and History to ensure the preservation and identification of significant historic structures and archaeological sites. Significant historic sites are identified on page 54 of this plan.

The Town has continued to coordinate town projects with the NC Division of Archives and History.

I.21 Windsor will consider establishing a basis for instituting a stormwater management program to work in conjunction with its existing ordinances that will assure the Town complies with all state and federal regulations.

The Town has not established a local stormwater management program. The Town has continued to rely on state requirements for stormwater control.

I.22 The town will continue to monitor state stormwater policy, and respond to any new regulations through update of the town's zoning ordinance.

The Town has continued to coordinate development with state stormwater contral regulations.

I.23 The Town of Windsor will cooperate with the NCDOT, the North Carolina Division of Water Quality, and other state agencies in mitigating the impact of stormwater runoff on all conservation classified areas. The town will support the Division of Water Quality stormwater runoff retention permitting process through its zoning permit system by verifying compliance prior to issuance of a zoning permit.

The Town has continued to cooperate/coordinate review and approval of development projects with both NCDOT and the Division of Water Quality.

I.24 The Town of Windsor will attempt to apply for grant funds, and utilize Powell Bill funds, to improve stormwater drainage systems associated with existing rights-of-way.

The Town has utilized Powell Bill funds to make right-of-way stormwater system improvements.

I.25 The Town of Windsor will support existing state regulations relating to stormwater runoff resulting from development (Stormwater Disposal Policy 15A NCAC 2H.001-.1003), including the revised coastal stormwater rules, through enforcement of the town's subdivision ordinance.

The Town has continued to support NC Stormwater Disposal Policy 15A NCAC 2H.001-.1003.

I.26 Windsor will consider revising water and sewer extension policies to ensure that public/private cooperation in the provision of infrastructure to serve new development is encouraged.

The Town has not revised its water and sewer extension policies to ensure public/private cooperation.

I.27 In cases where package treatment plants are approved (within the ETJ), the Town will require a specific contingency plan specifying how ongoing private operation and maintenance of the plant will be provided, and detailing provisions for assumption of the plant into a public system should the private operation fail.

There have been no package treatment plants approved since 2009.

I.28 Windsor will amend the future land use map, when needed, to reflect any water and/or sewer extension projects.

The future land use map has been amended as necessary.

I.29 Windsor will consult the future land use map when considering the locations of new public facilities and private developments.

The Town has continuously consulted the future land use map when considering public facility locations for private developments.

I.30 The Town will rely on the Division of Water Quality to oversee the operation and management of all package treatment plants in the ETJ, if applicable.

The Town has continued to rely on the NC Division of Water Quality to oversee the operation and management of package treatment plants.

I.31 The Town may pursue the planting of street trees along the US Highway 17 Bypass corridor.

Trees have been planted along the US Highway 17 Bypass.

I.32 Windsor will consider revising the zoning ordinance to provide regulations for frontage roads that require them to be far enough from the highway to accommodate businesses on both sides of the road.

The Town has not revised the zoning ordinance to require frontage roads.

I.33 Windsor will require where reasonably possible the utilization of frontage roads in non-residential development along major state highways.

There have been no new developments large enough to require frontage roads.

I.34 Windsor will consider revising its subdivision ordinance to encourage the development of joint or shared driveways in newly approved subdivisions.

The Town has not revised the subdivision ordinance to require joint or shared driveways.

I.35 Windsor will require the construction of acceleration/deceleration lanes for the entrances to major commercial and residential developments.

There have been no major commercial or residential developments since 2009.

I.36 Windsor will revise the zoning ordinance to require interconnectivity between new developments, including residential, commercial, and redevelopment projects.

The zoning ordinance has not been specifically revised to require interconnectivity between new developments. However, a Unified Development Ordinance was adopted in 2011 which includes specific site plan requirements that allow for interconnectivity to be required during site plan review.

I.37 Windsor will cooperate with the US Army Corps of Engineers in the regulation and enforcement of the 404 wetlands permit process.

The Town has continued to cooperate with the US Army Corps of Engineers.

