NC COASTAL RESOURCES COMMISSION
November 14-16, 2012
Vernon G. James Research & Extension Center
Plymouth, 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.

Wednesday, November 14th

11:00 Field Trip - Sea-level Rise and Drainage Issues in Hyde, Tyrrell & Dare Counties
Leave from Belhaven

Thursday, November 15th

9:00 EXECUTIVE COMMITTEE MEETING (Conference Center) — Bob Emory, Chair

10:00 COMMISSION CALL TO ORDER* (Conference Center) — Bob Emory, Chair
- Roll Call
- Approval of August 29-30 Meeting Minutes
- Executive Secretary's Report *(CRC-12-33)* — Braxton Davis
- Chairman's Comments — Bob Emory

10:30 Drainage Issues Facing Hyde, Tyrrell & Dare Counties
- Unique Challenges Facing Eastern NC Related to Sea-Level Rise and Drainage Issues — Paul Lilly, NCSU Assoc. Prof Emeritus
- Permitting Agricultural Drainage — David Moye
- CRC Discussion of Field Trip and Issue — Bob Emory

12:00 PUBLIC INPUT AND COMMENT — Bob Emory, Chair

12:15 LUNCH

1:30 VARIANCES
- Harbour Village Yacht Club *(CRC-VR-12-08)*Pender County, 30' Buffer — Christine Goebel

2:15 Adaptation Issues and Strategies
- Impact of Water-Level rise on Municipal Infrastructure : Town of Plymouth Perspective — Brian Roth, Mayor Town of Plymouth
- Tailwater Recovery as an Agricultural BMP — Erin Fleckenstein, NC Coastal Federation; Gene Fox, Mattamuskeet Mgmt & Consulting
- Impacts of Rising Water Levels on Wildlife Refuges — USF&W Service

4:00 BREAK

4:15 Legislative Update
- H819 Legislative Studies Status - *(CRC-12-40)* — Braxton Davis
  - Cape Fear River AEC Study
  - Inlet Hazard Areas Study
  - Sea-Level Rise Study
  - Science Panel Update

5:00 PUBLIC HEARING — Bob Emory, Chair
- 15A NCAC 7H .0308(a)(2) &15A NCAC 7H .1705 and Fiscal Analysis – Sandbags

RECESS

6:00 Reception for recipients of the Walter B. Jones Memorial Award for Coastal and Ocean Resource Management (Vernon James Center)

Friday, November 16th

8:00 Coastal Resources Advisory Council – Breakfast Meeting (Hotel Lobby)

9:00 COMMISSION CALL TO ORDER* (Conference Center) — Bob Emory, Chair

Estuarine Shoreline Stabilization

- Evaluating the Effects of Shoreline Stabilization on Fish Habitat Function and Erosion of Estuarine Shorelines in NC *(CRC-12-34)* — Rachel Gittman, UNC
- Sustainable Estuarine Shoreline Stabilization: Research, Education and Public Policy in NC — John Fear
- DENR Living Shorelines Strategy & Modification of Sill GP *(CRC-12-35)* — Daniel Govoni

11:00 BREAK

ACTION ITEMS

11:15 Land Use Plan Certifications and Amendments — John Thayer

- Brunswick County LUP Amendment Certification *(CRC-12-41)*
- Planning Program Review Strategy and Activities *(CRC-12-42)* — John Thayer

11:45 CRC Rule Development

- Amendments to 15A NCAC 7I .0401 & .0406 and Fiscal Analysis – Minor Permit Program *(CRC-12-36)* — Mike Lopazanski
- Public Comment Summary15A NCAC 7H .0304(1)(a) AECs Within Ocean Hazard Areas –Erosion Rates *(CRC-12-37)* — Ken Richardson
- Public Comment Summary and Adoption of **Temporary Rules** 15A NCAC 7H .0306 – Replacement of Single Family or Duplex Residential Dwellings *(CRC-12-38)* — Mike Lopazanski
- Approve 15A NCAC 7H .0306 and Fiscal Analysis – Replacement of Single Family or Duplex Residential Dwellings for Public Hearing – **Permanent Rule** *(CRC-12-39)* — Mike Lopazanski

OLD/NEW BUSINESS — Bob Emory, Chair

12:30 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. The commission will proceed through the agenda until completed.*

NC COASTAL RESOURCES COMMISSION (CRC)

August 29-30, 2012
Sea Trail Convention Center
Sunset Beach, NC

Present CRC Members
Bob Emory, Chair
Joan Weld, Vice Chair

Lee Wynns
Pat Joyce
David Webster
Jerry Old
Bill Peele
Melvin Shepard
Ed Mitchell
Jamin Simmons
Joseph Hester

Present CRAC Members
Randell Woodruff
Bob Shupe
Tim Tabak
Ray Sturza
Dave Weaver
Steve Myers
Missy Baskervill
Bill Morrison
Wayne Howell
J. Michael Moore
Debbie Smith
Bert Banks
Judy Hills
Tracy Skrabal
Spencer Rogers
Vernon Cox
Mark Zeigler (for Lee Padrick)
Anne Deaton
Boyd Devane
Phil Harris
Harry Simmons

Present Attorney General's Office Members
Mary Lucasse
Christine Goebel

CALL TO ORDER/ROLL CALL

Bob Emory called the meeting to order reminding the Commissioners of the need to state any conflicts due to Executive Order Number One and also 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. No conflicts were reported. Renee Cahoon, Charles Elam, and Veronica Carter were absent. Based upon this roll call, Chairman Emory declared a quorum.

Joseph Hester read his Evaluation of Statement of Economic Interest from the State Ethics Commission which indicated they did not find an actual conflict, but did find the potential for a conflict of interest. The potential conflict identified does not prohibit service.

MINUTES

Melvin Shepard made a motion to approve the minutes of the June 20-21, 2012 Coastal Resources Commission meeting and the June 21, 2012 closed session minutes. David Webster seconded the motion. The motion passed with nine votes in favor (Weld, Wynns, Joyce, Webster, Old, Peele, Shepard, Mitchell, Simmons) and one abstention (Hester).

EXECUTIVE SECRETARY'S REPORT

DCM Director Braxton Davis gave the following report.

It is good to see you all again and to welcome Commissioner Hester. I look forward to meeting with you soon to discuss our program. In your information packets you will find a DCM Update Memo. As you will recall, we have begun providing this as a standard part of your packets to provide a little more detail on ongoing activities at DCM in terms of permitting, enforcement, rule development, planning and Coastal Reserve activities. Some notable items include our prioritization of funding for beach and shoreline public access projects totaling $1.3 million in 13 of North Carolina's coastal communities; and a recent CAMA workshop for coastal surveyors conducted by the Reserve Program's Coastal Training Program that we think was very well received. I hope everyone here is also on our email list for our CAMAgram newsletter, which has a new format and will go out quarterly with program updates. If you are not please let me or Michele Walker know.

For today's agenda, we worked with the Executive Committee to address several important program areas. We will hear from Ray Sturza on the progress being made by the CRAC on understanding and improving public shoreline access in North Carolina. I will run through H819, SL 2012-202, which became law in August and how we are beginning to think about implementation of the various studies that are required by the bill. I'll also hand off to Robin Smith, Assistant Secretary of DENR, to discuss a few other recent bills and executive orders that are relevant to the CRC. You will hear from Commissioner Wynns on the outcomes of the Ocean Hazards Committee meeting yesterday afternoon, with a focus on sandbag enforcement priorities and moving forward with rule changes the CRC approved for public hearing last year. As you will recall from the last meeting, the Estuarine and Ocean Systems Committee met to discuss the draft SLR policy before reconsidering its release for public hearings. We heard a report from Commissioner Peele, who chairs that Committee, on the results of their discussions and today you'll have the draft policy before you for potential release to public hearings as an action item. But first, you'll hear from Tancred Miller from our staff about the kinds of activities DCM envisions undertaking, leading, or partnering on in response to the policy if it is eventually adopted. John Thayer will describe final recommendations from the 7B Land Use Planning Guidelines Review Committee and next steps that DCM would like to take in reviewing our LUP planning program over the coming year. Mike Lopazanski will provide an update on our Department-level initiative to advance "living shorelines," including marsh sills, which I described briefly at your last meeting. There are several action items before you related to temporary rules and consideration of the SLR policy and related fiscal analysis; approval of the 2012 Coastal Habitat Protection Plan's Annual Report, which will be presented by Jimmy Johnson; and several LUP certifications and amendments.

CHAIRMAN'S COMMENTS

Bob Emory said he has been asked by several Commissioners about the status of reappointments. There is no news from the Governor's Office on reappointments. After the last meeting there was a flurry of sea-level rise related activity. Braxton and I have met with a couple of interested parties.

CRAC REPORT

Ray Sturza, CRAC Chair, stated the CRAC has been focusing on public access issues over the last few months primarily in an attempt to gather some data about what the conditions are in terms of access. We have gathered a lot of information and found that we have a vibrant and successful coastal resource access program. The summary of all of these meetings has served to open some people's eyes about it. The CRAC heard from Ken Richardson who discussed the information that is available on the DCM website for various coastal access locations. We think it is a medium that will serve as a great source of information. We also summarized the related access issues that have come up as a result of looking at estuarine, ocean and marine related access locations and identified that there are conflict issues that arise with the principal of making public access available. In some locations we have found that there are conflicts when there is no fee or renumeration and there is an adjacent private entity that has access facilities available and then we are competing with those who operate for profit. That is an issue we will try to get into to find a way to resolve this unanticipated conflict. The CRAC came to agreement that we will use the 20 local government and 7 coastal cities representatives on the CRAC to poll the local governments in the coastal area and see who would be interested in some regional workshops to be conducted by our staff. The goal of the workshops will be to identify where the access is and try and resolve the conflict that we uncovered. The bigger goal is to aggregate what we think is available data in communities that have been working to establish local shoreline restoration or beach nourishment and put a value on our access facilities in order to defend, if not advocate, the access program. We feel it has great benefits, not just to the 20 coastal counties, but also to the other 80 counties in NC and in other states that use the facilities. We were also reminded by one of our members that there are legislative efforts adrift to try to revise the composition and organization of the Coastal Resources Advisory Council and the Coastal Resources Commission.

PRESENTATIONS

Legislative Update – H819 Coastal Management Policies
Braxton Davis

Braxton Davis stated H819 is composed of five sections. The first section defines the coastal area. This is the first time that the 20 coastal counties that define the North Carolina coastal zone have been codified. They were previously laid out through an Executive Order. The second section talks about sea-level rise policy. The Act says that the CRC and DCM shall be the only state agency authorized to define rates of sea-level change for regulatory purposes. The CRC cannot proceed to define a rate of sea-level rise for regulatory purposes until after July 1, 2016. The Act directs the Commission to direct the Science Panel to deliver a five year updated assessment report no later than March 31, 2015. This updated assessment report was already planned. The Act requires that the report include a comprehensive literature review. It asks the Science Panel to clearly define its assumptions and uncertainties and to make its report available for public comment. The CRC is asked to further evaluate the use of predictive models in assessing sea-level change and to look at regional rates of change. The Act also asks the Commission to look at the economic and environmental costs and benefits of any sea-level rise regulations. Using the timelines that are laid out in the Act, the Science Panel Assessment Report would be due March 31, 2015. DCM will ask the Science Panel to work with us to come up with a draft by late summer 2014. This will allow some time for technical review and amendments the Science Panel may want to make based on comments received. The CRC could then seek written comments upon receipt of the report for a ninety day period and could hold a public hearing during its May/June 2015 meeting. The Commission is required to submit a report including the Science Panel's Assessment for public

comment by December 31, 2015. All of the reports, policies, and comments must be delivered to the General Assembly's Environmental Review Commission by March 2016.

Section three of the Act looks at ocean setbacks. It creates a grandfathering provision. It says that the Commission shall not deny permits for replacement of single-family residential or duplex structures greater than 5,000 square feet based on the failure to meet the ocean setback if it was constructed prior to August 11, 2009, does not exceed the original square footage or footprint, and meets the minimum setback under 7H .0306(a)(2)(A). If it cannot meet the current setback the replacement shall be rebuilt as far landward on the lot as possible. The Act requires the Commission to adopt temporary rules until permanent rules become effective. We could have the permanent rule finalized by spring 2013.

Section four of the Act requests the Commission study the feasibility of creating a new AEC for lands adjacent to the mouth of the Cape Fear River. The Act asks the Commission to consider the unique coastal morphologies and hydrographic conditions in that region and to collaborate with the Town of Caswell Beach and the Village of Bald Head Island as well as land owners in the area in making this determination. If the CRC deems an action is necessary then it asks the CRC to eliminate overlapping AECs in that region and to incorporate the appropriate development standards in a single, unique AEC for this subregion. A report on this is due to the Secretary of the Department, the Governor and the General Assembly by December 31, 2013. There is already a formal AEC designation process that is laid out in CAMA as well as the related CRC rules 7H .0503. Staff and the Chair will meet with local officials in the region before the next Commission meeting to discuss the process for developing this report and assessment. We will lay out the timeline for meetings over the next year, develop a process for public engagement, and discuss roles and responsibilities and considerations for the final report.

Section five of the Act asks the CRC to determine the feasibility of eliminating the inlet hazard AEC and incorporating appropriate development standards adjacent to the State's developed inlets. The Act asks the CRC to consider eliminating the inlet hazard boxes that have been under consideration and developing tailored shoreline management strategies including erosion rates, setback factors and development standards. The CRC should take into account historical and ongoing dredging, beach fill and engineered structures. The CRC should also collaborate with local governments and landowners to identify regulatory concerns and develop strategies to address the concerns. This report is due to the Secretary of the Department, Governor and General Assembly by January 31, 2015. A Science Panel meeting will be scheduled on the inlet hazard area discussions. The Science Panel will be asked to evaluate various models for determining long-term erosion rates for inlets, evaluate implications of historical and ongoing engineering, and to propose the most scientifically defensible method for determining erosion hazards. We anticipate a technical review and public engagement by January 2014. Regional workshops will also be held with stakeholders to discuss regulatory issues and concerns in the Act that we need to address. The final report would outline proposed changes by July 2014 and then go out for public comment.

LEGISLATIVE UPDATE

Robin Smith, DENR Assistant Secretary, stated most of the legislative changes to coastal issues are included in H819. There are other studies and reporting requirements that applied to all of DENR's permitting and enforcement programs. Coastal Management will be participating in some other studies and reports on permit processing times, inspections and how we provide notice of inspections. We will be sending an overview of environmental legislative actions that will be provided to CRC/CRAC through the Director.

A reduction of almost two percent was taken out of the Department's budget. During the 2011-2012 biennium, DENR will have taken a total budget cut of about 14.5% over the two year period. If you look back to January 1, 2009, we are edging up toward a 40% reduction that includes special funds. This has had a a significant impact on our programs. Our goal is to be sure that as we implement these budget cuts we protect the core programs in the Department. We have largely been able to do that. The one area this year where we took a significant cut beyond the 2% that affected a core environmental protection program was a targeted staff reduction in the sedimentation program. This cut resulted in a reduction of 10% of staff. We will look at rebuilding this program as things start to turn around.

Governor Perdue issued Executive Order 124 that addresses protecting military installations by ensuring the compatibility of State action with military needs. For a number of years now, our Department has been looking at ways that we can use our non-regulatory capacity to help the military bases maintain their functionality. One of their big concerns is encroachment on their activities by non-military incompatible land uses (i.e. noise from low flying aircraft and residential neighborhoods). We could use our land conservation program and land acquisition program to help protect a natural area as well as buffer military activities. This led to the recent release of a Land Compatibility Analysis. The Governor's Executive Order is picking up on that report to remind the state agencies to be aware of what the military's needs are and to keep the information flowing back and forth between the state agencies and the military.

OCEAN HAZARDS COMMITTEE REPORT

Lee Wynns stated the Ocean Hazards Subcommittee received an overview of the sandbag enforcement activities that are taking place from Ted Tyndall. Mr. Tyndall advised the subcommittee that sandbags are a moving target since there are nourishment and realignment projects happening that change our evaluation of the existing sandbags. Mike Lopazanski reviewed proposed amendments that have been before us for awhile, but were put on hold. The proposed rule amendments include the length of time that sandbags can remain as well as eliminating the limitation requiring sandbags only be used one-time per property. A motion was made to ask the CRC to reaffirm the approval to take the amendments to public hearing.

Melvin Shepard made a motion to re-affirm sending 7H .0308 and 7H .1705 to public hearing. Bill Peele seconded the motion. The motion passed with seven votes in favor (Joyce, Old, Shepard, Peele, Wynns, Simmons, Mitchell), two opposed (Weld, Webster) and one abstention (Hester).

PRESENTATIONS

Land Use Planning Process

7B Guidelines Review Committee Recommendations (CRC 12-23)
John Thayer

John Thayer stated that in 2010 the CRC established a subcommittee group to review the 7B rules based on a section in CAMA that requires review of the guidelines every five years. We have not reviewed the 2002 guidelines since they were updated. The committee met several times and came

up with recommendations and comments. These recommendations have not yet been discussed with local governments or other interest groups.

The first recommendation is to take the recommendations out for review by local governments before the CRC considers formal rulemaking. The second recommendation is that the primary goal should be clarification of existing rules and plans. It was also recognized that the technical manual should be updated to ensure that the local governments have examples of how to meet any new rules. The committee felt that it was important that local governments update their land use plans periodically. Possible requirements relative to the frequency were discussed; however there was no resolution within the committee. The current rules require that everyone had to update local land use plans to meet the new rules within six years. The rules are silent on updating the plans after that. It is recommended that the Division develop guidance for local governments as to how to update portions of their land use plans without having to overhaul the entire document. The final recommendation is there is a need to develop an assessment related to using local policies for federal consistency. One of our meetings included a conference call with OCRM officials about this issue. The conclusion of that was that ideally we could include within the plan requirements that the local government look at the issue of when their local policy is suitable for use for federal consistency determinations. OCRM has a very narrow focus about what policy is suitable for acceptance and it has to be an enforceable statement. DCM will be talking to local governments to discuss their planning needs in the spring of 2013. The focus will be how we can help local governments more broadly. We will then come back to the CRC to discuss the best way to move forward.

PUBLIC HEARINGS

15A NCAC 07H .0304 AECs Within Ocean Hazard Areas – Erosion Rates
15A NCAC 07H .0304 Fiscal Note

No public comments were received.

PUBLIC INPUT AND COMMENT

No comments were received.

PRESENTATIONS

Discussion of Potential DCM Sea-Level Rise Activities
Tancred Miller

Tancred Miller reviewed the handout describing the types of things we may pursue under the draft sea-level rise policy. There are two broad categories. The first type of activity is to support the communication and dissemination of research efforts, which includes some items set forth in H819. The next broad category is fulfilling a supportive role and getting the information out to local governments to let them know the status of the science, to share what we learn about sea-level rise, and educate them about what resources are available. Since H819 has passed and is now Session Law we have examined it and do not find any conflicts with the intent of that Bill and with pursuing the policy and moving forward with these types of activities.

Estuarine Shoreline Stabilization – DENR Action Plan (CRC 12-24)
Mike Lopazanski

Mike Lopazanski stated this will provide you with an update on the progress we have made in promoting alternatives to vertical stabilization. We assembled all of the agencies to talk about marsh sills and where they stood in terms of the General Permit and the issues and concerns that revolved around the permitting of marsh sills. We have updated the CRC in past meetings on progress we have made in meeting those concerns. At the last meeting you heard about an initiative that the Directors of Marine Fisheries and Coastal Management put together to promote the use of marsh sills and living shorelines in general. A part of the strategy centered on DCM's General Permit. The effort was to streamline some of the conditions on the permit to make it a more useable permit. We also talked about ways we have been using outreach and awareness efforts to reach property owners and marine contactors. The strategy also looked at ways to incorporate financial incentives to bring these stabilization measures within reach of property owners. It was also acknowledged that there were additional concerns with the use of these structures. Some additional research is needed. Now that we know how much shoreline we have, through our mapping efforts, we also know where stabilization measures are being used. DCM and DMF worked together to put this strategy at the Department level and put together an inter-agency workgroup to look at what more we can do to implement this strategy.

When the GP was first put together it required coordination by Marine Fisheries, Water Quality, State Property Office, and the Army Corps of Engineers. We have been able to eliminate some of the specific conditions that required their review of individual projects. Marine Fisheries no longer needs to be involved in the review of a project issued under this GP. Under the new General Water Quality Certification, DWQ no longer needs to be involved in projects that are completed in accordance with the GP. There are still issues with the Army Corps of Engineers. They are reluctant to go along with our GP for marsh sills. We have arranged some meetings with the Corps to look at what their concerns are relative to the GP and see if some commonalities can be found between what we would like to accomplish and what they will allow. The Corps has been working with us through their programmatic general permit that is issued in conjunction with our Major Permit.

For the education and outreach part of the strategy we have continued to use materials we already use in public awareness efforts. We have conducted living shoreline workshops with marine contractors as well as property owners. Through our interagency workgroup we have looked for ways to conduct more outreach. Financial incentives will take a little bit more work. A year or two ago we made some progress in working with the Community Conservation Assistance Program. Marsh sills have been added to their program as a BMP that is eligible for cost sharing. It is not available in all counties depending on whether the county participates in the Community Conservation Assistance Program. We are looking at why some counties aren't participating and if there is a way to promote it through our advocacy. We also want to look at a way of addressing the costs of marsh sills. They are an expensive proposal for individual property owners. We will continue to do our mapping, monitoring and research efforts related to marsh sills. We want to look at the efficacy of these structures and how they perform in storms. We have some ongoing research projects that are wrapping up and we will provide the results at a future meeting. We have completed the estuarine shoreline mapping and now we are going to do some detailed analysis. We will be engaging other agencies within the Department to get their ideas on further implementing the broader goals associated with the strategy for living shorelines. We want to develop some longer term needs, particularly additional research that might be necessary for us to know the

impacts and effects of utilizing marsh sills and what are some of the impacts of vertical stabilization methods. We will try to develop a DENR strategy that is approved by the Department with some specific near-term activities and actions and bring that back to the CRC to show a commitment to promoting this idea.

ACTION ITEMS

Temporary Rules 15A NCAC 07H .0306
Replacement of Single Family or Duplex Residential Dwellings (CRC 12-25)
Mike Lopazanski

Mike Lopazanski stated during the last Legislative session H819 directed the CRC to take certain actions and among them was a modification to setback provisions that the CRC adopted in 2009 that pertained to single-family and duplex residential structures greater than 5,000 square feet. The legislation that was passed into law allows the replacement of such structures that cannot comply with the current setback factors for structures of that size.

The old setback factors had provisions that made a distinction between large and small structures. Small structures are less than 5,000 square feet. That determined what setback factors were used in combination with the erosion rates to determine how far from the first line of stable, natural vegetation the development needed to be sited. If a structure was considered a residential dwelling then it didn't matter how big it was and the small structure setback applied. In 2008, the CRC altered the rule to require that oceanfront setbacks be based only on structure size and not on use. In adopting this policy, the CRC also adopted the graduated setback factors that we use today.

This legislation creates an exception for single-family or duplex residential structures greater than 5,000 square feet. The replacement of these structures is now allowed if the structure was constructed prior to August 11, 2009; the structure does not exceed the original footprint or square footage; it can meet the minimum setback, it can't meet the current setback provisions, and if it is rebuilt as far landward on the lot as feasible. The legislation also directs the Commission not to deny any permits for the replacement of these structures. The law directs the CRC to adopt temporary rules that are consistent with the Session Law. If the CRC approves the temporary rules for public hearing today then we will hold a public hearing at the Morehead City office in October. The CRC could then adopt the temporary rule at the November meeting and the rule will be in effect in December. We will then begin the permanent rulemaking process and the permanent rule will be ready for the CRC to send to public hearing in November.

David Webster made a motion to send 15A NCAC 07H .0306 temporary rule to public hearing. Jerry Old seconded the motion. The motion passed with eight votes in favor (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Hester) and one abstention (Webster) (Mitchell absent for vote).

Draft 15A NCAC 07M .1300 Sea-Level Rise Policy and Fiscal Analysis (CRC 12-26)
Tancred Miller

Tancred Miller stated we reviewed the draft policy in June and the subcommittee had a couple of minor edits that are included. Following that meeting there were discussions with the Chairman and Staff about a couple of other items. The first was in the Declaration of Policy section to make the

language read more fluidly. The second change was in the Definitions section to the definition of "planned adaptation".

DCM's view on the fiscal analysis is that the fundamental premise of a non-regulatory policy is that there is no fiscal impact to the public, agencies, or local governments. This is meant to be an advisory, educational and research statement. There is no fiscal impact to anyone that would be affected by this policy.

Melvin Shepard made a motion to send 15A NCAC 07M .1300 and fiscal analysis to public hearing. David Webster seconded the motion. The motion passed unanimously (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster, Hester) (Mitchell absent for vote).

Approval of 2012 CHPP Annual Report (CRC 12-28)
Jimmy Johnson

Jimmy Johnson stated every year the Department is required by Statute to present an annual report on the Coastal Habitat Protection Plan. You have the report for this year. Each of the four Commissions involved in the Steering Committee have been asked to endorse the report. The format of the report has not changed over the years. This year DCM has put a lot of their focus on education and utilizing the Reserve program. There is one change. A sentence was added at the request of one of our partners on page 5 under Goal Number 2. We have added a second sentence that says, "the Strategic Habitat Area designations were completed in partnership with NC Sea Grant and DMF shared Marine Fisheries Management Fellow". We added this at the request of Sea Grant who is our partner in this effort. This report gets to the General Assembly through the Department. I am seeking an endorsement of the annual report and a recommendation that we forward the annual report to the General Assembly.

Joan Weld made a motion to approve the CHPP 2011-2012 Annual Report. Jerry Old seconded the motion. The motion passed unanimously (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster, Hester) (Mitchell absent for vote).

Land Use Plan Certifications and Amendments
John Thayer stated there are two Land Use Plans for certification and five for amendment.

Southern Shores LUP: The Southern Shores LUP was adopted on July 18 and this is the first full land use plan that the town of Southern Shores has had. The previous certified document was a sketch plan under the 1995 rules. Staff has no issues with the request and recommends that the CRC certify the plan. There are no substantive issues with the rules or conflicts with state or federal policy.

Town of Southern Shores LUP Certification (CRC 12-29)
Jerry Old made a motion to certify the Southern Shores Land Use Plan. Pat Joyce seconded the motion. The motion passed with eight votes in favor (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster) and one abstention (Hester) (Mitchell absent for vote).

Pender County LUP: The Pender County plan was certified in 2006 and it is a comprehensive update of the plan. Staff advised the Commission that Pender County received the Coastal Federation's Pelican Award recently in recognition of the County's efforts. There have been no comments on the County's adoption of the plan and staff recommends certification with the determination that it has met the substantive requirements of the 7B guidelines and that there are no conflicts with state or federal rules.

Pender County LUP Update Certification (CRC 12-30)
Jerry Old made a motion to certify the Pender County Land Use Plan. Joan Weld seconded the motion. The motion passed with eight votes in favor (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster) and one abstention (Hester) (Mitchell absent for vote).

Second Amendment to Town of Swansboro's LUP: The Town of Swansboro's plan was originally certified in November 2009. This is the second amendment to the plan. This amendment was adopted by the Town on June 19 and changes the future land use map. Staff recommends certification and has determined that it meets the substantive requirements of the 7B guidelines and that there are no conflicts with state or federal rules.

Town of Swansboro LUP Amendment Certification (CRC 12-31)
Bill Peele made a motion to certify the Town of Swansboro Land Use Plan amendment. Pat Joyce seconded the motion. The motion passed with eight votes in favor (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster) and one abstention (Hester) (Mitchell absent for vote).

First Amendment to City of Jacksonville's LUP: The City of Jacksonville's plan was certified in August 2011. This is the first amendment to that plan. This amendment recognizes annexations that have occurred since that time and some changing development trends. There are also changes to the future land use plan map. Staff recommends certification with the finding that it has met the substantive requirements of the 7B guidelines and that there are no conflicts with state or federal law.

City of Jacksonville LUP Amendment Certification (CRC 12-32)
Jamin Simmons made a motion to certify the City of Jacksonville's Land Use Plan amendment. Melvin Shepard seconded the motion. The motion passed with eight votes in favor (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster) and one abstention (Hester) (Mitchell absent for vote).

First Amendment to Camden County LUP: The Camden County Land Use Plan was certified in June 2005. The amendments are principally to the future land use plan map. Staff has reviewed the proposal and recommends certification based on the finding that it has met the substantive requirements of the 7B guidelines and there are no apparent conflicts with state or federal rules.

Camden County LUP Amendment Certification (CRC 12-33)
Jerry Old made a motion to certify the Camden County Land Use Plan amendment. Jamin Simmons seconded the motion. The motion passed with eight votes (Joyce, Old, Shepard, Weld, Peele, Wynns, Simmons, Webster) and one abstention (Hester) (Mitchell absent for vote).

OLD/NEW BUSINESS

Nominations Committee – CRC Appointed Advisory Council Representatives
Bob Emory

Mike Lopazanski stated the CRC appoints the coastal cities, marine science/technology, and local health director representatives to the CRAC. There are slots for representatives from eight coastal cities, three representatives with marine science/technology background and one slot reserved for a local health director. These representatives are appointed for two-year terms or for four-year terms with good attendance. It is time to do the reappointments. A nominations committee needs to be formed to solicit nominations from local governments to fill these slots. The nominations committee will then make a recommendation to the CRC for consideration. Chairman Emory selected Anne Deaton, Tim Tabak, Ed Mitchell, and Renee Cahoon to serve on the CRAC nominations committee.

Joan Weld requested an update of the status of applications for terminal groins. Braxton Davis stated we have already commented on Figure Eight Island's draft EIS and the Corps is currently compiling comments. Bald Head Island has a project review team that will be holding their second meeting. Ocean Isle Beach has hired a third party consultant and will hold its first project review team meeting with the next few weeks. Holden Beach has a project review team and is just getting into the process.

Braxton Davis stated that discussions are underway with Commissioners Simmons and Peele to plan the next CRC meeting, including a field trip.

With no further business, the CRC adjourned.

Respectfully submitted,

Braxton Davis, Executive Secretary

Angela Willis, Recording Secretary

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

CRC 12-33

November 14, 2012

MEMORANDUM

TO: Coastal Resources Commission

FROM: Braxton Davis

SUBJECT: DCM Update

Regulatory Update

For the third quarter of the year, the Division processed 42 major permit actions (39 new permits, 2 major modifications and 1 denial) with an average processing time of 75.1 days. In addition, regulatory staff from the four district offices issued 407 general permits and 41 minor permits. Through the Local Permitting Officer (LPO) program, local governments issued another 168 minor permits. Emergency General Permit (7H.2500), which was activated in August 2011 in response to damage caused by Hurricane Irene, expired on August 29, 2012. All work authorized by the General Permit was also to cease on August 29, 2012. However, in an effort to aid property owners who have experienced various unavoidable construction delays, on September 13, 2012 DENR Secretary Dee Freeman directed DCM staff to honor all project approvals issued prior to the expiration of the Emergency General Permit for an additional 120 days, resulting in a new construction completion date of December 27th, 2012. With the expiration of the Emergency General Permit, which did not require the payment of an application fee, staff anticipates that permit receipts should increase to pre-hurricane levels.

Notable permitting actions: On September 19, 2012, the Division issued a Major Permit to the N.C. Department of Transportation authorizing the replacement of the Bonner Bridge across Oregon Inlet in Dare County. The permit was processed in 63 days. On October 8th, 2012, the Southern Environmental Law Center, acting on behalf of the Defenders of Wildlife and National Wildlife Refuge Association, appealed the issuance of the CAMA permit. On October 23rd, 2012, Chairman Emory determined that the petitioners did not meet the statutory requirements for a "third party" appeal set forth in the Coastal Area Management Act, and therefore denied their request for a hearing by the Office of Administrative Hearings.

Compliance and enforcement update: DCM continues its contract with the NC Division of Marine Fisheries Marine Patrol to provide routine aerial monitoring flights. Bi-monthly monitoring flights are conducted by DCM regulatory staff to search for unauthorized development, dredge and fill violations, and to monitor permitted development projects. Flights for this period began on July 1, 2012. As of September 30, 2012, staff had flown nearly 14 hours under the new contract.

Policy and Planning

Program Administration

Policy and Regulatory staff have been working on a revision to the Ocean Resources Strategy section of the Division's five-year strategic plan. The revision is associated with the development of a NC Coastal Atlas. An increasing number of states are developing web-based "atlas" tools to help integrate and visualize spatial data related to coastal and ocean resources. Resource management and permitting agencies experience inefficiencies by not having access to a common, centralized, geo-referenced data portal for decision-making and public service. By assembling resource and permitting data routinely used by these agencies into a common, shared interface, agencies can expect to see improvements in coordination and a more streamlined business environment.

BIMP Implementation

The Division has been focusing on a BIMP recommendation for regional approaches to beach and inlet management projects. The intent is to develop a framework for regional planning and permitting of shoreline projects. Staff has met with the Carteret County Shore Protection Office to gain a better understanding of needs, activities and strategies for the Bogue Banks Master Nourishment Plan and programmatic EIS. The Bogue Banks project may serve as a model that can be applied to other areas of the coast.

Rule Development

Policy staff has continued to work with the Department and the Office of State Budget and Management with several rules approved by the Commission for public hearing:

- 15A NCAC 7H .0308(a)(2) & 7H .1705 – Sandbags: Approved by OSBM. Public Hearing scheduled for November 15, 2012 in Plymouth.
- 15A NCAC 7H .0304 – Erosion Rates: Approved by OSBM. Public hearings concluded. Recommended for adoption at the November 16th CRC meeting in Plymouth.
- 15A NCAC 7H.0304 – OEA, Mad Inlet, Unvegetated Beach Designation – Fiscal analysis in development.
- 15A NCAC 7H .0312 – Sediment Criteria: Fiscal Analysis in development.
- 15A NCAC 7M .1300 Sea-Level Rise Policy – Proposed for public hearing. Fiscal analysis approved by DENR.
- 15A NCAC 7H .0306(a)(2) General Use Standards for Ocean Hazard Areas (Temporary Rule)– Grandfather provision for single-family and duplex residential structures. Public Hearing held October 17, 2012 in Morehead City. Recommended for adoption at the November 15, 2012 CRC meeting in Plymouth.
- 15A NCAC 7H .0306(a)(2) General Use Standards for Ocean Hazard Areas (Permanent Rule) – Fiscal analysis approved by DENR. Recommended for public hearing.
- 15A NCAC 7I .0401 & .0406 – Amendments to Minor Permit Program. To be considered at the November 16, 2012 CRC meeting in Plymouth.

Land Use Planning/Public Access

Staff continued work on an internal assessment of CAMA Land Use Plans, focusing on each plan's defined goals and objectives, policies and implementation, inter-organizational coordination, tools and strategies. The assessment will also address issues critical to NOAA's goals (coastal habitats, water quality, coastal dependent uses and community development, public access, and decision making). Findings from this effort will contribute to the "listening sessions," as it will also touch on issues related to local government planning needs and CAMA LUP administration (amendments and updates). Staff are currently developing a proposed format and schedule for the listening sessions.

DCM Planners recently attended the North Carolina Planning Association Conference in Wilmington in late September, where John Thayer participated on a panel titled "Meeting the Climate Change Adaptation Challenge" and Charlan Owens spoke on a panel titled "Addressing 21st Century Regulatory Challenges in NC Coastal Communities." DCM Planning staff also assisted in the facilitation of a regional planning exercise as part of the PlanEast efforts; and a regional stakeholder meeting in Wilmington regarding the "North Carolina Statewide Pedestrian and Bicycle Plan (WalkBikeNC)."

Estuarine Shoreline Mapping
The Division has executed a contract with East Carolina University to conduct an in depth analysis of the digitized estuarine shoreline. The intention of this analysis is to aid discussions of the CRC, and for a variety of educational and research purposes. Input and suggestions solicited from other agencies has been incorporated into the project with ECU. DCM is also developing a plan to update the estuarine shoreline structures inventory to include data from 2012 aerial photography.

DENR Living Shoreline Strategy
The Division of Coastal Management (DCM) is planning a meeting with DENR agencies to develop a Draft Living Shorelines Implementation Strategy. The Draft Strategy will summarize previous and ongoing marsh sill research in the state, identify information gaps, highlight the need for continued education and outreach, and investigate potential financial incentives. It will also list DENR goals and objectives for promoting marsh sills or other alternative shoreline stabilization methods. The goal of the meeting is to develop a series of short-term and long-term actions to guide DENR's advancement of marsh sills, and to create a clear "starting point" for engagement with outside partners and stakeholders on this issue.

Coastal Reserve Program

The N.C. Coastal Reserve and National Estuarine Research Reserve updated the membership of existing and created three new Local Advisory Committees to inform management of the ten reserve sites. The Local Advisory Committees function as advisory groups, providing feedback and recommendations to staff on site management, research, and education activities, and reviewing policies and implementation strategies. Each Committee met once during October 29-November 8, 2012; committee membership and minutes are available on the reserve's website (www.nccoastalreserve.net).

The Coastal Training Program will host "Low Impact Development Basics for Water Quality Protection Workshop for Realtors" on November 2 in Beaufort. The goal of this workshop is to introduce realtors to the interconnectedness of land use choices and water quality. Participants will learn about the major pollutants that degrade water quality; sources of these pollutants; and methods to prevent this degradation, including stormwater management practices and low impact development (LID). The workshop will be hosted again on February 12, 2013.

The N.C. Sentinel Site Cooperative was established in 2012 as part of a NOAA-wide effort to provide coastal communities and resource managers with information on the potential impacts of sea level rise on coastal habitats focusing on the central North Carolina coast, including Beaufort Inlet and its environs. The N.C. Sentinel Site Cooperative recently submitted its draft implementation plan to NOAA; policy and reserve staff from the Division contributed significantly to the plan. Next steps include gathering input from partners on the draft implementation plan and hosting a research and monitoring workshop to learn more about available data and data needs in the region.

