NC COASTAL RESOURCES COMMISSION
February 27-28, 2019
The History Place
Morehead City, NC

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

Wednesday, February 27th

10:00 COASTAL RESOURCES ADVISORY COUNCIL MEETING

12:00 LUNCH

1:15 COMMISSION CALL TO ORDER* — Renee Cahoon, Chair
- Roll Call
- Chair's Comments

1:30 VARIANCES
- Lampley - *(CRC-VR-18-05)*, Perquimans County, 30' buffer — Lynn Mathis, Christine Goebel, Esq., Charles Evans, Esq.
- Hatch - *(CRC-VR-19-01)*, Town of Duck, oceanfront setback — Ron Renaldi, Christine Goebel, Esq., Pro se.

3:00 BREAK

3:15 COMMISSION & INTERAGENCY MATTERS
- Coastal Habitat Protection Plan — Jimmy Johnson, DEQ
- Science Panel Overview and Membership *(CRC-19-01)* — Mike Lopazanski
- Inland Waters Boundary and CRC Jurisdictional Areas – Possible Changes — Gordon Myers, Exec. Director, NC Wildlife Resources Commission

4:30 LEGAL UPDATES — Mary Lucasse
- Discussion of "Unnecessary Hardship" in Variance Criteria *(CRC-19-02)*
- Consideration of Request to Delete The Riggings Variance Reporting Condition *(CRC-19-03)*
- Update on Litigation of Interest to the Commission *(CRC-19-11)*

5:00 RECESS

Thursday, February 28th

8:30 COMMISSION CALL TO ORDER* — Renee Cahoon, Chair
- Roll Call
- Chair's Comments
- Approval of November 27-29, 2018 Meeting Minutes
- Executive Secretary's Report — Braxton Davis
- CRAC Report — Greg "rudi" Rudolph

9:00 COASTAL RESILIENCE INITIATIVES
- Division of Coastal Management Resilience Initiatives — Tancred Miller, Christian Kamrath
- National Climate Assessment – Overview — Doug Marcy, NOAA

10:30 BREAK

10:45 BEACH AND INLET MANAGEMENT

- Town of Wrightsville Beach Static Vegetation Line Exception Reauthorization *(CRC-19-04)* — Ken Richardson
- Inlet Hazard Areas – Consideration of Final Maps Approval and Use Standards *(CRC-19-05)* — Ken Richardson

11:45 PUBLIC INPUT AND COMMENT — Renee Cahoon, Chair

12:00 LUNCH

1:15 PUBLIC HEARING — Renee Cahoon, Chair

- 15A NCAC 7J .0409 Civil Penalties
- 15A NCAC 7H .2700 Marsh Sills General Permit

1:30 ACTION ITEMS

- Consideration of Final Adoption of Temporary Rule – 15A NCAC 7H .2700 General Permit for Construction of Riprap Sills for Wetland Enhancement In Estuarine and Public Trust Waters — Daniel Govoni
- Consideration of Fiscal Analysis Approval of Unvegetated Beach Designation – Surf City & Measurement Line Delineation *(CRC-19-06)* — Daniel Govoni / Ken Richardson
- Consideration of Fiscal Analysis Approval of Erosion Rates and Final Erosion Rate Report Approval *(CRC-19-07)* — Ken Richardson

2:15 CRC RULE DEVELOPMENT

- NC Shellfish Leasing Program — Jacob Boyd, DMF
- Amendments to 15A NCAC 7K Exemptions – Shellfish Leases *(CRC-19-08)* — Jonathan Howell

3:30 BREAK

3:45 CRC RULE DEVELOPMENT

- Major Permit Renewals *(CRC-19-12)* — Courtney Spears
- Amendments to 15A NCAC 7H .1900 Temporary Structures General Permit *(CRC-19-09)* — Kevin Hart

4:45 OLD/NEW BUSINESS — Renee Cahoon, Chair

5:00 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; some items may be moved from their indicated times.***

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

WILLIAM F. LANE
General Counsel

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, DEQ Assistant General Counsel

DATE: February 12, 2019 (for the February 27-28, 2019 CRC Meeting)

RE: **Variance Request by Joseph H. and Vicki S. Hatch (CRC-VR-18-05)**

Petitioners Thomas S. and Judith A. Lampley ("Petitioners") own property at 108 Virginia Court (the "Site") in Hertford, North Carolina. The property is located within the Commission's Public Trust Shoreline sub-category of the Coastal Shorelines Area of Environmental Concern ("AEC").

After having received CAMA permits for the bulkhead in 2007 and for the docking facility in 2017, DCM discovered an unauthorized paver patio and fire pit within the Commission's 30' Buffer, and initiated enforcement proceedings. Petitioners asked Director Davis to reconsider the enforcement and met with Director Davis and Representative Steinberg to discuss options in moving forward. Petitioners ultimately chose to proceed with the variance process, seeking both a procedural variance from the regular enforcement process as well as a variance from the 30' Buffer in order to allow the patio and fire pit to remain.

In July 2018, Petitioners applied for a CAMA Minor Permit in order to keep the patio and fire pit, and received the expected denial on July 30, 2018. On August 8, 2018, Petitioners, through counsel, filed a variance request seeking both the procedural variance and the substantive variance in order to allow the existing patio and fire pit to remain. Petitioners have since received professional reports included in the stipulated exhibits, and revised their written positions in January of 2019.

The following additional information is attached to this memorandum:

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

cc(w/enc.): Charles Evans, Esq., Petitioners' counsel, electronically
Mary Lucasse, Special Deputy AG and CRC Counsel, electronically

RELEVANT STATUTES OR RULES **APPENDIX 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:

(1) All development projects, proposals, and designs shall preserve and not weaken or eliminate natural barriers to erosion including peat marshland, resistant clay shorelines, and cypress gum protective fringe areas adjacent to vulnerable shorelines.

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

(3) All development projects, proposals, and designs shall comply with the following mandatory standards of the North Carolina Sedimentation Pollution Control Act of 1973:

(A) All development projects, proposals, and designs shall provide for a buffer zone along the margin of the estuarine water which is sufficient to confine visible siltation within 25 percent of the buffer zone nearest the land disturbing development.

(B) No development project proposal or design shall permit an angle for graded slopes or fill which is greater than an angle which can be retained by vegetative cover or other erosion control devices or structures.

(C) All development projects, proposals, and designs which involve uncovering more than one acre of land shall plant a ground cover sufficient to restrain erosion within 30 working days of completion of the grading; provided that this shall not apply to clearing land for the purpose of forming a reservoir later to be inundated.

(4) Development shall not have a significant adverse impact on estuarine and ocean resources. Significant adverse impacts include development that would directly or indirectly impair water quality standards, increase shoreline erosion, alter coastal wetlands or Submerged Aquatic Vegetation (SAV), deposit spoils waterward of normal water level or normal high water, or cause degradation of shellfish beds.

(5) Development shall not interfere with existing public rights of access to, or use of, navigable waters or public resources.

(6) No public facility shall be permitted if such a facility is likely to require public expenditures for maintenance and continued use, unless it can be shown that the public purpose served by the facility outweighs the required public expenditures for construction, maintenance, and continued use. For the purpose of this standard, "public facility" means a project that is paid for in any part by public funds.

(7) Development shall not cause irreversible damage to valuable, historic architectural or archaeological resources as documented by the local historic commission or the North Carolina Department of Cultural Resources.

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

(9) Within the AECs for shorelines contiguous to waters classified as Outstanding Resource Waters by the EMC, no CAMA permit shall be approved for any project which would be inconsistent with applicable use standards adopted by the CRC, EMC or MFC for estuarine waters, public trust areas, or coastal wetlands. For development activities not covered by specific use standards, no permit shall be issued if the activity would, based on site-specific information, degrade the water quality or outstanding resource values.

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

(A) Water-dependent uses as described in Rule 07H .0208(a)(1) of this Section;
(B) Pile-supported signs (in accordance with local regulations);
(C) Post- or pile-supported fences;
(D) Elevated, slatted, wooden boardwalks exclusively for pedestrian use and six feet in width or less. The boardwalk may be greater than six feet in width if it is to serve a public use or need;
(E) Crab Shedders, if uncovered with elevated trays and no associated impervious surfaces except those necessary to protect the pump;
(F) Decks/Observation Decks limited to slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet;
(G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase stormwater runoff to adjacent estuarine and public trust waters;
(H) Development over existing impervious surfaces, provided that the existing impervious surface is not increased and the applicant designs the project to comply with the intent of the rules to the maximum extent feasible;

(I) Where application of the buffer requirement would preclude placement of a residential structure with a footprint of 1,200 square feet or less on lots, parcels and tracts platted prior to June 1, 1999, development may be permitted within the buffer as required in Subparagraph (d)(10) of this Rule, providing the following criteria are met:

(i) Development shall minimize the impacts to the buffer and reduce runoff by limiting land disturbance to only so much as is necessary to construct and provide access to the residence and to allow installation or connection of utilities such as water and sewer; and

(ii) The residential structure development shall be located a distance landward of the normal high water or normal water level equal to 20 percent of the greatest depth of the lot. Existing structures that encroach into the applicable buffer area may be replaced or repaired consistent with the criteria set out in Rules .0201 and .0211 in Subchapter 07J of this Chapter; and

(J) Where application of the buffer requirement set out in 15A NCAC 07H .0209(d)(10) would preclude placement of a residential structure on an undeveloped lot platted prior to June 1, 1999 that are 5,000 square feet or less that does not require an on-site septic system, or on an undeveloped lot that is 7,500 square feet or less that requires an on-site septic system, development may be permitted within the buffer if all the following criteria are met:

(i) The lot on which the proposed residential structure is to be located, is located between:

(I) Two existing waterfront residential structures, both of which are within 100 feet of the center of the lot and at least one of which encroaches into the buffer; or

(II) An existing waterfront residential structure that encroaches into the buffer and a road, canal, or other open body of water, both of which are within 100 feet of the center of the lot;

(ii) Development of the lot shall minimize the impacts to the buffer and reduce runoff by limiting land disturbance to only so much as is necessary to construct and provide access to the residence and to allow installation or connection of utilities;

(iii) Placement of the residential structure and pervious decking may be aligned no further into the buffer than the existing residential structures and existing pervious decking on adjoining lots;

(iv) The first one and one-half inches of rainfall from all impervious surfaces on the lot shall be collected and contained on-site in accordance with the design standards for stormwater management for coastal counties as specified in 15A NCAC 02H .1005. The stormwater management system shall be designed by an individual who meets applicable State occupational licensing requirements for the type of system proposed and approved during the permit application process. If the residential structure encroaches into the buffer, then no other impervious surfaces will be allowed within the buffer; and

(v) The lots must not be adjacent to waters designated as approved or conditionally approved shellfish waters by the Shellfish Sanitation Section of the Division of Environmental Health of the Department of Environment and Natural Resources.

STIPULATED FACTS **ATTACHMENT B**

1. Petitioners Thomas S. Lampley and his wife Judith A. Lampley ("Petitioners") own property at 108 Virginia Court, Hertford, Perquimans County, North Carolina (the "Site"). Petitioner is represented on this variance by Charles D. Evans, Esq. of Kellogg and Evans, PA.

2. Petitioner obtained the Site, also known as Lot 19, Section EE, Bosher's Point, Phase 3 of Albemarle Plantation by deed dated August 17, 2007 and recorded in Book 333, Page 641 of the Perquimans County Public Registry, a copy of which is attached.

3. The Site is adjacent to Yeopim Creek, which is designated as "inland waters" by the NC Wildlife Resources Commission", is classified as SC waters by the Environmental Management Commission, and is closed to the harvest of shellfish by the Marine Fisheries Commission.

4. The Site is within the Public Trust Shorelines sub-category of the Coastal Shorelines Area of Environmental Concern ("AEC"), which includes uplands within 30' landward of normal water level.

5. After acquiring the property in 2007, Petitioners were granted CAMA General Permit #49979A on December 3, 2007 authorizing the development of a bulkhead along the shoreline. A copy of this CAMA GP is attached. The bulkhead was built several months later at the approximate normal water line.

6. Construction on the current residence began in October of 2015 and was completed in November of 2016. No CAMA Minor Permit was needed as all proposed development was landward of the 30' wide Public Trust AEC. Petitioners moved into the house in November of 2016. A copy of Petitioners' house plans is attached as a stipulated exhibit.

7. In April 2017, Petitioners developed an approximately 450 square foot paver brick patio and fire pit along a portion of their bulkhead adjacent to Yeopim Creek, a sketch of which is attached in the Stipulated Exhibits. The pavers used to construct the patio and fire pit were not pervious pavers. Petitioners did not contact DCM Staff to discuss this proposed development and whether it required a CAMA permit. Petitioners used three separate contractors for the construction of the patio and fire pit; Lazy Weekends Yard Care Services, LLC (NC Landscaping Contractors License #CL1002); Crossroads Fuel Service, Inc. (NC License #20920); and KCI Associates of NC (NC License #0267644.) Petitioners were not aware of any requirement to obtain a permit. A copy of Petitioners' Affidavit is attached as a stipulated exhibit.

8. In September 2017, Petitioner applied to DCM for a CAMA General Permit to construct a pier, platform, boathouse with lift and a PWC lift. CAMA General Permit #68701A was issued on September 12, 2017 for the pier facility. As part of the permit issuance, DCM Field Representative Lynn Mathis visited the Site on September 12, 2017 and after issuing the permit, observed the

unpermitted patio and fire pit within the 30' buffer area of the Public Trust Shorelines sub-category of the Coastal Shorelines AEC. Ms. Mathis advised Petitioners that it constituted "development," which is not allowed within the 30-foot wide Public Trust Shorelines AEC, as set out in 15A NCAC 7H.0209 (d) (10).

9. On September 25, 2017, DCM issued a Notice of Violation #17-15A for the unauthorized development of the patio and fire pit, a copy of which is attached. With this NOV, DCM also included a restoration plan, directing the Petitioners to remove the patio and fire pit which was within the 30' Buffer area.

10. On November 9, 2017, DCM issued a Notice of Continuing Violation #17-15A, which noted that DCM looked into Petitioners' request to be able to keep the development in place while seeking a variance or an appeal and verified that such variances and appeals may be submitted upon the denial of a permit and not subsequent to the undertaking of unauthorized development absent restoration. A copy of the CNOV is attached.

11. On December 15, 2017, Petitioners wrote to DCM Director Braxton Davis, requesting that he reconsider the issuance of NOV #17-15A and CNOV #17-15A and the associated restoration plan. A copy of this letter is attached.

12. On March 5, 2018, DCM Director Braxton Davis responded to Petitioners' letter of December 15, 2017. He notified Petitioners that he did not find sufficient ground to overturn the NOV or change the restoration plan. He explained that paver patios and other hardscaping are "development" which is not allowed within the 30' Buffer. A copy of this letter is attached.

13. On May 17, 2018, Petitioners sent a letter to Mr. Jennings, requesting that they wished to keep the patio and fire pit in place and also seeking a hearing to dispute the violation. A copy of this letter is attached and Petitioners copied the letter to Director Davis and then-Representative Bob Steinburg (now a state senator).

14. Petitioners contacted Representative Bob Steinberg about their NOVs, and asked Representative Steinberg to meet with them and DCM staff. On April 5, 2018, Petitioners and Representative Steinberg met with DCM District Manager Frank Jennings in the DCM Elizabeth City office. At this meeting, DCM explained the CAMA permit process and possible routes forward. A second meeting was held at the DCM Washington Regional office on May 25, 2018 with Petitioners, Representative Steinberg and DCM Director Braxton Davis. At or following the meeting, Director Davis indicated that Petitioners could (1) remove the patio and fire pit before seeking a permit and variance, (2) leave the development and seek a permit along with variances for both not undertaking restoration before applying for a permit/seeking a variance, as well as the buffer variance, or (3) to seek a declaratory ruling.

15. Following the meetings with DCM, Petitioners indicated that they wished to leave the development in place while they would apply for and get a denial for a CAMA permit, then seek

a variance from both the Commission's rules requiring that: a) restoration take place before a CAMA permit application is accepted and processed, a permit is denied, and a variance is sought; and b) non water-dependent structures be set back at least 30 feet from the normal water level.

16. DCM also advised Petitioners that they could seek a declaratory ruling from the Commission arguing that, while the Division does not agree, the installation of paver patios and paver fire pits was not "development' as defined by G.S. 113A-103 (5)a., but instead was "landscaping" which is generally determined to not be "development" by DCM. Petitioners have not decided to pursue a declaratory ruling.

17. On July 24, 2018, Petitioners filed their CAMA Minor Permit application with the DCM Elizabeth City office, seeking authorization for the paver patio and fire pit which had been previously constructed by Petitioners. A copy of the CAMA Minor Permit application and associated materials is attached, as well as the invoices for the materials used to develop the patio and fire pit.

18. As part of the CAMA Minor Permit process, notice of the development was sent to the adjacent riparian owners, the Wilcoxes and the Cassidys. Copies of these notices are attached, and both neighbors indicated they had no objections to the development of the patio and fire pit.

19. On July 30, 2018, DCM denied Petitioners' CAMA Minor Permit application as it was inconsistent with several provisions, including the Commission's rule requiring restoration be completed before a permit, permit denial and variance is sought from the Commission, and from the provisions requiring that development such as the paver patio and fire pit be set back further than the 30' buffer of the Public Trust Shoreline AEC per 15 NCAC 7H.0209 (d)(10). A copy of the denial letter is attached.

20. Petitioner was further advised in the denial letter that at that time, the paver brick patio and fire pit did not fall within the exception set forth in 15 NCAC 7H.0209 (d)(10)(G) which allows "Grading, excavation and landscaping with no wetland fill …" within the 30' buffer.

21. On August 8, 2018, Petitioner through counsel, Charles D. Evans, Esq. submitted a Variance Petition, seeking a variance from the Commission, firstly to consider and to confirm allowing the variance to proceed without first requiring the restoration of the affected area as required by 15A NCAC 7J.0204(e), and then secondly to seek a variance from the 30' Buffer in order to allow the paver patio and fire pit to remain.

22. Notice to the Adjacent riparian property owners about this Variance Request was sent on August 8, 2018. Copies of the notice and the certified mailing information are attached as stipulated exhibits. If any comments are received by the time of the commission meeting, they will be shared with the Commission prior to or at that time.

23. For purposes of this Variance Request, Petitioner stipulates that the development and construction of the paver brick patio and fire pit on Petitioner's property at 108 Virginia Court, adjacent to Yeopim Creek in Perquimans County is inconsistent with the Coastal Area Management Act (CAMA) and the Commission's rules noted in the July 30, 2018 denial letter.

24. Petitioners have attached affidavits which describe their choice in purchasing this Site and that they were unaware that a CAMA permit was needed for construction of the patio and fire pit. Copies of these affidavits are attached.

25. Petitioners engaged two engineering firms to provide engineering studies to support Petitioners' assertion that the construction of the paver patio and fire pit allows sufficient drainage and prevents any runoff into the adjacent waterway, Yeopim Creek.

26. On October 9, 2018, Hal Goodman, P.E., SECB submitted a sealed opinion letter regarding the paver patio and fire pit, following his inspection of the Site, a copy of which is attached. He concludes that "there will be no stormwater runoff into Yeopim Creek."

27. Samir Dumpor, P.E., a Regional Supervisor with DEQ's Division of Energy, Mineral, and Land Resources ("DEMLR") reviewed the written description of how the patio and fire pit were constructed, as well as the October 9, 2018 statement of Hal Goodman, P.E., SECB. In correspondence with DCM on October 30, 2018, He noted that while the design will infiltrate some stormwater, it was not designed pursuant to the DEQ Stormwater Design Manual's chapter on Permeable Pavement, a copy of which is attached as a stipulated exhibit. In the manual, only the infiltrating permeable pavement that is designed per the MDC (Minimum Design Criteria) may be considered as 100% pervious. In this particular case, the MDC 1, 2 and 5, as listed below, are not met.

- MDC 1 – site-specific soil investigation - not provided;
- MDC 2 – The minimum separation between the lowest point of the subgrade surface and the Seasonal High Water table (1 or 2 feet, depend on type of system used) - not provided;
- MDC 5 - Washed aggregate base materials shall be used. "Crush n' run" does not meet that criteria."

For these reasons, Mr. Dumpor believes that the patio and fire pit do not meet the requirements of 15A NCAC 2H .1055.

28. Under a subsequent sealed opinion letter, submitted January 14, 2019, to the Coastal Resources Commission, Hal Goodman, P.E., SECB, supplemented his initial opinion letter of October 9, 2018, in response to the comments received from NCDENR and DEQ stating the following:

- MDC 1 – GET Solutions has been scheduled to come to the site and conduct a subsurface investigation to determine the infiltration rate for the on-site soils;
- MDC 2 – The seasonal high water table has been measured to be approximately four feet (4') below the patio surface;

- MDC 5 - The four inch (4") crushed stone base layer was placed and not compacted so it will remain free draining and will not impede the infiltration of stormwater or cause any runoff.

In addition, the finished grade of the patio slopes away from the bulkhead and Yeopim Creek to a low point on the pavers so that any potential runoff that might not immediately drain through the gaps in the pavers is temporarily contained on the low area of the patio as it infiltrates through the gaps in the pavers, the non-compacted crushed stone base and into the pervious subgrade soil. A copy of the sealed opinion letter is included in the Stipulated Exhibits.

29. By sealed report dated January 14, 2019, signed by Gerald W. Stalls, Jr., P.E., GET Solutions, Inc. concludes the following based upon GET's shallow subsurface exploration and hydraulic conductivity testing conducted in and around the site of the paver patio and fire pit on January 7, 2019:

a. Testing indicated that the soil had a Unified Soil Classification System (USCS) of silty sands and sand mixtures with some clay;

b. Permeability testing indicated a Ksat Value of 2.1977 inches of water drainage per hour and a Ksat Classification of "Moderately High," meaning the soil is fairly well-drained; and

c. The report did not identify any restrictive clay layer that would cause water not to drain properly.

A copy of the sealed report is included in the Stipulated Exhibits.

30. Samir Dumpor, P.E. of DEMLR reviewed the additional reports of Hal Goodman dated January 14, 2019 and Gerald Stalls dated January 14, 2019, which were submitted to DCM. Based on his review, he commented to DCM on January 28, 2019, that "Based on the report by GET Solutions, it appears that MDC 1 and MDC 2 requirements are met, however; MDC 5 comment remains the same – Washed aggregate base materials shall be used. "Crush n' run" does not meet that criteria." Mr. Dumpor added as a reminder that "only the infiltrating permeable pavement that is designed per the MDC (Minimum Design Criteria) may be considered as 100% pervious."

Stipulated Exhibits:

1. Deed to property at Book 333, Page 641
2. CAMA General Permit #49979A authorizing the bulkhead
3. Plans for Petitioners' residence and building permit application
4. CAMA General Permit #68701A authorizing the pier and associated structures
5. September 25, 2017 NOV #17-15A with restoration plan
6. November 9, 2017 CNOV from DCM
7. December 15, 2017 letter from Petitioners to Director Davis
8. March 5, 2018 letter from Director Davis to Petitioners
9. May 17, 2018 letter from Petitioners to District Manager Jennings
10. July 24, 2018 CAMA Minor Permit Application with associated drawings and invoice for work completed
11. Notice to adjacent riparian owners of permit application
12. July 30, 2018 DCM Denial Letter
13. Notice to adjacent riparian owners of variance petition
14. Affidavits of Petitioners
15. Goodman opinion letter dated October 9, 2018
16. DEQ Stormwater Design Manual's Permeable Pavement chapter
17. Goodman opinion letter dated January 14, 2019
18. Stalls opinion letter dated January 14, 2019
19. PowerPoint with aerial and ground level photos of Site and surrounding area

PETITIONERS' and STAFF'S POSITIONS **ATTACHMENT C**

Initial Procedural Variance Request-

Petitioners seek a procedural variance from the Commission's rule at 15A NCAC 7J .0204(e) which requires the restoration of the affected area before the Commission proceed with the substantive variance. Before proceeding with processing a CAMA permit application and denial so Petitioners could then seek a variance, DCM staff and counsel formally consulted with CRC Counsel. CRC Counsel noted that there is some discretion in how DCM can respond to someone who undertakes development in an AEC without first obtaining a CAMA permit, which is a prerequisite for a variance. 15A NCAC 7H .0204(e) authorizes DCM to proceed with enforcement and to require restoration "[i]f the violation substantially altered the proposed project site, and restoration is deemed necessary" so that DCM staff can assess the impacts before concluding enforcement and can suspend the application during restoration and enforcement. However, in situations where DCM staff can assess impacts without first requiring restoration, DCM could issue a permit denial allowing the applicant to petition for a variance from both the rules describing the usual restoration and enforcement process, and from the substantive variance. In this case, Staff believes it can fairly assess impacts of the unpermitted development without restoration. Accordingly, Staff do not object to the Commission deciding to proceed with the substantive variance request before DCM requires the removal of the patio and fire pit and the restoration of the affected area. DCM also acknowledges that if the variance were granted, Petitioners would not have to pay for both the removal and the redevelopment of the features.

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.

Petitioners' Position: Yes.

Without the patio and fire pit, Petitioners would be unable to have reasonable enjoyment of their property. When they purchased the property in 2007, they specifically selected this lot because of the expansive view it has from this particular point of land. From the beginning, they planned a patio and fire pit at this exact location so as to be able to congregate around it and enjoy the sights and sounds of the water and its proximity. The patio and fire pit also were positioned at this location so as not to obstruct views from the house. From the patio and fire pit area, the Petitioners have a 270-degree view of the waterway and are able to see both the sunrise and the sunset. Not many residential lots, if any, at Albemarle Plantation have this unique feature, which was a major reason for Petitioners' purchasing the lot they did. This amenity provides the most commanding view on the property and is one of the most notable and attractive aspects of their home. Denying this variance request will significantly impact the value of this uniquely structured property and greatly negate one of the primary reasons the Petitioners purchased the property in the first place.

Staff's Position: No.

Staff does not agree that strict application of the Public Trust Shoreline 30' Buffer rule will cause Petitioner unnecessary hardships. While Petitioners selected this lot based on the expansive views from the proposed house and patio locations, these expectations did not take into account the long-standing 30' Buffer rule (adopted by this Commission in 1999). Before purchasing the lot, siting the house, patio and fire pit, and/or before construction of the patio and fire pit, Petitioners should have researched land use and other regulations or restrictions that applied to the lot. If they had researched applicable regualtions, they could have opted not to buy this lot, or they could have potentially shifted the house location or the patio and fire pit locations so as to avoid the 30' Buffer area. The buffer rule applies to all non-oceanfront coastal shorelines in North Carolina and does not appear to cause any additional or unusual hardship in this case.

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 hardship of Petitioners not being able to enjoy their property to its fullest is being created because it is waterfront property. If it were not waterfront property, they would be able to enjoy fully their property with a patio and fire pit without requiring permission from the State to build same.

Staff's Position: No.

Staff cannot identify any peculiar location, size, topography, or other site conditions that cause a hardship for this property. Petitioners argue that their waterfront location causes the hardship, but the Division contends that this variance criterion requires peculiar conditions in comparison with other waterfront properties subject to Coastal Area Management Act regulations along the thousands of miles of coastal and oceanfront shorelines in North Carolina.

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

Petitioner's Position: No.

This hardship was not created by Petitioners. They did not build or develop anything that changes this location and the hardship of not being able to have this patio and fire pit was not created by them. The patio and fire pit is an entirely reasonable and foreseeable use to be made of the property. The hardship is created by strict application of the current rules and regulations.

Staff's Position: Yes.

Petitioners took title to this property in 2007, eight years after the Commission's 30' Buffer rule was promulgated. Before buying the lot, Petitioners could have investigated what land-use and other regulations or restrictions would apply to the waterfront lot, limiting its development. In 2007, when Petitioner applied for and received a CAMA permit for a bulkhead, Petitioners could have discussed what limitations applied to development of the lot with the CAMA representative onsite. In 2010, when Petitioners had the lot surveyed, the surveyor had the "30' CAMA Setback" shown on the survey and Petitioners could have inquired about the 30' setback then (See Stipulated Exhibit # 10, part of their CAMA Minor Permit Application). In 2015, when the house was constructed, Petitioners could have asked what development restrictions applied to the waterfront lot. In the spring of 2017, when Petitioners constructed the patio and fire pit, they could have contacted local or CAMA officials to ask if a permit was needed for the project and if there were any development restrictions that would apply to their plan. There was a series of missed opportunities where Petitioners could ask questions of local and state officials about what development restrictions applied to their lot and redesigned accordingly. If Petitioners had made these inquiries as part of their due diligence before installing the patio and fire pit, they would have understood that the patio and fire place were not allowed within the established 30' Buffer. Staff contend that the Petitioners' stated lack of awareness of the 30' Buffer is not a reason to grant a variance.

The Commission's 30' Buffer Rule already allows an exception for the development of "slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet." Such a deck, coupled with a movable fire pit would offer a similar amenity within the buffer area on the lot without a variance. Staff also note that this is a large lot at three-quarters of an acre

(33,105 square feet), and affords Petitioners room outside the 30' Buffer to develop a similar-sized patio and fire pit.

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.

Contrary to harming the environment, Petitioners believe that this patio and fire pit have enhanced a safe, healthy, and pleasant environment in which to enjoy one of NC's waterways. Petitioner use of the patio and fire pit greatly extend the benefits they gain from being on the water and enjoying a unique environment, without causing any degradation or risk to health or safety – all key objectives of the NC EPA. (See § 113A-2. Purposes; § 113A-3. Declaration of State environmental policy; and 15A NCAC 01C.0101 Statement of Purpose, Policy, and Scope.)

Because of the way in which the patio and fire pit are constructed (to be permeable), no contamination of water, increase in run-off, impediments to drainage, erosion, or damage to wildlife will occur. In actuality, Petitioners have reduced the run-off of fertilizer, herbicides, and other contaminates from the chemically-treated lawn that existed prior to the installation of the pavers and fire pit. Furthermore, infiltration and permeability testing of the soil immediately surrounding the patio by geotechnical engineers (GET Solutions, Inc.) found that the rate of drainage for the soil upon which the patio was developed was "Moderately High."

Petitioners also believe that CAMA's interpretation of "landscaping" is too restrictive and severe. Patios and fire pits like the ones in question here are becoming ubiquitous and not atypical of landscaping projects overall. Because the Petitioners did no damage to the environment, land, and water, and meet the spirit, purpose, and intent of the law, this type of project should be included in the interpretation of "landscaping". Continued interpretation of "landscaping" to not allow environmentally friendly "softscaping" paver brick creates an unnecessary hardship. To do otherwise is an excessively narrow interpretation of the guidelines and does not support the primary intent of the law – to minimize harm to the NC waterways and allow for their enjoyment.

Staff's Position: No.

As an initial matter, Staff contend that Petitioners' arguments regarding the Division's definition of "landscaping," which is allowed by the Commission as an exception to the 30' Buffer rule, are inappropriate in the consideration of a variance. For reference, the landscaping exception to the 30' buffer rule cited by the Petitioners reads, in part (citation):

> *"(G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase stormwater runoff to adjacent estuarine and public trust waters."*

If a Petitioner contends that the Division is misinterpreting the Commission's rules, they may seek a Declaratory Ruling from the Commission under 15A NCAC 7J .0601 - .0603 or appeal the permit denial to the Office of Administrative Hearings in accordance with 15A NCAC 7J .0300 et seq.

As noted in the Stipulated Facts above, Petitioners were made aware that the declaratory ruling process was available to them (SF 16), but they opted to proceed with this variance process instead. The CAMA Permit Denial letter noted that what they proposed was not "landscaping" (SF 20), and Petitioners, as part of this variance process, have stipulated that "the development and construction of the paver brick patio and fire pit on Petitioner's property at 108 Virginia Court, adjacent to Yeopim Creek in Perquimans County is inconsistent with the Coastal Area Management Act (CAMA) and the Commission's rules noted in the July 30, 2018 denial letter." (SF 23) For these reasons, Staff recommend that the Commission disregard the arguments made by Petitioners related to the interpretation of "landscaping."

As to Petitioners' other arguments on this factor, Staff believe that the variance requested by Petitioners is not consistent with the spirit, purpose, and intent of the Commission's 30' Buffer rule.

The stated significance of the Commission's 30' Buffer rule includes limiting development on the shorelines which "serve as barriers against flood damage and control erosion between the estuary and the uplands." (15A NCAC 7H .0209(b)) The Commission's 30' Buffer rule is intended "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." The buffer reduces the development footprint along coastal shorelines, reduces impervious surfaces, restricts impacts to viewsheds, retains habitat value, and keeps structures set back a minimum distance from hazards associated with coastal storms, erosion, and flooding. While the Commission's rules include an exception for up to two hundred square feet of elevated, wood, slatted decking (15A NCAC 7H .0209(10)(F)), the overall size of the patio and firepit exceeds this allowance by 250 square feet, and pavers were used rather than wood decking.

Petitioners contend that the patio was designed and constructed to be permeable; that is, to allow rainwater to infiltrate sufficiently so as not to interfere with sheet flow across the property and/or

result in increased volumes or rates of stormwater discharges into the adjacent waterbody. If the patio is permeable, it may meet at least part of the spirit, purpose, and intent of the rule to reduce impervious surfaces in the buffer area. However, staff's review of the reports submitted by the Petitioners (Stipulated Exhibits 15, 17, 18) with assistance from the NC DEQ Division of Energy, Mineral, and Land Resource's (DEMLR) Mr. Dumpor, fail to resolve concerns about the permeable nature of the patio and fire pit. While no DEMLR or other state stormwater requirements apply to this patio, Staff requested that DEMLR review the design and materials to inform DCM's position on this variance. Petitioners used impervious pavers (as opposed to specially designed "pervious pavers") and laid these over a "crush n' run" (also known as crusher run and is comprised of pulverized stone and stone dust) foundation rather than over "washed aggregate base materials." For these reasons, according to Mr. Dumpor, the patio does not meet all design standards considered by DEMLR in evaluating permeable pavement for stormwater permitting (See 15A NCAC 02H .1055).

For these reasons, Staff believes that Petitioners' request fails to meet the spirit, purpose and intent of the 30' Buffer rule, and fails to protect public safety and welfare, specifically regarding the potential for reduced water quality and stormwater runoff. Finally, Staff believes that Petitioners' request for a 450 square foot patio and fire pit does not preserve substantial justice, where the area is more than double the existing exception in the Commission's rules allowing up to 250 square feet of wooden decking. Staff recommends, if the Commission approves this variance request, that the permit should be conditioned to allow only 200 square foot of patio area to better conform with the rule.

ATTACHMENT D:

PETITIONERS' VARIANCE REQUEST MATERIALS

(minus documents which are now stipulated exhibits in Attachment E)

KELLOGG AND EVANS, P.A.
ATTORNEYS AT LAW

CHARLES D. EVANS

MARTIN KELLOGG, JR.
1908-2001

P.O. BOX 189
MANTEO, NC 27954

DELIVERY ADDRESS:
201 ANANIAS DARE STREET
MANTEO, N.C. 27954

TELEPHONE: (252) 473-2171
FACSIMILE: (252) 473-1214

EMAIL ADDRESS:
charlese@kelloggandevans.com
janv@kelloggandevans.com
becky@kelloggandevans.com

August 8, 2018

To: Division of Coastal Management Director
400 Commerce Avenue
Morehead City, NC 28557
Attn: Angela Willis, Assistant to the Director
(transmitted via email only: angela.willis@ncdenr.gov)

Re: CAMA Variance Request Form
September 19-20, 2018 CRC Meeting

Dear Ms. Willis:

Attached with this letter please find the completed CAMA Variance Request Form, signed and dated by Charles D. Evans, as the Petitioner's Attorney. Also attached, please find the additional information required for submission with the said Form.

On behalf of the Petitioner, I am respectfully requesting that the enclosed Request Form and attachments and exhibits be considered at the CRC Meeting scheduled to be held on September 19 – 20, 2018 in Wilmington, NC.

After your review of the enclosed documents, if you determine that any supplemental materials are necessary, please let me know and I will provide them promptly. I greatly appreciate your continued assistance and guidance with this matter. Thank you for your acceptance of the enclosed Form on behalf of the Director of the Division of Coastal Management and for forwarding a copy to Christine A. Goebel, DEQ Assistant General Counsel.

Best regards,

Charles D. Evans

Charles D. Evans
CDE/rae
Attachments

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.:_____

PETITIONER'S NAME **Thomas S. Lampley and wife Judith A. Lampley**
COUNTY WHERE THE DEVELOPMENT IS PROPOSED **Perquimans**

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 of Variance Petition 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; DCM and Kellogg and Evans, PA to send notice of Variance Petition

✓ 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.

**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 D. Evans — August 8, 2018

Signature of Petitioner or Attorney — Date

Charles D. Evans
Printed Name of Petitioner or Attorney

charlese@kelloggandevans.com
Email address of Petitioner or Attorney

PO Box 189
Mailing Address

(252) 473-2171
Telephone Number of Petitioner or Attorney

Manteo — City
NC — State
27954 — Zip

(252) 473-1214
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

Variance Request

Application Number:

Name: Thomas S. Lampley and Judith A. Lampley

Location: 108 Virginia Court, Hertford, NC 27944
(Yeopim Creek – Perquimans County)
Albemarle Plantation

CAMA Variance Request

Petitioner's Responses to Four Variance Criteria:

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

Yes. Without the patio and fire pit, Petitioner would be unable to have reasonable enjoyment of Petitioner's property. When Petitioner purchased the property in 2007, Petitioner specifically selected this lot because of the expansive view it has from this particular point of land. From the beginning, Petitioner planned a patio and fire pit at this exact location so as to be able to congregate around it and enjoy the sights and sounds of the water and its proximity. The patio and fire pit also were positioned at this location so as not to obstruct views from the house. From the patio and fire pit area, Petitioner has a 270 degree view of the waterway and are able to see both the sunrise and the sunset. Not many residential lots, if any, at Albemarle Plantation have this unique feature, which was a major reason for Petitioner's purchasing the lot. This amenity provides the most commanding view on the property and is one of the most notable and attractive aspects of Petitioner's home. Denying this variance request will significantly impact the value of this uniquely structured property and greatly negate one of the primary reasons the petitioners purchased the property in the first place.

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

Yes. The hardship of Petitioner not being able to enjoy Petitioner's property to its fullest is being created because it is waterfront property. If it were not waterfront property, Petitioner would be able to enjoy fully the

property with a patio and fire pit without requiring permission from the State to build same. The existing definitions and their interpretation and application create a hardship as to the desired use of Petitioner's property as Petitioner proposes in order to make the best use of the location and surroundings. Continued interpretation of "landscaping" to not allow environmentally friendly "softscaping" paver bricks creates an unnecessary hardship.

(c) Do the hardships result from actions taken by the Petitioner's?

No. This hardship was not created by Petitioner's. Petitioner did not build or develop anything that changes this location and the hardship of not being able to have this patio and fire pit was not created by Petitioner. The development that was added is a natural and desired use of their property and the hardships result from interpretation and application of the existing rules.

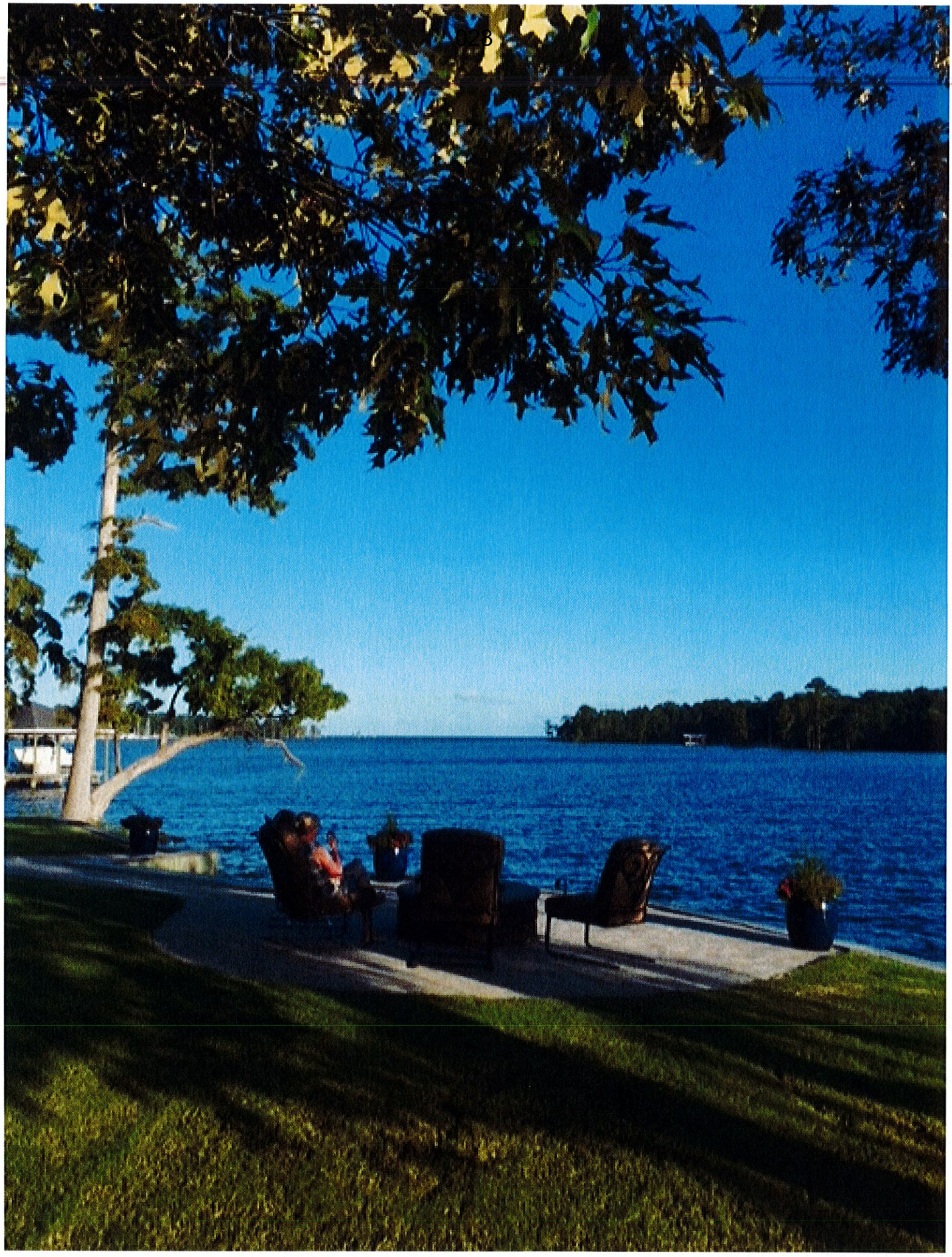
(d) Will the variance requested by the Petitioner's (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice?

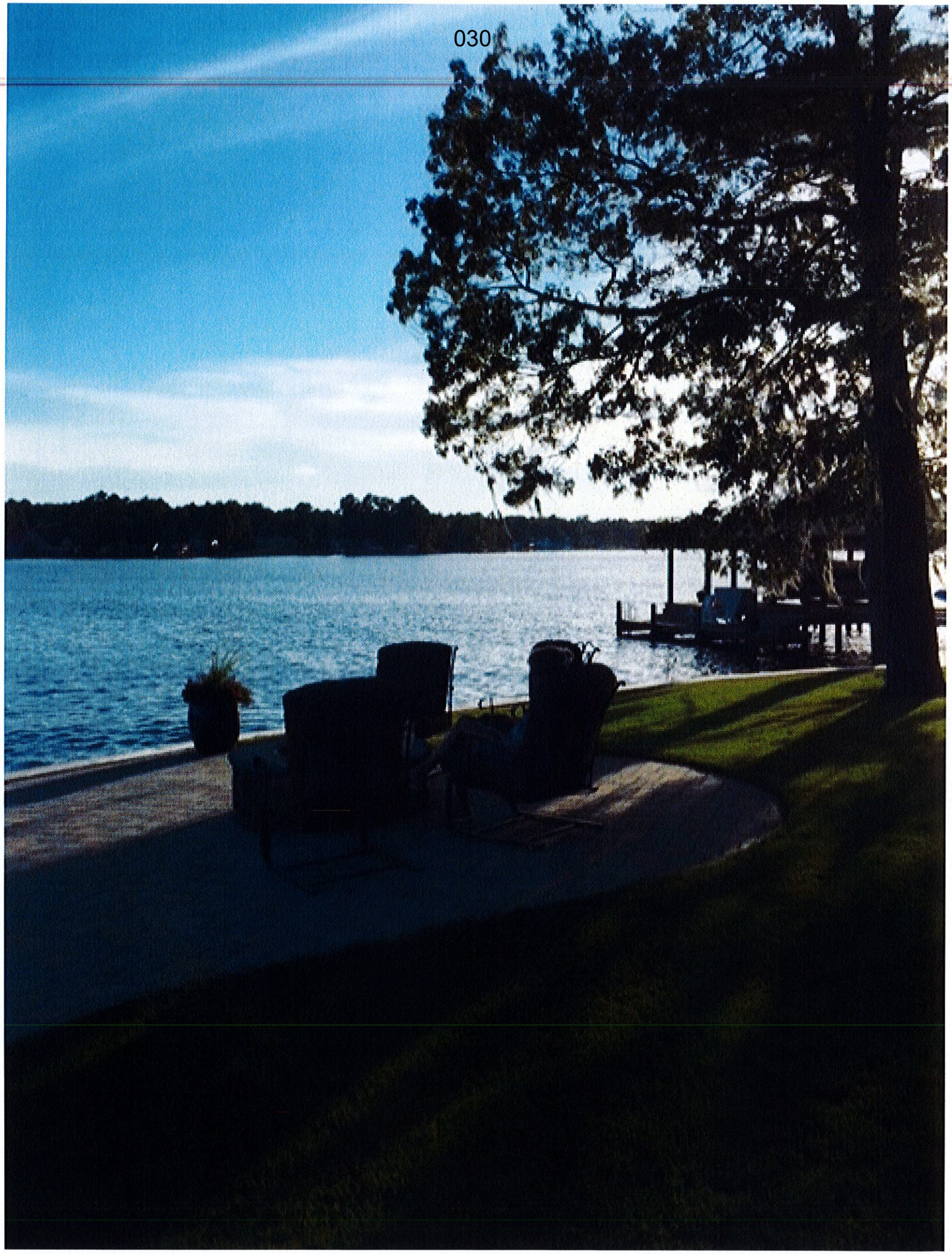
Yes. Contrary to harming the environment, Petitioner believes that this patio and fire pit have enhanced a safe, healthy, and pleasant environment in which to enjoy one of North Carolina's waterways. Petitioner's use of the patio and fire pit greatly extend the benefits Petitioner gains from being on the water and enjoying a unique environment, without causing any degradation or risk to health or safety - all key objectives of the NC EPA. (See Sec. 113A-2. Purposes; Sec.113A-3. Declaration of State environmental policy; and 15A NCAC 01C.0101 Statement of Purpose, Policy and Scope.)

Because of the way in which the patio and fire pit are constructed, no contamination of water, increase in run-off, impediments to drainage, erosion, or damage to wildlife will occur. In actuality, Petitioner has

reduced the fun-off of fertilizer, herbicides, and other contaminants from the chemically-treated lawn that existed prior to the installation of the pavers and fire pit.

Petitioner also believes that CAMA's interpretation of "landscaping" is too restrictive and severe. Patios and fire pits like the ones in question here are becoming ubiquitous and not atypical of landscaping projects overall. Because Petitioner did no damage to the environment, land and water; and meet the spirit, purpose and intent of the law, this type of project should be included in the interpretation of "landscaping" and should be allowed. To do otherwise is an excessively narrow interpretation of the guidelines and does not support the primary intent of the law - to minimize harm to the North Carolina waterways and estuaries and allow for their enjoyment in an environmentally friendly manner with no degradation of our wonderful surroundings.





CAMA Variance Request – Application Number – 20180725

Petitioners' Responses to Four Variance Criteria:

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

Yes. Without the patio and fire pit, Petitioners would be unable to have reasonable enjoyment of their property. When they purchased the property in 2007, they specifically selected this lot because of the expansive view it has from this *particular* point of land. From the beginning, they planned a patio and fire pit at this exact location so as to be able to congregate around it and enjoy the sights and sounds of the water and its proximity. The patio and fire pit also were positioned at this location so as not to obstruct views from the house. From the patio and fire pit area, the Petitioners have a 270 degree view of the waterway and are able to see both the sunrise and the sunset. Not many residential lots, if any, at Albemarle Plantation have this unique feature, which was a major reason for Petitioners' purchasing the lot they did. This amenity provides the most commanding view on the property and is one of the most notable and attractive aspects of their home. Denying this variance request will significantly impact the value of this uniquely structured property and greatly negate one of the primary reasons the Petitioners purchased the property in the first place.

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

Yes. The hardship of Petitioners not being able to enjoy their property to its fullest is being created because it is waterfront property. If it were not waterfront property, they would be able to enjoy fully their property with a patio and fire pit without requiring permission from the State to build same.

(c) *Do the hardships result from actions taken by the Petitioners?*

No. This hardship was not created by Petitioners. They did not build or develop anything that changes this location and the hardship of not being able to have this patio and fire pit was not created by them. The patio and fire pit is an entirely reasonable and forseeable use to be made of the property. The hardship is created by strict application of the current rules and regulations.

(d) *Will the variance requested by the Petitioners (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?*

Yes. Contrary to harming the environment, Petitioners believe that this patio and fire pit have enhanced a safe, healthy, and pleasant environment in which to enjoy one of NC's waterways. Petitioner use of the patio and fire pit greatly extend the benefits they gain from being on the water and enjoying a unique environment, without causing any degradation or risk to health or safety – all key objectives of the NC EPA. (See *§ 113A-2. Purposes; § 113A-3. Declaration of State environmental policy;* and *15A NCAC 01C.0101 Statement of Purpose, Policy, and Scope*.)

Because of the way in which the patio and fire pit are constructed (to be permeable), no contamination of water, increase in run-off, impediments to drainage, erosion, or damage to wildlife will occur. In actuality, Petitioners have reduced the run-off of fertilizer, herbicides, and other contaminates from the chemically-treated lawn that existed prior to the installation of the pavers and fire pit. Furthermore, infiltration and permeability testing of the soil immediately surrounding the patio by geotechnical engineers (GET Solutions, Inc.) found that the rate of drainage for the soil upon which the patio was developed was "Moderately High."

Petitioners also believe that CAMA's interpretation of "landscaping" is too restrictive and severe. Patios and fire pits like the ones in question here are

becoming ubiquitous and not atypical of landscaping projects overall. Because the Petitioners did no damage to the environment, land, and water, and meet the spirit, purpose, and intent of the law, this type of project should be included in the interpretation of “landscaping”. Continued interpretation of “landscaping” to not allow environmentally friendly “softscaping” paver brick creates an unnecessary hardship. To do otherwise is an excessively narrow interpretation of the guidelines and does not support the primary intent of the law – to minimize harm to the NC waterways and allow for their enjoyment.

