NC COASTAL RESOURCES COMMISSION
February 9-10, 2016
Hilton Double Tree
Atlantic Beach, NC

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

Tuesday, February 9th

1:00 Commission Call to Order* (Atlantic/Cape Lookout/Cape Fear) — Frank Gorham, Chair
- Roll Call
- Chair's Comments

1:15 VARIANCES
- Gray - *(CRC-VR-15-10)*, North Topsail Beach, 25% ORW Impervious Limit — Jason Dail, Christine Goebel
- SCS Ventures, LLC - *(CRC-VR-15-12)*, Wilmington, ¼ width rule — Robb Mairs, Christine Goebel

2:30 2015 Coastal Habitat Protection Plan (CHPP) Update
- Public and Commissions Comments *(CRC-16-01)* — Jimmy Johnson, DEQ
- Commission Discussion & Adoption

3:00 Sea-Level Rise Final Report
- Science Panel Report on Public Comments *(CRC-16-02)* — Tancred Miller
- Commission Discussion and Acceptance of Report

4:00 RECESS

4:15 COASTAL RESOURCES ADVISORY COUNCIL MEETING (Hatteras/Pamlico) Debbie Smith, Chair

Wednesday, February 10th

9:00 Commission Call to Order* (Atlantic/Cape Lookout/Cape Fear) — Frank Gorham, Chair
- Roll Call
- Chair's Comments
- Approval of November 17-18 & December 8, 2015 Meeting Minutes — Frank Gorham, Chair
- Executive Secretary's Report — Braxton Davis
- CRAC Report — Debbie Smith

9:30 CRC Rule Development
- Update on Amendments to to15A NCAC 7H .0306 Grandfathering Provisions for Multi-Family Oceanfront Structures *(CRC-16-03)* — Tancred Miller
- Commission Discussion
- Sandbag Rules and CRAC Recommendations — Mike Lopazanski

10:30 Legislative Studies
- Cape Fear Estuarine Resource Restoration "The Rocks" Update — Rebecca Ellin
- Beach Erosion Study – Update *(CRC-16-05)* — Ken Richardson

11:00 BREAK

11:15 Beach Management
- Beneficial Use/Generic MOU Study Group Update — Rudi Rudolph, Justin McCorkle, USACE

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

12:00 LUNCH

1:30 PUBLIC HEARING — Frank Gorham, Chair

- 15A NCAC 7H .0304 Ocean Erodible AEC - OEA Calculation

1:45 Action Items

- Review of Public Comments & Adopt Development Line Rule; Amendments - 15A NCAC 7H .0305; 7H .0306 7J .1201; 7J .1301; 7J .1302; 7J .1303 *(CRC-16-06)* — Ken Richardson
- Approval of Fiscal Analysis for Amendments to 15A NCAC 7H .1800; 7H .1802; 7H .1804; 7H .1805 Beach Bulldozing GP and 15A NCAC 7H .2505; 7H .2704; 7H .2705 Emergency GP *(CRC-16-07)* — Ken Richardson
- Approval of Fiscal Analysis for Amendments to Marsh Sill GP - 15A NCAC 7H .2704; 7H .2705; 7H .2701; *(CRC-16-08)* — Daniel Govoni
- Approval of Fiscal Analysis for Amendments to 15A NCAC 7H .0205 Coastal Wetlands *(CRC-16-09)* — Daniel Govoni
- Town of Emerald Isle LUP Amendment Certification *(CRC-16-11)* — Rachel Love-Adrick
- Perquimans/Hertford/Winfall LUP Certification *(CRC-16-12)* — Charlan Owens
- Bertie County LUP Certification *(CRC-16-13)* — Charlan Owens
- Resolution Delegating LUP Certification to DCM *(CRC-16-14)* — Mike Lopazanski
- Adoption of 15A NCAC 7L Local Planning & Management Grant Program Amendments *(CRC-16-15)* — Mike Lopazanski
- Public Comment/Adopt Sandbag Temporary Rules - 15A NCAC 7H .0308 Specific Use Standards for Ocean Hazard Areas; 15A NCAC 7H .1704 GP for Emergency Work; 7H .1705 Specific Conditions *(CRC-16-16)* — Mike Lopazanski

2:45 Old/New Business — Frank Gorham, Chair

3:00 Adjourn

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

**** Times indicated are only for guidance and will change. The Commission will proceed through the agenda until completed.***

STATE OF NORTH CAROLINA
DEPARTMENT OF JUSTICE

ROY COOPER
ATTORNEY GENERAL

P.O. BOX 629
RALEIGH, NC 27602

REPLY TO: CHRISTINE A. GOEBEL
ENVIRONMENTAL DIVISION
TEL: (919) 716-6600
FAX: (919) 716-6767
cgoebel@ncdoj.gov

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, Assistant Attorney General CAG

DATE: January 27, 2016 (for the February 9-10, 2016 CRC Meeting)

RE: **Variance Request by Dowell T. Gray, Jr. (15-10)**

Petitioner owns property in North Topsail Beach in Onslow County, North Carolina. The property is near, but not adjacent to Stump Sound, part of the AIWW. At this location, Stump Sound is designated as an Outstanding Resource Water, and Petitioner is within the ORW Shorelines AEC as defined in 15A NCAC 7H .0209(f). In October 2015, Petitioner applied for a CAMA minor permit to construct a single family residence on this lot. On November 13, 2015, DCM denied Petitioner's CAMA permit application as the proposed development exceeded the 25% impervious surface limit in the Commission's rules at 7H .0209(f)(10). Petitioner now seeks a variance from the 25% impervious surface limit in order to develop his lot as proposed.

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): Dowell T. Gray, Jr., Petitioner, electronically
Mary L. Lucasse, CRC Counsel, 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:

***

(f) Specific Use Standards for Outstanding Resource Waters (ORW) Coastal Shorelines.
(1) Within the AEC for estuarine and public trust shorelines contiguous to waters classified as ORW by the EMC, all development projects, proposals, and designs shall limit the built upon area in the AEC to no more than 25 percent or any lower site specific percentage as adopted by the EMC as necessary to protect the exceptional water quality and outstanding resource values of the ORW, and shall:

(A) have no stormwater collection system;

(B) provide a buffer zone of at least 30 feet from the normal high water line or normal water line;

(C) otherwise be consistent with the use standards set out in Paragraph (d) of this Rule.

(2) Development (other than single-family residential lots) more than 75 feet from the normal high water line or normal water line but within the AEC as of June 1, 1989 shall be permitted in accordance with rules and standards in effect as of June 1, 1989 if:

(A) the development has a CAMA permit application in process, or

(B) the development has received preliminary subdivision plat approval or preliminary site plan approval under applicable local ordinances, and in which financial resources have been invested in design or improvement.

(3) Single-family residential lots that would not be buildable under the low-density standards defined in Paragraph (f)(1) of this Rule may be developed for single-family residential purposes so long as the development complies with those standards to the maximum extent possible.

(4) For an ORW nominated subsequent to June 1, 1989, the effective date in Paragraph (f)(2) of this Rule shall be the dates of nomination by the EMC.

STIPULATED FACTS **ATTACHMENT B**

1. Petitioner, Dowell T Gray Jr., owns property located at 8708 3rd Avenue in North Topsail Beach, Onslow County, North Carolina (the "Site"). Mr. Gray has owned this property since 1985 according to deeds recorded at Book 3586, Page 204 and Book 748, Page 374 of the Onslow County Registry, copies of which is attached.

2. The Site is located within 575' of Stump Sound which, at this location is classified as an Outstanding Resource Water ("ORW") by the Environmental Management Commission. These waters are also classified as SA waters, are open to the harvest of shellfish, and are designated as a primary nursery area ("PNA").

3. The Site is located within the ORW Shoreline sub-category of the Coastal Shorelines Area of Environmental Concern ("AEC") as it is located within 575' feet of an ORW-classified water body. Pursuant to N.C.G.S. § 113A-118, development of this site requires a CAMA permit.

4. The Site is approximately 5,004 square feet (or 0.11 acres) in area according to a Site survey by Gairy Canady, PLS included with the application materials and attached.

5. Though it relates to the Commission's 30' buffer rule and not the 25% ORW impervious limits, this lot does not meet the definition of a "small lot" as that term is defined by 15A NCAC 7H.0209(d)(10)(J) as a lot with sewer which is 5,000 square feet or less.

6. There are currently no structures or development on the Site. Petitioner asserts that he and his wife had a singlewide mobile home on the property until the home was destroyed by Hurricane Fran in 1995.

7. On or about October 26, 2015, Petitioner, through his authorized agent Tom Russell of Future Homes, applied for a CAMA Minor Permit with the Division of Coastal Management (The Town of North Topsail Beach does not have an LPO program at this time). A copy of the permit application materials is attached.

8. Later on October 26, 2015, Jason Dail, DCM Field Representative, notified Petitioner's agent by email that the application was incomplete as it did not include information regarding impervious surfaces of the driveway. Mr. Dail also informed Petitioner that this Site had a 25% impervious surface or "built upon area" limitation pursuant to 15A NCAC 7H .0209 (f)(1), and suggested redesigning the project to meet this rule. A copy of this email is attached. Petitioner's surveyor provided the missing information on November 11, 2015.

9. Petitioner's CAMA Minor permit application proposed the development of a 1,200 (25' x 48') square foot 3-bedroom home and a 6'x 25' (150 sq. ft.) covered front porch, a driveway made up of 2' x 34' gravel strips, and porch steps (considered pervious).

10. On October 14, 2015 Petitioner met with Mr. Russell in person to review the options and look at other home designs that would lower the built upon area. The Petitioner asserts that since this will be his residence, he needs 3 bedrooms and 1200 sq. ft. of living space.

11. During a phone call in early-November, Mr. Dail explained to Mr. Russell and his colleague Mr. Vollrath, the Petitioner could apply for the permit, and when it gets denied, the Petitioner could apply for a variance from the impervious surface limit rule.

12. Pursuant to the Commission's rules for minor permit applications, notice was posted on Site, and was send to the adjacent riparian owners. DCM received no comments or objections regarding this project.

13. On November 13, 2015, DCM denied Petitioner's CAMA Minor permit application due to its inconsistency with the Commission's rule limiting impervious surfaces within the ORW Coastal Shorelines AEC found at 15 NCAC 7H .0209(f)(1). A copy of this denial letter is attached.

14. On December 11, 2015, Petitioner submitted this variance petition seeking to construct the development as proposed in the application. At this time, Petitioner is willing to cut the driveway strips from 2' to 1' in width, and asserts this would result in impervious surfaces of 28.34%.

15. Without a variance, Petitioner could have Future Homes engineer him a 1000 square foot home in order to meet the AEC's impervious surface limits. Petitioner asserts that constructing a 2-story home is not affordable for him. Petitioner intends for this to be his home once he retires and moves here permanently.

16. Petitioner did not propose a stormwater system in connection with his proposed development, though the Commission's rules at 15A NCAC 7H .0209(f) prohibit stormwater systems in this ORW Shoreline AEC in order to accommodate development.

Petitioner and Staff Positions **ATTACHMENT C**

I. 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.

The property has been reduced in impervious coverage percentage by the proximity of the ORW line. When we picked out our design in August of 2014, we had checked with the Town of North Topsail Beach and determined we had a 30% maximum impervious coverage. We couldn't build it then, but this small 1200 sq ft home is perfect for us to retire in and we were so happy. Now that we are ready to move, the mpc is now at 15% putting our home and little 6' x 25' porch over by 4.7%. The property has been owned by me, Dowell Gray Jr since 1985 when I worked for the Onslow County Environmental Health Dept. Hurricane Fran took the singlewide home that was there and I've always dreamed of coming back.

Staff's Position: Yes.

Staff agrees that Petitioners will suffer an unnecessary hardship from strict application of the Commission's ORW Shoreline's 25% impervious surface limitation to Petitioners' property. Staff agrees that Petitioner has unnecessary hardships due to the strict application of the rules limiting built upon area within the ORW Shoreline AEC where the development proposed for this modest lot results in a relatively de minimis impact over the 25% limitation imposed by the rule. If the Commission accepts Petitioner's proposal to narrow the driveway strips from a 2' width to a 1' width, the built upon area will cover 28.34% of the lot, or 167 square feet over the limit for this lot. Further, Staff notes that Petitioner could agree to uncover the proposed 150 square foot deck, or use a pervious shade cover (for example a slatted, open roof), and get very close to meeting the standard without having to reduce the size of the house or deck.

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.

The proximity of the property to the ORW line, and the fact that the property is only 5004 square feet, are causing us to ask for this variance.

Staff's Position: No.

Staff disagree that Petitioner's hardships are caused by conditions peculiar to the property such as location, size or topography. In the ORW Shoreline AEC which extends 575' landward of the water line, often lots which are not adjacent to the water are included. Also, while this is a smaller lot, it does not meet the Commission's definition of a "small lot" as defined in the 30-foot buffer rules as 5000 square feet. Finally, Staff contends there is nothing unusual about this flat, regularly shaped lot and that any hardships are not caused by physical characteristics of the lot.

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

Petitioner's Position: No.

There are no actions we have taken to cause this issue. It is simply a matter of the size of the lot, and not being able to move sooner due to finances.

Staff's Position: Yes.

While Staff acknowledges that Petitioner has proposed a modest structure for this lot and has agreed to reduce built upon area by narrowing the driveway strips, Staff also notes that Petitioner could further reduce built upon area by removing the roof from the proposed 150 square foot covered porch to reduce the size of the variance requested. The 167 square feet of built upon area could be reduced to just 17 square feet with the design change to the porch.

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.

The style, design and quality is in keeping with other homes on the street and on North Topsail Island. We are building an attractive, energy efficient home. We do not see that we are going against the spirit, purpose or intent of the rules. We love the environment at North Topsail Beach and are looking forward to contributing to the community.

Staff's Position: Yes.

As noted by the Commission in its rule, the ORW designated waters have exceptional water quality. The Commission's rule has incorporated the EMC's designation of such waters within the state in order to define the limits of the ORW Shoreline AEC. The EMC has defined ORWs in 15A NCAC 2B .0101(e)(4) as "unique and special waters of exceptional state or national recreational or ecological significance which require special protection to maintain existing uses." Due to the importance of continued protection of such waters, the Commission's rule limits the built upon area to 25% of a lot located within the larger AEC area measured landward from those waters.

If the Commission accepts Petitioner's proposal to reduce the width of the two driveway strips to 1' in width, and if Petitioner agrees to uncover the proposed deck, Staff agrees that this proposed development meets the spirit, purpose, and intent of the Commission's ORW Shoreline rules limiting the built upon area of such lots, where there is a truly de minimis overage, while still allowing the development of the house and deck as proposed. Such a de minimis overage will not harm public safety, and substantial justice will be preserved.

ATTACHMENT D

Petitioner's Petition
(without proposed attachments which are also included in the stipulated exhibits or draft facts)

#15-10

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.: NTB 15-26

PETITIONER'S NAME Dowell T Gray Jr.

COUNTY WHERE THE DEVELOPMENT IS PROPOSED Onslow

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);

___ 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.

Dowell T. Gray Jr.	DEC 10. 2015
Signature of Petitioner or Attorney	Date
DOWELL T GRAM JR	Dambootat@yahoo.com
Printed Name of Petitioner or Attorney	Email address of Petitioner or Attorney
313 NORTH CEDAR ST	(304) 697 5331
Mailing Address	Telephone Number of Petitioner or Attorney
HUNTINGTON WV 25705	(910) 270 9593
City State Zip	Fax Number of Petitioner or Attorney

PROJECT ADDRESS 8708 3RD AVE NORTH TOPSAIL BEACH NC 28460

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

RECEIVED
DEC 11 2015
DCM- MHD CITY

Revised: February 2011

DOGWOOD STATION
WILMINGTON, North Carolina
284052383
3613950400-0096
10/26/2015 (910)313-3273 09:31:12 AM

Sales Receipt

Product Description	Sale Unit Qty	Price	Final Price
DUDLEY NC 28333-5165 Zone-1 First-Class Mail Large Env 1.50 oz. Expected Delivery: Wed 10/28/15			$1.20
@@ Certified Mail USPS Certified Mail #: 70150640000050423005			$3.45
Issue Postage:			$4.65
MOUNT OLIVE NC 28365-7058 Zone-1 First-Class Mail Large Env 1.50 oz. Expected Delivery: Wed 10/28/15			$1.20
@@ Certified Mail USPS Certified Mail #: 70150640000050429960			$3.45
Issue Postage:			$4.65
Total:			$9.30

Paid by:
Debit Card $9.30
Account #: XXXXXXXXXXXX7209
Approval #: 984441
Transaction #: 758
23903234284
Receipt#: 004008

@@ For tracking or inquiries go to USPS.com or call 1-800-222-1811.

In a hurry? Self-service kiosks offer quick and easy check-out. Any Retail Associate can show you how

CASE # NTB 15-26

Variance criteria for 8078 3rd Ave North Topsail Beach NC 28460 **December 1st 2015**

A.) The property has been reduced in impervious coverage percentage by the proximity of the ORW line. When we picked out our design in August of 2014, we had checked with the Town of North Topsail Beach and determined we had a 30% maximum impervious coverage. We couldn't build it then, but this small 1200 sq ft home is perfect for us to retire in and we were so happy. Now that we are ready to move, the mpc is now at 25% putting our home and little 6' x 25' porch over by 4.7%. The property has been owned by me, Dowell Gray Jr since 1985 when I worked for the Onslow County Environmental Health Dept. Hurricane Fran took the singlewide home that was there and I've always dreamed of coming back.

B.) The proximity of the property to the ORW line, and the fact that the property is only 5004 square feet, are causing us to ask for this variance.

C.) There are no actions we have taken to cause this issue. It is simply a matter of the size of the lot, and not being able to move sooner due to finances.

D.) The style, design and quality is in keeping with other homes on the street and on North Topsail Island. We are building an attractive, energy efficient home. We do not see that we are going against the spirit, purpose or intent of the rules. We love the environment at North Topsail Beach and are looking forward to contributing to the community.

ATTACHMENT E

STIPULATED EXHIBITS:

a. Deeds 3586/204 and 748/374
b. Site survey by Gairy Canady
c. CAMA minor permit application
d. October 26, 2015 email from DCM to Petitioner's agent
e. November 13, 2105 denial letter
f. powerpoint of site photographs

ONSLOW COUNTY, NORTH CAROLINA

Recording requested by:

And when recorded, mail this deed and tax statements to:

This deed presented to
The Onslow Co Tax Office
Date 4/28/2011 Clerk

Doc ID: 008885490003 Type: CRP
Recorded: 04/28/2011 at 11:50:05 AM
Fee Amt: $50.00 Page 1 of 3
Revenue Tax: $0.00
Onslow County, NC
Rebecca L. Pollard Reg. of Deeds
BK 3586 PG 204-206

For Recorder's Use

QUIT CLAIM DEED

TRA:_____

APN:_____

For a valuable consideration, as described in the PROPERTY SETTLEMENT AGREEMENT attached to the divorce proceedings of CIVIL ACTION NO. 98-D-322 filed in Circuit Court of Kanawha County, West Virginia on August 19, 1998, of payment by Grantee of $10,250.00 to Grantor in irregular installments during the years 2007 through 2010 , receipt of which is hereby acknowledged,

MARJORY SCHAFER GRAY (Grantor)

hereby quitclaims to DOWELL TRABUE GRAY, JR (Grantee)

the following real property in the town of North Topsail Beach, County of Onslow, North Carolina:

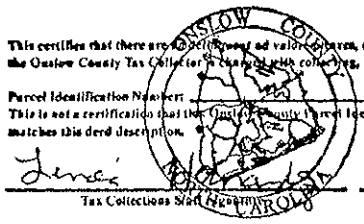
All of that vacant lot at 8708 Third Avenue, North Topsail Beach, Onslow County, North Carolina, 0.11 acres, being more particularly described as follows:

Being all of Lot No. 225 of Seahaven Beach Development of American Properties corporation, Map Book 3, said map being recorded in Map Book 3, Page 46 in the Office of the Register of Deeds of Onslow County, reference to said map being hereby made for a more perfect description of said Lot No. 225.

Grantor does hereby remise, release, and quitclaim unto said Grantee forever all the rights, title, interest and claim which the Grantor has in and to the above-described parcel of land, and any improvements and appurtenances thereto.

3/7/2011
Date

Marjory Schafer Gray
Marjory Schafer Gray



This certifies that there are no delinquent ad valorem taxes, or other taxes which the Onslow County Tax Collector is charged with collecting, that are a lien on

Parcel Identification Number: 811-71

This is not a certification that the Onslow County Parcel Identification Number matches this deed description.

Tax Collections Staff Representative — Date: 4-28-11

RECEIVED

DEC 11 2015

DCM- MHD CITY

Book: 3586 Page, 1977-Current: 204 Seq: 2

STATE OF IOWA
POLK COUNTY

Notary's Statement:

On March 7th, 2011, before me AP/ A Sahara Pollard a Notary Public, personally appeared MARJORY SCHAFER GRAY, whose name is subscribed to the above instrument, and executed the same in their authorized capacity, and whose signature I verify under Penalty of Perjury.

Witness my Hand and Official Seal:

Saharapollard
Notary

03/07/2011
Date

SEAL:

SAHARA POLLARD
Commission No. 762061
My Comm. Expires 03/05/2013

My commission expires: 03/05/2013.

RECEIVED

DEC 11 2015

DCM- MHD CITY

BOOK 748 PAGE 374

TO TAX OFFICE
DATE 9.13.85
CRAWFORD COLLINS pd

STATE OF NORTH CAROLINA
COUNTY OF ONSLOW

THIS DEED, made and entered into this the 12th day of SEPTEMBER, 1985, by and between JAMES VANN MAY and wife, HATTIE SUTTON MAY, parties of the first part; and DOWELL GRAY, JR. and wife, MARJORY GRAY, whose address is Route 1, Box 376A Holly Ridge, N.C., party of the second part;

W I T N E S S E T H :

That the parties of the first part in consideration of the sum of Ten Dollars ($10.00) and other good and valuable considerations to said parties paid by the parties of the second part, the receipt of which hereby is acknowledged, have bargained and sold and by these presents do bargain, sell, and convey unto the parties of the second part, said parties' heirs and assigns, the following described property, to wit:

All that certain tract or parcel of land lying and being situate in Onslow County, North Carolina and being more particularly described as follows:

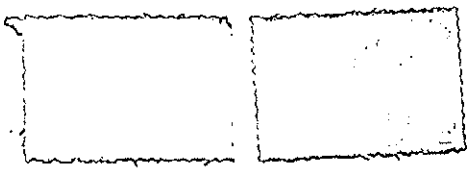
Being all of Lot No. 225 of Seahaven Beach Development of American Properties Corporation, Map No. 3, said map being recorded in Map Book 3, Page 46 in the office of the Register of Deeds of Onslow County, reference to said map being hereby made for a more perfect description of said Lot No. 225.

This conveyance is made subject to restrictive covenants of record.

TO HAVE AND TO HOLD said property and all privileges and appurtenances thereunto belonging to the parties of the second part, said parties' heirs and assigns forever.

And the parties of the first part do covenant that said parties are seized of said premises in fee and have the right to convey the same in fee simple; that the same is free from encumbrances except any encumbrances or restrictions

STAMPS: $6.00



mentioned above and that said parties will warrant and defend the title to the same against the lawful claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the parties of the first part have hereunto set said parties' hands and adopted as said parties' seals the typewritten word "SEAL" appearing beside said parties' names, this the day and year first above written.

James Vann May (SEAL)
James Vann May

By: N. Dallas Sutton (SEAL)
N. Dallas Sutton, Attorney-in-Fact for James Vann May

Hattie Sutton May (SEAL)
Hattie Sutton May

By: N. Dallas Sutton (SEAL)
N. Dallas Sutton, Attorney-in-Fact for Hattie Sutton May

STATE OF NORTH CAROLINA
COUNTY OF Onslow

I, Janet M. Miller (Williams), a Notary Public in and for said County and State, do hereby certify that N. DALLAS SUTTON, Attorney-in-Fact for JAMES VANN MAY, personally appeared before me this day, and being by me duly sworn, says that he executed the foregoing and annexed instrument for and in behalf of JAMES VANN MAY, and that his authority to execute and acknowledge said instrument is contained in an instrument duly executed, acknowledged, and recorded in the office of the Register of Deeds of Onslow County, State of North Carolina, on the 13 day of September 1985 in Book 748, at Page 364, and that this instrument was executed under and by virtue of the authority given by said instrument granting him Power of Attorney; that the said N. DALLAS SUTTON acknowledged the due execution of the foregoing and annexed instrument for purposes therein expressed for and in behalf of the said JAMES VANN MAY.

BOOK 748 PAGE 376

WITNESS my hand and official seal, this the 12th day of September, 1985.

Notary Public

My Commission expires:

MY COMMISSION EXPIRES SEPT. 30, 1985

STATE OF NORTH CAROLINA
COUNTY OF Onslow

I, [illegible], a Notary Public in and for said County and State, do hereby certify that N. DALLAS SUTTON, Attorney-in-Fact for HATTIE SUTTON MAY, personally appeared before me this day, and being by me duly sworn, says that he executed the foregoing and annexed instrument for and in behalf of HATTIE SUTTON MAY, and that his authority to execute and acknowledge said instrument is contained in an instrument duly executed, acknowledged, and recorded in the office of the Register of Deeds of Onslow County, State of North Carolina, on the 12 day of September 1985, in Book 748, at Page 369, and that this instrument was executed under and by virtue of the authority given by said instrument granting him Power of Attorney; that the said N. DALLAS SUTTON acknowledged the due execution of the foregoing and annexed instrument for purposes therein expressed for and in behalf of the said HATTIE SUTTON MAY.

WITNESS my hand and official seal, this the 12 day of September, 1985.

Notary Public

My Commission expires:

MY COMMISSION EXPIRES SEPT. 30, 1985

BOOK 748 PAGE 377

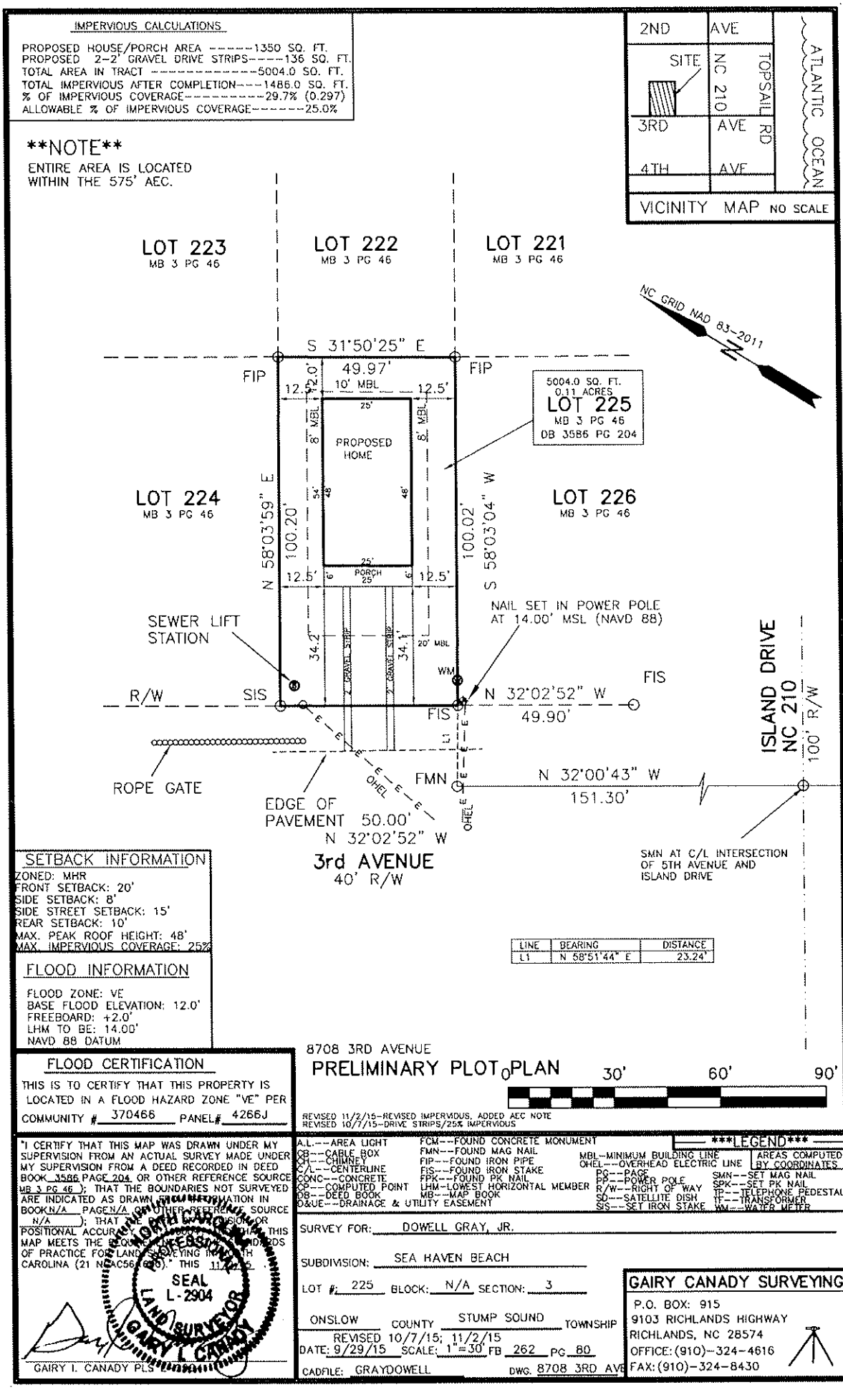
STATE OF NORTH CAROLINA
COUNTY OF ONSLOW

/Janet M. Miller(Williams)
The foregoing certificates of Notaries Public are certified to be correct. This instrument was presented for registration this day and hour and duly recorded in the office of the Register of Deeds of Onslow County, North Carolina, in Book 748, Page 374.

This 13th day of September, 1985, at 1:55 o'clock P.M.

Michael M. Thomas
Register of Deeds

80-127
6BSLL


IMPERVIOUS CALCULATIONS
PROPOSED HOUSE/PORCH AREA ------1350 SQ. FT.
PROPOSED 2-2' GRAVEL DRIVE STRIPS-----136 SQ. FT.
TOTAL AREA IN TRACT ----------5004.0 SQ. FT.
TOTAL IMPERVIOUS AFTER COMPLETION---1486.0 SQ. FT.
% OF IMPERVIOUS COVERAGE----------29.7% (0.297)
ALLOWABLE % OF IMPERVIOUS COVERAGE-------25.0%
NOTE
ENTIRE AREA IS LOCATED WITHIN THE 575' AEC.
2ND AVE
SITE
NC 210
TOPSAIL RD
3RD AVE
4TH AVE
ATLANTIC OCEAN
VICINITY MAP NO SCALE
LOT 223
MB 3 PG 46
LOT 222
MB 3 PG 46
LOT 221
MB 3 PG 46
NC GRID NAD 83-2011
S 31°50'25" E
FIP
49.97'
10' MBL
12.5'
12.5'
FIP
5004.0 SQ. FT.
0.11 ACRES
LOT 225
MB 3 PG 46
DB 3586 PG 204
8' MBL
8' MBL
PROPOSED HOME
25'
48'
54'
LOT 224
MB 3 PG 46
LOT 226
MB 3 PG 46
N 58°03'59" E
100.20'
S 58°03'04" W
100.02'
12.5'
6'
PORCH
25'
6'
12.5'
NAIL SET IN POWER POLE AT 14.00' MSL (NAVD 88)
SEWER LIFT STATION
34.2'
2' GRAVEL STRIP
2' GRAVEL STRIP
34.1'
20' MBL
WM
R/W
SIS
FIS
N 32°02'52" W
49.90'
FIS
L1
ISLAND DRIVE
NC 210
100' R/W
ROPE GATE
EDGE OF PAVEMENT
OHEL
FMN
N 32°00'43" W
151.30'
N 32°02'52" W
3rd AVENUE
40' R/W
SMN AT C/L INTERSECTION OF 5TH AVENUE AND ISLAND DRIVE
SETBACK INFORMATION
ZONED: MHR
FRONT SETBACK: 20'
SIDE SETBACK: 8'
SIDE STREET SETBACK: 15'
REAR SETBACK: 10'
MAX. PEAK ROOF HEIGHT: 48'
MAX. IMPERVIOUS COVERAGE: 25%
FLOOD INFORMATION
FLOOD ZONE: VE
BASE FLOOD ELEVATION: 12.0'
FREEBOARD: +2.0'
LHM TO BE: 14.00'
NAVD 88 DATUM
LINE | BEARING | DISTANCE
L1 | N 58°51'44" E | 23.24'
8708 3RD AVENUE
PRELIMINARY PLOT PLAN
30' 60' 90'
FLOOD CERTIFICATION
THIS IS TO CERTIFY THAT THIS PROPERTY IS LOCATED IN A FLOOD HAZARD ZONE "VE" PER
COMMUNITY # 370466 PANEL# 4266J
REVISED 11/2/15--REVISED IMPERVIOUS, ADDED AEC NOTE
REVISED 10/7/15--DRIVE STRIPS/25% IMPERVIOUS
"I CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM A DEED RECORDED IN DEED BOOK 3586 PAGE 204 OR OTHER REFERENCE SOURCE MB 3 PG 46); THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION IN BOOK N/A PAGE N/A OR OTHER REFERENCE SOURCE N/A); THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY ACHIEVED IS 1:10,000+; THAT THIS MAP MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 56 .1600)." THIS 11/2/15
NORTH CAROLINA REGISTERED SEAL L-2904 LAND SURVEYOR GARY I. CANADY
GAIRY I. CANADY PLS
A.L.--AREA LIGHT
CB--CABLE BOX
CH--CHIMNEY
C/L--CENTERLINE
CONC--CONCRETE
CP--COMPUTED POINT
DB--DEED BOOK
D&UE--DRAINAGE & UTILITY EASEMENT
FCM--FOUND CONCRETE MONUMENT
FMN--FOUND MAG NAIL
FIP--FOUND IRON PIPE
FIS--FOUND IRON STAKE
FPK--FOUND PK NAIL
LHM-LOWEST HORIZONTAL MEMBER
MB--MAP BOOK
MBL--MINIMUM BUILDING LINE
OHEL--OVERHEAD ELECTRIC LINE
PG--PAGE
PP--POWER POLE
R/W--RIGHT OF WAY
SD--SATELLITE DISH
SIS--SET IRON STAKE
LEGEND
AREAS COMPUTED BY COORDINATES
SMN--SET MAG NAIL
SPK--SET PK NAIL
TP--TELEPHONE PEDESTAL
TF--TRANSFORMER
WM--WATER METER
SURVEY FOR: DOWELL GRAY, JR.
SUBDIVISION: SEA HAVEN BEACH
LOT #: 225 BLOCK: N/A SECTION: 3
ONSLOW COUNTY STUMP SOUND TOWNSHIP
REVISED 10/7/15; 11/2/15
DATE: 9/29/15 SCALE: 1"=30' FB 262 PG 80
CADFILE: GRAYDOWELL DWG. 8708 3RD AVE
GAIRY CANADY SURVEYING
P.O. BOX: 915
9103 RICHLANDS HIGHWAY
RICHLANDS, NC 28574
OFFICE: (910)-324-4616
FAX: (910)-324-8430

VTB 15-26

Locality _____ Permit Number _____

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

(For official use only)

GENERAL INFORMATION

LAND OWNER

Name DOWELL T GRAY JR

Address 313 NORTH CEDAR ST

City HUNTINGTON State WV Zip 25705 Phone 304-697-5331

Email bambootat@yahoo.com

AUTHORIZED AGENT

Name TOM RUSSELL/FUTURE HOMES

Address 16663 US HWY 17

City HAMPSTEAD State NC Zip 28443 Phone 910-270-3313

Email tom@futurehomesnc.com

LOCATION OF PROJECT: (Address, street name and/or directions to site. If not oceanfront, what is the name of the adjacent waterbody.) 8708 3RD AVE NORTH TOPSAIL BEACH NC 28460 Stump Sound

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) MODULAR HOME ON PILINGS

SIZE OF LOT/PARCEL: 5004 square feet 0.11 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: 1356 square feet (includes the area of the roofdrip 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.)

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 ☑

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

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OCT 26 2015
WILMINGTON, NC

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.

STATEMENT OF OWNERSHIP:

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 of record title. Title is vested in DOWELL T. GRAY JR, see Deed Book 3586 page 204 in the ONSLOW County Registry of Deeds.

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

☐ 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)	WOODARD BURCH	2402 OBERRY RD MOUNT OLIVE NC 28365
(2)	JAMES BRANNON	549 OBERRY RD DUDLEY NC 28333
(3)		
(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 13th day of Oct, 2015

x Dowell T. Gray, Jr.

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

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.

RECEIVED
OCT 26 2015

N.C. DIVISION OF COASTAL MANAGEMENT

AGENT AUTHORIZATION FORM

Date 10/14/15

Name of Property Owner Applying for Permit:

DOWELL T GRAY JR.

Mailing Address:

313 NORTH CEDAR ST

HUNTINGTON WV 25705

I certify that I have authorized (agent) TOM RUSSELL / FUTURE HOMES **to act on my behalf, for the purpose of applying for and obtaining all CAMA Permits necessary to install or construct (activity)** SINGLE FAMILY RESIDENCE, **at (my property located at)** 8708 3RD AVE NORTH TOPSAIL BEACH NC 28460.

This certification is valid thru (date) 10-13-16.

Donald T. Gray, Jr. 10-13-15

Property Owner Signature **Date**

RECEIVED

DEC 11 2015

DCM- MHD CITY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DIVISION OF COASTAL MANAGEMENT
ADJACENT RIPARIAN PROPERTY OWNER NOTIFICATION/WAIVER FORM

Name of Property Owner: Dewey T Gray Jr.

Address of Property: 8708 3rd Ave North Topsail Beach NC 28460
(Lot or Street #, Street or Road, City & County)

Agent's Name #: Tom Ruster — Mailing Address: 16663 US Hwy 17

Agent's phone #: 910 231 2650 — Hampstead NC 28443

I hereby certify that I own property adjacent to the above referenced property. The individual applying for this permit has described to me as shown on the attached drawing the development they are proposing. A description or drawing, with dimensions, must be provided with this letter.

✓ I have no objections to this proposal. _______ I have objections to this proposal.

If you have objections to what is being proposed, you must notify the Division of Coastal Management (DCM) in writing within 10 days of receipt of this notice. Contact information for DCM offices is available at http://www.nccoastalmanagement.net/web/cm/staff-listing or by calling 1-888-4RCOAST. No response is considered the same as no objection if you have been notified by Certified Mail.

WAIVER SECTION

I understand that a pier, dock, mooring pilings, boat ramp, breakwater, boathouse, or lift must be set back a minimum distance of 15' from my area of riparian access unless waived by me. (If you wish to waive the setback, you must initial the appropriate blank below.)

_______ I do wish to waive the 15' setback requirement.

✓ I do not wish to waive the 15' setback requirement.

(Property Owner Information)	(Riparian Property Owner Information)
[signature]	[signature]
Signature	*Signature*
Dewey T Gray Jr.	Woodard Burch
Print or Type Name	*Print or Type Name*
313 N. George St	2402 Oberry Rd
Mailing Address	*Mailing Address*
Huntington WV 25705	Mount Olive NC 28365
City/State/Zip	*City/State/Zip*
1-304-617-4656 [illegible email]	919-689-2582
Telephone Number / Email Address	*Telephone Number / Email Address*
[illegible]	10-31-15
Date	*Date*

RECEIVED
DEC 11 2015
DCM- MHD CITY

(Revised Aug. 2014)

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DIVISION OF COASTAL MANAGEMENT
ADJACENT RIPARIAN PROPERTY OWNER NOTIFICATION/WAIVER FORM

Name of Property Owner: Dewey T Gray Jr.

Address of Property: 8708 3rd Ave North Topsail Beach NC 28460
(Lot or Street #, Street or Road, City & County)

Agent's Name #: Tom Russell   Mailing Address: 16663 US Hwy 17

Agent's phone #: 910 231 2658   Hampstead NC 28443

I hereby certify that I own property adjacent to the above referenced property. The individual applying for this permit has described to me as shown on the attached drawing the development they are proposing. A description or drawing, with dimensions, must be provided with this letter.

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If you have objections to what is being proposed, you must notify the Division of Coastal Management (DCM) in writing within 10 days of receipt of this notice. Contact information for DCM offices is available at http://www.nccoastalmanagement.net/web/cm/staff-listing or by calling 1-888-4RCOAST. No response is considered the same as no objection if you have been notified by Certified Mail.

WAIVER SECTION

I understand that a pier, dock, mooring pilings, boat ramp, breakwater, boathouse, or lift must be set back a minimum distance of 15' from my area of riparian access unless waived by me. (If you wish to waive the setback, you must initial the appropriate blank below.)

__________ I do wish to waive the 15' setback requirement.

__________ I do not wish to waive the 15' setback requirement.

(Property Owner Information)	(Riparian Property Owner Information)
[signature] Signature	[signature] Signature
Dewey T Gray Jr. Print or Type Name	James Brannon Print or Type Name
313 N. Cedar St Mailing Address	549 Oberry Rd Mailing Address
Huntington WV 25705 City/State/Zip	Dudley NC 28333 City/State/Zip
1-304-617-4656 [illegible] Telephone Number / Email Address	1-919-735-4480 Telephone Number / Email Address
10/13/15 Date	11-4-15 Date

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DCM- MHD CITY

(Revised Aug. 2014)

7015 0640 0000 5042 9960

U.S. Postal Service
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at www.usps.com®

MOUNT OLIVE NC 28365 OFFICIAL USE

Certified Mail Fee	$3.45
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$ N/A
☐ Adult Signature Restricted Delivery	$ N/A
Postage	$1.20
Total Postage and Fees	$4.65

0400
07 Postmark Here
10/26/2015

Sent To: WOODARD BURCH
Street and Apt. No., or PO Box No.: 2402 OBERRY RD
City, State, ZIP+4®: MOUNT OLIVE NC 28365

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

RETURN RECEIPT REQUESTED

COASTAL MANAGEMENT
ITY OWNER NOTIFICATION/WAIVER FORM

. T GRAY JR.

E NORTH TOPSAIL BEACH NC 28460

#, Street or Road, City & County)

Mailing Address: 16663 US HWY 17

HAMPSTEAD NC 28443

I hereby certify that I own property adjacent to the above referenced property. The individual applying for this permit has described to me as shown on the attached drawing the development they are proposing. A description or drawing, with dimensions, must be provided with this letter.

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If you have objections to what is being proposed, you must notify the Division of Coastal Management (DCM) in writing within 10 days of receipt of this notice. Contact information for DCM offices is available at http://www.nccoastalmanagement.net/web/cm/staff-listing or by calling 1-888-4RCOAST. No response is considered the same as no objection if you have been notified by Certified Mail.

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_____ I do wish to waive the 15' setback requirement.

_____ I do not wish to waive the 15' setback requirement.

(Property Owner Information)

Donald J. Gray, Jr.
Signature

DONALD T GRAY JR
Print or Type Name

713 N. CEDAR ST
Mailing Address

HUNTINGTON WV 25705
City/State/Zip

1-304-617 4656 bmmastergalus.com
Telephone Number / Email Address

10/13/15
Date

(Riparian Property Owner Information)

_____
Signature

WOODARD BURCH
Print or Type Name

2402 OBERRY RD
Mailing Address

MOUNT OLIVE NC 28365
City/State/Zip

RECEIVED
DCM WILMINGTON, NC
OCT 26 2015

_____
Telephone Number / Email Address

_____
Date

(Revised Aug. 2014)

7015 0640 0000 5042 3005

U.S. Postal Service
CERTIFIED MAIL RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com

DUDLEY NC 28333

OFFICIAL USE

Certified Mail Fee	$3.45
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$ N/A
☐ Adult Signature Restricted Delivery	$ N/A
Postage	$1.20
Total Postage and Fees	$4.65

0400

OCT 26 2015 Postmark Here

RECEIVED DCM WILMINGTON, NC

OCT 26 2015

Sent To: JAMES BRANNEN
Street and Apt. No., or PO Box No.: 549 OBERRY RD
City, State, ZIP+4®: DUDLEY NC 28333

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

ETURN RECEIPT REQUESTED

:OASTAL MANAGEMENT
TY OWNER NOTIFICATION/WAIVER FORM

T GRAY JR.

E NORTH TOPSAIL BEACH NC 28460

#, Street or Road, City & County)

Mailing Address: 16663 US HWY 17

HAMPSTEAD NC 28443

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WAIVER SECTION

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_____ I do wish to waive the 15' setback requirement.

_____ I do not wish to waive the 15' setback requirement.

(Property Owner Information)

Donald J. Gray, Sr.
Signature

DONALD T GRAY JR
Print or Type Name

313 N. CEDAR ST
Mailing Address

HUNTINGTON WV 25705
City/State/Zip

1-304-617 4656 bmbatatogabe com
Telephone Number / Email Address

10/13/15
Date

(Riparian Property Owner Information)

_____
Signature

JAMES BRANNEN
Print or Type Name

549 OBERRY RD
Mailing Address

DUDLEY NC 28333
City/State/Zip

_____
Telephone Number / Email Address

RECEIVED
DCM WILMINGTON, NC
OCT 26 2015
Date

(Revised Aug. 2014)

DOGWOOD STATION
WILMINGTON, North Carolina
28405 2383
3613950400-0096
10/26/2015 (910)313-3273 09:31:12 AM

Sales Receipt

Product Description	Sale Unit Qty	Price	Final Price
DUDLEY NC 28333-5165 Zone-1 First-Class Mail Large Env 1.50 oz. Expected Delivery: Wed 10/28/15			$1.20
@@ Certified Mail USPS Certified Mail #: 70150640000050423005			$3.45
Issue Postage:			$4.65
MOUNT OLIVE NC 28365-7058 Zone-1 First-Class Mail Large Env 1.50 oz. Expected Delivery: Wed 10/28/15			$1.20
@@ Certified Mail USPS Certified Mail #: 70150640000050429960			$3.45
Issue Postage:			$4.65
Total:			$9.30

Paid by:
Debit Card $9.30
Account #: XXXXXXXXXXXX7209
Approval #: 984441
Transaction #: 758
23903234284
Receipt#: 004008

@@ For tracking or inquiries go to USPS.com or call 1-800-222-1811.

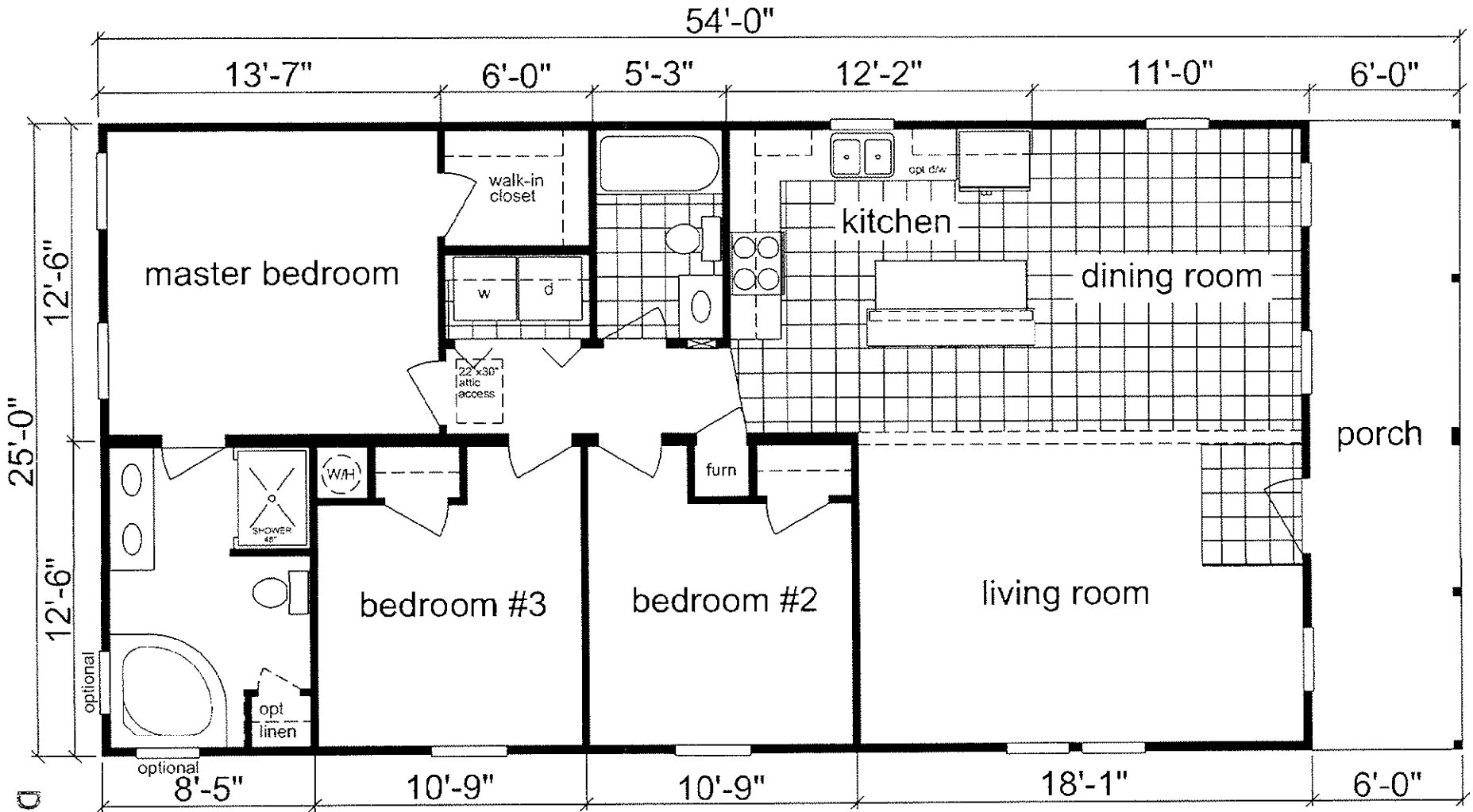
In a hurry? Self-service kiosks offer quick and easy check-out. Any Retail Associate can show you how

Description of proposed project at 8708 3rd Ave North Topsail Beach NC 28460

We propose to build a 1200 square foot off frame modular home, with a 150 square foot front porch, on a piling foundation. Water and sewer are existing on the property. Gravel runners will serve as a driveway to park under the home. This will be a single family residence. No other disturbance of the property will be required.

Attached is a picture of a home that is consistent with our proposal. Site plan also attached.

Please note the site plan notes the stipulation that the proposed development is inconsistent with the rule at issue.



NOTICE

CAMA PERMIT APPLIED FOR

PROJECT: ***Applicant proposes construct a single-family modular dwelling at 8708 3rd Ave., adjacent to Stump Sound, in North Topsail Beach, Onslow County.***

COMMENTS ACCEPTED THROUGH ***November 10, 2015***

APPLICANT:

Dowell T. Gray Jr.
313 N Cedar Street
Huntington, WV 25705

FOR MORE DETAILS CONTACT
THE LOCAL PERMIT OFFICER BELOW:

NC Div. of Coastal Management
127 Cardinal Dr. Ext.
Wilmington, NC 28405
Jason Dail, Field Representative
910-796-7221

Agent: Tom Russell (910) 270-3313

NTB 15-26

Dail, Jason

From: Dail, Jason
Sent: Monday, October 26, 2015 10:52 AM
To: 'tom@futurehomesnc.com'
Subject: CAMA Minor Development Permit application - Gray, 8708 3rd Ave, North Topsail Beach - Additional Information Required

RE: INCOMPLETE APPLICATION – Dowell T. Gray, Jr - ADDITIONAL INFORMATION REQUIRED
APPLICATION NUMBER – N/A
PROJECT ADDRESS – 8708 3rd AvenueNorth Topsail Beach, NC 28460

Dear Mr. Russell:

The Division of Coastal Management's Wilmington Regional office received a CAMA Minor Permit application from you on October 26, 2015 requesting approval for development activities at 8708 3rd Avenue, North Topsail Beach, NC. In reviewing your application, we have discovered that additional information is needed to complete the review process. Accordingly, I am requesting that you submit the following additional information to this office:

1) On the preliminary site plan, prepared by Gairy Canady and dated 9/29/15, the "impervious calculations" for the proposed driveway are shown at "0%"; however, by Rule this area will be considered built upon area (bua) and should be accounted for as impervious coverage. Also, please note that as proposed, the development exceeds the 25% maximum built upon limitation for development located within 575' of waters classified by the State of North Carolina as Outstanding Resource Waters (ORW). As a result, any proposed development exceeding 25% bua within the 575' AEC is inconsistent with the Rules of the Coastal Resources Commission and therefore a permit request will likely be denied. You may wish to reduce the amount of bua on this property in order to bring the plan of development into compliance with the current Rules. Please revise the preliminary site plan to account for the additional bua associated with the driveway/parking area and include a note on the plan that reads "entire property is location with 575' AEC", and return it to our office. Once the revised plan has been received, processing of your application will resume.

In accordance with the Department of Environment and Natural Resources regulations, we note that the application, as submitted on October 26, 2015, is incomplete for processing. Upon resubmission of a complete application, a local decision will be made in 25 days, provided this period is not extended as provided by law. Please contact me at 910-796-7221 if you have any questions.

Thank you and take care.

Environmental
Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

November 13, 2015

CERTIFIED MAIL – 7007 0220 0000 8224 5201
RETURN RECEIPT REQUESTED

Dowell T. Gray, Jr.
313 North Cedar Street
Huntington, WV 25705

RE: DENIAL OF CAMA MINOR DEVELOPMENT PERMIT
APPLICATION NUMBER- NTB15-26
PROJECT ADDRESS- 8708 3rd Avenue, North Topsail Beach, North Carolina

Dear Mr. Gray:

After reviewing your application in conjunction with the development standards required by the Coastal Area Management Act (CAMA), it is my determination that no CAMA 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. You have applied to construct a residential structure at the project address, which as applied, is inconsistent with 15 NCAC 7H .0209 (f)(1), which states: "***Within the AEC for estuarine and public trust shorelines contiguous to waters classified as ORW by the EMC, all development projects, proposals, and designs shall limit the built upon area in the AEC to no more than 25 percent or any lower site specific percentage as adopted by the EMC as necessary to protect the exceptional water quality and outstanding resource values of the ORW, and shall: (A) have no stormwater collection system; (B) provide a buffer zone of at least 30 feet from the normal high water line or normal water line; (C) otherwise be consistent with the use standards set out in Paragraph (d) of this Rule.***".

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, located at 400 Commerce Avenue, Morehead City, NC 28557, must receive appeal notices within twenty (20) days of the date of this letter in order to be considered.

Respectfully yours,

Jason Dail,
CAMA Field Representative and Local Permit Officer (LPO), 127 Cardinal Drive, Wilmington, NC 28405

cc: WiRO – files
Agent – Future Homes c/o Tom Russell, 16663 Hwy 17, Hampstead, NC 28443
Terrie Woodle, Town of North Topsail Beach

VARIANCE REQUEST

Petitioner – Dowell T. Gray, Jr.

Nothing Compares
NORTH CAROLINA

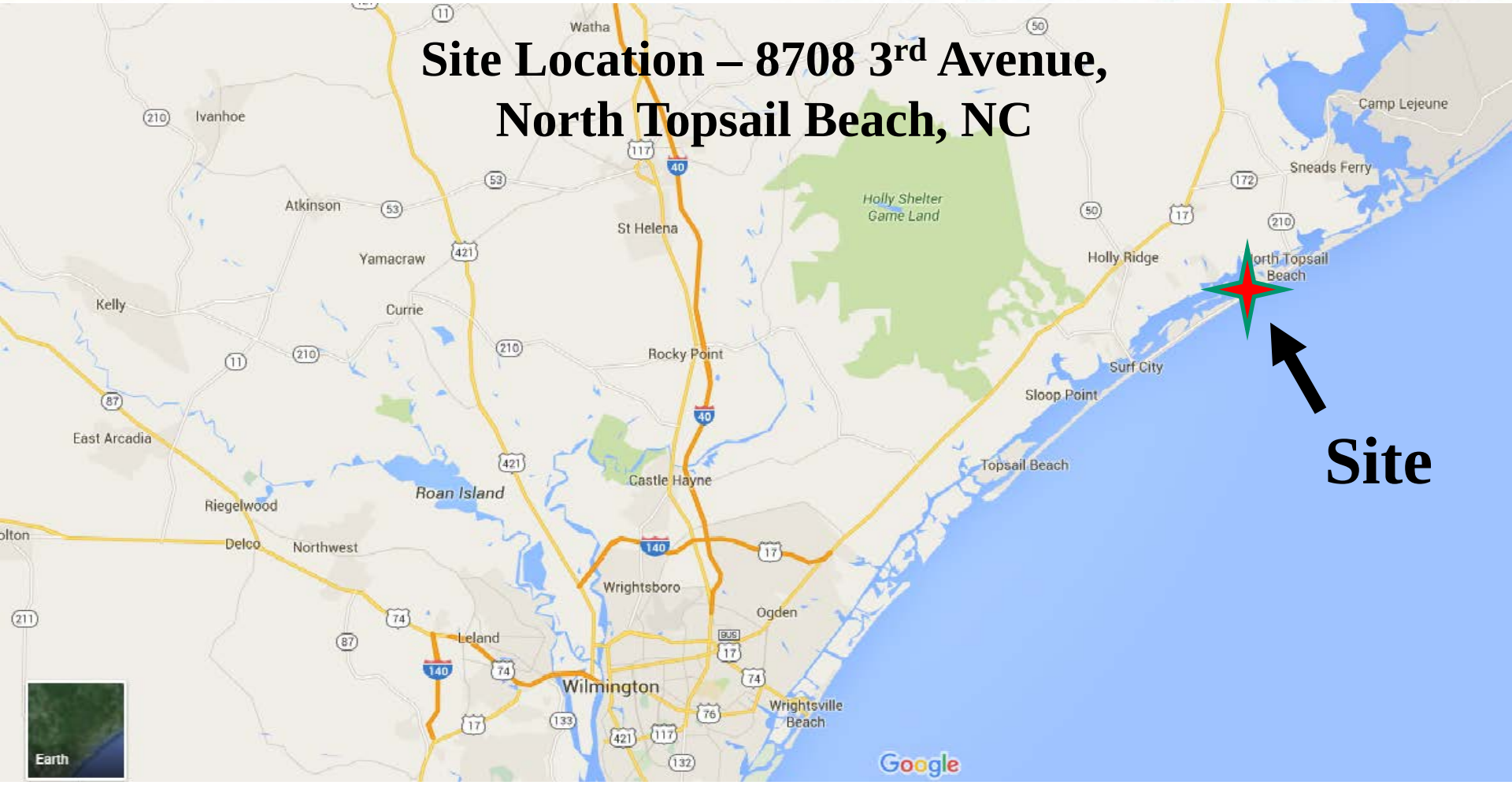
8708 3rd Avenue, North Topsail Beach, Onslow County

Presentation prepared and presented by: Jason Dail

Date: February 9, 2016

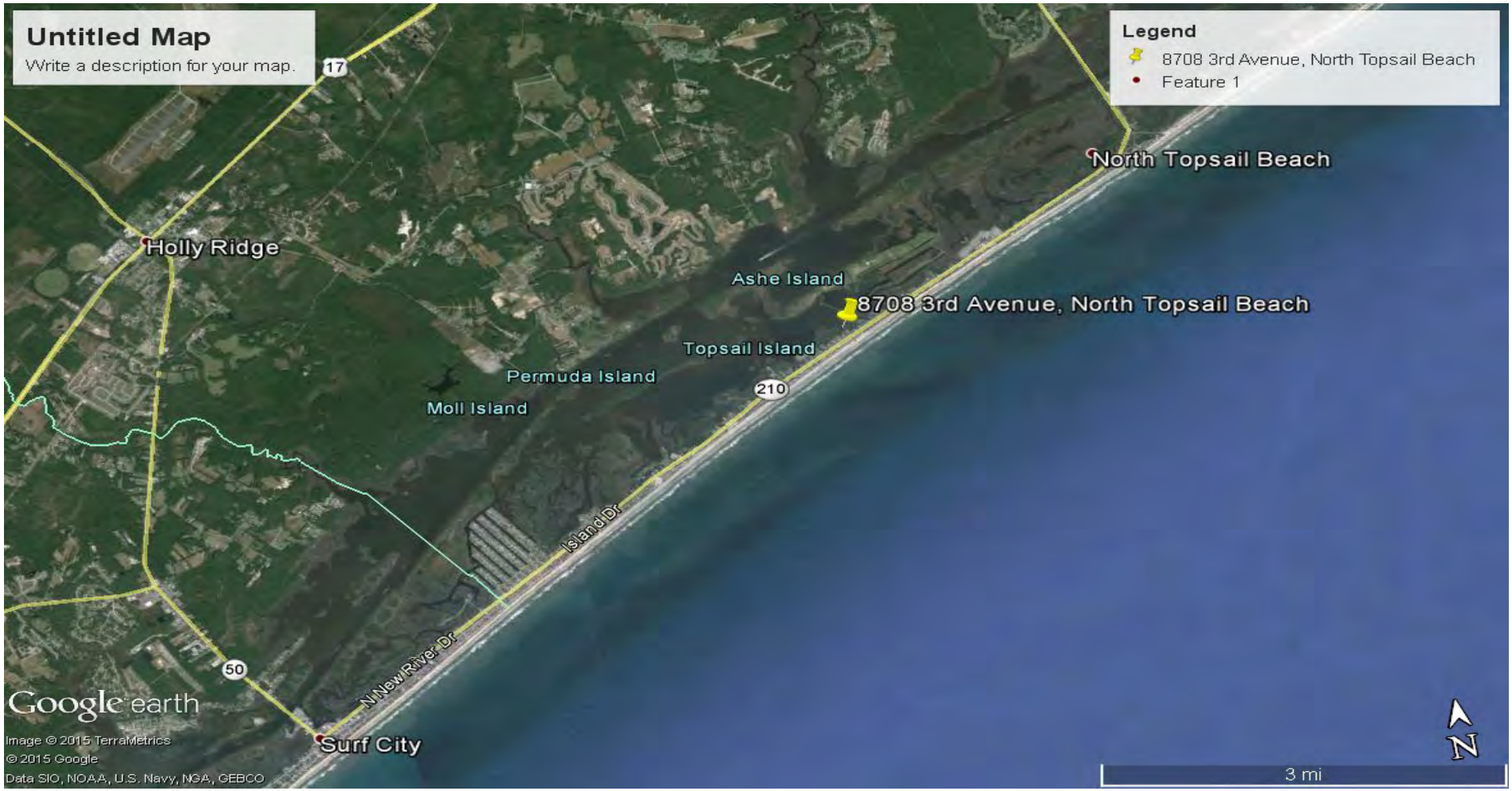
Petitioner – Dowell T. Gray, Jr. – Variance Request
February 9 , 2016

Site Location – 8708 3rd Avenue, North Topsail Beach, NC



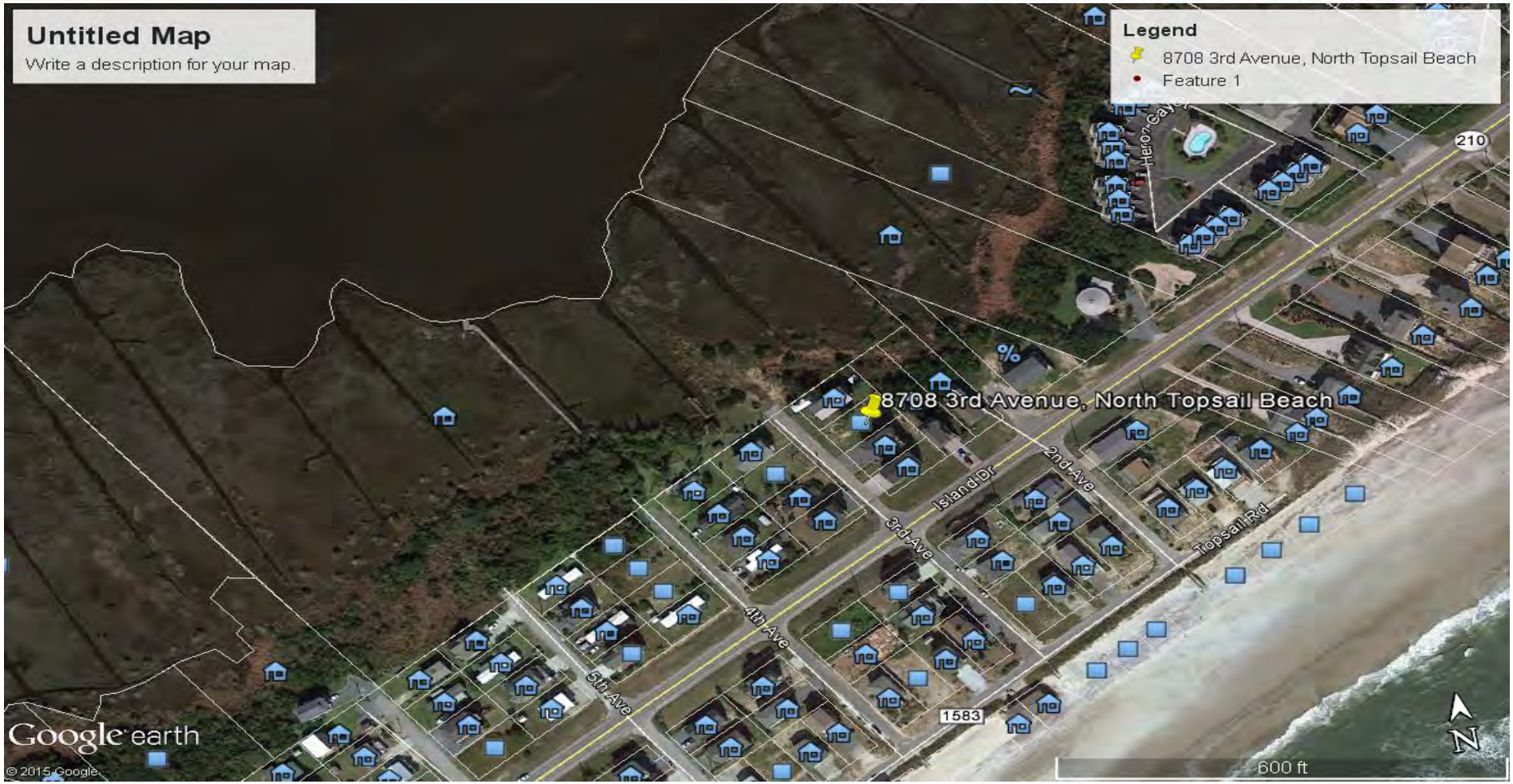
Department of Environmental Quality

Petitioner – Dowell T. Gray, Jr. – Variance Request
February 9 , 2016



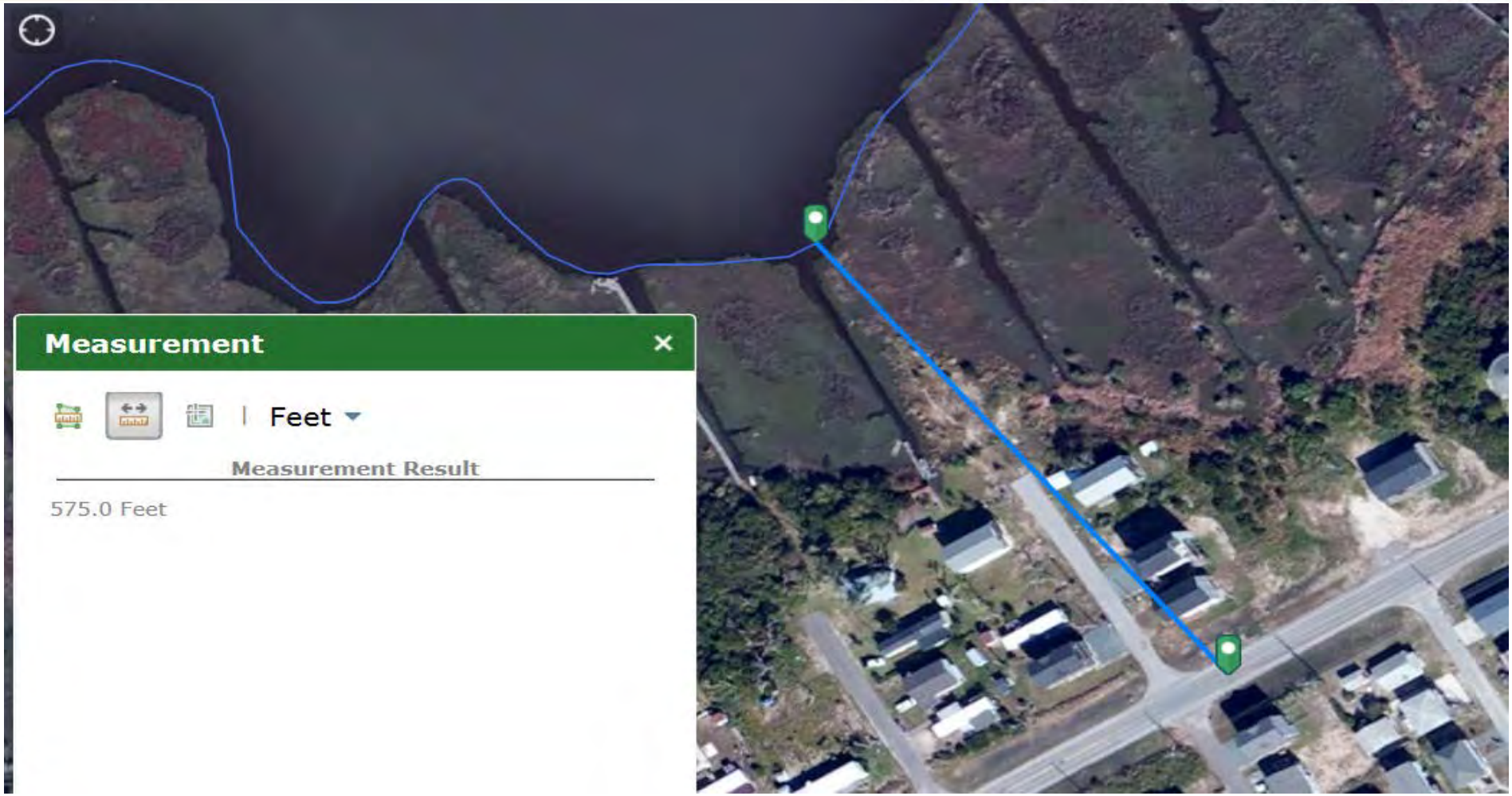
Department of Environmental Quality

Petitioner – Dowell T. Gray, Jr. - Variance Request
February 9, 2016



Department of Environmental Quality

Petitioner – Dowell T. Gray, Jr. - Variance Request
February 9, 2016

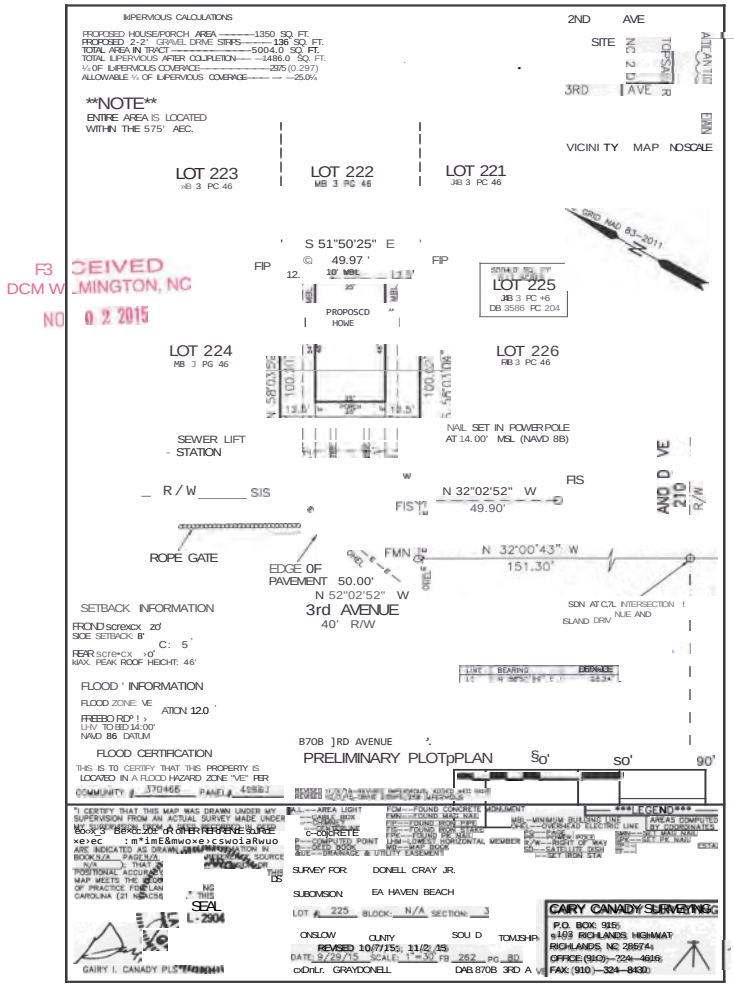


Petitioner – Dowell T. Gray, Jr. - Variance Request
February 9, 2016

Petitioner – Dowell T. Gray, Jr. - Variance Request
February 9, 2016

Department of Environmental Quality

Petitioner – Dowell T. Gray, Jr.- Variance Request
February 9, 2016



Department of Environmental Quality

Petitioner – Dowell T. Gray, Jr. – Variance Request
February 9, 2016

Division of Coastal Management

VARIANCE CRITERIA

15A NCAC 07J.0703(f)
To grant a variance, the Commission must affirmatively find each of the four factors listed in G.S. 113A-120.1(a).

(1) that unnecessary hardships would result from strict application of the development rules, standards, or orders issued by the Commission;
(2) that such hardships result from conditions peculiar to the petitioner's property such as location, size, or topography;
(3) that such hardships did not result from actions taken by the petitioner; and
(4) that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, standards or orders; will secure the public safety and welfare; and will preserve substantial justice.

STATE OF NORTH CAROLINA
DEPARTMENT OF JUSTICE

ROY COOPER
ATTORNEY GENERAL

P.O. BOX 629
RALEIGH, NC 27602

REPLY TO: CHRISTINE A. GOEBEL
ENVIRONMENTAL DIVISION
TEL: (919) 716-6600
FAX: (919) 716-6767
cgoebel@ncdoj.gov

TO: Coastal Resources Commission

FROM: Christine A. Goebel
Assistant Attorney General

DATE: January 27, 2016 (for the February 9-10, 2016 CRC Meeting)

RE: **Variance Request by SCS Ventures, LLC (Watermark Marina)**

SCS Ventures, LLC ("Petitioner") owns an existing marina in New Hanover County, along River Road south of the City of Wilmington on the Cape Fear River that was originally constructed by a prior owner in 2005-06, pursuant to CAMA Major Permit No. 66-01. In 2013-14, another prior owner sought a permit modification and CAMA variance in order to extend to the existing forklift pier to the -6'MLW depth or -5' MLW, which this Commission denied in May of 2014. In April of 2015, Petitioner applied for a permit modification for a redesigned project which extended the pier to the 1/3 width mark and shifted the structure extension to the south. On December 4, 2015, DCM denied Petitioner's application based on the proposal's inconsistency with the Commission's 1/4 width rule at 7H.0208(b)(6)(G)(iii) and the "rate to deep water" rule at 7H.0208(b)(H). Petitioner now seeks a variance from these rules in order to construct the pier as proposed in their 2015 CAMA Major Permit application.

The following additional information is attached to this memorandum:

Attachment A:	Relevant Rules
Attachment B:	Stipulated Facts, including new Stipulated Facts
Attachment C:	Petitioner's Position and Staff's Responses to Criteria
Attachment D:	Petitioner's Variance Request Materials
Attachment E:	Stipulated Exhibits, including new Stipulated Exhibits

cc: Charles S. Baldwin, IV, Counsel for Petitioner, electronically
Ken Vafier, CAMA LPO, New Hanover County, electronically
Mary Lucasse, CRC Counsel, electronically

ATTACHMENT A

RELEVANT STATUTES OR RULES

15A NCAC 7H.0203 Management Objective of the Estuarine and Ocean System

It is the objective of the Coastal Resources Commission to conserve and manage estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines, as an interrelated group of AECs, so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources. Furthermore, it is the objective of the Coastal Resources Commission to protect present common-law and statutory public rights of access to the lands and waters of the coastal area.

15A NCAC 7H .0208 Coastal Shorelines

***

(b) Specific Use Standards

(G) Pier and docking facility length shall be limited by:

(i) not extending beyond the established pier or docking facility length along the same shoreline for similar use; (This restriction does not apply to piers 100 feet or less in length unless necessary to avoid unreasonable interference with navigation or other uses of the waters by the public);

(ii) not extending into the channel portion of the water body; and

(iii) **not extending more than one-fourth the width of a natural water body**, or human made canal or basin. Measurements to determine widths of the water body, canals or basins shall be made from the waterward edge of any coastal wetland vegetation that borders the water body. The one-fourth length limitation does not apply in areas where the U.S. Army Corps of Engineers, or a local government in consultation with the Corps of Engineers, has established an official pier-head line. The one-fourth length limitation shall not apply when the proposed pier is located between longer piers or docking facilities within 200 feet of the applicant's property. However, the proposed pier or docking facility shall not be longer than the pier head line established by the adjacent piers or docking facilities, nor longer than one-third the width of the water body.

(H) Piers or docking facilities longer than 400 feet shall be permitted only if the proposed length gives **access to deeper water at a rate of at least 1 foot each 100 foot increment of length longer than 400 feet**, or, if the additional length is necessary to span some obstruction to navigation. Measurements to determine lengths shall be made from the waterward edge of any coastal wetland vegetation that borders the water body;

ATTACHMENT B

STIPULATED FACTS

1. The Petitioner, SCS Ventures, LLC, is a North Carolina limited liability company authorized to do business in North Carolina. Petitioner is represented by attorney Charles S. Baldwin, IV of Brooks, Pierce, McLendon, Humphrey & Leonard, LLP LLC.

2. The Petitioner is the owner of property located at 4114 River Road, Wilmington, North Carolina (the Site). The Site is located about 4.7 miles south of the Cape Fear Memorial Bridge at Wilmington.

3. Petitioner SCS Ventures, LLC purchased the property from CXA-10 Corporation by Special Warranty Deed dated December 15, 2014, following a bank foreclosure process against a prior owner.

4. The property consists of 12.14 acres of upland and 20.47 acres of marsh on the east bank of the Cape Fear River. At the Site, the waters of the Cape Fear River are designated as a Primary Nursery Area (PNA) and as SC waters by the Environmental Management Commission, and are closed to the harvest of shellfish.

5. The property is the location of an existing dry storage marina, a yacht club building, trailer and vehicle sheds, and a pier for launching boats by means of a forklift (launch pier).

6. A CAMA Major Permit Application was submitted on June 2, 2000 by Barnards Creek, LLC for a clubhouse, dry stack storage facility, a launch pier, floating docks and related on-shore development.

7. After the filing of the original application in June, 2000, it was determined that the proposed end of the launch pier and the floating docks were located in water that was too shallow to launch and operate boats during most of the tidal cycle.

8. A hydrographic survey was performed by Hanover Design Services, P.A., a registered land surveyor, in 2000 in an attempt to identify a location for the launch pier that had adequate water depth. A copy of this survey is attached.

9. Prior to the issuance of Permit 66-01 the plans for the pier were changed to relocate and extend the pier so that the depth at the end of the launch pier would be -3.46' at mean low water according to the Hanover Design Services hydrographic survey.

10. Prior to the issuance of Permit 66-01, then-DCM Assistant Director Charles Jones visited the site by boat to inspect the water depth at the new proposed location for the launch pier.

11. CAMA Major Permit 66-01 was issued on May 29, 2001 for the facility with a revision to the original plans that changed the location, length and orientation of the launch pier and the floating docks.

12. Permit 66-01 contained a condition stating "In accordance with commitments made by the permittee, if water depths at the launch dock is of insufficient depth to allow for launch and/or recovery operations to take place without disturbing the adjacent shallow bottom habitat, launch and recovery operations shall be suspended until such time as the water depth increases to an adequate level."

13. The Permit was renewed on December 3, 2004. On June 30, 2005, the property was purchased by Watermark Marina of Wilmington, LLC and the Permit was transferred to Watermark in July 2005 following the change in ownership.

14. Most of the development authorized by Permit 66-01 was constructed in late 2005 and early 2006, including the launch pier, floating docks and upland development.

15. A survey by a registered land surveyor from McKim & Creed in 2010, a copy of which is attached, showed the floating docks being located between 0' and -1' mean low water.

16. The Marina has never become a fully operational dry storage marina facility. In the 2013 major modification narrative, the prior owner noted that at that time, only 20 of 430 dry storage spaces were in use. Petitioner contends that this is due to shallow water at the launch pier, launching and retrieving is limited to two hours on either side of high tide.

17. The Permit was again renewed by Watermark Marina of Wilmington, LLC on March 28, 2007.

18. On May 4, 2010, CXA-5 Corporation purchased the Site and Marina through a foreclosure sale, after Watermark Marina of Wilmington, LLC's deed of trust was foreclosed on.

19. Effective July 2, 2012, the Texas Corporations CXA-1 Corporation and CXA-5 Corporation merged to become CXA-10 Corporation. Accordingly, the Marina changed ownership from CXA-5 Corporation to CXA-10 Corporation. On October 16, 2012, the Permit was transferred to CXA-10 Corporation.

20. On August 20, 2013, the prior owner applied for a major modification to Permit 66-01 to add an extension on to the existing launch pier. The proposed modification included development of additional forklift launch and retrieval pier approximately 1,031 feet by 23.5 feet, development of an irregularly-shaped platform area and transient floating docks.

21. The development proposed now is within the Public Trust and Estuarine Waters Areas of Environmental Concern (AECs). A CAMA permit (or major modification) is required by 113A-118 for the development proposed within these AECs.

22. CRC Rule 15A NCAC 7H.0208(b)(6)(G)(iii) provides that pier length shall be limited by "not extending more than 1/4th the width of a natural water body… measurements to determine widths of the water body, canals or basins shall be made from the waterward edge of any coastal wetland vegetation which borders the water body…".

23. CRC Rule 15A NCAC 7H.0208(b)(6)(H) states the pier length shall be limited by: "Piers or docking facilities longer than 400' shall be permitted only if the proposed length gives access to deeper water at a rate of at least 1' each 100' increment of length longer than 400', or, if the additional length is necessary to span some obstruction to navigation. Measurements to determine lengths shall be made from the waterward edge of any coastal wetland vegetation that borders the water body;".

24. The distance across the water body at the location of the proposed launch pier is approximately 2,364' from marsh to marsh.

25. The proposed forklift launch pier, pedestrian pier, and floating docks would extend a total of 788’ into the 2364’ waterbody, which is exactly one-third of the width of the natural water body at this location.

26. The federally maintained Cape Fear River channel is over 4,000' west of the site. The proposed modification would not encroach into the US Army Corps of Engineers navigation channel setback. One large undeveloped spoil disposal island directly across from the site is known as Island 13, which was used as a mitigation site for impacts to PNA by the Wilmington Harbor Deepening Project.

27. The presence of Island 13 creates a back channel, on which the permitted development is sited, separated from the main navigation channel, the Cape Fear River, by Island 13. In the absence of Island 13, the width of the water body (Cape Fear River) at the project location is approximately 6,750'.

28. The back channel has an extensive shallow water mud flats extending from the east shoreline of the River and a less extensive mud flat on the western shoreline of Island 13. A copy of the most recent McKim & Creed survey performed in 2015, is attached and is labeled as Figure 2 of 7 on the bottom right corner.

29. Petitioner’s property is located on a shoreline indentation approximately 1,025’ deep. Much of this indentation consists of the extensive shallow mud flats extending from the shore of Petitioner’s property, as shown on attached Exhibit 15.

30. The deepest water within the back channel is about -7 to -8' deep at mean low water and, in the vicinity of the proposed launch pier, is about 215' wide. The outer end of the proposed launch pier would be well landward of the channel portion of the back channel. A copy of the 2015 McKim & Creed survey is attached.

31. At the project location the distance from the marsh at the Petitioner's property to the edge of the -7 to -8' channel is approximately 1,504'. The distance from the marsh at Island 13 to the edge of the -7 to -8' channel is approximately 900'. The 7-8' channel is approximately 280' wide at this location. A copy of the 2015 McKim & Creed survey is attached.

32. Extending the launch pier into deeper water will decrease the likelihood that the bottom of the water body in the PNA will be disturbed by boat hulls and propellers.

33. The closest pier to the north of the project is an industrial off-loading conveyor system for bulk gypsum coming by ship. The conveyor pier extends approximately 1,565' beyond the edge of the marsh at a location where the width of the River from marsh to marsh is approximately 3,048'. The conveyor pier was built before the 1/4 Width rule was in effect, but was more affected by the location of the Corps harbor line.

34. Barnards Creek divides the Petitioner's property from the adjacent marina property to the south at 4410 River Road, which is owned by NNP IV, Cape Fear River, LLC ("NNP"). NNP is in the process of developing a 1,375 acre tract with 15,132' of shoreline on the Cape Fear River, which was permitted for 112 wet slips and 84 dry stack slips. NNP has been issued a CAMA permit and allowed to extend its pier facility beyond the ¼ line by Variance Request CRC-VR-13-03 granted by Order dated January 10, 2014, a copy of which is attached. NNP is authorized to construct a wet slip marina and forklift launch pier that extends 540' of the 1,800' wide back channel, which is 30% of the width of the back channel, and the wet slip marina at 450' of the 1,500' back channel, which is also 30% of the width of the back channel. The NNP piers and docks would extend to about the -5' to -6' depth at mean low water.

35. The width of the back channel from the waterward edges of the Coastal Wetlands (as rule 7H. 0208(b)(6)(G)(iii) requires for water-body measurement) at the NNP marina site is approximately 1,500-1,800'. The water width at the Petitioner's proposed pier site, from marsh to marsh, is approximately 2,686'. The difference in width between the Petitioner's site and the NNP site is due to the approximately 1,025' indentation in the east bank of the Cape Fear River at the Petitioner's site.

36. On June 17, 2014, McKim & Creed, RLS, conducted a bathymetric survey (2014 Survey) of the area of the proposed pier extension, based on the May 14, 2014 request of the Commission. A map of the survey was prepared with overlays of proposed piers and is included as a stipulated exhibit.

37. The prior owner of the property, CXA-10 Corporation, previously filed a Variance Petition on March 12, 2014, for a proposed major modification to CAMA Major Permit #66-01. That petition sought a modification to the permit to allow the extension of the pier to a total length of approximately

1,424', over half of the width of the back channel and almost 500' longer than the extension currently sought by Petitioner.

38. At the May 2014 Commission meeting, the Commission declined to rule on the variance and remanded the case, requesting CXA-10 Corporation if they would get an updated depth survey specifically showing the 5 and 6 foot contours (the 2014 Survey).At the July 2014 Commission meeting, after reviewing the 2014 survey, the CRC denied the Variance Petition by Order dated August 28, 2014, a copy of which is attached.

39. On April 12, 2015, Petitioner SCS Ventures, LLC submitted an application and supporting materials for a major modification of CAMA Major Permit #66-01 which proposed a reconfigured and relocated pier extending not more than 1/3rd of the width of the applicable water body or 788'. A copy of the application materials is attached.

40. As part of the CAMA major permit review process, notice was given to the public through on-site posting and notice in the local newspaper. Notice was also sent to the adjacent riparian owners. DCM received no comments or objections in response.

41. Also as part of the CAMA major permit review process, copies of the major modification application and the Field Report were sent to federal and state review agencies. DCM's fisheries resource staff, the Wildlife Resources Commission, and the Army Corps of Engineers each provided comment on this project, copies of which are attached. A copy of the Field Report is also attached.

42. Petitioner's proposed pedestrian and launch pier extension is approximately 941.7 feet and approximately 442.7 feet from the edge of the existing back channel, as depicted in Petitioner's Permit modification application.

43. On December 4, 2015, DCM denied Petitioner's major modification application, as the proposed development would be inconsistent with the Commission's Rules at 15A NCAC 7H .2028(b)(6)(G)(iii) (the ¼ Width Rule) and .0208(b)(6)(H) (rate to deeper water rule).

46. On December 30, 2015, Petitioner submitted this variance petition to seek a variance from the quarter width rule and the rate to deeper water rule in order to construct the pier as proposed.

47. Based on the 2015 Survey, the proposed pier and floating dock would have a rate to deeper water of 0.35' per 100' for that portion of the pier proposed past the first 400', which does not meet the 1' per 100' standard of 15A NCAC 7H .0208(b)(6)(H).

48. The surveyed mean low water depth at the proposed pier boat landing is 3.8' to 4.2'. As stated in the Affidavit of Gene Strader, Exhibit 19: "At this water depth, the boat landing, during any time of the tide cycle, would be able to accommodate vessels of any size which the facility would handle in dry storage. These sizes would range from approximately 16' to approximately 32'. The

prop clearance on vessels of this size would result in approximately 1' to 1.5' clearance between the prop and the mud flats bottom."

49. The proposed pier would add approximately 45,010 square feet of structure within the public trust area to the 7,180 square feet of existing forklift pier structure, for a total of approximately 52,190 square feet (1.19 acres) of structure within the public trust area.

50. The owner of the permitted Riverlights Marina to the south, NNP, has discussed a possible modification request to change the configuration of their floating docks. As currently proposed, it would not shift any of the slips closer to this Site.

STIPULATED EXHIBITS

1. DCM's December 4, 2015 modification request denial letter
2. Petitioner's application and supporting material for major modification of CAMA Major Permit #66-01 dated August 12, 2015, including, without limitation, Project plans and Figures 1-7, 2015 survey and overlays submitted with the application for major modification.
3. 2000 hydrological survey
4. 2005 McKim & Creed Survey
5. 2010 McKim & Creed Survey
6. 2014 Survey
7. CAMA Major Permit #66-01 issued 5/29/2001
8. CRC 2013/14 Variance Order for NNP (Marina to the South)
9. CRC 2014 Variance Order for CXA-10 (prior owner of this Site)
10. DCM's field report for the 2015 modification request
11. Response from Army Corps, WRC, and DCM Fisheries Resource Specialist
12. Overlay drawing for NNP's (Marina to the South) pending modification request
13. Aerial depiction of proposed pier extension to 1/3rd line at Petitioner's property and at the adjacent marina located at 4410 River Road
14. Hanover Design Service, P.A. 2000 Preliminary Plan of Pier/Dock Plan
15. Diagram showing 1,025' Property indentation.
16. Diagram showing width of waterbody and distances to main Shipping Channel.
17. PowerPoint of ground and aerial site photographs
18. PowerPoint from CXA -10 Corporation Variance Request dated July 30, 2014
19. Affidavit of Gene Strader

Petitioner and Staff Positions

I. 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.

The pier as constructed in accordance with the previous permit extends through an area of unusually shallow water in front of Petitioner's property, caused by a combination of the unusual shore contour of Petitioner's property that places the property in 1,025' indentation from the channel and shallow mud flats. The application of the one-fourth standard in 15 NCAC 07H.0208(b)(6)(G)(iii) prevents the pier from extending to a point in the back channel at which the mean low water (MLW) is sufficient to launch and receive boats at any time other than at or near high tide. Additionally, application of the "rate to deep water" standard in 15 NCAC 07H.0208(b)(6)(H) prevents a longer pier because of the sustained area of shallow mud flats in the shore indentation where Petitioner's property is located.

Currently, the water depth in the location of the existing forklift launch and retrieval pier is less than -1.0' MLW. This limits the launch and retrieval window from the marina, and in fact sometimes causes boats to ground when tied up at the pier. The property lies within a Primary Nursery Area (PNA), and the low water levels around the pier threaten damage to the PNA habitat as a result of boats attempting to operate in extremely shallow water. This hardship is unnecessary because the proposed pier extension, which would move the launch and retrieval pier to the one-third width mark where there is approximately -4.0' MLW, would allow much larger launch and retrieval windows, and therefore provide greater access to the public trust waters for the general public, while avoiding significant usurpation of the public trust waters and also avoiding any meaningful impairment to navigation.

Because the point on Petitioner's property from which the dock extends is located in a shoreline indentation, and because the pier extends at an angle from the shoreline rather than being directly perpendicular to the shore, the end of the proposed pier extension is still hundreds of feet away from the back channel and approximately 4,000 feet from the Cape Fear River shipping channel. Also, interference with navigation is less likely because the opposing bank of the back channel is formed by an artificial spoil site, known as Island 13, created by the Corps of Engineers from material dredged from the shipping channel, meaning that it is unlikely that any docks or other structures will extend from the opposing bank, which is much closer to the deepest water in the back channel. Additionally, in CRC-VR-13-03, the owners of a neighboring property received approval, via variance, to build a pier that would extend further into the main portion of the back channel than the Petitioner's proposed pier, further lessening any impact on navigation from the proposed pier extension. Therefore, strict application of the applicable rules unnecessarily causes hardship to Petitioner.

Staff's Position: Yes.

Strict application of the Commission's "¼ width rule" and the "rate to deep water" rule will cause Petitioner unnecessary hardships. The purpose of these rules is to limit pier length, to limit the public trust area usurped by such structures, and to protect the safe navigation of public trust waters. While this site was always marginal for a marina due to its location in a PNA where new dredging is prohibited and given the pre-existing shallow depths, this new Petitioner seeks to extend the forklift pier only to the 1/3 width, which is allowed in some special circumstances by the Commission's rules. While past variance requests sought to extend the structure as much as 53% and 49% across the waterbody, this Petitioner has redesigned the proposed pier extension to 33% and is able to reach reasonably deep water by resiting the extension further to the south. This new design will reduce the facility's existing impacts to the PNA from the operation of motor vessels over shallow water habitats, while also increasing the use of the larger facility. For these reasons, the strict application of the ¼ width rule in this case appears to rise to an unnecessary hardship for the Petitioner.

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.

The unusual shoreline indentation at Petitioner's property causes the abnormally wide stretch of shallow water in front of the property which makes a shorter pier difficult to utilize. Additionally, because the Petitioner's property lies within a PNA, there is no possibility of implementing dredging that could ameliorate the problems caused by the large area of shallow water in the area in front of Petitioner's property.

Petitioner's property also lies along a back channel of the Cape Fear River, separated from the shipping channel of the River by a spoil disposal site. The spoil island drastically decreases the width of the water body that existed before it was created, limiting the size of pier that can be constructed under the current rules and regulations referenced above. Without the presence of the spoil island, the proposed pier extension would be well short of the ¼ mark with respect to the width of the Cape Fear River. Therefore, the hardships that exist are largely the result of the presence of the spoil island, a condition which is peculiar to the Petitioner's property.

Staff's Position: Yes.

Staff agrees that certain conditions exist that are peculiar to the Petitioner's property and which may cause Petitioner's hardships. Specifically, Staff agrees that the site's location across from Island 13, which is used by the U.S. Army Corps of Engineers for spoil deposition, makes it unlikely that there will be future pier development on the opposite shoreline that would further impact navigation. Therefore, Staff agrees that any hardships which might exist, result from the location of Petitioner's property.

In making this recommendation, Staff notes that other conditions of this property noted by the Petitioner are not peculiar, including the "very shallow water", the location within a designated PNA, and the indentation along this shoreline.

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

Petitioner's Position: No.

The Petitioner had nothing to do with the indented shape of the shoreline or the presence of shallow mud flats adjacent to its lot. Petitioner has worked towards resolving the problem by proposing extension of its pier to the south instead of straight out from the property and instead of proposing dredging which could result in potential damage to PNA habitat. Surveys over time have shown that the site conditions have not materially changed, so siltation is not an issue. Rather, the shallow water mud flats do not result from the actions of Petitioner. The presence of the spoil site Island 13 between Petitioner's lot and the main river channel which limits the potential length of structures and access to deep water is also not the result of any action by the Petitioner.

Staff's Position: No.

The designation of the area as a PNA and associated regulatory limitations on dredging were all known in 2001 at the time of permitting, in 2005-06 at the time of construction, recently when Petitioner purchased this site, and continue today. In purchasing the property, the limitations of this site and of the Commission's long-standing limits on pier length were or should have been known to the Petitioner. However, Petitioner's hardships under the redesigned plan have been minimized as Petitioner has proposed a more modest pier length design in order to resolve the problem of possible siltation and shallow water by reaching deep water while limiting possible impacts to PNA**.** As such, Staff agrees that any hardships do not result from actions taken by the Petitioner.

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.

(1) Be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission

The spirit, purpose, and intent of the 1/4th rule is to prevent private piers from occupying more than a fair share of public trust waters, thereby hindering public navigation and other public uses of the water and submerged land.

The proposed pier will extend over a very shallow mud flat that extends from the Petitioner's lot to deeper water in the vicinity of the back channel. The area across which the pier will extend is not a natural navigation area and is not an area used for navigation either by the general public or by adjacent property owners. The only vessels that could use the area of the mud flat would be extremely small and shallow draft vessel such as canoes or kayaks, which could navigate around or under the pier when the tide is sufficiently high for such vessels to use the area. The proposed route takes a southern ward orientation to minimize its potential impact on the use of public trust waters and is located well within the lot's riparian corridor. The requested extension of the proposed pier will allow the Petitioner to gain access to deeper water without unduly infringing on the public's rights of navigation and use of the public trust water along this shoreline. 15 NCAC 7H.0208(b)(5)(A) specifies that marinas will be sited in deep waters not requiring dredging. By proposing to relocate the proposed development, Petitioner seeks to mitigate any adverse effects of PNA habitat by moving the proposed pier into deeper water.

(2) Secure the public safety and welfare

Allowing the pier to be extended into deeper water would prevent possible navigational hazards that could occur if the pier ended in the shallower waters at the 1/4th width location. Moreover, the increased length of the proposed development does not impede the navigability of the existing back channel.

Users of the existing facility could become stranded if they tried to return to the facility when the tidal cycle resulted in water depth that is too shallow to reach the pier. This could result in strandings for extended periods of time. Further, it prevents the use of the existing property and pier for the intended and permitted purposes of the marina, including recreational boating and fishing uses. The extended

pier and navigation markers also would alert boaters unfamiliar with this area to the shallow mud flats at this location.

(3) Preserve substantial justice

The pier enables a waterfront property owner to gain access to deep enough water for boat docking without unduly occupying public trust areas or interfering with public navigation or other public uses. The location of the proposed pier at the 1/3rd line is consistent with the 1/3rd line approved for a marina at 4410 River Road, Wilmington, New Hanover County by Variance Request CRC-VR-13-03.

Staff's Position: Yes.

Staff agrees that Petitioner's proposed pier extension will be consistent with the spirit, purpose and intent of the rules, standards and orders issued by the Commission. The rules which Petitioner seeks a variance from are the ¼ width rule and the "rate to deep water" rule. The Commission amended its pier length rule in 1998 to change the 1/3 standard to a 1/4 width requirement with certain exceptions (none of which apply in this case) to preserve traditional navigation by assuring that the middle one-half of any water body remained available for public use, and to limit overall pier size that any one pier can inhabit within a public trust waterbody such as the Cape Fear River. In this case, an exception to the ¼ width rule may be within the spirit of the rules in order to reduce the likelihood of impacts to shallow water PNA and allow more use by Petitioner; and due to the unlikely development of a pier on the opposite shoreline that would further impact navigation along this channel. Staff further contends that public safety and welfare will be preserved by limiting the amount of the public trust area of the Cape Fear River to be impacted through the proposed extension to 1/3 width of the channel.

Finally, Staff contends that the granting of this variance by the Commission would preserve substantial justice, where the Commission has authorized some piers to extend 1/3 of the waterbody width in special circumstances or through variances in specific cases.

ATTACHMENT D

Petitioner's Petition
(without proposed attachments which are also included in the stipulated exhibits or draft facts)

BROOKS PIERCE
FOUNDED 1897

115 North 3rd Street, Suite 301
Wilmington, NC 28401

T 910.444.2000
F 910.444.2001
WWW.BROOKSPIERCE.COM

December 30, 2015

VIA U.S. MAIL

Mr. Braxton C. Davis, Director
Division of Coastal Management
400 Commerce Avenue
Morehead City, North Carolina 28557

VIA EMAIL

Braxton.Davis@ncdenr.gov

Re: Variance Petition
SCS Ventures, LLC, New Hanover County, North Carolina
Our File No. 108835.1

Dear Mr. Davis:

Enclosed is a CAMA Variance Request Form regarding the above-referenced project. Please schedule the variance for the February 9-10, 2016 meeting of the Coastal Resources Commission.

Thank you for your attention to this matter.

Sincerely yours,

Charles S. Baldwin, IV

CSBIV/gw
Enclosures

pc: Ms. Christy Goebel (via United States Mail and email)

CAMA VARIANCE REQUEST FORM **DCM FORM 11**
DCM FILE No.:_____

PETITIONER'S NAME **SCS Ventures, LLC**

COUNTY WHERE THE DEVELOPMENT IS PROPOSED **New Hanover**

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__ A copy of the permit decision for the development in question;

__B__ A copy of the deed to the property on which the proposed development would be located;

__B__ A complete description of the proposed development including a site plan;

__C__ A stipulation that the proposed development is inconsistent with the rule at issue;

__D__ Proof that notice was sent to adjacent owners and objectors*, as required by 15A N.C.A.C. 07J .0701(c)(7);

____ Proof that a variance was sought from the local government per 15A N.C.A.C. 07J .0701(a), if applicable;

__E__ Petitioner's written reasons and arguments about why the Petitioner meets the four variance criteria, listed above;

__F__ 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.

**Please contact DCM or the local permit officer for a full list of comments received on your permit application. Please note, for CAMA Major Permits, the complete permit file is kept in the DCM Morehead City Office.*

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

Charles S. Baldwin IV — Dec 30, 2015

Signature of Petitioner or Attorney — Date

Charles S. Baldwin, IV
Printed Name of Petitioner or Attorney

cbaldwin@brookspierce.com
Email address of Petitioner or Attorney

Post Office Box 2460
Wilmington, North Carolina 28402
Mailing Address

(910) 444-2020
Telephone Number of Petitioner or Attorney

(910) 444-2001
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: July 2014

2014033911

FOR REGISTRATION REGISTER OF DEEDS
TAMMY THEUSCH BEASLEY
NEW HANOVER COUNTY, NC
2014 DEC 17 04:27:33 PM
BK:5857 PG:2785-2789 FEE:$26.00
NC REV STAMP:$2,810.00
INSTRUMENT # 2014033911

PREPARED BY:
Hunton & Williams LLP
One Bank of America Plaza
421 Fayetteville Street, Suite 1400
Raleigh, North Carolina 27601
ATTN: DAL RE

AFTER RECORDING RETURN TO:
Solana, Theriault & Gross, PLLC
1650 Military Cutoff Road #200
Wilmington, North Carolina 28403

GRANTEE'S ADDRESS:
SCS Ventures, LLC
c/o Carolina Marine Terminal, Inc.
3330 River Road
Wilmington, North Carolina 28412

Transfer Tax/Stamps: $2,810.00

Tax Parcel Nos: R07000-002-005-000
R07000-002-009-000

SPECIAL WARRANTY DEED

CXA-10 CORPORATION, a Texas corporation, successor-by-merger to CXA-5 Corporation, a Texas corporation ("**Grantor**"), in consideration of the sum of TEN AND NO/100 DOLLARS ($10.00) and other good and valuable consideration in hand paid by **SCS VENTURES, LLC**, a North Carolina limited liability company ("**Grantee**"), the receipt and sufficiency of which are hereby acknowledged, hereby GRANTS, BARGAINS, SELLS and CONVEYS unto Grantee the real property located in New Hanover County, North Carolina, which is more particularly described on **Exhibit "A"** attached hereto and made a part hereof, together with (i) all and singular, all of Grantor's right, title and interest, if any, in and to any and all rights, benefits, privileges, easements, tenements, and appurtenances thereon and pertaining thereto, including all of Grantor's right, title and interest, if any, in and to any adjacent streets, roads, alleys, easements and rights-of-way, (ii) any and all improvements and buildings located on such real property (said real property, together with such rights, appurtenances and interests, improvements and buildings being collectively called the "**Property**"), subject to, however, all easements, rights of way, encumbrances, liens, covenants, conditions, restrictions, obligations and liabilities as may appear of record and all matters that an accurate survey or a physical inspection of the Property would reveal, including, without limitation, the exceptions set forth in **Exhibit "B"** attached hereto and made a part hereof (said exceptions being called the "**Permitted Exceptions**").

TO HAVE AND TO HOLD the Property, subject to the Permitted Exceptions, together with all and singular the rights and appurtenances thereto in anywise belonging unto Grantee, its successors and assigns forever. Grantor does hereby bind itself, and its legal representatives and successors to WARRANT AND FOREVER DEFEND all and singular the Property unto Grantee, its successors and assigns, against every person whomever lawfully claiming or to claim the same or any part thereof, by or under Grantor, but not otherwise, and subject to the Permitted Exceptions.

[Signatures on following page]

EXECUTED to be effective as of the 15th day of December, 2014.

CXA-10 CORPORATION,
a Texas corporation,
successor-by-merger to CXA-5 Corporation,
a Texas corporation

By: _____
Print: Michael D. Wyant
Its: its Authorized Signatory

STATE OF TEXAS §
§
COUNTY OF COLLIN §

I, the undersigned authority, a Notary Public, in and for said county in said state, hereby certify that Michael D. Wyant, Authorized Signatory of CXA-10 CORPORATION, a Texas corporation, and whose name is signed to the foregoing instrument, and who is known to me, acknowledged before me on this day that, being informed of the contents of said instrument, he, as such Authorized Signatory and with full authority, executed the same voluntarily for and as the act of CXA-10 CORPORATION, a Texas corporation.

Given under my hand and seal of office this 15 day of December, 2014.

_____
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

My Commission Expires:
12/15/14

Elizabeth B. Francis
(Printed Name of Notary)

ELIZABETH B. FRANCIS
Notary Public, State of Texas
My Commission Expires
November 08, 2016

EXHIBIT "A"

PROPERTY DESCRIPTION

That certain tract of land being in New Hanover County, NorthCarolina, and being more fully described as follows:

Being all of a 40.45 acre tract as shown on a map of recombination for Watermark Marina of Wilmington as shown on plat recorded in Map Book 48, Page 331, New Hanover County Registry.

This conveyance is made together with all easements benefiting the aforesaid property, including, but not being limited to, the "60' Access Easement" located north of the northern line of Tract C as said line is extended westwardly 60 feet, depicted on the map entitled "Map of Recombination Watermark Marina of Wilmington", said map being recorded in Map Book 48, Page 331 in the office of the Register of Deeds of New Hanover County.

This conveyance is made subject to the rights of others in and to the non-exclusive use of the "60' Access Easement" located north of the northern line of Tract C, as said line is extended westwardly 60 feet, depicted on the map entitled "Map of Recombination of Watermark Marina of Wilmington" recorded in Map Book 48, Page 331 in the office of the Register of Deeds of New Hanover County, including, but not being limited to the non-exclusive easement rights of Watermark Marina of Wilmington, LLC in said non-exclusive easement (and including only that portion of said easement which is located north of the northern line of Tract C as said line is extended westwardly 60 feet) appurtenant to the property described by the deed recorded in Book 4929, Page 1235 in the office of the Register of Deeds of New Hanover County, which easement rights are and shall be non-exclusive and shall be used in common with all of the owners of other property benefited by said easement including, but not being limited to, the property depicted as "40.45 AC +/-" shown on the map entitled "Map of Recombination Watermark Marina of Wilmington" recorded in Map Book 48, Page 331 in the office of the Register of Deeds of New Hanover County.

EXHIBIT "B"

PERMITTED EXCEPTIONS

1. Taxes and assessments for the year 2015 and subsequent years, not yet due and payable.

2. The following matters:

   Easement(s) to Carolina Power and Light Company recorded in Book 542, Page 118; Book 1006, Page 372; Book 1500, Page 1527; and Book 1500, Page 1541, New Hanover County Registry.

   Easement(s) between CSA-5 Corporation and Cape Fear Public Utility Authority recorded in Book 5602, Page 652, New Hanover County Registry.

   Easement(s) between CSA-10 Corporation and Piedmont Natural Gas Company, Inc. recorded in Book 5730, Page 2451, New Hanover County Registry.

   Agreement(s) between CXA-10 Corporation, successor by merger from CXA-5 Corporation and Piedmont Natural Gas Company, Inc. recorded in Book 5730, Page 2455, New Hanover County Registry.

3. The following additional exceptions:

   A. Setbacks, easements, governmental regulations, or other matters shown on or disclosed by plat recorded in Map Book 48, Page 331, New Hanover County Registry.

   B. Existing easements for public roads and utilities now in use.

4. Riparian rights or title to that a portion of the Property, if any, lying below the highwater mark of Barnards Creek and the Cape Fear River.

5. Title to that portion of the Property, if any, which is marshland or which was formerly marshland.

6. Rights of third parties under boat, RV or other storage agreements and any pool membership agreements affecting the Property.

TAMMY THEUSCH BEASLEY
REGISTER OF DEEDS, NEW HANOVER
216 NORTH SECOND STREET

WILMINGTON, NC 28401

****

Filed For Registration:	12/17/2014 04:27:33 PM
Book:	RE 5857 Page: 2785-2789
Document No.:	2014033911
	5 PGS $26.00
NC REAL ESTATE EXCISE TAX:	$2,810.00
Recorder:	CRESWELL, ANDREA

State of North Carolina, County of New Hanover

PLEASE RETAIN YELLOW TRAILER PAGE WITH ORIGINAL DOCUMENT.

2014033911

2014033911

EXHIBIT C
CAMA VARIANCE PETITION
SCS VENTURES, LLC

STIPULATION

Petitioner, SCS Ventures, LLC, through its attorney, Charles S. Baldwin, IV, stipulates that the proposed development that is the subject of the variance petition is inconsistent with Coastal Resources Commission Rules 15A NCAC 7H.0208(b)(6)(G)(iii) and 15 NCAC 7H.0208(b)(6)(H).

BROOKS PIERCE
FOUNDED 1897

115 North 3rd Street, Suite 301
Wilmington, NC 28401

T 910.444.2000
F 910.444.2001
WWW.BROOKSPIERCE.COM

December 30, 2015

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

City of Wilmington
c/o Engineering Department
Post Office Box 1810
Wilmington, North Carolina 28402

Re: Variance Petition
SCS Ventures, LLC, New Hanover County, North Carolina
Our File No. 108835.1

Dear Sir or Madam:

This is to notify you that SCS Ventures, LLC is applying for a variance from the North Carolina Coastal Resources Commission for extension of the existing pier at Watermark Marina. A copy of the site plan depicting the extension is enclosed. A copy of the CAMA permit application (narrative, application forms and figures) was previously transmitted to you by correspondence from Land Management Group, Inc. dated August 12, 2015. The variance is projected to be heard at the February 9-10, 2016 meeting of the Coastal Resources Commission.

If you wish to receive further information regarding the variance, you may contact me. If you wish to make comments on the variance, you may direct your comments to the North Carolina Division of Coastal Management, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405. You may also contact CAMA Field Representative Robb Mairs directly at (910) 796-4215.

Sincerely yours,

Charles S. Baldwin, IV

CSBIV/gw
Enclosure

EXHIBIT
tabbies
D

BROOKS PIERCE
FOUNDED 1897

115 North 3rd Street, Suite 301
Wilmington, NC 28401

T 910.444.2000
F 910.444.2001
www.brookspierce.com

December 30, 2015

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

NNP IV Cape Fear River LLC
13777 Ballantyne Corporate Place, Suite 550
Charlotte, North Carolina 28277

Re: Variance Petition
SCS Ventures, LLC, New Hanover County, North Carolina
Our File No. 108835.1

Dear Sir or Madam:

This is to notify you that SCS Ventures, LLC is applying for a variance from the North Carolina Coastal Resources Commission for extension of the existing pier at Watermark Marina. A copy of the site plan depicting the extension is enclosed. A copy of the CAMA permit application (narrative, application forms and figures) was previously transmitted to you by correspondence from Land Management Group, Inc. dated August 12, 2015. The variance is projected to be heard at the February 9-10, 2016 meeting of the Coastal Resources Commission.

If you wish to receive further information regarding the variance, you may contact me. If you wish to make comments on the variance, you may direct your comments to the North Carolina Division of Coastal Management, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405. You may also contact CAMA Field Representative Robb Mairs directly at (910) 796-4215.

Sincerely yours,

Charles S. Baldwin, IV

CSBIV/gw
Enclosure

BROOKS PIERCE
FOUNDED 1897

115 North 3rd Street, Suite 301
Wilmington, NC 28401

T 910.444.2000
F 910.444.2001
www.brookspierce.com

December 30, 2015

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

NC Department of Transportation
Mr. Stoney Mathis
5501 Barbados Blvd.
Castle Hayne, North Carolina 28429

Re: Variance Petition
SCS Ventures, LLC, New Hanover County, North Carolina
Our File No. 108835.1

Dear Mr. Mathis:

This is to notify you that SCS Ventures, LLC is applying for a variance from the North Carolina Coastal Resources Commission for extension of the existing pier at Watermark Marina. A copy of the site plan depicting the extension is enclosed. A copy of the CAMA permit application (narrative, application forms and figures) was previously transmitted to you by correspondence from Land Management Group, Inc. dated August 12, 2015. The variance is projected to be heard at the February 9-10, 2016 meeting of the Coastal Resources Commission.

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Sincerely yours,

Charles S. Baldwin, IV

CSBIV/gw
Enclosure

BROOKS PIERCE
FOUNDED 1897

115 North 3rd Street, Suite 301
Wilmington, NC 28401

T 910.444.2000
F 910.444.2001
WWW.BROOKSPIERCE.COM

December 30, 2015

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Emmett C. Stovall Irrevocable Trust
c/o Coleman Commercial PR
1508 Military Cutoff Road 304
Wilmington, North Carolina 28403

Re: Variance Petition
SCS Ventures, LLC, New Hanover County, North Carolina
Our File No. 108835.1

Dear Sir or Madam:

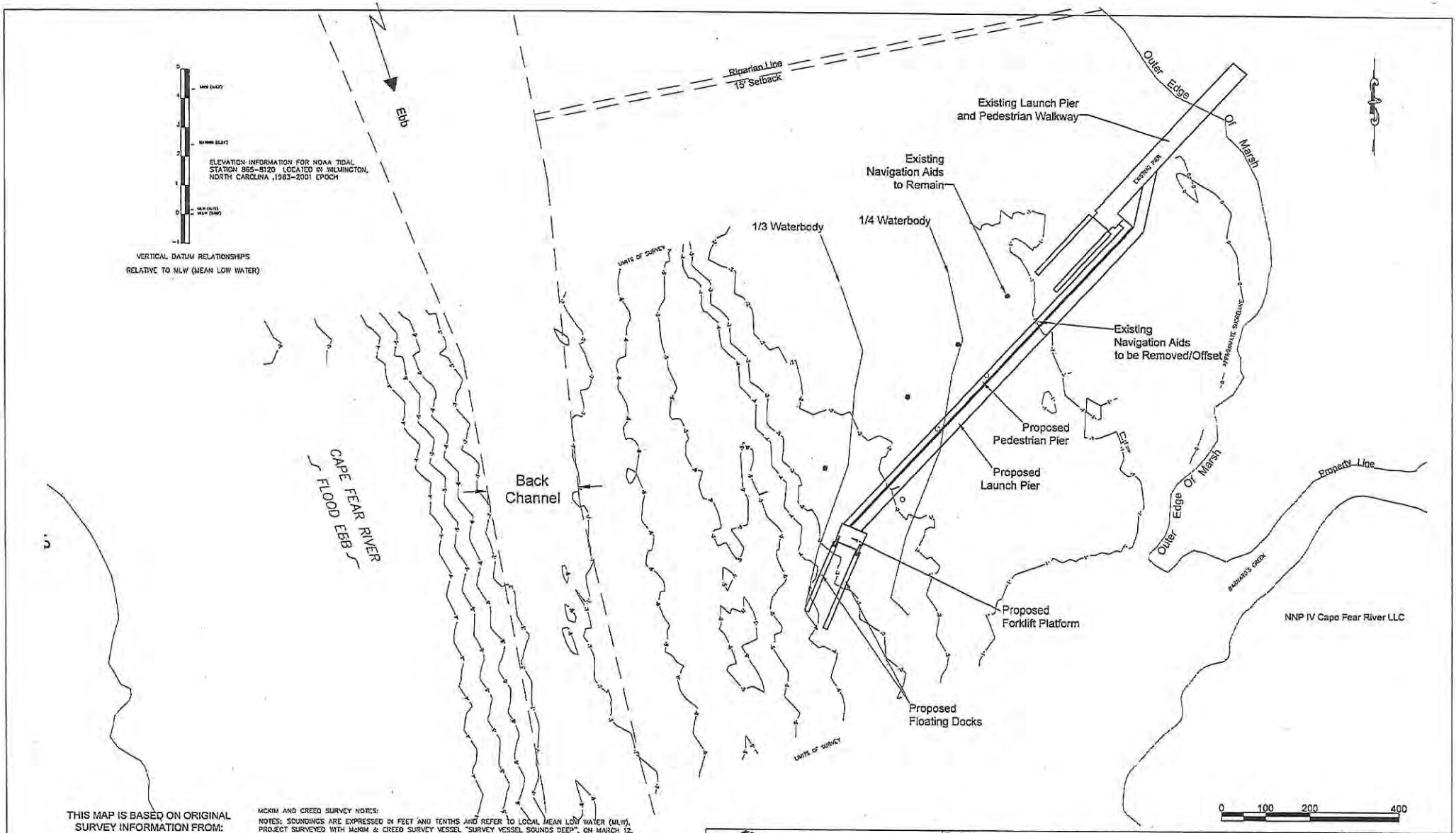
This is to notify you that SCS Ventures, LLC is applying for a variance from the North Carolina Coastal Resources Commission for extension of the existing pier at Watermark Marina. A copy of the site plan depicting the extension is enclosed. A copy of the CAMA permit application (narrative, application forms and figures) was previously transmitted to you by correspondence from Land Management Group, Inc. dated August 12, 2015. The variance is projected to be heard at the February 9-10, 2016 meeting of the Coastal Resources Commission.