STATE OF NORTH CAROLINA
DEPARTMENT OF JUSTICE

ROY COOPER
ATTORNEY GENERAL

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REPLY TO: CHRISTINE A. GOEBEL
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TO: The Coastal Resources Commission

FROM: Christine A. Goebel, Assistant Attorney General

DATE: October 31, 2012 (for the November 14-16, 2012 CRC Meeting)

RE: **Variance Request by Harbour Village Yacht Club, Inc. (12-08)**

Petitioner is a corporation which owns property adjacent to Topsail Sound in Hampstead, Pender County, North Carolina. On August 6, 2012, the CAMA Local Permit Officer (LPO) for Pender County denied Petitioner's CAMA minor permit application for an 8-foot by 16-foot extension to Petitioner's existing 192 square foot deck within the 30-foot buffer, as the proposed addition would exceed the 200 square-foot deck allowance within the 30-foot buffer rule found at 15A NCAC 7H.0209(d)(10)(F). On August 23, 2012, DCM received Petitioner's variance petition prepared by counsel, seeking a variance to the 30-foot buffer rule to allow the increased deck area as proposed in its permit application.

The following additional information is attached to this memorandum:

Attachment A: Relevant Rules
Attachment B: Stipulated Facts & List of Stipulated Exhibits
Attachment C: Petitioner's Positions and Staff's Responses to Criteria
Attachment D: Petitioner's Variance Request Materials
Attachment E: Stipulated Exhibits

cc(w/attachments): Ray C. Blackburn, Jr. Counsel for Petitioner, electronically
Mary L. Lucasse, CRC Counsel, electronically
Ashley Frank, Pender Co. CAMA LPO, electronically

RELEVANT STATUTES OR RULES **ATTACHMENT A**

15A NCAC 07H .0209 COASTAL SHORELINES

(a) Description. The Coastal Shorelines category includes estuarine shorelines and public trust shorelines. Estuarine shorelines AEC are those non-ocean shorelines extending from the normal high water level or normal water level along the estuarine waters, estuaries, sounds, bays, fresh and brackish waters, and public trust areas as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Environment and Natural Resources [described in Rule .0206(a) of this Section] for a distance of 75 feet landward. For those estuarine shorelines immediately contiguous to waters classified as Outstanding Resource Waters by the Environmental Management Commission, the estuarine shoreline AEC shall extend to 575 feet landward from the normal high water level or normal water level, unless the Coastal Resources Commission establishes the boundary at a greater or lesser extent following required public hearing(s) within the affected county or counties. Public trust shorelines AEC are those non-ocean shorelines immediately contiguous to public trust areas, as defined in Rule 07H .0207(a) of this Section, located inland of the dividing line between coastal fishing waters and inland fishing waters as set forth in that agreement and extending 30 feet landward of the normal high water level or normal water level.

(b) Significance. Development within coastal shorelines influences the quality of estuarine and ocean life and is subject to the damaging processes of shore front erosion and flooding. The coastal shorelines and wetlands contained within them serve as barriers against flood damage and control erosion between the estuary and the uplands. Coastal shorelines are the intersection of the upland and aquatic elements of the estuarine and ocean system, often integrating influences from both the land and the sea in wetland areas. Some of these wetlands are among the most productive natural environments of North Carolina and they support the functions of and habitat for many valuable commercial and sport fisheries of the coastal area. Many land-based activities influence the quality and productivity of estuarine waters. Some important features of the coastal shoreline include wetlands, flood plains, bluff shorelines, mud and sand flats, forested shorelines and other important habitat areas for fish and wildlife.

(c) Management Objective. The management objective is to ensure that shoreline development is compatible with the dynamic nature of coastal shorelines as well as the values and the management objectives of the estuarine and ocean system. Other objectives are to conserve and manage the important natural features of the estuarine and ocean system so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing these shorelines so as to maximize their benefits to the estuarine and ocean system and the people of North Carolina.

(d) Use Standards. Acceptable uses shall be those consistent with the management objectives in Paragraph (c) of this Rule. These uses shall be limited to those types of development activities that will not be detrimental to the public trust rights and the biological and physical functions of the estuarine and ocean system. Every effort shall be made by the permit applicant to avoid, mitigate or reduce adverse impacts of development to estuarine and coastal systems through the planning and design of the development project. In every instance, the particular location, use, and design characteristics shall comply with the general use and specific use standards for coastal shorelines, and where applicable, the general use and specific use standards for coastal wetlands, estuarine waters, and public trust areas described in Rule .0208 of this Section. Development shall be compatible with the following standards:

(2) All development projects, proposals, and designs shall limit the construction of impervious surfaces and areas not allowing natural drainage to only so much as is necessary to adequately service the major purpose or use for which the lot is to be developed. Impervious surfaces shall not exceed 30 percent of the AEC area of the lot, unless the applicant can effectively demonstrate, through innovative design, that the protection provided by the design would be equal to or exceed the protection by the 30 percent limitation. Redevelopment of areas exceeding the 30 percent impervious surface limitation may be permitted if impervious areas are not increased and the applicant designs the project to comply with the intent of the rule to the maximum extent feasible.

(10) Within the Coastal Shorelines category (estuarine and public trust shoreline AECs), **new development shall be located a distance of 30 feet landward of the normal water level or normal high water level,** with the exception of the following:

(F) Decks/Observation Decks limited to slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet;

STIPULATED FACTS

ATTACHMENT B

1. The Petitioner is Harbor Village Yacht Club, Inc. This Corporation was formed in 1989 "to conduct all business pursuant to operating a yacht club" and owns the property where the development is proposed (the Site). The registered agent listed with the Secretary of State's Office is Robert W. Kilroy.

2. The Site is listed as Tract 2 in the deed recorded on September 27, 1999 at Book 1516, Page 114 in the Pender County Registry. This is also known as Lot 1, Section 1 of the Olde Point Subdivision as shown on a map recorded at Map Book 22, Page 47 in the Pender County Registry. This site has the street address of 2019 King's Landing Road in Hampstead.

3. The Site is adjacent to Topsail Sound. At this location, Topsail Sound is also part of the Atlantic Intracoastal Waterway (AIWW). At this location, the waters of Topsail Sound are classified as SA by the Environmental Management Commission, and are open to the harvest of shellfish.

4. The Site is located within the Coastal Shorelines Area of Environmental Concern (AEC). There are some Coastal Wetlands waterward of the bulkhead but not within the proposed project area.

5. The Site is approximately a half-acre in size and is currently developed with a driveway and turn-around area, boat-ramp, two docks, a bulkhead and a 50-foot by 48-foot (2400 sq. ft.) clubhouse building with an existing 8-foot by 24-foot deck (192 sq. ft.). These structures can be seen in the attached exhibits.

6. Since Petitioner's purchase of the Site in 1999, some work has been done to the original, smaller clubhouse building, which was originally constructed in the 1960s or 1970s before the effective date of the Coastal Area Management Act (CAMA).

7. The existing deck was permitted through CAMA Minor Permit #2009-08, a copy of which is attached, and which authorized construction of an 8-foot by 25-foot (200 sq. ft.) deck. The Commission's 30-foot buffer rule was in effect at this time in 2009. The as-built dimensions are 8-foot by 24-foot (192 sq. ft.).

8. On or about April 25, 2012, the Petitioner, through its agent Allied Marine Contractors, LLC, submitted am incomplete CAMA Minor Permit Application. The LPO met with the Petitioner's agent on May 1, 2012 to discuss what was needed to complete the application, and the LPO then met with the Petitioner's agent and the club's commodore on site on July 19, 2012 to review the then-complete application.

9. In the application, Petitioner proposed to develop an 8-foot by 16-foot addition (128 sq. ft.) to the existing deck. A copy of the application is attached.

10. The existing deck and clubhouse lie entirely landward of the bulkhead and the proposed deck will be even or landward of the bulkhead. Normal High Water (NHW) is located approximately 6-feet waterward of the existing bulkhead.

11. As part of the application process, notice of the proposed project was sent to the two adjacent riparian neighbors, Longordo and Brooke, both of whom indicated in writing that they had "no objection" to this proposed project.

12. Also as part of the application process, notice of the proposed project was placed in the July 25, 2012 edition of the Pender-Topsail Post and Voice, and notice was posted on-site as well. No objections or comments were received regarding the project.

13. The Commission's 30-foot Buffer Rule is found at 15A NCAC 07H .0209(d)(10) and requires that "new development shall be located a distance of 30 feet landward of the normal water level or normal high water level."

14. The Buffer Rule goes on to set out some exceptions to the rule, which includes an allowance for "(F) Decks/Observation Decks limited to slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet."

15. Through a letter dated August 6, 2012, a copy of which is attached, the Pender County LPO denied Petitioner's CAMA minor permit application because the existing 192 sq. ft. deck plus the proposed 128 sq. ft. deck would exceed the 200 square feet of decking allowed by 15A NCAC 07H .0209(d)(10)(F), by 120 sq. ft. Petitioner's application was also denied based on the fact that the proposed development was in violation with the Commission's rules, and therefore is also in conflict with the Pender County CAMA Land Use Plan.

16. On August 23, 2012, DCM received Petitioner's variance request, a copy of which is attached. It seeks a variance to develop a 128 square feet addition to the existing 192 square feet of decking, as proposed in their application and which exceeds the decking allowance in the Commission's rules at 15A NCAC 07H .0209(d)(10)(F), by 120 sq. ft.

17. Though none was proposed with Petitioner's CAMA permit application, Petitioner does not object to the CRC conditioning a variance approval on Petitioner's agreement to install a stormwater management system.

STIPULATED EXHIBITS:

1. 8-6-12 Denial Letter
2. CAMA application with site drawing
3. Pender County Staff's 2 site diagrams (one on aerial, one line diagram)
4. 2009 CAMA permit for existing deck
5. Aerial and ground-level site photographs in the power-point
6. Architectural drawings (P's S)

Petitioner and Staff Positions **ATTACHMENT C**

1. **Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? If so, the petitioner must identify the hardships.**

Petitioner's Position: Yes.

Petitioner seeks to add on an additional deck to extend the existing deck. The rule at issue is 15A NCAC 7H .0209 (d) (10) (F) regarding exceptions to the 30' set back rule for new development within the estuarine and public trust shoreline AECs. Petitioner owns a building and boat landing located in Olde Point Subdivision, Pender County, North Carolina which said building was constructed sometime in the late 1960s or early 1970s. To our understanding the structure on this property was built prior to any of the current regulations came into being.

The building is located on a tract that is .5609 acres in size and also contains the launch facilities, docks and a drive and turn around area for loading and unloading boats. See Exhibits C, D, E and F for the facilities layout and location of structures and improvements. As can easily be seen, the additional decking requested by the petitioner simply cannot go anywhere else on this tract.

The hardship for petitioner lies in the fact the building was built long prior to the institution of the current coastal development regulations. Petitioner cannot erect the additional space on the side of the building as one side abuts the driveway to the boat launch area and the other side is too close to the neighbor's property line. Petitioner cannot build behind the building without having to physically move the driveway/turnaround and numerous trees. Petitioner cannot locate the deck on top of the building without tearing up its roof structure.

Without losing petitioner's view of the Intracoastal Waterway or gutting and relocating its building and losing use of a large portion of its lot in the process, petitioner can add its deck in no other location.

An additional factor is safety for visitors to the building. This building is available for use by the owners of property in Olde Point, members of the Harbor Village Yacht club and invited guests. One of the water side exits of petitioner's building opens up via a sliding glass door which leads to a drop off of several feet which potentially exposes petitioner to liability. The deck petitioner is seeking would transition traffic from the exit onto the new section of deck avoiding the potential drop off.

Staff's Position: No.

Staff disagrees that Petitioner will suffer an unnecessary hardship from strict application of the Commission's 30-foot buffer rule to Petitioner's property because Petitioner has other alternatives available to achieve its goal that would not be inconsistent with the buffer rule. Petitioner claims, and Staff agrees, that Petitioner's half-acre site is nearly built-out and there is limited remaining room outside the buffer to add another deck. However, Staff disagrees that all of that development was pre-CAMA or pre-buffer. Specifically, it is stipulated that the existing deck was permitted in 2009, well after the buffer rule took effect in 2000. Petitioner was authorized by its 2009 CAMA permit to construct 200 square-feet of decking as allowed by the Commission's rules. Petitioner's main reason for now proposing the new deck and seeking the variance is to allow decking to be placed within the buffer under the sliding-glass door on the south-west side of the building. Staff notes that the deck built in 2009 could have been designed to allow access from the sliding-glass door, but was not. To not now be allowed to extend the deck under the door by exceeding the deck allowance provided by rule does not cause Petitioner unnecessary hardships, especially because under the Commission's rules, Petitioner could reconfigure its 200 square-foot deck to extend and narrow the existing deck over to the sliding-glass door without a variance. Accordingly, Staff disagree that the strict application of the 30-foot buffer rule causes Petitioner any unnecessary hardships.

II. Do such hardships result from conditions peculiar to the Petitioner's property, such as location, size, or topography of the property? Explain.

Petitioner's Position: Yes.

As above noted, petitioner's tract contains docks, a pier, launching facilities, a drive and a turnaround for cars and boats and the building. There is simply no room to put anything else on this lot. The lot itself is long and narrow thus limiting its use and current Pender Zoning setbacks would limit this use even further. In addition, the deed by which petitioner acquired this lot contained a restriction which reserved use of the facilities for owners in Olde Point subdivision. For these reasons Petitioner is limited in what it can do with its property.

Had the building been erected today, the location and planning would have involved much more. Petitioner has inherited this building as is and is limited by its geography and actions that were taken by its predecessors in title. Petitioner seeks to make the most of its situation and its resources in a manner that is consistent with the existing rules and regulations.

Staff's Position: No.

Staff doesn't believe any hardships alleged by Petitioner result from conditions peculiar to the property, such as location, size or topography. As stated by Petitioner above, there is "simply no room to put anything else on this lot" other than where Petitioner proposes the deck extension within the buffer. Staff agrees that this site is already highly developed but that is not a physical characteristic of the property which causes any alleged hardship. To the contrary, numerous properties within and adjacent to the Coastal Shoreline AEC possess very similar characteristics to the Petitioner's property.

III. Do the hardships result from the actions taken by the Petitioner? Explain.

Petitioner's Position: No.

As noted above Petitioner took the building and other structures as it found them and has not created this situation.

Staff's Position: Yes.

Petitioner took title to this property in 1999, and contrary to its claims, has not simply taken the site as it now exists. Since 1999, Petitioner repaired and enlarged the main building structure on the property. In addition, Petitioner received a CAMA permit in 2009 authorizing the full 200 square-feet of decking allowed in the CAMA 30' buffer rule, and Petitioner constructed the existing deck to nearly that full amount of square feet. Petitioner's stated motivation to extend the deck now is to provide decking under the sliding glass door on the (direction?) side of the building, but fails to explain why decking wasn't placed under that door when the existing deck was built. Without a variance, Petitioner could redesign their existing deck under the Commission's rules to extend it below this sliding-glass door to address its primary concern. Accordingly, any hardship alleged by Petitioner is a result of its design choice of layout for the 200 square-feet of decking authorized in 2009.

IV. Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Petitioner's Position: Yes.

As petitioner understands the rules, the goal of the rules of the Coastal Management Act is to "establish a state management plan that is capable of rational and coordinated management of coastal resources." From 15A NCAC 07H.0101. This involves two areas per the rule: a. land use plans and b. designation of coastal areas of environmental concern. The intent of the rule appears to safeguard the coastal estuarine areas.

Petitioner notes that the proposed addition to its deck as shown on the architectural plans (Exhibit "S") show the location and plans for this decking. Please note that the new deck area lies entirely landward of the existing seawall. The plans call for careful excavation and hand dug piling support holes. No portion of the deck extends further out than the currently existing deck structure and none of the deck is cantilevered out over the water. No disturbance to the waterway, marsh areas or any landmass, except petitioner's lands behind the seawall, will occur.

If the goal of the regulations is, in part, to safeguard coastal areas and their attendant marine and vegetative life, petitioner's plans do nothing to really affect the marine environment. Petitioner's extended deck will allow Petitioner to fully enjoy its property and avoid any harm to the coastal areas.

At present, petitioner's building, with its sliding glass door to "nowhere," actually creates a potential hazard to its visitors and guests. The proposed deck will remedy this problem. And by not affecting the adjacent coastal areas, the public welfare is maintained.

By balancing the public's interest with the petitioner's desire to fully enjoy its property the intent of the regulations are maintained. Petitioner's plans, in no way, circumvent or evade the regulations. The plans simply extend laterally the Petitioner's deck. The deck plans do not push out into areas that are not now developed, do not affect any marine life, and do not affect property rights of any neighbors.

The petitioner's plans break the rules only in the technical sense in that petitioner is allowed a maximum of 200 square feet of decking within the thirty foot setback required by the rules. Petitioner plans call for an additional 132 square feet of additional decking. Given that the new deck area is entirely landward of the existing seawall and extends no further that corner of the building, no others should be affected. The intent of the rule is met.

Staff's Position: Yes.

Staff agrees that the variance requested by Petitioner, if conditioned by the Commission to require a stormwater management system, could be consistent with the spirit, purpose, and intent of the Commission's buffer rule. One of the management objectives for the Coastal Shorelines AEC is to conserve and manage the important natural features of the estuarine and ocean system so as to safeguard and perpetuate their biological, social, aesthetic, and economic value. Consistent with that management objective, all development proposals shall limit the construction of impervious surfaces and areas not allowing natural drainage to only so much as is necessary to adequately service the major purpose or use for which the lot is to be developed.

Staff notes that there is no existing stormwater management system on the highly developed Site. If the Commission believes that adding a condition to the variance that Petitioner install and maintain a stormwater management system for the entire lot would safeguard the buffer ability of this Site, then Staff agrees that a variance would be consistent with the spirit, purpose, and intent of the Commission's buffer rule, and would further safeguard public welfare by providing those benefits to water quality through use of a stormwater management system. Finally, Staff does not disagree with Petitioner's claims of substantial justice.

As requested by the Commission for buffer variances, staff include the stormwater management-related conditions which have been placed on prior variances issued by the Commission below.

(1) The permittee shall obtain a stormwater management plan meeting the requirements of 15A NCAC 7H .0209(d)(10)(J)(iv), which requires that the first one and one-half inches of rainfall from all impervious surfaces on the lot shall be collected and contained on-site in accordance with the design standards for stormwater management for coastal counties as specified in 15A NCAC 02H .1005. The stormwater management system shall be designed and certified by an individual who meets applicable State occupational licensing requirements for the type of system proposed, and approved by the appropriate governmental authority during the permit application process.

(2) Prior to occupancy and use of the deck addition and the issuance of a final Certificate of Occupancy (CO) by the local permitting authority, the permittee shall provide a certification from the design professional that the stormwater system has been inspected and installed in accordance with this permit, the approved plans and specification and other supporting documentation.

(3) The permittee shall provide for the operation and maintenance necessary to insure that the engineered stormwater management system functions at optimum efficiency and within the design specifications for the life of the project.

(4) The permittee shall insure that the obligation for operation and maintenance of the stormwater management system becomes a permanent obligation of future property owners.

ATTACHMENT D

Petitioner's Petition
(without proposed attachments and draft facts)

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.: 12-08

PETITIONER'S NAME Harbor Village Yacht Club, Inc.

COUNTY WHERE THE DEVELOPMENT IS PROPOSED Pender

Pursuant to N.C.G.S. § 113A-120.1 and 15A N.C.A.C. 07J .0700 *et seq.*, the above named Petitioner hereby applies to the Coastal Resources Commission (CRC) for a variance.

VARIANCE HEARING PROCEDURES

A variance petition will be considered by the CRC at a regularly scheduled meeting, heard in chronological order based upon the date of receipt of a complete petition. 15A N.C.A.C. 07J .0701(e). A complete variance petition, as described below, must be *received* by the Division of Coastal Management (DCM) a minimum of six (6) weeks in advance of the first day of a regularly scheduled CRC meeting to be eligible for consideration by the CRC at that meeting. 15A N.C.A.C. 07J .0701(e). The final set of stipulated facts must be agreed to at least four (4) weeks prior to the first day of a regularly scheduled meeting. 15A N.C.A.C. 07J .0701(e). The dates of CRC meetings can be found at DCM's website: **www.nccoastalmanagement.net**

If there are controverted facts that are significant in determining the propriety of a variance, or if the Commission determines that more facts are necessary, the facts will be determined in an administrative hearing. 15A N.C.A.C. 07J .0701(b).

VARIANCE CRITERIA

The petitioner has the burden of convincing the CRC that it meets the following criteria:

(a) Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.

(b) Do such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property? Explain.

(c) Do the hardships result from actions taken by the petitioner? Explain.

(d) Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Please make your written arguments that Petitioner meets these criteria on a separate piece of paper. The Commission notes that there are some opinions of the State Bar which indicate that non-attorneys may not represent others at quasi-judicial proceedings such as a variance hearing before the

Commission. These opinions note that the practice of professionals, such as engineers, surveyors or contractors, representing others in quasi-judicial proceedings through written or oral argument, may be considered the practice of law. Before you proceed with this variance request, you may wish to seek the advice of counsel before having a non-lawyer represent your interests through preparation of this Petition.

For this variance request to be complete, the petitioner must provide the information listed below. The undersigned petitioner verifies that this variance request is complete and includes:

- ✓ The name and location of the development as identified on the permit application;
- ✓ A copy of the permit decision for the development in question;
- ✓ A copy of the deed to the property on which the proposed development would be located;
- ✓ A complete description of the proposed development including a site plan;
- ✓ A stipulation that the proposed development is inconsistent with the rule at issue;
- ✓ Proof that notice was sent to adjacent owners and objectors, as required by 15A N.C.A.C. 07J .0701(c)(7); WAIVER
- ✓ Proof that a variance was sought from the local government per 15A N.C.A.C. 07J .0701(a), if applicable;
- ✓ Petitioner's written reasons and arguments about why the Petitioner meets the four variance criteria, listed above;
- ✓ A draft set of proposed stipulated facts and stipulated exhibits. Please make these verifiable facts free from argument. Arguments or characterizations about the facts should be included in the written responses to the four variance criteria instead of being included in the facts.
- ✓ This form completed, dated, and signed by the Petitioner or Petitioner's Attorney.

Due to the above information and pursuant to statute, the undersigned hereby requests a variance.

Signature of Petitioner or Attorney — Date: 8-22-12

Ray C. Blackburn, Jr.
Printed Name of Petitioner or Attorney

RCB@Rayblackburn.com
Email address of Petitioner or Attorney

P.O. Box 895
Mailing Address

(910) 270-2022
Telephone Number of Petitioner or Attorney

Hampstead, N.C. 28443
City State Zip

(910) 270-2002
Fax Number of Petitioner or Attorney

DELIVERY OF THIS HEARING REQUEST

This variance petition must be **received by** the Division of Coastal Management at least six (6) weeks before the first day of the regularly scheduled Commission meeting at which it is heard. A copy of this request must also be sent to the Attorney General's Office, Environmental Division. 15A N.C.A.C. 07J .0701(e).

Contact Information for DCM:

By mail, express mail or hand delivery:
Director
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

By Fax:
(252) 247-3330

By Email:
Check DCM website for the email address of the current DCM Director
www.nccoastalmanagement.net

Contact Information for Attorney General's Office:

By mail:
Environmental Division
9001 Mail Service Center
Raleigh, NC 27699-9001

By express mail:
Environmental Division
114 W. Edenton Street
Raleigh, NC 27603

By Fax:
(919) 716-6767

Revised: February 2011

PETITIONER: HARBOR VILLAGE YACHT CLUB

CAMA PERMIT APPLICATION # PC-2012-12

VARIANCE CRITERIA:

1. Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.

Petitioner seeks to add on an additional deck to extend the existing deck. The rule at issue is 15A NCAC 7H .0209 (d) (10) (F) regarding exceptions to the 30' set back rule for new development within the estuarine and public trust shoreline AECs. Petitioner own a building and boat landing located in Olde Point Subdivision, Pender County, North Carolina which said building was constructed sometime in the late 1960s or early 1970s. To our understanding the structure on this property was built prior to any of the current regulations came into being.

The building is located on a tract that is .5609 acres in size and also contains the launch facilities, docks and a drive and turn around area for loading and unloading boats. See Exhibits C, D, E and F for the facilities layout and location of structures and improvements. As can easily be seen, the additional decking requested by the petitioner simply cannot go anywhere else on this tract.

The hardship for petitioner lies in the fact the building was built long prior to the institution of the current coastal development regulations. Petitioner cannot erect the additional space on the side of the building as one side abuts the driveway to the boat launch area and the other side is too close to the neighbor's property line. Petitioner cannot build behind the building without having to physically move the driveway/turnaround and numerous trees. Petitioner cannot locate the deck on top of the building without tearing up its roof structure.

Without losing petitioner's view of the intracoastal waterway or gutting and relocating its building and losing use of a large portion of its lot in the process, petitioner can add its deck in no other location.

An additional factor is safety for visitors to the building. This building is available for use by the owners of property in Olde Point, members of the Harbor Village Yacht club and invited guests. One of the water side exits of petitioner's building opens up via a sliding glass door which leads to a drop off of several feet which potentially exposes petitioner to liability. The deck petitioner is seeking would transition traffic from the exit onto the new section of deck avoiding the potential drop off.

2. Do such hardships result from the conditions peculiar to the petitioner's property such as the location, size or topography of the property? Explain.

As above noted, petitioner's tract contains docks, a pier, launching facilities, a drive and a turnaround for cars and boats and the building. There is simply no room to out anything else on this lot. The lot itself is long and narrow thus limiting its use and current Pender Zoning set backs would limit this use even further. In addition, the deed by which petitioner acquired this lot contained a restriction which reserved use of the facilities for owners in Olde Point subdivision. For these reasons petitioner is limited in what it can do with its property.

Had the building been erected today, the location and planning would have involved much more. Petitioner has inherited this building as is and is limited by its geography and actions that were taken by its predecessors in title. Petitioner seeks to make the most of its situation and its resources in a manner that its consistent with the existing rules and regulations.

3. Do the hardships result from actions taken by petitioner? Explain.

No. As noted above Petitioner took the building and other structures as it found them and has not created this situation.

4. Will the variance requested by the petitioner (1) be consistent with the spirit, purpose and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

1. As petitioner understands the rules, the goal of the rules of the Coastal Management Act is to "establish a state management plan that is capable of rational and coordinated management of coastal resources." From 15A NCAC 07H.0101. This involves two areas per the rule: a. land use plans and b. designation of coastal areas of environmental concern. The intent of the rule appears to safeguard the coastal estuarine areas.

Petitioner notes that the proposed addition to its deck as shown on the architectural plans (Exhibit "S") show the location and plans for this decking. Please note that the new deck area lies entirely landward of the existing seawall. The plans call for careful excavation and hand dug piling support holes. No portion of the deck extends further out than the currently existing deck structure and none of the deck is cantilevered out over the water. No disturbance to the waterway, marsh areas or any landmass, except petitioner's lands behind the seawall, will occur.

If the goal of the regulations is, in part, to safeguard coastal areas and their attendant marine and vegetative life, petitioner's plans do nothing to really affect the marine

environment. Petitioner's extended deck will allow Petitioner to fully enjoy its property and avoid any harm to the coastal areas.

2. At present, petitioner's building, with its sliding glass door to "nowhere," actually creates a potential hazard to its visitors and guests. The proposed deck will remedy this problem. And by not affecting the adjacent coastal areas, the public welfare is maintained.

3. By balancing the public's interest with the petitioner's desire to fully enjoy its property the intent of the regulations are maintained. Petitioner's plans, in no way, circumvent or evade the regulations. The plans simply extend laterally the Petitioner's deck. The deck plans do not push out into areas that are not now developed, do not affect any marine life, and do not affect property rights of any neighbors.

The petitioner's plans break the rules only in the technical sense in that petitioner is allowed a maximum of 200 square feet of decking within the thirty foot setback required by the rules. Petitioner plans call for an additional 132 square feet of additional decking. Given that the new deck area is entirely landward of the existing seawall and extends no further that corner of the building, no others should be affected. The intent of the rule is met.

ATTACHMENT E

STIPULATED EXHIBITS:

1. 8-6-12 Denial Letter
2. CAMA application with site drawing
3. Pender County Staff's 2 site diagrams (one on aerial, one line diagram)
4. 2009 CAMA permit for existing deck
5. Architectural drawings (P's Exhibit S)
6. Aerial and ground-level site photographs in the power-point

EXHIBIT "A"

Pender County
Planning and Community Development

Planning Division
805 S. Walker Street
PO Box 1519
Burgaw, NC 28425

Phone: 910-259-1202
Fax: 910-259-1295
www.pendercountync.gov

August 6, 2012

CERTIFIED MAIL – 7006 0810 0001 4508 2475
RETURN RECEIPT REQUESTED

Harbor Village Yacht Club
2019 Kings Landing Road
Hampstead, NC 28443

RE: **DENIAL OF CAMA MINOR DEVELOPMENT PERMIT**
APPLICATION NUMBER- PC 2012-12
PROJECT ADDRESS- 2019 Kings Landing Road, Hampstead (Pender County)

Dear Harbor Village Yacht Club:

After reviewing your application in conjunction with the development standards required by the Coastal Area Management Act (CAMA) and our locally adopted Land Use Plan and Ordinances, it is my determination that no permit may be granted for the project which you have proposed.

This decision is based on my findings that your request violates NCGS 113A-120(a) (8) which requires that all applications be denied which are inconsistent with CAMA guidelines and Local Land Use Plans. You have applied to construct a 128 square foot (8 'X 16') uncovered deck addition to an existing, uncovered 192 square foot (8' X 24') deck which is inconsistent with 15 NCAC 7H .0209 (d) (10) (F), which states that: "Within the Coastal Shorelines category (estuarine and public trust shoreline AECs), new development shall be located a distance of 30 feet landward of the normal water level or normal high water level, with the exception of the following: Decks/Observation Decks limited to slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet." Your application is also inconsistent with our Local Land Use Plan. On page 18 of the Land Use Plan, you will find that **Land Use Compatibility Policies (3), (4) and (6):**

3) Development in the Estuarine Shoreline AEC (75 feet for non-ORW areas and 575 feet for ORWs) should be consistent with the CAMA use standards so that water quality and valuable coastal resources are protected and preserved.
4) The County will not approve a permit in the Estuarine Shoreline area that is known to be inconsistent with CAMA Standards or published North Carolina Regulations.
6) Development regulations for the Estuarine Shoreline promulgated by state standards will be supported.

On page 19 of the Land Use Plan, you will find that **Land Use Compatibility Policies (16):**

16) The county does not approve permits for any use that is in violation of adopted Coastal Resources Commission Policies, North Carolina or US Government regulations or laws when notified, in writing, by the appropriate agency that the project for which the permit is applied is in violation of such policies, regulations or laws.

Should you wish to appeal my decision to the Coastal Resource Commission or request a variance from that group, please contact me so I can provide you with the proper forms and any other information you may require. The Division of Coastal Management central office in Morehead City must receive appeal notices within twenty (20) days of the date of this letter in order to be considered.

Respectfully yours,

Ashley Frank

Ashley Frank, LPO
Pender County
PO Box 1519
Burgaw, NC 28425

cc: Jason Dail, Wilmington District Office
Hal Fogleman- Allied Marine Contractors, LLC (Agent)

EXHIBIT "B"

Locality Pender County, NC Permit Number PC 2012-12

Ocean Hazard _____ Estuarine Shoreline X ORW Shoreline _____ Public Trust Shoreline _____ Other _____

(For official use only)

GENERAL INFORMATION

RECEIVED

AUG 23 2012

DCM-MHD CITY

LAND OWNER

Name Harbor Village Yacht Club, Inc.

Address 2019 Kings Landing Rd

City Hampstead State NC Zip 28443 Phone _____

Email _____

AUTHORIZED AGENT

Name Hal Fogleman - Allied Marine Contractors LLC

Address 92 Harold Ct

City Hampstead State _____ Zip 28443 Phone 910 367 2159

Email hal-amc@charter.net

LOCATION OF PROJECT: (Address, street name and/or directions to site. If not oceanfront, what is the name of the adjacent waterbody.) 2019 K.L. Rd. (K.L. = KINGS LANDING) OLDE POINT SUBDIVISION, HAMPSTEAD, NC

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) 8x16 deck addition

SIZE OF LOT/PARCEL: 23,086.8 square feet .53 acres

PROPOSED USE: Residential ☐ (Single-family ☐ Multi-family ☐) Commercial/Industrial ☐ Other ☒

COMPLETE EITHER (1) OR (2) BELOW (***Contact your Local Permit Officer if you are not sure which AEC applies to your property***):

(1) OCEAN HAZARD AECs: TOTAL FLOOR AREA OF PROPOSED STRUCTURE: _____ square feet (includes air conditioned living space, parking elevated above ground level, non-conditioned space elevated above ground level but excluding non-load-bearing attic space)

(2) COASTAL SHORELINE AECs: SIZE OF BUILDING FOOTPRINT AND OTHER IMPERVIOUS OR BUILT UPON SURFACES: * square feet (includes the area of the roof/drip line of all buildings, driveways, covered decks, concrete or masonry patios, etc. that are within the applicable AEC. Attach your calculations with the project drawing.)

→ 4,405.3099 ft2

STATE STORMWATER MANAGEMENT PERMIT: Is the project located in an area subject to a State Stormwater Management Permit issued by the NC Division of Water Quality?

YES_____ NO X

If yes, list the total built upon area/impervious surface allowed for your lot or parcel: _____ square feet.

PC 2012-12

OTHER PERMITS MAY BE REQUIRED: The activity you are planning may require permits other than the CAMA minor development permit, including, but not limited to: Drinking Water Well, Septic Tank (or other sanitary waste treatment system), Building, Electrical, Plumbing, Heating and Air Conditioning, Insulation and Energy Conservation, FIA Certification, Sand Dune, Sediment Control, Subdivision Approval, Mobile Home Park Approval, Highway Connection, and others. Check with your Local Permit Officer for more information.

RECEIVED

STATEMENT OF OWNERSHIP:

AUG 23 2012

I, the undersigned, an applicant for a CAMA minor development permit, being either the owner of property in an AEC or a person authorized to act as an agent for purposes of applying for a CAMA minor development permit, certify that the person listed as landowner on this application has a significant interest in the real property described therein. This interest can be described as: (check one)

√ an owner or record title, Title is vested in Pender Co. NC, see Deed Book 1516 page 114 in the Pender County Registry of Deeds.

____ an owner by virtue of inheritance. Applicant is an heir to the estate of _____; probate was in _____ County.

____ if other interest, such as written contract or lease, explain below or use a separate sheet & attach to this application.

NOTIFICATION OF ADJACENT PROPERTY OWNERS:

I furthermore certify that the following persons are owners of properties adjoining this property. I affirm that I have given **ACTUAL NOTICE** to each of them concerning my intent to develop this property and to apply for a CAMA permit.

	(Name)	(Address)
(1)	See attached (1) Frank R. Longordo	2045 Kings Landing Road Hampstead
(2)	PIN	
(3)	Lands (2) Brooke, Steven	1991 Kings Land Road Hampstead
(4)		

ACKNOWLEDGEMENTS:

I, the undersigned, acknowledge that the land owner is aware that the proposed development is planned for an area which may be susceptible to erosion and/or flooding. I acknowledge that the Local Permit Officer has explained to me the particular hazard problems associated with this lot. This explanation was accompanied by recommendations concerning stabilization and floodproofing techniques.

I furthermore certify that I am authorized to grant, and do in fact grant, permission to Division of Coastal Management staff, the Local Permit Officer and their agents to enter on the aforementioned lands in connection with evaluating information related to this permit application.

This the 25 day of April, 20 12

Landowner or person authorized to act as his/her agent for purpose of filing a CAMA permit application

RECEIVED

JUL 19 2017

This application includes: general information (this form), a site drawing as described on the back of this application, the ownership statement, the Ocean Hazard AEC Notice where necessary, a check for $100.00 made payable to the locality, and any information as may be provided orally by the applicant. The details of the application as described by these sources are incorporated without reference in any permit which may be issued. Deviation from these details will constitute a violation of any permit. Any person developing in an AEC without permit is subject to civil, criminal and administrative action.

PC - 2012 - 12

SITE DRAWING/APPLICATION CHECKLIST

Please make sure your site drawing includes the following information required for a CAMA minor development permit. The Local Permit Officer will help you, if requested.