ATTACHMENT E:

STIPULATED EXHIBITS INCLUDING POWERPOINT

1. Deed to property at Book 333, Page 641
2. CAMA General Permit #49979A authorizing the bulkhead
3. Plans for Petitioners' residence and building permit application
4. CAMA General Permit #68701A authorizing the pier and associated structures
5. September 25, 2017 NOV #17-15A with restoration plan
6. November 9, 2017 CNOV from DCM
7. December 15, 2017 letter from Petitioners to Director Davis
8. March 5, 2018 letter from Director Davis to Petitioners
9. May 17, 2018 letter from Petitioners to District Manager Jennings
10. July 24, 2018 CAMA Minor Permit Application with associated drawings and invoice for work completed
11. Notice to adjacent riparian owners of permit application
12. July 30, 2018 DCM Denial Letter
13. Notice to adjacent riparian owners of variance petition
14. Affidavits of Petitioners
15. Goodman opinion letter dated October 9, 2018
16. DEQ Stormwater Design Manual's Permeable Pavement chapter
17. Goodman opinion letter dated January 14, 2019
18. Stalls opinion letter dated January 14, 2019
19. PowerPoint with aerial and ground level photos of Site and surrounding area

FILED in PERQUIMANS County, NC
on Aug 17 2007 at 04:03:44 PM
by: DEBORAH S. REED
REGISTER OF DEEDS
BOOK 333 PAGE 641

07-562

PERQUIMANS COUNTY
LAND TRANSFER TAX
AMOUNT $ 6400.00 FH
PAID $ 6400.00 P

105925 Issued Aug 17 2007
$1,280.00
State of North Carolina PERQUIMANS County
Real Estate Excise Tax

Excise Tax | Recording Time, Book and Page

Tax Lot No._____ Parcel Identifier No. 2-D082-EE19-AP
Verified by_____ County on the ____ day of _____, _____.
by

Mail after recording to: **Dixon & Thompson Law, PLLC Attorneys at Law. P.O. Box 24, Edenton, NC 27932**

This instrument was prepared by: Samuel B. Dixon, Attorney at Law, P.O. Box 24, Edenton NC 27932

ALBEMARLE PLANTATION
Lot 19, Section EE – Bosher's Point

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 17th day of August, 2007, by and between

GRANTOR	GRANTEE
HPB ENTERPRISES, a North Carolina Partnership One Plantation Drive Hertford, NC 27944	**THOMAS S. LAMPLEY and wife, JUDITH A. LAMPLEY** 708 Day Lane Alexandria, VA 22314

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledge, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in **Bethel** Township, Perquimans County, North Carolina and more particularly described as follows:

Being Lot 19, Section EE, Bosher's Point, Phase 3 of Albemarle Plantation, as shown on plat entitled "ALBEMARLE PLANTATION - BOSHER'S POINT, PHASE 3 - SECTION EE, LOTS 7-13" AND LOTS 15-32, which said plat is recorded in **Plat Cabinet 2, Slide 108, Map No. 9 and Plat Cabinet 2, Slide 109, Map No. 1**, Perquimans County Public Registry.

The property hereinabove described was acquired by Grantor by instrument recorded in Book 123, Page 102, Perquimans County Registry.

A map showing the above described property is recorded in Plat Cabinet 2, Slide 108, Map Nos. 9, and in Plat Cabinet 2, Slide 109, Map No. 1.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated.

Title to the property hereinabove described is subject to the following exceptions:

The above described tract is subject to any easements, rights of way, declarations and restrictions that appear of record, including but not limited to the restrictive covenants recorded in Book 130, Page 593, and as amended and supplemented in Book 151, Page 752, Book 171, Page 773, Book 225, Page 908, in Book 241, Page 366, Book 270, Page 241, Book 282, Pages 329 & 756, Book 517, Book 312, Page 501, Book, 319, Page 641 and in Book 244, Page 19.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

HPB ENTERPRISES, a NC General Partnership

By: Robert M. Bosher (SEAL)
Robert M. Bosher, Managing Partner

SEAL STAMP

STATE OF NORTH CAROLINA - COUNTY OF PERQUIMANS

I, DOROTHY K. HODGES, a Notary Public of the County and State aforesaid, certify that **ROBERT M. BOSHER, Managing Partner for HPB Enterprises**, a NC General Partnership Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

Witness my hand and official stamp or seal, this 17th day of August, 2007.

My commission expires: Nov. 27, 2010

Dorothy K. Hodges
Notary Public

046

No. A49979

☒ CAMA / ~~☐ DREDGE~~ & FILL

GENERAL PERMIT

☐ New ☐ Modification ☐ Complete Reissue ☐ Partial Reissue

Previous permit # _____

Date previous permit issued _____

As authorized by the State of North Carolina, Department of Environment and Natural Resources and the Coastal Resources Commission in an area of environmental concern pursuant to 15A NCAC 7H .1100.

☐ Rules attached.

Applicant Name Thomas Lampley

Address 708 Day Lane

City Alexandria State VA ZIP 22314

Phone # (202) 641-0027 Fax # (___) _____

Authorized Agent JR Milligan / Oceanside Contractors

Project Location: County Perquimans

Street Address/ State Road/ Lot #(s) off of SR- 1429 Lot 19 Boshers Point Virginia Crt.

Subdivision Albemarle Plantation

City Hertford ZIP 27944

Phone # (___) _____ River Basin Pasquotank

Adj. Wtr. Body Yeopim Creek (nat /man /unkn)

Closest Maj. Wtr. Body Albemarle Sound

Affected AEC(s): ☐ CW ☐ EW ☒ PTA ☐ ES ☒ PTS ☐ OEA ☐ HHF ☐ IH ☐ UBA ☐ N/A ☐ PWS: _____ ☐ FC: _____

ORW: yes / no **PNA** yes / no **Crit.Hab.** yes / no

Type of Project/ Activity Construct new wooden bulkhead 196' and 107' wooden bulkhead around wetland area (Scale: NTS)

Pier (dock) length _____

Platform(s) _____

Finger pier(s) _____

Groin length _____

number _____

Bulkhead/ Riprap length 196'

avg distance offshore 3'

max distance offshore 5'

Basin, channel _____

cubic yards _____

Boat ramp _____

Boathouse/ Boatlift _____

Beach Bulldozing _____

Other _____

Shoreline Length 196'

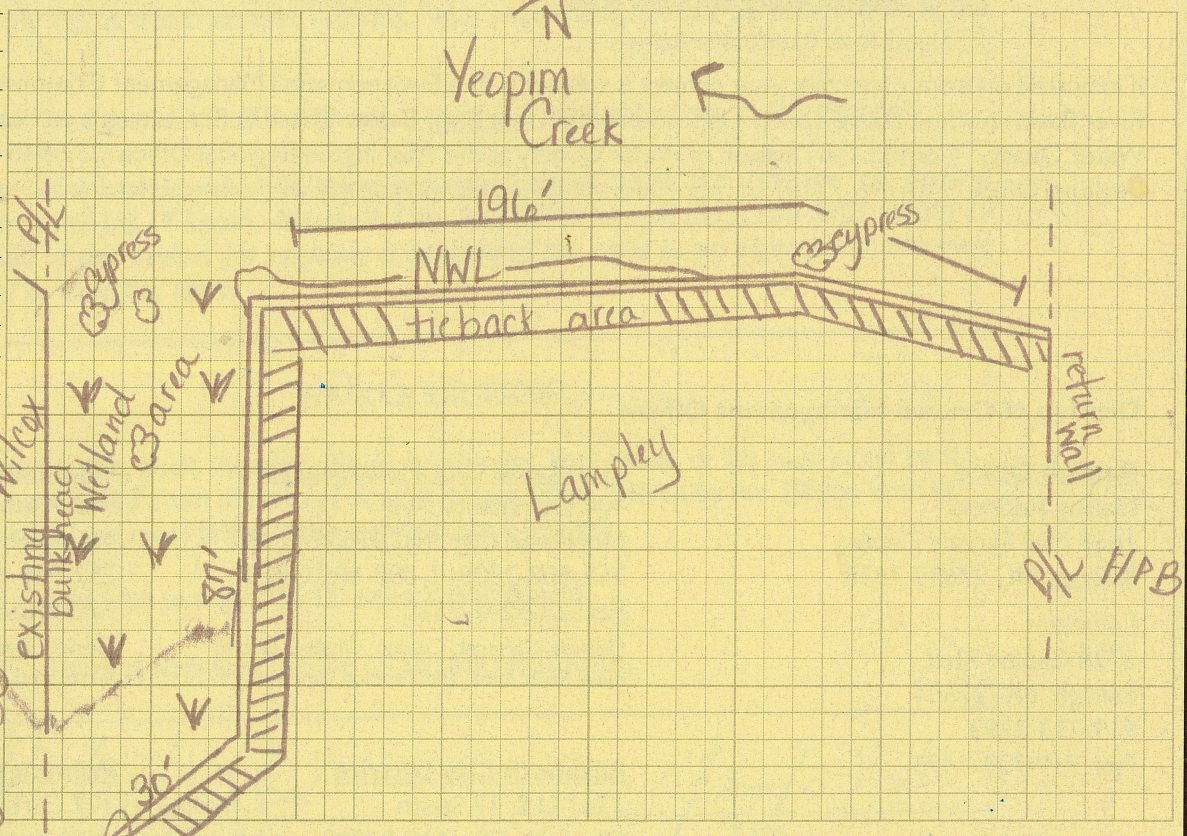
SAV: not sure yes no

Sandbags: not sure yes no

Moratorium: n/a yes no

Photos: yes no

Waiver Attached: yes no



A building permit may be required by: Perquimans.

☐ See note on back regarding River Basin rules.

Notes/ Special Conditions 7H 0.1100

JR Milligan
Agent or Applicant Printed Name

JR Milligan
Signature

** Please read compliance statement on back of permit **

$400.00
Application Fee(s)

12581
Check #

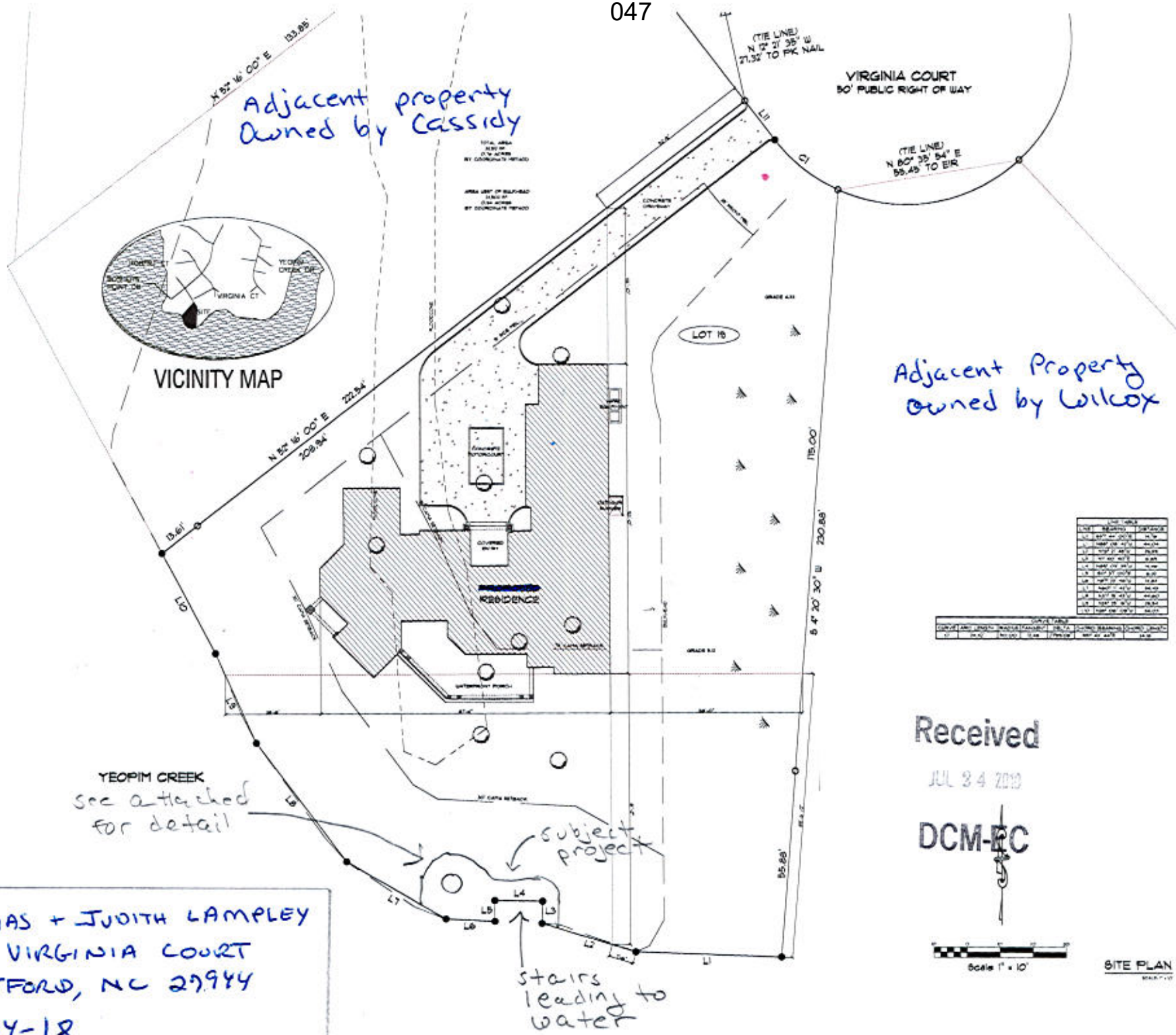
Kelly Russell
Permit Officer's Signature

12/3/07
Issuing Date

4/5/08
Expiration Date

Perquimans
Local Planning Jurisdiction

D120310A
Rover File Name



THE LAMPLEY RESIDENCE
LOT 19 VIRGINIA COURT
IN
BETHEL TOWNSHIP, NORTH CAROLINA

Received
JUL 24 2018
DCM-EC

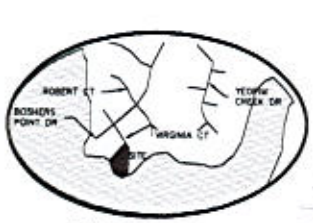
SITE PLAN

Scale 1" = 10'

SHEET 02 / 16

THOMAS + JUDITH LAMPLEY
108 VIRGINIA COURT
HERTFORD, NC 27944

7-24-18



VICINITY MAP

YEOPIM CREEK

LINE TABLE		
LINE	BEARING	DISTANCE
L11	S37° 44' 00"E	14.76
L1	N88° 08' 42"W	44.04
L2	N73° 21' 49"W	29.59
L5	N87° 23' 46"W	14.84
L10	N28° 06' 08"W	34.03

CURVE TABLE						
CURVE	ARC LENGTH	RADIUS	TANGENT	DELTA	CHORD BEARING	CHORD LENGTH
C1	24.42'	50.00'	12.46	27°58'08"	S51° 43' 44"E	24.18'

NOTE:
BEING LOT 19 OF PHASE 3 OF SECTION EE, "BOSHER'S POINT", OF ALBEMARLE PLANTATION SUBDIVISION AS RECORDED IN P.C. 2, SLD. 108, MAP 8.

SUBJECT PARCEL IS FOUND IN FLOOD ZONES AS SHOWN, SCALED FROM FIRM PANEL 3270786600J, DATED OCTOBER 5, 2004.

GRADES SHOWN APPROXIMATE

I, EDWARD T. HYMAN, JR. CERTIFY THAT THIS PLAT WAS DRAWN FROM AN ACTUAL FIELD LAND SURVEY MADE UNDER MY SUPERVISION; THAT THE DEED DESCRIPTION FOR SAID PROPERTY IS RECORDED IN D.B. 333, P. 641; THAT THE ERROR OF CLOSURE IS 1:10,000+ ; THAT ALL AREA CALCULATIONS ARE BY D.M.D; THAT THIS MAP WAS PREPARED IN ACCORDANCE WITH GS 47-30; WITNESS MY ORIGINAL SIGNATURE, REG. NUMBER, AND SEAL THIS 17 DAY OF MARCH, 2010.

NORTH CAROLINA PROFESSIONAL SEAL L-2690 LAND SURVEYOR EDWARD T. HYMAN, JR.

EDWARD T. HYMAN, JR.
P.L.S. L-2690

VIRGINIA COURT (50' R/W)

LEGEND
EXISTING IRON PIN
CALCULATED CORNER
PROPERTY LINE
R/W LINE
PROPERTY EXTENSION
EASEMENT SETBACK
EASEMENT CAMA
BULKHEAD
FLOODZONE

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

Received
JUL 2 4 2010
DCM-EC

HYMAN ROBEY
SOLUTIONS FROM THE GROUND UP
150 US Hwy 158 E.
PO Box 339
Camden, NC 27921
(252) 338-2913
(252) 338-5552 fax
www.hymanrobey.com
License C-0598

SURVEY FOR THOMAS S. & JUDITH A. LAMPLEY

BETHEL TOWNSHIP
PERQUIMANS COUNTY
NORTH CAROLINA

KEY PLAN:

Project #: 100057
Drawing #: 100057
Drawn: TWR
Checked: ETH
Approved: ETH
Date: 03/17/10
Sheet #: 01/01
Scale: 1:20

REVISIONS:
NUM. DATE DESCRIPTION

SHEET TITLE:
SURVEY

SHEET NUMBER:
1

☐ CAMA / ☐ DREDGE & FILL

GENERAL PERMIT

☒ New ☐ Modification ☐ Complete Reissue ☐ Partial Reissue

No. 68701 A B C D

Previous permit # _____

Date previous permit issued _____

As authorized by the State of North Carolina, Department of Environment and Natural Resources and the Coastal Resources Commission in an area of environmental concern pursuant to 15A NCAC 07H.1200.

☒ Rules attached.

Applicant Name TOM & JUDITH LAMPLEY

Address 108 VIRGINIA COURT

City HERTFORD State NC ZIP 27944

Phone # (252) 232-8677 E-Mail _____

Authorized Agent N/A

Affected AEC(s): ☐ CW ☐ EW ☒ PTA ☐ ES ☐ PTS ☐ OEA ☐ HHF ☐ IH ☐ UBA ☐ N/A ☐ PWS: _____

ORW: yes / (no) PNA yes / (no)

Project Location: County PERQUIMANS

Street Address/ State Road/ Lot #(s) 108 VIRGINIA COURT

Subdivision ALBEMARLE PLANTATION

City HERTFORD ZIP 27944

Phone # (252) 232 8677 River Basin PASQUOTANK

Adj. Wtr. Body YEOPIM CREEK (nat) /man /unkn)

Closest Maj. Wtr. Body YEOPIM RIVER → ALBEMARLE SOUND

Type of Project/ Activity 1) PIER: 6'X64 2) PLATFORM: 12'X24' 3) BOATHOUSE: 15'X24' W LIFT 4) 2ND LIFT (PWC) 5) 7'X24' STEP DOWN 6) STAIRS 14'X6' RAFTED (Scale:)

Pier (dock)-length 64'

Fixed Platform(s) 12'X24'

Floating Platform(s) _____

Finger pier(s) _____

Groin length _____

number _____

Bulkhead/ Riprap length _____

avg distance offshore _____

max distance offshore _____

Basin, channel _____

_____

cubic yards _____

Boat ramp _____

Boathouse/ Boatlift 15'X24' W LIFT & 2ND LIFT

Beach Bulldozing _____

Other STEP DOWN: 7'X24' STAIRS: 14'X6'

_____

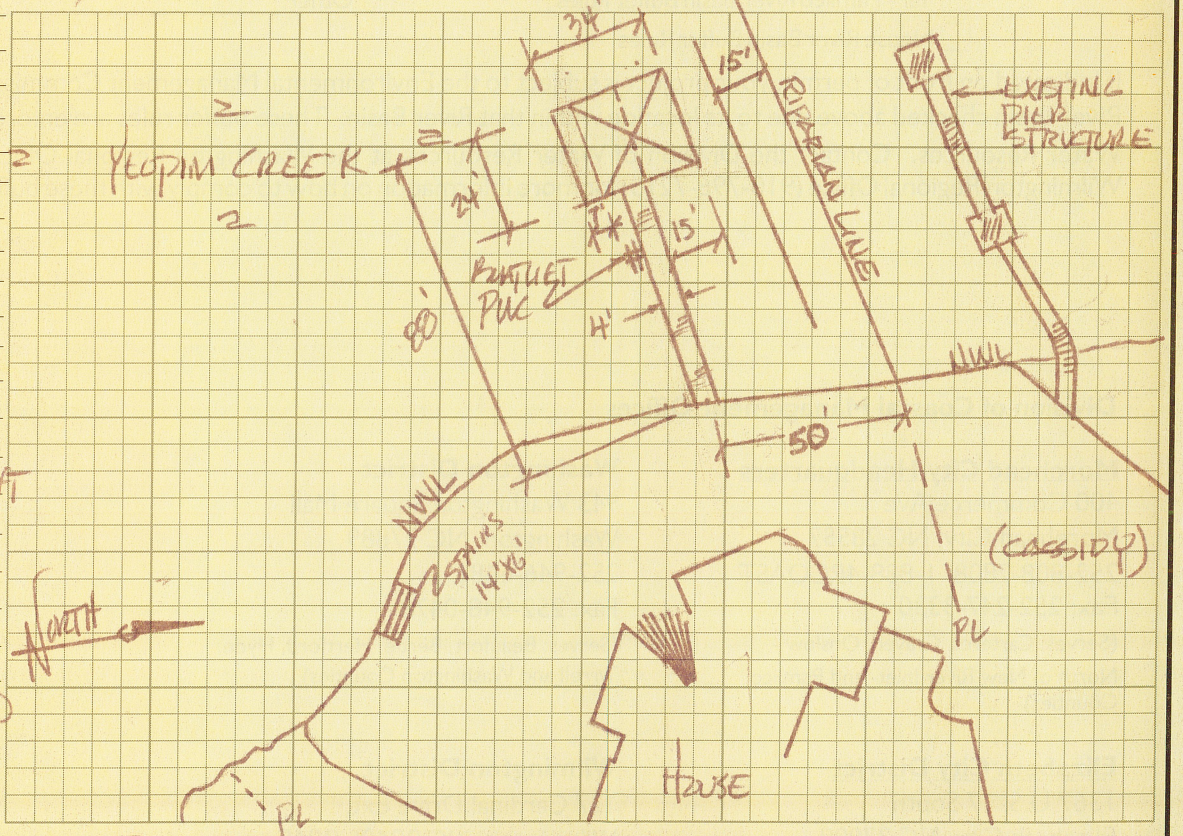
Shoreline Length 240

SAV: not sure yes (no)

Moratorium: (n/a) yes no

Photos: (yes) no

Waiver Attached: yes (no)



A building permit may be required by: PERQUIMANS COUNTY. ☐ See note on back regarding River Basin rules.

(Note Local Planning Jurisdiction)

Notes/ Special Conditions TOTAL LENGTH OF STRUCTURE = 88' FROM NWL

THOMAS LAMPLEY
Agent or Applicant Printed Name

Signature ** Please read compliance statement on back of permit **

$200.00 721
Application Fee(s) Check #

LYNN MATTHIS
Permit Officer's Printed Name

Signature

SEPT 12, 2017 JAN, 12, 2018
Issuing Date Expiration Date

Coastal Management
ENVIRONMENTAL QUALITY

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON DAVIS
Director

CERTIFIED MAIL: 7013 2250 0000 6213 5344
RETURN RECEIPT REQUESTED

NOTICE OF VIOLATION
September 25, 2017

Thomas and Judith Lampley
108 Virginia Court
Hertford, North Carolina 27944

RE: NOTICE OF VIOLATION AND REQUEST TO CEASE UNAUTHORIZED DEVELOPMENT CAMA MINOR VIOLATION #17-15A

Dear Mr. and Mrs. Lampley:

This letter confirms that on September 12, 2017, I was onsite at your property located at 108 Virginia Court, adjacent to Yeopim Creek, in Albemarle Plantation, Perquimans County, North Carolina. The purpose of the visit was to issue a General Permit for a pier, platform, lifts, and a boathouse. While onsite additional development was discovered involving the installation of a block patio and fire pit ~450sf in area within the Coastal Shoreline Area of Environmental Concern (AEC), more specifically the Public Trust Shoreline. During my site visit we discussed the placement of the impervious area and the rules governing the 30' buffer.

Based on my site visit it has been determined you have undertaken minor development in violation of the Coastal Area Management Act. No person may undertake minor development in a designated Area of Environmental Concern without first obtaining a permit from the North Carolina Department of Environment and Natural Resources, North Carolina General Statutes (N.C.G.S.) 113A-118.

I have information that you have undertaken, or are legally responsible for, unauthorized minor development by having a ~450sf patio installed along normal water level at an existing bulkhead on the aforementioned property. This activity took place in the Public Trust Shoreline that is contiguous with Yeopim Creek. Public Trust Shorelines are designated as Areas of Environmental Concern (AEC), and no permit was issued to you for work in this area. Based on these findings, I am initiating an enforcement action by issuing this ***Notice of Violation*** for violating the Coastal Area Management Act

I request that you immediately **CEASE AND DESIST** any further unauthorized development. A civil assessment of up to $1,000 may be assessed against any violator. Each day that the development described in this Notice is continued or repeated may constitute a separate violation that is subject to an additional assessment of $1,000. An injunction or criminal penalty may also be sought to enforce any violation in accordance with N.C.G.S. 113A-126.

It is the policy of the Coastal Resources Commission to assess a minimum civil penalty against all violations of this type. Investigative costs may also be assessed in addition to the civil penalty. This is done to recoup some of the costs of investigating the violation and/or to compensate the public for any damage to its natural

resources. Whether a higher amount will be assessed will depend on several factors, including the nature and area of the resources affected and the extent of the damage to them. If restoration of the affected resources is requested, but is not undertaken or completed satisfactorily, a substantially higher civil penalty will be assessed and a court injunction will be sought ordering restoration.

Based upon the North Carolina Administrative Code, Title 15A, Subchapter 07H. State Guidelines for Areas of Environmental Concern, the activity you have undertaken, the installation of a block patio and fire pit within the 30' buffer along the Public Trust Shoreline is not consistent with Section 07H .0209 Coastal Shorelines (d)(10), which states:

> *Within the Coastal Shorelines category (estuarine and public trust shoreline AECs), new development shall be located a distance of 30 feet landward of the normal water level or normal high water level, with the exception of the following:*
>
> *(A) Water-dependent uses as described in Rule 07H .0208(a)(1) of this Section;*
> *(B) Pile-supported signs (in accordance with local regulations);*
> *(C) Post- or pile-supported fences;*
> *(D) Elevated, slatted, wooden boardwalks exclusively for pedestrian use and six feet in width or less. The boardwalk may be greater than six feet in width if it is to serve a public use or need;*
> *(E) Crab Shedders, if uncovered with elevated trays and no associated impervious surfaces except those necessary to protect the pump;*
> *(F) Decks/Observation Decks limited to slatted, wooden, elevated and unroofed decks that shall not singularly or collectively exceed 200 square feet;*
> *(G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase stormwater runoff to adjacent estuarine and public trust waters;*
> *(H) Development over existing impervious surfaces, provided that the existing impervious surface is not increased and the applicant designs the project to comply with the intent of the rules to the maximum extent feasible;*
> *(I) Where application of the buffer requirement would preclude placement of a residential structure with a footprint of 1,200 square feet …*
> *(J) Where application of the buffer requirement set out in 15A NCAC 07H .0209(d)(10) would preclude placement of a residential structure on an undeveloped lot platted prior to June 1, 1999…*

The activity undertaken does not fall within the exceptions noted above; therefore, I am requesting that the block patio be removed from within the 30' buffer. Please refer to the enclosed Restoration Agreement. If you intend to cooperate with my request, please sign one of the attached Restoration Agreements and return it to me in the enclosed, self-addressed envelope within ten (10) days of receipt of this letter. Failure to comply with this request or respond back to this office prior to the requested deadline with an acceptable schedule for compliance will be interpreted as a refusal to cooperate and will result in a Notice of Continuing Violation, as well as a court injunction being sought ordering compliance.

Upon completion of the restoration as requested in the Restoration Plan Agreement to the satisfaction of the NC Division of Coastal Management, you will be notified by the Division of Coastal Management as to the amount of a civil assessment for undertaking development without first obtaining the proper permit.

The relevant statutes and regulations are available from this office, and I am willing to assist you in complying with the requirements of these laws. Do not hesitate to contact me if you have any questions.

Sincerely,

Lynn W. Mathis
Field Specialist

Cc: Frank Jennings, District Manager, DCM
Roy Brownlow, Compliance Coordinator, DCM

ENCLOSURES

RESTORATION PLAN
For
Thomas and Judith Lampley
CAMA Minor Violation #17-15A

Property located at 108 Virginia Court, Perquimans County

Remove all impervious surface created by the block patio constructed along the existing bulkhead within the 30' buffer. Reconstruction of the patio 30' landward of normal water level, measured from anywhere along the existing bulkhead, will not require authorization from this agency as long as all associated land disturbance is landward of the 30' buffer.

See attached aerial photograph of the site, and area to be removed or relocated.

We, **Thomas and Judith Lampley**, agree to complete this restoration to the satisfaction of the NC Division of Coastal Management by October 30, 2017, or provide an explanation for non-compliance and a reasonable request for time extension. When corrective actions are complete, I will notify the Elizabeth City Office of the Division of Coastal Management so the work can be inspected.

SIGNATURE: _____
(Signature of one or both of the property owners is required)

DATE: _____

It is the policy of the Coastal Resources Commission to levy a minimum civil assessment against all violations of this type depending upon the damage to the resources. If restoration is not undertaken or satisfactorily completed, a substantially higher civil assessment will be levied and an injunction sought to require restoration.

Thomas & Judith Lampley

108 Virginia Court
Hertford, NC 27944

Coastal Management
ENVIRONMENTAL QUALITY

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON DAVIS
Director

CERTIFIED MAIL: 7013 2250 0000 6213 5313
RETURN RECEIPT REQUESTED

NOTICE OF VIOLATION
November 9, 2017

Thomas and Judith Lampley
108 Virginia Court
Hertford, North Carolina 27944

RE: NOTICE OF CONTINUING VIOLATION AND REQUEST TO CEASE UNAUTHORIZED DEVELOPMENT – CAMA MINOR VIOLATION #17-15A

Dear Mr. and Mrs. Lampley:

This letter is in reference to the Notice of Violation that was issued to you on September 25, 2017, by the North Carolina Division of Coastal Management for unauthorized development in violation of the Coastal Area Management Act (CAMA). The violation occurred onsite your property located at 108 Virginia Court, adjacent to Yeopim Creek, in Albemarle Plantation, Perquimans County, North Carolina.

Information gathered by me for the Division of Coastal Management revealed that a block patio with a fire pit was constructed immediately adjacent to the bulkhead at normal water level (NWL), along Yeopim Creek. You were notified that no person may undertake development within a designated Area of Environmental Concern (AEC) without first obtaining a permit from the North Carolina Department of Environmental Quality, as imposed by North Carolina General Statute (herein abbreviated N.C.G.S.) 113A-118. Had an application been submitted to this office for the patio and fire pit, you would have been informed that such development could not be permitted within 30' of NWL.

Per your request I have looked into your requests for relief under the Variance and Third-Party Appeal process, and it has been verified that such requests may be submitted upon the denial of a permit, and not subsequent to the undertaking of unauthorized development that is inconsistent with the Division's rules. Base on this finding restoration of the affected area the Violation issued on September 25, 2017, stands.

In accordance with the N.C. Administrative Code, Subchapter 7J.0409(g)(4)(F)(ii), should you fail to restore the affected area you may be subject to an additional daily penalty starting from the date specified in this Continuing Notice of Violation and may continue until the Division's order is satisfied; or you contest the Division's order in a judicial proceeding by raising a justifiable issue of law or fact.

Thomas S. Lampley
108 Virginia Court
Hertford, NC 27944
(H) 252-232-8677 (C) 202-641-0027
thomas.lampley@kbr.com

December 15, 2017

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

Dear Mr. Davis,

We are writing to request reconsideration of the Notice of Violation cited in the attached letters dated September 25, 2017, and November 9, 2017.

In response to this NOV, on December 4, we had a very positive meeting with Mr. Frank Jennings and Ms. Lynn Mathis in the Elizabeth City office to discuss this issue. They were very understanding of our dilemma, but did not feel they were in a position to grant an exception to the existing regulations. Mr. Jennings suggested we present our case to you for further consideration in that he believed there was merit in our case. This is an extremely important issue to us and we would very much appreciate the opportunity to discuss this with you in person, if you would be willing to meet with us.

Prior to receiving the NOV, we were totally unaware of any requirement to obtain a permit to install a block (paver) patio and fire pit on our property. We had just moved from Alexandria, VA and had never been involved with construction permitting. There was never any attempt on our part to subvert or ignore any environmental laws or regulations. On the contrary, to ensure we properly designed and installed this project, we hired three well-known and highly-recommended contractors based on the extensive amount of work they have done in our gated community: (1) a landscape designer, (2) a licensed landscape contractor to scale down the original design and construct a fully permeable patio and fire pit, and (3) a licensed gas company in Hertford to install a propane gas line to the fire pit. None of these licensed contractors, that we relied on, advised us of any restrictions or permitting requirements with regard to performing this work.

We therefore were shocked to learn from the NOV that the work done on our property required a permit and that it would need to be removed as it was not in compliance with North Carolina's environmental laws. While the need for a permit was surprising, the idea that we could possibly be causing harm to the environment was inconceivable. The pervious paver patio and fire pit were specifically designed to have zero negative impact on the environment – the pavers are spaced apart and laid in sand, not concrete, allowing water to drain directly into the soil beneath. Contrary to

harming the environment, we believe that the work done on our property has enhanced a healthy and pleasant environment (a key objective of the NCEPA), while significantly reducing the run-off of fertilizer, herbicides, and other contaminates from the chemically-treated lawn that existed prior to the installation of the patio and fire pit. We further believe that these enhancements do not conflict in any way with the spirt or intent of North Carolina's environmental laws as we have read them and that we have not in any way caused damage to the environment on or around our property.

Having researched the NCEPA and its accompanying Administrative Code, we believe both provide CAMA full authority to use its discretion in making these types of environmental decisions. As such, we are appealing to you for an equitable resolution of this issue, short of removal of the patio and fire pit. Full removal and replacement of this project would be costly and result in a de facto penalty to us totally disproportionate to the lack of any potential environmental damage. Furthermore, removal of the patio and replacing it with grass actually would have a negative impact on the surrounding environment.

We believe that there is sufficient latitude in Section 07H.0209 Coastal Shorelines (d) (10), to apply exemption (G) (noted below) to our particular situation. Our landscaping complies with this exception, and does not increase storm water runoff—in fact it minimizes it.

> (G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase stormwater runoff to adjacent estuarine and public trust waters.

We request your consideration in applying the above section (G) exception to our situation in order to mitigate further damage to the environment and more rationally apply the spirit and intent of the law to these particular circumstances.

We sincerely appreciate your, Mr. Jennings', and Ms. Mathis's efforts in assisting us in this matter, considering our request, and hopefully finding an equitable solution to this issue.

Again, we would appreciate the opportunity to speak to you about this in person at your convenience.

We look forward to hearing back from you.

Sincerely,

Thomas S. Lampley

Attachments (2)

cc: Mr. Frank Jennings
Ms. Lynn Mathis

Coastal Management
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

March 5, 2018

Thomas and Judith Lampley
108 Virginia Court
Hertford, NC 27944

Re: CAMA Minor Violation #17-15A / Restoration Plan

Dear Mr. and Mrs. Lampley:

I want to first apologize for the lengthy delay in responding to your letter addressed to my attention and dated December 15, 2017. Your letter was somehow misplaced, likely due to my relocation from my former office at the N.C. Division of Marine Fisheries in January.

You requested that I reconsider CAMA Minor Violation #17-15A (NOV) and the letters you received from our Elizabeth City office, dated September 25, 2017 and November 9, 2017. I have reviewed all of the materials and photographs associated with your case. While I am sensitive to your situation and believe that you never intended to violate state rules, I cannot find sufficient grounds to overturn the NOV or change the required restoration plan. Patios and hardscaping are not included in the specific exceptions to the 30-foot buffer established 15A NCAC 07H.0209, which include slatted, wooden, elevated and unroofed decks of up to 200 square feet, among other specific exceptions. The N.C. Division of Coastal Management has consistently disallowed brick and paver patios in the Public Trust Shoreline and Estuarine Shoreline Areas of Environmental Concern.

For these reasons, you will need to follow the Restoration Plan associated with the NOV, as outlined in the letters you received in September and November 2017. Upon satisfactory completion of the restoration, you will be notified as to the amount of a civil assessment for undertaking development activity without first obtaining the proper permit.

You will be notified of your legal appeal rights if you are issued a formal civil penalty. In addition, once restoration is complete, you could apply for a permit for a similar patio or deck area in the shoreline buffer area. If your permit application is denied, you can then either file an appeal with the N.C. Office of Administrative Hearings or seek a variance from the N.C. Coastal

Resources Commission. We would be happy to provide additional information on those appeal rights and procedures at your request, but some introductory information can be found here: https://deq.nc.gov/about/divisions/coastal-management/coastal-management-permits/variances-appeals.

Sincerely,

Braxton Davis
Director, N.C. Division of Coastal Management

Cc: Frank Jennings, DCM District Manager, Elizabeth City

Thomas S. Lampley
108 Virginia Court
Hertford, NC 27944
(H) 252-232-8677 (C) 202-641-0027
thomas.lampley@kbr.com

May 17, 2018

Mr. Frank Jennings

Re: NOV No.

Dear Mr. Jennings:

With regard to the above-reference Notice of Violation (NOV), we are requesting a formal hearing on the issues involved therein. We believe that our fire pit and surrounding pavers are not so egregious as to require their full removal and restoration of the site to its original state (dirt and weeds.) Both the fire pit and pavers were designed in a way as to allow water to drain readily from the surface into the ground and have absolutely no negative impact to the surrounding water or land. While, we may have inadvertently not complied with the permitting process for installation of the fire pit and pavers, again, no harm was done to the environment by this omission on our part. Furthermore, what we have done is in line with the spirit and intent of the North Carolina Environmental Protection Act (NC EPA) and as such, we do not intend to remove the fire pit and pavers. We therefore request a formal hearing on this issue.

Prior to receiving the NOV, we were totally unaware of any requirement to obtain a permit to install a paver patio and fire pit on our property. We had just moved from Alexandria, VA and had never been involved with construction permitting. There was never any attempt on our part to subvert or ignore any environmental laws or regulations. On the contrary, to ensure we properly designed and installed this project, we hired three well-known and highly-recommended contractors based on the extensive amount of work they have done in our gated community: (1) a landscape designer, (2) a licensed landscape contractor to scale down the original design and construct a fully permeable patio and fire pit, and (3) a licensed gas company in Hertford to install a propane gas line to the fire pit. None of these licensed contractors, that we relied on, advised us of any restrictions or permitting requirements with regard to performing this work.

We therefore were shocked to learn from the NOV that the work done on our property required a permit and that it would need to be removed as it was not in compliance with North Carolina's environmental laws. While the need for a permit was surprising, the idea that we could possibly be causing harm to the environment was inconceivable. The pervious pavers and fire pit were specifically designed to have zero negative impact on the environment – the pavers are spaced apart and laid in sand and gravel, not concrete, allowing water to drain directly into the soil beneath. The fire pit is open and likewise, drains into sand.

Contrary to harming the environment, we believe that this work has enhanced a healthy and pleasant environment – a key objective of the NC EPA. According to the NC EPA:

> *§ 113A-2. Purposes.* The purposes of this Article are: to declare a State policy which will encourage the wise, productive, and beneficial use of the natural resources of the State without damage to the environment, maintain a healthy and pleasant environment, and preserve the natural beauty of the State
>
> *§ 113A-3. Declaration of State environmental policy.* The General Assembly of North Carolina . . . declares that it shall be the continuing policy of the State of North Carolina to conserve and protect its natural resources and to create and maintain conditions under which man and nature can exist in productive harmony. Further, it shall be the policy of the State to seek, for all of its citizens, safe, healthful, productive and aesthetically pleasing surroundings; to attain the widest range of beneficial uses of the environment without degradation, risk to health or safety

No contamination of water, impediments to drainage, erosion, or damage to wildlife has resulted from our fire pit and pavers. In actuality, we have reduced the run-off of fertilizer, herbicides, and other contaminates from the chemically-treated lawn that existed prior to the installation of the pavers and fire pit. We further believe that these enhancements do not conflict in any way with the spirt or intent of North Carolina's environmental laws or directives and that we have not in any way caused damage to the environment on or around our property.

While thus far we have been told that there is no exception that specifically addresses a paver surface and fire pit, we believe that there is sufficient latitude in Section 07H.0209 Coastal Shorelines (d) (10), to apply exemption (G) (noted below) to our particular situation. Our fire pit and pavers comply with this exception, and do not increase storm water runoff – in fact they minimize it.

> (G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase storm water runoff to adjacent estuarine and public trust waters.

Furthermore, we believe the NC EPA and accompanying Administrative Code provide CAMA full authority to use its discretion in making these types of environmental decisions.

> *15A NCAC 01C .0104 AGENCY COMPLIANCE*
>
> (a) Each DENR agency shall interpret the provisions of the NC EPA as a supplement to its existing authority and as a mandate to view its policies and programs in the light of the NC EPA's comprehensive environmental objectives, except where existing law applicable to the DENR agency's operations expressly prohibits compliance or makes compliance impossible.
>
> (b) As part of making a decision on a project for which an environmental document has been prepared, the DENR agency decision-maker shall review the document and incorporate it as part of continuing deliberations. The resulting decision shall be made after weighing all of the impacts and mitigation measures presented in the environmental document, which shall become part of the decision-making record.

15A NCAC 01C .0101 STATEMENT OF PURPOSE, POLICY, AND SCOPE

(e) The provisions of the rules in this Subchapter, the state rules (01 NCAC 25), and the NC EPA shall be read together as a whole in order to comply with the spirit and letter of the law.

Not taking all of the above into consideration in reaching a reasonable solution to this issue would result in an excessively narrow interpretation of the guidelines and would not support the primary intent of the law – to minimize harm to the NC waterways.

In the contrary, the cost of complying with requested restoration (estimated at $10,000) far exceeds any potential harm to the environment and would not benefit CAMA, the State of North Carolina, or its citizens. In fact, it could harm all while serving no practical purpose. We only seek an equitable solution to this problem that would benefit all concerned, including interpretation of (or perhaps even revision to) the current rules to allow for projects such as ours that cause no harm to the environment and allow for the enjoyment of the waterways by the citizens of the state.

As our discussions with CAMA have thus far been beneficial, in our view, they have not resulted in a satisfactory solution to our situation. It is for that reason, we request a formal hearing before the appropriate state entity so that we may present our case along with all of the mitigating factors and options available to the relevant NC authorities.

Thank you for your assistance in this regard and we look forward to hearing back from you.

Sincerely,

Thomas S. Lampley

cc: Rep. Bob Steinburg
Mr. Braxton Davis

Coastal Management
ENVIRONMENTAL QUALITY

APPLICATION FOR

CAMA MINOR DEVELOPMENT PERMIT

In 1974, the North Carolina General Assembly passed the Coastal Area Management Act (CAMA) and set the stage for guiding development in fragile and productive areas that border the state's sounds and oceanfront. Along with requiring special care by those who build and develop, the General Assembly directed the Coastal Resources Commission (CRC) to implement clear regulations that minimize the burden on the applicant.

This application for a minor development permit under CAMA is part of the Commission's effort to meet the spirit and intent of the General Assembly. It has been designed to be straightforward and require no more time or effort than necessary from the applicant. Please go over this folder with the Local Permit Officer (LPO) for the locality in which you plan to build to be certain that you understand what information he or she needs before you apply.

Under CAMA regulations, the minor permit is to be issued within 25 days once a complete application is in hand. Often less time is needed if the project is simple. The process generally takes about 18 days. You can speed the approval process by making certain that your application is complete and signed, that your drawing meets the specifications given inside and that your application fee is attached.

Other permits are sometimes required for development in the coastal area. While these are not CAMA-related, we urge you to check with the Local Permit Officer to determine which of these you may need. A list is included on page two of this folder.

We appreciate your cooperation with the North Carolina Coastal Management Program and your willingness to build in a way that protects the resources of our beautiful and productive coast.

Coastal Resources Commission
Division of Coastal Management

APPLICATION: Langley, Thomas + Judith LOCALITY: Pasquotank County E. City Offices

PERMIT ISSUED USING STATIC LINE EXCEPTION?
YES ☐ NO ☐
N/A

Locality PERQUIMANS COUNTY/E. City Office Permit Number 20180725

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

(For official use only)

GENERAL INFORMATION

LAND OWNER - MAILING ADDRESS

Name Thomas S. + Judith A. Lampley

Address 108 VIRGINIA CT

City Hertford State NC Zip 27944 Phone 252-232-8677

Email jlampley1227@gmail.com

AUTHORIZED AGENT

Name N/A

Address _____

City _____ State _____ Zip _____ Phone _____

Email _____

LOCATION OF PROJECT: (Address, street name and/or directions to site; name of the adjacent waterbody.)

108 VIRGINIA Ct., Hertford, NC 27944

Yeopim Creek

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) See attached.

SIZE OF LOT/PARCEL: _____ square feet .76 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: 450 square feet (includes the area of the foundation of all buildings, driveways, covered decks, concrete or masonry patios, etc. that are within the applicable AEC. Attach your calculations with the project drawing.) permeable surface of pavers + sand

STATE STORMWATER MANAGEMENT PERMIT: Is the project located in an area subject to a State Stormwater Management Permit issued by the NC Division of Energy, Mineral and Land Resources (DEMLR)?
YES _____ NO ✓

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

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

Received
JUL 24 2018
DCM-EC

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 or record title, Title is vested in name of Thomas S. + Judith A. Lampley see Deed Book 333 page 641 in the Perquimans County Registry of Deeds.

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

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

NOTIFICATION OF ADJACENT RIPARIAN 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)	William + Helen Wilcox	110 Virginia Ct, Hertford, NC 27944
(2)	Michael + Mary Anne Cassidy	106 Virginia Ct, Hertford, NC 27944
(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 24th day of July, 2018

Judith A. Lampley Thomas S. Lampley

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.*

SITE DRAWING/APPLICATION CHECKLIST

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

PHYSICAL DIMENSIONS

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

PHYSICAL CHARACTERISTICS

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

N/A If you will be working in the ocean hazard area:

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

If you will be working in a coastal shoreline area:

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

DEVELOPMENT PLANS

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

NOTE TO APPLICANT

Have you:

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

FOR STAFF USE

Site Notice Posted _____ Final Inspection _____ Fee Received $100 ck # 7434 7/24/18

Site Inspections

_____ _____

_____ _____

_____ _____

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

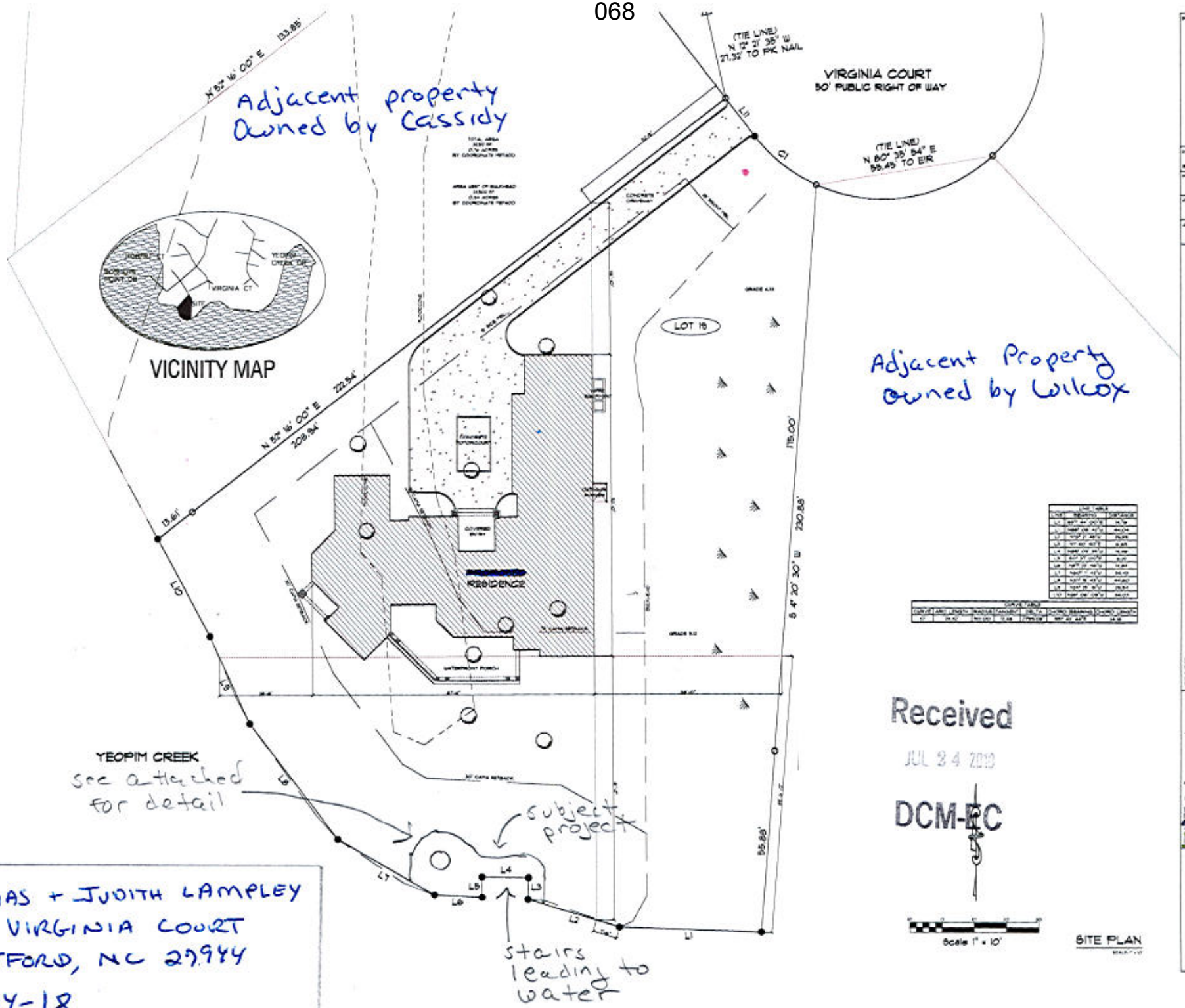
Application for CAMA Minor Development Permit

DESCRIPTION OF PROJECT: Excavation of approximately 450 square feet of lawn (grass, dirt, and sand) for installation of paver patio and fire pit. Depth of excavation approximately 7" with back fill of 4" of permeable ABC aggregate gravel (Crush n' Run) for the base and 1" of porous bedding sand on top of the aggregate. Pavers, which are 2.3" thick and range in size from 3" x 6" to 6" x 9," are randomly placed directly in the sand with ¼" to ½" spacing between pavers. No other filler between pavers. Bulkhead edge of patio seated approximately 1-2" below lip of bulkhead cap to prevent run-off. Patio includes permeable stone fire pit (52" in diameter and 15" high) placed in middle of paver patio and set in same base as patio.