If you wish to receive further information regarding the variance, you may contact me. If you wish to make comments on the variance, you may direct your comments to the North Carolina Division of Coastal Management, 127 Cardinal Drive Extension, Wilmington, North Carolina 28405. You may also contact CAMA Field Representative Robb Mairs directly at (910) 796-4215.

Sincerely yours,

Charles S. Baldwin, IV

CSBIV/gw
Enclosure



THIS MAP IS BASED ON ORIGINAL SURVEY INFORMATION FROM:

McKim & Creed
243 North Front Street
Wilmington, North Carolina 28401
Phone: (910)343-1048, Fax: (910)251-8282
www.mckimcreed.com

MCKIM AND CREED SURVEY NOTES:

NOTES: SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND REFER TO LOCAL MEAN LOW WATER (MLW). PROJECT SURVEYED WITH McKIM & CREED SURVEY VESSEL "SURVEY VESSEL SOUNDS DEEP", ON MARCH 12, 2015. FOR HORIZONTAL POSITIONING, AND 200 KHZ SOUNDING EQUIPMENT, HYPACK SOFTWARE VER. 10.1 WAS USED FOR DATA COLLECTION AND PROCESSING. HORIZONTAL DATUM NAD 1983 (2011).

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULT OF SURVEYS MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. BECAUSE THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS, A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE.

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants
3805 Wrightsville Ave., Suite 15
Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC	Date: 8/6/2015	Revision Date:	
	Scale: 1" = 200'	Job Number: 02-15-081	
Title: Proposed Structure	Drawn By: LMG	Figure: 2 of 7	

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c/o Engineering Department
Post Office Box 1810
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NC Department of Transportation
Mr. Stoney Mathis
5501 Barbados Blvd.
Castle Hayne, North Carolina 28429

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NNP IV Cape Fear River LLC
13777 Ballantyne Corporate Place, Suite 550
Charlotte, North Carolina 28277

9590 9403 0160 5120 0460 42

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1. Article Addressed to:

Emmett C. Stovall Irrevocable Trust
c/o Coleman Commercial PR
1508 Military Cutoff Road 304
Wilmington, North Carolina 28403

9590 9403 0160 5120 0460 66

2. Article Number *(Transfer from service label)*

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EXHIBIT E
TO
CAMA VARIANCE PETITION
SCS VENTURES, LLC

RESPONSE TO FOUR STATUTORY VARIANCE CRITERIA

Applicant: SCS Ventures, LLC (Watermark Marina in New Hanover County, NC)
4114 River Road
Wilmington, North Carolina 28412

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.

RESPONSE: **Yes.** The pier as constructed in accordance with the previous permit extends through an area of unusually shallow water in front of Petitioner's property, caused by a combination of the unusual shore contour of Petitioner's property that places the property in 1,025' indentation from the channel and shallow mud flats. The application of the one-fourth standard in 15 NCAC 07H.0208(b)(6)(G)(iii) prevents the pier from extending to a point in the back channel at which the mean low water (MLW) is sufficient to launch and receive boats at any time other than at or near high tide. Additionally, application of the "rate to deep water" standard in 15 NCAC 07H.0208(b)(6)(H) prevents a longer pier because of the sustained area of shallow mud flats in the shore indentation where Petitioner's property is located.

Currently, the water depth in the location of the existing forklift launch and retrieval pier is less than -1.0' MLW. This limits the launch and retrieval window from the marina, and in fact sometimes causes boats to ground when tied up at the pier. The property lies within a Primary Nursery Area (PNA), and the low water levels around the pier threaten damage to the PNA habitat as a result of boats attempting to operate in extremely shallow water. This hardship is unnecessary because the proposed pier extension, which would move the launch and retrieval pier to the one-third width mark where there is approximately -4.0' MLW, would allow much larger launch and retrieval windows, and therefore provide greater access to the public trust waters for the general public, while avoiding significant usurpation of the public trust waters and also avoiding any meaningful impairment to navigation.

Because the point on Petitioner's property from which the dock extends is located in a shoreline indentation, and because the pier extends at an angle from the shoreline rather than being directly perpendicular to the shore, the end of the proposed pier extension is still hundreds of feet away from the back channel and approximately 4,000 feet from the Cape Fear River shipping channel. Also, interference with navigation is less likely because the opposing bank of the back channel is formed by an artificial spoil site, known as Island 13, created by the Corps of Engineers from material dredged from the shipping channel, meaning that it is unlikely that any docks or other structures will extend from the opposing bank, which is much closer to the deepest water in the back channel. Additionally, in CRC-VR-13-03, the owners of a neighboring property received approval, via variance, to build a pier that would extend further into the main portion of the back channel than the Petitioner's proposed pier, further lessening any impact on navigation from the proposed pier extension. Therefore, strict application of the applicable rules unnecessarily causes hardship to Petitioner.

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

RESPONSE:

Yes. The unusual shoreline indentation at Petitioner's property causes the abnormally wide stretch of shallow water in front of the property which makes a shorter pier difficult to utilize. Additionally, because the Petitioner's property lies within a PNA, there is no possibility of implementing dredging that could ameliorate the problems caused by the large area of shallow water in the area in front of Petitioner's property.

Petitioner's property also lies along a back channel of the Cape Fear River, separated from the shipping channel of the River by a spoil disposal site. The spoil island drastically decreases the width of the water body that existed before it was created, limiting the size of pier that can be constructed under the current rules and regulations referenced above. Without the presence of the spoil island, the proposed pier extension would be well short of the ¼ mark with respect to the width of the Cape Fear River. Therefore, the hardships that exist are largely the result of the presence of the spoil island, a condition which is peculiar to the Petitioner's property.

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

RESPONSE: The Petitioner had nothing to do with the indented shape of the shoreline or the presence of shallow mud flats adjacent to its lot. Petitioner has worked towards resolving the problem by proposing extension of its pier to the south instead of straight out from the property and instead of proposing dredging which could result in potential damage to PNA habitat. Surveys over time have shown that the site conditions have not materially changed, so siltation is not an issue. Rather, the shallow water mud flats do not result from the actions of

Petitioner. The presence of the spoil site Island 13 between Petitioner's lot and the main river channel which limits the potential length of structures and access to deep water is also not the result of any action by the Petitioner.

(d) Will the variance requested by the petition:

(1) Be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission

RESPONSE: The spirit, purpose, and intent of the 1/4th rule is to prevent private piers from occupying more than a fair share of public trust waters, thereby hindering public navigation and other public uses of the water and submerged land.

The proposed pier will extend over a very shallow mud flat that extends from the Petitioner's lot to deeper water in the vicinity of the back channel. The area across which the pier will extend is not a natural navigation area and is not an area used for navigation either by the general public or by adjacent property owners. The only vessels that could use the area of the mud flat would be extremely small and shallow draft vessel such as canoes or kayaks, which could navigate around or under the pier when the tide is sufficiently high for such vessels to use the area. The proposed route takes a southern ward orientation to minimize its potential impact on the use of public trust waters and is located well within the lot's riparian corridor. The requested extension of the proposed pier will allow the Petitioner to gain access to deeper water without unduly infringing on the public's rights of navigation and use of the public trust water along this shoreline. 15 NCAC 7H.0208(b)(5)(A) specifies that marinas will be sited in deep waters not requiring dredging. By proposing to relocate the proposed development, Petitioner seeks to mitigate any adverse effects of PNA habitat by moving the proposed pier into deeper water.

(2) Secure the public safety and welfare

RESPONSE: Allowing the pier to be extended into deeper water would prevent possible navigational hazards that could occur if the pier ended in the shallower waters at the 1/4th width location. Moreover, the increased length of the proposed development does not impede the navigability of the existing back channel.

Users of the existing facility could become stranded if they tried to return to the facility when the tidal cycle resulted in water depth that is too shallow to reach the pier. This could result in strandings for extended periods of time. Further, it prevents the use of the existing property and pier for the intended and permitted purposes of the marina, including recreational boating and fishing uses. The

extended pier and navigation markers also would alert boaters unfamiliar with this area to the shallow mud flats at this location.

(3) Preserve substantial justice

RESPONSE: The pier enables a waterfront property owner to gain access to deep enough water for boat docking without unduly occupying public trust areas or interfering with public navigation or other public uses. The location of the proposed pier at the 1/3rd line is consistent with the 1/3rd line approved for a marina at 4410 River Road, Wilmington, New Hanover County by Variance Request CRC-VR-13-03.

ATTACHMENT E

STIPULATED EXHIBITS

1. DCM's December 4, 2015 modification request denial letter
2. Petitioner's application and supporting material for major modification of CAMA Major Permit #66-01 dated August 12, 2015, including, without limitation, Project plans and Figures 1-7, 2015 survey and overlays submitted with the application for major modification.
3. 2000 hydrological survey
4. 2005 McKim & Creed Survey
5. 2010 McKim & Creed Survey
6. 2014 Survey
7. CAMA Major Permit #66-01 issued 5/29/2001
8. CRC 2013/14 Variance Order for NNP (Marina to the South)
9. CRC 2014 Variance Order for CXA-10 (prior owner of this Site)
10. DCM's field report for the 2015 modification request
11. Response from Army Corps, WRC, and DCM Fisheries Resource Specialist
12. Overlay drawing for NNP's (Marina to the South) pending modification request
13. Aerial depiction of proposed pier extension to 1/3rd line at Petitioner's property and at the adjacent marina located at 4410 River Road
14. Hanover Design Service, P.A. 2000 Preliminary Plan of Pier/Dock Plan
15. Diagram showing 1,025' Property indentation.
16. Diagram showing width of waterbody and distances to main Shipping Channel.
17. PowerPoint of ground and aerial site photographs
18. PowerPoint from CXA -10 Corporation Variance Request dated July 30, 2014
19. Affidavit of Gene Strader

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

December 11, 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

SCS Ventures, LLC
c/o Mr. Mike McCarley
4114 River Road
Wilmington, NC 28412

Dear Mr. McCarley:

This letter is in response to your application for a Major Modification to Permit No. 66-01 under the Coastal Area Management Act (CAMA), in which authorization was requested to construct an extension of an existing forklift launch and retrieval pier adjacent to the Cape Fear River, at 4126 River Road in New Hanover County. Processing of the application, which was received as complete by the Division of Coastal Management's Wilmington Office on August 19, 2015 is now complete. Based on the state's review, the Division of Coastal Management has made the following findings:

1) The proposed project is a Major Modification to CAMA Major Permit No. 66-01. Permit No. 66-01 was originally issued on May 29, 2001 and has undergone several transfers, modifications and renewals. The permit was transferred to the current owner SCS Ventures, LLC on March 30, 2015. The original permit authorized the construction of the commercial dry-stack marina facility with an associated forklift launch pier and pedestrian pier. The original piers were permitted to extend less than one-quarter of the width of the waterbody at the site.

2) The application indicates that, based on a hydrographic survey conducted in March of 2015, the water depth in the location of the existing forklift launch and retrieval pier is less than -1.0' mean low water.

3) The subject property is located adjacent to the Cape Fear River and is located within a Primary Nursery Area (PNA), as designated by the North Carolina Marine Fisheries Commission.

4) Although the applicant did not propose any excavation, 15A NCAC07H.0208(b)(1) of the Coastal Resources Commission rules require excavation of new navigation channels, canals, and boat basins to be aligned or located so as to avoid Primary Nursery Areas.

5) The proposed project would extend the previously authorized forklift launch pier and pedestrian pier to a total distance of approximately 788 feet into the Cape Fear River, as measured from the outer edge of marsh.

6) The width of the natural waterbody in this project vicinity measures a distance of approximately 2,364 feet.

7) The proposed forklift launch pier and pedestrian pier would exceed the one-quarter width of the natural waterbody by approximately 197 feet.

8) The proposed forklift launch pier and pedestrian pier would extend to one-third the width of the natural waterbody.

9) The proposed forklift launch pier and pedestrian pier would locate the terminal end of the facility in approximately -4.0' mean low water.

10) The proposed forklift launch pier and pedestrian pier extension longer than 400 feet would gain deeper water at a rate of approximately 0.35 feet per 100 foot increment.

11) Based upon the above referenced findings, the Division has determined that the proposed project is inconsistent with the following Rules of the Coastal Resources Commission:

a) 15A NCAC 07H.0208(b)(6)(G)(iii), which states that pier length shall be limited by: "not extending more than one-fourth the width of a natural water body, or human-made canal or basin. Measurements to determine widths of the water body, canals or basins shall be made from the waterward edge of any coastal wetland vegetation which borders the water body…"

b) 15ANCAC 07H.0208(b)(H), which states: "Piers or docking facilities longer than 400 feet shall be permitted only if the proposed length gives access to deeper water at a rate of at least 1 foot each 100 foot increment of length longer than 400 feet, or, if the additional length is necessary to span some obstruction to navigation. Measurements to determine lengths shall be made from the waterward edge of any coastal wetland vegetation that borders the water body;"

Given the preceding findings, it is necessary that your request for issuance of a CAMA Major Permit under the Coastal Area Management Act be denied. This denial is made pursuant to N.C.G.S. 113A-120(a)(8) which requires denial for projects inconsistent with the state guidelines for Areas of Environmental Concern or local land use plans.

If you wish to appeal this denial, you are entitled to a contested case hearing. The hearing will involve appearing before an Administrative Law Judge who listens to evidence and arguments of both parties before making a final decision on the appeal. Your request for a hearing must be in the form of a written petition, complying with the requirements of §150B of the General Statutes of North Carolina, and must be filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714, within twenty (20) days from the date of this denial letter. A copy of this petition should be filed with this office.

Another response to a permit denial available to you is to petition the Coastal Resources Commission for a variance to undertake a project that is prohibited by the Rules of the Coastal Resources Commission. Applying for a variance requires that you first acknowledge and recognize that the Division of Coastal Management applied the Rules of the Coastal Resources Commission properly in processing and issuing this denial. You may then request an exception to the Commission's Rules based on hardships to you resulting from unusual conditions of the property. To apply for a variance, you must file a petition for a variance with the Director of the Division of Coastal Management and the State Attorney General's Office on a standard form, which must be accompanied by additional information on the nature of the project and the reasons for requesting a variance. The variance request may be filed at any time, but must be filed a minimum of six weeks before a scheduled Commission meeting for the variance request to be eligible to be heard at that meeting. The standard variance forms may be obtained by contacting a member of my staff, or by visiting the Division's web page at: http://www.nccoastalmanagement.net/web/cm/90.

Members of my staff are available to assist you should you desire to modify your proposal in the future. If you have any questions concerning this matter, please contact Ms. Heather Coats at (910) 796-7302.

Sincerely,

Braxton C. Davis
Director, NC Division of Coastal Management

cc: Col. Kevin P. Landers – U.S. Army Corps of Engineers, Wilmington, NC
OCRM/NOAA, Silver Spring, MD

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SCS Ventures, LLC
c/o Mike McCarley
4114 River Rd.
Wilmington, N.C. 28412
Street, Apt. No. or PO Box No.
City, State, ZIP

PS Form 3800, June 2002 See Reverse for Instructions

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| Environmental Quality | Coastal Management
l Drive Ext., Wilmington, NC 28405
910-796-7215

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants

August 12, 2015

Robb Mairs
Division of Coastal Management
127 Cardinal Drive Extension
Wilmington, N.C. 28405-3845

Re: Watermark Marina, New Hanover County
Major Modification to CAMA Permit #66-01

Robb,

On behalf of SCS Ventures, LLC please find the enclosed application and supporting materials for a Major Modification of CAMA Major Permit #66-01. This Major Modification is proposed to extend the existing launch and retrieval pier at Watermark Marina in order to provide for adequate water depths for operations throughout the tidal range. For purposes of review and permit processing, please find the attached information:

1. Project Narrative
2. Form DCM MP-1
3. Form DCM MP-4
4. Permit drawings, Sheets 1-7
5. Permit Fee check in the amount of $400.00
6. Signed Agent Authorization
7. Adjacent Riparian Notification Letters (Copy)
8. Deed (Copy)

We have mailed adjacent riparian notification letters via certified mail. The certified mail receipts will be forwarded to you as soon as we receive them. Thank you for your assistance with this project, please contact me if you have any questions or would like to schedule an on-site meeting at any point during the review process.

Sincerely,

Steve Morrison
Environmental Consultant

RECEIVED
AUG 31 2015
DCM-MHW [illegible]

RECEIVED
AUG 13 2015

RECEIVED
DCM WILMINGTON, NC
AUG 13 2015

Enclosures
CC: Michael McCarley, SCS Ventures, LLC

www.lmgroup.net • info@lmgroup.net • Phone: 910.452.0001 • Fax: 910.452.0060
3805 Wrightsville Ave., Suite 15, Wilmington, NC 28403

Project Narrative
Major Modification CAMA Permit Number 66-01
Watermark Marina
Wilmington, North Carolina
SCS Ventures LLC, Applicant
8/13/15

Introduction

This CAMA Major Permit is proposed to extend the existing launch and retrieval pier at Watermark Marina in order to provide for adequate water depths for operations throughout the tidal range. Watermark Marina features a dry storage facility for boaters with forklift transport to and from the Cape Fear River. Currently, water depths are inadequate for navigation at the end of the launching pier during a significant portion of the tidal cycle. This condition limits boating access to the river to higher tide stages and produces a major inconvenience to dry storage space holders and day customers arriving with trailered boats for launch. Beyond the impracticality of a marina not being able to launch and retrieve boats during much of the tidal cycle, this condition presents a safety hazard to boaters who launch on a high tide and are unable to return to the dock for mechanical difficulties or medical emergencies till the next high tide. Consequently, the marina is functionally unable to serve the intended purpose of providing public recreational access to the navigable waters of the Cape Fear River. In addition, under current conditions, there is a real potential for unintentional boating impacts to the soft bottom.

Existing Conditions

Waters of the Cape Fear River in the vicinity of Watermark Marina are classified as SC by the NC Division of Water Quality (DWQ). SC waters are tidal salt waters with "best usage" described as "aquatic life propagation and survival, fishing, wildlife and secondary recreation". The NC Division of Marine Fisheries (DMF) has classified the marshes and bottom areas in this location as Primary Nursery Area (PNA). DMF defines Primary Nursery Areas as "those areas in the estuarine system where initial post-larval development takes place. These areas are usually located in the uppermost sections of a system where populations are uniformly very early juveniles."

The federally maintained Cape Fear River channel is approximately 4790 feet southwest of the outer edge of the marsh at the existing launch pier. Several small islands created from dredge disposal activities associated with river channel maintenance exist between the federally maintained navigation channel and the Watermark Marina shoreline. The primary island known as Island 13 was used as a mitigation site for impacts to PNA by the Wilmington Harbor deepening project. Approximately 30 upland acres of the dredged material disposal site were excavated and graded to wetland and tidal elevations then planted with marsh plant species. The presence of these small islands creates an "inner"

or back channel, offshore of the marina launch pier, separated from the main navigation channel of the Cape Fear River by the disposal islands. The ~540' marina launch pier is located within a 1025 foot deep shoreline indentation representing a peculiar topographic disadvantage in accessing this back channel in light of existing pier length rules. Water depths within this shoreline indentation are very shallow. The latest hydrographic survey indicates water depths of less than 1' mlw at the end of the existing launching pier.

Proposed Project

In order to provide adequate water depths for the launch and retrieval of clientele boats at lower stages of the tidal cycle, the applicant proposes to construct an extension of the existing launch pier with temporary tie-up docks in a southwesterly direction out to the 1/3 water body distance of the subject back channel. The outer edge of the structure will be ~788' from the outer edge of the marsh. While remaining far from the deeper portion of the channel for purposes of navigation safety, the position of the extended pier will facilitate a continuous ability to serve the boating public accessing the river while minimizing any potential for disturbance of sensitive PNA bottom. Water depths at the launching platform are -2.8 to -2.9' mlw. The end of the proposed pier extension will feature two parallel floating docks extending from the launching platform in a southwestward direction. Depths at the outer ends of the floating docks are -3.8' and -4.2' mlw. For the length of the proposed structure beyond 400' from the outer marsh edge, water depths increase at an overall rate of .35' per 100'. The floating docks will be used as temporary tie-up locations for boaters leaving and returning to the facility. Hinged ramps will provide access from the elevated pier to the floating docks. No additional fueling dispensers will be installed. The divided pedestrian/cart boardwalk will also be extended to the end of the launch pier for safe separation from the forklift travel lane.

There is a 10,000 gallon above ground fuel storage tank located on uplands adjacent to the forklift pier. A fuel dispenser with an emergency shut-off valve is located on the existing forklift platform. The fuel dispenser and tank are currently not operational. It is the marina's policy to allow no overboard discharge of waste. There is a holding tank pumpout station currently located on the southern-most temporary tie-up dock which will continue to service the marina facility.

Navigation

As stated, the existing launch pier is sited on a back channel of the river separated by small islands from the main channel of the river. The back channel joins the main run of the river approximately 4,000' southwest and 5,500' northwest of the pier site. The next significant structure in the water to the north is beyond the point where the back channel joins the main river channel. This structure is an industrial offloading conveyor system for bulk gypsum arriving by ship. The structure extends approximately 1,565' beyond the outer edge of the marsh, or over half the width of the river which is approximately 3,048' wide in that location.

Virtually all of the river traffic between Wilmington and the Atlantic Intracoastal Waterway and the mouth of the Cape Fear at the Atlantic Ocean utilizes the main shipping channel. The primary navigation usage of the subject back channel is associated

with boat launching and retrieval from Watermark Marina and an unknown amount of occasional fishermen and pleasure boaters that have local knowledge of navigable areas outside of the shipping channel. The navigation aid pilings at Watermark Marina currently serve to guide launched boats toward the back channel offshore before turning north or south.

In general, the current Division of Coastal Management (DCM) rules limit the length of docks and piers such that they not extend beyond any established pier length, not extend into the channel portion of the water body and not extend more than ¼ the width of the water body.

There is no established pier length for this area of shoreline on the river. The nearest pier to the south is approximately 3.13 miles from the subject launch pier site. The nearest pier to the north is the 1,565'-long conveyor system structure approximately 1.1 miles from the marina site.

The "channel" portion of the water body is interpreted as the deepest (most navigable) part of the water body cross section. Water depths across the back channel near the launch pier site reach to more than -8' MLW. If the -7' MLW contour is used to define the channel portion of the water body, the edge will be located more than 442' beyond the outer end of the closest floating dock. The total width of the -7' MLW or deeper channel portion of the water body is approximately 215' wide in this location.

One of the primary justifications for the ¼ width of the water body pier and dock limitation is to preserve a significant portion of the water body for public navigation purposes. The ¼ rule assumes piers could extend to the full ¼ distance from opposite shorelines. However, in this instance, the opposite shoreline as described above is made up of small islands having been created and controlled by the Corps of Engineers and not subject to development. Therefore, there is no likelihood that a pier will ever extend from the opposing shoreline. The total width of the water body (outer marsh edge to outer marsh edge) in this location is 2364'. With the proposed launch pier extension, a 1576' width of open water containing the deepest section of the water body will remain for navigation. The applicant will install reflectors on the pilings of the floating docks and fixed pier for increased visibility during low light conditions and adhere to any additional navigational requirements as may be imposed by the Coast Guard.

Project History

CAMA Major Permit #66-01 was issued to Barnards Creek, LLC in 2001 for the construction of an elevated pier, walkway and two finger docks. The permit was renewed on December 3, 2004. The permit was transferred to Watermark Marina of Wilmington, LLC on July 12, 2005. A Minor Modification to CAMA Major Permit #66-01 was issued on August 22, 2005 and October 23, 2006. The permit was renewed on March 28, 2007 and transferred to CXA-5 Corporation on August 9, 2010. On October 16, 2012 the permit was transferred from CXA-5 Corporation to CXA-10 Corporation. Upon sale of the property, the permit was subsequently transferred to SCS Ventures LLC (current applicant).

The waterward limit of the existing structure falls short of the ¼ waterbody limit of the subject back channel. Watermark Marina has transferred ownership/management a number of times since the initial construction of the existing forklift pier and floating docks. While there is no definitive answer, it is assumed that the original applicant/owner did not maximize the full extent of the ¼ waterbody distance at the time of permitting due to the costs associated with construction of the heavy-plank wharf pier which may have represented a financial limitation. Consequently, the facility has been unable to operate as a functional marina.

The existing dry storage facility has a total capacity of 430 dry slips. There are currently only a handful of dry slips being utilized on the property. The low percentage of dry slips currently in use in comparison to the maximum capacity of the facility reflects the limited potential of the facility and results in an economic hardship for the current owner. The project as proposed is consistent with the local zoning. A Special Use Permit will not be required for the proposed modification.

A 112 slip community residential marina and commercial dry storage facility with a capacity of 80 dry slips were permitted on the property immediately to the south of Watermark Marina in 2007. The CAMA permit for that development was subsequently modified to extend the structures outward to the 1/3 waterbody distance to avoid unintentional impacts to the PNA bottom.

AGENT AUTHORIZATION FOR CAMA PERMIT APPLICATION

Name of Property Owner Applying for Permit: **SCS Ventures LLC c/o Mr. Mike McCarley**

Mailing address: **4114 River Road, Wilmington, NC, 28409**

Phone Number: **910-395-4777**

I certify that I have authorized **Land Management Group, Inc.,**
Agent / Contractor

to act on my behalf, for the purpose of applying and obtaining all CAMA permits necessary for the proposed development of **a forklift pier; launch/retrieval platform; floating docks**

---

at my property located at 4124 **4114 River Road**

in **New Hanover** County.

This certification is valid through **July 1, 2016**
Date

(Property Owner Information)

Michael E McCarley
Signature

Michael E McCarley
Print or Type Name

Member / Manager
Title

July 8, 2015
Date

910 · 395 · 4777
Phone Number

mike@carolinamarineterminal.com
Email Address

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AUG 13 2015

DCM MP-1

APPLICATION for Major Development Permit

(last revised 12/27/06)

North Carolina DIVISION OF COASTAL MANAGEMENT

1. Primary Applicant/ Landowner Information

Business Name: Scs Ventures Llc			Project Name (if applicable): Watermark Marina	
Applicant 1: First Name: c/o Mr. Mike	MI:		Last Name: McCarley	
Applicant 2: First Name:	MI:		Last Name:	
If additional applicants, please attach an additional page(s) with names listed.				
Mailing Address: 4114 River Road		PO Box:	City: Wilmington	State: NC
ZIP: 28412	Country: USA	Phone No.: 910 - 395 - 4777 ext.		FAX No.: - -
Street Address *(if different from above)*		City:	State:	ZIP: -
Email: atomlin@admci.com				

2. Agent/Contractor Information

Business Name: Land Management Group, Inc.				
Agent/ Contractor 1: First Name: Steve	MI:	Last Name: Morrison		
Agent/ Contractor 2: First Name: Laura	MI:	Last Name: Stasavich		
Mailing Address: 3805 Wrightsville Avenue, Suite 15		PO Box: NA	City: Wilmington	State: NC
ZIP: 28403		Phone No. 1: 910 - 452 - 0001 ext.	Phone No. 2: - - ext.	
FAX No.: 910 452 0060		Contractor #: NA		
Street Address *(if different from above)*: NA		City:	State:	ZIP: -
Email: smorrison@lmgroup.net				

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3. Project Location

County (can be multiple)	Street Address		State Rd. #
New Hanover	4126 River Road		1100
Subdivision Name	**City**	**State**	**Zip**
NA	Wilmington	NC	28412 -

Phone No.	Lot No.(s) *(if many, attach additional page with list)*
NA - - ext.	NA, , , ,
a. In which NC river basin is the project located? Cape Fear	b. Name of body of water nearest to proposed project Cape Fear River
c. Is the water body identified in (b) above, natural or manmade? ☒Natural ☐Manmade ☐Unknown	d. Name the closest major water body to the proposed project site. Cape Fear River
e. Is proposed work within city limits or planning jurisdiction? ☒Yes ☐No	f. If applicable, list the planning jurisdiction or city limit the proposed work falls within. City of Wilmington

4. Site Description

a. Total length of shoreline on the tract (ft.)	b. Size of entire tract (sq.ft.)
4,093 linear ft	1,760,252.56
c. Size of individual lot(s) NA, , , *(If many lot sizes, please attach additional page with a list)*	d. Approximate elevation of tract above NHW *(normal high water)* or NWL *(normal water level)* 0' - 10' ☒NHW or ☐NWL

e. Vegetation on tract

Salt marsh vegetation, native trees and shrubs, ornamental landscaping.

f. Man-made features and uses now on tract

Watermark Marina presently features a dry storage facility for boat and vehicular storage, forklift and pedestrian access piers, temporary floating docks and a clubhouse with a swimming pool. There is a 10,000 gallon above-ground, double walled fuel tank located on uplands adjacent to the forklift pier and a fuel dispenser located on the existing forklift landing, however, fuel service is currently not operational.

g. Identify and describe the existing land uses adjacent to the proposed project site.

Barnards Creek is located to the south of Watermark Marina, commercial/industrial properties are located to the north and properties to the east of River Road are residential.

h. How does local government zone the tract?	i. Is the proposed project consistent with the applicable zoning? (Attach zoning compliance certificate, if applicable)
I-2 Industrial District	☒Yes ☐No ☐NA

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j. Is the proposed activity part of an urban waterfront redevelopment proposal?	☐Yes ☒No
k. Has a professional archaeological assessment been done for the tract? If yes, attach a copy.	☒Yes ☐No ☐NA
If yes, by whom?	Brockington and Associates, Inc
l. Is the proposed project located in a National Registered Historic District or does it involve a National Register listed or eligible property?	☐Yes ☐No ☒NA

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m. (i) Are there wetlands on the site?	☒Yes ☐No
(ii) Are there coastal wetlands on the site?	☒Yes ☐No
(iii) If yes to either (i) or (ii) above, has a delineation been conducted? *(Attach documentation, if available)*	☒Yes ☐No
n. Describe existing wastewater treatment facilities. Cape Fear Public Utility Authority	
o. Describe existing drinking water supply source. Cape Fear Public Utility Authority	
p. Describe existing storm water management or treatment systems. Existing Stormwater Retention Basin	

5. Activities and Impacts

a. Will the project be for commercial, public, or private use?	☒Commercial ☐Public/Government ☐Private/Community
b. Give a brief description of purpose, use, and daily operations of the project when complete. The purpose of the proposed project is to extend the existing forklift/pedestrian pier out to deeper water depths and add additional temporary side-to dockage.	
c. Describe the proposed construction methodology, types of construction equipment to be used during construction, the number of each type of equipment and where it is to be stored. Standard marine construction methods and equipment will be used for the construction of the forklift pier, pedestrian access pier and floating docks.	
d. List all development activities you propose. Extension of a previously permitted forklift pier and pedestrian access pier, construction of associated temporary side-to dockage.	
e. Are the proposed activities maintenance of an existing project, new work, or both?	new work
f. What is the approximate total disturbed land area resulting from the proposed project?	The modification request proposes no change to the disturbed land area. ☐Sq.Ft or ☐Acres
g. Will the proposed project encroach on any public easement, public accessway or other area that the public has established use of?	☐Yes ☐No ☒NA
h. Describe location and type of existing and proposed discharges to waters of the state. No new discharges are proposed with this application.	
i. Will wastewater or stormwater be discharged into a wetland?	☐Yes ☒No ☐NA
If yes, will this discharged water be of the same salinity as the receiving water?	☐Yes ☐No ☒NA
j. Is there any mitigation proposed? If yes, attach a mitigation proposal.	☐Yes ☐No ☒NA

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6. Additional Information

In addition to this completed application form, (MP-1) the following items below, if applicable, must be submitted in order for the application package to be complete. Items (a) – (f) are always applicable to any major development application. Please consult the application instruction booklet on how to properly prepare the required items below.

a. A project narrative.

b. An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale. Please give the present status of the proposed project. Is any portion already complete? If previously authorized work, clearly indicate on maps, plats, drawings to distinguish between work completed and proposed.

c. A site or location map that is sufficiently detailed to guide agency personnel unfamiliar with the area to the site.

d. A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties.

e. The appropriate application fee. Check or money order made payable to DENR.

f. A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management.

Name Stovall Emmet C Irrevocable Trust c/o Coleman Commercial PR — Phone No. NA

Address 1508 Military Cutoff Road 304 Wilmington, NC 28403

Name NC Department of Transportation c/o Mr. Stoney Mathis — Phone No. NA

Address 5501 Barbados Blvd., Castle Hayne, NC 28429

Name NNP IV Cape Fear River LLC — Phone No. NA

Address 13777 Ballantyne Corporate Place Suite 550, Charlotte, NC 28277

g. A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

CAMA Major Permit #66-01

SW8000408

h. Signed consultant or agent authorization form, if applicable.

i. Wetland delineation, if necessary.

j. A signed AEC hazard notice for projects in oceanfront and inlet areas. *(Must be signed by property owner)*

k. A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A 1-10), if necessary. If the project involves expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

7. Certification and Permission to Enter on Land

I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit.

I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

Date Aug 13, 2015 Print Name L Stasavich, LMG Inc. (Agent)

Signature

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Please indicate application attachments pertaining to your proposed project.

☐DCM MP-2 Excavation and Fill Information
☐DCM MP-3 Upland Development
☒DCM MP-4 Structures Information
☐DCM MP-5 Bridges and Culverts

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Form DCM MP-4

STRUCTURES

(Construction within Public Trust Areas)

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

1. DOCKING FACILITY/MARINA CHARACTERISTICS

☐ *This section not applicable*

a. (i) Is the docking facility/marina:
☒Commercial ☐Public/Government ☐Private/Community

b. (i) Will the facility be open to the general public?
☐Yes ☒No

c. (i) Dock(s) and/or pier(s)
(ii) Number 2 fixed piers- pedestrian and forklift
(iii) Length 957' and 1,058'
(iv) Width 14' and 24'
(v) Floating ☐Yes ☒No

d. (i) Are Finger Piers included? ☒Yes ☐No
If yes:
(ii) Number 2 floating docks
(iii) Length 172' and 192'
(iv) Width 10' and 10'
(v) Floating ☒Yes ☐No

e. (i) Are Platforms included? ☒Yes ☐No
If yes:
(ii) Number 1 - new forklift launch/retrieval platform
(iii) Length roughly 60' (total area = 2,420 sq.ft.)
(iv) Width roughly 43' (total area =2,420 sq.ft.)
(v) Floating ☐Yes ☒No
Note: Roofed areas are calculated from dripline dimensions.

f. (i) Are Boatlifts included? ☐Yes ☒No
If yes:
(ii) Number _____
(iii) Length _____
(iv) Width _____

g. (i) Number of slips proposed
728 linear ft side-to temporary dockage at proposed launch/retrieval area-Using both sides of floating docks
(ii) Number of slips existing
720 linear ft side-to temporary dockage

h. Check all the types of services to be provided.
☐ Full service, including travel lift and/or rail, repair or maintenance service
☐ Dockage, fuel, and marine supplies
☒ Dockage ("wet slips") only, number of slips: 728 lf temporary
☒ Dry storage; number of boats: no change proposed to existing permit
☐ Boat ramp(s); number of boat ramps: _____
☒ Other, please describe:
720 linear ft temp dockage existing

i. Check the proposed type of siting:
☐ Land cut and access channel
☐Open water; dredging for basin and/or channel
☒Open water; no dredging required
☐Other; please describe:
_____

j. Describe the typical boats to be served (e.g., open runabout, charter boats, sail boats, mixed types).
mixed types

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k. Typical boat length: up to 40'

l. (i) Will the facility be open to the general public?

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m. (i) Will the facility have tie pilings? ☐Yes ☒No ☐Yes ☒No

(ii) If yes number of tie pilings?

NA

2. DOCKING FACILITY/MARINA OPERATIONS

☐ *This section not applicable*

a. Check each of the following sanitary facilities that will be included in the proposed project.

☒ Office Toilets

☒ Toilets for patrons; Number: >2; Location: clubhouse - existing

☒ Showers

☒ Boatholding tank pumpout; Give type and location: located on existing floating docks - authorized in CAMA Major Permit 66-01

b. Describe treatment type and disposal location for all sanitary wastewater.

community sewer- Cape Fear Public Utility Authority

c. Describe the disposal of solid waste, fish offal and trash.

trash bins and dumpsters at various locations

d. How will overboard discharge of sewage from boats be controlled?

no overboard discharge policy

e. (i) Give the location and number of "No Sewage Discharge" signs proposed.

1 - on proposed pedestrian pier

(ii) Give the location and number of "Pumpout Available" signs proposed.

1 - on proposed pedestrian pier

f. Describe the special design, if applicable, for containing industrial type pollutants, such as paint, sandblasting waste and petroleum products.

no maintenance activities, emergency shut-off valve for fuel on existing forklift platform

g. Where will residue from vessel maintenance be disposed of?

no maintenance activities

h. Give the number of channel markers and "No Wake" signs proposed. 8 channel markers existing, 4 of existing markers to be removed or relocated.

i. Give the location of fuel-handling facilities, and describe the safety measures planned to protect area water quality.

Above-ground storage tank adjacent to forklift pier, fuel dispenser on existing forklift platform with emergency shut-off valve

j. What will be the marina policy on overnight and live-aboard dockage?

no overnight and no live-aboard allowed- all dockage temporary

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k. Describe design measures that promote boat basin flushing?

NA- open water siting

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l. If this project is an expansion of an existing marina, what types of services are currently provided?
Existing services are fueling, holding tank pumpout and dry stack launch and retrieval

m. Is the marina/docking facility proposed within a primary or secondary nursery area?
☒Yes ☐No

n. Is the marina/docking facility proposed within or adjacent to any shellfish harvesting area?
☐Yes ☒No

o. Is the marina/docking facility proposed within or adjacent to coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.
☐CW _____ ☐SAV _____ ☐SB _____
☐WL _____ ☒None

p. Is the proposed marina/docking facility located within or within close proximity to any shellfish leases? ☐Yes ☒No
If yes, give the name and address of the leaseholder(s), and give the proximity to the lease.

3. BOATHOUSE *(including covered lifts)*

☒*This section not applicable*

a. (i) Is the boathouse structure(s):
☐Commercial ☐Public/Government ☐Private/Community
(ii) Number _____
(iii) Length _____
(iv) Width _____
Note: Roofed areas are calculated from dripline dimensions.

4. GROIN *(e.g., wood, sheetpile, etc. If a rock groin, use MP-2, Excavation and Fill.)*

☒*This section not applicable*

a. (i) Number _____
(ii) Length _____
(iii) Width _____

5. BREAKWATER *(e.g., wood, sheetpile, etc.)*

☒*This section not applicable*

a. Length _____

b. Average distance from NHW, NWL, or wetlands
_____

c. Maximum distance beyond NHW, NWL or wetlands
_____

6. MOORING PILINGS and BUOYS

☒*This section not applicable*

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a. Is the structure(s):
☐Commercial ☐Public/Government ☐Private/Community

b. Number _____

c. Distance to be placed beyond shoreline _____
Note: This should be measured from marsh edge, if present.

d. Description of buoy (color, inscription, size, anchor, etc.)

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e. Arc of the swing ____

7. GENERAL

a. Proximity of structure(s) to adjacent riparian property lines
greater than 15'

Note: For buoy or mooring piling, use arc of swing including length of vessel.

b. Proximity of structure(s) to adjacent docking facilities.
greater than 5700' to National Gypsum Conveyor Pier

c. Width of water body
~2,364'

d. Water depth at waterward end of structure at NLW or NWL
-4' MLW

e. (i) Will navigational aids be required as a result of the project?
☒Yes ☐No ☐NA
(ii) If yes, explain what type and how they will be implemented.
Voluntary - Reflectors on floating dock pilings

8. OTHER

☒ *This section not applicable*

a. Give complete description:

Revised 8/25/15
Date

Watermark Marina
Project Name

SCS Ventures
Applicant Name

[signature], agent Land Management Corp
Applicant Signature

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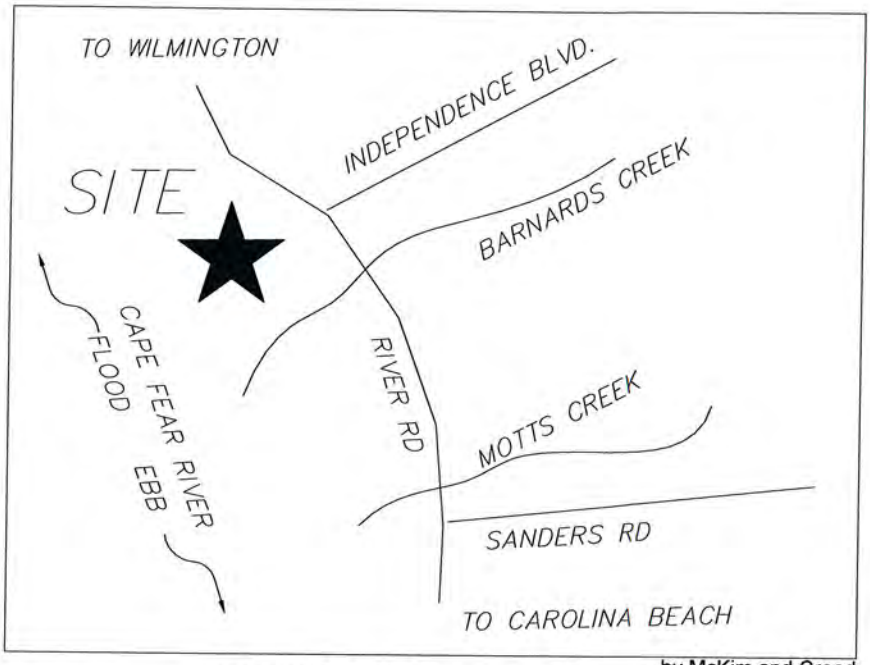
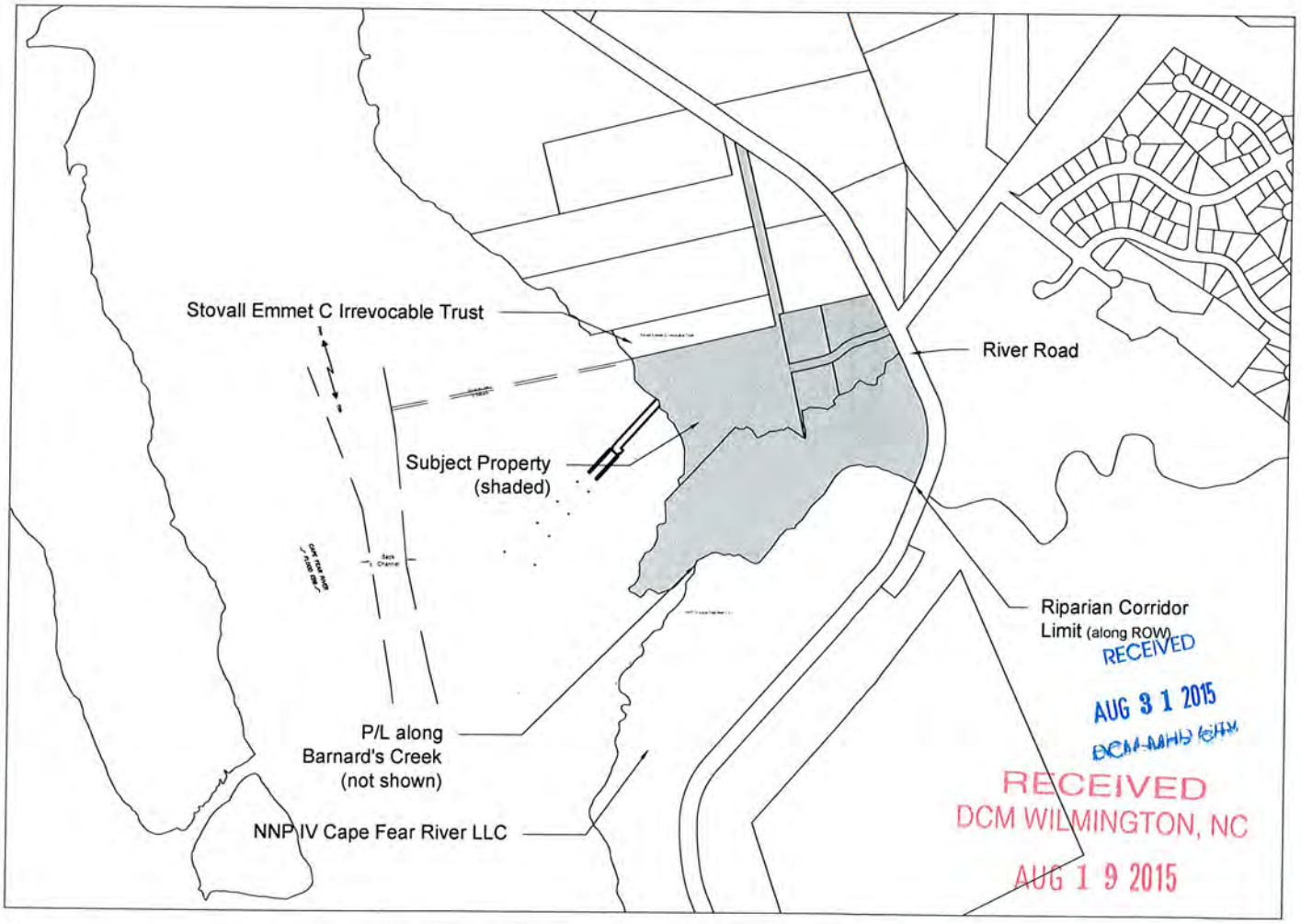


by McKim and Creed

VICINITY MAP - NOT TO SCALE



LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants
3805 Wrightsville Ave., Suite 15
Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 8/17/2015	Revision Date:
		Scale: nts	Job Number: 02-15-081
Title: Vicinity Map		Drawn By:	Figure: 1 of 7

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants

August 19, 2015

TO: Robb Mairs
NC Division of Coastal Management
127 Cardinal Drive Ext.
Wilmington, NC 28405

RE: CAMA Major Permit Application, Watermark Marina, New Hanover County
Certified Mail Receipts

Dear Robb:

Please find enclosed original certified mail receipts from the adjacent landowner notifications for the above-referenced application.

Sincerely,

Laura Stasavich
Land Management Group, Inc.

Encl. as stated

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www.lmgroup.net • Phone: 910.452.0001 • Fax: 910.452.0060
3805 Wrightsville Ave., Suite 15, Wilmington, NC 28403

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

NNP IV Cape Fear River LLC
13777 Ballantyne Corporate Place
Suite 500
Charlotte, NC 28277

9590 9403 0119 5077 8186 51

2. Article Number *(Transfer from service label)*
7005 2570 0000 5704 1560

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x Joyce Walker ☑ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery
8/17

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DCM WILMINGTON, NC

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

AUG 21 2015

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☑ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ ed Mail
☐ ed Mail Restricted Delivery
☐ $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receip

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

NC DOT
C/O Stacey Mathis
5501 Barbados Blvd.
Castle Hayne, NC 28429

9590 9403 0119 5077 8186 68

2. Article Number *(Transfer from service label)*
7005 2570 0000 5704 1577

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x Melodee Troy ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery
Melodee Troy

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
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☐ er $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery
Ian Conlin 8/17/15

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Stovall Summerlin Must
C/O Coleman Commercial PR
1508 Military Cutoff Rd. 304
Wilmington, NC 28403

9590 9403 0119 5077 8186 44

2. Article Number *(Transfer from service label)*
7005 2570 0000 5704 1553

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

NCDENR
North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

August 27, 2015

Steve Morrison
c/o Land Management Group, Inc.
3805 Wrightsville Avenue
Wilmington, North Carolina 28403

Dear Mr. Morrison:

The Division of Coastal Management hereby acknowledges receipt of your application, acting as agent for SCS Ventures, LLC c/o Mike McCarley, for State approval for the proposed development at 4126 River Road, adjacent to the Cape Fear River, Wilmington, in New Hanover County. It was received as complete on August 19, 2015, and appears to be adequate for processing at this time. The projected deadline for making a decision is November 3, 2015. An additional 75-day review period is provided by law when such time is necessary to complete the review. If you have not been notified of a final action by the initial deadline stated above, you should consider the review period extended. Under those circumstances, this letter will serve as your notice of an extended review. However, an additional letter will be provided on or about the 75th day.

If this agency does not render a permit decision within 70 days from August 19, 2015, you may request a meeting with the Director of the Division of Coastal Management and permit staff to discuss the status of your project. Such a meeting will be held within five working days from the receipt of your written request and shall include the property owner, developer, and project designer/consultant.

NCGS 113A-119(b) requires that Notice of an application be posted at the location of the proposed development. Enclosed you will find a "Notice of Permit Filing" postcard which must be posted at the property of your proposed development. You should post this notice at a conspicuous point along your property where it can be observed from a public road. Some examples would be: Nailing the notice card to a telephone pole or tree along the road right-of-way fronting your property; or at a point along the road right-of-way where a private road would lead one into your property. Failure to post this notice could result in an incomplete application.

A field report has been prepared and is in the process of being circulated to the various state and federal review agencies for their comments. If additional information is required based on this review, the agencies may contact you directly.

Sincerely,

Robb L. Mairs
Field Representative

cc: Heather Coats, DCM
Tyler Crumbley, USACE
Ken Vafier, NH Co.
Kathryn Thurston, City of Wilmington
Mike McCarley, Applicant
MHC

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127 Cardinal Drive Ext., Wilmington, NC 28405
Phone: 910-796-7215 \ FAX: 910-395-3964 Internet: www.nccoastalmanagement.net

NOTICE

CAMA PERMIT APPLIED FOR

PROJECT: ***Applicant proposes to extend an existing launch & retrieval pier into deeper waters of the Cape Fear River, at 4126 River Rd., (Watermark Marina), in Wilmington, New Hanover County.***

COMMENTS ACCEPTED THROUGH ***September 19, 2015***

APPLICANT:

SCS Ventures, LLC
c/o Mike McCarley
4114 River Road
Wilmington, NC 28412

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FOR MORE DETAILS CONTACT
THE LOCAL PERMIT OFFICER BELOW:

NC Div. of Coastal Management
127 Cardinal Dr. Extension
Wilmington, NC 28405
Robb Mairs, Field Representative
910-796-7423

Agent: Steve Morrison (910)452-0001

NCDENR

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

August 27, 2015

Advertising@starnewsonline.com
2 Pages

Star News
Legal Advertisement Section
Post Office Box 840
Wilmington, North Carolina 28402

Re: ***Watermark*** Major Public Notice

Kyle & Heather: Please publish the attached Notice in the ***Saturday, August 29, 2015*** issue.

The State Office of Budget & Management requires an original Affidavit of Publication prior to payment for newspaper advertising.

Please send the original affidavit and invoice for payment to Shaun Simpson at the NC Divison of Coastal Management, 127 Cardinal Drive Extension, Wilmington, NC 28405, 910-796-7226. Paying by Credit Card (number on file with Elsa Lawrence, Ref acct # 796-7215). Please send a copy of the credit card receipt to me.

Thank you for your assistance in this matter. If you should have any questions, please contact me at our Wilmington office.

Sincerely,

Shaun K. Simpson
Permit & Customer Support
Division of Coastal Management

cc: Doug Huggett MHC DCM
Heather Coats - WIRO DCM
Tyler Crumbley – USACE
Michele Walker- DCM

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N. C. Division of Coastal Management
127 Cardinal Drive Ext., Wilmington, NC 28405
Phone: 910-796-7215 \ FAX: 910-395-3964 Internet: www.nccoastalmanagement.net

NOTICE OF FILING OF
APPLICATION FOR CAMA MAJOR
DEVELOPMENT PERMIT

The Department of Environment and Natural Resources hereby gives public notice as required by NCGS 113A-119(b) that the following application was submitted for a development permit in an Area of Environmental Concern as designated under the CAMA. According to said application, ***On August 19, 2015, SCS Ventures, LLC c/o Mike McCarley proposed to extend an existing launch & retrieval pier into deeper waters of the Cape Fear River, at 4126 River Road (Watermark Marina) in Wilmington, New Hanover County;*** *A* copy of the application may be examined or copied at the office of Robb Mairs, N.C. Dept. of Environment & Natural Resources, Div. of Coastal Management, 127 Cardinal Drive Ext., Wilmington, North Carolina 28405, (910-796-7423) during normal business hours.

Comments mailed to Braxton C. Davis, Director, Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557-3421, prior to ***September 19, 2015*** will be considered in making the permit decision. Later comments will be accepted and considered up to the time of permit decision. Project modification may occur based on review and comment by the public and state and federal agencies. Notice of the permit decision in these matters will be provided upon written request.

ELEVATION INFORMATION FOR NOAA TIDAL STATION 865-8120 LOCATED IN WILMINGTON, NORTH CAROLINA ,1983-2001 EPOCH

VERTICAL DATUM RELATIONSHIPS

RELATIVE TO MLW (MEAN LOW WATER)

Ebb

Riparian Line
15' Setback

Outer Edge Of Marsh

Existing Launch Pier
and Pedestrian Walkway

Existing
Navigation Aids
to Remain

1/3 Waterbody

1/4 Waterbody

EXISTING PIER

APPROXIMATE SHORELINE

Existing
Navigation Aids
to be Removed/Offset

LIMITS OF SURVEY

Proposed
Pedestrian Pier

Proposed
Launch Pier

Back
Channel

CAPE FEAR RIVER
FLOOD EBB

Outer Edge Of Marsh

Property Line

BARNARD'S CREEK

Proposed
Forklift Platform

NNP IV Cape Fear River LLC

Proposed
Floating Docks

LIMITS OF SURVEY

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DCM-WILMINGTON

RECEIVED
DCM WILMINGTON, NC
AUG 19 2015

0 100 200 400

THIS MAP IS BASED ON ORIGINAL SURVEY INFORMATION FROM:

McKim & Creed
243 North Front Street
Wilmington, North Carolina 28401
Phone: (910)343-1048, Fax: (910)251-8282
www.mckimcreed.com

MCKIM AND CREED SURVEY NOTES:

NOTES: SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND REFER TO LOCAL MEAN LOW WATER (MLW). PROJECT SURVEYED WITH McKIM & CREED SURVEY VESSEL "SURVEY VESSEL SOUNDS DEEP", ON MARCH 12, 2015. FOR HORIZONTAL POSITIONING, AND 200 KHZ SOUNDING EQUIPMENT. HYPACK SOFTWARE VER. 10.1 WAS USED FOR DATA COLLECTION AND PROCESSING. HORIZONTAL DATUM NAD 1983 (2011).

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULT OF SURVEYS MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. BECAUSE THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS, A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE.

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants
3805 Wrightsville Ave., Suite 15
Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 8/17/2015	Revision Date:
		Scale: 1" = 200'	Job Number: 02-15-081
Title: Proposed Structure		Drawn By: LMG	Figure: 2 of 7

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0 150 300 600

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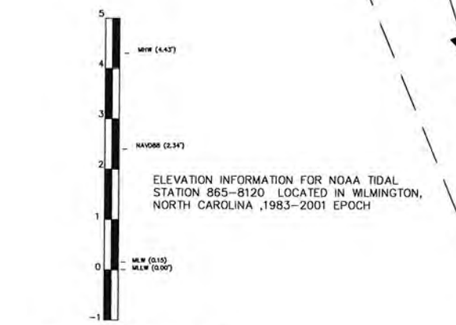
Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 8/17/2015	Revision Date: 8/26/2015
		Scale: 1" = 300'	Job Number: 02-15-081
Title: Proposed Structure		Drawn By: LMG	Figure: 2a of 7



ELEVATION INFORMATION FOR NOAA TIDAL STATION 865-8120 LOCATED IN WILMINGTON, NORTH CAROLINA ,1983-2001 EPOCH

VERTICAL DATUM RELATIONSHIPS

RELATIVE TO MLW (MEAN LOW WATER)

Ebb

Riparian Line
15' Setback

Outer Edge Of Marsh

Existing Launch Pier and Pedestrian Walkway

Existing Navigation Aids to Remain

1/3 Waterbody

1/4 Waterbody

LIMITS OF SURVEY

EXISTING PIER

APPROXIMATE SHORELINE

Existing Navigation Aids to be Removed/Offset

Proposed Pedestrian Pier

Proposed Launch Pier

Proposed Forklift Platform

Proposed Floating Docks

Back Channel

CAPE FEAR RIVER
FLOOD EBB

Outer Edge Of Marsh

Property Line

BARNARD'S CREEK

NNP IV Cape Fear River LLC

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AUG 19 2015

0 100 200 400

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Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 8/17/2015	Revision Date:
		Scale: 1" = 200'	Job Number: 02-15-081
Title: Proposed Structure		Drawn By: LMG	Figure: 2 of 7

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0 150 300 600

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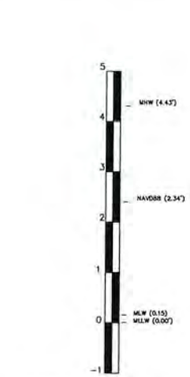
Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC	Date: 8/17/2015	Revision Date: 8/26/2015
	Scale: 1" = 300'	Job Number: 02-15-081
Title: Proposed Structure	Drawn By: LMG	Figure: 2a of 7



VERTICAL DATUM RELATIONSHIPS

RELATIVE TO MLW (MEAN LOW WATER)

ELEVATION INFORMATION FOR NOAA TIDAL STATION 865-8120 LOCATED IN WILMINGTON, NORTH CAROLINA ,1983-2001 EPOCH

Ebb

Property Line

Riparian Line
15' Setback

Outer Edge Of Marsh

Existing Launch Pier
and Pedestrian Walkway

Existing
Navigation Aids
to Remain

1/3 Waterbody

1/4 Waterbody

LIMITS OF SURVEY

134.1

EXISTING PIER

27.8

145.4

Existing
Navigation Aids
to be Removed/Offset

APPROXIMATE SHORELINE

941.7

CAPE FEAR RIVER
FLOOD EBB

Back
Channel

442.7

215

Outer Edge Of Marsh

Property Line

BARNARD'S CREEK

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NNP IV Cape Fear River LLC

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AUG 19 2015

0 100 200 400

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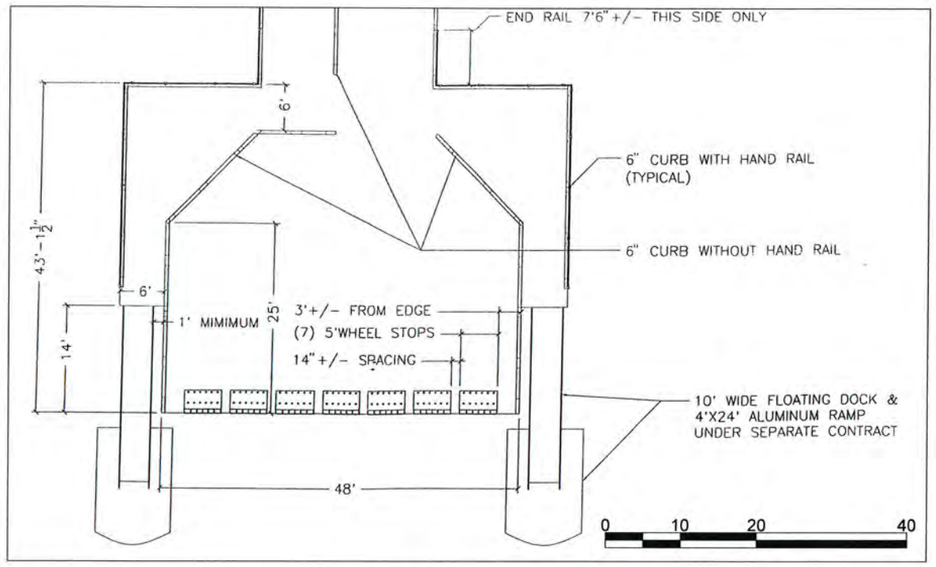
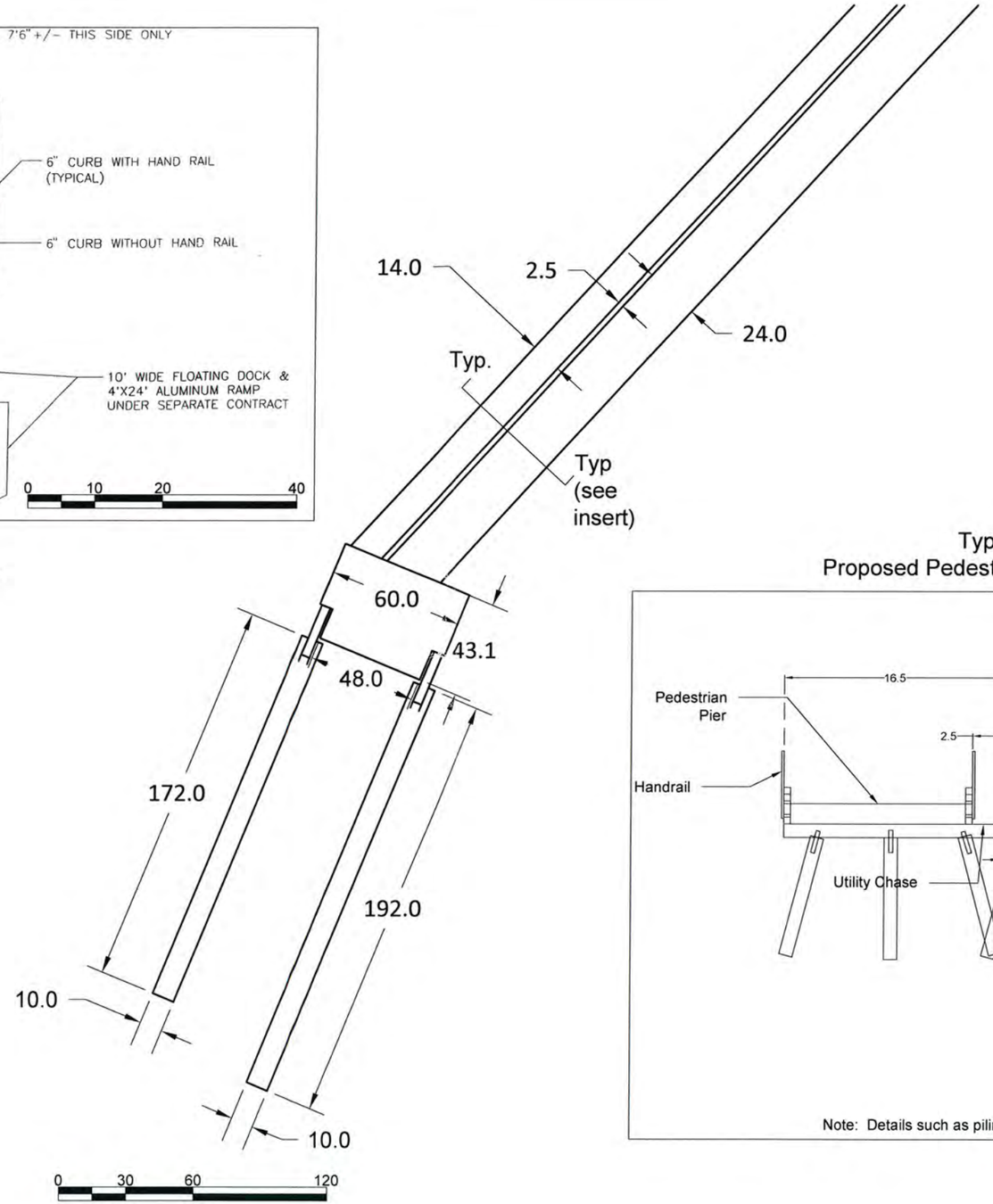
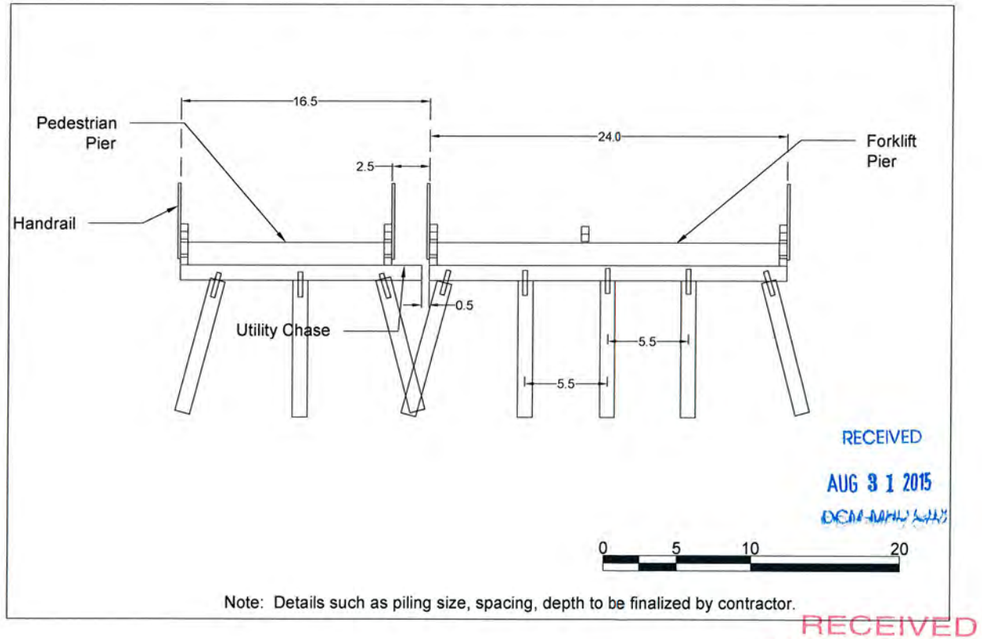
Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 8/17/2015	Revision Date:
		Scale: 1" = 200'	Job Number: 02-15-081
Title: Proposed Structure Details		Drawn By: LMG	Figure: 3 of 7



Detailed Plan View
Proposed Forklift Platform



Typical Cross Section
Proposed Pedestrian and Launch Pier Extension



Note: Details such as piling size, spacing, depth to be finalized by contractor.

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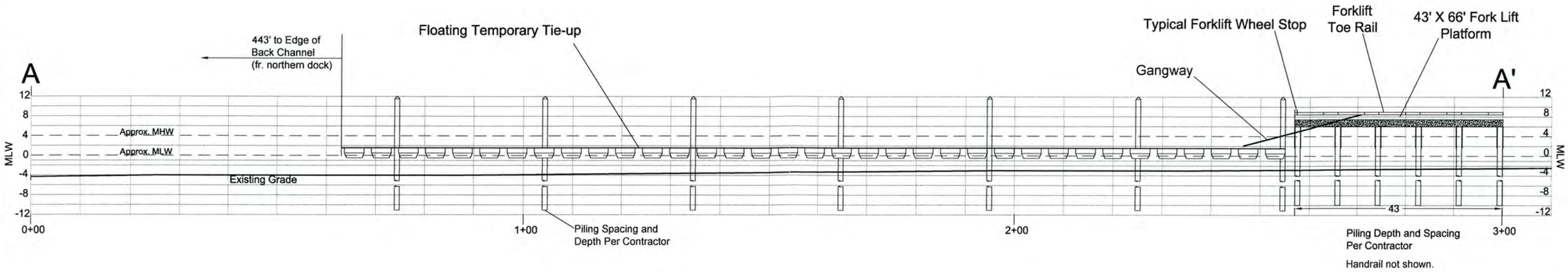
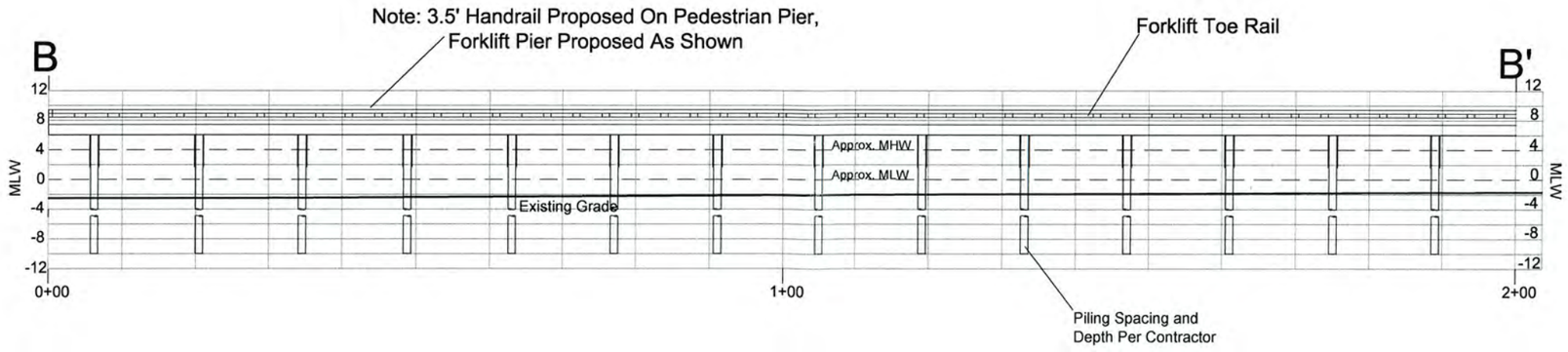
Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC	Date: 6/10/2015	Revision Date:	
	Scale: 1" = 60'	Job Number: 02-15-081	
Title: Details Proposed Forklift Platform	Drawn By: LMG	Figure: 4 of 7	

PROFILE A



PROFILE B



see Sheet 3 for cross section location

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AUG 19 2015

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LAND MANAGEMENT GROUP INC.
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Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC	Date: 6/10/2015	Revision Date:	
	Scale: 1" = 20'	Job Number: 02-15-081	
Title: Profiles of Proposed Structure	Drawn By: LMG	Figure: 5 of 7	

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants
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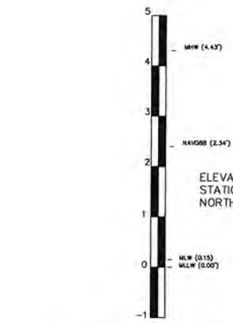
Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification, Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: 6/10/2015	Revision Date:
		Scale: 1" = 1000'	Job Number: 02-15-081
Title: Location within Waterbody		Drawn By: LMG	Figure: 6 of 7



ELEVATION INFORMATION FOR NOAA TIDAL STATION 865-8120 LOCATED IN WILMINGTON, NORTH CAROLINA ,1983-2001 EPOCH

VERTICAL DATUM RELATIONSHIPS

RELATIVE TO MLW (MEAN LOW WATER)

Existing Navigation Aids to Remain

Existing Launch Pier and Pedestrian Walkway

EXISTING PIER

Marsh

1/3 Waterbody

1/4 Waterbody

LIMITS OF SURVEY

Existing Navigation Aids to be Removed/Offset

APPROXIMATE SHORELINE

Proposed Pedestrian Pier

Proposed Forklift Launch Pier

Back Channel

CAPE FEAR RIVER

FLOOD EBB

Island 13

Outer Edge Of Marsh

Outer Edge Of Marsh

Property Line

BARNARD'S CREEK

Barnards Creek

788

2364

1576

LIMITS OF SURVEY

NNP IV Cape Fear River LL

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DCM WILMINGTON, NC

AUG 19 2015

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		Scale: 1" = 200'	Job Number: 02-15-081
Title: Waterbody Detail		Drawn By: LMG	Figure: 7 of 7

LINE	BEARING	DISTANCE
70	S 24°15'28"E	10.37
71	S 09°43'00"E	10.00
72	S 09°43'00"E	10.00
73	N 40°54'37"W	7.32
74	N 39°48'07"W	4.35

LINE	BEARING	DISTANCE
1	N 61°49'52"E	14.62
2	N 40°16'03"E	33.51
3	N 22°02'30"W	20.95
4	N 61°20'47"E	29.11
5	N 58°06'40"E	22.60
6	S 67°26'15"E	16.10
7	S 79°38'41"E	35.21
8	S 86°00'25"E	20.86
9	S 84°28'53"E	36.19
10	N 67°59'09"E	42.22
11	N 07°23'52"W	44.79
12	N 00°18'03"W	33.28
13	N 15°18'52"W	33.10
14	N 01°06'05"E	33.92
15	N 02°33'20"E	11.99
16	N 71°38'29"E	9.69
17	S 53°03'37"E	113.13
18	N 62°57'08"E	33.27
19	S 72°47'39"E	13.26
20	N 76°02'59"E	27.55
21	N 89°46'41"E	38.52
22	N 60°48'42"E	39.75
23	S 89°09'03"E	9.07
24	N 50°31'17"E	9.99
25	N 77°39'28"E	21.30

NOTES:
PROPERTY SURVEYED BY HANOVER DESIGN SERVICES.
THIS PROPERTIES SOUTHERN LINE IS TO THE LOW WATER LINE OF THE CAPE FEAR RIVER.
THE HIGH WATER LINE WAS SURVEYED FOR THE PURPOSE OF DEVELOPING THE HIGH GROUND.
AREA IS COMPUTED BY COORDINATE METHOD.
WETLAND DELINEATION BY LAND MANAGEMENT GROUP.
TOPOPGRAPHIC INFORMATION BY HANOVER DESIGN SERVICES.
COD LINE ESTABLISHED BY NEW HANOVER COUNTY PLANNING DEPARTMENT.

CURVE	DELTA	RADIUS	ARC	CHORD	TANGENT	CHORD BRG
1	9°01'28"	993.00	156.40	156.24	78.36	N 70°15'16"E
2	9°20'00"	1043.00	169.90	169.72	85.14	N 70°24'32"E

SITE DATA	
TOTAL AREA IN TRACT	11.9 AC
AREA TO BE DISTURBED	10.6 AC
AREA BELOW WETLANDS TO BE UNDISTURBED	1.3 AC
PROPOERTY IS ZONED I-2	
WATER BY INDIVIDUAL WELL	
SANITARY SEWER BY INDIVIDUAL WELL	

SITE DATA

AREA IN TRACT 11.9 ACRES (ABOVE HIGH WATER LINE)
PROPOSED DISTURBED AREA = 10.6 ACRES
AREA BELOW WETLANDS = 1.3 ACRES
SANITARY SEWER BY INDIVIDUAL SEPTIC SYSTEM
WATER BY INDIVIDUAL WELL
PROPERTY ZONED I-2

River Road Boat Storage
Masonboro Township New Hanover County North Carolina

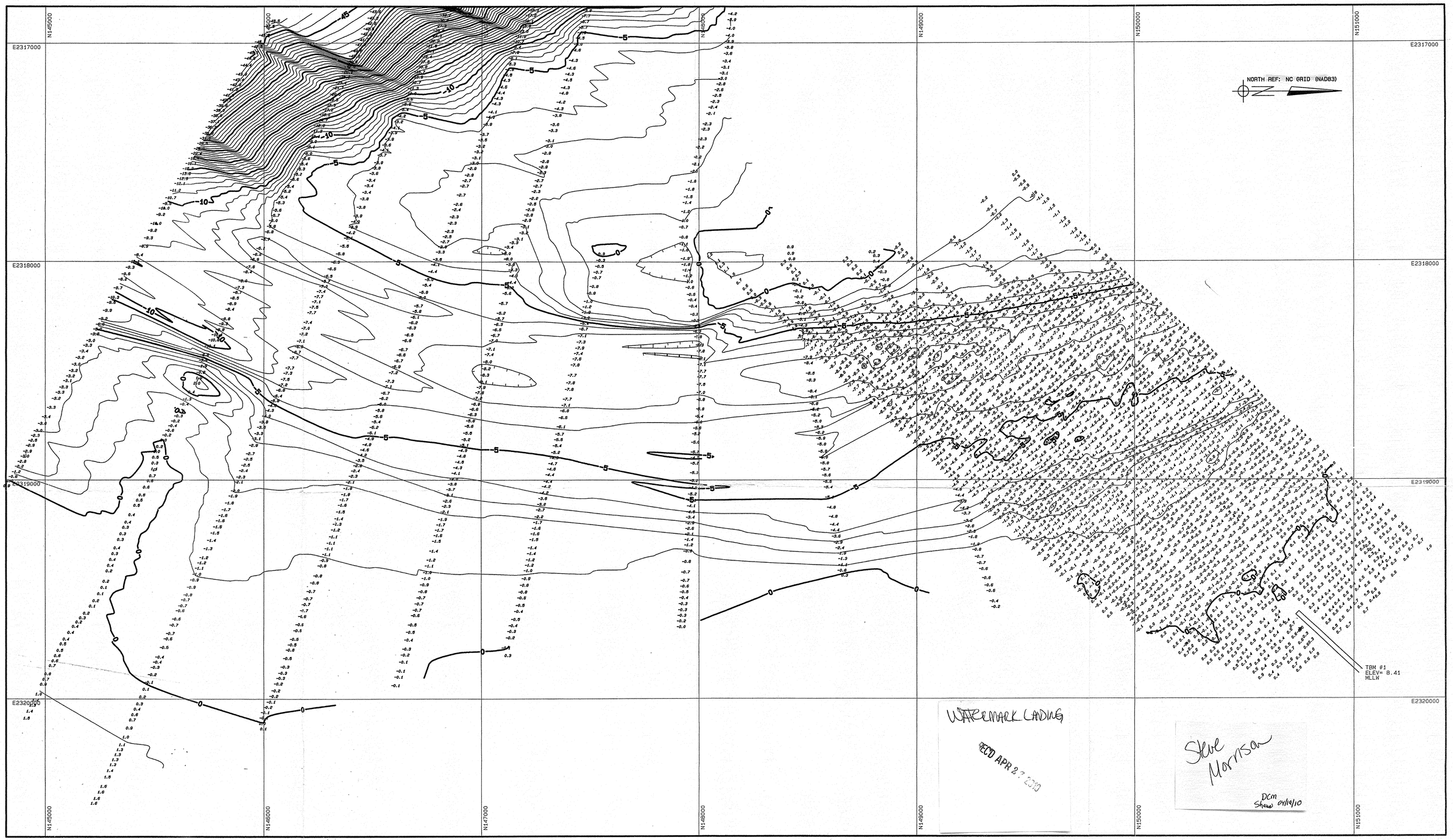
Design By: H.D.S.
Drawn By: J.J.
Scale: 1" = 60'
Date:

Preliminary Plan

Sheet: 1 of 2
Project No: 6759PRES.DWG JJ

Owner / Developer: Barnards Creek, LLC
P.O. Box 1083
Wilmington, North Carolina 28402

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343-8002



WATERMARK LANDING

RECD APR 27 2010

Steve Morrison

DCM Shared 04/19/10

RECEIVED
APR 27 2010
DCM WILMINGTON, NC

RECEIVED
DCM WILMINGTON, NC
MAY 16 2006

SCALE 1"=200'

0 100 200 400 600

NOTES:
SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND REFER TO LOCAL MEAN LOWER LOW WATER (MLLW).
STAFF GAGE LOCATED ON SW BRIDGE FENDER.
PROJECT SURVEYED WITH McKIM & CREED SURVEY VESSEL "HYDRO PHILLIE", ON SEPTEMBER 22 & 29, 2005 USING DGPS FOR HORIZONTAL POSITIONING, AND 200 KHZ SOUNDING EQUIPMENT. HYPACK SOFTWARE VER. 4.3 WAS USED FOR DATA COLLECTION AND PROCESSING.
HORIZONTAL DATUM NAD 1983.

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULT OF SURVEYS MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. BECAUSE THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS, A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE.

DATE:	REVISION:	INT.:
10/07/05	CHANGED TITLE FROM 28kHz TO 200kHz	TJC
10/07/05	ADDED TBM	TJC

McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
(910) 343-1048

INTERNET SITE http://www.mckimcreed.com

NORTH CAROLINA PROFESSIONAL SEAL L-3390 SURVEYOR TIMOTHY J. CRAWFORD

DATE 10-10-05

EXISTING CONDITIONS SURVEY
CAPE FEAR RIVER near BARNARD'S CREEK
for Watermark Marinas
200 kHz

September 29, 2005

Prepared for:
Watermark Marinas
Southfork Development Group
5110 Hillsdale Circle, Suite 300
El Dorado Hills, CA 95762

PROJECT # : 04073-0003
PROJ. SVYR : TJC
DRAWN BY : TJC
FIELD BK. :
COMP. FILE : vh_040730003

SHEET # : 1 of 2

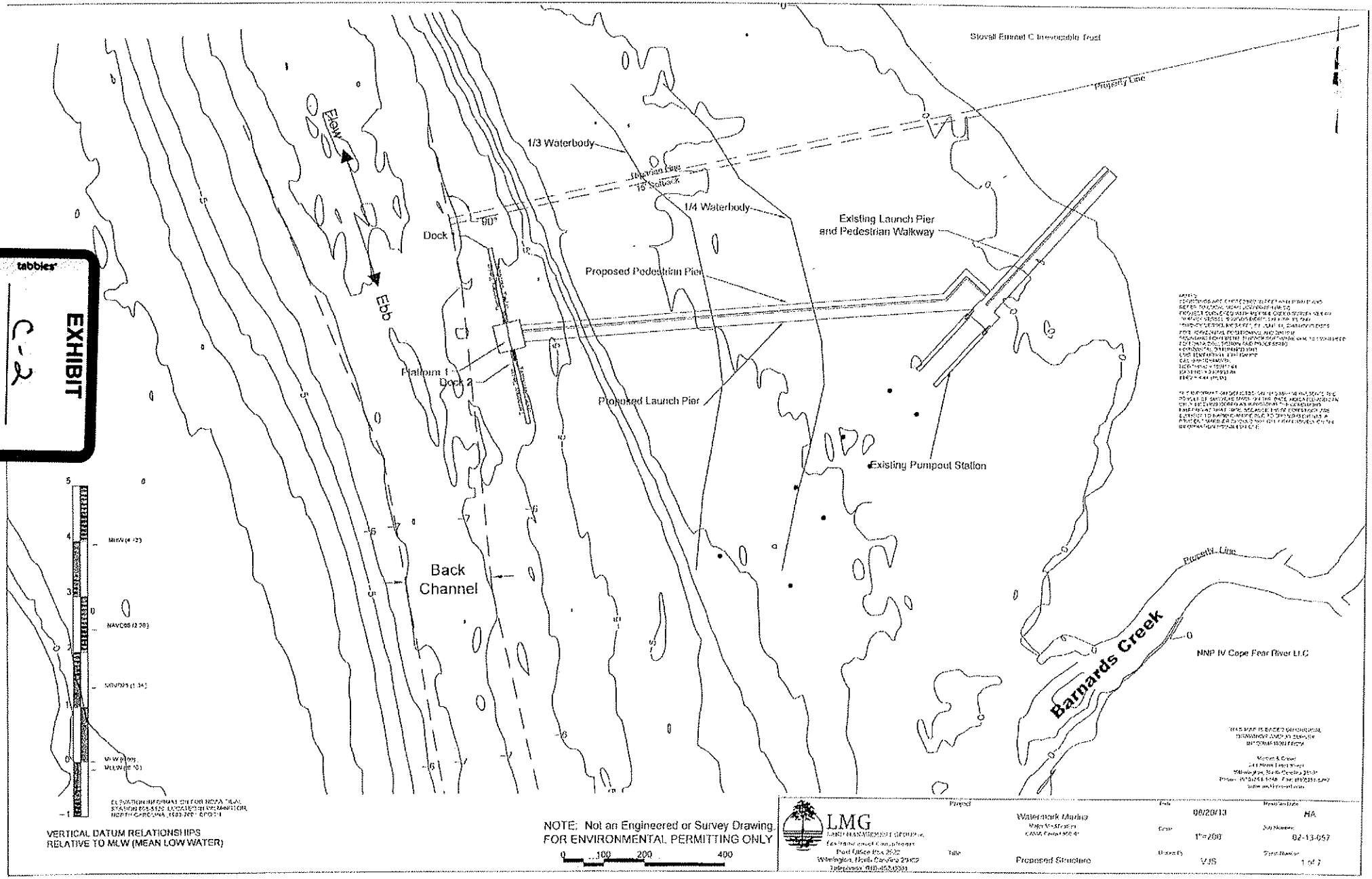


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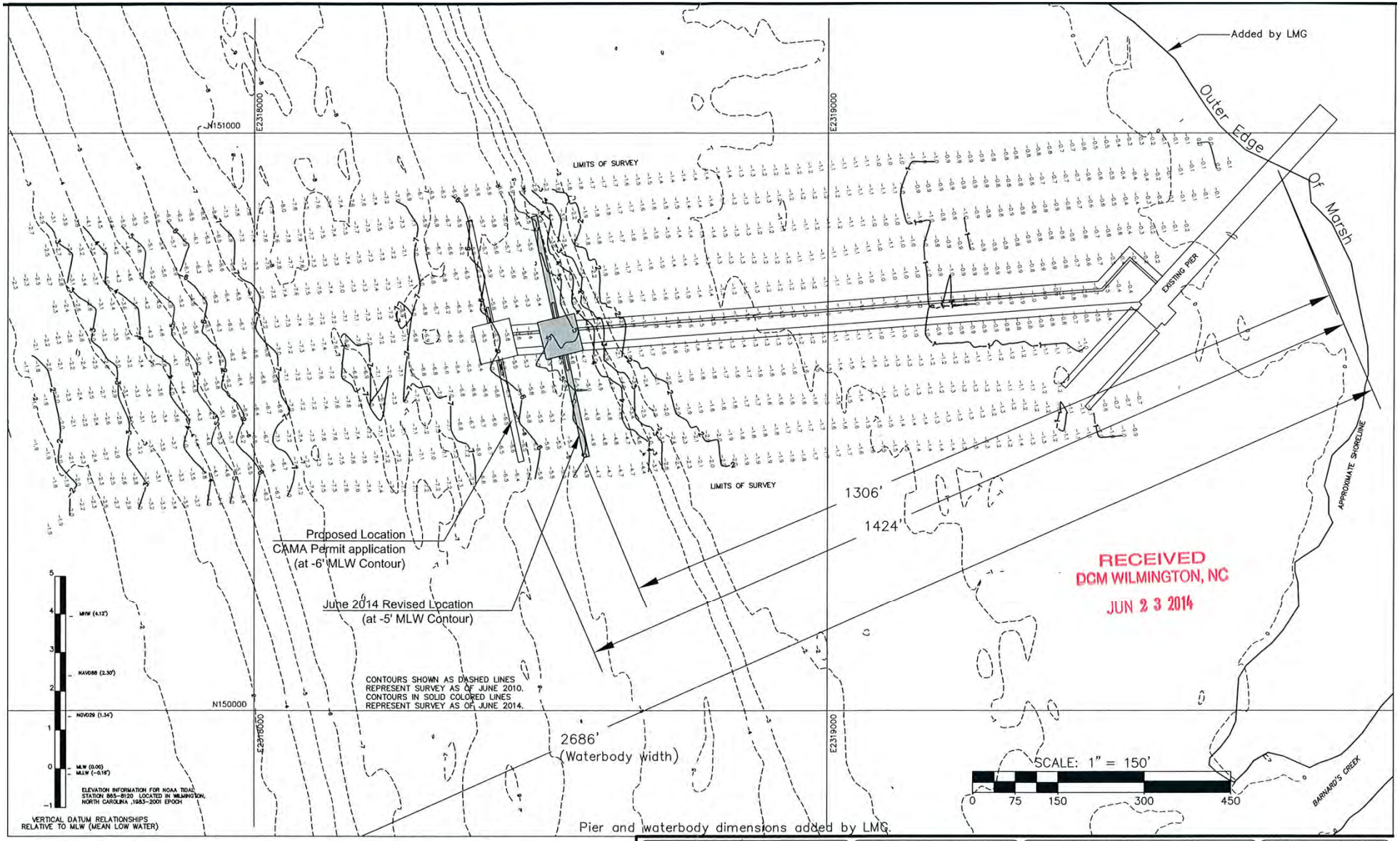
EXHIBIT

C-2



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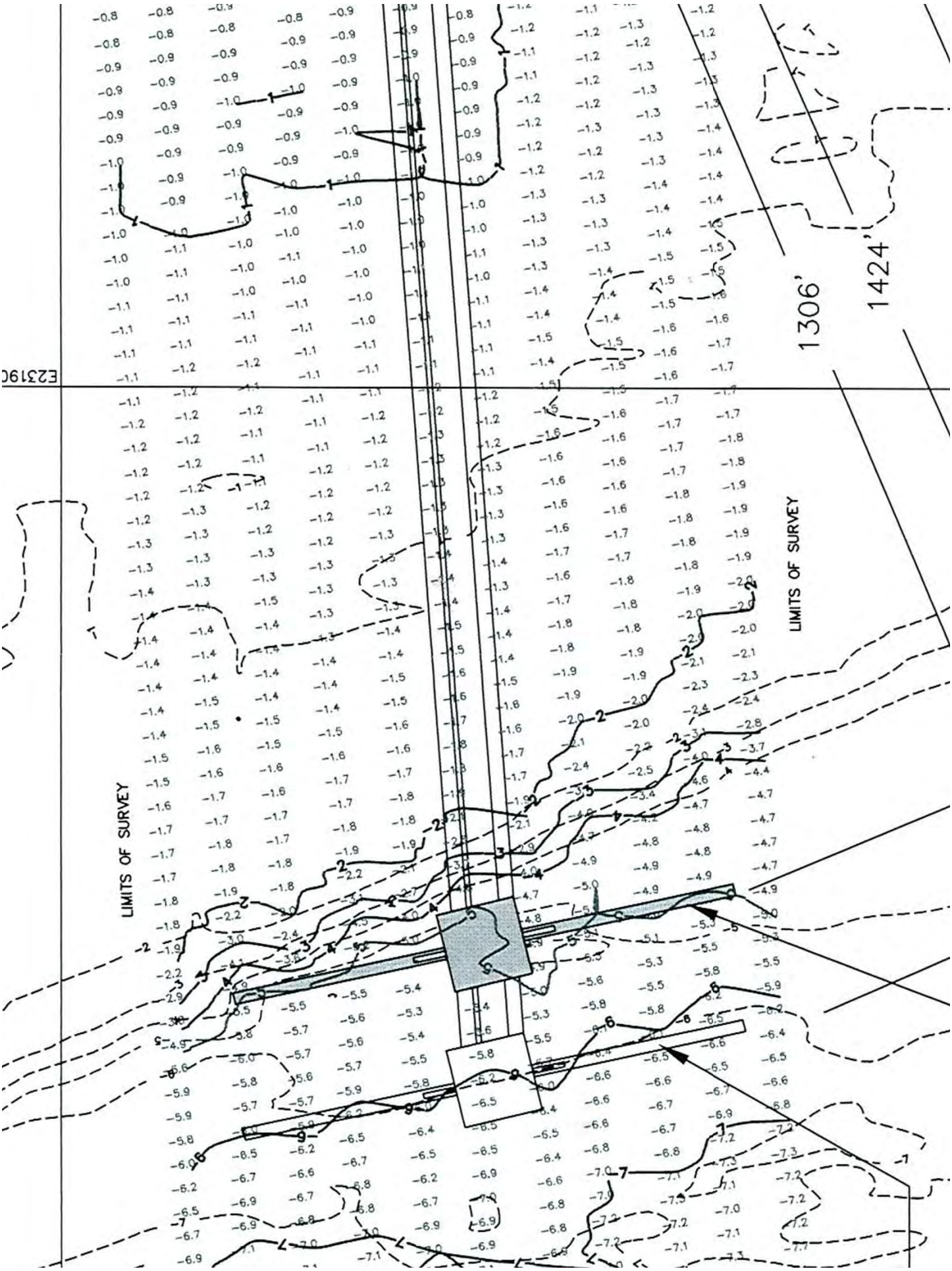
NOTES: SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND REFER TO LOCAL MEAN LOW WATER (MLW). PROJECT SURVEYED WITH McKIM & CREED SURVEY VESSEL "SURVEY VESSEL SOUNDS DEEP", ON JUNE 12, 2014. FOR HORIZONTAL POSITIONING, AND 200 KHZ SOUNDING EQUIPMENT. HYPACK SOFTWARE VER. 10.1 WAS USED FOR DATA COLLECTION AND PROCESSING. HORIZONTAL DATUM NAD 1983 (2011).

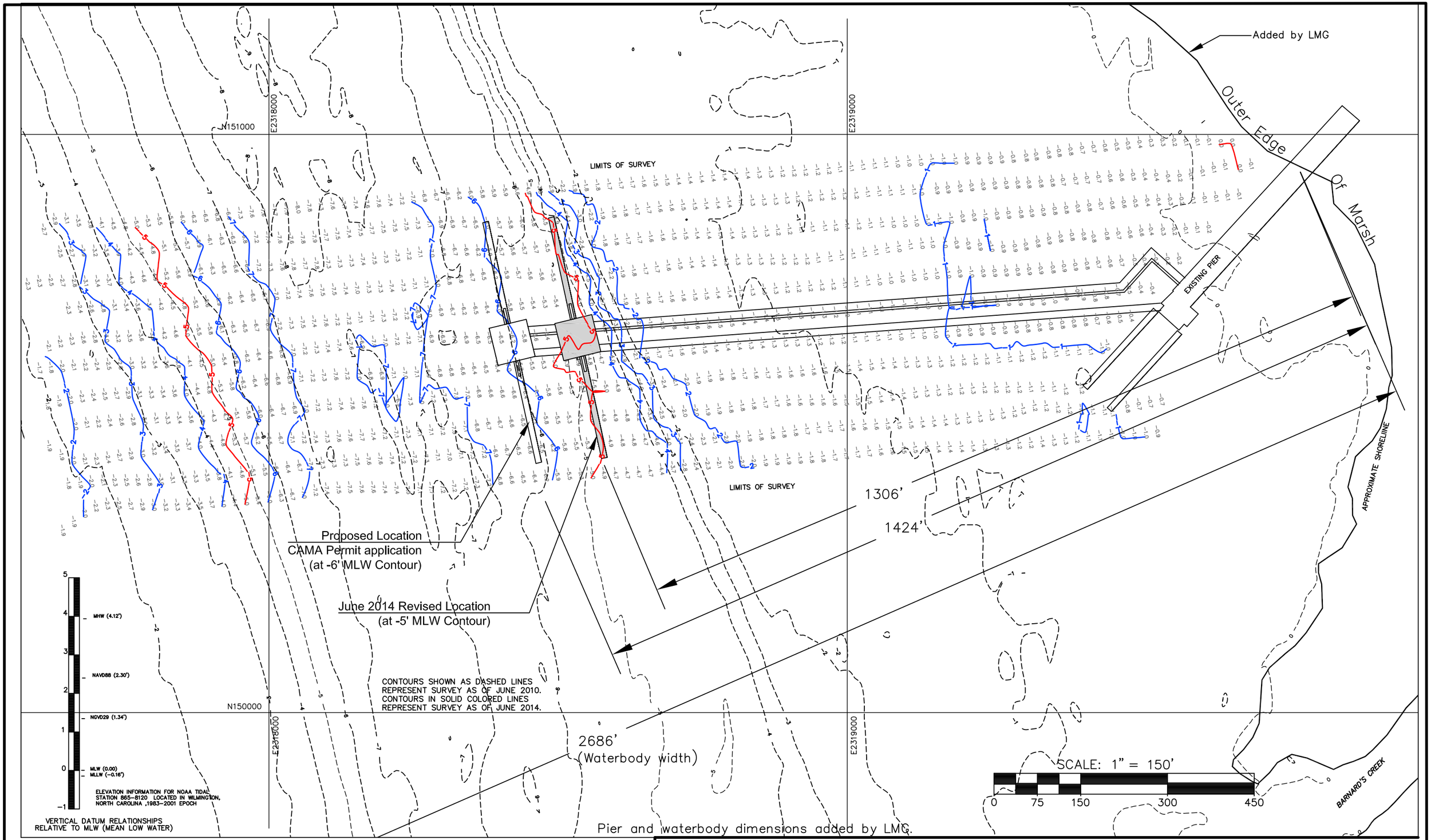
OVERLAY COMPARISON MAP

McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELEPHONE: (910) 343-1048
FAX: (910) 251-8282
NORTH CAROLINA FIRM LICENSE NUMBER: F-1222

BATHYMETRIC SURVEY
FOR
WATERMARK MARINA
MARINA PIER EXTENSION
CF MARINA PARTNERS, LLC
CITY OF WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA

JOB NUMBER:	08721-0001
SCALE:	1" = 150'
CAD NUMBER:	WM01-08721001_WATERMARK.DWG
PLS:	DLJ
PARTY CHIEF:	MBC
CAD TECH:	MBC
FIELD BOOK/PAGE:	W1410/41-42
DRAWING NUMBER:	2 OF 2


LIMITS OF SURVEY
LIMITS OF SURVEY
1306'
1424'



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OVERLAY COMPARISON MAP

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TELEPHONE: (910) 343-1048
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NORTH CAROLINA FIRM LICENSE NUMBER: F-1222

BATHYMETRIC SURVEY
FOR
WATERMARK MARINA
MARINA PIER EXTENSION
CF MARINA PARTNERS, LLC
CITY OF WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA
JUNE 17, 2014 1" = 150'

JOB NUMBER:	06721-0001
SCALE:	1" = 150'
CAD NUMBER:	WH101-067210001_WATERMARK.DWG
PLS:	DLJ
PARTY CHIEF:	MBT
CAD TECH:	MBH
FIELD BOOK/PAGE:	W1410/41-43
DRAWING NUMBER:	2014-042

Permit Class
NEW

Permit Number
66-01

STATE OF NORTH CAROLINA
Department of Environment and Natural Resources
and
Coastal Resources Commission

Permit

for

X Major Development in an Area of Environmental Concern pursuant to NCGS 113A-118

___ Excavation and/or filling pursuant to NCGS 113-229

Issued to **Barnards Creek, LLC, PO Box 1083, Wilmington, NC 28402**

Authorizing development in New Hanover County at Barnards Creek and Cape Fear River, off SR 1100, as requested in the permittee's application dated 5/31/00, including attached workplan drawings, 2 dated received 4/25/01 and 2 dated May, 2000.

This permit, issued on May 29, 2001, is subject to compliance with the application (where consistent with the permit), all applicable regulations, special conditions and notes set forth below. Any violation of these terms may be subject to fines, imprisonment or civil action; or may cause the permit to be null and void.

Dry Stack Marina Facility

1) Prior to the occupancy of any new slips authorized under this permit, a marine pumpout sewage disposal facility will be installed and operable, and maintained for the life of the authorized facility.

2) The facility will display a sign showing the location of the on-site pumpout facility, including other appropriate waste disposal information, at the entrance and exit from the main pier.

3) No sewage, whether treated or untreated, shall be discharged at any time from any boats using the dry stack marina facility. Any sewage discharge at the dry stack marina facility shall be considered a violation of this permit for which the permittee is responsible. This prohibition shall be applied and enforced throughout the entire existence of the permitted facility.

(See attached sheets for Additional Conditions)

This permit action may be appealed by the permittee or other qualified persons within twenty (20) days of the issuing date. An appeal requires resolution prior to work initiation or continuance as the case may be.

This permit must be accessible on-site to Department personnel when the project is inspected for compliance.

Any maintenance work or project modification not covered hereunder requires further Division approval.

All work must cease when the permit expires on

December 31, 2004

In issuing this permit, the State of North Carolina agrees that your project is consistent with the North Carolina Coastal Management Program.

Signed by the authority of the Secretary of DENR and the Chairman of the Coastal Resources Commission.

Donna D. Moffitt, Director
Division of Coastal Management

This permit and its conditions are hereby accepted.

Signature of Permittee

ADDITIONAL CONDITIONS

4) In accordance with commitments made by the permittee, if the water depth at the launch dock is of insufficient depth to allow for launch and/or recovery operations to take place without disturbing the adjacent shallow bottom habitat, launch and recovery operations shall be suspended until such time as the water depth increases to an adequate level.

5) The authorized project is located within a primary nursery area (PNA). Therefore, in accordance with T15A:07H.0208 of the Rules of the Coastal Resources Commission, no new dredging or excavation within the PNA shall be permitted. Dredging in any manner, including "kicking" with boat propellers, is strictly prohibited. This prohibition shall be applied and enforced throughout the entire existence of the permitted structure.

6) This permit authorizes only the docks, piers, and other structures and uses located in or over the water that are expressly and specifically set forth in the permit application. No other structure, whether floating or stationary, may become a permanent part of this dry stack marina facility without permit modification. No non-water dependent uses of structures may be conducted on, in or over public trust waters without permit modification.

7) The over-night occupancy of any vessels at the authorized facility is not authorized.

8) No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work.

9) The authorized structure and associated activity must not cause an unacceptable interference with navigation.

10) The permittee will maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without having it transferred to a third party.

11) This permit does not authorize the interference with any existing or proposed Federal project, and the permittee will not be entitled to compensation for damage to the authorized structure or work, or injury which may be caused from existing or future operations undertaken by the United States in the public interest.

12) The permittee understands and agrees that, if future operations by the United States requires the removal, relocation, or other alteration of the structure or work authorized by this permit, or if in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove relocate or alter the structural work or obstructions caused thereby, without expense to the United States or the state of North Carolina. No claim shall be made against the United States or the state of North Carolina on account of any such removal or alteration.

It is possible that the authorized structure may be damaged by wavewash from passing vessels. The issuance of this permit does not relieve the permittee from taking all proper steps to ensure the integrity of the permitted structure and the safety of moored boats. The permittee shall not hold the United States liable for any such damage.

ADDITIONAL CONDITIONS

13) The permittee must install and maintain at his expense any signal lights or signals prescribed by the U.S. Coast Guard, through regulation or otherwise, on the authorized facilities. At a minimum, permanent reflectors should be attached to the structure in order to make it more visible during hours of darkness or inclement weather.

14) The facility has been designed and permitted as a dry-stack facility. This permit does not authorize any tie pilings or permanent open-water moorings.

NOTE: It is strongly recommended that the permittee exercise all available precautions in the day-to-day operation of the facility to prevent facility waste from entering the adjacent waters. Such discharge, either directly or indirectly, to adjacent waters could contravene state water quality standards, thereby violating state law.

Easement

15) Prior to construction of any new boat slips or other docking facilities under this permit, the permittee must apply for and receive an **Easement** from the Department of Administration's State Property Office as required under N.C.G.S. 146-12(e).

Cultural Resource Protection

16) If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the authorized work, he will immediately notify the District Engineer, Wilmington Branch, U.S. Army Corps of Engineers at (910) 251-4511, who will initiate the required State and Federal coordination.

Stormwater Management

17) The Division of Water Quality approved this project under stormwater management rules of the Environmental Management Commission on 4/4/00 (Permit No. SW8 000408). Any violation of the permit approved by the DWQ will be considered a violation of this CAMA permit.

Sedimentation and Erosion Control

NOTE: An Erosion and Sedimentation Control Plan will be required for this project. This plan must be filed at least thirty (30) days prior to the beginning of any land disturbing activity. Submit this plan to the Department of Environment and Natural Resources, Land Quality Section, 127 Cardinal Drive Extension, Wilmington, NC 28405.

18) All disturbed areas will be properly graded and provided a ground cover sufficient to restrain erosion within 30 working days of project completion.

ADDITIONAL CONDITIONS

General

19) The authorized channel markers must be marked and installed in accordance with all requirements of the U.S. Coast Guard and/or N.C. Wildlife Resources Commission.

20) In keeping with NCAC 7H.0209(d)(3), no non-water dependent development may take place within 30 feet of the mean high water line. The authorized docks, the outflow pipe structure and the emergency spillway structure are all considered water dependent, and as such may be constructed within the buffer area. However, the stormwater retention pond is not considered water dependent. Therefore, no portion of the stormwater retention pond, or any land disturbing activities associated with its construction, may be located closer than 30 feet from the mean high water line at the time of construction. The permittee shall provide the Division of Coastal Management with modified plats depicting the revised stormwater pond location and design.

21) Should the requirements of Condition No. 17 of this Permit necessitate a revision of the Stormwater Management Permit previously authorized by the Division of Water Quality, the revised stormwater permit must be received and a copy provided to the Division of Coastal Management prior to the initiation of any land disturbing activities.

22) In accordance with commitments made by the permittee in the permit application, the permittee shall mitigate the impacts to all wetlands filled as a result of construction of this project by purchasing credits from the NC Wetlands Restoration Program. The mitigation effort must equal a minimum mitigation to impact ration of 2:1.

23) No excavated or fill material will be placed at any time in any vegetated wetlands, marsh or surrounding waters outside of the alignment of the fill area indicated on the workplan drawing(s).

NOTE: This permit does not eliminate the need to obtain any additional permits, approvals or authorizations that may be required.

NOTE: The permittee and/or his contractor is urged to meet with a representative of the Division prior to project initiation.

NOTE: The N.C. Division of Water Quality has authorized the proposed project under General Water Quality Certification No. 3274 (DWQ Project No. 001055), which was issued on 9/15/00.

NOTE: The U.S. Army Corps of Engineers has assigned the proposed project COE Action Id. No. 200001574.

NOTE: The permittee is encouraged to contact the New Hanover County Mosquito Control Office at (910) 252-2505 to discuss mosquito control measures.

STATE OF NORTH CAROLINA	)	BEFORE THE NORTH CAROLINA
	)	COASTAL RESOURCES COMMISSION
COUNTY OF NEW HANOVER	)	**CRC-VR-13-03**
	)	
	)	
IN THE MATTER OF:	)	
PETITION FOR VARIANCE	)	**FINAL AGENCY DECISION**
BY THE NNP IV – CAPE FEAR RIVER, LLC	)	
	)	

This matter was heard on oral arguments and stipulated facts at the regularly scheduled meeting of the North Carolina Coastal Resources Commission (hereinafter CRC) on December 12, 2013 in Atlantic Beach, North Carolina pursuant to N.C. Gen. Stat. § 113A-120.1 and 15A NCAC 7J .0700, *et seq.* Assistant Attorney General Amanda P. Little appeared for the Department of Environment and Natural Resources, Division of Coastal Management. William A. Raney, Esq. appeared on behalf of Petitioner NNP IV-Cape Fear River, LLC.

Upon consideration of the record documents and the arguments of the parties, the CRC adopts the following:

STIPULATED FACTS

1. Petitioner, NNP IV-Cape Fear River, LLC is a limited liability company, organized and existing under the laws of the State of Delaware, authorized to transact business in the State of North Carolina.

2. Petitioner owns approximately 1,375 acres of property located at 4410 River Road in Wilmington, New Hanover County, NC ("site"), purchased in June 2006. The site is adjacent to the Cape Fear River between Barnards Creek and Mott Creek. The site has approximately 15,132 feet of shoreline along the Cape Fear River.

3. The northern boundary of the property is located about five miles south of the Cape Fear Memorial Bridge at Wilmington. The southern boundary of the property is about eighteen miles north of the mouth of the Cape Fear River.

4. The site's high ground is currently undeveloped, but the proposed development consists of a subdivision named RiverLights which will include approximately 2,790 residential units and a marina village with mixed uses along the site's waterfront.

5. The proposed development is located within the Public Trust Areas, Estuarine Waters, and Coastal Wetlands Areas of Environmental Concern (AECs) as described in 15A NCAC 7H .0207, .0206 and .0205, respectively.

6. The proposed marina development is within an area designated as a Primary Nursery Area (PNA) by the N.C. Marine Fisheries Commission and is closed to the harvest of shellfish. The waters of the Cape Fear River at this site are classified as SC by the North Carolina Environmental Management Commission.

7. CAMA Major Permit No. 92-07 ("CAMA Permit No. 92-07") was issued to Petitioner on July 23, 2007, authorizing a 4-slip docking facility, crabbing pier with gazebo and a section of boardwalk and associated parking along the waterfront of the site. On March 3, 2009, a minor modification to CAMA Permit No. 92-07 was issued authorizing the realignment of both permitted piers, directional boring for utilities under Mott Creek, and for the relocation of a section of the permitted boardwalk. On April 23, 2010, a major modification to CAMA Permit No. 92-07 was issued authorizing construction of an 111-slip open water community marina, an 84-slip commercial dry stack facility, loading platform, transient docks, boatlifts and a kayak/scull launching pier and platform with associated utilities ("permitted development").

8. As proposed, the open water community marina and associated amenities would not be open to the general public; however, the dry stack storage facility and associated forklift pier and temporary docking are for commercial use and would be available to the general public.

9. To date, the only construction completed under CAMA Permit No. 92-07 is the aforementioned directional boring for utilities under Mott and Barnards Creeks.

10. On April 29, 2013, Petitioner, through its agent Virginia Sheridan with Land Management Group Inc., applied for a Major Modification to CAMA Permit No. 92-07 to relocate the footprint of the authorized community marina facility and commercial dry stack launch site from one-fourth to one-third the width of the water body (hereinafter "proposed modification").

11. Petitioner's proposed modification includes moving the permitted dimensions of the open water community marina and the fork lift drop pad and portions of the temporary tie-up floating docks associated with the 84-slip commercial dry stack facility out the distance of one-third width of the water body.

12. Petitioner also proposes to increase the authorized slips of the open water community marina from 111 slips to 112 permanent wet slips. The proposed wet slips would consist of seventy-two slips with boat lifts and forty wet slips to serve boats from thirty to fifty feet in length.

13. The proposed modification will move the marina footprint into deeper water and will also allow the lengthening of finger piers on the south end of the marina to a thirty-foot length to match the other finger piers.

14. CRC Rule 15A NCAC 7H .0208(b)(6)(G)(iii) provides that pier length shall be limited by "not extending more than one-fourth the width of a natural water body. . . Measurements to determine widths of the water body, canals or basins shall be made from the waterward edge of any coastal wetland vegetation which borders the water body. . .".

15. Pursuant to CRC Rule 15A NCAC 7H .0208(b)(6)(G)(iii), the one-fourth length limitation shall not apply when the proposed pier is located between longer piers for docking facilities within 200 feet if the applicant's property. However, the proposed pier or docking facility shall not be longer than the pier head line established by the adjacent piers of docking facilities, nor longer than one-third the width of the water body. Petitioner's proposal does not meet the necessary criteria to extend to the one-third width because the adjacent facilities along the shoreline for similar use are not located within 200 feet of the site.

16. The federally maintained Cape Fear River channel is over 2500 feet west of the site. The proposed modification would not encroach into the U.S. Army Corp of Engineers navigation channel setback. One large and several small undeveloped islands directly across from the site is known as Island 13, which was used as a mitigation site for impacts to PNA by the Wilmington Harbor deepening project.

17. The presence of these islands creates a back channel, on which the permitted development is sited, separated from the main navigation channel of the Cape Fear River by the disposal islands.

18. At this site, the width of the back channel from the edge of the marsh on the east bank of the river to the marsh on the west side of Island 13 ranges between approximately 1500 to 1800 feet. In the absence of the spoil islands, the width of the waterbody would be approximately 5,700 feet.

19. The proposed modification includes extending the open water community marina approximately 450 feet into a waterbody with a total width of approximately 1500 feet, and that the forklift pier associated with the dry stack building would extend approximately 540 feet into a waterbody with a total width of approximately 1800 feet.

20. The proposed modification to the open water community marina/main access pier and the dry stack launch pier would both extend approximately 130 feet beyond the one-fourth width of the waterbody to a point approximately one-third the width of the waterbody.

21. The proposed modification of moving the open water community marina from one-fourth to one-third the width of the waterbody would increase the water depth from a range of approximately -3 feet to -5 feet at mean low water to -5 feet to -6 feet at mean low water. In addition, moving the dry stack launch pier from one-fourth to one-third the width of the waterbody would increase the water depth at mean low water from approximately -3.5 feet to -5 feet.

22. The deepest part of the back channel begins approximately 300 feet to 400 feet beyond the outer edge of the proposed marina. The mean low water depths in this area are generally -7 feet to -8 feet.

23. Moving the footprint of the permitted development into deeper water will decrease the likelihood that the bottom of the waterbody will be disturbed by boat hulls and propellers, especially in those slips closest to the shore.

24. The nearest pier to the north of the permitted development is the Watermark Marina dry storage marina, which is about .25 miles from the proposed marina development. The Watermark pier extends about 540 feet into the Back Channel. At that location the width of the waterbody is about 2,600 feet. The Watermark Marina development meets the one-fourth width rule.

25. Transient boat traffic between Wilmington and points north of the permitted development and the Atlantic Ocean and points south of the permitted development typically use the main shipping channel for navigation purposes.

26. Other than the objection from the DCM based on the one-fourth width rule, all of the commenting state and federal resource agencies either have approved or had no comment or no objection to the proposed modification.

27. On July 15, 2013, Petitioner's application for a major modification to CAMA Permit No. 92-07 was denied on the basis that the proposed modification is inconsistent with CRC Rule 15A NCAC 7H .0208(b)(6)(G)(iii) which states that pier length shall be limited "by not extending more than one-fourth the width of a natural water body. . . ."

28. On August 1, 2013, Petitioner filed this variance request seeking relief from the application of the one-fourth width rule set forth at 15A NCAC 7H .0208(b)(6)(G)(iii). Petitioner seeks permission to construct the proposed modification to one-third width of the Back Channel at this site along the Cape Fear River.

29. The parties stipulate that the photographs and drawings submitted with the petition and at the hearing are admissible.

STIPULATED EXHIBITS

Included with the Staff Recommendation for the Commission's review were the following Stipulated Exhibits:

1. Drawing of the proposed modification (relocation to one-third the width of Back Channel) to the permitted development, dated April 22, 2013.

2. PowerPoint presentation (6 slides), dated December 12, 2013.

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the parties and the subject matter.

2. All notices for the proceeding were adequate and proper.

3. Petitioner has met each of the requirements set forth in Statute § 113A-120.1(a) and 15 NCAC 07J .0703(f) which must be found before a variance can be granted as set forth more specifically below.

a. Petitioner has shown that strict application of 15A N.C.A.C. 07H .0208(b)(6)(G)(iii) will cause unnecessary hardships.

The Commission affirmatively finds that strict application of the Commission's one-quarter width rule set forth in 15A NCAC 7H .0208(b)(6)(G)(iii) would cause Petitioner unnecessary hardships. Specifically, the water depth at the one-fourth distance is in the range of approximately -3 feet to -5 feet at mean low water. By moving the proposed development out further the water depth increases to -5 feet to -6 feet at mean low water. This area is classified as a Primary Nursery Area (PNA) and the Commission's rules prohibit new dredging in PNAs. Petitioner has attempted to minimize the facility's current impacts to the PNA through relocating the permitted development to deeper water instead of proposing dredging in the PNA at the one-quarter width location. There are no deeper options landward of the one-quarter width location. Adequate access can be provided by allowing the Petitioner to move the permitted development from one-fourth width to the one-third width line. The Commission agrees with DCM staff and Petitioner that allowing the permitted development to be located at the one-third width of the water body will accommodate the use of boats with less damage to PNA habitat. The strict application of the one-fourth width rule in this case appears to rise to an unnecessary hardship given the lower water

depths at one-fourth width mark compared to the water depths at the one-third width location coupled with the fact that relocating the proposed development would decrease the potential for damage to the PNA habitat by allowing the Petitioner to construct the proposed development in deeper water. Thus, the Commission finds that Petitioner has demonstrated that it meets the first factor required by N.C.G.S. § 113A-120.1(a)(1).

b. Petitioner has demonstrated that the hardship results from conditions peculiar to Petitioner's property.

The Commission affirmatively finds that the hardships in this case result from conditions peculiar to the Petitioner's property. Siltation at marinas or docking facilities is quite common. In this case Petitioner's property is located along a less developed shoreline of the Cape Fear River adjacent to an area which does not typically have heavy boating traffic. In addition, Petitioner's property is located across from Island 13 which is used by the U.S. Army Corps of Engineers for spoil deposition. This location makes it increasing unlikely that there will be future development across from Petitioner's property which would necessitate the strict application of the rule. The Commission agrees with DCM staff and Petitioner that these characteristics of the property make future navigation issues resulting from Petitioner's relocation of the permitted development unlikely. For these reasons, the Commission affirmatively finds that Petitioner has shown that any hardships result from conditions peculiar to the Property. Thus, Petitioner has established the second factor required by North Carolina General Statute § 113A-120.1(a)(2).

c. Petitioner has demonstrated that the hardship does not result from actions taken by Petitioner.

The Commission affirmatively finds that any hardships do not result from actions taken by the Petitioner. Petitioner has worked toward resolving the problem of potential siltation by

proposing the relocation of the permitted development to deeper water instead of proposing dredging which could result in potential damage to PNA habitat. For these reasons, the Commission affirmatively finds that Petitioner has shown that the hardships did not result from actions taken by Petitioner and finds that Petitioner has met the third factor required by North Carolina General Statute § 113A-120.1(a)(3).

d. **Petitioner has demonstrated that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, will secure public safety and welfare, and will preserve substantial justice.**

The Commission affirmatively finds that the variance requested by Petitioner would be consistent with the spirit, purpose and intent of the rules; secure the public safety and welfare; and preserve substantial justice. The Commission amended its pier length rule in 1998 and changed the one-third standard to a one-fourth width requirement with certain exceptions (none of which apply in this case) in order to preserve traditional navigation by assuring that the middle one-half of any water body remained available for public use. In this case, however, the Commission agrees with the DCM staff and Petitioner that the requested extension of the proposed pier will allow the Petitioner to gain access to deeper water without unduly infringing on the public's rights of navigation and use of public trust waters along this shoreline. Petitioner is correct that 15A NCAC 7H .0208(b)(5)(A) specifies that marinas shall be sited in deep waters not requiring dredging. By proposing to relocate the proposed development, Petitioner seeks to mitigate any adverse effects to PNA habitat by moving the proposed development into deeper water.

As for public safety and welfare, the Commission agrees with the parties that allowing the pier to be extended into deeper water would prevent possible navigational hazards that could occur if the pier ended in the shallower waters at the one-fourth width location. Moreover, the increased length of the proposed development does not impede the navigability of the existing back channel.

In addition, the Commission agrees with the parties that substantial justice will be preserved by allowing Petitioner to construct the proposed development in deeper water, as requested, because Petitioner is trying to address siltation and avoid dredging with this proposed solution. For these reasons, the Commission affirmatively finds that Petitioner has demonstrated that the requested variance is consistent with the spirit, purpose and intent of the Commission's

rules, will secure public safety and welfare, and will preserve substantial justice. Therefore, Petitioner has met the fourth factor required by N.C.G.S. § 113A-120.1(a)(4).

ORDER

THEREFORE, the variance from 15A NCAC 7H.0208(b)(6)(G)(iii) is GRANTED.

The granting of this variance does not relieve Petitioner of the responsibility for obtaining a CAMA permit from the proper permitting authority.

This variance is based upon the Stipulated Facts set forth above. The Commission reserves the right to reconsider the granting of this variance and to take any appropriate action should it be shown that any of the above Stipulated Facts is not true.

This the 10th day of January, 2014.