I.38 The Town will evaluate and revise the Hazard Mitigation Plan. The town will work towards updating its Hazard Mitigation Plan prior to the date of expiration (October 2010).

From 2010-2015, the Town participated in the Bertie County Multi-Jurisdictional Hazard Mitigation Plan. The Town will participate in the preparation of the 2015-2020 Bertie-Hyde-Martin-Tyrrell-Washington Regional Hazard Mitigation Plan.

I.39 Windsor will coordinate all development within the special flood hazard area with the Town's Zoning and Code Enforcement personnel, North Carolina Division of Coastal Management, FEMA, and the US Army Corps of Engineers.

The Town has continued to coordinate zoning/code enforcement with the NC Division of Coastal Management, FEMA, and the US Army Corps of Engineers. The Town is coordinating with the appropriate agencies in developing a disc golf course in the Maple Street area where FEMA funded a buyout project after Hurricane Floyd.

I.40 Windsor will continue to enforce its existing zoning and flood damage prevention regulations found in the town's zoning ordinance.

Windsor has continued to enforce its flood damage prevention regulations.

I.41 Windsor permits redevelopment of previously developed areas, provided the projects comply with all applicable policies, regulations, and ordinances.

Windsor has continued to permit redevelopment projects which comply with applicable policies and regulations.

I.42 Windsor will enforce the density controls in the town's zoning ordinance.

The Town has enforced the density controls included in its zoning ordinance.

I.43 Windsor will utilize the future land use map to assist with controlling the locations and types of development.

The Town has relied on the future land use map to control the locations and types of land use.

I.44 Windsor may develop and distribute a water quality pamphlet that educates the public about their role in protecting water quality.

The Town has not distributed a water quality pamphlet.

I.45 The Town will work with Bertie County to provide a public service announcement on how the public can contribute to protecting water quality.

The Town, in concert with Bertie County, has not provided a public service announcement on how the public can help with protecting water quality.

I.46 Windsor will work with the Roanoke/Cashie River Center to promote and educate citizens about ways to reduce stormwater pollutants.

The Town has continued to support Roanoke/Cashie River Center efforts to educate citizens about reducing stormwater pollutants.

I.47 The Town of Windsor will conserve its surficial groundwater resources by enforcing CAMA and the NC Division of Water Quality stormwater runoff regulations and by coordinating local development activities involving chemical storage or underground storage and installation/abandonment with Bertie County Emergency Management personnel and the NC Division of Water Quality. The Town will plan for an adequate long-range water supply. In the planning process, Windsor will cooperate with adjacent local governments to protect water resources.

The Town has continued to support/enforce state regulations concerning chemical storage or underground storage and installation/abandonment.

I.48 The Town will enforce its zoning ordinance to aid in protecting sensitive shoreline areas. It will rely on state and federal agencies to promote and protect environmentally sensitive areas.

The Town has continued to enforce its zoning ordinance to protect environmentally sensitive areas.

I.49 Windsor will rely on the technical requirements and state program approval for underground storage tanks (40 CFR, Parts 280 and 281), and any subsequent state regulations concerning underground storage tanks adopted during the planning period.

The Town has continued to rely on state regulations for the control of underground storage tanks.

I.50 The Town of Windsor will encourage low impact development techniques.

Windsor has continued to encourage low impact development techniques.

I.51 The Town will work with the US Army Corps of Engineers to coordinate local approval of industrial projects with the "404" permitting process.

The Town has continued to work with the US Army Corps of Engineers to coordinate approvals of industrial projects with the "404" permitting process.

I.52 Windsor will guide development so as to protect historic and potentially historic properties within the Town.

Windsor has continued to consider protection of historic properties during project review and approval.

I.53 Windsor will coordinate all housing code enforcement and/or redevelopment projects with the NC Division of Archives and History, to ensure that any significant architectural details or buildings are identified and preserved.

The Town has continued to coordinate all housing code enforcement activities with the NC Division of Archives and History.

I.54 Windsor will coordinate all Town public works projects with the NC Division of Archives and History, to ensure the identification and preservation of significant archaeological sites.