Thomas & Judith Lampley
108 Virginia Ct
Hertford, NC 27944
7-24-18

Received

DCM-EC



THE LAMPLEY RESIDENCE
LOT 19 VIRGINIA COURT
IN
BETHEL TOWNSHIP, NORTH CAROLINA

JULY 8, 2014
REVISED: SEPTEMBER 23, 2014

K. WILSON

201-266

K&H RESIDENTIAL DESIGN
PHONE 704-728-0509
WWW.KHRESIDENTIALDESIGN.COM

HomeBuilders MEMBER AIBD

SHEET 02 / 16

Received
JUL 24 2018
DCM-EC

Scale 1" = 10'

SITE PLAN

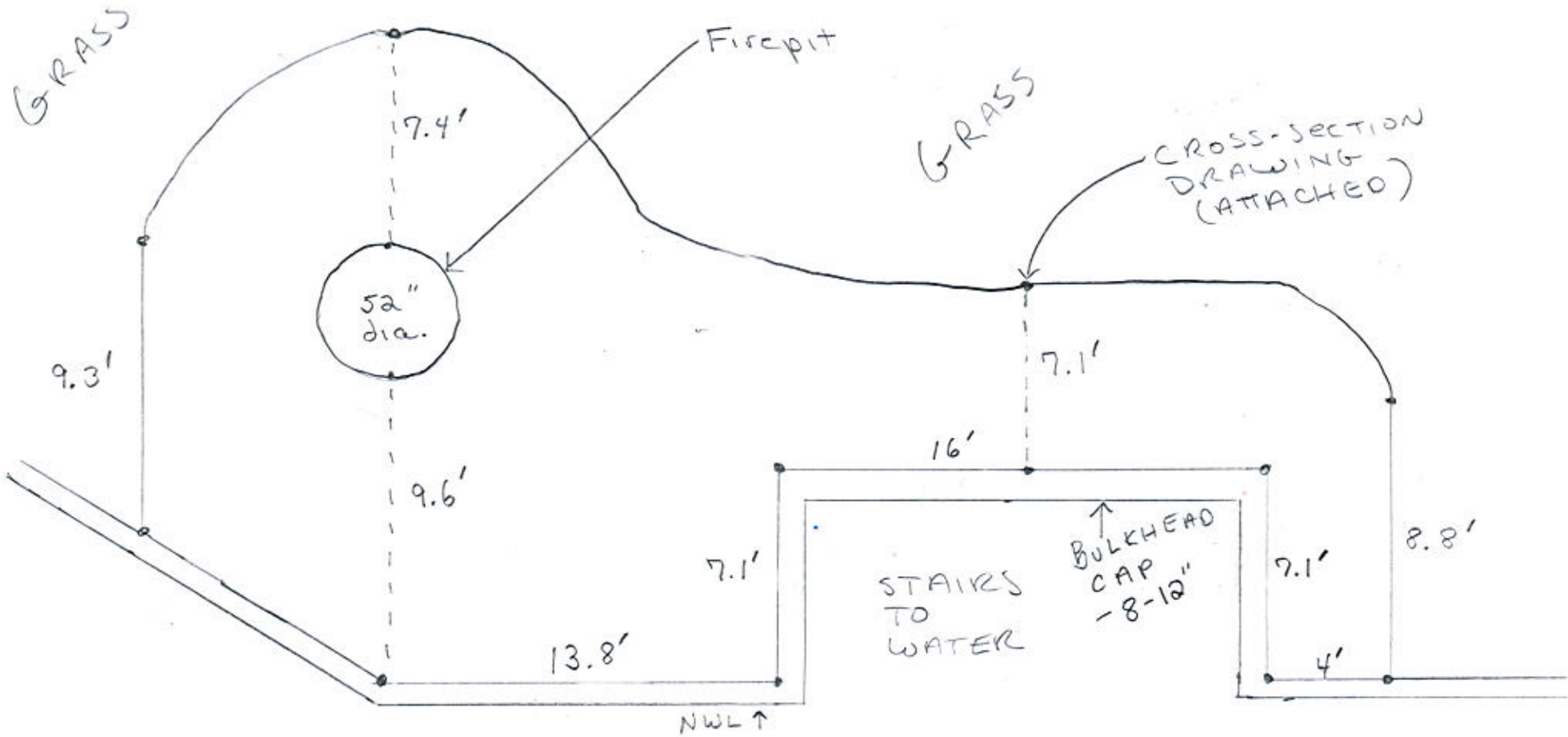
THOMAS + JUDITH LAMPLEY
108 VIRGINIA COURT
HERTFORD, NC 27944

7-24-18

HOUSE ↑

069

Paver Patio + Fire Pit



Yeopim Creek

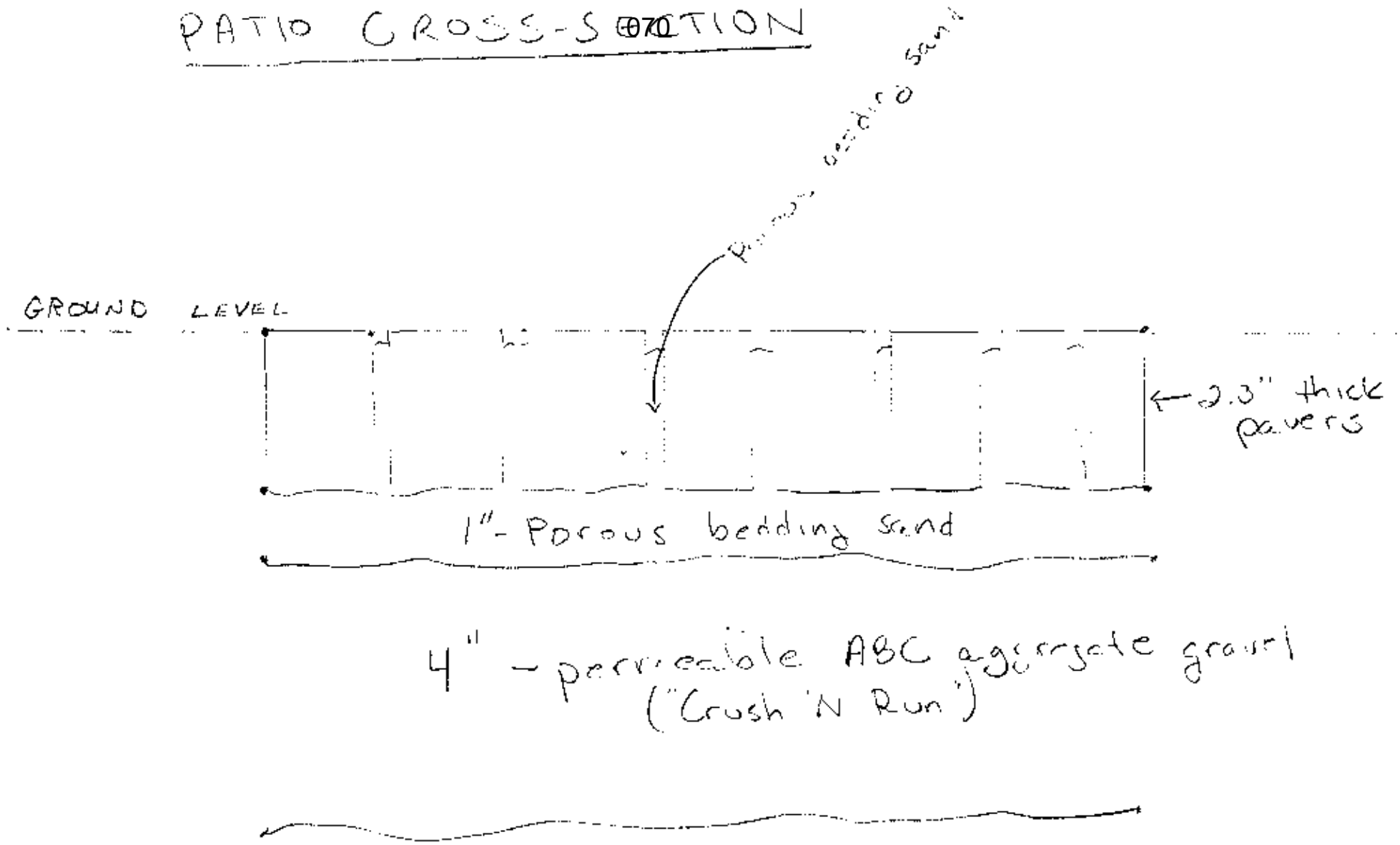
Thomas + Judith Lampley
108 VIRGINIA CT
HERTFORD, NC 27944

7-24-18

Received
JUL 24 2018
DCM-EC

SCALE
1" = 5'

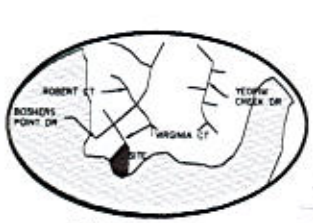
PATIO CROSS-SECTION



Thomas + Judith Lampley
108 Virginia Ct
Hertford, NC 27944
7-24-18

Received

DCM-EC



VICINITY MAP

YEOPIM CREEK

LINE TABLE		
LINE	BEARING	DISTANCE
L11	S37° 44' 00"E	14.76
L1	N88° 08' 42"W	44.04
L2	N73° 21' 49"W	29.59
L5	N87° 23' 46"W	14.84
L10	N28° 06' 08"W	34.03

CURVE TABLE						
CURVE	ARC LENGTH	RADIUS	TANGENT	DELTA	CHORD BEARING	CHORD LENGTH
C1	24.42'	50.00'	12.46	27°58'08"	S51° 43' 44"E	24.18'

NOTE:
BEING LOT 19 OF PHASE 3 OF SECTION EE, "BOSHER'S POINT", OF ALBEMARLE PLANTATION SUBDIVISION AS RECORDED IN P.C. 2, SLD. 108, MAP 8.

SUBJECT PARCEL IS FOUND IN FLOOD ZONES AS SHOWN, SCALED FROM FIRM PANEL 3270786600J, DATED OCTOBER 5, 2006.

GRADES SHOWN APPROXIMATE

I, EDWARD T. HYMAN, JR. CERTIFY THAT THIS PLAT WAS DRAWN FROM AN ACTUAL FIELD LAND SURVEY MADE UNDER MY SUPERVISION; THAT THE DEED DESCRIPTION FOR SAID PROPERTY IS RECORDED IN D.B. 333, P. 641; THAT THE ERROR OF CLOSURE IS 1:10,000+ ; THAT ALL AREA CALCULATIONS ARE BY D.M.D; THAT THIS MAP WAS PREPARED IN ACCORDANCE WITH GS 47-30; WITNESS MY ORIGINAL SIGNATURE, REG. NUMBER, AND SEAL THIS 17 DAY OF MARCH, 2010.

NORTH CAROLINA PROFESSIONAL SEAL L-2690 LAND SURVEYOR EDWARD T. HYMAN, JR.

EDWARD T. HYMAN, JR.
P.L.S. L-2690

Received
JUL 2 4 2010
DCM-EC

VIRGINIA COURT (50' R/W)

LEGEND
EXISTING IRON PIN
CALCULATED CORNER
PROPERTY LINE
R/W LINE
PROPERTY EXTENSION
EASEMENT SETBACK
EASEMENT CAMA
BULKHEAD
FLOODZONE

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

HYMAN ROBEY
SOLUTIONS FROM THE GROUND UP
150 US Hwy 158 E.
PO Box 339
Camden, NC 27921
(252) 338-2913
(252) 338-5552 fax
www.hymanrobey.com
License C-0598

SURVEY FOR THOMAS S. & JUDITH A. LAMPLEY

BETHEL TOWNSHIP
PERQUIMANS COUNTY
NORTH CAROLINA

KEY PLAN:

Project #: 100057
Drawing #: 100057
Drawn: TWR
Checked: ETH
Approved: ETH
Date: 03/17/10
Sheet #: 01/01
Scale: 1:20

REVISIONS:
NUM. DATE DESCRIPTION

SHEET TITLE:
SURVEY

SHEET NUMBER:
1

NC Division of Coastal Management
Cashier's Official Receipt

6651 (A) B C D

Date: 7/24 2018

Received From: Judith Langley

$ 100.00

Permit No.: Minor Permit

Check No.: 7434

Applicant's Name: Judith Langley

County: Perquimans

Project Address: 108 Virginia Ct.

Please retain receipt for your records as proof of payment for permit issued.

Signature of Agent or Applicant: _____ Date: _____

Signature of Field Representative: Ella Godfrey for Frank Jennings Date: 7/24/18

CERTIFIED MAIL, RETURN RECEIPT REQUESTED or HAND DELIVERED

7/24/18
Date

Mike + MARY ANNE Cassidy
Name of Adjacent Riparian Property Owner

106 VIRGINIA CT
Address

HERTFORD, NC 27944
City, State Zip

Received
JUL 24 2018
DCM-EC

To Whom It May Concern:

This correspondence is to notify you as a riparian property owner that I am applying for a CAMA Minor permit to install a pervious paver patio + fire pit on my property at 108 Virginia Ct, Hertford, NC 27944, in Perquimans County, which is adjacent to your property. A copy of the application and project drawing is attached/enclosed for your review.

If you have no objections to the proposed activity, please mark the appropriate statement below and return to me as soon as possible. If no comments are received within 10 days of receipt of this notice, it will be considered that you have no comments or objections regarding this project. If you have any questions about the project, please do not hesitate to contact me at my address/number listed below.

If you have objections or concerns about the project, please mark the appropriate statement below and send your correspondence to the NC Division of Coastal Management (DCM) at 401 S. Griffin St., Ste 300, Elizabeth City, NC 27909. The staff at DCM can be reached at 252-264-3901

Sincerely,

Judith A. Lampley
Property Owner's Name

252-232-8677
Telephone Number

Judith A. Lampley

Address City State Zip

✓ I have no objection to the project described in this correspondence.
____ I have objection(s) to the project described in this correspondence.

Mary A Cassidy
Adjacent Riparian Signature

7/23/18
Date

MARY A. CASSIDY
Print or Type Name

252 426 1819
Telephone Number

Address City State Zip

CERTIFIED MAIL, RETURN RECEIPT REQUESTED or HAND DELIVERED

7/24/18
Date

William + Helen Wilcox
Name of Adjacent Riparian Property Owner
110 VIRGINIA CT
Address
Hertford, NC 27944
City, State Zip

Received
JUL 24 2018
DCM-EC

To Whom It May Concern:

This correspondence is to notify you as a riparian property owner that I am applying for a CAMA Minor permit to install a permeable paver patio and fire pit on my property at 108 VIRGINIA CT, HERTFORD, NC 27944, in Perquimans County, which is adjacent to your property. A copy of the application and project drawing is attached/enclosed for your review.

If you have no objections to the proposed activity, please mark the appropriate statement below and return to me as soon as possible. If no comments are received within 10 days of receipt of this notice, it will be considered that you have no comments or objections regarding this project. If you have any questions about the project, please do not hesitate to contact me at my address/number listed below.

If you have objections or concerns about the project, please mark the appropriate statement below and send your correspondence to the NC Division of Coastal Management (DCM) at 401 S. Griffin St., Ste 300, Elizabeth City, NC 27909. The staff at DCM can be reached at 252-264-3901

Sincerely,

Judith A. Lampley
Property Owner's Name

252-232-8677
Telephone Number

Judith A. Lampley

Address City State Zip

X I have no objection to the project described in this correspondence.
____ I have objection(s) to the project described in this correspondence.

Helen H Wilcox
Adjacent Riparian Signature

7/23/18
Date

Helen H Wilcox
Print or Type Name

252-426-3356
Telephone Number

Address City State Zip

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

July 30, 2018

CERTIFIED MAIL - #7017 2680 0000 7708 8911 & Electronically
RETURN RECEIPT REQUESTED

Thomas S. & Judith A. Lampley
108 Virginia Court
Hertford, NC 27944

RE: DENIAL OF CAMA MINOR DEVELOPMENT PERMIT
APPLICATION NUMBER- 20180725
PROJECT ADDRESS- 108 Virginia Court, Hertford, Yeopim Creek

Dear Mr. & Mrs. Lampley:

After reviewing your application in conjunction with the development standards required by the Coastal Area Management Act (CAMA) and the Perquimans County Land Use Plan, 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:

(1) Your request violates NCGS 113A-120(a)(8) which requires that all applications be denied which are inconsistent with CAMA guidelines and Local Land Use Plans. You have applied for approval of an approximately 450 sq. ft. brick paver patio and fire pit constructed adjacent to Yeopim Creek and within the Public Trust Shoreline Area of Environmental Concern which is inconsistent with 15 NCAC 7H.0209 (d)(10), which states in relevant part:

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

Further, DCM finds that the brick paver patio and fire pit do not fall within the exception at 15A NCAC 7H.0209(d)(10)(G), which allows

> "(G) Grading, excavation and landscaping with no wetland fill except when required by a permitted shoreline stabilization project. Projects shall not increase stormwater runoff to adjacent estuarine and public trust waters."

(2) Your request violates 15A NCAC 7J.0204(e), which states:

> "Any violation occurring at a proposed project site for which an application is being reviewed shall be processed according to the procedures in 15A NCAC 7J.0408 – 0410 (DCM's enforcement process). If the violation substantially altered the proposed project site, and restoration is deemed necessary, the applicant shall be notified that processing of the application will be suspended pending compliance with the notice of required restoration. Satisfactory restoration of any unauthorized development that has substantially altered a project site is deemed necessary to allow a complete review of the application and an accurate assessment of the project's potential impacts. The applicant shall be notified that permit processing has resumed, and that a new processing deadline has been established once the required restoration has been deemed satisfactory by the Division of Coastal Management or Local Permit Officer."

Notice of Violation #17-15A was issued to you, from our office, on September 25, 2017 for the unauthorized construction of this project.

(3) Your request also violates NCGS 113A-120(a)(8), which requires that all applications be denied which are inconsistent with the Perquimans County Land Use Plan, specifically those portions which support the CAMA permitting process and standards.

Should you wish to appeal my decision to the Office of Administrative Hearings (OAH) or request a variance from the Coastal Resources Commission, please contact me so I can provide you with the proper forms and any other information you may require. The Division of Coastal Management central office in Morehead City must receive OAH appeal notices within twenty (20) days of the date of this letter in order to be considered. The deadline for submitting a petition for a variance from the CRC at their September meeting is August 8.

Respectfully yours,

Frank Jennings

Frank Jennings, District Manager
Northeastern District
Division of Coastal Management

cc: Braxton Davis, Director DCM, Morehead City
Christine Goebel, Assistant General Counsel, NCDEQ
Charles Evans, Esq.

KELLOGG AND EVANS, P.A.
ATTORNEYS AT LAW

CHARLES D. EVANS

MARTIN KELLOGG, JR.
1908-2001

P.O. BOX 189
MANTEO, NC 27954

DELIVERY ADDRESS:
201 ANANIAS DARE STREET
MANTEO, N.C. 27954

TELEPHONE: (252) 473-2171
FACSIMILE: (252) 473-1214

EMAIL ADDRESS:
charlese@kelloggandevans.com
becky@kelloggandevans.com

August 8, 2018

Mike and Mary Anne Cassidy
106 Virginia Court
Hertford, NC 27944

Re: Lampley Variance Petition for Project Approval

Dear Mr. and Mrs. Cassidy:

I am writing to you today on behalf of my clients, Thomas and Judith Lampley, the record owner of the property located at 108 Virginia Court, Hertford, North Carolina 27944; the same subject property being that which is located adjacent to the property you own.

As you may know, the Lampleys are requesting a CAMA Variance in order to gain approval of their paver brick patio and fire pit installed without permit.

If you have any questions or comments regarding this letter, please do not hesitate to contact attorney Charles D. Evans or a member of the Division of Coastal Management with comments or concerns (DCM, 401 S. Griffin St., Suite 300, Elizabeth City, 27909).

Best regards,

Charles D. Evans

CDE/rae
CC: Thomas and Judith Lampley (transmitted via email only)

SENDER: COMPLETE THIS SECTION

- Complete items 1 item 4 if Restricte
- Print your name a so that we can re
- Attach this card t or on the front if s

1. Article Addressed to

Mike + M
106 Virgi
Hertford

2. Article Number (Transfer from servic

PS Form 3811, July

078

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

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

OFFICIAL USE

Certified Mail Fee	3.45
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	2.75
☐ Return Receipt (electronic)	
☐ Certified Mail Restricted Delivery	
☐ Adult Signature Required	
☐ Adult Signature Restricted Delivery	
Postage	.47
Total Postage and Fees	6.67

Sent To: Mike + Mary Ann Cassidy
Street and Apt. No., or PO Box No.: 106 Virginia Ct.
City, State, ZIP+4®: Hertford NC 27944

MANTEO NC 27954-9998
Postmark Here
AUG - 8 2018
USPS

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

7016 1370 0002 2519 4389

☐ Agent
☐ Addressee
Date of Delivery
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Street and Apt. No., or PO Box No.: 106 Virginia Ct.
City, State, ZIP+4®: Hertford NC 27944

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

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Mike + MaryAnn Cassidy
106 Virginia Ct.
Hertford, NC 27944

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A. Signature
X Mary A. Cassidy ☐ Agent ☒ Addressee

B. Received by (Printed Name) MARY A. CASSIDY C. Date of Delivery 8/13/18

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1. Article Addressed to:

William + Helen Wilcox
110 Virginia Ct.
Hertford, NC 27944

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A. Signature
X William Wilcox ☐ Agent ☐ Addressee

B. Received by (Printed Name) WILLIAM WILCOX C. Date of Delivery

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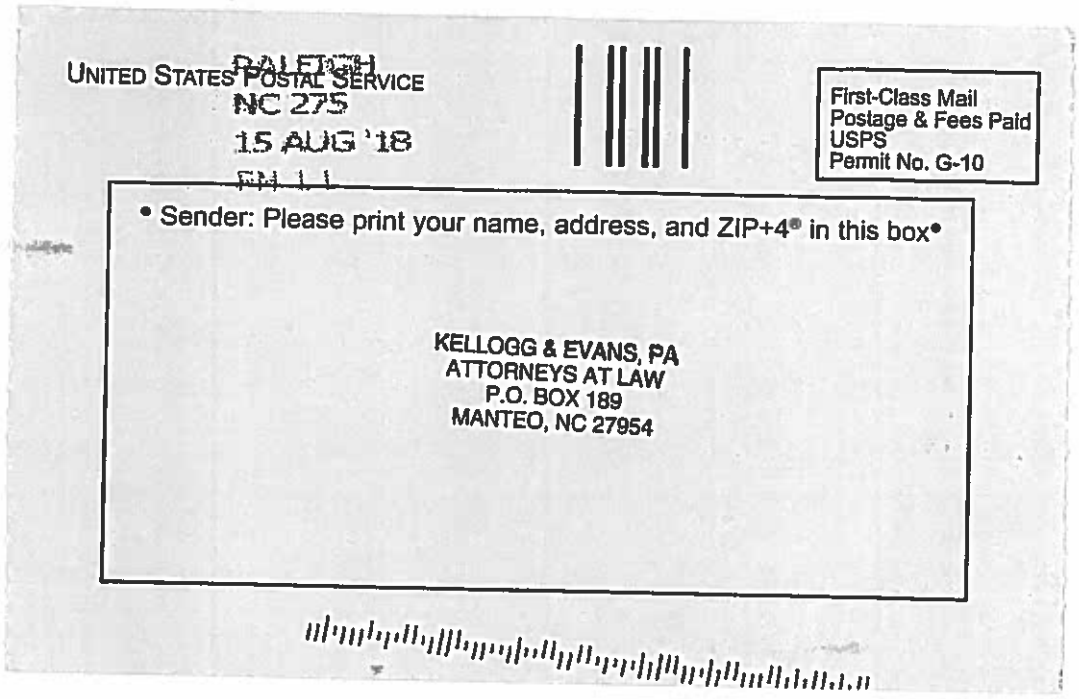
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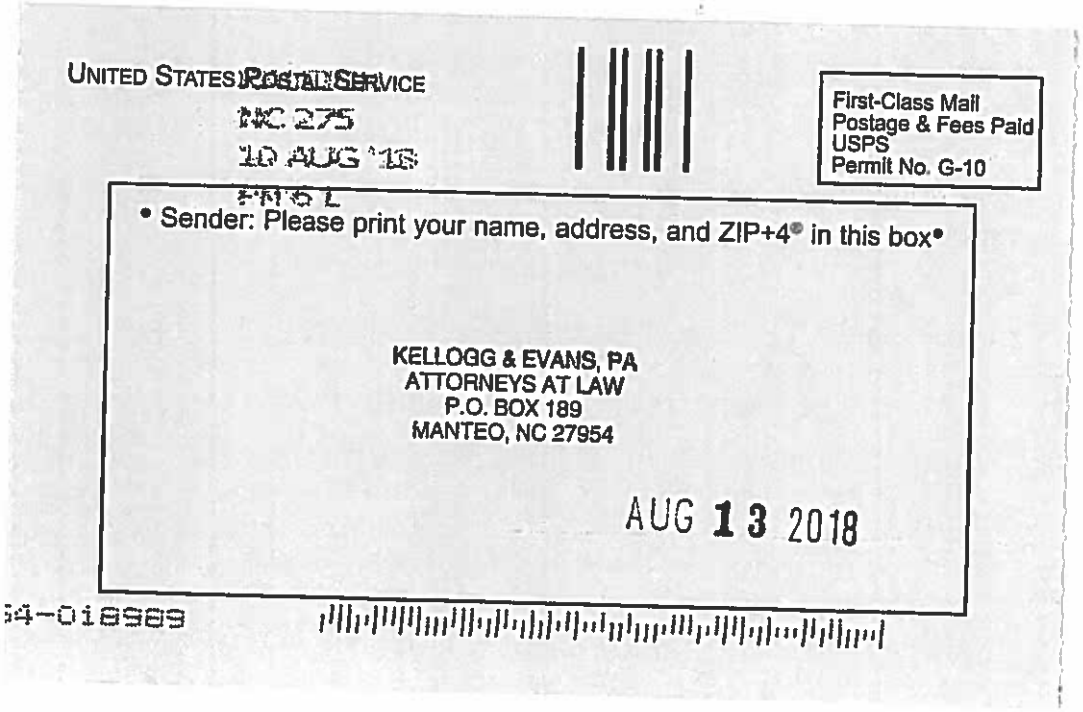
KELLOGG & EVANS, PA
ATTORNEYS AT LAW
P.O. BOX 189
MANTEO, NC 27954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MANTEO, NC 27954
AUG 13 2018
54-018989

KELLOGG AND EVANS, P.A.
ATTORNEYS AT LAW

P.O. BOX 189
MANTEO, NC 27954

CHARLES D. EVANS

MARTIN KELLOGG, JR.
1908-2001

DELIVERY ADDRESS:
201 ANANIAS DARE STREET
MANTEO, N.C. 27954

TELEPHONE: (252) 473-2171
FACSIMILE: (252) 473-1214

EMAIL ADDRESS:
charlese@kelloggandevans.com
becky@kelloggandevans.com

August 8, 2018

William and Helen Wilcox
110 Virginia Court
Hertford, NC 27944

Re: Lampley Variance Petition for Project Approval

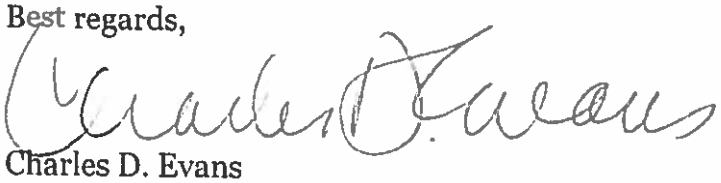
Dear Mr. and Mrs. Wilcox:

I am writing to you today on behalf of my clients, Thomas and Judith Lampley, the record owner of the property located at 108 Virginia Court, Hertford, North Carolina 27944; the same subject property being that which is located adjacent to the property you own.

As you may know, the Lampleys are requesting a CAMA Variance in order to gain approval of their paver brick patio and fire pit installed without permit.

If you have any questions or comments regarding this letter, please do not hesitate to contact attorney Charles D. Evans or a member of the Division of Coastal Management with comments or concerns (DCM, 401 S. Griffin St., Suite 300, Elizabeth City, 27909).

Best regards,



Charles D. Evans

CDE/rae
CC: Thomas and Judith Lampley (transmitted via email only)

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William + Helen Wilco
110 Virginia Ct.
Hertford, NC 279

2. Article Number
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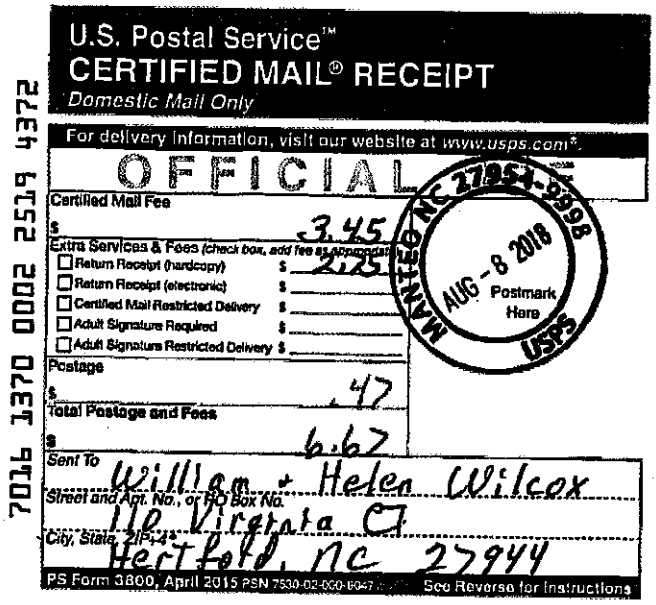
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AFFIDAVIT

STATE OF NORTH CAROLINA:

COUNTY OF PERQUIMANS:

The undersigned being duly sworn, hereby deposes and says:

1. I purchased the property specifically because of its location and ability to enjoy this particular amenity – a patio and fire pit from which to enjoy the water proximity and view.
2. Since purchasing the property, I have envisioned a patio and fire pit at the exact location currently at issue for the purpose of enjoying the view.
3. At no time prior to installation of the fire pit and patio was I aware that a permit of any kind was needed in order to install and maintain same.

I declare that to the best of my knowledge and belief, the information herein is true, correct, and complete.

Executed this 21st day of August 2018.

Judith A. Lampley

Judith A. Lampley

NOTARY PUBLIC ACKNOWLEDGMENT

STATE OF NORTH CAROLINA, COUNTY OF PERQUIMANS, ss:

Subscribed and sworn to before me on the 21st day of August, 2018, by JUDITH A. LAMPLEY.

Notary Public for North Carolina

My Commission Expires: 4/2/21

SHAYNE C. BYRUM NOTARY PUBLIC CHOWAN COUNTY, NC

AFFIDAVIT

STATE OF NORTH CAROLINA:

COUNTY OF PERQUIMANS:

The undersigned being duly sworn, hereby deposes and says:

1. I purchased the property specifically because of its location and ability to enjoy this particular amenity – a patio and fire pit from which to enjoy the water proximity and view.
2. Since purchasing the property, I have envisioned a patio and fire pit at the exact location currently at issue for the purpose of enjoying the view.
3. At no time prior to installation of the fire pit and patio was I aware that a permit of any kind was needed in order to install and maintain same.

I declare that to the best of my knowledge and belief, the information herein is true, correct, and complete.

Executed this 21st day of August 2018.

Thomas S. Lampley

NOTARY PUBLIC ACKNOWLEDGMENT

STATE OF VIRGINIA:

Subscribed and sworn to before me on the 21st day of August, 2018, by THOMAS S. LAMPLEY.

Notary Public for Virginia

My Commission Expires: 7/31/2022

VANESSA Y THOMPKINS
Notary Public
Commonwealth of Virginia
Registration No. 322984
My Commission Expires Jul 31, 2022

AFFIDAVIT

STATE OF NORTH CAROLINA:

COUNTY OF CHOWAN:

The undersigned being duly sworn, hereby deposes and says:

1) I am a North Carolina Licensed Landscape Contractor (License #0739).

2) My company, Lazy Weekends Landscaping and Yard Care, located in Edenton, NC, installed the patio and fire pit in question at 108 Virginia Court, Hertford, NC.

3) The patio and fire pit were constructed by excavating approximately 7 inches down and lining the bed with landscaping fabric. The bed was then filled with 4 inches of ABC aggregate (also called Crush 'n Run) for the base and then 1 inch of bedding sand and the pavers on top of that. The pavers, which are 2.3 inches thick, are laid in a random pattern. (See Attachment A.)

4) As a result of the materials used and the method of installation, the patio and fire pit are permeable and run off, if any, is reduced.

5) Should the fire pit and patio be moved back 30' from the water, they would be installed within a couple of feet of several full-size oak trees. Such installation could disturb the roots of the trees possibly causing irreversible damage to the trees. (See Attachments B and C.)

6) Should the fire pit and patio be removed and replaced with lawn, the fertilizer and herbicides used on the lawn would be more detrimental to the environment than the current patio and fire pit.

I declare that to the best of my knowledge and belief, the information herein is true, correct, and complete.

Executed this 27th day of August 2018.

Sean Tunney

NOTARY PUBLIC ACKNOWLEDGMENT

STATE OF NORTH CAROLINA, COUNTY OF PERQUIMANS, ss:

Subscribed and sworn to before me on the 27th day of August, 2018, by SEAN TUNNEY.

Logan Overton

Notary Public for North Carolina

My Commission Expires: 12/31/22

LOGAN OVERTON
Notary Public
State of North Carolina
Perquimans County
My Commission Expires 12/31/2022

CONSTRUCTION ENGINEERING SERVICES, INC.

P.O. BOX 665
MANTEO, NC 27954
PHONE: (252) 473-9733

OFFICE: 33 HAMMOCK DRIVE
MANTEO, NC 27954
FAX: (252) 473-4191

October 9, 2018

Thomas and Judith Lampley
108 Virginia Court
Hertford, NC 27944

Reference: Patio and fire pit at 108 Virginia Court, Hertford, NC

Thomas and Judith:

On October 3, 2018, we inspected the installation of the concrete paver patio and fire pit at the above referenced residence. The patio and fire pit are located along the southwest side of the property just behind and abutting the existing timber bulkhead along the Yeopim Creek shoreline. The patio runs for approximately 42 LF along the bulkhead line and extends approximately 21 LF back toward the house at its widest point. The 52 inch diameter fire pit is located near the center of this widest area. Both the patio and the fire pit have an underlying layer of pervious material that was placed during the patio construction. The pavers were laid over a 4" thick layer of crushed stone which was topped with a 1 inch thick layer of porous bearing sand. The 2.3 inch thick pavers were then set with an 1/8 inch gap between each paver. These 1/8 inch gaps were also filled with the porous bearing sand. The finished grade of the pavers is slightly below that of the bulkhead cap so that if there was any runoff it would be retained on the patio and not flow into the creek water. However, the gaps between the pavers provide sufficient pervious surface so that there is no ponding or runoff on the patio surface. Additionally, the 4 inch crushed stone base along with the 1 inch bedding sand layer provides a detention area to allow for temporary storage of any accumulated stormwater until it percolates into the ground.

The fire pit has a small gas burner just below the top edge and the remainder of the 52 inch diameter pit is filled with glass pebbles over porous bearing sand and is free draining into the crushed stone base layer.

In conclusion, the way this patio and fire pit have been designed and constructed there will be no stormwater runoff into Yeopim Creek. The stormwater will be contained on and under the patio surface as it filters into the ground. If you have any questions or if you need any additional information please contact us.

Very truly yours,
CONSTRUCTION ENGINEERING SERVICES, INC.

Hal Goodman

Hal Goodman, P.E., SECB
President

NORTH CAROLINA PROFESSIONAL SEAL 20446 ENGINEER HAROLD JAY GOODMAN
Harold Jay Goodman
10-9-18

C-5. Permeable Pavement

Design Objective

Permeable pavement captures stormwater through voids in the pavement surface and filters water through an underlying aggregate reservoir. The reservoir typically allows the water to infiltrate into the soil subgrade. The reservoir can also be designed to detain and release the water to a surface conveyance system if the underlying soil is not suitable for infiltration.

The purpose of permeable pavement is to control the quality and quantity of stormwater runoff while accommodating pedestrians, parking and possibly traffic (if adequate structural support is provided). Permeable pavement is especially useful in existing urban development where the need to expand parking areas is hindered by lack of space needed for stormwater management. Permeable pavement is also useful in new developments with limited space where land costs are high, and when nutrient reductions or green building certification program are desired.

Design Volume

The design volume for an infiltrating pavement system is equivalent to the volume that is stored in the aggregate and infiltrated into the ground within a 72-hour period. The design volume for a detention pavement system is the volume that is release slowly from the aggregate for a two to five-day period.

Important Links

Rule 15A NCAC 2H .1055. MDC for Permeable Pavement

SCM Credit Document, C-5. Credit for Permeable Pavement

Table of Contents

Built-upon Area Credit for Infiltrating Pavement

Infiltrating permeable pavement that is designed per the MDC may be considered as 100% pervious for the following purposes:

1. On new projects: As a tool to keep a project below the BUA threshold for high density or to reduce the volume of the SCM that is treating the balance of the project.

2. On existing projects: As a tool to add a driveway, parking area, road, patio or other paved area while still adhering to a BUA restriction imposed by development covenants, SCM design or permit conditions.

The BUA credit for infiltrating permeable pavement cannot be used to create an exemption from the permit requirements in 15A NCAC 02H .1019(2)(c) [Coastal Stormwater Requirements], because the permeable pavement must be reviewed to determine whether it meets the MDC.

Figure 1. Permeable Pavement Example: Cross-Section (NCSU-BAE)

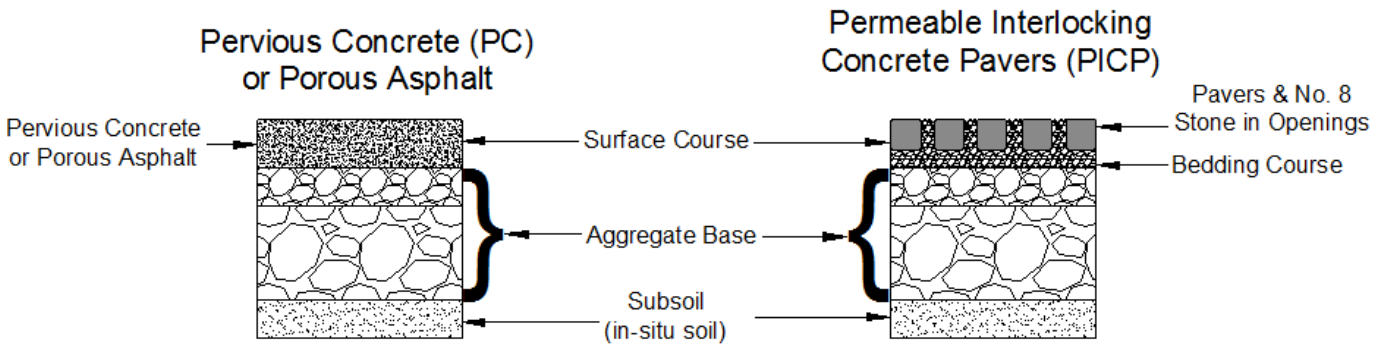
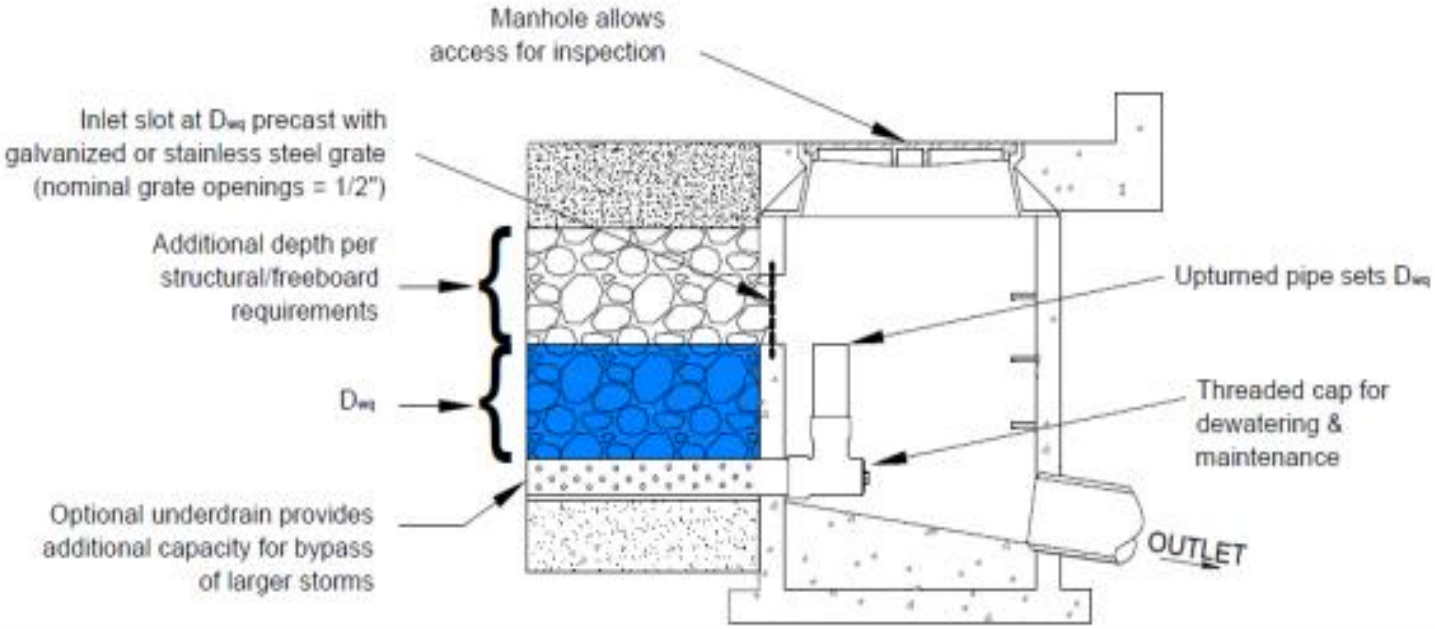


Figure 2. Permeable Pavement Example: Outlet for Infiltration System (NCSU-BAE)



Guidance on the MDC

PERMEABLE PAVEMENT MDC 1: SOIL INVESTIGATION
For infiltrating pavement systems, site-specific soil investigation shall be performed to establish the hydraulic properties and characteristics within the proposed footprint and at the proposed elevation of the permeable pavement system.

Guidance on soil testing is provided in Chapter A-2.

PERMEABLE PAVEMENT MDC 2: SHWT REQUIREMENTS
The minimum separation between the lowest point of the subgrade surface and the SHWT shall be:

(a) two feet for infiltrating pavement systems; however, the separation may be reduced to no less than one foot if the applicant provides a hydrogeologic evaluation that demonstrates that the water table will subside to its pre-storm elevation within five days or less; and
(b) one foot for detention pavement systems.

Guidance on soil testing and hydrogeologic evaluation is provided in Chapter A-2.

PERMEABLE PAVEMENT MDC 3: SITING
Permeable pavement shall not be installed in areas where toxic pollutants are stored or handled.

Permeable pavement shall not be used in areas where concentrations of oils and grease, heavy metals and toxic chemicals are likely to be significantly higher than in typical stormwater runoff. Installing permeable pavement in these areas increases the risk of these pollutants entering the groundwater. Examples of development types that often include stormwater hotspots are listed below. However, this is not a comprehensive list. Only the portion of the site where toxic pollutants are stored or handled is considered a hotspot. For example, the parking lot of an airport would not be a hotspot but the airplane hangar and maintenance areas are hotspots.

Table 1: Hot Spots Where Permeable Pavement may not be Appropriate

Fueling facilities	SIC code “heavy” industries	Commercial car washes
Fleet storage	Airport maintenance areas	Public works yards
Trucking & distribution centers	Wastewater treatment plants	Road maintenance areas
Vehicle maintenance areas	Racetracks	Scrap yards
Solid waste facilities	Railroads and bulk shipping	Landfills

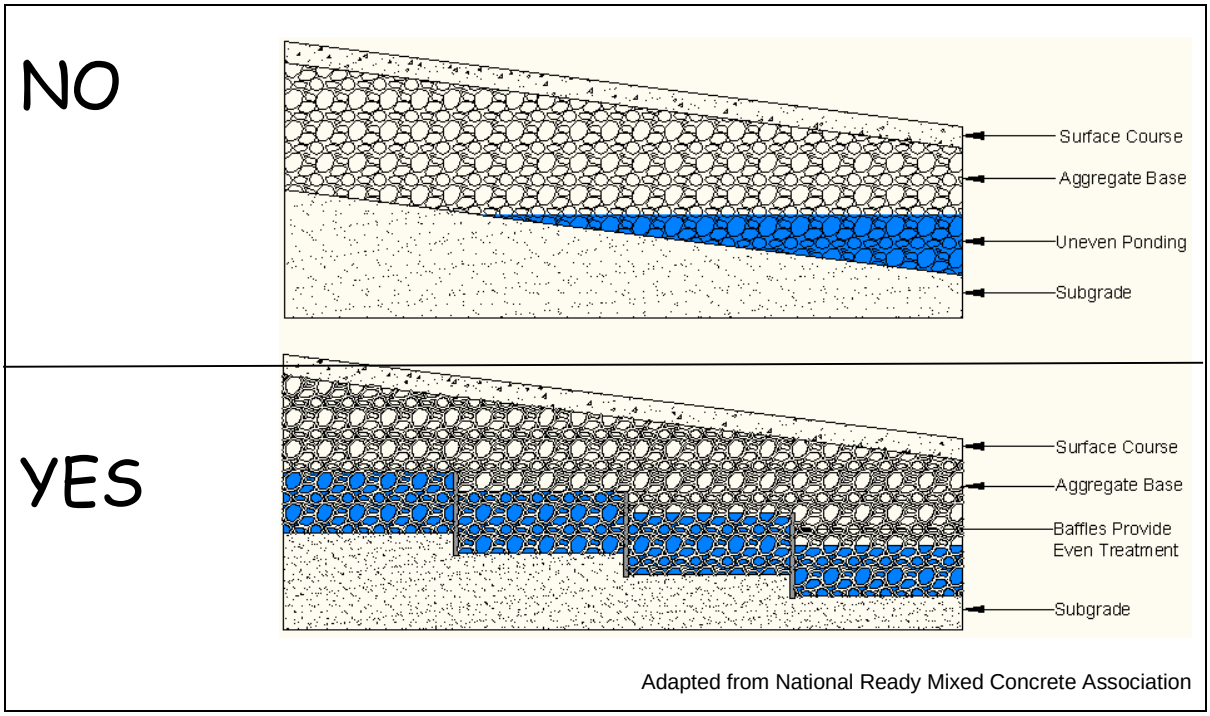
Care should be taken when implementing permeable pavement at redevelopment sites. Stormwater shall not be infiltrated into contaminated soils because this can cause dispersion of toxic substances to other sites and to groundwater. However, a permeable pavement system designed for detention may work on a contaminated site. If the site history includes land uses listed above, it shall be assumed that contaminated soils are present until detailed investigation determines otherwise. If contaminated soils are present or suspected, the DEQ recommends that the designer consult with an appropriately licensed NC professional.

PERMEABLE PAVEMENT MDC 4: SOIL SUBGRADE SLOPE
The soil subgrade surface shall have a slope of less than or equal to two percent.

Whether is the pavement is designed for infiltration or detention, it is crucial that the subgrade be almost flat, i.e., less than or equal to a 2% slope. Besides maximizing infiltration, a flat subgrade provides the most storage capacity within the aggregate base.

Terraces and baffles or graded berms can be used in the subgrade design to store stormwater at different elevations for treatment. See Figure 3 below for a schematic configuration of terraces and baffles in the subgrade. The plan drawing set shall include a separate subsurface (subgrade) grading plan, especially for sites with baffles, berms or terraces.

Figure 3. Terraces and Baffles under Permeable Pavement. (NCSU-BAE)



PERMEABLE PAVEMENT MDC 5: STONE BASE
Washed aggregate base materials shall be used.

In addition to supporting the pavement system, the aggregate base stores the design storm within its void spaces for infiltration or detention and release. The size of the aggregate base stone is selected by the designer based on the needs for structural strength and porosity. The aggregate shall be washed and have 2% or less passing the ASTM No. 200 sieve. If the aggregate is not washed, then the fines that are interspersed with it will eventually was to the top of the subgrade and possibly clog the in-situ soils, preventing infiltration. The aggregate supplier can likely provide the percentage of voids using ASTM C29 *Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate*. **The only way to be certain that the aggregate has been washed is to be present on the site when it is delivered.**

Equation 1 can be used to determine the depth of aggregate needed for the design volume. Please note that the bedding layer of aggregated in a PICP system may not be used to provide storage for the water quality storm.

Equation 1: Aggregate Depth for the Design Storm (D_{wq})

$$D_{wq} = \frac{P(1+R)}{n}$$

where:
- D_{wq} = Depth of aggregate needed to treat the water quality storm (inches)
- P = Rainfall depth for the water quality storm (inches)
- R = A_a/A_p, ratio of the additional BUA to permeable pavement area
- N = Percent voids, unitless decimal (from ASTM C29)

PERMEABLE PAVEMENT MDC 6: PAVEMENT SURFACE
The proposed pavement surface shall have a demonstrated infiltration rate of at least 50 inches per hour using a head less than or equal to 4 inches.

The pavement surface should be selected based on the desired appearance and the types of applied loads on the permeable pavement. Currently, the most widely used types of pavement courses applied in North Carolina are Permeable Interlocking Concrete Pavers (PICP), Pervious Concrete (PC) and Porous Asphalt (PA). Please note that PA and PICP are flexible pavement and rely on structural support from the aggregate base.

Designers may propose other types of pavement surface and base courses but shall demonstrate that the proposed design functions adequately hydraulically and structurally in the long term. See Table 2 below for a summary of the most commonly used pavement courses and some pros and cons of each.

Table 2: Permeable Pavement Types

Type of Pavement	DEQ Guidance
Permeable Interlocking Concrete Pavers (PICP) 	PICPs are a type of unit paving system that drains water through joints between the pavers filled with small, highly permeable aggregates. The pavers are placed on a thin aggregate bedding layer over a thicker choker course and base beneath. The choker course and aggregate base provide uniform support, water storage and drainage. **Pros:** Well suited for plazas, patios, small parking areas and stalls, parking lots and residential streets. PICP can be designed for a significant load of heavy vehicles and does not require curing time. As compared to PC and PA, PICP is easier and less costly to renovate if it becomes clogged. The Interlocking Concrete Pavement Institute offers a design guide, construction specifications, design software, and a Certified PICP Specialist Course for contractors. **Cons:** PICP often has the highest initial cost for materials and installation. Regular maintenance of PICP may be higher than PC and PA because of the need to refill the joints with aggregate after cleaning and the greater occurrence of weeds.
Pervious Concrete (PC) 	PC is produced by reducing the fines in a conventional concrete mix with other changes to create interconnected void spaces for drainage. Pervious concrete has a coarser appearance than standard concrete although mixtures can be designed to provide a denser, smoother surface profile than traditional pervious concrete mixtures. **Pros:** While not as strong as conventional concrete pavement, PC provides adequate structural support, making it a good choice for travel lanes or heavier vehicles in addition to parking areas and residential streets. The National Ready Mixed Concrete Association provides a contractor training and certification program. The American Concrete Institute publishes a construction specification and a report which provides guidance on structural, hydrological and hydraulic system and component design in addition to mix proportioning and maintenance. **Cons:** Mixing and installation must be done correctly or PC will not function properly. PC can be subject to surface raveling and deicing salt degradation if not designed and constructed properly. Restoring surface permeability after a significant loss of initial permeability may be difficult without removing and replacing the surface course for the affected area.

Porous Asphalt (PA)

PA is like conventional (impervious) asphalt except that less fine material is used in the mixture to provide for drainage, resulting in has a coarser appearance than conventional asphalt. A modified asphalt binder as specified by the Carolina Asphalt Pavement Association (CAPA) shall be used to ensure long term durability and permeability.

Pros: While not as strong as conventional asphalt pavement, PA offers sufficient structural strength for parking lots and streets. The National Asphalt Pavement Association (NAPA) provides a design, construction and maintenance guide for porous asphalt titled *Porous Asphalt Pavement for Stormwater Management*. CAPA provides a *Porous Asphalt Guide Specification* for the Carolinas. Training on PA for engineers and contractors is available through CAPA. For information regarding the use of PA and to obtain a list of qualified contractors, contact CAPA at: www.carolinaasphalt.org.

Cons: Mixing and installation must be done correctly or PA will not function properly. The owner, contractor and designer shall ensure that PA is not confused with standard asphalt. Asphalt sealants or overlays that eliminate surface permeability shall not be used. Restoring surface permeability after a significant loss of initial permeability may be difficult without removing and installing a portion of the surface course.

Concrete Grid Pavers (CGP)

CGPs are an "older cousin" to PICPs and have significantly larger openings filled with aggregates, sand, or topsoil and turf grass for infiltration. CGPs are intended for limited vehicular traffic such as overflow parking (e.g., intermittent stadium parking), emergency access fire lanes around buildings, and median crossovers. CGP is not recommended for regularly used parking areas and for roads intended for PICP or PC.

Pros: CGP is less expensive than PICP and CGP can provide a grassed surface. Design, construction and maintenance guidance is available from the Interlocking Concrete Pavement Institute.

Cons: CGP is intended for limited vehicular traffic and overloaded pavements often experience differential settlement and paving unit damage. CGP with grass requires mowing and may require watering, fertilizing and re-seeding.