Frank D. Gorham III

Frank D. Gorham, III, Chairman
Coastal Resources Commission

STATE OF NORTH CAROLINA COUNTY OF NEW BRUNSWICK IN THE MATTER OF: PETITION FOR VARIANCE BY CXA-10 CORPORATION (WATERMARK MARINA)	))))))))))	BEFORE THE NORTH CAROLINA COASTAL RESOURCES COMMISSION **CRC-VR-14-05** **FINAL AGENCY DECISION**

On March 12, 2014 Petitioner CSA-10 Corporation ("Petitioner") submits its CAMA variance request ("Request") seeking a variance from the Commission's ¼ width rule set forth in 15A 7H .0208(b)(6)(G)(iii) and its rate to deep water rule set forth in 15A NCAC 7H .0208(b)(H). This matter was initially heard on oral arguments and stipulated facts at the regularly scheduled meeting of the North Carolina Coastal Resources Commission (hereinafter "Commission") on May 14, 2014 in Atlantic Beach, North Carolina pursuant to N.C. Gen. Stat. § 113A-120.1 and 15A NCAC 7J .0700, *et seq.* Assistant Attorney General Christine A. Goebel, Esq. appeared for the Department of Environment and Natural Resources, Division of Coastal Management ("DCM") and William A. Raney, Jr. appeared on behalf of Petitioner. Upon consideration of the record documents and the arguments of the parties, the Commission upon duly made motion pursuant to 15A NCAC 07J .0703(d) determined that it could not reach a final decision because additional facts were necessary to show the current water depth at the site. Accordingly, by Order dated May 23, 2014, the Commission remanded Petitioner's Request to allow Petitioner the opportunity to provide a current (2014) survey by a registered land surveyor showing the mean low water values for the site and for the parties to provide supplemental stipulated facts to the Commission.

The variance request was rescheduled for further hearing following the submission of a

2014 survey of the site and supplemental stipulated facts. The July 31, 2014 hearing took place at the Commission's regularly scheduled meeting in Atlantic Beach, North Carolina pursuant to N.C. Gen. Stat. § 113A-120.1 and 15A NCAC 7J .0700, *et seq.* Assistant Attorney General Christine A. Goebel, Esq. appeared for the Department of Environment and Natural Resources, Division of Coastal Management and William A. Raney, Jr. appeared on behalf of Petitioner.

Commissioners Larry Baldwin and Neal Andrew recused themselves from consideration of this variance request.

Upon consideration of the record documents and the arguments of the parties, the CRC adopts the following:

STIPULATED FACTS

A. Submitted Prior to the May 14, 2014 Hearing.

1. The Petitioner, CXA-10 Corporation, is a Texas corporation authorized to do business in North Carolina.

2. The Petitioner is the owner of property located at 4114 River Road, Wilmington, North Carolina (the Site). The Site is located about 4.7 miles south of the Cape Fear Memorial Bridge at Wilmington. It was purchased at a foreclosure sale, as shown on a Trustee's Deed recorded May 7, 2010.

3. The property consists of 12.14 acres of upland and 20.47 acres of marsh on the east bank of the Cape Fear River. At the Site, the waters of the Cape Fear River are designated as a Primary Nursery Area (PNA) and as SC waters by the Environmental Management Commission, and are closed to the harvest of shellfish.

4. Located on the property is an existing dry storage marina, a yacht club building, trailer and vehicle sheds, and a pier for launching boats by means of a forklift (launch pier).

5. A CAMA Major Permit Application was submitted on June 2, 2000 by Barnards Creek, LLC for a clubhouse, dry stack storage facility, a launch pier, floating docks and related on-shore development.

6. After the filing of the original application in June, 2000, it was determined that the proposed end of the launch pier and the floating docks were located in water that was too shallow to launch and operate boats during most of the tidal cycle.

7. A hydrographic survey was performed by Hanover Design Services, P.A., a registered land surveyor, in 2000 in an attempt to identify a location for the launch pier that had adequate water depth.

8. Prior to the issuance of Permit 66-01 the plans for the pier were changed to relocate and extend the pier so that the depth at the end of the launch pier would be 3.46' at mean low water according to the Hanover Design Services hydrographic survey.

9. Prior to the issuance of Permit 66-01, then-DCM Assistant Director Charles Jones visited the site by boat to inspect the water depth at the new proposed location for the launch pier.

10. CAMA Major Permit 66-01 was issued on May 29, 2001 for the facility with a revision to the original plans that changed the location, length and orientation of the launch pier and the floating docks.

11. Permit 66-01 contained a condition stating, "In accordance with commitments made by the permittee, if water depths at the launch dock is of insufficient depth to allow for

launch and/or recovery operations to take place without disturbing the adjacent shallow bottom habitat, launch and recovery operations shall be suspended until such time as the water depth increases to an adequate level."

12. The Permit was renewed on December 3, 2004. On June 30, 2005, the property was purchased by Watermark Marina of Wilmington, LLC and the Permit was transferred to Watermark in July 2005 following the change in ownership.

13. Most of the development authorized by Permit 66-01 was constructed in late 2005 and early 2006, including the launch pier, floating docks and upland development.

14. A survey by a registered land surveyor from McKim & Creed in 2010, showed the floating docks being located between 0' and -1' mean low water.

15. The Marina has never become a fully operational dry storage marina facility. In the major modification narrative, the Petitioner noted that at that time, only 20 of 430 dry storage spaces were in use. Petitioner contends that this is due to shallow water at the launch pier, launching and retrieving is limited to two hours on either side of high tide.

16. The Permit was again renewed by Watermark Marina of Wilmington, LLC on March 28, 2007.

17. On May 4, 2010, CXA-5 Corporation purchased the Site and Marina through a foreclosure sale, after Watermark Marina of Wilmington, LLC's deed of trust was foreclosed on.

18. Effective July 2, 2012, the Texas Corporations CXA-1 Corporation and CXA-5 Corporation merged to become CXA-10 Corporation. Accordingly, the Marina changed ownership from CXA-5 Corporation to CXA-10 Corporation (Petitioner). On October 16, 2012, the Permit was transferred to CXA-10 Corporation.

19. On June 13, 2013, a scoping meeting was held for the proposed major modification to Permit 66-01.

20. On August 20, 2013, the Petitioner applied for a major modification to Permit 66-01 to add an extension on to the existing launch pier. The proposed modification included development of additional forklift launch and retrieval pier approximately 1,031 feet by 23.5 feet, development of an irregularly-shaped platform area and transient floating docks.

21. The development proposed in the major modification application is within the Public Trust and Estuarine Waters Areas of Environmental Concern (AECs). A CAMA permit (or major modification) is required by 113A-118 for the development proposed within these AECs.

22. The proposed pier extension would add 51,973 square feet (1.19 acres) of public trust area usurpation to the 7,180 square feet of the public trust area usurpation from the existing forklift pier, for a total of approximately 59,153 square feet (1.36 acres) of public trust area usurpation.

23. As part of the CAMA major permit review process, notice was given to the public through on-site posting and notice in the local newspaper. Notice was also sent to the adjacent riparian owners. DCM received no comments or objections in response.

24. Also as part of the CAMA major permit review process, copies of the major modification application and the Field Report were sent to federal and state review agencies. DCM's fisheries resource staff, DEH's (now DMF's) Shellfish Sanitation Section, and the Wildlife Resources Commission each had no comment on this project. The federal agencies had no objection but proposed conditions.

25. On December 2, 2013, DCM denied Petitioner's major modification application, as the proposed development would be inconsistent with the Commission's rules at 15A NCAC 7H .2028(b)(6)(G)(iii) (the ¼ width rule) and .0208(b)(H) (rate to deeper water rule). The denial letter stated that "8) The proposed forklift launch pier and pedestrian pier extension longer than 400 feet would gain deeper water at a rate of less than .5 feet per 100 foot increment."

26. CRC Rule 15A NCAC 7H.0208(b)(6)(G)(iii) provides that pier length shall be limited by "not extending more than ¼ the width of a natural water body . . . measurements to determine widths of the water body, canals or basins shall be made from the waterward edge of any coastal wetland vegetation which borders the water body . . . ."

27. CRC Rule 15A NCAC 7H.0208(b)(6)(H) states the pier length shall be limited by: "Piers or docking facilities longer than 400 feet shall be permitted only if the proposed length gives access to deeper water at a rate of at least 1 foot each 100 feet increment of length longer than 400 feet, or, if the additional length is necessary to span some obstruction to navigation. Measurements to determine lengths shall be made from the waterward edge of any coastal wetland vegetation that borders the water body[.]"

28. The application seeks to extend the pier to the -6-foot mean low water depth so that the existing pier and the proposed pier will extend a total distance of 1,424 feet into the body of water.

29. The distance across the water body at the location of the proposed launch pier is 2,686 feet from marsh to marsh.

30. The federally maintained Cape Fear River channel is over 4,000 feet west of the site. The proposed modification would not encroach into the US Army Corps of Engineers

navigation channel setback. One large undeveloped spoil disposal island directly across from the site is known as Island 13, which was used as a mitigation site for impacts to PNA by the Wilmington Harbor Deepening Project.

31. The presence of Island 13 creates a back channel, on which the permitted development is sited, separated from the main navigation channel, the Cape Fear River, by Island 13. In the absence of Island 13, the width of the water body (Cape Fear River) at the project location is approximately 6,750 feet.

32. The proposed launch pier would extend about 53% across the width of the back channel.

33. The back channel has extensive shallow water mud flats extending from the east shoreline of the River and a less extensive mud flat on the western shoreline of Island 13. 34.

The deepest water within the back channel is about 7-8' deep at mean low water and, in the vicinity of the proposed launch pier, is about 230-350' wide. The outer end of the proposed launch pier would be about 60' landward of the channel portion of the back channel. A copy of the 2010 McKim & Creed survey is attached to the DCM Staff Recommendation.

35. At the project location the distance from the marsh at the Petitioner's property to the edge of the 7-8' channel is approximately 1,504'. The distance from the marsh at Island 13 to the edge of the 7-8' channel is approximately 900'. The 7-8' channel is approximately 280' wide at this location.

36. Extending the launch pier into deeper water will decrease the likelihood that the bottom of the water body will be disturbed by boat hulls and propellers.

37. The closest pier to the north of the project is an industrial off-loading conveyor system for bulk gypsum coming by ship. The conveyor pier extends approximately 1,565 feet beyond the edge of the marsh at a location where the width of the River from marsh to marsh is approximately 3,048 feet. The conveyor pier was built before the ¼ width rule was in effect.

38. Barnards Creek divides the applicant's property from the next property to the south which is owned by NNP IV, Cape Fear River LLC (NNP). NNP is in the process of developing a 1,375 acre tract with 15,132 feet of shoreline on the Cape Fear River, which was permitted for 112 wet slips and 84 dry stack slips. NNP has been issued a CAMA Permit and a variance from the ¼ width rule allowing NNP to construct a wetslip marina and forklift launch pier that extends 540 feet of the 1800 foot back channel which is 30% of the width of the back channel, and the wet-slip marina at 450 feet of the 1500 foot back channel which is also 30% of the width of the back channel. The NNP piers and docks would extend to about the -5 foot to -6 foot depth at mean low water.

39. The width of the back channel from the waterward edges of the Coastal Wetlands (as rule 7H. 0208(b)(6)(G)(iii) requires for water-body measurement) at the NNP marina site is approximately 1,500 to 1,800 feet. The water width at the Watermark proposed pier site, from marsh to marsh, is approximately 2,686 feet. The difference in width between the Watermark site and the NNP site is due to the indentation in the east bank of the Cape Fear River at the Watermark site.

B. Submitted After the Initial Hearing and Before the July 30, 2014 Hearing.

40. On June17, 2014, McKim & Creed, RLS, conducted a bathymetric survey ("2014 Survey") of the proposed pier extension area based on the Commission's May 14, 2014 request.

41. According to the 2014 Survey, the -5 foot mean low water (MLW) depth at the proposed pier is approximately 118 feet landward from the location of the extended pier as depicted in the Application submitted by the Petitioner.

42. Limiting the pier length to the -5 foot MLW contour as shown on the 2014 Survey would result in a total pier length of 1306 feet rather than the total length of 1424 feet as proposed in the application submitted by the Petitioner.

43. If the pier were extended only to the -5 foot MLW contour as depicted on the 2014 Survey, the pier would extend 49 % across the back channel rather than 53% as requested in the Variance Petition.

44. A hydrographic survey performed by McKim & Creed in 2005 ("2005 Survey") was located by DCM staff since the last variance hearing.

45. Based on a pier which would extend to the -5 foot MLW contour as shown on the 2014 Survey, such a pier extension would gain deeper water at a rate less than 0.5 feet per 100 foot increment, which does not meet the "rate to deep water" standard of 15A NCAC 7H .0208(b)(6)(H).

46. Based on a pier which would extend of the -5 foot MLW contour as shown on the 2014 survey, such a pier extension would add approximately 47,194 square feet (1.08 acres) of public trust area usurpation to the 7,180 square feet of the public trust area usurpation from the existing forklift pier, for a total of approximately 54,374 square feet (1.24 acres) of public trust area usurpation. The Commission can contrast this fact with Stipulated Fact No. 22, which makes the same calculation for a pier extension to the proposed 6 foot contour.

47. The Petitioner agrees to a condition on any variance that would require the pier length as proposed in the permit modification application to be reduced by terminating the pier and at the -5 foot MLW contour rather than the -6 foot MLW contour, as that -5 foot MLW contour is shown on the 2014 Survey.

STIPULATED EXHIBITS

Included with the Staff Recommendation for the Commission's review were the following Stipulated Exhibits:

A. Submitted Prior to the May 14, 2014 Hearing.

1. 2000 hydrological survey by Hanover Design Services, P.A. (2 pages);
2. CAMA Major Permit No. 66-01 issued May 29, 2011 (4 pages);
3. 2010 McKim & Creed Survey;
4. August 20, 2013 Letter to Robb Mairs from Land Management Group, Inc. forwarding an Application and supporting materials for a major modification of CAMA Major Permit No. 66-01;
5. DCM Field Investigation Report on the 2013 Application for a major modification of CAMA Major Permit No. 66-01;
6. November 21, 2013 letter to DCM from the Department of the Army providing a response from the federal agencies and comments on the 2013 Application for a major modification of CAMA Major Permit No. 66-01;
7. December 2, 2013 letter to CXA-10 Corporation from Braxton C. Davis denying request for Major Modification of Permit No. 66-01;
8. PowerPoint of site photographs presented at the July 30, 2014 hearing;

B. Submitted After May 14, 2014 Hearing and Before July 30, 2014 Hearing.

9. June 17, 2014 Bathymetric Survey for Watermark Marina by McKim & Creed;
10. September 29, 2005 Existing Conditions Survey for Watermark Marina by McKim & Creed.

CONCLUSIONS OF LAW

1. The CRC has jurisdiction over the parties and the subject matter.

2. All notices for the proceeding were adequate and proper.

3. For the reasons set forth below, Petitioner has failed to meet the requirements set forth in Statute § 113A-120.1(a) and 15 NCAC 07J .0703(f).

a. Petitioner has failed to show that strict application of the ¼ width rule and the rate to deep water rule will cause unnecessary hardships.

The Commission's management objective for the Estuarine and Ocean System is

> to conserve and manage estuarine waters, . . . so as to safeguard and perpetuate their biological, social, economic, and aesthetic values, and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources.

15A NCAC 07H .0203. The specific use standards for Coastal Shorelines include detailed provisions enabling the Commission to meet the management objectives. The specific rules at issue in this case relate to piers and docking facilities and provide,

> (G) Pier and docking facility length shall be limited by:
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> ...
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> (iii) *not extending more than one-fourth the width of a natural water body,* or human made canal or basin. Measurements to determine widths of the water body, canals or basin shall be made from the waterward edge of any coastal wetland vegetation that borders the water body . . . . However, the proposed pier or docking facility shall not be longer than the pier head line established by the adjacent piers or docking facilities, nor longer than one-third the width of the water body.
>
> (H) Piers or docking facilities longer than 400 feet shall be permitted *only* if the proposed length gives access to deeper water at a rate of at least *1 foot for each 100 foot increment of length longer than 400 feet*[.]

15A NCAC 07H .0208(b)(6) (Emphasis added) (In this decision, subsection G is referred to as the "¼ width rule" and Subsection H is referred to as the "rate to deep water rule.").

The Commission's ¼ width rule allows an exception to the pier length limitation if the proposed pier will be located between longer existing piers within 200 feet of the applicant's property. However, even then, the proposed pier cannot be longer than the line established by the adjacent piers, nor longer than 1/3rd of the width of the water body ("1/3rd rule exception"). In this case, neither exception applies. The next significant structure to the north of the proposed development is approximately 1.1 miles away beyond the point where the back channel joins the main river channel. This structure is an industrial offload conveyor system for bulk gypsum arriving by ship. (SF No. 37; See Project Narrative included in Stipulated Exhibit 2). The conveyor pier was built before the effective date of the ¼ width rule. (S.F. No. 37) The nearest property to the south of Petitioner's property is on the other side of Barnards Creek and is owned by NNP IV, Cape Fear River LLC (NNP). NNP was recently issued a CAMA Permit and a variance from the ¼ width rule to construct a wet slip marina and forklift launch pier which is authorized to extend 1/3rd of the width of the back channel to a depth of approximately -5 to -6 feet at mean low water. (SF No. 38). The nearest existing pier to the south is approximately 3.13 miles from the subject launch pier site. There is no established pier length for this area of shoreline on the river. (See Project Narrative included in Stipulated Exhibit 2). Therefore, neither the northern or southern piers provide any support for Petitioner's requested exemption.

Under the facts in this case, strict application of the Commission's ¼ width rule and rate to deep water rule will not cause Petitioner unnecessary hardships. The purpose of these rules is to limit pier length, to limit the amount of public trust area usurped by such structures, and to

protect the safe navigation of public trust waters by not allowing piers to extend more than a quarter or under certain exceptions, at most, a third of the width of the waterbody. Petitioner seeks to extend the forklift pier beyond the ¼ width limit imposed by the Commission's rules. In fact, the pier length requested by Petitioner exceeds even the maximum allowed under the exception to the Commission's rule. Petitioner seeks to build to a pier that will extend 53 percent of the width of the waterbody– more than half the width of the waterbody.

Furthermore, at this site, the bottom slope and proposed design of the extension fail to give access to deeper water at a rate of at least 1 foot for each 100 foot increment of length longer than 400 feet as required by the Commission's rules.

Petitioner argues that the pier length restriction is an unnecessary hardship because it will limit Petitioner from launching and retrieving boats at its dry storage marina facility for much of the tidal cycle. Petitioner further claims that lengthening the pier will not unreasonably restrict navigation or interfere with other public uses because Island 13 has divided the main steam of the Cape Fear River at this location, and the back channel, as its name implies, is a less traveled thoroughfare for boat traffic and the ownership, use, zoning and configuration at this section of the Cape Fear River will limit structures in the back channel effectively leaving more of the water body open for public use. Petitioner further claims that a pier extension is preferable to dredging in a primary nursery area (PNA).

The Commission was not persuaded by these arguments. Based on the stipulated facts and exhibits, the Commission affirmatively finds that any hardships resulting from the strict application of the Commission's rules limiting pier length are necessary. Specifically, the proposed use of this site has always been marginal. When a CAMA Major Permit application

was initially submitted by Barnards Creek, LLC for a clubhouse, dry stack storage facility, a launch pier, floating docks and related on-shore development in June 2000, it was determined that the proposed end of the launch pier and the floating docks were located in water that was too shallow to launch and operate boats during most of the tidal cycle. (SF Nos. 5 and 6) Following the determination that the proposed location of the pier was not workable, in 2000 a hydrographic survey was performed in an attempt to identify a location for the launch pier that had adequate water depth. (SF No. 7; Stipulated Exhibit 1) As a result of the information provided in the survey, the plans for the pier were changed to relocate and extend the pier so that the depth at the end of the launch pier would be 3.46 feet at mean low water. (SF No. 5) Following a site inspection by the Assistant Director of DCM in 2000, CAMA Permit No. 66-01 was issued for construction of the proposed development as revised. (S.F. No. 10) As a condition for Permit No 66-01, the permittee agreed that "if [the] water depths [sic] at the launch dock is of insufficient depth to allow for launch and/or recovery operations to take place without disturbing the adjacent shallow bottom habitat, launch and recovery operations shall be suspended until such time as the water depth increases to an adequate level." (S.F. No. 11; Stipulated Exhibit 2) The terms of the existing CAMA permit clearly reflect that use of the launch pier was contingent on the depth of the water. Furthermore, if the water depth became inadequate, Permittee agreed to stop using the pier. Given this history, it is apparent that the CAMA rules do not create the hardship resulting from Petitioners inability to launch and retrieve boats for much of the tidal cycle. Instead, this hardship results from Permittee's development of a marina on a marginal site.

Despite the CAMA Permit condition which required that use of the pier be discontinued if the water depth was no longer sufficient, Petitioner now requests a lengthy extension of the

pier across more than half the waterway and argues that it will not unreasonably restrict navigation or other public uses. This claim is not supported by the facts. The waters of the Cape Fear River in the vicinity of the project are classified SC by the NC Division of Water Resources. The area is designated as a Primary Nursery Area by the NC Division of Marine Fisheries. (Stipulated Exhibit 5) Given its size, the proposed forklift pier will usurp and shade approximately 59,153 square feet of this public trust waterbody. (SF No. 22) Even if the proposed development is limited and designed to extend only as far as the -5 foot MLW contour as shown on the 2014 survey, such a pier extension would add approximately 47,194 square feet (1.08 acres) of public trust area usurpation to the 7,180 square feet of the public trust area usurpation from the existing forklift pier, for a total of approximately 54,374 square feet (1.24 acres) of public trust area usurpation. (SF No. 46) The reduction of the length of the pier from the -6' contour to the -5' contour did not significantly reduce the overall length and size of the pier proposed, (from 53 to 49 percent of the waterbody) and removed only 118 feet of the proposed length. This small reduction in the overall size, indicative of the marginal nature of this site for a marina, simply illustrates the significant amount of usurpation the overall structure will cause to these public trust waters which are designated as a PNA.

Granted, the proposed development does not encroach into the navigation channel setback which is located approximately 4790 feet southwest of the outer edge of the marsh at the existing launch pier. (SF No. 30; Project Narrative included in Stipulated Exhibit 2). Moreover, the river traffic between Wilmington and the Atlantic Intracoastal Waterway and the mouth of the Cape Fear River use the main shipping channel. However, fisherman and pleasure boaters use the back channel. (See Project Narrative included in Stipulated Exhibit 2). Moreover, the

number of boaters in the back channel will likely increase once the NNP Marina adds 112 wet slips and 84 dry stack slips. (S.F. No. 38) The back channel has extensive shallow water mud flats extending from the east shoreline of the river and a less extensive mud flat on the western shoreline of Island 13 (SF No. 33) The proposed pier extension would create a barrier across more than half the water body in a navigational setting which already presents a challenge for the mostly recreational users as a result of the extensive shallow water mud flats. Therefore, the grant of the requested variance would unreasonably restrict and impede the public's right to free navigation on the back channel.

The initial issuance of CAMA Permit No. 66-01 balanced the requested development with the protection of this estuarine area. The present request for an extension across more than half the waterway is not consistent with the Commission's management objectives for this AEC. For this reason, any hardships that may result from the denial of the variance request are necessary to conserve and manage these estuarine waters and "to safeguard and perpetuate their biological, social, economic, and aesthetic values." The limited amount of development permitted at this site to date and its conditional use under the terms of CAMA Permit No. 66-01 is compatible with maintaining the natural characteristics of this estuarine area and minimizing the likelihood of significant loss of public resources. The additional proposed development is not consistent with the Commission's rules and Petitioner has failed to establish that the hardships resulting from the strict application of the ¼ width rule and the rate to deep water rule is unnecessary. On the contrary, the stipulated facts and exhibits establish that the site was always marginal for a marina due to its location in a PNA where new dredging is prohibited (including prop dredging), that the existing forklift pier is located in less than 1 foot of water relative to

mean low water, and that the site gains depth at a rate of less than .5 feet per 100 foot increment. Therefore, any hardships which may result from the strict application of the Commission's rules limiting pier length are necessary to protect this public trust area and PNA. For these reasons, the Commission affirmatively finds that Petitioner fails to meet the first factor required in N.C.G.S. § 113A-120.1(a)(2).

b. Petitioner has demonstrated that the hardship results from conditions peculiar to Petitioner's property.

The Commission affirmatively finds that Petitioner has demonstrated that the claimed hardship results from the location of the property. Specifically, Petitioner's property is located across from Island 13 which is used by the U.S. Army Corps of Engineers for spoil deposition. This location makes it unlikely that there will be future development across from Petitioner's property that would further impact navigation. Island 13 divides the Cape Fear River into a major navigation channel and the back channel. This division significantly lessened the width of the stretch used to compute distance for the ¼ width rule. The Commission does not agree that other conditions of the property noted by Petitioner are peculiar, including the "very shallow water," the possible siltation at the site after the initial construction, and the indentation along this stretch of shoreline. For these reasons, the Commission affirmatively finds that Petitioner has demonstrated that any hardship that might exist results from the location of Petitioner's property. Thus, Petitioner has established the second factor required by N.C.G.S. §113A-120.1(a)(2).

c. Petitioner has failed to demonstrate that the hardship did not result from its actions.

The shallow site conditions, the likely siltation after development, and the designation of the area as a PNA and associated regulatory limitations on dredging were all known in 2001 at

the time of permitting, in 2005-06 at the time of construction, in 2010 when Petitioner's sister-company purchased the site through a foreclosure sale, and continue today. The Marina has never been a fully operational dry storage marina facility. (SF No. 15) In purchasing the property in 2010 through the foreclosure process, and during the process of transferring CAMA Permit 66-01 into the applicant's name, the limitations of this site, the conditions included in the permit and the Commission's existing limits on pier length were or should have been known to the Petitioner and its sister company. Any hardship now facing Petitioner are a result of strict application of the CAMA regulations are the result of its decision to request a variance to extend the pier well beyond the ¼ width limitation in order to try and overcome the long-standing limitations imposed by the site conditions at a significant cost to the public trust PNC. Petitioner caused any hardship it now suffers given its attempt to develop a piece of property contrary to the provisions in the existing CAMA permit and the applicable rules. Petitioner knew or should have known of the existing permit conditions and CAMA regulations in effect at the time it acquired the property. Petitioner has caused its own hardship by seeking to construct a viable marina in an area where there is a 1025 foot deep shoreline indentation with very shallow water depths. In fact, the 2010 hydrographic survey referred to in the Project narrative provided by Petitioner in its application for a major modification, indicates water depths of less than one foot MLW at the end of the existing launching pier. (Stipulated Exhibit 2) In an area where the waterway is only 2,686 feet across, Petitioner's plans for the site were not consistent with the CAMA regulations or the CAMA permit issued for the site and are caused by Petitioner's failure to plan an appropriate development at the site. Given the flat bottom of the cove, the shallow water and mudflats extending over much of the width of the back channel, Petitioner's plan to

limit possible PNA damage by extending the proposed pier over half the width of the waterbody is excessive and creates any hardship faced by Petitioner.

Therefore, the Commission finds the hardships resulted are caused by actions taken by the Petitioner and Petitioner has not met the criteria required by N.C.G.S. §113A-120.1(a)(2).

d. Petitioner failed to demonstrate that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, will secure public safety and welfare, and preserve substantial justice.

Petitioner's request for a variance from the Commission's ¼ width rule and its rate to deep water rule to allow the proposed pier extension at the Watermark Marina fails to meet the fourth factor without which a variance cannot be granted. First, the Commission affirmatively finds that Petitioner's proposed pier extension is not consistent with the spirit, purpose and intent of the rules, standards and orders issued by the Commission. The Commission amended its pier length rule in 1998 to change the one-third standard to a one-fourth width requirement with certain exceptions (none of which apply in this case) in order to preserve traditional navigation by assuring that the middle one-half of any water body remained available for public use, and to limit the overall size any one pier can inhabit within a public trust waterbody such as the back channel of the Cape Fear River. In this case, although an exception to the ¼ width rule would reduce the likelihood of impacts to shallow water PNA and allow more use, Petitioner's request fails to preserve the middle of the water body for public use and navigation, and fails to limit the size of the pier and its corresponding impacts on the public trust PNA.

Petitioner's proposed development would lengthen the existing pier in order to reach a depth of -6 feet so that the facility could be used throughout the entire tidal cycle. The extra distance needed to reach a -6 foot depth would require extending the pier to 53 percent of the

width of the waterbody and results in the usurpation of approximately 59,153 square feet of pier area within the public trust area of the Cape Fear River. The rules from which Petitioner is seeking a variance are a reasonable regulation of riparian rights and fairly balance Petitioner's riparian rights with the Commission's management objective of protecting the estuarine shoreline AEC and public trust PNA. To grant Petitioner's request for such a significant variance to these rules would not be within the spirit, purpose and intent of the Commission's rules regulating pier length.

Second, the Commission affirmatively finds that public safety and welfare will be preserved by denying the variance request insofar as it would be inconsistent with public and safety to allow such a large amount of the public trust area of the Cape Fear River be taken up by a large pier extension proposal and specifically, by allowing the pier to extend across 53 percent of the waterbody width.

Finally, the Commission affirmatively finds that this variance request should be denied in order to preserve substantial justice. Petitioner (and its predecessors-in-interest) knew or should have known the limitations on its property in 2010 at the time the marina was purchased through foreclosure. It would be unfair to other permit holders to allow Petitioner to extend the pier across 53 percent of the waterbody when others are limited to constructing piers no more than a quarter, or at most a third, of the width of the waterway. Furthermore, it would be unjust to allow Petitioner to extend the pier to reach a depth of six feet when the original permit holder agreed to issuance of CAMA Permit 66-01 with the condition that if the water depth at the launch dock was insufficient to allow for launch and recovery operations to take place without disturbing the adjacent shallow bottom habitat, the launch and recovery operations shall be suspended." It

would be unjust to change the condition in CAMA Permit 66-01 after the fact when that was the condition in effect at the time the permit was issued, when the construction was completed, and when Petitioner purchased the property, and when the permit was transferred. It would also be unjust to change the rules for one marina but not all marinas located in PNAs along this river and along the coast.

For these reasons, the Commission has found that Petitioner has shown that the requested variance is not consistent with the spirit, purpose and intent of the Commission's rules, will not secure public safety and welfare and will not preserve substantial justice. Therefore, Petitioner has not met the fourth factor in N.C.G.S. §113A-120.1(a)(2).

ORDER

Petitioner has failed to meet each of the four factors required by N.C.G.S. §113A-120.1(a). THEREFORE, the variance from 15A NCAC 7H.0208 is DENIED.

This the 28th day of August 2014.

Frank D. Gorham III

Frank D. Gorham, III, Chairman
Coastal Resources Commission

CERTIFICATE OF SERVICE

This is to certify that I have this day served the foregoing FINAL AGENCY DECISION upon the parties by the methods indicated below:

Lewis Zwick CXA-10 Corporation Watermark Marina 6000 Legacy Drive Plano, TX 75024	*Certified Mail, Return Receipt Requested*
William A. Raney, Jr. Wessell & Raney, L.L.P. P.O. Box 1049 Wilmington, NC 28402-1049	*Regular U.S. Mail and Electronically at* waraney@bellsouth.net
CXA-10 Corporation CT Corporation Sys, Registered Agent 150 Fayetteville Street, Box 1011 Raleigh, NC 27601	*Certified Mail, Return Receipt Requested*
Christine A. Goebel, Esq. Assistant Attorney General N.C. Department of Justice PO Box 629 Raleigh, NC 27602	*Electronically at* cgoebel@ncdoj.gov
Braxton C. Davis Angela Willis Division of Coastal Management 400 Commerce Avenue Morehead City, NC 28557	*Electronically at* braxton.davis@ncdenr.gov and angela.willis@ncdenr.gov

This the 28th day of August, 2014.

Mary L. Lucasse
Special Deputy Attorney General and Commission Counsel
N.C. Department of Justice
P.O. Box 629
Raleigh, N. C. 27602

DIVISION OF COASTAL MANAGEMENT
FIELD INVESTIGATION REPORT

1. **APPLICANT'S NAME**: SCS Ventures, LLC c/o Mr. Mike McCarley
PROJECT NAME: Watermark Marina Major Modification State Permit No. 66-01

2. **LOCATION OF PROJECT SITE**: 4126 River Road, adjacent to the Cape Fear River, Wilmington, in New Hanover County.
Photo Index - **2006:** 204-6653: K-P, 8-9 **2000:** 204-206: K-P, 7-8 **1995:** 14-147: D-J, 17-18
State Plane Coordinates - X: 2319995 **Y:** 151025 **Rover File –** O-082613A
Lat: 34°09'37.04149"N **Long:** 77°56'32.14349"W

3. **INVESTIGATION TYPE**: CAMA

4. **INVESTIGATIVE PROCEDURE**: **Dates of Site Visit** – 08/24/2015
Was Applicant Present – Yes (Gene Strader)

5. **PROCESSING PROCEDURE**: **Application Received** – 08/19/2015 (completed)
Office – Wilmington

6. **SITE DESCRIPTION**:
   (A) **Local Land Use Plan** - Wilmington/New Hanover County
   Land Classification From LUP – Conservation, Limited Transition
   (B) **AEC(s) Involved**: PT, EW
   (C) **Water Dependent**: Yes
   (D) **Intended Use**: Commercial
   (E) **Wastewater Treatment: Existing** – Municipal (CFPUA)
   Planned – N/A
   (F) **Type of Structures**: **Existing** – Dry-stack building, storage buildings, timber-bridge, clubhouse, parking areas, stormwater pond, above ground storage fuel tank, forklift pier, pedestrian access pier, platform, floating docks and channel markers.
   Planned – Proposed new forklift pier, platform and transient floating docks
   (G) **Estimated Annual Rate of Erosion**: N/A
   Source - N/A

7. **HABITAT DESCRIPTION**:

	[AREA] DREDGED	FILLED	OTHER
(A) Vegetated Wetlands –			
(B) Non-Vegetated Wetlands – Open Water			45,010 sq. ft. (incorporated)
(C) Other – High Ground			

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   (D) **Total Area Disturbed**: 45,010 sq. ft. (1.0 acres)
   (E) **Primary Nursery Area**: Yes
   (F) **Water Classification**: SC **Open**: Closed

8. **PROJECT SUMMARY**: The applicant proposes to construct an extension of an existing forklift launch and retrieval pier with transient floating docks associated with an existing dry-stack marina facility into deeper water of the Cape Fear River.

9. **SITE DESCRIPTION:**

The project is located on the east bank of the Cape Fear River, on the west side of River Road (SR 1100), approximately 2 miles south of the N.C. State Ports Authority (NCSPA), in Wilmington, New Hanover County. To locate the project location, travel west on Shipyard Blvd. until you reach the entrance to the NCSPA. Turn left onto River Road and travel approximately 2.3 miles south until you reach the property of interest, which will be located on the right hand side. The property is bounded by Barnards Creek to the south, and the Cape Fear River to the west. The property is locally zoned *Industry* and is bordered to the north by this type of existing land-use. The 11.9 acre tract is roughly triangular, with approximately 1,000'of frontage on the river. Its eastern property line is approximately 200' off River Road, but includes an easement, 200' in length by 50' in width to provide access from River Road. The property varies in depth from 600' (south side) to 1,200' (north side). The property ranges in elevation from 0' to +10' above normal high water (NHW). Historically, the tract had been used as a sand borrow pit, removing much of the natural elevation of the site. After exhausting the sand in the upper layers of the soil, the property was apparently used as a dump site and was littered with old tires and other refuse.

Existing structures on the property currently consists of a full service 430 slip dry-stack marina building, storage units, timber bridge, marina clubhouse, parking areas, stormwater pond, 10,000 gallons above ground storage fuel tank with fuel dispensers, forklift pier with a pedestrian access pier, fixed platform, floating docks, a marine pump-out facility and channel markers. State Permit No. 66-01 was originally issued to a previous property owner (Barnards Creek, LLC) on May 29, 2001 for the commercial dry-stack marina facility on the property. State Permit No. 66-01 was transferred to Watermark Marina of Wilmington on July 12, 2005 and was modified on August 22, 2005 and again on October 23, 2006. State Permit No. 66-01 was renewed on March 28, 2007 and was due to expire on December 31, 2008. State Permit No. 66-01 was then transferred to CXA-5 Corporation on August 9, 2010. State Permit No. 66-01 was then transferred to CXA-10 Corporation on October 16, 2012. State Permit No. 66-01 was due to expire on December 31, 2013, which was subject to extension by the Session Law 2009-406, and as amended by Session Law 2010-177, the Permit Extension Act. State Permit No. 66-01 was renewed on January 7, 2014 and was recently transferred to SCS Ventures, LLC on March 30, 2015, which is due to expire on December 31, 2015.

High ground vegetation at the site consists of Live Oak, Laurel Oak, Magnolia, Pine, Cypress and Cedar trees. Understory vegetation consists of Red Cedar, Wax Myrtle and Marsh Elder. The tract exhibits borders of coastal wetlands along the river (west) and the adjacent Barnards Creek (south). These tidal wetlands are predominantly Giant Cordgrass (*Spartina cynocoroides)*, Smooth Cordgrass (*Spartina alterniflora),* Sawgrass (*Cladium*, spp.), Cat-tail (*Typha*, spp) and Bulrush (*Scirpus*, spp.). Non-tidal wetlands on the site appear to be §404 type wetlands regulated by the U.S. Army Corps of Engineers (USACE). These areas include a narrow hardwood wetland drain which appears to run through an access easement on the east side of the property and connects to Barnards Creek.

The waters of the Cape Fear River (in the vicinity of the project) are classified SC, by the N.C. Division of Water Resources. The area **is** designated as a **Primary Nursery Area (PNA)**, by the N.C. Division of Marine Fisheries and these waters are **CLOSED** to the harvesting of shellfish. The Wilmington-New Hanover County Land Use Plan 2006 Update classifies the area as Conservation.

It should be noted that the island directly across from the project site is known as Island 13, which was used as a mitigation site for impacts to PNA by the Wilmington Harbor deepening project. The distance between the project site and Island 13 is approximately 2,686' across. The waterward limits of the authorized facility under State Permit No. 66-01 were limited to the ¼ distance rule, which is approximately 672'. However, the application indicates that the existing facility currently only extends approximately 540' into the waterbody, which is approximately 132' landward of the ¼ distance rule.

The original application of State Permit No. 66-01 in April 2001 indicated existing water depth of -3.112' @ "low water" in the location of the proposed forklift launch area. Based on historical aerial photography review, the 2000 aerial photograph depicts shallow water depths in the project area. This application indicates that based on the latest hydrographic survey conducted in 2010 the existing water depth in the location of the existing launch and retrieval pier is <-1.0' relative to mean low water (MLW). The federally maintained Cape Fear River channel in the vicinity of the existing launch and retrieval pier is approximately 4,790' southwest of the outer edge of marsh at the existing launch and retrieval pier (**See Sheets 1, 2, 2a, 6 and 7 of 7 and Project Narrative**).

PROPOSED PROJECT:

The applicant proposes to construct an extension of an existing forklift launch and retrieval pier with transient floating docks associated with an existing dry-stack marina facility into deeper water of the Cape Fear River. A new forklift pier, measuring approximately 1,058' in length by 24' in width along with a new pedestrian access pier, measuring approximately 957' in length by 14' in width would extend side-by-side to each other towards the southwest into the Cape Fear River. The proposed access piers would be in the location of the four existing southern channel markers. These piers would terminate onto a fixed platform, measuring approximately 60' in length by 43' in width. Access ramps would lead onto two (2) floating docks, one measuring approximately 172' in length by 10' in width and one, measuring approximately 192' in length by 10' in width. These floating docks would run perpendicular to the channel and shoreline. According to the application package, the proposed extension would locate the terminal end of the new fixed forklift launch and retrieval pier and floating docks in water depths ranging from approximately -2.8' to -4.0' @ MLW contour in the back channel between Island 13 and the existing launch and retrieval pier. Approximately 728 linear feet (potentially 29 wet slips) of side-to dockage would be associated with the proposed forklift marina facility, which the application states would be for temporary tie up only. The floating docks associated with the existing launch and retrieval pier currently could potentially provide up 29 side-to dockage for a potential of 58 slips. The application states that the proposed new extension would provide adequate water depths for the launch and retrieval of clientele vessels at lower stages of the tidal cycle, which is currently not practical at the existing facility. The application also states that the existing facility would be utilized for the launch and retrieval of vessel during higher tides. The application also states that only 20 of the 430 slips within the dry-stack marina building are currently being utilized (**See Sheets 1 through 7 of 7 and Project Narrative**).

The application does not propose additional high ground development in this modification request to State Permit No. 66-01. Please find below, a list of previous authorizations received to date includes: NC Division of Water Resources Stormwater Permit- #SW8000408 and US Army Corp of Engineers - Action ID SAW-2000-01574.

10. ANTICIPATED IMPACTS:

The proposed extension of the existing launch and retrieval pier would incorporate an additional approximately 45,010 sq. ft. of Estuarine Waters and Public Trust Areas. The structures would not encroach into the adjacent 15' riparian corridor setback requirement. The proposed facility would extend approximately 788' to 1,460' into a waterbody measuring approximately 2,364' across. The most waterward end of the proposed structures would extend approximately 1/3 the distance of the adjacent waterbody, exceeding the 1/4 distance rule of the waterbody. Based on provided water depths, the extension would only gain -4.0' @ MLW for the proposed total distance of 1,020' into the adjacent waterbody. The proposed structures would not encroach into the USACE navigation channel setback. Minor turbidity increases should be expected during the construction process.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

November 10, 2015

Regulatory Division

Action ID No. SAW-2000-01574

Mr. Doug Huggett
Division of Coastal Management
North Carolina Department of
Environmental Quality
400 Commerce Avenue
Morehead City, North Carolina 28557-3421

Dear Mr. Huggett:

Reference the application of Mr. Mike McCarley of SCS Ventures, LLC to conduct expansion of an existing launch and retrieval pier with a transient floating dock at the existing Watermark Marina. This project is located on the east bank of the Cape Fear River, at 4126 River Road, in Wilmington, New Hanover County, North Carolina. Coordinates in Decimal Degrees are: 34.159750 N -77.943308 W.

The Federal agencies have completed review of the proposal as presented by the application and your field investigation report.

We recommend that the following conditions be included in the State authorization:

1. In order to further protect the endangered West Indian Manatee, Trichechus manatus, the applicant must implement the U.S. Fish and Wildlife Service's Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at http://www.fws.gov/nc-es/mammal/manatee_guidelines.pdf.

2. Dredging is not authorized.

3. The permittee must install and maintain, at his expense, any signal lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, on authorized facilities. For further information, the permittee should contact the U.S. Coast Guard Marine Safety Office at (910) 772-2191.

4. All work authorized by this permit must be performed in strict compliance with the submitted plans, which are a part of this permit. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

5. The docks and piers extending over wetlands will be elevated sufficiently (a minimum of 3 feet) above the wetland substrate to prevent total shading of vegetation, substrate, or other elements of the aquatic environment.

6. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States.

7. Approval of the structure is based on determinations that there would be no obstruction to navigation. The structure may be damaged by wave wash from passing vessels. Issuance of this permit should not be construed, as relieving the permittee of taking proper steps to insure the structure and moored boats will not be damaged by wave wash.

8. The authorized structure and associated activity must not interfere with the public's right to free navigation on all navigable waters of the United States. No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work for reason other than safety.

9. Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.

10. Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

11. All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic

materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at (919) 733-5083, Ext. 526 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

12. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

13. If the permittee discovers any previously unknown historic or archeological remains while accomplishing the authorized work, he will immediately notify the Wilmington District Engineer who will initiate the required coordination procedures.

14. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

15. The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

16. The activity will be conducted in such a manner as to prevent a significant increase in turbidity outside the area of construction or construction-related discharge. Increases such that the turbidity in the waterbody is 50 NTU's or less in all rivers not designated as trout waters by the North Carolina Division of Environmental Management (NCDEM), 25 NTU's or less in all saltwater classes and in all lakes and reservoirs, and 10 NTU's or less in trout waters, are not considered significant.

17. The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

18. Violations of these conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

Questions or comments may be addressed to Mr. Tyler Crumbley, Wilmington Field Office, Regulatory Division, telephone (910) 251-4170.

Sincerely,

Tyler Crumbley, Project Manager
Wilmington Regulatory Field Office

Copies Furnished:

Ms. Karen Higgins
Division of Water Quality
North Carolina Department of
Environmental Quality
1650 Mail Service Center
Raleigh, North Carolina 27699-1650

Mr. Doug Huggett
Division of Coastal Management
North Carolina Department of
Environmental Quality
400 Commerce Avenue
Morehead City, North Carolina 28557-3421

Mr. Pete Benjamin
U.S. Fish and Wildlife Service
Fish and Wildlife Enhancement
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Fritz Rohde
National Marine Fisheries Service
Habitat Conservation Service
Pivers Island
Beaufort, North Carolina 28516

Mr. Pace Wilber
National Marine Fisheries Service
Habitat Conservation Division
219 Fort Johnson Road
Charleston, South Carolina 29412-9110

Mr. Todd Allen Bowers
US EPA Region 4 Life Scientist
Water Protection Division
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

Mr. Chad Coburn
Division of Water Resources
North Carolina Department of
Environmental Quality
127 Cardinal Drive Extension
Wilmington, North Carolina 28405

Mr. Robb Mairs
Division of Coastal Management
North Carolina Department of
Environmental Quality
127 Cardinal Drive Extension
Wilmington, North Carolina 28405

North Carolina Department of Environment and Natural Resource

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

****SEE: NEW "RETURN TO" CONTACT INFO****

August 27, 2015

C.15.08.31.03

MEMORANDUM:

TO: Maria Dunn
NCWRC
For WiRO

FROM: Heather Coats, NC DENR-DCM Assistant Major Permits Coordinator
127 Cardinal Drive Ext., Wilmington, NC 28405 heather.coats@ncdenr.gov
Fax: 395-3964 ***(Courier 04-16-33)***

SUBJECT: CAMA Permit Application Review 66-01MM

Applicant: ***SCS Ventures, LLC (Watermark Marina) c/o Mike McCarly***

Project Location: *4126 River Rd., adjacent to the Cape Fear River, in Wilm., New Hanover Co.*

Proposed Project: *to expand the existing launch & retrieval pier into deeper water*

Please indicate below your agency's position or viewpoint on the proposed project and ***return this form to Heather Coats*** at the address above by ***September 19, 2015.*** If you have any questions regarding the proposed project, contact Robb Mairs at (910)796-7423 when appropriate, in-depth comments with supporting data is requested.

REPLY:

_____ This agency has no objection to the project as proposed. * See attached

_____ This agency has no comment on the proposed project.

_____ This agency approves of the project only if the recommended changes are incorporated. See attached.

_____ This agency objects to the project for reasons described in the attached comments.

SIGNED Maria L. **DATE** 9-16-2015

N.C. Division of Coastal Management
127 Cardinal Drive Ext., Wilmington, NC 28405
Phone: 910-796-7215 \ FAX: 910-395-3964 Internet: www.nccoastalmanagement.net

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

MEMORANDUM

TO: Heather Coats
Division of Coastal Management
North Carolina Department of Environment and Natural Resources

FROM: Maria T. Dunn, Coastal Coordinator
Habitat Conservation

DATE: September 16, 2015

SUBJECT: CAMA Dredge/Fill Permit Application for SCS Ventures, LLC (Watermark Marina) c/o Mike McCarly, New Hanover County, North Carolina.

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) reviewed the permit application with regard to impacts on fish and wildlife resources. The project site is located at 4126 River Road, adjacent to the Cape Fear River in Wilmington, NC. Our comments are provided in accordance with provisions of the Coastal Area Management Act (G.S. 113A-100 through 113A-128), as amended, Sections 401 and 404 of the Clean Water Act, as amended, and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The applicant proposes to expand the existing launch and retrieval pier to deeper water. The current depths at normal low water are -1' at the terminus of the existing pier. The applicant proposes to add a new 1,058' by 24' forklift pier with an adjacent 957' by 14' pedestrian pier to the existing facility. The new structures would extend to approximately 1/3 the width of the waterbody in a southwesterly direction and have between -2.8' to -4.0' waterdepths at MLW. Access ramps and floating docks would be incorporated into the design. The NCWRC attended a scooping meeting in 2013 where the applicant presented another design that incorporated more public trust area and extended further into the Cape Fear River. No modification of upland development is proposed. The Cape Fear River is classified SC by the Environmental Management Commission and is designated a primary nursery area (PNA) by the NC Division of Marine Fisheries.

The NCWRC has reviewed the permit application and has considered other information presented at earlier meetings. We understand this proposal extends past the 1/4 width of the river, but to not believe

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

significant navigation impacts would occur due to the specific conditions of the site. These conditions include the width of the river at this location, the lack of an existing pier head alignment, the location of the shipping channel on the other side of Island 13, the inability of development or piering out from Island 13 to further constrict the river across from this development, and the repositioning of the pier from an earlier proposal to minimize navigation concerns.

We appreciate the opportunity to review and comment on this permit application. If you need further assistance or additional information, please contact me at (252) 948-3916 or at maria.dunn@ncwildlife.org

North Carolina Department of Environment and Natural Resource

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

****SEE: NEW "RETURN TO" CONTACT INFO****

August 27, 2015

MEMORANDUM:

TO: Gregg Bodner
Fisheries Resource Specialist
DCM, Morehead City

FROM: Heather Coats, NC DENR-DCM Assistant Major Permits Coordinator
127 Cardinal Drive Ext., Wilmington, NC 28405 *heather.coats@ncdenr.gov*
Fax: 395-3964 ***(Courier 04-16-33)***

SUBJECT: CAMA Permit Application Review 66-01MM

Applicant: ***SCS Ventures, LLC (Watermark Marina) c/o Mike McCarly***

Project Location: *4126 River Rd., adjacent to the Cape Fear River, in Wilm., New Hanover Co.*

Proposed Project: *to expand the existing launch & retrieval pier into deeper water*

Please indicate below your agency's position or viewpoint on the proposed project and ***return this form to Heather Coats*** at the address above by ***September 19, 2015.*** If you have any questions regarding the proposed project, contact Robb Mairs at (910)796-7423 when appropriate, in-depth comments with supporting data is requested.

REPLY:

_____ This agency has no objection to the project as proposed.

__X__ This agency has ~~no~~ A comment on the proposed project.

_____ This agency approves of the project only if the recommended changes are incorporated. See attached.

_____ This agency objects to the project for reasons described in the attached comments.

RECEIVED
AUG 31 2015

SIGNED _____ **DATE** 9/18/15

RECEIVED
DCM WILMINGTON, NC
SEP 18 2015

RECEIVED
AUG 31 2015

N.C. Division of Coastal Management
127 Cardinal Drive Ext., Wilmington, NC 28405
Phone: 910-796-7215 \ FAX: 910-395-3964 Internet: www.nccoastalmanagement.net

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM:

TO: Heather Coats, DCM Assistant Major Permit Coordinator

FROM: Gregg Bodnar, DCM Fisheries Resource Specialist

SUBJECT: SCS Ventures, LLC (Watermark Marina)

DATE: 9/18/2015

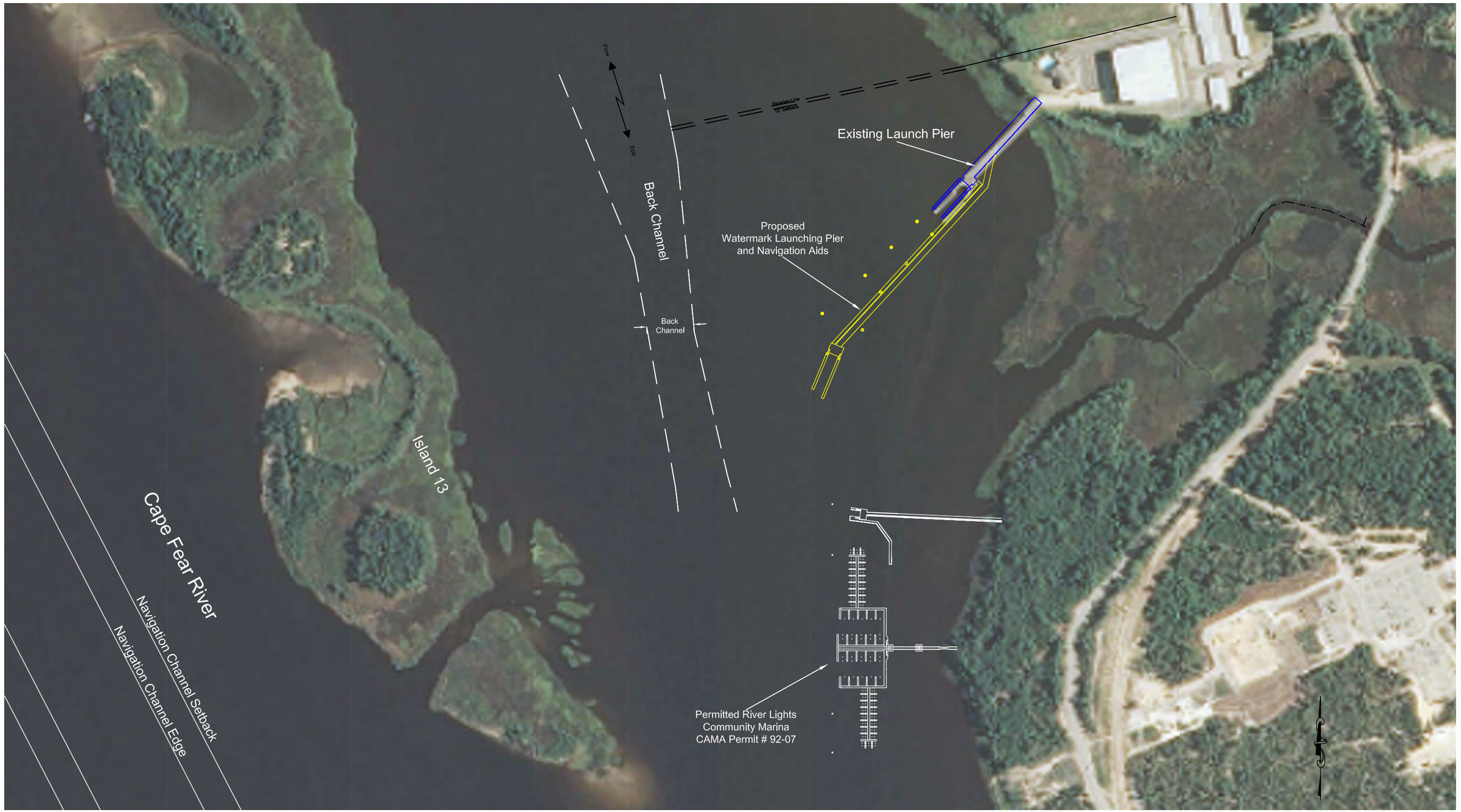
A North Carolina Division of Coastal Management (DCM) Fisheries Resource Specialist has reviewed the subject permit application for proposed actions that impact fish and fish habitats. The applicant proposes to expand and existing launch and retrieval pier. The existing launch and retrieval pier and floating docks is approximately 657ft in total length and terminates in less than 1ft at Mean Low Water (MLW). Surrounding waters of the Cape Fear River are classified as Primary Nursery Area (PNA), Anadromous Fish Spawning Area (AFSA), Secondary Recreation (SC), and are closed to shellfish harvest by the NC Division of Marine Fisheries Shellfish Sanitation Section.

PNA's are estuarine waters where initial post-larval development occurs. Species within this area are early post-larval to juvenile and include finfish, crabs, and shrimp. Species inhabit PNA's because they afford food, protection, and proper environmental conditions during vulnerable periods of their life history, thus protection of these areas are imperative. The applicant proposes to extend the launch and retrieval pier to approximately 1,058ft by 24ft and terminate in two floating docks (172ft x 10ft and 192ft x 10ft). The extension would put the terminal end of the structure in approximately -2.8ft to -4ft at MLW. The proposed floating docks would double the number of wet slips from 29 to 58.

This portion of the Cape Fear River has been designated as AFSA. AFSA's have evidence of anadromous fish spawning through direct observation, capture of running ripe females, or indication of eggs or early larvae. Anadromous species within the Cape Fear River include American and hickory shad, striped bass, river herring, American eel and both Atlantic and shortnose sturgeon. **Due to the magnitude of the proposed pier, the AFSA moratorium on in water work is recommended (1 February to 30 June).** This moratorium reduces the negative effects on critical fish life history activities, to include spawning migrations and nursery functions.

Finally, promoting the existing floating docks and launch/retrieval portion of the pier as fishing access would aid in minimizing any impacts to PNA habitat and provide useful recreational fishing access.

Contact Gregg Bodnar at (252) 808-2808 ext. 213 or gregg.bodnar@ncdenr.gov with further questions or concerns.



THIS MAP IS BASED ON ORIGINAL SURVEY INFORMATION FROM:

McKim & Creed
243 North Front Street
Wilmington, North Carolina 28401
Phone: (910)343-1048, Fax: (910)251-8282
www.mckimcreed.com

MCKIM AND CREED SURVEY NOTES:

NOTES: SOUNDINGS ARE EXPRESSED IN FEET AND TENTHS AND REFER TO LOCAL MEAN LOW WATER (MLW). PROJECT SURVEYED WITH McKIM & CREED SURVEY VESSEL "SURVEY VESSEL SOUNDS DEEP", ON MARCH 12, 2015. FOR HORIZONTAL POSITIONING, AND 200 KHZ SOUNDING EQUIPMENT. HYPACK SOFTWARE VER. 10.1 WAS USED FOR DATA COLLECTION AND PROCESSING. HORIZONTAL DATUM NAD 1983 (2011).

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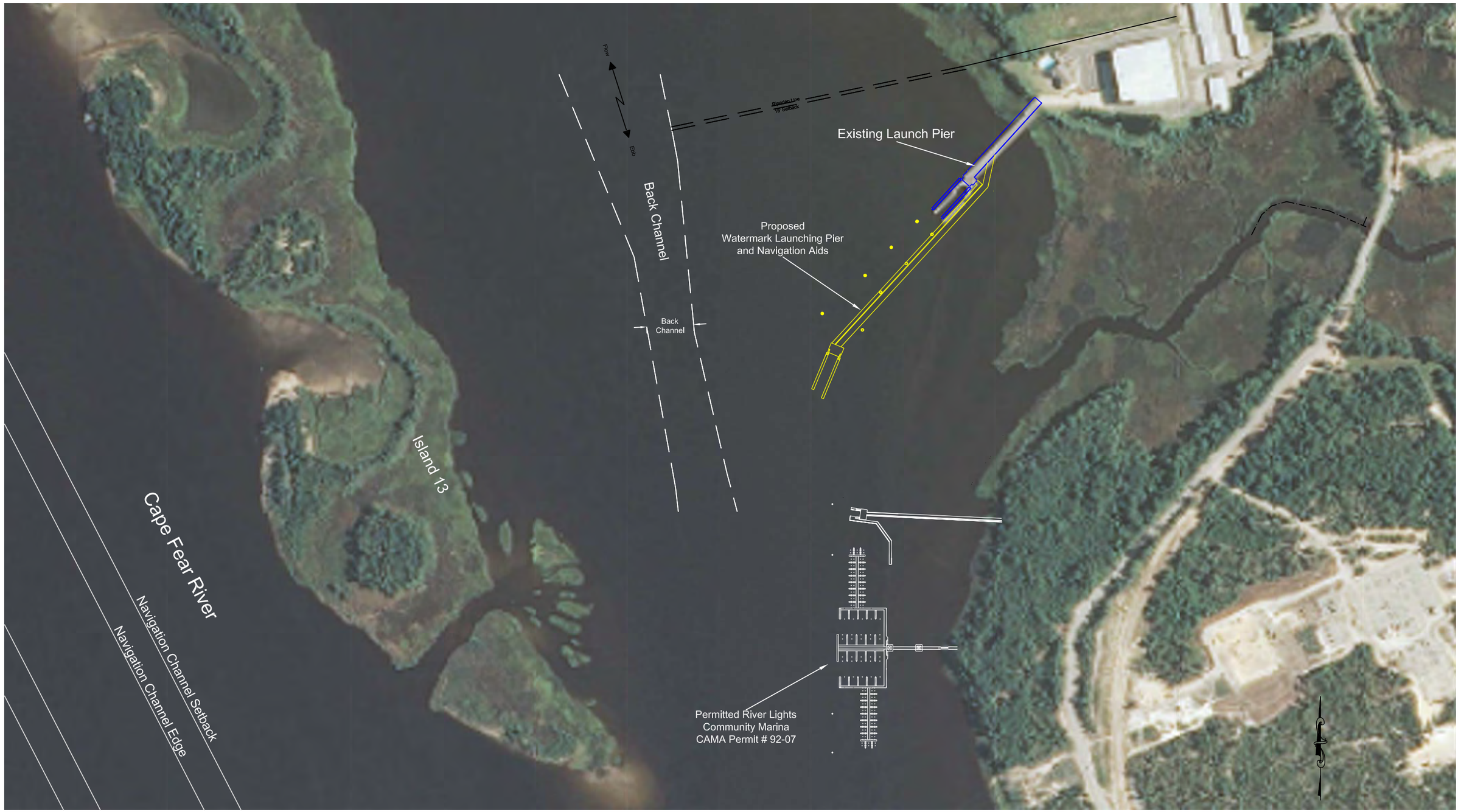
LAND MANAGEMENT GROUP INC.
Environmental Consultants
3805 Wrightsville Ave., Suite 15
Wilmington, North Carolina 28403
Telephone: 910-452-0001

Project: CAMA Major Modification Permit #66-01 Watermark Marina Cape Fear River, River Road, Wilmington, NC		Date: Jan 5, 2016	Revision Date:
		Scale: 1" = 400'	Job Number: 02-15-081
Title: Adjacent Permitted Structures		Drawn By: LMG	Figure: CRC Variance Supplement



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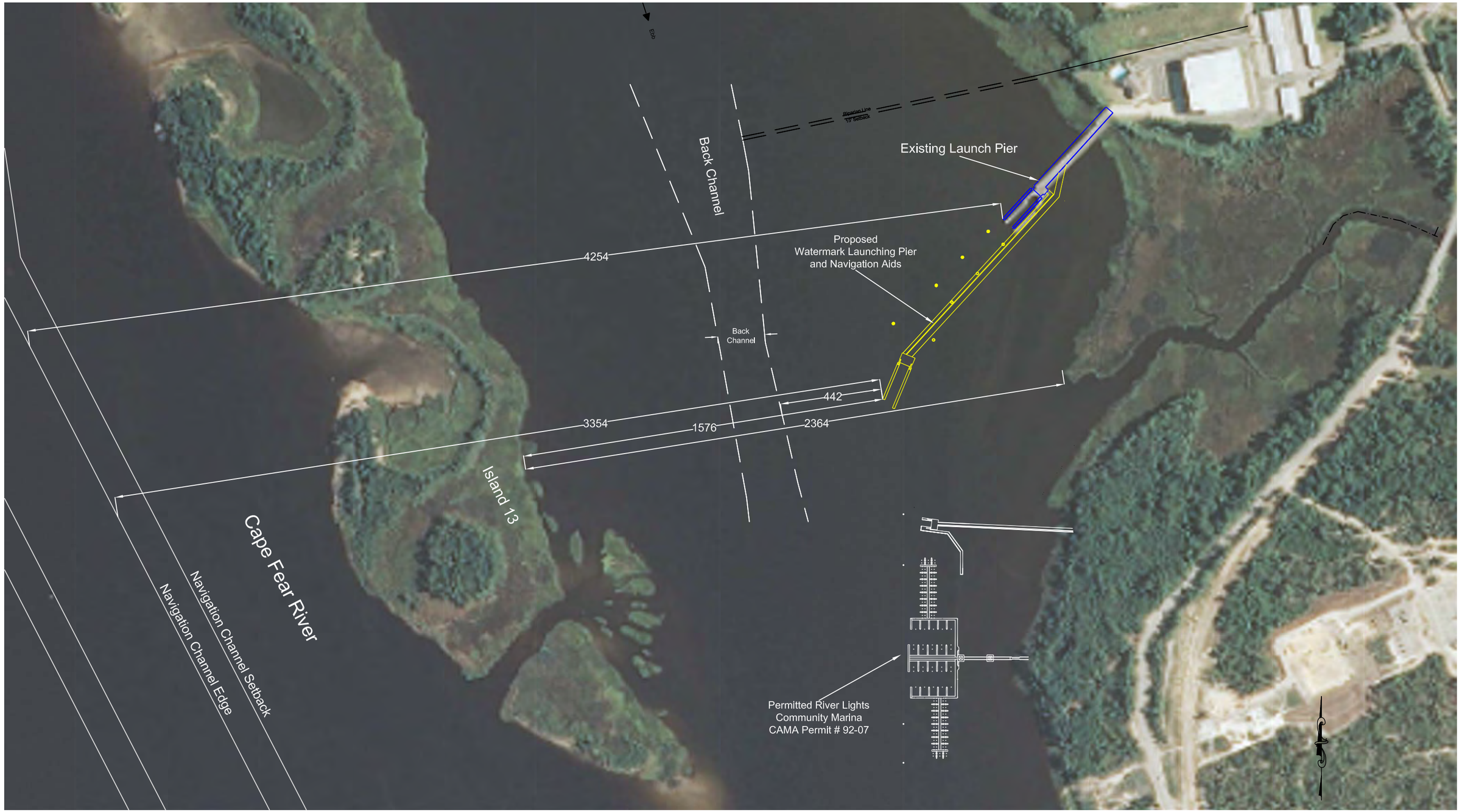

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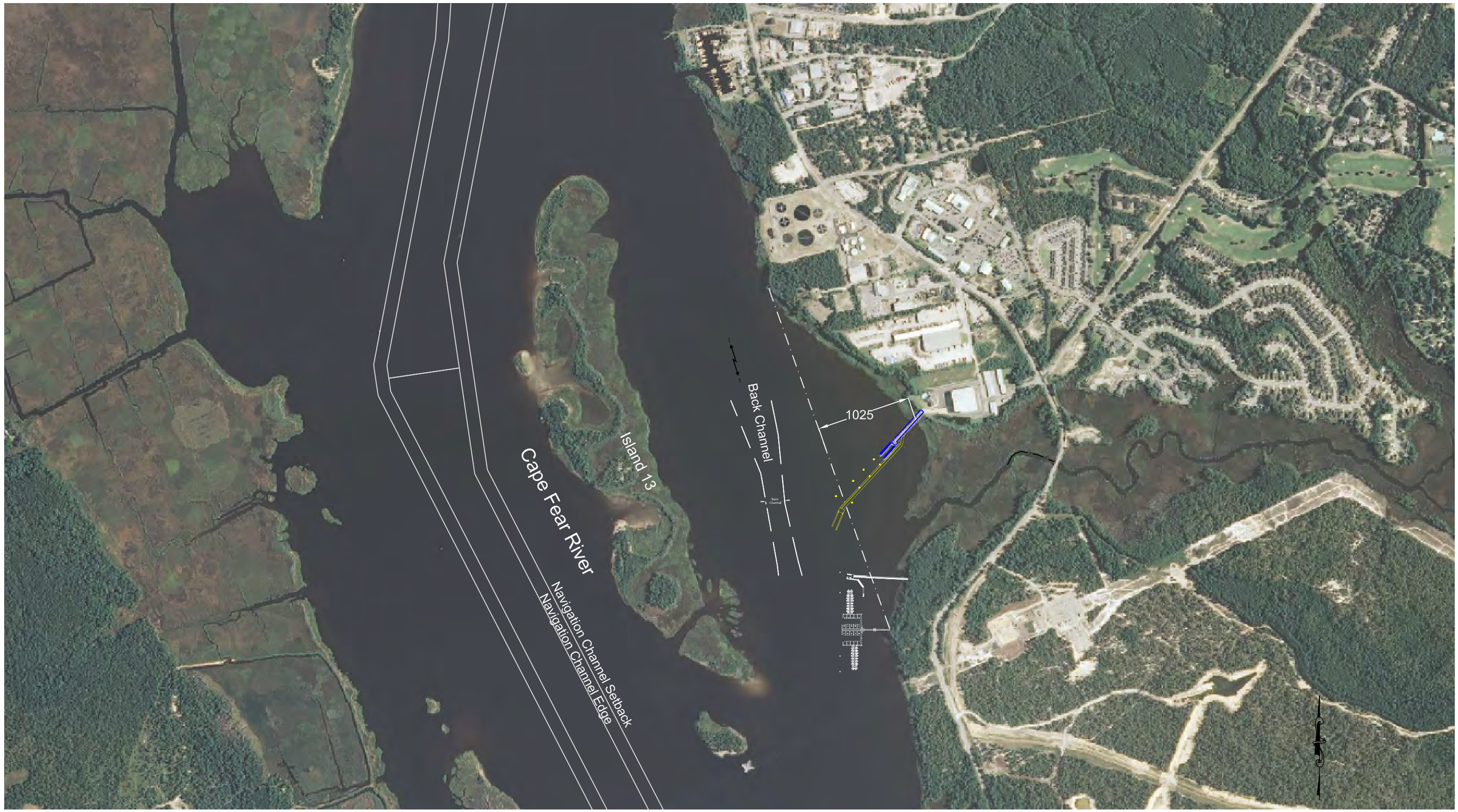

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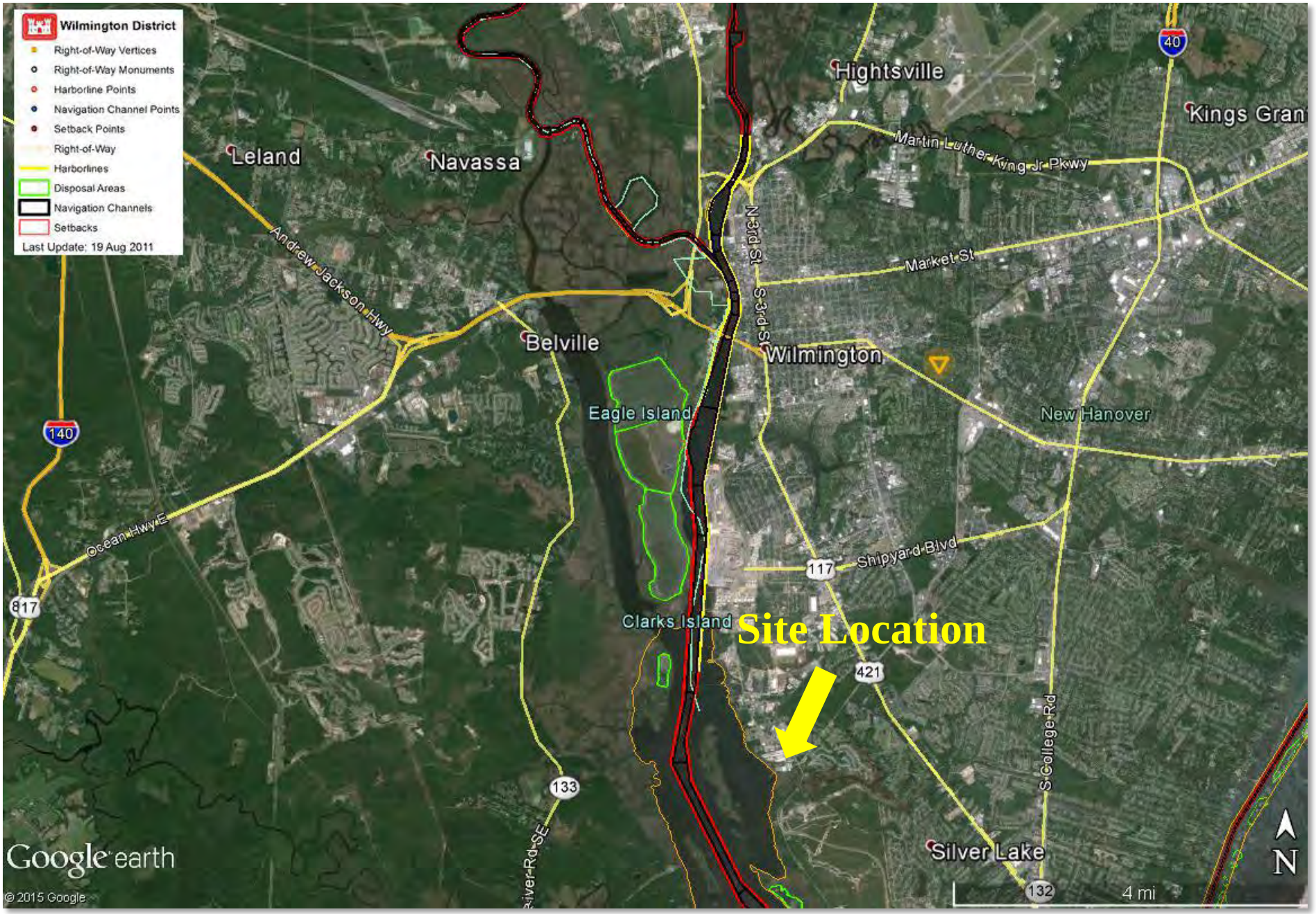
Title: Existing Shoreline Conditions		Drawn By: LMG	Figure: CRC Variance Supplement 2

SCS Ventures, LLC Variance Request

February 9, 2016

Department of Environmental Quality



Department of Environmental Quality

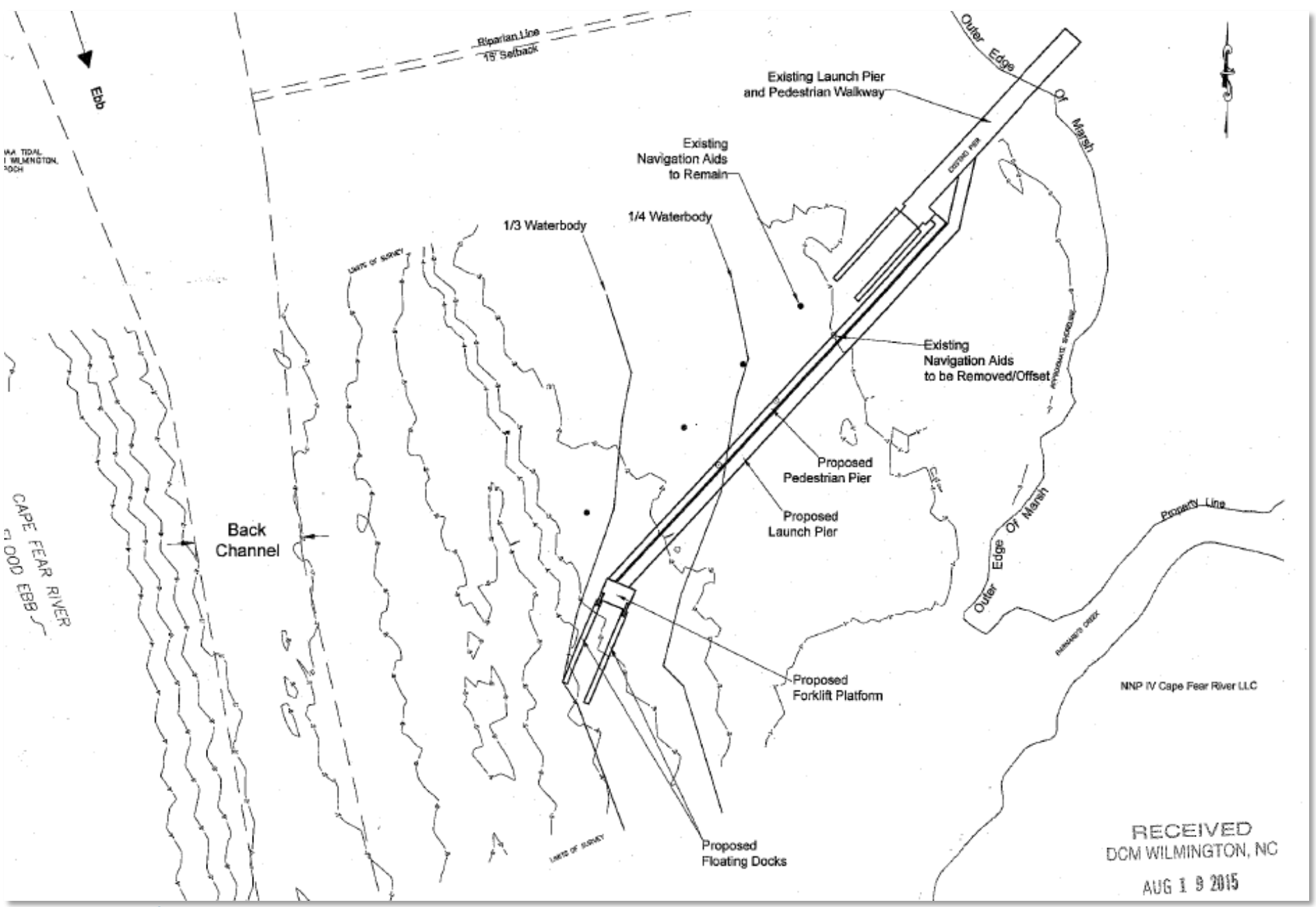
Department of Environmental Quality

Department of Environmental Quality


Back Channel of the Cape Fear River
Island 13
SCS Ventures, LLC
Watermark Marina Property
Barnards Creek
View of Project Site Facing West
Photo: NC DCM Aerial
Photography dated 11.20.2013


View of Project Site Facing East
Photo: NC DCM On-Site
Photography Dated 6.12.2014


2011
Back Channel
of the Cape Fear River
Approximate -4.0' @ MLW Contour
Based on 3.12.15 Hydrographic Survey
Barnards Creek
Island 13
2,346 feet across
1/3 distance
1/4 distance
N
River Road
River Rd


Ebb
Riparian Line
15' Setback
Existing Launch Pier
and Pedestrian Walkway
Outer Edge Of Marsh
Existing
Navigation Aids
to Remain
1/3 Waterbody
1/4 Waterbody
Existing
Navigation Aids
to be Removed/Offset
Proposed
Pedestrian Pier
Proposed
Launch Pier
Back
Channel
CAPE FEAR RIVER
FLOOD EBB
Outer Edge Of Marsh
Property Line
Proposed
Forklift Platform
NNP IV Cape Fear River LLC
Proposed
Floating Docks
RECEIVED
DCM WILMINGTON, NC
AUG 19 2015

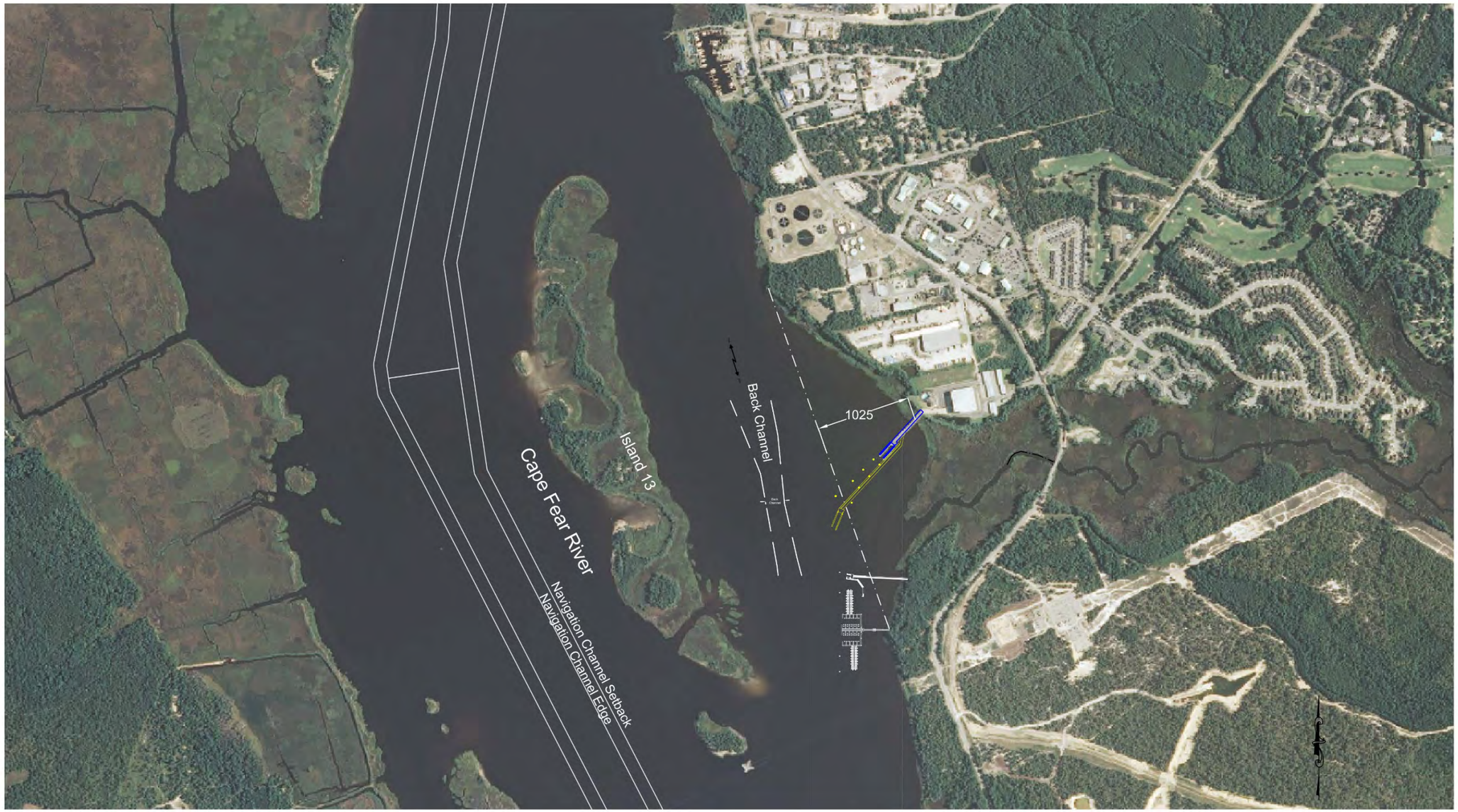
CAMA Variance Petition

SCS Ventures, LLC/Watermark Marina

New Hanover County, NC

BROOKS PIERCE


4114 River Rd, Wilmington, NC 28412, USA
Google earth



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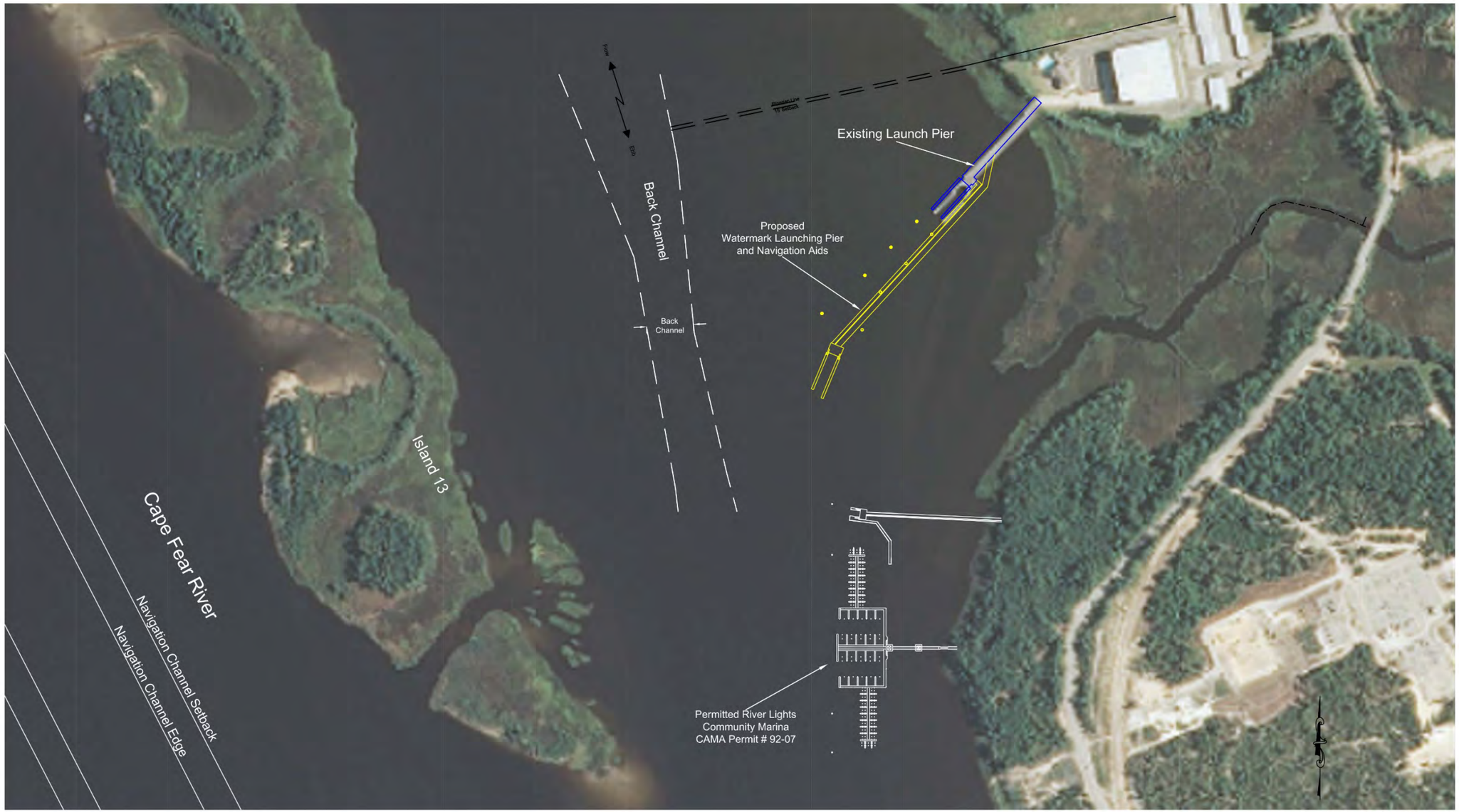

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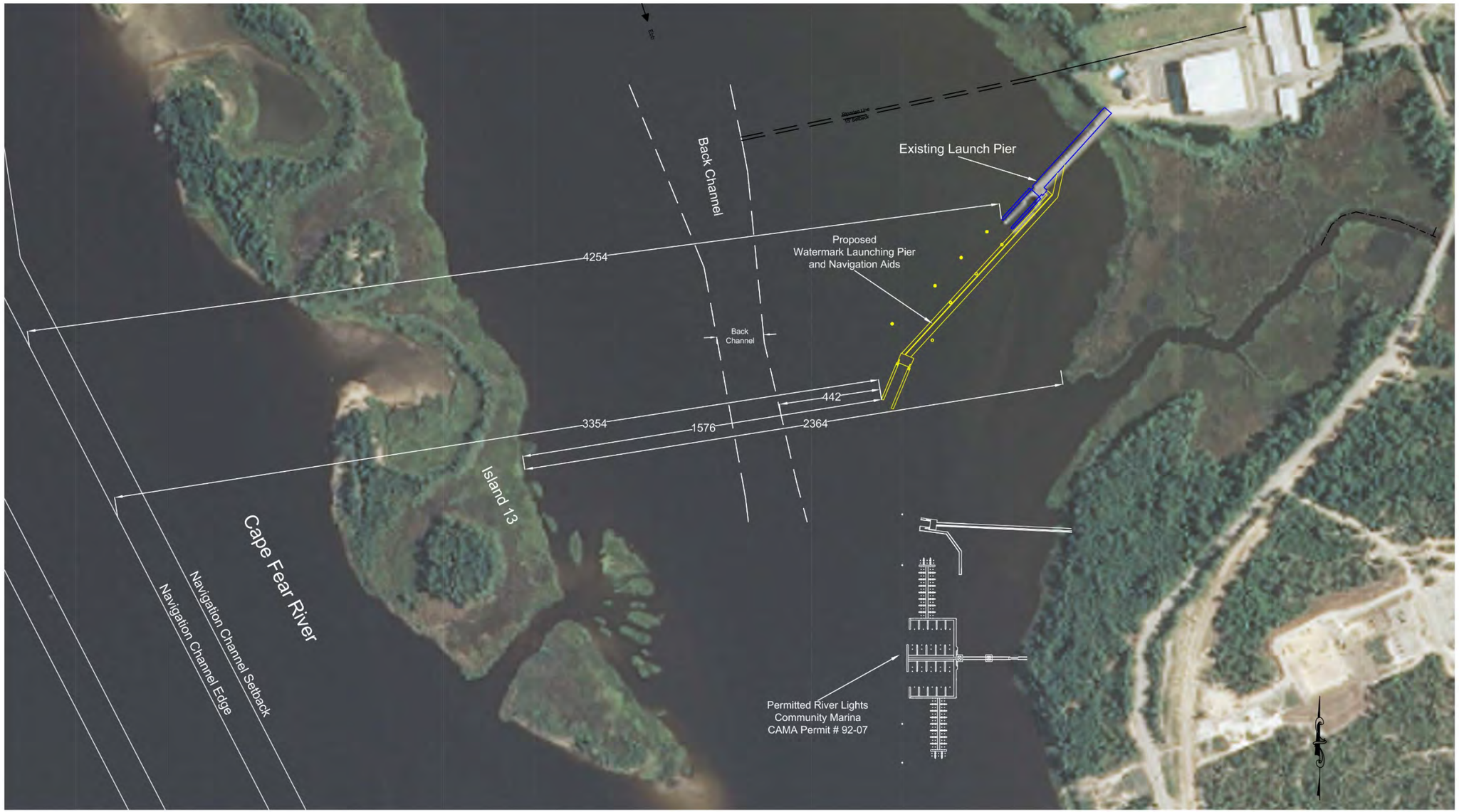

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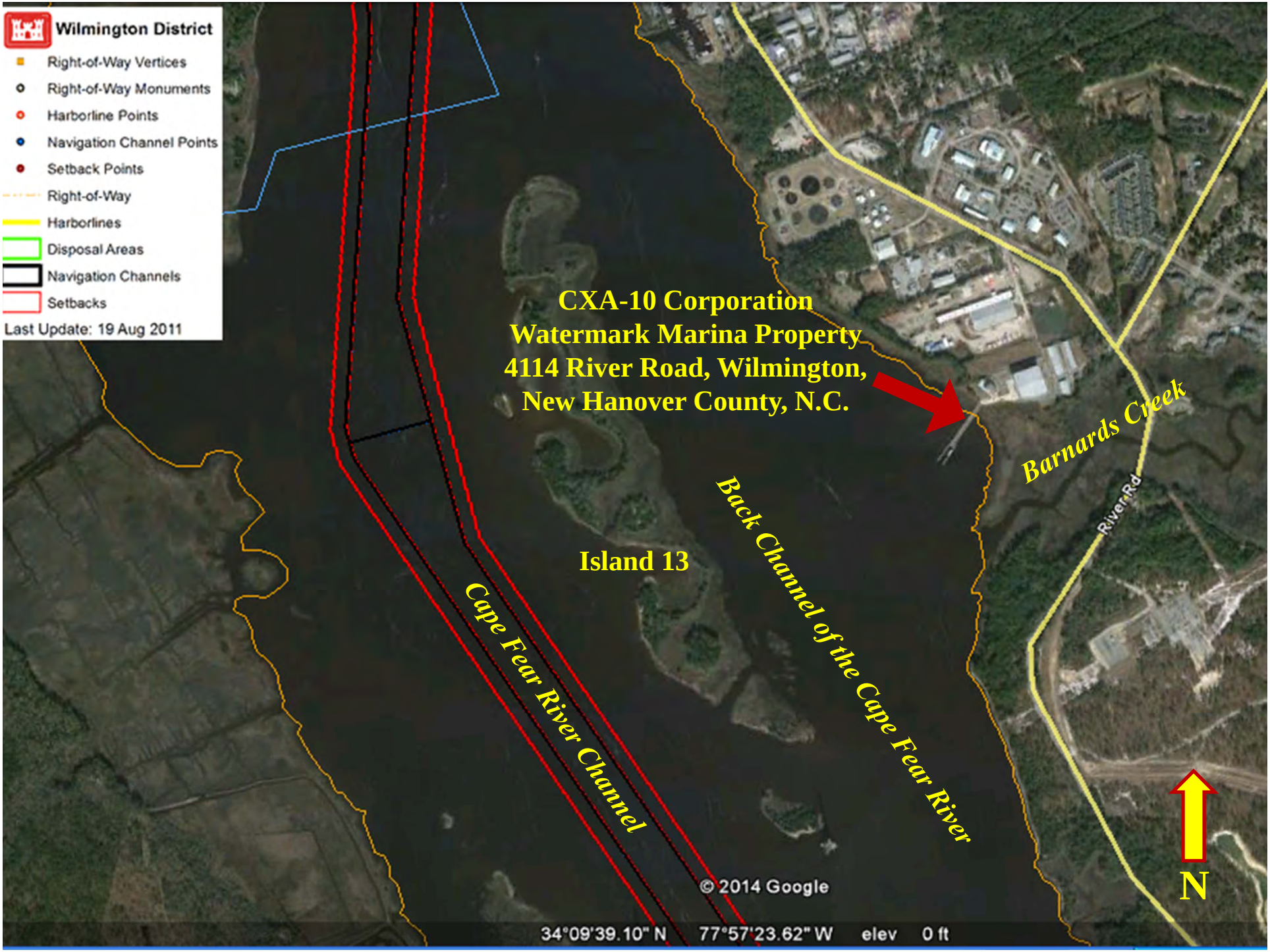
END

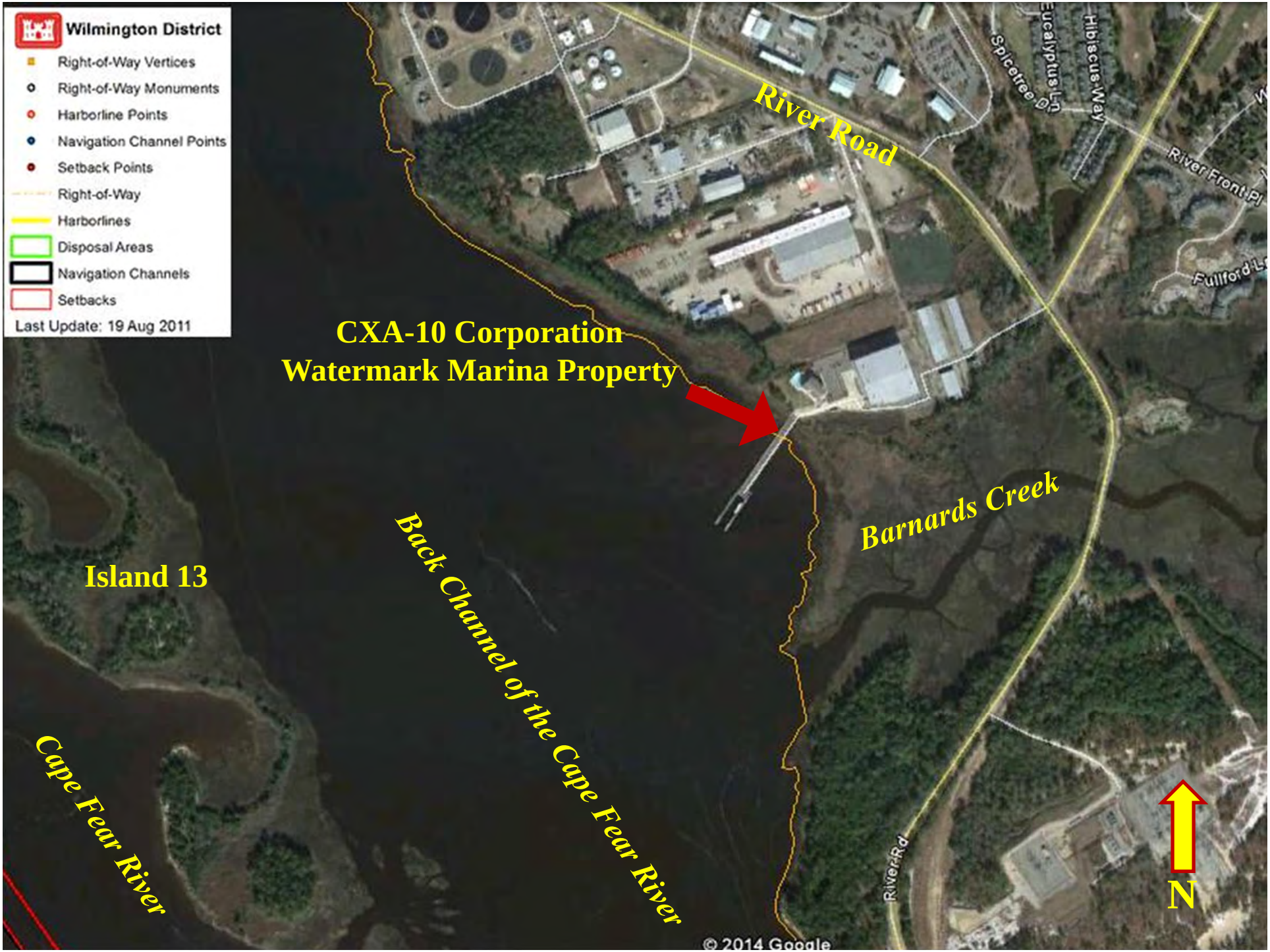
CXA-10 CORPORATION

Watermark Marina
4114 River Road, Wilmington
New Hanover County

Variance Request
July 30, 2014


Hampstead
40
140
17
Delco
76
74
Murrayville
Kings Grant
Leland
132
Wilmington
Wrightsville Beach
Site Location
Winnabow
Green Swamp Preserve
Myrtle Grove
421
211
17
Carolina Beach
Supply
Joe Eakes Park
87
Cape Fear River
Fort Fisher State Recreation Area
Southport
Oak Island
1100
N


Wilmington District
Right-of-Way Vertices
Right-of-Way Monuments
Harborline Points
Navigation Channel Points
Setback Points
Right-of-Way
Harborlines
Disposal Areas
Navigation Channels
Setbacks
Last Update: 19 Aug 2011
CXA-10 Corporation
Watermark Marina Property
4114 River Road, Wilmington,
New Hanover County, N.C.
Barnards Creek
River Rd
Island 13
Back Channel of the Cape Fear River
Cape Fear River Channel
© 2014 Google
34°09'39.10" N 77°57'23.62" W elev 0 ft
N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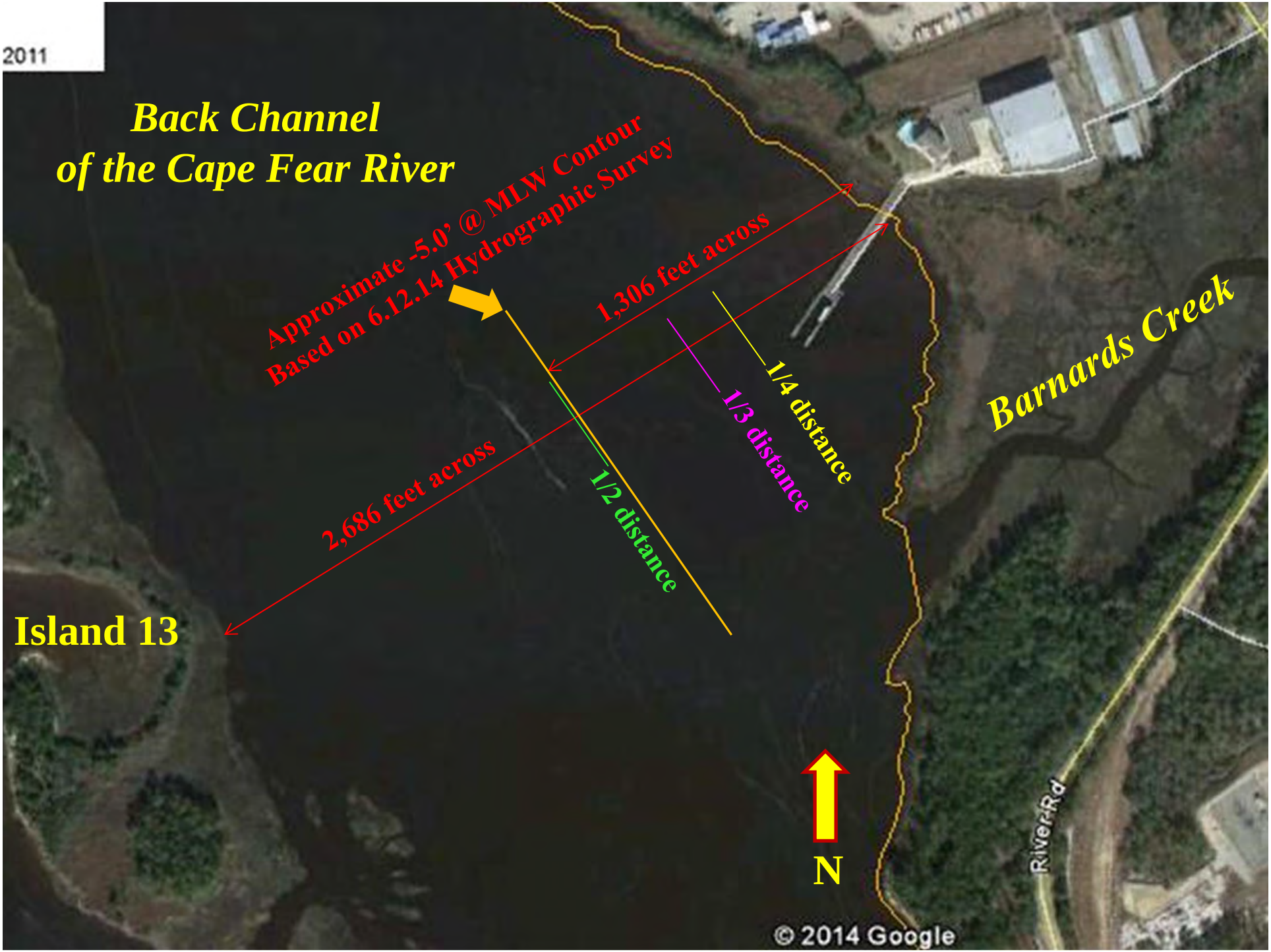
Disposal Areas
Navigation Channels
Setbacks
Last Update: 19 Aug 2011
River Road
Spicetree Dr
Eucalyptus Ln
Hibiscus Way
River Front Pl
Fullford Ln
CXA-10 Corporation
Watermark Marina Property
Barnards Creek
Back Channel of the Cape Fear River
Island 13
Cape Fear River
River Rd
© 2014 Google
N


Island 13
Back Channel of the Cape Fear River
CXA-10 Corporation
Watermark Marina Property
Barnards Creek
View of Project Site Facing West
Photo: NC DCM Aerial
Photography dated 11.20.2013

View of Project Site Facing East
Photo: NC DCM On-Site
Photography Dated 6.12.2014


2011
Back Channel
of the Cape Fear River
Approximate -5.0' @ MLW Contour
Based on 6.12.14 Hydrographic Survey
1,306 feet across
2,686 feet across
1/4 distance
1/3 distance
1/2 distance
Barnards Creek
Island 13
N
River Rd
© 2014 Google

STATE OF NORTH CAROLINA

AFFIDAVIT

COUNTY OF NEW HANOVER

The undersigned, being first duly sworn, hereby deposes and says:

1. My name is Gene Strader. I am over eighteen years of age and under no constraint or undue influence, and am competent to make this Affidavit.

2. I have an extensive background in and am knowledgeable of marina properties in the vicinity of Wilmington, North Carolina and Little River, South Carolina, having been in the real estate business in Wilmington for 32 years, and having served as a manager or principal of Watermark Marina located at 4114 River Road, Wilmington, North Carolina from 2010 to the present, and having the following prior involvements with marina properties:

a. Former owner of Oakwind Marina, Wilmington, North Carolina; and

b. Current owner of Coquina Yacht Club, Little River, South Carolina.

3. I have been around boats and marinas for over 40 years. I was the manager of Oakwind Marina. I am currently the owner and manager of Watermark Marina and Coquina Yacht Club. I am a Certified Marina Manager. I have been on the Board of Directors for the South Carolina Marina Association. I was service manager at Carolina Inlet Marina, Carolina Beach, North Carolina in the early 1980's. I have acted as a consultant with respect to the development and operation of marinas. Although I am not a licensed appraiser, I have acted as a paid consultant for marina appraisals.

4. I am familiar with the water depths and the planned pier at Watermark Marina, having engaged professional surveyors, McKim & Creed, Inc., to survey same and having reviewed such surveys and plans for the proposed pier subject of the above-captioned variance.

5. The surveyed mean low water depth at the proposed pier boat landing is 3.8' to 4.2'.

6. At this water depth, the boat landing, during any time of the tide cycle, would be able to accommodate vessels of any size which the facility would handle in dry storage. These sizes would range from approximately 16' to approximately 32'. The prop clearance on vessels of this size would result in approximately 1' to 1.5' clearance between the prop and the mud flats bottom.

This Affidavit is made upon my personal knowledge.

FURTHER THE AFFIANT SAYETH NOT.

This the 13th day of January, 2016.

GENE STRADER

STATE OF NORTH CAROLINA
COUNTY OF NEW HANOVER

SWORN TO and subscribed before me this the 13th day of January, 2016 by Gene Strader.

Gail G. Warren
Notary Public

[SEAL]

Gail G. Warren
Printed Name

My Commission Expires: July 10, 2020

NOTARY PUBLIC
GAIL G. WARREN
NEW HANOVER COUNTY, NC

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

CRC-16-01

January 27, 2016

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: 2015 Coastal Habitat Protection Plan

You will recall from the November 2015 meeting that the draft 2015 Coastal Habitat Protection Plan (CHPP) was to be presented at a series of public meetings in December to solicit comment and input. The CRC representatives on the CHPP Steering Committee, John Snipes and Larry Baldwin, along with DCM Staff had also submitted comments on the draft document. The CHPP Steering Committee met on January 21, 2016 to review public comments submitted. All of the CRC/DCM comments have been address in the final draft of the CHPP (attached). The Source Document, which serves as the basis of the goals and recommendations, can be viewed at the following link:
http://portal.ncdenr.org/web/mf/habitat/chpp/downloads

Jimmy Johnson, the Department's CHPP Coordinator, will present the revisions at the upcoming meeting in Atlantic Beach for CRC approval and adoption. The revisions will also be presented to the Environmental Management and Marine Fisheries Commissions for their approval and adoption. Following adoption, the involved agencies will begin preparing two-year implementation plans.

As a reminder, the NC Fisheries Reform Act (GS.143B-279.8) requires three of the state's regulatory commissions - the Marine Fisheries, Environmental Management, and Coastal Resources Commissions - to adopt a plan to protect and restore resources critical to North Carolina's fisheries. The Department of Environmental Quality (DEQ) developed a Coastal Habitat Protection Plan (CHPP) through a cooperative, multiagency effort. The CHPP was written by DEQ staff, adopted by the three commissions in 2004, and updated in 2010.

The areas of focus in the 2015 update include oyster restoration and living shorelines. The goals and revisions are designed to achieve the CHPP's goal of "long-term enhancement of coastal fisheries associated with each coastal habitat."

2015 North Carolina Coastal Habitat Protection Plan

Final Draft

By

North Carolina Department of Environmental Quality

Editors:

Teresa J. Barrett, Anne S. Deaton, Ernie F. Hain, Jimmy Johnson
North Carolina Department of Environmental Quality
Division of Marine Fisheries
Morehead City, NC 28557

EXECUTIVE SUMMARY

This document is intended as a resource and guide compiled by Department of Environmental Quality staff to assist the Marine Fisheries, Environmental Management, and Coastal Resources commissions in the development of goals and recommendations for the continued protection and enhancement of fishery habitats of North Carolina. Implementation of any of the recommendations through specific rules or policies will involve further discussion with stakeholders as well as the balancing of competing ecological and economic values. By adopting this update, the commissions agree to cooperatively manage aquatic habitats towards the goal of coastal fishery resources long-term viability. The "Source Document" continues to be a work-in-progress as more scientific data, inventories, and indicators become available. GS. 143B-279.8 requires that a Coastal Habitat Protection Plan (CHPP) be drafted by the Department of Environmental Quality, (formerly the Department of Environment and Natural Resources), and reviewed every five years. The purpose of the plan is to recommend actions to protect and restore habitats critical to enhancement of North Carolina's coastal fisheries. This is the third iteration of the plan. The Marine Fisheries, Coastal Resources, and Environmental Management commissions are required to approve the plan recommendations.

The 2015 Coastal Habitat Protection Plan summarizes the economic and ecological value of coastal fish habitats to North Carolina, their status, and the potential threats to their sustainability. Goals and recommendations to protect and restore fish habitat, including water quality, are included. The appended Source Document, compiled by staff of the Department of Environmental Quality, provides the science to support the need for such recommendations. Throughout the plan, there are references to the chapter of the Source Document where more details and references can be found.

The 2015 plan and Source Document describe many of the accomplishments that have occurred since the first iteration of the plan in 2005. Most have been non-regulatory, collaborative efforts across divisions. Continued progress will require cooperation across additional agencies.

2015 Goals and Recommendations

Goal 1. Improve effectiveness of existing rules and programs protecting coastal fish habitats.

Includes 5 recommendations regarding enhancement of compliance, monitoring, outreach, coordination across commissions, and management of invasive species.

Goal 2. Identify and delineate strategic coastal habitats.

Includes 2 recommendations regarding mapping and monitoring fish habitat, assessing their condition, and identifying priority areas for fish species.

Goal 3. Enhance and protect habitats from adverse physical impacts.

Includes 8 recommendations on expanding habitat restoration, managing ocean and estuarine shorelines, protecting habitat from destructive fishing gear, and dredging and filling impacts.

Goal 4. Enhance and protect water quality.

Includes 8 recommendations to reduce point and non-point sources of pollution in surface waters through encouragement of Best Management Practices, incentives, assistance, outreach, and coordination. This applies not only to activities under the authority of the Department of Environmental Quality, such as development and fishing, but to all land use activities, including forestry, agriculture, and road construction.

The Coastal Habitat Protection Plan and Source Document can be viewed and downloaded from:
http://portal.ncdenr.org/web/mf/habitat/chpp/downloads

The 2015 North Carolina Coastal Habitat Protection Plan

North Carolina's approximately 2.3 million acres of estuarine waters comprise the largest estuarine system of any state along the Atlantic seaboard. Located at the confluence of warm southern and cool northern currents, North Carolina's waters support a high diversity of aquatic species and six distinct, but interdependent, marine habitats. These waters are vital not only for the state's important fish species, but also for fish that migrate along the east coast.

North Carolina, with its billion dollar commercial and recreational fishing industries, ranks among the nation's highest seafood producing states. Aquatic species important to these industries depend on sufficient quality and quantity of habitats in our rivers, sounds, and ocean waters. From shellfish beds in the lower estuaries, to swamps in the upper estuaries, fish habitats are at risk. Activities causing habitat loss and degradation threaten more than the fishing industry vital to North Carolina's economy. They also threaten coastal tourism, outdoor recreation, and residential development.

Recognizing the critical importance of healthy fish habitat, the NC General Assembly passed the Fisheries Reform Act (GS.143B-279.8), requiring three of the state's regulatory commissions - the Marine Fisheries, Environmental Management, and Coastal Resources commissions - to adopt a plan to protect and restore resources critical to North Carolina's fisheries. The Department of Environmental Quality (DEQ) developed a Coastal Habitat Protection Plan (CHPP) through a cooperative, multiagency effort. The CHPP was written by DEQ staff, adopted by the three commissions in 2004, and updated in 2010.

The CHPP is a guidance document providing the latest science on North Carolina's coastal fish habitats, their ecological functions, values, and threats, as well as goals and recommendations to protect, enhance, and restore fish habitat. By adopting the revised plan, the commissions are committing to implement these goals and recommendations. To this end, each DEQ division develops a biennial implementation plan that includes tangible and achievable actions to progress forward.

In this 2015 plan, there is information on past implementation progress, updated recommendations, and priority issues to focus actions. Background on the six fish habitats, their status, and pertinent threats are included. Full details are in the 2015 CHPP Source Document (**http://portal.ncdenr.org/web/mf/habitat/chpp/downloads**). A key to acronyms is provided at the end of this document.

Value of NC's coastal fish habitats: *

- 2013 Economic impact of NC fisheries: commercial - $305 million; recreational - $1.7 billion.
- Submerged aquatic vegetation produces food, improves water quality. In Bogue Sound, NC, pollution removal services value - $3,000/ac/yr. Ecosystem services of seagrass and algae - $7,700/ac/yr.
- Oyster reefs remove pollutants, increase fish production, stabilize shorelines – ecosystem services estimated $2,200 - $40,200/ac/yr, without value of fishery. Recreational fishing from reef restoration value estimated - $640,000/yr.
- Coastal wetlands provide storm protection valued at $25.6 billion/yr.
- Property values adjacent to open shellfish harvest waters are higher than next to closed waters.
- NC hard bottom fishery generated more than $4.2 million average annually for each of three years between 2011-2013.
- For every $1 invested in land conservation in NC, ~$4 return from natural resource goods and services.
- Beach property 80' wide ~35% more valuable than same property 79' wide.

* Refer to the Source Document for details and literature references.

Water Column | Submerged Aquatic Vegetation | Shell Bottom | Wetlands | Hard Bottom | Soft Bottom

CHPP Implementation

The overarching goal of the CHPP is to enhance fisheries by protecting and restoring important coastal habitats. The plan includes *recommendations* that fall under four broad goals and address issues such as minimizing habitat impacts from fishing gear and channel dredging, as well as reducing water quality impacts from point and nonpoint sources.

To fulfill these recommendations, each DEQ division and department develops biennial *implementation plans* that include tangible achievable actions. Implementation actions have varied over time based on needs and changing priorities. Implementation actions are carried out by DEQ, the Marine Fisheries Commission (MFC) and Division of Marine Fisheries (DMF), the Coastal Resources Commission (CRC) and Division of Coastal Management (DCM), the Environmental Management Commission (EMC) and Division of Water Resources (DWR), the Sedimentation Control Commission (SCC) and Division of Energy, Mineral, and Land Resources (DEMLR), and other partnering agencies. Implementation progress is tracked on a regular basis (Ch. 1).

In the 2015 CHPP, four *priority habitat issues* were selected for the focus of implementation plans. Suggested implementation actions for these issues were developed and are included in the plan. The four issues are oyster restoration, living shorelines, sedimentation, and developing metrics to assess habitat trends and management effectiveness (Ch. 12).

Department of Environmental Quality

DEQ is the lead stewardship agency for the preservation and protection of North Carolina's outstanding natural resources. The organization, which has offices from the mountains to the coast, administers programs designed to protect and enhance water quality, aquatic resources, public health, fish, wildlife, and wilderness areas.

The department is responsible for drafting the habitat plan. The CHPP Team, consisting of staff from DEQ divisions, draft the plan with guidance from the department.

DEQ implementation actions include those of the Albemarle-Pamlico National Estuary Partnership, Office of Land and Water Stewardship, and Division of Mitigation Services. Other participating state agencies include the Division of Soil and Water Conservation, NC Forest Service, Wildlife Resources Commission, and the Department of Agriculture and Consumer Services.

CHPP Steering Committee

The CHPP Steering Committee consists of two commissioners from each of the three commissions specified in the Fisheries Reform Act - MFC, CRC, and EMC. Their role is to review and approve of the draft plan, be an advocate for the plan to their full commission, meet regularly as a committee to discuss solutions for difficult and cross-cutting habitat and water quality issues, and review implementation progress to ensure that the plan is implemented.

CHPP Implementation

The primary divisions responsible for implementing CHPP recommendations are the Division of Marine Fisheries, Division of Coastal Management, Division of Water Resources, and Division of Energy, Minerals, and Land Resources (Ch. 1).

Division of Marine Fisheries

The division, under the rulemaking authority of the MFC, manages the commercial and recreational fisheries in North Carolina's estuarine and ocean waters. The division protects habitats through fishing gear rules, planning, research, and enhancement activities. The division's mission is to ensure sustainable marine and estuarine fisheries for the benefit of the people of North Carolina.

Division of Coastal Management

Under the rulemaking authority of the CRC, this division manages coastal development in accordance with the NC Coastal Area Management Act and the NC Dredge and Fill Law. The DCM works to protect, conserve, and manage North Carolina's coastal resources through an integrated program of planning, permitting, education, and research.

Division of Water Resources

The DWR's mission is to protect, preserve, enhance, and manage North Carolina's surface water and groundwater resources for the health and welfare of the citizens of North Carolina and the economic well-being of the state. This division functions under the rulemaking authority of the EMC.

Division of Energy, Mineral, and Land Resources

The division, under the rulemaking authority of the EMC, manages and provides technical assistance related to sediment and erosion control, stormwater management, mining, dams, and energy. The mission of DEMLR is to promote the wise use and protection of North Carolina's land and geologic resources.

Implementation Progress

Substantial implementation progress has been made over the past ten years, with some positive habitat signs evident. In addition, some fishery species' populations have rebounded or are showing strong signs of recovery. Examples include spotted seatrout, red drum, gag grouper, black sea bass, oysters, and bay scallops. While this advancement cannot be directly or solely related to habitat improvement, it is a positive indication for management overall. Some examples of implementation success are below (Ch. 1).

Oyster restoration

- Since 2005, oyster sanctuary development has greatly expanded. DMF has constructed 13 oyster sanctuaries in the Pamlico Sound system, each ranging from 5 - 60 acres of permitted area, and totaling 159 acres of developed reef (Ch. 3 & 12).
- Creation of an oyster shell recycling program provided additional shell material to supplement the division's shell planting activities. Recycled and purchased shell and rock material is used to create additional oyster reef habitat that supports the oyster fishery and provides fish habitat. The area of oyster reef created annually through shell planting varies based on funding and availability of material. Despite budget cuts, efforts continue through partnerships, grant funding, and mitigation contract work (Ch. 3 & 12).

Improving strategies to reduce nonpoint runoff

- EMC adopted coastal stormwater rules to reduce further degradation of receiving waters (Ch. 14).
- DWR and DEMLR incorporated low impact development techniques as acceptable Best Management Practice options for controlling runoff from development (Ch. 14).

Mapping and assessing habitat condition

- Since 2005, much progress has been made in submerged aquatic vegetation (SAV) mapping. Through a coordinated partnership of APNEP, DMF, DCM, DWR, and others, the entire coast was mapped in 2007-2008, with portions repeated in 2013 and 2015. A monitoring plan was developed to improve mapping methods in low salinity waters and to allow repeat mapping to evaluate change over time (Ch. 4).
- DMF accelerated estuarine shellfish bottom mapping (to a maximum water depth of 15 ft). Mapping is now over 95% complete (Ch. 3).
- DCM mapped the coastal estuarine shoreline and shoreline structures such as bulkheads and piers (Ch.8).
- DMF has developed and begun a process to identify a subset of strategic habitats, based on their condition and location. This will allow conservation measures to focus on priority areas (Ch. 13).