PHYSICAL DIMENSIONS

- ✓ Label roads
- n/a Label highways right-of-ways
- n/a Label local setback lines
- ✓ Label any and all structures and driveways currently existing on property
- ✓ Label adjacent waterbody

PHYSICAL CHARACTERISTICS

- ✓ Draw and label normal high water line (contact LPO for assistance)
- ✓ Draw location of on-site wastewater system

If you will be working in the ocean hazard area:

- ____ Draw and label dune ridges (include spot elevations)
- ____ Draw and label toe of dunes
- ____ Identify and locate first line of stable vegetation (contact LPO for assistance)
- ____ Draw and label erosion setback line (contact LPO for assistance)
- ____ Draw and label topographical features (optional)

If you will be working in a coastal shoreline area:

- _____ Show the roof overhang as a dotted line around the structure
- _____ Draw and label landward limit of AEC
- _____ Draw and label all wetland lines (contact LPO for assistance)
- _____ Draw and label the 30-foot buffer line

DEVELOPMENT PLANS

- ✓ Draw and label all proposed structures
- n/a Draw and label areas that will be disturbed and/or landscaped
- n/a Note size of piling and depth to be placed in ground
- n/a Draw and label all areas to be paved or graveled
- ✓ Show all areas to be disturbed
- n/a Show landscaping

NOTE TO APPLICANT

Have you:

- completed all blanks and/or indicated if not applicable?
- notified and listed adjacent property owners?
- included your site drawing?
- signed and dated the application?
- enclosed the $100.00 fee?
- completed an AEC Hazard Notice, if necessary? (Must be signed by the property owner)

FOR STAFF USE

Site Notice Posted _____ Final Inspection _____ Fee Received 7.19.2012

Site Inspections
5.2.2012 N&L / Wetlands Flagging - ADE / REK (Pender Co.)
7.19.2012 Site inspection / Application Submitted

Date of Action: Issued _____ Exempted _____ Denied _____ Appeal Deadline (20 days from permit action) _____

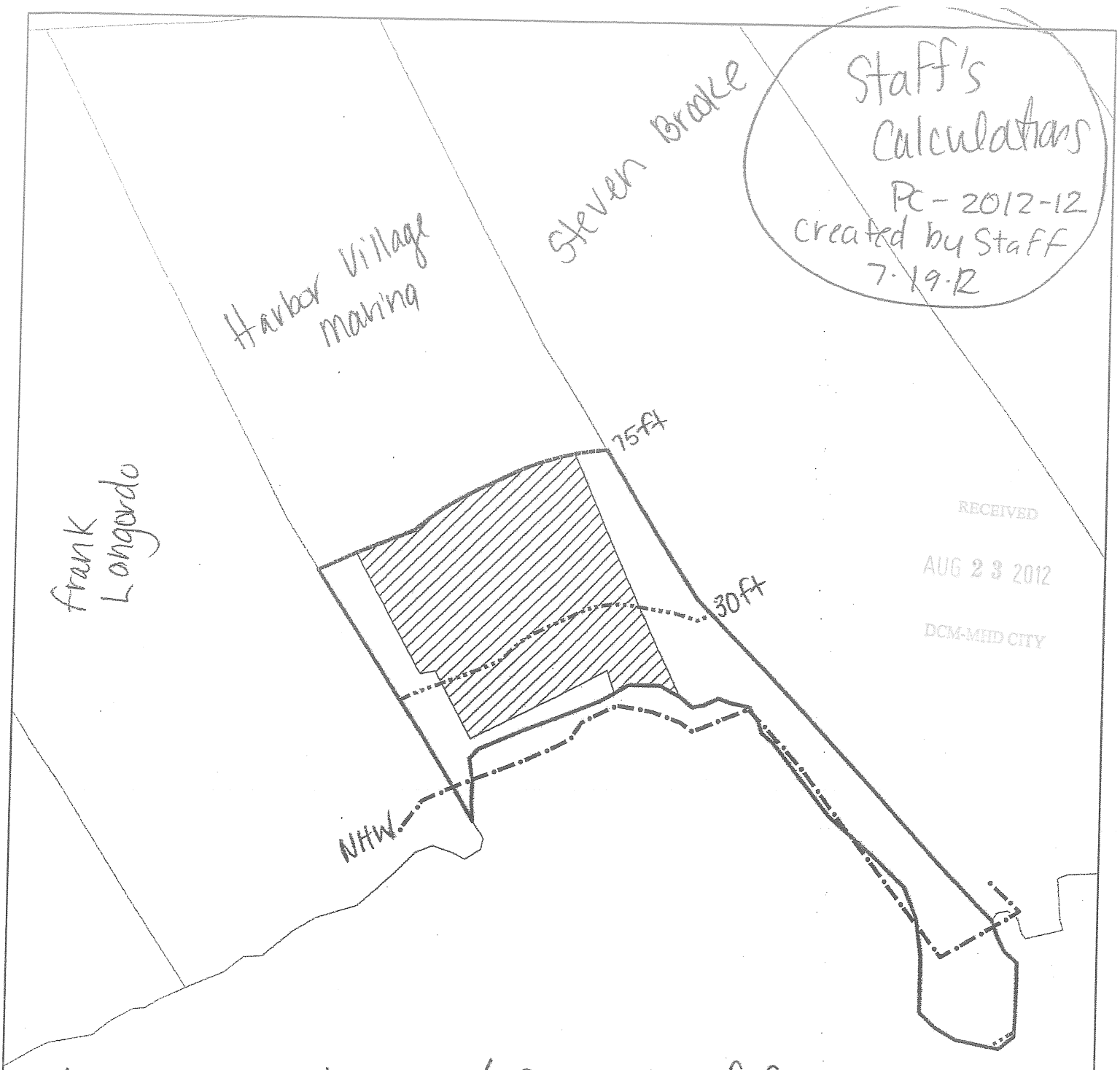
EXHIBIT F

PC-2012-12

PC 2012-12

This was created by Pender County 7·19·2012

EXHIBIT "E"



AEC = .20661 acres / 9002.1531 ft²

Impervious Area in AEC = .101132 ft² / 4,405,3099 ft²
(existing)

⟷ Atlantic ICW ⟷

Pender County
Government

2009-08
Permit Number

CAMA
MINOR DEVELOPMENT
PERMIT

as authorized by the State of North Carolina, Department of Environment, and Natural Resources and the Coastal Resources Commission for development in an area of environment concern pursuant to Section 113A-118 of the General Statutes, "Coastal Area Management"

Issued to Harbour Village Yacht Club, authorizing development in the Estuarine Shoreline (AEC) at 2019 Kings Landing Road, in HAMPSTEAD, NORTH CAROLINA, as requested in the permittee's application, dated November 30, 2009. This permit, issued on December 16, 2009, is subject to compliance with the application and site drawing (where consistent with the permit), all applicable regulations and special conditions and notes set forth below. Any violation of these terms may subject permittee to a fine, imprisonment or civil action, or may cause the permit to be null and void.

This permit authorizes: Construction of 8' x 25' (200 square feet) uncovered, wood slatted deck.

(1) All proposed development and associated construction must be done in accordance with the permitted work plat drawings(s) dated received on December 1, 2009.

(2) All construction must conform to the N.C. Building Code requirements and all other local, State and Federal regulations, applicable local ordinances and FEMA Flood Regulations.

(3) Any change or changes in the plans for development, construction, or land use activities will require a re-evaluation and modification of this permit.

(4) A copy of this permit shall be posted or available on site. Contact this office at 910.259.1202 for a final inspection at completion of work.

(Additional Permit Conditions on Page 2)

This permit action may be appealed by the permittee or other qualified persons within twenty (20) days of the issuing date. From the date of an appeal, any work conducted under this permit must cease until the appeal is resolved. This permit must be on the project site and accessible to the permit officer when the project is inspected for compliance. Any maintenance work or project modification not covered under this permit, require further written permit approval. All work must cease when this permit expires on:

DECEMBER 31, 2012

In issuing this permit it is agreed that this project is consistent with the local Land Use Plan and all applicable ordinances. This permit may not be transferred to another party without the written approval of the Division of Coastal Management.

Kenneth Vafier
CAMA LOCAL PERMIT OFFICIAL
PO Box 1519
Burgaw, NC 28425
910.259.1274

PERMITTEE
(Signature required if conditions above apply to permit)

(5) Pursuant to15A NCAC, Subchapter 7J.0406(b), this permit may not be assigned, transferred, sold or otherwise disposed of to a third-party

(6) This permit does not authorize construction or installation of any impervious surface. Any proposed further development of the site shall be re-evaluated for consistency with CAMA regulations.

(7) Prior to any development, silt fence shall be properly installed between all planned land disturbance and the adjacent marsh and open water areas; the silt fence shall be properly maintained throughout the construction period. Silt fence shall be installed such that it is properly toed-in to the soil.

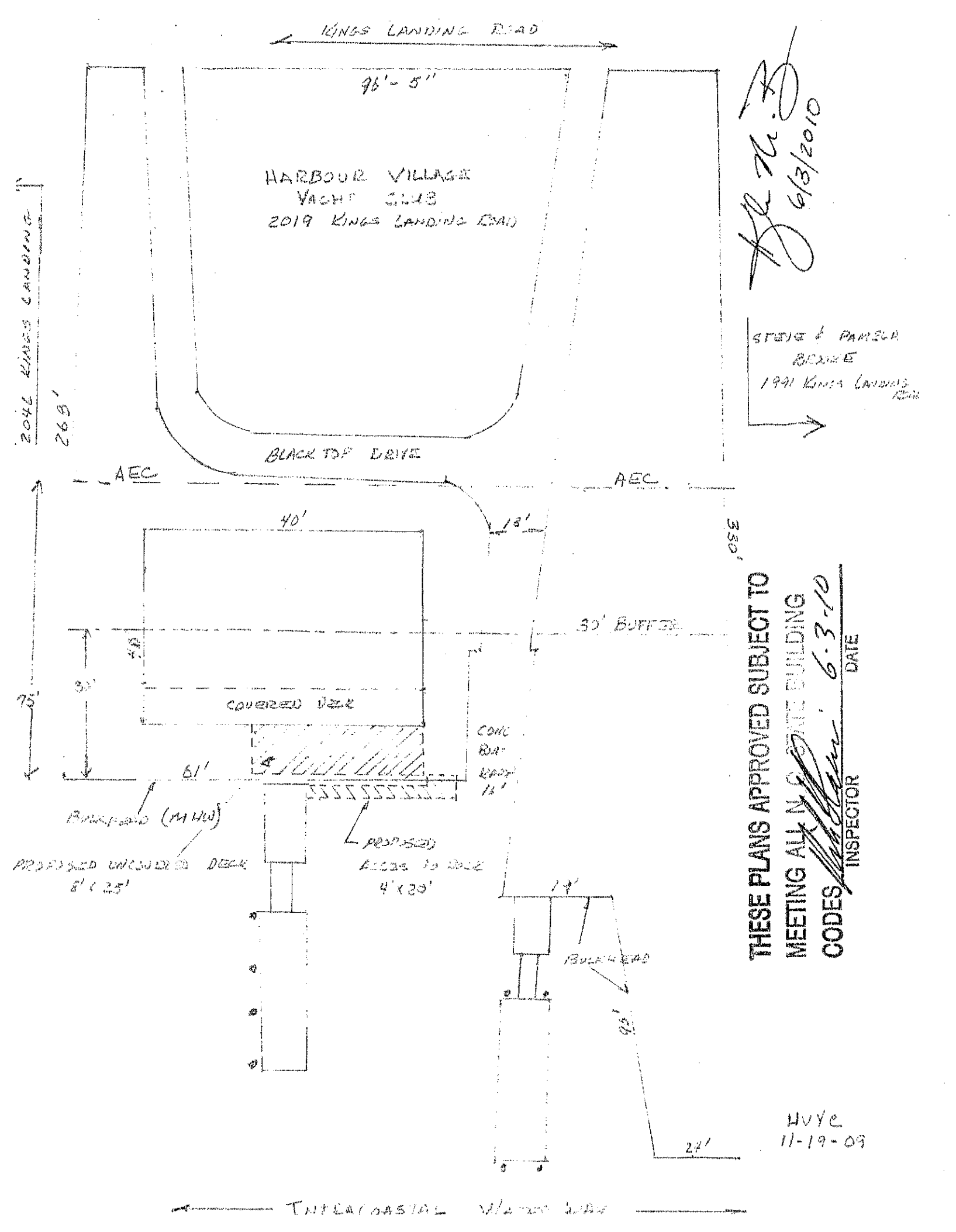
(8) All unconsolidated material resulting from associated construction shall be retained on site by effective sedimentation and erosion control measures. Sedimentation and erosion control measures shall be properly maintained throughout the construction period.

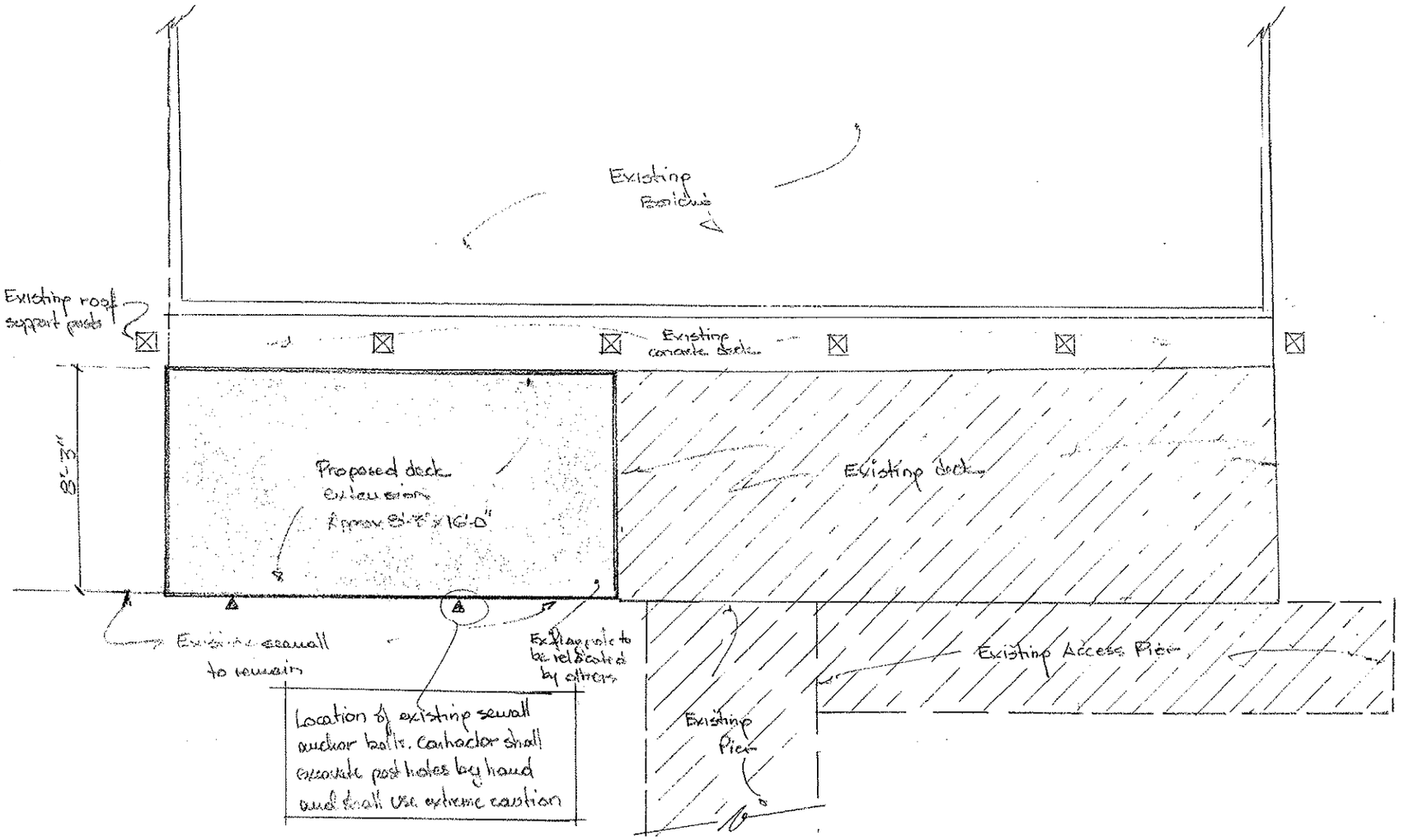
(9) All disturbed areas shall be vegetatively stabilized (planted and mulched) within 14 days of construction completion.

(10) Coastal Wetlands shall not be disturbed. Any ground disturbance of Coastal Wetlands will be subject to Notice of Violation.

(11) This permit does not authorize development within any wetlands or open water areas, including any development beyond the existing bulkhead.

SIGNATURE: John M Carpenter DATE: 12-17-09
PERMITTEE


KINGS LANDING ROAD
95'-5"
HARBOUR VILLAGE
YACHT CLUB
2019 KINGS LANDING ROAD
2042 KINGS LANDING CT.
263'
STEVE & PAMELA BLANKE
1991 KINGS LANDING ROAD
BLACK TOP DRIVE
AEC
AEC
40'
13'
330'
30' BUFFER
75'
30'
25'
COVERED DOCK
CONC BULKHEAD 12'
61'
BULKHEAD (MHW)
PROPOSED UNCOVERED DOCK 8' x 25'
PROPOSED ACCESS TO DOCK 4' x 20'
19'
BULKHEAD
27'
INTERCOASTAL WATERWAY
THESE PLANS APPROVED SUBJECT TO MEETING ALL CODES
INSPECTOR
6-3-10
DATE
6/3/2010
HVYC
11-19-09



PLAN

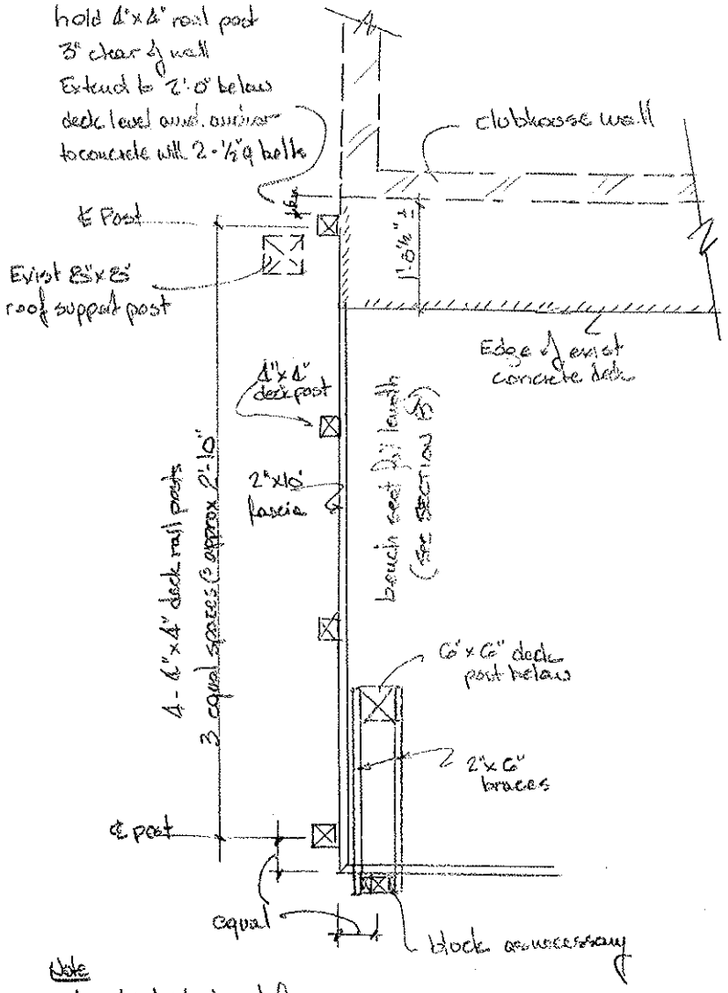
SCALE 1/8"=1'-0"

PROPOSED DECK EXTENSIONS

HARBOUR VILLAGE YACHT CLUB

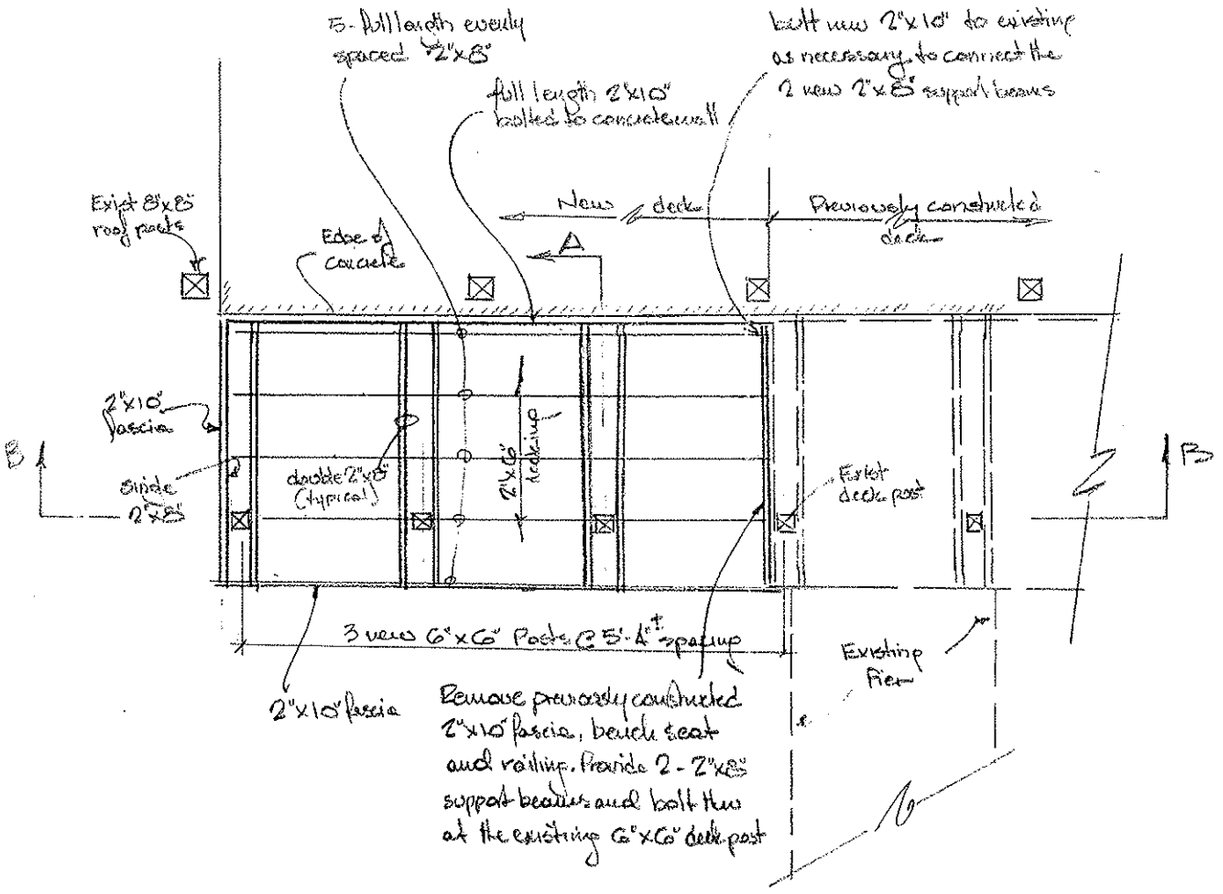
DEC 2011

sheet 1

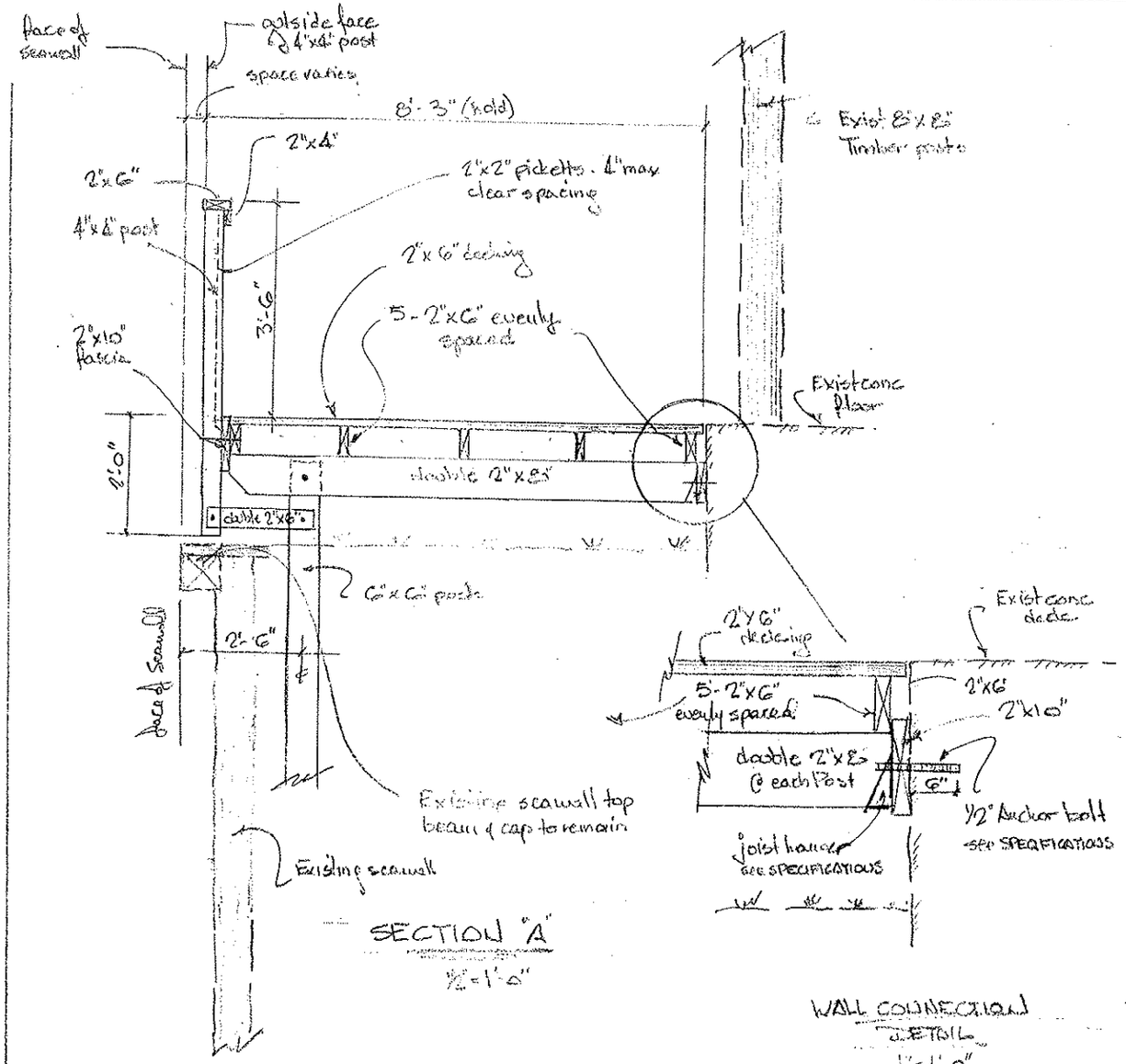


Note
Cast vertical & horizontal
hand rails @ 45° angle
at corners
tie into existing railings

DECK RAILING
POST DETAIL
½" = 1'-0"

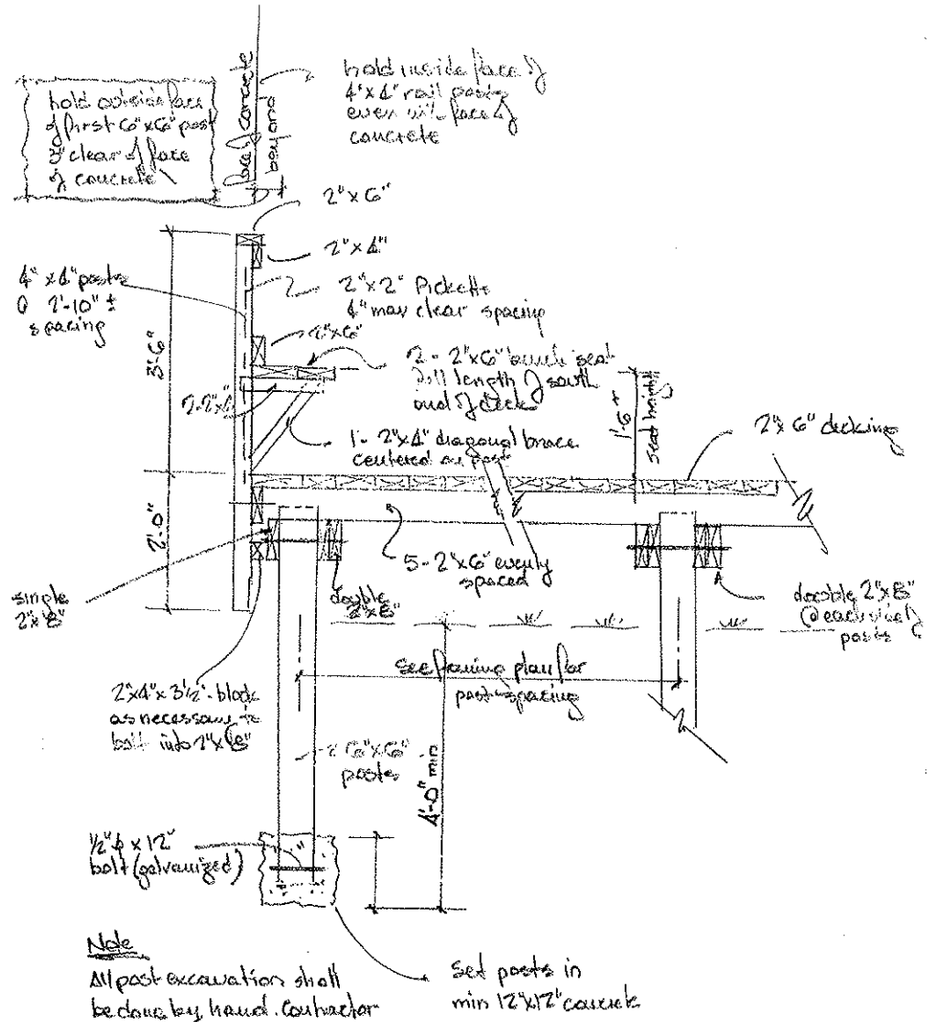


FRAMING PLAN
½" = 1'-0"



SECTION "A"
1/2"=1'-0"

WALL CONNECTION DETAIL
1"=1'-0"



Note
All post excavation shall be done by hand. Contractor shall use extreme care to not damage existing seawall anchor bolts

SECTION B
1/2"=1'-0"

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

MEMORANDUM **CRC-12-40**

TO: Coastal Resources Commission

FROM: Braxton Davis

SUBJECT: H819 Legislative Studies Status

DATE: October 31, 2012

At the August meeting of the Commission, I reviewed House Bill 819 (SL 2012-202) and proposed a work plan for completing three studies included in the legislation. Below is a brief description of each study, as well as a status report.

Cape Fear River AEC Study
H819 states that "the Coastal Resources Commission shall study the feasibility of creating a new Area of Environmental Concern for the lands adjacent to the mouth of the Cape Fear River." The two key components are 1) to consider the unique coastal morphologies and hydrographic conditions of the Cape Fear inlet area, and 2) to collaborate with the Town of Caswell Beach, the Village of Bald Head Island, and landowners to identify regulatory concerns and develop strategies for creating a more efficient regulatory framework.

Status:

- On October 2, 2012, the CRC Chair and DCM staff met with the Town of Caswell Beach, the Village of Bald Head Island, Baptist Assembly/Fort Caswell, Olsen Associates, and Moffatt & Nichol to discuss provisions of the study and a process by which the Commission could consider information and make a decision.

- DCM staff suggested utilizing the procedures outlined in 15A NCAC 07H.0503 Nomination and Designation Procedures as a guide for the development of the feasibility study.

- DCM suggested that the Town of Caswell Beach, the Village of Bald Head Island, Baptist Assembly/Fort Caswell, and their consultants use the AEC Nomination Form as a guide to provide information that demonstrates the uniqueness of the Cape Fear River Inlet area and why a new AEC is needed. They indicated that they will attempt to provide this information to DCM by December 2012.

- In order to accommodate stakeholder input, DCM will begin planning a public workshop for January 2013 to highlight existing AECs and associated rules as well as the Towns' justification for creating a new AEC. At this workshop, DCM will also seek public comments about how the current regulatory framework is functioning and ideas for improvements – a requirement of H819.

- DCM will synthesize the comments from the public workshop and the information received from the Town of Caswell Beach, the Village of Bald Head Island, and their consultants for a presentation to the Coastal Resources Commission.

- The Coastal Resources Commission will determine whether to endorse the AEC nomination and continue with a detailed review and development of a management plan or new use standards. The Commission report is due by December 31, 2013.

Inlet Hazard Areas Study

H819 states that "the Coastal Resources Commission shall study the feasibility of eliminating the Inlet Hazard Area of Environmental Concern and incorporating appropriate development standards adjacent to the State's developed inlets into the Ocean Erodible Area of Environmental Concern." The two key components in the legislation are 1) to consider eliminating the "inlet hazard boxes" and instead developing tailored shoreline management strategies in inlet areas (e.g. erosion rates, setback factors, use standards), and 2) to collaborate with local governments and landowners to identify regulatory concerns.

Status:

- On October 29, 2012, the CRC's Science Panel held a meeting attended by the CRC Chair and Vice-Chair to discuss this and other studies required by H819.

- The Science Panel agreed to reconvene the week of December 17, 2012 to develop a scope of work for completing the Inlet Hazard Areas study that will include a review of the previous work, and assessment of erosion rate calculation factors that include inlet related risk factors. The CRC will be involved in developing the scope of work.

- DCM will hold regional workshops to discuss regulatory issues or concerns.

- The Science Panel will finish a report which outlines proposed changes by July, 2014, and DCM will seek public comment on the report.

- The Science Panel report will be presented to the Coastal Resources Commission, and the Commission will evaluate the findings. The Commission report is due by January 31, 2015.

Sea-Level Rise

H819 states that "the Coastal Resources Commission shall direct its Science Panel to deliver its five-year updated assessment to its March 2010 report no later than March 31, 2015. The Commission shall direct the Science Panel to include in its five-year updated assessment a comprehensive review and summary of peer-reviewed scientific literature that address 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." The key components in this section of H819 are 1) to develop the comprehensive literature review, 2) to evaluate regional rates of sea-level change, 3) to make the report available for public comment, and 4) to study the economic and environmental costs and benefits of developing, or not developing, sea-level regulations and policies.

Status:

- The CRC's Science Panel included a discussion of this study at its October 29, 2012 meeting.

- The Science Panel agreed to reconvene the week of December 17, 2012 to develop a scope of work for completing the five-year assessment report. It was noted that the Science Panel will focus on the assessment of sea-level rise including a comprehensive assessment of the literature, while the Division will focus on the other aspects of the legislation. The CRC will be involved in developing the scope of work.

- The Science Panel will focus on its five-year updated assessment and present it to the Coastal Resources Commission by March 31, 2015. The report will be made available to the general public, allow for submittal of public comments, and include a public hearing. The Division is considering several approaches to the Economic Analysis component of the study.

- The Coastal Resources Commission will evaluate the Science Panel's five-year updated assessment, and draft a report which also evaluates the economic and environmental costs and benefits of developing, or not developing, sea-level regulations and policies. The draft report, which also includes the Science Panel's five-year updated assessment, will be released for public comment no later than December 31, 2015. The Division is currently discussing approaches for conducting this assessment, including an initial evaluation of approaches undertaken by other states and organizations.

COASTAL RECREATIONAL FISHING LICENSE

FINAL REPORT

August 15, 2012

Grant Title: Fisheries Habitat Impacts of Marsh Sills (Living Shorelines) as a Shoreline Stabilization/Restoration Alternative to Bulkheads

Grant Award Period: Year 1: July 1, 2010-June 30, 2011, Year 2: July 1, 2011-June 30, 2012

Grant Award #: A10-1485-003

Recipient: Charles H. Peterson and John F. Bruno, The University of North Carolina-Chapel Hill

Abstract/Executive Summary

Tidal salt marshes provide vital services to the coastal ecosystem and to human welfare, particularly by providing habitat to fish and crustaceans. With increasing coastal development, tidal salt marshes and other shoreline habitats of North Carolina are increasingly modified by artificial shoreline stabilizations structures, such as bulkheads and riprap revetments. Bulkheads interfere with salt marsh function and inhibit upwards migration of shoreline habitats, thereby leading to the loss of habitats critical to fish production. The Coastal Habitat Protection Plan (CHPP) has identified the issue of promoting marsh sills, a shoreline restoration strategy and alternative to bulkheads, as a current top priority. Unfortunately, few data exists to assess the performance of marsh sills. The purpose of this CRFL project is to assess the effectiveness of marsh sills in restoring and sustaining viable shoreline habitats for fish and mobile crustaceans. This was achieved through completion of four components: (1) Evaluation of the ecological function of the permitted and constructed marsh sills in North Carolina; (2) Assessment of the shoreline stabilization performance of marsh sills relative to traditional stabilization structures; (3) Quantification of fish and crustacean (nekton) use of coastal habitats adjacent to marsh sills; and (4) Comparison of the abundance and species composition of epibiota and nekton associated with marsh sills, bulkheads, and control (unstabilized) marshes to determine their relative habitat use and value.

Surveys of 25 marsh sills reveal that marsh sills are constructed using a variety of materials and designs in geographically diverse settings. The subset of marsh sills and control sites selected for further surveying and sampling do not differ in elevation, slope, marsh width, sediment OMC, marsh composition or seagrass density as a function of the presence of absence of a marsh sill. However, there is significant variation in slope, marsh width, marsh composition, and seagrass density between sites. These differences are attributed to site age (sills only) and small-scale differences in the physical characteristics of each site. The mean change in elevation, slope, sediment OMC, and marsh stem density did not differ between marsh sill and control sites pre- and post-landfall of Hurricane Irene. Individual sites were affected differently by the hurricane, but no or minimal damage or erosion was observed at any site post-Hurricane. On the contrary, post-hurricane damage surveys reveal that over 1/3 of the approximately 20km of bulkheads along the Outer Banks back-barrier shoreline were damaged or had collapsed completely. No damage was observed to marsh sill or riprap shorelines, indicating that marsh sills may provide better erosion protection than bulkheads during storm events. Nekton abundance, biomass, and diversity are greater in the marsh at sill sites than control sites, but are equivalent between sills and controls in seagrass/mudflat habitat. Epibiota community composition differs between bulkheads, sills and controls at upper elevations, with oysters dominating the community at sill and control sites and barnacles making up a large percentage of the cover at bulkhead sites. Nekton using habitat directly adjacent to bulkheads are less abundant, have less biomass, and are less diverse than nekton found adjacent to sills. Sills are more structurally complex than bulkheads and are likely serving as a predation refuge for juvenile transient and small resident species.

Through this project, we have provided the missing information on fish habitat function needed to reassure resource agencies that marsh sills restore and sustain fish habitat services and provide equivalent if not better erosion protection than bulkheads. We recommend that resource agencies consider and promote marsh restoration as the first option for shoreline stabilization, followed by carefully designed and reviewed marsh sills in lieu of bulkheads.

Introduction

In recognition of the reliance of fish on the habitats that produce them, the North Carolina General Assembly passed the Fisheries Reform Act of 1997 with a provision requiring the Department of Environment and Natural Resources (DENR) to prepare and then implement a Coastal Habitat Protection Plan (CHPP). The legislative intent for the CHPP is long-term enhancement of coastal fisheries associated with explicitly identified fish habitats. Salt marshes, seagrass beds, oyster reefs, and mudflats serve as important habitat for numerous marine fishes and crustaceans at various life stages (Grabowski et al. 2005, Rountree and Able 2006, Stunz et al. 2010). These habitats serve both as predation refuges and as foraging grounds, yet they are under threat from numerous anthropogenic stressors (Boesch and Turner 1984, Turner et al. 1999, Beck et al. 2001, Minello et al. 2003).