Plastic Turf Reinforcing Grid (PTRG)

PTRG, also called geocells, consists of flexible plastic interlocking units that infiltrate water through large openings filled with aggregate or topsoil and turf grass. PTRG is well suited for emergency vehicle access over lawn areas or overflow parking. PTRG is not approved for regularly used vehicular areas such as parking lots or roadways where PICP or PC should be used.

Pros: Reduces expenses and maximizes lawn area.

Cons: PTRG has less structural strength than the other pavement course options, especially when used under saturated conditions. Like CGP with grass, it shall be mowed, sometimes fertilized and watered. Overuse can kill the turf grass or create ruts from displaced aggregates. Also, sediment from adjacent sources can damage the grass and accelerate clogging.

For PC and PA, it is crucial to specify the proper mix design. For PC, the mix design shall be in accordance with the latest version of ACI 522.1 *Specification for Pervious Concrete*. For PA, the mix design shall be in accordance with NAPA's *Porous Asphalt Pavements for Stormwater Management* and CAPA's *Porous Asphalt Guide Specification*. For PICP, PA and PC, the use of certified and qualified contractors in accordance with industry standard documents shall be required and noted on both project plans and specifications.

For all types of permeable pavement, follow manufacturer recommendations, product standards, and industry guidelines to help ensure lasting installations. Manufacturer requirements and industry standards shall be implemented in addition to (and not instead of) the design requirements in this manual. Designers who propose to use a pavement surface other than PICP, PC or PA shall demonstrate that the pavement will function adequately hydraulically and structurally in the long term.

PERMEABLE PAVEMENT MDC 7: RUNOFF FROM ADJACENT AREAS

Runoff to the permeable pavement from adjacent areas shall meet these requirements:

(a) The maximum ratio of additional built-upon area that may drain to permeable pavement is 1:1. Screened rooftop runoff shall not be subject to the 1:1 loading limitation.

(b) Runoff from adjacent pervious areas shall be prevented from reaching the permeable pavement except for incidental, unavoidable runoff from stable vegetated areas.

Whether designed for infiltration or detention, permeable pavement systems may be designed to treat additional BUA up to a 1:1 ratio (additional BUA to pavement area). For example, in the parking lot shown below, the design could include parking stalls with permeable pavement (shaded in light green) and the travel lanes (not shaded) with conventional pavement. The design of the subgrade, aggregate base and underdrain would be tailored to handle the additional stormwater runoff. Impervious areas may drain to the permeable pavement with proper design of the pavement system per this chapter. Examples of areas that may be easily diverted onto the permeable pavement include: travel lanes in parking lots, sidewalks, and roof drains.

Roof downspouts may be directed to the permeable pavement surface, but it is the designer's responsibility to ensure that downspouts are of a sufficient number and spacing to prevent nuisance flooding. The downspouts may also drain directly into the permeable pavement base. Downspout outlets or ground level impervious surfaces shall not drain more than 1,000 sf to a single point onto the permeable pavement. The area of additional BUA draining to the pavement shall not exceed the area of the pavement itself (in other words, a maximum 1:1 ratio of additional BUA to pavement area).

To avoid pavement clogging, pervious areas such as lawns and landscaping shall not drain to permeable pavement. Exceptions such as site restrictions on redevelopment projects will be reviewed on a case-by-case basis. The site plan shall show pervious areas graded to flow away from the pavement or include conveyances to route pervious surface runoff elsewhere.

PERMEABLE PAVEMENT MDC 8: DRAWDOWN TIME
Infiltrating permeable pavement systems shall be designed to dewater the design volume to the bottom of the subgrade surface within 72 hours. In-situ soils may be removed and replaced with infiltration media or infiltration media may be placed on top of in-situ soils if the applicant provides a soils report demonstrates that the modified soil profile allows for infiltration of the design volume within 72 hours.

Before determining drawdown time, the designer should first determine if the site is appropriate for infiltration. In areas where in-situ soils become unstable when saturated, have high shrink-swell tendencies or there is contamination of groundwater or soils, a detention system should be used.

For infiltrating pavement, the designer may use the soil test results to calculate the drawdown time for the depth of stormwater that will be conveyed to the pavement system using Equation 2 below.

Equation 2: Drawdown Time

$$T = \frac{P(1+R)}{24*SF*i}$$

where:

T	=	Drawdown time (days)
P	=	Depth of the design storm (inches)
R	=	A_a/A_p, the ratio of additional BUA to permeable pavement area
SF	=	Safety factor (0.2)
i	=	Measured in-situ soil infiltration rate (in/hr)

If the drawdown time exceeds three days, then the designer can reduce the amount of additional BUA (if any) that drains to the permeable pavement and see if this decreases ponding time to less than five days. Otherwise, the site will require a detention pavement system that detains the stormwater for two to five days. For any site where the stormwater is not predicted to infiltrate within 48 hours, the DEQ advises consulting a geotechnical engineer to ensure that structural pavement design issues are properly addressed.

PERMEABLE PAVEMENT MDC 9: OBSERVATION WELL
Permeable pavement shall be equipped with a minimum of one observation well placed at the low point in the system. If the subgrade is terraced, then there shall be one observation well for each terrace. Observation wells shall be capped.

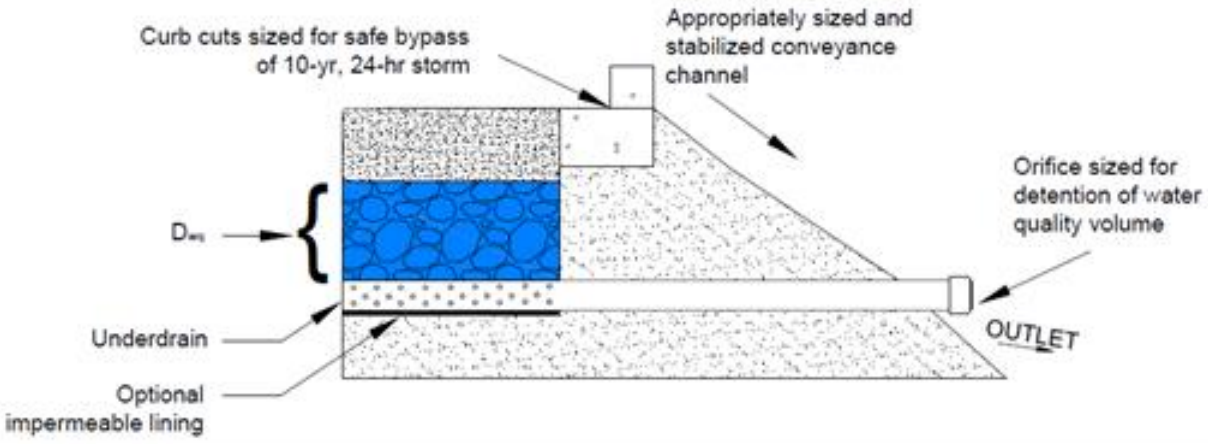
An observation well enables the owner to measure the depth of standing water in the permeable pavement system. Observation wells shall be fitted with a lockable cap installed placed even with the pavement surface to facilitate quarterly inspection.
Observations of the water depth throughout the estimated ponding time (T) indicate the rate of water infiltration. The observation well shall consist of a rigid 4 to 6-inch diameter perforated PVC pipe. The lower end of the PVC pipe should be placed below the elevations of the subgrade surface; therefore, the elevation of water within the pipe will match the elevation of water within the stone base.

Figure 4. Observation Well

PERMEABLE PAVEMENT MDC 10: DETENTION SYSTEMS
Pavement systems may be designed to detain stormwater in the Updated July 19, 2016 aggregate for a period of two to five days.

There are some compelling reasons to design a permeable pavement system for infiltration; it will receive credit for BUA reduction plus a higher pollutant removal credit than a comparably sized detention system. In addition, infiltrating systems are more compatible with a Low Impact Development (LID) approach to stormwater because they can help maintain pre-development hydrology. However, an infiltrating system will not work in all situations.

Figure 4. Permeable Pavement Example: Outlet for Detention System (NCSU-BAE)



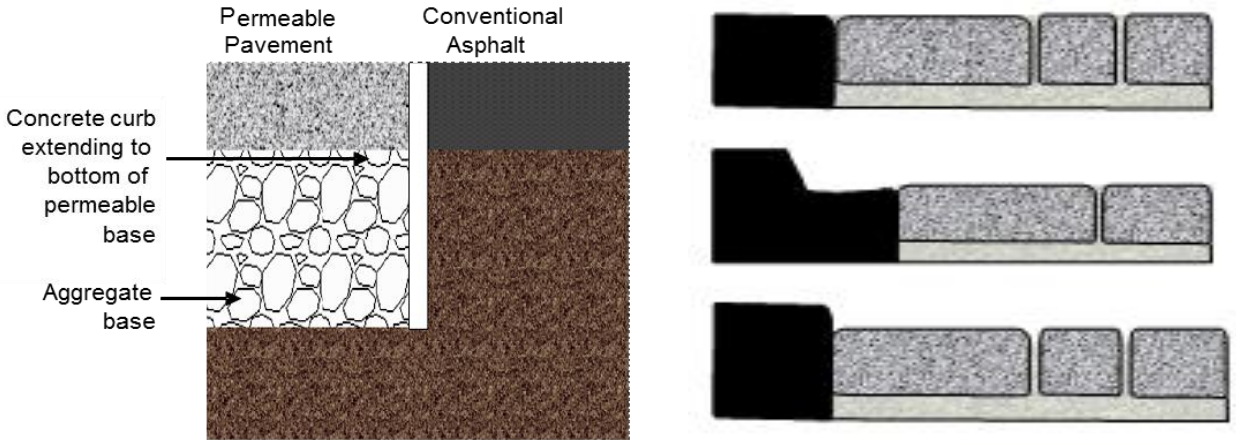
PERMEABLE PAVEMENT MDC 11: EDGE RESTRAINTS
Edge restraints shall be provided around the perimeter of permeable interlocking concrete pavers (PICP) and grid pavers.

Edge restraints are essential to the structural longevity of a PICP pavement system. Without edge restraints, pavers can move over time and reduce the surface's structural integrity. As pavers move, the joints open and pavers can be damaged. PC pavement systems provide adequate structural edge support and do not require perimeter edge restraints. The structural edge of PA systems can be enhanced by an edge restraint; they are recommended for PA, but not required.

Figure 5. Edge Restraints on PICP

Edge restraints shall be flush with the pavement or somewhat higher than the pavement surface. Edge restraints higher than the pavement surface help keep the stormwater on the pavement and prevent stormwater run-on from clogging the permeable pavement. In addition to providing structural support, the PICP can provide an attractive edge. See Figure 6 below for examples of acceptable edge restraints.

Figure 6. Edge Restraints: Example Cross-Sections



In addition to concrete edge restraints, an important consideration is the boundary between permeable and conventional pavement. At intersections between permeable pavement and conventional concrete, a geomembrane barrier should be provided to contain the stormwater under the permeable pavement and protect the base and subgrade under the conventional concrete. There should be a joint between the pavement surfaces for maintenance purposes.

At intersections between permeable pavement and conventional asphalt, a concrete curb that extends below the permeable base should be provided to protect the subgrade under the conventional asphalt. Concrete curbs provide more separation between the pavement courses, which is helpful when the conventional asphalt is resurfaced. An alternative design option uses a concrete curb to protect the asphalt and then an impermeable liner to separate the bases under the asphalt and permeable pavement.

PERMEABLE PAVEMENT MDC 12: GRADE WHEN DRY
The soil subgrade for infiltrating permeable pavement shall be graded when there is no precipitation.

Grading soils when they are wet is almost certain to cause a severe decrease in the soil infiltration rate and might result in a failure of the permeable pavement system.

PERMEABLE PAVEMENT MDC 13: INSPECTIONS AND CERTIFICATIONS
After installation, permeable pavement shall be protected from sediment deposition until the site is completed and stabilized. An in-situ infiltration permeability test shall be conducted and certified on the pavement after site stabilization.

After installation, a final as-built inspection and certification should be performed that includes:

- Ensuring that the pavement is installed per the plans and specifications.
- Ensuring that the surface is not damaged, free from fines and sediment.
- Checking that all pervious surfaces drain away from the pavement and that soil around the pavement is stabilized with vegetation
- Preparing the as-built plans that include any changes to the underdrains, observation well locations, terrace layouts, aggregate depth or storage structures, any revised calculations, etc.
- Testing the pavement surface permeability using the NCSU Simple Infiltration Test (see Maintenance Section 18.6.4) or other appropriate test such as ASTM C1701 *Standard Test Method for Infiltration Rate of In-Place Pervious Concrete*.

Any deficiencies that are discovered shall be promptly addressed and corrected.

Recommendations

PERMEABLE PAVEMENT RECOMMENDATION 1: SIGNAGE
Provide signage to encourage proper maintenance of permeable pavement.

Signage at permeable pavement installations is required because they are maintained and managed differently than traditional pavements. This promotes prolonged effectiveness and helps prevent damage from conventional pavement management.

Figure 8 illustrates an example of a sign for a permeable pavement location. The design is based on a 24 by 18 in. standard size for sign production.

The DEQ can provide this image in a high-resolution file for owners who would like to use it for their signs. This graphic is in color but color signs are not required. Large permeable pavement applications may require several signs.

The owner should consider whether this sign should also be provided in Spanish.

Figure 9. Example Sign Layout

***PERMEABLE PAVEMENT RECOMMENDATION* 2: GEOGRIDS, GEOTEXTILES, AND GEOMEMBRANES**
Geogrids and geotextiles may be used in accordance with manufacturer and designer recommendations. Geomembranes are not recommended on infiltration designs but may be used on detention designs.

Not all permeable pavement applications include geogrids, geotextiles and geomembranes, but some circumstances require their use. The advice of a licensed NC design professional with experience in geotechnical design is a valuable resource in addition to the guidance provided below.

Geogrids may be used at the top of the soil subgrade to provide additional structural support especially in very weak, saturated soils. All manufacturer requirements shall be followed in the design and installation.

Geotextiles (permeable) should line the sides of the aggregate base to prevent migration of adjacent soils into it and subsequent permeability and storage capacity reduction. This problem is more likely in sandy or loamy soils. Geotextiles are not recommended under the aggregate base in an infiltration design because they can accumulate fines and inhibit infiltration.

Geomembranes (impermeable) should be used to accomplish the following:

- Provide a barrier on the sides and bottom of the aggregate base in a detention design to prevent infiltration into the subgrade typically due to soil instability, the presence of

stormwater hotspots, or potential for groundwater contamination. Geomembrane barriers reduce the credit for TSS removal from 85% to 70%.

- Line the sides of the aggregate base whenever structure foundations or conventional pavement are 20 feet or less from the permeable pavement (to avoid the risk of structural damage due to seepage). The isolated use of geomembranes for this purpose will not reduce the credit for TSS removal in the system.

PERMEABLE PAVEMENT RECOMMENDATION 3: DISCUSSION WITH OWNER
Before pursuing a permeable pavement design beyond the conceptual stage, the designer shall verify site feasibility and meet with the owner to explain the installation, construction and maintenance requirements of the proposed permeable pavement system.

The pavement's maintenance needs may require the owner to purchase new equipment or contract with a new service provider. The required frequency of the maintenance may be greater than conventional pavement in the same location. These costs are likely the same or lower than other BMPs, but it is important to integrate maintenance requirements into the owner's planning for site operations.

During the discussion with the owner, the designer shall confirm assumptions about the site use and vehicle loading. For example, a parking lot primarily used by passenger cars may also see bus traffic or a pedestrian area may also be driven on by service vehicles. These situations require attention to structural design, specifically base, materials, thicknesses, soil strengths, axle loads and repetitions.

PERMEABLE PAVEMENT RECOMMENDATION 4: CONSIDER STRUCTURAL STRENGTH
The manual and rules do not provide structural design guidance of permeable pavements subject to vehicular traffic. The designer shall ensure that the pavement meets its hydrologic and structural goals by involving an NC licensed design professional with appropriate expertise in pavement design.

Construction

A preconstruction meeting is highly recommended to ensure contractors understand the need to prevent subgrade compaction and clogging of the pavement surface. The following should be discussed at the meeting:

- Walk through site with builder/contractor/subcontractor to review erosion and sediment control plan/stormwater pollution prevention plan
- Determine when permeable pavement is built in the project construction sequence; before or after building construction, and measures for protection and surface cleaning
- Aggregate material storage locations identified (hard surface or on geotextile)
- Access routes for delivery and construction vehicles identified

- Mock-up location, materials testing and reporting

A preconstruction meeting is also an opportunity to discuss other unique construction considerations for permeable pavement. Construction oversight by a design professional familiar with permeable pavement installation can help ensure that the investment results in adequate long-term performance.

Contractors not familiar with permeable pavement are accustomed to compacting pavement soil subgrades to increase structural strength. However, this is in direct opposition to the correct treatment of soil beneath permeable pavement for an infiltrating design.

Construction Step 1: Ensure Acceptable Conditions for Construction

Do not begin construction on permeable pavement until acceptable conditions are present. This includes the following items:

- Pervious surfaces are graded so that they do not discharge to the permeable pavement, except for instances when this is unavoidable, such as redevelopment projects.
- Impervious areas that will drain to the permeable pavement are completed.
- Areas of the site adjacent to the permeable pavement are stabilized with vegetation, mulch, straw, seed, sod, fiber blankets or other appropriate cover in order to prevent erosion and possible contamination with sediments.
- Construction access to other portions of the site is established so that no construction traffic passes through the permeable pavement site during installation. Install barriers or fences as needed.
- The forecast calls for a window of dry weather to prevent excess compaction or smearing of the soil subgrade while it is exposed.
- All permeable pavement areas are clearly marked on the site.

Construction Step 2: Excavate the Pavement Area and Prepare Subgrade Surface

Clear and excavate the area for pavement and base courses while protecting and maintaining subgrade infiltration rates using following these steps:

- Excavate in dry subgrade conditions and avoid excavating immediately after storms without a sufficient drying period.
- Do not allow equipment to cross the pavement area after excavation has begun. Operate excavation equipment from outside the pavement area or from unexcavated portions of the area using an excavation staging plan.
  See Figure 18-15.
- Use equipment with tracks rather than tires to minimize soil compaction when equipment on the subgrade surface is unavoidable.
- Dig the final 9 to 12 in. by using the teeth of the excavator bucket to loosen soil and do not smear the subgrade soil surface. Final grading or smoothing of the subgrade should be done by hand if possible.
- Minimize the time between excavation and placement of the aggregate.

The final subgrade slope shall not exceed 0.5%. The slope of the subgrade shall be checked before proceeding. **Where possible, excavate soil from the sides of the pavement area to minimize subgrade compaction from equipment.** After verifying the subgrade slope, scarify, rip or trench the soil subgrade surface of infiltrating pavement systems to maintain the soil's pre-disturbance infiltration rate. These treatments must occur while the soil is dry. To scarify the

pavement, use backhoe bucket's teeth to rake the surface of the subgrade. To rip the subgrade, use a subsoil ripper to make parallel rips 6 to 9 in. deep spaced 3 feet apart along the length of the permeable pavement excavation as shown in Figure 18-16. In silty or clayey soils, clean coarse sand must be placed over the ripped surface to keep it free-flowing (Brown and Hunt 2009). The sand layer should be adequate to fill the rips.

An alternative to scarification and ripping is trenching. See Figure 18-17. If trenching, then parallel trenches 12 in. wide by 12 in. deep shall be made along the length of the permeable pavement excavation. Excavate trenches every 6 ft (measured from center to center of each trench) and fill with ½ in. of clean course sand and 11½ in. of ASTM No. 67 aggregate (Brown and Hunt 2009).

Ripped or trenched (uncompacted) soil subgrade can settle after aggregate base and surface course installation and compaction. Therefore, base compaction requires special attention to means and methods in the construction specifications and during construction inspection to minimize future settlement from ripped or trenched soil subgrades.

Figure 10. Good Construction Practices, from left to right: Grading from the Side (NCSU), Scarifying the Subgrade (Tyner), Trenching the Subgrade (Tyner)

Construction Step 3: Test the Subgrade Soil Infiltration Rate (Infiltration Systems Only)

Conduct a direct measurement of the soil's infiltration rate immediately after excavation and before the aggregate is placed. Infiltration rate testing shall be conducted by an appropriately-qualified professional. If the soil infiltration rate has diminished so that a 72-hour drawdown time is no longer possible, then rip or trench the subgrade further to restore the original infiltration rate.

Construction Step 5: Place Geotextiles and Geomembrane (If Applicable)

If using geotextiles or geomembranes, then follow the manufacturer's recommendations so for the appropriate overlap between rolls of material. Secure geotextile or geomembrane so that it will not move or wrinkle when placing aggregate.

Construction Step 6: Place Catch Basins, Observation Well(s) and Underdrain System

Place the catch basins and observation wells per the design plans and verify that the elevations are correct.
If an upturned elbow design is used, then the underdrains are placed first. See Figure 11.

In such case, verify the following:

- Elevations of the underdrains and upturned elbows are correct.
- Dead ends of pipe underdrains are closed with a suitable cap placed over the end and held firmly in place.
- Portions of the underdrain system within one foot of the outlet structure are solid and not perforated.

Figure 11. Upturned Elbow (NCSU-BAE)

Construction Step 7: Place and Compact Aggregate Base

Inspect all aggregates to insure they are free of fines and conform to design specifications. If aggregates delivered to the site cannot be immediately placed, then they should be stockpiled on an impervious surface or geotextile to keep the aggregate free of sediment.

Before placing the aggregate base, remove any accumulation of sediments on the finished soil subgrade using light, tracked equipment. If the excavated subgrade surface is subjected to rainfall before placement of the aggregate base, the resulting surface crust must be excavated to at least an additional 2-inch depth, raked or scarified to break up the crust. For sites with an impermeable liner or geotextiles, remove any accumulated sediments and check placement. Slopes and elevations shall be checked on the soil subgrade and the finished elevation of base (after compaction) or bedding materials to assure they conform to the plans and specifications.

Figure 12. Aggregate Placement and Compaction (NCSU-BAE)

All aggregate shall be spread (not dumped) by a front-end loader or from dump trucks depositing from near the edge of the excavated area or resting directly on deposited aggregate piles. Moisten and spread the washed stone without driving on the soil subgrade. Be careful not to damage underdrains and their fittings, catch basins, or observation wells during compaction. Follow compaction recommendations by the permeable pavement manufacturer or that from industry guidelines. See Figure 12. Be sure that corners, areas around utility structures and observation wells, and transition areas to other pavements are adequately compacted. Do not crush aggregates during compaction as this generates additional fines that may clog the soil subgrade.

Construction Step 8: Install Curb Restraints and Pavement Barriers

Edge restraints and barriers between permeable and impervious pavement shall be installed per design. Before moving on to Construction Step 9, be certain that the design and installation are consistent.

Construction Step 9: Install Bedding and Pavement Courses

The bedding and pavement course installation procedures depend on the permeable pavement surface. It is important to follow the specifications and manufacturer's installation instructions. For PICP, a 4 in. thick choker course over the base transitions to a 2 in. thick bedding layer that provides a smooth surface for the pavers. See Figure 13. The bedding course shall be installed in accordance with manufacturer or industry guide specifications. Improper bedding materials or installation can cause significant problems in the performance of the pavers and stone jointing materials between them.

Figure 13. Upturned Elbow (NCSU-BAE)

If constructing a PICP pavement, use a contractor that holds a PICP Specialist Certificate from the Interlocking Concrete Pavement Institute. A list of contractors can be obtained from the Interlocking Concrete Pavement Institute.

PC pavements shall be constructed in accordance with the latest version of ACI 522.1 *Specification for Pervious Concrete*. Installation of PC may be accomplished using the One-Step or the Two-Step method. The Two-Step method is more commonly used and it separates the steps of strike-off from pervious concrete compaction. In this method, the pervious concrete usually requires a more traditional, stiffer mix. The One-Step method uses a counter-rotating roller screed to simultaneously strike-off and compact the pervious concrete. This method requires pervious concrete with a more flowable mix so that the screed can more adequately compact the mixture. Both methods require dense-paste pervious concrete mixtures. These mixes are defined by chemical admixtures that reduce the viscosity of the cement paste so that it will stick to and not run off the aggregates. The mixes provide greater cohesion that increases strength and durability.

Figure 14. Compacting Pervious Concrete (NCSU-BAE)

If constructing a PA pavement, use a contractor that is qualified per Carolina Asphalt Paving Institute (CAPA). In addition, be certain that the contractor follows the Design, Construction and Maintenance Guide for Porous Asphalt (by the National Asphalt Pavement Association) in conjunction with CAPA's *Porous Asphalt Guide Specification,* which will ensure that the binder mix is appropriate for the North Carolina climate.

Construction Step 10: Protect the Pavement through Project Completion

If is preferable to have the permeable pavement installed at the end of the site construction timeline. If that is not possible, protect the permeable pavement until project completion. This shall be done by:

- Route construction access through other portions of the site so that no construction traffic passes through the permeable pavement site. Install barriers or fences as needed.
- If this is not possible, protect the pavement per the construction documents. Protection techniques that may be specified include mats, plastic sheeting, barriers to limit access, or moving the stabilized construction entrance
- Schedule street sweeping during and after construction to prevent sediment from accumulating on the pavement.

Maintenance

Like all other SCMs, permeable pavements require maintenance to provide long-term stormwater benefits.

As shown in Figure 15, the majority of maintenance efforts are keeping the surface from clogging as well as avoiding pollutants such as deicing salts that might affect groundwater quality. Regular inspection will determine whether the pavement surface and reservoir are functioning as intended.

Figure 15. Clogged Pavement

Directions for Maintenance Staff

Communication with maintenance staff is crucial regarding permeable pavement locations and required management practices for keeping pavement unclogged. Maintenance staff must:

- Clean the surface with portable blowers frequently, especially during the fall and spring to remove leaves and pollen before they irreversibly reduce the pavement's surface permeability.
- Not stockpile soil, sand, mulch or other materials on the permeable pavement. Not wash vehicles parked on the permeable pavement.
- Place tarps to collect any spillage from soil, mulch, sand or other materials transported over the pavement.
- Cover stockpiles of same near the permeable pavement.
- Bag grass clippings or direct them away from the permeable pavement.
- Not blow materials onto the permeable pavement from adjacent areas.
- Not apply sand during winter storms.
- Immediately remove any material deposited onto the permeable pavement during maintenance activities. Remove large materials by hand. Remove smaller organic material using a hand-held blower machine.
- Remove weeds growing in the joints of PICPs by spraying them with a systemic herbicide such as glyphosate and then return within the week to pull them by hand.

After the weeds are removed from paver joints, the pavement shall be swept (with a vacuum sweeper if possible) to remove the sediment and discourage future weed growth.

Future Construction Projects

If not properly managed, future construction projects on a permeable pavement site can convey sediment to its surface. To prevent pavement clogging from future construction projects, the owner or prime contractor shall insure that the contractors on the site:

- Route construction traffic away from the permeable pavement. Sediment from muddy tire tracks can be deposited on the pavement and sometimes the equipment may exceed the loading pavement loading capacity.
- Install and frequently inspect erosion and sediment controls.
- Inspect the site to insure new grading patterns do not result in the pavement receiving run-on from landscaped areas especially with bare soil. If this occurs, then the site requires regrading. After re-grading, disturbed areas shall be promptly stabilized with vegetation.
- Schedule cleaning with a regenerative air or vacuum street sweeper during and after construction.

Snow and Ice Management

Permeable pavement can be more effective at melting snow and ice than conventional pavements. When snow and ice melts, the water infiltrates into the aggregate base rather than staying on the pavement surface and refreezing. Therefore, light snow and ice accumulation generally do not require removal. The base and soil act as a heat sink which helps drain water before it freezes and slows the rate of surface freezing.

For larger accumulations of snowfall, sand shall never be applied on or adjacent to permeable pavement to avoid surface clogging. In addition, pollutants such as deicing materials and fertilizer shall not be applied to (non-grassed) pavement surfaces because these chemicals infiltrate through the aggregate base to the subgrade and possibly to the groundwater.

PICP, PC and PA can be plowed like conventional pavements. For CGP and PTRG, the blade should be set about 1 in. higher than usual to avoid damaging them. A rubber strip can also be applied to the blade to protect them. Piles of plowed snow shall not be placed upon permeable pavement surfaces to avoid concentrations of dirt and sediment when the snow eventually melts.

Testing the Pavement Surface Infiltration Rate

The simplest way to see if permeable pavement is infiltrating rain is to look for puddles during and after a storm. Permeable pavement should not have puddles; puddles are a sure sign of surface clogging.

Because inspection and maintenance activities may not always coincide with rain events, NCSU developed a simple infiltration test to evaluate pavement surface clogging severity and extent. Simple Infiltration Test procedures are available at NCSU's Stormwater Group Web Site.

The Simple Infiltration Test shall be done on all permeable pavement applications at least one time a year, except for single family residential lots with a total permeable pavement area of under 2,000 sf. Whenever the Simple Infiltration Test indicates that maintenance is needed, the design professional shall work with the owner to:

- Determine the cause of the permeable pavement clogging and correct it. Previous sections with instructions for maintenance staff, future construction projects, and snow and ice management may assist in evaluating the cause of clogging. Efforts to renovate the clogged pavement are short lived unless the underlying problems are addressed.
- Vacuum the pavement in accordance with the next section.
- Check the observation wells to ensure that the pavement is not clogging beneath the surface.

Surface Cleaning

Surface cleaning is required whenever puddles are present or surface infiltration testing indicates that one or more areas on a permeable pavement application are clogged. DEQ recommends vacuum cleaning the entire pavement area rather than only the clogged portion since most of the expense is equipment mobilization. Owners are encouraged to clean PC and PA on an annual, or more frequent basis, because surface infiltration is very difficult to restore after it has become clogged, and the surface replacement is expensive.

The three main types of street cleaners are described below: mechanical, regenerative air and vacuum. Vacuum or regenerative air street sweepers are required because they are effective at cleaning the pore spaces in the pavement surface.

Figure 16. Mechanical Sweeper (NCSU-BAE)

Mechanical sweepers are the most common. They come in various sizes for cleaning pedestrian or vehicular pavements, and they generally do not use a vacuum. See Figure 16. They employ brushes that initially move litter toward the machine center and lift trash onto a conveyor belt for temporary storage inside the machine. The brush bristles can penetrate CGP, but not other types of permeable pavement. For other pavement types, mechanical sweepers may be used for removing trash, leaves, and other organic material, but the mechanical sweeper is not likely to be effective in removing sediment.

Figure 17. Regenerative Air Cleaner (TYMCO, Inc.)

Regenerative air cleaners are the second most common. They work by directing air at a high velocity within a confined box the rides across the pavement. The uplift from the high velocity effectively loosens dust and other fine particles on and near the pavement surface and lifts them into a hopper at the back of the truck. This equipment removes surface-deposited sediments from all pavement types. This equipment is recommended for regular preventive maintenance.

Figure 18. Vacuum Truck (NCSU-BAE)

Vacuum street cleaners are the least common and most expensive. They apply a strong vacuum to a relatively narrow area that lifts particles both at and below the surface of the pavement. Vacuum sweepers have demonstrated their ability to suction 3 to 4 inches of gravel from PICP and can restore infiltration to some types of pavements that have been grossly neglected. (Hunt, NCSU-BAE)

Regular PICP cleaning requires operator adjustment of the vacuum force from regenerative air equipment to minimize uptake of aggregate jointing materials. In some cases, the paver joints may require refilling. In contrast, vacuum street cleaners have demonstrated their ability in removing as much as 3 to 4 in. of aggregates from clogged PICP joints that have not received any cleaning for years. This cleaning can restore surface infiltration for PICP as well for other grossly neglected permeable pavement surfaces (Hunt NCSU-BAE).

Inspecting Observation Wells

The observation well allows the owner to determine how well the aggregate base and underdrains are functioning. Follow these steps to inspect the observation wells:

- Wait five days after a rainfall exceeding 1 in. or 1.5 in. if in a Coastal County. If no additional rain occurs in the five days, open each observation well.
- Visually assess whether water is present. If visual assessment isn't possible, use a yard stick or other water-level measurement method.
- If water is present, the soil subgrade is clogged and/or underdrains are not functioning. Note the locations of the observation wells with water present.
- The owner (or site manager) should consult the designer or other appropriate professional regarding possible remedies.

The designer or other appropriate design professional determines the actions needed to restore the BMP so that it functions and achieves regulatory credit. For a detention system, this may require repair of underdrains or other infrastructure. For an infiltration system, this shall require subgrade infiltration rate investigation and may lead to redesign or replacement.

Pavement Cracking

Cracked areas shall be repaired using the same materials as the original permeable pavement or, in the case of PC and PA small areas can be replaced with standard (impermeable) materials. The impervious repaired area shall not to exceed 5% of the total surface area. Figure 19 shows a small concrete patch in a PC area. Larger repaired areas shall be made from materials that infiltrate rain water in a similar manner as the original surface. Pavement that has buckled or shown major instability may require a major renovation or replacement. In this case, consult a pavement professional. Asphalt sealcoats or overlays that eliminate surface permeability shall not be used.

Figure 19. Pavement Patch

Required Operation and Maintenance Provisions

After permeable pavement is constructed, it shall be inspected **once a quarter.** The inspector shall check each BMP component and address any deficiencies in accordance with Table 18-4 below. The person responsible for maintaining the permeable pavement shall keep a signed and notarized Operation and Maintenance Agreement and inspection records. These records shall be available upon request.

Once a year, the Simple Infiltration Test shall be performed and any deficiencies in surface permeability shall be addressed.

At all times, the pavement shall be kept free of:

- Debris and particulate matter through frequent blowing that removes such debris, particularly during the fall and spring.
- Piles of soil, sand, mulch, building materials or other materials that could deposit particulates on the pavement.
- Piles of snow and ice.
- Chemicals of all kinds, including deicers.

Table 3: Inspection Process and Required Remedies

BMP element:	Potential problem:	How to remediate the problem:
The perimeter of the permeable pavement	Areas of bare soil and/or erosive gullies	Regrade the soil if necessary to remove the gully, then plant ground cover and water until established.
	A vegetated area drains toward the pavement.	Regrade the area so that it drains away from the pavement, then plant ground cover and water until established.
The surface of the permeable pavement	Trash/debris present	Remove the trash/debris.
	Weeds	Do not pull the weeds (may pull out media as well). Spray them with a systemic herbicide such as glyphosate and then return within the week to remove them by hand. (Another option is to pour boiling water on them or steam them.)
	Sediment	Vacuum sweep the pavement.
	Rutting, cracking or slumping or damaged structure	Consult an appropriate professional.
Observation well	Water present more than five days after a storm event	Clean out clogged underdrain pipes. Consult an appropriate professional for clogged soil subgrade.
Educational sign	Missing or is damaged.	Replace the sign.

Old Versus New Design Standards

The following is a summary of some of the changes in permeable pavement design standards between the archived version of the BMP Manual and the current MDC for permeable pavement. It is intended to capture the highlights only; any permeable pavement MDC that are not captured in this table are still required per 15A NCAC 02H .1055.

	Old manual requirements	New MDC
Additional BUA directed to permeable pavement	1:1 maximum ratio between pavement area and contributing drainage area. Runoff from pervious areas may not be directed to pavement.	1:1 maximum ratio; however, screened rooftop runoff is not subject to the 1:1 loading limitation. Runoff from pervious areas may not be directed to pavement except for small, unavoidable areas.
BUA credit	Infiltrating permeable pavement in A and B soils considered to be 75% pervious, 25% impervious. In C and D soils, considered to be 50% pervious, 50% impervious	Infiltrating permeable pavement considered to be 100% pervious in all soils
Slope of the subgrade surface	May not be greater than 0.5%	May not be greater than 2%
Minimum pavement surface infiltration rate for maintenance	Not specified	50 inches/hour must be maintained.
Signage	Required	Recommended

Resources

ACI Committee 522, *Report on Pervious Concrete*, American Concrete Institute, Farmington Hills, MI, ACI 522R-10, March 2010.

Brown, R.A., Hunt, W.F., *Urban Waterways: Improving Exfiltration from BMPs*, North Carolina Cooperative Extension, AG-588-17W, 2009

Hansen, K., *Porous Asphalt Pavements for Stormwater Management*, National Asphalt Pavement Association, Information Series 131, Lanham, Maryland, 2008.

Hunt, W. F., *Urban Waterways: Maintaining Permeable Pavements,* North Carolina Cooperative Extension, Raleigh, NC, AG-588-23, 2008

Leming, M. L., Malcom, H. R., and Tennis, P. D., *Hydrologic Design of Pervious Concrete,* EB303, Portland Cement Association, Skokie, Illinois, and National Ready Mixed Concrete Association, Silver Spring, Maryland, USA, 2007.

Smith, D.R., *Permeable Interlocking Concrete Pavements,* Fourth Edition, Interlocking Concrete Pavement Institute, Herndon, Virginia, 2011.

Tyner, J. S., W. C. Wright, and P. A. Dobbs. 2009. Increasing exfiltration from pervious concrete and temperature monitoring. J. Environ. Manage. 90(8): 2636-2641.

CONSTRUCTION ENGINEERING SERVICES, INC.

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MANTEO, NC 27954
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OFFICE: 33 HAMMOCK DRIVE
MANTEO, NC 27954
FAX: (252) 473-4191

January 14, 2019

Coastal Resources Commission
NC Department of Environmental Quality
21 West Jones Street
Raleigh, NC 27603

Reference: Patio and fire pit at 108 Virginia Court, Hertford, NC

Members of the Commission:

In response to the comments received from NCDENR and DEQ we offer the following to support our conclusion that there will be no stormwater runoff into Yeopim Creek.

MDC1– GET Solutions has been scheduled to come to the site and conduct a sub-surface investigation and determine the infiltration rate for the on site soils.

MDC2– The seasonal high water table has been measured to be approximately 4 feet below the patio surface.

MDC5– The 4" crushed stone base layer was placed and not compacted so it will remain free draining and will not impede the infiltration of stormwater or cause any runoff.

Additionally, the finished grade of the patio slopes away from the bulkhead and Yeopim Creek to a low point on the pavers so that any runoff that might not immediately drain through the gaps in the pavers is temporarily contained on the low area of the patio as it infiltrates through the gaps in the pavers, the non compacted crushed stone base and into the pervious subgrade soil.

As we stated in our previous letter of October 9, 2018 to the Lampleys, the way this patio and fire pit have been designed and constructed there will be no stormwater runoff into Yeopim Creek. The stormwater will be contained on and under the patio surface as it filters into the ground. If you have any questions or if you need any additional information please contact us.

Very truly yours,
CONSTRUCTION ENGINEERING SERVICES, INC.

Hal Goodman

Hal Goodman, P.E., SECB
President

NORTH CAROLINA PROFESSIONAL SEAL 20446 ENGINEER HAROLD JAY GOODMAN

Harold Jay Goodman

1-14-19

DESIGN **CONSULTING** **UNDERWATER INSPECTIONS**

GET Solutions, Inc.
Geotechnical • Environmental • Testing

January 14, 2019

TO: **Mr. Thomas Lampley**
108 Virginia Court
Hertford, NC 27944

RE: Report of Shallow Subsurface Exploration and Geotechnical Engineering Services
Lampley Residence – 108 Virginia Court
Hertford, North Carolina
GET Project No: EC18-288G

Dear Mr. Lampley:

As requested, a representative of **G E T Solutions, Inc.** visited the above stated site on the date of January 7, 2019. The purpose of our site visit was to perform shallow subsurface exploration and saturated hydraulic conductivity testing of the encountered near surface soils, which was indicated to be required by CAMA and specifically requested by the client. It is our understanding that due to CAMA regulations, a site specific soil evaluation was required in the immediate vicinity of the paver system previously installed to construct an exterior patio area along the Perquimans River at this previously developed single family residential parcel. Furthermore, it has been indicated that the subject portion of this parcel required in excess of about 5 feet of fill in order to establish the current site grade elevations during the original development of this site. It is noted that the, requested scope of services did not include a permeability evaluation of the pavers that were installed within the subject area.

Field Exploration and Shallow Subsurface Soils

In order to explore the general and near surface soil types and to aid in developing associated saturated hydraulic conductivity parameters, the following field exploration and testing program was performed:

- One (1) 4.5-foot deep hand auger boring was performed at approximately 1-foot east of the paver edge at the river access. The boring location was established in the field by the client and a representative of **G E T Solutions, Inc.** The hand auger boring depth was limited to that noted above due to a cave-in occurring as a result of the encountered groundwater level of approximately 4 feet below the existing site grade elevations.

The surficial and shallow subsurface soils encountered at the explored location at the site were noted to consist of Topsoil and SAND (SP-SM, SM, SC-SM) having varying amounts of Silt and/or Clay). As previously reported by the client, the original development at this site prior to the construction of the patio area required in excess of 5 feet of fill to establish the current surface grade elevations. As such, the encountered soils noted above were further identified as FILL. A summary of the subsurface soils conditions encountered at the boring location is presented in Table I.

Table I – Shallow Subsurface Soil Conditions

Average Depth (ft)	Stratum	Description	Ranges of SPT N-Values
0 to 0.3	FILL	Ø Topsoil	-
0.3 to 4.5(1)	FILL	Ø Tan, SAND (SP-SM, SM, SC-SM) with varying amounts of Silt and Clay	-
Note(s): (1) Boring HA-1 terminated in this strata			

The subsurface descriptions are of a generalized nature provided to highlight the major soil strata encountered. The records of the subsurface exploration are included on the attached Boring Log sheet which should be reviewed for specific information. The stratifications shown on the records of the subsurface exploration represent the conditions only at the actual boring location. Variations may occur at other locations. The stratifications represent the approximate boundary between subsurface materials and the transition may be gradual. It is noted that the “Topsoil” designation references the presence of surficial organic laden soil, and does not represent any particular quality specification.

Field and Laboratory Testing

Soil testing provided by **G E T Solutions, Inc.** was performed in accordance with American Society for Testing and Materials (ASTM) standards. All laboratory soils tests were performed in our AASHTO re:source (formally AMRL) certified Elizabeth City laboratory.

Soil Classification and Index Testing

A representative portion of the soil samples collected during drilling operations were labeled, preserved, and transferred to our laboratory in accordance with ASTM D4220 for classification and analysis. Soil descriptions on the boring log are provided using visual-manual methods in general accordance with ASTM D2488 using the Unified Soil Classification System (USCS). Soil samples that were selected for index testing were classified in general accordance with ASTM D2487. It should be noted that some variation can be expected between samples classified using the visual-manual procedure (ASTM D2488) and the USCS (ASTM D2487). A summary of the soil classification system is attached.

A representative soil sample was selected and subjected to natural moisture and #200 sieve wash testing in order to corroborate the visual classification. These test results are presented in Table II below and on the soil test boring log attached to this report.

Table II – Laboratory Test Results

Boring ID	Sample Depth (ft) (1)	Moisture Content (%)	Percent Fines (Silt and/or Clay)	USCS Classification
HA-1	0.5 – 1.3	16.8	28.8	SM with Clay

Note(s): (1) Sample depth refers to depth below the existing grade at the boring location.

In-situ Permeability Testing

Constant-Head Borehole Permeameter Testing was performed on the near surface soils adjacent to boring location HA-1. The borehole was prepared utilizing a hand auger to remove soil clippings from the base. Permeability testing was then conducted within the vadose zone utilizing a Johnson Permeameter™ and the following testing procedures:

A support stand was assembled and placed adjacent to the boreholes. This stand holds a calibrated reservoir and a cable used to raise and lower the water control unit (WCU). The WCU establishes a constant water head within the borehole during testing by use of a precision valve and float assembly. The WCU was attached to the flow reservoir with a braided PVC hose and then lowered by cable into the borehole to the test depth elevation. As required by the Glover solution, the WCU was suspended above the bottom of the borehole. The shut-off valve was then opened allowing water to pass through the WCU to fill the borehole to the constant water level elevation. The absorption rate slowed as the soil voids became filled and an equilibrium developed as a wetting bulb developed around the borehole. Water was continuously added until the flow rate stabilized. The reservoir was then re-filled in order to begin testing. During testing, as the water drained into the borehole and surrounding soils, the water level within the calibrated reservoir was recorded as well as the elapsed time during each interval. The test was continued until relatively consistent flow rates were documented. During testing the quick release connections and shutoff valve were monitored to ensure that no leakage occurred. The flow rate (Q), height of the constant water level (H), and borehole diameter (D) were used to calculate Ks utilizing the Glover Solution.

Based on the field testing, the hydraulic conductivities of the soils are presented in Table III. The comprehensive hydraulic conductivity worksheet is attached to this report.

Table III – Infiltration Test Results

Boring ID	Test Depth (ft) (1)	Percent Fines (Silt and/or Clay)	K_{sat} Value (in/hr)	K_{sat} Class	USCS Classification
HA-1	1.3	28.8	2.197	Moderately High	SM with Clay

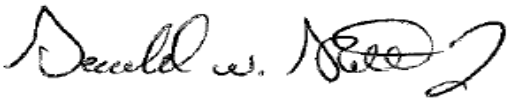
Note(s): (1) Test depth refers to depth below the existing grade at the test location.

The permeability test result of the near surface soils provided in this report is the result of permeability testing at the location and depth indicated. Varying site conditions, including soil composition, soil density, stratum depth, and stratum thickness may occur at other various locations throughout the residential parcel. As such, the permeability test result should not be assumed for all locations and depths across the residential parcel.

The Geotechnical Engineer warrants that the findings contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

We appreciate the opportunity to offer our services to you, and trust that you will call our Elizabeth City office with any questions that you may have.

Respectfully Submitted,
G E T Solutions, Inc.



Gerald W. Stalls Jr., P.E.
Senior Project Engineer
NC Lic. #034336

Attachments: Hand Auger Boring Log (Boring ID: HA-1)
Key to Soil Symbols and Terms
Soil Classification Chart and Key to Test Data
Constant-Head Borehole Permeameter Test

RECORD OF SUBSURFACE EXPLORATION

GET Solutions, Inc.
Geotechnical • Environmental • Testing

Virginia Beach
5465 Greenwich Road
Virginia Beach, VA 23642
757-518-1703

Williamsburg
1592-E Penniman Road
Williamsburg, VA 23185
757-564-6452

Elizabeth City
106 Capital Trace Unit E
Elizabeth City, NC 27909
252-335-9765

Jacksonville
415-A Western Blvd
Jacksonville, NC 28546
910-478-9915

HAND AUGER BORING ID HA-1

PROJECT NAME: **Lampley Residence**
CLIENT: **Mr. Thomas Lampley**
PROJECT LOCATION: **Hertford, North Carolilna**
BORING LOCATION: **Approximately 1-foot East of Paver Edge at River Access**
DRILLING METHOD(S): **Hand Auger**
GROUNDWATER*: INITIAL (ft) ▽: **4** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft) ▽: **5**
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **EC18-288G**
SURFACE ELEVATION (MSL) (ft): **INA**
LOGGED BY: **J. Mead**
DATE STARTED: **1/7/2019**
DATE COMPLETED: **1/1/1987**
DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	%<#200	TEST RESULTS
		0.3 4 Inches Topsoil (FILL)						
		0.7 Tan, moist, poorly graded SAND (SP-SM) with Silt to Silty SAND (SM) with trace Clay (FILL)		1		12		
	1	Tan, moist to very moist, Silty SAND (SM) with Clay to Silty Clayey SAND (SC-SM): (FILL)		2		12	29	
	2	2.0 Tan, very moist to wet, poorly graded SAND (SP-SM) with Silt to Silty SAND (SM): (FILL)		3		12		
	3			4		12		
▽	4	Wet from 4 feet		5		6		
		4.5 Cave In at 4.5 Feet						
▽		Boring terminated at 4.5 feet below existing grade.						

TEST RESULTS
Plastic Limit X——X Liquid Limit
Water Content - ●
Penetration - ▨
10 20 30 40 50 60 70

Sample Type(s):
AUGER - Auger Sample

Notes:

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Project: Lampley Residence
Project Location: Hertford, North Carolilna
Project Number: EC18-288G

GET Solutions, Inc.
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Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 4
Loose	15 to 35 %	4 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive Strength kPa	SPT Blow Count
Very soft	< 25	< 2
Soft	25 to 50	2 to 4
Medium stiff	50 to 100	4 to 8
Stiff	100 to 200	8 to 15
Very stiff	200 to 400	15 to 30
Hard	> 400	> 30

GENERAL NOTES

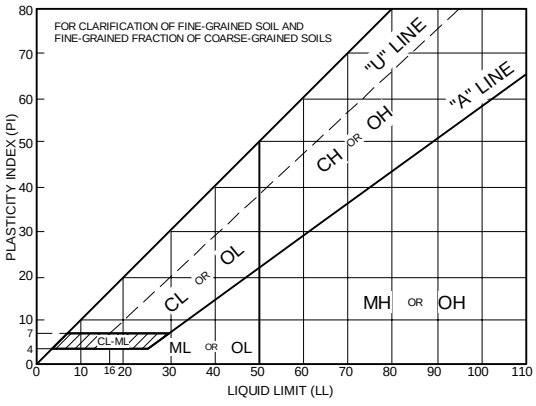
1. Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface conditions at other locations or times.

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravel (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW
		Gravel with fines (Appreciable amount of fines)	GM* d / u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4; Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-silt mixtures	Atterberg limits above "A" line or P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			SP	Poorly-graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4; Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line or P.I. greater than 7
Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Silts and Clays (Liquid limit less than 60)		ML	Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and Clays (Liquid limit greater than 60)		MH	Inorganic silts, micaceous or disto-maceous fine sandy or silty soils, organic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
	Highly Organic Soils		Pt	Peat and other highly organic soils	

Determine percentages of sand and gravel from grain size curve, Depending on percentage of fines (fraction smaller than No. 200 sieve) coarse-grained soils are classified as follows:
Less than 5 percent..... GW, GP, SW, SP
More than 12 percent..... GM, GC, SM, SC
6 to 12 percent..... Borderline case4s requiring dual symbols**



Plasticity Chart

Particle Size Material	Particle Size mm	Particle Size Sieve sizes
Silt or clay	< 0.074	< #200
Sand	0.074 to 0.42	#200 to #40
Fine	0.42 to 2.00	#40 to #10
Medium	2.00 to 4.76	#10 to #4
Gravel	4.76 to 19.1	#4 to 3/4 in.
Fine	19.1 to 76.2	3/4 in. to 3 in.
Coarse	76.2 to 304.8	3 in. to 12 in.
Cobble	304.8 to 914.4	12 in. to 36 in.
Boulders		

* Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg Limits: suffix d used when L.L. is 23 or less and the P.I. is 6 or less; the suffix is used when L.L. is greater than 26.

** Borderline classifications used for soils possessing characteristics of two groups are designated by combinations of groups symbols. For example; GW-GC, well-graded gravel-sand mixture with clay binder.

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 15% FINES	SM	SILTY SANDS, POOORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

	Modified California	RV	R-Value
	Split Spoon	SA	Sieve Analysis
	Pushed Shelby Tube	SW	Swell Test
	Auger Cuttings	TC	Cyclic Triaxial
	Grab Sample	TX	Unconsolidated Undrained Triaxial
	Sample Attempt with No Recovery	TV	Torvane Shear
CA	Chemical Analysis	UC	Unconfined Compression
CN	Consolidation	(1.2)	(Shear Strength, ksf)
CP	Compaction	WA	Wash Analysis
DS	Direct Shear	(20)	(with % Passing No. 200 Sieve)
PM	Permeability		Water Level at Time of Drilling
PP	Pocket Penetrometer		Water Level after Drilling(with date measured)

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA

Lampley Residence
Hertford, North Carolilna

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(1) GET - CLASSIFICATION LEGEND - GET_STANDARD_DATATEMPLATE(03-17-14).GDT - 1/14/19 14:27 - G:\GINT\PROJECTS\EC18\EC18-288G LAMPLEY RESIDENCE.GPJ

Constant-Head Borehole Permeameter Test

Analytical Method: Glover Solution

GET Solutions, Inc.