The Town has continued to coordinate all public works projects with the NC Division of Archives and History.

I.55 The Town of Windsor will work with the Chamber of Commerce and other services to recruit companies to the area.

The Town has continued to support the efforts of the Chamber of Commerce to recruit businesses.

I.56 The Town will continue to support "Downtown Windsor" to study downtown revitalization efforts.

Windsor has continued to support downtown revitalization efforts. The 2011 UDO included multiple zoning changes intended to support revitalization.

I.57 Windsor will support the following in the pursuit of industrial development:

(1) New heavy industrial developments should be located so that there is no adverse effect on the Town's ecosystem and be encouraged in areas where such uses can utilize available infrastructure.

The Town has selected industrially zoned areas to minimize impact on the Town's ecosystem.

(2) Re-zone additional parcels for industrial and commercial use along existing growth corridors with adequate infrastructure existing or planned and, when the need is demonstrated, provide a consistent growth policy with amendments to the future land development map when revision is needed. This will accommodate the future demand for additional industrial and commercial development in suitable areas.

There have been no significant rezonings of property to an industrial classification since 2011.

I.58 The Town of Windsor will develop a comprehensive recreation plan that identifies current facilities and deficiencies.

The Town prepared and adopted the 2013 Parks and Recreation Master Plan which identified current facilities and deficiencies.

I.59 The Town will prioritize park facility needs and apply for Parks and Recreation Trust Fund money to expand upon park facilities.

The Town of Windsor 2013 Parks and Recreation Master Plan prioritized park facility needs.

I.60 The Town of Windsor will consider design and funding sources for upgrading municipal facilities.

The Town has considered the upgrade of municipal facilities on a case-by-case basis.

I.61 The Town will continue to enforce the flood hazard reduction provisions of the Windsor zoning ordinance.

Windsor has continuously enforced the flood hazard reduction provisions of the Town's Unified Development Ordinance.

I.62 The Town will prohibit the installation of underground storage tanks in the 100-year floodplain.

The Town has continued to prohibit the installation of underground storage tanks in the 100-year floodplain.

I.63 Windsor will provide sufficient emergency services to all residents by ensuring the implementation of the following:

(1) Require that all necessary infrastructure firefighting capability/capacity be provided in new subdivisions and developments.

The Town has continued to require necessary infrastructure capability/capacity in all subdivisions.

(2) Continue to maintain an effective signage and addressing system for all streets, roads, and highways.

The Town has continued to maintain an effective signage and addressing system for all roadways.

I.64 Windsor will continue to support state and federal programs that are deemed necessary, cost-effective, and within the administrative and fiscal capabilities of the Town. These include:

(1) Community Development Block Grant Program
(2) Emergency Medical Services
(3) Coastal Area Management Act, including shoreline access funds
(4) Small Business Association
(5) Economic Development Administration Funds
(6) Rural Development/USDA
(7) Federal Emergency Management Program
(8) Parks and Recreation Trust Fund

The Town has continued to support state and federal programs which are within the fiscal and administrative capabilities of the Town.

I.65 Windsor will selectively support state and federal programs related to the Town. The Town, through its boards and committees, will monitor state and federal programs and regulations. It will use opportunities as they are presented to voice support for or to disagree with programs and regulations that are proposed by state and federal agencies.

The Town has continued to support state and federal programs which are within the fiscal and administrative capabilities of the Town.

I.66 Windsor officials will continue to work with the Army Corps of Engineers and any other state and federal agencies to ensure continued dredging and maintenance of river channels as needed to keep these facilities open to navigation.

The Town has continued to work with the US Army Corps of Engineers and other state/federal agencies to ensure dredging and maintenance of river channels.

NOTE: In 2010, the Town adopted a Comprehensive Plan. That plan incorporates the 2009 AEC-related policies by reference. The Town understands that the 2009 Plan is still in effect for consistency review. The Town will coordinate/revise the Comprehensive Plan to fully comply with the new CAMA Land Use Plan guidelines when they are adopted.