Coastal development and climate change are adversely affecting these coastal ecosystems and potentially altering their habitat value (Harley et al. 2006, Hoegh-Guldberg and Bruno 2010). Shoreline erosion caused by storms may prevent coastal habitats from keeping up with rising sea level, forcing habitats to transgress landward (Titus 1998, Tebaldi et al. 2012). While artificial shoreline stabilization can reduce erosion, structures such as bulkheads are thought to have long-term negative effects on fisheries habitats, in particular preventing salt marsh from migrating up-slope as sea level continues to rise (Figure 1) (Titus 1998). The current recommended action stated in the completed 2005 CHPP is to "protect fish habitat by revising estuarine and public trust shoreline stabilization rules using best available information, considering estuarine erosion rates, and the development and promotion of incentives for use of alternatives to vertical shoreline stabilization measures" (Street et al. 2005). Marsh sills are intertidal breakwaters typically constructed seaward of the salt marsh, with gaps or drop-downs between each sill length to allow for inundation of the marsh behind the sill (North Carolina Estuarine Biological, Physical Processes Work Group, and North Carolina Division of Coastal Management 2006). The marsh sill is intended to sustain, enhance, and restore salt marsh habitat, while still providing erosion protection, yet few studies have been completed to support these claims (Currin et al. 2007). Although some progress has been made in determining the effects of various types of stabilization on salt marshes and fish and mobile crustaceans, the results have been mixed (Bozek and Burdick 2005, Seitz et al. 2006, Currin et al. 2007).

The NC General Assembly has also acted directly with legislation to address this CHPP recommendation by mandating the Division of Coastal Management (DCM) to develop a General Permit for construction of marsh sills to facilitate their use in lieu of vertical bulkheads as a means of shoreline protection. The resultant Marsh Sill General Permit has now been in place for six years, but is rarely used by private property owners. This is in large part because of restrictive requirements from reviewing agencies who lack reassurance that the marsh sills do indeed meet their promise of enhancing and sustaining salt marsh and other associated fish and wildlife habitats. This CRFL project focuses on the impacts of shoreline stabilization on tidal salt marshes and adjacent intertidal and subtidal fish habitat. For this project, we collaborated with the NC Division of Coastal Management (DCM) and with Dr. Carolyn Currin's research group at the NOAA lab in Beaufort to conduct an integrated physical and biological assessment of marsh sills in North Carolina.

Objective: The overall objective of this project is to gather and analyze field data to determine how the ecological functions and fish habitat values of shorelines stabilized by marsh sills compare to those of natural shorelines occupied by salt marshes. This objective was accomplished through four interconnected components, which address the following questions:

1) What is the spatial distribution and quality of fish habitat associated with marsh sills in North Carolina?

2) How do marsh sills perform in terms of shoreline stabilization relative to other stabilization structures and marshes without artificial stabilization?

3) What are the effects of marsh sills on fish and crustacean (nekton herein) use of nearshore habitats (salt marsh, seagrass beds, and mudflats)?

4) What is the relative habitat value of marsh sills for nekton and epibiota (e.g., oysters, mussels) when compared to bulkheads and marshes without stabilization structures?

The components of the project objective were revised from those originally included in the proposal and an explanation and justification for these revisions is provided in the Discussion section of this report.

Procedures

We have provided a brief summary of our approach to completing each component, followed by a description of the study sites and component-specific procedures**.**

Component 1

To determine the spatial distribution of fish habitats associated with marsh sills, we visited 25 marsh sill sites in North Carolina in 2010 to assess the range of design techniques and geographic settings in which sills are used. We then selected three marsh sill sites, referred to herein as control-impact (CI) sites, that we deemed to be representative of appropriately constructed sills (after consultation with DCM staff). To ensure that we have the ability to detect differences in coastal habitats correlated with the presence or absence of marsh sills, we selected sites with similar geographic settings (wave exposure, tidal inundation patterns, and sediment type). We selected three marsh sites that are similar in geographic setting and habitat spatial distribution to serve as control sites.

Component 2

To assess the ability of marsh sills to stabilize the shoreline and prevent erosion, we surveyed the CI sites selected under Objective 1 prior to (2010) and post-landfall (2011) of Hurricane Irene's landfall in August 2011 and measured site characteristics (surface elevation, vegetation cover, and sediment parameters) at four sill-control site pairs located in the northern, central, and southern NC coastal regions pre- and post-sill construction, referred to as Before-After-Control-Impact (BACI) sites herein. To compare the stabilization performance of marsh sills to more traditional techniques (i.e. bulkheads and riprap revetments), we conducted visual, post-Hurricane Irene damage assessments of directly impacted shorelines in 2011.

Component 3

To determine if and how temporal patterns of nekton (fish and mobile crustaceans) utilization vary in response to the presence and consequences of marsh sills, we intensively sampled nekton in 2010 at CI sites and at BACI sites pre- and post-sill construction in 2010, 2011, and 2012.

Component 4

To test how hard substrates introduced to stabilized estuarine and sound shorelines are utilized as habitats by epibiota (macroalgae and invertebrates) and nekton, we sampled epibiota and nekton at replicate bulkheads, sills, and control sites (no stabilization) in 2011.

Description of study sites

CI sites consist of three existing granite marsh sills and three control marsh sites that lack artificial stabilization. The three stone sills and paired control sites are located in Pine Knoll Shores, NC (Figure 2c). At each site, a low sill, consisting of granite boulders was constructed at a base elevation near the mean low water mark, extending to a height just above mean sea level. Marsh grass, *Spartina alternaflora* and *S. patens*, was planted behind the sill at elevations consistent with nearby natural marshes. Sill sites 1 and 3 were constructed and planted in 2002, while sill site 2 was constructed in 2008 and planted in 2010. Control sites were selected near each marsh sill site based on physical similarity and proximity to the marsh sill sites. All sites were located within 500 m of one another, ensuring similar hydrology, geomorphology, tidal range, water quality, orientation and fetch.

BACI sites are located in Hatteras, NC (35°13'18.97"N, 75°41'35.21"W), Pine Knoll Shores, NC (34°42'11.58"N, 76°48'21.21"W), Swansboro, NC (34°41'49.90"N, 77° 6'24.61"W), and Holly Ridge, NC (34°28'12.30"N, 77°30'28.37"W) (Figure 2 a-d). At each site, a low sill, consisting of granite boulders (Hatteras and PKS) or oyster shell bags (Swansboro and Holly Ridge) was constructed at a base elevation near the mean low water mark, extending to a height just above mean sea level. *S. alternaflora* and *S. patens* (except the PKS site) was planted behind the sill at elevations consistent with nearby natural marshes. The Swansboro sill was constructed in the September 2010 and planted in May 2011, the Hatteras sill was constructed in March 2011 and planted in May 2011, the Holly Ridge sill was constructed in November 2011 and planted in May 2012, and the Pine Knoll Shores sill was constructed in April 2012 and will be planted in May 2013. All control sites were selected based on physical similarity and are located within 50 to 100 m of the paired sill site, ensuring similar hydrology, geomorphology, tidal range, water quality, orientation and fetch. When evaluating the stabilization performance of the marsh sill sites when compared to control sites, we had to exclude control site 2 because we were unable to obtain permission to revisit the site post-Hurricane Irene. Instead, we resurveyed the control site used for the BACI comparison in Pine Knoll Shores (referred to as CI control site 4 under Component 2).

For the Hurricane Irene damage surveys (Component 2), we selected sections of shoreline along Bogue and Pamlico Sounds, based on the path of Hurricane Irene in August 2011. We selected approximately 20 km of shoreline on Bogue Banks, a barrier island approximately 34 km in length, which runs east to west, and is bordered by Bogue Sound (north) and the Atlantic Ocean (south) and 60 km of shoreline on Hatteras Island, a barrier island approximately 320 km in length, bordered by Pamlico Sounds (west) and the Atlantic Ocean (east) (Figures 3 and 4, respectively).

We quantified epibiota and conducted edge habitat nekton sampling (Component 4) at CI stone sill and control sites surveyed under Components 1, 2, and 3, as well as at three bulkhead sites located in PKS along the same shoreline (Figure 2b).

Components 1 and 2: Assessing fish habitat availability and stabilization performance of marsh sills

Marsh sill statewide site assessments with NC DCM

We participated in the NC DCM marsh sill evaluations conducted from June to August 2010. The evaluations consisted of site visits to each marsh sill that had been permitted and constructed within North Carolina. For each site visit, we completed a questionnaire developed by DCM regarding the physical and biological performance of the marsh sill site. We participated in 25 of the 30 site visits. The methods and questionnaire for the evaluations can be found here: http://dcm2.enr.state.nc.us/estuarineshoreline/marshsill.html. In addition to completing the evaluations, we selected three sills that are representative of appropriately designed and permitted sills and were located with the same geographic setting to assess whether marsh sills affect fish habitat availability. The survey methods for these sites are described below.

Surface elevation, slope, and marsh width

We measured surface elevation at each site using a leveling rod and rotary laser level in the plots along five permanent transects and referenced the measurements to semi-permanent benchmarks with elevations determined using a Trimble Virtual Reference Station (VRS), Real Time Kinematic (RTK), Global Positioning System (GPS). The average slope (ratio of height over distance) of the marsh was calculated for each site. We calculated the maximum mean inundated (2cm or greater) marsh width (m) each site at one monthly spring high tide using marsh surface elevation data, additional width measurements taken using aerial photographs in ArcGIS, and water level data recorded every six minutes using a stationary HOBO continuous water level recorder located at Pine Knoll Shores Aquarium. Water level data was not available for the July spring tide due to an error with the water level recorder during that sample period. Therefore the maximum inundated marsh width (m) for the July sampling period was calculated by averaging the maximum marsh width of each site for June and August.

Sediment organic matter content

We took sediment organic matter samples by coring the top 3-5 cm of sediment layer at every plot on all site transects and taking the cores back to the lab to be frozen for later analysis. A subsample of approximately 30 g (wet weight) was dried overnight in a 100°C oven, and then placed in a 450°C oven for 6–8 h to obtain ash weight. Percent organic matter was calculated by subtracting the ash weight from the dry weight and then dividing by the total dry weight.

Salt marsh community characteristics

To compare marsh plant community composition at marsh sill sites and control sites, we measured salt marsh stem densities, maximum stem heights, and percent cover by species during the period of peak marsh biomass (July-August) at each site pair. Five transect locations were selected using restricted random sampling, which has been shown to produce better density estimates than simple random sampling (Neckles et al. 2002). Marsh transects began at the seaward edge of the marsh and continued to the start of upland vegetation or property owner landscaping, which reached no more than 20 m from the start of the transect at most sites. The length of each transect within a site depended on the extent of the marsh and the distance of the sill from shore. Marsh sampling plots began at the lower marsh edge and samples were collected at 1, 3 or 5 m intervals along each transect, depending on total transect length. We recorded percent cover by species within each 1-m^2 plot and stem density by species and stem heights of

the five tallest plants by species per 0.25-m^2 quadrat (Daoust and Childers 1998, Craft et al. 2003).

Seagrass community characteristics

We surveyed subtidal areas up to 30 meters seaward of the marsh edge at each site and quantified percent cover of seagrass by species, live oyster, loose shell, and mudflat. The length of each transect within a site depended on the extent of the seagrass beds and the distance of the sill from the estimate high water line. Subtidal sampling plots began at the lower marsh edge and samples were collected every 3 or 5 m along each transect, depending on total transect length. Seagrass shoot density was estimated by counting the total number of shoots per species enclosed by 0.25 m^2 quadrats using a snorkel and mask (Hauxwell et al. 2001).

Visual damage surveys

To assess the stabilization performance of different shoreline stabilization structures during Hurricane Irene, we conducted visual surveys of 20 km of continuous shoreline from Atlantic Beach, NC to Emerald Isle, NC, and 60 km of shoreline in Hatteras Village, Rodanthe, Waves, and Salvo on Hatteras Island, NC (Figures 3 and 4, respectively). We recorded GPS points using a Trimble GeoExplorer (2008 series), took photographs for each change in shore type (e.g., marsh, beach, bulkhead, riprap), and categorized each instance of visible shoreline erosion or damage (Table 1). The GPS data, photos, and category assignments were then used to determine the percentage of armored shoreline by type and the percentage of damaged shoreline by type.

Plotting GPS points along shoreline and comparison to 2012 NC DCM digitized shoreline

We imported the GPS points into ArcGIS as shapefiles overlaid on 2010 aerial imagery of the Bogue Banks and the Outer Banks shoreline. Each GPS point was classified according to shoreline type (e.g., marsh, beach, bulkhead, sill) using the aerial imagery, GPS coordinates, field notes, and field photos. After digitizing the shoreline based on our visual surveys and aerial imagery, we then reconciled our shoreline to the shoreline digitized by NC DCM in 2011 and 2012. We overlaid the DCM polylines onto our shapefiles and the 2010 aerial imagery of the Outer Banks and Bogue Banks coastlines. At each GPS point from our surveys, we classified the corresponding shoreline and structure polyline segments with a habitat or armoring descriptor. NC DCM classified the shoreline using 2007 aerial imagery for Dare and Hyde counties and 2010 aerial imagery for Carteret County, producing ArcGIS continuous polyline shapefiles that include the shoreline type (marsh, sediment bank, modified, miscellaneous) and shoreline structure type (boat ramp, vertical structure, breakwater, groin/jetty, sill, sloped structure). We did not receive the shoreline data for Carteret County until June 2012; therefore the results of the Bogue Banks analysis will not be presented in this report.

Component 3: Evaluating nekton use of fish habitats associated with marsh sills

Salt marsh nekton sampling

We sampled nekton during one night spring tide per month between June and October 2010 to determine nekton utilization of the marsh and subtidal habitats at each site. We sampled nekton utilizing the marsh during high tide by simultaneously setting two fyke nets at a paired marsh sill and natural marsh sites during a dusk or night spring tide. Fyke nets were placed at the sill gaps at the marsh sill sites and at random locations at the edge of natural marshes, with the fyke net opening set at approximately the same distance from the high water line at each paired site (Rozas

and Minello 1997, Currin et al. 2007). The fyke nets consist of a 0.9m by 0.9m by 5.1m compartmentalized net bag with 0.9m by 5.1m wings that stretch out from the bag. Fyke net wings were set at the same distance apart at marsh sill and control site and were collected simultaneously in order of setting at each site. Species were identified, counted, weighed, and the first twenty of each species were measured for standard length (fish and shrimp) or carapace length (crabs) either in the field or in the lab (after being transported using buckets and air bubblers) and then released to minimize mortality. We calculated catch per unit effort (individuals or grams per soak time, hours) for nekton caught by each net.

Seagrass/mudflat nekton sampling

To determine nekton utilization of subtidal habitats adjacent to marsh sills and natural marshes, we seined two times during an afternoon spring low tide each month (June to October 2010). Seining occurred parallel to the shoreline over a standard distance (typically 20 m intervals) at each site. Seines consisted of a 7.3m by 1.8m net with a 1.8m by 1.8m by 1.2m bag. Species were identified, counted, weighed, and the first twenty of each species were measured for true length (fish and shrimp) or carapace length (crabs) either in the field or in the lab (after being transported using buckets and air bubblers) and then released to minimize mortality. We calculated catch per unit effort (individuals or grams per area, m^2) for nekton caught by each net.

Component 4: Quantifying epibiota and nekton at bulkhead, marsh sill, and control sites

To test how hard substrates introduced to stabilized estuarine and sound shorelines are utilized as habitats by epibiota (macroalgae and invertebrates) and nekton, we sampled replicate bulkheads, stone sills, and control sites (n=3) in September 2011. We determined the percent cover (using the point-intersect method, with 16 intersections within a $0.25m^2$ quadrat) and species composition of epibiotic species attached to the introduced sections of hard substrates that are only submerged at high tide (high elevation) and completely submerged except during low tide (low elevation).

Nekton utilization of the substrate was assessed by setting replicate (n=10) minnow traps at the edge of each shoreline type two hours before high tide and collecting the traps two hours after high tide monthly from June to October 2011. Nekton species handling, identification, measurement were the same as for Component 3. We calculated catch per unit effort (individuals or grams per soak time, hours) for nekton caught by each net.

Statistics

We performed two-factor, nested (sill vs. control, nested site) analysis of variance (ANOVA)s to test for significant differences in marsh sediment OMC, total marsh plant stem densities, changes in sediment OMC, and changes in total marsh stem density. Data were averaged by plot before conducting these analyses. We conducted pairwise comparisons among sites using Tukey's HSD comparisons. Because of the violations of the assumptions for parametric statistical testing, two-factor (sill vs. control and site) permutational analysis of variance (PERMANOVAs) on Euclidean distance matrices were performed to test for significant differences in marsh species diversity indices, marsh elevation, marsh slope, maximum inundated marsh width, seagrass shoot densities, and epibiota total percent cover. PERMANOVA pairwise comparisons were performed to elucidate site differences. To decipher significant community differences between marsh sill and control sites, we performed two-factor, nested PERMANOVAs on the Bray-Curtis similarity matrices of marsh plant densities and epibiotic community composition. Marsh plant densities and epibiotic cover were log (x+1) transformed to reduce the effect of the most abundant species

when testing for differences in community composition.

The abundance and biomass of each species of fish and decapods were pooled separately for each habitat (marsh from fyke nets or seagrass/mudflat from seines) per month, per site. We compared nekton species diversity for each habitat between CI marsh sill and control sites by calculating species diversity indices. We performed two-factor (sill vs. control and sample month) PERMANOVAs on the Bray-Curtis similarity matrices of nekton abundance and biomass to decipher significant community differences in each habitat between CI marsh sills and control sites. Nekton species abundances were log (x+1) transformed to reduce the effect of the most abundant species when testing for differences in community composition. To test for significant differences in fish and decapod abundance, biomass, and on raw diversity indices, we performed two-factor ANOVAs on box-cox transformed pooled fyke net, seine, and minnow trap data. We performed Wilcoxon sign rank tests on individual abundances and biomass (pooled by net and month) of each species of fish and crustacean to compare individual species use of sill and control sites. An alpha level of 0.05 was used for all hypothesis testing. Analyses were conducted using JMP 9.0 (SAS 2012) and PRIMER-E software (Clarke and Gorley 2001).

Results

Component 1: State-wide marsh sill evaluations and selected marsh sill surveys

NC DCM statewide marsh sill evaluations

The results of the statewide marsh sill evaluations conducted in conjunction with NC DCM can be found in the final report completed by NC DCM (http://dcm2.enr.state.nc.us/estuarineshoreline/marshsill.html).

CI site surface elevation, slope, and marsh width

Mean elevation (m), slope, and maximum inundated width (m) of the marsh found at marsh sill sites was not significantly different from that of the marsh found at control sites ($P>0.05$, each metric, Table 2). Elevations are relative to NAVD88. However, the average slope of sill site 1 was less than the slope of control sites 1 and 3 ($P<0.05$) and the maximum inundated marsh width of sill site 2 and control site 2 was smaller than the other sill and control sites ($P<0.05$).

CI site sediment organic matter content

The organic matter content (OMC) of marsh sediments ranged from 2.1 to 3.4% at control sites and from 2.2 to 3.1% at marsh sill sites (Figure 5). Mean OMC did not differ by treatment (sill vs. control) or by site ($P>0.1$).

CI site marsh plant community characteristics

The community composition, species richness, evenness, and Shannon diversity of marsh plant species did not differ as a function of the presence of a marsh sill ($P>0.05$, each metric). However, there were differences in the community composition between sites, with the composition of sill site 2 differing from sill sites 1 and 3, as well as control site 3 ($P<0.05$, Figure 6). Mean total marsh plant stem density did not differ between sill and control sites, but the total density of marsh plants at sill site 2 was less than the density of sill site 1 (Figure 6, $P<0.05$). To avoid redundancy with stem density data, percent cover data is not presented in this report, but is included in the raw data files.

CI site seagrass community characteristics

Two species of seagrass were present at the CI sites, *Halodule wrightii* and *Zostera marina,* with *Z. marina* only present at sill site 3. The total seagrass density varied among some sites ($P<0.05$, Figure 7), but the mean density was not different between sill and control sites ($P>0.05$). To avoid redundancy with shoot density data, percent cover data is not presented in this report, but is included in the raw data files.

Component 2: Marsh sill stabilization performance

CI site comparison pre- and post-Hurricane Irene

Marsh surface elevation at CI control increased by 2.0 cm, while elevation of the sill sites decreased by 0.78 cm from August 2010 to October 2011 (Figure 8a). Elevation changes were more variable at marsh sill sites, ranging from -11.0 cm to 7.4 cm. Control site mean elevation changes ranged from -2.7 cm to 7.0 cm (Figure 8b). The slope of the marsh at sill and control sites increased by 0.0033 and 0.065, respectively (Figure 9a). Changes in slope at marsh sill sites ranged from -0.085 to 0.057 and changes in slope at control sites ranged from -0.089 to 0.28 (Figure 9b).

Mean marsh sediment OMC decreased by 0.73% at control sites, while mean OMC increased at marsh sill sites by 0.12% from August 2010 to October 2011, although these differences in OMC change were not significant ($P>0.1$). The change in sediment OMC ranged from -1.3 to 0.025% at control sites and from -0.24 to 0.63 at marsh sill sites (Figure 10).

The total marsh stem density decreased for all sites from August 2010 to October 2011 (Figure 11). There was no significant difference in the change in stem density between sill and control sites, with stem loss ranging from 13 stems to 62 stems per $0.25m^2$ at control sites, and stem loss ranging from 13 to 78 stems per $0.25m^2$ at sill sites ($P>0.1$, Figure 11). Losses in stem densities spanned all elevations of the marsh, with the mean loss at the marsh edge being 21 stems per $0.25m^2$ and the mean loss at the uppermost marsh plot being 51 stems per $0.25m^2$.

BACI site comparison

The results of the BACI site comparison pre- and post-sill construction will be presented in the publication associated with this project upon the completion of the post-construction sampling of the BACI sites. Post-construction sampling was beyond the original scope and award period of this grant. These results and data will be delivered per the guidelines of the CRFL grant program.

Hurricane Irene Damage Surveys

Of the approximately 60 km of shoreline surveyed along the back-barrier portion of the Outer Banks, 35% (~21 km) of shoreline was stabilized by bulkhead (Figure 12a). Other shoreline structure types (sills, riprap, and hybrid riprap/bulkhead) made up only 14% (~8km) of the shoreline, with the remaining shoreline being marsh or beach (Figure 12a). We did not find any visible damage (structural failure, landward erosion) to sill, riprap, or hybrid shorelines surveyed. Of the 21 km of bulkhead shoreline surveyed, 33% was damaged (Figure 12b) with damage ranging from landward erosion to complete bulkhead collapse. A majority of the damage was classified as structural damage to the bulkhead itself. We did not attempt to quantify damage to marsh or beach shorelines. The results of the Bogue Banks damage surveys will be presented in the manuscript to be submitted for publication in a peer-reviewed journal upon completion of the

shoreline analysis.

Component 3: Nekton habitat use

Abundance, biomass, and composition of nekton at CI sites

Salt marshes landward of marsh sills promoted a higher abundance, biomass, richness and diversity of fish and crustaceans than control sites ($P<0.05$, Figures 13a-c, respectively). Juvenile transient species, such as mojarra (*Eucinostomus spp*.), brown shrimp (*Penaeus spp.)* and flounder (*Paralichthys spp.),* as well as small resident species, such as mummichogs (*Fundulus heteroclitus*), killifish (*Fundulus majalis*), and grass shrimp (*Hippolyte spp.)* were more abundant at sill sites than control sites ($P<0.05$, Figure 14a).

There was no difference in abundance, biomass, or community composition of fish and crustaceans using mudflat or seagrass habitat adjacent to sills or control sites ($P>0.1$, Figure 15a-b). There was a correlation between seagrass percent cover for the area seined and total fish and crustacean abundance (adjusted $r^2=$ $P<0.05$, Figure 16).

Abundance, biomass, and composition of nekton at BACI sites

The results of the BACI nekton use pre- and post-sill construction will be presented in the publication associated with this project upon the completion of the post-construction sampling of the BACI sites. These results and data will be delivered per the guidelines of the CRFL grant program.

Component 4: Epibiota and nekton use of bulkheads and marsh sills

The total epibiotic percent cover did not differ between marsh sill, bulkhead, and control sites at either the high or low elevation plots ($P>0.05$, Figure 17a-b). At the high elevation plots, the community composition of epibiota was different between bulkhead and sill sites and between bulkhead and control sites ($P<0.05$, Figure 17a). At the low elevation plots, epibiotic community composition was different between control and sill sites ($P<0.05$, Figure 17b). Although the mean community composition of low elevation plots on bulkheads appeared to be different from that of sill and control sites, high variability in the total percent cover and community composition between bulkhead sites resulted in the difference being non-significant (Figure 17b).

Unvegetated habitat directly adjacent to bulkheads exhibited lower abundance and biomass of fish and crustaceans than habitat adjacent to sills (Figure 18a-b). The community composition of nekton caught at bulkhead sites, marsh sills, and controls sites was different ($P<0.05$). No mummichogs or killifish (*Fundulus spp.)* were caught at bulkhead sites, while the mean number of individuals caught at marsh sills sites and control sites was 124 and 8, respectively.

Discussion

Interpretation of results

Component 1: Statewide marsh sill evaluations and selected marsh sill surveys

The results of the statewide marsh sill evaluations are discussed in the final report on the NC DCM webpage. The surveys of the selected marsh sill and control sites in Pine Knoll Shores reveal that there are no overall differences in the physical or ecological characteristics sites with

marsh sills when compared to control sites. However, the youngest sill site, sill 2, had a lower marsh density and different marsh community composition than a majority of the control and other sill sites. This is likely due to the age of the restored marsh and the eroded state of the existing marsh at the site prior to the sill construction relative to the other sites. Previous studies of marsh restoration (e.g., (Boyer et al. 2000, Zedler and Callaway 2000, Currin et al. 2007)) have shown that it may take several years for the vegetation of a restored marsh vegetation to resemble that of a natural marsh.

Sediment OMC is relatively low at all sites, when compared to sediment OMC values reported for previously studied mature marshes on the Atlantic coast (e.g. (Craft et al. 1988)) but are consistent with those values reported by Currin et al. 2007. Although, there was no difference in OMC between control and sill sites, the reduction in wave energy caused by the presence of the sill may result in retention of higher amount of organic matter within the marsh over time. Once complete, the results of the BACI study will be used to further test this hypothesis.

Seagrass density was highly variable across sites, making it difficult to determine if the presence of a marsh sill may affect adjacent seagrass density. Other factors such as wave exposure, boat activity, and water depth (*see* (Fonseca 1998)) may have a greater affect on the seagrass community than the presence or absence of a marsh sill. The results of the BACI surveys of seagrass habitat under Component 2 may provide additional insights and will be considered in the final publication.

Because the marsh sill and control sites were selected within the same geographic setting, factors other than stabilization, such as tidal inundation, geomorphology, and wave exposure, were not expected to result in site differences. However, small differences in these and other factors may have resulted in some of the site differences (e.g., slope, marsh width, seagrass cover) observed. Currin et al. 2007 observed differences in marsh density, community composition, elevation between sites within the same NC region, but these sites were more geographically dispersed and had greater variation in shoreline orientation and fetch. All of these factors should be considered when determining the potential impacts of marsh sill construction on the adjacent habitats. Wave exposure, inundation time, and proximity to channels will be considered as covariates in the final analyses included in a future publication.

Component 2: Marsh sill stabilization performance

The landfall of Hurricane Irene in August 2011 occurred during high tide at the CI marsh sill and control sites. The high tide, combined with the storm surge, resulted in the entire marsh being inundated during the storm (as confirmed by HOBO water level data). The changes in marsh elevation and slope were highly variable across the control and sills sites surveyed (Figures 8 and 9, respectively). While some sites increased in overall elevation and slope (control sites 1 and 4 and sill sites 1 and 2), other sites saw a decrease in elevation and slope (control 3 and sill 3). Sites with a net increase in elevation saw the greatest increases at upper plots where sediment was most likely transported and deposited from landward unvegetated areas present at those sites (Gittman 2011, *personal observation*). Sites with a net decrease in marsh elevation saw the greatest elevations losses at both the highest and lowest elevation plots, indicating that sediments were scoured from the upper marsh edge and the lower marsh edge where vegetative cover is lower. Vegetation can stabilize sediments and prevent erosion along shorelines (Conaway 2005), but we did not find a correlation between vegetation density pre-Hurricane Irene and the overall change in elevation. The relationship between the change in elevation and vegetation percent cover or marsh plant species-specific densities will be explored in a future manuscript.

Changes in sediment OMC were highly variable across sites (Figure 10) and were not correlated with elevation change or marsh stem density change. Marsh density decreased for all sites post-Hurricane Irene and this may be as a result of Hurricane damage to the marsh, as well as seasonal (August to October) or annual differences (2010 to 2011) in stem density (Figure 11). Hurricane damage was visually apparent in some sites where vegetation had been scoured away, but these scoured areas were small (less than 1 m^2) and infrequent within the marsh (Gittman 2011, *personal observation*). Sites will be resurveyed in September 2012 to determine if losses in stem density remain after one growing season.

The results of the BACI site comparison pre- and post-sill construction will be discussed in the publication associated with this project upon the completion of the post-construction sampling of the BACI sites.

The results of the Hurricane Irene damage surveys conducted for shorelines along the Outer Banks, NC, reveal that over 1/3 of the properties with bulkheads were damaged at the time of the survey (Figure 12b). Bulkheads are the most common shoreline stabilization feature along the surveyed shoreline (Figure 12a). Riprap and marsh sills are less common than bulkheads along the Outer Banks shoreline, making up only 3.6% and 2.2% of the shoreline, respectively. No damage was visible to any shoreline protected by riprap or a marsh sill. Although the sample size of riprap and marsh sills is far less than that of bulkheads, the large difference in damage between the structure types (33% for bulkheads and 0% for other structures) may indicate the bulkheads do not provide the best protection against shoreline erosion and damage during storm events. Because the combined high tide and storm surge associated with Hurricane Irene overtopped the shoreline stabilization structures, much of the damage to the bulkheads was likely as a result of scouring of sediment landward of the bulkhead and then subsequent failure of the structural integrity of the bulkhead in the most extreme cases.

In many cases along the Outer Banks and Bogue Banks, NC, the slope of the shoreline landward of the bulkhead is steep (nearly vertical) when compared to marsh sill, riprap, or natural shorelines. This steep grade can result in a large loss of sediment if the stabilizing structure (the bulkhead) collapses or is breached. This result was evident at a majority of the damaged bulkheads surveyed (Gittman 2011, *personal observation*). One property owner in Bogue Banks, NC, reported that replacement of his bulkhead and restoration of his shoreline to its previous elevation and width after Hurricane Irene required 22 truckloads of clean sand fill (epibiota bulkhead 2, Acree 2012, *personal communication*). Marsh sill site 2, located approximately100 meters from this collapsed bulkhead saw an increase in overall marsh elevation and only a slight increase in the slope of the shoreline (Figures 8b and 9b, respectively). Additional analysis and interpretation of the results of the damage surveys will be included in the publication upon completion of the Bogue Banks shoreline analysis.

Component 3: Nekton habitat use

Fyke net data reveal that nekton are more abundant, have more total biomass, and are more diverse at sites with marsh sills than sites with just a fringing marsh (Figure 13a-c). Greater fish and crustacean abundance, biomass, and diversity may indicate that sills increase the structural complexity of the habitat, which could benefit small resident and juvenile fishes (Grabowski 2004). Some of the species that are more abundant at marsh sill sites, such as mummichogs and killifish (*Fundulus spp.*), are known to be marsh residents (Able et al. 2012), while others, such as flounder (*Paralichthys spp*.), are transient species that only enter the marsh at high tide (Rountree and Able 1992). It is unclear whether sills are serving as a predation refuge or as a potential foraging habitat, in the form of epibiota on the sill structure itself. Natural fringing oyster reefs

are thought to serve both roles (Peterson et al. 2003) and marsh sills may be serving as a substitute for natural oyster reefs lost to overharvesting and habitat degradation. Further discussion of the role of sills as a predation refuge or food source is provided under Component 4 discussion section. Results of the nekton sampling of BACI sites may clarify the mechanisms by which marsh sills enhance marsh habitat because the newly constructed and sampled sills have low densities of epibiota in the first year after their construction (Gittman 2011, *personal observation*).

Seine net data suggest that the presence of a marsh sill does not affect nekton use of seagrass or mudflat habitats seaward of the marsh sill (Figure 15a-b). The variability in seagrass cover at marsh sill and control sites may have masked the effect of marsh sills on habitat use. However, inclusion of seagrass cover as a covariate did not result in significant differences in marsh sill and control site nekton abundances or biomass. We did find a positive relationship between the percent cover of seagrass in the area seined and the abundance of nekton caught in the associated seine pull (Figure 16). However, because the area to perimeter ratio of seagrass cover was not determined, the relationship between nekton abundance and seagrass cover may not be as a result of greater seagrass area, but could be due to greater availability of seagrass edge habitat (Macreadie et al. 2009). We intend to use survey data and data available from NC DMF to determine if the relationship is a result of seagrass area or available seagrass edge for the final publication. Additionally, results of the nekton sampling of BACI sites may clarify the effects of marsh sills on seagrass habitat and the relationship between nekton abundance and seagrass cover.

Component 4: Epibiota and nekton use of bulkheads and marsh sills

Although the total epibiotic cover does not differ between bulkheads, sills, and control sites, the community composition did vary between bulkheads and sill and controls sites at high elevation plots and between control and sill sites at low elevations (Figure 18a-b). Within high elevation plots eastern oysters, *Crassostrea virginica,* made up the majority of the community at sill and control sites, while barnacles (*Balanus spp.)* constituted the majority of cover at bulkhead sites. Within the low elevations, marsh sill and control sites cover was dominated by eastern oysters, with ribbed mussels, *Geukensia demissa*, occupying a smaller portion of the cover at sill sites. In contrast, cover at bulkheads sites consisted of a mixture of barnacles, oysters, green macroalgae (*Enteromorpha spp.)*, and bryozoans. High variability between low elevation plot cover at bulkhead sites resulted in the differences in community composition from sills and control sites not being significant. Differences in community composition among shoreline stabilization structures may be caused by differences in substrate type, water flow, and sediment suspension.

Epibiota settlement and growth is driven by numerous physical and ecological factors, including, but not limited to availability of suitable substrate, salinity, tidal inundation, sedimentation, wave exposure, competition, and predation (McDougall 1943, Sutherland and Karlson 1977, Ortega and Sutherland 1992, Pineda and Caswell 1997, Olivier et al. 2000). Elevations were standardized across structure type into high and low elevation plots. However, unlike bulkheads, the orientation of the substrate surface changes with height for sills, therefore the suitable area for barnacles to occupy may be reduced when compared to bulkheads. The orientation and structure of marsh sills more closely resembles that of natural oyster reefs, which may explain the higher cover of oysters on sills than on bulkheads. Additional comparisons between stone sills and oyster reefs need to be made to determine if granite sills can be considered substitutes for natural oyster reefs. The BACI analysis of stone and oyster bag sills may provide further evidence that stone sills can serve a similar function to that of an oyster reef. The results of this comparison will be presented in a future publication.

Nekton abundance and biomass was higher within the unvegetated mudflat directly adjacent to marsh sills than adjacent to bulkheads (Figure 18a-b). However, neither bulkheads nor sills had significantly higher nekton abundance or biomass than control sites. These results indicate that more structurally complex habitats, defined as those habitats with more cover to serve as a predation refuge per unit area (Bartholomew and Diaz 2000), may support higher abundances and biomass of small resident and juvenile nekton. Control sites have an intermediate level of structural complexity with *S. alternaflora* marsh edge and loose oyster found adjacent to the area sampled. Therefore, nekton abundance and biomass from low (bulkhead) and high (sill) complexity would be expected to be intermediate at control sites. A majority of the nekton caught at marsh sill and control sites were small marsh resident species that depend structurally complex, resource-rich habitats, such as mummichogs (*Fundulus heteroclitus*) and grass shrimp (*Hippolyte spp*.) (Kneib 1997, Rountree and Able 2006). Bulkhead sites did not support any individuals of the aforementioned species. However, other common fish, pinfish (*Lagodon rhomboides*) and pigfish (*Orthopristis chrysoptera*), were found at bulkhead sites, as well as sill and control sites, indicating that all sites may serve as foraging habitat for these generalist consumer species. However, if only generalist species are supported by low complexity structures such as bulkheads, then the role of habitat structural complexity must be considered when assessing fish habitat quality.

Data limitations

The marsh sills we sampled were selected because they are considered to be appropriately designed, therefore conclusions drawn from data regarding fish habitat sustainment, stabilization performance, fish utilization, and epibiota coverage should only be applied to similarly designed sills in similar geographic settings. Additionally, this was a short-term survey of the habitats and supported nekton, additional years of surveying and sampling would be needed to examine long-term changes in habitat or nekton use associated with marsh sills or other stabilization methods. Finally, the mechanisms by which marsh sills have the potential to enhance fish habitat were not clearly identified by the results presented in this report. Further sampling and analysis is needed to determine if the sills serve as a predation refuge for juvenile and resident nekton or as foraging habitat.

Final analyses and interpretation of the results of this project will be presented in peer-reviewed publications to be completed in the near future. Once published, the results and interpretation of results presented in those publications should be used for management decisions in lieu of the results and interpretations presented in this report if those results differ.

Adherence to proposed project objectives

This project adhered to the primary objective provided in the proposal: "The overall objective is to gather and analyze field data to determine how the ecological functions and fish habitat values of shorelines stabilized by marsh sills compare to those of natural shorelines occupied by salt marshes," (Peterson and Bruno 2009). However, we revised the components necessary for achievement of this objective based on the availability of suitable marsh sill sites, preliminary field results, the addition of improved methods for achieving the proposed objective, and the opportunity to sample pre- and post-construction of marsh sills and pre- and post-landfall of Hurricane Irene. The original components proposed (*from* Peterson and Bruno 2009) are as follows, with revisions to each outlined below each component:

(1) To test the hypothesis that the abundance and distribution of fish habitats (salt marsh, SAV, soft bottom, and shell bottom=oyster reef) are modified by marsh sills as a function

of geographic environmental setting (surface elevation, sediment composition, wave exposure, and tidal prism), we will plot the spatial distribution of fish habitats and measure the marsh species composition and biomass for the estimated 30 permitted and completed marsh sill sites (exact number of sites will determined through DCM site visits in August and September 2009) and paired control marsh sites in North Carolina over 2 years. To characterize the geographic environmental setting, we will also measure the surface elevation, estimate the tidal prism and wave exposure, and determine sediment characteristics of each sill-control pair. Differences in physical site characteristics have implications for function, even determining the fish habitat type itself if sufficient deposition or erosion occurs. Additionally, a 2 year, multi-seasonal habitat assessment will reveal temporal and seasonal variation in geographic environmental setting and subsequent fish habitat distribution.