Project Name.....:	Lampley Residence - 108 Virginia Ct.	Project No.....:	EC18-288G	Terminology and Solution (R. E. Glover Solution)*	
Boring No.....:	HA-1	Proj. Location...:	Hertford, NC	$Ksat_B$: (Coefficient of Permeability) @ Base Tmp. T_B (°C)	14
Investigators.....:	J. Meads	Date.....:	1/7/19	Q: Rate of flow of water from the borehole	
Boring Depth.....:	1.3 ft (m, cm, ft, in)	WCU Base Ht. h:	15.0 cm	H: Constant height of water in the borehole	
Boring Diameter..:	8.3 cm	WCU Susp. Ht. S:	5.1 cm	r: Radius of the cylindrical borehole	
Boring Radius r...:	4.15 cm	Const. Wtr. Ht. H:	20.1 cm	V: Dyn. Visc. of water @ Tmp. T °C/Dyn. Visc. of water @ T_B	
Soil/Water Tmp. T:	11 °C	H/r **.....:	4.8	$Ksat = Q[\sinh^{-1}(H/r) - (r^2/H^2+1)^{.5} + r/H]/(2\pi H^2)$ [Basic Glover Solu.]	
Dyn. Visc. @ T °C.:	0.001271 kg/m·s	Dyn. Visc. @ T_B °C.:	0.001170 kg/m·s	$Ksat_B = QV[\sinh^{-1}(H/r) - (r^2/H^2+1)^{.5} + r/H]/(2\pi H^2)$ [Tmp. Correction]	

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	$Ksat_B$ Equivalent Values (cm/min)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
1,700		9:45:00 AM								
1,650	50	9:45:19 AM	0:00:19	0.32	157.89	0.099	1.65E-03	142.909	2.344	4.689
1,600	50	9:45:38 AM	0:00:19	0.32	157.89	0.099	1.65E-03	142.909	2.344	4.689
1,550	50	9:45:58 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,500	50	9:46:18 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,450	50	9:46:38 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,400	50	9:46:58 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,350	50	9:47:18 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,300	50	9:47:39 AM	0:00:21	0.35	142.86	0.090	1.50E-03	129.299	2.121	4.242
1,250	50	9:47:59 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,200	50	9:48:19 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,150	50	9:48:39 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,100	50	9:49:00 AM	0:00:21	0.35	142.86	0.090	1.50E-03	129.299	2.121	4.242
1,050	50	9:49:20 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
1,000	50	9:49:40 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
950	50	9:50:00 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.764	2.227	4.454
900	50	9:50:21 AM	0:00:21	0.35	142.86	0.090	1.50E-03	129.299	2.121	4.242
850	50	9:50:42 AM	0:00:21	0.35	142.86	0.090	1.50E-03	129.3	2.121	4.24
800	50	9:51:03 AM	0:00:21	0.35	142.86	0.090	1.50E-03	129.3	2.121	4.24
750	50	9:51:23 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.8	2.227	4.45
700	50	9:51:43 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.8	2.227	4.45
650	50	9:52:03 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.8	2.227	4.45
600	50	9:52:23 AM	0:00:20	0.33	150.00	0.094	1.57E-03	135.8	2.227	4.45
				Field-Estimated Ksat:		0.093	1.55E-03	133.917	2.197	4.394

Natural Moisture.....:	16.8	Consistency.....:	Loose
USDA Txt./USCS Class:	SM	Water Table Depth...:	4'
Struct./% Pass. #200.:	28.8	Init. Saturation Time.:	9:00:00 AM

Notes: Estimated field Ksat is determined by averaging and/or rounding of test results for the final three or four stabilized values and analyzing the graph.

*Glover, R. E. I953. Flow from a test-hole located above groundwater level, pp. 69-7I. in: Theory and Problems of Water Percolation. (C. N. Zanger. ed.). USBR. The condition for this solution exists when the distance from the bottom of the borehole to the water table or an impervious layer is at least twice the depth of the water in the well. **H/r>5 to >10 Johnson Permeameter, LLC Revised 11/29/13

Division of Coastal Management

NC COASTAL RESOURCES COMMISSION MEETING

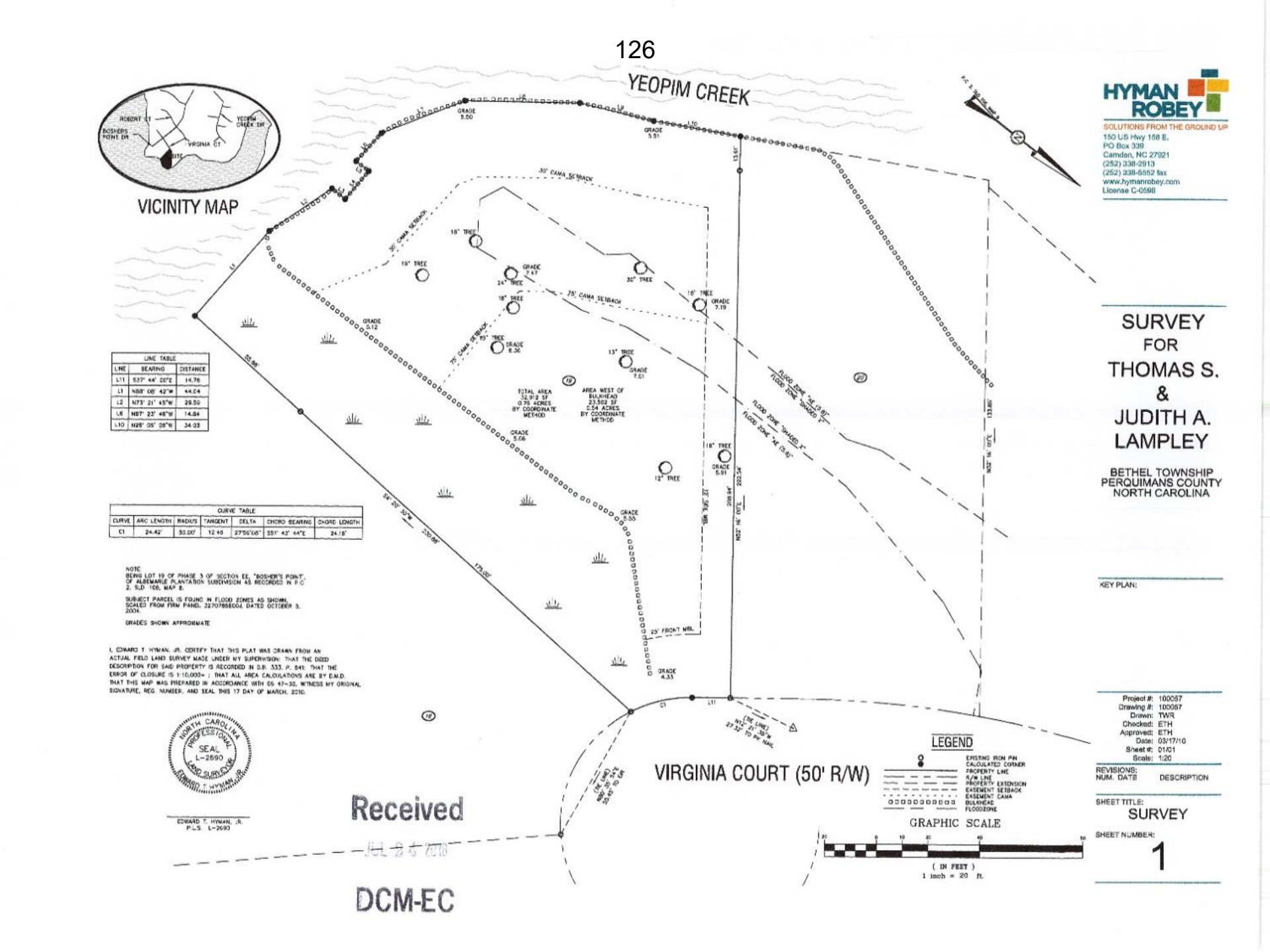
February 27-28, 2019

THOMAS & JUDITH LAMPLEY (CRC-VR-18-05)
PERQUIMANS COUNTY, 30' BUFFER VARIANCE

Frank Jennings, District Manager
Lynn Mathis, Environmental Specialist II
Northeastern District Office
Elizabeth City, NC

Nothing Compares
NORTH CAROLINA

Department of Environmental Quality



NOTE:
BEING LOT 19 OF PHASE 3 OF SECTION EE, "BOSHER'S POINT", OF ALBEMARLE PLANTATION SUBDIVISION AS RECORDED IN P.C. 2, SLD 106, MAP E.

SUBJECT PARCEL IS FOUND IN FLOOD ZONES AS SHOWN, SCALED FROM FIRM PANEL 3270788800J DATED OCTOBER 5, 2004.

GRADES SHOWN APPROXIMATE

I, EDWARD T. HYMAN, JR. CERTIFY THAT THIS PLAT WAS DRAWN FROM AN ACTUAL FIELD LAND SURVEY MADE UNDER MY SUPERVISION; THAT THE DEED DESCRIPTION FOR SAID PROPERTY IS RECORDED IN D.B. 333, P. 641; THAT THE ERROR OF CLOSURE IS 1:10,000+ ; THAT ALL AREA CALCULATIONS ARE BY D.M.D. THAT THIS MAP WAS PREPARED IN ACCORDANCE WITH GS 47-30. WITNESS MY ORIGINAL SIGNATURE, REG. NUMBER, AND SEAL THIS 17 DAY OF MARCH, 2010.

NORTH CAROLINA PROFESSIONAL SEAL L-2690 LAND SURVEYOR EDWARD T. HYMAN JR.

EDWARD T. HYMAN, JR.
P.L.S. L-2690

Received
JUL 26 2010
DCM-EC

HYMAN ROBEY
SOLUTIONS FROM THE GROUND UP
150 US Hwy 158 E.
PO Box 339
Camden, NC 27921
(252) 338-2913
(252) 338-5552 fax
www.hymanrobey.com
License C-0698

SURVEY FOR THOMAS S. & JUDITH A. LAMPLEY

BETHEL TOWNSHIP
PERQUIMANS COUNTY
NORTH CAROLINA

KEY PLAN:

Project #: 100057
Drawing #: 100057
Drawn: TWR
Checked: ETH
Approved: ETH
Date: 03/17/10
Sheet #: 01/01
Scale: 1:20

REVISIONS:
NUM. DATE DESCRIPTION

SHEET TITLE:
SURVEY

SHEET NUMBER:
1


Hertford
Crow Point Island
Durants Neck
New Hope
Perquimans
Bethel
108 Virginia Court, Albemarle Plantation
LOCATION
Albemarle Sound
Haughton Rd
Edenton
Yeopim Rd
Poplar Neck Rd
32
37

Bulkhead General Permit #49979A
issued 12/03/2007

Aerial Photo Date: 03/02/2008

Prequimans GIS 2012

29/2018 10:14:57 AM

1:564

0 0 0.01 0.01 mi

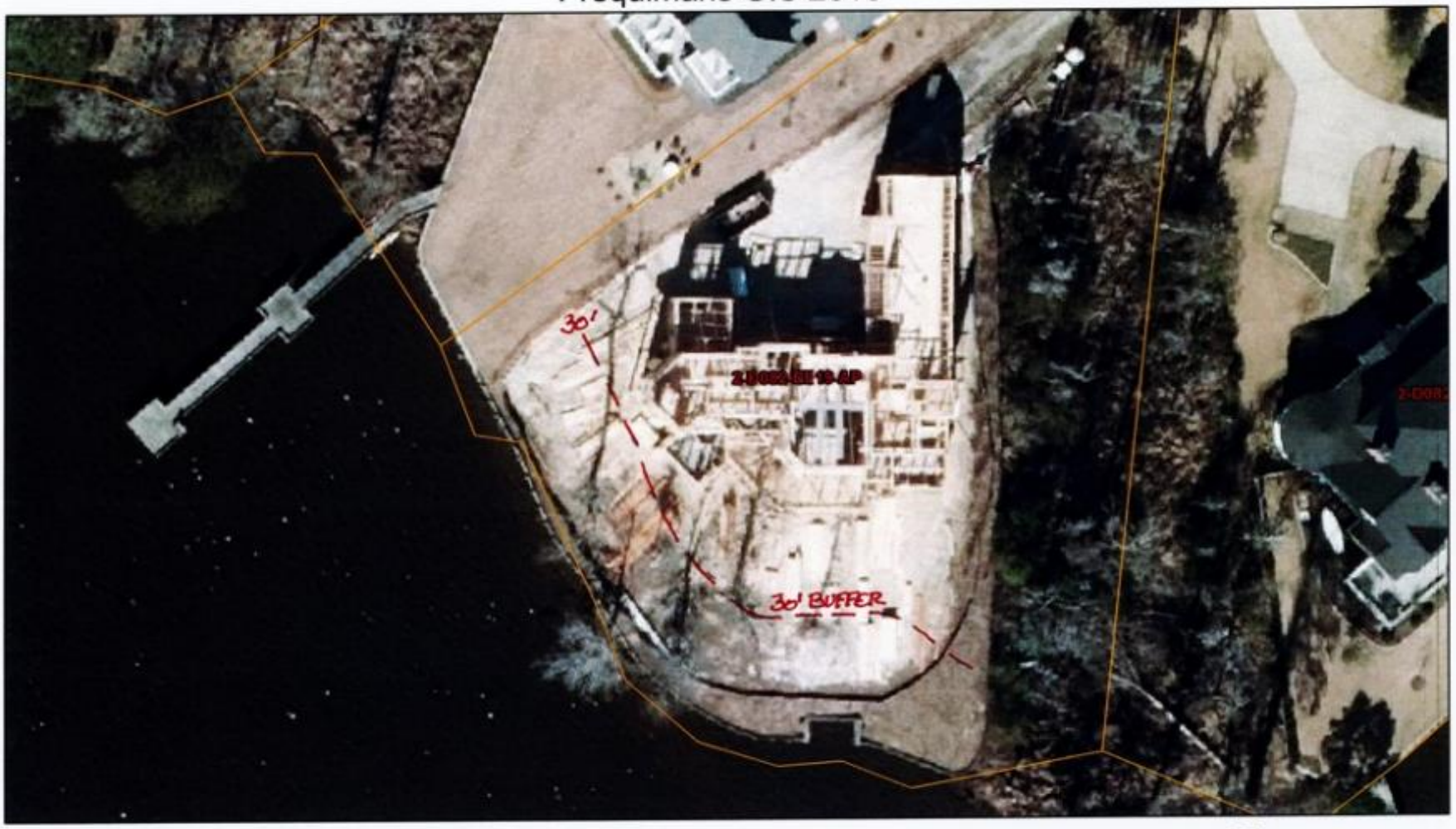
0 0.01 0.01 0.02 km

NCCGIA, Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS u
community

Prequimans

For tax purposes only. Not a legal document or survey. Perquimans nor State of NC assume any liability resulting from use of this m

Prequimans GIS 2016



8/29/2018 11:32:46 AM

Imagery2016

During construction of dwelling.

1:564

0 0 0.01 0.01 mi

0 0.01 0.01 0.02 km

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Prequimans GIS

For tax purposes only. Not a legal document or survey. Perquimans nor State of NC assume any liability resulting from use of this map.

Aerial Photo Date: 03/22/2017

STAFF PHOTOS

Facing west along Yeopim Creek
September 12, 2017

Facing east along Yeopim Creek
September 12, 2017

Facing south along Yeopim Creek
September 12, 2017

Facing southwest along Yeopim Creek
September 12, 2017

Photo provided by Petitioners

Photo provided by Petitioners

Photo provided by Petitioners

15A NCAC 07J .0703 PROCEDURES FOR DECIDING VARIANCE PETITIONS

(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.

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

WILLIAM F. LANE
General Counsel

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, DEQ Assistant General Counsel

DATE: February 11, 2019 (for the February 27-28, 2019 CRC Meeting)

RE: **Variance Request by Joseph H. and Vicki S. Hatch (CRC-VR-19-01)**

Petitioners Joseph L. and Vicki S. Hatch ("Petitioners") own property at 131 Buffell Head Road (the "Site") in Duck, North Carolina. The property is located within the Commission's Ocean Hazard Area of Environmental Concern ("AEC"). This area of Duck is subject to a "static line" following a large-scale beach nourishment project in 2017.

In January, Petitioners applied for a CAMA Minor Permit in order to replace all of the existing decking on their house with in the same footprint, including approximately 700 square feet of decking waterward of the 60-foot setback from the static line. On January 14, 2019, the Town of Duck's Coastal Area Management Act ("CAMA") Local Permitting Officer ("LPO") denied Petitioners' CAMA Minor Permit application as the proposed replacement deck does not meet the applicable 60' setback from the static line and does not meet the 60' setback exception under 15A NCAC 7H .0309. On January 15, 2019, Petitioners filed this variance petition to request the Commission vary the oceanfront setback rules so it can replace the existing structurally attached decking waterward of the setback as proposed.

The following additional information is attached to this memorandum:

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

cc(w/enc.): Joseph L. and Vicki S. Hatch, Pro-se Petitioners, electronically
Mary Lucasse, Special Deputy AG and CRC Counsel, electronically
Sandy Cross, Town of Duck CAMA LPO, electronically

RELEVANT STATUTES OR RULES **APPENDIX A**

15A NCAC 07H .0301 OCEAN HAZARD CATEGORIES

The next broad grouping is composed of those AECs that are considered natural hazard areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage.

15A NCAC 07H .0302 SIGNIFICANCE OF THE OCEAN HAZARD CATEGORY

(a) The primary causes of the hazards peculiar to the Atlantic shoreline are the constant forces exerted by waves, winds, and currents upon the unstable sands that form the shore. During storms, these forces are intensified and can cause significant changes in the bordering landforms and to structures located on them. Ocean hazard area property is in the ownership of a large number of private individuals as well as several public agencies and is used by a vast number of visitors to the coast. Ocean hazard areas are critical, therefore, because of both the severity of the hazards and the intensity of interest in the areas.

(b) The location and form of the various hazard area landforms, in particular the beaches, dunes, and inlets, are in a permanent state of flux, responding to meteorologically induced changes in the wave climate. For this reason, **the appropriate location of structures on and near these landforms must be reviewed carefully in order to avoid their loss or damage. As a whole, the same flexible nature of these landforms which presents hazards to development situated immediately on them offers protection to the land, water, and structures located landward of them.** The value of each landform lies in the particular role it plays in affording protection to life and property. (The role of each landform is described in detail in Technical Appendix 2 in terms of the physical processes most important to each.) Overall, however, the energy dissipation and sand storage capacities of the landforms are most essential for the maintenance of the landforms' protective function.

15A NCAC 07H .0303 MANAGEMENT OBJECTIVE OF OCEAN HAZARD AREAS

(a) The CRC recognizes that absolute safety from the destructive forces indigenous to the Atlantic shoreline is an impossibility for development located adjacent to the coast. The loss of life and property to these forces, however, can be greatly reduced by the proper location and design of structures and by care taken in prevention of damage to natural protective features particularly primary and frontal dunes. Therefore, it is the CRC's objective to provide management policies and standards for ocean hazard areas that serve to eliminate unreasonable danger to life and property and achieve a balance between the financial, safety, and social factors that are involved in hazard area development.

(b) **The purpose of these Rules shall be to further the goals set out in G.S. 113A-102(b), with particular attention to minimizing losses to life and property resulting from storms and long-term erosion, preventing encroachment of permanent structures on public beach areas, preserving the natural ecological conditions of the barrier dune and beach systems, and reducing the public costs of inappropriately sited development. Furthermore, it is the objective of the Coastal Resources Commission to protect present common-law and statutory public rights of access to and use of the lands and waters of the coastal area.**

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 the 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 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 or in 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.

***

15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This Paragraph 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. Primary dunes extend 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 the first mound of sand located landward of the ocean beach that has stable and natural vegetation present.

(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. Planted 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 and 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 project construction shall be defined as the "static vegetation line." The "onset of project 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 the contract date will be considered the onset of construction. 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.

***

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 Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established below the mean high water line.

(4) The setback distance shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

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

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

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

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

(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;

15A NCAC 07H .0309 USE STANDARDS FOR OCEAN HAZARD AREAS: EXCEPTIONS

(a) The following types of development shall be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of the Subchapter if all other provisions of this Subchapter and other state and local regulations are met:

***

(3) elevated decks not exceeding a footprint of 500 square feet;

****

In all cases, this development shall be permitted only if it is landward of the vegetation line or static vegetation line, whichever is applicable; involves no alteration or removal of primary or frontal dunes which would compromise the integrity of the dune as a protective landform or the dune vegetation; has overwalks to protect any existing dunes; is not essential to the continued existence or use of an associated principal development; is not required to satisfy minimum requirements of local zoning, subdivision or health regulations, and meets all other non-setback requirements of this Subchapter.

STIPULATED FACTS **ATTACHMENT B**

1. Petitioners Joseph L. and Vicki S. Hatch ("Petitioners") own an oceanfront home and property at 131 Buffell Head Road (the "Site") in the Town of Duck ("Town"), Dare County, North Carolina. (Lot 141, Section B of Carolina Dunes Subdivision). The Lot was platted on November 29, 1973, and is seen on a subdivision map recorded in Map Book 6, Page 59 of the Dare County Registry, a copy of which is attached as a stipulated exhibit.

2. Petitioners own the Site as trustees of the Joseph L Hatch Declaration of Trust, Dated March 16, 1999. The trust took title through a gift deed recorded on December 4, 2007 and recorded in Book 1750, Page 459 of the Dare County Registry. Petitioners originally took title to the Site from Roosevelt Hatch, Sr. through a deed recorded on May 16, 2005 in Book 1631, Page 51 of the Dare County Registry. Roosevelt Hatch, Sr. took title from the developer, Carolina Dunes, through a deed recorded in Book 270, Page 892 of the Dare County Registry. Copies of these deeds are attached as stipulated exhibits, except the deed at Book 270, Page 892.

3. In connection with a large-scale beach nourishment project, Petitioners granted a dry-sand beach access easement to the Town through an easement recorded on June 12, 2015 at Book 2026, Page 710 of the Dare County Registry, a copy of which is attached as a stipulated exhibit.

4. Aerial and ground-level photographs of the Site and surrounding area are attached as part of the powerpoint presentation, which is a stipulated exhibit.

5. The Lot is approximately 75 feet wide by 152 feet deep, as measured to the mean high water line measured before the recent nourishment project, as shown on the 2018 survey of the Site by M. Douglas Styons, Jr, P.L.S. (“2018 Survey”), a copy of which is attached and which was included as part of Petitioner's CAMA Minor Permit application.

6. A 1981 Survey of the Site (“1981 Survey”) was performed by Michael D. Barr, P.L.S. for Roosevelt Hatch and shows the Site before it was developed. A copy of this 1981 Survey is attached as a stipulated exhibit.

7. The Lot is within the Ocean Erodible Area of Environmental Concern ("AEC"), a subcategory of the Ocean Hazard AEC designated by the Coastal Resources Commission ("CRC") in 15A NCAC 7H .0304.

8. N.C.G.S. § 113A-118 requires that a CAMA permit be obtained before any development takes place in an AEC.

9. According to the Dare County Tax Card for the Site, Petitioners' three-story home was built in 1981 and has approximately 2,832 square feet of heated residential space and 700 square feet of detached garage. The site also includes a 13' x 52' concrete patio along the southern property line, and a concrete driveway.The 2018 Survey indicates that there is approximately 700 square feet of total decking waterward of the setback line, split into three stories of decks on the oceanfront, as follows:

- First story deck is approximately 336 square feet
- Second story deck is approximately 322 square feet
- Third story deck is approximately 248 square feet
- South side single story deck is approximately 208 square feet
- North side single story deck is approximately 156 square feet

10. On January 11, 2019, Petitioners applied to the Town's CAMA Local Permit Officer (LPO) for a CAMA minor development permit to demolish and rebuild the existing 3-stories of decking, within the existing footprint and reattaching to the primary structure, while meeting current building code requirements. A copy of the CAMA Minor Permit Application is attached as a stipulated exhibit.

11. As required, Petitioner sent notice of the application to the two adjacent riparian property owners and to the public through onsite posting. The adjacent owner to the north is the Ellie Buck Living Trust, with J. Craig and Ellen Rice, Trustees. Craig Rice indicated that he had no objections to the proposed deck work. A copy of his January 11, 2019 email is attached. The adjacent owners to the south are Moses and Semiramis Agral-Kaloustian. Moses Kaloustian emailed a copy of a January 12, 2019 form indicating that he had no objection to the project, a copy of which is attached. Carolina Dunes Association also commented with no objections, a copy of which is attached. No other comments were received by the LPO in connection with this proposed development.

12. On January 14, 2019, the Town's CAMA LPO denied Petitioner's application as the portions of the proposed decks that would be 100% removed and replaced are waterward of the ocean erosion setback and do not comply with N.C.G.S. § 113A-120(a)(8) and 15A NCAC 7H .0306(a). While the exception to the oceanfront erosion setback at 15A NCAC 7H .0309(a) allows 500 square feet of structurally separate decking, Petitioners proposed approximately 700 square feet of decking waterward of the 60-foot setback measured from the static line, which exceeds the 500 square feet allowed, and have proposed that it be structurally connected to the house (as the current deck is). Petitioner's application was also denied pursuant to N.C.G.A. § 113A-120(a)(8), where the permit application is inconsistent with specific provisions of the Town's Land Use Plan which requires that decisions comply with CRC rules. A copy of the denial letter is attached as a stipulated exhibit.

13. The CRC has adopted an erosion setback ("Erosion Setback") requirement that applies to development along the oceanfront. 15A NCAC 7H .0306(a).

14. The Erosion Setback is generally measured from the first line of stable and natural vegetation ("FLSNV"). "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 more stable upland areas. [It] is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment." 15A NCAC 7H .0305(a)(5).

15. As a point of reference, aerial photographs from 2006 and February of 2018, each with the surveyed static line superimposed over the aerial photos created by Town staff, are attached to show the location of the static line (FLSNV before the 2017 nourishment) and the vegetation in February of 2018. A copy of this photo comparison is attached as a stipulated exhibit.

16. In the case of sites within the bounds of a large-scale beach fill project, the location of the FLSNV is surveyed immediately before the project, and that line becomes the Static Vegetation Line, and is used for locating the oceanfront erosion setback, per 15A NCAC 7H .0305(a)(6), (a)(7) and 15A NCAC 7H .0306(a)(1). In this case, the Town and the Site were within the bounds of a 2017 large-scale beach fill project which was a joint project with the Towns of Kitty Hawk, Kill Devil Hills and Southern Shores.

17. Structures measuring less than 5,000 square feet must be set back at a distance of 30 times the long-term annual erosion rate affecting the Lot from the FLSNV. 15A NCAC 07H .0306(a)(5)(A).

18. The average annual erosion rate factor for the Lot is two feet per year. Therefore, the Erosion Setback applicable to the Lot, for the redevelopment of the approximately 700 square foot deck (added to the 2,832 square foot total floor area of the home) is 60 feet (30 years x 2 feet).

19. On Petitioners' Lot, the 60-foot setback from the static line bisects the house, where the waterward two-thirds of the house is within the 60-foot setback. This can be seen on the 2018 Survey, attached.

20. The CRC's rules governing variance procedures require that "[b]efore filing a petition for a variance from a rule of the Commission, the person must seek relief from local requirements restricting use of the property, and there must not be pending litigation between the petitioner and any other person which may make the request for a variance moot." 15A NCAC 7J .0701(a).

21. While the Town has building setbacks, Petitioner would not need to seek relief where the existing house is not proposed to be moved, and the existing decking is proposed to be rebuilt within the same footprint. Any variance from town setbacks (i.e. the street-side setback) would not offer relief from the Commission's oceanfront erosion setback, where both structures would have to be shifted toward the street to reduce a variance from the oceanfront erosion setback.

22. However, Petitioners did need to seek a variance from the Town's ordinance 156.124(c) and 2(a) which requires a 60' structure setback from the FLSNV. In this case, the waterward edge of the proposed re-built decking is located 25.8' from the FLSNV, and so a variance of 34.2' was needed. Petitioners submitted their local variance petition to the Town on November 28, 2018. Petitioners' variance was heard by the Town's Board of Adjustment on January 9, 2019, and was

granted through a written order, dated January 11, 2019. Copies of the local variance petition materials, the staff report, and the local variance order are attached as stipulated exhibits.

23. On January 15, 2019, DCM received Petitioners' variance request, attached. Petitioners seek a variance from the Commission to remove and reconstruct, in the same footprint, the existing three-level deck which will not be structurally independent, as proposed in his CAMA minor permit application.

24. Without a variance from this Commission, Petitioners could make repairs to the existing decking, where the cost of the work is less than 50% of the market value of the structure. Petitioners could also remove the existing decking and replace it with structurally independent "elevated decks not exceeding a footprint of 500 square feet" per 15A NCAC 7H .0309(a)(3).

25. Aerial and ground-level photographs of the Lot and the surrounding properties are attached as exhibits and as part of the powerpoint exhibit.

26. In this matter, the Division of Coastal Management is represented by Christine Goebel, Assistant General Counsel for DEQ. The Petitioners are representing themselves.

27. Petitioners stipulate that the permit was correctly denied based on the reasons set forth in the CAMA permit denial letter.

Stipulated Exhibits

1. Subdivision Plat Map 6, Page 59 of the Dare Co. Registry
2. Series of deeds: 1750/459, 1631/51
3. Easement for Nourishment project 2026/710
4. 2018 Survey of the Site
5. 1981 Survey of the Site for Roosevelt Hatch
6. Tax Card for Site
7. CAMA Minor Permit Application, dated January 11, 2019
8. Notice of the CAMA permit application to two adjacent neighbors, with responses
9. January 14, 2019 CAMA Permit Denial Letter
10. 2006/2018 aerial comparison with static line shown
11. Local Variance Petition, Staff Report and Order
12. Powerpoint

PETITIONERS' and STAFF'S 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.

Petitioners' Position: Yes.

The existing deck is aging and has been damaged by the storms over the past two years. The current regulation would prohibit the replacement of the deck, due to the existing structure lying within the CAMA setback. Replacing the 6" pilings with current building code pilings of 8" would be safer and stronger. To repair the existing structure would be far less safe, than total replacement.

Staff's Position: No.

Staff disagrees that the strict application of the oceanfront erosion setbacks and the setback exceptions at 7H.0309, which already allow a footprint of 500 square feet of elevated decking within the setback, causes Petitioners any hardships. Staff notes that the Commission's rule already allows a generous exception authorizing a footprint of 500 square feet of elevated decking within the setback, which can include stacked decks. In this case, Petitioners, who currently have approximately 700 square feet of decking within the setback, propose to replace the decking in the existing configuration and structurally attached. This decking is proposed to be added to the oceanward side of the home, closest to the ocean hazard and most susceptible to both long-term oceanfront erosion and storm-related erosion. Additionally, this Site has recently received its first large-scale nourishment project, but the Town of Duck does not have a long-term nourishment plan. On this eroding shoreline, it is certainly possible that in a short period of time, this decking, which would be located less than 30' from the static line and FLSNV, could be encroaching onto the public trust beach. The Commission's rules regarding the Ocean Hazard AEC acknowledge that shoreline erosion is part of the oceanfront system, and the intent of the rules is "minimizing losses to life and property resulting from storms and long-term erosion, preventing encroachment of permanent structures on public beach areas, preserving the natural ecological conditions of the barrier dune and beach systems, and reducing the public costs of inappropriately sited development" (15A NCAC 07H .0303(b)). While Staff agree that using larger pilings for the deck as required by current code would strengethen the replacement deck, on balance, Staff see no unnecessary hardships from not being able to replace all 700 square feet of decking within the setback given the oceanfront erosion on the Site and the proximity to the vegetation line on a beach that has no long-term nourishment plan. Finally, Staff notes that Petitioners can re-work their decking in other ways to be structurally independent and a desirable configuration without a variance as long as it does not exceed a footprint of 500 square feet of decking within the oceanfront setback. It appears to Staff that removing the decking on the north side of the home (which does not interfere with existing doors) would likely reduce the total decking below 500 square feet. Such design adjustments could offer reasonable deck space within a 500 square foot footprint and without the need for a variance.

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

Petitioners' Position: Yes.

The house was one of the first built in Carolina Dunes, in the early 80's and has been in our family the entire time. The house is surrounded on all sides by decking, as part of the design of the house. When the house was built in the early 80's , the dune extended much further to the east, (see attached survey from 1981).

Staff's Position: No.

Staff find no peculiarities of this property, such as size, location or topography, which cause any hardships to Petitioners. Petitioners' period of family ownership is not a condition which can be considered under this statutory factor, such and size, location or topography. Petitioners' argument that the dune had extend "much further" in the past does not support an argument that the erosion is peculiar. To the contrary, when the Site is located on an eroding shoreline and 38 years elapse, it is predictable that the house would eventually not meet a minimum 60 foot setback from the static line (which is currently in the same general location as the FLSNV).

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

Petitioners' Position: No.

The house was built in the early 80's, and the structure has maintained that footprint ever since, however, the accelerated natural erosion has moved the dune line from 269 feet from the front of the property line in the 1980's to approximately 161 feet currently. The hardship was created by erosion, and the westward movement of the dune, not by any of our actions. There have never been any walk overs, or pools or enlarged deckes added since the house was built.

Staff's Position: Yes.

While Staff agree that Petitioners did not cause the erosion of the vegetation line and dune system on their lot since their family purchased the Site in the early 1980's, and did not cause the deck to be located within the 60' setback, shoreline erosion is not uncommon for an ocean shoreline, and is contemplated in the Commission's rules for the Ocean Hazard AECs. Staff contend that the replacement of approximately 700 square feet of structurally attached decking, largely on the oceanfront side of the house, in excess of the Commission's existing 500 sq. ft. footprint exception, is a hardship caused by Petitioners' choice of design. Staff contend that the complete replacement of the existing deck is not required in order to ustilize the oceanfront residence, and could be scaled back to the 500 sq. ft. footprint (can be three 500 sq. ft. decks if stacked in the same footprint).

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.

Petitioners' Position: Yes.

The 34.2' variance is needed in order to maintain the house, as it was built in the 1980's. The deck is an existing feature, that will be replaced. Replacing the deck in its current location will not disturb the dune vegetation or create any significant additional impact to the dune, dune system, or surrounding neighbors. The requeseted variance is the minimum possible to allow the deck to be replaced in is existing footprint. The intention of the deck replacement is to maintain the property in the safest way possible. The plan includes the deck to be replaced with larger pilings, bringing it up to the current building code, and keeping it exactly in the same style and footprint that is existing. We are putting back what is there. This project would have minimal impact to the dune. The project should have no impact to the neighborhood or public. Additionally we have contacted the adjacent neighbors and homeowners association representative, to inform them of what we intend to do, and they have stated no objections.

Staff's Position: No.

Staff has concerns that replacing the 700 square feet of decking on the oceanside of the existing home is not in the spirit of the oceanfront erosion setback rules. The Commission's rules have provided an oceanfront erosion setback since 1979, and while most new structures are required to meet a setback (in this case, 60-feet), the Commission has made exceptions to allow limited development within the setback area (See the nine types of development listed in 07H.0309, above) including elevated decking not to exceet a 500 square foot footprint. At this time, Petitioners have approximately 700 square feet of decking that is structurally attached to the house. While they are not proposing any increase of decking, they are proposing that it continue to be structurally attached and are replacing the existing 6" pilings with 8" pilings to meet current code. The proposed deck is only located 25.8 feet from the current location of both the static line and the FLSNV, on an eroding beach with one recent large-scale nourishment project, but no long-term nourishment plan. The likelihood of the replacement deck becoming a cost to the public as future post-storm debris removal is significant. Likewise, Staff believes the replacement decking located on the oceanfront side of the home can likely become storm debris, which would not secure public safety and welfare. Staff contend that allowing a variance for 700 square feet of structurally attached replacement decking, 200 square feet more than the Commission's existing exception, would not preserve substantial justice where other oceanfront owners are limited to 500 square foot footprint.

ATTACHMENT D:

PETITIONERS' VARIANCE REQUEST MATERIALS

January 14, 2019

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JAN 15 2019

DCM-MHD CITY

Joseph and Vicki S. Hatch
131 Buffell Head Road
Duck, NC. 27949

Director
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Dear Director:

Re: CRC Variance Application

We are applying for a CRC Variance. Please allow this to serve as a cover sheet and index for the documents attached. If you have any questions, please call or email me. Thank you for your review of this application.

Sincerely,

Vicki Hatch

Vicki S. Hatch
(757) 650-7101
vhatch1@verizon.net

Mailing address: Joseph and Vicki S. Hatch
2340 Leeward Shore Drive
Virginia Beach, VA. 23451-1719

Attached:
Exhibit 1. CRC Variance Application 4 pages
Exhibit 2. Copy of Permit Decision 5 pages
Exhibit 3. Copy of the deed 2 pages
Exhibit 4. Description of proposed development site plan 2 pages
Exhibit 5. Stipulation that proposed development is inconsistent. 2 pages
Exhibit 6. Proof of notice to adjacent owners 14 pages
Exhibit 7. Proof variance was sought from local. 18 pages
Exhibit 8. Petitioner's written reason and arguments 2 pages
Exhibit 9. Stipulated facts and exhibits. 12 pages

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DCM-MHD CITY

Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 1. CRC Variance Application 4 pages

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.: 19-01

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PETITIONER'S NAME Joseph L. and Vicki S. Hatch
COUNTY WHERE THE DEVELOPMENT IS PROPOSED Dare County

Pursuant to N.C.G.S. § 113A120.1 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:

__X__ The name and location of the development as identified on the permit application;

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

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

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

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

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

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

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

__X__ 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.

__X__ 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.

Vicki S. Hatch

Signature of Petitioner or Attorney

January 14, 2019
Date

Vicki S. Hatch

Printed Name of Petitioner or Attorney

vhatch1@verizon.net

Email address of Petitioner or Attorney

2340 Leeward Shore Drive,
Virginia Beach, VA 23451
Mailing Address

(757) 650-7101

Telephone Number of Petitioner or Attorney

Fax Number of Petitioner or Attorney

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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

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 2. Copy of Permit Decision 5 pages

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 3 Copy of the deed 2 pages

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 4 Description of proposed dev. 2 pages

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 5 Stipulation that development is inconsistent
2 pages

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 6 Proof of notice. 14 pages

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JAN 15 2019

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 7. Proof variance was sought from local.
18 pages

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 8 Petitioner's written reason and arguments
2 pages

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CAMA Variance Request Form
Additional Page

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.

The existing deck is aging and has been damaged by the storms over the past two years. The current regulation would prohibit the replacement of the deck, due to the existing structure lying within the CAMA setback. Replacing the 6" pilings with current building code pilings of 8" would be safer and stronger. To repair the existing structure would be far less safe, than total replacement.

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

The house was one of the first built in Carolina Dunes, in the early 80's and has been in our family the entire time. The house is surrounded on all sides by decking, as part of the design of the house. When the house was built in the early 80's, the dune extended much further to the east, (see attached survey from 1981).

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

The house was built in the early 80's, and the structure has maintained that footprint ever since, however, the accelerated natural erosion has moved the dune line from 269 feet from the front of the property line in the 1980's to approximately 161 feet currently. The hardship was created by erosion, and the westward movement of the dune, not by any of our actions. There have never been any walk overs, or pools or enlarged decks added since the house was built.

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(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.

The 34.2' variance is needed in order to maintain the house, as it was built in the 1980's. The deck is an existing feature, that will be replaced. Replacing the deck in its current location will not disturb the dune vegetation or create any significant additional impact to the dune, dune system, or surrounding neighbors. The requested variance is the minimum possible to allow the deck to be replaced in its existing footprint. The intention of the deck replacement is to maintain the property in the safest way possible. The plan includes the deck to be replaced with larger pilings, bringing it up to current building code, and keeping it exactly in the same style and footprint that is existing. We are putting back what is there. This project would have minimal impact to the dune. The project should have no impact to the neighborhood or public. Additionally we have contacted the adjacent neighbors and homeowners association representative, to inform them of what we intend to do, and they have stated no objections.

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Joseph and Vicki Hatch
131 Buffell Head Road
Duck, NC. 27949

Exhibit 9 Stipulated facts and exhibits 12 pages

ATTACHMENT E:

STIPULATED EXHIBITS

1. Subdivision Plat Map 6, Page 59 of the Dare Co. Registry
2. Series of deeds: 1750/459, 1631/51
3. Easement for Nourishment project 2026/710
4. 2018 Survey of the Site
5. 1981 Survey of the Site for Roosevelt Hatch
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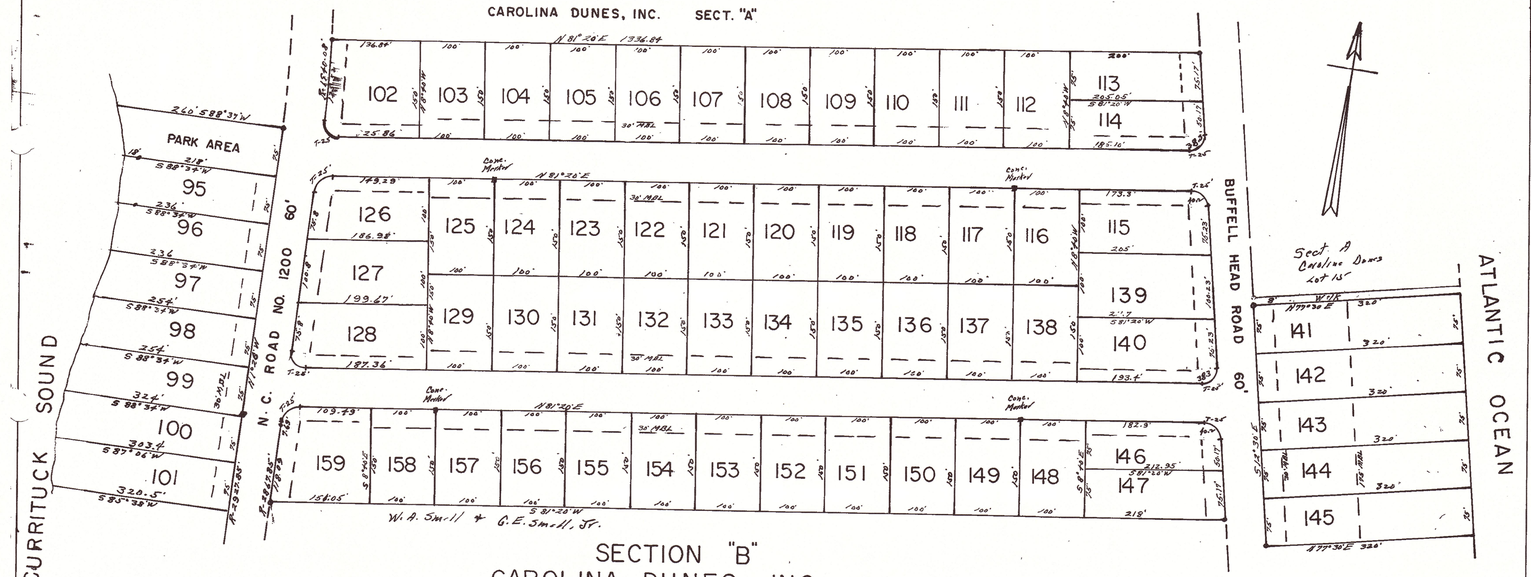
10. 2006/2018 aerial comparison with static line shown
11. Local Variance Petition, Staff Report and Order
12. Powerpoint

5-00pd 11-29-73 10-00 am 59



SECTION "B"
CAROLINA DUNES, INC.

DARE COUNTY, NORTH CAROLINA
SCALE 1 INCH = 100 FEET MARCH 30, 1973

0 1 2 3 4 500 FEET

CERTIFICATE OF OWNERSHIP AND DEDICATION

WE HEREBY CERTIFY THAT WE ARE THE OWNERS OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND THAT WE HEREBY ADOPT THIS PLAN OF SUBDIVISION WITH OUR FREE CONSENT, ESTABLISH MINIMUN BUILDING LINES, AND DEDICATE ALL ROADS, ALLEYS, WALKS, AND OTHER SITES TO PUBLIC OR PRIVATE USE AS NOTED. FUTHER WE CERTIFY THE LAND AS SHOWN HEREON IS WITHIN PLATTING JURISDICTION OF DARE COUNTY.

Carolina Dunes, Inc. By: [signature] Pres.
Attest: [signature] Sec.

CERTIFICATE OF APPROVAL – PRIVATE WATER AND SEWER SYSTEM

I HEREBY CERTIFY THAT THE WATER SUPPLY AND SEWAGE DISPOSAL SYSTEM INSTALLED, OR PROPOSED FOR INSTALLATION IN THE SUBDIVISION ENTITLED Section B Carolina Dunes FULLY MEETS THE REQUIREMENTS OF THE DARE COUNTY HEALTH DEPARTMENT AND ARE HEREBY APPROVED AS SHOWN.

[signature] 11/28/73

CERTIFICATE OF APPROVAL FOR RECORDING PLAT AND ACCEPTANCE OF DEDICATIONS.

I, Mary S. Austin, THE COUNTY CLERK OF DARE COUNTY, NORTH CAROLINA, DO CERTIFY THAT ON THE 27 DAY OF Nov., 1973, THE BOARD OF COMMISSIONERS APPROVED THIS PLAT FOR RECORDING AND ACCEPTED THE DEDICATION OF THE ROADS, EASEMENTS, RIGHTS-OF-WAY AND PUBLIC PARKS AND OTHER SITES FOR PUBLIC PURPOSES AS SHOWN HEREON, BUT ASSUME NO RESPONSIBILITY TO OPEN OR MAINTAIN THE SAME UNTIL, IN THE OPINION OF GOVERNING BODY OF DARE COUNTY IT IS IN THE PUBLIC INTEREST TO DO SO.

[signature] 11/29/73
CHAIRMAN DARE COUNTY BOARD OF COMMISSIONERS

BUILDING SETBACK LINES
FRONT PROPERTY LINE 30 FEET
SIDE PROPERTY LINE 8 FEET
SIDE LINE ABUTS STREET 15 FEET
REAR PROPERTY LINE 20 % OF LOT DEPTH

N. C. Dare County
The foregoing joint certificate of Edna A. Sawyer, N.P. & S. Elmo Williams is certified to be correct.
Presented for registration this the 29 day of November, 1973, at 10-00 o'clock A. M. and recorded in this office in Book [illegible], Page 59.
Estelle D. Gray
Register of Deeds
By [signature]
Assistant Register of Deeds

CERTIFICATE OF APPROVAL BY PLANNING BOARD

I, Tom McKinney Jr. CHAIRMAN OF THE DARE COUNTY PLANNING BOARD, HEREBY CERTIFY THAT SAID BOARD DULY APPROVED THE FINAL PLAT OF THE SUBDIVISION ENTITLED Carolina Dunes Sec. Section B ON 29 DAY OF Nov., 1973.

Tom McKinney Jr.

CERTIFICATE OF SURVEYOR

I, S. ELMO WILLIAMS CERTIFY THAT THIS MAP WAS DRAWN FROM A SURVEY MADE BY ME AND THE ERROR OF CLOSURE AS CALCULATED BY LAT. AND DEP. IS 1:11,000. THAT THIS MAP WAS PREPARED IN ACCORDANCE WITH G. S. 47-30 AS AMENDED.

WITNESS MY HAND AND SEAL THIS

S. Elmo Williams
N. C. REG. LAND SURVEYOR NO L609

Edna A. Sawyer NOTARY PUBLIC OF PASQ. COUNTY DO HEREBY CERTIFY THAT S. ELMO WILLIAMS PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE ABOVE CERTIFICATE.

WITNESS MY HAND THIS November 10, 1973.

Edna A. Sawyer
NOTARY PUBLIC

EDNA A. SAWYER, NOTARY PUBLIC
South Ctr., Pasquotank Co., N. C.
My Commission Expires 6/6/75
6/6/75

1-369

Unofficial Document

Filed Book: 1750 Page: 459
12/04/2007 08:36AM
Doc Code: DEED
BARBARA M GRAY, REGISTER OF DEEDS DARE CO, NC

Doc Id: 6231874
Receipt #: 196891

6231874
Page: 1 of 4
12/04/2007 08:36A

Prepared by and return to:
Midgett & Preti PC
477 Viking Drive, Suite 430
Virginia Beach, VA 23452
Parcel # 0095940000

NORTH CAROLINA
DARE COUNTY

EXEMPT
DARE COUNTY TAX
COLLECTOR
NO. 4754-07

THIS DEED OF GIFT, made on this 26th day of November, 2007, by and between **JOSEPH L. HATCH** and **VICKI S. HATCH**, his wife, **Grantors**, and **JOSEPH L. HATCH** and **VICKI S. HATCH**, **Trustees** under the Joseph L. Hatch Declaration of Trust, dated March 16, 1999, as amended and restated, **Grantees**, whose mailing address is 2340 Leeward Shore Road, Virginia Beach, VA 23451.

W I T N E S S E T H:

That for no monetary consideration, and as a gift only, the said Grantors do hereby grant and convey with General Warranty and English Covenants of Title unto the said Grantees, the following described property located in Dare County, North Carolina, to-wit:

> Being Lot No. 141 as shown and delineated on that certain plat entitled "Section B, Carolina Dunes, Inc." dated November 10, 1973, by S. Elmo Williams, Registered Surveyor, and recorded in Map Book 6, pages 59, in the office of the Register of Deeds of Dare County, N.C.
>
> IT BEING the same property conveyed to the Grantors herein by deed from Roosevelt Hatch, Sr. dated April 29, 2005 and recorded in the aforesaid Register's Office, in Book 1631 at page 51.

TO HAVE AND TO HOLD the said property as Trustee of the Joseph L. Hatch Declaration of Trust dated March 16, 1999, as amended and restated, for the purposes set forth herein and under the said Declaration of Trust,

and with the rights, powers and privileges as set forth in North Carolina Statutes § 32-27 and § 36A-136, including but not limited to the following:

1. Grantee, and any successor trustee (the "Trustee") shall have all powers with respect to the Property as are granted in the Joseph L. Hatch Declaration of Trust dated March 16, 1999, as amended and restated, ("Trust Agreement"), including, without limitation, all of the powers specified in North Carolina Statutes § 32-27 and § 36A-136 which include the power to sell, exchange, lease, encumber, grant options for and otherwise deal with and dispose of all or any portion of the Property subject to any limitations imposed upon Trustees under applicable law.

2. No party dealing with the Trustee in relation to the Property shall be (a) required to see to the application of any purchase money, rent or money borrowed or otherwise advanced on the Property, (b) required to see if the terms of the Trust Agreement have been complied with, (c) required to inquire into the authority, necessity or expediency of any act of the Trustee, or (d) privileged to inquire into any of the terms of the Trust Agreement.

3. Every instrument executed by the Trustee in relation to the Property shall be conclusive evidence in favor of every person claiming any right, title or interest under such instrument or in and to the Property of the following facts: (a) that at the time of the delivery of such instrument, the Trust Agreement was in full force and effect; (b) that such instrument was executed in accordance with the terms and conditions of the Trust Agreement and is binding upon all beneficiaries under the Trust Agreement; (c) that the Trustee is duly authorized and empowered to execute and deliver every such instrument; and (d) that if an individual or entity other than the Grantee is the Trustee under the Trust Agreement, such successor or successors to Grantee have been properly appointed and are fully vested with all the title, estate, rights, powers, duties and obligations granted to the Trustee under the Trust Agreement with reference to the Property.

6231874
Page: 2 of 4
12/04/2007 08:36A

Book 1750 Page 459-0002

Unofficial Document

4. The Trustee shall have no individual liability or obligation whatsoever arising from ownership, as a Trustee, of the Property, or with respect to any act done or contract entered into, or indebtedness incurred by it in dealing with the Property, or otherwise acting as the Trustee, except only so far as the property and any trust funds in the actual possession of the Trustee shall be applicable to the payment and discharge of any such liability or obligation.

5. This Deed is governed by and is to be read and construed with reference to North Carolina Statutes § 32-27 and § 36A-136.

This conveyance is made expressly subject to the conditions, restrictions, reservations and easements, if any of record, constituting constructive notice.

This conveyance is also made subject to such easements shown on the above mentioned plat as may affect said lot.

THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK

SIGNATURES APPEAR ON THE FOLLOWING PAGE

Unofficial Document

6231874
Page: 3 of 4
12/04/2007 08:36A

WITNESS the following signatures and seals:

Unofficial

Joseph L. Hatch (SEAL)
Joseph L. Hatch

Vicki S. Hatch (SEAL)
Vicki S. Hatch

COMMONWEALTH OF VIRGINIA
CITY OF VIRGINIA BEACH, to-wit:

I, Amber D. Ehrhardt, a Notary Public of the above-referenced jurisdiction, do hereby certify that Joseph L. Hatch and Vicki S. Hatch, hereby appeared before me and acknowledged the due execution of the aforesaid instrument, this 28th day of November, 2007. The person is ___ personally known to me, or ✓ I examined the following type of identification: VA DL. (Identification must be a United States Passport, a certificate of United States citizenship, a certificate of naturalization, an unexpired foreign passport, an alien registration card with photograph, a state-issued driver's license or state-issued identification card or a United States military card.)

AMBER D. EHRHARDT
NOTARY PUBLIC
Commonwealth of Virginia
Notary Registration No. 357909
My Commission Expires: October 31, 2009

Unofficial

Amber D. Ehrhardt
Notary Public

My Commission Expires:
SEAL

THIS DEED WAS PREPARED AT THE REQUEST OF THE GRANTOR HEREIN WITHOUT BENEFIT OF A TITLE EXAMINATION.

Unofficial Document

6231874
Page: 4 of 4
12/04/2007 08:36A

Unofficial Document

Filed Book: 1631 Page: 51
05/16/2005 02:29PM
Doc Code: DEED
BARBARA M GRAY, REGISTER OF DEEDS DARE CO, NC

Doc Id: 6168630
Receipt #: 140315
NC Excise Tax pd: $1000.00

6168630
Page: 1 of 2
05/16/2005 02:29P

Unofficial Document

APPROVED
DARE COUNTY TAX
COLLECTOR
NO: 3920-05 $1000.00

Excise Tax Recording Time, **Book** and Page
Tax Lot No

Prepared without benefit of a Title Exam

Parcel Identifier No #

Verified by . . . . . County on the day of . . . . . .

by

. . . . . .

. . . . . .

Mail after recording to: John Wm. Hester, 1136 Cedar Road, Chesapeake, Virginia, 23322
This instrument was prepared by: John Wm. Hester, Esquire N.C. State Bar No.:17877
Brief description for the Index: Lots 141, Section B, Carolina Dunes

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 29 day of April , 2005, by and between

GRANTOR	GRANTEE
ROOSEVELT HATCH, SR.	JOSEPH L. HATCH and VICKI S. HATCH, Husband and Wife.
_____	131 Buffell Head Road
_____	Duck North Carolina 27949

Enter an appropriate block for each party: name, address, and, if appropriate, character of entity, e.q. Corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.
WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lots or parcels of land situated in the County of Chowan, North Carolina and more particularly described as follows:

Being Lot No. 141 as shown and delineated on that certain plat entitled "Section B, Carolina Dunes, Inc." dated November 10, 1973, by S. Elmo Williams, Registered Surveyor, and recorded in Map Book 6, page 59, in the office of the Register of Deeds of Dare County, N.C.

PIN NO(s): 0095940000

DARE COUNTY
REAL ESTATE TRANSFER TAX
3920-05 $1000.00

Unofficial Document

Unofficial Document

The property hereinabove described was acquired by Grantor by instrument recorded in Deed Book 270 Page 892, Dare County Public Registry.
A map showing the above described property is recorded in Plat Book 6 , Page 59.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantees in fee simple.

And the Grantor covenants with the Grantee, that the Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinafter described is subject to the following exceptions:

(1) General utility easements and rights of way of record.
(2) Ad valorem taxes not yet due and payable.
(3) Restrictions and Covenants of record.
(4) Restrictions, conditions and covenants of record in Book 224, Page 48 Office of Register of Deeds, Dare County, North Carolina.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

BY: Roosevelt Hatch Sr.
Roosevelt Hatch, Sr.

STATE OF VIRGINIA
CITY OF Virginia Beach, to wit:

I, a Notary Public of the City and State aforesaid, certify that Roosevelt Hatch, Sr., personally came before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this 29 day of April, 2004.

My commission expires: 02/28/2007 Notary Public.

MATTHEW D. REASS

The foregoing Certificate(s) Matthew D. Reass notary public

is/are certified to be correct. This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof.

BARBARA M. GRAY REGISTER OF DEEDS FOR Dare COUNTY
By Deputy/ Assistant-Register of Deeds.

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Unofficial Document

4

Unofficial Document

BOOK 2026 PAGE 710 (4)

700012421

Recorded: 06/12/2015 02:10:45 PM
BY: Sharee Wilder
Vanzolla McMurran-Smith, Register of Deeds
Dare County, NC

Fee Amt: $26.00 NC Excise Tax: $0.00

6-11-15 MM

Space Above This Line For Recording Data

EXEMPT
DARE COUNTY TAX
COLLECTOR
1814-15/0

EASEMENT

Prepared by Robert B. Hobbs, Jr., Esq. Return to Town of Duck, PO Box 8369, Duck, NC 27949

Excise Tax: $-0-
Transfer Tax: $-0-

Tax Parcel: 009594000
LT Number _____

North Carolina, Dare County

THIS EASEMENT, dated June 8, 2015, by and between JOSEPH L HATCH and VICKI S HATCH, TRUSTEES UNDER THE JOSEPH L HATCH DECLARATION OF TRUST DATED MARCH 16, 1999 AS AMENDED AND RESTATED, whose mailing address is 2340 LEEWARD SHORE RD VIRGINIA BEACH VA 23451 (the "Owner"), and the TOWN OF DUCK, a North Carolina municipal corporation, PO Box 8369, Duck, NC 27949 (the "Town").

Owner is the owner in fee simple of certain real property, situated in the Town of Duck, Dare County, North Carolina and more particularly described as follows:
Property Address: 131 BUFFELL HEAD RD, DUCK, NC 27949; AND
Described in that certain deed to the Owner recorded in Book/Page 1750/0459, Dare County Registry (the "Property"), and Owner desires to grant a perpetual easement to the Town for the purposes stated below, and Town has agreed to accept such easement from Owner.

NOW, THEREFORE, for a valuable consideration, including the benefits Owner may derive therefrom, the receipt of which is hereby acknowledged, Owner has dedicated, bargained and conveyed and by these presents does hereby dedicate, grant and convey to Town, its successors and assigns, a perpetual, nonexclusive, irrevocable and assignable ambulatory easement and right-of-way in, on, over, through and across the hereinafter described land for use by the Town, its representatives, agents, employees, officials, engineers, consultants, surveyors, contractors, subcontractors, permittees, assignees, and invitees. The easement area shall be that portion of the Property located between the mean high water mark of the Atlantic Ocean, and the landward toe or the Frontal Dune or Primary Dune. In the absence of a discernable Frontal Dune or Primary Dune, the easement area shall be that portion of the Property located between the mean high water mark of the Atlantic Ocean, and the waterward edge of any Permanent Structure located on the Property as of the date of this Easement. In the absence of a discernable Frontal Dune or Primary Dune or a Permanent Structure, the easement area shall be that portion of the Property located between the mean high water mark of the Atlantic Ocean, and a northern and/or southern extension of the western boundary of the easement area for the property or properties adjoining the Property on the north and/or south whose comparable easement areas have been established using either the Frontal Dune or Primary Dune or a Permanent Structure located on such adjoining property (the "Easement Area"). Owner also grants and

Unofficial Document

conveys to Town a nonexclusive access easement across any portion of the Property for the purpose of permitting Town's inspection and, if necessary, observation, maintenance and repair of the Town's work and activities within the Easement Area (the "Access Easement").

TO HAVE AND HOLD the said easement unto the Town, its successors and assigns, forever. The Town shall have the right to temporarily or permanently assign this easement to the federal, state, or county governments, or any agencies or department thereof or any governmental authority formed to implement beach nourishment, renourishment and/or stabilization on the Ocean Beach in the Town, but only for the purposes set forth in this easement agreement. This easement shall be binding on the Owner, Owner's heirs, successors and assigns, and shall run with the title of the Property in perpetuity. The terms, uses, conditions and restrictions of the Easement are as follows:

1. Town may use the Easement Area to evaluate, survey, inspect, construct, preserve, patrol, protect, operate, maintain, repair, rehabilitate, and replace a public Ocean Beach, a dune system, and other erosion control and storm damage reduction measures, including the right to (a) deposit sand; (b) accomplish any alterations of contours on said land; construct berms and dunes; (c) nourish and renourish periodically; (d) move, store and remove equipment and supplies; (e) erect and remove temporary structures; (f) perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the Project; (g) plant vegetation on said dunes and berms; (h) erect, maintain and remove silt screens, sand fences and other sand collection measures; (i) facilitate preservation of dunes and vegetation through the limitation of access to dune areas; and (j) trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the boundaries of the Easement Area. Town will not engage in any of the foregoing activities in the Easement Area without holding a permit to do so, to the extent a permit for such activity or activities is required by law.

2. THERE IS RESERVED, HOWEVER, to the Owner, Owner's heirs, successors and assigns, the right to construct an Improved Dune Walkover Access structure within the Easement Area in accordance with any applicable Federal, State or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function, that same are consistent with Town zoning, and that prior approval of the plans and specifications for such structure is obtained from the Town. Such structure shall be subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the work authorized herein. There is further reserved to the Owner, Owner's heirs, successors and assigns all such rights and privileges as may be used and enjoyed without interfering with or abridging the rights and easements hereby acquired.

3. Owner becomes the owner of any sand deposited into the Easement Area by Town at the time of the deposit. Owner acknowledges and agrees that use of the Ocean Beach is subject to traditional public trust rights. Town, its officers, employees, and agents may enter the Easement Area and the Access Easement whenever reasonably necessary for the purpose of inspecting same to determine compliance herewith, to maintain as may be necessary or convenient thereto. Owner shall in all other respects remain the fee owner of the Property and Easement Area, subject to any existing traditional public trust rights, and may make all lawful uses of the Property not inconsistent with the easements described and conveyed herein. Nothing in this easement shall hinder or impair the Owner's littoral and riparian rights associated with the Owner's Property. This Easement and all of its covenants and conditions shall be binding upon Owner and its agents, personal representatives, heirs, successors and assigns, and shall continue as a servitude running in perpetuity with the Property. The designations Owner and Town shall include the parties, their heirs, successors and assigns.

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4. Definitions. The following capitalized terms as used in this Agreement shall have the following meanings:

Accessory Building: A subordinate Building consisting of walls and a roof, the use of which is clearly incidental to that of a Principal Building on the same lot.

Building: Any structure enclosed and isolated by exterior walls and constructed or used for a residence or business. The word Building includes the word Structure.

Frontal Dune: The first mound of sand located landward of the Ocean Beach having sufficient vegetation, height, continuity and configuration to offer protective value.

Improved Dune Walkover Access: A raised walkway constructed for the purpose of providing access to the Ocean Beach from points landward of the dune system.

Ocean Beach: The lands consisting of unconsolidated soil materials that extend for a distance of 100 yards east of the mean low water mark into the Atlantic Ocean landward to a point where either the growth of stable natural vegetation occurs or a distinct change in slope or elevation alters the configuration, whichever is farther landward.

Owner: The owner of the Property as identified on page 1 of this Easement.

Permanent Structure: A Building, including a Principal Building and any Accessory Building(s), covered decks, swimming pool, and improvements associated with a swimming pool, but not including any uncovered decks or any Improved Dune Walkover Access or any associated gazebos or other improved portions of an Improved Dune Walkover Access.

Primary Dune: The first mound 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. The primary dune extends landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the dune toe).

Principal Building: A Building in which is conducted the principal use of the lot on which it is located.

Property: The real property described on page 1 of this Easement.

Project: The Town's Beach Nourishment Project.

Town: The Town of Duck, North Carolina, a North Carolina municipal corporation.

IN WITNESS WHEREOF, Owner has executed this instrument, the day and year first above written.

(signatures begin on the following page)

Unofficial Document

Unofficial Document

EXECUTION AND NOTARY CERTIFICATE FOR AN OWNER WHO IS AN INDIVIDUAL

Owner:

Joseph L. Hatch (SEAL)

JOSEPH L HATCH, TRUSTEE UNDER THE JOSEPH L HATCH DECLARATION OF TRUST DATED MARCH 16, 1999 AS AMENDED AND RESTATED

Vicki S. Hatch (SEAL)

VICKI S HATCH, TRUSTEE UNDER THE JOSEPH L HATCH DECLARATION OF TRUST DATED MARCH 16, 1999 AS AMENDED AND RESTATED

State of Virginia, ~~County or~~ City of Va Beach

I certify that the following person personally appeared before me this day, each acknowledging to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: JOSEPH L HATCH and VICKI S HATCH, TRUSTEES UNDER THE JOSEPH L HATCH DECLARATION OF TRUST DATED MARCH 16, 1999 AS AMENDED AND RESTATED.

Date: 6-2-, 2015.

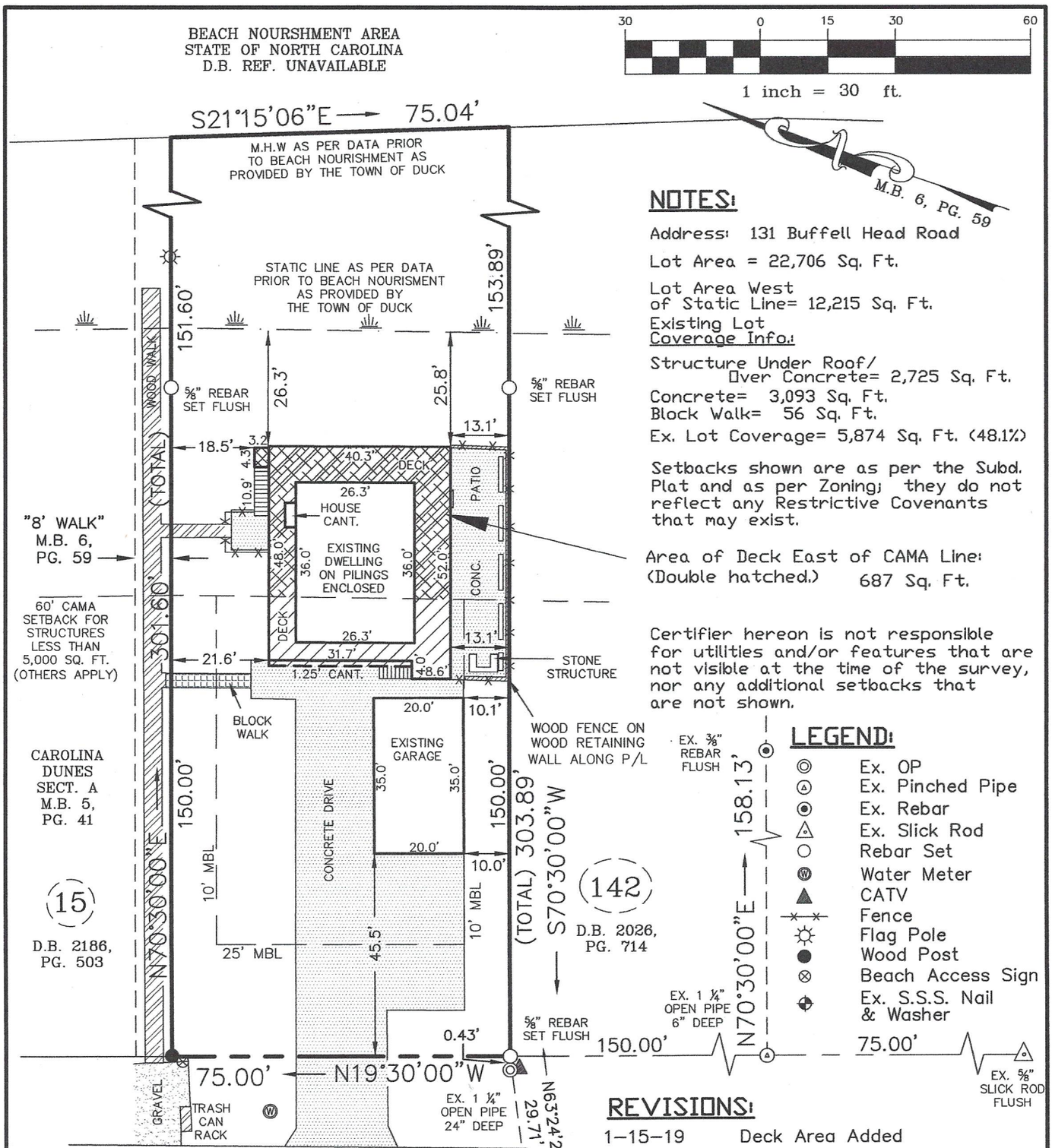
JACQUELINE A. ZALAS COMMONWEALTH 190617 OF VIRGINIA NOTARY PUBLIC

Affix Notary Seal Inside This Box

Jacqueline A. Zalas
Signature of Notary Public

Jacqueline A. ZALAS
Typed or printed name of Notary Public

My commission expires: 2-29-16



NOTES:

Address: 131 Buffell Head Road

Lot Area = 22,706 Sq. Ft.

Lot Area West of Static Line= 12,215 Sq. Ft.

Existing Lot Coverage Info.:

Structure Under Roof/ Over Concrete= 2,725 Sq. Ft.
Concrete= 3,093 Sq. Ft.
Block Walk= 56 Sq. Ft.
Ex. Lot Coverage= 5,874 Sq. Ft. (48.1%)

Setbacks shown are as per the Subd. Plat and as per Zoning; they do not reflect any Restrictive Covenants that may exist.

Area of Deck East of CAMA Line: (Double hatched.) 687 Sq. Ft.

Certifier hereon is not responsible for utilities and/or features that are not visible at the time of the survey, nor any additional setbacks that are not shown.

LEGEND:

- Ex. OP
- Ex. Pinched Pipe
- Ex. Rebar
- Ex. Slick Rod
- Rebar Set
- Water Meter
- CATV
- Fence
- Flag Pole
- Wood Post
- Beach Access Sign
- Ex. S.S.S. Nail & Washer

REVISIONS:

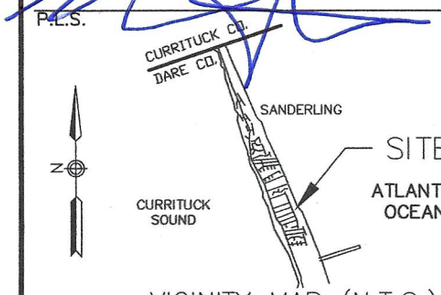
1-15-19 Deck Area Added

I, M. DOUGLAS STYONS, JR., P.L.S., certify that this plat was drawn from an actual field land survey that the error of closure as calculated by latitudes and departures is at least 1:10,000;

Witness my hand and seal this 15th day of January A.D. 2019

NORTH CAROLINA PROFESSIONAL SEAL L-3227 LAND SURVEYOR M. DOUGLAS STYONS, JR.

P.L.S. L-3227



REVISED SURVEY OF

LOT 141, CAROLINA DUNES, SECTION B

SURVEYED FOR

JOSEPH L HATCH TRUSTEES and VICKI S. HATCH

ATLANTIC TOWNSHIP
DUCK

DARE COUNTY
NORTH CAROLINA

DATE SURVEYED: 10-4-18
REV.: 01-15-19
SCALE: 1" = 30'
FILE NO.: 18-291
DWG NO.: 18291P2

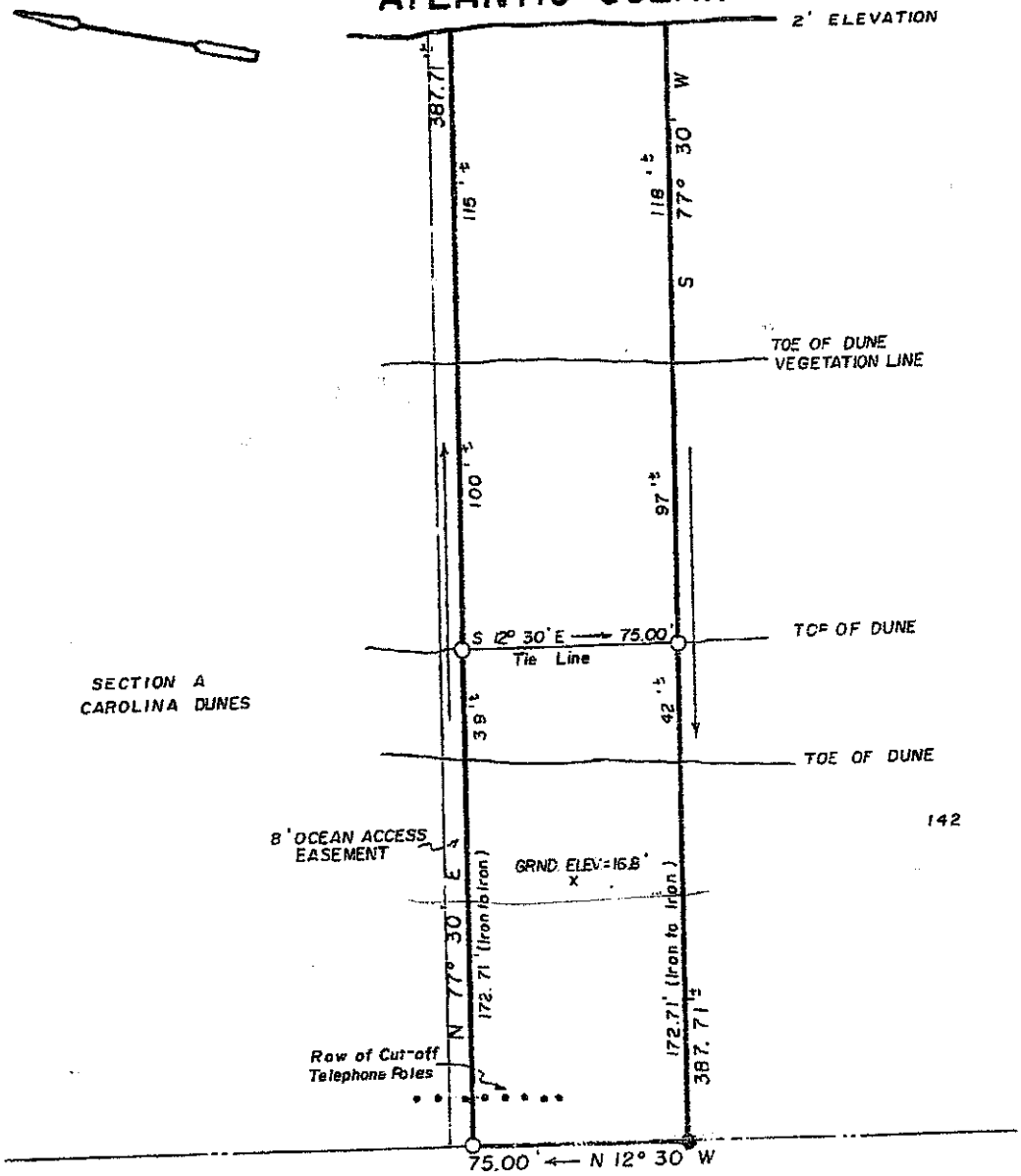
F.I.R.M.: 3720 9950 00 J
F.I.R.M. DATE: 9-20-06
FLOOD ZONE: VE (12.0')
REC. REF. M.B. 6, PG. 59
D.B. 2026, PG. 710
PIN NO.: 21995011750342

C-1697
Styons Surveying Services P.A.
2700 N. Croatan Hwy. Kill Devil Hills, NC. 27948
Phone: (252) 441-1415 Fax: (252) 480-1182

Any unauthorized use or alteration of this document is prohibited
A red seal must be present for this to be an original document

Applicant Exhibit C

RECEIVED
JAN 15 2019
DCM-MHD CITY



LOT 141, SECT. B

CAROLINA DUNES
RECORDED IN M.B. 6, PG. 59, DARE COUNTY REGISTRY

○ IRON PIPE SET
● EXISTING IRON PIPE

I, MICHAEL D. BARR hereby certify that this map is correct [redacted] and that there are no encroachments of other buildings on the said lot.

Michael D. Barr
L - 1756

SURVEY FOR

ROOSEVELT HATCH, Sr.

DUCK — DARE COUNTY — NORTH CAROLINA

scale	date	file
1" = 50'	5-11-81	

triangle engineering and surveying, inc.

raleigh, kinston, kill devil hills, greenville, nc
charleston, sc memphis, tn

County of Dare, North Carolina

*Owner and Parcel information is based on current data on file and was last updated on December 07 2018

Primary (100%) Owner Information:

HATCH, JOSEPH L TRUSTEES TRE
HATCH, VICKI S TRE
2340 LEEWARD SHORE RD
VIRGINIA BEACH VA 23451

Parcel Information:

Parcel: 009594000 PIN: 995011750342
District: 21- DUCK
Subdivision: CAROLINA DUNES SECTION B
LotBlkSect: LOT: 141 BLK: SEC: B
Multiple Lots: -
PlatCabSlide: PL: 6 SL: 59 Units: 1
Deed Date: 06/12/2015
BkPg: 2026/0710
Parcel Status: ACTIVE

Property Use: RESIDENTIAL

131 BUFFELL HEAD RD

BUILDING USE & FEATURES	**Tax Year Bldg Value: $168,100**	**Next Year Bldg Value: $168,100**
Building Use:	BEACH BOX	
Exterior Walls:	MODERN FRAME	**Actual Year Built:** 1981
Full Baths:	3 Half Baths: 0	
Bedrooms:	5	
Heat-Fuel:	3 - ELECTRIC	
Heat-Type:	2 - FORCED AIR	**Finished sqft for building 1:** 2832
Air Conditioning:	4 -CENTRAL W/AC	**Total Finished SqFt for all bldgs:** 2832

Disclaimer: In instances where a dwelling contains unfinished living area, the square footage of that area is included in the total finished sqft on this record. However, the assessed value for finish has been removed.

MISCELLANEOUS USE	**Tax Year Misc Value: $11,200**	**Next Year Misc Value: $11,200**

Misc Bldg a: (RG1) FRAME OR CB DETACHED GARAGE Year Built: 1990 sqft: 700

LAND USE	**Tax Year Land Value: $727,900**	**Next Year Land Value: $727,900**

Land Description : 21-Ocean front

TOTAL LAND AREA: 13000 square feet

	Tax Year Total Value: $907,200	**Next Year Total Value: $907,200**

**Values shown are on file as of December 07 2018*

Locality Town of Duck Permit Number D-2019-416

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

(For official use only)

RECEIVED
By Sandy Cross at 1:45 pm, Jan 11, 2019
check #7680

GENERAL INFORMATION

LAND OWNER - MAILING ADDRESS

Name Joseph L. and Vicki S. Hatch

Address 2340 Leeward Shore Drive

City Virginia Beach State VA Zip 23451 Phone (757) 650-7101

Email Vhatch1@verizon.net

AUTHORIZED AGENT

Name same as owner

Address ____

City ____ State ____ Zip ____ Phone ____

Email ____

LOCATION OF PROJECT: (Address, street name and/or directions to site; name of the adjacent waterbody.)

131 Buffell Head Rd.
Duck, NC 27949

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) Removal and replacement of aged, exterior deck and pilings in the same location/footprint and same square footage, reattaching to primary structure as it currently exists to meet current building code requirements

SIZE OF LOT/PARCEL: 12,215 square feet ____ 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: <5k 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: n/a square feet (includes the area of the foundation 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 Energy, Mineral and Land Resources (DEMLR)?
YES ____ NO xx

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

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)

X an owner or record title, Title is vested in name of Hatch, Joseph L Trustees TRE HATCH, Vicki S. TRE
see Deed Book 2026 page 0710 in the Dare County Registry of Deeds.

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

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

NOTIFICATION OF ADJACENT RIPARIAN 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)	J. Craig and Robbie Rice	129 Buffell Head Rd, Duck, NC 27949
(2)	Moses K. and Semiramis Ayral-Kaloustian	133 Buffell Head Rd. Duck, NC 27949
(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 11th day of January, 20 19

Vicki S. Hatch
_____
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.*

OCEAN HAZARD AEC NOTICE

Project is in an: xx **Ocean Erodible Area** xx **High Hazard Flood Area** _____ **Inlet Hazard Area**

Property Owner: Vickie and Joseph Hatch, 2340 Leeward Shore Road, Virginia Beach, VA 23451

Property Address: 131 Buffell Head Road, lot 141, Section B

Date Lot Was Platted: 11/29/1973 *must be completed*

This notice is intended to make you, the applicant, aware of the special risks and conditions associated with development in this area, which is subject to natural hazards such as storms, erosion and currents. The rules of the Coastal Resources Commission require that you receive an AEC Hazard Notice and acknowledge that notice in writing before a permit for development can be issued.

The Commission's rules on building standards, oceanfront setbacks and dune alterations are designed to minimize, but not eliminate, property loss from hazards. 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. Permits issued in the Ocean Hazard Area of Environmental Concern include the condition that structures be relocated or dismantled if they become imminently threatened by changes in shoreline configuration. The structure(s) must be relocated or dismantled within two (2) years of becoming imminently threatened, and in any case upon its collapse or subsidence.

The best available information, as accepted by the Coastal Resources Commission, indicates that the annual long-term average ocean erosion rate for the area where your property is located is 2 feet per year.

The rate was established by careful analysis of aerial photographs of the coastline taken over the past 50 years.

Studies also indicate that the shoreline could move as much as n/a feet landward in a major storm.

The flood waters in a major storm are predicted to be about 12 feet deep in this area.

Preferred oceanfront protection measures are beach nourishment and relocation of threatened structures. Hard erosion control structures such as bulkheads, seawalls, revetments, groins, jetties and breakwaters are prohibited. Temporary sand bags may be authorized under certain conditions.

The applicant must acknowledge this information and requirements by signing this notice in the space below. Without the proper signature, the application will not be complete.

1-11-19

Applicant Signature *Date*

Vicki S. Hatch

SPECIAL NOTE: This hazard notice is required for development in areas subject to sudden and massive storms and erosion. Permits issued for development in this area expire on December 31 of the third year following the year in which the permit was issued. Shortly before work begins on the project site, the Local Permit Officer must be contacted to determine the vegetation line and setback distance at your site. If the property has seen little change since the time of permit issuance, and the proposed development can still meet the setback requirement, the LPO will inform you that you may begin work. Substantial progress on the project must be made within 60 days of this setback determination, or the setback must be re-measured. Also, the occurrence of a major shoreline change as the result of a storm within the 60-day period will necessitate re-measurement of the setback. It is important that you check with the LPO before the permit expires for official approval to continue the work after the permit has expired. Generally, if foundation pilings have been placed and substantial progress is continuing, permit renewal can be authorized. It is unlawful to continue work after permit expiration.

For more information, contact:

Sandy M. Cross

Local Permit Officer

1200 Duck Road, P.O. Box 8369

Address

Town of Duck, NC 27949

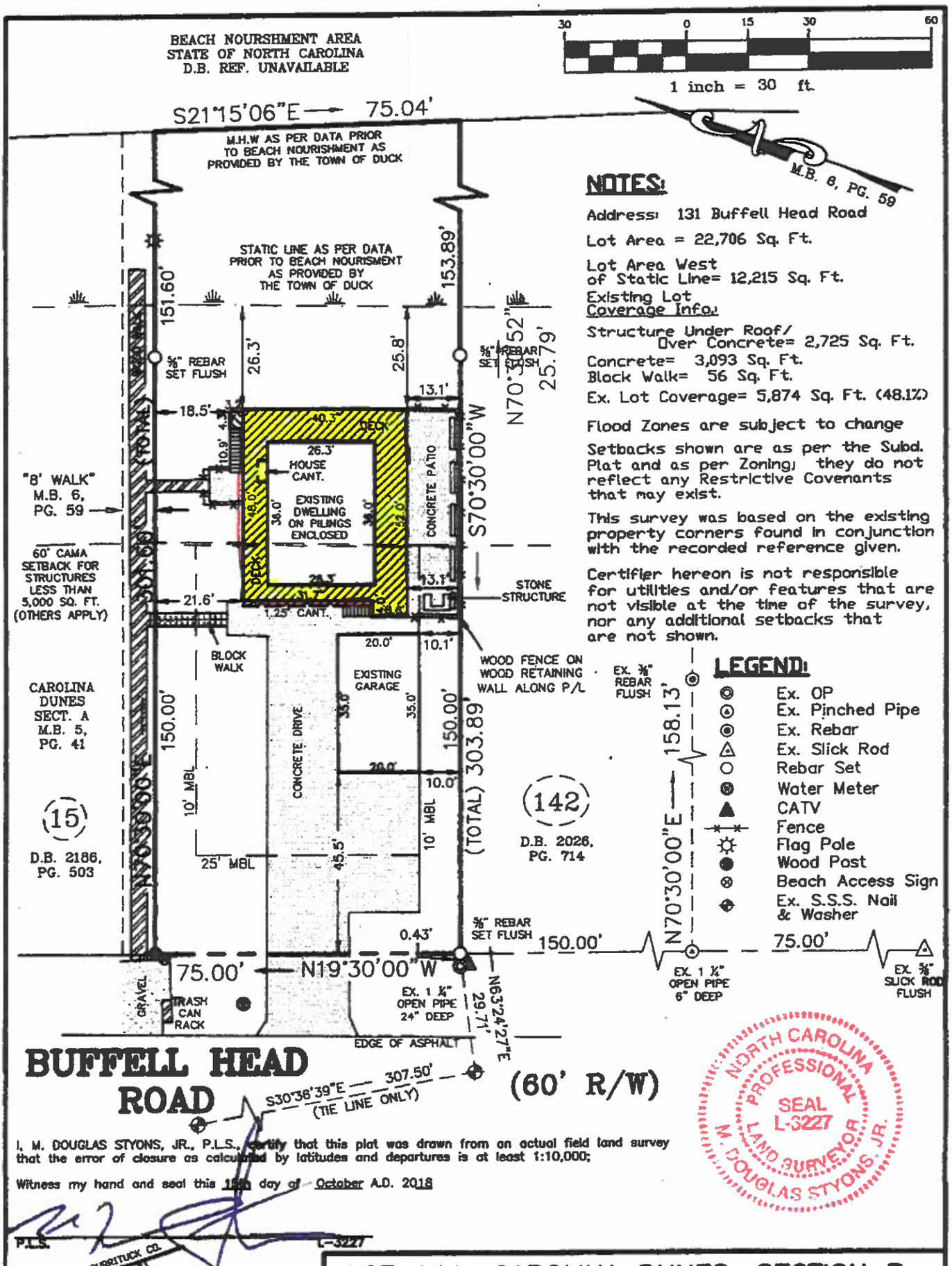
Locality

252-255-1234, 252-255-1236 (f)

Phone Number

scross@townofduck.com

*** Hazard Notice Must Be Signed By Owner ***
Not by Agent



NOTES:

Address: 131 Buffell Head Road

Lot Area = 22,706 Sq. Ft.

Lot Area West of Static Line= 12,215 Sq. Ft.

Existing Lot Coverage Info:

Structure Under Roof/ Over Concrete= 2,725 Sq. Ft.
Concrete= 3,093 Sq. Ft.
Block Walk= 56 Sq. Ft.
Ex. Lot Coverage= 5,874 Sq. Ft. (48.1%)

Flood Zones are subject to change

Setbacks shown are as per the Subd. Plat and as per Zoning; they do not reflect any Restrictive Covenants that may exist.

This survey was based on the existing property corners found in conjunction with the recorded reference given.

Certifier hereon is not responsible for utilities and/or features that are not visible at the time of the survey, nor any additional setbacks that are not shown.

LEGEND:

- Ex. OP
- Ex. Pinched Pipe
- Ex. Rebar
- Ex. Slick Rod
- Rebar Set
- Water Meter
- CATV
- Fence
- Flag Pole
- Wood Post
- Beach Access Sign
- Ex. S.S.S. Nail & Washer

I, M. DOUGLAS STYONS, JR., P.L.S., certify that this plat was drawn from an actual field land survey that the error of closure as calculated by latitudes and departures is at least 1:10,000;

Witness my hand and seal this 15th day of October A.D. 2018

NORTH CAROLINA PROFESSIONAL SEAL L-3227 LAND SURVEYOR M. DOUGLAS STYONS, JR.

P.L.S. L-3227

VICINITY MAP (N.T.S.)

LOT 141, CAROLINA DUNES, SECTION B

SURVEYED FOR

JOSEPH L HATCH TRUSTEES and VICKI S. HATCH

ATLANTIC TOWNSHIP
DUCK

DARE COUNTY
NORTH CAROLINA

DATE SURVEYED: 10-4-18
REV.:
SCALE: 1" = 30'
FILE NO.: 18-291
DWG NO.: 18291P

F.I.R.M.: 3720 9950 00 J
F.I.R.M. DATE: 9-20-06
FLOOD ZONE: VE (12.0')
REC. REF. M.B. 6, PG. 59
D.B. 2026, PG. 710
PIN NO.: 21995011750342

C-1697
Styons Surveying Services P.A.
2700 N. Croatan Hwy. Kill Devil Hills, NC. 27948
Phone: (252) 441-1415 Fax: (252) 480-1182

Any unauthorized use or alteration of this document is prohibited
A red seal must be present for this to be an original document

From: James Rice
To: Sandy Cross
Subject: Re: Hatch"s Project in Duck
Date: Friday, January 11, 2019 11:14:47 AM
Attachments: image001.png

Sandy,
I received Vicki Hatch's E-mail notification concerning the work they have proposed doing on their deck at 131 Buffell Head Road.
We have no objections to the proposed deck work.
Best regards,
Craig Rice
129 Buffell Head Road
804-337-0126

On Fri, Jan 11, 2019 at 10:04 AM Sandy Cross <scross@townofduck.com> wrote:

> Craig and Robbie -
>
> A simple acknowledgement that you received Vicki's email will suffice. Thanks.
>
> Sandy Cross
>
> Permit Coordinator/CAMA LPO/CZO/CFM
>
> Department of Community Development
>
> PO Box 8369
>
> Duck, NC 27949
>
> 252-255-1234
>
> 252-255-1236 (f)
>
> scross@townofduck.com
>
> www.townofduck.com

From: Vicki Hatch
To: J. Craig Rice
Cc: Sandy Cross
Subject: Hatch"s Project in Duck
Date: Friday, January 11, 2019 10:43:11 AM
Attachments: CAMA Minor application doc neighbors 1.pdf
CAMA Minor application doc neighbors.pdf
Rice Neighbor CAMA 11019 copy.pages
Duck Survey 3.pdf

Dear Craig and Robbie:

Thank you again for providing us with a letter to assist with our approvals for the Town of Duck. We met with the Board of Adjustments on Wednesday, and I'm happy to say that we received the variance for zoning, by unanimous vote. The next step is to apply for a minor CAMA permit, which is expected to be rejected, (for the same reason we had to pursue the zoning variance.) After we have the CAMA permit rejection, we then apply for a CAMA variance. Unfortunately, the CAMA board that reviews the variances, only meets every three months, and the deadline for application is next Wednesday, the 16th. As part of the CAMA permit process, the neighbors have to be notified. Since we have such a short time line, Sandy Cross, the Local Permit Officer for the Town of Duck, suggested that we use email to notify you and provide you the form letter for response. If you are able and agree, would you please sign the letter, stating you have no objections and return it via email? I have attached the form letter for your use.

I do apologize to have to ask for your help once again. I am available to discuss any questions you have about the project. To reiterate, our intention is to replace the decking surrounding our house, exactly as it is now in size and shape. The only change is that the pilings will be brought up to the current building code of 8'. (When the house was built the code was 6').
Thank you again for considering this. We hope that this will be the last time we have to call on your good graces, but appreciate it if you are able to comply.

Best wishes,
Vicki and Joe Hatch

January 11, 2019 **Via Electronic Mail

J. Craig and Robbie Rice
129 Buffell Head Road
Duck, NC 27949

Dear Mr. and Mrs. Rice:

This letter is to notify you, as an adjacent riparian landowner, that I have applied for a CAMA Minor Permit on my property at 131 Buffelhead Road. It is my intention to replace the existing decking on the exterior of the house. I have enclosed a copy of my permit application and a copy of the drawing(s) of my proposed project.

Should you have no objections to this construction, please check the appropriate statement below, sign and date where indicated and return this letter, in the self-addressed envelope, as soon as possible.

If you have any questions or comments on my proposed project, please contact me at (757) 650-7101 or by mail at 2340 Leeward Shore Drive, Virginia Beach, VA. 23451. If you wish to file written comments or objections with the Town of Duck, you may submit them to:

Sandy M. Cross
Local Permit Officer for the Town of Duck
P.O. Box 8369
Duck, NC 27949

Written comments must be received within 10 days of receipt of this notice. Failure to respond within 10 days will be interpreted as no objection.

Sincerely,

APPLICANT'S NAME

[ ] I have no objection to the project as shown and hereby waive that right of objection.

[ ] I have objection to the project and have enclosed comments.

_____
Signature

_____
Date

From: bigbuck089@gmail.com
Subject: Fwd: neighbor letter
Date: November 19, 2018 at 12:58 PM
To: vhatch1@verizon.net

Sent from my iPhone

Begin forwarded message:

November 18, 2018

Department of Community Development
Duck Board of Adjustment
P. O. Box 8369
1200 Duck Road
Town of Duck, North Carolina. 27949

Dear Board Members:

Re: Joe and Vicki Hatch, 131 Buffellhead Road

We/I own the property adjacent to the Hatch's property. We have no objections to a variance to the existing setback line for the replacement of the decking on the house, as presented in their application.

Sincerely yours,

James Cragg Rice

Neighbor
129 Buffell Head

From: M. K. Kaloustian
To: vhatch1@verizon.net
Cc: Sandy Cross
Subject: From Moses - Re: The Hatch"s in Duck
Date: Saturday, January 12, 2019 4:37:33 PM
Attachments: Hatch 1_12_19.pdf

Dear Vicki,

Attached is a scan of the the signed photographed letter you requested. A copy is also being forwarded to Ms. Sandy Cross. No need to thank; it is the neighborly thing to do. If you need anything else, do not hesitate to let us know.

Good luck with the variance process and the execution of the project! Do keep us posted.

Thank you for the positive update on the state of the dune and the beauty of the surroundings!

Sincerely,
Moses

-----Original Message-----
From: Vicki Hatch <vhatch1@verizon.net>
To: Moses K. Kaloustian <chirogen@aol.com>
Sent: Sat, Jan 12, 2019 9:55 am
Subject: Re: From Moses - Re: The Hatch's in Duck

Dear Moses,
Thank you so much for helping us, yet again! I apologize that it was a cumbersome process for you. I spoke with Sandy Cross yesterday, and she said if you just acknowledge receipt, it will be fine. I will forward your email to her and hopefully that will suffice. The email that I sent you had three attachments, the survey and a two page application. I signed the application on the second page, although I think they scanned in out of order. They only required one owner signature.

We were in Duck a few days this week, and noticed how lovely the dune is. It is growing and the grasses are holding. I am always in awe of how beautiful it is there.

Thank you again for your efforts. I am hopeful that we will be able to get this crucial work done this spring. I will let you know if the variance process is successful, if you are interested. Take care, Vicki and Joe

[illegible], 2019 ***Via [illegible] Mail

Moses K. Kaloustian and [illegible] Ayval-Kaloustian
133 [illegible] Road
Duck, NC 27949

Dear Dr. Kaloustian and Dr. Ayval-Kaloustian:

This letter is to notify you, as an adjacent riparian landowner, that I have applied for a CAMA Minor Permit on my property at 131 Buffelhead Road. It is my intention to replace the existing decking on the exterior of the house. I have enclosed a copy of my permit application and a copy of the drawing(s) of my proposed project.

Should you have no objections to this construction, please check the appropriate statement below, sign and date where indicated and return this letter, in the self-addressed envelope, as soon as possible.

If you have any questions or comments on my proposed project, please contact me at (757) 65[illegible] or by mail at 2340 Leeward Shore Drive, Virginia Beach, VA 23451. If you wish to file written comments or objections with the Town of Duck, you may submit them to:

Sandy M. Cross
Local Permit Officer for the Town of Duck
P.O. Box 8369
Duck, NC 27949

Written comments must be received within 10 days of receipt of this notice. Failure to respond within 10 days will be interpreted as no objection.

Sincerely,

APPLICANT'S NAME

[✓] I have no objection to the project as shown and hereby waive that right of objection.

[ ] I have objection to the project and have enclosed comments.

[signature] 1/12/19
Signature

Date

From: Vicki Hatch
To: Moses K. Kaloustian
Cc: Sandy Cross
Subject: The Hatch"s in Duck
Date: Friday, January 11, 2019 10:41:20 AM
Attachments: Duck Survey 3.pdf
CAMA Minor application doc neighbors 1.pdf
CAMA Minor application doc neighbors.pdf
Kaloustian Neighbor CAMA 11019 copy.pages

Dear Moses and Semi,

Thank you again for providing us with a letter to assist with our approvals for the Town of Duck. We met with the Board of Adjustments on Wednesday, and I'm happy to say that we received the variance for zoning, by unanimous vote. The next step is to apply for a minor CAMA permit, which is expected to be rejected, (for the same reason we had to pursue the zoning variance.) After we have the CAMA permit rejection, we then apply for a CAMA variance. Unfortunately, the CAMA board that reviews the variances, only meets every three months, and the deadline for application is next Wednesday, the 16th. As part of the CAMA permit process, the neighbors have to be notified. Since we have such a short time line, Sandy Cross, the Local Permit Officer for the Town of Duck, suggested that we use email to notify you and provide you the form letter for response. If you are able and agree, would you please sign the letter, stating you have no objections and return it via email? I have attached the form letter for your use.

I do apologize to have to ask for your help once again. I am available to discuss any questions you have about the project. To reiterate, our intention is to replace the decking surrounding our house, exactly as it is now in size and shape. The only change is that the pilings will be brought up to the current building code of 8'. (When the house was built the code was 6').
Thank you again for considering this. We hope that this will be the last time we have to call on your good graces, but appreciate it if you are able to comply.

Best wishes,
Vicki and Joe Hatch

January 11, 2019 **Via Electronic Mail

Moses K. Kaloustian and Semiramis Ayral-Kaloustian
133 Buffell Head Road
Duck, NC 27949

Dear Dr. Kaloustian and Dr. Ayral-Kaloustian:

This letter is to notify you, as an adjacent riparian landowner, that I have applied for a CAMA Minor Permit on my property at 131 Buffelhead Road. It is my intention to replace the existing decking on the exterior of the house. I have enclosed a copy of my permit application and a copy of the drawing(s) of my proposed project.

Should you have no objections to this construction, please check the appropriate statement below, sign and date where indicated and return this letter, in the self-addressed envelope, as soon as possible.

If you have any questions or comments on my proposed project, please contact me at (757) 650-7101 or by mail at 2340 Leeward Shore Drive, Virginia Beach, VA. 23451. If you wish to file written comments or objections with the Town of Duck, you may submit them to:

Sandy M. Cross
Local Permit Officer for the Town of Duck
P.O. Box 8369
Duck, NC 27949

Written comments must be received within 10 days of receipt of this notice. Failure to respond within 10 days will be interpreted as no objection.

Sincerely,

APPLICANT'S NAME

[ ] I have no objection to the project as shown and hereby waive that right of objection.

[ ] I have objection to the project and have enclosed comments.

_____
Signature

_____
Date

From: **M. K. Kaloustian** chirogen@aol.com
Subject: From Moses K. Kaloustian and Semiramis Ayral-Kaloustian
Date: November 19, 2018 at 3:30 PM
To: vhatch1@verizon.net

November 19, 2018

Department of Community Development
Duck Board of Adjustment
P. O. Box 8369
1200 Duck Road
Town of Duck, N.C., 27949

Re: Joe and Vicki Hatch, 131 Buffellhead Road, Duck, N.C.

Dear Board Members,

We own the property adjacent to the Hatch's property at 131 Buffellhead Road.

We have no objections to a variance to the existing setback line for the replacement of the decking on their house, as presented in their application, as long as it does not impact our property at 133 Buffellhead Road in any way.

Sincerely yours,

Moses K. Kaloustian
Semiramis Ayral-Kaloustian

From: Ron Blunck
To: Vicki Hatch
Cc: Sandy Cross
Subject: Re: The Hatch"s in Duck
Date: Friday, January 11, 2019 3:28:55 PM

Hi Vicki,

I received your email.

I was aware of your project as Sandy C had sent me info on it some weeks ago. I told Sandy the Association has no problem or objection with your project. That will be true of any CAMA requirements as well.

Good luck with the project.

Happy New Year, and congratulations and being grandparents. Have grandchildren is great!

Ron

The information contained in this message is confidential and intended only for the use of the individual or entity named above, and may be privileged. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please reply to the sender immediately, stating that you have received the message in error, then please delete this e-mail. Thank you.

On Fri, Jan 11, 2019 at 3:15 PM Vicki Hatch <vhatch1@verizon.net> wrote:

> Dear Ron,
>
> Happy new year greetings to you and your family! I hope all are well! Joe and I welcomed a new grandchild just before Christmas, so the holidays were quite busy and beautiful.
>
> Joe and I are in the process of trying to get permits to begin work on the house on Buffell Head Road. Our intention is to remove and replace the aged, exterior deck and pilings in the same location/footprint and same square footage to meet current building code requirements. Because of the erosion over time, part of our house now lies within the setback for CAMA, and requires more approvals, variances and the like. I know you are familiar with this process. We cleared the first hurdle this past Wednesday, receiving approval from the Board of Adjustments for the town. The next step is to apply for the CAMA minor permit, knowing that we will be turned down, and then applying for a variance from that board. I have sent the required documents to our adjoining neighbors, and Sandy asked me to send the information to the Homeowner's association as well. I am available to discuss any questions, but would you acknowledge receipt to either Sandy, (I've copied her in on this email), or to me? To complicate matters, the Board only meets once a quarter and the deadline for submission of applications is next Wednesday. Suffice to say, I'm scrambling to get everything in on time. Sandy and Joe Heard have been very patient and helpful through the process and we are hoping for a good result.

Thanks again for taking the time to acknowledge receipt of the information, if you are able.
I look forward to seeing you and Rosemary soon!

Sincerely,
Vicki and Joe

January 14, 2019

CERTIFIED MAIL – 7013 3020 0001 7724 2188
RETURN RECEIPT REQUESTED
and EMAIL DELIVERY

Joseph & Vicki Hatch
2340 Leeward Shore Drive
Virginia Beach, VA 23451

RE: DENIAL OF CAMA MINOR DEVELOPMENT PERMIT
APPLICATION NUMBER- D-2019-416
PROJECT ADDRESS- 131 Buffell Head Road

Dear Mr. and Mrs. Hatch:

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

You have applied to remove and replace all of the aged, exterior decks and pilings in the same location/footprint and square footage, re-attaching the decks to the primary structure as they currently exist. This project, therefore does not qualify for a repair and maintenance exemption pursuant to Article 7, of the Coastal Management Act, Section 113-103(5)(b)(5) since this is replacement rather than repair Discussions with your general contractor also indicated that this project will exceed 50% of the value the structure.

This decision that no permit may be granted 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. Your project details as presented in your permit application dated January 11, 2019 are inconsistent with 15 NCAC 7H.0309(a)(3) which only allows a maximum of 500 sf of elevated decks seaward of the applicable setback. The survey you have provided indicates approximately 720 sf of decks will be seaward of the applicable setback, where a maximum of 500 sf would be permissible.

Additionally, 15A NCAC 7H.0306(a)(9) states that structural additions or increases in the footprint 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. Your request to rebuild the existing decks as they currently exist, attached to the primary structure would be inconsistent this rule.

Lastly, I have concluded that your request violates NCGS 113A-120(a)(8), which requires that all applications be denied which are inconsistent with our Local Land Use Plan. On page IX-16 of the Land Use Plan, you will find that GOAL #13 aims to conserve and maintain barrier dunes, beaches, wetlands, and other coastal features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

POLICY #13a states that Duck will prevent the disruption of natural hazard areas by adopting and enforcing ordinances and procedures to regulate land use, development, and redevelopment and supports applicable State and Federal laws and regulations regarding land uses and development in areas of environmental concern.