Implementation Progress

Managing shorelines

- DCM developed sediment criteria for beach nourishment and a Beach and Inlet Management Plan that provides guidelines for ocean beach nourishment to minimize ecological impacts and address socioeconomic concerns (Ch. 8).
- DCM has taken several actions to encourage greater use of living shorelines for estuarine shoreline stabilization. Working with DMF, DWR, and other agencies, DCM surveyed living shorelines for success, and agencies worked to simplify the permitting process. Outreach to multiple audiences through workshops, written material, and websites continues (Ch. 8).

Coordination and compliance

Regular CHPP Steering Committee meetings and CHPP quarterly permit reviewer meetings have greatly improved collaboration among divisions and problem solving on cross-cutting issues. New compliance positions were established in several divisions through appropriated funds, allowing greater assessment of compliance. However, due to budget shortfalls and resulting staff reductions over the past few years, divisions have maintained compliance monitoring through reorganization, reprioritization, and placing additional responsibilities on staff. (Ch. 1).

Research and outreach

- The Coastal Recreational Fishing License grant program funded multiple research projects that were identified as priorities in CHPP Implementation Plans or that will expand our understanding of the link between habitat condition and fish use (Ch. 1).
- The National Estuarine Research Reserve has produced educational materials on the value of different fish habitats and environmentally friendly shoreline stabilization techniques. The NERR also held workshops to promote living shorelines (Ch. 14).
- Several educational kiosks and displays on the value of fish habitat were constructed at a variety of museums and public access locations using Coastal Recreational Fishing License funds (Ch. 14).

Restoring fish passage

- In 2012, a rock ramp fish passage was constructed around Lock and Dam #1 on the Cape Fear River by the US Army Corps of Engineers to allow anadromous fish to migrate farther upstream to spawn. The work was done collaboratively with DMF, WRC, USFWS, and other partners (Ch. 9).

Goals and Recommendations

GOAL 1:

IMPROVE EFFECTIVENESS OF EXISTING RULES AND PROGRAMS PROTECTING COASTAL FISH HABITATS

North Carolina has a number of programs in place to protect coastal fisheries and the natural resources that support them. The Marine Fisheries Commission has adopted rules addressing the impacts of certain types of fishing gear and fishing practices that may damage fish habitats. The Coastal Resources Commission regulates development impacts on certain types of critical habitat, such as saltwater marshes and Primary Nursery Areas. The Environmental Management Commission has water quality standards that address pollution of all waters, from direct discharges to dredge and fill impacts. The Division of Energy, Mineral, and Land Resources addresses erosion and sediment control from land development or mining, and regulates energy activities. The Coastal Habitat Protection Plan identifies strategies that could continue to improve rule compliance, coordination of environmental monitoring, and outreach, which in turn will result in greater success in protecting critical fish habitats (Ch. 15).

RECOMMENDATIONS:

1. Continue to ensure compliance with Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and Marine Fisheries Commission (MFC) rules and permits.
2. Coordinate and enhance:
    a. monitoring of water quality, habitat, and fisheries resources (including data management) from headwaters to the near-shore ocean.
    b. assessment and monitoring of effectiveness of rules established to protect coastal habitats.
3. Enhance and expand educational outreach on the value of fish habitat, threats from land use and other activities, and explanations of management measures and challenges.

4. Continue to coordinate among commissions and agencies on coastal habitat management issues.
5. Enhance management of invasive species with existing programs. Monitor and track status in affected waterbodies.

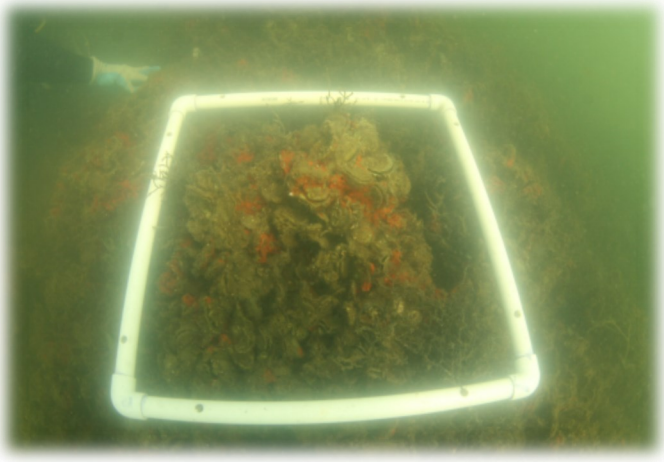
GOAL 2:

IDENTIFY AND DELINEATE STRATEGIC COASTAL HABITATS

Maintaining healthy coastal fisheries requires consideration of the entire ecosystem and the way different types of fish habitats work together. For example, coastal marshes help prevent erosion of shallow soft bottom habitat, which provides a food source and corridor for juvenile finfish. Shell bottom reduces sediment and nutrients in the water column, which enhances conditions for submerged aquatic vegetation. Together these habitats provide different functions for fish and protective stepping stones for their migration through coastal waters. Fragmenting these habitats, or damaging one of a series of interrelated habitats, makes it more difficult for aquatic systems to support strong and healthy coastal fisheries. The Marine Fisheries Commission identified a need to locate strategic habitats. These areas are a subset of all coastal habitats and consist of strategically located complexes of fish habitat that provide exceptional ecological functions ("best of the best"), or are particularly at risk due to vulnerability or rarity. These areas merit special attention and should be given high priority for research, monitoring, and possibly conservation (Ch. 15).

RECOMMENDATIONS:

1. Support assessments to classify habitat value and condition by:
    a. coordinating, completing, and maintaining baseline habitat mapping (including seagrass, shell bottom, shoreline, and other bottom types) using the most appropriate technology.
    b. selectively monitoring the condition and status of those habitats.
    c. assessing fish-habitat linkages and effects of land use and other activities on those habitats.
2. Continue to identify and field groundtruth strategic coastal habitats.



NC Fishing

Goals and Recommendations

GOAL 3:

ENHANCE AND PROTECT HABITATS FROM ADVERSE PHYSICAL IMPACTS

The CHPP identifies a number of ways in which fish habitats can be damaged by direct physical impacts. Some examples include filling of wetlands, dredging of soft bottom habitat, destruction of shell bottom and hard bottom areas, damage to submerged aquatic vegetation by use of certain types of fishing gear, and physical obstructions that block fish movement to and from spawning areas. While large impacts can directly contribute to the loss of habitat functions, the accumulation of many small impacts can make a habitat more vulnerable to injuries from which it might otherwise recover quickly. In some cases, historic damage to a habitat can be mitigated through the creation of sanctuaries where the resource can recover. One such program involves creation of protected oyster reefs. In other cases, the cumulative impacts of multiple projects can be more effectively managed through comprehensive planning (Ch. 15).

RECOMMENDATIONS:

1. Expand habitat restoration in accordance with restoration plan goals, including:
    a. increasing subtidal and intertidal oyster habitat through restoration.
    b. re-establishing riparian wetlands and stream hydrology.
    c. restoring SAV habitat and shallow soft bottom nurseries.
2. Sustain healthy barrier island systems by maintaining and enhancing ecologically sound policies for ocean and inlet shorelines, and implement a comprehensive beach and inlet management plan that provides ecologically based guidelines to protect fish habitat and address socioeconomic concerns.
3. Protect habitat from adverse fishing gear effects through improved compliance.

Goals and Recommendations

GOAL 3:

ENHANCE AND PROTECT HABITATS FROM ADVERSE PHYSICAL IMPACTS

RECOMMENDATIONS:

4. Improve management of estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of site specific conditions, and advocate for alternatives to vertical shoreline stabilization structures.
5. Protect and restore habitat for migratory fishes by:
    a. incorporating the water quality and quantity needs of fish in water use planning and management.
    b. restoring fish passage through elimination or modification of stream obstructions, such as dams and culverts.
6. Ensure that energy development and infrastructure is designed and sited to minimize negative impacts to fish habitat, avoid new obstructions to fish passage, and, where possible, provide positive impacts.
7. Protect and restore important fish habitat functions from damage associated with activities such as dredging and filling.
8. Develop coordinated policies including management adaptations and guidelines to increase resiliency of fish habitat to ecosystem changes.

Seasonal restrictions on navigational dredging are an effective means of protecting fish during critical times of their lives, such as during spawning periods or when early juvenile fish are growing in nursery areas.

GOAL 4:

ENHANCE AND PROTECT WATER QUALITY

Clean water is essential to coastal fisheries. Water conditions necessary to support coastal fish include the right combination of temperature, salinity, and oxygen, as well as the absence of harmful pollutants. Achieving and maintaining good water quality for purposes of fish productivity requires management of both direct discharges to surface waters and nonpoint runoff from land activities. While there have been great improvements to water quality management, support through funding and technological advances is needed to sustain water quality as coastal uses increase. The CHPP recommends strategies to address water quality impacts by maintaining rule compliance through inspections, local government incentives, and developing new technology to reduce point and nonpoint pollution through voluntary actions. Maintaining the water quality necessary to support vital coastal fisheries will benefit not only the fishing industry, but also a large sector of the entire coastal economy built around travel, tourism, recreational fishing, and other outdoor activities (Ch. 15).

RECOMMENDATIONS:

1. Reduce point source pollution discharges by:
    a. increasing inspections of wastewater discharges, treatment facilities, collection infrastructure, and disposal sites.
    b. providing incentives and increased funding for upgrading all types of discharge treatment systems and infrastructure.
    c. developing standards and treatment methods that minimize the threat of endocrine disrupting chemicals on aquatic life.
2. Address proper reuse of treated wastewater effluent and promote the use of best available technology in wastewater treatment plants (including reverse osmosis and nanofiltration effluent), to reduce wastewater pollutant loads to rivers, estuaries, and the ocean.

3. Prevent additional shellfish closures and swimming advisories by:
    a. conducting targeted water quality restoration activities.
    b. prohibiting new or expanded stormwater outfalls to coastal beaches and to coastal shellfishing waters (EMC surface water classifications SA and SB) except during times of emergency (as defined by the DWR's Stormwater Flooding Relief Discharge Policy) when public safety and health are threatened.
    c. continuing to phase out existing outfalls by implementing alternative stormwater management strategies.
4. Enhance coordination with, and provide financial/technical support for, local government/private actions to effectively manage stormwater and wastewater.

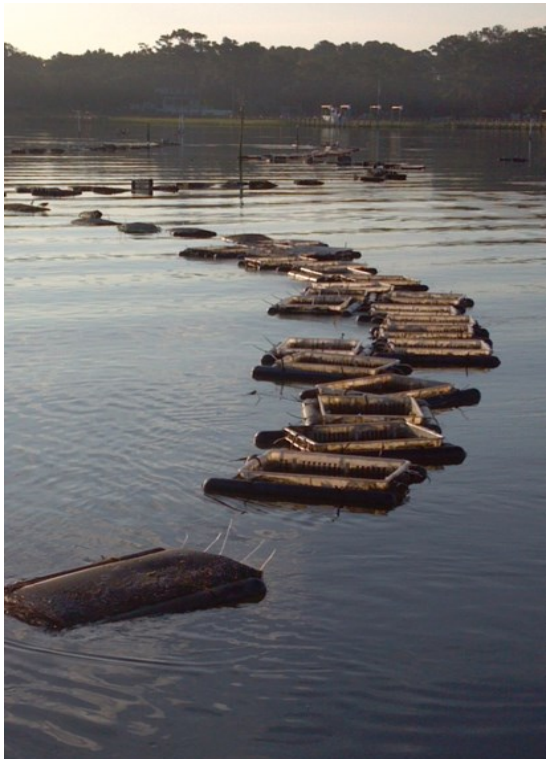
Goals and Recommendations

GOAL 4:

ENHANCE AND PROTECT WATER QUALITY

RECOMMENDATIONS:

5. Continue to improve strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat through voluntary actions, assistance, and incentives, including:
    a. improving methods to reduce pollution from construction sites, agriculture, and forestry.
    b. increasing on-site infiltration of stormwater.
    c. encouraging and providing incentives for implementation of Low Impact Development practices.
    d. increased inspections of onsite wastewater treatment facilities.
    e. increasing use of reclaimed water and recycling.
    f. Increasing voluntary use of riparian vegetated buffers for forestry, agriculture, and development.
    g. increasing funding for strategic land acquisition and conservation.
6. Maintain effective regulatory strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat, including use of vegetated buffers and established stormwater controls.
7. Maintain adequate water quality conducive to the support of present and future mariculture in public trust waters.
6. Reduce nonpoint source pollution from large-scale animal operations by:
    a. Ensuring proper oversight and management of animal waste management systems.
    b. Ensuring certified operator compliance with permit and operator requirements and management plan for animal waste management systems.



For every $1 invested in land conservation in NC, there is estimated to be a $4 return in economic value from natural resource goods and services alone, without considering other economic benefits.

Priority Habitat Issue - *Oyster Restoration*

Oyster populations in North Carolina have declined by as much as 90% from historic levels. Overfishing, habitat destruction, disease, and pollution have contributed to the significant decline and slow recovery rates of oyster reefs. Recognized as an ecosystem engineer, oyster reefs are critical economically for the seafood industry, and ecologically for improving water quality and providing fish habitat. For 100 years, DMF has been "planting" oyster shell in open harvest areas to provide additional hard substrate for oyster recruitment. The planted shell soon becomes a living oyster reef, enhancing the oyster fishery and providing fish habitat. Since 1998, DMF has constructed 13 subtidal oyster sanctuaries where shellfish harvest is not allowed. Oysters growing in the protected sanctuaries serve as broodstock, providing larvae that recruit onto hard substrate in surrounding waters. Despite these efforts, oyster populations remain well below historic levels, fishing pressure increases, and water quality declines. Lack of additional funding to purchase and deploy hard material and conduct research limits the ability to expand oyster restoration activities. The CHPP Steering Committee considers this one of the most important activities that could be done to improve habitat and water quality in North Carolina's coastal waters (Ch. 12).

Proposed Implementation Actions

Cultch Planting

- ◊ Increase spending limit per bushel of shell to compete with other states.
- ◊ Develop a cooperative public/private, self-sustaining shell recycling program by providing financial incentives in exchange for recycled shell.
- ◊ Work with the shellfish industry to institute an "oyster use fee" to help support the cultch planting program.
- ◊ Identify alternative substrates for larval settlement in intertidal and subtidal reefs, including a cost-benefit analysis.
- ◊ Establish long term monitoring program to support future decision making.
- ◊ Utilize new siting tools and monitoring protocols to maximize reef success.

Hatchery Oyster Seed Production

- ◊ Explore options for increasing funds to support UNCW oyster hatchery.
- ◊ Identify regional genetic variability within NC.
- ◊ Improve availability of seed oysters genetically suited to respective regions.

Oyster Sanctuaries

- ◊ Identify alternative substrates for larval settlement in intertidal/subtidal reefs, including cost-benefit analysis.
- ◊ Identify the size and number of sanctuaries needed.
- ◊ Develop reefs that deter poaching by mechanical means.
- ◊ Utilize new siting tools to maximize reef success.
- ◊ Explore options for in situ sampling protocol to incorporate alternative construction materials.

Priority Habitat Issues - *Living Shorelines*

Living shorelines is the term used for a type of designed shoreline stabilization technique that incorporates live components such as marsh plants, frequently in combination with rock or oyster sill structures. Wetland and shell bottom habitat along the shoreline have declined in many areas due to natural erosion and vertical shoreline hardening with bulkheads. Living shorelines offer an effective alternative for protecting waterfront property, while restoring fish habitat and ecosystem services. Since 2005, progress has been made in documenting, through scientific studies, the benefits and limitations of living shorelines. Research in North Carolina has shown that living shorelines support a higher diversity and abundance of fish and shellfish than bulkheaded shorelines, effectively deter erosion, and survive storm events well. Outreach efforts have been done to increase awareness of this technique to the public and contractors. Nonprofit organizations and DCM have constructed several demonstration projects. Despite these efforts, approximately 60 living shorelines have been permitted coastwide, in contrast to 93 miles of bulkheads (based on 2012 DCM mapping). The CHPP Steering Committee requested that efforts continue to focus on encouraging living shorelines to protect property, restore shoreline habitat, and improve water quality (Ch. 12).

Proposed Implementation Actions

Outreach

- ◊ Seek funding and partnerships to increase the number of highly visible demonstration projects.
- ◊ Develop case studies that property owners can relate to that discuss site conditions, initial and ongoing costs, and performance of the structure.
- ◊ Actively engage with contractors, realtors, and homeowners associations in the design and benefits of living shorelines.
- ◊ Enhance communications, marketing, and education initiatives to increase awareness of, and build demand for, living shorelines among property owners.

Research

- ◊ Examine the effectiveness of natural and other structural materials for erosion control and ecosystem enhancement.
- ◊ Examine the long-term efficacy of living shorelines and vertical structures, particularly after storm events.
- ◊ Map areas where living shorelines would be suitable for erosion control.
- ◊ Investigate use of living shorelines as BMP or mitigation options.

Permitting

- ◊ Continue to simplify the federal and state permitting process for living shorelines.

Priority Habitat Issue - *Sedimentation*

Sedimentation in creeks, particularly in nursery areas, is a continuing concern. While a moderate amount of sediment input is necessary to maintain shallow soft bottom habitat that supports wetlands, excessive amounts can silt over existing oyster beds and submerged aquatic vegetation, smother invertebrates, clog fish gills, reduce survival of fish eggs and larvae, reduce recruitment of new oysters onto shell, and lower overall diversity and abundance of marine life. Pollutants such as toxins, bacteria, and nutrients bind to sediment particles and are transported into estuarine waters, where they can accumulate in the sediment and impact aquatic organisms. Sediment enters the upper estuary via runoff and ditching due to land clearing activities associated with agriculture, forestry, and development. Shoreline erosion, tidal inflow, and dredging also contribute sediment in the lower estuary. Studies in North Carolina indicate that relatively high sedimentation has occurred in the past. The effect on estuarine productivity is uncertain. More assessment on the extent and effect of sedimentation in coastal creeks and rivers is needed, along with current rates of sediment inputs, to determine the best way to address the issue (Ch. 12).

Proposed Implementation Actions

- ◊ Determine magnitude and change in sedimentation rates and sources over time at sufficiently representative waterbodies and regions.
- ◊ Determine the effect of sedimentation in the upper estuaries on primary and secondary productivity and juvenile nursery function.
- ◊ Encourage research for innovative and effective sediment control methods in coastal river basins.
- ◊ Encourage expanded use of voluntary stormwater BMPs and low impact development (LID) to reduce sediment loading into estuarine creeks.
- ◊ Partner with NC Department of Transportation to retrofit road ditches that drain to estuarine waters.
- ◊ Improve effectiveness of sediment and erosion control programs by:
  - ♦ Encouraging development of effective local erosion control programs to maintain compliance and reduce sediment from reaching surface waters.
  - ♦ Enhancing monitoring capabilities for local and state sediment control programs (e.g., purchase turbidity meters and train staff in their use).
  - ♦ Continuing to educate the public, developers, contractors, and farmers on the need for sediment erosion control measures and techniques for effective sediment control.

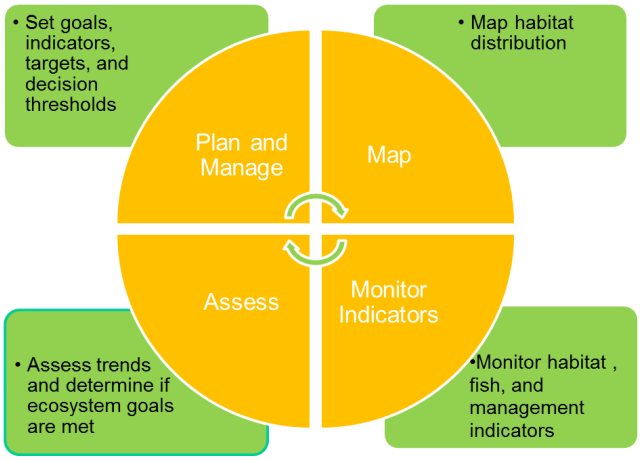
♦ Provide education and financial/ technical support for local and state programs to better manage sediment control measures from all land disturbing activities.

In 2014, 6,290 acres were impaired by turbidity for the aquatic life use support classification in coastal subbasins (DWR 2014 Integrated Report).

Priority Habitat Issue - *Developing Metrics*

Developing metrics to assess habitat trends and management effectiveness is the cornerstone of habitat protection and restoration. Without them, needed habitat conservation initiatives are unknown. Ecosystem-based management is the process where monitoring of ecosystem indicators is done to assess the condition of the resource and the effectiveness of management strategies; management actions are modified based on monitoring results. This process requires mapping all habitat to assess trends in distribution, developing and monitoring representative indicators to assess habitat condition, monitoring fish use of habitats in priority areas, and developing management performance criteria for measuring success of management actions. The DEQ has already initiated mapping and monitoring of some habitats, but has not established continual monitoring to evaluate management effectiveness. The Albemarle-Pamlico National Estuary Partnership established ecosystem indicators in 2012 to help determine the status of that system. The DMF has identified strategic coastal habitats in most of the coastal waters that are high priority for protection so that fish populations are sustained. More work is needed to establish a cyclic process to monitor, assess, and successfully and efficiently manage North Carolina's coastal resources.

The lack of quantified trends in habitat condition and success of management actions was identified as a priority concern of the CHPP Steering Committee (Ch. 12).



Proposed Implementation Actions

- ◊ Develop indicator metrics for monitoring the status and trends of each of the six habitat types within North Carolina's coastal ecosystem (water column, shell bottom, SAV, wetlands, soft bottom, hard bottom).
- ◊ Establish thresholds of habitat quality, quantity, or extent similar to limit reference points - or traffic lights - which would initiate pre-determined management actions.
- ◊ Develop indicators for assessing fish utilization of strategic coastal habitats.
- ◊ Develop performance criteria for measuring success of management decisions.
- ◊ Include specific performance criteria in CHPP management actions where possible.

The Fishery Reform Act requires the CHPP to describe, classify, and evaluate biological habitat systems, including wetlands, spawning grounds, nursery areas, shellfish beds, and submerged aquatic vegetation, and outstanding resource waters.

NC Coastal Habitats

North Carolina's coastal fish habitats provide crucial functions for the plants and animals living in them. This diversity of interconnected habitats provides food and shelter in which to reproduce and grow for a tremendous variety of fish, shellfish, and crustaceans. Protecting and restoring these habitats is essential to the survival of North Carolina's fisheries.

While poor water quality puts the habitats' ability to function and support fish populations at risk, physical damage caused by humans is also a serious threat. Conversion of wetlands by draining, filling, and water control projects are the major sources of wetland loss in eastern North Carolina. Shell bottom habitat along our coast has been decimated by a century of excessive mechanical harvests and diseases. More recently, dredging for navigation channels and marinas, as well as damage from bottom-disturbing fishing gear, threatens remaining shell bottom and submerged aquatic vegetation habitat and impedes establishment of those habitats. Submerged aquatic vegetation is also vulnerable to uprooting by boat propellers and to shading by docks and piers. These and other types of physical impacts affect the ability of fish habitats to sustain fisheries and increase their vulnerability to water quality problems (Ch. 2-7).

The CHPP identifies six fish habitats that need protection or enhancement:

- Water Column
- Shell Bottom
- Submerged Aquatic Vegetation (SAV)
- Wetlands
- Soft Bottom
- Hard Bottom

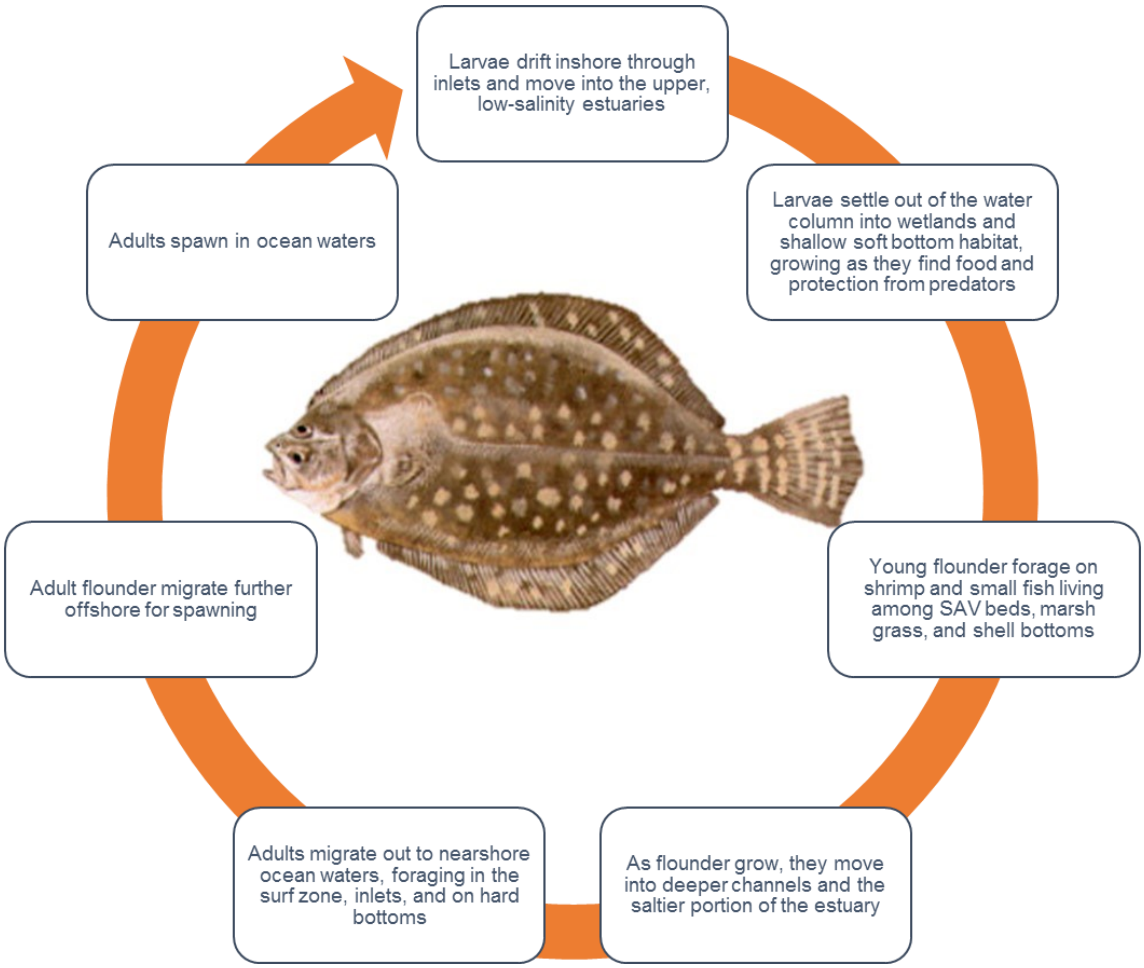
Habitats provide important functions for fish species.

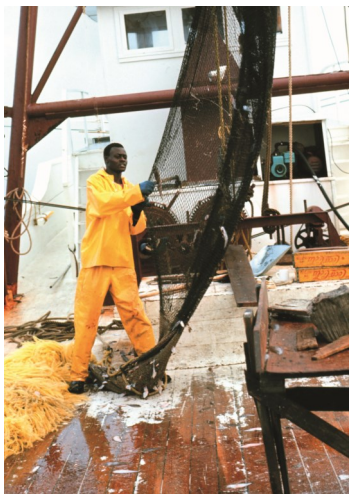
Refuge:	shelter for fish at various life stages and a place for plants and animals to attach
Nursery:	refuge and foraging habitat suitable for development of juvenile life stages of fish, shellfish, and crabs
Spawning:	conditions that allow adults to reproduce
Foraging:	presence and accessibility of food sources
Corridor:	connectivity for safe passage among foraging, spawning, and refuge areas

Habitat: "a place, or set of places, in which a fish or fish population finds the physical, chemical, and biological features needed for life."

NC Coastal Habitats

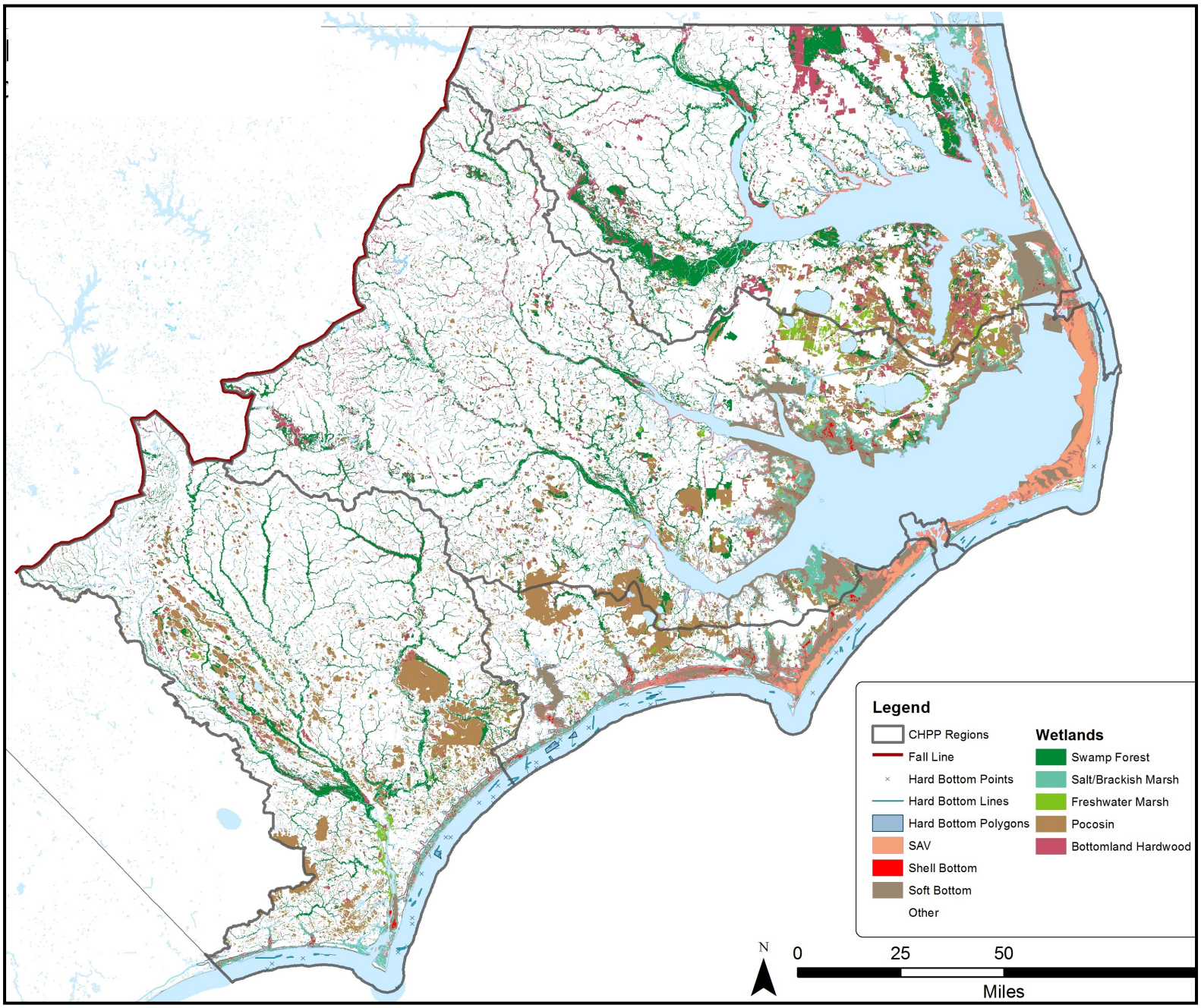
All fish habitats are integral components of the entire aquatic ecosystem because species require use of multiple habitats throughout their life history; the water column connects them all. Organisms occupy specific areas or habitats that meet their needs for each particular life stage. Certain areas, such as nursery areas, are especially important to fish production, and some, such as shallow grass beds, are particularly vulnerable to human impacts. To maintain a healthy coastal ecosystem that provides all the ecological functions necessary for North Carolina's coastal fish populations, it is more effective to address the entire system of interdependent habitats, rather than a single habitat type (Ch. 2-7).





The relationship between habitat conditions and populations of fishery species is complex. In the past, the decline of a particular fish stock was often attributed to overfishing. We know now that the quality and quantity of fish habitats is important to healthy fish populations. Habitat loss and degradation make fish populations more susceptible to overfishing and can cause a delay in recovery, even after management actions have successfully reduced fishing pressures. River herring and shortnose sturgeon are examples of species that have not recovered despite lengthy fishing moratoriums. Thus, the status of fisheries can be an indicator of impacts to fish habitats. Successful implementation of the CHPP recommendations is a necessary component for sustaining productive fisheries for future generations.

MAPPED FISH HABITATS OF COASTAL NORTH CAROLINA



Water Column - *The Most Essential Habitat*

Water column is the medium through which all aquatic habitats are connected, affecting all other habitats and the distribution and survival of fish. The water column includes riverine, estuarine, lacustrine, palustrine, and marine systems. Properties affecting fisheries resources and distribution include: temperature, salinity, dissolved oxygen (DO), total suspended solids (TSS), nutrients (nitrogen, phosphorus), chlorophyll a, pollutants, pH, velocity, depth, movement, and clarity. Within a river basin, these properties change as you move from the headwaters to the ocean (Ch. 2).

Fish distribution in the water column is often determined by salinity and proximity to inlets. The potential productivity of fish and invertebrates begins with energy and nutrient production at the base of the food chain. Productivity in the water column comes from phytoplankton, floating plants, macroalgae, benthic microalgae, and detritus.

Economic Benefits

U.S. commercial and recreational saltwater fishing generated more than $199 billion in sales in 2012, according to the Fisheries Economics of the United States. In North Carolina, the recreational and commercial fishery generated $1.87 billion in 2011.

Habitat Functions and Fish Use

The corridor between freshwater creeks or rivers and estuarine/marine systems is important to all fish, particularly species whose life spans more than one system, such as species that must migrate upstream to spawn (anadromous) or marine-spawning estuarine-dependent species.

Water column provides nursery habitat for juvenile pelagic species, such as bluefish and pompano, in the surf zone. Optimum physical and chemical properties, such as currents, temperature, and salinity determine survival and settlement of larvae. The water column is a food source for all size organisms, supporting microscopic plants and animals (phytoplankton and zooplankton), and prey species of all sizes.

The ability of the water column to provide predatory refuge varies relative to area, depth, water quality, and vegetation. Juvenile fishes are protected in shallow areas inaccessible to larger fish. Turbidity and DO can provide refuge for pelagic species by excluding predators that feed visually or are not tolerant of low DO.

FACT: 76,927 acres of coastal water column is designated as Primary Nursery Area. 82,000 acres is designated as Secondary or Special Secondary Nursery Area.

Habitat Profile

Water Column Functions

- Connects all habitat types
- Allows fish to move among habitats
- Surrounds and supports aquatic animals and habitats

How Fish Use the Water Column

- Transports eggs, larvae, and oxygen
- Nursery area for all fish species
- Foraging area for all fish species
- Spawning area for all fish species

Water Column - *The Most Essential Habitat*

Status and Trends

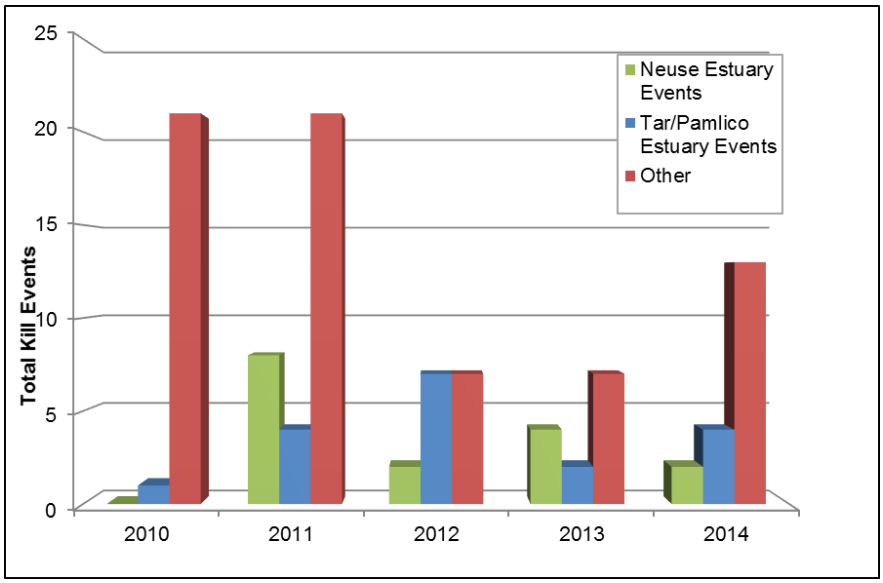
The condition of the water column is described by physical and chemical properties, pollution indicators, and the status of the fishery resources. However, evaluating the status and trends of water column characteristics is difficult. The number of monitoring agents, monitoring site distribution, frequency of data collection, and parameters measured are not conducive to comprehensive water quality assessments. Monitoring for microbial contamination of shellfish harvesting waters remains the most abundant measurement of estuarine water quality. Data collected from monitoring stations within the CHPP area include those from ±1,020 shellfish growing area stations, 240 recreational water quality stations, and ±256 DWR ambient stations. Water quality data from selected stations are shown in the CHPP Source Document.

The health of pelagic fishery species can be an indicator of water quality. Spanish mackerel, bluefish, and Atlantic menhaden are positive examples of species with improving or stable populations.

FACT: As of March 2014, over 442,106 acres of shellfish harvesting waters, or 20% of classified shellfish waters, were closed in North Carolina due to high levels of fecal coliform or the potential risk of bacterial contamination. As an adaptive measure to reduce permanent closures, 55,628 acres are conditionally opened and closed based on rainfall and sampling.

Threats to Water Column

Whether certain species will thrive and reproduce is strongly affected by conditions such as water clarity, DO, and nutrient levels. Fish kills and harmful algal blooms during the 1980s and 1990s were visible signs of coastal water quality problems. Most frequently reported species in fish kills are Atlantic menhaden, spot, flounder, and croaker. Large fish kills have diminished somewhat in recent years, but many coastal waters remain impaired. Excess sediment loading is the most common cause of impairment.



Human activities often change the chemistry of the water, reducing water quality. These changes can originate from point sources, such as industrial or wastewater discharges, or from non-point runoff from construction or industrial sites, development, roads, agriculture, or forestry. Any number of sources can result in pollutants and sediment entering surface waters. It is apparent when excess sediment clouds the water and fills a waterway, but beneath the water's surface, these particles clog fish gills and bury plants, shellfish, and other aquatic species.

All coastal habitats are connected by water. Clean water is essential to aquatic life.

Shell Bottom - *Building Reefs & Cleaning Water*

Shell bottom is unique because it is the only coastal fish habitat that is also a fishery species (oysters). Shell bottom is estuarine intertidal or subtidal bottom composed of surface shell concentrations of living or dead oysters, hard clams, and other shellfish. Oysters, the primary shell-building organism in North Carolina estuaries, are found throughout the coast, from southeast Albemarle Sound to the South Carolina border. The protection and restoration of living oyster beds is critical to the restoration of numerous fishery species, as well as to the proper functioning and protection of surrounding coastal fish habitats. Historically, restoration was managed for oyster fishery enhancement. Current efforts mix fishery and ecosystem enhancement with sanctuary development (Ch. 3).

Habitat Profile

Shell Bottom Functions

- Provides structure, shelter, and food source
- Filters pollutants and other particles from water
- Protects shoreline by slowing wave energy

How Fish Use Shell Bottom

- Place for oysters and other shellfish to attach
- Nursery area for blue crab, sheepshead, and stone crab
- Foraging area for drum, black sea bass, and southern flounder
- Spawning area for hard clams, toadfish, and goby
- Refuge for goby, grass shrimp, and anchovy

Economic Benefits

Conservatively, restored and protected oyster reefs provide up to $40,200 per acre per year (2012 dollars) in ecosystem benefits, including water filtration and sediment stabilization. The dollar benefit of the nitrogen removal service provided by oyster reefs was estimated to be $3,167 per acre per year (2014 dollars).

Habitat Functions and Fish Use

Shell bottom is widely recognized as essential fish habitat (EFH) for oysters and other reef-forming mollusks and provides critical fish habitat for ecologically and economically important finfish, mollusks, and crustaceans. In North Carolina, over 40 species of fish and crustaceans have been documented to use natural and restored oyster reefs, including American eel, Atlantic croaker, Atlantic menhaden, black sea bass, sheepshead, spotted seatrout, red drum, and southern flounder. Oysters are ecosystem engineers that alter current and flows, protect shorelines, and trap and stabilize large quantities of suspended solids, reducing turbidity by building high relief structures. The interstitial spaces between and within the shell matrix of oyster reefs are critical refuges for the survival of recruiting oysters and other small, slow-moving macrofauna, such as worms, crabs, and clams. Shell bottom is also valuable nursery habitat for juveniles of commercially and recreationally important finfish, such as black sea bass, sheepshead, gag grouper, and snappers. Additionally, shell bottom is important foraging ground for many economically and ecologically important species. The proximity and connectivity of oyster beds enhances the fish utilization of nearby habitats, especially SAV. Shell bottom contributes primary production indirectly from plants on and around it, but it is more important for its high secondary productivity contribution from the biomass of oysters and other macroinvertebrates living among the shell structure. This in turn supports a high density of mobile finfish and invertebrates, which was found to be more than two times greater than in marshes, soft bottom, and SAV.

Shell bottom areas include reefs made of living oysters or shells, located in the subtidal or intertidal zone of estuaries.

Shell Bottom - *Building Reefs & Cleaning Water*

Status and Trends

North Carolina oyster stocks declined for most of the twentieth century. Poor harvesting practices led to initial degradation and loss of shell bottom habitat in the Pamlico Sound area. After 1991, oyster stocks and harvests began to collapse from disease mortalities and low spawning stock biomass. Harvests began to rise again around 2002, and the trend has continued. Between 2000 and 2013, oyster dredging trips and hand harvest trips have risen substantially, with increasing harvest. A trend of stable or increasing spatfall coastwide is indicative of increasing larval availability, connectivity, and recruitment potential for restored and existing reefs. As of January 2015, there were 13 established oyster sanctuaries, with an additional two proposed.

Fact: Oyster beds were once so abundant that they were considered a navigation hazard.

Threats to Shell Bottom

Shell bottom habitat can be damaged by overharvesting, mechanical harvest fishing gear, navigational dredging, marinas and boating activity. Water quality degradation, especially toxin contamination, sedimentation, and hypoxia, can cause lethal or sublethal impacts. Shell bottom is occasionally susceptible to diseases and microbial stressors. The protozoan pathogen *Perkinsus marinus*, also called "dermo" has been responsible for major oyster mortalities in North Carolina. Monitoring of dermo disease by DMF shows a declining trend in prevalence, with an increasing trend in overall infection.

Boring sponge, sponges belonging to the genus *Cliona*, are found in North Carolina shell bottom habitats. Boring sponges compromise the integrity of shells and are linked to reduced reproductive viability and possibly increased oyster mortality rates. Two North Carolina oyster sanctuaries experienced dramatic population declines since 2012, coinciding with increasing percent cover of marine boring sponge. *Cliona* is endemic to North Carolina but has recently become more pervasive, especially on limestone marl rocks. To improve reef design in high salinity waters, DMF is conducting research on alternative substrates to identify materials that maximize oyster recruitment, growth, and survival, while offering high resistance to environmental stressors, such as *Cliona* boring sponge.

Shell bottom is considered to be one of the most threatened habitats because of its greatly reduced extent.

SAV - Underwater Gardens

Submerged aquatic vegetation (SAV) is a fish habitat dominated by one or more species of underwater vascular plants that occur in patches or extensive beds in shallow estuarine waters. The presence and density of SAV varies seasonally and inter-annually. A key factor affecting distribution is adequate light penetration; therefore, SAV occurs in shallow clear water. Sediment composition, wave energy, and salinity are also determining factors (Ch. 4).

Habitat Profile

SAV Functions

- Provides refuge for fish and other aquatic animals
- Serves as food for fish and waterfowl
- Produces dissolved oxygen
- Reduces wave energy and limits erosion
- Uses nutrients and traps sediments

How Fish Use SAV

- Nursery area for blue crab, pink shrimp, and red drum
- Foraging area for spotted sea trout, gag, and flounder
- Spawning area for spotted sea trout, grass shrimp, and bay scallop
- Refuge for bay scallop and hard clam

Economic Benefits

SAV habitat has a very high economic value due to the ecosystem services it provides. The estimated value of SAV and algal beds combined is $7,700/acre/year. This estimate takes into account services such as seafood production, wastewater treatment, climate regulation, erosion control, recreation, and others. The value of SAV for denitrification services (wastewater treatment) is estimated at $3,000/acre/year compared to approximately $400/acre/year for subtidal soft bottom. With North Carolina having the second largest expanse of SAV on the east coast, protection and enhancement of this valuable resource should be a high priority for the state.

Habitat Functions and Fish Use

Submerged aquatic vegetation is recognized as essential fish habitat because of five interrelated features – primary production, structural complexity, modification of energy regimes, sediment and shoreline stabilization, and nutrient cycling. Water quality enhancement and fish utilization are especially important ecosystem functions of SAV relevant to the enhancement of coastal fisheries. Seagrasses produce large quantities of organic matter. Many fish species occupy SAV at some point in their life for refuge, spawning, nursery, foraging, and corridors. SAV is considered essential fish habitat for red drum, shrimp, and species in the snapper-grouper complex. Spotted seatrout are also highly dependent on SAV, and bay scallops occur almost exclusively in SAV beds.

Due to its stringent water quality requirements, SAV presence is considered a barometer of water quality.

SAV - Underwater Gardens

Status and Trends

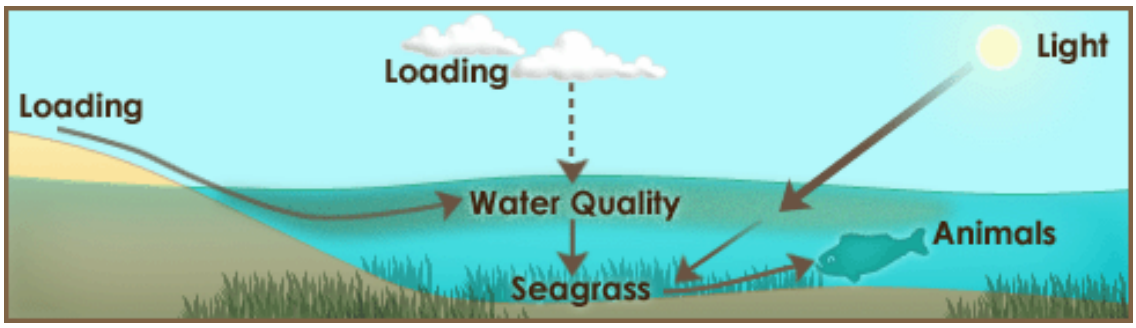
There has been a global and national trend of declining SAV habitat, with seagrasses disappearing at rates similar to coral reefs and tropical rainforests. In North Carolina, SAV loss has not been quantified, but anecdotal reports indicate that the extent of SAV may have been reduced by as much as 50%, primarily on the mainland side of coastal sounds. Mapping of SAV has been done by several entities since the 1980s, but often with different methods, and not coastwide. Comprehensive mapping of SAV habitat in coastal North Carolina was initiated in 2007 by a joint effort of federal and state agency and academic institutions. In 2013, mapping protocols for high and low salinity areas was developed so that mapping can be repeated approximately every five years on a rotational basis among five coastal areas. This mapping, in combination with sentinel sampling, will allow trends to be assessed. In 2013 high salinity SAV from Currituck Sound to Bogue Sound were mapped using aerial photography and field groundtruthing. In Albemarle Sound and Tar-Pamlico River SAV was mapped in 2014-15 using a newly developed method for low salinity turbid waters with side scan data and low light underwater photography for groundtruthing. In 2015, SAV south of Bogue Sound was mapped.

Fact: Over 150,000 acres of SAV were mapped in coastal North Carolina since 2000.

While a quantified change analysis is not yet available, preliminary review of core areas of SAV, such as behind the Outer Banks in Pamlico Sound and Core Sound, did not detect large changes since previous imagery for those areas in 2004. Expansion of SAV has been observed in Albemarle Sound and south of Bogue Inlet. Bay scallop abundance in the southern area is increasing in areas of expanding SAV.

Threats to SAV

Major threats to SAV habitat are channel dredging and water quality degradation from excessive nutrient and sediment loading. Natural events, human activities, and an ever-changing climate influence the distribution and quality of SAV habitat. Natural events include shifts in salinity due to drought and excessive rainfall, animal foraging, storm events, temperature, and disease. Submerged vegetation is vulnerable to water quality degradation, in particular, suspended sediment and pollutant runoff. Large amounts of algae and sediment make the water cloudy such that sufficient light cannot reach the plants, reducing their growth, survival, and productivity. Dredges and boat propellers can also have a direct effect on SAV habitat by uprooting and destroying the plants.

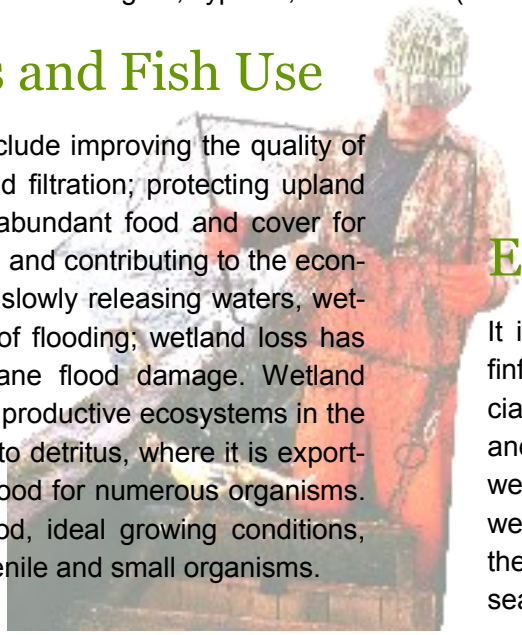


Wetlands - *Nature's Nurseries*

Wetlands are essential breeding, rearing, and feeding grounds for many species of fish and wildlife. They provide critical ecosystem services that contribute to healthy ecosystems and fisheries habitat. Coastal wetlands cover 40 million acres in the continental United States, with 81% in the southeast. Wetlands require the presence of water at or near the surface and vegetation adapted to wet soils. Wetlands occupy low areas, often marking the transition between uplands and submerged bottom, in areas subject to regular or occasional flooding by lunar or wind tides. Wetlands are vegetated with marsh plants such as cordgrass and black needle rush, or forested wetland species like sweet gum, cypress, and willows (Ch. 5).

Habitat Functions and Fish Use

Services provided by wetlands include improving the quality of habitats through water control and filtration; protecting upland habitats from erosion; providing abundant food and cover for finfish, shellfish, and other wildlife; and contributing to the economy. By storing, spreading, and slowly releasing waters, wetlands are linked to reduced risk of flooding; wetland loss has been linked to increased hurricane flood damage. Wetland communities are among the most productive ecosystems in the world. The plant matter decays into detritus, where it is exported to other waters and provides food for numerous organisms. Additionally, wetlands provide food, ideal growing conditions, and predator refuge for larval, juvenile and small organisms.



Economic Benefits

It is estimated that over 95% of the finfish and shellfish species commercially harvested in the United States, and over 90% in North Carolina, are wetland-dependent. Consequently, wetlands significantly contribute to the productivity of North Carolina's seafood and fishing industries.

Habitat Profile

Wetland Functions

- Provide refuge and food for fish and other animals
- Filter pollutants
- Trap sediments
- Shoreline erosion control
- Hold and slowly release flood waters

How Fish Use Wetlands

- Nursery area for blue crab, shrimp, and southern flounder, spot, and croaker
- Foraging area for spotted sea trout, red drum, and flounder
- Spawning area for river herring, killifish, and grass shrimp
- Refuge for blue crab and grass shrimp

The economic benefit of wetlands in providing flood control, stabilizing shorelines, and trapping and filtering pollutants has been extensively studied. By providing flood control and reducing shoreline erosion, wetlands protect coastal property. Wetlands also protect property by deterring shoreline erosion. Studies have shown that even narrow (7-25m) marsh borders reduce wave energy by 60-95%. These services explain why wetland habitat has been linked to reducing hurricane damage. One study estimated that the loss of 1 acre of coastal wetlands could result in a $13,360 loss in gross domestic product ($14,759 in 2014 dollars), and that U.S. coastal wetlands could provide as much as $23.2 billion/year (25.63 billion/year in 2014 dollars) in storm protection services.

Wetlands - *Nature's Nurseries*

Status and Trends

The 2015 CHPP Source Document summarizes wetlands within the CHPP region based on two data sources: the National Land Cover Dataset (NLCD) and the National Wetlands Inventory (NWI). According to the 2011 NLCD, there were ±3,759,729 acres of woody and emergent herbaceous wetlands within the CHPP regions. This represents a 2.7% decrease in woody wetlands and an 18.9% increase in emergent herbaceous wetlands since 2001. During the same time and area, developed land increased approximately 30%. The US Fish and Wildlife Service (FWS) has produced a NWI since the mid 1970s. The distribution of these wetlands is presented in Table 5.1 of the 2015 CHPP Source Document. Populations of spotted seatrout and red drum, two wetland-dependent species, have shown great improvements in the past few years.

Fact: Over 95 percent of the United States' commercially harvested finfish and shellfish are wetland dependent.

Threats to Wetlands

In the late 1800s and early 1900s, large amounts of wetland loss resulted from ditching and draining for agriculture and forestry. Over the years, wetland loss has occurred from dredging conversion to deep-water habitat for boat basins and navigation channels, followed by upland development, erosion, and shoreline hardening.

Statewide wetlands losses/gains and compensatory mitigation during FY 2012/13, 2013/14, and 2014/15. Data reflect permitting by DEQ and compensatory mitigation by DMS.

	Permitted gains and losses		
Linear feet of streams	**2012-13**	**2013-14**	**2014-15**
Losses	81,473.0	117,694.0	59,498.9
Gains	48,712.0	78,024.0	22,620.0
Net change	-32,761.0	-39,670.0	-36,878.9
Acres of wetlands			
Losses	203.6	98.9	102.1
Gains	197.8	59.9	104.5
Net change	-5.8	-39.0	2.4
Acres of riparian buffers			
Losses	75.6	48.0	56.1
Gains	37.9	21.2	18.2
Net change	-37.8	-26.9	-37.9

*Data provided by DWR and DMS

Wetland impacts are now regulated by numerous federal and state laws including the US River and Harbors Act, the US Clean Water Act, the NC Coastal Area Management Act (CAMA), and the NC Dredge and Fill Law, among others. Wetland filling for development and wetland loss due to erosion and rising water levels are currently the primary threats. Reduction of vegetated buffers can result in wetland loss and increased stormwater runoff. Legislative changes increasing thresholds for permitted impacts could contribute to additional freshwater wetland loss. Mitigation is required for larger wetland impacts. Offsetting historic wetland loss may now be possible through opportunities such as wetland restoration on conservation lands, creating marsh habitat on unused dredge disposal sites, and constructing living shorelines.

Coastal wetlands are critical nursery areas and serve as the primary buffer between land and water-based impacts.

Soft Bottom - *The Dynamic Habitat*

Soft bottom is unconsolidated, unvegetated sediment that occurs in freshwater, estuarine, and marine systems. Mud flats, sand bars, inlet shoals, and intertidal beaches are specific types of soft bottom. Grain size distribution, salinity, DO, and flow characteristics affect the condition of soft bottom habitat and the type of organisms that use it. Soft bottom covers approximately 1.9 million acres. North Carolina's coast can be divided into geologically distinct northern and southern provinces. In the northern province (north of Cape Lookout), the seafloor consists of a thick layer of unconsolidated mud, muddy sand, and peat sediments. The low slopes of the bottom result in an extensive system of drowned river estuaries, long barrier islands, and few inlets. The southern province has a thin and variable layer of surficial sands and mud, with underlying rock platforms, a steeper sloping shoreline with narrow estuaries, short barrier islands, and numerous inlets (Ch. 6).

Habitat Functions and Fish Use

Soft bottom is important as a storage reservoir of nutrients, chemicals, and microbes in coastal ecosystems, allowing for both deposition and resuspension of nutrients and toxic substances. The surface supports benthic microalgae, contributing substantial primary production to the coastal system. Estuarine soft bottom supports over 400 species of benthic invertebrates in North Carolina. Juvenile stages of species such as summer and southern flounder, spot, Atlantic croaker, and penaeid shrimp use the shallow unvegetated flats, which larger predators cannot access, as important nursery habitat. As fish get larger, they will venture out of protective cover to forage in soft bottom. Fishery independent data from shallow creeks and bays in Pamlico Sound documented 78 fish and invertebrate species. Eight of those — spot, bay anchovy, Atlantic croaker, Atlantic menhaden, silver perch, blue crab, brown shrimp, and southern flounder — comprised > 97% of the total nekton abundance. Soft bottom between structured habitat (SAV, wetlands, shell bottom) acts as a barrier to connectivity, which can be beneficial to small invertebrates by reducing predation risk. Fish and invertebrates that commonly occur in this habitat, including hard clams, flatfish, skates, rays, and other small cryptic fish such as gobies, avoid predation by burrowing into the sediment, thus camouflaging themselves from predators. Ocean soft bottom, particularly in the surf zone and along shoals and inlets, serves as an important feeding ground for fish that forage on benthic invertebrates. These predators generally have high economic value as recreational and commercial species, and include Florida pompano, red drum, kingfish, spot, Atlantic croaker, weakfish, Spanish mackerel, and striped bass. Many demersal and estuary-dependent fish spawn over soft bottom habitat in North Carolina's coastal waters.

Habitat Profile

Soft Bottom Functions

- Stores and recycles nutrients, chemicals
- Is a source of sand for other habitats
- Provides an area for marine animals to burrow

How Fish Use Soft Bottom

- Nursery area for blue crab, flounder, and croaker
- Foraging area for seatrout, red drum, and flounder
- Spawning area for shrimp, sturgeon, and kingfish
- Refuge area for hard clam, shrimp, and flounder

Soft bottom includes features such as mud flats, inlets, shoals, channel bottoms, and ocean beaches.

Economic Benefits

Soft bottom benefits the economy by providing habitat for critical food sources, by cycling nutrients, burying pollutants, and dampening wave energy. Beaches are extremely valuable for tourism and recreation, including surf fishing, surfing, and beach going. One study, averaging data from seven North Carolina beaches, found the net economic benefits of a day at a beach ranged from $14—$104 for single day trips and $14 to $53 overnight stays. For example, the total average annual benefits of long-term beach nourishment was estimated to be $14,836,688 (2014 dollars) due to recreational and storm damage reduction benefits.

Status and Trends

Comprehensive mapping of soft bottom habitat has not been completed. The loss of more structured habitat, such as SAV, wetlands, and shell bottom, has undoubtedly led to gains in soft bottom habitat. The quality of soft bottom habitat is a better indicator of soft bottom status than quantity. The best available information on sediment quality comes from EPA's latest National Coastal Condition Report (NCCR IV). The report rated the coast from North Carolina to Florida at 3.6 (fair) overall, while sediment quality was rated 2 (fair to poor), which was lower than in previous reports. Sediment quality is based on toxicity, contaminants, and total organic carbon (TOC). The percentage of area determined to be in poor condition was 13%. The primary reason for the low rating was sediment toxicity. The quality of soft bottom habitat can affect species abundance and diversity. Sediments in soft bottom habitat can accumulate both chemical and microbial contaminants, potentially affecting benthic organisms and community structure. Tidal creeks are sensitive to various aspects of human development, but sensitivity depends on the size and location of the creeks. Because tidal creeks are the nexus between estuaries and land-based activities, potential for contamination is high. Intertidal creeks close to headwaters demonstrate greater concentrations of nonpoint source contamination than larger systems near the mouth. The degree of contamination also depends on the impervious cover surrounding the land.

Fact: Soft bottom covers about 2.1 million acres of estuarine and ocean bottom within state waters.

Threats to Soft Bottom

Soft bottom strongly influences the water column by the constant cycling of nutrients and sediments.

Inadequate information is available to determine the current condition of soft bottom. Many human activities aimed at enhancing the "coastal experience" can inadvertently degrade this habitat. The ecological functions provided by soft bottom can be altered by activities such as dredging for channels or marinas, shoreline stabilization, water churning in marinas, and use of certain types of fishing gear. Along the oceanfront, jetties form barriers to the movement of sand, altering the natural sediment cycle. Excess nutrient concentrations in coastal rivers, in combination with certain environmental conditions, can lead to no or low oxygen levels near the bottom, killing the benthic organisms in the sediment, which reduces food availability for larger invertebrates and fish. Sediment contaminated with toxins can affect reproduction and growth of shellfish and other aquatic animals. Soft bottom habitat is relatively resistant to a changing environment.

Hard Bottom - *Rocks, Reefs, and Wrecks*

Hard bottom habitat, also referred to as live bottom or reef, consists of exposed areas of rock or consolidated sediments that may or may not be characterized by a thin veneer of live or dead biota and is generally located in the ocean rather than in the estuarine system. Natural hard bottom is colonized to a varying extent by algae, sponges, soft coral, hard coral, and other sessile invertebrates. In South Atlantic waters, hard bottom can consist of exposed rock ledges or outcrops with vertical relief or can be relatively flat and covered by a thin veneer of sand.

Artificial reefs are structures constructed or placed in waters for the purpose of enhancing fishery resources. Because artificial reefs become colonized by algae, invertebrates, and other marine life, they provide additional hard bottom habitat and serve similar ecological functions for fish. Some of the materials used in artificial reef construction are vessels, concrete pipe, or prefabricated structures such as reef balls. The DMF Artificial Reef Program is responsible for deployment and maintenance of artificial reef sites in state and federal waters. There are 50 DMF-managed artificial reefs of varying construction in North Carolina, of which 29 are located in federal ocean waters, 13 in state ocean waters, and eight in estuarine waters (Ch. 7).

Habitat Functions and Fish Use

Exposed hard substrate provides stable attachment surfaces for colonization by numerous marine invertebrates and algae. This productive three-dimensional habitat is often the only source of structural refuges in open shelf waters and a source of concentrated food. Most reef fish spend almost their entire life cycle on hard bottom, which serves as nursery, spawning, and foraging grounds. The presence of ocean hard bottom off North Carolina, along with appropriate water temperatures, allows for the existence of a temperate-to-subtropical reef fish community and a snapper-grouper fishery. Because of their importance for spawning, nursery, and foraging, all of the nearshore hard bottoms off North Carolina have been federally designated as Habitat Areas of Particular Concern for the snapper-grouper complex.

Habitat Profile

Hard Bottom Functions

- Provides a place for sponges, algae, and coral to attach
- Offers refuge for reef fish
- Supplies new sand through erosion

How Fish Use Wetlands

- Nursery area for groupers, snapper, and black sea bass
- Foraging area for king mackerel, gag, and snapper
- Spawning area for black sea bass, grouper, and tropicals
- Refuge area for gag and black sea bass

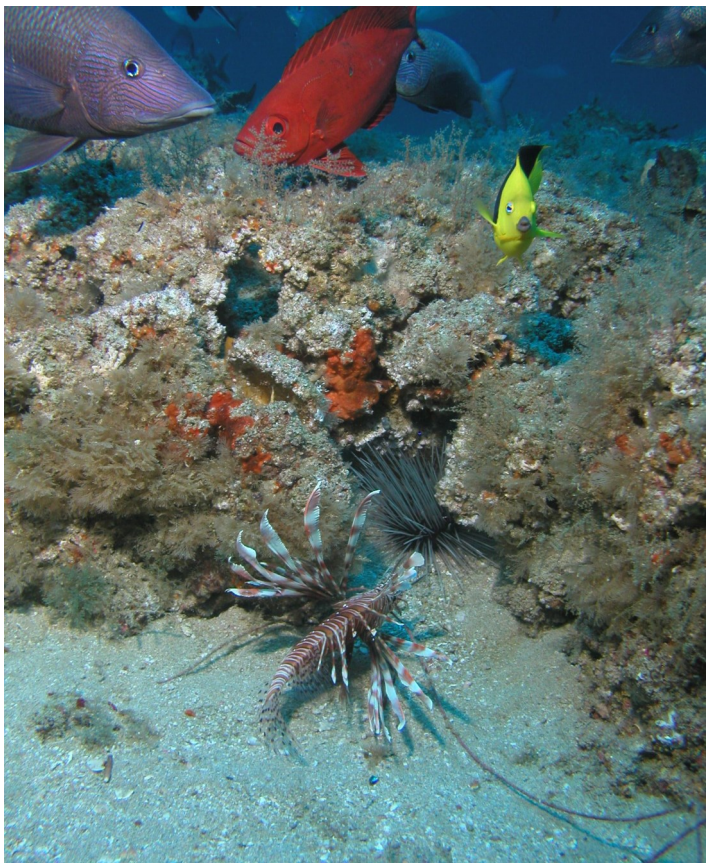
Economic Benefits

Between 2011 and 2013, the North Carolina commercial snapper-grouper fishery harvested an annual average of 1,638,434 lbs of fish (total of 5,015,570 lbs) with an annual market value of over $4.2 million (total for 3 years - $12,567,964). During that same time period, recreational fisherman (private boats, charter boats, and head boats) harvested an average of 568,146 lbs of fish in the snapper-grouper complex/year, for a total of 1,204,439 lbs. Economic benefits also include revenue from the dive industry, since hard bottom reefs are popular dive sites.

Hard Bottom - Rocks, Reefs, and Wrecks

Status and Trends

The condition of shallow hard bottom in North Carolina state territorial waters is of particular importance to the health and stability of estuary-dependent snapper-grouper species that utilize this habitat as “way stations” or protective stopping points as they emigrate offshore. Because of market value, high recreational participation, and the associated fishing tackle industry, the offshore snapper-grouper complex supports productive commercial and recreational fisheries. The South Atlantic Fishery Management Council reported that nearshore hard bottoms in the South Atlantic were considered to be in “good general” condition overall in 2002. Although adequate information exists on the distribution of hard bottom off the North Carolina coast, little information is available to evaluate the status and trends of hard bottom habitat in state territorial waters. The black sea bass populations north and south of Cape Hatteras and gag grouper have improved in the past few years.



Fact: 50 artificial reefs are located in ocean waters along North Carolina’s coast and 8 are located in estuarine waters. In addition, there are numerous shipwrecks along the coast

Threats to Hard Bottom

Threats to nearshore hard bottom habitat in North Carolina include beach nourishment, certain fishing gear, and water quality degradation. Sand from nourished beaches can also cover hard bottom structures. Studies have found that some hard bottom areas adjacent to nourished beaches were buried by sand washed off of nourished beaches. These once productive reef fishing grounds are no longer fished due to poor yield. Boat anchors and bottom trawls can uproot coral and tear loose chunks of rock. Poor water quality can affect growth or survival of the invertebrates living on hard bottom structure. A growing threat to hard bottom is the impact of the highly invasive Pacific lionfish on the reef community. This species has rapidly expanded in range from more southerly waters to North Carolina, and has exhibited extremely high predation rates on snapper and grouper species. Ocean acidification is another concern. More acidic ocean water over time is expected with increasing carbon dioxide levels which can cause calcium based organisms like corals and sponges to disintegrate.

The hard bottom habitat of the North Carolina coast is considered crucial spawning and foraging habitat for many commercially important species of grouper and snapper.

ACRONYM LIST

APNEP:	**Albemarle-Pamlico National Estuary Partnership**
BMPs:	**Best Management Practices**
CAMA:	**NC Coastal Area Management Act**
CHPP:	**Coastal Habitat Protection Plan**
CRC:	**Coastal Resources Commission**
CRFL:	**Coastal Recreational Fishing License**
DACS:	**Department of Agriculture and Consumer Services**
DCM:	**Division of Coastal Management**
DEMLR:	**Division of Energy, Mineral, and Land Resources**
DENR:	**Department of Environment and Natural Resources**
DEQ:	**Department of Environmental Quality (formerly DENR)**
DMF:	**Division of Marine Fisheries**
DMS:	**Division of Mitigation Services**
DO:	**Dissolved Oxygen**
DOT:	**Department of Transportation**
DSWC:	**Division of Soil and Water Conservation**
DWR:	**Division of Water Resources**
EBM:	**Ecosystem-Based Management**
EFH:	**Essential Fish Habitat**
EMC:	**Environmental Management Commission**
EPA:	**US Environmental Protection Agency**
FWS:	**US Fish and Wildlife Service**
LID:	**Low Impact Development**
MFC:	**Marine Fisheries Commission**
NCCR:	**National Coastal Condition Report**
NCFS:	**NC Forest Service**
NLCD:	**National Land Cover Database**
NWI:	**National Wetlands Inventory**
SAFMC:	**South Atlantic Fishery Management Council**
SAV:	**Submerged Aquatic Vegetation**
SCC:	**Sedimentation Control Commission**
SCH:	**Strategic Coastal Habitats**
SWCC:	**Soil and Water Conservation Commission**
TOC:	**Total Organic Carbon**
TSS:	**Total Suspended Solids**
USACE:	**US Army Corps of Engineers**
WRC:	**Wildlife Resources Commission**

For more information or to download the CHPP and Source Document, go to http://portal.ncdenr.org/web/mf/habitat/chpp/downloads

This document should be cited as follows:
NCDEQ (North Carolina Department of Environmental Quality). North Carolina Coastal Habitat Protection Plan. Morehead City, NC. Division of Marine Fisheries; 2016. 33 p.

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-16-02

January 24, 2016

MEMORANDUM

TO: Coastal Resources Commission
FROM: Tancred Miller
SUBJECT: 2015 N.C. Sea level Rise Assessment – Final Report

Session Law 2012-202

N.C. Session Law 2012-202 (HB 819), directed the CRC and DCM to perform a number studies, including an update of the 2010 Sea Level Rise Assessment Report, and instructed the CRC to direct the Science Panel to deliver the updated report no later than March 31, 2015. The law required the updated report to consider spatial variations sea level rise, based upon a review of the relevant literature and data from federally-maintained tide gauges. The legislation mandated the reporting of regional rates of sea level rise, as well as a discussion of predictive modeling and opportunities for public comment.

N.C. Session Law 2012-202 (HB 819) further directed the CRC to make the draft report available for public comment, to hold a public hearing at the CRC's first meeting after March 31, 2015, and to deliver the final report, along with public comments and any sea level rise rules or policies adopted or under consideration, to the Environmental Review Commission by March 1, 2016.

Additionally, the law directed the CRC to "study the economic and environmental costs and benefits to the North Carolina coastal region of developing, or not developing, sea-level regulations and policies." The CRC determined at their April 2015 meeting that since there are no regulations or policies under consideration, it is not feasible to study potential costs or benefits at this time, and any future regulations will undergo a fiscal impact analysis as required under the N.C. Administrative Procedures Act.

Science Panel

Prior to and shortly after the start of work on the report, three members of the Science Panel stepped down, leaving several vacancies on the volunteer panel. The CRC issued a call for nominations for new members, as well as for potential ad hoc members to participate only on the sea level rise study. After receiving and reviewing the nominations, the CRC added just one new member to the panel - Greg "Rudi" Rudolph - and no ad hoc members.

Following the membership changes, the panel consisted of 10 members, all unpaid volunteers serving at the pleasure of the CRC. In addition to the significant undertaking of preparing the new sea level rise report, the panel had already been assisting DCM for several months with evaluating the feasibility of eliminating the CRC's Inlet Hazard Areas of Environmental Concern (AEC), and applying appropriate development standards from the adjacent Ocean Erodible AEC to the Inlet Hazard Areas. This feasibility study was also required under S.L. 2012-202, and the final report was due to the Legislature by Jan. 31, 2015, just two months before the law made the draft sea level rise report due to the CRC.

The full membership of the Science Panel that conducted the sea level rise study included:

- **Dr. Margery Overton, Chair**
  Department of Civil, Construction, and Environmental Engineering, N.C. State University
- **Mr. William Birkemeier, Co-Chair**
  Field Research Facility, ERDC/CHL, US Army Corps of Engineers
- **Mr. Stephen Benton**
  N.C. Division of Coastal Management (Retired), Raleigh
- **Dr. William Cleary**
  Center for Marine Science, University of North Carolina at Wilmington
- **Mr. Tom Jarrett, P.E.**
  U.S. Army Corps of Engineers (Retired), Wilmington
- **Dr. Charles "Pete" Peterson**
  Institute of Marine Sciences, University of North Carolina at Chapel Hill
- **Dr. Stanley R. Riggs**
  Department of Geological Sciences, East Carolina University
- **Mr. Spencer Rogers**
  North Carolina Sea Grant, Wilmington
- **Mr. Greg "Rudi" Rudolph**
  Shore Protection Office, Carteret County
- **Dr. Elizabeth Judge Sciaudone, P.E.**
  N.C. State University, Raleigh

Charge to the Science Panel

The CRC issued a study charge to the panel in June 2014, and requested an initial draft by December 31, 2014 for use in a technical peer review process. The charge was based upon the requirements in the law, and the CRC included a request to limit the projection to 30 years into the future. The CRC intended the 30-year projection to become the standard time period used in future updates, rather than the much longer time horizon used in the 2010 report. The panel accepted the charge at their July 2014 meeting.

CHARGE TO THE SCIENCE PANEL

The CRC has determined that the issue of potential sea level rise is of extreme importance to the State, its policy makers and the citizens of NC. It is further noted that periodic updates of current data are vital to help formulate future policy.

The CRC therefore charges the Science Panel to conduct a comprehensive review of scientific literature and available North Carolina data that addresses the full range of global, regional and North Carolina specific sea level change.

The CRC further determines that the scope and time period of the study and report regarding sea level rise shall be limited to a "Rolling 30-Year Time Table". It is the intent of the CRC that this rolling 30-year time table will be updated every five years.

Report Development

With a start date of July 2014, and a technical peer review draft due by December 31st of the same year, the panel held monthly in-person meetings in order to complete the task by the CRC's deadline. DCM provided logistical support, but panel members were responsible for all research and writing.

The Science Panel's goal for their process was to be open and transparent, that all of the data and information used be publicly available, and that their methodology be easily replicated by other scientists. The panel also decided that all of the mathematical calculations and formulas used in developing the rates would be included in the report.

The panel met five times between July and December 2014, and delivered the peer review draft to DCM on December 31st. All panel meetings were open to the public and advertised at least a week in advance, and all meetings were attended by members of the public and the media. Time was set aside at every meeting to allow public input, and the panel received public input at every meeting.

The December 31st draft was delivered to the CRC, and to the technical peer review team of Drs. Robert Dean and James Houston. The panel met again in January and March of 2015 to complete the technical peer review process and finalize the draft for the commission.

The panel delivered the final draft to DCM on March 31, 2015, as required by the session law. This began an extended public comment period, which the CRC held open until December 31, 2015. DCM received just over a dozen public comments during this period, and they are attached to the final report.

Technical Peer Review

A technical peer review process was designed to address claims of bias that were heard after the 2010 report was completed, and to ensure that the report considered the full range of sea level change data and hypotheses in the peer-reviewed scientific literature, as required by the Legislature. Chairman Gorham obtained consent from two well-known, and widely respected, scientists who had previously published papers challenging the some of the research findings of accelerating sea level rise rates.

Dr. Robert G. Dean
Bob Dean was Professor Emeritus in the Coastal and Oceanographic Engineering Program, Civil and Coastal Engineering Department, University of Florida, Gainesville, Florida. Sadly, Dr. Dean passed away in February 2015.

Dr. James R. Houston
Dr. Houston is Director Emeritus of the U.S. Army Engineer Research and Development Center, the R&D laboratories of the Corps of Engineers.

The panel and peer reviewers set up a timeline for the process that included an initial technical review by Drs. Dean and Houston in mid-January 2015, a response from the panel by mid-February, and a final review by Drs. Dean and Houston by the end of February. The technical peer reviews and Science Panel responses are included in the attached materials.

Next Steps

The final report package is attached for your approval. Upon approval by the CRC, staff will deliver the final report and accompanying documents to the department, and the department will submit the complete package to the General Assembly Environmental Review Commission.

MARCH 31, 2015

NORTH CAROLINA

Sea Level Rise

Assessment Report

2015 Update to the 2010 Report and 2012 Addendum

Prepared by the N.C. Coastal Resources Commission Science Panel

This work supported by the N.C. Department of Environment and Natural Resources, Division of Coastal Management.

Disclaimer: This report was prepared by the N.C. Coastal Resources Commission's Science Panel, acting entirely in a voluntary capacity on behalf of the Coastal Resources Commission. The information contained herein is not intended to represent the views of the organizations with which the authors are otherwise affiliated.

Members of the CRC Science Panel

The Science Panel consists of the following individuals, who serve voluntarily and at the pleasure of the Coastal Resources Commission.

Dr. Margery Overton, Chair
Department of Civil, Construction, and Environmental Engineering, N.C. State University

Mr. William Birkemeier, Co-Chair
Field Research Facility, ERDC/CHL, US Army Corps of Engineers

Mr. Stephen Benton
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Department of Geological Sciences, East Carolina University

Mr. Spencer Rogers
North Carolina Sea Grant, Wilmington

Mr. Greg “Rudi” Rudolph
Shore Protection Office, Carteret County

Dr. Elizabeth Judge Sciaudone, P.E.
N.C. State University, Raleigh

Executive Summary: 2015 Science Panel Update to 2010 Report and 2012 Addendum

Charge: This report has been written by the members of the Science Panel as a public service in response to a charge from the Coastal Resources Commission (CRC) and the N.C. General Assembly Session Law 2012-202. The CRC charge specified that sea level rise projections be developed for a 30-year timeframe.

Background: The Science Panel, along with six additional contributors, issued a report in March 2010 titled "North Carolina Sea Level Rise Assessment Report." In response to a series of questions by the CRC, in April 2012 the panel issued a follow up Addendum to the report. As stated in these documents, the Science Panel recommendation was for re-assessments to be completed every five years. The present document serves as the 2015 update of the 2010 report.

Approach: It is critical to the Science Panel that our process be transparent. Therefore all numerical values used in this report, as well as the corresponding sources, are presented. In addition, mathematical calculations and formulas employed are described in detail.

What's New: This document expands on the 2010 report and 2012 addendum in a number of important ways, including the following:

- Inclusion of scenario based global sea level rise predictions from the most recent Intergovernmental Panel on Climate Change (IPCC) Report (AR5).
- Emphasis on the spatial variation of relative sea level rise rates as evidenced by the analysis of data collected by NOAA tide gauges along the North Carolina coast.
- Additional discussion of the expected spatial variability in relative sea level rise rates along the North Carolina coast due to geologic factors.
- Review of recent research indicating that ocean dynamics effects may be a significant source of spatial variability in existing relative sea level rise rates along the North Carolina coast.
- Discussion of recent research into the impacts of sea level rise on the frequency of relatively minor coastal flooding not necessarily associated with storms (*nuisance flooding*).
- Examination of dredging effects on tide range and sea level signal.
- Consideration of a 30-year time frame for sea level rise projections as requested by the CRC.
- Development of a range of predictions at each of the long-term tide gauges along the North Carolina coast based on a combination of local vertical land motion information and the IPCC scenarios.

Summary: Sea level is rising across the coast of North Carolina. The rate of local sea level rise varies, depending on location (spatially) and the time frame for analysis (temporally). Two main factors affect the spatial variation of rates of sea level rise along the North Carolina coast: (1) vertical movement of the Earth's surface, and (2) effects of water movement in the oceans (including the shifting position and changing speed of the Gulf Stream). There is evidence from both geological data and tide gauges that there is more land subsidence north of Cape Lookout than south of Cape Lookout. This contributes to higher measured rates of sea level rise along the northeastern N.C. coast. Oceanographic research reveals a strong link between speed and position of the Gulf Stream and sea level. This effect has been

observed to increase sea level primarily north of Cape Hatteras. The differences in the rates of relative sea level rise (meaning, the rate of sea level rise at a specific location including local effects, and distinct from the global average rate of sea level rise) at different locations along the North Carolina coast are evident in the sea level trends reported by the National Oceanic and Atmospheric Administration (NOAA) at tide gauge stations along the North Carolina coast. Five tide gauges along the state's coast have collected water level data for long enough to have reported sea level trends. Two are located in Dare County: one of those at the U.S. Army Corps of Engineers' Field Research Facility in Duck and another at the Oregon Inlet Marina. A third is located in Carteret County at the Duke University Marine Lab dock in Beaufort. The fourth station is located in Wilmington, at the U.S. Army Corps of Engineers' maintenance yard and docks at Eagle Island. This location is in New Hanover County, immediately adjacent to Brunswick County. These stations still continue to record water level data. The fifth station was located at the Southport Fishing Pier, but is no longer active.

NOAA makes available these data and an analysis of rate based on linear regression. Data span the time period from the initial installation of the gauge through December 2013 for the gauges at Duck, Oregon Inlet Marina, Beaufort and Wilmington and through 2008 for the gauge at Southport. NOAA reports a high, a low, and a mean value for the rate of relative sea level rise using a 95% confidence interval for each gauge. The Science Panel worked closely with Dr. Chris Zervas (*e.g.,* Zervas 2001, Zervas 2009, Zervas et al. 2013) at the NOAA National Ocean Service Center for Operational Oceanographic Products and Services, who provided additional analyses of tide gauge data for this report. The existing published rate of sea level rise is converted to a future elevation by multiplying the rate plus or minus the 95% confidence interval (for the high/low estimates respectively) by 30 years – the time frame specified by the CRC for the projections in this update.

Since tide gauges only measure past sea levels, the Science Panel used the most recent report of the Intergovernmental Panel on Climate Change (AR5) to provide scenario-based global sea level rise projections. The scenarios chosen to model sea level rise over the next 30 years are the IPCC's low greenhouse gas emissions scenario (RCP 2.6) and the high greenhouse gas emissions scenario (RCP 8.5), as all other scenario projections fall within the range of these two. These values were combined with rates of vertical land movement (subsidence) determined by the analysis of tide gauge records and provided by NOAA (Zervas et al. 2013; Zervas, pers. comm. 2014) to develop a range of values across the North Carolina coast.

Table ES1 summarizes the results. Using existing gauge rates, sea level rise across North Carolina by 2045 would vary from a low estimate of 2.4 inches (with a range between 1.9 and 2.8 inches) at Southport to a high estimate of 5.4 inches (with a range between 4.4 and 6.4 inches) at Duck. Considering the IPCC scenario RCP 2.6 combined with vertical land movement, sea level rise would vary from a low estimate of 5.8 inches (with a range between 3.5 and 8.0 inches) at Wilmington to a high estimate at Duck of 7.1 inches (with a range between 4.8 and 9.4 inches). Considering IPCC scenario RCP 8.5 with vertical land movement, sea level rise would vary from a low estimate of 6.8 inches (with a range between 4.3 and 9.3 inches) at Wilmington to a high estimate at Duck of 8.1 inches (with a range between 5.5 and 10.6 inches).

Table ES1. Three relative sea level rise (RSLR) scenarios by 2045 using published tide gauge rates (NOAA 2014a), and IPCC scenario projections RCP 2.6 and RCP 8.5 (Church et al. 2013) representing the lowest and highest greenhouse gas emission scenarios, combined with local vertical land movement (VLM) at each tide gauge.*

Station	Tide Gauge Projections		IPCC RCP 2.6 + VLM		IPCC RCP 8.5 + VLM	
	RSLR in 30 years (inches)		RSLR in 30 years (inches)		RSLR in 30 years (inches)	
	Mean	Range	Mean	Range	Mean	Range
Duck	5.4	4.4-6.4	7.1	4.8-9.4	8.1	5.5-10.6
Oregon Inlet	4.3	2.7-5.9	6.3	3.9-8.7	7.3	4.7-9.9
Beaufort	3.2	2.8-3.6	6.5	4.2-8.7	7.5	5.0-10.0
Wilmington	2.4	2.0-2.8	5.8	3.5-8.0	6.8	4.3-9.3
Southport	2.4	1.9-2.8	5.9	3.7-8.2	6.9	4.4-9.4
*Note: Projections were rounded to the nearest tenth of an inch.						

Using the Projections: The range of sea level values (from 1.9 to 10.6 inches) reported in **Table ES1** reflects both the uncertainty in the predictions and the spatially varying nature of sea level in North Carolina. Economic, social and environmental sustainability in the coastal region of North Carolina will, in part, be dependent on how this information is used. Agency groups should work in an open and informed manner with the scientific community, local landowners and political bodies, and other affected stakeholders to consider acceptable levels of risk. Planning objectives that span longer time frames (greater than 30 years) will require looking at the IPCC results directly as the IPCC scenarios begin to differ significantly beyond 30 years.

Table ES1 reflects change in mean sea level. Recent research into the frequency of coastal flooding has shown that, regardless of the rate of rise, as the mean sea level increases, North Carolinians should expect more frequent flooding of low-lying areas.

Future Data Collection, Data Analysis and Reporting: Recommendations are made to:

- continue to monitor oceanographic research with regards to the effect of ocean-atmospheric oscillations and regional ocean currents (*e.g.*, the Gulf Stream) on sea level,
- sustain existing water level recording stations and land movement measurements and establish additional gauges to provide more complete spatial coverage,
- review updated satellite sea level data as the record is extended and consider use of these data in the future,
- consider additional analysis of the tide gauge data to standardize the time period covered using the NOAA analysis of rate procedures, and
- update the assessment every five years to include the rapidly changing science of projecting sea level rise.

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Terms and Acronyms

BIMP: Beach and Inlet Management Plan –a joint project by the North Carolina Division of Water Resources and the North Carolina Division of Coastal Management to manage the state's inlets and beaches

AR5: Fifth Assessment Report – the most recent report (2013) on climate change from the Intergovernmental Panel on Climate Change

CORS: Continuously Operating Reference Stations – ground based reference stations that continuously collect and record GPS data

Eustatic Sea Level – the global sea level; eustatic sea level changes affect all areas across the globe and include changes in the volume of water in the ocean or changes in ocean basins that affect the volume of water they can hold

GIA: Glacial Isostatic Adjustment – describes the Earth's rebound, both positively and negatively, from the melting of kilometers-thick ice sheets that covered much of North America and Europe during the last glacial maximum approximately 20,000 years ago

GPS: Global Positioning System – a satellite based navigation system that provides location and time information anywhere on or near Earth where there is an unobstructed line of sight to four or more GPS satellites

GSL: Global Sea Level – the global average sea level

IPCC: Intergovernmental Panel on Climate Change – the leading international body for the assessment of climate change. It operates under the auspices of the United Nations (UN)

Nuisance flooding – flooding events not necessarily associated with storms

OE: Oceanographic effects – changes in sea level due to movement of the ocean waters, including effects of ocean-atmospheric oscillations and changes in ocean currents

RCP: Representative Concentration Pathways – four greenhouse gas concentration trajectories adopted by the IPCC for AR5; these scenarios are used for climate modeling and research and represent possible climate futures depending on the amounts of greenhouse gases emitted in the years to come

RSL: Relative Sea Level – the sea level at any location and time

Thermal expansion of ocean water – increase in ocean water volume due to a corresponding increase in water temperature

VLM: Vertical land movement or vertical land motion –sinking or rising of the Earth's surface *(i.e.*, subsidence or uplift, respectively)

1. Introduction

In 1954, Hurricane Hazel made landfall at the border of North Carolina and South Carolina as a category 4 hurricane arriving at spring high tide and packing 140 mph winds (Smith 2014). Her winds, waves and 18-ft storm surge swept across the barrier islands causing wide-spread destruction along the coast. In North Carolina, 19 people died; on Long Beach only five of 357 homes survived. Hurricane Hazel was one of the most damaging storms in North Carolina history. Because of the sea level change that has occurred since, a storm of similar intensity today, 60 years later, would have a storm surge approximately 5 inches higher (~10 inches higher north of Cape Hatteras). In low lying areas of the coast, a few inches may be the difference between the ground floor of a house staying dry or being underwater. Sea Level change is not a new coastal hazard, but over time it "exacerbates existing coastal hazards such as flooding from rain or tide, erosion, and storm surge" (Ruppert 2014). Over time, rising water levels also increase the occurrence of *nuisance flooding* (flooding events not necessarily associated with storms) during more frequent events (like monthly spring tides) (Sweet et al. 2014, Sweet and Park 2014, Ezer and Atkinson 2014).

Because of the potential impact of future sea levels to coastal North Carolina, in 2009 the Coastal Resources Commission (CRC) asked the Science Panel on Coastal Hazards to develop an assessment of future sea levels for NC. The first assessment was published in March 2010 (NC Science Panel 2010). Because climate and sea level science is advancing rapidly, the 2010 report recommended an update every five years. In 2013 the CRC, responding to Session Law 2012-202 from the N.C. General Assembly, requested the first 5-year update using the latest science to estimate future sea levels. The CRC requested that the update consider only the next 30 years, from 2015 to 2045 (see Appendix A for the charge from the CRC and Appendix B for S.L. 2012-202) rather than the 90-year timeframe used in the original report.

Since our original report, there have been significant advances in climate science and the publication of several major reports, including the 2013 report of Working Group I (WG1) to the Fifth Assessment (AR5) of the Intergovernmental Panel on Climate Change (IPCC 2013b, 2013c). That report is a thorough and updated analysis of climate and sea level prediction. It represents a 5-year effort by 250 authors and their conclusions were based on 9,200 published papers and were finalized after fielding 50,000 comments.

Because the IPCC report is based on peer-reviewed research and is itself peer-reviewed science, it is the most widely used and vetted climate document. We make use of their projections in the present report. The AR5 scenarios are currently also being used in recent efforts by New York State (New York State Energy Research and Development Authority 2014) and the Canadian coast (Zhai et al. 2014).

Also published since our 2010 report are the 2014 update to the United States National Climate Assessment, which includes sea level predictions (Melillo et al. 2014) and a series of studies of sea level along the Atlantic coast which are relevant to North Carolina and are discussed in this report.

In this update, we:

1) Introduce the concept of sea level and the variables that control sea level change;

2) Provide and explain how sea level change varies across coastal North Carolina and the factors that control that variation;

3) Present a range of sea level values appropriate for different areas of North Carolina, which may occur by 2045 based on the IPCC scenarios as well as local geologic and oceanographic variations;

4) Provide guidance as to how to interpret and make use of these values.

2. Sea Level Change: What influences ocean water levels?

The sea level at any location and time is known at the Relative Sea Level or RSL, which is the combination of three primary factors including the *Global Sea Level* (GSL), *Vertical Land Movement* (VLM) and *Oceanographic Effects* (OE). GSL and RSL are discussed in this section; VLM and OE are discussed in **Section 3**. These parameters are usually discussed in terms of their rates of temporal change, commonly expressed in mm/year.

2.1 Historical Sea Level Change

Over the scale of 10,000s to 100,000s of years, climate has oscillated between extensive periods of cold and warm phases, triggering the uptake of seawater in glacial ice during cold stages of global climate and the release of this water during warm episodes (Wright 1989). Periods of glaciation and interglaciation, and the corresponding fall and rise of sea level respectively have been well documented in the geologic record using an array of indicators [*e.g.*, oxygen isotopes in calcium carbonate fossils, coral reef terraces, marsh peat elevation and geochemistry, paleo-shorelines, etc. (Cohen and Gibbard 2011; Blanchon and Shaw 2005; NOAA 2014b)]. The cyclicity of the "Ice Ages" has been used to signify the Quaternary geologic period, which includes both the Pleistocene and Holocene Epochs.

As depicted in **Figure 1** (Imbrie et al. 1984) the most recent previous interglacial (warm) period was approximately 125,000 years ago when sea level was ~16 to 20 feet above present, which was subsequently followed by a period of glaciation that reached a maximum at ~20,000 years ago when sea level was ~425 feet below present. Currently, we are in a warm phase that was first marked by rapid de-glaciation and rising sea level, which also represents the demarcation

of the Pleistocene/Holocene boundary (**Figure 2**, Donoghue 2011; Fairbanks 1989; Peltier and Fairbanks 2006; Bard et al. 2010). Climate and sea level have relatively plateaued over the past 5,000 years and sea level is estimated to have risen on the order of 3 feet during this timeframe (**Figures 2 and 3**; Kemp et al. 2011).

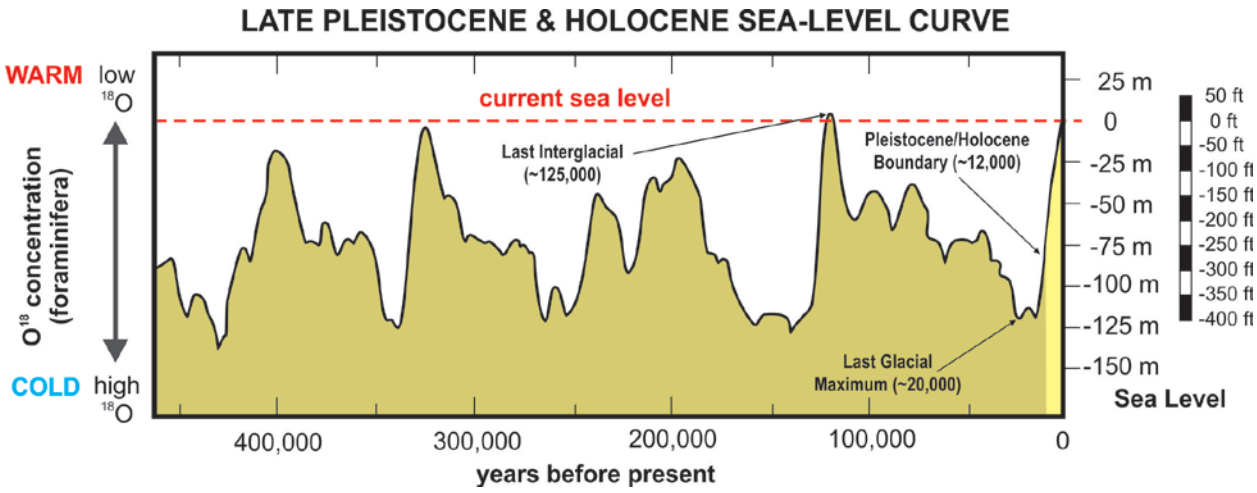

Figure 1. Global sea level curve over the scale of 100,000s of years developed from the marine delta ^{18}O record, which also depicts the last interglacial highstand and glacial maximum. (Modified from Imbrie et al. 1984)

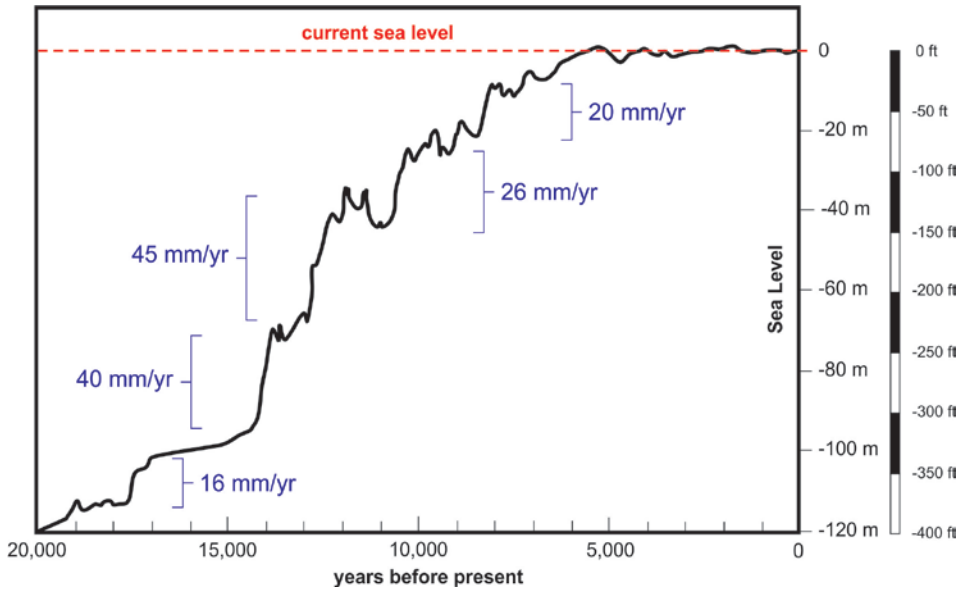

Figure 2. Global sea level curve over the scale of the past 10,000s of years based on radiocarbon-dated reef corals and paleoshoreline indicators constraining sea level movement since the last glacial maximum. (Adapted from Donoghue 2011).

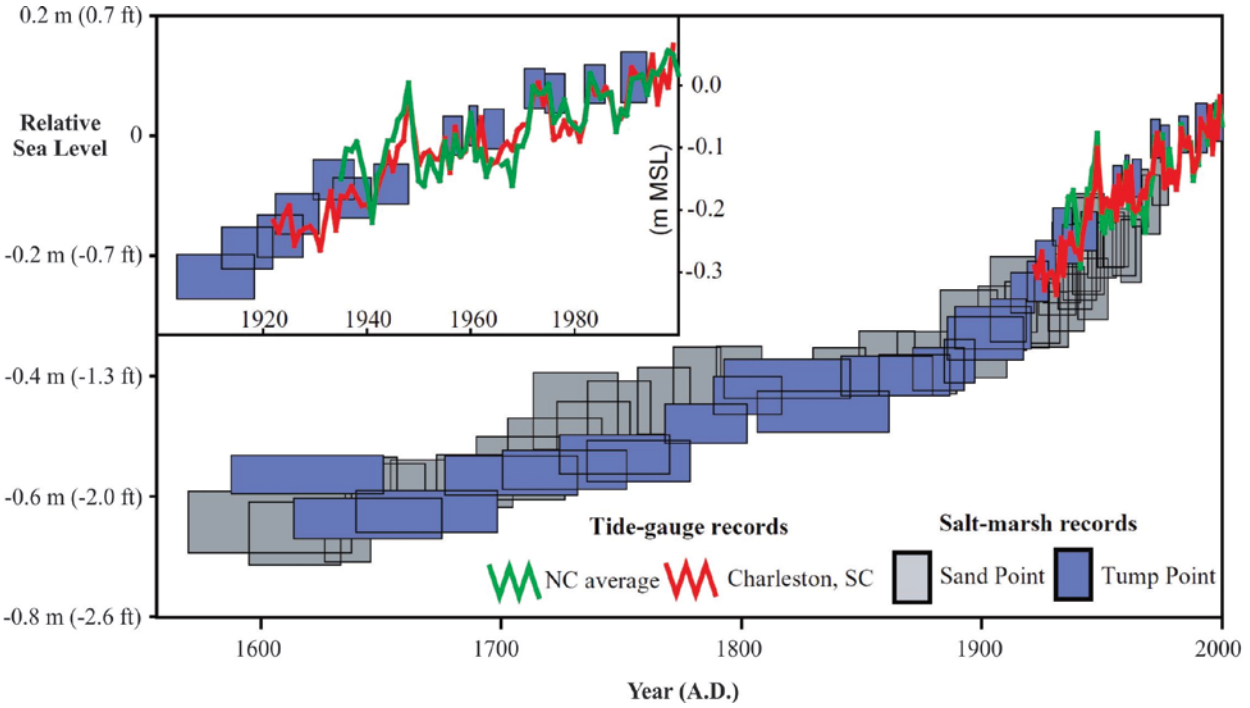

Figure 3. Sea level curve over the scale of the past decades or centuries of years based on N.C. salt marsh records, presented along with the N.C. and S.C. tide gauge records superimposed upon the latter portion of the salt marsh data. The rate of sea level rise has ranged from approximately 0–2 mm/year during the timeframe shown. (Adapted from Kemp et al. 2009)

2.2 Global or Eustatic Sea Level (GSL)

Sea level movement attributable to changes in the volume of water in the world's ocean basins, in general responding to cooling and warming, is referred to as eustatic or Global Sea Level (GSL) change. There are many forces driving changes in water volume (**Table 1**, Church et al. 2013) and future GSL is anticipated to be controlled predominantly by the thermal expansion of ocean water and mass loss from glaciers, ice caps, and ice sheets on the Earth's surface.

Table 1. Major factors contributing to Global Sea Level (GSL), representing the volume change of water in the world's ocean basins; and their respective inputs to the present rate of GSL change. (Adapted from Church et al. 2013.)

FACTORS CONTRIBUTING TO GLOBAL SEA LEVEL (GSL) FROM 1993-2010	
Thermal Expansion (+) or Contraction (-)	39%
Glaciers (non Greenland and Antarctica)	27%
Greenland and Antarctic ice sheets	21%
Land water storage	13%

2.3 Relative Sea Level (RSL)

Relative sea level is the measurement of the sea surface elevation relative to a local datum incorporating both the global rate of rise and other dynamics affecting land and/or sea movement such as tectonic uplift, land subsidence, glacial isostatic adjustment (GIA), ocean-atmospheric oscillations, and other non-climatic local oceanographic effects (**Table 2,** Church et al. 2013). Importantly, tide gauges and satellites record relative sea level changes at particular locations. For instance, in areas where mountain building is occurring, the land may be rising at a rate close to that of GSL. Therefore, the measured rate of sea level rise would be close to zero. Conversely, in areas where land is subsiding (sinking), sea level measurements will record sea level rise at a higher rate than global sea level rise because GSL is rising and the land is sinking, producing an additive effect.

Table 2. Major factors contributing to positive and negative changes to the surface of the Earth and sea. These changes affect Relative Sea Level (RSL). (Adapted from Church et al. 2013.)

FACTORS CONTRIBUTING TO CHANGES IN THE EARTH & SEA SURFACES	
LAND	**SEA**
Plate Tectonics	**Ocean-Atmospheric Oscillations**
Faults	*El Niño* Southern Oscillation
Volcanic-isostasy Earthquakes	Atlantic Multi-decadal Oscillation Pacific Decadal Oscillation
Glacial Isostatic Adjustment	Oceanographic effects on western boundary currents like the Gulf Stream
Subsidence	**River run-off/floods**
Structural deformation	**Astronomical Tides**
Compaction	**Wind driven pile up**
Loss of interstitial fluids	**Sea Surface Topography**
(hydrocarbon and/or water)	(changes in water density & currents)

3. Relative Sea Level Change: What causes variation across North Carolina?

Along the North Carolina coast, sea level is rising. The rate of rise varies depending on the location. There are two primary reasons for this variation: vertical land motion (VLM) and the effects of ocean dynamics. These are discussed in this section.

3.1 Vertical Land Motion (VLM)

Two primary regional elements impact vertical land motion that have long-term overprints on North Carolina's relative sea level record – structural deformation of the bedrock underlying the coastal plain (Grow and Sheridan 1988; Klitgord and Hutchinson 1988; N.C. Geological Survey 1991; Snyder et al. 1993) and glacial isostatic adjustment in response to the retreat of glacial ice sheets in North America (Horton et al. 2009; Peltier 2004). These factors segregate the North Carolina Coastal Plain into different zones of relative sea level change.

Tectonic Structural Deformation Resulting in Subsidence and Uplift

The rifting of the supercontinent Pangea and formation of the Atlantic Ocean that began 180 million years ago had (and continues to have) a pronounced impact on the spatial geometry and physical dynamics of the N.C. Coastal Plain and Continental Shelf (Dillon and Popenoe 1988; Gohn 1988; Klitgord and Hutchinson 1988; Riggs et al. 2011). The resulting deformation of the crystalline rock (bedrock) created structural lows providing basins for subsequent deposition of thick sequences of sediment/rock, and structural highs that limited the amount of sediment/rock accumulation. The rates of modern subsidence and uplift are related to the processes still at work that created the highs and lows of the bedrock surface and determined the thickness of sediment/rock accumulation, as well as the subsequent erosion and loss of sediments/rocks. In general, there is a greater amount of subsidence associated with the structural lows that correspond to areas of thick sediment/rock accumulation and conversely, less subsidence, or a greater likelihood of uplift associated with the structural highs and areas of low sediment/rock accumulation areas. This produces the fundamental differences between the southeastern and northeastern North Carolina coastal systems, which are characterized by stability to slight uplift and subsidence, respectively (Riggs 1984; Poponoe 1990; Riggs and Belknap 1988; Schlee et al. 1988; Riggs et al. 1990, 1995; Snyder et al. 1990).

Glacial Isostatic Adjustment (GIA)

GIA describes the Earth's rebound, both positively and negatively, from the melting of kilometers-thick ice sheets that covered much of North America and Europe during the last glacial maximum approximately 20,000 years ago (Peltier 2004). Accumulation and subsequent melting of vast ice masses caused the depression and release, respectively, of the Earth's surface beneath the ice sheet and developed fore-bulges of the surface out in front of the ice sheet. The ongoing rates of GIA rebound are measured directly in the northern portions of the U.S., but are primarily estimated based upon model studies within the southern portions of the country, including North Carolina. More specifically, models for the northeastern North Carolina coastal system demonstrate the region was part of a fore-bulge that lifted the Earth's surface upward during the last glacial maximum, but which has been collapsing (subsiding) since and continues today (Engelhart et al. 2009, 2011; Horton et al. 2009). This phenomenon

also causes some ocean basins to be subsiding as mantle material moves from under the oceans into previously glaciated regions on land.

Other Factors Influencing Vertical Land Motion

The extraction of fluids such as water and fossil fuels from subsurface sediments by extensive pumping is also known to increase regional land subsidence as evidenced in southern Chesapeake Bay, Va.; Houston, TX; etc. (Eggleston and Pope 2013; Coplin and Galloway 1999). However no studies have been conducted citing fluid extraction as a factor in eastern North Carolina, even in the coast's major water *Capacity Use Areas* where high levels of fresh-water aquifer pumping occurs; specifically the Central Coastal Plain Capacity Use Area or in the Capacity Use Area #1 region near the Aurora phosphate mine and Pamlico River Estuary (NC Department of Environment and Natural Resources 2014).

Geological Zonation of the North Carolina Coastal Plain

Studies demonstrate there is a regional effect of uplift and subsidence on RSL rise in North Carolina (Engelhart et al. 2009, 2011; Kemp et al. 2009, 2011; van de Plassche et al. 2014). However on the basis of existing data, it is extremely difficult to separate the effects of structural deformation from GIA processes. Consequently, the Science Panel assumes for the purpose of this analysis that both processes are ongoing and differentially impact the North Carolina coastal system. Because no data are available to constrain the precise inputs of the two processes, they are considered together as a net influence on vertical land motion. Regions with substantial variations in the rate of vertical land motion have been delineated for coastal North Carolina and are described below and graphically depicted in **Figure 4**. The figure was developed by members of the Science Panel and it is important to note the lines represent the general location of divisions in geologic characteristics and are not to be interpreted as delineation for policy implementation.

> **Zone 1: Carolina Platform:** Old crystalline basement rocks form a high platform within this zone that is capped by a relatively thin layer of younger marine sediment units. This results in higher land topography; a broad, shallow, rock-floored continental shelf; and a coastal system of narrow barrier islands and estuaries (Riggs et al. 1995, 2011). This zone is characterized by a relative rate of uplift of 0.24 mm/yr ±0.15 mm (van de Plassche et al. 2014).
>
> **Zone 2: Albemarle Embayment**: The old crystalline basement rocks slope downward to the north forming a deep basin which has been buried through time with a very thick layer of younger marine sediments (Mallinson et al. 2009). This results in very low land topography; a narrow and deep sediment-floored continental shelf; and a coastal system dominated by broad, embayed estuaries and high wave energy barrier islands (Riggs et al. 1995, 2011). This zone is characterized by a high rate of relative subsidence of 1.00 ± 0.10 mm/yr (Engelhart et al. 2009, 2011; Kemp et al. 2009, 2011).

Zone 3: Cape Lookout Transition Zone: This intermediate zone occurs in the region where the crystalline basement rocks of the Carolina Platform (Zone 1) dip gradually into the deeper basin of the Albemarle Embayment (Zone 2) (Snyder et al. 1990, 1993). The resulting coastal system contains sediment rich barrier islands with extensive beach ridges, dune fields, and moderate sized shore-parallel estuaries (Riggs et al. 1995, 2011). Since there is a general northward slope of both the basement rocks and the younger sequence of marine deposits between the uplift of Zone 1 and the subsidence of Zone 2, the vertical land movement in this area likely falls in a range between those two zones.

Zone 4: Inner Estuarine Hinge Zone: This is an intermediate zone that generally constitutes the central Coastal Plain in northeastern NC. It represents the transition from the upper Coastal Plain to the west and the lower Coastal Plain to the east which is dominated by the Albemarle Embayment (Zone 2) (Brown et al. 1972; Riggs 1984). The crystalline bedrock occurs at intermediate depths and is covered by a moderately thick sequence of older marine sediments. The coastal system within this hinge zone consists of the inner or western portions of the drowned river estuaries that grade westward and upslope into the riverine systems of the stable upper Coastal Plain (Riggs et al. 1995, 2011). Since the Inner Estuarine Hinge Zone occurs between the stable region of the upper Coastal Plain to the west and the subsiding Albemarle Embayment (Zone 2) to the east, subsidence is estimated to have an approximate value between zero and 1 mm/yr (as measured in Zone 2).

The information presented for Zones 1 through 4 is intended to be utilized as estimates of the VLM contribution characterizing the difference between the GSL and the different RSL values observed along the North Carolina coast. This assumption is predicated by the following: (1) the geographic area of each zone is large and therefore the underlying geology is spatially heterogeneous, resulting in different rates of VLM within each zone; (2) similarly, the collapse of the deglaciation fore-bulge is also not uniform across the northern provenance of the state and subsidence rates across Zones 2 and 4 most notably will be different; (3) the VLM numbers were obtained from sediment studies at two discrete locations in two of the four zones—the VLM calculation therefore is applicable to only the specific sampling location(s) and again may not represent the entire zone; and (4) no exact VLM numbers are provided for Zones 3 and 4, rather, the values are expected to be in a range between known values in adjacent zones.

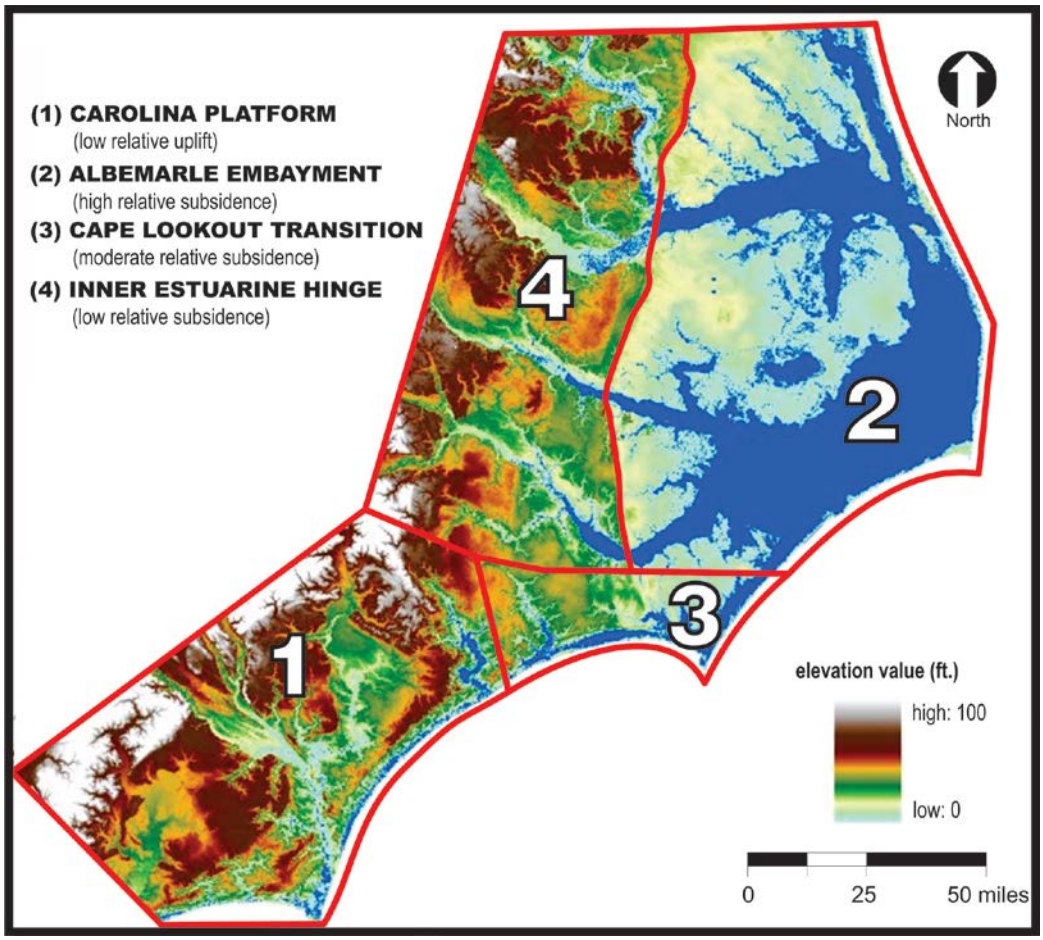

Figure 4. Zones of uplift and subsidence across coastal North Carolina based on major differences in structure, composition, and thickness of the underlying geologic framework.

3.2 Oceanographic Effects

Data observed from tide gauges (NOAA 2014a) show sea level rise rates along the mid-Atlantic coast of more than twice the global sea level rise average rate from 1900 to 2009 of 1.7 mm/yr determined by Church and White (2011). Some of that difference is attributed to vertical land movement, discussed in the previous section, and the remainder to short and longer term oceanographic effects (see **Table 2**). Examples relevant to the N.C. coast include sea level response to the Atlantic Multi-decadal Oscillation (AMO), North Atlantic Oscillation (NAO), and velocity changes and position shifting of the Gulf Stream (Ezer et al. 2013). The signature of these is imprinted in the sea level record (both satellite and tide gauge measurements) and considerable recent research has looked at separating out temporal, local, and global effects.

Sallenger et al. (2012) identified a "hotspot" approximately 600 miles north of Cape Hatteras where the sea level rise rate increase was 3 to 4 times the global rate, while south of Cape Hatteras there was no increase. Houston and Dean (2013) examined the tide gauge analysis of Sallenger et al. (2012) and pointed out that because of long-term quasi-periodic variations in

the record up to 60 years (see Chambers et al. 2012), the records used for computing acceleration were too short. Most studies use a linear (or quadratic) regression analysis to compute the sea level trend and acceleration which is sensitive to both record length and the variation included in the period of coverage. Ezer (2013), and Ezer and Corlett (2012) used an Empirical Mode Decomposition/Hilbert-Huang Transformation (EMD/HHT) to remove the quasi-periodic variations from the trend, thereby allowing the direct computation of the acceleration in the record. They found similar findings to those of Sallenger et al. (2012) and Boon (2012) with marked differences north and south of Cape Hatteras. There is evidence that the Atlantic Ocean circulation is slowing down (Smeed et al. 2014), resulting in a weakening of the Gulf Stream. Ezer et al. (2013) and Ezer (2013) hypothesize that variations in the Gulf Stream location and strength change the sea surface height gradient, raising sea level along the U.S. East Coast north of Cape Hatteras and lowering sea level in the open ocean southeast of the Gulf Stream. They correlate observational data to Gulf Stream changes in support of this hypothesis.

Kopp (2013) examined the findings in the mid-Atlantic of Boon (2012), Sallenger et al. (2012), and Ezer and Corlett (2012) using a different technique, a Gaussian Process model. He confirmed a recent shift toward higher than global sea level rise rates in the mid-Atlantic, but noted that the rates were not unprecedented within the available record and would need to continue for two more decades before they would exceed the range of past variability. Yin and Goddard (2013) and Calafat and Chambers (2013) also examine the relationship between variation in oceanographic observations and sea level change along the Atlantic coast and obtained similar patterns as in Ezer (2013).

Along with these studies of the change in RSL along the Atlantic coast are new studies into the increased frequency of minor flooding. Flooding occurs when sea level, typically during a storm or during high tide, exceeds land elevation. Sweet et al. (2014), Sweet and Park (2014) and Ezer and Atkinson (2014) show that water level exceedance above an elevation threshold for “minor” (meaning, not necessarily associated with a storm event) coastal flooding, established by the local NOAA National Weather Service forecast offices, has increased over time, and that minor, nuisance flooding event frequencies are accelerating at many East and Gulf Coast gauges. They found that some of the increased frequency of flooding resulted both from high rates of VLM at locations like Duck, N.C. and from natural oceanographic variation. These factors were less important at Wilmington, N.C. but the frequency of nuisance flooding has also increased there because of the low elevation threshold established by the local forecast office. Ezer and Atkinson (2014) and Boon (2012) have both examined nuisance flooding using available tide station data. All of these studies strongly indicate that, as mean sea level rises, the frequencies of flooding will increase at all locations.

The studies discussed above, all published in just the past two years, represent the interest and focus on the mid-Atlantic and the challenge of separating naturally varying ocean dynamics

from GSL changes. Relevant to North Carolina is the growing evidence that sea level change is currently greater north of Cape Hatteras (after the Gulf Stream separates from the coast) than it is to the south and that oceanographic effects at times can greatly influence RSL along the coast. At this stage, it is unknown whether oceanographic effects on RSL will persist into the future; however, this is an important area of current oceanographic research which should be followed closely in future sea level rise assessment reports.

The variability of relative sea level change along the North Carolina coast is examined further in the following section, using data measured at tide gauges.

4. Tide Gauge Data in North Carolina

In North Carolina there are five NOAA tide gauges with published rates of sea level change. The measured rates vary along the coastline, with the highest in Dare County in the northeast and the lowest along New Hanover and Brunswick counties to the south. The Science Panel worked closely with Dr. Chris Zervas (*e.g.*, Zervas 2001, Zervas 2009, Zervas et al. 2013) at the NOAA National Ocean Service Center for Operational Oceanographic Products and Services, who provided additional analyses of the tide gauge data for this report.

4.1 Measured Historical Local Sea Level Rise in North Carolina

In order to accurately determine historical sea level change trends nationwide, Zervas (2001, 2009) used National Water Level Observation Network stations with a minimum of a 30-year record, because trends computed with shorter data ranges have wide error bars and in some cases differ noticeably from longer-term stations nearby. The data analyzed are monthly mean sea levels, which are the arithmetic average of all of the hourly data for each complete calendar month. The monthly data are characterized as an autoregressive time series of order 1 and processed such that the monthly seasonal trend is identified and removed and a linear long-term trend is determined (Zervas 2001, 2009). This method accounts for the fact that consecutive monthly mean water levels are not independent variables, and it provides an estimate of the uncertainty associated with the long-term trend.