Revisions: In collaboration with NC DCM, we conducted site visits and questionnaire-based assessments of 25 or the 30 permitted and constructed sills identified in NC in 2009. We selected a subset of sill and control sites for further evaluation and sampling over the 2-year study period. Additionally, we selected sites planned for marsh sill construction in the northern, central and southern regions of NC to further evaluate the effects of marsh sill construction on fish habitat distribution and function. Sediment grainsize analysis is also only being completed for BACI sites, rather than for all survey sites. Finally, completion of damage survey assessments was also not included in the proposal and because NC DCM could not provide shoreline data before until June 15, 2012, only the results of the Outer Banks damage surveys are presented in this report. Further data analyses and interpretation of results from this component with be presented in subsequent peer-reviewed publications.

(2) To determine if and how temporal patterns of nekton (fish and mobile crustaceans) utilization vary in response to the presence and consequences of marsh sills, we will intensively sample nekton in the spring, summer, and fall of year 1 at 3 stone sill-stabilized marshes and in 3 control marshes, including sites studied by Currin's NOAA team. We will sample nekton over 3-day periods (1 day and night for each of 3 sill-control site pairs) during spring tides from May to October using fyke nets. By sampling nekton frequently through the spring-summer-fall seasons of fish and crustacean use, we will develop the first integrated data set on fishery habitat value of sill-stabilized vs. natural marshes.

Revisions: We completed this component for sites surveyed under components 1 and 2. However, we sampled nekton during night spring tides only to maximize the number of sites we could sample and night sampling proved to produce a higher abundance and diversity of nekton (Young et al. *unpublished data*). This revised component is listed as Component 3 in this report.

(3) To quantify variation in nekton use of distinct fish habitats in response to marsh sills, we will sample nekton in the marsh interior, marsh edge, and adjacent seagrass beds using throw traps at the sites mapped and sampled in Objectives 1 and 2. We will adopt the Objective 2 sampling period, alternating throw trap sampling with fyke net sampling by full tidal cycle at each site, thus allowing us to sample nekton in each habitat during spring tides. We will collect 30 throw trap replicates per habit type per site beginning at low tide to quantify temporal nekton use as a function of the spatial distribution of important fish habitats.

Revisions: We completed this component for sites surveyed under Components 1 and 2. Instead of using throw traps, we used seines to sample seagrass habitat and due to the small size of the marshes sampled (less than 10 m width on average), distinction between marsh interior and marsh edge was not deemed to be necessary to achieving the goals of the project.

(4) To test the hypothesis that marsh sills affect nekton utilization of available fish habitats as a function of geographic environmental setting, we will sample nekton of a large suite of the 30 sill-control sites in the spring and fall of year 2. By sampling nekton at sites throughout the North Carolina coast, we can determine whether the affects of marsh sills on shoreline habitat and use of habitat by nekton are specific to the geographic environmental setting in which the marsh sills are constructed.

Revisions: In lieu of sampling additional existing marsh sills, we elected to sample sites pre- and post-construction of marsh sills along north, central and southern NC coasts and to conduct post-hurricane damage surveys of the NC shorelines to evaluate relative stabilization performance of different stabilization structures. These revisions are represented as Components 2 and 3 in this report. Because completion of the BACI sampling was not included in the original proposal and sill construction extended beyond the project award period, only pre-construction data is being provided to NC DMF at this time.

(5) To test how hard substrates introduced to stabilized estuarine and sound shorelines are utilized as habitats by epibiota (macroalgae and invertebrates) and nekton, we will sample replicate bulkheads, riprap revetments, and sills (both stone and oyster-bag) in year 2. We will determine the percent cover and species composition of epibiotic species attached to the introduced hard substrates that are continuously submerged. Nektonic utilization will be assessed by suction dredge sampling of volumetrically isolated samples using throw traps to establish a fixed sample during both day and night. From this sampling, specific conclusions could be drawn about the suitability of stone as compared to oyster bags for oyster colonization, thus indicating the best substrate for creating new fish habitat (oyster reef), as well as utilization of this habitat by nekton.

Revisions: We completed this component of the project. However, instead of sampling epibiota and nekton on riprap revetments, we sampled control sites without artificial stabilization to compare to marsh sills and bulkheads. Additionally, minnow traps were used instead of suction dredge sampling to sample nekton because it is less time intensive, destructive, and minimizes nekton mortality. This revised component is listed as Component 4 in this report.

Applicability of study results to CRFL Strategic Plan and priorities

This CRFL project is applicable to the Habitat goal to "enhance coastal fisheries through the protection, enhancement, and restoration of coastal fish and fish habitats" and to the following Habitat objectives outlined in the CRFL Strategic Plan:

- Improve effectiveness of existing programs;
- Identify, designate, and conserve fish habitat and Strategic Habitat Areas (SHAs); and
- Enhance habitat and protect it from physical harm (DMF 2007).

More specifically, this project is applicable to the following habitat strategies (DMF 2007):

- **Strategy H.1.1.** In cooperation with other DENR agencies and university scientists, conduct coastal habitat status assessments using standard indicators of estuarine and near shore ocean conditions.
- **Strategy H.1.4.** Enhance education of fishermen and the public concerning fish habitats, how they function, and what people can do to protect them.
- **Strategy H.2.4.** Conduct research to clarify the linkages between coastal fish habitat and fish production and identify the key aspects of habitat function and how these functions are affected by human activities.
- **Strategy H.2.5.** Coordinate mapping and monitoring of fish habitats to delineate causes of and effects of habitat disturbance and loss.
- **Strategy H.3.1.** Identify degraded fish habitat and implement restoration measures
- **Strategy H.3.2.** Initiate monitoring programs to evaluate success of restoration and enhancement projects.
- **Strategy H.3.3.** Conduct research on restoration techniques in order to improve the quality and function of created or enhanced habitat.
- **Strategy H.3.4.** Refine materials and deployment techniques to maximize long- term ecological function and structural integrity of restoration efforts.

Through this project, we have achieved the following:

- Conducted coastal habitat assessments in collaboration with NC DMF and NC DCM (H.1.1);
- Provided information necessary to educate the public on alternative shoreline stabilization techniques (H.1.4);
- Identified how shoreline stabilization can affect coastal habitat function (H.2.4);
- Monitored fish habitats to determine if shoreline stabilization can adversely affect coastal habitats (H.2.5);
- Identified degraded habitats associated with bulkheads (H.3.1);
- Monitored habitat characteristics and nekton use of restored marshes associated with marsh sill construction (H.3.2);
- Conducted research on the effects of marsh sills on coastal fish habitats (H.3.3); and
- Made recommendations to NC DCM and NC DMF for marsh sill construction techniques for long-term sustainment of coastal ecosystem function through presentations and personal communications (H.3.4).

Recommendations

We recommend that the results of this CRFL project be considered when making new priorities for habitat protection, research needs, and education and outreach goals within the CRFL Strategic Plan and future revisions to the Coastal Habitat Protection Plan. Marsh sills are a viable alternative to traditional shoreline stabilization techniques, such as bulkheads and riprap revetments. Marsh sills combine marsh habitat restoration with shoreline stabilization that is equivalent, if not superior to that provided by bulkheads. Nevertheless, careful site evaluation, engineering design, and agency review of potentially affected coastal habitats is necessary for the appropriate design and construction of marsh sills. In many sites with only minor to moderate erosion and low to intermediate wave energy, marsh planting may be the most appropriate shoreline stabilization technique. Only when stabilization through planting is not sufficient should any form of artificial stabilization be employed. If possible, stabilization through oyster shell or oyster bags should be considered and recommended by permitting agencies.

Additional research is needed on the long-term effects of all forms of artificial shoreline stabilization, particularly in the context of sea level rise and reoccurring major storm events. Although the results of this project provide evidence for the ability of marsh sills to support habitat function and short-term stabilization during a major storm event, it is still unclear if marsh sills (or any stabilization structure) will provide the protection against future storm events and erosion caused by sea level rise. NC DMF and DCM should consider long-term monitoring programs for coastal habitats most vulnerable to the combined effects of shoreline stabilization and sea level rise, particularly salt marshes and seagrass beds.

Finally, regardless of the findings of this project in favor of marsh sills over other artificial shoreline stabilization strategies, marsh planting and marsh sill construction will likely not increase in NC in lieu of bulkhead construction if the public is not adequately informed and educated. NC DMF and DCM have made strides in educating the public about estuarine shoreline stabilization options and procedures for obtaining the appropriate permits, but many property owners and contractors are still unaware of bulkhead alternatives. We recommend the continued use of estuarine shoreline stabilization workshops like those held in 2012 and continued improvements to the educational NC DCM and DMF webpages. Additionally, we also recommend streamlining the permit review process for shoreline stabilization in a way that maximizes efficiency without sacrificing the review and careful planning necessary for shoreline stabilization projects.

Figures

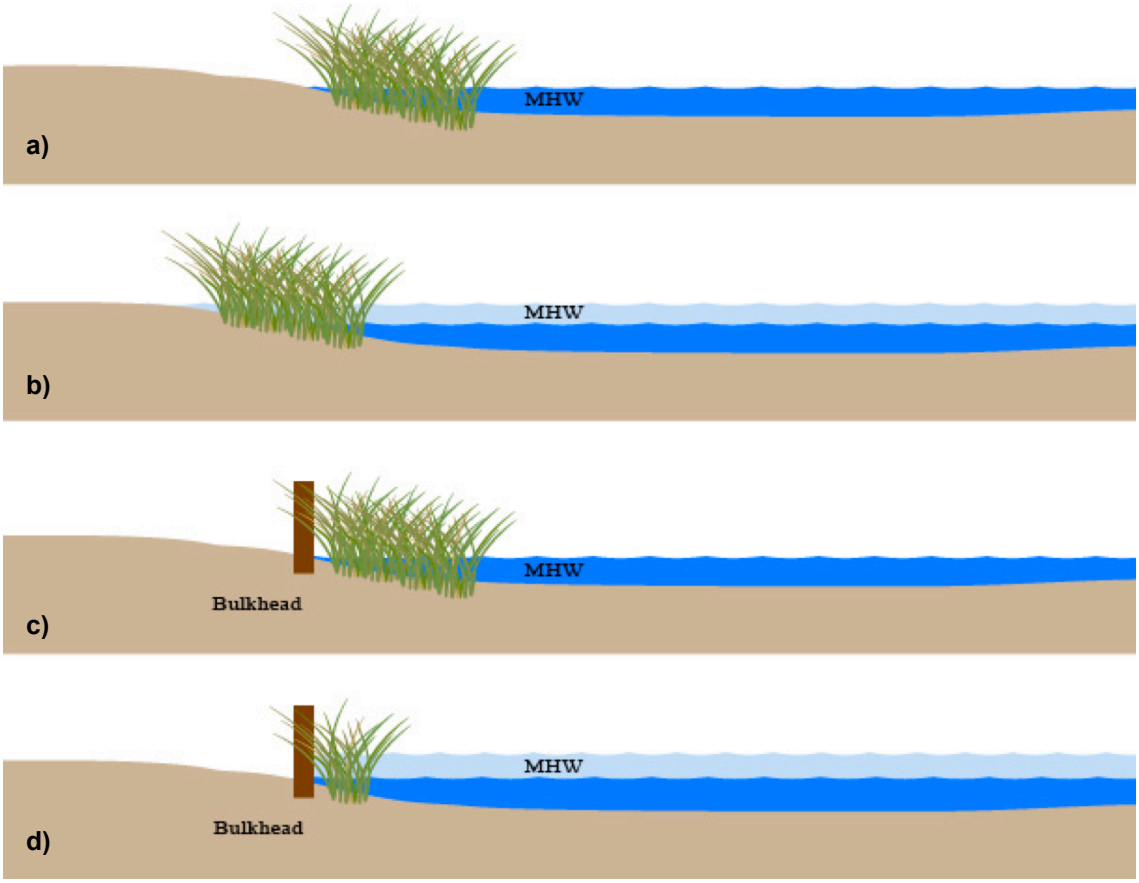


Figure 1. Schematic showing the loss of marsh in front of a bulkhead as sea level rises. **a)** Salt marsh position at the current sea level. **b)** The marsh retreats up the shoreline as sea level rises. **c)** The marsh position at current sea level with a bulkhead located landward of the marsh. **d)** The marsh is unable to retreat up the shore because of the presence of the bulkhead. Symbols are courtesy of the Integration and Application Network (ian.umces.edu/symbols/).

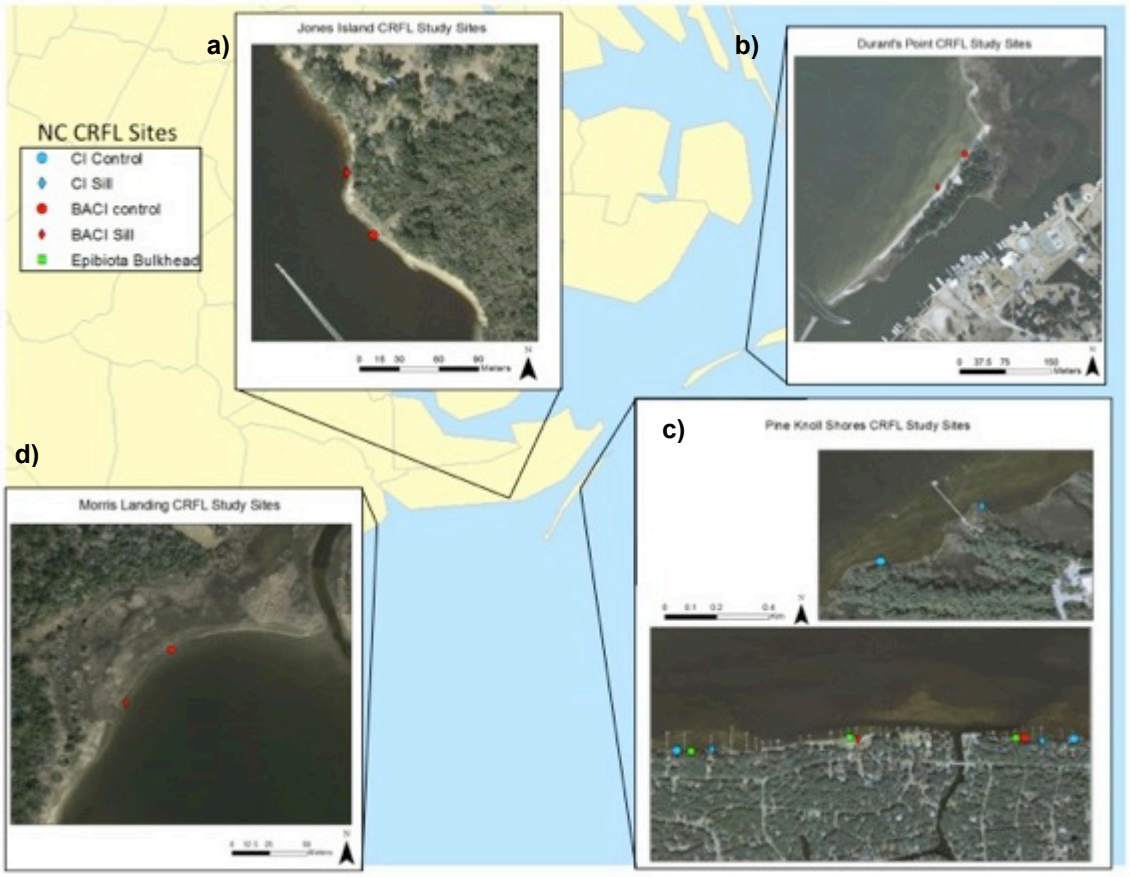


Figure 2. a) BACI study sites on Jones Island in Swansboro, NC. **b)** BACI study sites on Durant's Point in Hatteras, NC. **c)** CI and BACI study sites in Pine Knoll Shores, NC**. d)** BACI study sites at Morris Landing in Holly Ridge, NC.

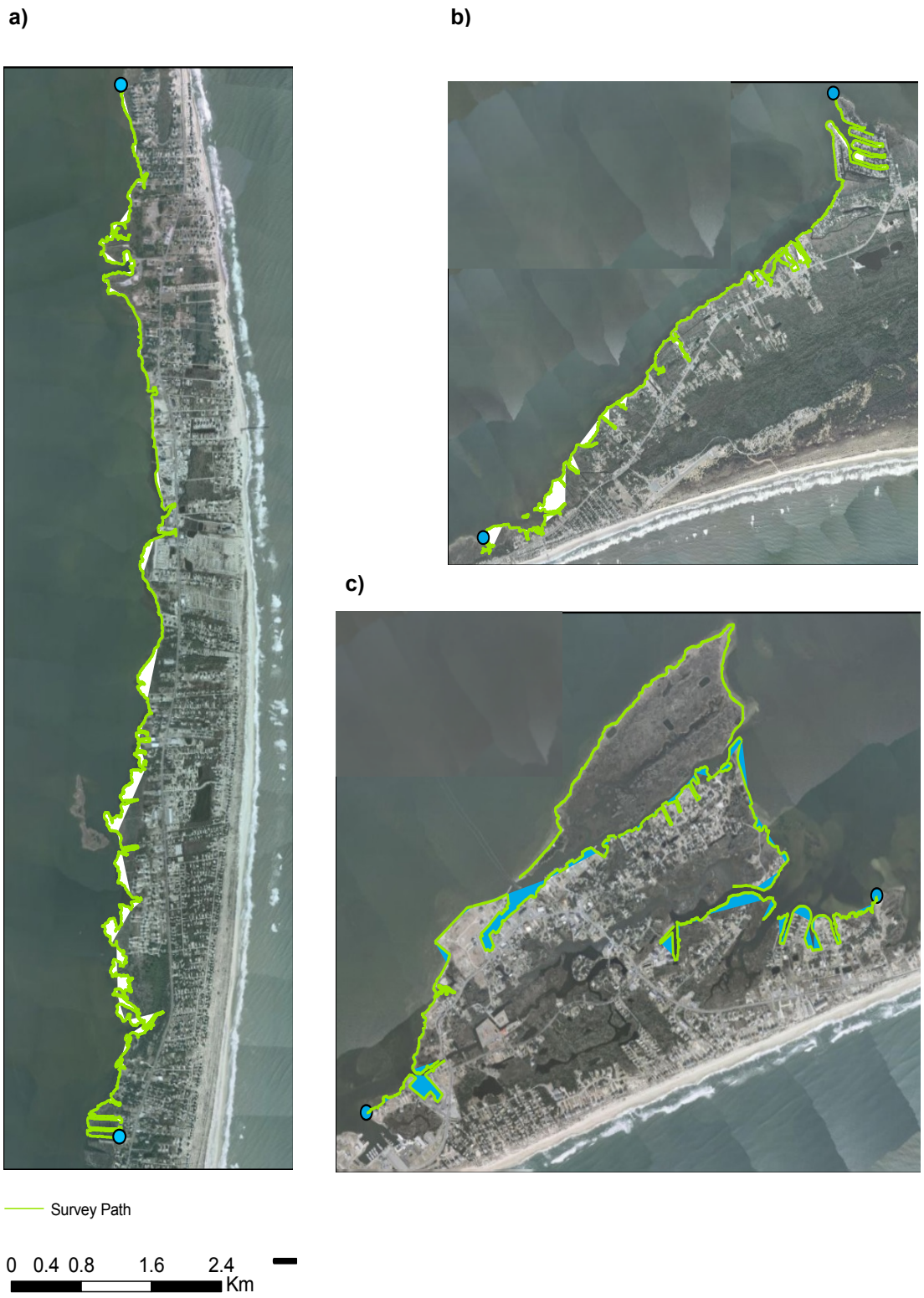


Figure 3. Shoreline surveyed on Hatteras Island post-Hurricane Irene**. a)** Salvo to Rodanthe **b)** Frisco **c)** Hatteras Village

Figure 4. Shoreline surveyed on Bogue Banks post-Hurricane Irene.

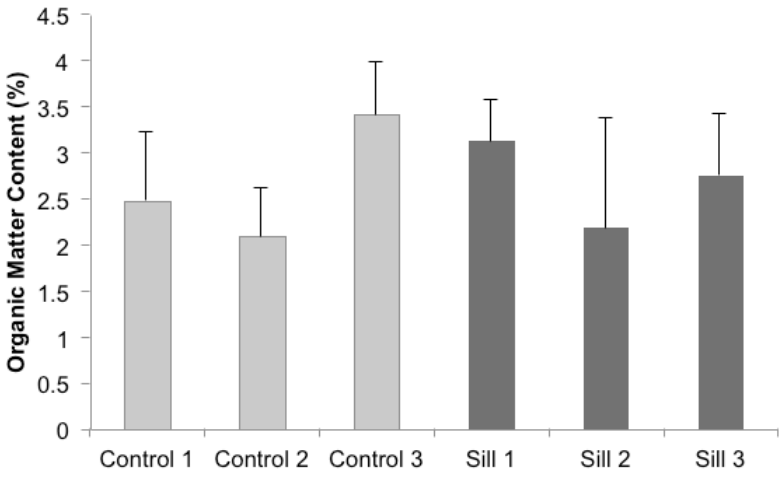


Figure 5. Sediment organic matter content (%) by site. Values are means (+SE).

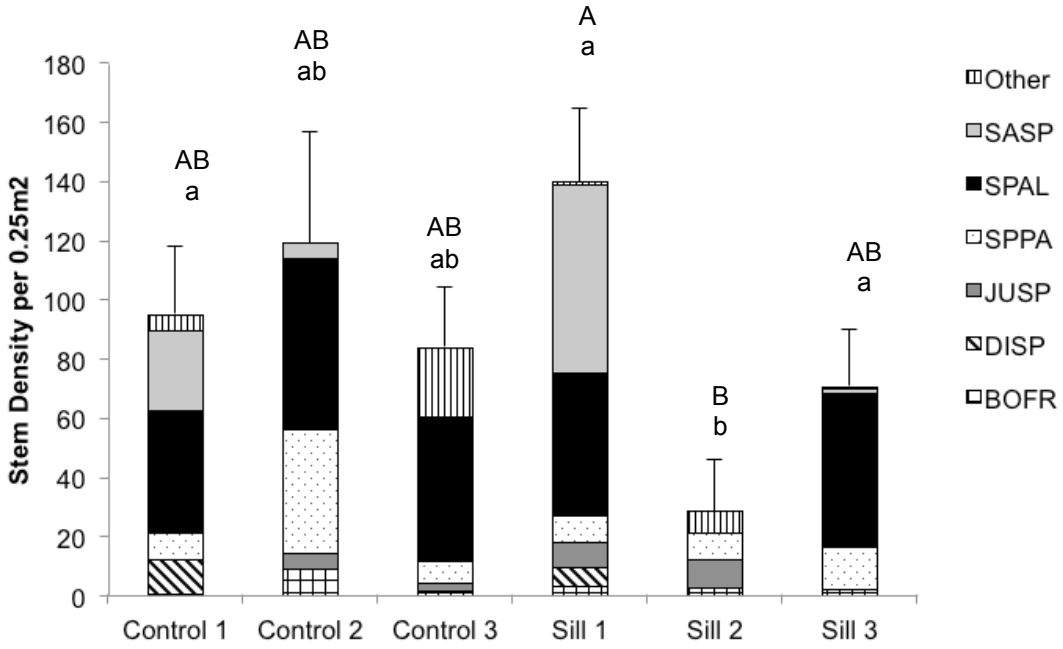


Figure 6. Mean marsh stem density by species. Error bars are + SE of total stem densities. Functionally similar species were combined for display purposes and only the six most common species groups are shown, all others are grouped as "Other": SASP= *Salicornia species*, SPAL= *Spartina alternaflora*, SPPA=*Spartina patens*, JUSP= *Juncus species,* DISP= *Distichlis spicata* BOFR= *Borrichia frutescens.* Sites with different capital letters "A" and "B" have significantly different total marsh densities (P<0.05). Sites with different lower case "a" and "b" have significantly different marsh plant community compositions (P<0.05).

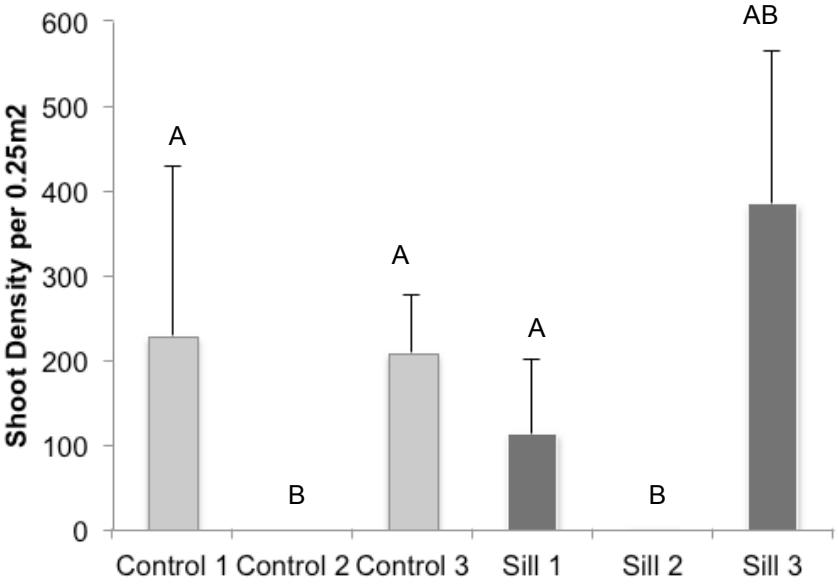


Figure 7. Mean seagrass shoot density by site. Error bars are + SE. Sites with different letters ("A" or "B") are significantly different (P<0.05).

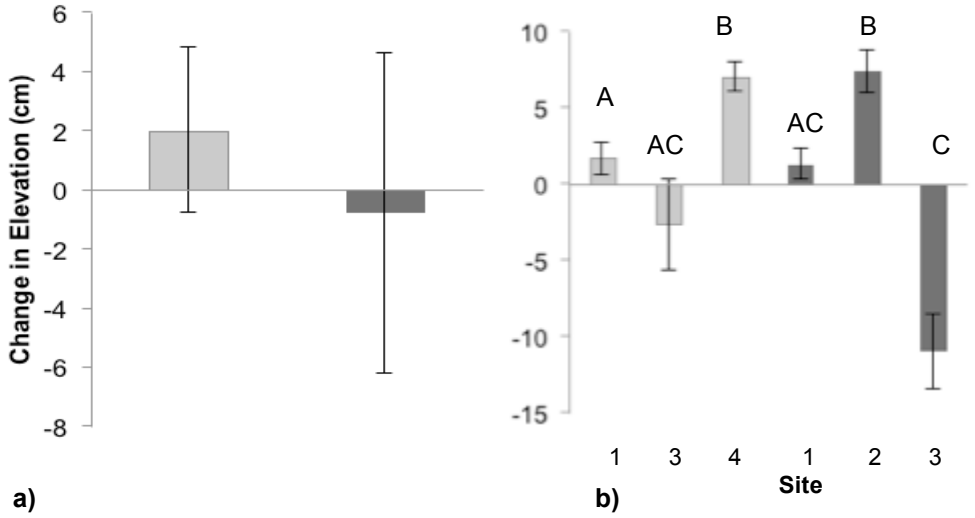


Figure 8. a) Change in marsh surface elevation from August 2010 (pre-Hurricane Irene) to October 2011 (post-Hurricane Irene) at control sites (light gray) and sites with sills (dark gray) along Bogue Sound, NC. **b)** Change in marsh surface elevation by site. Values are means (+SE). Control site 4 (BACI control site) was surveyed in lieu of control site 2. Sites with different letters ("A", "B", or "C") are significantly different (P<0.05).

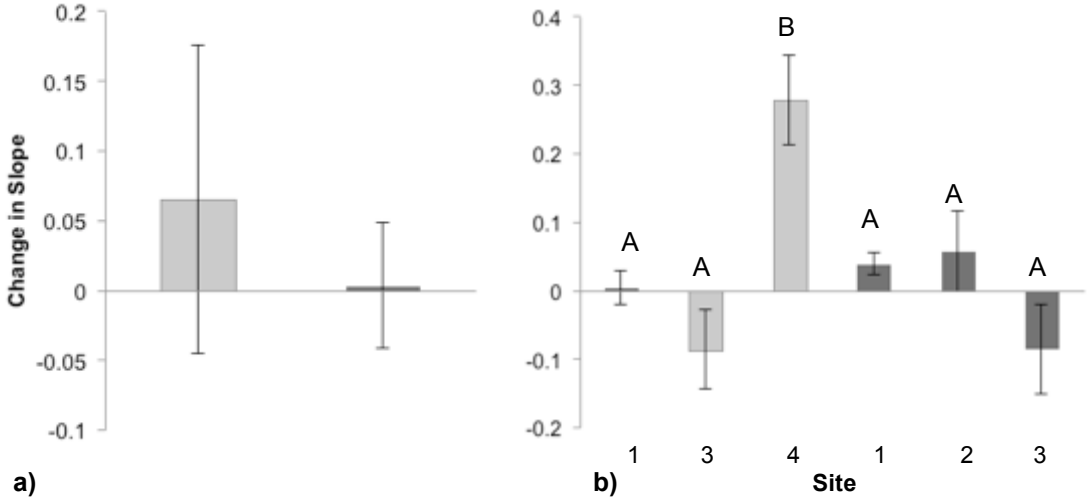


Figure 9. a) Change in marsh slope from August 2010 (pre-Hurricane Irene) to October 2011 (post-Hurricane Irene) at control sites (light gray) and sites with sills (dark gray) along Bogue Sound, NC. **b)** Change in marsh slope by site. Values are means (±SE). Control site 4 (BACI control site) was surveyed in lieu of control site 2. Sites with different letters ("A"or "B") are significantly different (P<0.05).

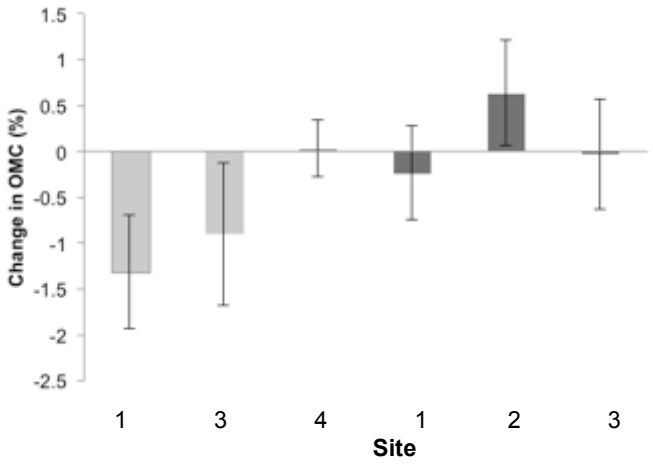


Figure 10. Change in sediment organic matter content from August 2010 (pre-Hurricane Irene) to October 2011 (post-Hurricane Irene) at control sites (light gray) and sill sites (dark gray). Values are means (±SE).

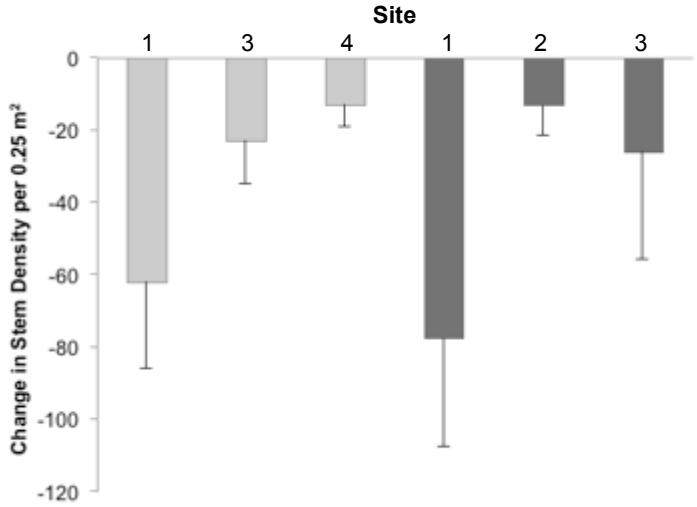
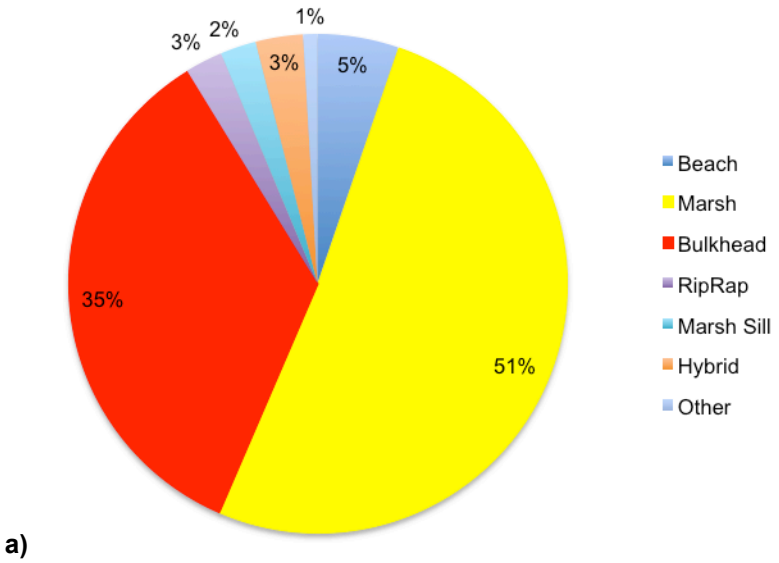
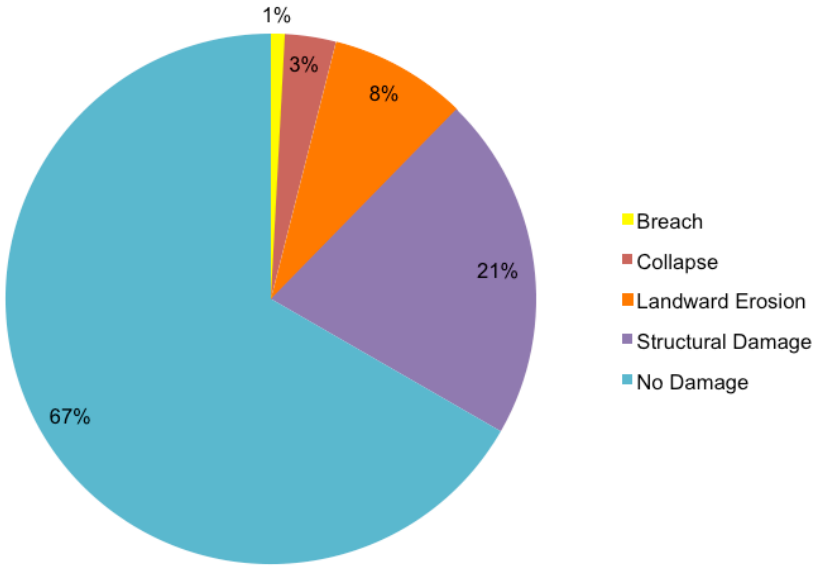


Figure 11. Change in total marsh stem density from August 2010 (pre-Hurricane Irene) to October 2011 (post-Hurricane Irene) at control sites (light gray) and sill sites (dark gray). Values are means (-SE).

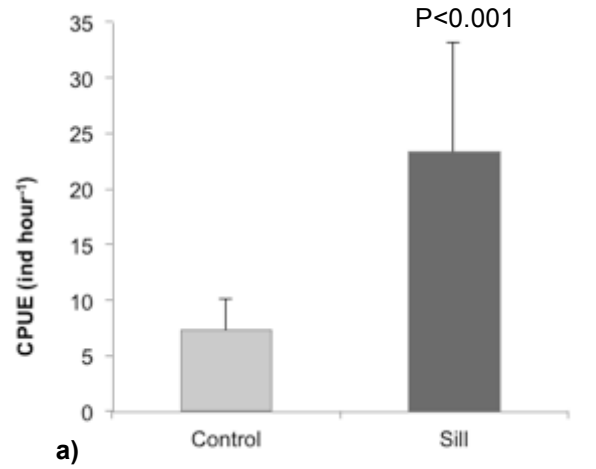


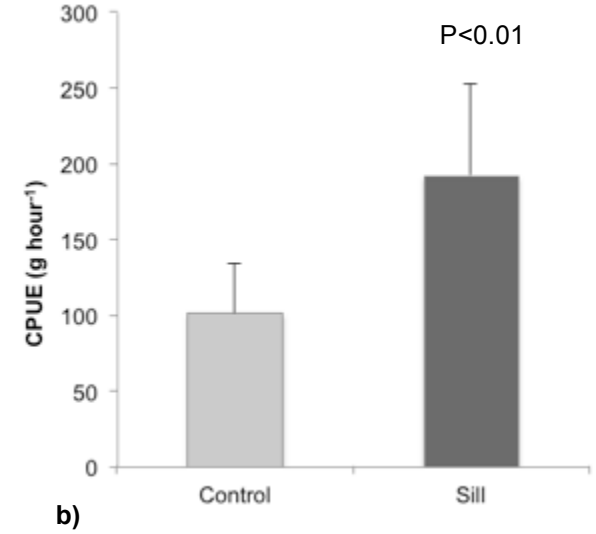
a)



b)

Figure 12. a) Percentage of shoreline by type for ~60 km of back-barrier shoreline surveyed in the Outer Banks, NC (Hatteras Village, Frisco, Salvo, Waves, and Rodanthe) post-Hurricane Irene. **b)** Percentage of bulkhead shoreline by damage category for Outer Banks back-barrier shorelines.





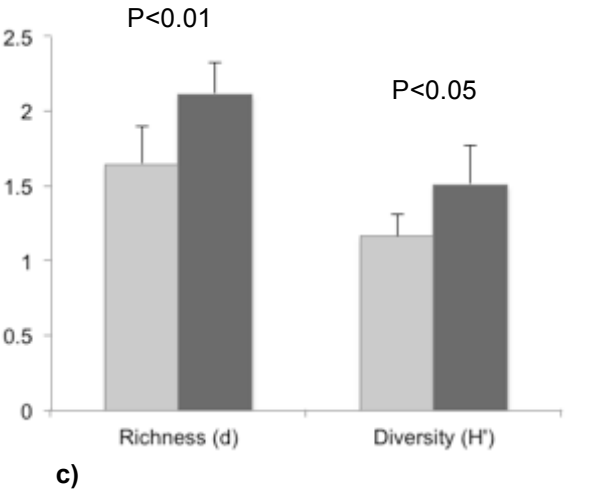


Figure 13. a) Fish and crustacean abundance (CPUE) from fyke net catches (salt marsh) at control (light gray) and sill sites (dark gray), n=3. **b)** Fish and crustacean biomass (CPUE) from fyke net catches (salt marsh) at control (light gray) and sill sites (dark gray), n=3. **c)** Species richness and Shannon Diversity for fyke net catches at control and sill sites. Values are means (+SE).