POLICY #13d states that Duck will support State and Federal policies that regulate the location and intensity of development in State designated areas of environmental concern.

POLICY #13f states that Duck will allow development and redevelopment within special flood hazard areas subject to the provisions and requirements of the National Flood Insurance Program, CAMA regulations, and the Town's zoning ordinance.

Pursuant to our discussions, it is my understanding that you wish to request a variance from the Coastal Resource Commission (CRC) related to this matter. Please be advised that variance petitions will be considered by the CRC at a regularly scheduled meeting and will be 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 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. The next schedule meeting begins on February 27, 2019. A Variance Form and associated information to assist you has been included with this denial. Please note that you must send a petition to both the DCM and the Attorney's General Office. You may mail, fax or email DCM (Braxton.Davis@NCDENR.Gov) but may only mail or fax to the Attorney General. Their mail and fax information are located on the variance application. I would encourage you to send a copy by certified or priority mail so that you have delivery confirmation.

It will be necessary for you to include your Variance request to the Town with your petition to the CRC and I encourage you to include the Order granting your Variance from the Town.

If there is anything else I can do to assist you in this matter, please let me know.

Respectfully yours,

Sandy Cross

Sandy Cross, LPO

cc: Frank Jennings, District Manager DCM
Ron Renaldi, Field Representative DCM
Christine Goebel, Assistant General Counsel
Joe Heard, Director of Community Development

Staff Exhibit I

Aerial Photograph Comparison

07/17/2006

02/03/2018

Town of Duck, North Carolina
Department of Community Development
BOV 18-001, 131 Buffell Head Road

Agenda Item 3a

TO: Chairman Finch and Members of the Town of Duck Board of Adjustment

FROM: Joe Heard, Director of Community Development

DATE: January 9, 2019

RE: Staff Report for BOV 18-001, 131 Buffell Head Road

Application Information

Application #:	BOV 18-001
Project Location:	131 Buffell Head Road
Dare County PIN:	995011750342
Existing Use:	Single-Family Residence
Zoning:	Single-Family Residential (RS-1)
Property Owner/Applicant:	Joseph & Vicki Hatch

Public Meeting Advertised:	December 23 & 30, 2018 (Coastland Times) December 26, 2018 & January 2, 2019 (OBX Sentinel)
Public Meeting Notices Sent:	December 14, 2018
Public Meeting Sign Posted:	December 17, 2018
Public Meeting Town Website:	December 14, 2018
Public Meeting Town Hall Posted:	December 14, 2018

Application Summary

Subsection 156.124(C)(2)(b) of the Town Code states that accessory structures (such as decks) cannot be located within 30 feet of the static vegetation line. In addition, Subsection 156.124(C)(2)(a) requires development to be consistent with setback standards established by the Coastal Area Management Act (CAMA). The CAMA requires a minimum setback of 60 feet for structures from the static vegetation line.

Property owners Joseph and Vicki Hatch are seeking a variance from these setback standards to permit the demolition and reconstruction of the existing decks on the rear (oceanfront) of the residence at 131 Buffell Head Road in the same, nonconforming location. The existing residence has three levels of decks that are presently located only 25.8 feet from the static vegetation line, thus encroaching 4.2 feet into the required thirty-foot (30') setback. While the existing decks can be repaired and maintained in their present location, complete replacement of the decks requires full compliance with current Town standards. A copy of a survey showing the existing/proposed location of the proposed decks is included as Attachment B.

Property Information

Located in the Carolina Dunes neighborhood, the property at 131 Buffell Head Road is zoned Single-Family Residential (RS-1). The subject property is approximately 13,000 square feet (0.30 acre) in size according to Dare County tax records. The property is approximately 75 feet in width and 162 feet in depth measured to the static vegetation line on the oceanfront primary dune. The subject property presently contains a five-bedroom, 2,832 square foot single-family residence that was constructed in 1981 under the jurisdiction and standards of Dare County. The property has been owned by the Hatch family ever since.

The adjoining property to the south at 133 Buffell Head Road is zoned RS-1 and contains a single-family residence constructed in 1988. An eight-foot (8') wide easement containing a beach access walkway for Carolina Dunes property owners is situated immediately north of the subject property. The property across the beach access to the north at 129 Buffell Head Road is also zoned RS-1 and was developed with a single-family residence in 1988. Directly across Buffell Head Road to the west are two additional residences zoned RS-1.

Background Information

In most areas of Duck, the minimum building setback is measured from the First Line of Stable Natural Vegetation (FLSNV), typically located on the primary oceanfront dune. The FLSNV is determined on a property-by-property basis and staked on-site by a CAMA representative. However, just prior to the beginning of the beach nourishment project in 2017, the Town of Duck worked with CAMA officials to survey the existing vegetation and establish a Static Vegetation Line (SVL) from which future measurements will be taken. As the subject property is in the beach nourishment area, its setback measurements are taken from the SVL.

The issue leading to this variance request was identified when the Hatch's contractor met with the Community Development Department to propose demolition and reconstruction of the existing three tiers of oceanfront decks on the rear of the subject house. After reviewing the recently prepared survey and field-checking the situation, Community Development staff confirmed that the existing decks are located within thirty feet (30') of the static vegetation line. Due to the nonconforming location, if the decks are removed, they cannot be rebuilt unless in conformance with current minimum setback standards of the Town.

Community Development staff discussed several alternatives with the owners and contractor. These options included:

- Repairing, rather than replacing, the existing decks.
- Completing a phased repair/replacement project over two years.
- Reducing the width of the decks to eliminate any encroachment.

- Reducing the size of the decks to 64 square feet, which can be permitted as an accessory dune structure.

Noting an immediate interest in addressing the poor condition of the existing decks by reconstructing the decks to meet current building codes and safety standards, the applicants chose to proceed with this variance application to construct the new decks as a single project.

A similar situation arose on the adjoining property to the north.

NOTE: Should the Board of Adjustment grant the requested variance, the property owners will have the additional step of obtaining a setback variance from the N.C. Coastal Resources Commission (CRC). The CRC requires that the owner obtain local government approval before proceeding through their process.

History

When originally constructed in 1981, the residence on the subject property was located much further to the west of the dune and FLSNV. Over the subsequent decades, the dune and FLSNV (now SVL) have migrated to the west as a result of natural processes and beach erosion. The aerial photograph from 2006 (Attachment G) shows a FLSNV approximately 60-65 feet from the residence. A more recent aerial photograph from 2018 (Attachment H) shows the extent to which the dune and vegetation has migrated westward to a distance of approximately 25 feet from the subject residence.

The adjoining property to the north at 129 Buffell Head Road faced a similar problem when seeking to reconstruct an oceanfront swimming pool following damage by Hurricane Sandy in 2013. If you look closely at the comparison aerial photographs (Attachment I), you will notice that the size of the swimming pool and pool decks were significantly decreased in order to comply with the changed location of the FLSNV at that time.

Applicable Ordinance Standards

Duck Zoning Ordinance:
Section 156.124 Structures Within the Primary and Frontal Dunes

(C) *Regulatory Standards*

(2*) Setbacks Established for Dune Protection*

(a) Development shall be regulated in accordance with the setback criteria established by the Coastal Area Management Act (CAMA) as defined in 15A NCAC 07H .0306.

(b) Accessory structures that are exempt from the CAMA setback criteria shall not be located within 30 feet of the first line of stable natural vegetation or static vegetation line. This shall include decks, gazebos, pools and any other structure which meets the exception criteria establish by the Coastal Area Management Act (CAMA) in 15A NCAC 07H.0309. This setback shall not apply to dune walkover structures as defined in this section. Additionally, one dune deck per lot may be allowed no closer than 15 feet to the first line of stable natural vegetation or static vegetation line provided that the dune deck does not exceed 8 feet measured in any dimension, including the area that is combined with or adjacent to any dune walkover structure that may be present, and also provided that the dune deck is no higher than 30 inches above grade. In cases where the first line of stable natural vegetation is not evident on the subject property, this line shall be determined by interpolating a straight line between nearest identifiable first line of stable natural vegetation on the adjacent properties directly to the north and south of the subject property (this clause does not apply to properties subject to the static vegetation line).

Coastal Area Management Act:
7H. State Guidelines for Areas of Environmental Concern

.0306 General Use Standards for Ocean Hazard Areas

(1) The ocean hazard setback for is measured in a landward direction from the vegetation line, the static vegetation line, or the measurement line, whichever is applicable.

(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;

Variance Criteria/Staff Analysis

Section 156.167 of the Duck Town Code states that when unnecessary hardships will result from carrying out the strict standards of the zoning ordinance, the Board of Adjustment may grant a variance from provisions of the zoning ordinance consistent with the spirit, purpose and intent of the ordinance, such that public safety is secured and substantial justice is achieved.

During its evaluation of the variance application, the Board of Adjustment is required to consider and make findings concerning the following six criteria. If the Board finds that all six of the criteria have been met, then the Board should vote to grant the requested variance. If the Board finds that one or more of the criteria have not been met, then the Board should deny the requested variance.

As part of its decision, the Board of Adjustment members may impose conditions on the approval of a variance, as long as the conditions are reasonably related to the variance. Such conditions are often intended to mitigate any potential impacts resulting from the variance.

1. **Sec. 156.167(A)(1) - Unnecessary hardship would result from the strict application of the ordinance. It shall not be necessary to demonstrate that, in the absence of the variance, no reasonable use can be made of the property.**

   - The applicant's proposed project is a reasonable request to replace the house's oceanfront decks in their current location. The applicant is not seeking to expand the footprint or size of the decks.
   - The existing decks do not comply with current setback requirements from the static vegetation line on the dune. Section 156.124(C)(2)(b) of the Town Code prevents reconstruction of new decks in the same, nonconforming footprint as the existing decks.
   - The current decking is decades old, not in good condition, and does not meet current construction standards. The applicant is seeking to upgrade the safety and sturdiness by demolishing the existing decks and rebuilding them entirely.
   - To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reduced to less than four feet in width, which is not very functional for a deck.
   - It is staff's opinion that strict application of the ordinance would restrict construction of decks with a reasonable width, resulting in hardship to the applicant.

2. **Sec. 156.167(A)(2) - The hardship results from conditions that are peculiar to the subject property, such as location, size, or topography. Hardships resulting from personal circumstances, as well as hardships resulting from conditions that are common to the neighborhood or the general public, may not be the basis for granting a variance.**

- The adjoining property to the north faced similar challenges when replacing a swimming pool in 2013. However, these issues related to a swimming pool, not decks attached to the residence like the current situation.
- Although there are other properties in the surrounding area that contain similar physical characteristics (oceanfront location, existing nonconforming structures, beach erosion, etc.), there are few properties with the exact set of circumstances as the subject property.
- It is staff's opinion that the subject property has unique conditions peculiar to the property and that such conditions are not common to the neighboring properties.

3. **Sec. 156.167(A)(3) - The hardship did not result from actions taken by the applicant or the property owner. The act of purchasing the property with knowledge that circumstances exist that may justify the granting of a variance shall not be regarded as a self-created hardship.**

- When constructed under Dare County's purview in 1981, the residence at 131 Buffell Head Road was located significantly further to the west of Atlantic Ocean and oceanfront dune. It's location in relationship to the first line of stable natural vegetation at that time would have complied with the Town's current setback standards.
- The applicants have not subsequently enlarged the decks or conducted any activities that exacerbated the situation.
- It appears that the hardship has resulted from erosion and westward movement of the beach and dune, which has moved the static vegetation line closer to the residence.
- It is staff's opinion that the hardship has not resulted from actions of the applicant.

4. **Sec. 156.167(D) - The requested variance is the minimum variance that will make possible the reasonable use of the land, building, or structure.**

- The Board of Adjustment must decide if a width of eight feet (8') for the proposed decks is the minimum possible to allow reasonable use of the decks.
- To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reconstructed at less than four feet in width, which is not very functional for a deck.
- Staff notes that the requested variance is the minimum necessary to reconstruct the deck in its current configuration and location. However, there are other options available for construction of some decking that would require either a lesser variance or no variance at all. For example, one alternative that could be permitted is a reduction of the deck size to an 8' by 8' (64 square feet) structure, consistent with Town and CAMA allowances for dune deck structures.
- The Board of Adjustment may wish to explore if other alternatives are available to provide reasonable use of the residence and decks.

5. **Sec. 156.167(E) - Granting the variance will be in harmony with the general purpose and intent of the Zoning Ordinance.**

- Section 156.124(A) of the Zoning Ordinance contains a purpose statement outlining the intent of the Town Council when adopting these standards for structures within the primary and frontal dunes. The ordinance reads, "It is the purpose of this section to develop regulatory standards which will assist with the preservation of a continuous dune system within the town, acknowledging the protective and aesthetic values that this feature provides. Regulations are hereby established to limit structures within the dune system that are known to weaken its structural integrity. Further, construction standards are established for dune walkover structures to minimize their impact on the dune, recognizing that these structures provide a safe and responsible mechanism to access the ocean beach."
- Constructing a new deck structure into the western side of the dune within the 30/60 foot minimum setback has the potential to weaken or compromise the stability of the dune.
- However, it can be accurately debated that replacement of the decks within the same footprint will not cause further damage to the adjoining dune or weaken the dune's structural integrity.
- As the proposed decking is in the same location as decks that have existed within the dune for decades, it is staff's opinion that the proposed project will not substantially damage the dune system and the proposed variance is consistent with the stated intent of the ordinance.

6. **Sec. 156.167(E) - Granting the variance will not be injurious to the neighborhood or otherwise detrimental to the public welfare.**

- The proposed project would replace the decks in their existing configuration. So, while there will be temporary noise and activity impacts during construction, there will be no additional visual impact to the surrounding properties and neighborhood. The decking and house will look much like it has in the past.
- The location of the proposed decks is on the rear of the residence and minimally visible from Buffell Head Road. The proposed decks will only be visible from adjoining properties to the north and south.
- The applicant contacted both abutting property owners and has submitted emails from the adjoining properties to the north and south of the subject property (**Attachment E**). James Rice, owner of 129 Buffell Head Road, expressed no objection to the proposed variance application. Moses & Semiramis Kaloustian offered more measured comments on the application, supporting the variance "…as long as it does not impact our property at 133 Buffell Head Road in any way."
- Based on the information available, it is staff's opinion that granting the variance will not negatively impact the neighboring properties or be detrimental to the public welfare.

Staff Recommendation

In summary, it is staff's opinion that the applicant has provided sufficient evidence to show that the subject property contains a legitimate hardship due to the movement of the dune system westward over the past few decades. The applicant has proposed a reasonable project to replace the existing, deteriorating decks with new, safer, sturdier decks in the same footprint. It does not appear that granting the variance will negatively impact the adjoining dune system or any of the surrounding properties.

- As outlined in detail above, it is staff's opinion that the applicant has satisfied the conditions of Findings 1, 2, 3, 5, and 6.
- Finding 4 may also be satisfied if the Board of Adjustment accepts that the dimensions of the proposed deck replacement are the minimum necessary to allow reasonable use of the decks.

Provided that the Board of Adjustment finds that the variance is the minimum necessary, all findings will have been met and staff recommends **APPROVAL** of this variance application.

ATTACHMENTS

Applicant Exhibits:

A. Variance Application
B. Current As-Built Survey Dated 10/4/18
C. Plat Dated 5/11/81
D. Aerial Photograph Dated 9/3/10
E. Email Comments from Adjoining Property Owners

Staff Exhibits:

F. Location Map and Property Information
G. Aerial Photograph Dated 7/17/06
H. Aerial Photograph Date 2/3/18
I. Aerial Photograph Comparison
J. Draft Order Approving the Variance

Applicant Exhibit A

Department of Community Development
PO Box 8369
1200 Duck Road
Town of Duck, North Carolina 27949
(252) 255-1234

NOV 28 REC'D

ZONING VARIANCE APPLICATION

Applicant: Joseph L. and Vicki S. Hatch Date: 11/19/18

Mailing Address: 2340 Leeward Shore Dr., Virginia Beach, VA 23451

Telephone #: (757) 650-7101 Email: vhatch1@verizon.net

Representative (if different from applicant): _____

Mailing Address: _____

Representative Telephone #: _____ Email: _____

Property Information:
Property Address/Location: 131 Buffell Head Rd.

Dare County PIN #: 995011-75-0342

Zoning District: RS-1 Use of Property: Residential

Variance Request:
Applicable Ordinance Section: 156.124(C) 2(a)

Ordinance Requirement: 60' structure setback to the first line of stable natural vegetation.

Variance Requested: 34.2' amount of variance requested resulting in 25.8' from first line of stable natural vegetation.

The Duck Board of Adjustment, with a vote of four-fifths of the membership, may grant a variance from specific provisions of the Zoning Ordinance. Consistent with the N.C. General Statutes, Section 156-167 of the Zoning Ordinance states that the Board of Adjustment is required to make certain findings as a prerequisite to granting a variance. The following questions are intended to offer the applicant an opportunity to address these criteria for the Board members. Please answer each question as thoroughly as possible.

1. Describe the hardship created by strict application of the Duck Zoning Ordinance?

(see attached)

2. Describe any special conditions or circumstances (such as property dimensions, location, or topography) contributing to the hardship that are peculiar to the subject land or structure and not applicable to other properties in the same area.

3. Explain why the hardship is not the result of the applicant's or property owner's own actions.

4. Explain how the requested variance is the minimum possible to make reasonable use of the land or structure.

5. How is the requested variance in harmony with the general purpose and intent of the zoning ordinance? Please cite specific examples.

6. Would granting the variance be injurious to the surrounding neighborhood or detrimental to the public welfare? Please explain your answer.

Vicki S. Hatch Jhatch

Applicant Signature

Property Owner Signature (if different from applicant)

A complete application can be submitted in person to the Town of Duck Community Development Department at Duck Town Hall, 1200 Duck Road or mailed to Town of Duck, P.O. Box 8369, Duck, NC 27949. Checks should be made payable to the *Town of Duck*. A complete application consists of:

- ☐ Complete, signed zoning variance application form
- ☐ Zoning variance application fee ($500)
- ☐ Plat, site plan, or building plans drawn to scale showing the existing and proposed improvements
- ☐ Other exhibits or information in support of the variance request

FOR OFFICE USE ONLY

Application Received NOV 28 RECD

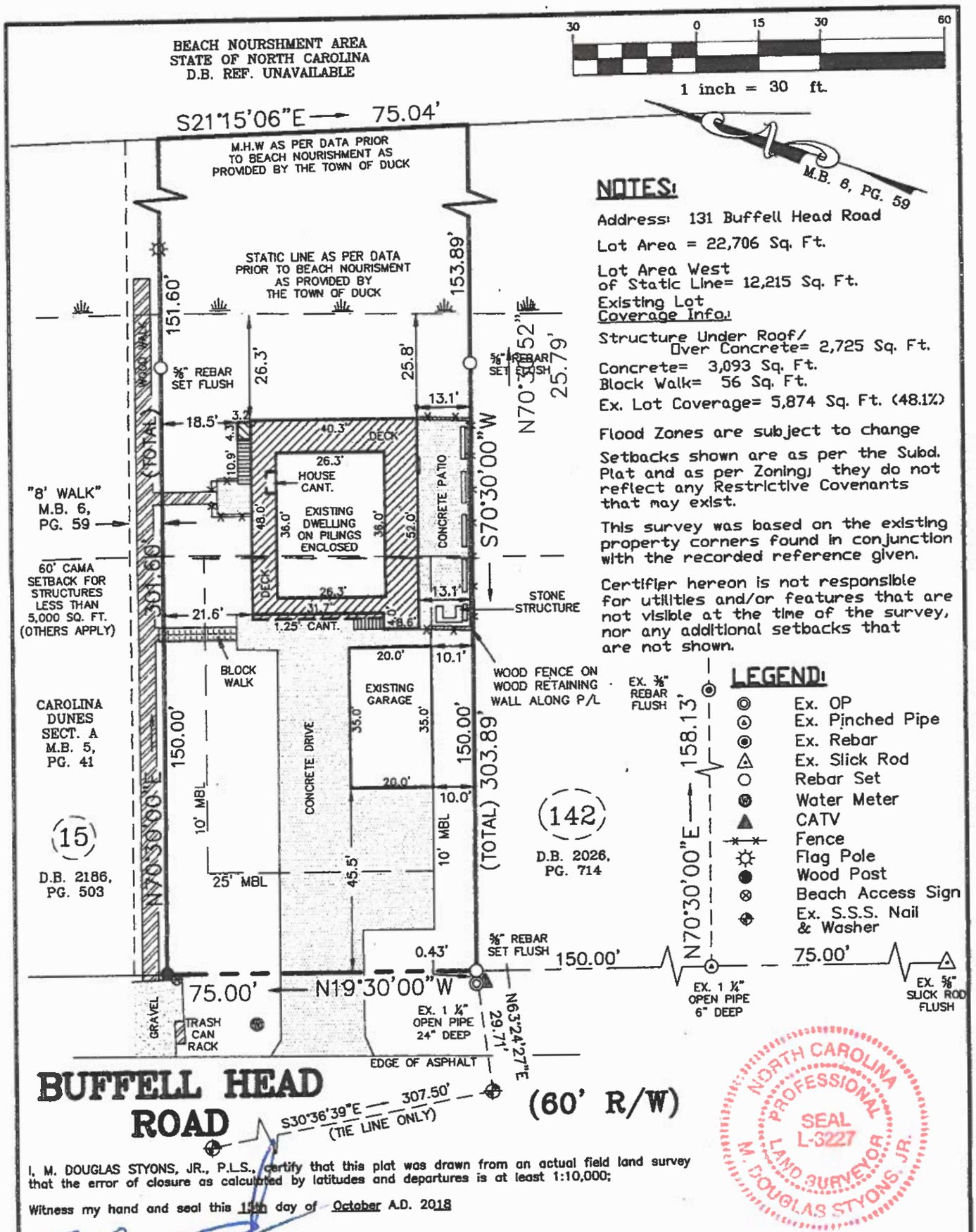
Received By

Fee Paid #500

Receipt # CK # 7672

Zoning Variance Application for 131 Buffell Head Road, Joe and Vicki Hatch

1. **Describe the hardship created by strict application of the Duck Zoning Ordinance?**
   The existing deck is aging and has been damaged by the storms over the past two years. The current regulation would prohibit the replacement of the deck, due to the existing structure lying within the CAMA setback. Replacing the 6" pilings with current building code pilings of 8" would be safer and stronger. To repair the existing structure would be far less safe, than total replacement.
2. **Describe any special conditions or circumstances (such as property dimensions, location, or topography) contributing to the hardship that are peculiar to the subject land or structure and not applicable to other properties in the same area.** The house was one of the first built in Carolina Dunes, in the early 80's and has been in our family the entire time. The house is surrounded on all sides by decking, as part of the design of the house. When the house was built in the early 80's, the dune extended much further to the east, (see attached survey from 1981).
3. **Explain why the hardship is not the result of the applicant's or property owner's own actions.** The house was built in the early 80's, and the structure has maintained that footprint ever since, however, the accelerated natural erosion has moved the dune line from 269 feet from the front of the property line in the 1980's to approximately 161 feet currently. The hardship was created by erosion, and the westward movement of the dune, not by any of our actions. There have never been any walk overs, or pools or enlarged decks added since the house was built.
4. **Explain how the requested variance is the minimum possible to make reasonable use of the land or structure.** The requested variance is the minimum possible to allow the deck to be replaced in its existing footprint.
5. **How is the requested variance in harmony with the general purpose and intent of the zoning ordinance.** The 34.2' variance is needed in order to maintain the house, as it was built in the 1980's. The deck is an existing feature, that will be replaced. Replacing the deck in its current location will not disturb the dune vegetation or create any significant additional impact to the dune or dune system.
6. **Would granting the variance be injurious to the surrounding neighborhood or detrimental to the public welfare?** The intention of the deck replacement is to maintain the property in the safest way possible. The plan includes the deck to be replaced with larger pilings, bringing it up to current building code, and keeping it exactly in the same style and footprint that is existing. We are putting back what is there. This project would have minimal impact to the dune. The project should have no impact to the neighborhood or public. Additionally we have contacted the adjacent neighbors to inform them of what we intend to do, and they have stated no objections.



NOTES:

Address: 131 Buffell Head Road

Lot Area = 22,706 Sq. Ft.

Lot Area West of Static Line= 12,215 Sq. Ft.

Existing Lot Coverage Info.:

Structure Under Roof/ Over Concrete= 2,725 Sq. Ft.
Concrete= 3,093 Sq. Ft.
Block Walk= 56 Sq. Ft.
Ex. Lot Coverage= 5,874 Sq. Ft. (48.1%)

Flood Zones are subject to change

Setbacks shown are as per the Subd. Plat and as per Zoning; they do not reflect any Restrictive Covenants that may exist.

This survey was based on the existing property corners found in conjunction with the recorded reference given.

Certifier hereon is not responsible for utilities and/or features that are not visible at the time of the survey, nor any additional setbacks that are not shown.

LEGEND:

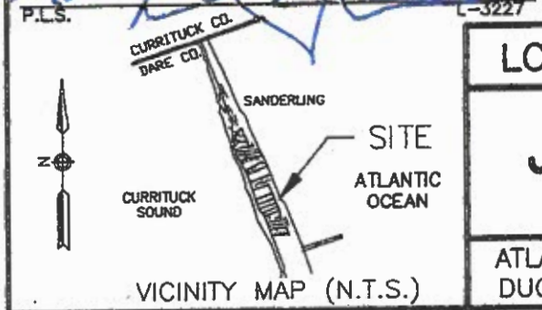
- Ex. OP
- Ex. Pinched Pipe
- Ex. Rebar
- Ex. Slick Rod
- Rebar Set
- Water Meter
- CATV
- Fence
- Flag Pole
- Wood Post
- Beach Access Sign
- Ex. S.S.S. Nail & Washer

I, M. DOUGLAS STYONS, JR., P.L.S., certify that this plat was drawn from an actual field land survey that the error of closure as calculated by latitudes and departures is at least 1:10,000;

Witness my hand and seal this 15th day of October A.D. 2018

NORTH CAROLINA PROFESSIONAL SEAL L-3227 LAND SURVEYOR M. DOUGLAS STYONS, JR.

P.L.S. L-3227



LOT 141, CAROLINA DUNES, SECTION B

SURVEYED FOR

JOSEPH L HATCH TRUSTEES and VICKI S. HATCH

ATLANTIC TOWNSHIP
DUCK

DARE COUNTY
NORTH CAROLINA

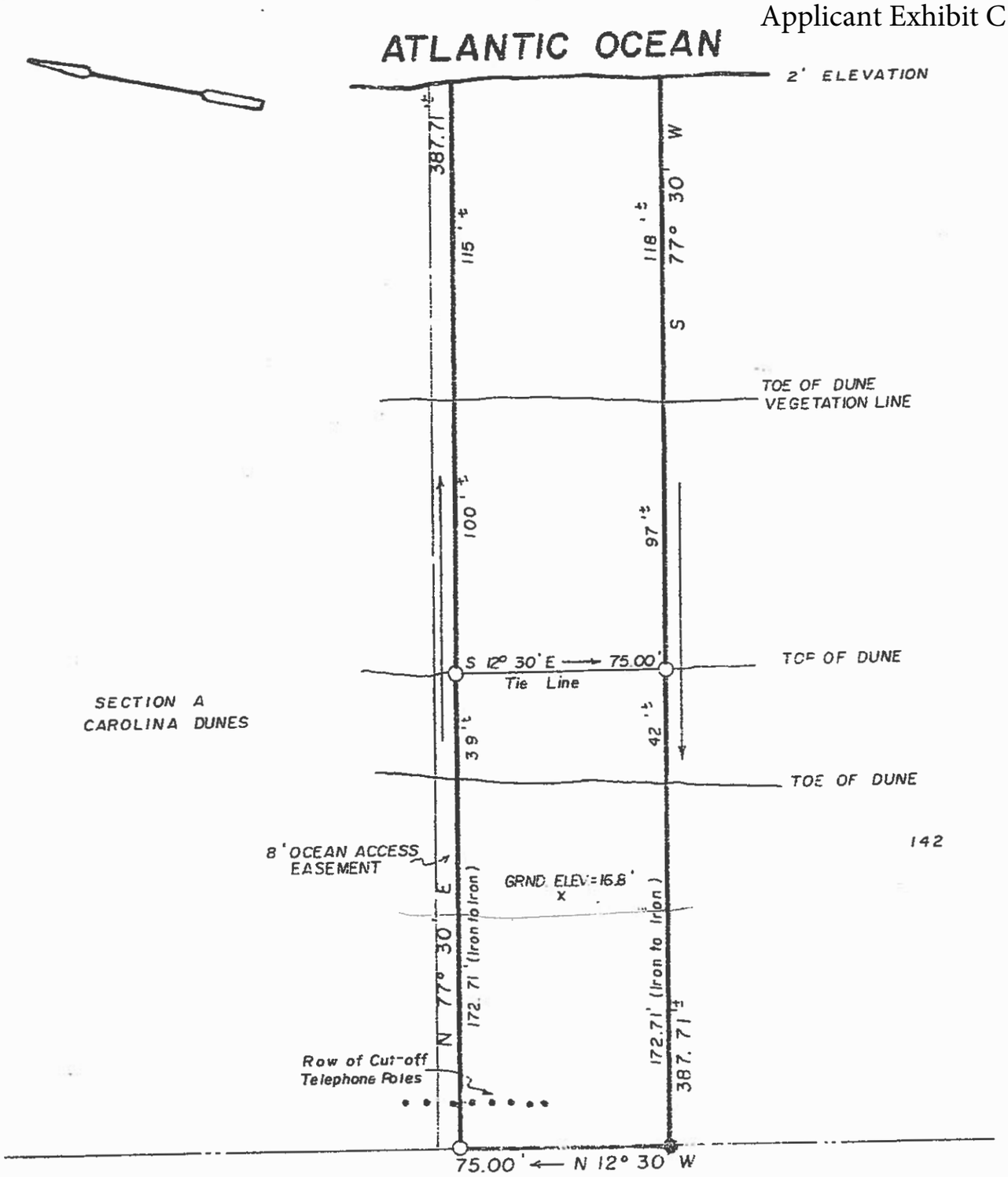
DATE SURVEYED: 10-4-18
REV.:
SCALE: 1" = 30'
FILE NO.: 18-291
DWG NO.: 18291P

F.I.R.M.: 3720 9950 00 J
F.I.R.M. DATE: 9-20-06
FLOOD ZONE: VE (12.0')
REC. REF. M.B. 6, PG. 59
D.B. 2026, PG. 710
PIN NO.: 21995011750342

C-1697
Styons Surveying Services P.A.
2700 N. Croatan Hwy. Kill Devil Hills, NC. 27948
Phone: (252) 441-1415 Fax: (252) 480-1182

Any unauthorized use or alteration of this document is prohibited
A red seal must be present for this to be an original document

Applicant Exhibit C



LOT 141, SECT. B

CAROLINA DUNES

RECORDED IN M.B. 6, PG. 59, DARE COUNTY REGISTRY

○ IRON PIPE SET

● EXISTING IRON PIPE

I, MICHAEL D. BARR hereby certify that this map is correct [redacted] and that there are no encroachments of other buildings on the said lot.

Michael D. Barr

L - 1756

SURVEY FOR

ROOSEVELT HATCH, Sr.

DUCK DARE COUNTY NORTH CAROLINA

scale	date	file
1" = 50'	5-11-81	

triangle engineering and surveying, inc.

raleigh, kinston, kill devil hills, greenville, nc
charleston, sc memphis, tn

Applicant Exhibit D

9-3-10

Applicant Exhibit E

From: **M. K. Kaloustian** chirogen@aol.com
Subject: From Moses K. Kaloustian and Semiramis Ayral-Kaloustian
Date: November 19, 2018 at 3:30 PM
To: vhatch1@verizon.net

November 19, 2018

Department of Community Development
Duck Board of Adjustment
P. O. Box 8369
1200 Duck Road
Town of Duck, N.C., 27949

Re: Joe and Vicki Hatch, 131 Buffellhead Road, Duck, N.C.

Dear Board Members,

We own the property adjacent to the Hatch's property at 131 Buffellhead Road.

We have no objections to a variance to the existing setback line for the replacement of the decking on their house, as presented in their application, as long as it does not impact our property at 133 Buffellhead Road in any way.

Sincerely yours,

Moses K. Kaloustian
Semiramis Ayral-Kaloustian

From: bigbuck089@gmail.com
Subject: Fwd: neighbor letter
Date: November 19, 2018 at 12:58 PM
To: vhatch1@verizon.net

JR

Sent from my iPhone

Begin forwarded message:

November 18, 2018

Department of Community Development
Duck Board of Adjustment
P. O. Box 8369
1200 Duck Road
Town of Duck, North Carolina. 27949

Dear Board Members:

Re: Joe and Vicki Hatch, 131 Buffellhead Road

We/I own the property adjacent to the Hatch's property. We have no objections to a variance to the existing setback line for the replacement of the decking on the house, as presented in their application.

Sincerely yours,

James Craig Rice

Neighbor
129 Buffell Head

County of Dare, North Carolina

*Owner and Parcel information is based on current data on file and was last updated on December 07 2018

Primary (100%) Owner Information:

HATCH, JOSEPH L TRUSTEES TRE
HATCH, VICKI S TRE
2340 LEEWARD SHORE RD
VIRGINIA BEACH VA 23451

Parcel Information:

Parcel: 009594000 PIN: 995011750342
District: 21- DUCK
Subdivision: CAROLINA DUNES SECTION B
LotBlkSect: LOT: 141 BLK: SEC: B
Multiple Lots: -
PlatCabSlide: PL: 6 SL: 59 Units: 1
Deed Date: 06/12/2015
BkPg: 2026/0710
Parcel Status: ACTIVE

Property Use: RESIDENTIAL

131 BUFFELL HEAD RD

BUILDING USE & FEATURES	**Tax Year Bldg Value: $168,100**	**Next Year Bldg Value: $168,100**
Building Use:	BEACH BOX	
Exterior Walls:	MODERN FRAME	**Actual Year Built:** 1981
Full Baths:	3 Half Baths: 0	
Bedrooms:	5	
Heat-Fuel:	3 - ELECTRIC	
Heat-Type:	2 - FORCED AIR	**Finished sqft for building 1:** 2832
Air Conditioning:	4 -CENTRAL W/AC	**Total Finished SqFt for all bldgs:** 2832

Disclaimer: In instances where a dwelling contains unfinished living area, the square footage of that area is included in the total finished sqft on this record. However, the assessed value for finish has been removed.

MISCELLANEOUS USE	**Tax Year Misc Value: $11,200**	**Next Year Misc Value: $11,200**

Misc Bldg a: (RG1) FRAME OR CB DETACHED GARAGE Year Built: 1990 sqft: 700

LAND USE	**Tax Year Land Value: $727,900**	**Next Year Land Value: $727,900**

Land Description : 21-Ocean front

TOTAL LAND AREA: 13000 square feet

	Tax Year Total Value: $907,200	**Next Year Total Value: $907,200**

**Values shown are on file as of December 07 2018*


081
N
BUFFELL HEAD
Town of Duck
North Carolina
131 Buffell Head Road
prepared January 4, 2019

Staff Exhibit G

Staff Exhibit H

Staff Exhibit I

Aerial Photograph Comparison

07/17/2006

02/03/2018

Staff Exhibit J

TOWN OF DUCK BOARD OF ADJUSTMENT
ORDER GRANTING A VARIANCE

131 Buffell Head Road

The Board of Adjustment for the Town of Duck, having held a public hearing on January 9, 2019 to consider application number BOV-2018-001 submitted by Joseph & Vicki Hatch, a request for a variance to use the property located at 131 Buffell Head Road in a manner not permissible under the literal terms of the ordinance, and having heard all of the evidence and arguments presented at the hearing, makes the following FINDINGS OF FACT and draws the following CONCLUSIONS:

1. It is the Board's CONCLUSION that an unnecessary hardship would result from the strict application of the ordinance. This conclusion is based on the following FINDINGS OF FACT:

- The applicants have submitted a reasonable proposal to replace the existing oceanfront decks in their current location. The applicant is not seeking to expand the footprint or size of the existing decks.
- The existing decks do not comply with current setback requirements from the static vegetation line on the dune. Section 156.124(C)(2)(b) of the Town Code prevents reconstruction of new decks in the same, nonconforming footprint as the existing decks.
- The current decking is decades old, not in good condition, and does not meet current construction standards. The applicant is seeking to upgrade the safety and sturdiness by demolishing the existing decks and rebuilding them entirely.
- To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reduced to less than four feet in width. This width would not be functional for a deck.

2. It is the Board's CONCLUSION that the hardship results from conditions that are peculiar to the subject property. This conclusion is based on the following FINDINGS OF FACT:

- The hardship has resulted from erosion and westward movement of the beach and dune, which has moved the static vegetation line closer to the residence.

DRAFT

- Although there are other properties in the surrounding area that contain similar physical characteristics (oceanfront location, existing nonconforming structures, beach erosion, etc.), these properties do not have the exact set of circumstances as the subject property.

3. It is the Board's CONCLUSION that the hardship did not result from actions taken by the property owner. This conclusion is based on the following FINDINGS OF FACT:

- When constructed under Dare County's purview in 1981, the residence at 131 Buffell Head Road was located significantly further to the west of Atlantic Ocean and oceanfront dune. The location of the decks in relationship to the first line of stable natural vegetation at that time would have complied with the Town's current setback standards.
- The applicants have not subsequently enlarged the decks or conducted any activities that exacerbated the situation.
- The hardship has resulted from erosion and westward movement of the beach and dune, which has moved the static vegetation line closer to the residence.

4. It is the Board's CONCLUSION that the requested variance is the minimum variance that will make possible the reasonable use of the land, building, or structure. This conclusion is based on the following FINDINGS OF FACT:

- A width of eight feet (8') for the proposed decks is a minimal dimension allowing reasonable use of the decks.
- To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reconstructed at less than four feet in width, which is not functional for a deck.

5. It is the Board's CONCLUSION that granting the variance will be in harmony with the general purpose and intent of the Town of Duck Zoning Ordinance. This conclusion is based on the following FINDINGS OF FACT:

- Section 156.124(A) of the Zoning Ordinance contains a purpose statement outlining the intent of the Town Council when adopting these standards for structures within the primary and frontal dunes. The ordinance reads, "It is the purpose of this section to develop regulatory standards which will assist with the preservation of a continuous dune system within the town, acknowledging the protective and aesthetic values that this feature provides. Regulations are hereby established to limit structures within the dune system that are known to weaken its structural integrity. Further, construction standards are established for dune walkover structures to minimize their impact on the dune, recognizing that these structures provide a safe and responsible mechanism to access the ocean beach."
- Replacement of the decks within the same footprint will not cause further damage to the adjoining dune or weaken the dune's structural integrity.

6. It is the Board's CONCLUSION that granting the variance will not be injurious to the neighborhood or otherwise detrimental to the public welfare. This conclusion is based on the following FINDINGS OF FACT:

- The proposed project would replace the decks in their existing configuration. The decking and house would look much like it has in the past and there would be no additional visual impact to the surrounding properties and neighborhood.
- The location of the proposed decks is on the rear of the residence and minimally visible from Buffell Head Road.
- Abutting property owners have submitted emails from owners of the adjoining properties to the north and south (Attachment E). James Rice, owner of 129 Buffell Head Road, expressed no objection to the proposed variance application. Moses & Semiramis Kaloustian offered more measured comments on the application, supporting the variance "…as long as it does not impact our property at 133 Buffell Head Road in any way."

THEREFORE, as all of the variance criteria have be met, IT IS ORDERED that the application for a VARIANCE be **APPROVED**.

ORDERED this _____ day of _____, 20_____.

_____
Chairman

NOTE: Each decision of the Board is subject to review by the superior court by proceedings in the nature of certiorari. If an aggrieved party is dissatisfied with the decision of this Board, a petition may be filed with the clerk of superior court within thirty days after the date this order is filed in the Planning and Zoning Office or after a written copy thereof is delivered to every aggrieved party who has filed a written request for such copy with the secretary or chairman of the board at the time of its hearing of the case, whichever is later. The decision of the board may be delivered to said aggrieved party by personal service or by registered or certified mail return receipt requested.

Return to:	Town of Duck P.O. Box 8369 Duck, NC 27949	Document Prepared by:	Town of Duck P.O. Box 8369 Duck, NC 27949

TOWN OF DUCK BOARD OF ADJUSTMENT
ORDER GRANTING A VARIANCE

131 Buffell Head Road, Duck, NC

The Board of Adjustment for the Town of Duck, having held a public hearing on January 9, 2019 to consider application number BOV-2018-001 submitted by Joseph & Vicki Hatch, a request for a variance to use the property located at 131 Buffell Head Road in a manner not permissible under the literal terms of the ordinance, and having heard all of the evidence and arguments presented at the hearing, makes the following FINDINGS OF FACT and draws the following CONCLUSIONS:

1. It is the Board's CONCLUSION that an unnecessary hardship would result from the strict application of the ordinance. This conclusion is based on the following FINDINGS OF FACT:

- The applicants have submitted a reasonable proposal to replace the existing oceanfront decks in their current location. The applicant is not seeking to expand the footprint or size of the existing decks.
- The existing decks do not comply with current setback requirements from the static vegetation line on the dune. Section 156.124(C)(2)(b) of the Town Code prevents reconstruction of new decks in the same, nonconforming footprint as the existing decks.
- The current decking is decades old, not in good condition, and does not meet current construction standards. The applicant is seeking to upgrade the safety and sturdiness by demolishing the existing decks and rebuilding them entirely.
- To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reduced to less than four feet in width. This width would not be functional for a deck.

2. It is the Board's CONCLUSION that the hardship results from conditions that are peculiar to the subject property. This conclusion is based on the following FINDINGS OF FACT:

- The hardship has resulted from erosion and westward movement of the beach and dune, which has moved the static vegetation line closer to the residence.
- Although there are other properties in the surrounding area that contain similar physical characteristics (oceanfront location, existing nonconforming structures, beach erosion, etc.), these properties do not have the exact set of circumstances as the subject property.

3. It is the Board's CONCLUSION that the hardship did not result from actions taken by the property owner. This conclusion is based on the following FINDINGS OF FACT:

- When constructed under Dare County's purview in 1981, the residence at 131 Buffell Head Road was located significantly further to the west of Atlantic Ocean and oceanfront dune. The location of the decks in relationship to the first line of stable natural vegetation at that time would have complied with the Town's current setback standards.
- The applicants have not subsequently enlarged the decks or conducted any activities that exacerbated the situation.
- The hardship has resulted from erosion and westward movement of the beach and dune, which has moved the static vegetation line closer to the residence.

4. It is the Board's CONCLUSION that the requested variance is the minimum variance that will make possible the reasonable use of the land, building, or structure. This conclusion is based on the following FINDINGS OF FACT:

- A width of eight feet (8') for the proposed decks is a minimal dimension allowing reasonable use of the decks.
- To comply with the 30-foot minimum setback standard, the currently eight-foot wide deck would have to be reconstructed at less than four feet in width, which is not functional for a deck.

5. It is the Board's CONCLUSION that granting the variance will be in harmony with the general purpose and intent of the Town of Duck Zoning Ordinance. This conclusion is based on the following FINDINGS OF FACT:

- Section 156.124(A) of the Zoning Ordinance contains a purpose statement outlining the intent of the Town Council when adopting these standards for structures within the primary and frontal dunes. The ordinance reads, "It is the purpose of this section to develop regulatory standards which will assist with the preservation of a continuous dune system within the town, acknowledging the protective and aesthetic values that this feature provides. Regulations are hereby established to limit structures within the dune system that are known to weaken its structural integrity. Further, construction standards are established for dune walkover structures to minimize their impact on the dune, recognizing that these structures provide a safe and responsible mechanism to access the ocean beach."

- Replacement of the decks within the same footprint will not cause further damage to the adjoining dune or weaken the dune's structural integrity.

6. It is the Board's CONCLUSION that granting the variance will not be injurious to the neighborhood or otherwise detrimental to the public welfare. This conclusion is based on the following FINDINGS OF FACT:

- The proposed project would replace the decks in their existing configuration. The decking and house would look much like it has in the past and there would be no additional visual impact to the surrounding properties and neighborhood.
- The location of the proposed decks is on the rear of the residence and minimally visible from Buffell Head Road.
- Abutting property owners have submitted emails from owners of the adjoining properties to the north and south (Attachment E). James Rice, owner of 129 Buffell Head Road, expressed no objection to the proposed variance application. Moses & Semiramis Kaloustian offered more measured comments on the application, supporting the variance "...as long as it does not impact our property at 133 Buffell Head Road in any way."

THEREFORE, as all of the variance criteria have been met, IT IS ORDERED that the application for a setback variance of 4.2 feet be **APPROVED** allowing three levels of decks to be reconstructed 25.8 feet from the static vegetation line at the rear of the property.

(continued on the following page)

ORDERED this 11 day of Jan, 2019.

Olin Finch

Olin Finch, Chair of the Board of Adjustment for the Town of Duck

North Carolina, Dare County

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: Olin Finch, Chair of the Board of Adjustment for the Town of Duck.

Witness my hand and seal this 11th day of January, 2019.

Kristiana M. Nickens
NOTARY PUBLIC
Dare County, NC
My Commission Expires November 25, 2023

Affix Notary Seal Inside This Box

Kristiana M. Nickens

Signature of Notary Public

Kristiana M. Nickens

Typed or printed name of Notary Public

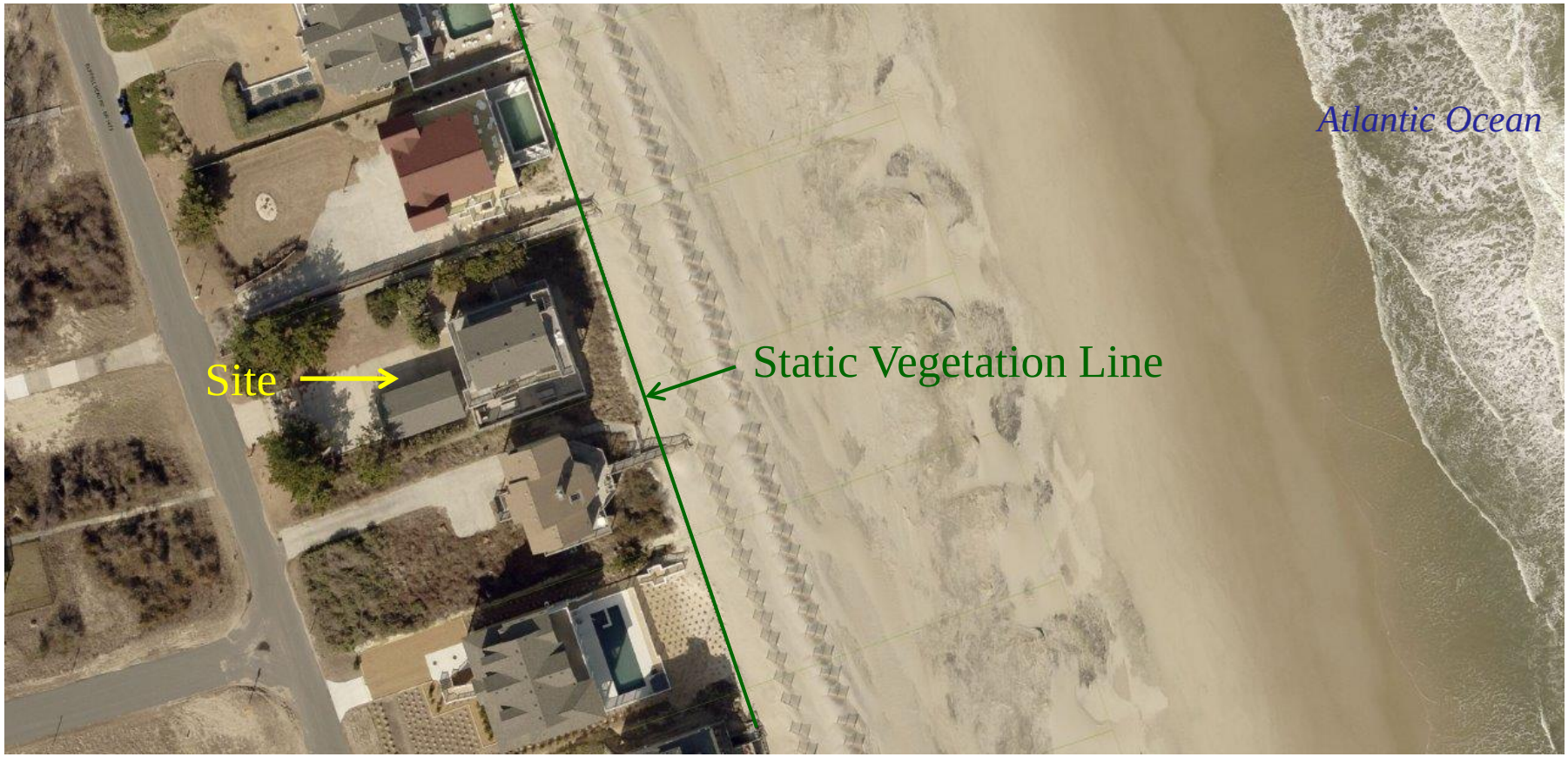
My commission expires: 11-25-2023

NOTE: Each decision of the Board is subject to review by the superior court by proceedings in the nature of certiorari. If an aggrieved party is dissatisfied with the decision of this Board, a petition may be filed with the clerk of superior court within thirty days after the date this order is filed in the Planning and Zoning Office or after a written copy thereof is delivered to every aggrieved party who has filed a written request for such copy with the secretary or chairman of the board at the time of its hearing of the case, whichever is later. The decision of the board may be delivered to said aggrieved party by personal service or by registered or certified mail return receipt requested.

Joseph & Vicki Hatch Variance
Duck, NC

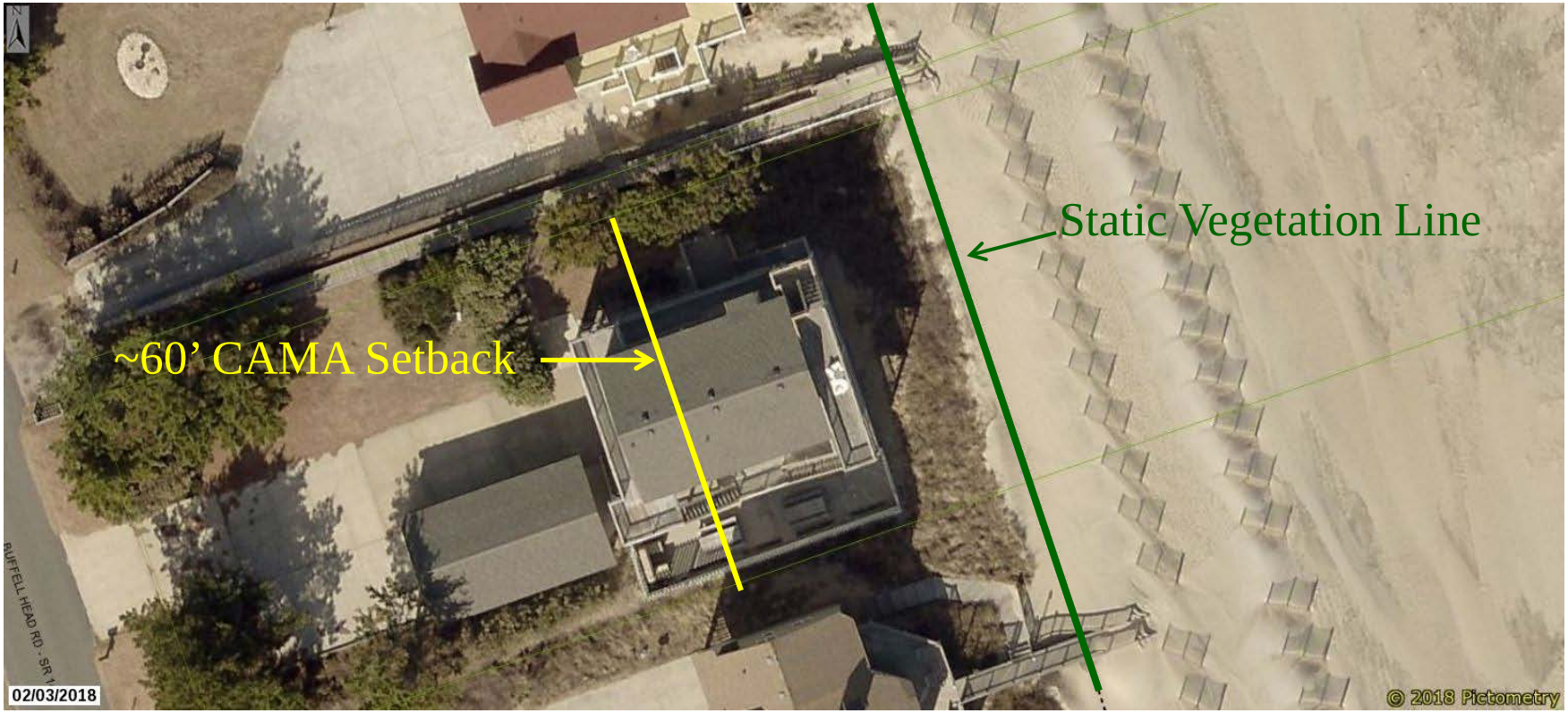
131 Buffell Head Rd.