Published sea level trends are available (NOAA 2014a) through calendar year 2013 for five stations along the North Carolina coast (see **Figure 5**). These long term trends are presented in **Table 3**. In general, the sea level trends from the stations north of Cape Hatteras (Duck, Oregon Inlet) are substantially higher than those from the stations south of Cape Hatteras, with the highest sea level rise in North Carolina measured at Duck.

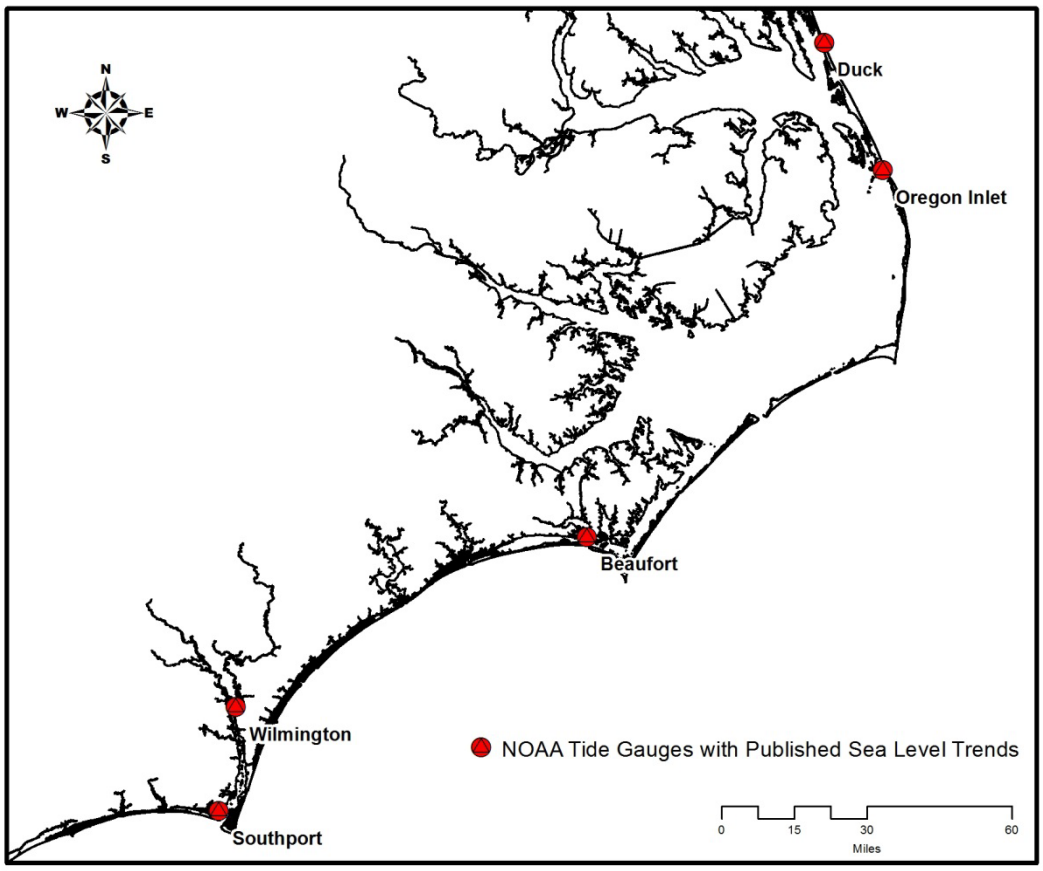

Figure 5. Location of NOAA tide gauges with published sea level trends in North Carolina.

Table 3. Long Term Sea Level Change Trends in North Carolina (NOAA 2014a).

Station (North to South)	Sea Level Change Trend, mm/yr (NOAA 2014a)	Coverage Dates	Time Span of the Data (years)
Duck	4.57 ± 0.84	1978-2013	36
Oregon Inlet	3.65 ± 1.36	1977-2013	37
Beaufort	2.71 ± 0.37	1953-2013	61
Wilmington	2.02 ± 0.35	1935-2013	79
Southport	2.00 ± 0.41	1933-2008	76

The monthly mean sea level trend plots from NOAA for each location are shown for reference in **Figure 6.** It is noted that the Oregon Inlet and Southport gauges have some discontinuity in their records. Zervas (2001, 2009) notes that at some locations where sea level trends were determined, there are long data gaps. However, it is stated that the existing discontinuous data can still provide good estimates of linear mean sea level trends because the vertical datums have been carefully maintained through periodic leveling to stable benchmarks with respect to the adjacent landmass (Zervas 2001, 2009).

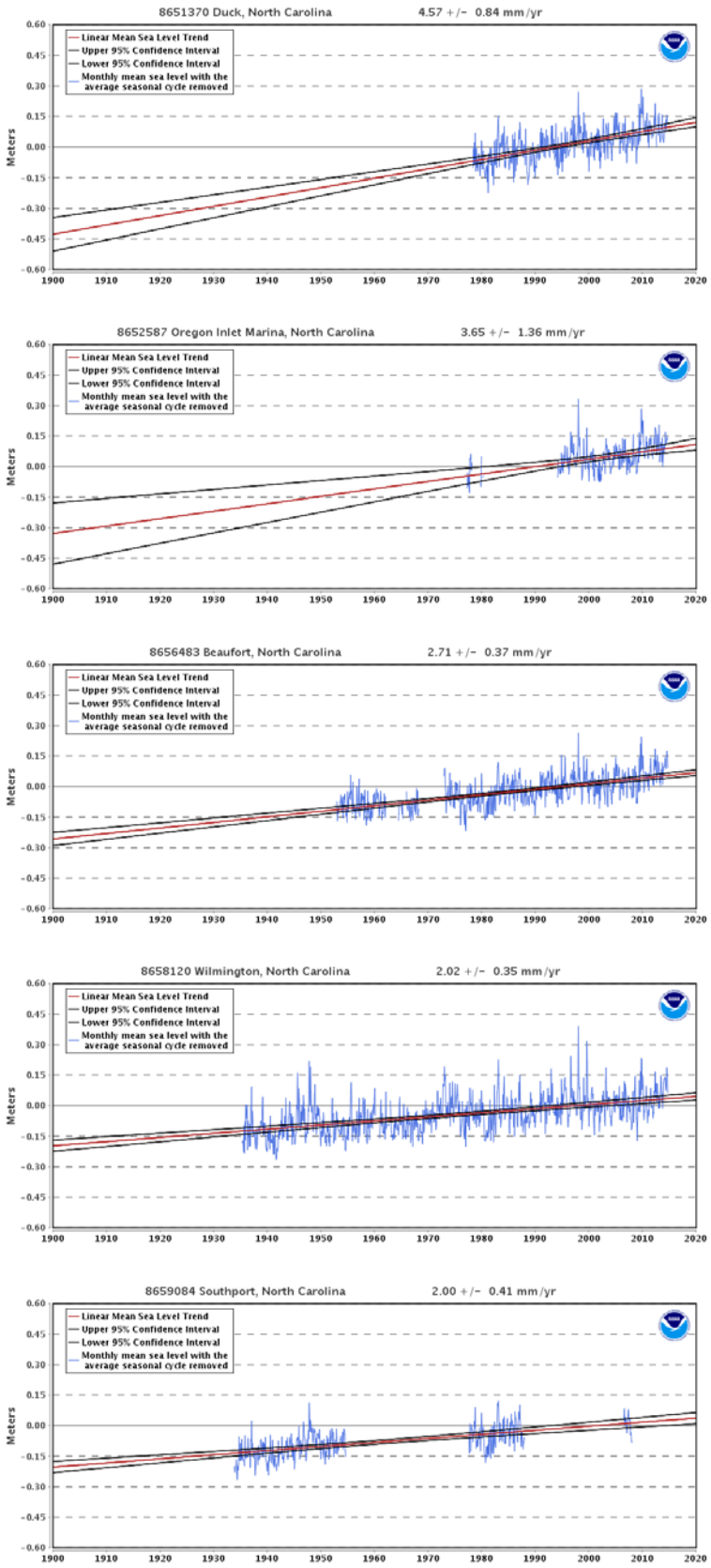

Figure 6. Monthly mean sea levels with seasonal trends removed, for each station with published sea level trends. The long-term linear trend is also shown, including its 95% confidence interval. (NOAA 2014a)

The 2010 Sea Level Rise Assessment Report based its projections on the Duck gauge, the only ocean gauge with a long-term record. The other gauges were not used due to concern that dredging could have altered the tide range and the sea level trend. On the Cape Fear River, mean high water, as recorded by the Wilmington tide gauge, had been found to have risen significantly after the deepened channel efficiently circulated more water (Hackney and Yelverton 1990). Dredging events and corresponding depths of the Cape Fear channel are shown in **Table 4**. The impact of increasing the tide range on sea level depends on how mean low water is altered relative to mean high water. If mean low water goes down the same amount that mean high water goes up, the change is symmetrical and the sea level record is not altered by the dredging.

Dredging impacts have since been analyzed using two methods — numerical modeling and more detailed analysis of the water level records. The North Carolina Flood Mapping Program is upgrading the coastal flood maps using a storm surge model that is initially verified by modeling the daily tides. The present Wilmington and Beaufort tides were compared to the results obtained using the shallower channel depths in place at the beginning of the tidal record (R. Luettich, pers. comm. 2013). The modeling found no significant dredging impacts for the Beaufort gauge. However, the modeling found an increase in the Wilmington tide range of 15 cm since the tide gauge was installed in 1935. Because the model resets mean sea level for each channel condition, assessment of the impact of the tide range changes on sea level measurements was inconclusive.

Table 4. Cape Fear River Channel Deepening Progression. The Wilmington tide gauge was installed in 1935.

Dredging Completion Date	River Channel Depth (feet)
1829-1889	16
1907	20
1913	26
1930	30
1949	32
1958	34
1970	38
2002	42

Zervas (pers. comm., Oct. 16, 2014) updated the tidal analysis for Wilmington including the relative changes in mean high water and mean low water for the 1935 to 2013 period. While changes in the tide range have been observed, there do not appear to be obvious shifts in the monthly mean water levels following the dredging events detailed in **Table 4** (refer to **Figure 6**). For these reasons, dredging impacts on mean sea level are not considered to substantially affect sea level changes measured at the Wilmington tide gauge.

4.2 Vertical Land Movement Estimated from Tide Gauge Data

Because local sea level change measurements include the vertical land movement (subsidence and/or uplift), tide gauge data can be used to assess the magnitude of this movement. Zervas et al. (2013) used tide gauge records to estimate vertical land movement at stations across the U.S. coasts. Long-term gauge records were analyzed with linear mean sea level trends through 2006 as presented in Zervas (2009). Seasonal and regional oceanographic signals were removed as well as an approximated global (eustatic) sea level trend. A linear trend was then fit to the resultant data to estimate vertical land movement at the gauge station. Results were reported in Zervas et al. (2013) for gauges at Oregon Inlet Marina, Beaufort, Wilmington, and Southport. These published results were computed through 2006 for consistency with previously published sea level trends in Zervas (2009). The Science Panel contacted Zervas, who at our request updated the vertical land movement trends through 2013 and included an analysis of the vertical land movement at the Duck gauge. These results (Zervas, pers. comm. Oct. 21, 2014) are presented in **Table 5**. From this analysis, the highest rates of subsidence were found at Duck and the lowest at Wilmington. While the numbers in **Table 5** are not exactly the same as those reported in **Section 3**, the trends are the same as those determined from geologic evidence. It is noted that geological data indicate a small amount of uplift in the Wilmington/Southport area, and tide gauge determined land motion shows a small amount of subsidence. Similar to the published values reported for vertical land motion in **Section 3**, these values are also obtained at discrete locations along the coast, which differ from those precise locations where the geologic data were obtained. This likely explains some of the differences in the exact numerical values. *Most important is the fact that both data sources indicate that subsidence has more influence on relative sea level rise in the northeastern portion of North Carolina than in the southeastern counties.*

Table 5. Vertical Land Movement Trends Determined from Tide Gauge Data in North Carolina.

Station (North to South)	Vertical Land Movement Trend*, (mm/yr)	Coverage Dates	Time Span of the Data (years)
Duck	-1.49 ± 0.39	1978-2013	36
Oregon Inlet	-0.84 ± 0.65	1977-2013	37
Beaufort	-0.99 ± 0.17	1953-2013	61
Wilmington	-0.39 ± 0.19	1935-2013	79
Southport	-0.51 ± 0.15	1933-2008	76
*Zervas pers. comm. Oct. 21, 2014			

5. Future Sea Level in North Carolina

The Science Panel considered three scenarios for future sea level in North Carolina: (1) sea level rise will continue at existing rates as measured at tide gauges, (2) sea level rise will decelerate, and (3) sea level rise will increase in response to changes in the climate. These scenarios are discussed in this section for the 2015-2045 timeframe (30 years, specified by the N.C. Coastal Resources Commission's charge for this report).

5.1 Existing Rates of Sea Level Rise

Table 6 presents the amount of future sea level rise that would occur over 30 years at the tide gauges along the N.C. coast using the published sea level rise (SLR) rates given in **Table 3** (NOAA 2014a). As shown, if existing conditions continue for the next 30 years, sea level would be expected to rise between approximately 2 and 6 inches across the North Carolina coast, with the highest sea levels expected north of Cape Hatteras. This computation assumes that the trends at each gauge will remain the same as historical trends over the 30-year time frame.

Table 6. Relative sea level rise over 30 years at existing published rates (NOAA 2014a) of sea level rise. Magnitude of rise was determined by multiplying the rate ± the confidence interval (for the high/low estimates respectively) by 30 years.*

Station	Tide Gauge Projections		
	RSLR in 30 years, inches		
	Mean	Low	High
Duck	5.4	4.4	6.4
Oregon Inlet	4.3	2.7	5.9
Beaufort	3.2	2.8	3.6
Wilmington	2.4	2.0	2.8
Southport	2.4	1.9	2.8
*Note: Sea level rise over 30 years was rounded to the nearest tenth of an inch.			

5.2 Potential Decrease in Sea Level Rise

The Science Panel examined the scientific research regarding deceleration of sea level rise, meaning a rate lower than existing published global rates of sea level rise, over the next 30 years. There have been many efforts to detect acceleration or deceleration in the past sea level record. AR5 (Rhein et al. 2013) discusses these studies and concludes, as have others (Houston and Dean 2011, 2013; Houston 2013, Chambers et al. 2012), that strong multi-decadal variations in the tide gauge record make it difficult to detect whether there is a long-term

acceleration or deceleration using record lengths less than 60 years (see also **Section 3.2)**. While researchers using both tide data and altimetry data have reported analyses that observe deceleration in sea level records (*e.g.*, Houston and Dean 2011, 2013; Ezer 2013), the signal is small and indicative of cyclic or multi-decadal variations. Houston (2013) summarizes the existing studies and concludes that the range of acceleration in the existing record is from -0.01 to 0.01 mm/yr^2, or just $\pm$0.18 inches over 30 years, so not a significant factor. There is therefore no justification to apply a global deceleration factor to existing gauge rate projections for the next 30 years.

5.3 Potential Increase in Sea Level Rise

Global Mean Sea Level through 2045

The IPCC is the leading international body for the assessment of climate change and for predicting future global sea level. It operates under the auspices of the United Nations (UN), and reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis (IPCC 2013c). Multiple stages of review are an essential part of the IPCC process to ensure a comprehensive, objective, and transparent assessment of the current state of knowledge of the science related to climate change. The review process includes wide participation, with hundreds of reviewers critiquing the accuracy and completeness of the scientific assessment contained in the drafts (IPCC 2013d). The IPCC's most recent publication is the Fifth Assessment Report (AR5, Church et al. 2013), which was released in draft form on Sept. 30, 2013, and published in final form in March 2014. For the 30-year time frame requested by the CRC, the panel considers the IPCC scenarios to be the most scientifically vetted predictions to use for global sea level rise.

Future climate predictions require assumptions about activities that may alter the climate. Accordingly the IPCC has developed a series of scenarios or *Representative Concentration Pathways* (RCPs), each defined by a specific mix of emissions, concentrations and land use. RCP 2.6 is the "best case" scenario in which greenhouse gases are lowest in concentration, and RCP 8.5 is the "worst case" with the highest concentration.

AR5 states that it is very likely that the rate of global mean sea level rise during the 21st century will exceed that observed in the 20th, in response to increased ocean warming and loss of mass from glaciers and ice sheets. **Table 7** presents the range of sea level rise predictions through the year 2050 from a variety of process-based model scenarios (Church et al. 2013). This table was developed by converting the original table in the IPCC report (Table AII.7.7) from meters to inches, rounded to the nearest tenth of an inch.

Table 7. Global mean sea level rise projections with respect to 1986-2005 at Jan. 1 on the years indicated, with uncertainty ranges for the four IPCC Representative Concentration Pathways (modified from Table AII.7.7, IPCC 2013a).*

Year	RCP 2.6 (inches)	RCP 4.5 (inches)	RCP 6.0 (inches)	RCP 8.5 (inches)
2010	1.6 [1.2 to 2.0]	1.6 [1.2 to 2.0]	1.6 [1.2 to 2.0]	1.6 [1.2 to 2.0]
2020	3.1 [2.4 to 3.9]	3.1 [2.4 to 3.9]	3.1 [2.4 to 3.9]	3.1 [2.4 to 4.3]
2030	5.1 [3.5 to 6.3]	5.1 [3.5 to 6.3]	4.7 [3.5 to 6.3]	5.1 [3.9 to 6.7]
2040	6.7 [5.1 to 8.7]	6.7 [5.1 to 8.7]	6.7 [4.7 to 8.3]	7.5 [5.5 to 9.4]
2050	8.7 [6.3 to 11.0]	9.1 [6.7 to 11.4]	8.7 [6.3 to 11.0]	9.8 [7.5 to 12.6]
*Note: Projections were rounded to the nearest tenth of an inch.				

In addition to the process-based models, the IPCC (Church et al. 2013) also reviewed other approaches to sea level projections including semi-empirical models, paleo-records of sea level change, and ice sheet dynamics. They state that of the approaches examined, they have greater confidence in the process-based projections, and that the global mean sea level rise during the 21st century is likely to lie within the 5-95% uncertainty ranges given by the process-based projections and shown in **Table 7** (Church et al. 2013). For completeness, all scenarios are presented in **Table 7**. However, to provide a range of potential effects across the North Carolina coast, the low greenhouse gases (RCP 2.6) and high greenhouse gases (RCP 8.5) model scenarios are presented as upper and lower bounds of the potential range of future sea level rise. The endpoints of the range of global sea level rise scenarios for this report were computed as follows:

1) Use linear interpolation of **Table 7** values to estimate sea level and its uncertainty range in 2015 and 2045.
2) Subtract each 2015 value from the corresponding 2045 value to obtain magnitude of the projected rise over the 30-year time frame.

When values with quantified uncertainties are added and subtracted, the uncertainties associated with those values are added in quadrature (*i.e.*, added as the square root of the sum of squares). The uncertainties in **Table 8** have been added in quadrature to obtain the uncertainty of the change in SLR from 2015 to 2045. This provides a better estimate of the confidence interval than simply adding or subtracting the uncertainty values. In the case of **Table 8** where there are uneven confidence intervals, the larger of the two was used to obtain the quadrature uncertainty.

Table 8. Global sea level rise from 2015 to 2045 as predicted by IPCC Scenarios.*

Predicted Amount of Sea Level Rise by Year	Scenario RCP 2.6 (inches)	Scenario RCP 8.5 (inches)
2015	2.4 [1.8 to 3.0]	2.4 [1.8 to 3.1]
2045	7.7 [5.7 to 9.8]	8.7 [6.5 to 11.0]
Change in SLR (2015 to 2045)	5.3 [3.1 to 7.6]	6.3 [3.8 to 8.8]
*Note: Projections were rounded to the nearest tenth of an inch.		

Note that the range of values for the two scenarios overlap and differ only by approximately 1 inch, reflecting the fact that these scenarios are similar initially and begin to differ significantly after 2045.

Linking Global Sea Level Rise Projections to Local RSL

In order to consider the relationship of global sea level rise projections to those in North Carolina, factors causing variability in sea level trends across the state must be quantified. As discussed in **Section 4.2**, vertical land movement has been quantified using tide gauge data; additional information on vertical land movement is presented in **Section 3.1** based on geologic studies. The VLM trends are dependent upon long-term geologic factors; therefore they are considered to be likely to persist into the future.

While considerable study has been devoted to identifying oceanographic effects on relative sea level rise (**Section 3.2**), it is unknown whether these effects will persist in the 30-year time period considered for sea level rise projections in this report. Therefore, for the present report, no quantification of oceanographic effects has been included in the sea level projections. Should continued research suggest that these effects may be persisting, future reports may incorporate these factors.

In order to make the global sea level rise values from **Table 8** relevant for North Carolina, VLM was used as a proxy for local effects. This was done by adding 30-year VLM projections (30 years times the values presented in **Table 4)** to the global sea level projections in **Table 8**. As discussed previously, the confidence intervals on the VLM and global projections were added in quadrature to assess uncertainty associated with the projections.

To provide a range of potential increase scenarios, the 30-year projection values were computed for the low and high values of the projected sea level rise from 2015 to 2045 using scenarios RCP 2.6 and RCP 8.5. For comparison with **Table 6,** values were rounded to the nearest tenth of an inch. Results, including the 95% confidence intervals, are presented in **Tables 9 and 10**. The low value in each table is the 95% confidence interval subtracted from the mean, and the high is the mean plus the confidence interval.

Table 9. Relative sea level rise by 2045 considering potential increased rates of sea level rise (RCP 2.6 which is the lowest greenhouse gas emission scenario, combined with vertical land movement at each tide gauge).*

Station	RCP 2.6 + VLM			
	RSLR in 30 years, inches			
	Mean	Low	High	95% CI
Duck	7.1	4.8	9.4	2.3
Oregon Inlet	6.3	3.9	8.7	2.4
Beaufort	6.5	4.2	8.7	2.3
Wilmington	5.8	3.5	8.0	2.3
Southport	5.9	3.7	8.2	2.3
*Note: Projections were rounded to the nearest tenth of an inch.				

Table 10. Relative sea level rise by 2045 considering potential increased rates of sea level rise (RCP 8.5 which is the highest greenhouse gas emission scenario, combined with vertical land movement at each tide gauge).

Station	RCP 8.5 + VLM			
	RSLR in 30 years, inches			
	Mean	Low	High	95% CI
Duck	8.1	5.5	10.6	2.5
Oregon Inlet	7.3	4.7	9.9	2.6
Beaufort	7.5	5.0	10.0	2.5
Wilmington	6.8	4.3	9.3	2.5
Southport	6.9	4.4	9.4	2.5
*Note: Projections were rounded to the nearest tenth of an inch.				

As shown, under alternative rates of increase in sea level rise as a function of varying emissions scenarios, sea level could rise from a low estimate of 3.5 inches to high of 10.6 inches by 2045, depending on location. Locations with higher rates of subsidence have correspondingly higher relative sea level rise projections.

5.4 Future Sea Level Rise across North Carolina

Preparing a map depicting varying sea level rise estimates across the state of North Carolina is difficult, because the local effects are quantified only at the tide gauge locations. The four

geologic regions presented in **Figure 4** indicate areas within which effects driven by local vertical land movement are expected to be similar based on the geologic data. Further, Session Law 2012-202 (Appendix B), specifies that the Coastal Resources Commission consider the four regions presented in the N.C. Dept. of Environment and Natural Resources' April 2011 report entitled "North Carolina Beach and Inlet Management Plan" (BIMP) in making geographically variable sea level rise assessments. Therefore the following discussion to address similarities and differences of the regions provided in the geologic map in **Figure 4** compared with the BIMP map (shown in **Figure 7**) is provided.

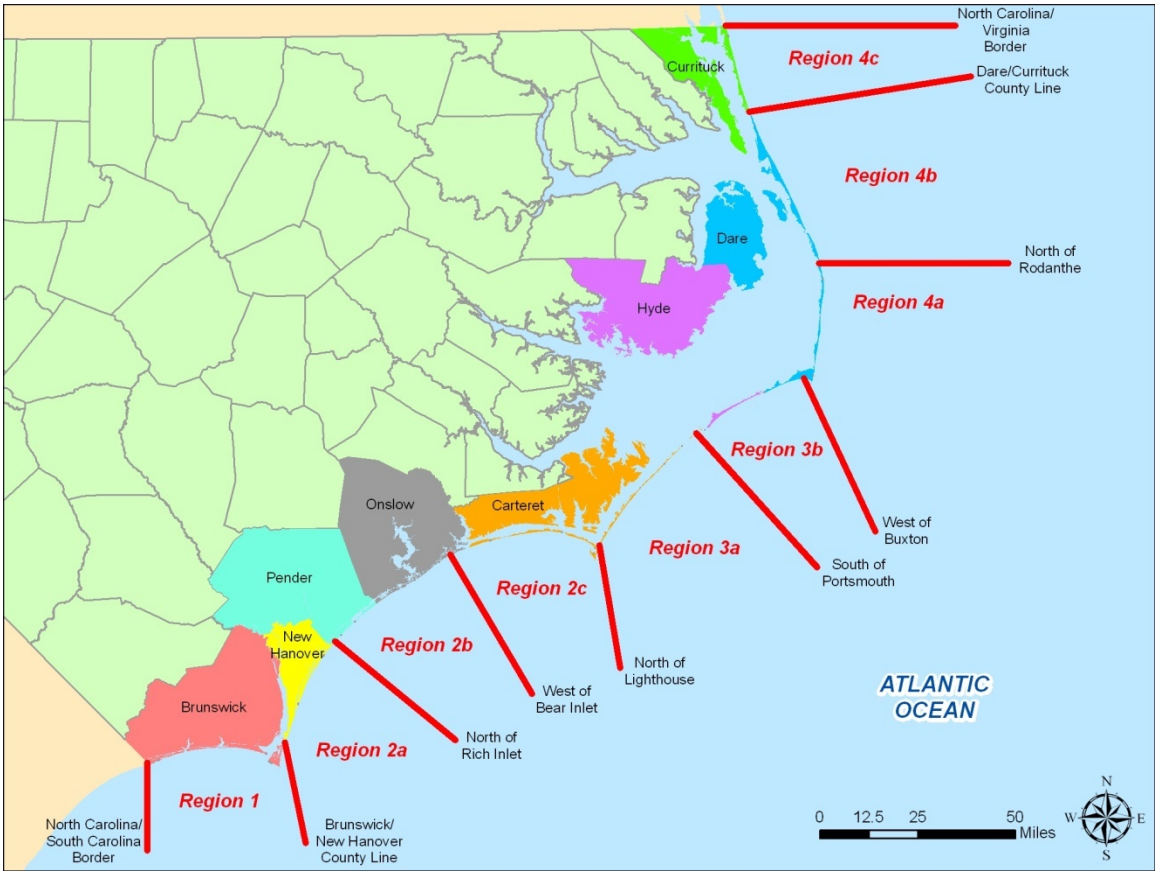

Figure 7. Beach and Inlet Management Plan (BIMP) Regions referenced in S.L. 2012-202.

Region 1 (Carolina Platform) in **Figure 4** corresponds roughly to Regions 1 and 2a, plus part of Region 2b, as drawn in the BIMP (**Figure 7**). The gauges in that part of North Carolina are the Wilmington and Southport gauges, which are very similar in characteristics, with similar future increased sea level rise predictions. Region 2 (Albemarle Embayment) in **Figure 4** encompasses Regions 3b, 4a, 4b, and 4c, as well as a portion of Region 3a as drawn in the BIMP (**Figure 7**). Both the Oregon Inlet and Duck tide gauges are located in this area. The Duck gauge has the highest expected sea level rise by 2045 across the state, with the projections at Oregon Inlet slightly lower. Region 3 in **Figure 4** (Cape Lookout Transition) corresponds approximately to BIMP Region 2c, with parts of Region 2b and 3a included as well. This region contains the

Beaufort tide gauge, which has an expected sea level rise by 2045 similar to the Oregon Inlet gauge. Region 4 (Inner Estuarine Hinge) in **Figure 4** does not correspond to any of the BIMP regions, and contains no tide gauges.

For any management decisions, the CRC will have to evaluate the potential division of the state by region. Additional monitoring and data will facilitate this type of decision.

6. Making Sense of the Predictions

The report presents a range of sea level values that may occur by 2045 across the North Carolina coast. Providing a range of values reflects both the uncertainty in the predictions with regards to future climate and the varying nature of sea level. From a planning perspective, the *risk* of flooding decreases by selecting a higher elevation within the expected range of sea levels. The goal in planning is to match the selected elevation with a level of *acceptable risk* for a particular project (road, bridge, hospital, etc.) based on the expected range of water levels. The U.S. Army Corps of Engineers (USACE 2014) has adopted a planning process similar to this, requiring that every coastal project be evaluated using three sea level scenarios. Doing so allows the project planner to estimate the risk of any impacts of sea level rise, and if the potential impact is found to not be acceptable, require a change to the project design. The adoption of this planning guidance by the USACE is relevant to North Carolina as it is required on every federal coastal project.

We also note that the difference between the highest (**Table 10**) and lowest (**Table 6**) potential increase in mean sea level varies from just 2.7 inches at Duck to 4.5 inches at Southport. This small change reflects the short 30-year time span of the projection. This small amount adds to, but is inconsequential relative to, the extreme water levels experienced in a storm surge and is small relative to the twice daily excursion of the tide. But since it is cumulative and rising, areas of N.C. will be impacted. Recent research into the frequency of coastal flooding has shown that, regardless of the rate of rise, as sea level increases North Carolinians should expect more frequent flooding of low-lying areas. These impacts are already being observed in North Carolina (Sweet et al. 2014; Sweet and Park 2014; Ezer and Atkinson 2014).

The short 30-year period also allows increased confidence in the forecast, relative to a 60- or 100-year forecast during which more rapid climate change is expected. One of the major sources of uncertainty in estimates of sea level rise is the behavior of ice sheets. However, the IPCC states that only the collapse of marine-based sectors of the Antarctic ice sheet, if initiated, could cause global mean sea level to rise substantially above the likely predicted range during the 21st century (Church et al. 2013). As research evolves with more data and our understanding of these phenomena improves, forecasts will be updated. This is one of the many reasons that the panel recommends updating this report every five years.

Because our focus is on the next 30 years, people whose planning requirements extend beyond that should consult other reports on sea level such as the IPCC (2013b) or the USACE guidance (2014) and their online sea level calculator (http://www.corpsclimate.us/ccaceslcurves.cfm).

7. Recommendations for Improved Sea Level Rise Monitoring in North Carolina

Tide gauges provide a critical and permanent record of sea level in North Carolina. Consequently, as we recommended in our 2010 report, it is important to sustain the long-term tidal observations. At a minimum, continued monitoring at the recently established gauge (2010) at Cape Hatteras and establishment of long-term tidal monitoring in the Albemarle Sound and at a location in the Pamlico Sound near the entrance to the Neuse River as well as on the innermost portion of the drowned river estuaries (*e.g.*, New Bern, Washington, and Edenton) would start to fill gaps in knowledge of not only local sea level changes but also the magnitude of tidal surge and wind set-up during storms of differing intensity and track across the North Carolina coast. Ongoing efforts by the North Carolina Division of Emergency Management include maintenance of seven new gauges in the Albemarle and Pamlico Sounds. These gauges should also be maintained long-term to augment the sea level record in North Carolina.

The state should also consider augmenting existing Continuously Operating Reference Stations (CORS) to provide coverage in all the regional zones in order to quantify and refine land subsidence and uplift on the coastal plain. Since 2007 the N.C. Geodetic Survey has been installing CORS which are used to improve the accuracy and ease of surveying using Global Position Survey (GPS) techniques. These stations use the GPS satellites to determine the exact location and elevation of the station as frequently as once a second. Thirty-three stations are presently installed in or near the four zones in **Figure 4**. With time these stations will provide detailed measurement of land elevation changes that can be used to put water level records in perspective. The collection and analysis of additional sediment cores is also desirable to compliment the CORS stations. To be useful, all new CORS and tide gauge locations will need to be sustained for decades, so the sooner they are deployed, the better.

8. Recommendations for Updating the Report

Predicting future sea level rise in North Carolina will continue to be an important topic of interest. As we have seen over the past five years, knowledge in climate science and forecast models is rapidly advancing — improving predictions and reducing uncertainty. Continued monitoring of global and regional sea levels using satellite data will improve as the record length is extended, and these data should be reviewed for consideration in future reports. The panel again recommends a general reassessment of sea level rise in North Carolina every five years. Information from future analyses of CORS GPS stations and from additional geologic research (*e.g.,* expanded regional salt marsh studies) should be considered to provide additional information on vertical land movement across the state. Continuing research on oceanographic impacts on sea level rise should be followed closely. Detailed analyses of tide gauge data and potential dredging impacts are areas of research that the CRC may wish to pursue on a contract basis with researchers in those fields.

9. Summary

Sea level is rising across the entire coast of North Carolina. This report discusses the variation in sea level rise across the state's coastline and provides projections of future sea level. The following points summarize the results of this report:

- The rate of sea level rise varies within NC, depending on location. Two main factors affect the local rate of sea level rise: (1) vertical movement of the Earth's surface, and (2) effects of ocean dynamics (oceanographic influences).
- There is evidence from both geological data and tide gauges that there is more subsidence north of Cape Lookout than south of Cape Lookout. This contributes to higher measured rates of sea level rise along the northeastern N.C. coast.
- Oceanographic research points to a link between speed and position of the Gulf Stream and local sea level. This effect has been reported primarily north of Cape Hatteras.
- At existing rates of sea level rise, over a 30-year time frame, sea level rise across the North Carolina coast would vary from a low estimate of 2.4 inches (with a range between 1.9 and 2.8 inches) at Southport to a high estimate of 5.4 inches (with a range between 4.4 and 6.4 inches) at Duck.
- In a scenario with low greenhouse gas emissions, projected potential sea level rise over a 30-year time frame would vary from a low estimate of 5.8 inches (with a range between 3.5 and 8.0 inches) at Wilmington to a high estimate at Duck of 7.1 inches (with a range between 4.8 and 9.4 inches).
- In a scenario with high greenhouse gas emissions, projected potential sea level rise over a 30-year time frame would vary from a low estimate of 6.8 inches (with a range

between 4.3 and 9.3 inches) at Wilmington to a high estimate at Duck of 8.1 inches (with a range between 5.5 and 10.6 inches).

- Recent research into the frequency of coastal flooding has shown that, regardless of the rate of rise, as sea level increases North Carolinians should expect more frequent flooding of low-lying areas.

Because the science is changing rapidly, it is recommended that this assessment be updated every five years, and that water level monitoring and land movement measurements be sustained and additional gauges placed in as yet unmonitored locations where necessary.

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Appendix A. CRC Charge to the Science Panel, June 11, 2014

The CRC has determined that the issue of potential sea-level rise is of extreme importance to the State, its policy makers and the citizens of NC. It is further noted that the periodic updates of current data are vital to help formulate future policy. The CRC therefore charges the Science Panel to conduct a comprehensive review of scientific literature and available North Carolina data that addresses the full range of global, regional, and North Carolina specific sea-level change. The CRC further determines that the scope and time period of the study and report regarding sea-level rise shall be limited to a "Rolling 30-Year Time Table". It is the intent of the CRC that this rolling 30-year time table will be updated every five years. The CRC further directs the Science Panel to report regional ranges of sea-level rise as described in S.L. 2012-202

Timeline

S.L. 2012-202 requires the Science Panel to deliver your report to the CRC no later than March 31, 2015.

This will be the version that will be made available for public comment, and we would like this version to include the review and responses as described in the technical peer review process. In order to complete the technical peer review process we are asking you to deliver your initial draft to us by **December 31, 2014.** The technical peer review timeline is as follows:

1. CRC sends the initial draft report for Drs. Dean and Houston's review on January 1, 2015.

2. Drs. Dean and Houston write a brief review with comments and suggestions as appropriate, and forwards to the Science Panel through CRC by January 21, 2015.

3. Science Panel submits a response to Drs. Dean and Houston's comments by February 15, 2015.

4. Drs. Dean and Houston respond in writing as to whether the Science Panel has adequately addressed their comments, by February 28, 2015.

All four written documents will be publicly disseminated together without change.

Following the March 31, 2015 public release of the draft report, there will be an extended public comment period through December 31, 2015, as well as the preparation of an economic and environmental cost-benefit study. The Science Panel will not be asked to prepare the cost-benefit study. The CRC will ask the Science Panel to finalize the report in early 2016, following the close of the public comment period.

Appendix B. General Assembly of North Carolina: Session 2011, Session Law 2012-202, House Bill 819

SECTION 2.(a) Article 7 of Chapter 113A of the General Statutes is amended by adding a new section to read:

"**§ 113A-107.1. Sea-level policy.**

The General Assembly does not intend to mandate the development of sea-level policy or the definition of rates of sea-level change for regulatory purposes.

No rule, policy, or planning guideline that defines a rate of sea-level change for regulatory purposes shall be adopted except as provided by this section.

Nothing in this section shall be construed to prohibit a county, municipality, or other local government entity from defining rates of sea-level change for regulatory purposes.

All policies, rules, regulations, or any other product of the Commission or the Division related to rates of sea-level change shall be subject to the requirements of Chapter 150B of the General Statutes.

The Commission shall be the only State agency authorized to define rates of sea-level change for regulatory purposes. If the Commission defines rates of sea-level change for regulatory purposes, it shall do so in conjunction with the Division of Coastal Management of the Department. The Commission and Division may collaborate with other State agencies, boards, and commissions; other public entities; and other institutions when defining rates of sea-level change."

SECTION 2.(b) The Coastal Resources Commission and the Division of Coastal Management of the Department of Environment and Natural Resources shall not define rates of sea-level change for regulatory purposes prior to July 1, 2016.

SECTION 2.(c) The Coastal Resources Commission shall direct its Science Panel to deliver its five-year updated assessment to its March 2010 report entitled "North Carolina Sea Level Rise Assessment Report" to the Commission 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. When summarizing research dealing with sea level, the Commission and the Science Panel shall define the assumptions and limitations of predictive modeling used to predict future sea-level scenarios. The Commission shall make this report available to the general public and allow for submittal of public comments including a public hearing at the first regularly scheduled meeting

after March 31, 2015. Prior to and upon receipt of this report, the Commission shall study the economic and environmental costs and benefits to the North Carolina coastal region of developing, or not developing, sea-level regulations and policies. The Commission shall also compare the determination of sea level based on historical calculations versus predictive models. The Commission shall also address the consideration of oceanfront and estuarine shorelines for dealing with sea-level assessment and not use one single sea-level rate for the entire coast. For oceanfront shorelines, the Commission shall use no fewer than the four regions defined in the April 2011 report entitled "North Carolina Beach and Inlet Management Plan" published by the Department of Environment and Natural Resources. In regions that may lack statistically significant data, rates from adjacent regions may be considered and modified using generally accepted scientific and statistical techniques to account for relevant geologic and hydrologic processes. The Commission shall present a draft of this report, which shall also include the Commission's Science Panel five-year assessment update, to the general public and receive comments from interested parties no later than December 31, 2015, and present these reports, including public comments and any policies the Commission has adopted or may be considering that address sea-level policies, to the General Assembly Environmental Review Commission no later than March 1, 2016.

2015 N.C. SEA LEVEL RISE ASSESSMENT REPORT

TECHNICAL PEER REVIEW
AND
PUBLIC COMMENTS

TECHNICAL PEER REVIEW

Comments on 2015 Science Panel Update to 2010 Report and 2012 Addendum
Robert Dean & James Houston, Jan. 17, 2015

Comments on 2015 Science Panel Update to 2010 Report and 2012 Addendum

We highly commend the members of the Science Panel for volunteering their time and talents in public service to the people of North Carolina.

The 2015 Science Panel Update to 2010 Report and 2012 Addendum (referred to as SPU) presents two good approaches that use different assumptions to estimate sea level rises by 2045 at tide gauge locations in North Carolina (NC). One approach estimates rises by projecting empirical data measured by the NC tide gauges, which assumes the future reflects that past. The second approach uses sea level projections of the Intergovernmental Panel on Climate Change (IPCC 2013), which are based on IPCC global warming scenarios in which temperature rises more rapidly in the future than the past.

The SPU has two significant problems. Confidence intervals are incorrectly added and subtracted in the report, and it uses a value for global sea level rise that is appropriate for the period 1900 through 2009 but not for the periods of North Carolina tide gauge measurements, leading to projections not supported by the data.

Confidence intervals in SPU were incorrectly added and subtracted, producing errors in most tables. Averages are properly added and subtracted, but variances add for confidence intervals, meaning that confidence intervals are added in quadrature. For example (a ± c) – (b ± c) is not a - b ± 0 and (a ± c) + (b ± c) is not a + b ± 2c. In both cases the confidence interval is $\pm \sqrt{c^2 + c^2} = \pm \sqrt{2}$ c. The following website explains this:
http://ipl.physics.harvard.edu/wp-uploads/2013/03/PS3_Error_Propagation_sp13.pdf.
Note that IPCC (Church, et al, 2013) adds confidence intervals in quadrature for components of global sea level rise.

As an example of the errors caused by adding confidence intervals incorrectly, for Southport the SPU has (2.0 ± 0.41) - (1.7 ± 0.20) equal to 0.3 ± 0.21. However, the result should be 0.3 ± $\sqrt{(0.41)^2 + (0.2)^2}$ = 0.3 ± 0.46, making the range (- 0.16 to 0.76) rather than (0.09 to 0.51). Another example is in Table 8. The 2015 values for RCP2.6 and RCP8.5 are correctly given as both being about 2.4 ± 0.6 inches and the 2045 values as about 7.7 ± 2.1 inches and 8.7 ± 2.3 inches for RCP2.6 and RCP8.5 respectively. But when the 2015 values are subtracted from the 2045 values, the errors do not subtract, but add in quadrature, so the correct values are 5.3 ± 2.2 inches for RCP2 and 6.3 ± 2.4 inches for RCP8.5. Therefore, results should be 5.3 (3.1 to 7.5) for RCP2.6 and 6.3 (3.9 to 8.7) for RCP8.5 rather than 5.3 (3.9 to 6.8) and 6.3 (4.7 to 7.9) in SPU. The SPU should include a simple discussion and reference that explain how confidence intervals are added and subtracted.

It is not valid to use a global sea level rate of 1.7 ± 0.2 mm/yr over the periods of NC gauge measurements because this rate was determined for 1900 to 2009, whereas global rates during actual times of NC gauge measurements were sometimes much greater. SPU subtracts this unrepresentative low global rate along with subsidence from measured rates and calls the difference "oceanographic effects". SPU then assumes these "oceanographic effects" continue unchanged for

the next 30 years and adds them to IPCC scenarios, and this produces rises by 2045 that are not supported by the data.
The problem of using a global rate not representative of actual rates during periods of gauge measurements is readily seen for Duck and Oregon Inlet. The Duck gauge recorded from 1978 through 2013 and the Oregon Inlet gauge from 1977 through 2013. Satellite altimeters measured a global rise rate of 3.2 ± 0.4 mm/yr from 1993 through 2013 (University of Colorado, 2014). Therefore, for about 60% of the Duck and Oregon Inlet tide gauge records the global rise rate was substantially greater than 1.7 ± 0.2 mm/yr. It is important to realize that in addition to the linear rise of 1.7 mm/yr given in Church and White (2011), they have an acceleration term so the rise rate increases with time, and this is not considered in the SPU. The linear and acceleration terms determined by Church and White could be used to estimate rise rates during periods of NC gauge measurements. However, Church and White's approach underestimates the rise rate measured by satellite altimeters. Church and White use "synthetic data" generated by combining tide gauge data with Empirical Orthogonal Functions, whereas the satellite altimeter data are measured data. Therefore, the satellite altimeter data should be used for 1993 though 2013.

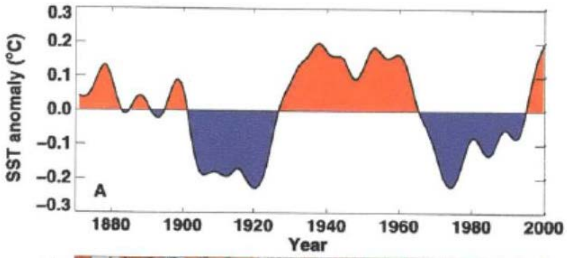
We can estimate the rate from 1978 to 2013 by taking a global rate of 1.9 ± 0.4 mm/yr for 1978 through 1992 (Church and White, 2011, have a global rate of 1.9 ± 0.4 mm/yr for 1961 through 2009, which is much more representative of the time period than the rate from 1900 through 2009) and a global rate of 3.2 mm ± 0.4 mm/yr from 1993 through 2013. Combining these rates gives a global rate from 1978 to 2013 of 2.66 ± 0.4 mm/yr (Ray and Douglas, 2011, show a global rise from 1978 to 2007 of about 2.5 mm/yr that when coupled with a rise from 2007 through 2013 of 3.2 mm/yr results in a similar global rate of 2.6 mm/yr from 1978 through 2013). With subsidence of - 1.49 ± 0.39 at Duck, this gives a relative sea level rise (global rate minus subsidence) of 4.15 ± 0.56 mm/yr (confidence intervals added in quadrature). This compares with the gauge recording of 4.57 ± 0.84 mm/yr over the same period. Note the two rates are within confidence intervals of each other. The same analysis for Oregon Inlet, results in an average global rate from 1977 to 2013 of 2.64 ± 0.4 mm/yr. With a subsidence of - 0.84 ± 0.65 mm/yr, this leads to a relative rise of 3.48 ± 0.76 mm/yr versus the recorded 3.65 ± 1.36 mm/yr. Again, calculated and measured rates are within confidence intervals.

If global sea level rise rates are estimated for Beauford, Wilmington, and Southport using rates of 0.71 ± 0.4 mm/yr prior to 1935 and 1.84 ± 0.19 mm/yr from 1935 to 1961 (Church and White, 2006), 1.9 ± 0.4 mm/yr from 1961 to 1993 (Church and White, 2011), and 3.2 ± 0.4 mm/yr for 1993 through 2013 (University of Colorado, 2014); subtracting the vertical motions of Table 2 from these global rates result in relative sea level rise rates within confidence intervals of the measured rates in Table 1. For all five NC gauges, realistic global rates combined with subsidence yield relative sea level rates within confidence intervals of measured rates. Therefore, "oceanographic effects" must have relatively small magnitudes that are less than confidence intervals of measured rates.

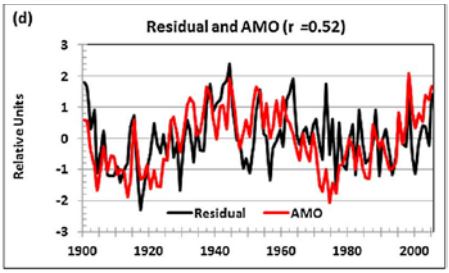
The above method of estimating global rise rates also applies to the gauges north and south of the NC gauges. Figure 5 of the SPU presents a figure from Ezer (2013) that is shown presumably to indicate there is a significant difference in sea level rise north of Cape Hatteras. The figure shows that the Norfolk (Sewell Point) gauge recorded the greatest sea level rise rate and acceleration of the gauges from Key West to Boston, and it is the nearest gauge north of the Duck and Oregon Inlet gauges. Using the same approach as for the NC gauges yields a global rate from 1927 through 2006 of 1.99 ± 0.33 mm/yr. Zervas (2013) shows a subsidence of - 2.61 ± 0.11 mm/yr. Combining

the calculated rate with subsidence yields 4.60 ± 0.33 mm/yr. Zervas shows the rise measured by the Norfolk tide gauge from 1927 through 2006 was 4.44 ± 0.27 mm/yr. The same approach applied to the Charleston gauge, the nearest long-term gauge south of NC, yields a global and subsidence relative rise of 3.14 ± 0.34 mm/yr versus the rate of 3.15 ± 0.25 mm/yr recorded by the Charleston tide gauge. As was the case for the five NC tide gauges, calculated rates for the Charleston and Norfolk gauges that are based on subsidence and realistic global sea level rates during periods of recording agree within confidence intervals of measured relative sea level rise rates. The average rise rate based on calculated global rates and subsidence for the five NC, Charleston, and Norfolk gauges is 3.15 ± 0.43 mm/yr, and this is in good agreement with the measured average rate for the seven gauges of 3.22 ± 0.55.

There certainly are oceanographic effects that affect sea level along the NC coast such as variations in the Atlantic Multidecadal Oscillation (AMO), North Atlantic Oscillation (NAO), and Gulf Stream as governed by the Atlantic Meridional Overturning Current (AMOC), and other factors. Indeed, Houston and Dean (2014) show that there are multi-decadal oscillations in the rate of sea level rise in every gauge recording in the world. Variations in the AMOC, AMO (see figures), and NAO can affect sea levels along the NC coast, but these variations will not remain constant over the next 30 years as is assumed in SPU ("oceanographic effects" are assumed in SPU to have a constant rate over 30 years when used with the IPCC scenarios). For example, it would not be valid to take falling sea levels on the Pacific Coast measured over the last 22 years by satellite altimeters (caused by an oscillation of the Pacific Decadal Oscillation – PDO), and project that sea level will fall on the Pacific Coast over the next 22 years. Indeed, Bromirski et al (2011) assert just the opposite will occur, the rise in sea level will be greater than the worldwide average along this coast for decades as the PDO reverses. AMO, NAO, and AMOC also have periodic reversals.



AMOC (Buckley, 2011)



AMO (Chylek et al, 2014)

SPU cites journal papers that indicate there has been acceleration in sea level rise in the mid-Atlantic area, but some of the papers also indicate the acceleration may well be a typical variation in decadal oscillations and not enduring. For example, Smeed et al (2014) say that evidence suggests that the decrease in the AMOC, "… represents decadal variability of the AMOC system rather than a response to climate change." Knopp (2013) says, "Consistent with the hypothesis that the regional 'hot spot' represents variability rather than the start of a trend, none of these indexes currently exceeds its range of historical variability. As the changes in these indices reflect the driving factors underlying the 'hot spot', the phenomenon may not prove to be enduring." Varying and non-enduring phenomenon cannot be assumed constant and projected into the future. In any case, magnitude of sea level change rates resulting from "oceanographic effects" are not apparent because relative sea level rates estimated from realistic global and subsidence rates agree within confidence intervals with measurements at all five NC gauge locations and gauges at Charleston and Norfolk.

The SPU should discuss how calculated rises as shown above agree within confidence intervals at all seven gauges, so additional factors other than subsidence should not be added to IPCC projected rises.

The error caused by using a rate of 1.7 ± 0.2 mm/yr at Duck from 1978 to 2013 and then having to postulate "oceanographic effects" that would remain constant for the next 30 year is easily shown. As shown earlier, there is a global sea level rise of 6.3 ± 2.4 in/yr for IPCC scenario RCP 8.5 (confidence intervals added incorrectly in Table 8). If we subtract the vertical motion of - 1.8 ± 0.5 in/yr at Duck, the relative sea level projection becomes 8.1 ± 2.5 in/yr (confidence intervals from adding in quadrature). The low, medium, and high values are therefore 5.6, 8.1, and 10.6 in/yr versus 7.3, 9.7, and 12.3 in/yr in Table 10.

Dropping the incorrect rate of 1.7 ± 0.2 mm/yr as representative of the global rate over the time of NC gauge measurements also simplifies results and makes them more understandable and transparent to non-technical readers. For example, one approach would just multiply measured rates by 30. The second approach would merely combine subsidence over 30 years with IPCC projections. These approaches are simple, understandable, and defensible; in contrast to the current approach in SPU 2015, which is easily criticized and, therefore, likely to be controversial.

Using three sentences to dismiss the possibility of deceleration may not satisfy critics. Satellite altimeters have made the best measurements of sea level rise in the past two decades because they measure over the globe rather than the limited locations of tide gauges and they do not have the problem of vertical land motions that tide gauges have. Satellite altimeter measurements show a decelerating sea level rise. Dean and Houston (2013) show that during the period of satellite altimeter measurements from 1993 to 2011, sea level had a deceleration of - 0.083 mm/yr^2 (deceleration also seen in Figure 5b of the SPU and Ezer, 2013, p. 5441). They analyzed all 456 tide gauges in the world with records from 1993 to 2011 and found a deceleration of - 0.041 mm/yr^2. The altimeter record (University of Colorado, 2014) analyzed from 1992.9595 through 2014.6508 still shows a deceleration of - 0.035 mm/yr^2. However, the record is relatively short and, as noted in Dean and Houston (2013), the deceleration may just be evidence of cyclic behavior - that is, caused by decadal variations. As noted earlier, uncertain and varying phenomena cannot be assumed to remain at current values and then be projected into the future.

With the Duck gauge as an example, projecting the current rate of rise at Duck for 30 years yields an average relative sea level rise of 137.1 ± 25.2 mm. Analysis of the altimeter record from 1992.9595 through 2014.6508 shows that the rise has the form $3.245x - 0.0176x^2$ with x equal to years of record. Over the next 30 years, this rise would produce a global rise of 81.5 ± 12 mm including the deceleration term. Subsidence would add 44.7 ± 11.7 mm/yr for a total of 126.2 ± 23.7 mm. This value is well within the confidence interval of the rise determined by projecting Duck rates without deceleration. Moreover, the difference in the two projections is only 10.9 mm, or 0.4 inches. Assuming the global deceleration for last 22 years will continue unchanged for the next 30 years is not justified, and its effect is small in any case.

Duck is shown in Table 4 to have a substantially greater vertical land motion than does Oregon Inlet, although the tide gauges are only about 30 miles apart. Since the Duck pier pilings are concrete, is it known whether the pier itself is sinking, so that it is not representative of land subsidence in the area? There are bench marks on the pier, in the parking lot, and along the pier

access road, so the question can be settled if it has not been already. If settled, a sentence should note that there is not subsidence of the pier relative to land.

Additional comments on SPU 2015 are listed below by page section and page.

Executive Summary

We suggest a brief introductory paragraph in the Executive Summary. Something like:

"Two bases for quantifying global sea level change are reported in the scientific literature: (1) sea level as observed directly by tide gauges, and (2) volumetric changes including the best estimate of the average global subsidence of the sea floor (0.3 mm/yr) due to Glacial Isostatic Adjustment (GIA) as reported in the satellite altimeter measurements and calculations by Church and White (2006, 2011) and others. In this report, the first basis is used as the most relevant to those who will use the results."

We also suggest an expanded discussion of the above be included as an early section of the main text of the report. The 0.3 mm/yr is relevant to the SPU because IPCC projections include the GIA average global sea floor subsidence of 0.3 mm/yr. When IPCC projections are used to determine local relative rise projections, they are too large by 0.3 mm/yr because they include the effect of global sea floor subsidence. However, Zervas (2013) subtracted 1.7 mm/yr (includes the GIA value of 0.3 mm/yr) instead of 1.4 mm/yr to determine local subsidence. Therefore, subsidence values are too low by 0.3 mm/yr. The 0.3 mm/yr portions of IPCC projections and subsidence values offset, so IPCC and subsidence numbers are properly added (as done in the SPU) to determine relative sea level change at NC tide gauges.

Also, early in the main body of the report or alternatively as a table preceding the report there should be a description of terms and acronyms including: Relative Sea Rise (RSL), etc.

Page 1. Ezer and Atkinson 2014 does not appear in the references.

Page 2. Fairbanks (1989) does not appear in the references.

Page 4. Table 1 has a percentage contribution to sea level rise from the Greenland and Antarctic ice sheets for the period from 1971 to 2010, but it is based on Table 13.1 of Church et al (2013), which does not have percentage contributions for these ice sheets for the period. SPU apparently assumes the numbers must add to 100%, but contributions are so uncertain that Church et al (2013) do not give percentages for either ice sheet. We suggest instead percentages be presented for the period shown in Table 13.1 from 1993 to 2010, because Greenland and Antarctic ice sheet contributions are given (it appears the total should be 2.94 rather than 2.8 mm/yr). In addition, the 1993 to 2010 rates give a better appreciation of current contributions to sea level rise. For example, "Land water storage", which includes water impoundment and groundwater extraction, is shown in Table 1 to be only 6% of the contribution to sea level rise, whereas Table 13.1 has it contributing 13%, illustrating how important groundwater extraction has become to sea level rise.

Page 7.

Eggleston et al. 2013 should be Eggleston and Pope 2013.

The reference should be Engelhart et al. 2009 and not Englehart et al. 2009.

The acronym NCDENR appears without being defined as North Carolina Department of Environment and Natural Resources

Page 9.

Text says, "The present rate of GSL rise is 1.7 mm/yr (Church and White, 2011) …" Of course, this is not the present rate, but the average rate from 1900 to 2009. The present rate as measured by satellite altimeters from 1993 through the present is 3.2 mm/yr (University of Colorado, 2014).

Page 10.

Spanger-Siegfried et al. (2014) is a non-peer-reviewed internet article authored by an advocacy group. There are many non-peer-reviewed internet articles authored by skeptics of global warming and increased sea level rise that also could be cited, so we suggest dropping the reference. In addition, NOAA (June 2014) isn't referenced although it focuses on nuisance flooding (Sea Level Rise and Nuisance Flood Frequency Changes around the United States, NOAA Technical Report NOS CO-OPS 073, http://tidesandcurrents.noaa.gov/publications/NOAA_Technical_Report_NOS_COOPS_073.pdf)

We recommend the reference to the 2014 National Climate Assessment (actual citation should be Melillo et al 2014 rather than Melillo 2014) be dropped because it has about a page of its 841 pages devoted to sea level rise. It has no original information, but bases its maximum projected sea level rise on the intermediate high listed in NOAA 2012. The NOAA report says the intermediate high is, "… based on an average of the high end of semi-empirical, global SLR projections." IPCC 2013 (page 1140) said of semi-empirical modeling, "…there is no consensus in the scientific community about their reliability, and consequently low confidence in projections based on them." A couple of authors of IPCC 2013 have used semi-empirical models and published papers, but they agreed with the IPCC statement that there is low confidence in projections based on semi-empirical modeling.

Pages 9-11.

The discussion of "oceanographic effects" is interesting, but as discussed earlier, the section should be eliminated or shortened with an emphasis on the effects having a magnitude less than confidence intervals and being oscillatory and likely non-enduring as pointed out by Smeed et al (2014) and Knopp (2013). As discussed earlier, the usefulness of Figure 5 is not apparent because subsidence combined with global rates equals measured rates within confidence intervals for the tide gauges from Charleston to Norfolk.

Page 12.

The acronym NWLON is never used.
Text says Yelverton and Hackney 1990, but references say Hackney, C.T. and G.F. Yelverton. 1990.

Page 23.

Sweet and Parker 2014 should be Sweet et al 2014.

Page 24.

The text says that, “One of the major sources of uncertainty in estimates of sea level rise even over a period as short as 30 years is introduced by our limited understanding of the rates of loss of the Greenland and West Antarctic ice shelves. The rates of melting and ice sheet loss into the sea are highly uncertain and could occur rapidly.” These sentences have an element of hyperbole. The IPCC numbers in Table AII 7.7 include uncertainties in loss of ice in Greenland and West Antarctica. In 2045, even for Scenario RCP 8.5, the upper confidence level is only 2.4 inches higher than the average and only part of this uncertainty is due to uncertainty in the loss of ice in Greenland and West Antarctica. There have been a number of media releases in 2014 emphasizing studies that indicate the West Antarctic ice sheet has started to collapse and the collapse is unstoppable. Joughin et al (2014) is the only one of these studies with a projected sea level rise rate resulting from this beginning collapse. They note that losses in the 21st century due to the beginning collapse of the West Antarctic ice sheet at the Thwaites glacier (which would eventually release other glaciers – in hundreds of years) will be less than 0.25 mm/yr with a more rapid rise of greater than 1 mm/yr within the range of 200 to 900 years from now. A rise of less than 0.25 mm/yr results in a rise over the next 30 years of less than 0.3 inches, and is largely accounted for in current IPCC projections.

The reference Boon, J. D., J. M. Brubaker, and D. R. Forrest (2010) is not found in the text.

Page 27.

The reference Horton, B.P., W.R. Peltier, S.J. Culver, R. Drummond, S.E. Engelhart, A.C. Kemp, D. Mallinson, E.R. Thieler, S.R. Riggs, D.V. Ames, and K.H. Thomson, 2009 does not appear in the text.

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Science Panel response to January 17th comments from Robert Dean and James Houston
Feb. 19, 2015

We first extend our appreciation to our reviewers for their time and careful consideration of this report and methodology. Two issues that impact the calculation of the range of future sea level rise projections are the primary focus of the review comments. They are 1) how the confidence interval or range of projections for each component is treated mathematically as elements are combined in the methodology and 2) the assessment of local effects and how these are used in combination with the IPCC projections. The Panel has considered these comments and a synthesis of our discussions are provided below. The additional comments were more editorial in nature and will be considered in our revised draft in March.

1) The Panel discussed possible inclusion of 'quadrature' in assessing limits or ranges of estimates in our November meeting and is revisiting our proposed methodology based on the reviewers' comments. Because of the expression of range of estimates in the Table ll.7.7 of Annex ll: Climate System Scenario Tables is not a confidence interval, we have asked for additional review from statistics at NC State on our methodology and will not have their input until later this month. At that time we plan to update our calculations and will communicate with the reviewers on the outcome.

2) The reviewers note that the length of record for the gauge at Duck is not consistent with the time period used to establish a global SLR of 1.7 mm/yr and conclude that therefore the computed local effect at Duck is in error. Further, they suggest an alternative computation which would result in a conclusion that the local effect can be explained by the local VLM (vertical land motion) only.

The Panel recognizes the issues with respect to length of record of the tide gauges and the time period of the record relative to assessment of global sea level rise and in the November meeting considered using different rates for different gages. The primary tide gauge that has spurred this discussion is the Duck gauge. The time frame of operation of this gauge and the Oregon Inlet gauge are the shortest in North Carolina, spanning the late 1970s to present time frame (data through the end of 2013 were employed for the report). The panel spent considerable time discussing the issue of the different time periods of measurement for each of the gauges including an analysis offered by Tom Jarrett that could simulate the extension of the time series at Duck in order to be more consistent with the time frame for the use of 1.7 mm/yr. As a result of this discussion the Panel recommended that the time series issue should be dealt with as a special project outside the work of the Panel.

In response to the reviewers' comments we offer the following discussion. The time frame of operation of the Duck gauge coincides with a measured increase in the rates of sea level rise along the mid-Atlantic region (consistent with the reviewers' analysis). The question at hand is whether this measured increase reflects a global increase or is local. In addition, if local, will the effect persist for the 30 year response period requested by the CRC or is it other (i.e., cyclic or not persisting). In our draft, the Panel made the assumption that the local effect was separate from the global and would persist into the future. This assumption is clearly stated and the numbers reflect that approach. The Panel felt that it was responsible to acknowledge the possibility that local effects including oceanographic factors could persist and to bring this information to the attention those making management decisions. After discussion in the January meeting, the Panel decided to keep this analysis in the report.

Because it is an assumption and we recognize it as such, we can compute and present the alternative formulation (considering the IPCC projections in combination with the VLM numbers) in order to communicate the magnitude of the difference in the projections by making this assumption. Using VLM directly eliminates the step of assuming a global sea level rise rate in the proposed methodology. Using the updated 2013 VLM values as computed by Zervas essentially reduces the local effects at Duck and Oregon Inlet 1-2 inches in the 30 year projection since these gauges have the shorter temporal records and are located north of Cape Hatteras where the increase in the mid-Atlantic rates has been observed. Projections for the Beaufort gauge remain the same and Wilmington and Southport differ by less than 1 inch. (see table below). Note, the magnitude of the high and the low of the local effect and the difference may change when procedures for error analysis are finalized.

Station	Local Effects			VLM Effects			Difference		
	Relative Sea Level Rise by 2045, inches			Relative Sea Level Rise by 2045, inches			Relative Sea Level Rise by 2045, inches		
	Mean	High	Low	Mean	High	Low	Mean	High	Low
Duck	3.4	4.2	2.6	1.8	2.2	1.3	-1.6	-2.0	-1.3
Oregon Inlet Marina	2.3	3.7	0.9	1.0	1.8	0.2	-1.3	-1.9	-0.7
Beaufort	1.2	1.4	1.0	1.2	1.4	1.0	0.0	0.0	0.0
Wilmington	0.4	0.6	0.2	0.5	0.7	0.2	0.1	0.1	0.0
Southport	0.4	0.6	0.1	0.6	0.8	0.4	0.2	0.2	0.3

The issue of the impact of the length of record and time period of the record of the tide gauges on the computations (including VLM) is important as the state considers how to use the information and our recommendation for further analysis will likely remain in the report.

Robert Dean and James Houston reply to Science Panel's Feb. 19, 2015 response
Feb. 20, 2015

The Science Panel has not adequately addressed our comments on the Science Panel Update (SPU), and, therefore, in its present form the SPU is not publishable as we expected in a referred journal. The Panel did not rebut our criticisms of assumptions underlying one of its key approaches. Instead it merely said the assumptions were clearly stated. However, these assumptions were not justified in the SPU or in a rebuttal of our criticisms. Assumptions must be clearly justified, not merely clearly stated.

The Panel's one action that was responsive was to indicate it would include in one part of a table sea level rises based on the standard approach of adding IPCC projections and vertical ground. We recommended this approach because local and global data presented in the SPU provided no evidence of a persistent local effect other than ground motion that would cause an extra increase in sea level rise on the NC coast over the next 30 years.

The Panel did not address our comments relating to adding and subtracting errors. The approach used in the SPU is embarrassingly incorrect, and the Panel should have simply admitted so and made corrections. It is good the Panel will be seeking help from NC State. However, it is important to provide NC State with correct information. For example, the Panel's response says, "…the expression of range of estimates in the Table ll.7.7 of Annex ll: Climate System Scenario Tables is not a confidence interval." This is incorrect. Table II.7.7 of Annex II uses the term "likely range" and says to go to Section 13.5.1 of "Sea Level Change" of IPCC (2013) to see what this means. On page 1184 of Section 13.5.1 (entitled "Confidence in Likely Ranges and Bounds"), it says "The AR5 5 to 95% process-based model range is interpreted as a likely range". The IPCC numbers all have 95% confidence intervals.

Even if the Panel was not sure about the IPCC numbers, it should have been clear that the NOAA sea level rise rates, vertical land motion, and global rates from Church and White (2011) all had confidence intervals, so it is inexplicable that the Panel did not agree with our comments and correct the SPU. The NOAA (2014) sea level rise rates have confidence intervals as can be seen in Table ES1 of the SPU report itself, which has the caption, "Sea level rise over 30 years at existing published rates of sea level rise (NOAA 2014). Magnitude of rise was determined by multiplying the rate ± the 95% confidence interval…" VLM numbers from Zervas (2013) have confidence intervals as noted in the following from Zervas, "Table 1 lists the published relative NOAA sea level trend for each station (along with the 95% Confidence Interval of the trend) and the estimated rate of VLM (along with the 95% Confidence Interval) using the methodology described above." The projections of Church and White (2011) have standard deviation confidence intervals.

Had the errors been simple average errors rather than confidence intervals, the absolute value of the errors would have had to have been added regardless of whether the means were added or subtracted. In any case, the approach used in the SPU is glaringly incorrect. The website below explains how to add and subtract both simple average errors and confidence intervals. http://www.rit.edu/cos/uphysics/uncertainties/Uncertaintiespart2.html.

The Panel's response says, "The reviewers note that the length of record for the gauge at Duck is not consistent with the time period used to establish a global SLR of 1.7 mm/yr and conclude that

therefore the computed local effect at Duck is in error." Actually, this comment holds for all the NC gauges with the lack of consistency being greater the shorter the record. The SPU approach results in spurious "local effects" for all gauges with the spurious effects being about equally large at Oregon Inlet and Duck. We noted in our review that it was not valid to use a global sea level rate of 1.7 mm/yr over the periods of NC gauge measurements because this rate was determined for 1900 to 2009, whereas global rates during actual times of NC gauge measurements were all greater, and sometimes much greater. We showed for all the NC gauges and for the Norfolk and Charleston gauges that if a simple approach is used to estimate realistic global sea level rates, when these rates are added to vertical motion rates, the results match measured data within confidence intervals for every gauge - that is, there are no residuals for any of the gauges. The SPU only obtains residuals that it calls "local effects" because 1.7 mm/yr is lower than the actual global sea level rise rates during the periods of tide gauge measurements. No one would claim that the global rise in sea level was 1.7 mm/yr from 1977 (Oregon Inlet gauge) or 1978 (Duck gauge) to 2013, when satellite altimeters (and tide gauges within confidence intervals) say the rise from late 1992 to 2013 was 3.2 mm/yr. We do not know yet if the increase in global sea level rise from the early 1990s to today is an enduring increase or a multidecadal variation. However, there is no doubt from measurements that it occurred and the global sea level rate from 1977 or 1978 to 2013 was a good deal greater than 1.7 mm/yr. The SPU did not justify using the incorrect global rise of 1.7 mm/yr during gauge measurements, but just "assumed" it was true and as a result obtained spurious local effects. If realistic values for global rates during periods of gauge measurements are used, these residuals all disappear (within confidence intervals of measurements). The Panel's response provided no rebuttal of our demonstration that the global sea level rate it used over the periods of NC gauge measurements was incorrect and led to its spurious "local effects".

We also showed in our comments that even if there had been local effects, the SPU's own references, which it uses to justify projecting the effects forward, do not support projecting varying and non-enduring phenomena forward. We noted that Smeed et al (2014) say that evidence suggests that the decrease in the AMOC, "… represents decadal variability of the AMOC system rather than a response to climate change." We noted that Knopp (2013) says, "Consistent with the hypothesis that the regional 'hot spot' represents variability rather than the start of a trend, none of these indexes currently exceeds its range of historical variability. As the changes in these indices reflect the driving factors underlying the 'hot spot', the phenomenon may not prove to be enduring." Eber (2013) says, "The results suggest that global SLR is accelerating in recent years but that this acceleration is a combination of long-term trends and multidecadal variations." IPCC (2013) projections include acceleration and are the best source for determining the long-term global trend that Eber noted. "Multidecadal variations" that Eber noted north of Cape Hatteras are oscillatory, and even if they were significant today in NC, they would have different values in 30 years, and could even have phases that reduce sea level rise somewhat. We also provided a classic case of why a multidecadal variation on the Pacific Coast of the US, which has resulted in an actual fall in sea level over more than 20 years, cannot be projected forward at present values. As we noted in our review, "Varying and non-enduring phenomenon cannot be assumed constant and projected into the future." The Panel provides no rebuttal of our criticism and no justification for carrying forward a varying and non-enduring effect, even if it were shown to exist.

In its response, the Panel justifies using a 1.7 mm/yr rate and assuming the resulting local effects persist unchanged for 30 years because it says they are "clearly stated" assumptions. However, the Panel cannot justify assumptions that are not supported by evidence by merely saying the

assumptions are clearly stated. Incorrect assumptions lead to incorrect outcomes regardless of how clearly the incorrect assumptions are stated.

The Panel did not even comment on our question as to whether the Duck pier might be sinking relative to land.

We had numerous comments on the last four pages of our review of the SPU, and none of these comments were addressed by the Panel. It only said it would "consider" the comments. Considering comments and addressing them are not the same.

An adequate response would have sent the latest version of the draft report and provided real responses to our comments. The Panel would have addressed our comments by rebutting our criticisms and justifying its assumptions or agreeing with us and changing its approach. Instead it basically ignored the comments, providing no rebuttals and keeping assumptions that it does not justify.

We recommend that the Panel adequately address our comments even with the pressing time constraints. It can easily remove the approach in the SPU that it has not been able to justify, making the SPU simple, understandable, and defensible. We would happy to review another version of the SPU to determine if it is publishable.

Science Panel response to January 17th comments from Robert Dean and James Houston
March 18, 2015

1) *Calculation of confidence intervals.*

The reviewers were correct in pointing out that the propagation of error in the estimates should be added in quadrature. Therefore, the 30 year change in sea level for RCP 2.6 and RCP 8.5 is 5.3 (3.1 to 7.6) inches and 6.3 (3.8 to 8.8) inches, respectively. This has also been incorporated into the projections including VLM (see No. 2).

2) *Estimation of local effects and use of 1.7 ± 0.2 mm/yr for global sea level rise.*

The panel appreciates the detailed review comments related to global and local sea level rates and their computation. The Panel met on March 13, 2015 and has agreed to adopt the approach of combining the IPCC projections with VLM estimates from Zervas. The revised projections presented in the table below have also been combined considering quadrature error propagation as discussed above.

RCP 2.6 + VLM				
	Mean	**Low**	**High**	**95% CI**
Duck	7.1	4.8	9.4	2.3
OI	6.3	3.9	8.7	2.4
Beaufort	6.5	4.2	8.7	2.3
Wilmington	5.8	3.5	8.0	2.3
Southport	5.9	3.7	8.2	2.3
RCP 8.5 + VLM				
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Wilmington	6.8	4.3	9.3	2.5
Southport	6.9	4.4	9.4	2.5

Note that the VLM and IPCC confidence intervals were added in quadrature.

3) *Since the Duck pier pilings are concrete, is it known whether the pier itself is sinking, so that it is not representative of land subsidence in the area?*

As part of NOAA's maintenance program, they routinely (once or twice a year) run a new level from the land-based benchmarks to the gauge. These data show that the pier has not settled.

4) *Using three sentences to dismiss the possibility of deceleration may not satisfy critics.*

We have changed the structure and revised these sections to separate Potential Decrease in Sea Level Rise (now section 5.2) from Potential Increase in Sea Level Rise (now section 5.3). We have revised Section 5.2 based on the comments as follows:

5.2 Potential Decrease in Sea Level Rise

The Science Panel examined the scientific research regarding deceleration of sea level rise, meaning a rate lower than existing published global rates of sea level rise, over the next 30 years. There have been many efforts to detect acceleration or deceleration in the past sea level record. AR5 (Rhein et al. 2013) discusses these studies and concludes, as have others (Houston and Dean 2011, 2013; Houston 2013, Chambers et al. 2012), that strong multi-decadal variations in the tide gauge record make it difficult to detect whether there is a long term acceleration or deceleration using record lengths less than 60 years (see also Section 3.2). While researchers using both tide data and altimetry data have reported analyses that observe deceleration in sea level records (e.g., Houston and Dean 2011, 2013; Ezer 2013), the signal is small and indicative of cyclic or multi-decadal variations. Houston (2013) summarizes the existing studies and concludes that the range of acceleration in the existing record is from -0.01 to 0.01 mm/yr2, or just $\pm$0.18 inches over 30 years, so not a significant factor. There is therefore no justification to apply a global deceleration factor to existing gauge rate projections for the next 30 years.

5) *We suggest a brief introductory paragraph in the Executive Summary and an expanded discussion of GIA in the body of the report.*

A brief note on GIA has been added to the body of the report. However, we have not modified the Executive Summary to include comments on GIA because we are not emphasizing this factor as a result in itself but rather as a contributor to the results.

Section 3.1 Vertical Land Motion (VLM)

<u>This phenomenon also causes some ocean basins to be subsiding as mantle material moves from under the oceans into previously glaciated regions on land.</u>

In addition a reference to satellite data has been added to **Section 8 Recommendations for Updating the Report**:

<u>Continued monitoring of global and regional sea levels using satellite data will improve as the record length is extended, and these data should be reviewed for consideration in future reports. This will also provide the opportunity to examine coincident time frames with varying data sources (i.e., satellite altimetry and tide gauges).</u>

7) *There should be a description of terms and acronyms including Relative Sea Rise (RSL), etc.*

After the Table of Contents a section describing Terms and Acronyms has been added.

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Figure 5 and references to it have been removed and conclusion has been added that:

At this stage, it is unknown whether oceanographic effects on RSL will persist into the future; however, this is an important area of current oceanographic research which should be followed closely in future sea level rise assessment reports.

Panel feels this discussion is important to bring forward and an area of research that should be followed closely.

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Citation has been corrected to Hackney and Yelverton 1990

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The paragraph has been rephrased as:

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Robert Dean and James Houston Final Review
March 20, 2015

The Science Panel's reply to comments that Professor Bob Dean and I made was thorough and quite responsive.

I highly commend Science Panel members for the many hours they spent and expertise they contributed in developing the Science Panel Update (SPU). Their task was difficult, but they successfully adhered to a tight schedule to produce the SPU on time and in accordance with NC General Assembly Session Law 2012-202. The State of North Carolina is indebted to them for their voluntary service and the fine product they produced. Special recognition must be given to Professor Margery Overton for her leadership as Chair of the SPU. The State also is very much indebted to Mr Frank Gorham, Chairman, Coastal Resource Commission, who set up a process that stayed on schedule and faithfully followed a peer review process.

Projecting future sea level rise is a difficult task, given that there are many uncertainties in everything from local ground motions to local oceanographic processes to global sea level change. The SPU presents two basic approaches to project sea level change over the next 30 years in North Carolina. First, it takes empirical data of relative sea level rise rates (that include ground motions) at five NC gauges and projects the rates into the future. Second, it takes the 2013 projections of global sea level rise made by the Intergovernmental Panel on Climate Change (IPCC) and adds local ground motion determined by Zervas (2014). The first approach provides an estimate of relative sea level rise at the NC gauges if the rise in the future is the same as in the past. The second approach provides an estimate of relative sea level rise if climate projections made by the IPCC occur. These two approaches cover the likely range of sea level rise over the next 30 years.

I believe the SPU is a good contribution to the scientific literature and agree with SPU recommendations for further research and a five-year update. I recommend the highlights of the SPU be submitted to a peer-reviewed journal for publication. Many states and local communities would be interested in the approach.

I discussed the SPU with Professor Bob Dean up to three days before his death, including the conversation Professor Overton and I had about the planned SPU response to our comments. He would have agreed with all of my comments above.

James R. Houston
Director Emeritus
Engineer Research and Development Center
Corps of Engineers

PUBLIC COMMENTS

CRC Meeting
April 29-30, 2015
Dare County Government Complex
Manteo, NC

Public Comment on Sea-Level Rise Report 2015 Update

Heather Jarman, Regulatory Affairs Director with BASE, commented that BASE has provided feedback throughout the process and believes this report is a much better, thorough report that encompasses not only a scientific approach, but plain common sense that is applicable in today's development world. We will continue to be supportive of the process that this Board put forth.

Jim Early, retired engineer from Kitty Hawk, stated this is very well written report and I would like to add my appreciation for the excellent effort. I only take exception with one parameter used in the report and that is the current rate of sea level rise, not the future projections, just the current rate. The value used in the report was taken from the IPCC report and the value is higher than can be justified. The IPCC value is much higher than the measures by NOAA.

Dave Burton stated this report is much better than the 2010 report and pointed out the differences in the two. Mr. Burton was concerned that this report relied too heavily on sources from one end of the scientific opinion spectrum and questioned its credibility.

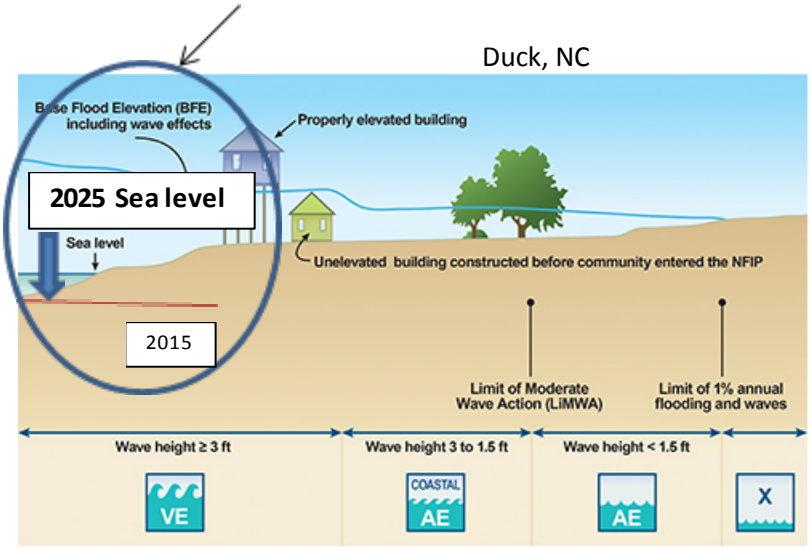
Mattie Lawson, retired engineer from Kill Devil Hills, requested that the CRC not come up with a one-size fits all regulation for the entire state of NC, but please allow the localities to manage this problem.

Wally Overman, Vice-Chairman Dare County Board of Commissioners, agreed that a 30-year plan or assessment of sea level rise was a better option than 100-years. Mr. Overman expressed his support for the position of Chairman Gorham that any decisions regarding regulations should be made at the local level.

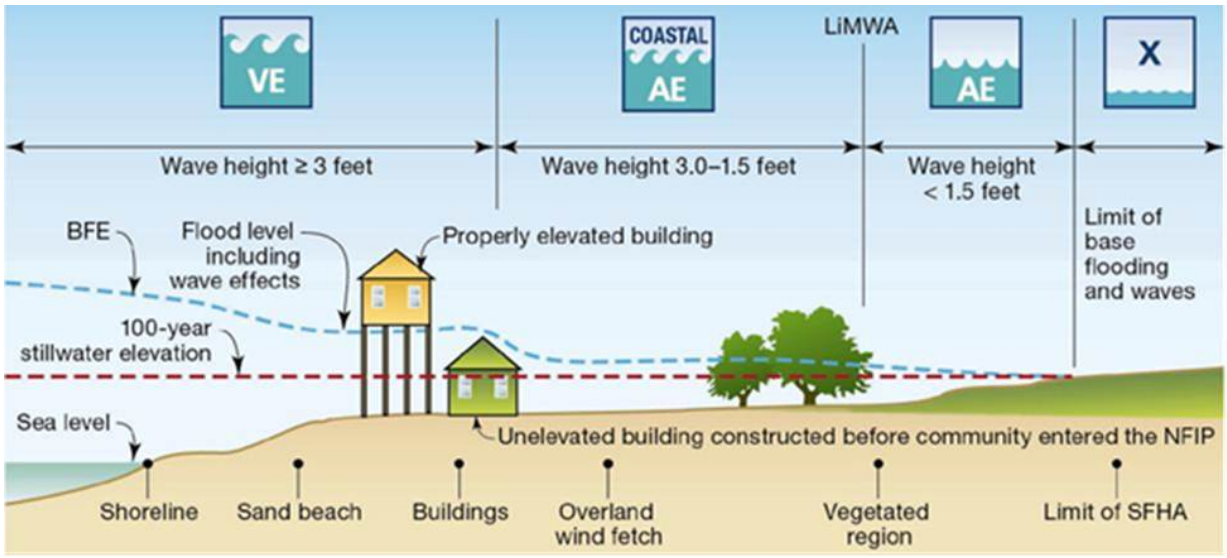
Neil L. Perry, NCDOT Rail Division (via email on 4/26/2015)

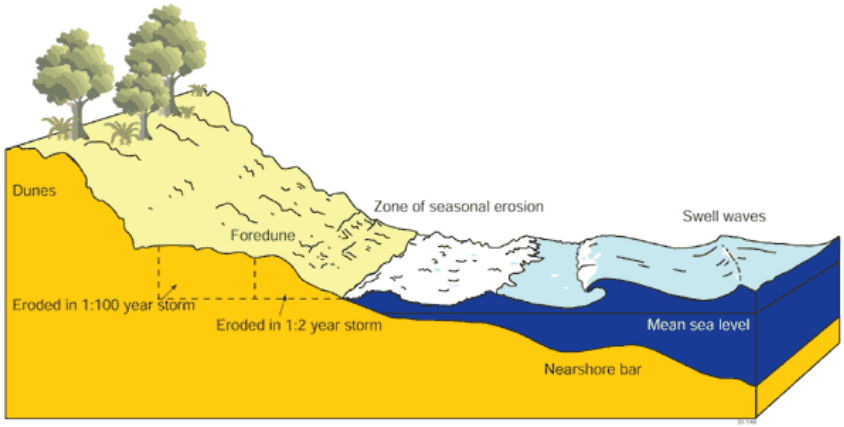
I've read through the updated report and wanted to provide a general comment.
You are **NOT** telling your story in a manner that the general public and general assembly will understand. The most important information that you are trying to get across needs to be disseminated pictorially. See below.
FYI, I'm a former student of Dr. Overton's at NC State. BSCE 1995. I grew up in Virginia Beach and along the northern Outer Banks (Kill Devil Hills, NC). I'm very familiar with this issue and surrounding politics.

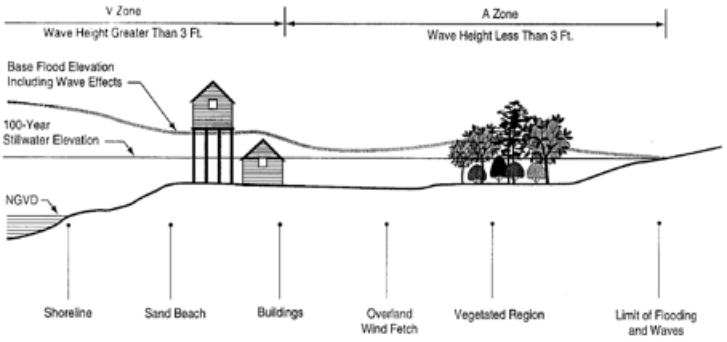
Duck, NC

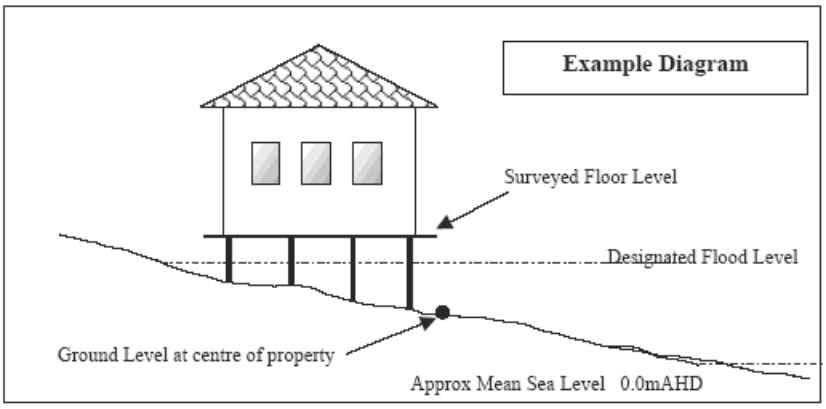


Or use one of the diagrams below or create your own. Point is you HAVE to tell this story pictorially or much of your work will be misunderstood.









Neil L. Perry, PE, PTOE, PTP, LEED BD+C
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Direct: 919-707-4711
Main Office: 919-707-4700
Michael OBrian (via email on 4/8/2015)

NC Sea Level Rise Report Is Biased High

Hi,

The sea level rise report released at the end of March is biased high. There is no scenario for steady or declining global sea temperatures which may be likely if we experience a grand minimum in solar activity over the next 30 years. There are scientists predicting a global temperature drop of 1 to 1.5 degrees Celsius over the forecast horizon of the NC Sea Level Rise Study. Currently solar cycle 24 is showing significantly reduced sun spot activity with cycle 25 forecast at grand minimum levels.

By using the UN's climate study as the only likely outcomes for global sea temperatures, the study appears political rather than scientific. It is hard to find a more political organization than the UN.

The Commission should revise its study to include at least one scenario of falling ocean temperatures.

Best regards,

Mike

Mike Hayes (via email on 4/10/2015)

greetings

Subsidence Subsidence

The Atlantic Ocean is expanding from the Mid Atlantic Ridge. The shore lines are being moved away from the MARidge. The shorelines have been eroding the whole time. There are no natural phenomena to add materials to the ever moving shorelines other that river carried materials to replace what is eroded away by normal ocean activity. The ocean has not been rising. The shorelines are eroding. Additionally Ocean level rises at the same rate on every inch of shoreline equally. This has been true for the past 18K years. Every body of water on the globe with depths over 420 feet has an escarpment at 420 feet deep that is a remnant of the end of the last Ice Age which ended 18K years ago. That's every ocean has an old historic beach displayed by a level plateau area at the depth of 420 feet. Yes, a beach, now 420 feet deep in the ocean.

So, ocean rises at different levels at different locations on The NC shoreline. NOT and NEVER. I think the sky is falling. Let's get that fixed first.

Show me where the Ocean is rising anywhere!

Mike Hayes.....NC Outer Banks resident and former Virginia Beach resident of the Pungo Ridge, an older outer banks dune ridge, ranging from the Chesapeake Bay to the Atlantic Ocean in southern NC that is 125K old when the ocean level was 20 feet higher that it is right now. Show me how stupid you are by proving me wrong without using CO_2. If you are interested I can show you that less CO_2 leaves North America into the Atlantic than comes off the Pacific into North America. Read the previous sentence carefully! Geeze the CO_2 disappeares

Self-appointed amateur marine geologist.....Mike Hayes

Mike Hayes (via email on 4/11/2015)

greetings from the Outer Banks, and please enjoy, and good luck

How can I respond in any other way than idiotic, when your science is so idiotic. I tried otherwise but just couldn't get it done. Why are you people getting paid to do this? Are you not glad I had nothing else to do this morning April 11, 2015. I will be referencing my representative to reference this from you! Enjoy the humor.

****

How about calling it what it is: Subsidence by linear erosion. It is impossible for the ocean to NOT rise equally on every inch of shoreline. It is also impossible for the ocean to NOT drop equally on every inch of shoreline. Remember, there is a substantial tide that causes the ocean to rise and fall unequally on every inch of shoreline. Be careful when you measure. Don't create another hockey stick scam. Call it what it is, and stop with the snake oil campaign. Borrow a government laser measuring device (satellite) that is used to measure a submerged submarine wake on the ocean surface when the sub is running in stealth mode 1000 feet deep, and then measure ocean level rise and you will find out that the ocean level might be falling right now! This satellite system is accurate beyond 1/100 of an inch. It might be all the submarines that cause the next epic of ocean rise? No that wont work because the subs are not actually adding water to the ocean.

What might be fun is to take you scientists to the Netherlands. How in this world did the Dutch gather vast amounts of land from the North Sea that in some cases is 22 feet below seal level? What is that all about? Plus, those ingenious people are sequestering the CO2 from their Shell Refinery and pumping this CO2 into the greenhouses in their massive greenhouse industry that grows vegetables for the markets in Europe. You know that CO2 fertilizer, grows great vegetables.

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The Scientist's Mantra: "Lie so we can get funded"

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"Sea-Level Rise Study Update"

"The Coastal Resources Commission's Science Panel is working to update its 2010 report on sea-level rise in North Carolina, as required by Session Law 2012-202. The CRC's charge to the panel is to conduct "a comprehensive review of scientific literature and available North Carolina data that addresses the full range of global, regional and North Carolina specific sea-level change." The CRC further directed the panel to limit the scope of the study to a 30-year rolling time table, to be updated every five years.

The panel’s initial draft report was completed in December 2014, and forwarded to a technical peer review group for comment.

The draft report and all comments were submitted to the CRC and released for public comment on Mar. 31:”

****

Subsidence Subsidence

The Atlantic Ocean is expanding from the Mid Atlantic Ridge. The shore lines are being moved away from the MARidge. The shorelines have been eroding the whole time. There are no natural phenomena to add materials to the ever moving shorelines other that river carried materials to replace what is eroded away by normal ocean activity. The ocean has not been rising. The shorelines are eroding. Additionally Ocean level rises at the same rate on every inch of shoreline equally. This has been true for the past 18K years. Every body of water on the globe with depths over 420 feet has an escarpment at 420 feet which is a remnant of the end of the last Ice Age which ended 18K years ago. That’s every ocean has an old historic beach displayed by a level plateau area at the depth of 420 feet. Yes, a beach, now 420 feet deep in the ocean.

****

So ocean rise is at different levels at different levels at different locations on The NC shoreline. NOT. I think the sky is falling. Let’s get that fixed first.

Show me where the Ocean is rising!

****

Mike Hayes.....NC Outer Banks resident and former Virginia Beach resident of the Pungo Ridge, an older outer banks dune ridge, ranging from the Chesapeake Bay to the Atlantic Ocean in southern NC that is 125K years old when the ocean level was 20 feet higher that it is now. Show me how stupid you are by proving me wrong without using CO2. If you are interested I can show you that less CO2 leaves North America into the Atlantic than comes on to North America off the Pacific Ocean. Read the previous sentence carefully! Wow, that’s bad for your conspiracy theory!!!!!

Self-appointed amateur, marine geologist, climatologist, skeptic, and conspiracy theorist .....Mike Hayes

George Mears (via email on 4/13/2015)

My undergraduate (U of Wisconsin) was in geology and my Masters is in Environmental Engineering Old Dominion University). I've also been a project manager for several coastal engineering projects over the past decade.

I am very skeptical of the agenda driven IPCC reports--and especially the Executive Summary section of each report which has been proven many times over to distort or actually refute the claims and actual conclusions of the actual authors of sections of the full report. The use of a global average SLR metrics is a farce to start with because local conditions dictate coastal conditions which are far more driven by coastal dynamics, urban stormwater hydrology, and coastal sediment consolidation and compression over time which has little to do with SLR.

At the risk of coming off as an alarmist loon, I have personally come to the conclusion that the political left wants to create a Climate Caliphate and to declare climate jihad against anyone smart enough to understand that none of their climate models have proven predictive, not one of their apocalyptic predictions has been proven true, and—given that the average global temperature hasn't risen over the past 18 years while carbon dioxide in the atmosphere has increased by
8 percent, CO2 clearly isn't driving global temperatures! Even with constant NOAA and NASA cherry picking of data points and after hundreds of weather station temperature data "adjustments" in North America and around the world, they still haven't been able to force a trend that can be statistically defended or justified. And they don't have a substitute herring to blame so they play whack-a-mole with global warming, ocean acidification, SLR, biodiversity and species extinction--almost all with cherry picked data, annecdotal evidence, improper statistices (Mann-made Hockey Stick) all with little to no government QA, taking unpaid volunteers years to study and refute.
And most for increased budgets, political influence, and academic one-upsmanship.

Before becoming an engineer I had over 5,800 flight hours that included several years of flying scientific research missions with John Hopkins, Scripps and Woods Hole, Naval Oceanographic Office scientists studying extreme north and south latitude ice reconnaissance, deep ocean eddy current data collection, and worldwide vector magnetic survey all over the globe. I also helped train NOAA aircrews to take over the hurrican penetration missions from the Navy during the late 1970s.

These are becoming desperate times for desperate minions committed to overthrowing capitalist economies and redistributing wealth using any garbage scientific rationale they can come up with for our media to run with without questioning!

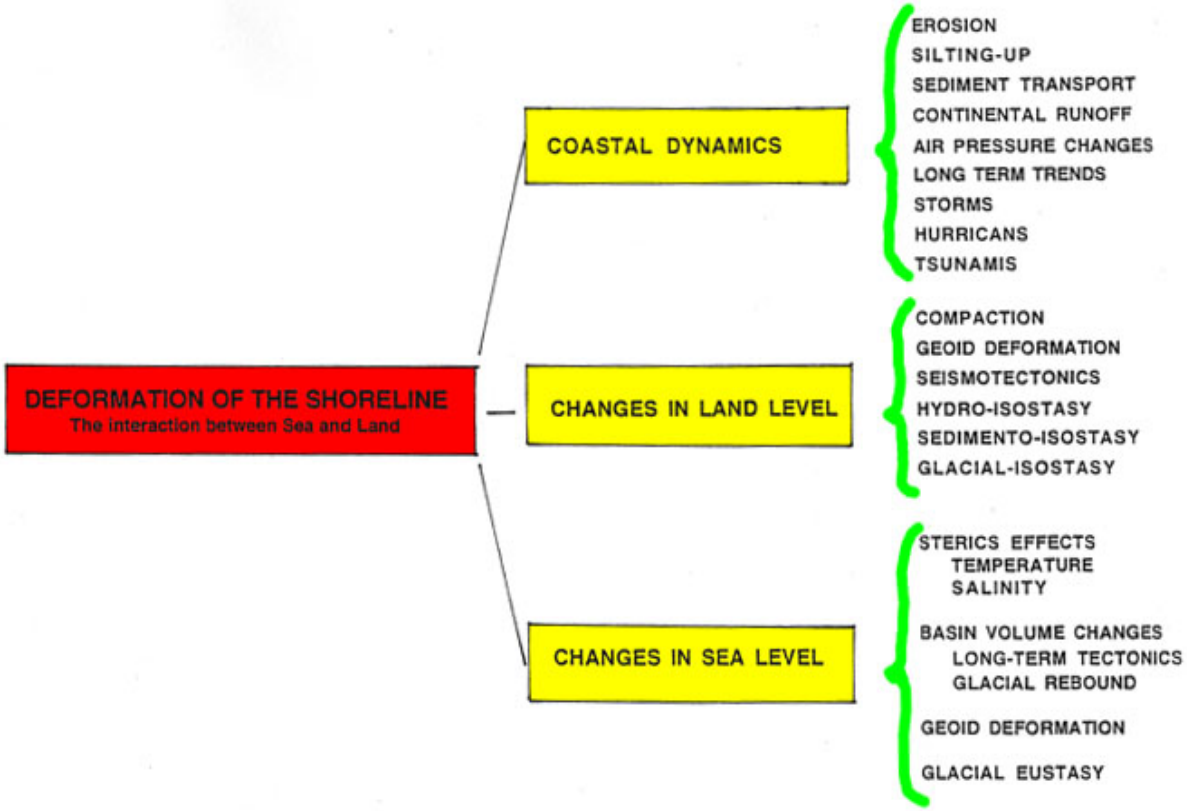
Thank you,

George H. Mears ME, MBA, PMP
Hydrologist/Environmental Engineer
4304 Ainslie Court South
Suffook, VA 23434

(Attachment)

The entire Sea Level Rise mantra is misunderstood by politicians and most in the public, and I dare say, most scientists. Please note the figure below that depicts where Sea Level Rise plays in the overall process of what the environmental left and the media loves to blame on SLR but is much more related to Coastal

Dynamics, urban stormwater hydrology, and coastal sediment consolidation and compression over time. As shown, SLR is limited to steric impacts, eustatic changes in sea level, glacial isostacy-eustacy, and basin geoid deformation and resulting volume change—most of which are literally drowned out by dominant coastal and hydrologic factors that have little relationship to SLR.



Professor Nils-Axel Mörner of Stockholm University was the former President of the INQUA Commission on Neotectonics (1981-1989) and President of the INQUA Commission on Sea Level Changes and Coastal Evolution (1999-2003). In 2000, he launched an international research project on sea level in the Maldives. In 2008, at an international meeting on sea level in Portugal, Professor Mörner was awarded the Golden Chondrite of Merit from the University of the Algarve "for his irreverence and his contribution to our understanding of sea-level change". He has argued for years that global sea levels are not rising significantly or dangerously. In a recent paper (the 547th in his 42-year career) he continued his arguments and a fellow researcher summarized his main points for those outside the oceanographic community below:

- At most, global average sea level is rising at a rate equivalent to 2-3 inches per century. It is probably not rising at all.
- Sea level is measured both by tide gauges and, since 1992, by satellite altimetry. One of the keepers of the satellite record told Professor Mörner that the record had been interfered with to show sea level rising, because the raw data from the satellites showed no increase in global sea level at all.
- The raw data from the TOPEX/POSEIDON sea-level satellites, which operated from 1993-2000, shows a slight uptrend in sea level. However, after exclusion of the distorting effects of the Great El Niño Southern Oscillation of 1997/1998, a naturally-occurring event, the sea-level trend is zero.
- The GRACE gravitational-anomaly satellites are able to measure ocean mass, from which sea-level change can be directly calculated. The GRACE data show that sea level fell slightly from 2002-2007.

- These two distinct satellite systems, using very different measurement methods, produced raw data reaching identical conclusions: sea level is barely rising, if at all.
- Sea level is not rising at all in the Maldives, the Laccadives, Tuvalu, India, Bangladesh, French Guyana, Venice, Cuxhaven, Korsør, Saint Paul Island, Qatar, etc.
- In the Maldives, a group of Australian environmental scientists uprooted a 50-year-old tree by the shoreline, aiming to conceal the fact that its location indicated that sea level had not been rising. This is a further indication of political tampering with scientific evidence about sea level.
- Modeling is not a suitable method of determining global sea-level changes, since a proper evaluation depends upon detailed research in multiple locations with widely-differing characteristics. The true facts are to be found in nature itself.
- Since sea level is not rising, the chief ground of concern at the potential effects of anthropogenic "global warming" – that millions of shore-dwellers the world over may be displaced as the oceans expand – is baseless.
- We are facing a very grave, unethical "sea-level-gate".

How much of the current SLR argument is hype to justify more government regulations and to advance the radical environmentalist agenda? As a hydrogeologist and an environmental engineer, I suspect, most of it. Is flooding increasing? Absolutely! But is this related to sea level rise, or climate change? Unlikely and only at the margins and if there was any cost effective way to alter that in any measurable way, we still wouldn't notice any difference in the nuisance flooding because SLR isn't a major factor in it. The primary cause involves that have been well understood by urban hydrologists for decades. As areas become more urbanized-- more developed—areas increasingly loose surface stormwater retention sites as building activity continues. This turns fields and lowlands into impermeable rooftops and pavement and fewer places to contain stormwater following rains. The result is a vastly reduced Time of Concentration—the time it takes for a raindrop to fall on the outer edge of a watershed and travel to the lowest spot where flooding starts. At this point, cue crickets and glazing over of eyes of media, politicians, and climate zealots since this means thinking—which certainly doesn't support their activist agendas.

Most people recognize the impact of a large business or a parking lot when it comes to increased runoff. Unfortunately, the state of municipal planning and environmental oversight is such that if the developers can divert any increase in runoff away from their building site, many believe the problem has "gone away" when all they have managed to do is push the problem into other low areas within the same watershed. But even singular construction sites can increase the flooding problem as long as local inspectors consider it OK to allow increased runoff to leave the property where the increase is generated. Every time we build larger houses, provide parking for an extra vehicle, or level and pave what was undisturbed land before, we potentially increase storm runoff unless we insist upon Best Management Practices (BMPs)—engineering solutions to capture, use, or retain the increased runoff to prevent it from leaving the property. So, am I arguing for ceasing development as do many of the radical environmentalists? No. But I would argue that they who develop, build, or alter land be responsible for the consequences of their own activity in the external environment. Regulators should hold developers, builders, and even individual property owners to a standard that does not make it permissible to allow increased runoff to exit that property. Allow prudent development but require developers –and even individual property owners--capture and deal with any increase in site runoff due to improvements to the property that they are making.

Too few builders or even municipal planning and building officials seem to understand the impact of developing or expanding impermeable surfaces at the single lot level—business or residential. Federal regulations naturally focus on large areas of developmental impact but this shouldn't mean that the municipalities shouldn't be concerned with individual building sites when dealing with neighborhoods. There

is a legal concept that when you do something to your property that impacts mine, you should be held accountable. But that requires me to sue you over something neither of us know much about. I'd suggest that the municipalities exist to protect the liberty and property rights of its citizens. So the municipality is in the best position to insist that each building permit is issued with a land disturbance permit that insists requires the land owner, builder, or developer to be responsible for dealing with any increased runoff generated by building or site modification activities.

More often than not, the best building lots in a community are chosen first and developed early on in the history of the neighborhood. As area populations grow, the best lots disappear and individuals start buying and trying to develop less desirable building lots—and in so doing, making only the improvements that municipality or community building inspectors mandate. These lost are likely to be smaller, lower topographically, and subject to more frequent flooding, overgrown and costlier to develop, or near areas of heavy traffic, business, or industrial activity. So as properties that were formerly low areas that captured and contained stormwater are filled in and converted to building lots, the increase in runoff is often disproportionate to the sizes of the infill lots being developed. The low lands disappear and are replaced with fill, rooftops, and pavement. Areas that used to capture stormwater now shed it into the neighborhoods surrounding them. And this is by far the greatest single contributor to increased area flooding in both urban and suburban areas. Ranking well below development comes local subsidence since most of the Atlantic Coastal Plain consists of 10,000 to 15,000 vertical feet of consolidating sediment. This is a geological reality and as sediment compacts, land sinks. And as municipalities, businesses, and residential homeowners use groundwater pumps to supply their needs, subsidence only increases. So the real problem is reduced Time of Concentration as rain runoff that used to stay within an area, no longer does. Sea level rise and climate change is just a convenient red herring that advances the agenda of the bigger government environmentalists. But if you really want to reduce local flooding, start paying attention to the increase in runoff from properties following construction by insisting on pre-and post-development hydrographs generated by a neutral arbiter. I've suggested for years that where local or regional colleges with hydrology departments and students who need to learn are available, this could be a win-win, with the work funded by the developers but executed by folks who aren't paid for the result the developer is hoping to find. This will only work with the cooperation of reputable professors who are available and willing to supervise their students closely to maintain standards.

Jim Early (via email on 4/28/2015)

Frank Gorham, Chair NCDENR CRC
Margery Overton, Chair NCDENR CRC Science Panel

April 29, 2015

The Science Panel report on sea level rise (SLR) is clearly written and is a major improvement over the previous (2010) document. I wish to comment on only one problem, the value used for the current global sea level rise rate.

In the preliminary Panel meetings the Panel seemed committed to using the Church & White (2011) paper for recent past and current global sea level rise data and to using the IPCC document for future sea level acceleration projections. In the later drafts the Panel chose to also use the IPCC document as the source for the current global sea level rise rate.

The single **most important** number in this entire report is the value assumed for the current SLR rate. It is much more important than the small accelerations projected by the two IPCC cases. The Panel inserts the IPCC value of 4.0mm/y into its calculations with no mention or discussion. The Panel only presents and discusses the time integral of the sea level rise rates which hides the actual rates used. The panel takes this value without question or comment from the IPCC report.

This sea level rise rate is higher than global tide gauge values from NOAA or the questionable satellite values as can be seen in figure 1. It is also higher than tidal gauge data from the CW paper. More importantly, this value is incompatible with the tidal gauge data from Wilmington where the land is known to have a low subsidence rate or even may be rising (figure 2).

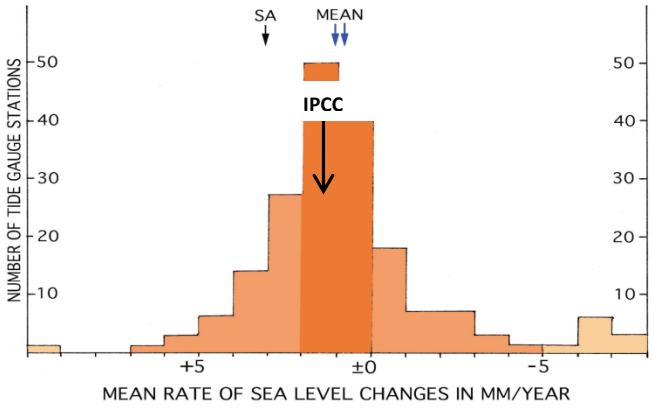


Figure 1. SLR rate distribution of 204 world wild tide gauges used by NOAA
[*Morner,N. 2013,Energy & Environment, 24,509-536.*]

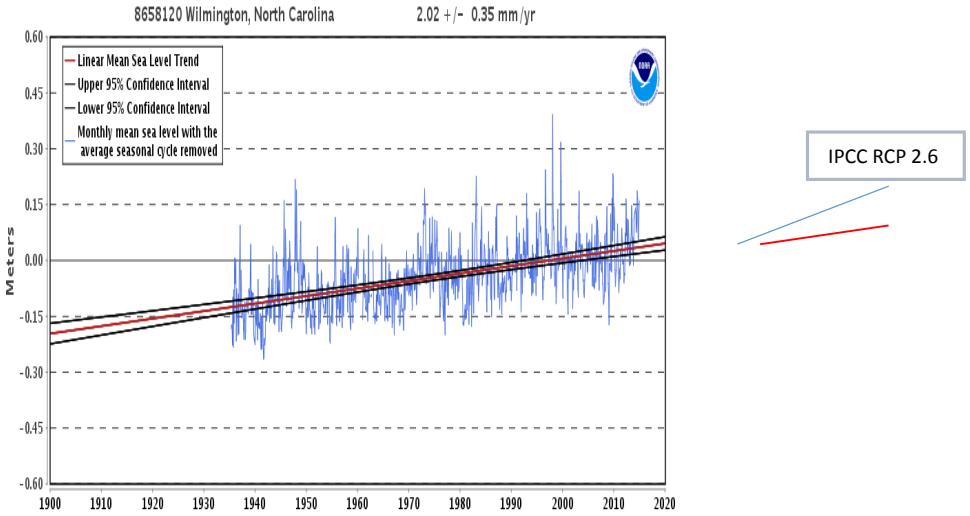


Figure 2. Wilmington tide gauge (NOAA)

As I have stated at previous meetings, you cannot simply ignore any discussion of the current SLR rate which you use. This report will be of little value and no credibility without such a discussion. The best approach would be to simply use the NC tide gauge data as the best measure of the current local sea level rise rates. The IPCC document could then be used to estimate the future increases in the sea level rise rate. This was the procedure that the Panel initially discussed. It would base the estimates of current rates on real local scientific data. Using the value from the IPCC document for a current local measurable rate is simply an appeal to authority rather than science.

James Early
Kitty Hawk, NC
Retired engineer from DOE Lawrence Livermore National Laboratory
(Doctorate in engineering from Stanford University)

Dave Burton (via email on 4/2+/2015)

Comments to the CRC April 29, 2015.

By Dave Burton
www.sealevel.info
www.NC-20.com
http://www.sealevel.info/burtonvita.html

This is one of those glass half-empty or half-full situations. This draft report is much, much better than the 2010 Report. That Report showed no actual tide gauge graphs; this one does. That Report ignored the differences between local rates of sea-level change in different parts of the State; this one analyzes them. That Report made an erroneous central claim that SLR has accelerated in response to global warming; this one does not make that error. That Report relied heavily on a discredited paper by Stefan Rahmstorf; this one does not.

However, I still have concerns.

One is that this draft report does not acknowledge any of the errors in the previous report, not even the mistaken claim that SLR accelerated due to global warming. I think we have a responsibility to do our best to undo the confusion which was caused by that error.

Another concern is the Report's exclusive reliance on sources from one end of the scientific opinion spectrum, primarily global sea level rise predictions from the most recent U.N. Intergovernmental Panel on Climate Change's 5th Assessment Report (AR5).

I was an Expert Reviewer of that IPCC Report, and I'm here to tell you that it's not a firm foundation. Their so-called expert review process was a sham. Their accelerated SLR scenarios are not credible. Even their low emission scenario projects over twice the current global rate of sea-level rise, 5.3" vs 2.2" for 30 years. That's ridiculous.

The next 30 years will probably see only about 70 additional ppmv CO2, which, because of its logarithmically decreasing effect, will have much less effect than the last 100 ppmv – and that hasn't caused any acceleration in SLR at all. It is absurd for the IPCC to predict that global SLR will double in response to a small forcing, when it didn't increase at all in response to a much larger forcing.

This draft report praises the IPCC and notes the 50,000 comments they received on their Report. But those comments were often ignored, and that praise is misplaced.

To balance the IPCC, I recommended that our Science Panel use the relevant sections of the reports from the Nongovernmental International Panel on Climate Change (NIPCC) and the U.S. Senate's Environment and Public Works Committee's Republican staff reports on climate change, but they did not.

The most important fact that everyone needs to understand about sea-level rise is that it has not accelerated at all in response to human greenhouse gas emissions.

The vast majority of human GHG emissions have been since the 1940s. Since then, we've driven up CO2

from about 300 ppm to 400 ppm – yet the rate of sea-level rise hasn't increased at all.

This fact is a huge problem for the models that the IPCC relies on. Dr. Steven Koonin was undersecretary for science in the Energy Department during President Obama's first term. After he left that position, he finally felt at liberty to tell the inconvenient truth. He said, *"Even though the human influence on climate was much smaller in the past, the models do not account for the fact that the rate of global sea-level rise 70 years ago was as large as what we observe today."*

And yet, the IPCC still relies on those models. They just can't accept the empirical fact that anthropogenic CO2 has very little effect on sea-level rise. They still base their sea-level projections on hypothetical extreme acceleration scenarios, which they claim will be caused by CO2 emissions.

This Report is much better than the last one, but the Science Panel erred by basing so much of their work on the flawed projections of the UN IPCC's 5th Assessment Report, and by not examining more credible sources, like the Nongovernmental International Panel on Climate Change.

# # #

Clyde Hunt, Jr (via email on 6/4/2015)

If I read the results of the recent meeting in Manteo correctly, concerning decisions on how the state should or should not respond to the estimated future sea level rise, please accept my appreciation for your overall involvement **and** the apparent decision to allow more local autonomy on this. And, for your rejection of the estimated/guess of 39" and 55" sea level rise.

We (the Hunt Family) have had four ocean-front nice rental houses at Ocean Isle since the mid '60's. I have been directly involved with several projects beneficial to not only the Ocean Isle property owners but ultimately every citizen of North Carolina. I've never hesitated to explain this to my more inland friends and associates here in Greensboro and elsewhere…ie…North Carolina coastal tourism is a huge revenue generator, supporting thousands of local businesses, tens of thousands of jobs, and accounting for millions of tax dollars for NC. Why do tourists from not only NC but dozens of other states and some foreign countries come to our coast? For the **beaches**! For the developed beaches. If we do not retain our developed beaches, no one will come. But obviously, any responsible person recognizes we must **responsibly** develop and maintain our magnificent beaches.

It appears most recognized the 39" (and 55") sea level rise estimates are apparently way out of line, just as the hope of **no** sea level rise is equally untenable, unrealistic. I guess the bottom line is….(a) We cannot move everything and everybody 50 miles inland based on a projected, estimated, guess that 39" is absolute….(b) So, let's locally keep a keen eye on what the rise is (or is not) each year or so, and based on several criteria…eg…past history, present 5, 10, 15 year trends, other coastal area trends, etc., make appropriate decisions. Duck has very different "challenges" than our Brunswick county beaches, and therefore very different solutions would apply.

Importantly, let's not put our heads in the sand, totally ignoring the possibility of sea level rise, **and** let's not over-react to scare tactics of those with a total anti-development/abandon the coast agenda.

Hope you fellows continue to give this most important topic the attention and consideration it deserves. And that your decisions are based on the very best scientific analysis, and not on emotion. A great deal of North Carolina's future depends on it.

Jim Early, John Droz and Stan Young (via email from Jim Early on 6/16/2015)

Frank Gorham, Chair NCDENR CRC June 16, 2015

Comments on 2015 NC Sea Level Rise Assessment Report

The Science Panel report on sea level rise (SLR) is clearly written and is an improvement over the previous (2010) document. It does a particularly good job on explaining the differences in SLR within North Carolina.

In this note we wish to comment on only one problem, the value used for the current sea level rise rate. This parameter does not depend on complicated projections of future behavior; rather it depends only on past and current physical measurements of sea level. It is also the most important single parameter in the report.

The Panel chose an admirable goal of only using publicly documented data and literature in this report. There is little literature written specifically on the SLR along the coast of North Carolina, but the detailed tidal gauge data from the five stations along the NC coast are available on the NOAA website [1]. This data can be used directly to determine the recent SLR rate at each location, and the long term average values for each are given on the NOAA site.

An alternative approach, the one chosen by the Panel, is to use the extensive literature on the world wide average SLR rates. Specifically the Panel used the value from the last IPCC report [2]. Currently the tide gauges for the measurement of SLR have an uneven distribution around the world's oceans, and older tide gauges had a much more limited coverage. This data must be manipulated to account for the limited distribution in space and time to calculate the world average rate. This calculation introduces many sources of possible errors.

The resulting world average rate must then be adjusted to account for local conditions at any specific site which introduces more opportunities for errors. The need for this last step can be illustrated by the fact that US tide gauge data shows that the average SLR rate on the US East coast is over three times the value for the US West Coast (excluding Alaska)[3]. The Panel uses the local NC tide gauge measurements to estimate the correction needed for the world sea level rate. This introduces the circular reasoning of using local sea level rise rates measured by tide gauges to correct the world sea level rise rate with the objective of finding the local sea level rise rate.

We believe the CRC should directly use the data from the local tide gauges to determine the current local SLR rate. This procedure introduces much less opportunity for error. We will discuss the two approaches and show that the procedure of going through the world wide average value gives results that are clearly incorrect for the North Carolina sites.

First the procedures used by the panel are discussed. The referenced IPCC result is then shown to have been questioned in the literature. Finally, the Panel's projections of SLR are compared to NC tide gauge data and shown to be clearly inconsistent.

The use of IPCC reports to project future acceleration of SLR rates is not discussed in this comment. However the Appendix lists a number of references provided by John Droz which discuss the subject.

Science Panel procedure and the IPCC SLR rate

The Science Panel chose the Fifth IPCC report [2] as its primary source of documentation on the projected SLR due to future warming from current and potential future increases in greenhouse gases. The IPCC document reports the calculated impact of a range of future emission scenarios in order to capture a range of potential sea level rises. The Panel referenced the IPCC summary, Table A11.7.7, shown below.

Table AII.7.7 | Global mean sea level rise (m) with respect to 1986–2005 at 1 January on the years indicated. Values shown as median and *likely* range; see Section 13.5.1.

Year	SRES A1B	RCP2.6	RCP4.5	RCP6.0	RCP8.5
2007	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]	0.03 [0.02 to 0.04]
2010	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]	0.04 [0.03 to 0.05]
2020	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.11]
2030	0.12 [0.09 to 0.16]	0.13 [0.09 to 0.16]	0.13 [0.09 to 0.16]	0.12 [0.09 to 0.16]	0.13 [0.10 to 0.17]
2040	0.17 [0.13 to 0.22]	0.17 [0.13 to 0.22]	0.17 [0.13 to 0.22]	0.17 [0.12 to 0.21]	0.19 [0.14 to 0.24]
2050	0.23 [0.17 to 0.30]	0.22 [0.16 to 0.28]	0.23 [0.17 to 0.29]	0.22 [0.16 to 0.28]	0.25 [0.19 to 0.32]
2060	0.30 [0.21 to 0.38]	0.26 [0.18 to 0.35]	0.28 [0.21 to 0.37]	0.27 [0.19 to 0.35]	0.33 [0.24 to 0.42]
2070	0.37 [0.26 to 0.48]	0.31 [0.21 to 0.41]	0.35 [0.25 to 0.45]	0.33 [0.24 to 0.43]	0.42 [0.31 to 0.54]
2080	0.44 [0.31 to 0.58]	0.35 [0.24 to 0.48]	0.41 [0.28 to 0.54]	0.40 [0.28 to 0.53]	0.51 [0.37 to 0.67]
2090	0.52 [0.36 to 0.69]	0.40 [0.26 to 0.54]	0.47 [0.32 to 0.62]	0.47 [0.33 to 0.63]	0.62 [0.45 to 0.81]
2100	0.60 [0.42 to 0.80]	0.44 [0.28 to 0.61]	0.53 [0.36 to 0.71]	0.55 [0.38 to 0.73]	0.74 [0.53 to 0.98]

This table only gives the sea levels at future dates in meters (which the Panel converted to inches). The associated SLR rates are not apparent from this table. The Panel just incorporates the SLR values for the years 2015 to 2045 in their report without ever discussing the underlying SLR rates. It can be seen that the change in SLR by 2050 between the different cases is not significant, only 0.03m (1 inch). Of much greater importance, Table A11.7.7 assumes the initial global average SLR rate in 2010 is 4.0mm/y.