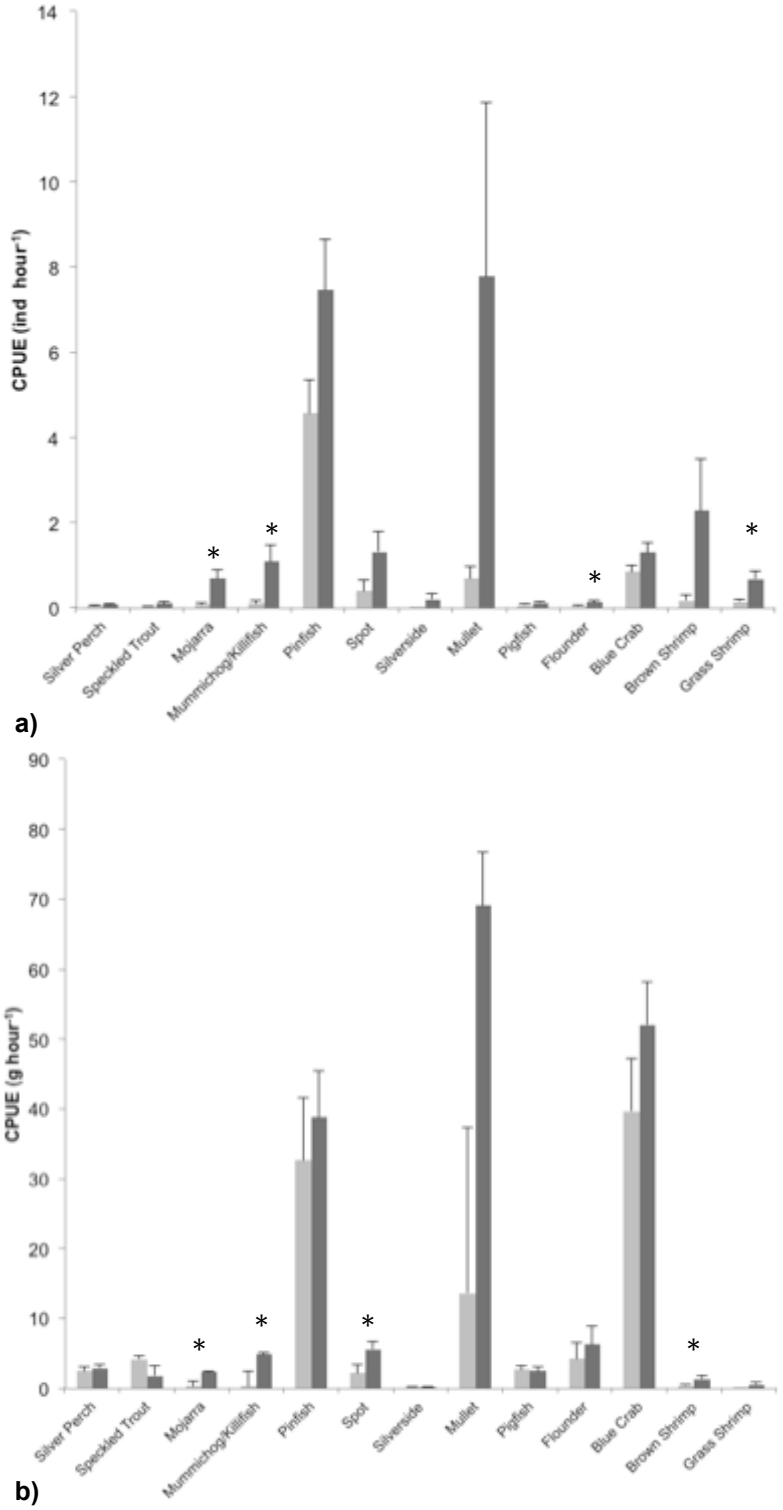


Figure 14. a) Fish and crustacean abundance (CPUE) from fyke net catches by species at control (light gray) and sill sites (dark gray). **b)** Fish and crustacean biomass (CPUE) from fyke net catches by species. * indicates significant difference in control and sill means ($P<0.05$). Values are means (+SE).

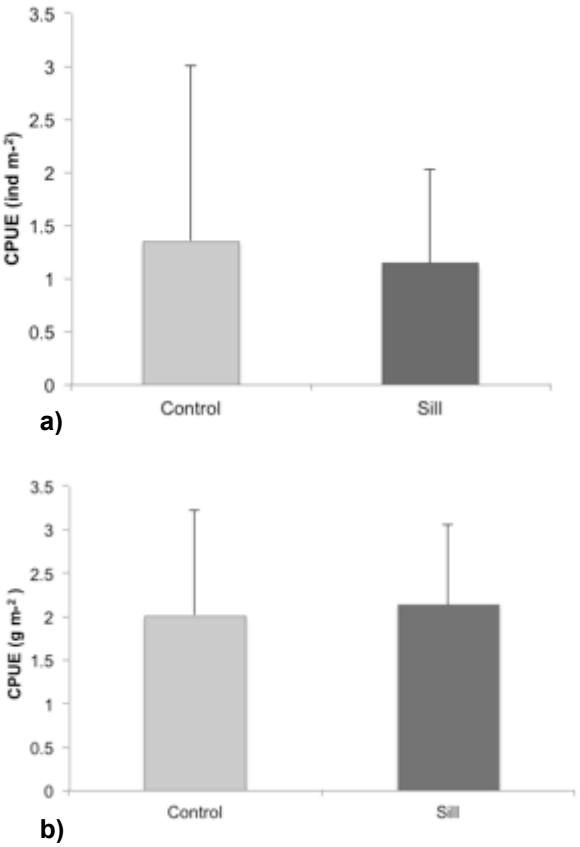


Figure 15. a) Fish and crustacean abundance (CPUE) from seine net catches (seagrass/mudflat) at control and sill sites (n=3). **b)** Fish and crustacean biomass (CPUE) from seine net catches (seagrass/mudflat) at control and sill sites. Values are means (+SE).

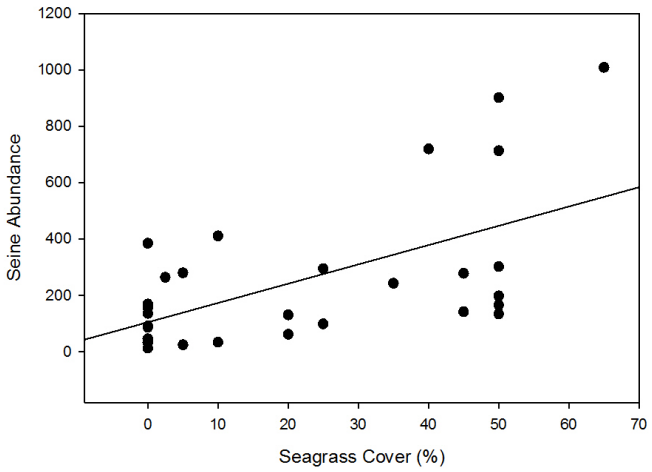


Figure 16. Relationship between seagrass percent cover within the area seined at each site and the total abundance of fish and crustaceans caught within that seine pull. Adjusted r^2= 0.343, P<0.001.

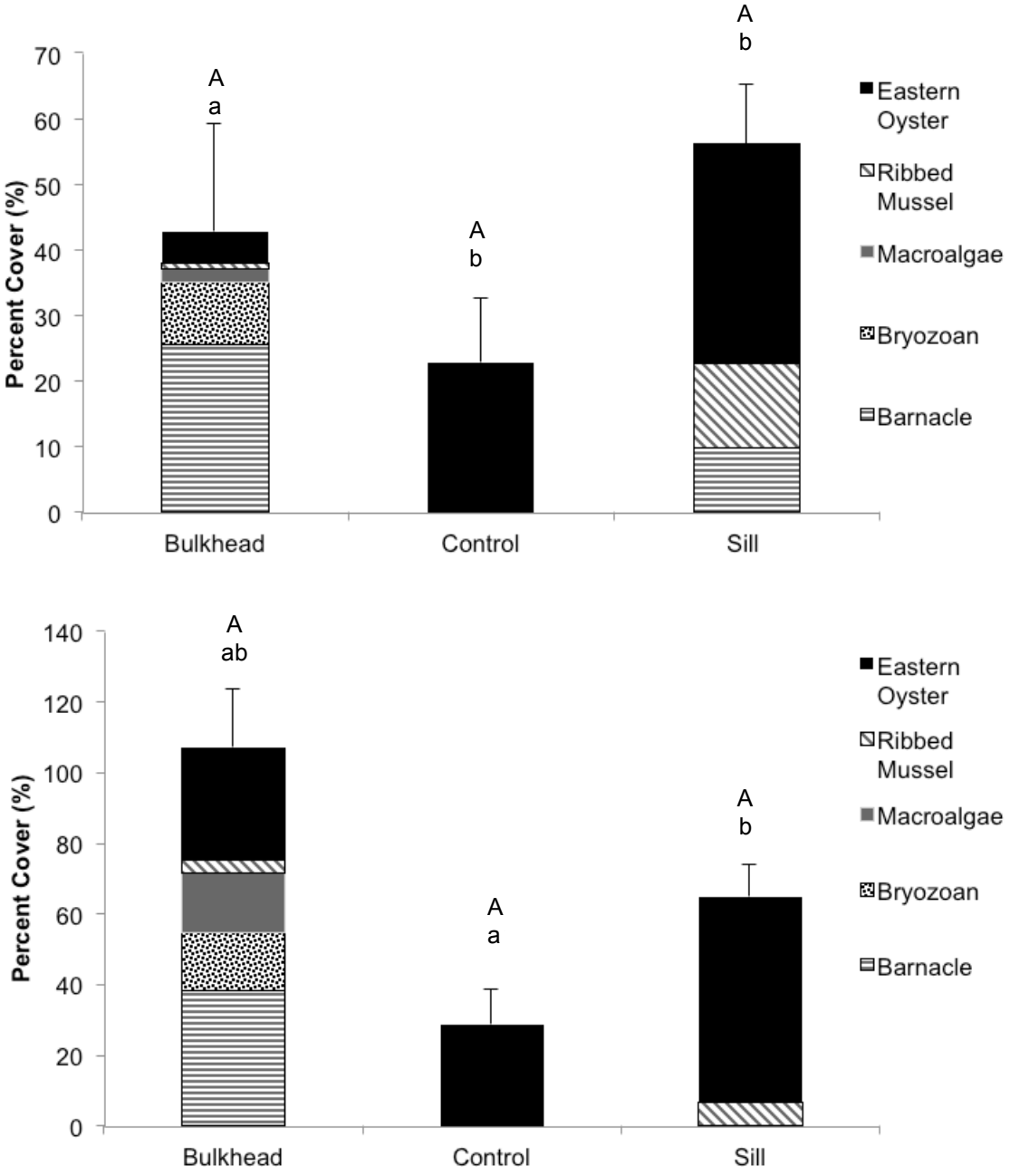


Figure 17. a) Community composition for bulkhead, control, and marsh sill epibiota (high elevation) (n=3). **b)** Community composition for bulkhead, control, and marsh sill site epibiota (low elevation). Means greater than 100% indicate multiple groups were found at each intersection within the 0.25m^2 quadrat. Values are means (+SE of total percent cover of all epibiota). Sites with different capital letters "A" and "B" have significantly different total epibiota cover ($P<0.05$). Sites with different lower case "a" and "b" have significantly different epibiota community compositions ($P<0.05$).

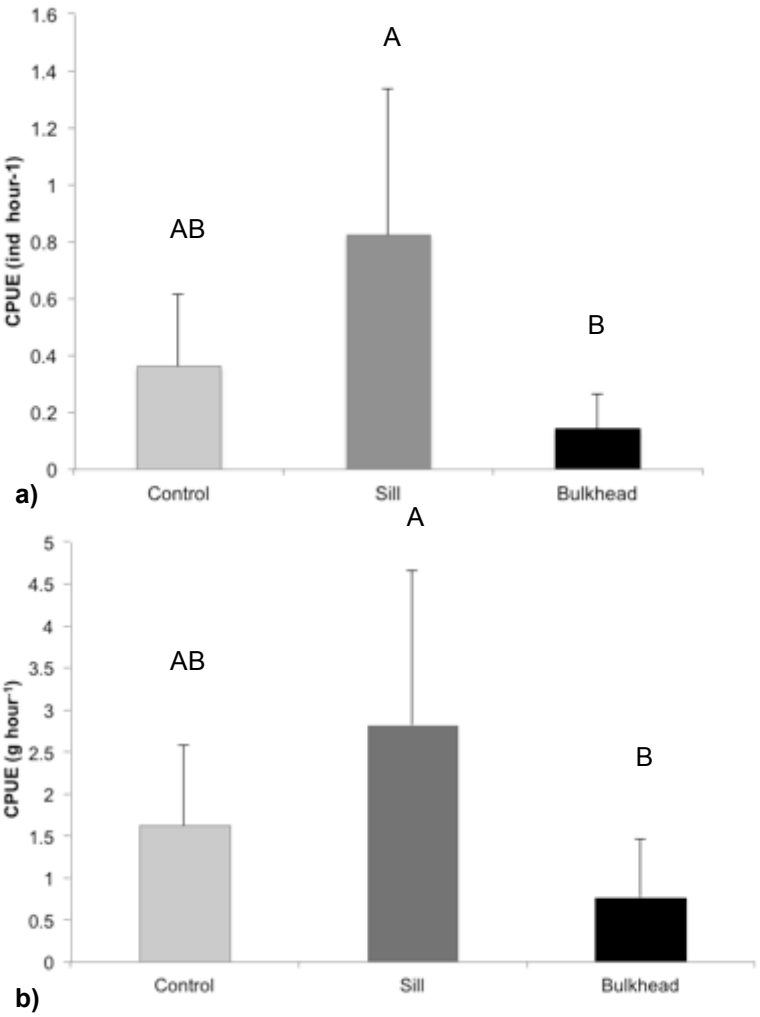


Figure 18. a) Fish and crustacean abundance (CPUE) from minnow trap catches at control, sill, and bulkhead sites (n=3). **b)** Fish and crustacean biomass (CPUE) from minnow trap catches at control, sill, and bulkhead sites Values are means (+SE). Sites with different capital letters "A" and "B" have significantly different total nekton abundance or biomass ($P<0.05$).

Tables

Table 1. Shoreline stabilization damage classifications.

Stabilization Type	Damage Category	Description
Bulkhead	Landward Erosion	Erosion occurred above and behind the bulkhead.
	Collapse	The bulkhead failed completely.
	Breach	The bulkhead has a breach or partial collapse, where sediment has been scoured out.
	Structural damage	Bulkhead is warped or pieces are missing, but no breach has occurred.
Riprap	Landward Erosion	Erosion occurred above and behind the riprap.
	Breach	Rocks have been displaced and a gap is visible in the riprap.
Marsh sill/breakwater	Landward Erosion	Erosion occurred above and behind the marsh sill.
	Breach	Rock or wood is missing from the sill and a gap (unplanned) is visible in the sill.
All	No damage	No noticeable damage.

Table 2. Mean marsh surface elevation, slope, and maximum inundated marsh width for CI sites. Elevations are relative to NAVD88, ± SE.

	Elevation (m)	Slope	Max. Inundated Marsh Width (m)
Control Average	**0.033 ± 0.016**	**0.370 ± 0.043**	**10.3 ± 1.5**
Control 1	0.051 ± 0.057	0.331 ± 0.020	11.6 ± 1.8
Control 2	0.046 ± 0.063	0.325 ± 0.042	7.3 ± 2.0
Control 3	0.002 ± 0.080	0.455 ± 0.061	12.0 ± 0.8
Sill Average	**0.061 ± 0.056**	**0.292 ± 0.053**	**11.2 ± 3.5**
Sill 1	0.154 ± 0.024	0.244 ± 0.015	15.3 ± 1.2
Sill 2	-0.038 ± 0.084	0.397 ± 0.124	4.2 ± 0.1
Sill 3	0.068 ± 0.057	0.235 ± 0.090	14.0 ± 1.0

Annual Budget expenditures

Category	Year 1 Expenditures	Year 2 Expenditures
Personnel	$70,405	$73,095
Fringe	$10,227	$7,598
Travel	$400	$1,675
Equipment	$0	$0
Supplies	$11,486	$2,309
Construction	$0	$0
Contractual	$0	$0
Other	$3,750	$3,750
Total Direct	$96,268	$88,427
Indirect	$14,441	$13,284
TOTAL	$110,709	$101,711

Budget deviations

We had a budget deviation in year 1, which required a no-cost extension for $1,500 from the Miscellaneous Services (Other) funding category. The details of the budget deviation are provided in the attached Letter of Request for a No-Cost Extension submitted to DMF in 2011.

References

Able, K. W., D. N. Vivian, G. Petruzzelli, and S. M. Hagan. 2012. Connectivity Among Salt Marsh Subhabitats: Residency and Movements of the Mummichog (Fundulus heteroclitus). Estuaries and Coasts 35:743–753.

Acree, D. 2012. Personal communication (telephone). June 29, 2012.

Bartholomew, A., and R. J. Diaz. 2000. New dimensionless indices of structural habitat complexity: predicted and actual effects on a predator's foraging success. Marine Ecology Progress Series 206: 45-58.

Beck, M. W., K. L. Heck, K. W. Able, D. L. Childers, D. B. Eggleston, B. M. Gillanders, B. Halpern, C. G. Hays, K. Hoshino, T. J. Minello, R. J. Orth, P. F. Sheridan, and M. P. Weinstein. 2001. The Identification, Conservation, and Management of Estuarine and Marine Nurseries for Fish and Invertebrates. BioScience 51:633–641.

Boesch, D. F., and R. E. Turner. 1984. Dependence of Fishery Species on Salt Marshes: The Role of Food and Refuge. Estuaries 7:460–468.

Boyer, K. E., J. C. Callaway, and J. B. Zedler. 2000. Evaluating the progress of restored cordgrass (Spartina foliosa) marshes: Belowground biomass and tissue nitrogen. Estuaries 23:711–721.

Bozek, C. M., and D. M. Burdick. 2005. Impacts of Seawalls on Saltmarsh Plant Communities in the Great Bay Estuary, New Hampshire USA. Wetlands Ecology and Management 13:553–568.

Clarke and Gorley. 2001. PRIMER. Plymouth Marine Laboratory, Plymouth.

Conaway, C. 2005. Aeolian dynamics along scraped shorelines, Bogue Banks, North Carolina. Journal of coastal research 21: 242-255.

Craft, C. B., S. W. Broome, E. D. Seneca, and W. J. Showers. 1988. Estimating sources of soil organic matter in natural and transplanted estuarine marshes using stable isotopes of carbon and nitrogen. Estuarine, Coastal and Shelf Science 26:633–641.

Craft, C., P. Megonigal, S. Broome, J. Stevenson, R. Freese, J. Cornell, L. Zheng, and J. Sacco. 2003. The Pace of Ecosystem Development of Constructed Spartina alterniflora Marshes. Ecological Applications 13:1417–1432.

Currin, C. A., P. C. Delano, and L. M. Valdes-Weaver. 2007. Utilization of a citizen monitoring protocol to assess the structure and function of natural and stabilized fringing salt marshes in North Carolina. Wetlands Ecology and Management 16:97–118.

Daoust, R. J., and D. L. Childers. 1998. Quantifying aboveground biomass and estimating net aboveground primary production for wetland macrophytes using a non-destructive phenometric technique. Aquatic Botany 62:115–133.

Fonseca, M. and S.S. Bell. 1998. Influence of Physical Setting on Seagrass Landscapes Near Beaufort, North Carolina. Marine Ecology Progress Series 171:109-121.

Gittman, R.K. 2011. Personal observation.

Grabowski, J. 2004. Habitat complexity disrupts predator-prey interactions but not the trophic cascade on oyster reefs. Ecology 85:995–1004.

Grabowski, J. H., A. R. Hughes, D. L. Kimbro, and M. A. Dolan. 2005. How habitat setting influences restored oyster reef communities. Ecology 86:1926–1935.

Harley, C. D. G., A. Randall Hughes, K. M. Hultgren, B. G. Miner, C. J. B. Sorte, C. S. Thornber, L. F. Rodriguez, L. Tomanek, and S. L. Williams. 2006. The impacts of climate change in coastal marine systems. Ecology Letters 9:228–241.

Hauxwell, J., J. Cebrian, C. Furlong, and I. Valiela. 2001. Macroalgal canopies contribute to eelgrass (Zostera marina) decline in temperate estuarine ecosystems. Ecology 82:1007–1022.

Hoegh-Guldberg, O., and J. F. Bruno. 2010. The Impact of Climate Change on the World's Marine Ecosystems. Science 328:1523–1528.

Kneib, R. 1997. Early life stages of resident nekton in intertidal marshes. Estuaries 20:214–230.

Macreadie, P. I., J. S. Hindell, G. P. Jenkins, R. M. Connolly, and M. J. Keough. 2009. Fish Responses to Experimental Fragmentation of Seagrass Habitat. Conservation Biology 23:644–652.
McDougall, K. D. 1943. Sessile Marine Invertebrates of Beaufort, North Carolina: A Study of Settlement, Growth, and Seasonal Fluctuations among Pile-Dwelling Organisms. Ecological Monographs 13:321.
Minello, T. J., K. W. Able, M. P. Weinstein, and C. Hays. 2003. Salt marshes as nurseries for nekton: testing hypotheses on density, growth and survival through meta-analysis. Marine Ecology Progress Series 246:39–59.
Neckles, H. A., M. Dionne, D. M. Burdick, C. T. Roman, R. Buchsbaum, and E. Hutchins. 2002. A Monitoring Protocol to Assess Tidal Restoration of Salt Marshes on Local and Regional Scales. Restoration Ecology 10:556–563.
North Carolina Division of Marine Fisheries. 2007. Coastal Recreational Fishing License Strategic Plan.
North Carolina Estuarine Biological, Physical Processes Work Group, and North Carolina Division of Coastal Management. 2006. Recommendations for Appropriate Shoreline Stabilization Methods for Different North Carolina Estuarine Shoreline Types.
Olivier, F., R. Tremblay, E. Bourget, and D. Rittschof. 2000. Barnacle settlement:field experiments on the influence of larval supply, tidal level, biofilm quality and age on Balanus amphitrite cyprids. Marine Ecology Progress Series 199:185–204.
Ortega, S., and J. P. Sutherland. 1992. Recruitment and Growth of the Eastern Oyster, Crassostrea virginica, in North Carolina. Estuaries 15:158.
Peterson, C., J. Grabowski, and S. Powers. 2003. Estimated enhancement of fish production resulting from restoring oyster reef habitat: quantitative valuation. Marine Ecology Progress Series 264:249–264.
Peterson C.H. and J.F. Bruno. 2009. Fisheries Habitat Impacts of Marsh Sills (Living Shorelines) as a Shoreline Stabilization/Restoration Alternative to Bulkheads Coastal Recreational Fishing License Grant Proposal. Submitted June 30, 2009.
Pineda, J., and H. Caswell. 1997. Dependence of settlement rate on suitable substrate area. Marine Biology 129:541–548.
Rountree, R. A., and K. W. Able. 2006. Spatial and temporal habitat use patterns for salt marsh nekton: implications for ecological functions. Aquatic Ecology 41:25–45.
Rountree, R., and K. W. Able. 1992. Foraging Habits, Growth, and Temporal Patterns of Salt-Marsh Creek Habitat Use by Young-of-Year Summer Flounder in New-Jersey. Transactions of the American Fisheries Society 121:765–776.
Rozas, L. P., and T. J. Minello. 1997. Estimating Densities of Small Fishes and Decapod Crustaceans in Shallow Estuarine Habitats: A Review of Sampling Design with Focus on Gear Selection. Estuaries 20:199–213.
SAS. 2012. JMP Statisyical Software, Version 9.0
Seitz, R., R. Lipcius, N. Olmstead, M. Seebo, and D. Lambert. 2006. Influence of shallow-water habitats and shoreline development on abundance, biomass, and diversity of benthic prey and predators in Chesapeake Bay. Marine Ecology Progress Series 326:11–27.
Street, M., A. Deaton, W. Chappell, and P. Mooreside. 2005. North Carolina Coastal Habitat Protection Plan. North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, Morehead City, NC.
Stunz, G., T. Minello, and L. Rozas. 2010. Relative value of oyster reef as habitat for estuarine nekton in Galveston Bay, Texas. Marine Ecology Progress Series 406:147–159.
Sutherland, J. P., and R. H. Karlson. 1977. Development and stability of the fouling community at Beaufort, North Carolina. Ecological Monographs:425–446.
Tebaldi, C., B. H. Strauss, and C. E. Zervas. 2012. Modelling sea level rise impacts on storm surges along US coasts. Environmental Research Letters 7:014032.

Titus, J. 1998. Rising seas, coastal erosion, and the takings clause: how to save wetlands and beaches without hurting property owners. Md L Rev 57:1279–1318.
Turner, S., S. Thrush, J. Hewitt, V. Cummings, and G. Funnell. 1999. Fishing impacts and the degradation or loss of habitat structure. Fisheries Management and Ecology 6:401–420.
Young, E. and C.H. Peterson. Unpublished data.
Zedler, J. B., and J. C. Callaway. 2000. Evaluating the progress of engineered tidal wetlands. Ecological Engineering 15:211–225.

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

CRC 12-35

October 31, 2012

MEMORANDUM TO: Coastal Resources Commission

FROM: Daniel Govoni

SUBJECT: Living Shorelines Strategy & General Permit .2700 Update

The Division of Coastal Management (DCM) has been working with the Division of Marine Fisheries and other DENR Divisions to develop a Department-level strategy to facilitate the use of "living shorelines" for shoreline stabilization along certain non-beachfront coastlines. Since our last update at the Commission's August meeting, the Division has held a number of meetings and two relevant research studies have been concluded.

Living Shoreline Strategy

On October 16, 2012 DCM staff met with representatives from the Virginia Institute of Marine Science (VIMS) in Washington, NC to compare living shoreline initiatives and permitting procedures in Maryland, Virginia, and North Carolina. VIMS researchers presented significant online information and training resources, as well as a "decision support tool" to help resource agencies and the public consider which shoreline stabilization approaches may be best suited to specific shoreline segments. DCM staff will be examining these resources and approaches, and will continue to interact with VIMS staff to discuss lessons learned and the transferability of various approaches.

DCM staff will also be meeting with other DENR agencies including the Wildlife Resources Commission, N.C. Ecosystem Enhancement Program, and the Division of Water Quality to engage feedback in the development of a draft strategy document. Information gathered from these discussions will be used to finalize a draft strategy for presentation at the February 2013 CRC meeting. Mike Lopazanski presented an outline for the draft strategy at your August meeting that included staff advocacy and public awareness efforts, financial incentives, monitoring, and research needs. The strategy will include short-term actions that can be accomplished with existing resources as well as long-term needs that may include additional research and public engagement through strategic partnerships.

400 Commerce Ave., Morehead City, NC 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

Living Shoreline Permitting

On October 11, 2012 a meeting was held with staff from DCM and the U.S. Army Corps of Engineers (USACE) regarding efforts to further streamline the permitting of riprap sills. Discussions focused on the Coastal Resource Commission's General Permit (15A NCAC 7H .2700) for the construction of riprap sills for wetland enhancement in estuarine and public trust waters. Both parties had an open dialogue discussing all possibilities to streamline permit reviews through the USACE permit and review process, including the use of Nationwide Permits, Regional General Permits, and the 291 Programmatic General Permit, which is currently being used to process these types of actions. DCM asked if there were any design modifications to the existing General Permit Use Standards (e.g. reducing the maximum distance offshore or eliminating the use of backfill) that would facilitate more rapid USACE approvals for such projects).

USACE representatives responded that due to federally mandated coordination requirements with other federal resource management agencies, most notably the National Marine Fisheries Service and the US Fish and Wildlife Service, there are no other expedited permit review options available to the USACE. It was also discussed that the 291 Programmatic General Permit process is one of the most efficient permit processes in the nation for authorizing work in coastal counties, and has resulted in permits being issued for riprap sills in as little as 45 days by the USACE. This process is allowing permits for riprap sills in North Carolina to be processed in a much shorter period of time than other USACE Districts with coastal permitting responsibilities. With this information in mind, staff recommends that the existing General Permit for riprap sills remain in its current form, with the understanding that staff will implement the various streamlining measures that have resulted from recent coordination with other DENR resource agencies. Formal rulemaking is not proposed at this time.

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

MEMORANDUM
CRC-12-41

To: The Coastal Resources Commission

From: Michael Christenbury, Wilmington District Planner

Date: October 30, 2012

Subject: Certification of Amendment #3 of the 2007 Brunswick County Core Land Use Plan

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Recommendation: **Certification of Amendment # 3 for the '2007 Brunswick County Core LUP' based on the determination that the amendment has met the substantive requirements outlined within the 2002 7B Land Use Plan Guidelines and that there are no conflicts evident with either state or federal law or the State's Coastal Management Program.**

Overview:

Brunswick County is located in southeast North Carolina along the coast between New Hanover County and the South Carolina State line. This is the third (3rd) amendment to the 2007 Brunswick County Core Land Use Plan (LUP) certified by the Coastal Resources Commission (CRC) on November 30, 2007, and last amended on August 25, 2011.

Specifically, the amendments involve three (3) components: (1) changes to the Future Land Use Plan Map and the Future Land Use Acreage Table; (2) changes to the Comprehensive Wastewater Service Area Map and Service Area Tables, and (3) changes to the Zoning Map and Zoning Table. ***See Attachment #1 for Brunswick County Resolution to Adopt Amendments and all associated maps and tables.***

Component 1:

Brunswick County strives to keep the LUP as up to date as possible by amending the plan anytime there are changes to the plan itself.

The first component of this amendment involves 12 changes to the Future Land Use Map designations (Map 26), as well as changes to the corresponding Future Land Use Map Acreage Table (Table 64). The update to Table 64 is needed to insure that the table accurately reflects the acreage changes made to each Future Land Use Map designation. The attached resolution also lists more specifically the twelve map changes.

Specifically, the net resulting changes to the Future Land Use Map designations and Table are as follows (in acres):

Future Land Use Map Designations:	**Amending from: (Approx. Acres)**	**Amending to: (Approx. Acres)**	**% of Change: (Approx.)**
Commercial	11,550	11,694	1.25% Increase
Community Commercial	4,802	4,826	No Change
Conservation	186,739	184,865	No Change
High-Density Residential	931	930	0.1% (Decrease)
Industrial	19,491	19,738	1.26% Increase
Low-Density Residential	193,357	192,925	0.2% (Decrease)
Medium-Density Residential	27,043	27,085	0.15% Increase
Military	9,147	9,147	No Change
Mixed Use	5,715	5,717	.03% Increase
Protected Lands	13,731	13,731	No Change
Recreation	672	672	No Change

Component 2:

The second component of this amendment involves updating the Comprehensive Wastewater Service Area Map (Map 32) as well as an update to the Service Area Table (Table 79).

The information depicted on the Comprehensive Wastewater Service Area Map within the LUP is an overlay on top of the Future Land Use Map. Once changes are made to the Future Land Use Map, the Comprehensive Service Area Map must also be amended to insure internal consistency within the plan. Updating the Comprehensive Service Area Map to reflect changes made to the Future Land Use Map insures that both maps are accurate and up-to-date.

The second part of this component is an update to the Service Area Table (Table 79). This update is needed to insure that the table accurately reflects the acreage changes made to each Future Land Use Map designation.

Component 3:

The third component of this amendment involves changes to the Brunswick County Zoning Map, which is Map 24 within the LUP and its corresponding Zoning Table (Table 60 within the plan). Changes to county zoning come primarily due to requests for rezoning from individual property owners, as well as the annexation of county jurisdiction into municipalities

within the county. Once changes are made to the zoning map within the plan, amendment(s) to the Zoning Table are needed to accurately reflect the number of acres within each zoning district noted on the zoning map.

Summation:

It is the desire of Brunswick County to keep the Land Use Plan up to date. These amendments (maps and tables) help further the County's vision and desire to plan for future development. The amendments also help the plan serve as the basis and guide for subsequent changes to the County's development regulations, furthering the likelihood of the County achieving its vision.

The Brunswick County Board of Commissioners unanimously adopted the amendments per the attached resolution following a public hearing that was held on October 1, 2012.

Brunswick County reviewed the amendments and determined they are not in conflict with any other policies or sections of the 2007 Brunswick County Land Use Plan, nor with any other Brunswick County plan(s) or Ordinance(s).

The public had the opportunity to provide written comments to DCM up to fifteen (15) business days (excluding holidays) prior to the CRC meeting. No comments have been received, written or otherwise as of the date of this memorandum.

To view the full 2007 Brunswick County Core Land Use Plan, go to the following link and scroll down to Brunswick County LUP:

http://www.nccoastalmanagement.net/Planning/under_review.htm

Attachment 1: Resolution to Adopt Amendments with Associated Maps and Tables.

RESOLUTION IN SUPPORT OF THE AMENDMENT OF THE 2007 BRUNSWICK COUNTY CAMA CORE LAND USE PLAN

WHEREAS, many countless hours of work by the public, elected officials, appointed officials, volunteers, staff and others went into the preparation of these amendments, and

WHEREAS, Brunswick County realizes the importance of these amendments in guiding future growth and development of the County, and

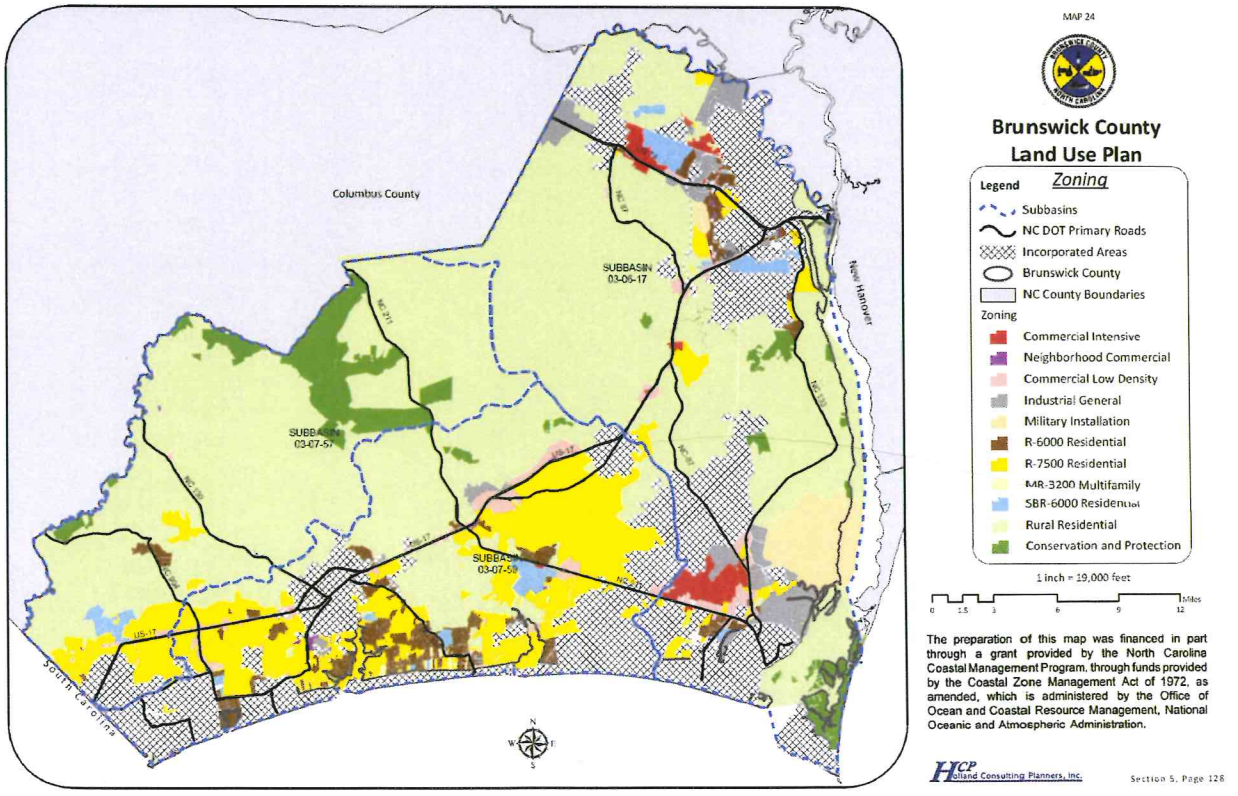
WHEREAS, Brunswick County has met the intent and requirements as set forth in the North Carolina General Statues and the North Carolina Administrative Code, and

WHEREAS, Brunswick County certifies that the County has followed the process as required in GS 113A-110 and notices as referred to in 15A NCAC 07B.0802 (b)(3), and

WHEREAS, Brunswick County hereby finds that these amendments have been evaluated with existing policies and it has been determined that no internal inconsistencies exist.

NOW, THEREFORE BE IT RESOLVED, THAT the Board of Commissioners of Brunswick County hereby adopts these amendments as reviewed for public hearing on October 1, 2012 and hereby requests that these amendments and their supporting documentation be sent forward to the Coastal Resources Commission for their review at the November 14-15, 2012 meeting:

- **PROPOSED AMENDMENT TO MAP 24 (BRUNSWICK COUNTY ZONING MAP):**



- **PROPOSED AMENDMENT TO SECTION 5.V.A. (TABLE 60), BRUNSWICK COUNTY ZONING:**

Table 60.

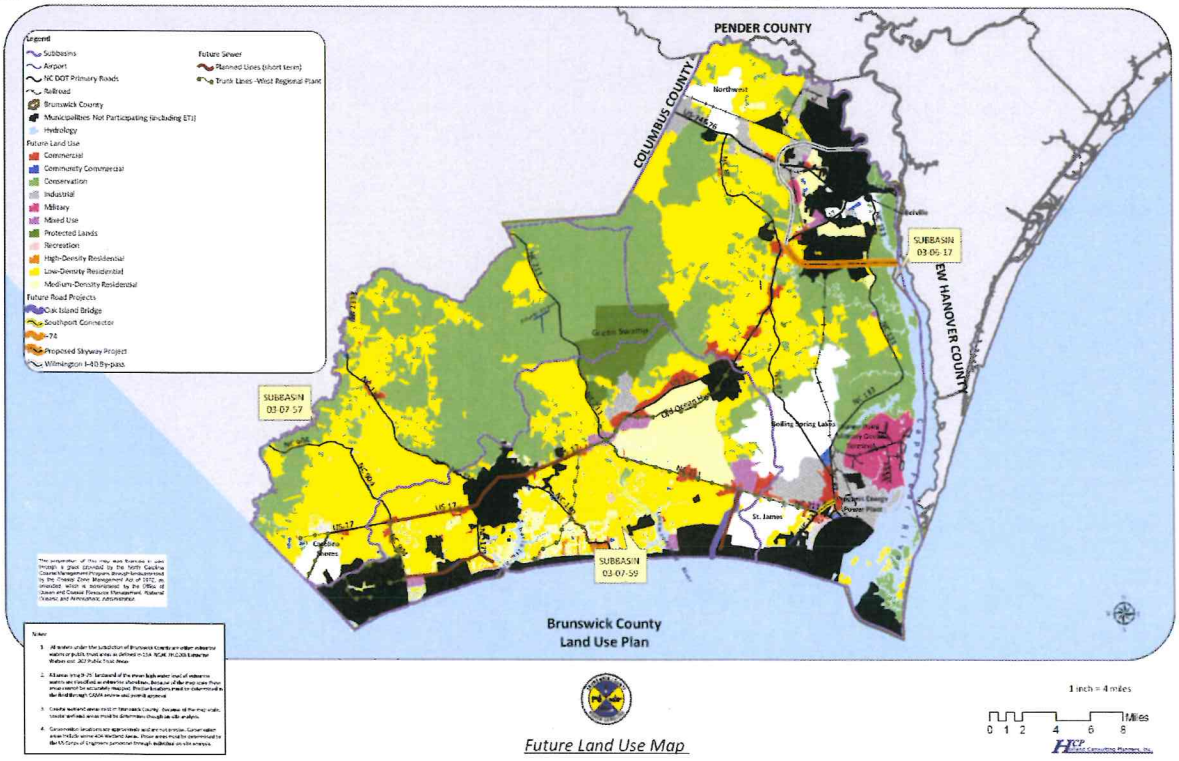
Brunswick County - Zoning

	Aug. 2011 - Aug. 2012		Aug. 2012 - Present	
Districts	Acres	% of Total	Acres	% of Total
Commercial Intensive	5,958.7	1.3%	5,902.2	1.3%
Neighborhood Commercial	644.1	0.1%	645.3	0.1%
Commercial Low Density	11,012.4	2.4%	11,093.1	2.4%
Conservation and Protection	24,000.3	5.3%	23,996.2	5.2%
Industrial - General	12,901.9	2.8%	13,099.1	2.8%
Military Installation	11,773.9	2.6%	11,773.9	2.6%
MR-3200 High Density Residential	673.2	0.1%	493.3	0.1%
R-6000 Residential	13,075.9	2.9%	13,210.6	2.9%
R-7500 Residential	61,565.3	13.5%	63,854.4	13.9%
Rural Residential	306,836.5	67.3%	308,824.4	67.1%
SBR-6000 Residential	7,259.6	1.6%	7,172.8	1.6%
	455,701.8	*100.0%*	460,065.2	100.00%

NOTE: Figures include only the unincorporated areas of the County

Source: Brunswick County Planning and Community Development Department

- **PROPOSED AMENDMENT TO MAP 26 (FUTURE LAND USE MAP):**



Future Land Use Map

- ***ASSOCIATED LAND USE PLAN AMENDMENTS:***

  - **LAND USE PLAN AMENDMENT (LUM-666) FOR Case Z-666:** Request to amend the Official Brunswick County Land Use Plan Map from MDR (Medium Density Residential) to Commercial for Tax Parcel 04700004 located at 152 Buckeye Road (SR 1415) near Leland, NC.

  - **LAND USE PLAN AMENDMENT (LUM-667) FOR Case Z-667:** Request to amend the Official Brunswick County Land Use Plan Map from LDR (Low Density Residential) to Industrial for a portion of Tax Parcels 1370000806 and 15200058 located at 339 and 341 Middle River Road, NC.

  - **LAND USE PLAN AMENDMENT (LUM-668) FOR Case Z-668:** Request to amend the Official Brunswick County Land Use Plan Map from LDR (Low Density Residential) to Commercial for Tax Parcel 02700015, 0270002001, AND 0270001501 located at 2711, 2841, 2851, 2859, and 2823 Maco Road (NC 87) near Sandy Creek, NC.

  - **LAND USE PLAN AMENDMENT (LUM-673) FOR CASE Z-673:** Request to amend the Official Brunswick County Land Use Plan Map from Industrial to Commercial for Tax Parcels 03700054, 0380000103, and 0380000104 located at 9630 and 9720 Blackwell Road near Belville, NC.

  - **LAND USE PLAN AMENDMENT (LUM-674) FOR CASE Z-674:** Request to amend the Official Brunswick County Land Use Plan Map from LDR (Low Density Residential) to Commercial for Tax Parcel 2280001201 located off Ocean Isle Beach Road near Ocean Isle Beach, NC.

  - **LAND USE PLAN AMENDMENT (LUM-676) FOR CASE Z-676:** Request to amend the Official Brunswick County Land Use Plan Map from LDR (Low Density Residential) to MDR (Medium Density Residential) for Tax Parcels 18500001, 1850000101, 1850000102, 1850000103, 18500002, 1850000202, 1850000203, 18500003, 1860002401, 201DB001, 201DB002, 201DB003, 201DB006, 201DB007, 201DB008, 201DB009, and 201DB010, located off Gary Street, Twin Town Drive and Smithtown Road (SR 1193) near Supply, NC.

  - **LAND USE PLAN AMENDMENT (LUM-678) FOR CASE Z-678:** Request to amend the Official Brunswick County Land Use Plan Map from HDR (High Density Residential) to Commercial for Tax Parcels 232HG003, 232HG004, and 232HG027 located at 2739 and 2893 John T. Holden Road near Holden Beach, NC. This land use amendment totals approximately 1.43 acres.

  - **LAND USE PLAN AMENDMENT (LUM-682) FOR CASE Z-682:** Request to amend the Official Brunswick County Land Use Plan Map from MDR (Medium Density Residential) to LDR (Low Density Residential) for Tax Parcel 1990013504 located off Holden Beach Road (NC 130) near Shallotte, NC. This land use amendment totals approximately 0.61 acres.

  - **LAND USE PLAN MAP AMENDMENT (LUM-683) FOR REZONING CASE Z-683:** Request to amend the Official Brunswick County Land Use Plan Map from LDR (Low Density Residential) to Commercial for Tax Parcels 21300001, 213000015, 213000016, 213000017, 213000018, 213000019, 2130000107, and 2130000111 located off Hale Swamp Road (SR 1154), Apple Orchard Street, Peach Orchard Street, and at 759 Hale Swamp Road near Shallotte, NC. This Land Use Plan Map Amendment totals approximately 34.28 acres

  - **LAND USE PLAN AMENDMENT (LUM-684) FOR CASE Z-684:** Request to amend the Official Brunswick County Land Use Plan Map from undesignated to Mixed Use for the former right-of-way section of the B-Var Road (SR 1211) located on Tax Parcel 23200039 near Holden Beach, NC. This land use plan amendment totals approximately 0.95 acres.

  - **LAND USE PLAN AMENDMENT (LUM-685) FOR CASE Z-685:** Request to amend the Official Brunswick County Land Use Plan Map from MDR (Medium Density Residential) and undesignated abandoned right-of-way to Commercial for the former right-of-way section of the Angler Drive and a portion of Tax Parcel 232HA017 located off Angler Drive near Holden Beach, NC. This land use plan amendment totals approximately 0.35 acres.

  - **LAND USE PLAN AMENDMENT CASE FOR TAX PARCEL 2360001806:** Request to amend the Official Brunswick County Land Use Plan Map from undesignated to HDR (High Density Residential) for Tax Parcel 2360001806 located near Minnesota Dr. and Barnes Bluff Dr. near Oak Island, NC. This land use plan amendment totals approximately 8.7 acres.

- **PROPOSED AMENDMENT TO SECTION 6.V.C. (TABLE 64), BRUNSWICK COUNTY FUTURE LAND USE ACREAGE:**

Table 64.

Brunswick County Future Land Use Acreages

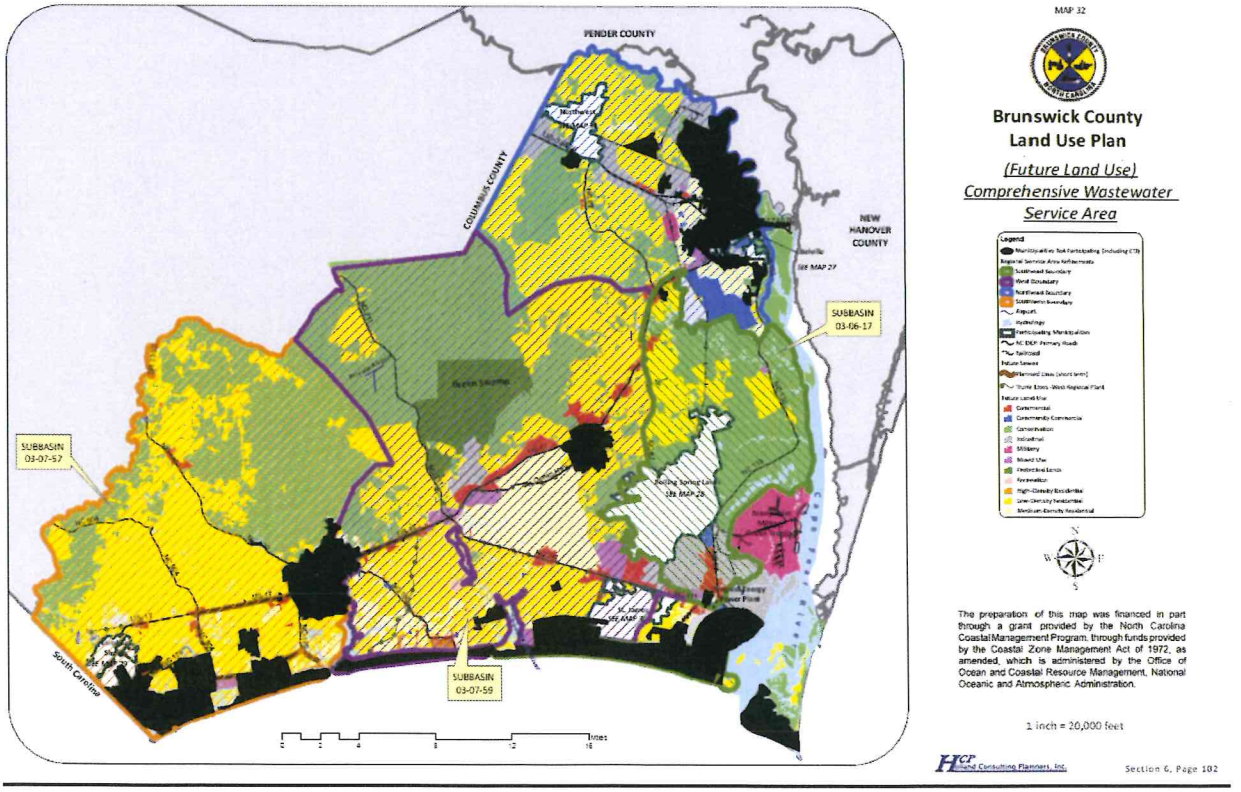
Districts	Acres	% of Total
Commercial	11,694.92	2.5%
Community Commercial	4,826.06	1.0%
Conservation	184,865.37	39.2%
High-Density Residential	929.70	0.2%
Industrial	19,737.87	4.2%
Low-Density Residential	192,924.58	40.9%
Medium-Density Residential	27,084.94	5.7%
Military	9,147.21	1.9%
Mixed-Use	5,716.64	1.2%
Protected Lands	13,731.36	2.9%
Recreation	672.02	0.1%
Total	*471,330.67*	*100.0%*

*The acreage in this table assume total build-out of the attached future land use map.

NOTE: The acreage included only the unincorporated areas of the County.

Source: Brunswick County Planning and Community Development Department

- **PROPOSED AMENDMENT TO MAP 32 (COMPREHENSIVE WASTEWATER SERVICE AREA MAP):**



- **PROPOSED AMENDMENT TO SECTION 6.V.F. (TABLE 79), BRUNSWICK COUNTY FUTURE LAND USE ACREAGE:**

Table 79.

Brunswick County Future Land Use Acreages*

Land Use**	Northeast (Acres)	Southeast (Acres)	Southwest (Acres)	West (Acres)	Total
Commercial	566.6	1,927.8	1,415.6	7,376.1	11,286.1
Community Commercial	3,556.7	429.7	420.4	266.1	4,672.9
Conservation	18,652.8	40,159.2	58,301.8	59,443.4	176,557.2
High-Density Residential	5.2	45.1	129.6	688.1	868.0
Industrial	7,412.0	5,566.0	222.9	2,659.6	15,860.5
Low-Density Residential	34,244.9	11,830.6	70,420.7	71,791.3	188,287.5
Medium-Density Residential	5,035.7	14.8	1,267.5	20,460.7	26,778.7
Military	608.6	16.5	0.0	0.0	625.1
Mixed Use	549.4	352.3	343.1	4,461.0	5,705.8
Protected Lands	0.0	147.0	0.0	13,584.3	13,731.3
Recreation	0.0	0.3	58.1	158.9	217.3
Total	70,631.9	60,489.3	132,579.7	180,889.5	444,590.4

* This table includes all areas that have been included in the Brunswick County Comprehensive Wastewater and Water Master Plans. The acreage does not include waterbodies, water road right of ways, or the following municipalities: Leland, Navassa, Sandy Creek, Southport, Oak Island, Caswell Beach, Shallotte, Sunset Beach, Calabash, Ocean Isle Beach, and Bald Head Island. These municipalities may be affected by the water and sewer improvements discussed, but did not participate in the County's Land Use Plan Update.
**For land use category explanations and associated densities included in the Brunswick County Unified Development Ordinance see Section 6.V.D.

Source: Holland Consulting Planners, Inc.

Approved by a vote of 5 in favor and 0 opposed on the 1st day of October 2012.

BRUNSWICK COUNTY NORTH CAROLINA

Signed by: _____
William M. Sue, Chairman
Board of County Commissioners

Attest: _____
Debby Gore, Clerk to the Board

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue, Governor | Braxton C. Davis, Division Director | Dee Freeman, Secretary

Memorandum *CRC 12-42*

To: Coastal Resources Commission

From: John A. Thayer Jr. AICP Manager, Local Planning & Public Access Programs

Date: October 29, 2012 (CRC Mtg. 11/15/2012)

Reference: Planning Program Review Strategy and Activities

- **Land Use Plan Assessments:** Planners are developing an instrument designed for reviewing existing LUPs and creating a profile and assessment that recognizes CAMA land use planning program's critical components and issues. The assessment of LUPs will also recognize unique local characteristics and institutional planning capacity. (Assessment conducted December through April 2013)

- **Local Government Listening Sessions:** Staff is developing an approach and strategy for conducting meetings with local governments to discuss how the DCM Planning Section can further assist local governments relative to the planning and access programs. The timing of local plan updates and suggested clarifications to the 7B Land Use Planning Guidelines will also be discussed. (Listening Sessions anticipated for March- June)

- **Routine LUP Amendment Workshops:** Planners will be soliciting interest from local governments in attending a "Routine LUP Amendment Workshop". DCM will be requesting input for development of the workshop agenda. (Workshop to be scheduled early 2013)

- **Community Rating System (CRS) Review:** Planners are working with FEMA representatives and reviewing the proposed 'FEMA 2013 CRS Manual' to determine how DCM might assist coastal communities in "scoring more points" and how DCM can help reduce barriers so that local governments may achieve better FEMA insurance ratings.

- **Updates & Enhancements to the DCM Webpage for Planning & Access Programs:** Staff is updating the status charts denoting LUPs/Certifications and Amendments and including 'Implementation Status Reports'; ensuring digital links to documents and CRC records of decision ensuring that maps are current; and adding 'LUP Technical Manual updates'.

- **Access Grant Program:** In addition to anticipating soliciting applications for the Public Beach and Coastal Waterfront Access 2013 Grant cycle, staff is developing an application and funding workshop for local governments that would include potential public and private grant partnering agencies in the early stages of development. This was a recommendation from the CRAC access discussions.

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

CRC-12-36

October 25, 2012

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Amendments to 15A NCAC 7I .0401 & .0406 - Minor Permit Program

In addition to the Major and General Permit programs administered by the Division of Coastal Management (DCM), the Coastal Area Management Act (CAMA) allows **for** the development of Local Implementation and Enforcement programs for the expeditious processing of permit applications. Projects, such as single-family homes, that do not require Major or General Permits are reviewed under the Minor Permit Program. Local governments review, issue and administer Minor Permits in accordance with standards adopted by the Coastal Resources Commission and under contract with the DCM. A county or municipal representative, known as the CAMA local permit officer or LPO, issues the permits. LPOs are trained by the Division to administer Minor Permits for their locality. There are currently 36 local governments (10 counties and 26 municipalities) participating in the Minor Permit Program.

The Division typically conducts two regional two-day-long training workshops along the coast. The Local Permit Officers' reimbursement for attendance at this workshop is included as an eligible expense in the contract between the Division and local governments participating in the Local Implementation and Enforcement Program. Reimbursement to counties and/or municipalities for LPO travel includes both mileage as well as state per diems for motel and meal expenses.

The LPO training session are held regionally in order to minimize travel costs to the local governments and the Division. Since 1993, local governments have been reimbursed for LPO travel expenses at a rate of $200 per LPO for up to three LPOs from a single local government. During a review of Coastal Resources Commission rules, specifically the Minor Permit Program, in accordance with the Governor's Executive Order 70 (Rules Modification and Improvement Program), it was noted that the Commission's administrative rule had not been changed to reflect the increased amount for LPO reimbursement. This proposed rule amendment will increase the reimbursement rate from

400 Commerce Ave., Morehead City, NC 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

$150 to $200 per person. This update will bring the Commission's administrative rules into compliance with the reimbursement policies that the division has used for 19 years.

To ensure that no local government will have to forego the assumption of permit-letting authority because of inadequate local finances or to severely burden its local budget, the CRC allows local governments to recoup application fees for administration of Local Implementation and Enforcement programs. The intent of the fee is to only cover the cost of administering the permit program. The Minor Permit application fee is currently $100.00 [15A NCAC 7J .0204(b)(6)(B)] as authorized by the CRC and approved by the Council of State in 2000. However, a reference in 15A NCAC 7I .0406 states that the fee is $25 and has not been changed since 1982. These amendments will correct this inconsistency by citing the more current reference to permit fees that has been in effect for the past 12 years.

These actions are based on a periodic evaluation and review of the Commission's rules in accordance with the procedures described in Executive Order 70 of the Governor's Rules Improvement and Modification Program. The results of this review noted the above inconsistencies and do not change any existing policies or procedures. Staff recommends that the Commission send the amendments and fiscal analysis to public hearing in order to avoid any confusion on the part of local governments or property owners.

I look forward to discussing these amendments at the upcoming meeting in Plymouth.

SECTION .0400 - GENERALLY APPLICABLE STANDARDS

15A NCAC 07I .0401 PROGRAM COSTS

(a) Costs associated with the management of a local Implementation and Enforcement Program will be recovered on a per permit basis established by the Secretary unless specified elsewhere in this Rule.

(b) The per permit reimbursement rate has been set in consideration of local costs, such as salaries, office supplies, copying, mailing and telephone use, and funds made available to the Division of Coastal Management. These rates are set as follows:

(1) All county permit-letting authorities are eligible to receive seventy-five dollars ($75.00) for each processed permit.

(2) All municipal permit-letting authorities are eligible to receive fifty-five dollars ($55.00) for each processed permit.

(3) For multi-unit programs involving a county and a municipality, the higher county rate applies, however, programs involving two or more municipalities will use the municipal rate.

(4) Mandatory follow-up inspections are required when the permitted activity is completed, and such inspections will be documented on a form specified by the Secretary; the follow-up inspection fee received by all local governments is set at forty dollars ($40.00).

~~(c) Funds for field and office equipment have been made available for the first four years of the permit program. Due to funding limitation, no further funds will be allocated for the purpose.~~

(c)~~(d)~~ Training costs for Local Permit Officers (LPOs) at the Department of Environment ~~Environment, Health,~~ and Natural Resources annual training session are limited to a maximum ~~one~~ two hundred ~~fifty~~ dollars ($200.00)/LPO ~~($150.00)/LPO~~ for up to three (3) LPOs per local government upon submittal of proper receipts. No funds will be provided for attendance at ~~CRC~~ Coastal Resources Commission meetings.

History Note: *Authority G.S. 113A-112; 113A-124;*
Eff. December 10, 1977;
Amended Eff. May 1, 1990; October 1, 1982; May 20, 1980; August 1, 1978.

15A NCAC 07I .0406 APPLICATION FEES

The application fees collected by the locality shall be used only to defray the administrative costs associated with processing of a CAMA Minor Development Permit application. Deficits resulting from administrative costs exceeding amounts received from application fees shall be recovered from ~~per~~ permit reimbursements. The ~~current~~ application fee ~~is now~~ shall be consistent with NCAC 7J .0204(b)(6)(B). ~~twenty-five dollars ($25.00).~~

History Note: *Authority G.S. 113A-112; 113A-119; 113A-124;*
Eff. December 10, 1977;
Amended Eff. October 1, 1982; May 20, 1980; August 1, 1978.

Fiscal Analysis

Minor Permit Program Costs and Application Fees

Amendments to 15A NCAC 7I .0401 and 7I .0406
General Applicability Standards

Prepared by

Mike Lopazanski
NC Division of Coastal Management
(252) 808-2808 Ext. 223

October 25, 2012

Basic Information

Agency	DENR, Division of Coastal Management (DCM) Coastal Resources Commission
Title	General Applicability Standards
Citation	15A NCAC 7I .401 & 7I .0406
Description of the Proposed Rule	15A NCAC 7H.0400 defines the reimbursement to be paid by the Division of Coastal Management to local governments for costs associated with administering Implementation and Enforcement Programs associated with Coastal Area Management Act (CAMA) Minor Development permits. Amendments to section 7I.0401(c) increase the reimbursement to local governments from $150 to $200 for attendance of up to three Local Permitting Officers at training sessions. Amendments to 7I .0406 corrects the citation for CAMA Minor Permit application fees.
Agency Contact	Mike Lopazanski Coastal & Ocean Policy Manager Mike.Lopazanski@ncdenr.gov (252) 808-2808 ext 223
Authority	G.S. 113A-112; 113A-119; 113A-124
Necessity	The proposed amendments are in the public interest and consistent with the mandate of the Governor's Executive Order 70 Rules Modification and Improvement Program because they will alleviate confusion among the regulated community regarding the cost of CAMA permits.
Impact Summary	State government: No Local government: No Substantial impact: No Federal government: No Private Property Owners: No

Summary

The Coastal Area Management Act (CAMA) allows the Coastal Resources Commission to develop Local Implementation and Enforcement programs for the expeditious processing of permit applications. Local governments review, issue and administer Minor Permits in accordance with standards adopted by the Coastal Resources Commission and under contract with the Division of Coastal Management. In order to promote participation, the Division of Coastal Management reimburses counties and municipal governments for the cost of training and allows the local governments to keep permit fees to cover administrative program costs. This rule package contains two amendments. The first will formally increase the amount of travel reimbursement paid to local governments for participation in annual training sessions. The second amendment will change a reference to the Minor Permit cost to make it consistent with the current fee structure.

The division trains county and municipal representatives, known as the CAMA local permit officers or LPO, to issue Minor Permits for their locality. The division conducts training workshops along the coast and the LPOs' attendance at this workshop is included as an eligible expense in the contract between the division and participating local governments. Since 1993, local governments have been reimbursed for LPO travel expenses at a rate of $200 per LPO for up to three LPOs from a single local government. During a review of Coastal Resources Commission rules, specifically the Minor Permit Program, in accordance with the Governor's Executive Order 70 (Rules Modification and Improvement Program), it was noted that the Commission's administrative rule had not been changed to reflect the increased amount for LPO reimbursement. This proposed rule amendment will increase the reimbursement rate from $150 to $200 per person. This update will bring the Commission's administrative rules into compliance with the reimbursement policies that the division has used for 19 years.

To ensure that no local government will have to forego the assumption of permit-letting authority because of inadequate local finances or to severely burden its local budget, the CRC allows local governments to recoup application fees for administration of local Implementation and Enforcement programs. The intent of the fee is to only cover the cost of administering the permit program. The Minor Permit application fee is currently $100.00 [15A NCAC 7J .0204(b)(6)(B)] as authorized by the CRC and approved by the Council of State in 2000. However, a reference in 15A NCAC 7I .0406 states that the fee is $25 and has not been changed since 1982. These amendments will correct this inconsistency by citing the more current reference to permit fees that has been in effect for the past 12 years.

These actions are based on a periodic evaluation and review of the Commission's rules in accordance with the procedures described in Executive Order 70 of the Governor's Rules Improvement and Modification Program. The results of this review noted the above inconsistencies and do not change any existing policies or procedures. As such, there is no economic impact associate with the rule change.

These amendments will have no impact on Department of Transportation projects or on DCM permit receipts.

The proposed effective date of these amendments is March 1, 2013.

Introduction and Purpose

In addition to the Major and General Permit programs administered by the Division of Coastal Management (DCM), the Coastal Area Management Act (CAMA) allows for the development of Local Implementation and Enforcement programs for the expeditious processing of permit applications. Projects, such as single-family homes, that do not require Major or General Permits are reviewed under the Minor Permit Program. Local governments review, issue and administer minor permits in accordance with standards adopted by the Coastal Resources Commission and under contract with the Division of Coastal Management. A county or municipal representative, known as the CAMA local permit officer or LPO, issues the permits. LPOs are trained by the Division of Coastal Management to administer Minor Permits for their locality.

The Division typically conducts two regional two-day-long training workshops along the coast. The Local Permit Officers' reimbursement for attendance at this workshop is included as an eligible expense in the contract between the division and local governments participating in the Local Implementation and Enforcement Program. Reimbursement to counties and/or municipalities for LPO travel includes both mileage as well as state per diems for motel and meal expenses.

There are currently 36 local governments (10 counties and 26 municipalities) participating in the Minor Permit Program. The LPO training session are held regionally in order to minimize travel costs to the local governments and the division. Due to budget cuts during fiscal years 2009-2010 and 2010-2011, one-day training sessions were held in order to minimize and in some cases, eliminate the need for overnight travel. Table 1. depicts the reimbursements paid to local governments in connection with LPO Training meetings during the last five years.

Table 1. LPO Training Reimbursements by Fiscal Year

Local Gov't	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12
Bertie	$400.00	$200.00		$104.00	$ 200.00
Brunswick		$59.40	$43.00	$43.00	$200.00
Carteret		$400.00	$200.00		$ 200.00
Chowan	$400.00	$200.00			
Craven		$446.26			
Currituck					
Dare					
Hertford	$200.00			$99.00	
New Hanover	$600.00				$600.00
Onslow					
Pamlico		$200.00			
Pender	$600.00				
Atlantic Beach					
Bald Head Island	$400.00	$66.00		$35.00	$200.00
Calabash					
Cape Carteret					
Carolina Beach	$400.00				$364.07
Duck					
Elizabeth City					
Emerald Isle	$200.00	$523.13			
Havelock					

Holden Beach					
Holly Ridge					
Jacksonville	$297.47	$110.00			
Kill Devil Hills					
Kitty Hawk					
Kure Beach	$400.00				
Morehead City		$215.00			
Nags Head					
New Bern		$354.90			
North Topsail	$298.91				
Oak Island	$600.00	$88.92			$ 400.00
Ocean Isle Beach		$107.80			$ 200.00
Pine Knoll Shores	$200.00	$395.01			
River Bend					
Southern Shores					
Southport	$200.00	$86.90			
Sunset Beach	$200.00	$116.60	$52.00	$52.00	$ 200.00
Surf City	$144.97				$ 200.00
Topsail Beach	$303.15	$66.00		$32.50	
Washington City	$200.00			$122.00	
Wrightsville B.	$400.00				$ 400.00
TOTALS:	**$ 6,444.50**	**$3,547.00**	**$295.00**	**$487.50**	**$2,964.07**

In order to promote participation, the Division of Coastal Management reimburses counties and municipal governments for the cost of training and allows the local governments to keep permit fees to cover administrative program costs. The Minor Permit application fee is currently $100.00 [15A NCAC 7J .0204(b)(6)(B)] as authorized by the CRC and approved by the Council of State in 2000. The reference in 15A NCAC 7I .0406 states that the fee is $25 and has not been changed since 1982. These amendments will correct this inconsistency by citing the more current reference to permit fees that has been in effect for the past 12 years.

Description of Rule Amendments

15A NCAC 7I .0400 Generally Applicable Standards, contains the administrative rules and policies governing reimbursements and eligible activities as well as permit application fees associated with Local Implementation and Enforcement Program (Minor Permit Program). 15A NCAC 7I .0401 Program Costs, specifically outlines how local governments are to be reimbursed for activities including the issuance of minor permits and attendance at annual training sessions. According to 15A NCAC .401(d), local governments are eligible for reimbursement of up to $150 per LPO for travel costs associated with participation in LPO training session. However, since 1993, the Division has allowed reimbursement of $200 per LPO for up to three LPOs per local government participating in annual training sessions. The proposed amendment will rectify what has been the Commission's policy for the past 19 years.

15A NCAC 7I .406 cites the application fee associated with Minor Permits as $25.00 and was last amended in 1982. This fee is in conflict with subsequent changes to fees associated with CAMA permits found in 15A NCAC 7J .0204(b)(6) which indicates processing fees for all

CAMA permits. 15A NCAC 7J .0204(b)(6)(B) in particular cites the fee for processing Minor Development Permits as $100 and was last amended in 2000. In order to avoid future conflicts of this nature, 7I .0406 is being amended to include only a reference to 7J .0204(b)(6)(B).

Other minor technical amendments are proposed to bring both rules in to compliance with the NC Administrative Procedures Act.

Cost or Neutral Impacts

Private Property Owners:

The reimbursement to local governments for participation in LPO trainings sessions (15A NCAC 7I .0401) does not affect private property owners. No changes are proposed in the fees [15A NCAC 7J .0204(b)(6)(B)] paid by private property owners to obtain Minor development permits.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, the proposed amendments to 15A NCAC 7H .0306(a)(2) will not affect environmental permitting for the NC Department of Transportation.

Local Government:

Since 1993, local governments have been reimbursed up to $200.00 per LPO for up to three LPOs per local government for travel costs associated with participating in annual LPO training sessions. As this has been the Commission's policy for 19 years, no impact to local government funds is anticipated. The Minor Development permit fee collected and retained by local governments has been $100.00 per permit for the past 12 years. Correcting the reference to CAMA permit fees will not impact local government funding.

Division of Coastal Management:

Since 1993, local governments have been reimbursed up to $200.00 per LPO for up to three LPOs per local government for travel costs associated with participating in annual LPO training sessions. As this has been the Commission's policy for 19 years, no impact to the Division's budget is anticipated. Since the $100.00 fee for Minor Development permits is retained by the local government issuing the permit and has not changed since 2000, the Division of Coastal Management does not anticipate changes in permitting receipts due to the proposed action.

Benefits

Private Citizens:

The proposed amendments are consistent with the mandate of the Governor's Executive Order 70 Rules Modification and Improvement Program and will alleviate any confusion among the regulated community regarding the cost of CAMA permits. Referencing the common citation to CAMA permit fees as opposed to the fee itself will also eliminate the occurrence of similar inconsistencies within the CRC's administrative rules in the future.

Cost/Benefit Summary

This action is based on a periodic evaluation and review of the Commission's rules in accordance with the procedures described in Executive Order 70 of the Governor's Rules Improvement and Modification Program. The results of this review noted the above inconsistencies and do not change any existing policies or procedures. As such, there is no economic impact associate with the rule change. Correcting the inconsistencies will alleviate any confusion among the regulated community regarding the cost of CAMA permits and referencing the common citation to CAMA permit fees as opposed to the fee itself will also eliminate the occurrence of similar inconsistencies within the CRC's administrative rules in the future.

SECTION .0400 - GENERALLY APPLICABLE STANDARDS

15A NCAC 07I .0401 PROGRAM COSTS

(a) Costs associated with the management of a local Implementation and Enforcement Program will be recovered on a per permit basis established by the Secretary unless specified elsewhere in this Rule.
(b) The per permit reimbursement rate has been set in consideration of local costs, such as salaries, office supplies, copying, mailing and telephone use, and funds made available to the Division of Coastal Management. These rates are set as follows:

(1) All county permit-letting authorities are eligible to receive seventy-five dollars ($75.00) for each processed permit.
(2) All municipal permit-letting authorities are eligible to receive fifty-five dollars ($55.00) for each processed permit.
(3) For multi-unit programs involving a county and a municipality, the higher county rate applies, however, programs involving two or more municipalities will use the municipal rate.
(4) Mandatory follow-up inspections are required when the permitted activity is completed, and such inspections will be documented on a form specified by the Secretary; the follow-up inspection fee received by all local governments is set at forty dollars ($40.00).

~~(c) Funds for field and office equipment have been made available for the first four years of the permit program. Due to funding limitation, no further funds will be allocated for the purpose.~~
(c)~~(d)~~ Training costs for Local Permit Officers (LPOs) at the Department of Environment ~~Environment, Health,~~ and Natural Resources annual training session are limited to a maximum ~~one~~ two hundred ~~fifty~~ dollars ($200.00)/LPO ~~($150.00)/LPO~~ for up to three (3) LPOs per local government upon submittal of proper receipts. No funds will be provided for attendance at ~~CRC~~ Coastal Resources Commission meetings.

History Note: *Authority G.S. 113A-112; 113A-124;*
Eff. December 10, 1977;
Amended Eff. May 1, 1990; October 1, 1982; May 20, 1980; August 1, 1978.

15A NCAC 07I .0406 APPLICATION FEES

The application fees collected by the locality shall be used only to defray the administrative costs associated with processing of a CAMA Minor Development Permit application. Deficits resulting from administrative costs exceeding amounts received from application fees shall be recovered from ~~per~~ permit reimbursements. The ~~current~~ application fee ~~is now~~ shall be consistent with NCAC 7J .0204(b)(6)(B). ~~twenty-five dollars ($25.00).~~

History Note: *Authority G.S. 113A-112; 113A-119; 113A-124;*
Eff. December 10, 1977;
Amended Eff. October 1, 1982; May 20, 1980; August 1, 1978.

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

MEMORANDUM **CRC 12-37**

TO: Coastal Resources Commission

FROM: Ken Richardson

SUBJECT: 15A NCAC 7H.0304(1)(a), AEC' s Within Ocean Hazard Areas, Public Comments and Staff Response

DATE: October 26, 2012

The 2011 Draft Erosion Rates and Setback Factors, Fiscal Analysis, and Amendments to 15A NCAC 7H.0304(1)(a) were presented at Public Hearings in each of the eight oceanfront counties. The following are summaries of publicly-recorded and written comments received at each hearing, followed by the Division of Coastal Management's response:

New Hanover County, August 28, 2012
New Hanover County Government Center
Ed Mitchell, Hearing Officer

No public comment received.

Brunswick County, August 29, 2012
Sea Trail Convention Center, Sunset Beach
Bob Emory, Hearing Officer

No public comments received.
Written comments:

Town of Oak Island
Summary of Oak Island Comment: Supports the adoption of the updated erosion rates.

Hyde County, September 5, 2012
Ocracoke Fire Department
Jamin Simmons, Hearing Officer

No public comments received.

Carteret County, September 6, 2012
NC Division of Coastal Management, Morehead City
Pat Joyce, Hearing Officer

Public and written comments:

Carteret County, Shoreline Protection Office (SPO), Mr. Greg "Rudi" Rudolph:

1. **Summary of Carteret County Comment:** Commended the N.C. Coastal Resources Commission and the Division of Coastal Management for submitting the 2011 Oceanfront Erosion update for public comment; and was appreciative of the DCM staff working diligently and placing a high emphasis on providing the most accurate erosion rates possible. The county considers the publication of updated erosion rates to be one of the more important functions of the NC DCM, as the county believes it serves two important purposes for their local communities. The erosion rates are the backbone of the State's oceanfront setback policy, which helps to promote smart development while protecting the natural resources of the beach environment, and (2) the update allows FEMA to provide communities with valuable points towards the National Flood Insurance Program's (NFIP's) Community Rating System (CRS). The county was also appreciative of NC DCM's sensitivity to the CRS issue and the timeliness of the 2011 update.

2. **Summary of Carteret County Comment:** The 2011 update should include a range of error for the data presented:

DCM Response:
To test relative horizontal accuracy between the 2009 NAIP imagery and the most current county tax imagery (2004-2008), DCM analyzed digitizer interpretations of common identifiable point features in all data sets, and estimated the GSD to be (+/-) 3.5 feet with a root mean square (RMS) error of 4.2 feet.

While this reflects the positional accuracy of the imagery, it does not necessarily translate as range of error for the actual long-term average annual erosion rates. Since distance was measured between only two shorelines at any given location (one historical and one recent position), and this distance was then divided by a period of time and then statistically smoothed, this method effectively filters short-term phenomena and some errors associated with shoreline positions. None of the previous erosion rate update studies have included a range of error, for this same reason.

With regard to NOS T-Sheet Mean High Water shorelines, the National Oceanic and Atmospheric Administration (NOAA), has released these historical shorelines as a digital data product that has been quality-controlled by NOAA. These data are considered by the federal government to be an accurate representation of the shoreline for that time period, and are specifically intended to be used for scientific and research purposes such as calculating long-term erosion rates. The National Academy of Sciences Committee on Coastal Zone Management (NAS, 1990)[1] stated that "*This high accuracy makes them quite useful in delineating the land-water boundary and particularly for determining net changes over the long term*." (p. 123)

As the Division considers other methodologies for calculation of erosion rates in the future, a range of error may be included in future updates.

3. **Summary of Carteret County Comment:** The image resolution should be provided for the 2009 aerial photos utilized in the update

DCM Response: The resolution, or pixel size, of the 2009 NAIP imagery is 3.281 feet (1 meter). This will be included in the report.