If the Panel had used the figures from the section of the IPCC report where this table originated (Section 13.5.1), then this hidden assumption would have been apparent. This can be seen in the frames below on the right where the black lines represent the total value of the SLR rates. It can be seen that in both cases the rates are assumed to start at 4.0mm/y.

Dave Burton and Jim Early both tried to point out the importance of this hidden assumption to the Panel. Whether from the press of time, inertia, miscommunication or some other reason, the Panel never addressed the problem.

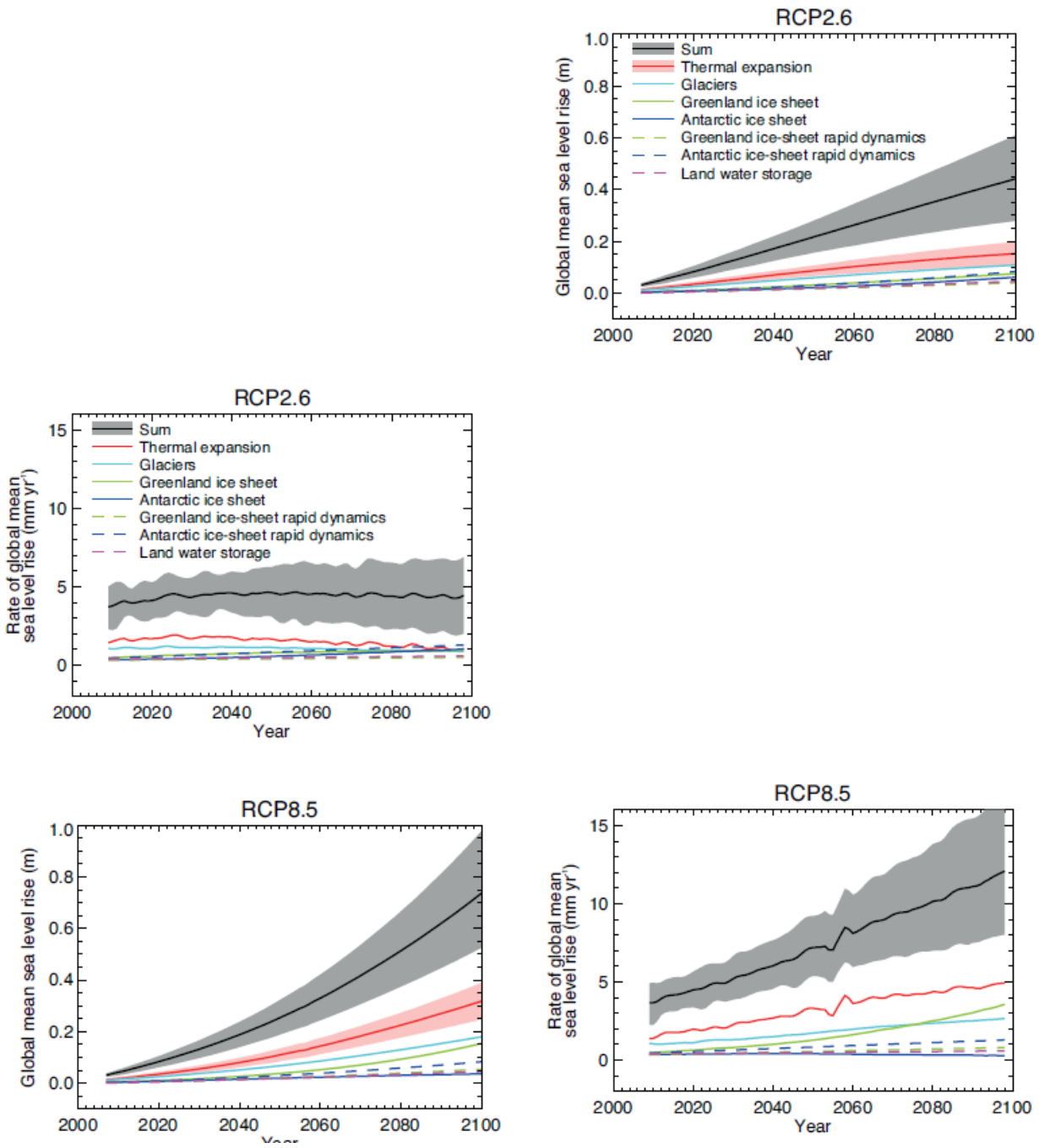


Figure 13.11 | Projections from process-based models of (a) global mean sea level (GMSL) rise relative to 1986–2005 and (b) the rate of GMSL rise and its contributions as a function of time for the four RCP scenarios and scenario SRES A1B. The lines show the median projections. For GMSL rise and the thermal expansion contribution, the *likely* range is shown as a shaded band. The contributions from ice sheets include the contributions from ice-sheet rapid dynamical change, which are also shown separately. The time series for GMSL rise plotted in (a) are tabulated in Annex II (Table AII.7.7), and the time series of GMSL rise and all of its contributions are available in the Supplementary Material. The rates in (b) are calculated as linear trends in overlapping 5-year periods. Only the collapse of the marine-based sectors of the Antarctic ice sheet, if initiated, could cause GMSL to rise substantially above the *likely* range during the 21st century. This potential additional contribution cannot be precisely quantified but there is *medium confidence* that it would not exceed several tenths of a metre of sea level rise.

Critique of IPCC current SLR rate

The IPCC report does not provide a detailed explanation of the source of the 4.0mm/y SLR rate. It references the work of Church and White [4] which gives a value of 2.8mm/y based on tide gauges and

3.2mm/y based on satellites. The world-wide average of tide gauge data requires complicated statistics to offset the uneven tide gauge distribution in space and time. The satellite data also requires adjustments for instrument calibrations. Both procedures are thus vulnerable to systematic errors.

Morner [5] shows the statistical distribution of tide gauge data (Figure 1) for SLR rates from a world-wide NOAA database of 204 tide gauges. The wings of the distribution represent locations where the land is either subsiding or rising. Clearly the average or median rate is between 1 to 2 mm/y.

The satellite (sa) value of 3.2mm/y and the IPCC value of 4.0mm/y are outside of any reasonable reading of the data. A review of the British data base of 1000 world-wide tide gauges by Beenstock et.al.[6] indicates an average of 0.4-1.1mm/y. They note that the spatial distribution of the older tide gauge distribution was much narrower with most of those tide gauges located in harbors served by European commerce (ie, Northeastern US, the Baltic, the European Atlantic, and the Mediterranean). Much of this group is located in areas with known land subsidence which strongly biased the older data. The author suggests that the efforts to weigh the world wide average has not adequately accounted for the distribution bias, and this problem has led to the strange discrepancy between data from current tide gauges and the "adjusted" values of the IPCC and satellites. A recent analysis of US coastal gauges [3] points to this same conclusion.

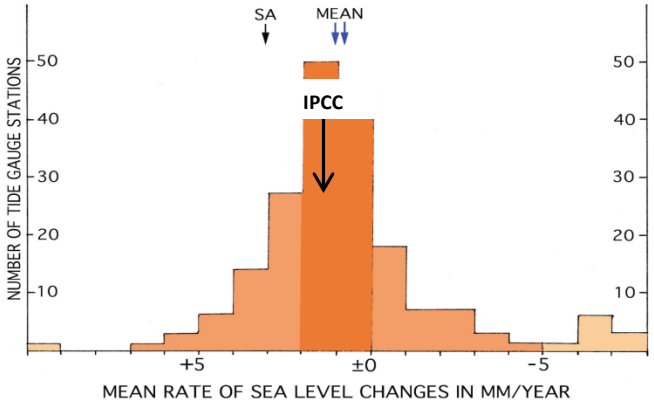
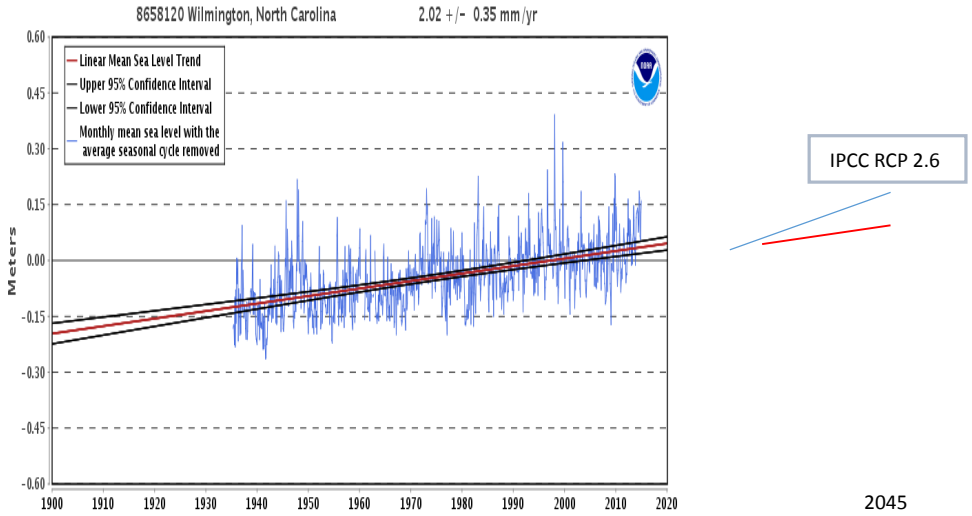


Figure 1. SLR rate distribution of 204 world wild tide gauges used by NOAA
[*Morner,N. 2013,Energy & Environment, 24,509-536*.]

Comparison of IPCC SLR rate and NC tide gauge data

In the IPCC case RCP2.6 the SLR rate is relatively constant, rising to only 4.7mm/y by 2045. This means they are projecting very little change from the current SLR rate within the next 30 years for that scenario. This case can be compared with a simple linear extrapolation of the NC tide gauge.

Figure 2 shows the NOAA tide gauge data with a linear extrapolation for thirty years shown by the red line. By comparison the blue line shows the IPCC RCP 2.6 case with the Panel values for local adjustments added. The IPCC case requires a change in the rate of SLR which is not supported by the data nor discussed in the report.



Wilmington tide gauge (NOAA)

Figure 2. Comparison of thirty year SLR for IPCC case RCP2.6 versus simple linear projections

Recommended Procedure

We would recommend that the CRC use the linear projection of the local NC tide gauges at each location as the best measure of the current local SLR rates. It can be seen from the plots of tide gauge data that the local rates fluctuate over short time scales, but that there is no evidence of any change in the local rates over the time scale of the measurements. The advantage of this procedure is the direct relation to published experimental data. No complex or questionable manipulation of data sets for remote locations would need to be justified. Both simplicity and clarity would recommend this procedure.

To account for future increase in the SLR rates, the IPCC report could be used as a documented estimate. Simply take the thirty year changes in SLR rates estimated in the two IPCC cases, and add these changes to the current rate obtained from the tide gauges. Since case RCP2.6 shows almost no change in SLR rate, we would drop that case and use the linear extrapolation as the low SLR estimate. Case RCP8.5 could then be used as the basis for the increase in SLR rate for the conservative or high SLR case. Table ES1 in the assessment would become:

Table ES1. Two relative sea level rise (RSLR) scenarios by 2045 using published NC tide gauges (NOAA 2014a) and IPCC scenario projection RCP 8.5 (Church et al. 2013). The linear projection of the tide gauge data representing the lowest scenario and the sea level rise acceleration from RCP 8.5 added to the tide gauge projection representing the highest warming scenario.

Station	Tide Gauge Projections		Tide Gauge + IPCC RCP 8.5 Projections	
	RSLR in 30 years (inches)		RSLR in 30 years (inches)	
	Mean	Range	Mean	Range
Duck	5.4	4.4-6.4	6.7	5.7-7.9
Oregon Inlet	4.3	2.7-5.9	5.6	4.0-7.3
Beaufort	3.2	2.8-3.6	4.5	2.4-5.2
Wilmington	2.4	2.0-2.8	3.7	3.3-4.4
Southport	2.4	1.9-2.8	3.7	3.3-4.4

References:

1. NOAA Mean Sea Level Trends, http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.htm?gid=1237
2. IPCC Fifth Assessment Report (AR5), Climate Change 2013-The Physical Science Basis,Chapter 13 http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter13_FINAL.pdf
3. Parker, A. and C. Ollier, *Discussion of a Modelling Study of Coastal Inundation Induced by Storm Surge, Sea-level Rise, and Subsidence in the Gulf of Mexico: The US Average Tide Gauge is not Accelerating Consistently with the Worldwide Average,* Physical Science International Journal 7(1): XX-XX, 2015, Article no.PSIJ.2015.057, ISSN: 2348-0130
4. Church, J. A., and N.J. White, 2011. Sea-level rise from the late 19th to the early 21st century *Surveys in Geophysics* , 32(4-5), 585–602. doi:10.1007/s10712-011-9119-1.
5. Morner,N. 2013,Energy & Environment, 24,509-536.
6. Beenstock, Michael, Daniel Felsenstein, Eyal Frank, and Yaniv Reingewertz. "Tide gauge location and measurement of global sea level rise." *Environmental and Ecological Statistics* (2014): 1-28.

James Early, Kitty Hawk, NC; retired engineer from DOE Lawrence Livermore National Laboratory, . Doctorate in engineering from Stanford University

S. Stanley Young, Doctorate in Statistics and Genetics from NC State University
Fellow of the American Statistical Association and the AAAS

John Droz, jr. Morehead City, NC Physicist

Appendix

The intention of this Commentary is to achieve two objectives:

a) a timely response to the NC 2015 SLR Report that is technically significant & accurate, *as well as*

b) a response to the NC SLR Report that is understandable by the public, and our NC legislators.

To simultaneously achieve both goals, is a substantial challenge. The *Appendix* was setup to separate out some of the more technical parts of this complex subject — which the casual reader can just peruse, and still hopefully get the point. [BTW: here is a good layman's overview of SLR measurements.]

The key issue with this Report is the authors' adulation with the IPCC (Intergovernmental Panel on Climate Change). Yes, on the surface the IPCC seems like a credible, objective source — *but is it really?*

Let's start with this **insightful synopsis** that's a good overview of IPCC issues. Here's another. As mentioned in those analyses, there is a significant and fundamental problem with the IPCC that needs to be clearly understood:

> Many people believe that the IPCC objectively and scientifically looked at the whole climate situation — and then concluded that human factors were dominant. Subsequent to that presumed scientific assessment, the IPCC focused on the human related climate change elements.

However, that is **not the case**. Read what their charter said:

> "The role of the IPCC is to assess on a comprehensive, objective, open and trans-parent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk **of human-induced climate change**, its potential impacts and options for adaptation and mitigation. The IPCC does not carry out research, nor does it monitor climate related data **or other relevant parameters**."

I've put the key parts in red. What this says is that the IPCC, by *statute*, is forced to **ONLY** consider human related climate changes. No other climate related changes — *no matter how important* — are seriously analyzed.
Science is a **Process** that involves a *comprehensive*, *objective*, *transparent* and *empirical* analysis of a technical issue.

Understanding the IPCC's directive makes it clear why their reports focus on human related climate change: *not that it's necessarily so important, but rather that this is what their charter had mandated them to do*. So, no matter how many scientists work with the IPCC, or how much "peer-review" there is, or how polished their methodology seems, the IPCC's charter **is fundamentally contrary to how real Science works!**

On January 2nd, 2015, a request was sent to several SLR experts — asking that they review the Version 4 draft of the CRC advisory Panel SLR Report. Below is a brief summary of some of the more applicable studies received to date, in response:

1 - There was a well-known Australian Report ("South Coast Regional Sea Level Rise Policy and Planning Framework": summary here) that basically regurgitated the IPCC conclusions. That is of interest, as this is essentially the same position taken by the NC CRC's technical advisory Panel. There were two detailed critiques of the Australian Report, and arguments against the IPCC very much apply to the NC situation:

a - NIPCC Commentary (authored by 11 scientists). There is **considerable** information here about the veracity of the IPCC and satellite SLR data.

b - Dr. John Happs Commentary (sent by the author)

2 - US Congressional testimony (2/26/14) by Dr. Patrick Michaels and Dr. Paul Knappenberger. They have a section in that worthwhile document that deals with SLR, and the IPCC's models. Their point appears to be: if the IPCC can't get the temperatures right, how can they accurately forecast SLR?

3 - US Congressional testimony (2/26/14) by Dr. Randy Randol. He pointedly objects to the IPCC scenarios — noting that none of them have been calibrated. He has a particularly worthwhile section ("VI") on SLR.

4 - US Congressional testimony (5/29/14) by Dr. Daniel Botkin. His very reasoned discussion is about the accuracy of IPCC models, which is a key matter here.

5 - State of the Climate Debate (9/16/14) by Dr. Judith Curry. She likewise discusses the IPCC process and the accuracy of its assumptions.

6 - Understanding The IPCC AR5 Climate Assessment (10/13) by Dr. Richard Lindzen. He writes that "the IPCC report … is a political document, and as George Orwell noted, 'is designed to make lies sound truthful.'"

7 - The IPCC AR5 Report: Facts -vs- Fictions (10/13) by Dr. Don Easterbrook, concludes that: "the IPCC report must be considered the grossest misrepresentation of data ever published." See also this critique.

8 - Sea Level Changes in the 19, 20th and 21st Centuries (10/14) by Dr. Nils-Axel Mörner. He cites considerable empirical records, concluding that: "This data set is in deep conflict with the high rates proposed by the IPCC."

9 - German Review: Sea Level Rise Way Below Projections – No Hard Basis For Claims Of Accelerating Rise (1/23/14) by Dr. Sebastian Lüning. This very detailed analysis concludes that the IPCC projections are "unscientific."

10-IPCC AR5: Unprecedented Uncertainty (10/13) by Dr. Euan Mearns. He concludes that "The IPCC has become confused… The consensus is broken."

11-A strong critique (7/16/14) by Larry Hamlin concludes: "IPCC AR5 claims of increasing rates of sea level rise from 1971 to 2010 are unsupported." That, in turn, undermines the veracity of their proposed scenarios.

12-Multi-scale dynamical analysis (MSDA) of sea level records versus PDO, AMO, and NAO indexes (5/14) by Dr. Nicola Scafetta. He concludes that SLR predictions (like IPCC's) are inaccurate as their basic methodology is flawed.

13-Ethics and Climate Change Policy (12/15/14) by Dr. Peter Lee. Although a bit more

general, he analyzes the IPCC and its methodology. There is a subsequent discussion of this insightful paper on Dr. Curry's site.

14-Regional Climate Downscaling: What's the Point? (1/31/12) by Dr. Roger Pielke. This well-researched paper discusses the differences and limitations between short term weather predictions, and long term climate predictions.

15-Twentieth-Century Global-Mean Sea Level Rise (6/13) by Gregory, et al. "Semi-empirical methods for projecting GMSLR depend on the existence of a relationship between global climate change and the rate of GMSLR, but the implication of the authors' closure of the budget is that such a relationship is weak or absent during the twentieth century."

16-Secular and Current Sea Level Rise (2014) by Dr. Klaus-Eckart Puls is mostly about how satellite readings have diverged from tidal gauges. However, he strongly criticizes the IPCC saying: "IPCC forecasts do not have much to do with objective science any more."

17-Evidence for Long-term Memory in Sea Level (8/5/14) by Dangendorf, et al observes that "natural variations could be playing a large role in regional and global sea level rise than previously thought."

18-Stop Climate Fear Mongering (12/23/14) by Dr. William Gray. His conclusion about the IPCC scenarios: "The science behind these CO_2 induced warming projections is very badly flawed and needs to be exposed."

19-Video Link to Sea-Level Rise Reality by Dr. Tom Wysmuller. He wrote me: "the NC SLR report treats the Glacial Isostatic Adjustment rather poorly (as does the University of Colorado and the IPCC)." [Ref page 7 of the Report.]

20-Statistical analysis of global surface air temperature and sea level using cointegration methods (2012) by Dr. Torben Schmith, et. al. They conclude that "the number of years of data needed to build statistical models that have the relationship expected from physics, exceeds what is currently available by a factor of almost ten."

Robert Kopp (on behalf of Kopp, Ben Horton, Andrew Kemp, and Claudia Tebaldi, via email on 6/23/2015)

Dear Mr. Miller,

On behalf of myself and my collaborators Ben Horton, Andrew Kemp and Claudia Tebaldi, I'm writing to comment upon the March 31, 2015, draft of "North Carolina Sea-Level Rise Assessment Report: 2015 Update to the 2010 Report and 2012 Addendum." Please find attached a PDF with detailed comments, along with a preprint copy of a background report currently in press at Climatic Change. We hope these comments are helpful, and we would be happy to be of further assistance as you revise the draft.

Sincerely,

Bob Kopp
--
Robert E. Kopp, Ph.D.
Associate Professor, Department of Earth & Planetary Sciences
Associate Director, Rutgers Energy Institute
Rutgers University

June 23, 2015

Mr. Tancred Miller
Division of Coastal Management
North Carolina Department of Environment and Natural Resources 1601
Mail Service Center, Raleigh, NC 27699-1601
tancred.miller@ncdenr.gov

Comments re: March 31, 2015, Draft of "North Carolina Sea-Level Rise Assessment Report: 2015 Update to the 2010 Report and 2012 Addendum"

Dear Mr. Miller,

As researchers working on the risks posed by sea-level rise and climate change to coastal communities, infrastructures, and ecosystems, we appreciate the opportunity to comment upon the March 31, 2015, draft of the 2015 update to the 2010 North Carolina Sea-Level Rise Assessment Report and 2012 Addendum.

As background, we attach our paper "Past and future sea-level rise along the coast of North Carolina, USA," which is currently in press at *Climatic Change* (Kopp et al., 2015)[1]. A version of this paper is publicly available from arXiv at http://arxiv.org/abs/1410.8369.

The current draft of "North Carolina Sea-Level Rise Assessment Report: 2015 Update to the 2010 Report and 2012 Addendum" makes a fundamental error in interpreting the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Nowhere does the IPCC estimate sea-level change beyond what it calls the 'likely' range (67% probability range; i.e., the 17th–83rd percentiles). The current report mistakenly describes these as "*5-95% uncertainty ranges*" (p. 18) and then uses these ranges as the basis for constructing its uncertainty estimates for

regional sea-level rise. (Note that these mistakenly construed 90% confidence intervals subsequently turn into 95% confidence intervals on page 19.)

Consistent with the IPCC estimates upon which they are based, the ranges of the current projections should be viewed as bracketing the central 67% of the probability distribution. As such, there is a 17% probability that sea-level rise will exceed the 'high' projections.

The current draft includes "no quantification of oceanographic effects … in the sea level projections."

This is not a tenable strategy, given the observed history of dynamic sea level off of North Carolina over the last three decades. It is also not a tenable strategy when trying to quantify uncertainty in projections of future sea-level change. Kopp et al. (2014)[2] and Kopp et al. (2015) estimate that oceanographic factors are responsible for about 80% of the variance in sea-level rise projections for Wilmington in the 2040s.

As discussed in the background paper, ocean dynamics (likely associated with either a long-term shift or multidecadal variability in the Gulf Stream) caused a sea-level deceleration off parts of North Carolina

[1] R. E. Kopp, B. P. Horton, A. C. Kemp and C. Tebaldi (2015). Past and future sea-level rise along the coast of North Carolina, United States. *Climatic Change*, arXiv:1410.8369, doi:10.1007/s10584-015-1451-x.
[2] R. E. Kopp, R. M. Horton, C. M. Little, J. X. Mitrovica, M. Oppenheimer, D. J. Rasmussen, B. H. Strauss, and C. Tebaldi (2014). Probabilistic 21st and 22nd century sea-level projections at a global network of tide gauge sites. *Earth's Future* 2: 287–306, doi:10.1002/2014EF000239.

over the last ~30 years. Relative sea-level rise in Wilmington from 1980-2010 was 0.7 ± 0.9 mm/y, compared to a 20th century average of 2.1 ± 0.5 mm/y. When projecting future sea-level rise for Wilmington (and other locations in North Carolina), one of two assumptions must be made. (1) The sea-level rise that was suppressed over 1980-2010 will not be recovered. This is the implicit assumption made in the report by using IPCC projections for 2015 as a baseline. (2) Alternatively, the suppressed sea-level rise represents natural variability that will be recovered, in which case projected sea-level rise should be measured from an earlier baseline.

Bound up in this issue is the report's use of 2015 as a baseline. Sea-level trends generally do not refer to year-to-year variability, which can be quite significant. At Wilmington for example, the difference between annual mean sea level and 20-year average sea level has a standard deviation of ~8 cm (~3 inches). Therefore, in an average 20-year interval, one year will experience an annual average sea level 5 inches above the 20-year mean, and another will experience an annual average sea level 5 inches below the 20-year mean. For this reason, it is commonplace to use a multi-decadal average as the baseline for sea-level projections. The IPCC uses 1986-2005 as its baseline; Kopp et al. (2014) take 19-year running averages of dynamic sea level, so their baseline is effectively 1991-2009.

In light of these concerns, the purported precision of the draft report should be viewed skeptically.

The practical need for localized sea-level rise estimates that cover more of the range of possible futures led Kopp et al. (2014) to develop a framework for generating self-consistent, probabilistic projections of localized sea-level rise.

Below, we present percentiles of the Kopp et al. (2014, 2015) sea-level rise projections for Wilmington and Duck from 2015 (i.e., the 2006-2024 average) to 2045 (the 2036-2054 average) under two different assumptions. The first set of assumptions (labeled 'a') follow the practices used in the current draft report, where 2015 is used as a baseline and the suppressed sea-level rise caused by ocean dynamic changes during the last ~30 years is not be recovered. In the second set of assumptions (labeled 'b') we assume that the suppressed sea-level rise is recovered over the next ~30 years. This difference in interpretation results in a ~2-4 inch difference between projections.

We highlight the 17th-83rd percentile projections, as these should be most comparable to the mistakenly construed '95% confidence intervals' in the draft report. For Wilmington, under RCP 8.5 and assumption a, we find a 67% probability interval of 5.9-10.2 inches, which compares to 4.3-9.3 inches in the draft report. For Duck under RCP 8.5 and assumption a, we find a 67% probability interval of 7.9-12.6 inches, which compares to 5.5-10.6 inches in the draft report. These differences of less than 2.5 inches arise both from the inclusion of ocean dynamic effects and from modestly higher global projections that arise in the self-consistent probabilistic framework employed by Kopp et al. (2014). As noted previously, a different assumption about the nature of dynamic sea-level variability over the last ~30 years (assumption b) would amplify these projections by 2-4 inches. Neither assumption is necessarily correct; rather, these should be taken as guides to one source of uncertainty that arise in projecting sea level, and should be judged appropriately in risk analysis.

More generally, we note that the 97.5th percentile (the upper bound of the central 95% probability interval), is ~2.3-3.5 inches higher at Wilmington than the 83rd percentile. Similarly, the 2.5th percentile (the lower bound of the central 95% probability interval) is ~2.0-3.2 inches lower at Wilmington than the 17th percentile. This indicates the extent to which the high and low estimates in the draft report must be extended if the goal is to offer a 95% probability interval. We also note that a 95% probability interval may not be the only relevant probability window for sea-level rise projections. The 1% average annual probability flood level, for example, is often used to define the flood plain, which suggests the 99th

percentile projection merits some attention. Under RCP 8.5, this reaches 14-19 inches at Wilmington and 17-22 inches at Duck.

By construction of the Kopp et al. (2014) framework, the estimates of the 99.9th percentile under RCP 8.5 align with other estimates of the maximum physically possible sea-level rise and may also be of interest. Over 2015-2045, this maximum possible level is 24 inches at Wilmington and 26 inches at Duck.

Based on the concerns described above, we urge that the draft report be revised to (1) give appropriate attention to the role of ocean dynamics, (2) correctly describe the probability intervals it is presenting, and (3) span a broader range of probability intervals than the 67% interval used, so as to better inform risk analysis.

Thank you for your consideration of these suggestions. We would be happy to be of further assistance as you revise the draft.

Sincerely, Robert

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Sea-Level Projections for Wilmington, NC and Duck, NC

after Kopp et al. (2014, 2015)

Wilmington (inches of sea-level rise, 2015-2045)

	Percentile										
	1%	**2.5%**	**5%**	**16.7%**	**50%**	**83.3%**	**95%**	**97.5%**	**99%**	**99.5%**	**99.9%**
RCP 8.5a	3.1	3.9	4.7	5.9	7.9	10.2	11.8	12.6	13.8	15.4	20.1
RCP 8.5b	3.5	4.7	5.9	7.9	11.0	14.2	16.5	17.7	19.3	20.1	24.4
RCP 2.6a	2.4	3.1	3.5	5.1	7.1	9.1	10.6	11.4	12.6	13.8	18.5
RCP 2.6b	3.1	4.3	5.1	7.1	9.8	12.6	15.0	16.1	17.7	18.9	22.8

Duck (inches of sea-level rise, 2015-2045)

	Percentile										
	1%	**2.5%**	**5%**	**16.7%**	**50%**	**83.3%**	**95%**	**97.5%**	**99%**	**99.5%**	**99.9%**
RCP 8.5a	4.7	5.5	6.3	7.9	10.2	12.6	14.2	15.4	16.5	17.7	22.8
RCP 8.5b	3.9	5.5	6.7	9.1	12.6	15.7	18.5	20.1	21.7	22.8	26.4
RCP 2.6a	3.9	4.7	5.1	6.7	9.1	11.0	13.0	13.8	15.4	16.5	20.9
RCP 2.6b	3.5	4.7	5.9	7.9	11.4	14.6	17.3	18.5	20.1	21.7	24.8

RCP 8.5: High emissions pathway, consistent with continued fossil-fuel intensive economic growth
RCP 2.6: Low emissions pathway, consistent with a rapid transition away from fossil fuels **Assumption a:** Sea-level rise suppressed by ocean dynamics over last two decades is not recovered **Assumption b:** Sea-level rise suppressed by ocean dynamics over last two decades is recovered

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Past and future sea-level rise along the coast of North Carolina, USA

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Abstract We evaluate relative sea level (RSL) trajectories for North Carolina, USA, in the context of tide-gauge measurements and geological sea-level reconstructions spanning the last ~11,000 years. RSL rise was fastest (~7 mm/yr) during the early Holocene and slowed over time with the end of the deglaciation. During the pre-Industrial Common Era (i.e., 0–1800 CE), RSL rise (~0.7 to 1.1 mm/yr) was driven primarily by glacio-isostatic adjustment, though dampened by tectonic uplift along the Cape Fear Arch. Ocean/atmosphere dynamics caused centennial variability of up to ~0.6 mm/yr around the long-term rate. It is extremely likely (probability $P = 0.95$) that 20th century RSL rise at Sand Point, NC, (2.8 ± 0.5 mm/yr) was faster than during any other century in at least 2,900 years. Projections based on a fusion of process models, statistical models, expert elicitation, and expert assessment indicate that RSL at Wilmington, NC, is very likely ($P = 0.90$) to rise by 42–132 cm between 2000 and 2100 under the high-emissions RCP 8.5 pathway. Under all emission pathways, 21st century RSL rise is very likely ($P > 0.90$) to be faster than during the 20th century. Due to RSL rise, under RCP 8.5, the current '1-in-100 year' flood is expected at Wilmington in ~30 of the 50 years between 2050-2100.

1 Introduction

Sea-level rise threatens coastal populations, economic activity, static infrastructure, and ecosystems by increasing the frequency and magnitude of flooding in low-lying areas. For example, Wilmington, North Carolina (NC), USA, experienced nuisance flooding ~2.5 days/yr on average between 1938 and 1970, compared to 28 days/yr between 1991 and 2013 (Ezer and Atkinson, 2014). However, the likely magnitude of 21st century sea-level rise – both globally and regionally – is uncertain. Global mean sea-level (GMSL) trends are driven primarily by ocean heat uptake and land ice mass loss. Other processes, such as ocean dynamics, the static-equilibrium 'fingerprint' effects of land ice loss on the height of Earth's geoid and surface, tectonics, and glacio-isostatic adjustment (GIA), are spatially variable and cause sea-level rise to vary in rate and magnitude between regions (Milne et al, 2009; Stammer et al, 2013). Sound risk management necessitates that decision-makers tasked with creating resilient coastal ecosystems, communities, and economies are informed

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by reliable projections of the risks of regional relative sea-level (RSL) change (not just GMSL change) on policy-relevant (decadal) timescales (Poulter et al, 2009).

The North Carolina Coastal Resources Commission (CRC)'s Science Panel on Coastal Hazards (2010) recommended the use of 1 m of projected sea-level rise between 2000 and 2100 for statewide policy and planning purposes in North Carolina. Since the CRC's 2010 assessment, several advances have been made in the study of global and regional sea-level change. These include new reconstructions of sea level in the U.S. generally and North Carolina in particular during the Holocene (the last ~11.7 thousand years) (Engelhart and Horton, 2012; van de Plassche et al, 2014) and the Common Era (the last two millennia) (Kemp et al, 2011, 2013, 2014), estimates of 20th century GMSL change (Church and White, 2011; Ray and Douglas, 2011; Hay et al, 2015), localized projections of future sea-level change (Kopp et al, 2014), and state-level assessments of the cost of sea-level rise (Houser et al, 2015).

Political opposition led to North Carolina House Bill 819/Session Law 2012-202, which blocked the use of the 1 m projection for regulatory purposes and charged the Science Panel on Coastal Hazards to deliver an updated assessment in 2015 that considered *"the full range of global, regional, and North Carolina-specific sea-level change data and hypotheses, including sea-level fall, no movement in sea level, deceleration of sea- level rise, and acceleration of sea-level rise"* (North Carolina General Assembly, 2012). Here, we assess the likelihood of these trajectories with respect to past and future sea-level changes in North Carolina.

2 Mechanisms for global, regional, and local relative sea-level changes

Relative sea level (RSL) is the difference in elevation between the solid Earth surface and the sea surface at a specific location and point in time. Commonly, it is time-averaged to minimize the influence of tides and is compared to the present as the reference period (Shennan et al, 2012). RSL averaged over all ocean basins yields an estimate of GMSL.

GMSL rise is driven primarily by (1) increases in ocean mass due to melting of land-based glaciers (e.g., Marzeion et al, 2012) and ice sheets (e.g., Shepherd et al, 2012) and (2) expansion of ocean water as it warms (e.g., Gregory, 2010). Changes in land water storage due to dam construction and groundwater withdrawal also contributed to 20th century GMSL change (e.g., Konikow, 2011). RSL differs from GMSL because of (1) factors causing vertical land motion, such as tectonics, sediment compaction, and groundwater withdrawal; (2) factors affecting both the height of the solid Earth and the height of Earth's geoid, such as long-term GIA and the more immediate 'sea-level fingerprint' static-equilibrium response of the geoid and the solid Earth to redistribution of mass between land-based ice and the ocean; and (3) oceanographic and atmospheric factors affecting sea-surface height relative to the geoid, such as changes in ocean-atmospheric dynamics and the distribution of heat and salinity within the ocean (e.g., Kopp et al, 2014, 2015)

Along the U.S. Atlantic coast, the principal mechanism for regional departures from GMSL during the Holocene is GIA, which is the ongoing, multi-millennial response of Earth's shape and geoid to large-scale changes in surface mass load (e.g., Clark et al, 1978) (Figure 1e). Growth and thickening of the Laurentide ice sheet during the last glaciation caused subsidence of land beneath the ice mass (Clark et al, 2009). A compensating outward flow in the mantle created a peripheral bulge around the ice margin in the U.S. mid-Atlantic region. In addition to uplifting the solid Earth in the U.S. mid-Atlantic region, these flows also increased the regional height of the geoid and reduced the global volume of the ocean basin. These latter two factors led to a rising sea-surface height in the U.S. mid-Atlantic region and thus a total RSL fall less than the regional uplift (Farrell and Clark, 1976). As the Laurentide ice sheet shrunk, mantle flow back toward the center of the diminishing ice sheet caused subsidence and progressive inward migration of the peripheral forebulge. One commonly used physical model of GIA (ICE-5G-VM2-90) yields contributions to 20th century sea-level rise of ~1.3 mm/yr at New York City and ~0.5 mm/yr at Wilmington, NC (Peltier, 2004), but exact values depend upon assumptions regarding ice-sheet history and mantle viscosity.

Along much of the U.S. Atlantic coast, the tectonic contribution to RSL change is assumed to be negligible over timescales of centuries to millennia (e.g., Rowley et al, 2013), but parts of the North Carolina coastal plain are underlain by the Cape Fear Arch (Sheridan, 1976) (Figure 1b). Geologic and geomorphic data suggest that uplift of the crest of the Cape Fear Arch began during the Pliocene (Wheeler, 2006) and is ongoing (Brown, 1978). Late Holocene rates of uplift (RSL fall) have been estimated at $\sim 0.2 \pm 0.2$ mm/yr (e.g., Marple and Talwani, 2004; van de Plassche et al, 2014).

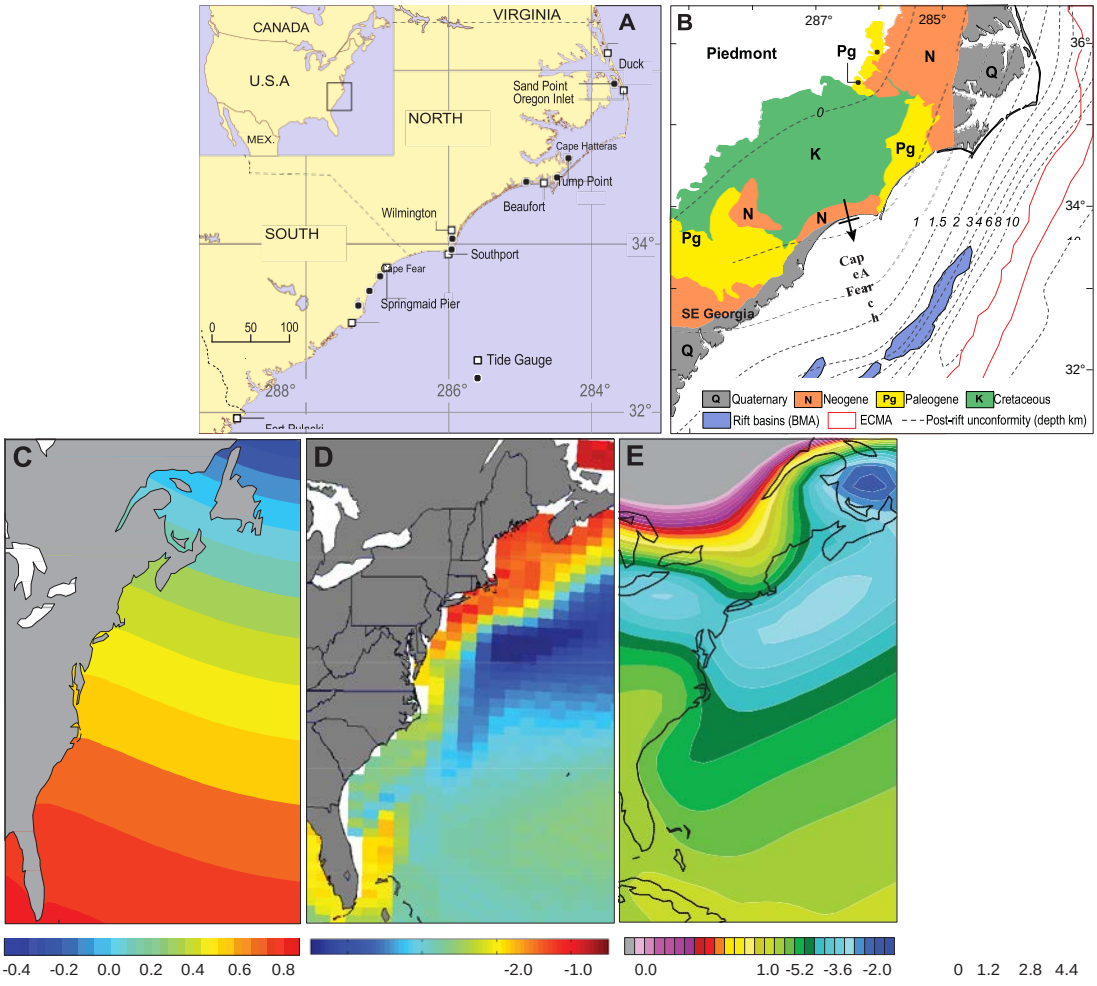

Fig. 1 (A) Location map. (B) Map of regional shallow subsurface geology, post-rift unconformity, and large-scale structural geology (Dillon and P., 1988; Gohn, 1988; Grow and Sheridan, 1988; North Carolina Geological Survey, 2004). (C) Static-equilibrium fingerprint of RSL change from uniform melting of the Greenland Ice Sheet (Mitrovica et al, 2011), in units of mm RSL rise per mm GMSL rise. (D) Ocean dynamic contribution to RSL over 2006-2100 in the Community Earth System Model RCP 8.5 experiment from the Coupled Model Intercomparison Project Phase 5 (Taylor et al, 2012). (E) GIA contribution to RSL under the ICE-6G VM5b model (Engelhart et al, 2011)

The static-equilibrium 'fingerprint' contribution to RSL changes arises from the immediate response of Earth's geoid, rotation, and elastic lithosphere to redistribution of mass between land ice and the ocean (Clark and Lingle, 1977; Mitrovica et al, 2011). As the mass of an ice sheet or glacier shrinks, sea-level rise is greater in areas geographically distal to the land ice than in areas close to it, primarily because the gravitational attraction between the ice mass and the ocean is reduced. Greenland Ice Sheet (GrIS) mass loss, for instance, generates a meridional sea-level gradient along the U.S. Atlantic coast (Figure 1c), where Maine experiences ~30% of the global mean response, compared to ~60% in North Carolina and ~80% in south Florida. Melting of the West Antarctic Ice Sheet (WAIS), by contrast, causes a nearly uniform rise along the U.S. Atlantic coast (including North Carolina), which is about 20% higher than the global average due primarily to the effect of WAIS mass loss on Earth's rotation (Mitrovica et al, 2009). Though the magnitude of sea-level fingerprints proximal to a changing ice mass is sensitive to the internal distribution of that mass, this sensitivity diminishes with distance. For example, at the distance of North Carolina, assumptions about the distribution of mass lost from GrIS have only an ~10% effect on the fingerprint (i.e., a RSL effect equal to ~6% of the global mean) (Mitrovica et al, 2011).

Oceanographic effects change sea-surface height relative to the geoid (e.g., Kopp et al, 2010). They include both global mean thermal expansion and regional changes in ocean-atmospheric dynamics and in the distribution of heat and salinity within the ocean. For example, changes in the Gulf Stream affect sea level in the western North Atlantic Ocean (e.g., Kienert and Rahmstorf, 2012; Ezer et al, 2013). As observed by satellite altimetry, the dynamic sea-surface height off of New Jersey averages ∼60 cm lower than the height off of Bermuda. By contrast, off the North Carolina coast, the dynamic sea-surface height averages ∼30 cm lower than off Bermuda, and this difference diminishes much more quickly off shore than it does north of Cape Hatteras, where the Gulf Stream separates from the U.S. Atlantic coast and turns toward northern Europe (Yin and Goddard, 2013). Ocean modeling shows that a slower Gulf Stream, which can be caused by a weaker Atlantic Meridional Overturning Circulation or by shifting winds, would reduce these sea-level gradients, increasing sea level along the U.S. Atlantic coast north of Cape Hatteras (Figure 1d). A northward shift in the position of the Gulf Stream, which could result from a migration of the Intertropical Convergence Zone (ITCZ), would similarly raise mid-Atlantic sea levels. In contrast, sea-surface height in coastal regions south of Cape Hatteras is less influenced by changes in the Gulf Stream (Yin and Goddard, 2013).

Locally in North Carolina, RSL also changes in response to sediment compaction (Brain et al, 2015), groundwater withdrawal (Lautier, 2006), and tidal-range shifts. North Carolina is partly located within the Albemarle Embayment (Figure 1b), a Cenozoic depositional basin (Foyle and Oertel, 1997) stretching from the Norfolk Arch at the North Carolina/Virginia border to southern Pamlico Sound at the Cape Lookout High. The embayment is composed of ∼1.5 km thick post-rift sedimentary rocks and Quaternary unconsolidated sediments (e.g., Gohn, 1988), currently undergoing compaction (e.g., van de Plassche et al, 2014).

The influence of local factors on regional RSL reconstructions is minimized by using proxy and instrumental data from multiple sites. For example, Kemp et al (2011) concluded that local factors were not the primary driving mechanisms for RSL change in North Carolina over the last millennium, because the trends reconstructed at two sites located >100 km apart in different water bodies closely agree.

3 Methods

3.1 Historical reconstruction

Tide gauges provide historic measurements of RSL for specific locations (Figure 1a). In North Carolina, there are two long-term tide-gauge records: Southport (covering 1933-1954, 1976-1988, and 2006-2007) and Wilmington (covering 1935 to present). Both have limitations: Southport has temporal gaps in the record, while the Wilmington record was influenced by deepening of the navigational channels, which increased the tidal range (Zervas, 2004). There are also shorter records from Duck (1978 to present), Oregon Inlet (1977 and 1994 to present), and Beaufort (1953-1961, 1966-1967, and 1973 to present), which we also include in our analysis.

Geological reconstructions provide proxy records of pre-20th century RSL. Our database of Holocene RSL reconstructions from North Carolina includes 107 discrete sea-level constraints from individual core samples collected at a suite of sites (Horton et al, 2009; Engelhart and Horton, 2012; van de Plassche et al, 2014). It also includes two continuous Common Era RSL reconstructions, from Tump Point (spanning the last ∼1000 years) and Sand Point (spanning the last ∼2000 years), produced using ordered samples from cores of salt-marsh sediment (Kemp et al, 2011) (Figure 1a). Salt marshes from the U.S. Atlantic Coast provide higher-resolution reconstructions than other sea-level proxies (in North Carolina, < 0.1 m vertically and ± 1 to ± 71 y geochronologically). The combination of an extensive set of Holocene sea-level index points, multiple, high-resolution Common Era reconstructions, and tide-gauge measurements makes North Carolina well suited to evaluating past sea-level changes.

We fit the proxy and tide-gauge observations to a spatio-temporal Gaussian process (GP) statistical model of the Holocene RSL history of the U.S. Atlantic Coast. The model is similar to that of Kopp (2013), though with a longer temporal range and with geochronological uncertainty accommodated through the noisy-input GP method of McHutchon and Rasmussen (2011). To provide regional context, the fitted data also include records from outside of North Carolina, in particular salt-marsh reconstructions from New Jersey (Kemp et al, 2013) and Florida (Kemp et al, 2014) and all U.S. Atlantic Coast tide-gauge records in the Permanent Service for Mean Sea Level (2014) database with >60 years of data. To aid comparison with the proxy reconstructions, tide-gauge measurements were incorporated into the analysis as decadal averages. The GP

model represents sea level as the sum of spatially-correlated low-frequency (millennial), medium-frequency (centennial) and high-frequency (decadal) processes. Details are provided in the Supporting Information. All estimated rates of past RSL change in this paper are based on application of the GP model to the combined data set and are quoted with 2σ uncertainties.

3.2 Future projections

Several data sources are available to inform sea-level projections, including process models of ocean and land ice behavior (e.g., Taylor et al, 2012; Marzeion et al, 2012), statistical models of local sea-level processes (Kopp et al, 2014), expert elicitation on ice-sheet responses (Bamber and Aspinall, 2013) and expert assessment of the overall sea-level response (Church et al, 2013; Horton et al, 2014). Kopp et al (2014) synthesized these different sources to generate self-consistent, probabilistic projections of local sea-level changes around the world under different future emission trajectories.

Combined with historical records of storm tides, RSL projections provide insight into the changes in expected flood frequencies over the 21st century. We summarize the RSL projections of Kopp et al (2014) for North Carolina and apply the method of Tebaldi et al (2012) and Kopp et al (2014) to calculate their implications for flood-return periods.

Note that the projections of Kopp et al (2014) are not identical to those of the expert assessment of the Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report (Church et al, 2013). The most significant difference arises from the use of a self-consistent framework for estimating a complete probability distribution of RSL change, not just the likely (67% probability) GMSL projections of the IPCC. Kopp et al (2014) and the IPCC estimate similar but not identical likely 21st century GMSL rise (under RCP 8.5, 62–100 cm vs. 53–97 cm, respectively; under RCP 2.6, 37–65 cm vs. 28–60 cm).

4 Holocene sea-level change in North Carolina

RSL rose rapidly during the early and mid-Holocene, increasing in central North Carolina from -30.1 ± 1.8 m at 9000 BCE to -4.1 ± 0.7 m at 2000 BCE (Fig. 2a). The rate of RSL rise decreased over time, as a result of declining input from shrinking land ice reservoirs and slowing GIA (Peltier, 2004; Milne and Mitrovica, 2008), from a millennially-averaged rate of 6.8 ± 1.2 mm/yr at 8000 BCE to 0.8 ± 1.0 mm/yr at 2500 BCE. A declining GIA rate with increasing distance from the center of the Laurentide ice sheet (Engelhart et al, 2009), along with a contribution from tectonic uplift along the Cape Fear Arch (van de Plassche et al, 2014), caused spatial variability in the rate of Common Era RSL rise along the U.S. Atlantic coast and within North Carolina (Fig. 3a). At Sand Point in northern North Carolina, RSL rose from -2.38 ± 0.06 m at 0 CE to -0.37 ± 0.05 m by 1800 CE, an average rate of 1.11 ± 0.03 mm/yr. In the Wilmington area, the estimated average rate of RSL rise from 0 to 1800 CE was 0.8 ± 0.2 mm/yr (Fig. 3a-b; Table S-1).

Century-average rates of RSL change varied around these long-term means. For example, between 1000 and 1800 CE at Sand Point, century-average rates of RSL change ranged from a high of 1.7 ± 0.5 mm/yr (in the 12th century) to a low of 0.9 ± 0.5 mm/yr (in the 16th century) (Figure 2b). Synchronous sea-level changes occurred in southern NC over the same period of time (Kemp et al, 2011). However, the sign of the North Carolina RSL rate changes contrasts with that reconstructed at sites further north in New Jersey (Kopp, 2013) (Figure 2c). This contrast suggests a role for changes in ocean and atmosphere circulation, such as a shift in the position or strength of the Gulf Stream, in explaining these variations. A strengthening of the Gulf Stream (the opposite of the pattern depicted in Figure 1d) would be consistent with the observations. The absence of similarly timed variations in Florida (Kemp et al, 2014) excludes a significant contribution from the static-equilibrium fingerprint of GrIS mass changes (Figure 1c).

5 Twentieth-century sea-level changes in North Carolina

The most prominent feature in the North Carolina Common Era sea-level record is the acceleration of the rate of rise between the 19th and 20th centuries (Figure 2b-c). At Sand Point, the average rate of RSL rise over the 19th century (1.0 ± 0.5 mm/yr) was within the range of previous Common Era variability and close

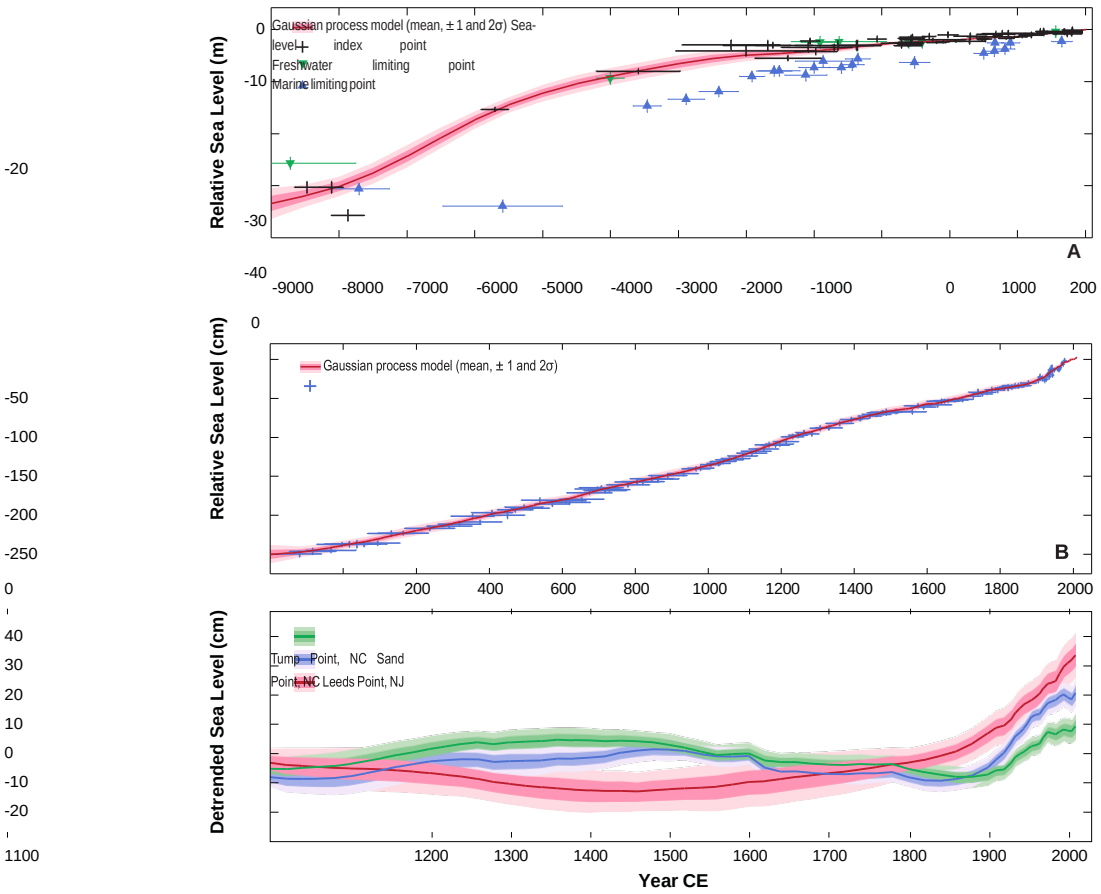

Fig. 2 (a) Holocene RSL in North Carolina, showing a representative GP estimate for central North Carolina (*red*), as well all index points (*crosses*), marine limiting points (*blue upward triangles*), and freshwater limiting points (*green downward triangles*) from North Carolina. Index/limiting points shown with 2σ error bars. (b) RSL over the Common Era at Sand Point, North Carolina. (c) RSL detrended with respect to the 1000-1800 CE average rate for North Carolina (NC) and New Jersey (NJ). GP estimates are shown with 1σ (*dark shading*) and 2σ (*light shading*) errors.

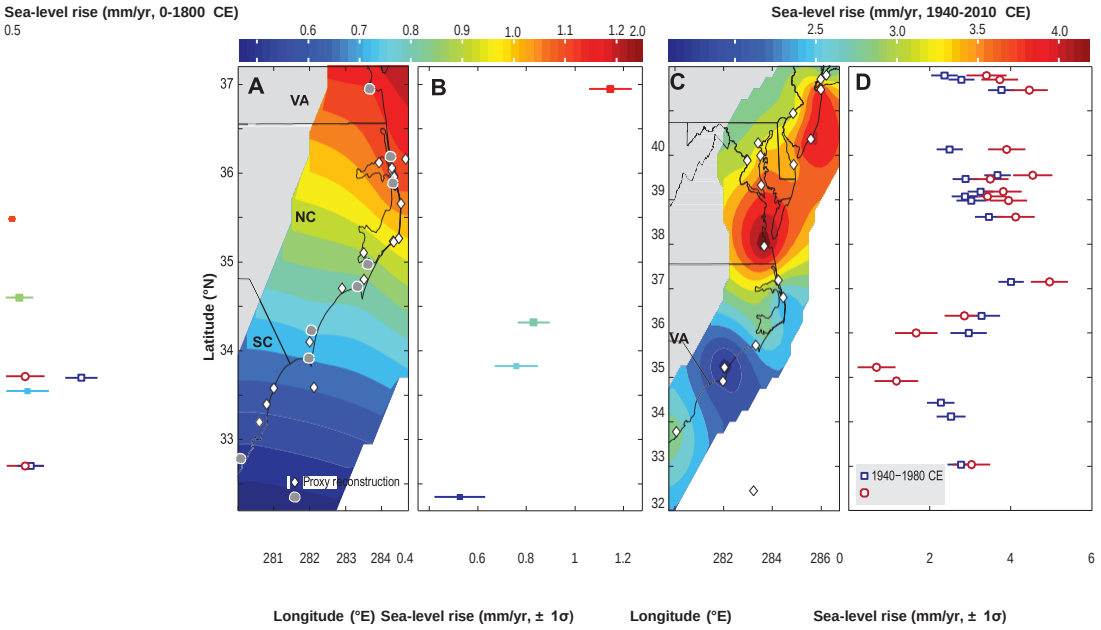

Fig. 3 (a) Pre-Industrial Common Era rate of RSL rise (0-1800 CE; mm/yr). Diamonds: proxy sites; grey circles: selected tide gauges and continuous proxy records (as in Tables S-1 and S-2). Uncolored areas have 1σ uncertainty >0.15 mm/yr. (b) shows estimates at indicated tide-gauge and continuous proxy record sites (1σ errors). (c) 1940-2010 rate of RSL rise. Diamonds: tide-gauge locations with >60 years of data. Uncolored areas have 1σ uncertainty >0.5 mm/yr. (d) 1940-1980 (blue squares) and 1980-2010 (red circles) rates of RSL rise at tide-gauge sites.

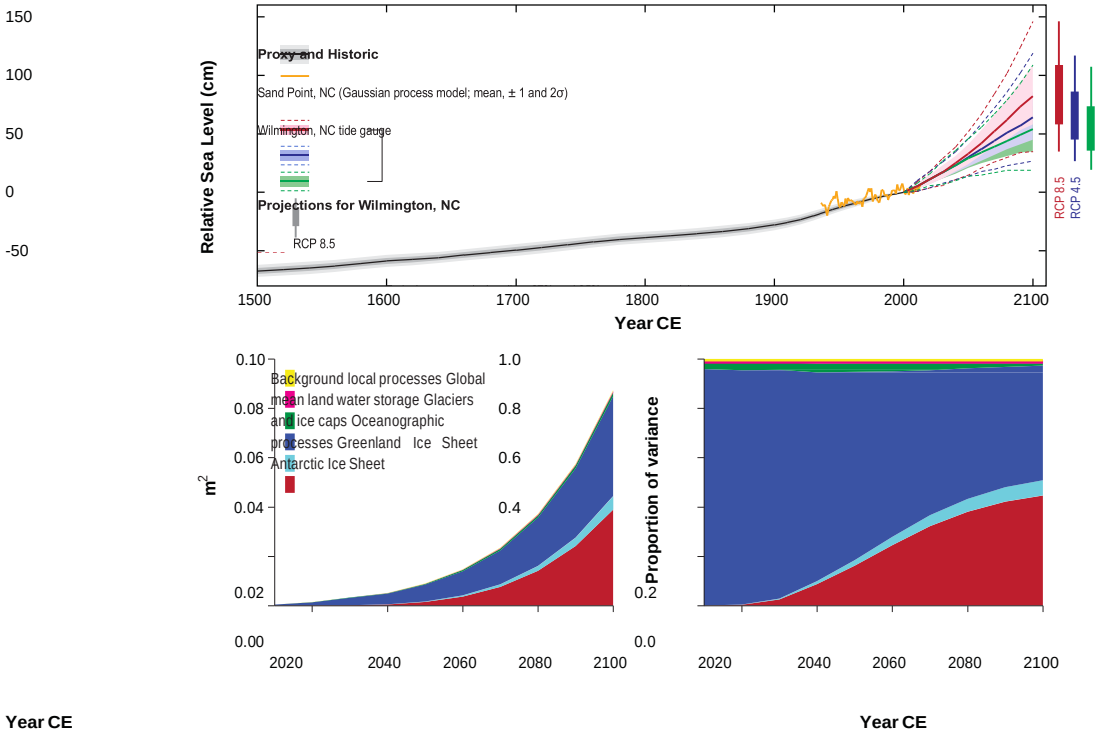

Fig. 4 (a) GP estimate of sea-level at Sand Point (*black*), annual Wilmington tide-gauge data (*orange*), and Kopp et al (2014) projections for RCP 8.5 (*red*), 4.5 (*blue*), and 2.6 (*green*). Shading/dashed lines = 67%/95% credible intervals. Bars and whiskers represent 67% and 95% credible intervals of 2100 CE projections. All heights relative to 2000 CE. (b-c) Sources of uncertainty in RCP 8.5 20-year-average sea-level rise projection at Wilmington, shown in units of (b) variance and (c) fractional variance as in Kopp et al (2014).

to the long-term average. By contrast, it is extremely likely ($P = 0.95$) that the 2.7 ± 0.5 mm/yr experienced in the 20th century was not exceeded in any century since at least the 10th century BCE (which had a rate of 1.2 ± 1.6 mm/yr). Average 20th century RSL rates range from 2.1 ± 0.5 mm/yr at Wilmington to 3.5 ± 0.3 mm/yr at Tump Point (Table S-1).

Spatial patterns of sea-level variability are detectable at higher temporal frequencies in the tide-gauge record (Kopp, 2013; Yin and Goddard, 2013) (Figure 3c-d; Table S-2). From 1940 to 1980 CE, sea-level rise in both North Carolina and the U.S. mid-Atlantic region exceeded the global mean. At Wilmington and Duck, the average rates were 2.3 ± 0.7 mm/yr and 3.3 ± 0.9 mm/yr, respectively, compared to 2.8 ± 0.6 mm/yr at New York City and a GMSL rise of 0.8 ± 0.8 mm/yr (Hay et al, 2015). This pattern changed over the interval from 1980 to 2010 CE, when the rate of GMSL rise increased to 2.5 ± 0.5 mm/yr while rates of RSL rise south of Cape Hatteras remained stationary or decreased (1.7 ± 1.0 mm/yr at Beaufort, 0.7 ± 0.9 mm/yr at Wilmington, and 1.2 ± 1.1 mm/yr at Southport). In contrast, sites north of Cape Hatteras experienced a significant increase in rate; at New York City, for example, RSL rose at 3.7 ± 0.9 mm/yr.

Several recent papers identified this regional phenomenon in the northeastern U.S. as a "hot spot" of sea-level acceleration (Sallenger et al, 2012; Boon, 2012; Ezer and Corlett, 2012; Kopp, 2013). Less attention has been paid to its counterpart in the southeastern U.S., which might be regarded as a "hot spot" of deceleration, especially when considered in the context of the GMSL acceleration occurring over the same interval. The pattern of a sea-level increase north of Cape Hatteras and sea-level decrease south of Cape Hatteras is consistent with a northward migration of the Gulf Stream (Yin and Goddard, 2013; Rahmstorf et al, 2015). It is also consistent with the dominant spatial pattern of change seen in the North Carolina and New Jersey proxy reconstructions from the 16th through the 19th century (Figure 2c). Dredging has, however, contaminated some North Carolina tide gauges, rendering a simple assessment of the ocean dynamic contribution during the 20th century challenging.

Table 1 Projected sea-level rise in North Carolina under RCP 8.5 and RCP 2.6

cm	RCP 8.5					RCP 2.6			
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
DUCK, NC									
2030	23	16–29	12–33	6–39	43	22	17–28	12–32	7–38
2050	41	31–51	24–59	15–72	83	37	28–46	22–53	13–66
2100	100	73–129	54–154	29–214	304	70	50–93	36–113	17–181
2150	160	124–206	103–255	76–425	627	99	71–136	56–184	39–357
2200	225	166–304	134–394	99–715	1055	131	80–196	58–287	33–607
WILMINGTON, NC									
2030	17	12–23	8–27	3–33	36	17	12–21	9–25	4–30
2050	33	24–42	18–48	10–61	75	29	21–36	16–42	9–55
2100	82	58–109	42–132	20–194	281	54	36–74	24–94	8–162
2150	135	101–180	81–230	57–395	596	77	48–113	34–161	16–334
2200	194	136–273	105–364	74–678	1016	101	50–166	27–257	3–575

Values represent two-decade averages and are in cm above 1990–2010 ('2000') mean sea level.
Columns correspond to different projection probabilities. For example, the "5-95" columns correspond to the 5th to 95th percentile; in IPCC terms, the 'very likely' range.
The RCP 8.5 99.9th percentile corresponds to the maximum level physically possible.

6 Future sea-level projections for North Carolina

The integrated assessment and climate modeling communities developed Representative Concentration Pathways (RCPs) to describe future emissions of greenhouse gases consistent with varied socio-economic and policy scenarios (Van Vuuren et al, 2011). These pathways provide boundary conditions for projecting future climate and sea-level changes. RCP 8.5 is consistent with high-end business-as-usual emissions. RCP 4.5 is consistent with moderate reductions in greenhouse gas emissions, while RCP 2.6 requires strong emissions reductions. These three RCPs respectively yield likely ($P = 0.67$) global mean temperature increases in 2081-2100 CE of 3.2–5.4°C, 1.7–3.2°C, and 0.9–2.3°C above 1850-1900 CE levels (Collins et al, 2013).

A bottom-up assessment of the factors contributing to sea-level change (Kopp et al, 2014) indicates that, regardless of the pathway of future emissions, it is virtually certain ($P > 0.998$) that both Wilmington and Duck will experience a RSL rise over the 21st century and very likely ($P > 0.90$) that the rate of that rise will exceed the rate observed during the 20th century. Below, we summarize the bottom-up projections of Kopp et al (2014) for Wilmington and Duck, NC, which bracket the latitudinal extent and degree of spatial variability across the state (Tables 1, S-3, S-4, S-5).

Under the high-emissions RCP 8.5 pathway, RSL at Wilmington will very likely ($P = 0.90$) rise by 8–27 cm (median of 17 cm) between 2000 and 2030 CE and by 18–48 cm (median of 33 cm) between 2000 and 2050 CE (Figure 4a). Projected RSL rise varies modestly across the state, with a very likely rise of 12–33 cm (median 23 cm) between 2000 and 2030 CE and of 24–59 cm (median of 41 cm) between 2000 and 2050 CE at Duck. Because sea level responds slowly to climate forcing, projected RSL rise before 2050 CE can be reduced only weakly (~3-6 cm) through greenhouse gas mitigation.

It is important to consider these numbers in the context of the background variability in annual-mean and decadal-mean RSL. Relative to 20-year-mean RSL, annual-mean RSL as measured by the Wilmington tide gauge has a standard deviation of ~8 cm, so the median projection for 2030 CE is only slightly above twice the standard deviation. It would therefore not be surprising to see an isolated year with RSL as high as that projected for 2030 CE even in the absence of a long-term trend. However, consecutive years of that height would be unexpected, as decadal-mean RSL has a standard deviation of ~1 cm. Given the magnitude of decadal variability, however, differences in projections of <~4 cm should not be viewed as significant.

Reductions in greenhouse gases over the course of the 21st century can significantly affect sea-level rise after 2050 CE. Under the high-emissions RCP 8.5 pathway, RSL at Wilmington is very likely to rise by 42–132 cm (median of 82 cm) between 2000 and 2100 CE, while under the low-emissions RCP 2.6 pathway, it is very likely to rise by 24–94 cm (median of 54 cm). The maximum physically possible 21st century sea-level rise is significantly higher (~280 cm), although the estimated probability of such an outcome is extremely low ($P \approx 0.001$) (Kopp et al, 2014). Projected RSL rise varies modestly across the state, with a very likely rise of 54–154 cm (median of 100 cm) under RCP 8.5 and 36–113 cm (median of 70 cm) under RCP 2.6 at Duck, a difference from Wilmington of ~12–22 cm.

Uncertainty in projected RSL rise in North Carolina stems from two main sources: the (1) oceanographic and (2) Antarctic ice sheet responses to climate change. The former source dominates the uncertainty through most of the century, with the Antarctic response coming to play a roughly equal role by the end of the century (Figure 4b-c). At Wilmington, under RCP 8.5, ocean dynamics is likely ($P = 0.67$) to contribute -9 to +17 cm (median 5 cm) to 21st century sea-level rise. The dynamic contribution increases to the north, with -9 to +25 cm (median 8 cm) likely at Duck. These contributions are less than those in the northeastern United States; for example, at New York, ocean dynamics are likely to contribute -6 to +35 cm (median 14 cm). The GrIS contribution to uncertainty in North Carolina RSL change is smaller than the Antarctic contri- bution because of two factors. First, GrIS makes a smaller overall contribution to GMSL uncertainty, because GrIS mass change is dominated by surface mass balance, while the behavior of WAIS is dominated by more complex and uncertain ocean/ice sheet dynamics. Second, the GrIS contribution to North Carolina RSL change and to its uncertainty is diminished by the static-equilibrium fingerprint effect to about 60% of its global mean value.

7 Implications of sea-level rise for flood risk and economic damages

Based on historical storm tides, the '1-in-10 year' flood (i.e., the flood level with a probability of 10% in any given year) at the Wilmington tide gauge is 0.60 m above current mean higher high water (MHHW). In the absence of sea-level rise, one would expect three such floods over a 30-year period. Assuming no increase in the height of storm-driven flooding relative to mean sea level and accounting for the probability distribution of projected sea-level rise as in Kopp et al (2014), seven similar magnitude floods are expected between 2000 and 2030 (regardless of RCP). Between 2000 and 2050, the expected number of years experiencing a flood at 0.60 m above current MHHW increases from 5 to 21. After 2050, regardless of RCP, almost every year is expected to see at least one flood at 0.60 m above current MHHW. Similarly, the expected number of 0.93 m '1-in-100 year' floods will increase with projected sea-level rise. The '1-in-100 year' flood is expected about 1.6–1.8 times between 2000 and 2050 (rather than the 0.5 times expected in the absence of sea-level rise). During the second half of the century, '1-in-100 year' flooding is expected in 29 of 50 years under RCP 8.5 and 17 of 50 years under RCP 2.6.

Houser et al (2015) characterized the costs of projected sea-level rise and changes in flood frequency using the Risk Management Solutions North Atlantic Hurricane Model, which models wind and coastal flood damage to property and interrupted businesses caused by a database of tens of thousands of synthetic storm events. Under all RCPs, projected RSL rise in North Carolina would likely ($P = 0.67$) place >$4 billion of current property below MHHW by 2050 and >$17 billion by 2100. Statewide (assuming fixed distribution and value of property), average annual insurable losses from coastal storms will very likely ($P = 0.90$) increase by 4-17% between 2011 and 2030 and by 16-75% between 2011 and 2050 (regardless of RCP). By 2100, they are very likely to increase by 50-160% under RCP 8.5 and 20-150% under RCP 2.6 (Houser et al, 2015). Projected increases in the intensity of tropical cyclones under RCP 8.5 (Emanuel, 2013) may amplify the increase in losses by ~1.5x by 2050 and ~2.1x by 2100. These cost estimates assume a fixed distribution and valuation of property; intensification of development along the coastline will increase exposure and therefore cost, while protective measures will decrease exposure and cost.

8 Concluding remarks

North Carolina Session Law 2012-202/House Bill 819 requires assessment of future sea-level change trajectories that include "sea-level fall, no movement in sea level, deceleration of sea-level rise, and acceleration of sea-level rise." Geological and historical records indicate that, over the last 11,000 years, North Carolina experienced periods of RSL deceleration and acceleration, but no periods of RSL stasis or fall.

- Millennially-averaged RSL rise in central North Carolina decelerated from 8000 BCE (6.8 ± 1.2 mm/yr) until 2500 BCE (0.8 ± 1.0 mm/yr).

- From 0 to 1800 CE, average RSL rise rates within North Carolina varied from 1.11 ± 0.03 mm/yr in northern North Carolina to 0.8 ± 0.2 mm/yr in southern North Carolina (in the vicinity of the Cape

Fear Arch, and farther away from the peripheral bulge). Century-average rates of sea-level change varied around these long-term means. Comparison of records along the U.S. Atlantic coast indicate that pre-Industrial Common Era sea-level accelerations and decelerations had a spatial pattern consistent with variability in the strength and/or position of the Gulf Stream.

- It is extremely likely ($P = 0.95$) that the accelerated rate of 20th century RSL rise at Sand Point, NC, (2.7 ± 0.5 mm/yr) had not been reached in any century since at least the 10th century BCE.

- Between 1940-1980 and 1980-2010, sea level in North Carolina decelerated relative to the global mean and possibly in absolute terms (at Wilmington, from 2.3 ± 0.5 mm/yr to 0.7 ± 0.9 mm/yr; at Southport, from 2.5 ± 0.7 mm/yr to 1.2 ± 1.1 mm/yr), while sea-level rise accelerated north of Cape Hatteras. The spatial pattern and the magnitude of change are consistent with Gulf Stream variability.

- It is virtually certain ($P = 0.99$) that RSL rise at Wilmington between 2000 and 2050 will exceed 2.2 mm/yr, nearly three times the 0-1800 CE average rate. It is extremely likely ($P = 0.95$) that it will exceed 3.2 mm/yr, in excess of the 20th century average of 2.2 ± 0.6 mm/yr. Under the high-emissions RCP 8.5 pathway, RSL is very likely to rise by 42–132 cm, and under the low-emissions RCP 2.6 pathway RSL is very likely to rise by 24–94 cm between 2000 and 2100.

- Storm flooding in North Carolina will be increasingly exacerbated by sea-level rise. After 2050, the current '1-in-10 year' flood is expected to occur in Wilmington almost every year and the '1-in-100 year' flood is expected to occur in about 17–29 years. Assuming the current distribution of property and economic activity, average annual insurable losses statewide would very likely increase by 50-160% under RCP 8.5 and 20-150% under RCP 2.6.

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Supporting Information: Spatio-temporal statistical model

The spatio-temporal sea-level field $f(\mathbf{x}, t)$ is modeled as a sum of Gaussian processes (Rasmussen and Williams, 2006) with different characteristic spatial and temporal scales.

$$f(\mathbf{x}, t) = l(\mathbf{x}, t) + m(\mathbf{x}, t) + h(\mathbf{x}, t) \tag{S-1}$$

Each field has a prior mean of zero and spatially and temporally separable prior covariances given by

$$k_l(\mathbf{x_1}, t_1, \mathbf{x_2}, t_2) = \sigma^2 \cdot C_3(|t_2 - t_1|, \tau_l) \cdot C_5(r(\mathbf{x_1}, \mathbf{x_2}), \gamma_l) \tag{S-2}$$

$$k_m(\mathbf{x_1}, t_1, \mathbf{x_2}, t_2) = \sigma^2 \cdot C_3(|t_2 - t_1|, \tau_m) \cdot C_1(r(\mathbf{x_1}, \mathbf{x_2}), \gamma_m) \tag{S-3}$$

$$k_h(\mathbf{x_1}, t_1, \mathbf{x_2}, t_2) = \sigma^2 \cdot C_3(|t_2 - t_1|, \tau_h) \cdot C_1(r(\mathbf{x_1}, \mathbf{x_2}), \gamma_m) \tag{S-4}$$

(S-5)

where $C_\nu(r, \lambda)$ is a Matérn covariance function with scale λ and smoothness parameter ν. Here σ_i^2 are the amplitudes of the prior variances, τ_i are characteristic time scales, γ_i are characteristic length scales, and $r(\mathbf{x_1}, \mathbf{x_2})$ is the angular distance between $\mathbf{x_1}$ and $\mathbf{x_2}$.
The observations $y(\mathbf{x}, t^i)$ are modeled as

$$y(\mathbf{x}, t^i) = f(\mathbf{x}, t + E_t) + w(\mathbf{x}, t^i) + E_y + y_0(\mathbf{x}), \tag{S-6}$$

where t^i is the true age of the observation, t the mean observed age, w a process that captures sea-level variability at a sub-decadal level (which we treat here as noise), E_t and E_y are errors in the age and sea-level observations, and y_0 is a site-specific datum offset. For tide gauges, E_t is zero and E_y is estimated during a smoothing process (see below) in which annual data are assumed to have uncorrelated, normally distributed noise with standard deviation 3 mm. For proxy data, E_t and E_y are treated as independent and normally distributed, with a standard deviation specified for each observation based on the original publication. The sub-decadal and datum offset processes are modeled as Gaussian processes with mean zero and prior covariances given by

$$k_w(\mathbf{x_1}, t_1, \mathbf{x_2}, t_2) = \sigma_w^2 \delta(t_1, t_2)\, \delta(\mathbf{x_1}, \mathbf{x_2}) \tag{S-7}$$

$$k_0(\mathbf{x_1}, \mathbf{x_2}) = \sigma_0^2 \delta(\mathbf{x_1}, \mathbf{x_2}), \tag{S-8}$$

where $\delta(\mathbf{x_1}, \mathbf{x_2})$ is the Kronecker delta function. Geochronological uncertainties are incorporated using the noisy-input Gaussian process method of McHutchon and Rasmussen (2011):

$$y(\mathbf{x}, t^i) \approx f(\mathbf{x}, t^i) + E_t f'(\mathbf{x}, t^i) + w(\mathbf{x}, t) + E_y + y_0(\mathbf{x}). \tag{S-9}$$

The low-frequency process $l(\mathbf{x}, t)$ (physically corresponding to GIA, tectonics, long-term sediment compaction, and long-term GMSL change), medium-frequency process $m(\mathbf{x}, t)$, and high-frequency process $h(\mathbf{x}, t)$ all have Matérn temporal covariance functions with smoothness parameter $\nu = 1.5$, implying a functional form in which the first derivative is everywhere defined. The low-frequency process is assumed to vary smoothly over space ($\nu = 2.5$), while the medium- and high-frequency process are allowed to vary more roughly ($\nu = 0.5$). The length scale γ_m is required to be equal for the medium- and high-frequency processes, as both are expected to reflect similar oceanographic processes operating on different timescales.
The hyperparameters $\Theta = \{\sigma_l, \sigma_m, \sigma_h, \sigma_w, \sigma_0, \tau_l, \tau_m, \tau_w, \gamma_l, \gamma_m\}$ are set through a three-step optimization process. First, the hyperparameters of a simplified model, in which a linear term replaces the low-frequency process, are globally optimized through simulated annealing to maximize the marginal likelihood $L(\Theta|\mathbf{y_1})$, where $\mathbf{y_1}$ is the set of post-1000 BCE observations. Second, the hyperparameters of $m(\mathbf{x}, t)$, $h(\mathbf{x}, t)$ and $w(\mathbf{x}, t)$ are fixed. The remaining hyperparameters of the full model – the amplitude, scales, and spatial roughness of the low-frequency process, as well as the datum offset – are globally optimized so as to maximize the marginal

likelihood $L(\boldsymbol{\Theta}|\mathbf{y_2})$, where $\mathbf{y_2}$ is the complete data set . Finally, all the hyperparameters are locally optimized to maximize the marginal likelihood $L(\boldsymbol{\Theta}|\mathbf{y_2})$. This multi-step process improves performance relative to
globally optimizing all hyperparameters simultaneously and is guided by the recognition that the long-term, low-resolution data provide the greatest insight into the lowest-frequency processes while the salt-marsh and tide-gauge data provide the greatest insight into the medium-frequency and high-frequency processes. The optimized time scales of the high-, medium- and low-frequency processes are respectively τ_l = 14.5 kyr, τ_m = 296 years and τ_h = 6.3 years; other hyperparameters are shown in Table S-6.

Annual mean tide-gauge data are decadally averaged prior to incorporation into the analysis. To accommodate data gaps estimate the covariance of the decadal averages, we fit each annual record $y_j(t)$ separately with the model

$$y_j(t) = a_j(t - t_0) + d_j(t) + y_{0,j}, \quad \text{(S-10)}$$

where a_j is a slope, t_0 a reference time period, and $d_j(t)$ a Gaussian process with prior mean zero and a prior Matérn covariance. Hyperparameters are optimized on a site-by-site basis to maximize their marginal likelihood. Decadal averages, including their covariances, are then taken from the interpolated process $y_j(t)$.

References

Hay CC, Morrow ED, Kopp RE, Mitrovica JX (2015) Probabilistic reanalysis of 20th century sea-level rise. Nature 517:481–484, doi:10.1038/nature14093

McHutchon A, Rasmussen C (2011) Gaussian process training with input noise. In: Advances in Neural Information Processing Systems, vol 24, pp 1341–1349

Rasmussen C, Williams C (2006) Gaussian processes for machine learning. MIT Press, Cambridge, MA

Table S-1 Common Era sea-level rates (mm/yr)

Site	Lat	Long	0-1800	1000-1500	1500-1800	1800-1900	1900-2000
GMSL							**1.3 ± 0.2**
New York, NY	40.7	-74.0	1.69 ± 0.18	1.5 ± 0.5	1.9 ± 0.7	2.1 ± 0.7	2.9 ± 0.3
Leeds Point, NJ	39.5	-74.4	1.52 ± 0.09	1.2 ± 0.2	1.7 ± 0.4	2.4 ± 0.8	3.8 ± 0.5
Cape May, NJ	39.1	-74.8	1.46 ± 0.10	1.2 ± 0.2	1.5 ± 0.3	2.2 ± 0.6	3.7 ± 0.5
Sewell's Point, VA	37.0	-76.3	1.15 ± 0.18	1.2 ± 0.5	0.9 ± 0.6	1.6 ± 0.9	4.2 ± 0.5
Duck, NC	36.2	-75.8	1.13 ± 0.08	1.4 ± 0.3	1.0 ± 0.4	1.2 ± 0.6	3.1 ± 0.6
Sand Point, NC	35.9	-75.7	1.11 ± 0.03	1.4 ± 0.1	1.0 ± 0.2	1.0 ± 0.5	2.7 ± 0.5
Oregon Inlet, NC	35.8	-75.6	1.11 ± 0.07	1.4 ± 0.2	1.0 ± 0.3	1.1 ± 0.6	2.6 ± 0.5
Tump Point, NC	35.0	-76.4	0.87 ± 0.11	1.2 ± 0.2	0.7 ± 0.2	1.4 ± 0.4	3.5 ± 0.3
Beaufort, NC	34.7	-76.7	0.83 ± 0.13	1.2 ± 0.3	0.7 ± 0.4	1.2 ± 0.7	2.9 ± 0.5
Wilmington, NC	34.2	-78.0	0.76 ± 0.18	1.0 ± 0.5	0.7 ± 0.6	0.9 ± 1.0	2.1 ± 0.5
Southport, NC	33.9	-78.0	0.70 ± 0.18	0.9 ± 0.5	0.6 ± 0.6	0.9 ± 1.0	2.3 ± 0.6
Charleston, SC Fort	32.8	-79.9	0.53 ± 0.21	0.6 ± 0.6	0.4 ± 0.7	1.1 ± 1.1	2.9 ± 0.5
Pulaski, GA	32.0	-80.9	0.47 ± 0.19	0.5 ± 0.5	0.3 ± 0.7	1.0 ± 1.1	2.7 ± 0.5
Nassau, FL	30.6	-81.7	0.41 ± 0.05	0.5 ± 0.2	0.4 ± 0.3	0.7 ± 0.8	1.9 ± 0.4

Errors are ±2σ. GMSL from Hay et al (2015).

Table S-2 Industrial era sea-level rates (mm/yr)

Site	Lat	Long	1860-1900	1900-1940	1940-1980	1980-2010
GMSL			**1.2 ± 1.1**		**0.8 ± 0.8**	**2.5 ± 0.5**

New York, NY	40.7	-74.0	2.5	± 0.7	2.7	± 0.7	2.8	± 0.6	3.7	± 0.9
Atlantic City, NJ	39.4	-74.4	3.0	± 1.1	3.7	± 0.9	3.7	± 0.7	4.6	± 1.0
Cape May, NJ	39.1	-74.8	2.8	± 1.0	3.4	± 0.9	3.4	± 0.8	4.4	± 1.1
Sewell's Point, VA	37.0	-76.3	2.3	± 1.3	3.9	± 1.1	4.0	± 0.6	5.0	± 0.9
Duck, NC	36.2	-75.8	1.7	± 1.1	3.2	± 1.0	3.3	± 0.9	2.9	± 1.0
Sand Point, NC	35.9	-75.7	1.4	± 1.0	3.0	± 0.9	3.0	± 0.8	2.0	± 1.1
Oregon Inlet, NC	35.8	-75.6	1.5	± 1.0	3.0	± 0.9	3.0	± 0.9	1.7	± 1.1
Tump Point, NC	35.0	-76.4	2.0	± 0.9	4.0	± 0.8	3.7	± 0.7	2.0	± 1.1
Beaufort, NC	34.7	-76.7	1.7	± 1.1	3.5	± 1.0	3.1	± 0.8	1.7	± 1.0
Wilmington, NC	34.2	-78.0	1.3	± 1.3	2.5	± 1.2	2.3	± 0.7	0.7	± 0.9
Southport, NC	33.9	-78.0	1.4	± 1.4	2.5	± 1.2	2.5	± 0.7	1.2	± 1.1
Charleston, SC Fort	32.8	-79.9	1.7	± 1.5	2.8	± 1.1	3.0	± 0.7	2.9	± 0.9
Pulaski, GA	32.0	-80.9	1.5	± 1.4	2.4	± 1.2	2.8	± 0.7	3.0	± 0.9
Fernandina Beach, FL	30.7	-81.5	1.2	± 1.3	1.5	± 0.7	1.9	± 0.7	2.3	± 0.9

Errors are ±2σ. GMSL from Hay et al (2015).

Table S-3 Projected sea-level rise in North Carolina by decade under RCPs 8.5 and 2.6

cm	RCP 8.5					RCP 2.6			
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
DUCK, NC									
2010	7	5–9	4–10	1–12	13	7	5–9	3–11	1–13
2020	14	11–18	8–21	4–25	27	15	11–18	9–21	5–24
2030	23	16–29	12–33	6–39	43	22	17–28	12–32	7–38
2040	31	24–39	18–45	11–53	60	30	22–37	17–43	10–51
2050	41	31–51	24–59	15–72	83	37	28–46	22–53	13–66
2060	52	40–65	32–74	20–93	120	44	33–57	25–66	13–85
2070	64	49–80	39–92	24–118	158	51	38–65	28–77	15–103
2080	76	57–95	45–111	27–146	201	57	43–74	32–87	17–125
2090	88	66–112	51–132	30–179	250	63	46–83	34–100	18–151
2100	100	73–129	54–154	29–214	304	70	50–93	36–113	17–181
2150	160	124–206	103–255	76–425	627	99	71–136	56–184	39–357
2200	225	166–304	134–394	99–715	1055	131	80–196	58–287	33–607
WILMINGTON, NC									
2010	5	3–7	2–8	0–10	11	5	4–7	2–8	1–10
2020	11	8–15	5–17	1–21	22	11	8–14	6–16	4–18
2030	17	12–23	8–27	3–33	36	17	12–21	9–25	4–30
2040	25	18–31	13–36	6–44	51	23	17–29	12–34	6–42
2050	33	24–42	18–48	10–61	75	29	21–36	16–42	9–55
2060	42	31–53	24–62	13–80	107	34	25–44	18–52	9–70
2070	52	39–66	29–78	17–103	142	39	28–51	20–61	9–88
2080	62	46–79	35–94	19–130	183	44	31–58	23–71	10–111
2090	73	53–94	40–113	21–162	229	49	34–66	24–82	10–135
2100	82	58–109	42–132	20–194	281	54	36–74	24–94	8–162
2150	135	101–180	81–230	57–395	596	77	48–113	34–161	16–334
2200	194	136–273	105–364	74–678	1016	101	50–166	27–257	3–575

Values represent two-decade averages and are in cm above 1990–2010 ('2000') mean sea level.
Columns correspond to different projection probabilities. For example, the "5-95" columns correspond to the 5th to 95th percentile; in IPCC terms, the 'very likely' range.
The RCP 8.5 99.9th percentile corresponds to the maximum level physically possible.

Table S-4 Projected sea-level rise in North Carolina by decade under RCP 4.5

cm	RCP 4.5			
50		17–83	5–95	0.5–99.5
DUCK, NC				
2010	7	5–9	3–11	1–13
2020	14	11–18	8–21	4–25
2030	22	17–27	13–31	8–36
2040	30	24–37	19–42	13–50
2050	39	30–47	23–54	15–67
2060	47	36–59	28–68	17–86
2070	56	42–71	32–82	18–108
2080	64	48–82	37–96	21–130
2090	72	54–93	41–110	23–158
2100	81	60–105	45–126	25–188
2150	121	84–164	60–209	30–374
2200	160	101–232	67–315	24–618
WILMINGTON, NC				
2010	5	3–7	1–9	-1–11
2020	11	7–14	5–17	1–20
2030	17	12–21	9–24	5–29
2040	23	17–29	13–33	8–40
2050	30	22–37	17–43	10–55
2060	37	27–47	20–55	11–72
2070	44	32–56	24–66	12–91
2080	51	37–66	27–78	14–114
2090	57	41–75	30–91	16–140

2100	64	45–86	33–105	16–170
2150	96	62–137	40–182	14–344
2200	128	71–199	39–282	0–581

Values in cm above 1990–2010 mean sea level.
Columns correspond to different probability ranges.

Table S-5 Projected contributions to sea-level rise at Wilmington, NC, in 2100 CE

cm			RCP 8.5				RCP 2.6		
	50	17–83	5–95	0.5–99.5	99.9	50	17–83	5–95	0.5–99.5
Oc	41	23–61	10–74	-10–93	100	21	8–34	-1–44	-15–57
GrIS	9	5–16	3–25	2–44	60	4	2–7	2–11	1–20
AIS	4	-8–18	-12–38	-15–109	180	7	-4–20	-8–40	-11–111
GIC	16	12–19	10–21	6–25	25	10	8–13	6–15	3–18
LWS	5	3–7	2–8	0–11	10	5	3–7	2–8	0–11
Bkgd	5	3–6	2–8	0–10	10	5	3–6	2–8	0–10
Sum	82	58–109	42–132	20–194	280	54	36–74	24–94	8–162

Oc: Oceanographic. GrIS: Greenland ice sheet. AIS: Antarctic ice sheet.
GIC: Glaciers and ice caps. LWS: Land water storage. Bkgd: Background.
All values are cm above 1990–2010 CE baseline. Columns correspond to probability ranges.

Table S-6 Optimized hyperparameters

Low frequency			
amplitude	σ_l	19.1	m
time scale	τ_l	14.5	kyr
length scale	γ_l	25.0	degrees
Medium frequency			
amplitude	σ_m	119	mm
time scale	τ_m	296	yr
length scale	γ_m	3.0	degrees
High frequency			
amplitude	σ_h	13.7	mm
time scale	τ_h	6.3	y
length scale	γ_m	3.0	degrees
White noise	σ_w	4.2	mm
Datum offset	σ_0	45	mm

Bob Emory (via email on 11/19/2015)

Please accept these comments on the 2015 SLR Update. While I have used my work e-mail to send these comments, they are strictly my own, not those of my employer.

Thank you.

Bob

Bob Emory
17 Batts Hill Road
New Bern, NC 28562

November, 19, 2015

To:
Chairman Frank Gorham
Tancred Miller
Dr. Braxton Davis
Dr. Margery Overton

Subject: Comments Regarding the 2015 Update to the 2010 Sea Level Rise Report

Dear Sirs and Madam,

Please accept my comments on the 2015 Update to the 2010 Sea Level Rise Report.

I found the Update to be straightforward, science-based and free of conjecture or opinion. The Update allowed the Science Panel to utilize more up to date data and their reliance on the IPCC Fifth Assessment is appropriate given that it is the most robust study of SLR available.

Among the significant improvements incorporated in the Update are the explanation of the different conditions and dynamics associated with different regions of our coast and the differential levels of SLR predicted for those regions. The explanation of Vertical Land Motion and Ocean Dynamics was also helpful.

The use of ranges of predicted SLR based on a range of emissions scenarios was helpful. The use of ranges and the inclusion of various futures that are not totally predictable acknowledge that there is uncertainty regarding future conditions and the rates of SLR that will result. The acknowledgement of uncertainty was included in the 2010 Report but is made more obvious in the 2015 Update.

Regarding criticism of the 2010 Report and the 2012 Addendum, many of those criticisms were a result of the questions posed by the CRC to the Panel. The Panel faithfully responded to the

CRC's questions and produced a very valuable Report that would have been subject to less criticism had the CRC's questions been better thought out. I appreciate the Panel's willingness to persevere in spite of criticism, some of which was simply outlandish.

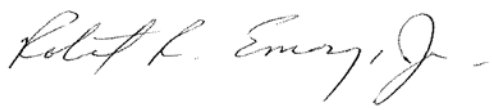
So, what to do now.

If I read the Update correctly, the data do not suggest that a decrease in the rate of SLR is likely, and just using existing rates of SLR over the next 30 years we can expect SLR of approximately 6" in the North and 2" inches in the South. Another clear message from the Update is that whatever rate of SLR you assume, we can expect an increased frequency of coastal flooding. The CRC should proactively communicate that coastal flooding, particularly in the northern coastal region, is becoming more frequent. And as SLR increases, the number of people exposed to flooding will increase. Such communication need not come across as alarmist but coastal residents and towns that are likely to experience more frequent flooding should be made aware of this likelihood and advice on responses should be provided. In many cases the response may be as simple as elevating new construction a foot or two more than is typical. Existing development presents greater challenges but there are remedies available. I am not suggesting regulation; just education on hazard mitigation based on the Update and the voluminous other sources of information that are available.

The CRC's decision to focus on the next thirty years instead of looking toward 2100 does make the Update seem more relevant for residents and policy makers. However, the longer-term outlook should not be ignored, particularly for projects with a lifespan greater than thirty years such as highways, water and sewage treatment plants, bridges and large structures which are difficult to elevate or move, including some houses. Looking beyond thirty years, at least in the northern region of the coast where a simple extension of current SLR for sixty years could easily be a foot or more, SLR should be considered when planning long-lived development. The CRC has the ability, and I would argue obligation, to keep this information in front of coastal citizens and other branches of government. And again there is the opportunity to provide this information in a way that does not open the CRC to accusation of alarmism, although there will continue to be individuals and groups that will criticize you, no matter what you do. Your obligation is to be forthright with costal property owners and local governments.

Thank you for this opportunity to provide comments and thank you to the CRC, DCM and the Science Panel for everything you do to make the North Carolina coastal region such a wonderful place.

Sincerely,



Bob Emory

E. Matheson (via email on 12/10/2015)

Late in the game, but my sound front land has gained height from the natural process. Decaying plant matter accumulates at a surprising rate in certain locations. CO 2 plus solar plus soil creates plant matter that adds to top soil that adds to height above sea level. Complicated measurement in total but not in particular. Seems driven by solar more than other factors. The question is significance. That's your department.

E Matheson BSME BS Bio Science
7008 Sound Drive
Emerald Isle NC

Larry Baldwin (via email on 12/21/2016)

1. To: Tancred Miller, NCDCM

Please add the attached reference to the public comments regarding the proposed NC Sea Level Rise Report (NCSLRR).

Much of the current NCSLRR draft relies upon projections by the UN-IPCC. The attached report is creditable and critical of much of the philosophy, scientific methods, and data used within the UN-IPCC document. In science all theories must be considered until proven false, or until a scientific theory can be repeated and proven positive through a rigorous scientific method process.

Thank you for accepting this reference and public comment.

Larry F. Baldwin, CPSS / NCLSS
(910) 471-0504 LBaldwin@ec.rr.com

Reference: https://www.heartland.org/sites/default/files/12-04-15_why_scientists_disagree.pdf

2. To: Tancred Miller, NCDCM

One more creditable reference to be submitted as part of the public comment period for the draft NC Sea Level Rise Report. This is recent data and testimony to the U.S. Senate regarding global warming, which is considered as a paramount factor for accelerated sea level rise to occur.

Thank you for accepting this public comment and reference.

Larry F. Baldwin, CPSS / NCLSS
(910) 471-0504 LBaldwin@ec.rr.com

Reference: https://curryja.files.wordpress.com/2015/12/christyjr.pdf

3. Tancred,

Thank-you for acknowledgment and receipt of these additional recently produced references.

I sent these references to NCDCM as informational sources on their own merit, and as a private citizen. Please do not put any additional emphasis or value on this information as my current position.
Just trying to provide both sides of the issue and science.

Hope the holiday break was enjoyable for you and your family, and I too look forward to 2016.

Larry F. Baldwin, CPSS / NCLSS
(910) 471-0504 LBaldwin@ec.rr.com

Clyde Hunt, Jr. (via email on 12/28/2015)

As an Ocean Isle Beach ocean-front property owner since 1965, anything relative to coastal NC is of great interest to me and my family. Fourth generation Hunts are now enjoying the pleasures of our wonderful beach. We have worked closely with Ocean Isle Beach and Brunswick County officials, our elected officials in Raleigh and Washington as well as the several environment agencies over these years, for the responsible development, preservation and maintenance of Ocean Isle Beach.

Fortunately, Ocean Isle Beach has had a succession of elected and appointed officials with the best interests of our beach as their prime concern and responsibility…ie…the less our federal, state and county "officials" are involved in the policy-making processes for Ocean Isle, and the more truly **local** control exists, the better the outcome for local residents and businesses and our many revenue producing visitors each year.

I was very pleased to hear that apparently……1. More thoroughly investigated and compiled information on "projected"/ estimated possible sea level rise information will be made available, and……2. Our **local** authorities will be given much more leeway in decisions on how to interpret and respond to this information.

Federal, state and county departments, keep the good information coming, and please leave it to the locals (who will be affected most) to make the necessary decisions on how to respond; a much more democratic (and I feel confident, **effective**) approach.

END OF RECORD

NC COASTAL RESOURCES COMMISSION (CRC)

November 17-18, 2016
DoubleTree by Hilton
Atlantic Beach

Present CRC Members
Frank Gorham, Chair
Renee Cahoon, Vice-Chair
Neal Andrew, Second Vice-Chair

Gwen Baker
Larry Baldwin
Marc Hairston
Greg Lewis
Phil Norris
Jamin Simmons
John Snipes
Bill White

Present CRAC Members
Debbie Smith, Chair
Rudi Rudolph, Vice-Chair
John Brodman
Jett Ferebee
Beth Midgett
Mike Moore
David Moye
Kris Noble
Bobby Outten
Frank Rush
Dave Weaver
Lee Wynns

Present Attorney General's Office Members
Mary Lucasse
Christine Goebel

CALL TO ORDER/ROLL CALL

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

Chairman Gorham introduced Phil Norris who fills the seat on the Commission as an At-Large member. Commissioner Norris read the evaluation of his statement of economic interest. Angela Willis called the roll. All duly appointed Commissioners were present. No actual conflicts were reported for this meeting. However, Commissioner Norris stated that he would recuse himself from an upcoming variance request being submitted by the NC State Ports Authority. Based upon this roll call Chairman Gorham declared a quorum.

Mary Lucasse, CRC Counsel, gave an overview of the variance process and reviewed the four statutory criteria which must be met in order for the Commission to grant a variance.

CHAIRMAN'S COMMENTS

Chairman Gorham stated that there is a vacant spot on the Executive Committee that needs to be filled.

Renee Cahoon made a motion to appoint Larry Baldwin to the CRC Executive Committee. Bill White seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Chairman Gorham stated he would like to get a certificate of appreciation from the Commission to be presented to former Commissioner Suzanne Dorsey for her service.

Neal Andrew made a motion to invite Suzanne Dorsey to the September CRC meeting in Wilmington and present her with a certificate of appreciation from the Commission. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Chairman Gorham stated several commissioners had reported conflicts with the proposed dates for 2016 CRC meetings. New dates have been proposed to alleviate a majority of the conflicts. After discussion, the Commission voted on the following CRC dates for 2016:
February 9-10, May 10-11, July 12-13, September 13-14, November 30-December 1.

Renee Cahoon made a motion to approve the proposed 2016 Coastal Resources Commission meeting dates. Jamin Simmons seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Chairman Gorham stated he would like a task force setup to review the variance process and third party hearing request process. This should consist of 6-7 outside attorneys as well as Mary Lucasse and Christy Goebel.

VARIANCES

TJ's Land Development, LLC (CRC VR 15-06), Beaufort County, Pier Width
Steve Trowell, Christine Goebel

Steve Trowell, DCM Field Representative, gave an overview of the site of the proposed development. Christy Goebel, of the Attorney General's office, represented staff and stated Attorney Franz Holsher is present and will represent Petitioners. Petitioner owns property on Pungo Creek near Belhaven in Beaufort County. On August 4, 2015, DCM issued CAMA Major Permit #79-15 to Petitioner which allows development of a 66 slip T-head marina dock with an approximately 730 foot long accessway. Condition #6 on the permit requires that a portion of the permitted pier accessway which crosses the Coastal Wetlands AEC at this site be limited to a six foot width per the Commission's rule 15A NCAC 7H .0205. The Petitioner now seeks a variance to allow the portion of the accessway over coastal wetlands to be eight feet in width as was authorized for those portions of the accessway over high ground, 404 Wetlands and open water, as proposed in the permit applications. Ms. Goebel reviewed the stipulated facts of this variance request and stated that Staff and Petitioners agree on three of the four variance criteria which must be met in order for the Commission to grant a variance. Staff disagrees with Petitioner that hardships result from conditions peculiar to the Petitioner's property. While this site has an expansive Coastal Wetland AEC and 404 Wetland area, such wetlands are not unique physical conditions in this part of Pungo Creek and the inner banks area of North Carolina.

Franz Holsher, counsel for Petitioner, reviewed the stipulated facts which he contends supports the granting of this variance request and stated there will be a lot of public use of this pier and docking facility and a six foot limitation will not be sufficient. If these wetlands were not on the Site then the condition would not be necessary. There is not another location on this site that does not have wetlands.

Renee Cahoon made a motion to support Petitioner's position that strict application of the applicable development rules, standards, or orders issued by the Commission will cause the Petitioner an unnecessary hardship. Neal Andrew seconded the motion. The motion passed with ten votes in favor (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Snipes, Lewis) and one opposed (Baker).

Renee Cahoon made a motion to support Petitioner's position that hardships result from conditions peculiar to the petitioner's property. Neal Andrew seconded the motion. The motion passed with seven votes in favor (Hairston, White, Norris, Baldwin, Andrew, Cahoon, Gorham) and four votes opposed (Simmons, Baker, Snipes, Lewis).

Renee Cahoon made a motion to support Staff's position that hardships do not result from actions taken by the Petitioner. Greg Lewis seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Renee Cahoon made a motion to support Staff's position that the variance request will be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; will secure the public safety and welfare; and preserve substantial justice. John Snipes seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

This variance request was granted.

Town of Carolina Beach (CRC VR 15-07), Oceanfront Setback
Robb Mairs, Christine Goebel

Robb Mairs, DCM Field Representative, gave an overview of the site of the proposed development. Christy Goebel of the Attorney General's office represented staff and stated attorneys Clark Wright and Noel Fox are present and will represent the Town on this variance request. On November 18, 2013, the Town of Carolina Beach applied for a CAMA minor development permit requesting approval of the Carolina Beach Boardwalk Improvement Project to replace and expand the Carolina Beach boardwalk. DCM denied the permit application because the development extended oceanward of the ocean hazard setback. At the February 2014 CRC meeting, the Town sought a variance for the entire project and the Commission granted the variance for enlargement of the existing boardwalk and its improvements, but denied the variance for the northern extension of the boardwalk. On May 6, 2014, the Town applied for a new CAMA minor development permit seeking approval of the boardwalk's redesigned northern extension. On June 2, 2014, DCM denied the permit due to the inconsistency with the ocean hazard setback. The Town sought a variance from the Commission in October 2014, but the Town withdrew the variance petition before final action was taken. On October 6, 2015, the Town filed this third variance request seeking approval of a newly reduced size northern extension, based on the June 2, 2014 permit denial. Ms. Goebel

reviewed the stipulated facts of this variance request and stated staff and petitioner agree on all four variance criteria. Clark Wright of Davis Hartman Wright represented Petitioner and reviewed the stipulated facts which he contends supports the granting of this variance request.

Chairman Gorham expressed his concerns for the security being provided by the Town. Mr. Wright responded that video cameras will be utilized by the Town for security, the limited width and the removal of the bump outs in the new addition, secured locked accesses as well as the commitment of increased patrol by law enforcement. Ms. Goebel stated that operational conditions on a permit would be difficult for DCM to enforce. Commissioner Baker questioned if the design of the boardwalk would weaken the dune structure. Ms. Goebel pointed to stipulated fact #53 which states that because the boardwalk will be elevated above the existing dune system, the boardwalk should have only temporary, minimum dune impacts during the installation of the pilings and construction. Following construction, grade will be restored to original heights outside the boardwalk and ramp footprints, and will be fully re-vegetated with native vegetation. Commissioner Baldwin expressed his concerns that this is a large, beach-parallel structure in a renourished area. A horizontal structure during a major storm could be a huge issue. Chairman Gorham again questioned the Town's level of commitment to security for the boardwalk extension. Following a short recess to meet with his client, Mr. Wright stated the Town will make a commitment to double the officers on patrol and the boardwalk. The Town will also rebuild the gate in front of the Avarette residence and make it lockable if they desire. Stipulated Fact #24 addressed detailed security and lighting issues. The Town is also willing to station someone on the boardwalk to direct crowd flow away from the structure during events on the pavilion end of the boardwalk. The Town will work with DCM and CRC counsel to get a letter of commitment from the Mayor.

Renee Cahoon made a motion to support staff and petitioner's position that strict application of the applicable development rules, standards or orders issued by the Commission will cause the petitioner an unnecessary hardship. Neal Andrew seconded the motion. The motion passed with ten votes in favor (Hairston, White, Simmons, Norris, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis) and one opposed (Baldwin).

Renee Cahoon made a motion to support staff and petitioner's position that hardships result from conditions peculiar to the petitioner's property. Neal Andrew seconded the motion. The motion passed with eight votes in favor (Hairston, White, Simmons, Andrew, Cahoon, Gorham, Baker, Snipes) and three opposed (Norris, Baldwin, Lewis).

Renee Cahoon made a motion to support staff and petitioner's position that the hardships do not result from actions taken by the petitioner. Neal Andrew seconded the motion. The motion passed with eight votes in favor (Hairston, White, Simmons, Andrew, Cahoon, Gorham, Baker, Snipes) and three opposed (Norris, Baldwin, Lewis).

Renee Cahoon made a motion to support staff and petitioner's position that the variance request will be consistent with the spirit, purpose and intent of the rules, standards, or orders issued by the Commission; will secure the public safety and welfare; and preserve substantial justice. Neal Andrew seconded the motion. The motion passed with eight votes in favor (Hairston, White, Simmons, Andrew, Cahoon, Gorham, Baker, Snipes) and three opposed (Norris, Baldwin, Lewis).

This variance request was granted.

The Riggings HOA – On Remand (CRC VR 15-08), Kure Beach, Sandbags
Robb Mairs, Christine Goebel

Robb Mairs, DCM Field Representative, gave an overview of the site of the proposed development. Christy Goebel of the Attorney General's office represented staff and stated attorney William Wright is present and will represent petitioner. This is a rehearing on remand from the Supreme Court of North Carolina. Petitioner is the Homeowners Association for The Riggings condominium development in Kure Beach, which owns oceanfront property just north of Fort Fisher. Since 2000, when its original sandbag authorization expired, the petitioner has been granted four variances from the Commission to keep sandbags for a period longer than allowed by Rule 15A NCAC 7H .1705(a)(7), which limits sandbag use to up to five years. In January of 2008, the CRC denied a fifth variance request. On appeal to superior court, the case was remanded to the Commission for rehearing. In April 2009, the Commission again denied this variance request. On appeal to Superior Court, the Judge reversed the Commission's decision and remanded the case with orders to grant the variance. The Commission appealed the case to the Court of Appeals, where the majority of the Court upheld the Superior Court's Order, with a dissent relating to one of the variance factors. The Commission appealed the case to the Supreme Court, which, on a tie vote, upheld the lower court without legal precedent. This fifth variance request is now before the Commission on remand, where the petitioner seeks a variance to keep the sandbags in place. Ms. Goebel reviewed the stipulated facts of this variance request and stated staff and petitioner agree on all four variance criteria. Part of the variance Statute which the Commission administers includes language that says the Commission may impose reasonable conditions and safeguards upon any variance it grants. As stated in Stipulated Fact # 35, The Riggings HOA proposes that the sandbags remain in place until such time as their proposed Habitat Enhancement Project and/or a renourishment project, either privately or publically funded, has been completed. Staff recommends three things in order to safeguard the beach in front of The Riggings. The first is that the petitioner removes any existing, visible sandbag debris. Staff recommends that any new sandbags placed should be installed in conformance with the CRC's sandbags rules with the exception of the time limits. Finally, staff recommends that the Commission place a condition on any new variance that includes a time limit of up to five years from the date of the variance order for the replacement of any sandbag structures. Additionally DCM recommends that the Commission require The Riggings HOA to submit an annual written report to the CRC Executive Secretary providing a progress report on the steps taken to develop alternative solutions to the sandbags. Such a condition would allow the CRC and staff to follow the petitioner's progress in seeking long-term solutions to address erosion at The Riggings and could provide an opportunity for the CRC and staff to suggest other avenues for addressing erosion.

Attorney William Wright of Shipman and Wright represented petitioner and reviewed the stipulated facts which he contends supports the granting of this variance request. Petitioner does not object to staff's suggested conditions.

Neal Andrew made a motion to support staff's position that strict application of the development rules, standards or orders issued by the Commission cause the petitioner an unnecessary hardship. Larry Baldwin seconded the motion. The motion passed with ten votes in favor (Hairston, White, Simmons, Norris, Baldwin, Andrew, Gorham, Baker, Snipes, Lewis) and one opposed (Cahoon).

Neal Andrew made a motion to support staff's position that hardships result from conditions peculiar to the petitioner's property. Larry Baldwin seconded the motion. The motion passed

unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Neal Andrew made a motion to support staff's position that hardships do not result from actions taken by the petitioner. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Neal Andrew made a motion to support staff's position that the variance will be consistent with the spirit, purpose, and intent of the rules, standards, or orders issued by the Commission; will secure the public safety and welfare; and preserve substantial justice. Larry Baldwin seconded the motion. The motion passed with nine votes in favor (Hairston, White, Simmons, Norris, Baldwin, Andrew, Gorham, Snipes, Lewis) and two opposed (Cahoon, Baker).

Larry Baldwin made a motion to condition the grant of the variance request and permit on the removal of any existing, visible sandbag debris; a requirement that any new sandbags placed be installed in conformance with the CRC's sandbag rules with the exception of the time limits required in 7H .0308(a)(2)(F); a requirement that replacement of the existing sandbag structures should be completed within nine months from the date of the variance order; and to set a time limit for the new sandbag structure of five years. Additionally, The Riggings HOA is required to submit an annual written report to the CRC Executive Secretary updating the Commission on the progress it has made to identify and pursue alternative solutions to sandbags. Neal Andrew seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

This variance request was granted subject to conditions.

MINUTES

Greg Lewis made a motion to approve the minutes of the September 23, 2015, Coastal Resources Commission meeting. Neal Andrew seconded the motion. The motion passed unanimously (Gorham, Andrew, Baker, Baldwin, Cahoon, Hairston, Lewis, Norris, Simmons, Snipes, White).

EXECUTIVE SECRETARY'S REPORT

Braxton Davis, DCM Director, gave the following report:

I would like to give a special welcome to Commissioner Norris. Staff at the Division of Coastal Management look forward to working with you, and I hope to get together with you soon to provide an overview of our agency. As hurricane season comes to an end, we are again thankfully reflecting on a relatively quiet season. However, we did have an unusual weather event in early October, when the passage of Hurricane Joaquin offshore coincided with very high tides and strong northeasterly winds to cause some serious problems along the coast. Primarily the impacts were limited to dune and beach erosion, as well as minor damage to some shoreside cottages. NC Highway 12 was compromised at Milepost 4, and there was overwash of Highway 12 on Hatteras Island. Standing water was present in Corolla and in some parts of Kitty Hawk. The beachfront damage was sufficient to warrant my recommendation to the Secretary of DEQ to authorize the CAMA Emergency General Permit, which is found in section 7H.2500 of your rules, for beach bulldozing

and dune repairs along the entire coast. This emergency GP does not require a fee and can be issued in an expedited fashion to property owners. So far, we have issued 32 Emergency General Permits (7H.2500) for dune reconstruction following the storm. Wrightsville Beach, Carolina Beach & Figure Eight Island used either the Town's existing Major Permit or, in the case of Figure Eight, bulldozing was to protect imminently threatened structures and was therefore exempt from permitting requirements. We have had two Northeasters since the October storm, and we are still experiencing some beach erosion, especially in Dare County.

Notable permit actions since the last commission meeting include a Major permit issued to Beaufort County for the construction of a boating access area, a Major Permit issued to the Town of Bellville to add walkways, boardwalks and observation platforms at an existing park, and a Major permit issued to the NC Department of Natural and Cultural Resources authorizing a large scale shoreline stabilization project to protect important cultural resources at the Brunswick Town historic site in Brunswick County. The Division also expedited the issuance of a permit modification, allowing NCDOT to dredge a portion of a navigation channel adjacent to Ocracoke Island, which is currently experiencing heavy shoaling and preventing easy ingress and egress through Hatteras Inlet for commercial and recreational boaters.

DCM Policy staff are working on the various legislative reports that were included as part of the budget bill, and I'll go over each requirement briefly:
Cape Fear Estuarine Restoration (Section 14.6(h)) – a study of removal of The Rocks on the Cape Fear River. We are drafting letters to the Corps of Engineers and NOAA notifying them of the study and requesting information from NOAA on procedures for boundary changes to the federally-designated Coastal Reserve at Zeke's Island. We are hoping to publish a Request for Information in January through DEQ for the study of removal of the Rocks. Our draft report is due to DEQ in March.
Section 14.6 Erosion Control Structures requires the Commission to amend it sandbag rules. The Commission is directed to pass temporary rules in accordance with the provisions by December 31, 2015, so we will begin that process today. If temporary rules are approved, the public comment period will run until December 22, 2015. A public hearing will be held December 10, 2015.
Section 14.10A(a) Simplify Oyster Restoration Project Permitting requires DMF and DCM in consultation with representatives of nongovernmental conservation organizations to create a new permitting process specifically designed for oyster restoration projects. The report, including recommended legislation, is to be submitted to the Environmental Review Commission by May 1, 2016. A team of staff within DCM and DMF will be planning a meeting with nongovernmental conservation organizations soon.
Section 14.10 I.(a) Beach Erosion Study requires the Division to study and develop a proposed strategy for preventing, mitigating and remediating the effects of beach erosion. Staff are assembling information to be included in the Study. Due to the short time (due to the Dept. on January 15, 2016), a draft will not be available for public review. However, the Division has been soliciting public comments to include as an appendix to the report. Public comments are due by December 31, 2015 and the final report is due to the legislature by February 15, 2016.

Staff are also continuing the rulemaking process and fiscal analysis changes to the Ocean Erodible AEC (7H .0304). The fiscal analysis has been approved by DENR and OSBM, so we can proceed today with asking for your approval of the fiscal analysis.

The Coastal Reserve is continuing its work on the draft management plan update for the N.C. National Estuarine Research Reserve. This draft will be informed by comments received by Local

Advisory Committees and NOAA on the draft outline review earlier this year. Additional input will also be solicited on the full draft management plan from DENR, Local Advisory Committees, the Commission, and NOAA later this winter. A 30-day public comment period and public meetings on the final draft will be held prior to final publication sometime in 2016. The Division is continuing its efforts to increase awareness of and promote use of living shorelines in the state. The Reserve's Coastal Training Program will hold 2 workshops for real estate professionals and technical professionals in Columbia on December 2 and 3. Participants will receive continuing education credits and learn about the benefits and limitations of using living shorelines for erosion control; design standards and best practices for living shorelines; permitting requirements; and case studies. Similar workshops were held in the Beaufort and Wilmington this spring and presentations and video from the Beaufort workshops are available on the Reserve's Coastal Training Program website. A living shoreline workshop for realtors is also being held on November 18 in Wilmington by request. The Coastal Reserve and NC Sea Grant are accepting applications for the 2016 NC Coastal Reserve Fellowship. One successful applicant will receive a grant of up to $10,000 for the 2016 calendar year to conduct research within the sites of the Coastal Reserve on ecosystem services, community and habitat resilience, land use and water quality, or habitat management and restoration. Applications are due November 20.

Staff Updates

Will Creef, a field representative in our Elizabeth City office, recently accepted a job in Currituck County as their soil and storm water technician. The position will allow Will to work closer to his home. We have enjoyed having Will with us and will miss him. Just yesterday, Rachel Love-Adrick began work as our Morehead City District Planner. She has a Bachelor's degree with majors in both Geography and Environmental Studies and a Master's degree in Community Planning. She comes to DCM from the Division of Marine Fisheries where she provided GIS support for the Habitat and Enhancement Section and the Artificial Reef and Oyster Sanctuaries biologists as well as staff of the Coastal Habitat Protection Plan program. She also has experience with Town of Morehead City Urban Planning Committee. Sean Farrell will begin working as a new Field Representative in the Wilmington Regional Office on Dec. 2nd, and will be handling Oak Island, Caswell Beach; Southport, and parts of Pender County. Sean has a Bachelor's in Environmental Science / Biology from UNCW. His experience includes working as a Field Biologist with CZR, Inc. consulting firm, where his duties included jurisdictional wetland delineations, sediment sampling for pre and post beach nourishment projects for CAMA Permitting and surveying of submerged aquatic vegetation for CAMA permitting.

CRAC REPORT

Debbie Smith, CRAC Chair, stated the CRAC began its discussion on sandbag policies and rule amendments. We would like to continue to work on this and will come back for our next meeting, after talking with our respective communities, with some meaningful thoughts and recommendations. We are going to need more time for the CRAC meetings to cover the topics on our agenda.

ACTION ITEMS

Approval of Amendment to CRC Internal Operating Procedures – Article III (CRC 15-25)

Mary Lucasse, CRC Counsel, stated the CRC Internal Operating Procedures have been updated to reflect the leadership change voted on at the last Commission meeting adding a second vice-chair position. The second vice-chair will be voted on by and elected from the members of the Commission and will serve for a one-year term. At our last meeting, the Commission voted in favor of Neal Andrew filling the second vice-chair position.

Renee Cahoon made a motion to approve the updated Internal Operating Procedures. Gwen Baker seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Public Comment/Adopt 15A NCAC 7B State Guidelines for Land Use Planning and 7L Local Planning and Management Grants (CRC 15-26)

Mike Lopazanski stated we have spent a lot of time revising the land use planning guidelines and the legislative review of Subchapter 7B. The public comment period ended November 16, 2015. The amendments are designed to increase the flexibility for plan content and format, clarifies that the amendments and updates are voluntary, added a new process for review of CAMA Major Permits, streamlined the approval of the plan, and promote integrated planning efforts. These amendments will reduce the regulatory burden, institute shorter time lines, and add new language to include Coastal Management goals. We received one positive public comment on these amendments and received positive feedback from local governments. To speed up the process we wanted to have the certification delegated to the Division. We requested legislation that would revise CAMA to change the process by allowing the Commission to delegate certification of the land use plans. This proposed change was not included in the session's legislative actions. We will attempt to get this change made in the upcoming short session.

Phil Norris made a motion to send a letter to the General Assembly and Secretary van der Vaart to request the change to CAMA to change the delegation of authority to the DEQ Secretary for Land Use Plan certifications. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Renee Cahoon made a motion to adopt the amendments to Subchapter 15A NCAC 07B. John Snipes seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Renee Cahoon made a motion to adopt the amendments to Subchapter 15A NCAC 07L. John Snipes seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Approval of Fiscal Analysis for Amendments to Ocean Erodible AEC – Recession Line (CRC 15-27)

Mike Lopazanski stated we have received the approval from OSBM on this fiscal analysis. This amendment is a change to the Ocean Erodible Area AEC. This permit jurisdiction is determined by a formula of sixty times the erosion rate plus the shoreline recession rate. In 2009, graduated setbacks were implemented. For consistency, we need to change the sixty to ninety. This would greatly increase the permitting jurisdiction beyond what we felt was necessary to achieve the management objectives of the Ocean Erodible AEC. The shoreline recession line is based on modeling and was instituted in the early days of the program before we had erosion rates. This is based on dune erosion modeling and is outdated. We want to eliminate the shoreline recession line from the calculation. This will leave a straight formula of ninety times the erosion rate. This will result in a significant decrease in the CRC's permitting jurisdiction in the south and a moderate increase in the OEA in the north. This change will maintain the setback factor of ninety times the erosion rate for structures over 10,000 square feet. This change does not affect the setbacks. It affects the permitting jurisdiction. It maintains the construction, dune protection, and erosion control standards, and owners are still required to sign the Ocean Hazard AEC notice. It will result

in a coast-wide decrease of 4,500 properties from DCM permitting jurisdiction and generally will decrease the regulatory burden on property owners. DCM issues an average of 381 Minor Permits per year. There is a $100 fee for the permit. Coast-wide there is a net savings of $7,400 per year. Local governments that participate in our LPO program get to keep the $100 permit fee and a $115 reimbursement from DCM for handling the permit. Coast-wide local governments will see a net loss of permit fees and reimbursements of $16,000 per year. DCM will see a cost savings of $8,300 per year. Since this amendment affects the landward edge of the AEC, staff made the determination that DOT permitting will not be affected by this action.

Neal Andrew made a motion to approve the fiscal analysis for 15A NCAC 7H .0304 for public hearing. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Town of Topsail Beach LUP Certification (CRC 15-28)
Mike Christenbury stated the Town of Topsail Beach is seeking certification of the 2015 Topsail Beach Land Use Plan. Topsail Beach is located in Pender County along the southern tip of Topsail Island, just to the south of the Town of Surf City. In 2014, the Town began the process to update the currently certified 2005 land use plan. The Town updated all the demographic information within the plan as well as the maps. They also revised the Plan policies to reflect the current desires of the Town in terms of future growth and land use. The Town held a duly advertised public hearing on September 9, 2015, and voted unanimously by Resolution to adopt the 2015 Land Use Plan. Staff has reviewed the plan and has determined that the Plan meets the requirements outlined in the 7B Land Use Plan guidelines and that there are no conflicts with either state or federal law or the State's Coastal Management program. DCM did not receive any comments from the public and recommends certification.

Renee Cahoon made a motion to certify the 2015 Town of Topsail Beach Land Use Plan. Phil Norris seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Grandfathering Provisions for Oceanfront Structures – Options for Amendments to 15A NCAC 07H .0306 General Use Standards for Ocean Hazard Areas (CRC 15-29)
Tancred Miller stated this was an issue that came before us about a year ago from the Wilmington Regional Association of Realtors. The memo in your packet gave a brief summary of the history of the setback provisions in place since the 1970s. A conforming structure is a structure that complied with the rules that were applicable at the time of construction and are still in compliance with the current rules. A non-conforming structure is a structure that did not comply with the rules at the time of construction and still do not comply. Legal non-conforming structures are structures that complied with the applicable rules at the time of construction, but no longer comply with the current rules. The term grandfather is a status that is granted to a structure that is legally non-conforming, it no longer complies, but is allowed to remain in place with current use. This issue is a policy decision and there are multiple ways the Commission can go. We have not been able to find a scientifically justifiable basis for grandfathering. How do you become legally non-conforming? Within the CRC rules there could be a rule change to setback factors, as with the graduated setback changes. There can be an erosion rate increase. If the erosion rate increases then the structure would not be able to meet the setback requirement. There could be a landward migration of the vegetation line. There could be a large scale beach nourishment project that results in the creation of a static line. How do you get out of legal non-conforming status? One way is the static line exception process. You can modify your structure. The CRC can change its rules, which is what is before the

Commission today. Granting grandfather status to a structure does not convey conforming status. It allows the structure to remain, but does not make it conforming. As a policy decision, the Commission can decide what can be allowed if the structure is damaged or destroyed. A variance may allow replacement, but also does not convey conforming status.

In the memo we provided three alternatives. The first alternative is one that was requested by the Wilmington Association of Realtors. They requested that the Commission consider grandfathering multi-family residential structures between 5,000 square feet and 10,000 square feet. They came back to the Commission earlier this year with a revised request for grandfathering of multi-family residential structures over 5,000 square feet with no maximum size. This is the first alternative. The second alternative that DCM presented was based on a recognition that the CRC has moved away from managing setbacks based on use and instead, assigns setbacks based on the size of the building. As a fairness question and in terms of consistency with other regulations, the Commission needs to determine whether to go back to the practice of regulating based on use or whether it will continue to regulate based on the size of the building? The second alternative would put all structures over 5,000 square feet into grandfather status. The structures could be rebuilt if they are damaged or destroyed. The third alternative is a compromise. This approach is a conditional grandfather status. The CRC could consider if the damaged or destroyed structure is located in a community that has a demonstrated commitment to managing the beaches and protecting the property with beach infrastructure. In this third alternative, the structure would be grandfathered giving the homeowner the ability to rebuild at a lower setback. We have also come up with a fourth option for consideration. It is based on the existing rules in a community that already has a static line exception in place. Under current rules, a property owner must rebuild and measure the setback from the most restrictive of the static vegetation line, the actual vegetation line, or any other applicable measurement line where a static line exception exists. A fourth alternative would be to simply require the property owner to use the least restrictive line.

DCM would like to put several questions of fairness before the Commission. In 2012, HB819 directed the Commission to make the initial changes to allow for single-family or duplex residential structures over 5,000 square feet. If they cannot meet the setback then they are allowed to meet the minimum setback which is thirty times the erosion rate or a minimum of sixty feet. That raises a question of fairness for the multi-family residential structures. If you are going to do this for residential structures then what about commercial structures? If you have a similar sized commercial structure, is it fair to that person that is making a livelihood off of that structure to deny them the benefit that you would afford to a single-family, duplex, or multi-family residential structure? If the CRC were to grandfather all of these pre-2009 structures regardless of size, what does that mean for the structures after 2009? As we know, there are not many lots that were not built out on the oceanfront prior to 2009. You are singling out a small segment of property owners that would not receive the same benefit. If HB819 were expanded to all commercial and residential structures regardless of size, then everything regardless of size could conceivably be as close as sixty feet to the oceanfront. That would be a huge step backwards in the protections that we are requiring these developers to undertake. Consider the value of graduated setbacks. Does it still make sense to have larger structures setback from the ocean hazard? Consider the taxpayers who are asked to bear the cost of beach management, and the threat of encroachment onto public beaches.

Seth Palmer, NC Association of Realtors, and Shane Johnson, Wilmington Association of Realtors, were both present. Mr. Palmer stated we have been very interested in this matter given the amount of Realtors and the amount of property that exists on North Carolina's coastline. The foremost issue to us is the residential property and the potential to grandfather those that have fallen into legal non-

conforming status. This comes down to a financing situation that many of these properties are facing whether it be through sale or refinancing. We understand the concerns that staff has raised and we would be interested in continuing the discussion with the Commission and with staff to find other opportunities to increase conformity.

Braxton Davis stated one of the examples from a past meeting was from Carolina Beach which has a static line exception. The changes proposed initially by the Realtors Association had a cap of 10,000 square feet and now it does not have a cap. Without a cap and allowing grandfathering would actually reduce the strength of today's setbacks. Staff had put forward an alternative that was based on our perspective that our communities have changed over time and many communities are developing financial plans and mapping sand resources that we would like to encourage since it is responsible beach management. The static line exception process recognizes that and allows the use of the vegetation line based on the fact that the community has shown to the Commission that it can continue to maintain the beach. Under the exception, there was a grandfathering provision put in, however, it says the "most restrictive" of the static line or vegetation line. This could be changed to "least restrictive". Seth Palmer stated the Association is most in favor of Alternative One. Neal Andrew and Renee Cahoon agreed that Alternative One was their preference as well. Chairman Gorham asked about a size cap of 10,000 square feet. Mr. Palmer stated the Association would prefer that there not be a cap as it may cause an equity perception in looking at the coast as a whole. We feel that setting any boundary, other than a minimum, would not necessarily accomplish the goal. A cap of 10,000 square feet would probably remedy most of the residential issues. Gwen Baker stated the intent of the setback rules are to mitigate the loss of life and property, to prevent encroachment on the public beach, and to reduce the public costs of poorly sited development. It is difficult to look at these alternatives and try to evaluate them against this framework. I would like to have a better understanding of the third alternative and how to operationalize it. Larry Baldwin stated he would also like to hear more about the third alternative with a size limitation of 10,000 square feet.

John Snipes made a motion to postpone this issue until the next meeting. Gwen Baker made a friendly amendment to the motion to include staff providing more information on the third alternative at the next meeting. John Snipes accepted the amendment. Bill White seconded the motion. The motion failed with five votes in favor (White, Norris, Baker, Snipes, Lewis) and six opposed (Hairston, Simmons, Andrew, Baldwin, Cahoon, Gorham).

Jamin Simmons made a motion to eliminate the second alternative presented, of placing all structures over 5,000 square feet into grandfather status. Renee Cahoon seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Neal Andrew made a motion to approve for public hearing the first alternative to expand the grandfathering privilege to all residential structures over 5,000 square feet up to 10,000 square feet and not include commercial structures of the same size. Renee Cahoon seconded the motion. The motion passed with eight votes in favor (Hairston, White, Simmons, Baldwin, Andrew, Cahoon, Gorham, Lewis) and three opposed (Norris, Baker, Snipes).

Gwen Baker made a motion to have the third alternative further defined with additional data of affected properties including structures above 10,000 square feet and commercial structures, for consideration at the next meeting. Phil Norris seconded the motion. The motion

passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Sea Level Rise Report 2015 Update
Tancred Miller stated the memo in the packet contained a copy of all of the public comments received. We have not received any additional comments. The purpose of the update is to ask the Commission if there are any further requests of the Science Panel. Most of the comments are not technical comments. The Science Panel will be asked to evaluate the comments received and determine if a formal response is necessary. All of the comments will be attached to the final report as an addendum. The comment period closes December 31, 2015, and the final report is due to the legislature on March 1, 2016.

PUBLIC INPUT AND COMMENT
No comments were received.

CRC RULE DEVELOPMENT
15A NCAC 7H .1800 GP to Allow Post-storm Beach Bulldozing Below Mean High Water (CRC 15-33)
Ken Richardson stated recent storm events have raised questions about how beach bulldozing is authorized. Beach bulldozing is an activity that typically occurs above mean high water and below the first line of stable and natural vegetation for the purpose of rehabilitating a dune damaged by erosion. One way to do that is to get a General Permit that allows bulldozing above mean high water and below the first line of stable and natural vegetation within the Ocean Erodible AEC, but does not allow it within the Inlet Hazard AEC. During the turtle moratorium (May 1 – November 15), coordination is necessary with multiple agencies to get their approval. Another mechanism to allow beach grading is the use of a CAMA Major Permit. Typically, these are issued to towns following a storm event so their entire oceanfront jurisdiction can be bulldozed should they choose to do so. With the Major Permit, this activity can occur in both the Ocean Erodible and Inlet Hazard AECs for the purpose of dune creation and rehabilitation. However you cannot create a new dune in an Inlet Hazard AEC with the Major Permit. There are currently four communities that have an active CAMA Major Permit. If an individual property owner wanted to coordinate with the local government to bulldoze in front of their property, they could coordinate with the town and a minor modification to the permit would allow that property owner to bulldoze under the same conditions issued to the town. One other option is an exemption that allows for beach bulldozing in a situation with an imminently threatened structure. Staff would like to propose a few modifications to the rules to allow beach bulldozing below mean high water, but above mean low water. This will be consistent with the Army Corps of Engineers' permit for beach bulldozing. The Corps' General Permit has the turtle moratorium starting in April and our General Permit has it starting in May so we would modify our General Permit to match the Corps' permit.

Neal Andrew made a motion to approve the proposed amendments to the General Permit for beach bulldozing (15A NCAC 7H .1801, .1802, .1803, .1804, .1805, 7H .2501, .2505) for public hearing. Renee Cahoon seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

15A NCAC 7H .2700 GP to Allow for the Construction of Marsh Sills (CRC 15-32)
Daniel Govoni stated living shorelines have been shown to promote good water quality ecosystem services and habitat values. Living shorelines contain a suite of options and included in those options are shoreline erosion control measures that are either marsh sills with wetland plantings or

wetland plantings with no structural components. Sill material is placed offshore and consists of rock, oyster bags or loose oyster shell. Sometimes fill is placed landward of the sill with wetland plantings. Of all the shoreline stabilization structures constructed in North Carolina, approximately 23 percent of those are riprap revetments and 72 percent of them are bulkheads with the remaining five percent being living shorelines. To help promote living shorelines as an alternative to traditional vertical structures, such as bulkheads, staff has created a living shoreline strategy. Included in this strategy is advocacy, public awareness, investigating any possible financial incentives, and monitoring and performance of these structures. To date, staff has completed workshops for property owners, marine contractors and engineers, we have also created an estuarine shoreline stabilization handbook, and conducted a multi-agency assessment of permitted sills. The assessments were concentrated on the sills' performance and the landowner's perception of these structures. We have had ongoing coordination meetings to revise the marsh sill General Permit. House Bill 1028, which was passed in 2003, established a General Permit for the construction of riprap sills. During its development, the merits of this permit were discussed and some of the points of discussion included some concerns. These concerns included the distance offshore these structures could be built, the trading of one habitat type for another, and navigation of public trust concerns, suitability of these structures in certain areas and the permitting requirements of other agencies. The General Permit became effective April 1, 2005, and had 29 specific conditions. This permit is not consistent with other permits for bulkheads and riprap. Bulkhead and riprap permits do not have any coordination requirements and have a lot less conditions and therefore their processing and issuance time is a lot shorter. Staff has had ongoing meetings with the federal and state agencies to try to identify any opportunities to help streamline this General Permit. Through these meetings, the Division of Marine Fisheries has agreed there is no longer a need for their review. The Division of Water Resources has revised and reissued their General Water Quality Certificate and no longer requires written concurrence. The proposed amendments to this General Permit remove these coordination requirements and other redundant, unnecessary conditions. Staff requests approval of the amendments for public hearing. Braxton Davis added that the Corps of Engineers nationally is considering developing a Nationwide Permit for marsh sills and we are engaged in that discussion. They have also been working with us through this General Permit to see what conditions make sense for them to allow us to take the lead on these. Currently, this General Permit is not going to be exercised because typically you will need a separate Corps' permit if you use this General Permit. As we refine this permit we will get to a set of conditions that everyone is comfortable with. We have had meetings with stakeholders and scientists to try to get to the necessary conditions to take this new General Permit to the Corps to see if they could do a regional General Permit.

Renee Cahoon made a motion to approve the amendments to 15A NCAC 7H .2700 for public hearing. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

Chairman Gorham stated he is interested in this and would like to see it in more detail on a future agenda. Braxton stated we would like to have an entire session on estuaries and estuarine shorelines. We have a lot of efforts in the Division focused on estuarine shoreline management.

Sandbag Temporary Rules (CRC 15-30)
15A NCAC 7H .0308, 15A NCAC 7H .1704, and 15A NCAC 7H .1705

Mike Lopazanski stated the Legislature included in Session Law 2015-241 that the CRC take some action on temporary erosion control structure rules. Specifically, the CRC has been directed to amend the rules to allow sandbags even if there is no imminently threatened structure as long as the property is adjacent to a property that already has sandbags, to allow contiguous sandbag structures

from one boundary of the property to the other regardless of the proximity to any imminently threatened structure, to set the termination date for all permits associated with a contiguous sandbag structure on the same property to be the same and the latest date of any permits on that property, and to allow the replacement, repair or modification of sandbags that have been legally placed under a current or expired permit if it is being litigated by the property owner. The CRC was directed to adopt rule language that allows these four items. Staff has made the changes, but with a couple of clarifications to address some potential issues.

For allowing sandbags even if there are no imminently threatened structures, we have added the provision that the sandbags be in compliance with the CRC's rules. To address the oceanward creep of any sandbag structures we have added that they must be aligned no further oceanward than the landward most sandbag structure. For allowing contiguous sandbag structures from one shoreline property boundary to the other, we deleted the twenty foot extension past the structure restriction. For the termination date, we added the language that was in the legislation. With regard to the replacement or modification of sandbag structures that are under litigation, we have clarified that would be in state or federal court. If the CRC approves these amendments then the comment period will run from December 1-22, 2015. A public hearing will be held on December 10 in Morehead City. The CRC could then adopt the temporary rules at the February 2016 meeting and begin the permanent rulemaking process.

Braxton Davis stated if the intent of this rule was to prevent gaps along the shoreline between sandbag structures then we are supportive of that. These changes will protect the shoreline position rather than focus on imminently threatened structures. The concern is this could be potentially expansive stretches of shoreline with just the words "adjacent to". Before we move forward with the permanent rules we can try to find out if this was the intent or if there is flexibility.

Chairman Gorham asked if the CRC could legally limit what the Legislature told us to do. Gwen Baker added if during the permanent rulemaking process there is a clear indication that this is a bad idea, do we have the flexibility to go in a different direction contrary to the legislative language? Braxton Davis replied that this legislation does not say the rules have to be written exactly as the legislation is written just that it accomplish what the legislation says. Mary Lucasse stated the legislature has the right to make legislation. They delegate to the CRC the ability to make the rules to implement the statute. The CRC cannot make rules that are inconsistent with the statutory authority. If the CRC makes rules that did not have the statutory framework to support them then there could be a challenge to a permit decision based on rules that are not consistent with the legislative authority. Gwen Baker stated, we could see what public comments are received during the permanent rulemaking process and what the fiscal analysis reveals and use that as justification to approach the legislature to point out unintended consequences.

Renee Cahoon made a motion to approve the temporary rule amendments to 15A NCAC 7H .0308, 7H .1704, and 7H .1705 for public hearing. Jamin Simmons seconded the motion. The motion passed with eight votes in favor (Hairston, White, Simmons, Norris, Baldwin, Gorham, Baker, Snipes) and three opposed (Andrew, Cahoon, Lewis).

PUBLIC HEARING
15A NCAC 7H .0305, 7H .0306, 7J .1201, 7J .1301, 7J .1302, 7J .1303
Ken Richardson stated the development line procedures are defined in Section 15A NCAC 07J .1300. These rules describe the procedures for who may request the development line, how it is delineated, what information needs to be provided to the CRC, and who may request changes to the

development line. They also outline where the request needs to be submitted and when the CRC will consider them. The process is also described for presenting the requests to the CRC and the criteria and time frame for the CRC's decision. These rules specify how and when Petitioners will be notified of the CRC's decision, and how the decision can be appealed. The Division of Coastal Management will maintain a list of approved development lines and related information about them and make this information available to the public for inspection. Amendments to the static vegetation line exception rules, found in 15A NCAC 7H .0306 and 7J .1201, are also proposed. Significant changes here are eliminating the five-year waiting period, eliminating the building size restriction, and defining who can apply for a static vegetation line. The comment period ends on January 2, 2016.

No public comments were received during the public hearing.

CHPP Update

2015 Coastal Habitat Plan Update

Jimmy Johnson, NC Albemarle-Pamlico National Estuary Partnership, stated I am the State's Coastal Habitat Coordinator and as such it is my responsibility to see to the implementation of the Department's Coastal Habitat Protection Plan. For the past 16 months we have been working on the five year update of NC's CHPP. The CHPP is the only plan of its kind in the nation and we are proud of the fact that we have had this plan for the past 10 years and it is updated every five years. This is a Departmental plan and involves a number of agencies within DEQ. The Coastal Resources Commission, the Environmental Management Commission and the Marine Fisheries Commission are the three major players within the development of the plan and their staff. There are several things that are required by statute to be included in the Plan and we have addressed each of those. These include a description and classification of the biological systems within the habitats including wetlands, fish spawning grounds, estuarine or aquatic endangered or threatened species, primary or secondary nursery areas, shellfish beds, submerged aquatic vegetation beds, and habitats in outstanding resource waters. Also required in the Plan is an evaluation of the function and value to coastal fisheries of each of the identified habitats, and the status and trends of those habitats. The Plan also has to identify existing and potential threats to the habitats and the impact that those threats have on coastal fishing. Recommendations are also found in the Plan designed to protect and restore the habitats. The overarching goal of the CHPP is the long term enhancement of coastal fisheries. This enhancement will come through addressing habitat and water quality needs for the important fish species found in North Carolina waters. In the statute is a statement that the CRC, EMC and MFC shall ensure, to the maximum extent practicable, that their actions are consistent with the CHPP. The CHPP is a guidance and resource document. It is used to aid the Department and their Divisions and Commissions in the management of fish habitat and water quality. The document is organized into four sections: habitats; the threats to those habitats; priority issues; and recommendations. Each Commission has the opportunity to adopt the CHPP. I will back before you early next year to give the CRC the opportunity to adopt it. Today, I am asking for you as a Commission to allow the document before you to go out for public comment in the month of December. All of this takes place through a steering committee. Members of the steering committee consist of two members from the CRC (Baldwin and Snipes), two from the MFC, and two from the EMC. Through this process we have received guidance and suggestions and some criticism from each member of the steering committee. From their direction and advice we created the smaller version of the CHPP to be able to reach a larger audience. North Carolina is remarkable in where it is situated within the east coast and by the fact that we have 2.3 million acres of estuarine waters. We have the largest estuary of any single state on the east coast. Those waters produce a lot of fish. The fisheries produce a lot of important economic benefits to the eastern part of North Carolina. We

are positioned between the convergences of two ocean currents and have the opportunity to catch fish that come in from the Caribbean as well as a Maine lobster. You will also notice that we have some significant rivers that enter into our estuarine system and the CHPP also covers the seven major rivers. Ninety percent of the commercial and recreational fisheries will spend some portion of their life cycle within the estuarine waters. In 1994, North Carolina was faced with a lot issues regarding its fisheries. We were seeing our fish stocks decline, there was disease in our oyster beds, we had a red tide that our scallop industry still has not recovered from, and we were seeing an increasing number of shellfish closures. The Legislature set out to design legislation to help with the fisheries. In 1997, the Fisheries Reform Act was passed. There is a licensing structure, the habitat component, and the Fisheries Management Plans in the Act. The CHPP has identified six critically important habitats to the fisheries. The first is wetlands. Wetlands are a critical nursery area. They provide protective cover for juvenile fish and a corridor for smaller fish to pass through. They provide a food source and are a water quality enhancer. Oysters and shell bottom are another habitat identified. Not only is it a habitat, but it is also a fishery. Oysters provide protective cover for small organisms, are a food source, and filter impurities out of the water. Submerged aquatic vegetation (SAV) is an important part of the fisheries production. It provides a refuge for the smaller fishery. Hard bottom, although we don't have a lot in North Carolina, is a complex structure and is covered by barnacles and other living organisms and support a lot of reef fish that come up from the south. Soft bottom stores nutrients and provides critical foraging areas for fish. The water column is also one of the important habitats that is listed and documented within the CHPP. The first CHPP was passed in later 2004 and was adopted by the Commissions in late 2004. The CHPP was reorganized and revised in 2010. The Plan has been completely reorganized and is a shorter. It has been divided into a source document and a smaller CHPP for the public. There is an emphasis on the economic value of habitat protection. There are no rulemaking recommendations found in the CHPP. It is a non-regulatory document. Mapping of habitat and the assessment of those habitats has been a critical part of the CHPP and that continues to be included in the 2015 document. There have been a lot of updates as new information and new science comes about. Economically fisheries are incredibly important to the State. If you live in one of the 20 coastal counties then you know how important fishing is for tourism and travel to this region. Throughout this process we have been reminded that we need to balance the economics and the environment. We have done a good job because the two are not mutually exclusive. There is a growing body of science that has assessed the economic value of these habitats that are found within the CHPP. Some of the past accomplishments that we have seen that have come about because of the CHPP include oyster restoration, mapping and assessing habitat, collaborative research efforts, actions by the CRC and Coastal Management including the estuarine shoreline restoration and oyster sill project, inventory of docks and piers, living shoreline strategy, and clean marina handbook. The interagency coordination meetings continue to be held where all agencies within DEQ come together to talk about coastal projects. There are four primary goals that are found in the CHPP. The first is to improve the effectiveness of the existing rules and programs protecting coastal fish habitats. Under that goal the 2015 update has five recommendations centered on compliance and monitoring, outreach and coordination, and invasive species. Goal number two is to identify and delineate strategic coastal habitat. There are two recommendations under this goal. Goal three is to enhance and protect habitats from adverse physical impacts. There are eight recommendations found under this goal including habitat restoration and managing ocean and estuarine shorelines, protecting habitat from destructive fishing gear, and dredge and fill impacts. The fourth goal is enhance and protect water quality. There are eight recommendations for this goal. Early on the steering committee identified four priorities for the 2015 update: continue with oyster restoration; living shorelines; develop metrics through the recommendations in the CHPP; and sedimentation. I am here to ask permission from the CRC to allow us to take this out for public comment. There will be

four meetings that will be held in December to receive public comment. The steering committee will meet in January to discuss the comments that are received. This was before the EMC on November 5 and they voted to allow it to go out for comment and did request a change to one of the recommendations.

John Snipes made a motion to approve the 2015 CHPP update for public comment. Larry Baldwin seconded the motion. The motion passed unanimously (Hairston, White, Simmons, Norris, Baldwin, Andrew, Cahoon, Gorham, Baker, Snipes, Lewis).

With no further business, the CRC adjourned.

Respectfully submitted,

Braxton Davis, Executive Secretary

Angela Willis, Recording Secretary

NC COASTAL RESOURCES COMMISSION (CRC)

Special Meeting
December 8, 2015
DEQ-Wilmington Regional Office

Participating CRC Members

Frank Gorham, Chair
Renee Cahoon, Vice-Chair
Neal Andrew, Second Vice-Chair
Larry Baldwin
Greg Lewis
Russell Rhodes, Jr.
John Snipes
Bill White

Participating Attorney General's Office Members

Mary Lucasse, CRC counsel
Christine Goebel, Counsel for DCM
Scott Slusser, Co-council for Petitioner
Thomas Henry, Co-council for Petitioner

CALL TO ORDER/ROLL CALL

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

Angela Willis called the roll. Russell Rhodes, Jr. read his November 2015 Evaluation of Statement of Economic Interest which indicated that there were no actual conflicts and any potential conflicts would not preclude service. Gwen Baker, Marc Hairston, Phil Norris, and Jamin Simmons were absent. No actual conflicts were reported. Based upon this roll call Chairman Gorham declared a quorum.

VARIANCES

North Carolina State Ports Authority (CRC VR 15-09)
Christine Goebel

Robb Mairs, DCM field representative, gave an overview of the site. Christy Goebel of the Attorney General's office stated the Petitioner is the North Carolina Ports Authority which develops and administers the state port facility in Wilmington, south of the Cape Fear Memorial Bridge on the Cape Fear River. In October 2015, Petitioner sought a major modification to an existing CAMA major development permit in order to perform new dredging to enlarge the existing turning basin and the associated relocation of existing facilities. This area of the Cape Fear River is designated as a Primary Nursery Area (PNA) by the Marine Fisheries Commission and per CRC rule 15A NCAC

07H .0208, new dredging in a PNA is prohibited. Based on this rule, DCM denied Petitioner's permit application on November 30, 2015. Petitioner seeks a variance to allow the proposed new dredging. Ms. Goebel reviewed the stipulated facts of the variance request and stated that staff agrees with Petitioners on all four variance criteria.

Scott Slusser of the Attorney General's office spoke and confirmed that Petitioner agrees with staff on all four variance criteria. He reviewed those stipulated facts which Petitioner contends supports the granting of the variance request including the refinement of the amount of dredging from 300,000 to 100,000 cubic yards.

Neal Andrew made a motion to support staff's position that strict application of the applicable development rules, standards or orders issued by the Commission cause the petitioner unnecessary hardships. Renee Cahoon seconded the motion. The motion passed unanimously (Gorham, Andrew, Baldwin, Cahoon, Lewis, Rhodes, Snipes, White).

Neal Andrew made a motion to support staff's position that hardships result from conditions peculiar to the Petitioner's property. Renee Cahoon seconded the motion. The motion passed unanimously (Gorham, Andrew, Baldwin, Cahoon, Lewis, Rhodes, Snipes, White).

Neal Andrew made a motion to support staff's position that hardships do not result from actions taken by the Petitioner. Renee Cahoon seconded the motion. The motion passed unanimously (Gorham, Andrew, Baldwin, Cahoon, Lewis, Rhodes, Snipes, White).

Neal Andrew made a motion to support staff's position that the variance request will be consistent with the rules, standards or orders issued by the Commission; will secure the public safety and welfare; and preserve substantial justice. Renee Cahoon seconded the motion. The motion passed unanimously (Gorham, Andrew, Baldwin, Cahoon, Lewis, Rhodes, Snipes, White).

This variance request was granted.

With no further business, the CRC adjourned.

Respectfully submitted,

Braxton Davis, Executive Secretary

Angela Willis, Recording Secretary

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-16-03

January 24, 2016

MEMORANDUM

TO: Coastal Resources Commission

FROM: Tancred Miller

SUBJECT: Update on Amendments to 15A NCAC 7H .0306: Grandfathering Provisions for Multi-Family Oceanfront Structures

Summary of Rulemaking Action

At the November 2015 CRC meeting, in response to a request from the Wilmington Regional Association of Realtors and the North Carolina Association of Realtors, the commission initiated rulemaking to grandfather certain multi-family residential structures on the oceanfront. Eligible properties under the draft rule change are legal nonconforming, multifamily structures that contain three or more residential units within a single structure, that were originally constructed prior to August 11, 2009, and that are no larger than 10,000 combined square feet. The grandfathered multi-family structures will be subject to the same conditions already in place in 7H .0306 for single-family and duplex residential structures over 5,000 square feet. While there is no maximum size limit for grandfathered single-family or duplex residential structures, the commission established a 10,000 square foot maximum for multi-family residential structures that will be grandfathered.

The commission decided not to take action on grandfathering with respect to commercial structures on the oceanfront, regardless of size. In communities with a static line exception, however, all structures over 5,000 square feet, including commercial structures already have some relief from the graduated setbacks under 7H .0306(a)(2)(K), where the required minimum setback is 120 feet or 60 times the erosion rate, whichever is greater. This relief was included in the rule when the graduated setbacks first went into effect on August 11, 2009.

The draft rule language that was modified during the November meeting limits the eligible structure size to 10,000 square feet, and would also have applied to single-family and duplex residential structures that were the focus of the S.L. 2012-202 provisions. In the course of further review following the November meeting, staff noted that S.L. 2012-202 directed the commission to grandfather single-family and duplex structures over 5,000 square feet, but did not specifically authorize the commission to set a maximum size limit. Staff has therefore revised the amendment to accomplish the action the commission wants to take on multi-family structures, without contravening what the commission was directed to do under S.L. 2012-202. The revised version of the proposed amendment to 7H .0306(a)(2)(L) adds a new clause specifically for multi-family structures between 5,000 and 10,000 square feet, and does not set a maximum limit for single-family and duplex residential structures. The Commission will need to formally approve this revised language at the February meeting in order to avoid conflict with S.L 2012-202.

(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~~ feet, and multi-family residential structures with a total floor area no greater than 10,000 square feet, shall be allowed provided that the structure meets the following criteria:
  (i) The structure was originally constructed prior to August 11, 2009;
  (ii) The structure as replaced does not exceed the original footprint or square footage;
  (iii) It is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(2) of this Rule;
  (iv) The structure as replaced meets the minimum setback required under Part (a)(2)(A) of this Rule; and
  (v) The structure is rebuilt as far landward on the lot as feasible.

When the rule amendment takes effect, two classes of oceanfront structures will be grandfathered under the commission's rule 7H .0306:

1. Single-family and duplex residential structures of any size, originally constructed prior to August 11, 2009; and
2. Multi-family residential structures up to 10,000 square feet, originally constructed prior to August 11, 2009.

The table below summarizes which types of oceanfront structures will, and will not have grandfather status once the rule amendment takes effect:

Structure Type	**Grandfathered**	**Not Grandfathered**
Single-family or duplex residential over 5,000 square feet, originally constructed prior to August 11, 2009	✓	
Single-family or duplex residential over 5,000 square feet, originally constructed on or after August 11, 2009		✓
Multi-family residential up to 10,000 square feet, originally constructed prior to August 11, 2009	✓	
Multi-family residential up to 10,000 square feet, originally constructed on or after August 11, 2009		✓
Multi-family residential over 10,000 square feet, regardless of the original date of construction		✓
Commercial structures of any size, regardless of the original date of construction		✓

Table 1. Grandfather protection by oceanfront structure type following amendments to 7H .0306

In accordance with the N.C. Administrative Procedures Act, G.S. 150B, DCM must prepare a fiscal analysis before the draft rule amendment can proceed to public hearing. For this fiscal analysis, it is necessary to determine the number of multi-family residential structures on the oceanfront that are between 5,000 and 10,000 square feet, and were originally constructed prior to August 11, 2009. In addition to building size, use, date of construction, and number of units, we need to perform a GIS analysis on the location of the relevant structures relative to the applicable setback lines. This analysis is necessary r to determine how many of these structures are currently legal nonconforming, and how many could meet the minimum setback that would apply under the grandfather provision. Once we know the number of structures that will be affected by this rule change, staff will need to estimate the value of granting grandfather protection, by rule, to legal nonconforming structures.

Staff is gathering data from the counties to use in preparing the fiscal analysis. The county data should tell us which structures fit the parameters of being multi-family residential, between 5,000 and 10,000 square feet. The county data will also allow staff to analyze which structures are currently legal nonconforming, and which of those will or will not benefit from receiving grandfather status. With this information, plus a method for estimating the economic value of granting grandfather status by regulation, staff will prepare the fiscal analysis for submission to the Department and the Office of State Budget and Management (OSBM) for approval. Staff expects to complete the analysis and potentially have it approved by the Department and OSBM in time for the May meeting. The commission will need to approve the fiscal analysis before the rule change can proceed to public hearing.

Further Review of Alternative 3

The commission also asked staff to expand upon what was presented in memo CRC-15-29, in November, as Alternative 3. Alternative 3 was a conceptual proposal to extend a package of incentives to communities that voluntarily adopt a local beach management plan, and have it approved by the commission. A community would also have the option to adopt a subregional beach management plan under a formal agreement with neighboring communities, which would qualify each of them for the regulatory and programmatic incentives.

Alternative 3 was presented conceptually because the commission would need to discuss specific incentives before staff is able to incorporate them into draft rule language. Draft rule language can be prepared if the commission wishes to explore any of the concepts in more detail. Similarly, the number of impacted properties, and the potential fiscal and regulatory impacts, would depend on the specific provisions included in the proposed rules. Examples of incentives that could be included in a package are listed below.

- Beach management plans would be voluntary
- Plans would apply to the petitioner's entire jurisdictional area
- Grandfathering of all existing structures, regardless of size or use, could be allowed in a community with an approved beach management plan
- Approval of a beach management plan would also grant a static line exception, if applicable
- Sandbag rules could be customized in communities with an approved plan, for example:
    - could be used to protect accessory structures
    - could be allowed when the erosion scarp is 50 feet away
    - may remain in place as long as the plan is periodically updated and re-approved
    - permits could be renewed if the bags are still necessary
- Permit duration can be extended, possibly up to five years instead of three
- Additional options for streamlined/expedited permitting could be explored

Staff looks forward to the discussion with the commission in February.

*** DRAFT ***

Grandfathering of multi-family residential structures up to 10,000 square feet in the Ocean Hazard Areas AEC

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(L) Notwithstanding any other setback requirement of this Subparagraph, replacement of single family or duplex-residential structures with a total floor area greater than 5,000 square ~~feet~~ feet, and multi-family residential structures with a total floor area no greater than 10,000 square feet, shall be allowed provided that the structure meets the following criteria:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(2) restore the affected environment; or

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

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

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

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

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

February 9, 2016

MEMORANDUM **CRC-16-05**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: Status Update on Mandated Coastal Erosion Study, North Carolina 2015 Appropriations Act (S.L. 2015-241, Section 14.101.(a))

In September 2015, the North Carolina General Assembly directed the N.C. Department of Environmental Quality (DEQ), Division of Coastal Management (DCM), under the 2015 Appropriations Act (S.L. 2015-241, Section 14.101.(a)), to "*study and develop a proposed strategy for preventing, mitigating, and remediating the effects of beach erosion.*" The law requires DCM to report the results to the Environmental Review Commission, the Chairs of the Senate Appropriations Committee on Natural and Economic Resources and the House Appropriations Committee on Agriculture, Natural, and Economic Resources, and the Fiscal Research Division, by February 15, 2016.

Between October 2015 and January 2016, DCM drafted a report based on a review of the relevant literature and previous work done in the state, a site visit to observe an experimental structural approach to mitigating beach erosion in South Carolina, and by drawing upon staff experience in shoreline change analysis and permitting beachfront development and engineering projects. The draft report was submitted to the NC Department of Environmental Quality on January 15, 2016 for internal review.

The subject of beach erosion and methods used to mitigate and prevent its negative effects is a broad and highly complex issue. In order to focus on the charge given to the DCM, the draft report is organized around the follow topic areas:

- Causes of Beach Erosion
- Historical Shoreline Change
- Mitigation & Prevention – Responses to Erosion
- Overview of Existing Policies, Standards, and Actions
- Summary of Strategies and Recommendations
- Summary of Public Comments

In addition to summarizing historical rates of shoreline change, the draft report also includes a summary of past studies related to North Carolina's beach erosion issues, and consideration of previously proposed and alternative policies and strategies for mitigating its effects. These studies included:

- Prior Studies by the N.C. General Assembly**:**
    - In 1997, a study of issues related to coastal beach "movement" was authorized by 2.1(3) of Chapter 483 of the 1997 Session Laws, and under authority of G.S. 120-30.17(1), the Legislative Research Commission established a study committee charged with studying issues to include financial aspects of beach nourishment and storm hazard mitigation on the barrier islands. However, due to the unusual length of the 1998 Regular Session of the General Assembly, the Legislative Research Commission's Study Committee only met once, and later recommend that the study be reauthorized.
    - In 1999, a study of Coastal Beach Movement, Beach Nourishment and Storm Mitigation was authorized by Part II, Section 2.1(6)(e) of Chapter 395 of the 1999 Session Laws (Regular Session, 1999). Part II of Chapter 395 allowed for studies authorized by that part of the Legislative Research Commission to consider House Bill 118 and Senate Bill 54 in determining the nature, scope and aspects of the study. The Legislative Research Commission authorized that study under authority of G.S. 120-30.17(1). The Legislative Research Commission reported its findings and recommendations to the 2001 Session of the General Assembly of North Carolina, and is summarized in the report.

- In 1997, the NC Division of Emergency Management published a mitigation report that was based on lessons learned during the aftermath of Hurricane Fran. The report stressed the importance of a comprehensive strategy to reduce damages associated with future hurricanes, and provided recommendations that incorporated both public and private sector input.

- In 1984, the Outer Banks Task Force Study was established by the CRC in response to growing concerns over beach erosion problems in Dare and Currituck Counties. The 16-member group was comprised of commissioners, the Coastal Resources Advisory Council, town and county governments, the USACE, and specialists in coastal erosion, in addition to 13 technical and policy advisors.

<u>Public Comment</u>

DCM solicited public comments from October 2015 through December 31, 2015. All public comments have been included in the appendices of this report. The following summarizes the comments and recommendations received by DCM during the comment period:

1. **Monitoring and Research**
    a. In order to better understand sediment budgets and sand volume changes over time, funding should be established so that routine monitoring of the shoreface, beach and dunes can be performed for the entire oceanfront.

b. In the past, N.C. has focused its attention on oceanfront shoreline change rates. It is recommended that the state also routinely study changes occurring at developed inlets to include mapping of inlet features (channels, swash bars, ebb and flood-tide deltas, etc.).

2. Funding and Management

a. The state should develop a dedicated funding source for locally-initiated beach nourishment and inlet management projects similar to the "Shallow Draft Navigation Channel and Lake Dredging Fund." Beach nourishment projects have occurred where only local, or local and federal funds have been used without any contribution from the State.
b. The state should promote and support regional approaches to beach and inlet management that cross multiple jurisdictions, which are codified by state law, inter-local agreements, or some other legal mechanism.
c. Beneficial use of dredged material should be a priority. The state should continue working with the USACE to ensure disposal of dredged beach quality material is done in a manner that replicates the sand budget to keep it in the system.
d. Some opposition to the use of public funds for beach erosion mitigation.

3. Regulatory

a. Beach nourishment is the most effective solution to mitigate erosion. The state should endorse beach nourishment as the primary alternative for dealing with erosion, and abandon the concept of "retreat" since this is not a practical option for most.
b. Responsibly expand dredging windows with safeguards and mitigation measures in an effort to reduce local and potentially state costs, while allowing more time for projects to be completed.
c. Improve permitting timelines. Knowing that beach nourishment is the primary method communities will be using to mitigate most erosion, the permitting process should be streamlined, and Environmental Assessments/FONSIs should be required for individual nourishment and inlet relocation projects.
d. When merited, the state should oppose future species listing (endangered or threatened) and critical habitat designations established by the U.S. Fish and Wildlife Service and National Marine Fisheries Service. These designations create another layer of review and consultation that require additional funds when seeking a nourishment project.
e. The state should require the USACE to abide by its erosion monitoring and mitigation obligations made in the environmental review process and incorporated in the State's consistency determination.
f. The state should work with the USACE to adequately study the effects and impacts of shipping channel dredging.
g. Update and implement recommendation in NC's Beach and Inlet Management Plan (BIMP).
h. Hardened structures can accelerate erosion on adjacent shorelines, resulting in loss of habitat, and public's ability to access and enjoy the dry sand beach.

Next Steps

After the Department of Environmental Quality and Division of Coastal Management have completed final edits, the report will be submitted to the Environmental Review Commission, the Chairs of the Senate Appropriations Committee on Natural and Economic Resources and the House Appropriations Committee on Agriculture, Natural, and Economic Resources, and the Fiscal Research Division, by February 15, 2016. The final report will also be provided to the Commission, CRAC, and made available to the public at the same time. A full summary of the report will be presented at the May 10, 2016 Coastal Resources Commission meeting in Dare County.

TITLE 15A – DEPARTMENT OF ENVIRONMENTAL QUALITY

Notice is hereby given in accordance with G.S. 150B-21.2 that the Coastal Resources Commission intends to amend the rule cited as 15A NCAC 07H .0304.

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

Proposed Effective Date: *July 1, 2016*

Public Hearing:
Date: *February 10, 2016*
Time: *1:30 p.m.*
Location: *Carteret County, DoubleTree by Hilton, 2717 W. Fort Macon Road, Atlantic Beach, NC 28512*

Public Hearing:
Date: *February 18, 2016*
Time: *3:00 p.m.*
Location: *Pender County, Surf City Town Hall, 214 N. New River Drive, Surf City, NC 28445*

Public Hearing:
Date: *February 18, 2016*
Time: *5:00 p.m.*
Location: *Onslow County, Onslow County Public Library, 1330 Hwy 210, Sneads Ferry, NC 28460*

Public Hearing:
Date: *March 3, 2016*
Time: *1:00 p.m.*
Location: *Brunswick County, Oak Island Town Hall, 4601 E. Oak Island Drive, Oak Island, NC 28465 (Council Room)*

Public Hearing:
Date: *March 3, 2016*
Time: *5:00 p.m.*
Location: *New Hanover County, New Hanover County Government Center, 230 Government Center Drive, Wilmington, NC 28403 (Finance Conference Room #500)*

Public Hearing:
Date: *April 6, 2016*
Time: *1:00 p.m.*
Location: *Hyde County, Ocracoke Volunteer Fire Department, 822 Irvin Garrish Hwy, Ocracoke, NC 27960*

Public Hearing:
Date: *May 9, 2016*
Time: *5:00 p.m.*
Location: *Currituck County, Outer Banks Center for Wildlife Education, 1160 Village Lane, Corolla, NC 27927*

Public Hearing:
Date: *May 10, 2016*
Time: *1:30 p.m.*
Location: *Dare County, Dare County Administration Building, 954 Marshall C. Collins Drive, Manteo, NC 27954*

Reason for Proposed Action: *15A NCAC 07H .0304 outlines the subcategories of Areas of Environmental Concern (AEC) within the broader Ocean Hazard AEC. The proposed rule change amends the formula for calculating the width of the Ocean Erodible AEC. The Coastal Resources Commission (CRC) is proposing to alter the formula used to calculate the width of the Ocean Erodible Area (OEA) for consistency with the setback factors found in 15A NCAC 07H .0306 and to delete utilization of an outdated dune recession that is no longer necessary due to FEMA incorporation of dune recession into the National Flood Insurance Program V-Zones.*

Comments may be submitted to: *Braxton Davis, 400 Commerce Avenue, Morehead City, NC 28557, phone (252) 808-2808*

Comment period ends: *May 10, 2016*

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become

effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).

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

CHAPTER 07 – COASTAL MANAGEMENT

SUBCHAPTER 07H - STATE GUIDELINES FOR AREAS OF ENVIRONMENTAL CONCERN

SECTION .0300 – OCEAN HAZARD AREAS

15A NCAC 07H .0304 AECS WITHIN OCEAN HAZARD AREAS

The ocean hazard AECs contain all of the following areas:

(1) Ocean Erodible Area. This is the area where there exists a substantial possibility of excessive erosion and significant shoreline fluctuation. The oceanward boundary of this area is the mean low water line. The landward extent of this area is determined as follows:

(a) a distance landward from the first line of stable and natural vegetation as defined in 15A NCAC 07H .0305(a)(5) to the recession line established by multiplying the long-term annual erosion rate times ~~60;~~ 90; provided that, where there has been no long-term erosion or the rate is less than two feet per year, this distance shall be set at 120 feet landward from the first line of stable natural vegetation. For the purposes of this Rule, the erosion rates are the long-term average based on available historical data. The current long-term average erosion rate data for each segment of the North Carolina coast is depicted on maps entitled "2011 Long-Term Average Annual Shoreline Rate Update" and approved by the Coastal Resources Commission on May 5, 2011 (except as such rates may be varied in individual contested cases, declaratory, or interpretive rulings). In all cases, the rate of shoreline change shall be no less than two feet of erosion per year. The maps are available without cost from any Local Permit Officer or the Division of Coastal Management on the internet at ~~http://www.nccoastalmanagement.net; and~~ http://www.nccoastalmanagement.net.

~~(b) a distance landward from the recession line established in Sub-Item (1)(a) of this Rule to the recession line that would be generated by a storm having a one percent chance of being equaled or exceeded in any given year.~~

(2) Inlet Hazard Area. The inlet hazard areas are natural-hazard areas that are especially vulnerable to erosion, flooding and other adverse effects of sand, wind, and water because of their proximity to dynamic ocean inlets. This area extends landward from the mean low water line a distance sufficient to encompass that area within which the inlet shall migrate, based on statistical analysis, and shall consider such factors as previous inlet territory, structurally weak areas near the inlet, and external influences such as jetties and channelization. The areas on the maps identified as suggested Inlet Hazard Areas included in the report entitled INLET HAZARD AREAS, The Final Report and Recommendations to the Coastal Resources Commission, 1978, as amended in 1981, by Loie J. Priddy and Rick Carraway are incorporated by reference and are hereby designated as Inlet Hazard Areas except for:

(a) the Cape Fear Inlet Hazard Area as shown on the map does not extend northeast of the Bald Head Island marina entrance channel; and

(b) the former location of Mad Inlet, which closed in 1997.

In all cases, the Inlet Hazard Area shall be an extension of the adjacent ocean erodible areas and in no case shall the width of the inlet hazard area be less than the width of the adjacent ocean erodible area. This report is available for inspection at the Department of ~~Environment and Natural Resources,~~ Environmental Quality, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Sub-item (1)(a) of this Rule. Photocopies are available at no charge.

(3) Unvegetated Beach Area. Beach areas within the Ocean Hazard Area where no stable natural vegetation is present may be designated as an Unvegetated Beach Area on either a permanent or temporary basis as follows:

(a) An area appropriate for permanent designation as an Unvegetated Beach Area is a dynamic area that is subject to rapid unpredictable landform change from wind and wave action. The areas in this category shall be designated following studies by the Division of Coastal Management. These areas shall be designated on maps approved by the Coastal Resources Commission and available without cost from any Local Permit Officer or the Division of Coastal Management on the internet at the website referenced in Sub-Item (1)(a) of this Rule.

(b) An area that is suddenly unvegetated as a result of a hurricane or other major storm event may be designated by the Coastal Resources Commission as an Unvegetated Beach Area for a specific period of time, or the

vegetation has re-established in accordance with 15A NCAC 07H .0305(a)(5). At the expiration of the time specified, or re-establishment of the vegetation, the area shall return to its pre-storm designation.

Authority G.S. 113A-107; 113A-107.1; 113A-113; 113A-124.

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

February 9, 2016

MEMORANDUM **CRC-16-06**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: Summary of Public Comments for the Proposed Development Line Procedures & Amendments to the General Use Standards for Ocean Hazard Areas and Static Vegetation Line Exception Procedures

The public comment period for the proposed Development Line Procedures (15A NCAC 07J.1301, 15A NCAC 07J.1302, and 15A NCAC 07J.1303), and amendments to the General Use Standards for Ocean Hazard Areas (15A NCAC 07H.0306) and Static Vegetation Line Exception Procedures (15A NCAC 07J.1201) ended on January 2, 2016. Staff only received two public comments during the sixty-day period; one supporting the proposed and amended rules, and the other opposed.

Support of Proposed Rules & Amendments:
With noticeable success of past beach nourishment project, property owner at Oak Island hopes the proposed rules and amendments will make his home conforming.

Opposition to Proposed Rules and Amendments:
Concerned with the potential for increased seaward encroachment of larger oceanfront structures into hazard prone areas with no assurances from local government that they will commit to maintaining beach fill projects. If approved, the result could mean degradation of the quality of NC's beaches, and eventual interference with public access to the dry sand beach.

Next Steps:
If after consideration of public comment, the CRC does not wish to make any additional modifications to either the proposed Development Line rules or amended Static Vegetation Line Exception rules, the CRC can vote to approve the proposed rules. The proposed rules would then be submitted to the Rules Review Commission (RRC) for final approval. If approved by RRC, the rules will go into effect in mid- to late spring of 2016. If significant modifications or amendments to the rule are made, it is possible that a new fiscal analysis and public hearing would be required.

Attachments: (A) Public Comments, **(B)** Proposed Rules, and **(C)** Fiscal Analysis

Attachment A: Public Comments

Public Comments from: Mr. Robert Smith, Oak Island, NC

Mr. Smith, your most recent email will suffice if you'd like for it to be included as a public comment for consideration by the Coastal Resources Commission.

Thanks

Braxton C. Davis
Director
NC Division of Coastal Management
Department of Environmental Quality

252 808 2808 x202 office
Braxton.Davis@ncdeq.gov

400 Commerce Avenue
Morehead City, NC 28557

From: Robert Smith [mailto:rsquare@comporium.net]
Sent: Wednesday, December 23, 2015 9:23 AM
To: Davis, Braxton C <Braxton.Davis@NCDENR.Gov>
Subject: Re: Oak Island Static Line

Sir I thank you for your response to my recent e mail. I am aware the newly constructed beach front homes at Oak Island meet CRC static line requirements. I also realize my home does not. My only point is that after almost 17 yrs (years), after the major renourishment, there have been no changes to the regulations. At time of the renourishment we were told if all goes well, the static line would be adjusted in 7 to 10 yrs (years) to allow unbuildable homes to be buildable. As I understand, the line is to provide protection and safety. Currently, as I have pointed out, my property has more sand and vegetation, on the ocean side, than those which conform to regulations. My property poses less threat to others than the homes I have brought to your attention. I only desire fairness. I have read the proposed changes and hope they will help .You also mentioned that public comments would be accepted. Would you inform me if this e mail will suffice or should I contact another office? Again, thanks for your assistance and have a very Merry Xmas.

Robert R Smith

From: "Braxton Davis" <Braxton.Davis@NCDENR.Gov>
To: "Robert Smith" <rsquare@comporium.net>
Cc: "Donna Coleman" <dcoleman@ci.oak-island.nc.us>, "Frank Gorham" <frankgorhamCRC@gmail.com>, "Tim Holloman" <tholloman@ci.oak-island.nc.us>
Sent: Monday, December 21, 2015 4:20:07 PM
Subject: RE: Oak Island Static Line

Mr. Smith,
I received your follow-up emails to Ms. Coleman's earlier response on August 10, 2015. From what I understand, the three homes you referred to in your email do meet the applicable oceanfront construction setbacks in accordance with rules of the NC Coastal Resources Commission (CRC). I also understand that your home, while legally constructed, presently does not meet the applicable setbacks from the oceanfront "static line."

In order to gain relief from the static line setback requirements, there are 2 potential options:

1) The Town of Oak Island could petition the CRC for an exception to the Static Line in accordance with state rules found at 15A NCAC 07J.1200; or

2) Currently, the CRC has begun rulemaking to provide local governments with a second option, to legally establish a "development line," which would then remove the static line designation. Details on this proposed rule are available at: http://portal.ncdenr.org/web/cm/proposed-rules. Public comments on this proposed rule will be accepted through January 2, 2016.

I hope this information is helpful,
Braxton

Braxton C. Davis
Director
NC Division of Coastal Management
Department of Environmental Quality

252 808 2808 x202 office
Braxton.Davis@ncdeq.gov

400 Commerce Avenue
Morehead City, NC 28557

Nothing Compares

From: Robert Smith [mailto:rsquare@comporium.net]
Sent: Thursday, December 17, 2015 7:39 PM
To: Davis, Braxton C <Braxton.Davis@NCDENR.Gov>
Cc: Donna Coleman <dcoleman@ci.oak-island.nc.us>; Gorham, Frank <frankgorhamCRC@gmail.com>; Holloman, Tim <tholloman@ci.oak-island.nc.us>
Subject: Oak Island Static Line

At my recent visit to Oak Island, I again observed three new beach front home under construction. As I have pointed out in the past, these homes {5399 W Beach Dr,3613 W Beach Dr., and 2709 W Beach Dr., are being built on lots with less beach frontage than my home at 4319 E Beach dr. I do not understand the logic of the static line which was created many years ago with pre 2000 data. Why am I, and others, being penalized for nature providing us with a growing dune, since the 2000 renourishment, and not being able to rebuild? I understand this subject is under consideration for change and I urge you and your committee take action to assure all property owners, on the beachfront at Oak Island, be treated equally. Your attention to this matter is appreciated.

Robert R Smith

Public Comments from: North Carolina Coastal Federation

North Carolina
Coastal Federation
Working Together for a Healthy Coast

December 31, 2015

Mr. Braxton Davis
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
Braxton.Davis@ncdenr.gov

RE: Requesting, approving, and managing an oceanfront Development Line Rules

Dear Mr. Davis:

Please accept the following comments on the proposed development line rules on behalf of the North Carolina Coastal Federation. The federation actively supports the preservation and public use of our state's beautiful and productive beaches and inlets as public trust resources for everyone in North Carolina.

The federation objects to the proposed rules because they have the potential to increase seaward encroachment of oceanfront development. This in turn could destroy the quality of our natural beaches and interfere with the public's right to use the dry sand beach.

In particular, the federation takes issue with the following rule changes:

- The proposed rules allow for larger-scale development (elimination of the 2,500 square foot building floor area restriction) to be built in areas that are likely to experience erosion, storm surge, and/or are in close proximity to inlets. After big storms or periods of erosion, these large structures could end up washed on the public beaches.
- The proposed rules allow the oceanfront development in line with the seaward most structure as opposed to the current rules that require the landward most structure be used as a reference point to limit new development.
- The proposed rules do not clearly specify how the development line will be delineated in cases where adjacent neighbor site-line approach will not be feasible due to non-linear seaward edge of development. It is unclear how the currently nonconforming structures (i.e. in Nags Head) would affect the delineation of the proposed development line.

- The proposed rules eliminate requirements for local governments to demonstrate commitment to maintain beach fill projects. The relaxation of beach maintenance commitments will exacerbate the threat posed to our public beaches. Collectively, the proposed rules will result in larger structures being built closer to the ocean in erosion-prone areas, with no assurance that local governments will do their due diligence to keep such buildings from falling into the sea.

Overall the proposed rules encourage large-scale oceanfront development, re-building of previously damaged structures, and development of plots deemed unbuildable by current standards. Given erosion rates as well as the effects of strong storms and storm surge along our coast, the Coastal Resources Commission should promote more sound coastal policies that would limit oceanfront encroachment and encourage responsible coastal development.

The federation strongly recommends that the Coastal Resources Commission does not adopt the proposed rules.

Thank you for taking our comments into consideration.

Sincerely,

Ana Zivanovic-Nenadovic
Program and Policy Analyst

ATTACHMENT B: Proposed Rules

PROPOSED DEVELOPMENT LINE PROCEDURES AND AMENDMENTS TO THE GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS AND STATIC VEGETATION LINE EXCEPTION PROCEDURES

15A NCAC 07H .0304 AECS WITHIN OCEAN HAZARD AREAS

The ocean hazard AECs contain all of the following areas:

(1) Ocean Erodible Area. This is the area in which there exists a substantial possibility of excessive erosion and significant shoreline fluctuation. The oceanward boundary of this area is the mean low water line. The landward extent of this area is determined as follows:

(a) a distance landward from the first line of stable and natural vegetation as defined in 15A NCAC 07H .0305(a)(5) to the recession line that would be established by multiplying the long-term annual erosion rate times 60, provided that, where there has been no long-term erosion or the rate is less than two feet per year, this distance shall be set at 120 feet landward from the first line of stable natural vegetation. For the purposes of this Rule, the erosion rates are the long-term average based on available historical data. The current long-term average erosion rate data for each segment of the North Carolina coast is depicted on maps entitled "2011 Long-Term Average Annual Shoreline Rate Update" and approved by the Coastal Resources Commission on May 5, 2011 (except as such rates may be varied in individual contested cases, declaratory or interpretive rulings). In all cases, the rate of shoreline change shall be no less than two feet of erosion per year. The maps are available without cost from any Local Permit Officer or the Division of Coastal Management on the internet at http://www.nccoastalmanagement.net; and

(b) a distance landward from the recession line established in Sub-Item (1)(a) of this Rule to the recession line that would be generated by a storm having a one percent chance of being equaled or exceeded in any given year.

(2) The High Hazard Flood Area. This is the area subject to high velocity waters (including hurricane wave wash) in a storm having a one percent chance of being equaled or exceeded in any given year, as identified as zone V1-30 on the flood insurance rate maps of the Federal Insurance Administration, U.S. Department of Housing and Urban Development.

(3) Inlet Hazard Area. The inlet hazard areas are natural-hazard areas that are especially vulnerable to erosion, flooding and other adverse effects of sand, wind, and water because of their proximity to dynamic ocean inlets. This area extends landward from the mean low water line a distance sufficient to encompass that area within which the inlet shall migrate, based on statistical analysis, and shall consider such factors as previous inlet territory, structurally weak areas near the inlet and external influences such as jetties and channelization. The areas identified as suggested Inlet Hazard Areas included in the report entitled INLET HAZARD AREAS, The Final Report and Recommendations to the Coastal Resources Commission, 1978, as amended in 1981, by Loie J. Priddy and Rick Carraway are incorporated by reference and are hereby designated as Inlet Hazard Areas except for:

(a) the Cape Fear Inlet Hazard Area as shown on the map does not extend northeast of the Bald Head Island marina entrance channel; and

(b) the former location of Mad Inlet, which closed in 1997.

In all cases, the Inlet Hazard Area shall be an extension of the adjacent ocean erodible areas and in no case shall the width of the inlet hazard area be less than the width of the adjacent ocean erodible area. This report is available for inspection at the Department of Environment and Natural Resources, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Sub-item (1)(a) of this Rule. Photo copies are available at no charge.

(4) Unvegetated Beach Area. Beach areas within the Ocean Hazard Area where no stable natural vegetation is present may be designated as an Unvegetated Beach Area on either a permanent or temporary basis as follows:

(a) An area appropriate for permanent designation as an Unvegetated Beach Area is a dynamic area that is subject to rapid unpredictable landform change from wind and wave action. The areas in this category shall be designated following studies by the Division of Coastal Management. These areas shall be designated on maps approved by the Coastal Resources Commission and available without cost from any Local Permit Officer or the Division of Coastal Management on the internet at the website referenced in Sub-item(1)(a) of this Rule.

(b) An area that is suddenly unvegetated as a result of a hurricane or other major storm event may be designated as an Unvegetated Beach Area for a specific period of time. At the expiration of the time specified by the Coastal Resources Commission, the area shall return to its pre-storm designation.

History Note: *Authority G.S. 113A-107; 113A-107.1; 113A-113; 113A-124;*
Eff. September 9, 1977;
Amended Eff. December 1, 1993; November 1, 1988; September 1, 1986; December 1, 1985;
Temporary Amendment Eff. October 10, 1996;
Amended Eff. April 1, 1997;
Temporary Amendment Eff. October 10, 1996 Expired on July 29, 1997;
Temporary Amendment Eff. October 22, 1997;
Amended Eff. May 1, 2014; February 1, 2013; January 1, 2010, February 1, 2006; October 1, 2004; April 1, 2004; August 1, 1998.

15A NCAC 7H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This section describes natural and man-made features that are found within the ocean hazard area of environmental concern.

(1) Ocean Beaches. Ocean beaches are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either:
(A) the growth of vegetation occurs, or
(B) a distinct change in slope or elevation alters the configuration of the landform, whichever is farther landward.

(2) Nearshore. The nearshore is the portion of the beach seaward of mean low water that is characterized by dynamic changes both in space and time as a result of storms.

(3) Primary Dunes. Primary dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. The primary dune extends landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the dune trough).

(4) Frontal Dunes. The frontal dune is deemed to be the first mound of sand located landward of the ocean beach having sufficient vegetation, height, continuity and configuration to offer protective value.

(5) Vegetation Line. The vegetation line refers to the first line of stable and natural vegetation, which shall be used as the reference point for measuring oceanfront setbacks. This line represents the boundary between the normal dry-sand beach, which is subject to constant flux due to waves, tides, storms and wind, and the more stable upland areas. The vegetation line is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment. The Division of Coastal Management or Local Permit Officer shall determine the location of the stable and natural vegetation line based on visual observations of plant composition and density. If the vegetation has been planted, it may be considered stable when the majority of the plant stems are from continuous rhizomes rather than planted individual rooted sets. The vegetation may be considered natural when the majority of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring. In areas where there is no stable natural vegetation present, this line may be established by

interpolation between the nearest adjacent stable natural vegetation by on ground observations or by aerial photographic interpretation.

(6) Static Vegetation Line. In areas within the boundaries of a large-scale beach fill project, the vegetation line that existed within one year prior to the onset of initial project construction shall be defined as the static vegetation line. A static vegetation line shall be established in coordination with the Division of Coastal Management using on-ground observation and survey or aerial imagery for all areas of oceanfront that undergo a large-scale beach fill project. Once a static vegetation line is established, and after the onset of project construction, this line shall be used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In all locations where the vegetation line as defined in this Rule is landward of the static vegetation line, the vegetation line shall be used as the reference point for measuring oceanfront setbacks. A static vegetation line shall not be established where a static vegetation line is already in place, including those established by the Division of Coastal Management prior to the effective date of this Rule. A record of all static vegetation lines, including those established by the Division of Coastal Management prior to the effective date of this Rule, shall be maintained by the Division of Coastal Management for determining development standards as set forth in Rule .0306 of this Section. Because the impact of Hurricane Floyd (September 1999) caused significant portions of the vegetation line in the Town of Oak Island and the Town of Ocean Isle Beach to be relocated landward of its pre-storm position, the static line for areas landward of the beach fill construction in the Town of Oak Island and the Town of Ocean Isle Beach, the onset of which occurred in 2000, shall be defined by the general trend of the vegetation line established by the Division of Coastal Management from June 1998 aerial orthophotography.

(7) Beach Fill. Beach fill refers to the placement of sediment along the oceanfront shoreline. Sediment used solely to establish or strengthen dunes shall not be considered a beach fill project under this Rule. A large-scale beach fill project shall be defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the U.S. Army Corps of Engineers. The onset of construction shall be defined as the date sediment placement begins with the exception of projects completed prior to the effective date of this Rule, in which case the award of contract date will be considered the onset of construction.

(8) Erosion Escarpment. The normal vertical drop in the beach profile caused from high tide or storm tide erosion.

(9) Measurement Line. The line from which the ocean hazard setback as described in Rule .0306(a) of this Section is measured in the unvegetated beach area of environmental concern as described in Rule .0304(4) of this Section. Procedures for determining the measurement line in areas designated pursuant to Rule .0304(4)(a) of this Section shall be adopted by the Commission for each area where such a line is designated pursuant to the provisions of G.S. 150B. These procedures shall be available from any local permit officer or the Division of Coastal Management. In areas designated pursuant to Rule .0304(4)(b) of this Section, the Division of Coastal Management shall establish a measurement line that approximates the location at which the vegetation line is expected to reestablish by:

(A) determining the distance the vegetation line receded at the closest vegetated site to the proposed development site; and

(B) locating the line of stable natural vegetation on the most current pre-storm aerial photography of the proposed development site and moving this line landward the distance determined in Subparagraph (g)(1) of this Rule.

The measurement line established pursuant to this process shall in every case be located landward of the average width of the beach as determined from the most current pre-storm aerial photography.

(10) Development Line. The line established in accordance with 15A NCAC 07J.1300 by local governments representing the seaward-most allowable location of oceanfront development. In areas that have approved development lines, the vegetation line or measurement line shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of 15A NCAC 07H.0306(a)(2).

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined 15A NCAC 07I .0500, a readily identifiable land area within which

the ocean hazard areas occur. This designated notice area must include all of the land areas defined in Rule .0304 of this Section. Natural or man-made landmarks may be considered in delineating this area.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124;*
Eff. September 9, 1977;
Amended Eff. December 1, 1992; September 1, 1986; December 1, 1985; February 2, 1981;
Temporary Amendment Eff. October 10, 1996;
Amended Eff. January 1, 1997;
Temporary Amendment Eff. October 10, 1996 Expired on July 29, 1997;
Temporary Amendment Eff. October 22, 1997;
Amended Eff. April 1, 2008; August 1, 2002; August 1, 1998.

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

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

(1) The ocean hazard setback for development is measured in a landward direction from the vegetation line, the static vegetation line, or the measurement line whichever is applicable.

(2) In areas with a development line, the ocean hazard setback line shall be set at a distance in accordance with sub-sections (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established below the mean high water line.

(4) The setback distance is determined by both the size of development and the shoreline erosion rate as defined in 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)~~(5) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback is established based on the following criteria:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)~~(2)~~(5) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)~~(2)~~(5)(A) of this Rule; and

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

~~(3)~~(6) If a primary dune exists in the AEC on or landward of the lot on which the development is proposed, the development shall be landward of the crest of the primary dune~~, or~~ the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line, ~~or~~ measurement line, whichever is applicable. For existing lots, however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but shall not be located on or oceanward of a frontal dune or the development line. The words "existing lots" in this Rule shall mean a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and which cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership.

~~(4)~~(7) If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot on which the development is proposed, the development shall be set landward of the frontal dune~~, or landward of the~~ ocean hazard setback, or development line, whichever is farthest from the vegetation line, static vegetation line, or measurement line, whichever is applicable.

~~(5)~~(8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot on which development is proposed, the structure shall be landward of the ocean hazard setback or development line, whichever is more restrictive.

~~(6)~~(9) Structural additions or increases in the footprint or total floor area of a building or structure represent expansions to the total floor area and shall meet the setback requirements established in this Rule and 15A NCAC 07H .0309(a). New development landward of the applicable setback may be cosmetically, but shall not be structurally, attached to an existing structure that does not conform with current setback requirements.

~~(7)~~(10) Established common law and statutory public rights of access to and use of public trust lands and waters in ocean hazard areas shall not be eliminated or restricted. Development shall not encroach upon public accessways, nor shall it limit the intended use of the accessways.

~~(8)~~(11) Beach fill as defined in this Section represents a temporary response to coastal erosion, and compatible beach fill as defined in 15A NCAC 07H .0312 can be expected to erode at least as fast as, if not faster than, the pre-project beach. Furthermore, there is no assurance of future funding or

beach-compatible sediment for continued beach fill projects and project maintenance. A vegetation line that becomes established oceanward of the pre-project vegetation line in an area that has received beach fill may be more vulnerable to natural hazards along the oceanfront if the beach fill project is not maintained. A development setback measured from the vegetation line ~~provides~~ may provide less protection from ocean hazards. Therefore, development setbacks in areas that have received large-scale beach fill as defined in 15A NCAC 07H .0305 shall be measured landward from the static vegetation line as defined in this Section unless a development line has been approved by the Coastal Resources Commission.

~~(9)~~(12) ~~However, in~~ In order to allow for development landward of the large-scale beach fill project that ~~is less than 2,500 square feet and~~ cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (1) and ~~(2)(A)~~(5) of this Paragraph, a local government ~~or community~~, group of local governments involved in a regional beach fill project, or qualified owner's association defined in NCGS 47F-1-103-(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one (1) mile of ocean shoreline, may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback provisions defined in Part (a)(2)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner as well as the boundaries of the large-scale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;

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

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

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

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

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

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

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

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

(f) Development shall comply with general management objective for ocean hazard areas set forth in 15A NCAC07H .0303.

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

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

(1) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;
(2) restore the affected environment; or
(3) compensate for the adverse impacts by replacing or providing substitute resources.

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

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

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

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

SECTION .1200 – STATIC VEGETATION LINE EXCEPTION PROCEDURES

15A NCAC 07J .1201 REQUESTING THE STATIC LINE EXCEPTION

(a) Any local government, group of local governments involved in a regional beach fill project, qualified owner's association defined in NCGS 47F-1-103-(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one (1) mile of ocean shoreline, or permit holder of a large-scale beach fill project, herein referred to as the petitioner, that is subject to a static vegetation line pursuant to 15A NCAC 07H .0305, may petition the Coastal Resources Commission for an exception to the static line in accordance with the provisions of this Section.

(b) A petitioner is eligible to submit a request for a static vegetation line exception after ~~five years have passed since~~ the completion of construction of the initial large-scale beach fill project(s) as defined in 15A NCAC 07H .0305 that required the creation of a static vegetation line(s). For a static vegetation line in existence prior to the effective date of this Rule, the award-of-contract date of the initial large-scale beach fill project, or the date of the aerial photography or other survey data used to define the static vegetation line, whichever is most recent, shall be used in lieu of the completion of construction date.

(c) A static line exception request applies to the entire static vegetation line within the jurisdiction of the petitioner including segments of a static vegetation line that are associated with the same large-scale beach fill project. If multiple static vegetation lines within the jurisdiction of the petitioner are associated with different large-scale beach fill projects, then the static line exception in accordance with 15A NCAC 07H .0306 and the procedures outlined in this Section shall be considered separately for each large-scale beach fill project.

(d) A static line exception request shall be made in writing by the petitioner. A complete static line exception request shall include the following:

(1) A summary of all beach fill projects in the area for which the exception is being requested including the initial large-scale beach fill project associated with the static vegetation line, subsequent maintenance of the initial large-scale projects(s) and beach fill projects occurring prior to the initial large-scale projects(s). To the extent historical data allows, the summary shall include construction dates, contract award dates, volume of sediment excavated, total cost of beach fill project(s), funding sources, maps, design schematics, pre-and post-project surveys and a project footprint;

(2) Plans and related materials including reports, maps, tables and diagrams for the design and construction of the initial large-scale beach fill project that required the static vegetation line, subsequent maintenance that has occurred, and planned maintenance needed to achieve a design life providing no less than 30~~25~~ years of shore protection from the date of the static line exception request. The plans and related materials shall be designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for said work;

(3) Documentation, including maps, geophysical, and geological data, to delineate the planned location and volume of compatible sediment as defined in 15A NCAC 07H .0312 necessary to construct and maintain the large-scale beach fill project defined in Subparagraph (d)(2) of this Rule over its design life. This documentation shall be designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for said work; and

(4) Identification of the financial resources or funding sources necessary to fund the large-scale beach fill project over its design life.

(e) A static line exception request shall be submitted to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. Written acknowledgement of the receipt of a completed static line exception request, including notification of the date of the meeting at which the request will be considered by the Coastal Resources Commission, shall be provided to the petitioner by the Division of Coastal Management.

(f) The Coastal Resources Commission shall consider a static line exception request no later than the second scheduled meeting following the date of receipt of a complete request by the Division of Coastal Management, except when the petitioner and the Division of Coastal Management agree upon a later date.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124*
Eff. March 23, 2009.

15A NCAC 07J .1202 REVIEW OF THE STATIC LINE EXCEPTION REQUEST

(a) The Division of Coastal Management shall prepare a written report of the static line exception request to be presented to the Coastal Resources Commission. This report shall include:

(1) A description of the area affected by the static line exception request;

(2) A summary of the large-scale beach fill project that required the static vegetation line as well as the completed and planned maintenance of the project(s);

(3) A summary of the evidence required for a static line exception; and

(4) A recommendation to grant or deny the static line exception.

(b) The Division of Coastal Management shall provide the petitioner requesting the static line exception an opportunity to review the report prepared by the Division of Coastal Management no less than 10 days prior to the meeting at which it is to be considered by the Coastal Resources Commission.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124*
Eff: March 23, 2009.

15A NCAC 07J .1203 PROCEDURES FOR APPROVING THE STATIC LINE EXCEPTION

(a) At the meeting that the static line exception is considered by the Coastal Resources Commission, the following shall occur:

(1) The Division of Coastal Management shall orally present the report described in 15A NCAC 07J .1202.

(2) A representative for the petitioner may provide written or oral comments relevant to the static line exception request. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

(3) Additional parties may provide written or oral comments relevant to the static line exception request. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

(b) The Coastal Resources Commission shall authorize a static line exception request following affirmative findings on each of the criteria presented in 15A NCAC 07J .1201(d)(1) through (d)(4). The final decision of the Coastal Resources Commission shall be made at the meeting at which the matter is heard or in no case later than the next scheduled meeting. The final decision shall be transmitted to the petitioner by registered mail within 10 business days following the meeting at which the decision is reached.

(c) The decision to authorize or deny a static line exception is a final agency decision and is subject to judicial review in accordance with G.S. 113A-123.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124*
Eff. March 23, 2009.

15A NCAC 07J .1204 REVIEW OF THE LARGE-SCALE BEACH-FILL PROJECT AND APPROVED STATIC LINE EXCEPTIONS

(a) Progress Reports. The petitioner that received the static line exception shall provide a progress report to the Coastal Resources Commission at intervals no greater than every five years from date the static line exception is authorized. The progress report shall address the criteria defined in 15A NCAC 07J .1201(d)(1) through (d)(4) and be submitted in writing to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. The Division of Coastal Management shall provide written acknowledgement of the receipt of a completed progress report, including notification of the meeting date at which the report will be presented to the Coastal Resources Commission to the petitioner.

(b) The Coastal Resources Commission shall review a static line exception authorized under 15A NCAC 07J .1203 at intervals no greater than every five years from the initial authorization in order to renew its findings for the conditions defined in 15A NCAC 07J .1201(d)(2) through (d)(4). The Coastal Resources Commission shall also consider the following conditions:

(1) Design changes to the initial large-scale beach fill project defined in 15A NCAC 07J .1201(d)(2) provided that the changes are designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for the work;

(2) Design changes to the location and volume of compatible sediment, as defined by 15A NCAC 07H .0312, necessary to construct and maintain the large-scale beach fill project defined in 15A NCAC 07J .1201(d)(2), including design changes defined in this Rule provided that the changes have been

designed and prepared by the U.S. Army Corps of Engineers or persons meeting applicable State occupational licensing requirements for the work; and

(3) Changes in the financial resources or funding sources necessary to fund the large-scale beach fill project(s) defined in 15A NCAC 07J .1201(d)(2). If the project has been amended to include design changes defined in this Rule, then the Coastal Resources Commission shall consider the financial resources or funding sources necessary to fund the changes.

(c) The Division of Coastal Management shall prepare a written summary of the progress report and present it to the Coastal Resources Commission no later than the second scheduled meeting following the date the report was received, except when a later meeting is agreed upon by the local government or community submitting the progress report and the Division of Coastal Management. This written summary shall include a recommendation from the Division of Coastal Management on whether the conditions defined in 15A NCAC 07J .1201(d)(1) through (d)(4) have been met. The petitioner submitting the progress report shall be provided an opportunity to review the written summary prepared by the Division of Coastal Management no less than 10 days prior to the meeting at which it is to be considered by the Coastal Resources Commission.

(d) The following shall occur at the meeting at which the Coastal Resources Commission reviews the static line exception progress report:

(1) The Division of Coastal Management shall orally present the written summary of the progress report as defined in this Rule.

(2) A representative for the petitioner may provide written or oral comments relevant to the static line exception progress report. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

(3) Additional parties may provide written or oral comments relevant to the static line exception progress report. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124*
Eff. March 23, 2009.

15A NCAC 07J .1205 REVOCATION AND EXPIRATION OF THE STATIC LINE EXCEPTION

(a) The static line exception shall be revoked immediately if the Coastal Resources Commission determines, after the review of the petitioner's progress report identified in 15A NCAC 07J .1204, that any of the criteria under which the static line exception is authorized, as defined in 15A NCAC 07J .1201(d)(2) through (d)(4) are not being met.

(b) The static line exception shall expire immediately at the end of the design life of the large-scale beach fill project defined in 15A NCAC 07J .1201(d)(2) including subsequent design changes to the project as defined in 15A NCAC 07J .1204(b).

(c) In the event a progress report is not received by the Division of Coastal Management within five years from either the static line exception or the previous progress report, the static line exception shall be revoked automatically at the end of the five-year interval defined in 15A NCAC 07J .1204(b) for which the progress report was not received.

(d) The revocation or expiration of a static line exception is considered a final agency decision and is subject to judicial review in accordance with G.S. 113A-123.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124*
Eff. March 23, 2009.

15A NCAC 07J .1206 LOCAL GOVERNMENTS AND COMMUNITIES WITH STATIC VEGETATION LINES AND STATIC LINE EXCEPTIONS

A list of static vegetation lines in place for petitioners and the conditions under which the static vegetation lines exist, including the date(s) the static line was defined, shall be maintained by the Division of Coastal Management. A list of static line exceptions in place for petitioners and the conditions under which the exceptions exist, including the date the exception was granted, the dates the progress reports were received, the design life of the large-scale beach fill project and the potential expiration dates for the static line exception, shall be maintained by the Division of

Coastal Management. Both the static vegetation line list and the static line exception list shall be available for inspection at the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557.

History Note: *Authority G.S. 113A-107; 113A-113(b)(6), 113A-124*
Eff. March 23, 2009.

SECTION .1300 – DEVELOPMENT LINE PROCEDURES

15A NCAC 07J .1301 REQUESTING THE DEVELOPMENT LINE

(a) Any local government, group of local governments involved in a regional beach fill project or qualified owner's association with territorial jurisdiction over an area that is subject to ocean hazard area setbacks pursuant to 15A NCAC 07H .0305, may petition the Coastal Resources Commission for a development line for the purposes of siting oceanfront development in accordance with the provisions of this Section. A qualified owner's association is an owner's association defined in NCGS 47F-1-103-(3) that has authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one (1) mile of ocean shoreline.

(b) A development line request applies to the entire large scale project area as defined in 15A NCAC 7H .0305(a)(7), and at the petitioner's request may be extended to include the entire oceanfront jurisdiction or legal boundary of the petitioner.

(c) The petitioner shall utilize an adjacent neighbor sight-line approach, resulting in an average line of structures. In areas where the seaward edge of existing development is not linear, the petitioner may determine an average line of construction on a case-by-case basis. In no case shall a development line be established seaward of the most seaward structure within the petitioner's oceanfront jurisdiction.

(d) An existing structure that is oceanward of an approved development line can remain in place until damaged greater than fifty percent in accordance with 15A NCAC 7J .0210; and can only be replaced landward of the development line, and must meet the applicable ocean hazard setback requirements as defined in 15A NCAC 06~~7~~ H .0309(a).

(e) A request for a development line or amendment shall be made in writing by the petitioner and submitted to the CRC by sending the written request to the executive director of the DCM. A complete request shall include the following:

(1) A **detailed survey of the development line using on-ground observation and survey, or aerial imagery along the oceanfront jurisdiction or legal boundary; any local regulations associated with the development line; a record of ~~local~~ adoption of the development line by the petitioner; and documentation of incorporation of development line into local ordinances or rules and regulations of an owner's association.**

(2) The survey shall include the development line and static vegetation line.

(3) Surveyed development line spatial data in a geographic information systems (GIS) format referencing North Carolina State Plane North American Datum 83 US Survey Foot, to include Federal Geographic Data Committee (FGDC) compliant metadata;

(f) Once a development line is approved by the Coastal Resources Commission, only the petitioner can request a change or reestablishment of the position of the development line.

(g) A development line request shall be submitted to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. Written acknowledgement of the receipt of a completed development line request, including notification of the date of the meeting at which the request will be considered by the Coastal Resources Commission, shall be provided to the petitioner by the Division of Coastal Management.

(h) The Coastal Resources Commission shall consider a development line request no later than the second scheduled meeting following the date of receipt of a complete request by the Division of Coastal Management, except when the petitioner and the Division of Coastal Management agree upon a later date.

History Note: Authority G.S. 113A-107; 113A-113(b)(6); 113A-124
Eff.

15A NCAC 07J .1302 PROCEDURES FOR APPROVING THE DEVELOPMENT LINE

(a) At the meeting that the development line request is considered by the Coastal Resources Commission, the following shall occur:

(1) A representative for the petitioner shall orally present the request described in 15A NCAC 07J .1301. The Chairman of the Coastal Resources Commission may limit the time allowed for oral presentations.

(2) Additional persons may provide written or oral comments relevant to the development line request. The Chairman of the Coastal Resources Commission may limit the time allowed for oral comments.

(b) The Coastal Resources Commission shall approve a development line request if the request contains the information required and meets the standards set forth in 15A NCAC 7J. 0301. The final decision of the Coastal Resources Commission shall be made at the meeting at which the matter is heard or in no case later than the next

scheduled meeting. The final decision shall be transmitted to the petitioner by registered mail within 10 business days following the meeting at which the decision is reached.
(c) The decision to authorize or deny a development line is a final agency decision and is subject to judicial review in accordance with G.S. 113A-123.

History Note: Authority G.S. 113A-107; 113A-113(b)(6); 113A-124
Eff..

15A NCAC 07J .1303 LOCAL GOVERNMENTS AND COMMUNITIES WITH DEVELOPMENT LINES

A list of development lines in place for petitioners and any conditions under which the development lines exist, including the date(s) the development lines were approved, shall be maintained by the Division of Coastal Management. The list of development lines shall be available for inspection at the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557.

History Note: Authority G.S. 113A-107; 113A-113(b)(6), 113A-124
Eff..

Attachment C: Fiscal Analysis

General Identification and Description of Landforms
15A NCAC 07H .0305

General Use Standards for Ocean Hazard Areas
15A NCAC 07H .0306

Requesting the Static Line Exception
15A NCAC 07J .1201

Development Line Procedures
15A NCAC 07J .1301
15A NCAC 07J .1302
15A NCAC 07J .1303

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September 30, 2015

Basic Information

Agency	DENR, Division of Coastal Management (DCM) Coastal Resources Commission (CRC)
Title	PROPOSED DEVELOPMENT LINE PROCEDURES AND AMENDMENTS TO THE GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS AND STATIC VEGETATION LINE EXCEPTION PROCEDURES
Citation	15A NCAC 07H .0305, 15A NCAC 07H .0306, 15A NCAC 07J .1201, and 15A NCAC 07J .1301 - .1303
Description of the Proposed Rule	15A NCAC 07J .1300 (1301, 1302, and 1303) creates procedures for requesting, approving, and managing an oceanfront Development Line, and establishes an alternative to the Static Vegetation Line Exception 15A NCAC 07J .1200 for oceanfront communities receiving a large scale beach fill project. Amendments to the General Use Standards for Ocean Hazard Areas 15A NCAC 07H .0306 and Static Vegetation Line Exception Procedures 15A NCAC 07J .1200 are proposed for the purpose of easing requirements by eliminating the mandatory 5-year waiting period and the 2,500 maximum square footage limit on structures.
Agency Contact	Ken Richardson Shoreline Management Specialist Ken.Richardson@ncdenr.gov (252) 808-2808 ext. 225
Authority	G.S. 113A-107; 113A-113; 113A-124
Necessity	The Coastal Resources Commission proposes the Development Line Procedures and amendments to current rules collectively allow local government to have less restrictive management options following a large scale beach fill project.
Impact Summary	State government: Minimal Local government: Yes Substantial impact: No Federal government: No

Summary

The North Carolina Coastal Resources Commission (CRC) requires that oceanfront development be set back from a defined reference line that is generally either the oceanward edge of natural vegetation, or a surveyed line for communities that have completed large beach nourishment projects.

The CRC is proposing amendments to create another reference line called a Development Line that would allow a local government to delineate the most oceanward location for new development. Development Line Procedures will be contained in Title 15A NCAC 07J .1300. This action also requires an amendment to 15A NCAC 07H .0305, General Description of Landforms, which is the CRC's rule that defines various coastal features and reference lines, and 15A NCAC 07H .0306 to establish use standards for the Development Line.

In addition to establishing the Development Line procedures and use standards, the CRC is also amending their existing rules governing Static Line Exception Procedures contained in 15A NCAC 07J .1201 and 15A NCAC 07H .0306. The intent of these amendments is to provide local governments with additional flexibility in managing oceanfront development.

Should a local government choose to adopt a Development Line for CRC approval, the costs to do so are anticipated to be minor. The economic benefits of adopting a Development Line for private property owners can range from moderate to significant depending on where a local government chooses to site the Development Line, but are not accurately quantifiable.

This proposal will have no impact on Department of Transportation projects or on DCM permit receipts.

The estimated effective date of these rules is July 01, 2016.

Description of Proposed Actions

Residential and commercial development built adjacent to the ocean shoreline may be vulnerable to erosion and storm surge. Under the NC Coastal Area Management Act (CAMA), hardened erosion protection structures are generally not allowed on the ocean shoreline; therefore, local governments use beach fill (nourishment) as a means to protect oceanfront property from storm damage and to address chronic erosion issues.

While the first line of stable-natural vegetation (FLSNV) has been used as an oceanfront setback measurement line since 1979, the CRC determined that the vegetation on nourished beaches was not "stable and natural" and should not be used for measuring oceanfront setbacks. In 1995 the CRC codified a method of measuring setbacks on nourished beaches that utilizes the surveyed pre-project vegetation line, which became known as the "static line." The CRC's static line rule was based on three primary issues: 1) evidence that nourished beaches can have higher erosion rates than natural ones, 2) no assurance that funding for future nourishment projects would be available for maintenance work as the original project erodes away, and 3) structures could be more

vulnerable to erosion damage since their siting was tied to an artificially-forced system. The intent of the static line provisions has been to recognize that beach nourishment is an erosion response necessary to protect existing development but should not be a stimulus for new development on sites that are not otherwise suitable for building. Once a static line is established it does not expire.

Prior to 2009, a community that completed construction of a large-scale beach fill project was required to measure construction setbacks from the static line or the first line of stable-natural vegetation, whichever was more landward. Over time, the Commission found that some communities had demonstrated a long-term commitment to beach nourishment and maintenance of their nourished beaches. Due to this long-term commitment, the vegetation had become stable and migrated oceanward of the static line. In many cases, proposed development on lots within these communities could meet the required setback from the natural vegetation line, but could not be permitted since they did not meet the setback from the static vegetation line.

To recognize local government efforts to address erosion through long-term beach nourishment and offer relief from the Static Vegetation Line requirements, the CRC adopted Static Vegetation Line Exception Procedures in 2009. The procedures require local communities to petition the CRC for an exception to the static line that allows property owners within that community to measure construction setbacks from the first line of stable-natural vegetation instead of the static line, under specific conditions. To qualify for the exception, communities must demonstrate that they have a source of sand and a funding mechanism to continue beach nourishment for at least 30 years. The CRC also requires communities to update this information every five years in order to maintain the exception.

Several local governments have applied for and received Static Line Exceptions, and have now had them in place for up to six years. Some of these local governments have since expressed concerns regarding difficulties and costs associated with the static vegetation line rules and its exception procedures. The CRC is proposing new Development Line rules and amendments to the Static Vegetation Line Exception procedures to address these concerns.

DEVELOPMENT LINE (new)

The CRC is adding a new section for Development Line Procedures, 15A NCAC 07J .1300.

1. 15A NCAC 07J .1301 Requesting the Development Line
   Describes the procedures for who may request a Development Line, how it is to be delineated, what information needs to be provided to the CRC, and who may request changes to the Development Line. Also explains where requests are to be submitted and when the CRC will consider them.

2. 15A NCAC 07J .1302 Procedures for Approving the Development Line
   Describes the process for presenting requests to the CRC, and the criteria and timeframe for a CRC decision. Specifies how and when petitioners will be notified of the CRC's decision. Indicates how petitioners may appeal a CRC decision.

3. 15A NCAC 07J .1303 Local Governments and Communities with Development Lines
   States that the Division of Coastal Management will maintain a list of approved

development lines and related information about them, and make this information available for public inspection upon request.

STATIC VEGETATION LINE EXCEPTION (amendments)

Additional amendments to the General Use Standards for Ocean Hazard Areas 15A NCAC 07H .0306 and Static Vegetation Line Exception Procedures 15A NCAC 07J .1201 are proposed for the purpose of easing regulatory burdens. The amendments eliminate the mandatory 5-year waiting period before communities can apply for a Static Line Exception, and remove the 2,500 maximum square footage limit on structures built under the exception. An amendment to 07J .1201 also allows groups of local governments to petition the CRC jointly for a Static Line Exception in order to benefit adjacent communities such as those on Bogue Banks by enabling them to share costs. The most significant proposed amendments to the static line exception rules are as follows:

1. Waiting period. Current rules require communities to wait a minimum of five years after they receive a static vegetation line before they may submit a request to the CRC for a Static Vegetation Line Exception. Because the SVL identifies both where the erosion hazard is in proximity to oceanfront structures, and the location of where the first line of stable and natural vegetation was just prior to the construction of a large-scale beach nourishment project, the waiting period was included in the initial rule language to establish a minimum period of time needed for a newly constructed beach to equilibrate (return to a more natural state), and to also allow sufficient time needed for any new oceanward growth of vegetation to be considered both stable and natural. However, after reviewing this criteria, it was determined that this requirement in rule language serves no real benefit because, both the natural processes (beach erosion and rate of vegetation growth), and maintenance cycles of the initial large-scale beach nourishment project determine how soon a community may benefit from oceanward growth of vegetation, the waiting requirement is unnecessary. Therefore, the amendment will eliminate this waiting period, allowing communities to apply immediately after their static line is established, even though there is no benefit until the vegetation grows oceanward and is considered stable and natural.

2. Building size restriction. Total floor area for new construction authorized under a Static Vegetation Line Exception is currently limited to 2,500 square feet. The intent of this rule was to establish an allowable development footprint for undeveloped oceanfront lots that were considered to be non-conforming prior to the construction of a large-scale nourishment project. However, considering that a structure must meet setback requirements already defined in 15A NCAC 07H.0306, in addition to setbacks defined in local ordinances, there is no justifiable benefit gained in keeping the 2,500 square feet restriction in current rules. The proposed amendment removes this limitation.

3. Requesting an exception. Currently, only individual local governments may request a Static Vegetation Line Exception from the CRC. The proposed amendments will allow groups of local governments and qualified property owners' associations to request exceptions.

Anticipated Impacts

Local Governments:

Requesting a Development Line or Static Vegetation Line Exception is voluntary for communities; therefore, these new rules do not require local governments to incur any additional expenditures unless they choose to do so. Currently, there are 16 communities with static vegetation lines (see first column in Table 1 below). Of those, eight have CRC-approved Static Vegetation Line Exceptions (Ocean Isle, Carolina Beach, Wrightsville Beach, Emerald Isle, Indian Beach, Salter Path, Pine Knoll Shores, and Atlantic Beach).

Under the proposed amendments, local governments will have three oceanfront development setback options:

1) Continue to measure setbacks from the Static Vegetation Line or FLSNV, whichever is applicable;
2) Request a Static Vegetation Line Exception from the CRC, if they already have a Static Vegetation Line, and measure setbacks from first FLSNV or Static Line, whichever is more restrictive, and no construction oceanward of the landward-most adjacent neighbor; or
3) Request a Development Line from the CRC and measure setbacks from first line of stable-natural vegetation, with no construction oceanward of the Development Line.

The proposed Static Vegetation Line Exception rule amendments and Development Line Rule are two voluntary options offered to local governments wanting to utilize the existing first line of stable and natural vegetation instead of the pre-project static vegetation for the siting of new oceanfront development. Therefore, the impact of this proposal to local governments is a result of choosing between different options:

a) If a community chooses not to do anything different than what current rules allow, they would incur no impact;
b) If one of the eight communities that currently has a SVL Exception chooses to opt for the Development Line, they would incur a cost savings by no longer having to demonstrate a commitment to maintain a beach nourishment project and to endure any five-year recurring costs associated with the identification of sand sources and financial resources that are required by the CRC to receive an approved SVL Exception. The estimated cost for a Development Line to be surveyed is approximately $1,200 per mile times the length of the SVL, which would result in a one-time cost for those communities opting for a Development Line. Therefore, the average cost of the eight communities that already have a SVL exception would be about $4,000. In comparison, under the current rule, these communities would continue to incur the five-year reauthorization report cost averaging $3,500 per exception (see Table 1 for further details). So the net present value of the saving over 10 years could be $1,800 (using a 7% discount rate);
c) If a community currently has a Static Vegetation Line and does not have a Static Vegetation Line Exception may find it beneficial to incur the cost of obtaining a Development Line, average of $5,750 (see Table 1), if the additional value to property owners outweighs that cost (see discussion of impact on property owners below).

d) If a community who currently does not have a Static Vegetation Line installs a large-scale beach nourishment project in the near future, and opts for the SVL Exception, they would incur the cost of the SVL exception ($9,000) for the initial cost of compiling the necessary information to present to CRC and the five-year reauthorization ($3,500), on average (see Table 1). If a community chooses the Development Line instead, they would incur the cost of the Development line of between $1,000 and $12,500. On average, their savings would be $6,000 in net present value terms assuming they would have started next year; and

Table 1. Estimated Cost of Development Line versus Cost of Static Vegetation Line Exception

Location	SVL Exception Costs			*Estimated DL Costs*
	Initial SVL Exception	SVL Exception 5-Year Reauthorization	SVL Exception (6-Year Total)	*Development Line Survey*
Ocean Isle	$300	$159	**$459**	*$3,840*
Oak Island	N/A	N/A	N/A	*$10,060*
Caswell Beach	N/A	N/A	N/A	*$2,830*
Bald Head Island	N/A	N/A	N/A	*$3,324*
Kure Beach	N/A	N/A	N/A	*$3,382*
Carolina Beach	$13,250	$0	**$13,250**	*$3,987*
Wrightsville Beach	$13,250	$2,320	**$15,570**	*$3,891*
Topsail Beach	N/A	N/A	N/A	*$5,457*
North Topsail Beach	N/A	N/A	N/A	*$5,570*
Emerald Isle	$13,775	$5,120	**$18,895**	*$6,671*
Indian Beach	$5,800	$5,120	**$10,920**	*$2,285*
Salter Path	$5,800	$5,120	**$10,920**	*$1,009*
Pine Knoll Shores	$11,600	$5,120	**$16,720**	*$5,961*
Atlantic Beach	$7,000	$5,120	**$12,120**	*$5,055*
Rodanthe (Mirlo Beach)	N/A	N/A	N/A	*$3,079*
Nags Head	N/A	N/A	N/A	*$12,430*
Sum	***$70,775***	***$28,079***	***$98,854***	***$78,830***
Average	***$8,847***	***$3,510***	***$12,357***	***$4,927***

Assumptions:

SVL Exception costs are real expenditures reported by communities with Static Vegetation Line Exceptions (Table 1), and are used for the following assumptions to estimate costs for those communities without an exception, or those considering the Development Line option.

- All other costs and benefits between a Static Vegetation Line Exception and a Development Line are equal, except for the initial costs to adopt, and ongoing reporting costs for a Static Vegetation Line Exception, as the resulting setbacks from the two options would be the same.
- Communities without an Exception can anticipate an average first-time cost of approximately $9,000 to assemble require information to be submitted to the CRC for an approval based on current information.
- Communities choosing to seek a SVL re-authorization every five-years can anticipate average costs to be approximately $3,500.
- Based on estimated costs (from discussion with staff at *CB&I* and *Geodynamics*), a Development Line is likely to cost approximately $1,200 per mile, or $4,000 per day to survey. Averaging lengths of current Static Vegetation Lines, it is assumed that an average total cost to survey a Development Line to be approximately $5,000.

- Based on these estimates, it is assumed that costs will remain constant over the next few years.
- The Static Vegetation Line Exception and the Development Line address non-conforming lots similarly, in that each have to meet construction setbacks measured from the first line of stable and natural vegetation.
- Local governments interested in Static Vegetation Line Exceptions and Development Lines are already undertaking beach fill projects and in some cases already assume the costs of long-term commitments to beach nourishment.
- If a community opts for a Development Line and discontinues the beach fill projects, the construction setback requirements from the FLSNV would prevent structures from being built too close to the beach.
- Currently, 16 out of 34 oceanfront communities have Static Vegetation Lines. Since 1996, at least one oceanfront community has installed a large-scale beach nourishment project once every five years; thus qualifying them for a Static Vegetation Line. Based on this historic trend, it can be assumed that the number of communities with a Static Vegetation Line is unlikely to change much in the next five to ten years.

Public infrastructure (e.g., parking lots and public utilities) has a minimum setback factor of sixty (60) feet 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.

Private Property Owners:

The static vegetation rules apply only when oceanfront property owners are seeking a Coastal Area Management Act (CAMA) permit for the purpose of development. Development includes construction of new a structure, or replacement of an existing structure defined as requiring more than fifty percent (50%) repair or re-construction.

To the extent that a community is more likely to apply for a Development Line under the proposed rules than it would have for a Static Vegetation Line Exception under the current rules is uncertain at this time. In terms of property value, any potential benefits gained would be the same for both the SVL Exception and Development Line alternatives. Each allow for construction setbacks to be measured from First Line of Stable and Natural Vegetation instead of the potentially more restrictive Static Vegetation Line; thus resulting in a net impact of zero.

Private property owners may experience some unquantified increase in the value of their property, or opportunity cost, if the community in which their property is located has a Static Vegetation Line and chooses to apply for a Static Line Exception or a Development Line. In the reverse scenario where they do not apply for an Exception or Development Line, should vegetation growth occur oceanward of the Static Vegetation Line, property owners would still be required to measure setback from the more restrictive SVL, thus potentially keeping more private-properties in a non-conforming status and negatively affecting their property values and development options. Based on discussions with coastal NC realtors, it is difficult to determine how much loss would be avoided by opting for an Exception or Development Line when a structure is considered non-

conforming since resale value is influenced by a wide range of factors, such as; amenities, location, proximity to sandbag structures, and the overall willingness of the buyer to take risks.

These proposed amendments to the Static Line Exception and new Development Line rules will benefit oceanfront property owners by allowing the potential utilization of a more favorable measurement line for new or re-development. Additionally, it provides new construction management options to local governments that under current rules may have prevented them from installing large-scale beach nourishment projects, which offer greater short-term storm protection to oceanfront property owners, in order to avoid having a Static Vegetation Line. These potential benefits are tied to complex factors, like amenities and the presence of sandbags, that drive local, regional, national and global real estate markets, and any attempt to estimate them would be speculative on the part of the Division.

If a community with a Static Vegetation Line Exception or Development Line maintains its beach fill project and vegetation grows oceanward, oceanfront property owners could see a positive effect on their property value. In current Static Vegetation Line Exception rules (15A NCAC 07H .0306(a)(12)), a new structure's oceanward placement is limited its adjacent neighbors. If a community chooses the Development Line alternative, it is possible that a property owner could build more oceanward than current SVL Exception rules permit, thus potentially allowing a property owner more space for construction of a larger structure only if setback requirements can be met. Without having a Development Line and contextual historic property value data available, the ability to evaluate and quantify potential economic benefits gained in this scenario is not possible at this time. Given that there are very few empty lots on the oceanfront, the potential for oceanward placement of new structures is considered very minimal.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, no impacts to NCDOT permitting are anticipated from the proposed amendments to 15A NCAC 07H .0305, 15A NCAC 07H .0306 and the proposed new Development Line rule 15A NCAC 07J .1200. The new and amended rules do not create any new procedures or restrictions that would affect NCDOT permits. 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 NCDOT needs to build or maintain a road located within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity.

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. Review of existing Static Vegetation Line Exception reports require approximately 8 hours of staff's time for each community every five years, for a combined recurring total cost to range between $1,500 and $2,000 whereas a Development Line alternative would only require a one-time review of the surveyed Development Line. In either case, there would be no increased cost

for staff's time as a direct result of the proposed rules and amendments. However, there could be a minimal cost savings should communities choose the Development Line alternative since it only requires a one-time review.

Cost/Benefit Summary

The proposed amendments to 15A NCAC 07H .0305, 15A NCAC 07H .0306, 15A NCAC 07J .1201 and adding the proposed Development Line rule 15A NCAC 07J .1300, will have modest cost impacts on local governments depending on whether they choose to adopt a Development Line or apply for a Static Line Exception. The benefits to local governments and private property owners are assumed to be the same regardless which of the two options is selected, as are the opportunity costs if neither option is chosen.

- Development Line requires an estimated initial cost of $5,000 to adopt; and no cost to maintain.

Static Line Exception requires average initial cost of $9,000 to adopt; and an average five-year recurring cost of $3,500 to maintain.

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

February 9, 2016

MEMORANDUM **CRC-16-07**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: Fiscal Analysis for Proposed Amendments to 15A NCAC 7H.1800; 7H.1801; 7H.1802; 7H.1803; 7H.1804; 7H.1805 Beach Bulldozing GP, and 15A NCAC 7H.2505 Emergency GP

At the November 2015 CRC meeting, commissioners voted in favor of staff's proposed rule amendments to Beach Bulldozing General Permit (15A NCAC 07H.1800) and Emergency Permit (15A NCAC 07H.250). The purpose of these amendments is to make general and specific permit conditions align with the US Army Corps of Engineers (USACE) General Permit (GP 198000048), which will result in less restrictive permit conditions.

As you may recall, the USACE GP is available to the general public, and authorizes emergency construction of primary dunes and any associated excavation *below the MHW* elevation contour, and also requires inter-agency coordination between *May 1* and November 15 under special and general conditions. However, in order to minimize impacts to the beach and adjacent properties, beach bulldozing under the CAMA General Permit has been limited to *above the MHW* line, and only within the period of *April 1* through November 15 is inter-agency coordination required. These proposed rule changes to the CRC's Beach Bulldozing General Permit will align the CAMA GP with the USACE GP, allowing bulldozing *below the MHW* and landward of Mean Low Water (MLW), and make inter-agency coordination consistent with the USACE GP conditions.

Staff have prepared and submitted the fiscal analysis for the proposed amendments to CRC's Beach Bulldozing General Permit (GP) 15A NCAC 7H.1800; 7H.1801; 7H.1802; 7H.1803; 7H.1804; 7H.1805, and 15A NCAC 7H.2505 Emergency GP, to both the Department of Environment of Environmental Quality (DEQ) and Office of State Budget and Management (OSBM). The DCM is awaiting approval from each, and does not anticipate a need for any substantial changes since there is no cost impact, or added restrictions associated with these proposed amendments.

Attachments: (A) – Fiscal Analysis, (B) – proposed rule changes

Attachment A: Beach Bulldozing General Permit Fiscal Analysis

Fiscal Analysis

General Permit to Allow Beach Bulldozing Landward of the Mean High Water Mark in the Ocean Hazard AEC

15A NCAC 07H .1800
15A NCAC 07H .1801
15A NCAC 07H.1802
15A NCAC 07H.1804
15A NCAC 07H.1805

Emergency General Permit, to be Initiated at the Discretion of the Secretary of the Department of Environment and Natural Resources for Replacement of Structures, the Reconstruction of Primary or Frontal Dune Systems, and the Maintenance Excavation of Existing Canals, Basins, Channels, or Ditches, Damaged, Destroyed, or Filled in by Hurricanes or Tropical Storms, Provided all Replacement, Reconstruction and Maintenance Excavation Activities Conform to all Current Standards

15A NCAC 07H .2505

Prepared by

Ken Richardson
Shoreline Management Specialist
Policy & Planning Section
NC Division of Coastal Management
(252) 808-2808

January 28, 2016

Basic Information

Agency	DEQ, Division of Coastal Management (DCM) Coastal Resources Commission (CRC)
Title	Proposed Amendments to the General Permit Procedures, General Conditions, and Specific Conditions to Allow Beach Bulldozing Waterward of the Mean High Water Mark in Ocean Hazard Areas of Environmental Concern
Citation	15A NCAC 07H .1800, 15A NCAC 07H .1801, 15A NCAC 07H .1802, 15A NCAC 07H .1804, 15A NCAC 07H .1805, AND 15A NCAC 07H .2505
Description of Rule Amendments	15A NCAC 07H .1800 (1801, 1802, 1803, 1804, and 1805) define procedures for requesting and approving a General Permit (GP) for the purpose of beach bulldozing above Mean High Water (MHW); and also defines general and specific permit conditions. Currently, specific conditions only allows this activity above MHW. However, the U.S. Army Corps of Engineers (USACE) also has a General Permit for this activity allowing beach bulldozing below MHW. The CRC is proposing these amendments to be consistent with the USACE.
Agency Contact	Ken Richardson Shoreline Management Specialist Ken.Richardson@ncdenr.gov (252) 808-2808 ext. 225
Authority	G.S. 113A-107; 113A-113; 113A-124
Necessity	The Coastal Resources Commission proposes the amendments to current rules to permit beach bulldozing below MHW, and align the CRC's General Permit conditions with those in the USACE General Permit. These changes are consistent with G.S. 150B-19.1(b) which requires agencies to identify existing rules that are unnecessary, unduly burdensome, or inconsistent with the principles set forth in 150B-19.1(a) and modify them to reduce regulatory burden.
Impact Summary	State government: No Local government: No Substantial impact: No Federal government: No

Summary

Beach bulldozing is a method of oceanfront erosion management that pushes beach sand from areas seaward of the first line of stable and natural vegetation (FLSNV) to repair or stabilize an existing dune damaged by erosion, or to create a protective berm for an imminently threatened structure. This activity can be authorized for areas *above the Mean High Water (MHW) mark* and below the vegetation line through the Coastal Resources Commission General Permit 15A NCAC 07H.1800 and Emergency General permitting 15A NCAC 07H.2505. The U.S. Army Corps of Engineers (USACE) also has a General Permit (GP 198000048) allowing beach *bulldozing below the Mean High Water mark*, thus making the CRC GP more restrictive than the USACE GP. Therefore, the CRC is proposing changes to 15A NCAC 07H .1800 and 15A NCAC 07H .2505 for two reasons: #1) to make conditions of the general permit consistent with those in the USACE general permit, and; #2) to make permit conditions less restrictive, easing the regulatory burden on property owners.

The proposed rule amendments would apply to oceanfront property owners undertaking beach bulldozing for the purpose of repairing or restoring the dune system. Since this activity is common along the state's oceanfront shoreline, and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to private property owners, and the amendments will have no fiscal impact on private property owners. However, property owners will receive a benefit of increased flexibility of where and when beach bulldozing activities can occur.

Local governments are eligible for the CAMA General Permit for beach bulldozing and its associated uses. Since only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to local governments. The amendments therefore will have no fiscal impact on local government for the purpose of repairing or restoring the dune system.

Pursuant to G.S. 150B-21.4, no impacts to NCDOT permitting are anticipated from the proposed amendments to 15A NCAC 07H .1800 and 15A NCAC 07H .2500. Since this activity is common along the state's oceanfront shoreline and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to NCDOT. In the event NCDOT needs to build or maintain a road located within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity.

Since only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued and there will be no changes to 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.

The fee for a beach bulldozing CAMA GP (15A NCAC 07H .1800) is $400, while there is no fee for an Emergency GP (15A NCAC 07H .2500). Based on information maintained in the Division of Coastal Management permit tracking database for a five year period (2011 to 2016), ninety-

eight percent (98%) of the General Permits issued were Emergency GPs, thus requiring no collection of fees.

The most substantive amendments to CAMA GPs 15A NCAC 07H .1800 and 15A NCAC 07H .2500 are changes to conditions allowing beach bulldozing below the Mean High Water line, and above the Mean Low Water Line. This change will make CRC's rules consistent with the USACE's beach bulldozing GP. Because Emergency General Permits make up the majority of General Permits issued for this activity, there are no anticipated negative-cost impacts on local governments, private property owners, or state agencies.

Introduction and Purpose

Beach bulldozing is a method of oceanfront erosion management that pushes beach sand from areas seaward of the first line of stable and natural vegetation (FLSNV) to repair or stabilize an existing dune damaged by erosion, or to create a protective berm for an imminently threatened structure. This activity can currently be authorized for areas *above the Mean High Water (MHW) line* and below the vegetation line through the Coastal Resources Commission General Permit 15A NCAC 07H.1800 and Emergency General permitting 15A NCAC 07H.2505. The U.S. Army Corps of Engineers (USACE) also has a General Permit (GP 198000048) allowing beach bulldozing *below the Mean High Water* mark, thus making the CRC GP more restrictive than the USACE GP. Therefore, the CRC is proposing changes to 15A NCAC 07H .1800 and 15A NCAC 07H .2505 for two reasons: #1) to make conditions of the general permit consistent with those in the USACE general permit, and; #2) to make permit conditions less restrictive, easing the regulatory burden on property owners.

General Permit for Beach Bulldozing

Current Coastal Resources Commission General Permit (GP) rules (15A NCAC 07H.1800) allow the bulldozing of sand from the beach area between Mean High Water (MHW) line and the vegetation line within the Ocean Hazard Area of Environmental Concern (AEC) for the purpose of reconstructing or repairing frontal or primary dune systems, and does not apply within the boundaries of a designated Inlet Hazard AEC. Additionally, the current GP requires that no work shall occur within the period of May 1 through November 15 without prior approval from the Division of Coastal Management, in coordination with the N.C. Wildlife Resources Commission, U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers to minimize adverse impacts to nesting sea turtles, (15A NCAC 07H.1805(f)).

If a project exceeds the conditions allowed under the general permit, or if the activity requires movement of sand from the area between the Mean Low Water mark (MLW) and the MHW mark, a CAMA Major Permit is required under 15A NCAC 07H.0308(a)(4).

Emergency General Permit

Following damage to coastal North Carolina due to a storm event, the Secretary of the Department of Environmental Quality may, based on an examination of the extent and severity of damage,

implement any or all provisions outlined in the Emergency General Permit's Purpose, Procedures, and both Specific and General Conditions (15A NCAC 07H.2500). Because this permit is applicable to the replacement of structures, reconstruction of primary or front dune systems, the maintenance excavation of existing canals, basins, channels, damaged, or filled in by storms, procedures and conditions are not identical to the Beach Bulldozing GP (15A NCAC 07H.1800). However, specific conditions (15A NCAC 07H.2505(b)((5)) do reference 15A. NCAC 07H.1800 that limits beach bulldozing to landward of MHW mark. Based on information collected in the DCM permit tracking database, approximately ninety-eight percent of beach bulldozing GPs are issued using this Emergency GP.

Dune Creation and Stabilization Projects

Bulldozing sand from the beach may be done to facilitate dune recovery following a storm event, or to create new dunes. Dunes serve as a natural buffer against the erosive forces of wind, water and waves. Dune establishment and stabilization projects must be thoughtfully planned and carried out to avoid damaging the beach and dune system. There are two types of dunes defined in the CRC's rules: 1) Primary Dunes are the first mounds of sand located landward of the ocean beach having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet, and extends landward to the lowest elevation in the depression behind that same mound of sand commonly referred to as the dune trough (15A NCAC 7H.0305(a)(3)), and; 2) a Frontal Dune is deemed to be the first mound of sand located landward of the ocean beach having sufficient vegetation, height, continuity and configuration to offer protection value (15ANCAC7H.0305(a)(4)).

The USACE utilizes a (Regional) General Permit (GP 198000048) that is available to the general public authorizing emergency construction of primary dunes and any associated excavation waterward of, or *below* the MHW mark, or elevation contour, under special and general conditions. However, the CRC's General Permit is limited to *above* MHW, or landward of the MHW mark, and requires interagency coordination between the period of *April 1* through November 15. The CRC is recommending modifications to the CRC's beach bulldozing General Permit rules to also allow bulldozing *below* the MHW mark, and landward of Mean Low Water (MLW) mark, and to also change the interagency coordination period start date from *May 1* to *April 1* to be consistent with conditions specified in the USACE General Permit.

Since this activity is common along the state's oceanfront shoreline, and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate any increase or decrease in the number of permits. The amendments will have no fiscal impact on property owners, local governments, Department of Transportation projects or on DCM permit receipts.

The estimated effective date of these rules is August 01, 2016.

Description of Proposed Actions

Both the CRC's General Permit and the USACE General Permit allow beach bulldozing. The primary differences are that the USACE GP allows this activity waterward of (*below*) the MHW mark, and the CAMA GP does not. In addition, the CRC GP specifies *May 1st* as the start date

when specific conditions apply in order to avoid adverse impacts to nesting sea turtles, while the USACE GP specifies *April 1st*. In an effort to make the CRC GP consistent the USACE GP, the CRC is proposing amendments to their GP to allow beach bulldozing waterward of (below) MHW mark, and landward of (above) MLW mark. The following summarizes the proposed changes:

Proposed Amendments to 15A NCAC 07H .1800:

1. 15A NCAC 07H .1800 General Permit to Allow Beach Bulldozing Landward of the Mean High Water Mark In The Ocean Hazard AEC
   The title will be changed to "General Permit to Allow Beach Bulldozing in the Ocean Hazard AEC".

2. 15A NCAC 07H .1801 Purpose
   To become consistent with the USACE, the CRC proposes removal of "caused by a major storm event".

3. 15A NCAC 07H .1802 Approval Procedures
   Describes the procedures for obtaining approval for beach bulldozing activities, and who may authorize them. Under current rules, both the Division of Coastal Management and Local Permitting Officers (LPO) have the authority to approve this activity; however, in practice, only the DCM approves this activity before issuance of GP for beach bulldozing. Therefore, the CRC is proposing to remove LPOs as an authorized agent from the rule.

4. 15A NCAC 07H.1804 General Conditions
   Describes the General Conditions associated with the GP for beach bulldozing. The CRC is proposing the following changes:

   a. Because setback requirements are specified in other rules, the CRC proposes elimination of 15A NCAC 07H .0306)(a).
   b. Change the department name to Department of Environmental Quality
   c. Change Division of Archives and History to Department of Natural and Cultural Resources

5. 15A NCAC 07H .1805 Specific Conditions
   Describes specific conditions associated with the GP for beach bulldozing. Several proposed minor changes are simply grammatical and serve to refine existing language. The most significant changes are:
   a. In 15A NCAC 07H .1805(c) the proposed change would restrict bulldozing to above MLW line, rather than the MHW line, which would make the condition consistent with the USACE GP.
   b. In 15A NCAC 07H .1805(f) the condition specifies that from *May 1 through November 15*, no work shall occur without permission from NCDCM in coordination with the NC Wildlife Resources Commission, US Fish and Wildlife, and the USACE in order to minimize impacts to nesting sea turtles. Because the

USACE GP (198000048) specifies *April* instead of *May*, the CRC is proposing to change their rule to specify *April* for consistency.

Proposed Amendments 15A NCAC 07H .2500

This rule is for Emergency General Permits initiated by the Department of Environmental Quality. For consistency with 15A NCAC 07H.1800, the CRC is recommending the following change:

1. 15A NCAC 07H.2505 Specific Conditions
    a. Removal of ". . . *landward of the mean high water mark*" from 15A NCAC 07H.2505(b)(5) for consistency purposes.