4. **Summary of Carteret County Comment:** NCDCM should investigate utilizing a datum-derived shoreline from LIDAR:

[1] National Academy of Sciences, 1990. Managing Coastal Erosion. National Research Council, Committee on Coastal Erosion Zone Management, National Academy Press, Washington, 182p.

DCM Response: In 2007, and with assistance from the U.S. Geological Survey (USGS), the DCM completed a study that examined the interchangeability of using a LiDAR-derived MHW shoreline as a proxy for the wet-dry shoreline orthorectified imagery (Limber, List, & Warren, 2007a.)[2]. The wet-dry line in North Carolina has been shown to vary by up to 5.8 meters during a single tidal cycle (Dolan et al., 1980)[3] and 10.3 meters during a single day (Martin, 1997)[4] due to tides and wave run-up. Similarly, the HWL can vary on the order of 10 meters during a single month (Pajak & Leatherman, 2002)[5], excluding storm events. In the 2007 DCM study, it was demonstrated that there can be an average difference of 3.53 meters (11.4 feet) between MHW and wet-dry shorelines with this biasing long-term shoreline change rates by 0.06 meters/year (0.2 feet/year). The results showed that a MHW shoreline derived from LiDAR could credibly serve as a proxy for a wet-dry shoreline for purposes of analyzing long-term average annual erosion rates along North Carolina's oceanfront and the Division will consider its use in future updates depending on the data's availability.

5. **Summary of Carteret County Comment:** For future updates, NCDCM should thoroughly review the usefulness of the end-point method and concurrently explore utilizing a linear regression analysis for shoreline erosion rates. Likewise, a standard deviation analysis should also be explored as this may provide useful information to assess shoreline behavior. Moreover, the State should invest in its own profile network, Light Detection And Ranging (LiDAR), or other data acquisition methods to begin ascertaining volume changes and providing more accurate shoreline data.

DCM Response: The DCM is planning to evaluate alternative peer-reviewed and industry-accepted methods for determining erosion/accretion rates. Methods will compare results derived using the end-point analysis (analyzing two shorelines) and linear regression analysis (more than two shorelines).

6. **Summary of Carteret County Comment:** The overall presentation of the erosion rates (smoothed rate) is extremely confusing, poorly related to the setback factors (blocked rates), and does not adequately identify areas that are accreting (Tables on pages 22 through 25).

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[2] Limber, P.W., List, J.H., and Warren, J.W. (2007a.). Using togographic LiDAR data to delineate the North Carolina shoreline. *Proceedings of Coastal Sediments*, (pp.1837-1850). New Orleans, Louisiana.

[3] Dolan, R. Hayden, B.P., May, P., and May, S.K. (1980). The reliability of shoreline change measurements from aerial photographs. 48 (4), 22-29.

[4] Martin, J. (1997). *Analysis of the wet/dry line as an indicator of shoreline position on a sand beach*. Masters, Thesis, North Carolina State University, Raleigh, NC.

[5] Pajak, M.J., and Leatherman, S. (2002). The high water line as a shoreline indicator. Journal of Coastal Research, 18 (2), 329-337.

a. DCM concurs. The maps themselves should be labeled “Setback Factor Maps.” Because the maps are labeled “Long-Term Average Annual Erosion Rates,” it is inferred that the entire coastline of North Carolina is eroding. The blocked data increments are consistent with the State’s oceanfront setback policy and the presentations of those data are useful. However the public can easily misconstrue the maps to represent actual erosion/accretion rates.
b. Tables on pages 22 through 25 in the report are confusing since the length of accreting 2009 shoreline and length of eroding 2009 shoreline does not appear to add up to 100%.
c. Upon further inspection, the total miles of shoreline also do not add up to 307.4 as presented but rather 304.6. This is another source of confusion, and will be addressed.
d. The SPO requests NCDCM to; (1) either generate two separate maps (smoothed and blocked) or change the title of the “erosion rate update” map to “setback factor update” map, and (2) make the changes necessary in the methodology report so the blocked and smoothed rates are unmistakably differentiated and it is clear to the public what rate is being discussed and applied.

DCM Response: When North Carolina updates its erosion rates once every five years, the Federal Emergency Management Agency (FEMA) will award qualified communities fifty points towards their overall Community Rating System (CRS) score under the National Flood Insurance Program. This can potentially reduce flood insurance premiums for individual homeowners by five percent. To avoid delaying the erosion rate update process and risking the loss of points for those communities, DCM elected to use the same erosion rate methodology and to preserve the general layout of the erosion rate report used in the previous study.

DCM agrees that the terminology can be confusing However, the primary intent of this study is to generate oceanfront construction setback factors founded on calculated erosion rates generated using a statistically sound and methodical process to establish continuous segments of shoreline with ‘like’ erosion rates (for purposes of manageability). The terms and fundamentals of the method are no different from those employed by the State of North Carolina starting in 1979 and that have been generally accepted by the public for over thirty years.

Though the tables starting on page 22 of the report are consistent with those presented in previous studies (see Table 1), they can be confusing to the reader for two reasons: 1) When comparing *accreting* shoreline and shoreline segments labeled ‘*Erosion,*’ the total does not add up correctly when summed out of context. For the 2011 study, the

total shoreline analyzed is 307.4 miles. If the total accreting shoreline (103.7 miles) is added to the total for shorelines labeled '*Erosion*' (304.6 miles), the result totals 408 miles, which is obviously a greater length than 307.4 miles. As with previous update studies, the table rows labeled 'Erosion' actually represent the lengths of shoreline and their corresponding *setback factors*. Even though there are 103.7 miles of accreting shoreline, this total is reflected as part of the total length labeled "*Erosion <2 ft/yr*," where the default setback factor is two when the shoreline is accreting or eroding two feet or less per year; 2) The second source of confusion is the table row labels – '*Erosion*' should be replaced with '*Setback Factor*' for purposes of clarity.

The troublesome table (below) has been revised below in an effort to reduce confusion, and will be included in the final report.

	South Facing Miles (% of total)	**East Facing** Miles (% of total)	**Statewide Total** Miles (% of total)
Miles	103.9	203.5	307.4
Accreting	50.1 (48.2 %)	53.6 (26.3%)	103.7 (33.7%)
Erosion <2 ft/yr	77.3 (74.4%)	112.8 (55.4%)	190.2 (61.9%)
Erosion 2.1 to 5 ft/yr	13.8 (13.3%)	48.3 (23.7%)	62.1 (20.2%)
Erosion 5.1 to 8 ft/yr	9.0 (8.7%)	22.4 (11.0%)	31.5 (10.2%)
Erosion >8.1 ft/yr	3.6 (3.5%)	17.2 (8.5%)	20.8 (6.8%)
Maximum Erosion (ft/yr)	12.5	28	28
Mean (ft/yr)	2.8	3.7	3.4

The original table as it appeared in the report (Table 3) on page 22. If one sums "Erosion" distance values within in each column, and then adds that value to the distance in the "Accreting" row, the result will exceed total miles of shoreline; thus creating confusion. "Erosion" is actually the "Setback Factor," thus being the next source of confusion. The row labeled "Erosion <2 ft/yr" is actually the shoreline distance with a Setback Factor equal to two.

	South Facing Miles (% of total)	**East Facing** Miles (% of total)	**Statewide Total** Miles (% of total)
Erosion and Accretion Comparison			
Miles of Shoreline	103.9	203.5	307.4
Accreting	50.1 (48 %)	53.6 (26.3%)	103.7 (33.7%)
Eroding	53.6 (52%)	147.1 (72.2%)	200.9 (65.4%)
No Data	0.2 (0%)	2.8 (1%)	2.8 (>1%)
Maximum Erosion Rate (ft/yr)	12.5 ft/yr	28 ft/yr	28 ft/yr
Mean Erosion Rate (ft/yr)	2.8 ft/yr	3.7 ft/yr	3.4 ft/yr
Setback Factor Comparison (*Minimum = 2 ft*)			
Setback Factor (2 ft)	77.3 (74.4%)	112.8 (55.4%)	190.2 (61.9%)
Setback Factor (2.5 to 5.0 ft)	13.8 (13.3%)	48.3 (23.7%)	62.1 (20.2%)
Setback Factor (5.5 to 8.0 ft)	9.0 (8.7%)	22.4 (11.0%)	31.5 (10.2%)
Setback Factor (>8.0 ft)	3.6 (3.5%)	17.2 (8.5%)	20.8 (6.8%)

Revised Table 3 now in report. This table has been separated into two sections: 1) the top section illustrates a comparison of total measured oceanfront shoreline, and then sub-divisions of total shoreline length for those segments demonstrating accretion, erosion, and those with "no data," where "no data" simply means one segment of either the early or current shoreline is missing and could not be analyzed (i.e. migrating or closed inlets). 2) the lower section of the table is an illustrative comparison of total length of shoreline and its calculated construction Setback Factor, where sixty feet is the minimum construction setback (2 ft. x 30 = 60 ft.) per Rule *15A NCAC 07H.0306(a)(2)(A)*. For example, when a section of shoreline is accreting, or when it is eroding at two feet per year or less, the Setback Factor is two (2). Therefore, length shown in the row labeled "*Setback Factor (2 ft)*" is inclusive of length values for all accreting sections of shoreline, and those calculated to be eroding at two feet, or less, per year.

Public comments:

Mr. Tom Thompson, Chairman of NC-20:

Summary of Mr. Thompson Comments: NC-20 shared similar concerns as those expressed by Mr. Rudi Rudolph with the Carteret County Shoreline Protection Office. The tables presented on pages 22 through 25 of the report seem confusing for those comparing miles of shoreline, and accreting versus eroding shoreline distances.

DCM Response (See replies to Carteret County Shoreline Protection Office).

Currituck County, September 11, 2012
Outer Banks Center for Wildlife Education, Corolla
Renee Cahoon, Hearing Officer

No public comments received.

Dare County, September 11, 2012
Kill Devil Hills Town Hall, Kill Devil Hills
Renee Cahoon, Hearing Officer

Public comments:

Willo Kelly of the Outer Banks Association of Realtors and Outer Banks Home Builders Association:

Summary of Ms. Kelly Comments: Stated, "We have reviewed the comments submitted by Greg Rudolph of the Shore Protection Office and agree with his comments. We also know that Tom Thompson of NC-20 has submitted comments and we also agree with those comments."

1. There are a lot of issues with regards to the shoreline erosion and accretion from 1980-2011.
2. There has also been some confusion between the erosion rates and the setback rules.
3. She heard from realtors from South Nags Head down towards Avon and Hatteras and questions about how this will impact those lots and whether this will make those lots unbuildable. I will be pointing out some of the information that I publish in my weekly Legislative briefing with regards to some of the properties that will see higher construction setbacks. It seems like there are many of those properties here in Dare County and we would like to get that information out as clearly as possible if the Division of Coastal Management could help us out with that.

4. We thank you for updating these maps which impact our flood insurance premiums and the CRS discounts and points. We appreciate the Division's work and effort on updating these maps."

DCM Response (*See the NC DCM responses to Carteret County Shoreline Protection Office*):

Following the public hearing, the DCM staff addressed Ms. Kelly's specific questions and comments related to setback requirements and how the proposed changes might influence property owner's abilities to redevelop or rebuild homes where erosion rates are greater than two feet per year. While these areas are experiencing high erosion rates, they are consistent with those rates calculated in previous studies – in general, some of the areas that have experienced severe erosion in the past continue to experience severe erosion.

Pender County, September 13, 2012
Surf City Town Hall, Surf City
Charles Elam, Hearing Officer

Public comments:

Mr. Steve Smith, Topsail Beach:

Summary of Mr. Smith Comments: Recommend that the term '*cost avoidance*' be used on page 10 of the Fiscal Analysis rather than '*cost savings*' where it states, "*. . . contributes to an annual cost savings of $161,000 for property owners . . .* ."

DCM Response: Since both terms make the same point, the DMC recommends keeping the original text.

Onslow County, September 18, 2012
North Topsail Beach City Hall, North Topsail Beach
Melvin Shepard, Hearing Officer

No public comments received.

Written comments:

Mr. Daniel Tuman, Mayor, North Topsail Beach

Summary of Mr. Tuman Comments: The Town of North Topsail Beach stated that the proposed erosion rates were appropriate everywhere, but recommended that the State of North Carolina pursue alternative techniques for calculating erosion rates at inlets.

DCM Response: The DCM will continue its effort to analyze areas adjacent to active inlets, with the intention of defining areas of inlet influence and formulating an acceptable methodology for calculating erosion rates in those areas.

General Public Comments

Written comments:

Mr. Bill Price

Summary of Mr. Price Comments: Mr. Price shared similar critiques as those articulated by Carteret County's Shoreline Protection Office and Mr. Tom Thompson representing NC 20. Additionally, Mr. Price expressed the following concerns:

1. "How much Coast Line is measured from aerial photos, how much by survey, and what are the methods?"
2. "Cause of erosion?"

DCM Response: (s*ee the NC DCM responses to Carteret County Shoreline Protection Office)* – The answers to Mr. Price's first question can be found starting on page 10 of the erosion rate report. The 2011 study does not attempt to explain "causes of erosion."

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

CRC-12-38

October 26, 2012

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Public Comment Summary **Temporary Rules** - 15A NCAC 7H .0306(a)(2)(L) – Replacement of Single-Family or Duplex Residential Structures

A public hearing was held on October 17, 2012 in Morehead City for temporary rules [15A NCAC 7H .0306(a)(2)(L)] to allow replacement of single-family or duplex residential structures greater than 5,000 sq. ft. as mandated by House Bill 819 (SL2012-202). Bobby Outten, Dare County Manager spoke on behalf of Dare County supporting the temporary rules. Mr. Outten comments centered on the ability of property owners to retain value in their homes and that banks would be willing to lend to potential buyers. Mr. Outten stated that this was a common sense approach with little harm to the environment or community.

Larry Baldwin representing NC-20 spoke expressing support for the temporary rules. Mr. Baldwin's comments focused on the impact to homeowner's insurance and that events such as occurred at Piney Island (structure fire) was an unfair taking of property.

The text of the two comments received at the hearing is attached and staff is recommending adoption of the temporary rules. The anticipated effective date is December 3, 2012.

400 Commerce Ave., Morehead City, NC 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

15A NCAC 07H .306 Temporary Rule
General Use Standards for Ocean Hazard Areas
Public Hearing Record

October 17, 2012
5:00 p.m.
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
Roy Brownlow, Hearing Officer

Bobby Outten, Dare County Manager, stated I am here on behalf of Dare County. The mandates of SL2012-202 are a common sense approach to grandfather the pre-2009 5,000 square foot dwellings to conditions that were in existence when they made their investment decisions. This will allow most of those homes to be rebuilt should they be destroyed. It will allow them to be refinanced. Under the existing rules banks were unwilling to lend because values were going down and they had no assurance that their collateral would remain in place. It will allow these folks to sell their homes because banks will now lend. Under the existing rules there were limitations on lending because the collateral could not be replaced. It removed another impediment for falling property values in coastal communities. Banks were down-valuing properties because they could not be rebuilt. This is a common sense approach and solves a multitude of problems for these types of dwellings. It does so with little harm to the environment or the community. We appreciate that this is going forward and hope the CRC continues to work on rules with a common sense approach to solve problems on the coast.

Larry Baldwin, NC-20, stated we are a coalition representing the 20 coastal counties. NC-20 would like to add its support to these rules. Mr. Outten's comments were right on target. In the public notice it stated the supporters of HB819 argued that the rule should be grandfathered because of an event such as Piney Island and any other similar properties that create an unfair taking of the property. I won't even mention the implications on the impact on homeowner's insurance. Many cannot build back what they have insured. We are in full support of HB819, SL2012-202 and the appropriate administrative rule change.

North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

Braxton C. Davis
Director

Dee Freeman
Secretary

CRC-12-39

October 25, 2012

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: ***Permanent Rules*** - 15A NCAC 7H .0306(a)(2) – Replacement of Single-Family or Duplex Residential Structures

You will recall that House Bill 819 (SL2012-202), directed the Coastal Resources Commission to adopt temporary rules allowing for the replacement of single-family or duplex residential structures greater than 5,000 sq. ft. constructed prior to August 11, 2009 that cannot meet the setback criteria of 15A NCAC 7H .0306(a)(2).

The Commission approved the temporary rules for public hearing (hearing held October 17, 2012 in Morehead City) at the August 2012 CRC meeting and staff will be recommending adoption of the temporary rules at the November 16th meeting in Plymouth. The temporary rules are anticipated to become effective the first week of December 2012 and will remain in effect until permanent rules are adopted.

Staff is now asking the Commission to approve the amendments to 15A NCAC 7H .0306(a)(2)(L) and the accompanying fiscal analysis for public hearing as ***permanent*** rules. No changes are proposed as SL2012-202 directs the Commission to adopt rules that are "substantively identical to the provisions of Section 3.(a) of this Act" and that they "shall remain in effect until permanent rules…become effective."

I will discuss the permanent rule language as well as the rulemaking process at the upcoming meeting in Plymouth.

400 Commerce Ave., Morehead City, NC 28557
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

Draft Amendments to 15A NCAC 7H .0306(a)(2)

SUBCHAPTER 7H – STATE GUIDELINES FOR AREAS OF ENVIRONMENTAL CONCERN

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 CRC'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; and

(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.

(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) the structure as replaced meets the minimum setback required under Subpart (a)(2)(A) of this rule; and

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

(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 exist 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 Subparagraph (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 to allow development of property that lies both within the jurisdictional boundary of the petitioner as well as 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 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, and any disturbance of any other dunes is allowed only to the extent allowed 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.

(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 DCM 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. In these cases, all other applicable local and state rules shall be met.

(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). The structure(s) 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 renourishment 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 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 12, 2009; April 1, 2007; November 1, 2004; June 27, 1995.

Fiscal Analysis

Replacement of Residential Structures Greater than 5,000 Square Feet

Amendments to 15A NCAC 7H .0306(a)(2)
General Use Standards for Ocean Hazard Areas

Prepared by

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October 10, 2012

Basic Information

Agency	DENR, Division of Coastal Management (DCM) Coastal Resources Commission

TITLE **GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS**

Citation	15A NCAC 7H .0306(a)(2)
Description of the Proposed Rule	7H.0306 defines specific development requirements in Ocean Hazard Areas. The proposed rule change amends language in section 7H.0306(a)(2) pertaining to setbacks for oceanfront development, creating and exemption for the replacement of single-family or duplex residential structures greater than 5,000 sq. ft. that cannot meet the setback criteria of 15A NCAC 7H .0306(a)(2).
Agency Contact	Mike Lopazanski Coastal & Ocean Policy Manager Mike.Lopazanski@ncdenr.gov (252) 808-2808 ext 223
Authority	SL2012-202; G.S. 113A-107; 113A-113(b)(6); 113A-124
Necessity	Passage of House Bill 819 and subsequent law (SL2012-202), requires the CRC to adopt permanent rules allowing for the replacement of single-family or duplex residential structures that cannot meet the setback criteria of 15A NCAC 7H .0306(a)(2).
Impact Summary	State government: No Local government: No Substantial impact: No Federal government: No Private property owners: Yes

Summary

Passage of House Bill 819 and its subsequent law (SL2012-202), directs the Coastal Resources Commission (CRC) to 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 .0306(a)(2) if the structure meets specific criteria: the structure was originally constructed prior to August 11, 2009; the structure as replaced does not exceed the original footprint or square footage; the structure as replaced meets the minimum setback required under 15A NCAC 07H .0306(a)(2)(A); 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) and; the structure is rebuilt as far landward on the lot as feasible.

The legislation requires the CRC to adopt rules that are substantively identical to the provisions of SL2012-202 Section 3.a notwithstanding G.S. 150B-19(4) which prohibits agencies from repeating the content of a law, a rule, or federal regulations in its administrative rules. This rule amendment will not require anyone to rebuild, and will simply comply with the unambiguous mandatory directive of G.S. 150B-21.9(a)(3), being reasonably necessary to implement or implement an enactment of the General Assembly. Given the specificity of the legislation, there is no legal alternative to incorporating the language into the Administrative Code.

The costs and savings described in this document stem from the changes to state law and not the proposed rule changes. This rule amendment will make Division of Coastal Management rules conform to state statutes. Nevertheless, the division presents this analysis to depict probable results from the adoption of this legislation.

The economic impacts of this policy change are potential benefits to property owners seeking to replace structures greater than 5,000 square feet that are damaged (by fire, flood, wind etc.) beyond 50 percent (requiring a CAMA permit and thus compliance with current rules). These property owners will not have to comply with the current oceanfront setback and will be able to re-build the structure to its original dimensions. A division inventory of properties estimates that there are approximately two hundred lots on which homes are located that could potentially be affected by this rule change if they were destroyed by fire, flood or wind and if the owner decided to rebuild. The division's estimate of how many structures will be re-built under the exemption would be highly speculative as it would depend upon the occurrence of storms, normal deterioration and other events such as structure fires, as well as upon the individual willingness of landowners to rebuild in locations where their prior home had been destroyed.

These amendments will have no impact on Department of Transportation projects, local governments, the federal government, or on DCM permit receipts.

The proposed effective date of these amendments is March 1, 2013.

Introduction and Purpose

Passage of House Bill 819 and its subsequent law (SL2012-202), directs the Coastal Resources Commission (CRC) not to 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 .0306(a)(2) if the structure meets specific criteria: the structure was originally constructed prior to August 11, 2009; the structure as replaced does not exceed the original footprint or square footage; the structure as replaced meets the minimum setback required under 15A NCAC 07H .0306(a)(2)(A); 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) and; the structure is rebuilt as far landward on the lot as feasible. SL2012-200 specifically targets single-family or duplex residential structures greater than 5,000 square feet which are currently required to be set back from the first line of stable, natural vegetation 120 feet or 60 times the shoreline erosion rate, whichever is greater.

The CRC approved temporary rules for public hearing at its August 30, 2012 meeting (to be held October 17, 2012) and expects to adopt the temporary rules at its November 15, 2012 meeting (Anticipated effective date of December 3, 2012). Through this action, the CRC is now seeking to initiate permanent rulemaking to replace the temporary rules. The temporary rules are to remain in effect until the CRC adopts permanent rules.

The intent of the CRC's use standards for Ocean Hazard Areas is to reduce the risk to life and property from the destructive forces of the Atlantic Shoreline through the proper location and design of structures and by care taken in prevention of damage to natural protective features particularly primary and frontal dunes. The objective is to provide management policies and standards that serve to eliminate unreasonable danger to life and property and achieve a balance between the financial, safety, and social factors that are involved in hazard area development.

The Commission current setback rules went into effect August 11, 2009, implementing oceanfront setback requirements that are determined by the size of the structure and not its use. Specifically, oceanfront setbacks are based on total square footage regardless of whether the structure is single-family, multi-family, or commercial. The shift in policy was due to observations by the Commission that the size of single-family residences had increased along the oceanfront. This was a change from the previous policy which provided an exemption for single-family structures, regardless of size, to be set back from the shoreline a distance of 30 times the erosion rate. Prior to the 1990's this distance was deemed to be sufficient to protect private property from beach erosion and ocean flooding hazards as few residential structures exceeded 5,000 ft^2. The most recent action by the General Assembly reinstitutes this prior exemption for the setback requirement.

Current CRC rules for siting development along oceanfront shorelines utilize graduated setback factors to calculate the required distance between structures and the shoreline. For all structures less than 5,000 ft^2, the minimum setback factor is 30 times the erosion rate, whichever is greater. Above 5,000 ft^2, and every 5,000 ft^2 thereafter, the setback factor increases from 60 to 90 in increments of five. The maximum setback factor is 90 times the erosion rate for structures greater than or equal to 100,000 ft^2 (Table 1).

Table 1. Minimum construction setbacks based on structure size and minimum setback factor of 2 ft/yr.

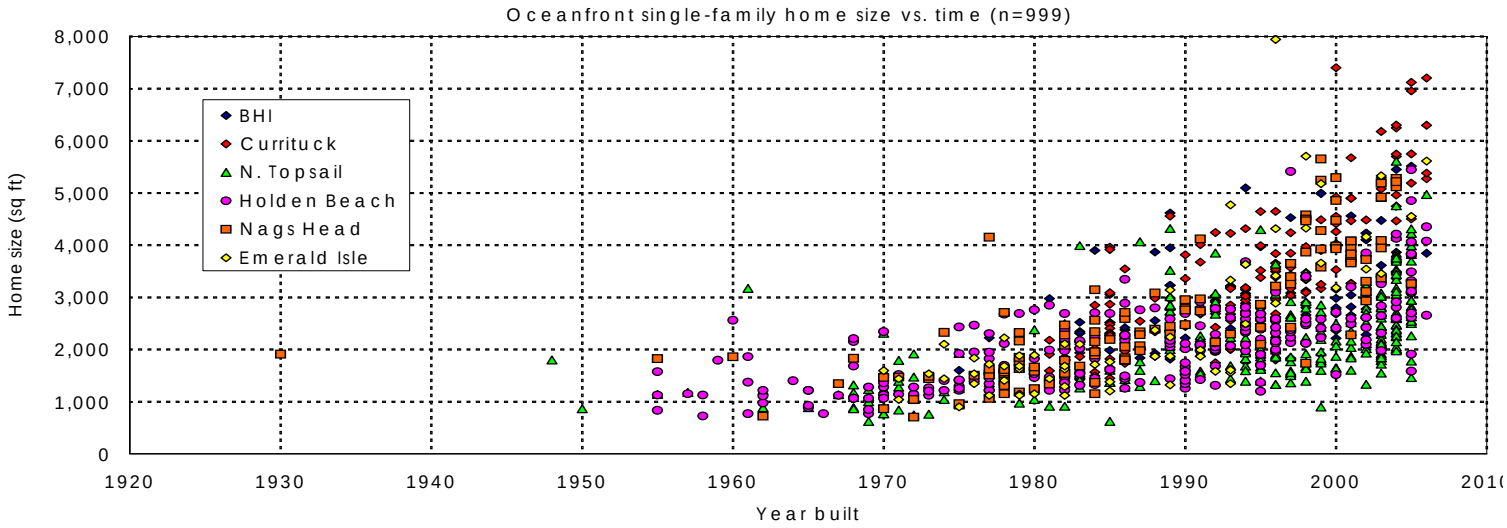
Structure Size (square feet)	Construction Setback Equation	Minimum Setback (calculated using Setback Factor = 2 ft/yr)
Less than 5,000	30 x Setback Factor	60
=>5,000 and < 10,000	60 x Setback Factor	120
=>10,000 and < 20,000	65 x Setback Factor	130
=>20,000 and < 40,000	70 x Setback Factor	140
=>40,000 and < 60,000	75 x Setback Factor	150
=>60,000 and < 80,000	80 x Setback Factor	160
=>80,000 and < 100,000	85 x Setback Factor	170
Greater than 100,000	90 x Setback Factor	180

With regard to re-building or replacement of structures, 15A NCAC 7J .0210 (Replacement of Existing Structures) distinguishes between repair and replacement. Repair of structures damaged by natural elements, fire or normal deterioration is not considered development and does not require a CAMA permit. Replacement of structures is allowed if the development complies with current CRC rules, and requires a CAMA permit. Proposed work is considered replacement if the cost to do the work exceeds 50 percent of the market value of the structure, excluding the value of the land, value resulting from the location of the property, value of accessory structures, or value of other improvements located on the property. The amendments enacted by the General Assembly exempt the replacement of single family and duplex residential structures greater than 5,000 square feet from having to comply with the current oceanfront setback requirement for structures of that size. Prior to this action by the General Assembly, a property owner would need to rebuild the structure in compliance with the applicable oceanfront setback. If they cannot meet the current set, and the lot was created prior to June 1, 1979, development can be seaward of the oceanfront setback provided that:

- Development is sited as far back on the lot as feasible;
- Development is sited at least 60 feet landward of the vegetation or measurement line whichever is applicable;
- Development is not located on or in front of a frontal dune, but is entirely behind the landward tow of the frontal dune;
- All pilings have a tip penetration of at least four feet below mean sea level;
- The footprint of the structure is no more than 1,000 ft^2 and the total floor area does not exceed 2,000 ft^2;

In 2007 the NC Division of Coastal Management (DCM) conducted a survey of single family residences (SFRs) located within the municipalities of Bald Head Island, Currituck, North Topsail Beach, Holden Beach, Nags Head and Emerald Isle. The survey utilized statistical analysis of SFRs listed on each municipality's property tax website. Figure 1. provides the results of this research and represents how the size of SFRs has increased within these municipalities from 1920 to 2007. The graph in Figure 1. shows that out of 999 SFRs located along the oceanfront, relatively few exceed 5,000 ft^2. In addition, the graph illustrates that these larger homes were all built after 1990.

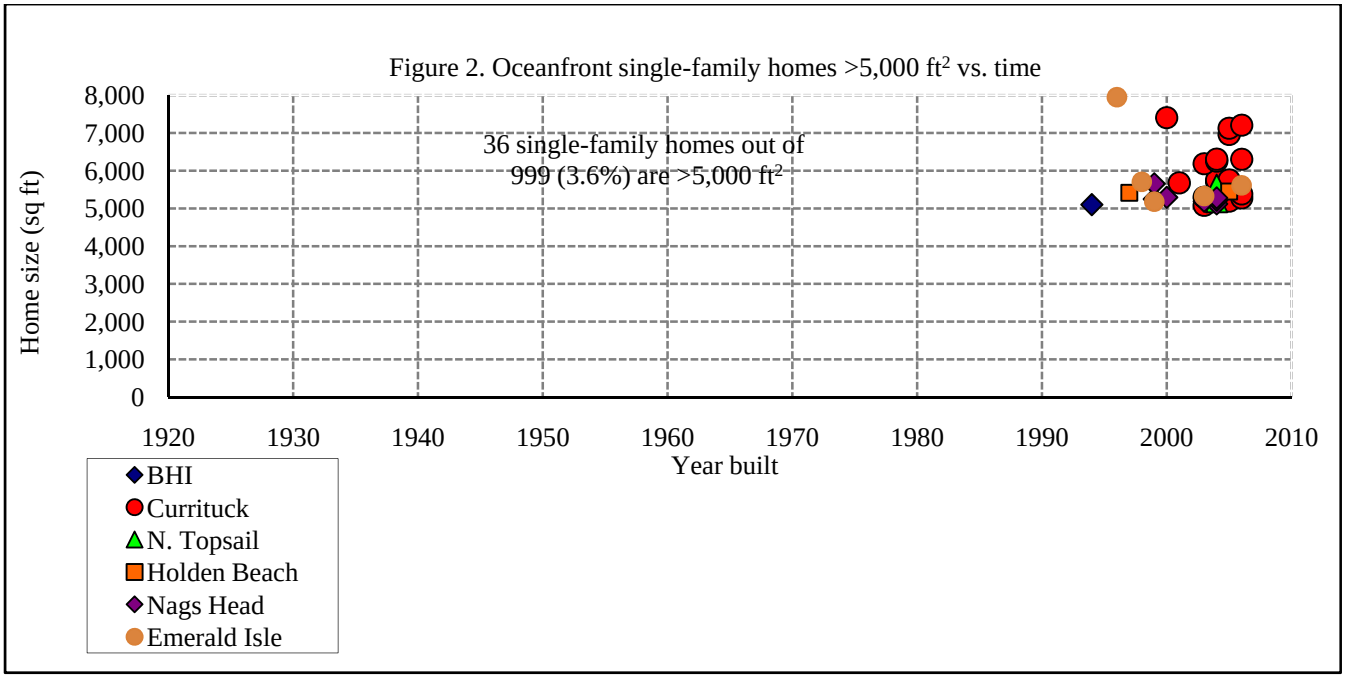
Figure 2: Oceanfront Single-Family Residence Size vs. Time



Note: Left end of graph is cropped; study dates on the X-axis range from 1920 to 2010

An assumption can be made given the statistical analysis performed and the information provided by the graph above that the majority of SFRs along the NC oceanfront are smaller than 5,000 ft² and will therefore not be eligible for the exemption.

Similarly to Figure 1., Figure 2. highlights this general trend of increasing size for SFRs over time. However, the difference in Figure 2. is that it focuses on the subset of homes that are larger than 5,000 ft². From the graph in Figure 2. it is apparent that there are only 36 homes (3.6%) out of the 999 SFRs sampled that are larger than 5,000 ft². The maximum SFR size presented in this study is a residence of 8,000 ft². If the number of SFRs generated from this confined study area is extrapolated through statistical analysis to the remaining ocean-front communities not addressed by this study, DCM estimates that out of 8,611 oceanfront structure (counted in 2009) there are approximately 200 SFRs located along the NC oceanfront that are larger than 5,000 ft².



Description of Rule Amendment

15A NCAC 7H .0306 includes the General Use Standards for Ocean Hazard Areas. The proposed rule amendment to 15A NCAC 7H .0306(a)(2) will create an exemption for the replacement of single family and duplex residential structures greater than 5,000 ft^2 constructed prior to August 11, 2009 from having to meet the current oceanfront setback requirements. In order to quality for the exemption, the structure must meet the following criteria:

- The structure was originally constructed prior to August 11, 2009;
- The structure as replaced does not exceed the original footprint or square footage;
- The structure as replaced meets the minimum setback required under 15A NCAC 07H .0306(a)(2)(A);
- 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) and;
- The structure is rebuilt as far landward on the lot as feasible.

Cost or Neutral Impacts

Private Property Owners:

The amended setback rule would apply when oceanfront property owners are seeking a Coastal Area Management Act (CAMA) permit for the replacement of an existing structure requiring more than fifty percent (50%) repair or re-construction. Based on statistical survey results,

approximately 200 residential structures would quality for the exemption. The overwhelming majority of the 999 oceanfront structures sampled or the 8,611 oceanfront structures counted will not be affected by this rule change.

A potential cost to private property owners is the chance for structural damage if an exemption is issued and the reconstructed residence is then subjected to erosion or other ocean hazards as a result of being closer to the shoreline. The probability of this occurring to an individual structure is a factor of the erosion rate in a particular area, the occurrence and severity of storms as well as its proximity to the shoreline. Since a number of natural conditions and events are involved, the division cannot calculate with any degree of certainty what this cost may be. The CRC has long recognized that absolute safety from the destructive forces indigenous to the Atlantic Shoreline is an impossibility for development located adjacent to the coast. The Commission reduces this risk to life and property from these forces through the proper location and design of structures.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, the proposed amendments to 15A NCAC 7H .0306(a)(2) will not affect environmental permitting for the NC Department of Transportation. Development such as roads, parking lots, and other public infrastructure such as utilities continue to have a minimum setback factor of sixty feet (60) or thirty (30) times the shoreline erosion rate (whichever is greater) as defined by 07H.0306(a)(2)(I). In the event that NC DOT needs to replace or rebuild public infrastructure within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity.

Local Government:

Public infrastructure (roads, parking lots, & utilities) have a minimum setback factor of sixty feet (60) or thirty (30) times the shoreline erosion rate (whichever is greater) as defined by 07H.0306(a)(2)(I). In the event that local governments need to replace or rebuild public infrastructure within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity. While the amendment may have a positive impact on local government's tax base by preserving the tax value of a destroyed structure, any estimate of how many structures would be re-built under the exemption would be highly speculative as it would depend upon the occurrence of storms, normal deterioration and other events such as structure fires, as well as upon the individual willingness of landowners to rebuild in locations where their prior home had been destroyed.

Division of Coastal Management:

The Division of Coastal Management's permit review process will not be changed by these amendments and DCM does not anticipate changes in permitting receipts due to the proposed action.

Benefits

Private Citizens:

The amended setback rule would apply when oceanfront property owners are seeking a Coastal Area Management Act (CAMA) permit for the replacement of an existing structure requiring more than fifty percent (50%) repair or re-construction. Based on statistical survey results,

approximately 200 residential structures would quality for the exemption. The overwhelming majority of the 8,611 oceanfront structures will not be affected by this rule change.

The economic impacts of this proposed rule change are potential benefits to property owners with structures greater than 5,000 square feet that are damaged (by fire, flood or wind) beyond 50 percent (requiring a CAMA permit and thus compliance with current rules) in that they will not have to comply with the current oceanfront setback and will be able to re-build the structure to its original dimensions. The Division estimates that there are approximately two hundred lots on which homes are located that could potentially be affected by this rule change if they were destroyed by fire, flood or wind and if the owner then decided to rebuild. The Division's estimate of how many structures will be re-built under the exemption would be highly speculative as it would depend upon the occurrence of storms, normal deterioration and other events such as structure fires, as well as upon the individual willingness of landowners to rebuild in locations where their prior home had been destroyed. While it is challenging to provide an estimate of value, we are able to state that this is a positive net impact over the current situation.

Cost/Benefit Summary

The economic impacts of this proposed rule change are potential benefits to property owners with structures greater than 5,000 square feet that are damaged (by fire, flood, wind etc.) beyond 50 percent (requiring a CAMA permit and thus compliance with current rules) in that they will not have to comply with the current oceanfront setback and will be able to re-build the structure to its original dimensions. The Division's estimate of how many structures will be re-built under the exemption would be highly speculative as it would depend upon the occurrence of storms, normal deterioration and other events such as structure fires, as well as upon the individual willingness of landowners to rebuild in locations where their prior home had been destroyed. However, it is expected that this exemption would only be issued once or twice in a ten year period. As such, the rule does not have substantial economic impacts.

The legislation requires the Commission to adopt rules that are substantively identical to the provisions of SL2012-202 Section 3.a notwithstanding G.S. 150B-19(4) which prohibits agencies from repeating the content of a law, a rule, or federal regulations in its administrative rules. This rule amendment will not require anyone to rebuild, and will simply comply with the unambiguous mandatory directive of G.S. 150B-21.9(a)(3), being reasonably necessary to implement or implement an enactment of the General Assembly. Given the specificity of the legislation, there is no legal alternative to incorporating the language into the Administrative Code.

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 CRC'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; and

(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.

(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) the structure as replaced meets the minimum setback required under Subpart (a)(2)(A) of this rule; and

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

(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 exist 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 Subparagraph (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 to allow development of property that lies both within the jurisdictional boundary of the petitioner as well as 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 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, and any disturbance of any other dunes is allowed only to the extent allowed 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.

(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 DCM 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. In these cases, all other applicable local and state rules shall be met.

(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). The structure(s) 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 renourishment 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 condition shall not affect the permit holder's right to seek authorization of temporary protective measures allowed under 15A NCAC 07H .0308(a)(2).

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