Anticipated Impacts

Local Governments:

Local governments are eligible for the CAMA General Permit for beach bulldozing and its associated uses. Since this activity is common along the state's oceanfront shoreline and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to local governments. The amendments therefore will have no fiscal impact on local government for the purpose of repairing or restoring the dune system.

Private Property Owners:

The proposed rule amendments would apply to oceanfront property owners undertaking beach bulldozing for the purpose of repairing or restoring the dune system. Since this activity is common along the state's oceanfront shoreline and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to private property owners and the amendments therefore will have no fiscal impact on private property owners.

NC Department of Transportation (DOT):
Pursuant to G.S. 150B-21.4, no impacts to NCDOT permitting are anticipated from the proposed amendments to 15A NCAC 07H .1800 and 15A NCAC 07H .2500. Since this activity is common along the state's oceanfront shoreline and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued to NCDOT. In the event NCDOT needs to build or maintain a road located within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity.

Division of Coastal Management:

Since this activity is common along the state's oceanfront shoreline and only the boundary of the area where the activity is allowed is affected, the Division does not anticipate an increase or decrease in the number of permits issued. 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.

Cost/Benefit Summary

The fee for a beach bulldozing CAMA GP (15A NCAC 07H .1800) is $400, while there is no fee for an Emergency GP (15A NCAC 07H .2500). Based on information maintained in the Division of Coastal Management permit tracking database for a five year period (2011 to 2016), ninety-eight percent (98%) of the General Permits for beach bulldozing were issued as Emergency GPs, thus requiring no collection of fees.

The most substantive amendments to CAMA GPs 15A NCAC 07H .1800 and 15A NCAC 07H .2500 are changes to conditions allowing beach bulldozing below the Mean High Water mark. This change will make the CRC's rules consistent with the USACE's beach bulldozing GP. Because Emergency General Permits make up the majority of General Permits issued for this activity, there are no anticipated negative-cost impacts on local governments, private property owners, or state agencies.

Attachment B: Proposed Rule Amendments

SECTION .1800 - GENERAL PERMIT TO ALLOW BEACH BULLDOZING ~~LANDWARD OF THE MEAN HIGH WATER MARK~~ IN THE OCEAN HAZARD AEC

15A NCAC 07H .1801 PURPOSE

This permit will allow beach bulldozing needed to reconstruct or repair frontal and/or primary dune systems. For the purpose of this general permit, beach bulldozing is defined as the process of moving natural beach material from any point seaward of the first line of stable vegetation to repair damage to frontal and/or primary dunes ~~caused by a major storm event~~. This general permit is being developed according to the procedures outlined in Subchapter 7J .1100 and will apply only to the Ocean Erodible AEC. This general permit shall not apply to the Inlet Hazard AEC.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987.

15A NCAC 07H .1802 APPROVAL PROCEDURES

(a) The applicant ~~must~~ shall contact the Division of Coastal Management ~~or local permit officer (LPO)~~ and complete an application ~~form~~ requesting approval for development. The applicant shall provide information on site location, dimensions of the project area, and ~~his~~ their name and address.

(b) The applicant must provide:

(1) confirmation that a written statement has been obtained signed by the adjacent riparian property owners indicating that they have no objections to the proposed work; or

(2) confirmation that the adjacent riparian property owners have been notified by certified mail of the proposed work. Such notice should instruct adjacent property owners to provide any comments on the proposed development in writing for consideration by permitting officials to the Division of Coastal Management within ten days of receipt of the notice, and, indicate that no response will be interpreted as no objection. DCM staff will review all comments and determine, based on their relevance to the potential impacts of the proposed project, if the proposed project can be approved by a General Permit. If DCM staff finds that the comments are worthy of more in-depth review, the applicant will be notified that he must submit an application for a major development permit.

(c) No work shall begin until an on-site meeting is held with the applicant and ~~appropriate LPO or~~ a Division of Coastal Management representative so that the existing first line of stable natural vegetation can be appropriately marked and recorded on the application. Written authorization to proceed with the proposed development may be issued during this visit. All bulldozing must be completed within 30 days of the date of permit issuance or the general authorization expires.

History Note: *Authority G. S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Amended Eff. January 1, 1990.

15A NCAC 07H .1803 PERMIT FEE

The applicant shall pay a permit fee of four hundred dollars ($400.00) by check or money order payable to the Department.

History Note: *Authority G.S. 113-229(c1); 113A-107; 113A-113(b); 113A-118.1; 113A-119; 113A-119.1;*
Eff. December 1, 1987;
Amended Eff. September 1, 2006; August 1, 2000; March 1, 1991.

15A NCAC 07H .1804 GENERAL CONDITIONS

~~(a) Any future setback determinations which may be required shall be made using the first line of stable natural vegetation established prior to the bulldozing activity.~~
(a)~~(b)~~ Individuals shall allow authorized representatives of the Department of Environmental Quality ~~Environment and Natural Resources~~ to make periodic inspections at any time deemed necessary to ensure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed herein.
(b)~~(c)~~ This permit will not be applicable to proposed construction where the Department has determined, based on an initial review of the application, that notice and review pursuant to G.S. 113A-119 is necessary because there are unresolved questions concerning the proposed activity's impact on adjoining properties or on water quality; air quality; coastal wetlands; cultural or historic sites; wildlife; fisheries resources; or public trust rights. If a shipwreck is unearthed, all work shall stop and both the ~~Division of Archives and History~~ Department of Natural and Cultural Resources and Division of Coastal Management shall be contacted immediately.
(c)~~(d)~~ This permit does not eliminate the need to obtain any other required state, local or federal authorization.
(d)~~(e)~~ Development carried out under this permit must be consistent with all local requirements, ~~AEC~~ Commission rules, and local Land Use Plans current at the time of authorization.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Amended Eff. May 1, 1990;
RRC Objection due to ambiguity Eff. May 19, 1994;
Amended Eff. August 1,1998; July 1, 1994.

15A NCAC 07H .1805 SPECIFIC CONDITIONS

(a) The area in which this activity is being performed must maintain a slope ~~of adequate grade so as to not endanger the public or the public's use of the beach and should follow~~ that follows the pre-emergency slopes as closely as possible so as not to endanger the public or the public's use of the beach. The movement of material by a bulldozer, front-end loader, backhoe, scraper or any type of earth moving or construction equipment shall not exceed ~~1~~ one (1) foot in depth measured from the pre-activity surface elevation.
(b) The activity must not exceed the lateral bounds of the applicant's property unless ~~he has~~ the written permission of the adjoining ~~landowner(s)~~ property owner(s) is obtained.
(c) Movement of material from seaward of the mean ~~high~~ low water line is not authorized.
(d) The activity must not ~~demonstratively~~ increase erosion on neighboring properties.
(e) Adding sand to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The fill areas will be immediately replanted or temporarily stabilized until planting can be successfully completed.
(f) In order to minimize adverse impacts to nesting sea turtles, no work shall occur within the period of ~~May~~ April 1 through November 15 of any year, without the ~~prior~~ approval of the Division of Coastal Management, in coordination with the North Carolina Wildlife Resources Commission, the United States Fish and Wildlife Service and the United States Army Corps of Engineers, that the work can be accomplished without adversely impacting sea turtle nests or suitable nesting habitat.
(g) If one contiguous acre or more of oceanfront property is to be excavated or filled, an erosion and sedimentation control plan must be filed with the Division of Energy, Mineral, and Land Resources, or appropriate local government having jurisdiction. This plan must be approved prior to commencing the land disturbing activity.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. December 1, 1987;
Temporary Amendment Eff. September 2, 1998;
Amended Eff. August 1, 2012 (see S.L. 2012-143, s.1.(f)); August 1, 2000.

SECTION .2500 - EMERGENCY GENERAL PERMIT, TO BE INITIATED AT THE DISCRETION OF THE SECRETARY OF THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES FOR REPLACEMENT OF STRUCTURES, THE RECONSTRUCTION OF PRIMARY OR FRONTAL DUNE SYSTEMS, AND THE MAINTENANCE EXCAVATION OF EXISTING CANALS, BASINS, CHANNELS, OR DITCHES, DAMAGED, DESTROYED, OR FILLED IN BY HURRICANES OR TROPICAL STORMS, PROVIDED ALL REPLACEMENT, RECONSTRUCTION AND MAINTENANCE EXCAVATION ACTIVITIES CONFORM TO ALL CURRENT STANDARDS

15A NCAC 07H .2501 PURPOSE

Following damage to coastal North Carolina due to hurricanes or tropical storms, the Secretary may, based upon an examination of the extent and severity of the damage, implement any or all provisions of this Section. Factors the Secretary may consider in making this decision include, but are not limited to, severity and scale of property damage, designation of counties as disaster areas, reconnaissance of the impacted areas, or discussions with staff, state or federal emergency response agencies. This permit shall allow for:

(1) the replacement of structures that were located within the estuarine system or public trust Areas of Environmental Concern and that were destroyed or damaged beyond 50 percent of the structures value as a result of any hurricane or tropical storm,

(2) a one time per property fee waiver for the reconstruction or repair by beach bulldozing of hurricane or tropical storm damaged frontal or primary dune systems, and

(3) a one time per property fee waiver for maintenance dredging activities within existing basins, canals, channels, and ditches. Structure replacement, dune reconstruction, and maintenance excavation activities authorized by this permit shall conform with all current use standards and regulations. The structural replacement component of this general permit shall only be applicable where the structure was in place and serving its intended function at the time of the impacting hurricane or storm, and shall not apply within the Ocean Hazard System of Areas of Environmental Concern (AEC) or waters adjacent to these AECs with the exception of those portions of shoreline that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Adoption Eff. October 2, 1999;
Temporary Adoption Expired on July 28, 2000;
Eff. April 1, 2001.

15A NCAC 07H .2505 SPECIFIC CONDITIONS

(a) The replacement of a damaged or destroyed structure shall take place within the footprint and dimensions that existed immediately prior to the damaging hurricane or tropical storm. No structural enlargement or additions shall be allowed.

(b) Structure replacement, dune reconstruction, and maintenance excavation authorized by this permit shall conform to the existing use standards and regulations for exemptions, minor development permits and major development permits, including general permits. These use standards include, but are not limited to:

(1) 15A NCAC 07H .0208(b)(6) for the replacement of docks and piers;

(2) 15A NCAC 07H .0208(b)(7) for the replacement of bulkheads and shoreline stabilization measures;

(3) 15A NCAC 07H .0208(b)(9) for the replacement of wooden and riprap groins;

(4) 15A NCAC 07H .1500 for maintenance excavation activities; and

(5) 15A NCAC 07H .1800 for beach bulldozing in the Ocean Hazard AEC. ~~landward of the mean high water mark.~~

(c) The replacement of an existing dock or pier facility, including associated structures, marsh enhancement breakwaters or groins shall be set back 15 feet from the adjoining property lines and the riparian access dividing line. The line of division of riparian access shall be established by drawing a line along the channel or deep water in front of the property, then drawing a line perpendicular to the line of the channel so that it intersects with the shore at the point the upland property line meets the water's edge. Application of this Rule may be aided by reference to the approved diagram in 15A NCAC 07H .1205(q), illustrating the rule as applied to various shoreline configurations. Copies of the diagram may be obtained from the Division of Coastal Management. When shoreline configuration is

such that a perpendicular alignment can not be achieved, the pier shall be aligned to meet the intent of this Rule to the maximum extent practicable. The setback may be waived by written agreement of the adjacent riparian owner(s) or when the two adjoining riparian owners are co-applicants. Should the adjacent property be sold before replacement of the structure begins, the applicant shall obtain a written agreement with the new owner waiving the minimum setback and submit it to the Division of Coastal Management prior to initiating any construction of the structure.

History Note: *Authority G.S. 113A-107; 113A-118.1;*
Temporary Adoption Eff. October 2, 1999;
Temporary Adoption Expired on July 28, 2000;
Eff. April 1, 2001.

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-16-08

January 25, 2016

MEMORANDUM

TO: Coastal Resources Commission
FROM: Daniel Govoni
SUBJECT: Fiscal Analysis, 15A NCAC 7H .02700 General Permit for the Construction of Marsh Sills General and Specific Conditions

Living shorelines include a suite of options for shoreline erosion control that maintain existing connections between upland, intertidal, estuarine, and aquatic areas which are necessary for maintaining water quality, ecosystem services, and habitat values. Unlike vertical stabilization measures such as bulkheads, living shoreline techniques typically use native materials such as marsh plants, oyster shells, and occasionally minimal amounts of structural materials (e.g. marsh sills made from of natural stone or oyster shell) to stabilize estuarine shorelines, minimize erosion, and enhance habitats. DCM has undertaken substantial efforts to promote marsh sills and other forms of living shorelines as alternatives to traditional bulkheads for estuarine shoreline stabilization in North Carolina.

At the November 2015 commission meeting; staff proposed to amend the General Permit for the construction of Marsh Sills. There has been an ongoing effort to modify the marsh sill general permit to remove the more time-consuming conditions. Numerous marsh sills have been constructed since their inception, and their habitat and environmental impacts have been studied by state and federal resource managers, and by academic researchers. As a result of these studies, Division of Marine Fisheries (DMF) is comfortable that the resource impacts associated with marsh sills authorized under the general permit are relatively minor, and has agreed that there is no longer a need to review each potential marsh sill general permit. Also, Division of Water Resources (DWR) has revised and re-issued their General Water Quality Certification, which no longer requires written concurrence for marsh sill projects that receive a CAMA General Permit. The proposed rule amendments would therefore remove these agency coordination requirements and other redundant or unnecessary conditions with the intent to streamline the permitting process.

DCM does not anticipate any economic impacts as a result of this proposed rule change. The proposed amendment does not affect permitting costs nor add additional regulatory burden. These amendments will have no impact on Department of Transportation projects, local governments or the federal government. There will be no impact on the Division of Coastal Management permit receipts.

DEQ and OSBM have reviewed the fiscal note and determined the proposed rule change has little to no impact on state or local governments and no substantial economic impact, thus a fiscal note was not required. The CRC is also required to approve this fiscal note before the proposed amendments can proceed to public hearing. The fiscal analysis and proposed rule amendments are attached.

Fiscal & Regulatory Impact Analysis

Marsh Sills

Amendments to 15A NCAC 07H .2700, .2701, .2704. .2705

General Permit For The Construction of Marsh Sills General and Specific Conditions

Prepared by

Daniel Govoni

NC Division of Coastal Management

(252) 808-2808 Ext. 233

December 9, 2015

Basic Information

Agency	DEQ, Division of Coastal Management (DCM) Coastal Resources Commission (CRC).
Citations and Titles	15A NCAC 07H .2701 – Purpose 15A NCAC 07H .2704 – General Conditions 15A NCAC 07H .2705 – Specific Conditions
Description of the Proposed Rule	Section 07H .2700 defines the specific development requirements for the construction of marsh sills. The proposed amendments will remove unnecessary coordination requirements and would also remove redundant and unnecessary conditions. This would also change the title of the Section .2700 to reflect the rule changes in this Section.
Agency Contact	Daniel Govoni Policy Analyst Daniel.Govoni@ncdenr.gov (252) 808-2808 ext 233
Authority	113A-107; 113A-118.1
Necessity	The CRC is proposing to amend its rules governing the construction of marsh sills in order for this general permit to become consistent with other general permits that govern construction of shoreline stabilization methods such as bulkheads.
Impact Summary	State government: No Local government: No Substantial impact: No

Federal government:	No
Private property owners:	No

Summary

Living shorelines include a suite of options for shoreline erosion control that maintain existing connections between upland, intertidal, estuarine, and aquatic areas which are necessary for maintaining water quality, ecosystem services, and habitat values. Unlike vertical stabilization measures such as bulkheads, living shoreline techniques typically use native materials such as marsh plants, oyster shells, and occasionally minimal amounts of structural materials (e.g. marsh sills made from of natural stone or oyster shell) to stabilize estuarine shorelines, minimize erosion, and enhance habitats. DCM has undertaken substantial efforts to promote marsh sills and other forms of living shorelines as alternatives to traditional bulkheads for estuarine shoreline stabilization in North Carolina.

During the 2003 legislative session, the North Carolina Legislature approved House Bill 1028, a bill which authorized the Coastal Resources Commission to adopt temporary and permanent rules to establish a general permit for the construction of "riprap sills." This was implemented as a temporary rule in 2004, and became a permanent rule on April 1st, 2005. Significant discussions on the relative merits of this general permit were discussed during its development. Due to these original concerns, the current General Permit for the construction of marsh sills requires coordination with the Division of Marine Fisheries (DMF), the Division of Water Resources (DWR), and the United States Army Corps of Engineers (USACE) before issuance, for review of potential natural resource impacts. This process can take more time than normally associated with other CAMA General Permits for shoreline stabilization. There has been an ongoing effort to modify the marsh sill general permit to remove the more time-consuming conditions. Dozens of marsh sills have been constructed since 2004, and their habitat and environmental impacts have been studied by state and federal resource managers, and by academic researchers. As a result of these studies, DMF is comfortable that the resource impacts associated with marsh sills authorized under the general permit are relatively minor, and has agreed that there is no longer a need for DMF review of each potential marsh sill general permit. Also, DWR has revised and re-issued their General Water Quality Certification, which no longer requires written concurrence for marsh sill projects that receive a CAMA General Permit. The proposed rule amendments would therefore remove these agency coordination requirements and other redundant or unnecessary conditions.

Description of Rule Amendment

15A NCAC 7H. .2701, .2704 and .2705 include the Purpose, and General and Specific Use Standards for the construction of marsh sills. The proposed amendments will provide additional options in the construction materials allowable for marsh sills, provide clarification on how to measure width and height of sills, make additional wording changes to provide consistency with other rules, correct ambiguous language, and remove DMF and DWR coordination requirements. By removing these coordination requirements, these proposed rule amendments potentially reduce the CAMA permit processing time to be comparable with other shoreline stabilization general permits such as bulkheads, which do not require resource agency coordination. The USACE however, still requires review of each permit application; therefore, applicants will not likely see a significant decrease in the length of the complete permitting process. In the absence of significant time savings, DCM does not anticipate any fiscal impact for permit applicants.

Based on these rule amendments, the title of Section .2700 is amended to reflect these changes.

Affected Parties

Private Property Owners:

DCM does not anticipate any increased costs to private property owners as a result of the proposed rule amendments. There will not be any increase in permit fees nor any savings in permitting-related costs.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, the agency declares that the proposed amendments to 15A NCAC 7H .2701, .2704 and .2705 will not affect environmental permitting for the NC Department of Transportation. DOT has not historically used this general permit.

Local Government:

DCM does not anticipate any increased costs to Local Governments as a result of the proposed rule amendments. There will not be any increase in permit fees.

Division of Coastal Management:

The Division will not experience any change in permit receipts as a result of this action. Staff will not experience a significant change in workload as a result of these amendments.

Cost/Benefits Summary

The Division of Coastal Management does not anticipate any increase in expenditures in the government or private sector as a result of this action. The proposed amendments will reduce conditions and remove some resource agency coordination thus allowing this General Permit to become consistent with other General Permits. However the USACE still requires permit review; therefore, staff does not anticipate any meaningful reduction in overall permit processing time. Since the creation of this General Permit (GP) in 2005, DCM has issued an average of one permit per year. Staff does not anticipate any increase in the number of GPs sought under these rules as a result of the proposed amendments. DCM is not proposing new or increased permit fees in this action, and does not foresee any change in project costs for either design or construction as a result of this action.

SECTION .2700 – GENERAL PERMIT FOR THE CONSTRUCTION OF MARSHRIPRAP SILLS ~~FOR WETLAND ENHANCEMENT IN ESTUARINE AND PUBLIC TRUST WATERS~~

15A NCAC 7H .2701 PURPOSE

A general permit pursuant to this Section shall allow for the construction of marsh~~riprap~~ sills for wetland enhancement and shoreline stabilization in estuarine and public trust waters as set out in Subchapter 7J .1100 and according to the rules in this Section. Marsh sills are generally shore-parallel structures built in conjunction with existing, created, or restored wetlands. This general permit shall not apply within the Ocean Hazard System AECs or waters adjacent to these AECs with the exception of those portions of shoreline within the Inlet Hazard Area AEC that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.

History Note: Authority G.S. 113A-107; 113A-118.1;

Temporary Eff. June 15, 2004;

Eff. April 1, 2005.

15A NCAC 7H .2704 GENERAL CONDITIONS

(a) Structures authorized by a permit issued pursuant to this Section shall be marsh~~riprap or stone~~ sills conforming to the standards in these Rules.

(b) Individuals shall allow authorized representatives of the Department of Environmental Quality (DEQ) to make periodic inspections at any time deemed necessary in order to insure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed in these Rules.

(c) The placement of marsh~~riprap or stone~~ sills authorized in these Rules shall not interfere with the established or traditional rights of navigation of the waters by the public.

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

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

(f) Development carried out under this permit shall be consistent with all local requirements, AEC Guidelines as set out in Subchapter 7H. 0200, and local land use plans current at the time of authorization.

History Note: Authority G.S. 113A-107; 113A-118.1;

Temporary Eff. June 15, 2004;

Eff. April 1, 2005.

15A NCAC 7H .2705 SPECIFIC CONDITIONS

(a) A general permit issued pursuant to this Section shall be applicable only for the construction of marsh~~riprap or stone~~ sill structures built in conjunction with existing, created or restored wetlands. Planted wetland vegetation shall consist only of native species.

~~(b) This general permit shall not apply within the Ocean Hazard System Areas of Environmental Concern (AEC) or waters adjacent to these AECs with the exception of those portions of shoreline within the Inlet Hazard Area AEC that feature characteristics of Estuarine Shorelines. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area.~~

~~(c)~~(b) ~~On shorelines where no fill is proposed,~~ The landward edge of the sill shall be positioned no more than 5 feet waterward ~~of the waterward depth contour~~ of locally growing wetlands ~~or to mid-tide depth contour, whichever is greater~~. Where no wetlands exist, in no case shall the landward edge of the sill be positioned greater than 30 feet waterward of the ~~mean high water or~~ normal high water or normal water line.

~~(d) On shorelines where fill is proposed, the landward edge of the sill shall be positioned no more than 30 feet waterward of the existing mean high water or normal high water line.~~

~~(e)~~ (c) The permittee shall maintain the authorized sill including wetlands and tidal inundation ~~and existing or planted wetlands~~ in conformance with the terms and conditions of this permit, or the remaining sill structures shall be removed within 90 days of notification from the Division of Coastal Management.

~~(f)~~(d) The height of sills shall not exceed ~~six~~ twelve inches above ~~normal~~mean high water, normal water level, or the height of the adjacent wetland substrate, whichever is higher~~greater~~.

~~(g)~~(e) Sill construction authorized by this permit shall be limited to a maximum length of 500 feet.

~~(h) Sills shall be porous to allow water circulation through the structure.~~

~~(i)~~(f) The sills shall have at least one five-foot ~~drop-down or~~ opening every 100 feet and may be staggered or overlapped or left open as long as the five-foot ~~drop-down or~~ separation between sections is maintained. Overlapping sections shall not overlap more than 10 feet. Deviation from these ~~drop-down~~opening requirements shall be allowable following coordination with the N.C. Division of Coastal Management ~~the N.C. Division of Marine Fisheries and the National Marine Fisheries Service.~~

~~(j)~~ (g) The sill~~riprap~~ structure shall not exceed a slope of a one and a half foot rise over a one ~~two~~ foot horizontal distance and a minimum slope of a one ~~and a half~~ foot rise over a ~~one~~ two foot horizontal distance. The width of the structure on the bottom shall be no wider than ~~15~~ 12 feet.

~~(k) For the purpose of protection of public trust rights, fill waterward of the existing mean high water line shall not be placed higher than the mean high water elevation.~~

~~(l) The permittee shall not claim title to any lands raised above the mean high or normal water levels as a result of filling or accretion.~~

~~(m)~~ (h) For water bodies ~~more~~ narrower than 150 feet, no portion of the structures shall ~~not~~ be positioned offshore more than one sixth (1/6) the width of the waterbody.

~~(n)~~ (i) The sill shall not be within a navigation channel or associated setbacks marked or maintained by a state or federal agency.

~~(o)~~ (j) The sill shall not interfere with leases or franchises for shellfish culture.

~~(p)~~ (k) All structures shall have a minimum setback distance of 15 feet between any parts of the structure and the adjacent property owner's riparian access corridor, unless either a signed waiver statement is obtained from the adjacent property owner or the portion of the structure within 15 feet of the adjacent riparian access corridor is located no more than 25 feet from the normal~~mean~~ high or normal water level. The riparian access corridor line is determined by drawing a line parallel to the channel, then drawing a line perpendicular to the channel line that intersects with the shore at the point where the upland property line meets the water's edge. The sill shall not interfere with the exercise of riparian rights by adjacent property owners, including access to navigation channels from piers, or other means of access.

~~(q) The sill shall not interfere with the exercise of riparian rights by adjacent property owners, including access to navigation channels from piers, or other means of access.~~

~~(r)~~ (l) Sills shall be marked at 50-foot intervals with yellow reflectors extending at least three feet above normal~~mean~~ high water or normal water level.

~~(s)~~ (m) If the crossing of wetlands with mechanized construction equipment is necessary, temporary construction mats shall be utilized for the areas to be crossed. The temporary mats shall be removed immediately upon completion of the construction of the sill~~riprap~~ structure. Material used to construct the sill shall not be stockpiled on existing wetlands or in open water unless fully contained in a containment structure supported by construction mats.

~~(t)~~ (n) Sedimentation and erosion control measures shall be implemented to ensure that eroded materials do not enter adjacent wetlands or waters.

~~(u)~~ (o) No excavation or filling other than that necessary for the construction and proper bedding of the sill structure, is authorized by this general permit~~. of any native submerged aquatic vegetation is authorized by this general permit~~.

~~(v)~~ (p) No excavation of the shallow water bottom or any wetland is authorized by this general permit

~~(w) No more than 100 square feet of wetlands may be filled as a resulted of the authorized activity.~~

~~(x) Backfilling of sill structures may be utilized only for the purpose of creating a suitable substrate for the establishment or reestablishment of wetlands. Only clean sand fill material may be utilized.~~

~~(y)~~ (q)The sill~~riprap~~ material shall consist of clean rock, marl, oyster shell, or masonry materials such as granite or broken concrete or other materials that are approved by the N.C. Division of Coastal Management. Sill~~Riprap~~ material shall be free of loose sediment or any pollutant, including exposed rebar. The sill material ~~structures~~ shall be of sufficient size and slope to prevent its movement from the approved alignment ~~site~~ by wave or current action.

~~(z) If one or more contiguous acre of property is to be graded, excavated or filled, an erosion and sedimentation control plan shall be filed with the Division of Energy, Mineral, and Land Resources, or appropriate government having jurisdiction. The plan must be approved prior to commencing the land-disturbing activity.~~

~~(aa) In order to ensure that no adverse impacts occur to important fisheries resources, the Division of Marine Fisheries shall review and concur with the location and design of the proposed project prior to the issuance of this general permit.~~

~~(bb) Prior to the issuance of this general permit, Division staff shall coordinate with the Department of Administration's State Property Office to determine whether or not an easement shall be required for the proposed activity.~~

~~(cc)~~ (r) Following issuance of this general permit, the permittee shall contact ~~the N.C. Division of Water Quality and~~ the U.S. Army Corps of Engineers to determine any additional permit requirements. Any such required permits, or a certification from the U.S. Army Corps of Engineers ~~appropriate agency(s)~~ that no additional permits are required, shall be obtained and copies provided to the Division of Coastal Management prior to the initiation of any development activities authorized by this permit.

History Note: Authority G.S. 113A-107; 113A-118.1;

Temporary Eff. June 15, 2004;

Eff. April 1, 2005;

Amended Eff. August 1, 2012 (see S.L. 2012-143, s.1.(f)).

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

CRC-16-09

January 25, 2016

MEMORANDUM

TO: Coastal Resources Commission
FROM: Daniel Govoni
SUBJECT: Fiscal Analysis, 15A NCAC 7H .0205 Coastal Wetlands

DCM staff and DCM-trained local permit officers (LPOs) are regularly called upon by property owners to delineate wetlands on their property in conjunction with permit applications for development. Wetland delineations are important because wetlands are protected by federal and state law, and the location of wetlands influences where development can occur. Staff and LPOs have historically used a two-part test to identify coastal wetlands: evidence of regular or occasional flooding, and/or the presence of any of ten species of marsh plants. While the ten species of marsh plants are listed in the rule, there has not been a definition of regular or occasional flooding.

At the October 2014 commission meeting; staff proposed to amend the Coastal Wetlands rule, 7H .0205, to codify how regular and occasional flooding of marshes is being determined. The term "occasional flooding" is currently used in the rule, but is not currently defined and this has led to some confusion. Precise definitions of "regular" and "occasional" flooding are impractical since it is impossible to monitor the precise frequency and extent of tidal inundation across the state's more than 2.5 million acres of coastal wetlands. In lieu of precise measurements, the state must rely on proven indicators of regular or occasional flooding. These indicators, as seen in the attached proposed rule amendment, include the observation of lunar and wind-driven tidal water, changes in elevation, presence of periwinkle (Littoraria spp.), crab burrows, staining, or wrack lines. Aside from adding the list of flooding indicators, no other changes to the rule are proposed.

DCM does not anticipate any economic impacts as a result of this proposed rule change. The proposed amendment does not affect permitting costs nor add additional regulatory burden. These amendments will have no impact on Department of Transportation projects, local governments or the federal government. There will be no impact on the Division of Coastal Management permit receipts.

DEQ and OSBM have reviewed the fiscal note and determined the proposed rule change has little to no impact on state or local governments and no substantial economic impact, thus a fiscal note was not required. The CRC is also required to approve this fiscal note before the proposed amendments can proceed to public hearing. The fiscal analysis and proposed rule amendments are attached.

Fiscal & Regulatory Impact Analysis

Coastal Wetlands

15A NCAC 07H .0205

Prepared by

Daniel Govoni
NC Division of Coastal Management
(252) 808-2808 Ext. 233

December 2, 2015

Basic Information

Agency	DEQ, Division of Coastal Management (DCM) Coastal Resources Commission (CRC).
Title	Coastal Wetlands
Citation	15A NCAC 07H .0205
Description of the Proposed Rule	7H .0205 is the Coastal Resources Commission's (CRC) rule that defines coastal wetlands, describes their significance and management objectives, and establishes use standards.
Agency Contact	Daniel Govoni Coastal Policy Analyst Daniel.Govoni@ncdenr.gov (252) 808-2808 ext 233
Authority	113A-107(a) & (b); 113A-113(b)(1); 113A-124.
Necessity	The CRC is proposing to amend its rule governing coastal wetlands in order to describe how "regular and occasional flooding" of wetlands shall be determined. The terms "regular" and "occasional" flooding are currently used in the rule, but are not defined and this has led to confusion.

Impact Summary		
	State government:	No
	Local government:	No
	Substantial impact:	No
	Federal government:	No
	Private property owners:	No

Summary

The CRC is proposing to amend its Coastal Wetlands rule, 7H .0205, to codify how regular and occasional flooding of marshes is being determined. The term "occasional flooding" is currently used in the rule, but is not currently defined and this has led to some confusion. Precise definitions of "regular" and "occasional" flooding are impractical since it is impossible to monitor the precise frequency and extent of tidal inundation across the state's more than 2.5 million acres of coastal wetlands. In lieu of precise measurements, the state must rely on proven indicators of regular or occasional flooding.

This amendment will codify the standard indicators that are used to determine wetland extent, and will help to ensure consistent wetland delineations in the field, whether they are performed by DCM staff or by other qualified persons.

Hurricane and storm tides are explicitly excluded from the categories of regular and occasionally flooded because these are considered extreme events that can inundate areas that do not possess any other characteristics of coastal wetlands.

DCM does not anticipate any economic impacts as a result of this proposed rule change. The amendment is administrative in nature and does not require any affected party to take or avoid any specific action. The proposed amendment does not affect permitting costs nor add additional regulatory burden.

These amendments will have no impact on Department of Transportation projects, local governments or the federal government. There will be no impact on Division of Coastal Management permit receipts.

The proposed effective date of these amendments is June 1, 2016.

Description of Rule Amendment

DCM staff and DCM-trained local permit officers (LPOs) are regularly called upon by property owners to delineate wetlands on their property in conjunction with permit applications for

development. Wetland delineations are important because wetlands are protected by federal and state law, and the location of wetlands influences where development can occur. Staff and LPOs have historically used a two-part test to identify coastal wetlands: evidence of regular or occasional flooding, and/or the presence of any of ten species of marsh plants. While the ten species of marsh plants are listed in the rule, there has not been a definition of regular or occasional flooding. DCM staff uses a number of well-established and non-controversial indicators of flooding, and trains LPOs in detecting those indicators, but the list of indicators has never been codified. This amendment will codify those indicators so that all affected parties have a uniform understanding of the wetland delineation methodology.

DCM and LPOs are using a set of flooding indicators that are well established, ecologically-based, and are also used in varying forms by other states in their regulatory programs. As included in the proposed amendment, these indicators include the observation of lunar and wind-driven tidal water, changes in elevation, presence of periwinkle (Littoraria spp.), crab burrows, staining, or wrack lines. Aside from adding the list of flooding indicators, no other changes to the rule are proposed.

Affected Parties

Private Property Owners:

DCM does not anticipate any increased costs to private property owners as a result of the proposed rule amendments. There will not be any increase in permit fees nor change in permit receipts.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, the agency declares that the proposed amendments to 15A NCAC 7H .0205 will not affect environmental permitting for the NC Department of Transportation.

Local Government:

DCM does not anticipate any increased costs to Local Governments as a result of the proposed rule amendments. There will not be any increase in permit fees.

Division of Coastal Management:

DCM permit review process will not be changed by this amendment, and the Division will not experience any change in permit receipts.

Cost/Benefits Summary

The Division of Coastal Management does not anticipate any increase in expenditures in the government or private sector as a result of this action. The proposed amendments will codify how regular and occasional flooding of marshes is being determined and will help to ensure consistent wetland delineations in the field.

APPENDIX A

15A NCAC 07H .0205 COASTAL WETLANDS

(a) Description. Coastal wetlands are defined as any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses), provided this does not include hurricane or tropical storm tides. Regular or occasional flooding shall be established through field indicators including but not limited to the observation of tidal water (including wind tides) on the site, changes in elevation, presence of periwinkle (Littoraria spp.), presence of crab burrows, staining, or wrack lines. Coastal wetlands may contain the following marsh plant species:

(1) Cord Grass (Spartina alterniflora),

(2) Black Needlerush (Juncus roemerianus),

(3) Glasswort (Salicornia spp.),

(4) Salt Grass (Distichlis spicata),

(5) Sea Lavender (Limonium spp.),

(6) Bulrush (Scirpus spp.),

(7) Saw Grass (Cladium jamaicense),

(8) Cat-tail (Typha spp.),

(9) Salt Meadow Grass (Spartina patens),

(10) Salt Reed Grass (Spartina cynosuroides).

The coastal wetlands AEC includes any contiguous lands designated by the Secretary of DENR pursuant to G.S. 113-230(a).5.

(b) Significance. The unique productivity of the estuarine and ocean system is supported by detritus (decayed plant material) and nutrients that are exported from the coastal marshlands. The amount of exportation and degree of importance appears to be variable from marsh to marsh, depending primarily upon its frequency of inundation and inherent characteristics of the various plant species. Without the marsh, the high productivity levels and complex food chains typically found in the estuaries could not be maintained.

Man harvests various aspects of this productivity when he fishes, hunts, and gathers shellfish from the estuary. Estuarine dependent species of fish and shellfish such as menhaden, shrimp, flounder, oysters, and crabs make up over 90 percent of the total value of North Carolina's commercial catch. The marshlands, therefore, support an enormous amount of commercial and recreational businesses along the seacoast.

The roots, rhizomes, stems, and seeds of coastal wetlands act as good quality waterfowl and wildlife feeding and nesting materials. In addition, coastal wetlands serve as the first line of defense in retarding estuarine shoreline erosion. The plant stems and leaves tend to dissipate wave action, while the vast network of roots and rhizomes resists soil erosion. In this way, the coastal wetlands serve as barriers against flood damage and control erosion between the estuary and the uplands.

Marshlands also act as nutrient and sediment traps by slowing the water which flows over them and causing suspended organic and inorganic particles to settle out. In this manner, the nutrient storehouse is maintained, and sediment harmful to marine organisms is removed. Also, pollutants and excessive nutrients are absorbed by the marsh plants, thus providing an inexpensive water treatment service.

(c) Management Objective. It is the objective of the Coastal Resources Commission to conserve and manage coastal

wetlands so as to safeguard and perpetuate their biological, social, economic and aesthetic values, and to coordinate and establish a management system capable of conserving and utilizing coastal wetlands as a natural resource essential to the functioning of the entire estuarine system.

(d) Use Standards. Suitable land uses are those consistent with the management objective in this Rule. Highest priority of use is allocated to the conservation of existing coastal wetlands. Second priority of coastal wetland use is given to those types of development activities that require water access and cannot function elsewhere.

Examples of unacceptable land uses include restaurants, businesses, residences, apartments, motels, hotels, trailer parks, parking lots, private roads, highways and factories. Examples of acceptable land uses include utility easements, fishing piers, docks, wildlife habitat management activities, and agricultural uses such as farming and forestry drainage as permitted under North Carolina's Dredge and Fill Law or other applicable laws. In every instance, the particular location, use, and design characteristics shall be in accord with the general use standards for coastal wetlands, estuarine waters, and public trust areas described in Rule .0208 of this Section.

(e) Alteration of Coastal Wetlands. Alteration of coastal wetlands includes mowing or cutting of coastal wetlands vegetation whether by mechanized equipment or manual means. Alteration of coastal wetlands by federal or state resource management agencies as a part of planned resource management activities is exempt from the requirements of this paragraph. Mowing or cutting of coastal wetlands by academic institutions associated with research efforts is allowed subject to approval from the Division of Coastal Management. Alteration of coastal wetlands is governed according to the following provisions:

(1) Alteration of coastal wetlands is exempt from the permit requirements of the Coastal Area Management Act (CAMA) when conducted in accordance with the following criteria:

(A) Coastal wetlands may be mowed or cut to a height of no less than two feet, as measured from the coastal wetland substrate, at any time and at any frequency throughout the year;

(B) Coastal wetlands may be mowed or cut to a height of no less than six inches, as measured from the coastal wetland substrate, once between each December 1 and March 31;

(C) Alteration of the substrate is not allowed;

(D) All cuttings/clippings shall remain in place as they fall;

(E) Coastal wetlands may be mowed or cut to a height of no less than six inches, as measured from the coastal wetland substrate, to create an access path four feet wide or less on waterfront lots without a pier access; and

(F) Coastal wetlands may be mowed or cut by utility companies as necessary to maintain utility easements.

(2) Coastal wetland alteration not meeting the exemption criteria of this Rule requires a CAMA permit. CAMA permit applications for coastal wetland alterations are subject to review by the North Carolina Wildlife Commission, North Carolina Division of Marine Fisheries, U.S. Fish and Wildlife Service, and National Marine Fisheries Service in order to determine whether or not the proposed activity will have an adverse impact on the habitat or fisheries resources.

History Note: *Authority G.S. 113A-107(a); 113A-107(b); 113A-113(b)(1); 113A-124; Eff. September 9, 1977; Amended Eff. November 1, 2009; August 1, 1998; October 1, 1993; May 1, 1990; January 24, 1978.*

Amended Eff. June 1, 2016

Coastal Management
ENVIRONMENTAL QUALITY

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Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

MEMORADUM **CRC-16-11**

To: Coastal Resources Commission
From: Rachel Love-Adrick, Morehead City District Planner
Date: January 25, 2015
Subject: Certification of two Amendments to the 2004 Emerald Isle CAMA Land Use Plan

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Recommendation

Certification of an Amendment to the 2004 Town of Emerald Isle CAMA Land Use Plan, as amended through February 12, 2009 with the determination that the Town has met the substantive requirements outlined in the 15 NCAC 7B Land Use Plan Guidelines and that there are no conflicts with either state or federal law or the State's Coastal Management Program.

Overview

The Town of Emerald Isle is seeking Certification of two (2) map amendments to the 2004 Town of Emerald Isle CAMA Land Use Plan (LUP). The Town amended the LUP to modify the Future Land Use Map designations on two (2) parcels of land to reflect newly adopted zoning requests since the LUP was last amended and Certified by the CRC on February 12, 2009. The Town of Emerald Isle held two duly advertised public hearings. The adopted changes and proposed amendments to the LUP are outlined below:

1. November 10, 2015, voted 4 – 1, by resolution, to adopt the Land Use Plan Amendment. The resolution requests that the parcel located at 3307 Emerald Drive be designated as Single/Dual-Family Residential rather than Eastern Commercial Area on the Future Land Use Map.

2. December 8, 2015, voted unanimously, by resolution, to adopt the Land Use Plan Amendment. The resolution requests that the parcel known by PIN 538311561363000 be designated as Village West Area rather than Business (B) on the Future Land Use Map.

The public had the opportunity to provide written comments on the LUP up to fifteen business days prior to the CRC meeting at which the amendments are being considered for certification (February 10, 2016). DCM did not receive any comments.

Attachments: Resolution Amending Land Use Plan
City Staff Report
Changes to Future Land Use Map designations
Affidavit of Publication

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Town of Emerald Isle
7500 Emerald Drive
Emerald Isle, NC 28594

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RESOLUTION AMENDING LAND USE PLAN

WHEREAS, the Town of Emerald Isle desires to amend its 2004 CAMA Land Use Plan, specifically the Future Land Use Map, in order to project the future land use of 3307 Emerald Drive as Single/Dual-Family Residential rather than Eastern Commercial Area, and

WHEREAS, the Town conducted a public hearing on the proposed amendment at a meeting of the Board of Commissioners held on November 10, 2015, and

WHEREAS, the Town has sufficient facility capacity to handle the proposed development of the property for residential purposes, and

WHEREAS, the amendment to the Future Land Use Map has been evaluated for its consistency with other existing policies and no internal inconsistencies exist, and

WHEREAS, the amendment is consistent with the six management topics outlined in the Town's Land Use Plan, and

WHEREAS, the amendment is consistent with the federally approved North Carolina Coastal Management Program and the rules of the Coastal Resources Commission, and

WHEREAS, the amendment does not violate any state or federal laws,

NOW, THEREFORE, BE IT RESOLVED by the Emerald Isle Board of Commissioners that

1. The Town's Future Land Use Map in the 2004 CAMA Land Use Plan is hereby amended to project 3307 Emerald Drive as Single/Dual-Family Residential rather than Eastern Commercial Area, and

2. The North Carolina Coastal Resources Commission is hereby asked to certify the aforesaid amendment.

Adopted this the 10th day of November, 2015.

Eddie Barber, Mayor

ATTEST:

Rhonda Ferebee, Town Clerk, CMC

SEAL

Excerpt of the Minutes of the Emerald Isle Board of Commissioners Regularly Scheduled Meeting – Tuesday, November 10, 2015

10. Proposed Rezoning – 3307 Emerald Drive

a. **Public Hearing – Land Use Plan Amendment (Eastern Commercial Area to Single / Dual-Family Residential)**
b. **Resolution Amending Land Use Plan**
c. **Public Hearing Proposed Rezoning**
d. **Consideration of Rezoning Request**

Land Use Plan Amendment Memo

Due to a request for a change in zoning of the property located at 3307 Emerald Dr., an amendment to the 2004 Future Land Use Plan (FLUP), specifically the Future Land Use Map (FLUM) is necessary for the rezoning to be consistent with the FLUP. The property is currently shown to be in the Eastern Commercial Area and the rezoning request was a change to Single/Dual-Family Category as defined in the FLUP. The following is an excerpt from the FLUP regarding the Eastern Commercial Area of which the property in question is a part of:

> The planned Commercial Area on the east-end is located on the south side of Emerald Drive between Connie Drive and Hunter Circle. The objective of this land use category is to provide residents of the surrounding neighborhoods with shopping areas and community facilities that provide goods and services that meet residents' day-to-day needs or that meet the service needs of neighborhood properties. Examples of appropriate uses in this area are convenience retail, barber shops and hair salons, real estate rental offices, small restaurants, and small gift shops. These types of uses add to the convenience of these neighborhoods and help reduce the number and length of trips on NC 58.

The Town encourages uses in the Eastern Commercial Area that meet the following guidelines:

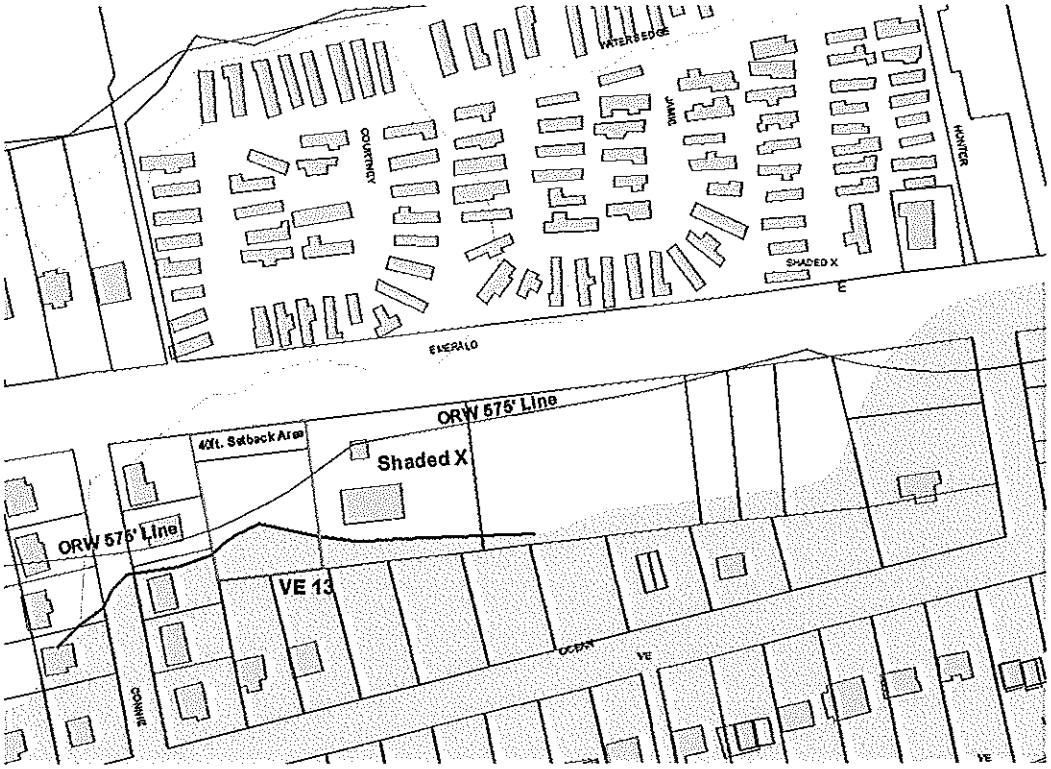
- provide shopping areas and community facilities with goods and services that meet day-to-day needs of nearby residences and properties;
- are in scale with the overall neighborhood development; and
- are in keeping with the other policies of this plan.

The Town will ensure full compliance with all policies and development requirements, including the minimum lot sizes, setbacks, height restrictions, density limits, and preservation of native vegetation as established by the Town's current development management ordinances.

The reason for sharing this is to show the importance of this area for commercial development to the eastern end of the Town. With that said, I would point out there are still vacant or undeveloped parcels in this commercial area that are zoned Business which provides opportunity for further commercial development. Also, a change to Single/Dual-Family use of the property is consistent with the residential land use goals of the LUP, the contiguous Residential properties of the area and eastern part of Town.

Furthermore, physical and environmental conditions are factors that limit the use of this property for commercial purposes. Included in this memo is map depicting some of these issues. First, note the bright red line separating the Shaded-x flood zone and the VE zone. The reason for pointing this out is that per NFIP and Town flood regulations, no fill can be used in the VE zone as a means of structural support. This takes away a little more than 8,000 square feet from the 31,000 square feet of lot area that can essentially not be built on. Also, note the thin black line south of Emerald Drive. This is the 40ft front setback/minimum building line. Again, this is a portion of the property that can have no structure. Combine this with the VE zone issue and buildable area for a commercial land use is limited. Lastly, note the thin red line towards the center of the lot. This is the CAMA 575' ORW line limiting every lot within to

25% maximum impervious cover. This is another limiting factor for a commercial lot that would have roof impervious and parking impervious areas. I say all this just to point out the challenges of this property as a commercial land use.



The Planning Board discussed this potential amendment at its October meeting and following discussion of the matter, voted 4-2 to recommend to the Board of Commissioners that the amendment be denied. If the amendment is approved by the Board, then it will have to be certified by the Coastal Resources Commission at a future meeting of the CRC. Please find attached a Resolution in support of the amendment to the CAMA Land Use Plan.

Rezoning Request Memo

A request has been received from Ritchie & Marcie Creech, for the rezoning of 3307 Emerald Dr. from Business (B) to the Residential (R2) Zoning District. The parcel, which is located immediately west of Flip Flops, is approximately .6 acre and is currently vacant. The owners of the property have possessed the parcel for some time. The owners are considering developing the property for a residential use. The current zoning, Business (B), does not permit residential uses; therefore, the owner has requested a rezoning to the Residential (R2) Zoning District. The R2 district allows for single family uses including duplexes. The zoning change would be contiguous to adjacent (R2) designations and very compatible with the uses of the area. The change of this property to (R2) is consistent with the overall land use policies of the CAMA Landuse Plan, however unless amended by the Board the proposed rezoning is not consistent with the Future Landuse Map. Attached to this memorandum is an excerpt from the Town's Zoning Map which shows the zoning of adjacent and nearby parcels, rezoning mailing affidavit and rezoning statement.

The Planning Board at its October meeting discussed this potential amendment and following discussion of the matter, voted 4-2 to recommend to the Board of Commissioners that the amendment be denied. The reasons cited for denial was the inconsistency with the Landuse Plan and removing commercially zone property from the limited Eastern Commercial Area. I look forward to discussing this issue with the Commissioners at its November 10 meeting. Please let me know if you have any questions regarding the foregoing information.

Town Planner Josh Edmondson spoke to the Board about the two issues to be considered by the Board beginning with the Land Use Amendment that had been

brought on by the request for the rezoning and was necessary for the rezoning to be consistent with the future Land Use Plan, more importantly the future Land Use Map. Mr. Edmondson noted the location of the property as being west of Flips Flops and was currently designated as being the eastern commercial area in the Land Use Plan with the thought being if a future pier was ever located in that area there would be potential for commercial development at that time. Mr. Edmondson noted that the land uses surrounding the proposed lot requested to be rezoned were single/dual family uses which was what the owners Ritchie and Marcie Creech were requesting the property be zoned.

Mr. Edmondson noted that while this commercial property was important, there were several more properties to the east zoned commercial that could potentially be developed for those uses. Mr. Edmondson also pointed out that changing the land use of this property from Business to single / dual family would be very consistent with the existing uses surrounding that were also single / dual family uses. Mr. Edmondson also noted the physical and environmental challenges for developing this property for commercial purposes because of the flood zone, setbacks and the CAMA 575' ORW which would be a limiting factor for roof and parking impervious areas all as outlined in his memo above.

Mr. Edmondson noted that the Planning Board on both issues, the Land Use Plan amendment and the proposed rezoning, had voted to deny by a 4-2 vote. Mr. Edmondson said the Planning Board felt as the property was shown as commercial it was important that it should remain as commercial. Mr. Edmondson noted for the proposed rezoning that if the Land Use Plan and the future Land Use Map were to be updated the rezoning would be consistent with the zoning classifications in that area. Mr. Edmondson said it would probably be less of an impact for the surrounding residents were this property to be zoned residential rather than commercial.

Commissioner Messer asked whether Town Planner Edmondson had presented the same information to the Planning Board. Mr. Edmondson noted that he had not gone over the environmental issues but he wasn't sure that would have changed their mind. Commissioner Wootten disagreed and thought they should send this issue back to the Planning Board.

Motion was made by Commissioner Messer to open the Public Hearing for the proposed amendment to the Town's 2004 CAMA Land Use Plan, and the Public Hearing for the proposed rezoning of 3307 Emerald Drive from Business to Residential-2.

Ritchie Creech, owner of 3307 Emerald Drive, thanked the Board for hearing this proposal. Mr. Creech noted they had purchased Flip Flops / Emerald Isle Mini-Mart in 2003. Mr. Creech said they purchased the property proposed to be rezoned in 2005 with every intention of building a restaurant, and had found when talking with an engineer that there were some issues as noted by Town

Planner Edmondson that would have caused challenges and because of the cost he and his wife had decided not to pursue a restaurant on that property. Mr. Creech said they thought the rezoning would benefit their neighbors, and thanked the Board for their consideration.

Motion was made by Commissioner Messer to close both of the Public Hearings. The Board voted unanimously 5-0 in favor. Motion carried.

Motion was made by Commissioner Messer to approve the Resolution Amending Land Use Plan.

Commissioner Wootten stated that he had a problem with this more to do with the process, and that they were making a change to the Land Use Plan where one of the major tenets of the Land Use Plan was to keep the commercial property on the east end of town. Commissioner Wootten said he would much rather send this back to the Planning Board.

Following this discussion, ***the Board voted on the motion as presented 4-1 in favor, Commissioner Wootten opposed. Motion carried.***

Motion was made by Commissioner Messer to approve the proposed rezoning of 3307 Emerald Drive from Business to Residential-2.

Commissioner Wright felt that there was enough commercial land still available on the other end of the commercial area, a much bigger property that would not be as difficult to develop. Commissioner Hoover said he had always felt it was best to do what the landowner wanted to do with their own property, and they were not putting a residential house in the middle of a business district as this property was on the edge.

Following this discussion, ***the Board voted on the motion as presented unanimously 5-0 in favor. Motion carried.***

Respectfully submitted:

Rhonda C. Ferebee, CMC, NCCMC
Town Clerk

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Mayor
Eddie Barber

Mayor Pro-Tem
Floyd Messer, Jr.

Board of Commissioners
Tom Hoover, Jr.
Jim Normile
John Wootten
Maripat Wright

Town Manager
Frank A. Rush, Jr.
frush@emeraldisle-nc.org

November 10, 2015

MEMO TO: Mayor Barber and Board of Commissioners

FROM: Frank A. Rush, Jr., Town Manager

SUBJECT: Proposed Rezoning – 3307 Emerald Drive

The Board of Commissioners is scheduled to consider the proposed rezoning of 3307 Emerald Drive (adjacent to Flip-Flops retail store) from Business (B) to Residential-2 (R-2) at the November 10 meeting. Prior to considering the proposed rezoning, the Board must first consider an amendment to the Town's 2004 CAMA Land Use Plan. Public hearings have been scheduled on each item at the November 10 meeting.

Resolution Amending Land Use Plan

As noted in the attached memo from Josh Edmondson, Town Planner, the proposed rezoning is not consistent with the Town's 2004 CAMA Land Use Plan, which projects the ~ ½ acre parcel in question as "Eastern Commercial Area" on the Future Land Use Map. If the Board wishes to proceed with the proposed rezoning to R-2, it must first amend the Land Use Plan. The attached resolution and map would formally amend the Land Use Plan to project this parcel as "Single/Dual Family Residential".

The parcel in question is on the western edge of the "Eastern Commercial Area". The properties located west and south of 3307 Emerald Drive are also projected as "Single/Dual Family Residential" in the Land Use Plan, and the property across NC 58 (Waters Edge Mobile Home Park) is projected as "Mixed Residential".

The "Eastern Commercial Area" includes a total of 10 parcels (including 3307 Emerald Drive) occupying approximately 5 ½ acres total. The existing Flip Flops retail store and Dollar General store are located on 2 separate parcels that occupy approximately 2 ½ acres. A kayak rental operation is located across NC 58 across from the Ocean Drive intersection on 1 small parcel that occupies less than ¼ acre. A telephone service facility is located east of Dollar General on 1 small parcel and occupies approximately ¼ acre. Aside from the ~ ½ acre parcel in question, there are 5 other parcels east of Dollar General that are vacant, and these parcels collectively occupy approximately 2 acres. Thus, if the proposed rezoning is approved, there would remain a total of approximately 2 acres for future commercial development in the "Eastern Commercial Area".

The attached memo from Josh Edmondson includes excerpts from the Land Use Plan that outline the intent behind the "Eastern Commercial Area", which was established to promote a future commercial node to serve eastern Emerald Isle. The attached memo also describes other regulatory constraints (CAMA regulations, flood zone requirements, etc.) impacting the parcel in question that make commercial development more challenging than residential development.

Rezoning Request

If the amendment to the Land Use Plan is approved, the Board may proceed with the rezoning request. The attached memo from Josh Edmondson outlines the rezoning request, and a rezoning map and formal Record of Zoning Amendment are also attached. The rezoning map is essentially identical to the Future Land Use Map in the Land Use plan.

If the rezoning is approved, the applicants, Ritchie and Marcie Creech, would have the ability to subdivide the parcel into two residential lots, with a minimum lot size of 12,500 sq. ft. each. Future residential development would likely be similar to the surrounding lots to the west and south, which are currently zoned R-2.

The Board may recall that a similar Land Use Plan amendment and rezoning request was considered for the vacant parcels currently occupied by Dollar General in the mid-2000s. The Board rejected that request in order to preserve available land for future commercial development in this area, and Dollar General was constructed a few years ago. In that case, history has proven the wisdom of the Board's decision on that rezoning request, as the Dollar General now provides convenient retail services for eastern Emerald Isle residents and visitors. In the case of 3307 Emerald Drive, however, it should be noted that this parcel is approximately one-third of the size of the Dollar General parcel, is located on the edge of the "Eastern Commercial Area" rather than in the middle, and is encumbered by other regulatory constraints that did not impact the Dollar General site as significantly.

As noted in Josh Edmondson's memo, the Planning Board voted 4-2 to recommend denial of the rezoning request. The Planning Board cited the inconsistency with the Land Use Plan and also the planned future development (in the long-term) of a new fishing pier at the Eastern Ocean Regional Access, and the likelihood that facility will create demand for additional commercial facilities in this area of Emerald Isle.

Josh Edmondson and I look forward to reviewing the proposed rezoning request with the Board at the November 10 meeting.


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Town Planner
Josh Edmondson
jedmondson@emeraldisle-nc.org

DATE: November 3, 2015

TO: Frank Rush, Town Manager

FROM: Josh Edmondson, CZO, Town Planner

SUBJECT: **Amendment to the 2004 CAMA Future Land Use Plan**

Due to a request for a change in zoning of the property located at 3307 Emerald Dr., an amendment to the 2004 Future Land Use Plan (FLUP), specifically the Future Land Use Map (FLUM) is necessary for the rezoning to be consistent with the FLUP. The property is currently shown to be in the Eastern Commercial Area and the rezoning request was a change to Single/Dual-Family Category as defined in the FLUP. The following is an excerpt from the FLUP regarding the Eastern Commercial Area of which the property in question is a part of: about half acre w/ cond

> The planned Commercial Area on the east-end is located on the south side of Emerald Drive between Connie Drive and Hunter Circle. The objective of this land use category is to provide residents of the surrounding neighborhoods with shopping areas and community facilities that provide goods and services that meet residents' day-to-day needs or that meet the service needs of neighborhood properties. Examples of appropriate uses in this area are convenience retail, barber shops and hair salons, real estate rental offices, small restaurants, and small gift shops. These types of uses add to the convenience of these neighborhoods and help reduce the number and length of trips on NC 58.

The Town encourages uses in the Eastern Commercial Area that meet the following guidelines:

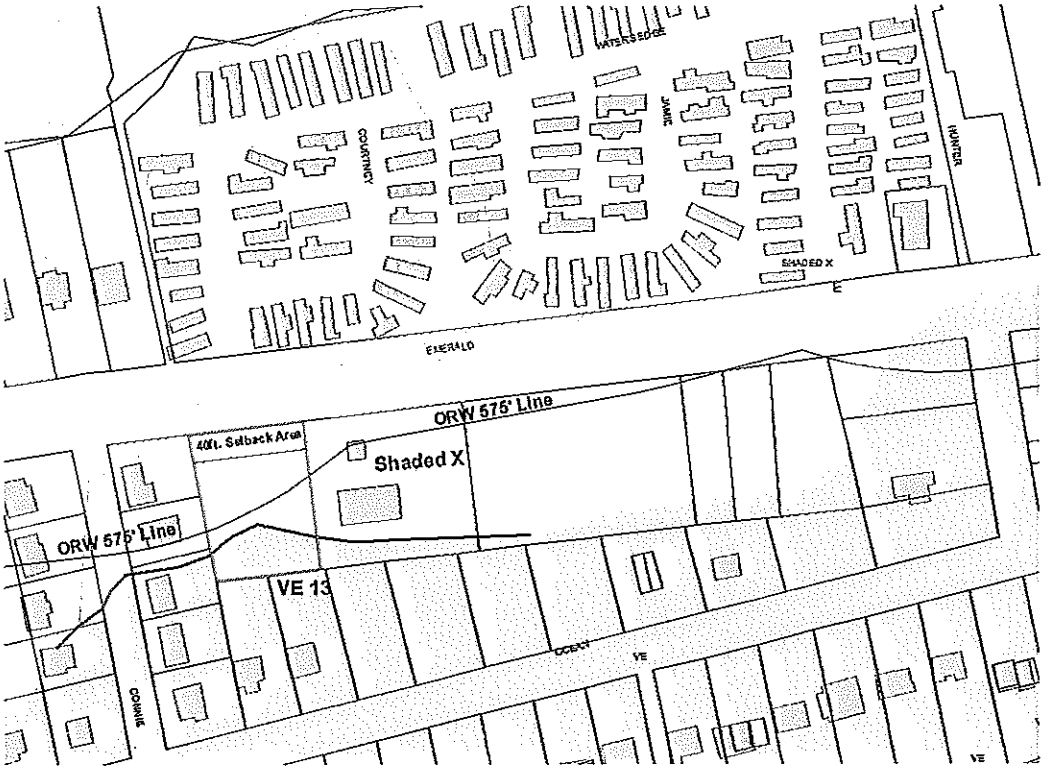
- provide shopping areas and community facilities with goods and services that meet day-to-day needs of nearby residences and properties;
- are in scale with the overall neighborhood development; and
- are in keeping with the other policies of this plan.

The Town will ensure full compliance with all policies and development requirements, including the minimum lot sizes, setbacks, height restrictions, density limits, and preservation of native vegetation as established by the Town's current development management ordinances.

The reason for sharing this is to show the importance of this area for commercial development to the eastern end of the Town. With that said, I would point out there are still vacant or undeveloped parcels in this commercial area that are zoned Business which provides opportunity for further commercial development. Also, a change to Single/Dual-Family use of the property is consistent with the residential land use goals of the LUP, the contiguous Residential properties of the area and eastern part of Town.

Furthermore, physical and environmental conditions are factors that limit the use of this property for commercial purposes. Included in this memo is map depicting some of these issues. First, note the bright red line separating the Shaded-x flood zone and the VE zone. The reason for pointing this out is that per NFIP and Town flood regulations, no fill can be used in the VE zone as a means of structural support. This takes away a little more than 8,000 square feet from the 31,000 square feet of lot area that can essentially not be built on. Also, note the thin black line south of Emerald Drive. This is

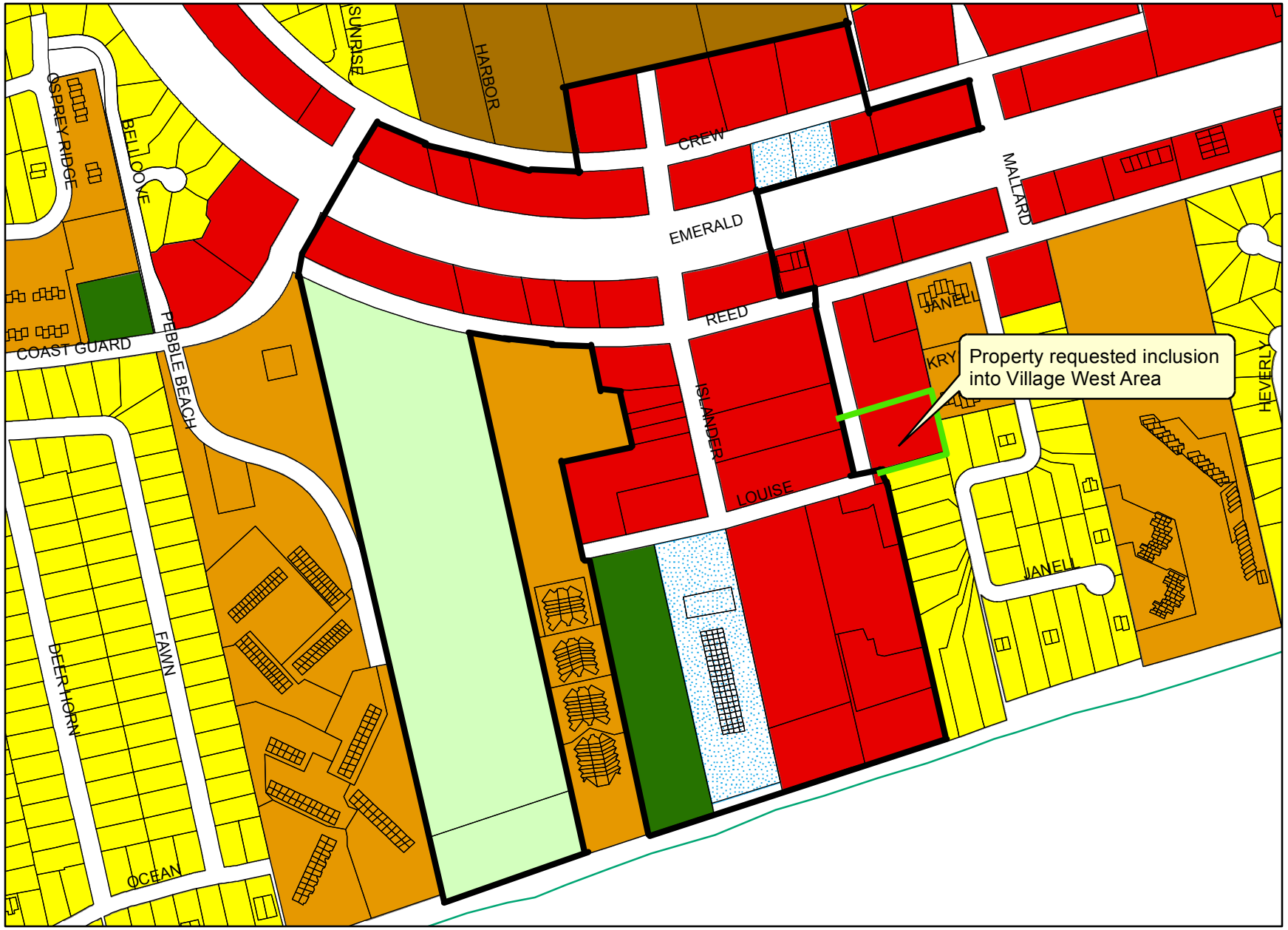
the 40ft front setback/minimum building line. Again, this is a portion of the property that can have no structure. Combine this with the VE zone issue and buildable area for a commercial land use is limited. Lastly, note the thin red line towards the center of the lot. This is the CAMA 575' ORW line limiting every lot within to 25% maximum impervious cover. This is another limiting factor for a commercial lot that would have roof impervious and parking impervious areas. I say all this just to point out the challenges of this property as a commercial landuse.



The Planning Board discussed this potential amendment at its October meeting and following discussion of the matter, voted 4-2 to recommend to the Board of Commissioners that the amendment be denied. If the amendment is approved by the Board, then it will have to be certified by the Coastal Resources Commission at a future meeting of the CRC. Please find attached a Resolution in support of the amendment to the CAMA Landuse Plan.

I look forward to discussing this issue with the Commissioners at its November 10 meeting. Please let me know if you have any questions regarding the foregoing information.

Landuse Plan Amendment - Proposed Amendment to the Village West Area



(All properties bound by the thick dark line are currently in the Village West Area as shown on the 2004 CAMA Landuse Plan Furture Landuse Map)

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PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

MEMORANDUM

CRC- 16-12

To: Coastal Resources Commission (CRC)
From: Charlan Owens, AICP, Elizabeth City District Planner
Date: January 27, 2016
Subject: Certification of the Perquimans County/Town of Hertford/Town of Winfall Joint Land Use Plan (LUP)

Recommendation: **CONDITIONAL CERTIFICATION of the Perquimans County/Town of Hertford/Town of Winfall Joint Land Use Plan based on the determination that the document has met the substantive requirements outlined within the 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; provided that the potential conflict with recent state law regarding riparian buffers is resolved.**

Once the local governments comply with all conditions of certification, as determined by the Executive Secretary, the plan certification is automatic with no further action needed by the CRC.

Overview

Perquimans County is bounded by Gates County to the north, Pasquotank County and the Little River to the east, the Albemarle Sound and Yeopim River to the south, and Chowan County to the west. The Perquimans River is located in the center of the county, with the Town of Hertford located on the west side of the river and the Town of Winfall directly across from Hertford on the east side of the river.

The 2014 population estimate for Perquimans County indicates a permanent population of 13,466 persons, which is 13 more than the 2010 permanent population of 13,453 persons. The land use plan covers the entire county, which is approximately 247 square miles.

Perquimans County is an agricultural, historic community that is working to ensure sustained, planned growth, promote open space to improve the quality of life, and encourage economic development through planned growth.

Recent changes in state law have resulted in a potential conflict with the following county and town water quality policies:

> Policy WQ #2, Page IX-14
> Perquimans County, Hertford, and Winfall shall require, as appropriate, subdivision developments to control and treat the storm water runoff generated by a 1.5- inch rain

event and that all buildings or related structures within waterfront subdivisions be set back 50 feet from the shoreline.

Policy WQ #9, Page IX-15
Because of water quality concerns, only limited construction will be allowed within a landward buffer (provided in accordance with locally adopted best management practices) of the mean high water mark on subdivision lots which adjoin the Little River, Perquimans River, Yeopim River, the Albemarle Sound, or their impounded waters and tributaries. The landward buffer shall not contain any buildings or related structure, such as decks, paved patios, or utility sheds. The primary use of the area is the growth of natural vegetation such as a grassed lawn. The only structure permissible within the waterfront set-back area is an elevated pier of wood construction constructed to provide access to the water. On-site septic systems and nitrification lines are also prohibited from the required setback area. The locations of buildings or related structures, such as decks, paved patios, or utility sheds in new developments shall be subject to the more or less stringent provisions of any applicable State law.

Policy WQ #10, Page IX-16
Perquimans County, Hertford, and Winfall, in order to minimize sedimentation and erosion, shall require that all developments maintain a vegetated buffer along each side of a stream or natural drainage way. The vegetated buffer shall remain undisturbed except as may be necessary to accommodate roads, utilities and their easements, pedestrian paths and their easements and approved water-dependent uses such as marinas, docks, piers, boat ramps and bridges. In cases in which the buffer may not be practical or desirable, the Board of Adjustment may consider a special exception if it finds that an acceptable alternative means of handling storm water can be achieved without maintaining a vegetated buffer.

House Bill 44 Session Law 2015-246 includes a section on RIPARIAN BUFFER REFORM which impacts the ability of local governments to enact, implement or enforce a riparian buffer or setback for water quality protection that goes beyond the requirements of state or federal law or an approval issued by a State or federal agency. The law provides for consideration of ordinances enacted prior to August 1, 1997 and allows a local government to request the authority to enact, implement and enforce a local riparian buffer that exceeds state and state or federal law from the Environmental Management Commission (EMC). Perquimans County, the Town of Hertford, and the Town of Winfall have been asked to review their local ordinances and make a determination as to whether or not their plan policies are consistent with the new state law. If the policies are determined to be consistent, the plan will be certified as submitted. If any policy is determined to be inconsistent, it will be removed from the plan and the remaining document will be certified.

The Hertford and Winfall town councils unanimously adopted the LUP at separate, duly advertised public hearings held on November 9, 2015. The Perquimans County Board of Commissioners unanimously adopted the LUP at their duly advertised public hearing on November 16, 2015.

To view the Perquimans County/Town of Hertford/Town of Winfall Joint LUP go to the following link: http://portal.ncdenr.org/web/cm/perquimans-county. Plan policies can be found on .pdf pages 189-207. The future land use maps and map designation descriptions are located on .pdf pages 210-234. The plan implementation actions are shown on .pdf pages 272-281.

The public was provided the opportunity to submit written comments on the LUP up to fifteen (15) business days prior to the CRC meeting (January 20th). No written comments or objections were received.

Coastal Management
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PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

MEMORANDUM

CRC- 16-13

To: Coastal Resources Commission (CRC)
From: Charlan Owens, AICP, Elizabeth City District Planner
Date: January 27, 2016
Subject: Certification of the Bertie County Land Use Plan (LUP)

Recommendation: **CONDITIONAL CERTIFICATION of the Bertie County Land Use Plan based on the determination that the document has met the substantive requirements outlined within the 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; provided that the potential conflict with recent state law regarding riparian buffers is resolved.**

Once the local government complies with all conditions of certification, as determined by the Executive Secretary, the plan certification is automatic with no further action needed by the CRC.

Overview

Bertie County is bounded by Hertford County to the north, the Chowan River to the east, the Roanoke River to the south and west, and Northampton County to the northwest. The county land area is approximately 699 square miles. The 2014 population estimate for Bertie County indicates a permanent population of 20,106 persons, which is 1,176 less than the 2010 permanent population of 21,282 persons.

The county land use plan covers unincorporated areas of Bertie County as well as the incorporated towns of Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, and Roxobel (approximately 687 square miles). The remaining area is covered under the Town of Windsor's certified land use plan.

Bertie County strives to improve the quality of life for its residents and maintain economic stability. The county supports and welcomes second home and retirement community development, much of which is oriented along the waterways, while also preserving its heritage and community character.

Bertie County implements a 75 foot shoreline buffer for Planned Unit Developments (PUDs), which exceeds the State's minimum standards for development (Water Quality Policy 5.5, Page 82). There are no additional policy statements more restrictive than the State's CAMA rules "Minimum Use Standards".

Recent changes in state law have resulted in a potential conflict with the county's water quality policy implementing a 75 foot shoreline buffer for PUDs. House Bill 44 Session Law 2015-246

includes a section on RIPARIAN BUFFER REFORM which impacts the ability of local governments to enact, implement or enforce a riparian buffer or setback for water quality protection that goes beyond the requirements of state or federal law or an approval issued by a State or federal agency. The law provides for consideration of ordinances enacted prior to August 1, 1997 and allows a local government to request the authority to enact, implement and enforce a local riparian buffer that exceeds state or federal law from the Environmental Management Commission (EMC). Bertie County has been asked to review their local ordinances and make a determination as to whether or not their riparian buffer policy is consistent with the new state law. If the policy is determined to be consistent, the plan will be certified as submitted. If the policy is determined to be inconsistent, it will be removed from the plan and the remaining document will be certified.

The Bertie County Board of Commissioners unanimously adopted the LUP at their duly advertised public hearing on January 4, 2016.

To view the Bertie County LUP go to the following link: http://www.nccoastalmanagement.net/web/cm/bertie-county. The land use plan consists of the document and map .pdf files. The document file includes plan policies and implementation strategies on pages 70-86, future land use map designation descriptions on pages 88-94, and an implementation action plan on page 110. The future land use map is a separate file.

The public was provided the opportunity to submit written comments on the LUP up to fifteen (15) business days prior to the CRC meeting (January 20th). No written comments or objections were received.

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

CRC-16-14

January 14, 2016

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Resolution Delegating LUP Certification to DCM

At your November 2015 meeting, the Commission adopted amendments to the 15A NCAC 7B Land Use Planning Guidelines which included shorter timelines for state review and certification to speed up the land use plan and amendment review process. One of these amendments, delegating authority for the certification of LUPs to the Department/Division, could not be included as the necessary amendment to CAMA was not enacted by the General Assembly. The wording of the rule language was changed to revert certification of LUPs back to the Commission.

During subsequent discussion, the Commission requested that a resolution be sent to the Department requesting that such delegation of authority be included in its legislative requests during the next section. Attached is a draft resolution requesting the change as well as the proposed amendment to G.S 113A-124(c).

§ 113A-110. Land-use plans.

(f) No land-use plan shall become finally effective until it has been approved by the Commission or its duly authorized agent. The county or other unit adopting the plan shall transmit it, when adopted, to the Commission for review. The Commission or its duly authorized agent, shall afford interested persons an opportunity to present objections and comments regarding the plan, and shall review and consider each county land-use plan in light of such objections and comments, the State guidelines, the requirements of this Article, and any generally applicable standards of review adopted by rule of the Commission. Within 45 days after receipt of a county land-use plan the Commission or its duly authorized agent, shall either approve the plan or notify the county of the specific changes which must be made in order for it to be approved. Following such changes, the plan may be resubmitted in the same manner as the original plan.

§ 113A-124. Additional powers and duties.

(a) The Secretary shall have the following additional powers and duties under this Article:

(1) To conduct or cause to be conducted, investigations of proposed developments in areas of environmental concern in order to obtain sufficient evidence to enable a balanced judgment to be rendered concerning the issuance of permits to build such developments.

(2) To cooperate with the Secretary of the Department of Administration in drafting State guidelines for the coastal area.

(3) To keep a list of interested persons who wish to be notified of proposed developments and proposed rules designating areas of environmental concern and to so notify these persons of such proposed developments by regular mail. A reasonable registration fee to defray the cost of handling and mailing notices may be charged to any person who so registers with the Commission.

(4) To propose rules to implement this Article for consideration by the Commission.

(5) To delegate such of his powers as he may deem appropriate to one or more qualified employees of the Department or to any local government, provided that the provisions of any such delegation of power shall be set forth in departmental rules.

(6) To delegate the power to conduct a hearing, on his behalf, to any member of the Commission or to any qualified employee of the Department. Any person to whom a delegation of power is made to conduct a hearing shall report his recommendations with the record of the hearing to the Secretary for decision or action.

(b) In order to carry out the provisions of this Article the secretaries of Administration and of Environment and Natural Resources may employ such clerical, technical and professional personnel, and consultants with such qualifications as the Commission may prescribe, in accordance with the State personnel rules and budgetary laws, and are hereby authorized to pay such personnel from any funds made available to them through grants, appropriations, or any other sources. In addition, the said secretaries may contract with any local governmental unit or lead regional organization to carry out the planning provisions of this Article.

(c) The Commission shall have the following additional powers and duties under this Article:

(1) To recommend to the Secretary the acceptance of donations, gifts, grants, contributions and appropriations from any public or private source to use in carrying out the provisions of this Article.

(2) To recommend to the Secretary of Administration the acquisition by purchase, gift, condemnation, or otherwise, lands or any interest in any lands within the coastal area.

(3) To hold such public hearings as the Commission deems appropriate.

(4) To delegate the power to conduct a hearing, on behalf of the Commission, to any member of the Commission or to any qualified employee of the Department. Any person to whom a delegation of power is made to conduct a hearing shall report his recommendations with the evidence and the record of the hearing to the Commission for decision or action.

(5) Repealed by Session Laws 1987, c. 827, s. 141.

(6) To delegate the power to determine whether a contested case hearing is appropriate in accordance with G.S. 113A-121.1(b).
(7) To delegate the power to grant or deny requests for declaratory rulings under G.S. 150B-4 in accordance with standards adopted by the Commission.
(8) To adopt rules to implement this Article.
(9) To delegate the power to approved Land Use Plans in accordance with G.S. 113A-110(f).

(d) The Attorney General shall act as attorney for the Commission and shall initiate actions in the name of, and at the request of, the Commission, and shall represent the Commission in the hearing of any appeal from or other review of any order of the Commission. (1973, c. 1284, s. 1; 1975, c. 452, s. 5; 1977, c. 771, s. 4; 1981, c. 932, s. 2.1; 1987, c. 827, ss. 125, 141; 1989, c. 727, s. 135; 1991 (Reg. Sess., 1992), c. 839, s. 2; 1997-443, s. 11A.119(a).)

DRAFT February 9, 2016

North Carolina
Coastal Resources Commission

NC Coastal Resources Commission and
NC Coastal Resources Advisory Council Resolution
Supporting Delegation of CAMA Land Use Plan Certification Authority to the Secretary of the Department of Environmental Quality

WHEREAS, the Coastal Area Management Act (CAMA) established a cooperative program of coastal area management between local and State governments, where local governments have the initiative for planning with the State acting primarily in a supportive, standard-setting, and review capacity; with permitting and enforcement as concurrent State and local responsibilities. Under CAMA, each coastal county is required to develop and adopt a land use plan. Municipalities within the 20-county jurisdiction are not required to have a land use plan; however, they may be delegated planning authority if they are currently enforcing a zoning ordinance, subdivision regulations, and the State Building Code, and;

WHEREAS, the State's coastal program employs a two-tiered approach to managing coastal resources. Critical resource areas, designated as Areas of Environmental Concern (AECs), comprise the first tier. The Division of Coastal Management (DCM) regulates certain activities in these areas through CAMA permits. CAMA permits are required to be consistent with an approved local CAMA land use plan. The second tier comprises non-AEC areas. These areas are managed through a coordinated effort of other state laws, local land use plans, and the requirement for State agency actions to be consistent with local land use plans. Approved local land use plans are also considered during the review of federal actions and federal permits, and;

WHEREAS, the local land use plans require approval of the CRC to become effective. Plans are reviewed for consistency with the CRC's planning rules and requirements of CAMA, and;

WHEREAS, the Commission and Division have conducted a comprehensive review of the Land Use Planning Program that included public input, staff experience implementing the program, and regional workshops with local elected officials, local planning staff, consultants, and other interest stakeholders, and;

WHEREAS, the CRC has adopted changes to the Land Use Planning Program to provide increased flexibility for plan content and format, reduce unnecessary regulatory burdens on local governments, and improve the quality and value of the plans;

WHEREAS, the CRC has instituted shorter timelines for state review and certification to expedite land use plan approvals and amendments by delegating certification authority to the Secretary of the Department of Environmental Quality.

THEREFORE, IT IS HEREBY RESOLVED THAT, the North Carolina Coastal Resources Commission encourages the Department of Environmental Quality to include in legislative requests to the N.C. General Assembly a proposed amendment to the NC Coastal Area Management Act, delegating authority for the certification of CAMA Land Use Plans to the Department.

Frank D. Gorham, III CRC Chair

Debbie Smith, CRAC Chair

February 10, 2016

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

CRC-16-15

January 22, 2016

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Re-adoption of 15A NCAC 7L Planning & Management Grant Program Amendments

Included in recent revisions to the CAMA Land Use Planning Program were amendments to the 7L Planning & Management Grant Program rules, which outline the criteria for land use plan implementation grants to local governments. These amendments were adopted by the Commission at the November 2015 meeting and sent to the Rules Review Commission (RRC) as part of the rulemaking process. During their review of the adopted rules, RRC attorneys suggested several technical changes (routine part of rulemaking) that included deletion of a rule which seemed unnecessary (compliance with state rules and standards) as well as combining two rules which deal with similar subject matter (priorities for funding and eligible projects). DCM Staff agreed with RRC Staff and made the technical changes. However, since these changes were not part of the package adopted by the CRC in November, it was suggested that the Division request an Extension of Review from the RRC in order to have the amendments adopted by the Commission. The RRC has approved the request and the attached amendments are being presented for adoption by the CRC. Both DCM Staff and RRC Staff consider the technical changes non-substantive.

15A NCAC 7L .0502 Consistency with Plans and Rules is recommended for repeal since the requirement that projects be consistent with CAMA, state rules implementing CAMA, local land use plans and the federally-approved coastal management program appear in CAMA and other CRC rules. This rule is considered duplicative and unnecessary.

15A NCAC 7 .0503 Priorities for Funding Land Use Plans and Implementation Projects is recommended to be combined with the language in 15A NCAC 7L .0504 Eligible Projects, which will be deleted, to create one rule that outlines eligible projects and their priority for funding. Since the language of both rules is essentially retained, both DCM Staff and RRC Staff believe this technical change provides clarity in the rules and is non-substantive in nature.

If the CRC approves these technical changes, the amended rules will be re-submitted to the RCC for consideration at their February 18, 2016 meeting with an anticipated effective date of March 1, 2016.

All of the 7L Planning and Management Grant rules and their recommended technical changes are attached and I look forward to discussing the amendments at our upcoming meeting in Atlantic Beach.

15A NCAC 07L .0502 is amended with changes as published in 30:06 NCR 632 as follows:

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

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

History Note: *Authority G.S. 113A-112; 113A-124;*
Eff. August 1, 2002;
Repealed Eff. February 1, 2016.

15A NCAC 07L .0503 is amended with changes as published in 30:06 NCR 632-633 as follows:

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

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

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

(1) The highest ~~priority~~ priority, Category I, includes projects ~~directly~~ mandated by statute, including initial and updated or amended ~~CAMA~~ land use ~~plans,~~ plans or comprehensive plans, hereinafter referred to as the plan, local participation in projects initiated by ~~DENR,~~ DEQ, and projects ~~DENR~~ DEQ indicates urgently need local attention in order to meet ~~CRC~~ Coastal Resources Commission (CRC) management topics pursuant to 15A NCAC 07B .0702(d)(2). ~~In general, grants for projects in this priority category, except CAMA Workbook land use plans, shall be funded for no more than 85 percent of the total project cost, although lower funding percentages may be awarded. The type of CAMA land use plan to be funded and the corresponding percentage of funding shall be based on community characteristics as determined during the scoping process described in 15A NCAC 07L .0505 to be held prior to project application.~~ Examples of eligible projects and their associated priority category include:

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

(B) Adopting, amending, or updating plans to reflect changed conditions which may include necessary data collection, public participation, and policy development.

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

(A) Adopting or amending ordinances to further secure compliance with state rules in AECs pursuant to Subchapter 15A NCAC 07H;

15A NCAC 07L .0504 is amended with changes as published in 30:06 NCR 633-634 as follows:

15A NCAC 07L .0504 ~~ELIGIBLE PROJECTS~~

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

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

~~(1) Priority Category Type 1~~

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

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

~~(2) Priority Category Type 2~~

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

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

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

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

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

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

~~(G) Hazard mitigation plans.~~

~~(3) Priority Category Type 3~~

~~(A) Initial water and sewer plans and studies;~~

~~(B) Land use related capital facilities programming;~~

~~(C) Base mapping as a management tool;~~

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

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

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

~~(G) Other coastally related management projects.~~]

History Note: *Authority G.S. 113A-112; 113A-124;*
Eff. August 1, 2002;
Repealed Eff. February 1, 2016.

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

CRC-16-16

January 26, 2016

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Public Comment on 15A NCAC 7H .0308 Specific Use Standards for Ocean Hazard Areas (Sandbags) – Temporary Rules

The NC General Assembly has directed the Commission to amend its rules for the use of temporary erosion control structures (sandbags) (S.L. 2015-241). Specifically, the Commission is directed to:

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

The CRC approved rule language (attached) addressing the legislative directive at your November 2015 meeting. A public hearing was held December 10, 2015 in Morehead City and the public comment period ended on December 22, 2016. At total of five written comments were received and all were opposed to the amendments. I look forward to discussing the substantive comments (summarized below) at our meeting in Atlantic Beach.

NC Coastal Federation

Comment
The proposed rules (15A NCAC 07H .0308(a)(2(B) and 15A NCAC 07H .1705(a)(2)) allow sandbags to be installed if sandbags exist on an adjacent riparian property. The proposed rules (15A NCAC 07H .0308(a)(2(E) and 15A NCAC 07H .1705(a)(5)) also would allow sandbags to cover the entire length of a lot, and remove the existing limitation that they must be within 20 feet of a threatened structure. This will allow our public trust beaches to be walled off with sandbags even where there are no threatened structures to protect.

Comment
Two other proposed changes allow replacement, repair or modification of damaged sandbags while the permit status is being litigated by the property owner (15A NCAC 07H .0308(a)(2(N) and 15A NCAC 07H .1705(a)(15)); and extend the termination date of all sandbag permits on one property to be that of the last permit issued (15A NCAC 07H .0308(a)(2(F) and 15A NCAC 07H .1705(a)(6)). The sandbags are supposed to be "temporary erosion control structures" thus allowing landowners to temporarily protect threatened property while looking for more permanent solutions. The last two proposed changes will leave sandbags in place perhaps even in perpetuity.

Comment
The federation requests that the Coastal Resources Commission: (1) Requests that the N.C. Attorney General evaluate if the law enacted by the N.C. General Assembly that mandates this temporary rule is constitutional and consistent with the state's public trust doctrine.

Comment
Requests the Division of Coastal Management to officially inform the coastal local governments that according to Senate Bill 151 ("§160A---203) of 2013 they have the right to pass an ordinance or include a provision in their land use plan that would prevent Coastal Area Management Act permits from being issued under this temporary sandbag rule in order to protect public trust rights in their communities.

Southern Environmental Law Center

Comment
It is certain that the proposed rules will dramatically increase the extent of the oceanfront shoreline that is armored with sandbags. Given that DCM assumes a minimum of two feet of erosion per year along the entire oceanfront of North Carolina-and therefore all properties are likely to be found to be "experiencing erosion" under l5A N.C. Admin. Code 07H.0308(a)(2)(A)-the only apparent limitation to whether a property owner can install sandbags across the oceanfront of his or her property is whether a neighbor has armored its oceanfront. Therefore, the rule change all but ensures that existing sandbag bulwarks will steadily creep across the coast, extending their reach property by property.

The increased sandbagging of the North Carolina coast that can be expected under these rules is likely to result in the take of protected species….. Approval and implementation of these rules are certain to result in a take of loggerhead sea turtles by eliminating nesting habitat-including nesting habitat that has been designated as critical habitat…. The proposed rules would similarly take threatened and endangered piping plover due to elimination of intertidal foraging habitat and adjacent roosting habitat. Loss of habitat due to activities including revetment construction is "of grave concern for piping plovers…

Town of Nags Head

Comment

We ask that the CRC consider that not all jurisdictions are in favor of permitting sandbags and consider rules that allow each location to choose for themselves which means and methods it chooses to protect its ocean shorelines.

North Carolina
Coastal Federation
Working Together for a Healthy Coast

December 11, 2015

Via Electronic Email
Mr. Braxton Davis
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
Braxton.Davis@ncdenr.gov

RE: Temporary Rules – Sandbag Amendments

Dear Mr. Davis:

Please accept the following comments on the development of temporary rules for the use of sandbags. The federation actively supports the preservation and public use of our state's beautiful and productive beaches and inlets as public trust resources for everyone in North Carolina.

The federation objects to the proposed rule because it will destroy the quality of our natural beaches and interfere with the public's right to use the dry sand beach.

The proposed rules (15A NCAC 07H .0308(a)(2(B) and 15A NCAC 07H .1705(a)(2)) allow sandbags to be installed if sandbags exist on an adjacent riparian property. The proposed rules (15A NCAC 07H .0308(a)(2(E) and 15A NCAC 07H .1705(a)(5)) also would allow sandbags to cover the entire length of a lot, and remove the existing limitation that they must be within 20 feet of a threatened structure. This will allow our public trust beaches to be walled off with sandbags even where there are no threatened structures to protect.

Two other proposed changes allow replacement, repair or modification of damaged sandbags while the permit status is being litigated by the property owner (15A NCAC 07H .0308(a)(2(N) and 15A NCAC 07H .1705(a)(15)); and extend the termination date of all sandbag permits on one property to be that of the last permit issued (15A NCAC 07H .0308(a)(2(F) and 15A NCAC 07H .1705(a)(6)). The sandbags are supposed to be "temporary erosion control structures" thus allowing landowners to temporarily protect threatened property while looking for more permanent solutions. The last two proposed changes will leave sandbags in place perhaps even in perpetuity.

These proposed changes will further litter our beautiful beaches with sandbags and deny the public its right to use the beach. The federation requests that the Coastal Resources Commission:

(1) Requests that the N.C. Attorney General evaluate if the law enacted by the N.C. General Assembly that mandates this temporary rule is constitutional and consistent with the state's public trust doctrine.

(2) Requests that N.C. Attorney General enforces the public trust doctrine on behalf of the Commission and the citizens of North Carolina. In Town of Nags Head v. Cherry, Inc. (2012) the North Carolina Court of Appeals determines:

> *"[The N.C] case law clearly reflects that affirmative actions regarding public trust property must be taken by the State "through the Attorney General[.]"*

(3) Requests the Division of Coastal Management to officially inform the coastal local governments that according to Senate Bill 151 ("§160A-203) of 2013 they have the right to pass an ordinance or include a provision in their land use plan that would prevent Coastal Area Management Act permits from being issued under this temporary sandbag rule in order to protect public trust rights in their communities.

Thank you for taking our comments into consideration.

Sincerely,

Ana Zivanovic-Nenadovic
Program and Policy Analyst

cc: Mary Lucasse, N.C. Attorney General's office

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 919-967-1450 | 601 WEST ROSEMARY STREET, SUITE 220 CHAPEL HILL, NC 27516-2356 | Facsimile 919-929-9421

December 18, 2015

Via U.S. and Electronic Mail
Braxton Davis
Director
N.C. Division of Coastal Management
400 Commerce Ave.
Morehead City, NC 28557
Braxton.davis@ncdenr.gov

Re: Temporary Rules – Sandbag Structures

Dear Mr. Davis:

Please accept these comments on the proposed temporary rules for sandbag structures—15A N.C. Admin. Code 07H.1705, 07H.1704, and 07H.0308. As described below, the proposed temporary rules pose a substantial danger to wildlife protected by the Endangered Species Act ("ESA"), 16 U.S.C. § 1531, *et seq.*, including the loggerhead sea turtle (*Caretta caretta*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*). Although directed by the General Assembly to implement these rules, the Division of Coastal Management ("DCM") must carefully analyze whether it can authorize such widespread sandbag use without violating federal law.

It is certain that the proposed rules will dramatically increase the extent of the oceanfront shoreline that is armored with sandbags. Given that DCM assumes a minimum of two feet of erosion per year along the entire oceanfront of North Carolina—and therefore all properties are likely to be found to be "experiencing erosion" under 15A N.C. Admin. Code 07H.0308(a)(2)(A)—the only apparent limitation to whether a property owner can install sandbags across the oceanfront of his or her property is whether a neighbor has armored its oceanfront. Therefore, the rule change all but ensures that existing sandbag bulwarks will steadily creep across the coast, extending their reach property by property.

The nature of sandbag revetments ensures increased erosion on adjacent properties and, under the proposed rules, guarantees that a significant portion of North Carolina's oceanfront will be sandbagged. Because sandbags displace wave energy, they inevitably lead to flanking that results in greater erosion on adjacent properties. Because the proposed rules allow sandbag embankments to stretch across the entire oceanfront of a property, they promise to exacerbate erosion on neighboring properties.

The increased sandbagging of the North Carolina coast that can be expected under these rules is likely to result in the take of protected species. The ESA's conservation mandate is

incorporated into Section 9 of the ESA. Under Section 9, it is "unlawful for any person" to "take [any endangered species] within the United States ...." 16 U.S.C. § 1538(a)(1)(B). In general, this prohibition also applies to threatened species. 50 C.F.R. § 17.31(a). It is also unlawful for any person to violate regulations pertaining to threatened and endangered species. 16 U.S.C. § 1538(a)(1)(G).

The term "take" is defined broadly as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." 16 U.S.C. § 1532(19); *Defenders of Wildlife v. EPA*, 882 F.2d 1294, 1300 (8th Cir. 1989) ("Take is defined in the broadest possible manner to include every conceivable way in which a person ... can 'take' or attempt to 'take' any fish or wildlife") (internal citation omitted). "Harm" means "an act which actually kills or injures wildlife," including habitat modification or degradation that "injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." 50 C.F.R. § 17.3. "Harass" means "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." *Id.*

It is also unlawful for "any person" to "cause to be committed" any offense described in Section 9, including take of threatened or endangered species, or a violation of regulations pertaining to these species. 16 U.S.C. § 1538(g). The term "person" includes "any officer, employee, agent, department, or instrumentality ... of any State, municipality, or political subdivision of a State ...." *Id.* § 1532(13).

Approval and implementation of these rules are certain to result in a take of loggerhead sea turtles by eliminating nesting habitat—including nesting habitat that has been designated as critical habitat. The Loggerhead Sea Turtle Recovery Plan identifies coastal armoring, including through the use of sandbags, as one of the primary threats to the survival of the species. These structures "prevent long-term recovery of the beach/dune system (i.e., building of the back beach) by physically prohibiting dune formation from wave uprush and wind-blown sand."[1] In addition "[a]rmoring structures can effectively eliminate a turtle's access to upper regions of the beach/dune system."[2] Therefore, the Recovery Plan identifies "minimizing the effects of coastal armoring" as an "action[] that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future."[3] The Federal Register notice announcing critical habitat in North Carolina also recognized the detrimental effect of armoring the shoreline, "which causes changes, additional loss of, or impact to the remaining sea turtle habitat."[4]

It is clear that DCM will be liable for the take of loggerheads resulting from the installation of sandbag revetments. A government entity—such as DCM—causes take to be committed when it authorizes activity resulting in take. Courts have established that "a governmental third party pursuant to whose authority an actor directly exacts a taking ... may be

[1] U.S. Fish and Wildlife Service, *Recovery Plan for the Northwest Atlantic Population of Loggerhead Sea Turtle (Caretta caretta): Second Revision* at I-37 (Dec. 2008).
[2] *Id.* at I-38.
[3] *Id.* at xii.
[4] 79 Fed. Reg. 39756, 39776 (July 10, 2014).

deemed to have violated the provisions of the ESA." *Strahan v. Coxe*, 127 F.3d 155, 163 (1st Cir. 1997) (holding Massachusetts state officers caused take by licensing and permitting fishing practices that injured endangered Northern Right whales); *Sierra Club v. Yeutter*, 926 F.2d 429, 438–39 (5th Cir. 1991) (holding Forest Service caused take of endangered red-cockaded woodpeckers by permitting logging practices near nesting colonies); *Defenders of Wildlife v. EPA*, 882 F.2d at 1301 (holding EPA caused take of endangered species through its registration of pesticides for use by others); *Animal Prot. Inst. v. Holsten*, 541 F. Supp. 2d 1073, 1078–80 (D. Minn. 2008) (holding state agency caused take of lynx through its licensure of trapping and its regulation of trap uses).

The proposed rules would similarly take threatened and endangered piping plover due to elimination of intertidal foraging habitat and adjacent roosting habitat.[5] Loss of habitat due to activities including revetment construction is "of grave concern for piping plovers."[6] The rules similarly threaten to take red knots because "stabilization projects fundamentally alter the naturally dynamic coastal processes that create and maintain beach strand and bayside habitats, including those habitat components that red knots rely upon."[7]

By eliminating the restrictions that limit sandbags to those properties that are imminently threatened, the proposed rules will substantially increase the number of properties eligible for sandbag installation. The potentially massive seawall created by new sandbag revetments would not only change the face of North Carolina's oceanfront, it would cause DCM to violate the ESA. Although the General Assembly can direct DCM to issue these temporary rules, it cannot absolve the agency of its responsibilities under the ESA. We will be closely monitoring DCM's implementation of these proposed rules to ensure that the agency complies with its obligation to protect threatened and endangered wildlife.

Thank you for your consideration of these comments. Please contact me at (919) 967-1450 or ggisler@selcnc.org if you have any questions regarding these comments.

Sincerely,

Geoffrey R. Gisler
Senior Attorney

GRG/rgd

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[5] *See* U.S. Fish and Wildlife Service, *Piping Plover (Charadrius melodus) 5-Year Review: Summary and Evaluation* at 36 (Sept. 2009).
[6] *Id.* at 54.
[7] U.S. Fish and Wildlife Service, *Rufa Red Knot Background Information and Threats Assessment* at 143 (Nov. 2014).

Willis, Angela

From: Davis, Braxton C
Sent: Monday, December 07, 2015 2:35 PM
To: Willis, Angela
Subject: Fw: Sandbag use in North Carolina is a MISTAKE

From: Debbie Hickey <deb85hickey@gmail.com>
Sent: Monday, December 7, 2015 12:03 PM
To: Davis, Braxton C
Cc: John Bleattler; Tony & Barbara Maskello; Carolyn Brooker; Marie Bridgers; Ernie Bridgers
Subject: Sandbag use in North Carolina is a MISTAKE

Dear Mr. Davis:

I am a homeowner in South Nags Head, NC. I would like to cast my vote strongly against the Coastal Resource Commission's intended consideration of allowing sandbags.

We in South Nags Head have been down this path before, and in an environment as fragile and ever changing as ours, the use of sandbags would only serve to increase the erosion that we are experiencing currently, and historically I would add there has never been a clear "owner" of the sandbag deterioration and removal process.

Research done by the Scottish Natural Heritage supports this:
Exposed sand bags are unsightly and easily damaged. As structures are effectively impermeable they will not absorb wave energy, and may cause local beach scour to accelerate. Damaged bags will release the fill material back onto the beach, but the bags will remain as unsightly debris along the shoreline. Assuming that the fill material is taken locally or is similar to the beach material then losses will be harmless.
As with all fixed defences the sand bags will interfere with the natural dynamic interchange of material between beach and dune. They will also influence the longshore transfer of sand, modify dune habitats, disrupt the natural landform and potentially result in localised dune face scour at their terminal ends.
http://www.snh.org.uk/publications/on-line/heritagemanagement/erosion/appendix_1.6.shtml

A guide to managing coastal erosion in beach/dune systems

Prior to construction the dune face will need to be dressed to form a plane slope on which bags can be laid evenly. This slope should not be steeper than 1:1.5.

Read more...

Having been a homeowner, beach activist, and observer for over 16 years in Nags Head, NC, I have seen the failed results of using sandbags and gone through countless frustrations as homeowners and town representatives are powerless to remove the debris caused by the use of sandbags because of the control by CAMA or other Coastal agencies. Please do not let this get new life. It does not represent a viable solution to the erosion problem on the Outer Banks.
Respectfully,

Debbie Hickey
10105 S. Colony South Drive
Nags Head NC 27959

Willis, Angela

From: Davis, Braxton C
Sent: Monday, December 07, 2015 9:29 AM
To: Willis, Angela
Subject: Fw: Sandbags
Attachments: IMG_2093.JPG; IMG_2100.JPG

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Braxton Davis
Director, Division of Coastal Management
NC Department of Environment and Natural Resources
400 Commerce Avenue
Morehead City, NC 28557
(252) 808-2808 x202

From: john Bleattler <johnbleattler@comcast.net>
Sent: Saturday, December 5, 2015 12:26 AM
To: Davis, Braxton C
Cc: 'Tony and Barbara Maskello'
Subject: Sandbags

Do we really want to go down that ugly road again. I am not in favor of sandbagging. We have dealt with sandbags for over 15 years and still are dealing with the remains of sand bags. The beaches in South Nags Head still have the remains waving in the ocean. They get cover by the ocean and then uncovered by the ocean. They are first an eye sore and second dangerous especially when you have little children out running around in the water and can get caught on them.

I realize that the beaches need to be restored but can we take a look and beach re-nourishment again way before sandbagging. The five years should be up by next year. If they are going to re-nourishment Kitty Hawk can we get them back down to our end of the island again?

Attached are two picture I took last week while we were in Ocean City, New Jersey. The beaches were absolutely lovely. They were as long as a football field, little dunes closer to the house but no higher than my waist and the houses on the beach have small little bulkheads and a walking path in front of them, then a dune fence, then a small dune then this big beautiful beach. The down side of their beaches is they are extremely crowded in the summer time and we must purchase a beach tag ☹

Might want to see why are neighbors are not having issues and if they are how they are dealing with it. Certainly not with sandbags.

We wish you luck and hope you will make the right decision for "everyone" that will have to deal with the outcome and hopefully as we have done in the past have a meeting with us out of towners who can't make it to the meeting but would like to help get our final input before you make the decisions for us.

Toni can you please send this to the Neighborhood Group!!!

Thanks and Merry Christmas to you all,

Willis, Angela

From: Davis, Braxton C
Sent: Monday, December 28, 2015 10:13 AM
To: Cliff Ogburn
Subject: RE: Sandbags

Cliff, thank you for your comments. We will include this in the official record of public comments for consideration by the Coastal Resources Commission.

Happy holidays,
Braxton

Braxton C. Davis
Director
NC Division of Coastal Management
Department of Environmental Quality

252 808 2808 x202 office
Braxton.Davis@ncdeq.gov

400 Commerce Avenue
Morehead City, NC 28557

From: Cliff Ogburn [mailto:cliff.ogburn@nagsheadnc.gov]
Sent: Tuesday, December 22, 2015 3:45 PM
To: Davis, Braxton C <Braxton.Davis@NCDENR.Gov>
Subject: Sandbags

Braxton-

Merry Christmas and I hope you are well.

I understand that, as required by the 2015 Appropriations Act, the CRC is taking comments concerning temporary sandbag rules. I am writing to ask that local governments be given the authority to determine when it may or may not be appropriate to allow sandbags within their communities.

As you know, the Town of Nags Head nourished our shoreline in 2011 with about 4.7 million cubic yards of sand. Just prior to this project, we sent letters to property owners with sandbags letting them know that CAMA would be notifying them that their sandbags had to be removed. We let it be

known that beach nourishment was our preferred option for maintaining the town's shoreline and explained the negative impacts sandbags have on the shoreline. Some of those property owners complied and some did not.

In August of 2013 our Board of Commissioners took action to amend our Land Use Plan to address the use of sandbags.

With the completion of the recent beach nourishment project, the Town has carried out a major goal of the 2010 Land Use Plan as it was adopted. At the Board of Commissioner's direction, Staff brought forward an Amendment to the 2010 Land Use Plan to establish policies designed to protect public access to the nourished beach, promote safety, prevent erosion, and position the Town to pursue future re-nourishment efforts. In particular, the Board wanted to clarify policies regarding the repair and installation of sandbags and septic systems eastward of the static vegetation line or the first line of natural, stable vegetation.

The Town's Attorney, Board of Commissioners, Planning Board and staff put extensive work into the proposed language to
amend the LUP.

A resolution authorizing modifications to the Land Use Plan was unanimously adopted. Part of the resolution read:

> "WHEREAS, the Town of Nags Head (herein "The Town") desires to amend its 2010 Land Use Plan, specifically the policies related to protection of the oceanfront Area of Environmental Concern; and
>
> 'WHEREAS, in accordance with Article VII, Coastal Area Management 113A-110, Land Use Plans,
> the Town's Land Use Plan "shall give special attention to the protection and appropriate development of areas of environmental concern ... (and)... be consistent with the goals of the coastal area management system as set forth in G.S. 113A-102 and with the State guidelines adopted by the Commission under G.S. 113A-107"; and
>
> 'WHEREAS, the Town has carried out the 2010 Land Use Plan goal of beach nourishment through
> a locally funded project of Major Development in an Area of Environmental Concern pursuant to
> NCGS 113A-118 and permitted through the State of North Carolina; and

And the amendments read in part:

> Sandbags
> In the early 1980's, the Coastal Resources Commission allowed property owners to temporarily protect imminently threatened structures on the oceanfront with sandbags. However, there were
> limits placed on how long they could be utilized because the Coastal Resources Commission was

also charged with protecting access to the public beach area. Sandbags left in place for too long
can block public access to the beach, be harmful to nesting habitats of sea turtles and can worsen
erosion on neighboring properties. Additionally, sandbags can inhibit emergency and public works
vehicle access.

In 2000, the Coastal Resources Commission passed a rule which allowed property owners in communities actively seeking beach nourishment to keep their sandbags for five years from the
date they were installed or until May 1, 2008, whichever was later. However, sandbags which were covered with sand and stabilized with natural vegetation were allowed to remain in place until they were uncovered by a storm or other natural event. Despite continued efforts by the Division of Coastal Management, enforcement of sandbag removal requirements has been unsuccessful.

Essentially, sandbags which previously have been allowed by the Coastal Resources Commission as
temporary erosion control structures, over time, become harmful permanent "hardened" structures
which are not permitted by Coastal Resources Commission and have been banned by the State since 1985. Such sandbags reduce the width of the beach, deflect wave energy and increase erosion on adjacent properties. Such actions are a detriment to the Town's beaches and the completed nourishment project, as well as future re-nourishment efforts. With the completion of a
locally funded beach nourishment project that must be monitored and maintained in the future,
the Town opposes any new installation of sandbags seaward of the static vegetation line or the
first line of stable natural vegetation.

The Board has also unanimously approved an ordinance that prohibits beach bulldozing because of its negative effects on the beach. On its January 6 agenda, the Board will be hearing an ordinance that prohibits the use of sandbags.

We ask that the CRC consider that not all jurisdictions are in favor of permitting sandbags and consider rules that allow each location to choose for themselves which means and methods it chooses to protect its ocean shorelines.

Thanks very much-

Cliff

Cliff Ogburn
Town Manager
Town of Nags Head

Coastal Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON DAVIS
Director

NC COASTAL RESOURCES ADVISORY COUNCIL
February 9, 2016
Hilton Double Tree
Atlantic Beach, NC

4:15	**CALL TO ORDER** (Hatteras/Pamlico) • Roll Call • Approval of November Meeting Minutes	Debbie Smith
4:25	**Proposed Amendments to 7H .0308 Temp. Erosion Control Structures** (Attached)	Mike Lopazanski
5:10	**Old/New Business**	Debbie Smith
5:15	**Adjourn**	

Next Meeting: May 10-11, 2016; Manteo

January 20, 2016

MEMORANDUM

TO: Coastal Resources Advisory Council

FROM: Mike Lopazanski

SUBJECT: Proposed Amendments to 7H .0308 Temporary Erosion Control Structures

The Commission and Advisory Council has been discussing the rules and policies associated with the use of temporary erosion control structures (sandbags) for many of the 2015 CRC meetings. These discussions have focused around appropriate time limits for permits, provisions for removal when no longer necessary, and the allowance for structures to remain beyond permitted time limits when "covered and vegetated.". While recent legislative directives have the potential to expand the use of sandbags, Staff have proposed amendments to the sandbag rules to address the primary issues raised during discussions.

The attached draft rule language includes the legislative provisions discussed at the November 2015 meeting (highlighted) and new draft amendments (**bold**). The new draft amendments would be intended to:

- Remove the distinction between structures greater or less than 5,000 square feet, setting the time limit at five years for all structures that are not within an area with a planned beach nourishment or inlet relocation/stabilization project;
- Remove the "vegetated" requirement for sandbags structures to remain beyond their permitted time when covered by sand dunes;
- Require that only sandbags exposed above grade be removed at the expiration of the permit;
- Modify the "no longer necessary" provisions to require the removal of sandbags exposed above grade upon completion of a beach nourishment or inlet relocation/stabilization project.

Staff believe that this draft rule language addresses several of the recommendations raised during recent CRC and CRAC meetings. We look forward to discussing these proposed amendments with the CRAC at our meeting in Atlantic Beach.

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

(a) Ocean Shoreline Erosion Control Activities:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(2) Temporary Erosion Control Structures:

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

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

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

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

(E) ~~Temporary erosion control structures shall not extend more than 20 feet past the sides of the structure to be protected~~. The landward side of such temporary erosion control structures shall not be located more than 20 feet seaward of the structure to be protected or the right-of-way in the case of roads. If a building or road is found to be imminently threatened and at an increased risk of imminent damage due to site conditions such as a flat beach profile or accelerated erosion, temporary erosion control structures may be located

more than 20 feet seaward of the structure being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or their designee in accordance with Part (2)(A) of this Subparagraph.

(F) Temporary erosion control structures may remain in place for up to ~~**two years after the date of approval if they are protecting a building with a total floor area of 5000 sq. ft. or less and its associated septic system, or, for**~~ **up to** five years for a building ~~**with a total floor area of more than 5000 sq. ft.**~~ and its associated septic system. Temporary erosion control structures may remain in place for up to five years if they are protecting a bridge or a road. The termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits. The property owner shall be responsible for removal of **any portion of the temporary erosion control structure exposed above grade** ~~**the temporary structure**~~ within 30 days of the end of the allowable time period.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

15A NCAC 07H .1704 GENERAL CONDITIONS

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

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

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

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

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

(5) Structural work shall meet sound engineering practices.

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

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

(c) Development shall not jeopardize the use of the waters for navigation or for other public trust rights in public trust areas including estuarine waters.
(d) This permit shall not be applicable to proposed construction where the Department has determined, based on an initial review of the application, that notice and review pursuant to G.S. 113A-119 is necessary because there are unresolved questions concerning the proposed activity's impact on adjoining properties or on water quality, air quality, coastal wetlands, cultural or historic sites, wildlife, fisheries resources, or public trust rights.
(e) This permit does not eliminate the need to obtain any other state, local, or federal authorization.
(f) Development carried out under this permit must be consistent with all local requirements, CAMA rules, and local land use plans, storm hazard mitigation, and post-disaster recovery plans current at the time of authorization.

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

15A NCAC 07H .1705 SPECIFIC CONDITIONS

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

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

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

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

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

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

(6) Temporary erosion control structures may remain in place for up to **~~two years after the date of approval if they are protecting a building with a total floor area of 5,000 square feet or less and its associated septic system, or for up to~~** five years for a building **~~with a total floor area of more than 5,000 square feet~~** and its associated septic system. Temporary erosion control structures may remain in place for up to five years if they are protecting a bridge or a road. The

termination date of all permits for contiguous temporary erosion control structures on the same property shall be the same and shall be the latest termination date of any of the permits. The property owner shall be responsible for removal of **any portion of the temporary erosion control structure exposed above grade** ~~**the temporary structure**~~ within 30 days of the end of the allowable time period.

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

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

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

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

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

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

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

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

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

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

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

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

(14) An imminently threatened structure may be protected only once regardless of ownership, unless the threatened structure is located in a community that is actively pursuing a beach nourishment project, or in an Inlet Hazard Area and in a community that is actively pursuing an inlet relocation or stabilization project in accordance with Subparagraph (7). Existing temporary erosion control structures may be eligible for an additional eight year permit extension provided that the structure being protected is still imminently threatened, the temporary erosion control structure is in compliance with requirements of this Subparagraph and the community in which it is located is

actively pursuing a beach nourishment, an inlet relocation or stabilization project in accordance with Subparagraph (7) of this Paragraph. In the case of a building, a temporary erosion control structure may be extended, or new segments constructed, if additional areas of the building become imminently threatened. Where temporary structures are installed or extended incrementally, the time period for removal under Subparagraph (6) or (7) shall begin at the time the ~~initial~~ most recent erosion control structure is installed. For the purpose of this Rule:

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

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

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

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

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

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

(3) Fill material used in conjunction with emergency work for storm or erosion control in the Estuarine Shoreline, Estuarine Waters and Public Trust AECs shall be obtained from an upland source.

(c) Protection, Rehabilitation, or Temporary Relocation of Public Facilities or Transportation Corridors.

(1) Work permitted by this general permit shall be subject to the following limitations:

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

(B) the erosion control structure shall be located no more than 20 feet waterward of the imminently threatened structure or the right-of-way in the case of roads. If a public facility or transportation corridor is found to be imminently threatened and at increased risk of imminent damage due to site conditions such as a flat shore profile or accelerated erosion, temporary erosion control structures may be located more than 20 feet seaward of the facility or corridor being protected. In cases of increased risk of imminent damage, the location of the temporary erosion control structures shall be determined by the Director of the Division of Coastal Management or designee in accordance with Subparagraph (a)(1) of this Rule. Temporary erosion control structures may be used to protect properties that are experiencing erosion when there are no imminently threatened structures on the property if an adjacent property has an existing temporary erosion control structure that is in compliance with the Commission's rules. Temporary erosion control structures used to protect property without imminently threatened structures shall be sited to align with and be no further oceanward than the most landward adjacent temporary erosion control structure;

(C) any fill materials used in conjunction with emergency work for storm or erosion control shall be obtained from an upland source except that dredging for fill material to protect public facilities or transportation corridors shall be considered in accordance with standards in 15A NCAC ~~7H .0208;~~ 7H .0208; and

(D) all fill materials or structures associated with temporary relocations which are located within Coastal Wetlands, Estuarine Water, or Public Trust AECs shall be removed after the emergency event has ended and the area restored to pre-disturbed conditions.

(2) This permit authorizes only the immediate protection or temporary rehabilitation or relocation of existing public facilities. Long-term stabilization or relocation of public facilities shall be consistent with local governments' post-disaster recovery plans and policies which are part of their Land Use Plans.

History Note: Authority G.S. 113-229(cl); 113A-107(a),(b); 113A-113(b); 113A-115.1; 113A-118.1;
Eff. November 1, 1985;
Amended Eff. April 1, 1999; February 1, 1996; June 1, 1995;
Temporary Amendment Eff. July 3, 2000; May 22, 2000;
Amended Eff. May 1, 2013; May 1, 2010; August 1, 2002.Temporary Amendment Eff. July 3, 2000; May 22, 2000;
Temporary Amendment Eff. December 31, 2015.

NC Coastal Resources Advisory Council
November 17, 2015
Hilton Double Tree, Atlantic Beach, NC
Meeting Summary

Attendance

Debbie Smith (Chair)	Rudi Rudolph (Vice Chair)
John Brodman	Robert Outten
Jett Ferebee	Dave Weaver
David Moye	Kris Noble
Frank Rush	Lee Wynns
Beth Midgett	Mike Moore
Bobby Outten	

Call to Order

Debbie Smith called the meeting to order with 13 members in attendance.

Minutes were approved unanimously.

Sandbags

Staff presented the history of sandbags in North Carolina and the current regulations. Staff also presented a Legislative update regarding House Bill 97. Staff concluded by requesting the CRAC to brainstorm sandbag rules in general.

The Council began discussing sandbags, several key points of discussion included:

- Sandbag time limits
- Covered vs. uncovered
- Definition of temporary
- Fees/Bonds

Debbie Smith explained that more time is needed to discuss these issues and requested to table sandbag discussions until the next council meeting.

Farming/Water Management

Jett Ferebbee requested the council to discuss the issue of water management and flooding issues pertaining to farming. It was discussed that the US Fish and Wildlife Service Wildlife Refuges were causing water to back up and flood adjacent farm land in the area. Staff explained that a working group would be put together to study this issue in more detail.

Adjourn

The council concluded the discussion agreeing to continue discussing the future of sandbags use in North Carolina and with no further business the Council adjourned and joined the CRC meeting.