(2/3/2018 Imagery)



131 Buffell Head Rd.

(2/3/2018 Imagery)



131 Buffell Head Rd.
Birdseye View From East
(2/5/2018 Imagery)

131 Buffell Head Rd.
Birdseye View From South
(2/3/2018 Imagery)

131 Buffell Head Rd.
Birdseye View From North
(2/3/2018 Imagery)

131 Buffell Head Rd.

(Photo Date: 01/15/2019)

131 Buffell Head Rd.

(Photo Date: 01/15/2019)

131 Buffell Head Rd.

(Photo Date: 01/15/2019)

131 Buffell Head Rd.

(Photo Date: 01/15/2019)

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

CRC-19-01

February 13, 2019

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Science Panel Role, Studies and Vacancies

As you will recall from the November 2018 meeting presentation on Inlet Hazard Areas, the Commission and Division often enlist the assistance of the CRC Science Panel in the understanding and application of coastal processes into management decisions. The creation of a standing scientific panel stemmed from the Commission's intent to apply scientific knowledge to problems the CRC faced as regulators. There was interest in enlisting the participation of scientists who had an understanding of the coastal management program, as well as the CRC's rules, to help apply the current state of knowledge and best available science in the development of CRC regulations. The origin of the Commission's Science Panel on Coastal Hazards can be found in the attached memo (CRC-14-08).

In assembling the Panel, the CRC created a Charge to guide their direction. In 2014, the Commission updated the Charge (attached) to formalize the appointment of members, outline a consensus-based approach to assignments, enact four-year staggered terms, and clarify officer elections. Two additional membership slots were added (for a total of 15), as well as provisions for the use of ad hoc members to fill specific study needs. Given the time since the last update, the Charge should be reviewed to ensure consistency with Commission's vision for the Science Panel. CRC Chair Renee Cahoon has also expressed an interest in expanding Panel membership to include coastal researchers and practitioners in the natural and social sciences.

Science Panel vacancies have traditionally been filled by recommendations of the Division and Panel members in consultation with, and at the discretion of, the CRC Chair. The Panel currently has nine active members (membership list attached), and more than four years have passed since the last appointments. With the upcoming 2020 Sea-Level Rise Assessment Update scheduled to begin this summer, DCM staff would like have members in place as soon as possible. CRC Chair Cahoon has contacted the current members inquiring whether they would like to be considered

for reappointment. Pending discussion of the Science Panel Charge at the upcoming meeting, Staff would like to solicit Science Panel nominations from the CRC, CRAC and the current Panel members in March to begin preparations for the Sea-Level Rise Assessment Update. I will review past projects and use of the Science Panel at our upcoming meeting in Morehead City.

May 15, 2014

CHARGE TO THE COASTAL RESOURCES COMMISSION'S SCIENCE PANEL

CHARGE

The purpose of the Science Panel (Panel) is to provide the Coastal Resources Commission (CRC) scientific data and recommendations regarding coastal processes including erosion, accretion, sand transport and the interactions of wind, waves and currents with the shoreline. At the specific request of the CRC, the Panel is charged with the following: 1) reviewing the current state of knowledge of coastal processes and ecological functions of coastal North Carolina; 2) assessing the current methodologies being used by North Carolina and others to define and identify areas subject to adverse impacts of coastal processes associated with development in public trust areas of North Carolina; 3) reviewing the scientific basis of the CRC's rules as applied by the Division of Coastal Management (DCM) to development in the coastal area; and 4) developing recommendations for the CRC on topics that include the following:

1. Opportunities to incorporate current scientific information on North Carolina coastal processes in the CRC rules for Estuarine and Ocean Areas;

2. New coastal engineering technologies or methods;

3. Specific projects as assigned by the CRC or requested by the Panel. When the CRC assigns a project, it should provide the Panel with specific questions it needs answered and any necessary timelines. The Panel should maintain the flexibility to propose projects and scopes of work to the CRC for approval.

MEMBERSHIP AND OFFICERS

The membership of the Panel should be no more than 15 individuals having professional expertise in coastal science or engineering, but additional members may be added on an ad hoc basis to expand the expertise of the Panel for specific studies if deemed necessary by the CRC Chair in consultation with the Panel. Nominations for new members and ad hoc members may be made by CRC members, current Science Panel members, DCM staff, or the Coastal Resources Advisory Council at any public meeting of the CRC. New members and ad hoc members will be appointed by the CRC Chair based on a review of the nominee's relevant expertise and credentials with respect to coastal science or engineering. New and replacement members will be appointed as needed. Panel members should serve staggered terms of four years to ensure continuity. New member terms should be for four years, with re-appointments for additional four-year terms when mutually agreed upon by the Panel member and CRC Chair. Regular attendance or participation by other means is important, and a Panel member may be asked to step down after prolonged non-participation, or at the discretion of the CRC Chair.

The officers of the Panel are the Chair and Vice-Chair. Officer terms are for two years, and the Chair and Vice-Chair should be elected biennially by the Panel. The Chair should work with staff to establish meeting agendas, preside over Panel meetings, and appoint subcommittees and subcommittee chairs as necessary to carry out the Panel's business. The Vice-Chair should preside over Panel meetings in the absence of the Chair and assume the duties of the Chair if the Chair is unable to complete their term until another Chair is selected by the Panel.

PANEL MEETING AGENDAS

Meetings of the Panel will be open to the public and each meeting should include an opportunity for public comments for the Panel to consider. Meeting notes and other records of all Panel meetings will be kept by the Division of Coastal Management. Draft notes will be distributed to Panel members for review, and final notes will be posted on the DCM webpage.

The Chair, Vice-Chair, and DCM staff should work together to prepare meeting agendas, which will be provided to members and to the public at least seven days prior to a scheduled meeting.

CONSENSUS BUILDING

Final Panel reports should be developed by consensus whereby (preferably) all Panel members support the general findings and recommendations, and clearly articulate any differences of opinion related to specific findings. In the absence of consensus, a minority opinion section should be included with each recommendation or report, if applicable.

The outline below is a general guideline for larger reports, but not all communications between the Panel and the CRC need to follow this format. Some recommendations, such as those pertaining to new coastal engineering technologies or methods, may be in memo form from the Panel to the CRC.

Larger Panel reports should follow a common outline so the CRC and stakeholders know what to expect in terms of format and content. The goal of Panel reports is to use the best available data to identify common ground and areas of disagreement to help set the context for CRC policy deliberations. To help reach consensus, it is essential for Panel members to participate in discussions, weigh in on draft recommendations, and review final reports. The outline should include, at a minimum, the following sections:

- General Issue
- Specific Question(s) to be Answered
- Options Explored by Panel
- Best Available Science
- Key Assumptions, Uncertainties, and/or Data Limitations Associated with Each Option
- Consensus Findings and Recommendations
- Minority Opinions and/or Specific Areas of Disagreement

DISSEMINATION OF INFORMATION

Draft findings and recommendations for which the Commission intends to incorporate public input should only be released for public comment following preliminary review and approval by the Coastal Resources Commission. Division of Coastal Management staff will coordinate the public review process.

Final recommendations of the Panel adopted pursuant to the consensus building and public review procedures described above should be reported in writing to the Division Director and the Chair of the Coastal Resources Commission. Presentations of Panel recommendations to the CRC should be made by the Panel Chair or their designee.

Science Panel Members

Dr. Margery Overton, Chair	Department of Civil, Construction, and Environmental Engineering N.C. State University
Stephen Benton	Division of Coastal Management (retired) Raleigh
Dr. William Cleary	Center for Marine Science University of North Carolina at Wilmington (Retired)
Tom Jarrett, P.E.	Coastal Planning & Engineering Wilmington, N.C.
Dr. Charles "Pete" Peterson	Institute of Marine Sciences University of North Carolina at Chapel Hill
Spencer Rogers	North Carolina Sea Grant Wilmington
Greg "Rudi" Rudolph	Shore Protection Office Carteret County
William Birkemeier	Field Research Facility, ERDC/CHL US Army Corps of Engineers (Retired)
Dr. Elizabeth Judge Sciaudone, PE	N.C. State University

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

Pat McCrory
Governor

Braxton C. Davis
Director

John E. Skvarla, III
Secretary

CRC-14-08

January 30, 2014

MEMORANDUM

TO: Coastal Resources Commission

FROM: Mike Lopazanski

SUBJECT: Science Panel Origin, Role and Composition

Background – Hurricanes and Hazard Mitigation

Beginning with Hurricane Opal in October 1995 and ending with Hurricane Fran in September 1996, North Carolina experienced five presidentially declared disasters within a twelve month period. As a result, Governor Hunt formed a Disaster Recovery Task Force in October 1996 to develop a comprehensive set of recommendations to facilitate the state's recovery. The recommendations included the review of the CRC's hazard mitigation rules and Ocean Hazard Areas. Specifically, the Commission was requested to evaluate the methodologies used to delineate hazard areas including an assessment of erosion rate calculations, setback requirements and accuracy of ocean, flood and inlet hazard area delineations.

The Division arranged for a panel comprised of Dr. Bill Cleary (UNCW, geologist), David Owens (UNCCH Institute of Government, lawyer), Dr. Stan Riggs (ECU, geologist), and Dr. John Wells (UNC-CH Institute of Marine Sciences, geologist) to discuss the Ocean Hazard AEC at the January 1997 CRC meeting. Dr. Cleary recommended the creation of a barrier island erosion task force to re-examine erosion rates, setbacks and associated methodologies used in their determination. Such a task force would allow scientists actively involved in related research to interact regularly and effectively with the Commission. The CRC created the task force and discussed the need for applying scientific knowledge to the problems the CRC faced as regulators. CRC Chairman Hackney stated that the Commission needed the participation of scientists who had an understanding of the coastal management program as well as the CRC's rules. The intent of such a task force would be to determine how the current state of knowledge could assist the Commission in the development of regulations - bridging the gap between science and policy. The Commission also discussed the need for a long-term, on-going task force and that there would need to be a clear charge from the Commission to ensure their direction.

The Division had already been planning to make coastal hazards an area of focus in its five-year strategic. As part of this effort, DCM was to propose rule changes to the Ocean Hazard AEC, develop an emergency response plan and hire a coastal geologist into a coastal hazards specialist position to guide the initiative. An advisory scientific task force was incorporated into the implementation of this strategy.

CRC Science Panel on Coastal Hazards – Formation, Members and Charge

The initial science advisory task force was assembled by DCM and began meeting in May 1997. The initial panel included Dr. Bill Cleary (Geologist – UNC-W), Dr. John Fisher (NCSU - engineer), Mr. Tom Jarrett (US Army Corps of Engineers, engineer), Dr. Stan Riggs (ECU – Geologist), Mr. Spencer Rogers (NC Sea Grant - coastal engineering specialist), Dr. Margery Overton (NCSU - engineer), and Dr, John Wells (UNC- Geologist), Craig Webb (Duke Earth Sciences). Dr. Fisher volunteered to chair the panel and DCM provided staff support.

Officially named the CRC's Science Panel on Coastal Hazards, the original charge was developed by the Panel and the Commission to focus on:

1. Update and report on current state of knowledge of coastal processes of NC.

2. Review current methodologies being used by NC and others to define and identify coastal hazard areas.

3. Review current rules applied by DCM to development in coastal hazard areas.

4. Considering immediate (next 1-3 years) and long term (three or more years out) actions, and develop recommendations for the CRC in the following areas:
    i. Studies that are needed to better describe NC coastal processes for management purposes.
    ii. Specific changes to the methodology utilized by DCM to determine coastal hazards.
    iii. New hazard identification methodologies that should be considered.
    iv. Opportunities to incorporate current information on NC coastal processes.

Over the next year, a set of short- and long-term recommendations were developed by the Science Panel and presented to the CRC in May 1999 and February 2000, respectively. The short-term recommendations included suggestions for digital mapping, erosion rate computation, storm surge modeling to define OEA width, development of a structures database (e.g., piers and bulkheads along estuarine shoreline), outreach and public education, creation of a coastal coordination committee (federal and state agencies with coastal responsibilities), inlet hazard area re-delineation, building code issues, sandbags, and oceanfront setbacks. The long-term recommendations included the development of an integrated hazard classification of the ocean shoreline including physical dynamics, geologic framework, subaerial characteristics, modern inlets, sediment budget, and erosion/accretion rates. In the development of the recommendations, the Panel discussed that it would keep to the science and not make recommendations that were broader than the science and technical issues they were charged with examining.

Science Panel Appointments

Traditionally, the Science Panel membership has been balanced with coastal engineers and coastal geologists. A marine biologist was added to assist with the sediment criteria and vacancies were filled by recommendations of the Division, Panel members and in consultation with and at the discretion of

the CRC Chair. The Panel has also asked others to provide information when particular expertise was required.

Science Panel Activities

Over the intervening years, the Panel has been asked by the Commission and Division to develop recommendations or provide technical advice on a number of issues including:

1. Sediment Criteria Development (2002 - 2007)
2. Review Innovative Erosion Control Structures - Holmberg Stabilizer System (2002 - 2003)
3. Inlet Hazard Areas Analysis & Delineation (2007 – 2010; per HB-819 continue study in 2013)
4. Terminal Groins (Review Feasibility Study 2009)
5. Terminal Groins (Guidance on monitoring for adverse impacts 2011- 2012)
6. Sea Level Rise Assessment (2009 to Present)
7. Review results from updated Erosion Rate study (2011)
8. Mad Inlet Assessment (2013)

Recent CRC Discussions

In late 2012, the Commission began reviewing the structure and function of the Science Panel beginning with the Charge (attached) and formalizing the appointment of members. The Charge focuses on a consensus based approach to working on assignments, four-year staggered terms, member appointment procedures as well as officer elections. The Commission also incorporated, two additional slots, the use of ad hoc members to fill specific needs, provisions for replacement due to non-participation, staggered terms and the review of a nominee's expertise and credentials. Once Panel members are formally appointed, the members will elect a Chair and Vice-Chair. The Chair and Vice-Chair serve two-year terms as officers. In order to implement staggered terms, it has been necessary for half of the existing Panel members to volunteer for two-year terms and the other half to volunteer for four-year terms which they have done. There have been two resignations due to time commitments and with the two additional slots, there are four vacancies.

Member Qualifications

In reviewing the 2013 draft Charge, the Science Panel discussed the need for a basis for the CRC Chair to evaluate credentials of nominees, but stated that new members should not be limited to those that are published in peer-reviewed journals. For example, some practicing coastal engineers or geologists may not be published, but they may still be qualified to join the Panel. The Science Panel members recommended and the Commission agreed that new members and ad hoc members will be appointed by the CRC Chair based on a review of the nominee's relevant expertise and credentials with respect to coastal hazards processes.

In discussing the CRC's interest in expanding the Panel and possibly including an economist, the Panel members recommended that economists should be added on an ad hoc as needed basis to work on specific projects. The Science Panel has traditionally focused on oceanfront coastal hazard processes and has been balanced between coastal engineers and coastal geologists. Panel members recommended that the Commission retain that composition and focus.

Science Panel Reports

Under the existing Charge, the CRC reviews draft Panel recommendations or reports before they are released for public comment. With regard to report format, the Panel suggested clarifying what is

expected for larger more complex reports while allowing for communication of recommendations on engineering technologies and methods in memo form. Final Panel reports are to be developed by consensus whereby (preferably) all Panel members support the general findings and recommendations, and clearly articulate any differences of opinion related to specific findings. In the absence of consensus, a minority opinion section is to be included with each recommendation or report, if applicable.

2013 Science Panel Nominations

In order to fill vacancies, the Commission agreed to a nominations process for two categories: Science Panel slots and "ad hoc" study slots (e.g., for the Sea Level Rise Assessment Update). For the four vacant Science Panel slots, the Division issued a call for nominations letter to CRC, CRAC and Science Panel members seeking nominations for two engineers and two geologists with the charge to the Science Panel used as guidance for qualifications. Nominees were asked to provide the CRC, CRAC or Science Panel member with a resume, CV and any other qualifying information that will be forwarded to the DCM Director. The call for nominations will also request that the potential nominee be contacted prior to submission in order to ensure their interest in serving. The nominations period was open for 30 days. A subcommittee of the CRC, including the CRC Executive Committee (CRC committee chairs, CRAC Chair and Executive Secretary) and Science Panel Chair, would then review the nominees and make a recommendation to the CRC Chair. The Chair would then make the appointments known at an upcoming CRC meeting.

For the ad hoc study members, the Science Panel could indicate that they need a certain number of members with specified expertise. The Commission or Advisory Council could also suggest a number of members with specific expertise. The call for nominations would be handled and reviewed in the same manner as above, with the specifics dictated by the needs.

Current Status

At the July 2013, the CRC agreed to re-appoint the current members of the Science Panel at the discretion of the CRC Executive Committee. However, no action has been taken on nominations received due to the legislative changes made to the Commission. A meeting of the Science Panel is currently scheduled for February 4th at the Washington DENR Regional Office. The Panel will be reviewing a methodology for determining erosion rates in inlet areas and discussing the history of Mad Inlet, local geomorphology and other factors involved in inlet formation as was requested by the Commission at December 2013 meeting.

Current members of the Science Panel

Chairman Dr. Margery Overton (Dept. of Civil, Construction & Environmental Engineering, NCSU)
Mr. Steve Benton (coastal geologist, retired DCM)
Dr. William Cleary (Center for Marine Science, UNC-W)
Mr. Tom Jarrett P.E. (US Army Corps of Engineers, retired)
Dr. Charles "Pete" Peterson (Institute of Marine Sciences, UNC-CH)
Dr. Stan Riggs (Dept. of Geology, ECU)
Mr. Spencer Rogers (NC Sea Grant)
Dr. Antonio Rodriguez (Institute of Marine Sciences, UNC-CH)
Mr. William Birkemeier (Field Research Facility, ERDC/CHL US Army Corps of Engineers)
Dr. Elizabeth Sciaudone, P.E. (Dept. of Civil, Construction & Environmental Engineering, NCSU)
Dr. Robert Young (Dept. of Geosciences, Western Carolina University).

JOSH STEIN
ATTORNEY GENERAL

REPLY TO:
MARY L. LUCASSE
(919) 716-6962
MLUCASSE@NCDOJ.GOV

Memorandum

To: North Carolina Coastal Resources Commission

Fr: Mary Lucasse, Special Deputy Attorney General, NCDOJ

Date: February 11, 2019

Re: Follow-up on our conversation regarding variances.

During the North Carolina Coastal Resources Commission's ("Commission") November 2018 meeting, it received refresher training on the CAMA variance procedure and engaged in a robust discussion of the concept of "unnecessary hardships." During that meeting, I was asked to provide additional information about what is meant by that phrase as it is used in the Commission's variance procedure. In preparing this memo, I reviewed information forwarded by Commissioners and DCM staff; considered various legal treatises, including a blog post by the UNC School of Government on the concept as it is used in zoning decisions; and reviewed discussions of the concept in case law (both North Carolina and other states). I have synthesized information here to provide a guide to the Commission for its consideration. In an attempt to keep this memo relatively user friendly, at the end of this memo I included citations for those Commissioners who might be interested in diving deeper into the issue and provided a summary of the three North Carolina cases that discuss CAMA's unnecessary hardship standard. I hope the rest of you will not get bogged down. I look forward to discussing these issues at the Commission's upcoming meeting.

The Commission's authority to issue a variance from the restrictions imposed on development in Areas of Environment Concern ("AEC") by the Coastal Areas Management Act of 1974 ("CAMA") is provided by the General Assembly in N.C. Gen. Stat. § 113A-120.1. Specifically,

> (a) Any person may petition the Commission for a variance granting permission to use the person's land in a manner otherwise prohibited by rules or standards prescribed by the Commission, or orders issued by the Commission, pursuant to this Article. To qualify for a variance, the petitioner must show all of the following:

(1) Unnecessary hardships would result from strict application of the rules, standards, or orders.

(2) The hardships result from conditions that are peculiar to the property, such as the location, size, or topography of the property.

(3) The hardships did not result from actions taken by the petitioner.

(4) The requested variance is consistent with the spirit, purpose, and intent of the rules, standards, or orders; will secure public safety and welfare; and will preserve substantial justice.

(b) The Commission may impose reasonable and appropriate conditions and safeguards upon any variance it grants.

The current language of the CAMA variance was amended in 2002 following the Court of Appeals ruling in *Williams v. North Carolina Dept. of Environment and Natural Resources.*[1] This amendment shifted the burden of proving the four variance factors to petitioners and more closely conformed the variance factors to those used in the zoning statute. Specific requirements governing the variance process are included in the Commission's rules. *See e.g.*, 15A N.C. Admin. Code 07J .0701.

The General Assembly has authorized counties and municipalities to issue variances from zoning ordinances when practical difficulties or unnecessary hardships would result from carrying out the strict letter of those ordinances and granting a variance would be consistent with the spirit of the ordinance, would secure public safety and welfare, and would allow for substantial justice to be done.[2] The General Assembly has allowed variances based on a finding of unnecessary hardship in other statutes as well.[3] Given the similarity in the CAMA and zoning statutes allowing for variances, the case law on the application of the unnecessary hardship standard under the zoning statute is particularly useful to our analysis here.

I. Variances may be granted if certain conditions are met.

A variance allows a landowner "to use or build on land in a way prohibited by strict application of a zoning ordinance" if certain conditions are met.[4] It provides a means for a landowner to seek relief when the hardship imposed on an individual parcel of land outweighs the public benefit sought by the regulation and is out of proportion to the hardship shared in common with other property owners who also benefit from the restrictions. The ability to issue a variance has been described as a 'safety valve" which waives strict application "of the zoning ordinance without sacrifice to its spirit and purposes."[5] The purpose of the variance process is to provide flexibility and to prevent practical difficulties and unnecessary hardships resulting from strict interpretations of zoning ordinances.[6]

A petitioner has a heavy burden to establish in requesting a variance:

> The power to grant variances from the strict application of zoning ordinances should be carefully and sparingly exercised, because unless great caution is used and variances are granted only in proper cases, the whole fabric of town-wide and city-wide [and coast-wide] zoning will be worn through in spots and raveled at the edges until its purpose in protecting the property values and securing the orderly development of the community is completely thwarted.[7]

To avoid rezoning by variance or spot zoning, variances should only be exercised in exceptional cases.[8] If similar variance requests relating to a particular rule are often granted, the best practice is to consider revising the rule. In the past, the Commission and staff have considered whether the 30-foot buffer rule should be revised to allow some development in the buffer if an engineered stormwater system was included in the plans and maintenance of that system was required by local ordinance. The Commission and staff also considered rule revision for development proposed for a lot on a canal system where the buffer applied to multiple sides of the lot. Eventually, Commission and staff concluded that variations in the situations presented required these types of development to be addressed through the variance process.

II. A hardship is not the same as an "unnecessary hardship"

Zoning ordinances limit what property owners can do with their property within zoning districts. These restrictions are compensated for by similar restrictions on neighboring property. "Such hardship, consistent with the hardship imposed on all other pieces of property in the district, is not a ground for a variance."[9] To be considered an unnecessary hardship, a hardship must be different in kind from those generally affecting properties in the same zoning district.[10]

Likewise, the CAMA provisions impose some degree of hardship on all property within the twenty coastal counties. Consider, for example, a situation in which an ocean front setback based on a high erosion rate may cause a hardship on property in the Ocean Hazard AEC. The applicable setback limits the placement of development and the area available for development on all similarly situated lots with the same erosion rates. The restrictions imposed for the purpose of protecting life and property[11] on one lot in the ocean hazard AEC are consistent with restrictions on all other similarly situated properties rendering any resulting hardships necessary to meet the purpose of the rule. As long as the hardship is imposed on all similarly situated properties, such a restriction, without more, would not provide grounds for a variance.

III. When is a hardship an "Unnecessary hardship"?

There "is no simple formula" for determining when a hardship is an unnecessary hardship. Each variance request is considered on a case-by-case basis on the evidence presented.[12] The Commission is not required to grant a variance merely because it granted another petitioner a variance for the same type of property which was subject to the same type of

CAMA restrictions. However, if the facts relating to separate variance requests are exactly the same, the Commission's decision should be the same. When factors differ, the Commission may reach different results.[13] The types of factors relevant to an assessment of whether a hardship is unnecessary include the following:

A. Consider whether there is a Reasonable Use of the Property.

"An unnecessary hardship occurs where the restriction when applied to the property in the setting of its environment is so unreasonable as to constitute an arbitrary and capricious interference with the basic right of private ownership."[14] Such interference with property ownership can result from restrictions that prevent a property owner from making a reasonable use of the property consistent with the uses made of similarly situated property. Thus, one factor for the Commission to consider is whether the Petitioner can make reasonable use for the property.

In the past, many jurisdictions applied a standard requiring the applicant to show that there is no reasonable use of the property without a variance. Following a 2013 amendment to North Carolina's statute governing local zoning ordinance, it now explicitly states, "It is not necessary to demonstrate that, in the absence of the variance, no reasonable use can be made of the property."[15] This change appears to allow flexibility to grant a zoning variance even if there are reasonable uses that can be made of the property. Following *Williams,* the variance statute was amended to shift the burden of proving the four variance factors to Petitioner. The revised CAMA does not mirror the explicit language included in the zoning statute regarding reasonable use.[16] Therefore, I recommend that as part of any unnecessary hardship analysis, the best practice for the Commission when it denies a request would be to include findings of fact, based on the stipulated facts submitted by the parties, as to whether in the absence of a variance some reasonable use could be made of the property.

Note, even if petitioner argues that no reasonable use can be made of the property, the Commission is not required to grant a variance. A variance can only be granted when Petitioner has established all four of the variance criteria. If a variance is denied and Petitioner can establish there is no reasonable use for the property, CAMA expressly allows a property owner to bring a takings claim seeking compensation.[17] This would take place in a proceeding that is separate from your variance proceeding.

B. Consider Financial Impact along with other Factors.

Case law regarding zoning and CAMA variances is consistent and establishes "pecuniary loss alone is not enough to show an 'unnecessary hardship' requiring a grant of a variance."[18] Pecuniary loss can take several forms. For example, if construction has begun, a property owner might argue a variance should be granted based on the cost to bring the project into compliance. Another argument is that without a variance, the site will not make its highest financial return. Neither argument standing alone is sufficient to constitute an unnecessary hardship. However, pecuniary loss is a factor to be taken into consideration and should not be ignored.[19]

C. Consider Unique Nature of the Property.

The second factor of the CAMA statute requires petitioner to establish that "the hardships result from conditions that are peculiar to the property, such as the location, size, or topography of the property." The hardship described in this second factor arguably requires that strict application of the regulation cause an unequal burden on the property as a result of some unique aspect of the property different than the burden on neighboring properties. It is this unequal burden that has been described as an unnecessary hardship and, I would argue, intertwines consideration of the first and second factor. The Commission may determine additional unnecessary hardship that do not result from conditions peculiar to the property. But, I think that because the second factor is a required factor under the CAMA variance criteria, the Commission is required to find that some aspect of the hardship is based on conditions peculiar to the property before granting any variance. The other factors that could be considered in an analysis of what is an unnecessary hardship may differ based on the facts of the case. But, the Commission is always required to consider whether there is some feature of the property that causes the ordinance to have a more burdensome effect on the applicant's property than on neighboring properties.

In past variance requests, the Commission has consider whether the 30 foot buffer ordinance unequally burdens a property with a man-made canal on two sides compared to the burden on neighboring properties where the canal is only present on one property line. The Commission also found peculiar conditions existed on a lot near the North River Bridge which serves as a gateway to "Down East" when there were county setbacks, a DOT right-of-way setback, and limitations on the sightlines caused by a curve in the road. These conditions limited the location on the property where a sign could be installed (and still be visible) and the Commission found that strict application of the CAMA regulations prohibiting non-water dependent development in coastal wetlands imposed an unequal burden on the property.

D. Do Not Consider Property Owner's Situation.

Whether an unnecessary hardship exists depends upon the unique nature of the property not the personal situation of the landowner. In the past, the Commission denied a variance request when the petitioner owned other property on which the development could be constructed without damage to coastal wetlands. In that case, the North Carolina Court of Appeals overturned the Commission's decision based on its finding that it was immaterial whether a petitioner owned other property. The Court held that considering the personal situation of the landowner was improper because it would result in different petitioners being treated differently based on whether they owned other property even if the property for which the variance was sought was the same.[20]

Another fact pattern implicating this issue was raised during The Riggings Homeowner's request for a variance. At one point, the Commission denied Petitioner's request to maintain a temporary sandbag erosion control structure on the beach in front of its buildings based in part on the Commission's finding that sandbags had been present on the property for almost 30 years

pursuant to a permit and variances and could no longer be considered temporary. Because the intent of the statute was that erosion control structures only be allowed to remain on the beach temporarily, the Commission found that the hardship caused by strict application of the sandbag statute was necessary. The Court of Appeals was not persuaded by the Commission's argument that the prior variances and permits run with the land[21] and were therefore related to the property. It held that since the variances and permits had been issued to petitioner, these factors were related to the petitioner not to the property and thus, immaterial to the unnecessary hardship analysis.[22] The North Carolina Supreme Court affirmed the Court of Appeal's decision without precedential value.[23] Given the Supreme Court's decision, I would argue that the Commission could again make the argument that permits and/or variances run with the land and could be considered as a fact material to the property.

E. Consider whether Request is consistent with CAMA and rules.

The requirement that the variance only be granted if it will not harm the intent of statute or rules is both implicit in the consideration of "unnecessary hardship and is also explicitly stated in CAMA's fourth variance criteria. This is another example of the way in which the Commission's consideration of the different variance criteria will, at times, appear to be duplicative. As explained by the North Carolina Supreme Court, a finding of "unnecessary hardship" should not be used to

> Abrogate the very intent and purpose of the ordinance, amend, if not partially repeal, an act regularly adopted by the local Legislature, and create a means by which the entire ordinance could be frustrated at will by limitless exceptions. It cannot be construed to include a hardship imposed upon all alike so as to effectuate the primary purpose and intent of the legislative body.[24]

In cases where strict application of the rules does not accomplish the policy objectives and goals, or does little to accomplish them, the resulting hardship may be unnecessary. A "board cannot disregard the provisions of the statute or its regulations. It can merely 'vary' them to prevent injustice when the strict letter of the provisions would work 'unnecessary hardship.'"[25] As pointed out during the Commission's discussion, it is not the Commission's purpose to restrict what the property owner wishes to do, within reason, when doing so does not further the policy objectives and goals of CAMA. The term "unnecessary" connotes the idea that it is not essential to maintain the restriction complained of because no harm would befall neighboring properties and the purpose of the regulation would not be contravened by granting the variance. On the other hand, when strict application of the rules accomplishes the policy objectives and goals the resulting hardship may be necessary.

Based on this principle, a request for a zoning variance to allow construction of a grocery store-service station in a residential area was denied, as the request would subvert the intent and purpose of having a residential zoning designation.[26] Similarly, in an unpublished decision, the North Carolina Court of Appeals upheld the Commission's denial of a request for a variance

from CAMA to enable Petitioners to build within the ocean hazard setback. It found the request was not within the spirit and purpose of the ocean hazard rules and would not promote substantial justice because it would be unfair to other property owners who had constructed structures based on required setbacks or whose structures were grandfathered.[27]

IV. Conclusion

In determining whether strict application of CAMA causes unnecessary hardship, the Commission is required to approach the subject through each of the criteria identified by the General Assembly in the CAMA variance statute. These concepts are connected and intertwined. The concept of unnecessary hardship contemplates that the strict application of CAMA would impose an unequal burden on the property and prevent reasonable use of the property. In addition, by listing such other specific concepts in the second, third, and fourth factors in the statute, the legislature alerted the Commission to additional factors which if not found would result in a conclusion that the hardship caused by strict application is necessary. Following is a summary of three North Carolina cases.

* * * * *

Review of North Carolina cases with applicable discussion of CAMA

Williams v. North Carolina Dept. of Environment and Natural Resources, 144 N.C. App. 479, 548 S.E.2d 793 (2001)(based on original CAMA variance statute). In this case, the CRC denied variance for construction in coastal wetlands based on finding of no unnecessary hardship when petitioner owned other property on which to place development. Court held:

- Superior Court lacked authority to grant a variance and must remand to Commission for decision.
- Whether strict application of the CAMA places "unnecessary hardship" on property, depends upon unique nature of property, not landowner. If "hardship" stemmed from landowner's situation, then persons owning less land would have easier time showing unnecessary hardship than those owning multiple parcels and cause equal protection issue.
- Fact that landowner owned other property did not establish lack of "unnecessary hardship" and should not be considered as it relates to applicant not property.
- To determine whether property suffers from "unnecessary hardship" due to strict application of CAMA, Commission must make Findings of Facts and Conclusions of Law as to impact of CAMA on landowner's ability to make reasonable and significant use of property.

Midgett v. N. Carolina Coastal Res. Comm'n, 212 N.C. App. 420, 713 S.E.2d 791 (2011) *(unpublished)*. COA reversed superior court's decision to reverse Commission's denial of variance request holding:

- Erosion setback on property was 420 feet from first line of stable natural vegetation based on an average annual erosion rate of 14 feet per year leaving building envelope of 34 by 66 feet.
- Proposed development was approximately 272 feet landward of vegetation line.
- Commission denied variance based on petitioner's failure to show 2nd, 3rd, and 4th factor.
- COA held petitioner had burden to show all four factors. And, there was substantial evidence in the record to conclude that the request for a valance was inconsistent with the spirit and purpose of the ocean hazard rules and would not promote substantial justice because it would

be unfair to other existing owners who had constructed structures based on the required setback distances or whose structures were grandfathered.

- Although there is contrary evidence in record, reviewing court is not permitted to substitute its judgment for that of Commission.

Riggings Homeowners, Inc. v. Coastal Res. Comm'n, 228 N.C. App. 630, 747 S.E.2d 301 (2013) *aff'd by equally divided court* 367 N.C. 643, 766 S.E.2d 320 (2014). Decision followed cross-appeals of superior court's decision on judicial review of CRC's denial of variance to retain sandbags. It stands without precedential value since N.C. Supreme Court was equally divided. Aspects of COA decision relating to unnecessary hardships include following:

- Without explaining basis for statement, Court held CRC not required to make "reasonable use" determination before denying variance.
- Court rejected CRC's argument that length of time sandbags had been in place authorized by prior permit and variances related to the property and should be considered in the "unnecessary hardships" analysis. Instead, the Court held a prior permit or variance requests are immaterial as they relate to property owner rather than property.
- COA declined to address argument that CRC could find hardships exist under 2nd and 3rd factors yet not find hardship unnecessary in 1st factor.
- COA reviewed 4th factor as matter of law and did its own balancing of private property interests and competing public interests. COA did not review whole record to determine whether there was substantial evidence in the record to support CRC's decision. COA substituted its own judgment for CRC's finding that private property interests outweighed public interests.

Endnotes

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[1] 144 N.C. App. 479, 548 S.E.2d 793 (2001).

[2] *See* N.C. Gen. Stat. § 160A-388(d) (2018) which replaced former N.C. Gen. Stat. §§ 160-172 and -178 (2013).

[3] For example, N.C. Gen. Stat. § 63-32 (2018) provides a process to request a variance from airport zoning regulations. N.C. Gen. Stat. § 136 – 44.50 (2018) allows individuals to request variances from limitations on development imposed by the Transportation Corridor Official Map Act.

[4] Laura Hunter Dietz & Anne E. Melley, *Variances, Generally; Authority to Grant, in* Strong's North Carolina Index 4th Zoning §§107, 108, and 109 (Feb. 2019 update).

[5] Eric M. Larsson, *Proof of Hardship Necessary for Zoning Variance,* in 131 Am. Jur. Proof of Facts 3rd 253 (Nov. 2018 update). See also, *Husnander v. Town of Barnstead*, 139 N.H. 476, 478, 660 A.2d 477, 478 (1995) citing 3 E. Ziegler, Rathkopf's The Law of Zoning and Planning, § 38.01[1] (4th ed. 1994).

[6] James A. Webster, Jr., Patrick K. Hetrick & James B. McLaughlin, Jr., Webster's Real Estate Law in North Carolina § 18–19, at 874 (5th ed.1999); see also N.C. Gen. Stat. § 160A–388(d) (2009).

[7] Larrson, *supra,* §13.

[8] *Lee v. Board of Adjustment*, 226 N.C. 107, 111, 37 S.E. 2d 128, 132 (1946).

[9] Arden H. Rathdopf, et al., *The Law of Zoning and Planning* § 58:5 (4th ed. Nov. 2018 update) (Emphasis added).

[10] *Dupont v. Zoning Bd. of Appeals of Town of Manchester*, 834 A.2d 801, 803 (Conn. 2003) (citations and punctuation omitted); *see also* Larrsen, *supra*, at §16.

[11] *E.g.,* 15A N.C. Admin Code 07H .0301, .0303(b), and .0306(a)

[12] Adam Lovelady, *Variance Standards: What is Hardship and When is it Unnecessary?* Coates Canons: NC Local Government Law Blog (May 27, 2014), https://canons.sog.unc.edu/variance-standards-what-is-hardship-and-when-is-it-unnecessary/.

[13] *Through The Looking Glass, Inc. v. Zoning Bd. of Adjustment for City of Charlotte*, 136 N.C. App. 212, 523 S.E.2d 444 (1999).
[14] *Showcase Realty and Const. Co. v. City of Fayetteville Bd. of Adjustment*, 155 N.C. App. 548, 542, 573 S.E. 2d 737, 741 (2002) citing *Williams v. N.C. Dep't of Env't & Natural Res.*, 144 N.C. App. 479, 486, 548 S.E.2d 793, 798 (2001)(Citations and punctuation marks omitted); *but see Riggings Homeowners, Inc. v. Coastal Resources Com'n*, 367 N.C. 643, 766 S.E.D2d 320 (2014) (Court of Appeals held that following statutory amendment, Commission does not have the burden of making "a 'reasonable use' determination before denying a variance request.").
[15] N.C. Gen. Stat. § 160A-388; *see also,* Lovelady, *supra.*
[16] N.C. Gen. Stat. § 113A-120.1.
[17] N.C. Gen. Stat. 113A-123(b)(2009) (The court shall determine whether a final decision of the Commission so restricts the use of property as to deprive a person of the practical uses and constitutes a taking.).
[18] *See,* Dietz & Melley, *supra,* § 108; *see also Turik v. Town of Surf City*, 182 N.C. App. 427, 642 S.E.2d 251 (2007) and *Williams v. N.C. Dep't of Env't & Natural Res.*, 144 N.C. App. 479, 486, 548 S.E. 2d 793, 798 (2001).
[19] *Williams,* 144 N.C. App. at 486, 548 S.E.2d at 798 (2001).
[20] *Id.*
[21] For a discussion of this issue, *see,* 83 Am. Jur. 2d Zoning and Planning § 710 citing *R and R Pool and Patio, Inc. v. Zoning Bd. of Appeals of Town of Ridgefield*, 19 A.3d 715 (Conn. 2011); *Sheppard v. Zoning Bd. of Appeal of Boston*, 963 N.E.2d 748 (Mass. App. Ct. 2012); *Campus Associates L.L.C. v. Zoning Bd. of Adjustment of Tp. of Hillsborough*, 996 A.2d 1054 (N.J. App. Div. 2010).
[22] *Riggings Homeowners, Inc. v. Coastal Resources Com'n*, 228 N.C. App. 630, 642, 747 S.E.2d 301, 308-209 (2013).
[23] *Riggings Homeowners, Inc. v. Coastal Resources Com'n,* 367 N.C. 643, 766 S.E.D2d 320 (2014).
[24] *Lee v. Bd. of Adjustment of City of Rocky Mount,* 226 N.C. 107, 111, 37 S.E.2d 128, 132 (1946).
[25] *Showcase Realty and Const. Co. v. City of Fayetteville Bd. of Adjustment,* 155 N.C. App. 548, 542, 573 S.E. 2d 737, 741 (2002) citing *Lee v. Board of Adjustment*, 226 N.C. 107, 111, 37 S.E. 2d 128, 132 (1946).
[26] *Sherrill v. Town of Wrightsville Beach*, 76 N.C. App 646, 648, 334 S.E.2d 103, 104 (1985).
[27] *Midgett v. North Carolina Coastal Resources Com'n,* 212 N.C. App. 420, 713 S.E.2d 791 (2011) (unpublished).

JOSH STEIN
ATTORNEY GENERAL

REPLY TO:
MARY L. LUCASSE
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Memorandum

To: N.C. Coastal Resources Commission

cc: Braxton Davis, Executive Director, DCM
Mike Lopazanski, Policy & Planning Section Chief, DCM
Christine A. Goebel, Esq., Counsel to DCM

Fr: Mary Lucasse, Special Deputy Attorney General and Counsel to the Commission

Date: January 17, 2019

Re: The Riggings Homeowners, Inc.'s Request to revise the Final Agency Decision in CRC-VR-15-08

On December 7, 2018, The Riggings Homeowners, Inc. ("The riggings HOA") submitted its third annual update as required under the terms of the variance issued by the Commission in 2015. In that update, the Riggings HOA requested that the Commission revise the variance and remove the annual reporting requirement given the N.C. General Assembly's revisions to N.C. Gen. Stat. §113A-114(c1).

The Commission will make a final decision on this request at its February 2019 meeting. I have attached a draft revised final agency decision for your consideration and some other relevant documents.

Attachments:

1. Draft Revised Final Agency Decision in CRC-VR-15-08
2. Original Final Agency Decision in CRC-VR-15-08 issued December 14, 2015
3. December 7, 2018 letter to Braxton Davis from William Wright providing update

STATE OF NORTH CAROLINA	)	BEFORE THE NORTH CAROLINA
	)	COASTAL RESOURCES COMMISSION
COUNTY OF NEW HANOVER	)	**CRC-VR-15-08**
	)	
	)	
IN THE MATTER OF:	)	**REVISED FINAL AGENCY DECISION**
PETITION FOR VARIANCE	)	**(February 21, 2019)**
BY RIGGINGS HOMEOWNERS, INC.	)	

On December 7, 2018, Petitioner, the Homeowners Association for The Riggings ("the Riggings HOA") submitted its third annual update as required by the Final Agency Decision issued in the above captioned case by the Coastal Resources Commission ("Commission") on December 11, 2015 ("2015 Decision") granting The Riggings HOA's request for a variance. In its update, The Riggings HOA explained that, as a result of the enactment of Session Law 2018-14, any future request to repair or replace existing sandbags at its Kure Beach property, will not require a variance from the Commission. Before the North Carolina General Assembly's revision to N.C. Gen Stat. § 113A-114(c1), such a request would have been time barred by the Commission's rules. In its update, The Riggings' HOA asserts that as long as a future request complies with the remaining requirements in the Commission's rules, DCM will be able to issue a permit for repair or replacement of the existing sandbags without a variance. Accordingly, The Riggings HOA notified the Commission that its permanent solution to the erosion issues in front of its complex will be to repair and replace the existing sandbag structure on the site. Given the material change in the law since the 2015 Decision, the Riggings HOA respectfully requested that it no longer be required to report to the Commission on an annual basis.

The Commission considered the Riggings HOA's request at its regularly scheduled meeting on February 27-28, 2019 at the History Museum of Carteret County in Morehead City, North Carolina. The Commission affirmatively agrees that under the revised statute, DCM may issue a

permit to the Riggings HOA for a permit to repair or replace the existing sandbags as long as the proposed work meets all requirements in the Commission's rules other than the time limitation which was the subject of the variance granted in the 2015 Decision. In addition, the Commission affirmatively finds that the changes to N.C. Gen Stat. § 113A-114(c1) enacted in 2018 are material changes that impact its 2015 Decision.

ORDER

THEREFORE, the 2015 Decision granting The Riggings HOA's request for a variance from 15A NCAC 7H. 0308(a)(2) and 15A NCAC 7H .1705(a)(7) is hereby revised as follows:

1. The Findings of Fact and Conclusions of law in the 2015 Decisions are hereby incorporated by reference except to the extent that the Conclusions of Law are in conflict with the revised statute.

2. The Commission hereby revises the 2015 Decision and deletes Conditions 3 and 4. Accordingly, the temporary sandbags authorized by the variance are no long time limited in conformance with the revised statute and The Riggings HOA is no longer required to submit an annual written update to the Commission.

This revision to the 2015 Decision does not relieve Petitioner of the responsibility to obtain other required permits from the proper permitting authorities. This variance is based upon the Findings of Facts and Conclusions of Law incorporated, the stipulated facts and exhibits which make up the record, and the arguments presented in The Riggings HOA's December 07, 2018 annual report letter from William G. Wright to Braxton Davis, Executive Secretary of the Commission. The Commission reserves the right to reconsider its revision of the 2015 Decision if there is a material change to any of the facts or law upon which the revision was granted. .

This the __ day of February, 2019.

_____

M. Renee Cahoon, Chair
Coastal Resources Commission

CERTIFICATE OF SERVICE

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

The Riggings Homeowners, Inc. Dawn Gual, Registered Agent P.O. Box 1124 Carolina Beach, NC 28428	*Certified Mail/ Return Receipt Requested*
William G. Wright Shipman & Wright, L.L.P. 575 Military Cutoff Road, Suite 106 Wilmington, NC 28405	*U.S. Mail and Electronically at* wwright@shipmanlaw.com
Christine A. Goebel, Esq. Assistant General Counsel N.C. Department of Environmental Quality 217 West Jones Street Raleigh, NC 27603	*Electronically at* christine.goebel@ncdenr.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 __ day of February, 2019

_____

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

STATE OF NORTH CAROLINA	)	BEFORE THE NORTH CAROLINA
	)	COASTAL RESOURCES COMMISSION
COUNTY OF NEW HANOVER	)	**CRC-VR-15-08**
	)	
	)	
IN THE MATTER OF:	)	
PETITION FOR VARIANCE	)	**FINAL AGENCY DECISION**
BY RIGGINGS HOMEOWNERS, INC.	)	

On October 6, 2015, Petitioner, the Homeowners Association for The Riggings condominium development in Kure Beach, New Hanover County, submitted a request seeking a variance from Rule 15A NCAC 7H .1705(a)(7) to allow sandbags to remain on the beach for a period longer than is allowed by the rules of the North Carolina Coastal Resources Commission ("Commission"). The matter was heard on oral arguments and stipulated facts at the regularly scheduled meeting of the Commission on November 17, 2015 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 Environmental Quality, Division of Coastal Management and William G. Wright, Esq. appeared on behalf of Petitioner.

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

FINDINGS OF FACTS

1. Petitioner Riggings Homeowners, Inc. ("Riggings HOA" or "Petitioner") is a non-profit corporation organized under the laws of the State of North Carolina. "The Riggings" is also the name of the 48-unit residential condominium project bordering the Atlantic Ocean in Kure Beach, New Hanover County, North Carolina, whose unit owners are members of Riggings HOA.

2. The Riggings was constructed in 1985 near the boundary between the town of Kure Beach and the Fort Fisher State Historic Site. Immediately south of The Riggings is Fort Fisher, a North Carolina State Park, which is also located on the shoreline of the Atlantic Ocean.

3. The Riggings has been threatened by erosion since 1985, and a sandbag revetment has been used to protect it since that time.

4. In the 1920's the Board of County Commissioners of New Hanover County allowed a contractor to remove some of the coquina rock outcropping northeast of Fort Fisher for use in the completion of a section of U.S. Highway 421, a public project.

5. The contractor removed approximately 6,000 cubic yards of rock from a strip approximately 50 to100 feet wide.

6. An intertidal rock outcrop near Fort Fisher, known as the Fort Fisher Coquina Outcrop Natural Area, was entered on the official North Carolina Registry of Natural Heritage Areas on February 6, 1982.

7. Among other things, coquina rock outcroppings can provide a partial natural barrier against beach erosion.

8. Currently some of these coquina rock outcroppings are within sight of The Riggings, and the southern portion of a large outcropping is situated in front of the northern section of The Riggings.

9. A large part of the rock outcroppings within sight of The Riggings was uncovered during Hurricane Floyd, and its vegetation was uprooted by the storm surge.

10. Since 2000, beach nourishment projects conducted by the U.S. Army Corps of Engineers have covered some coquina rock outcroppings north of The Riggings.

11. The first CAMA permits for sandbags at The Riggings were issued by the Local Permit Officer for the Town of Kure Beach.

12. Since 1992, the CAMA permits for the sandbags have been issued by the Division of Coastal Management ("DCM").

13. In 1994 DCM issued CAMA General Permit No. 13355-D, which authorized repair of the sandbags and the addition of new ones.

14. Permit No. 13355-D was modified in February 1995 to allow the filling of holes in the sandbag revetment with sandbags.

15. The sandbags which were in place when Permit No. 13355-D expired on March 5, 1995, could legally remain in place until May 1, 2000.

16. In order to protect Fort Fisher from the effects of erosion from the Atlantic Ocean, the State of North Carolina erected a permanent revetment from July 1995 to January 1996.

17. At the time the revetment was erected, the general policy of the State of North Carolina did not permit the construction of hardened structures like the Fort Fisher revetment in recognition of the adverse erosion effects such structures can cause to adjacent properties. However, the revetment was constructed under an exception to this policy for the protection of federal and state historic sites, such as Fort Fisher.

18. Initially after the construction of the revetment at Fort Fisher, the rate of erosion of the shoreline in front of The Riggings increased, but since then the rate of erosion has decreased.

19. On May 26, 2000, the Commission granted a variance to the Riggings HOA extending the deadline for removing the sandbag to May 26, 2001. (Stipulated Exhibit 6, pp 164-68)

20. The Carolina / Kure Beach Renourishment Project of 2001 included a large part of Carolina Beach and 98 percent of Kure Beach but fell approximately 1,500 feet short of the Riggings Condominium.

21. The Riggings HOA made various attempts to get the United States Army Corps of Engineers to extend beach nourishment projects to include the shoreline immediately adjacent to The Riggings, but the attempts did not succeed.

22. The Corps of Engineers informed U.S. Representative Mike McIntyre by letter dated February 25, 2000, that the "primary reason that the (beach nourishment) project stops short of the Riggings is due to the intertidal coquina rock outcropping." The letter further states that the "rock outcropping has been declared a natural heritage area by the North Carolina Natural Heritage Program and burying them was not an acceptable alternative."

23. On February 4, 2002, the Commission granted a variance to the Riggings HOA, extending the deadline for removal of the sandbags until May 23, 2003. (Stipulated Exhibit 6, at 158-63)

24. On May 9, 2003, CRC signed an order granting a variance to allow the sandbags to remain in place until May 9, 2005. (Stipulated Exhibit 6, at 152-57)

25. After obtaining estimates for relocating the condominium, Riggings HOA sought financial assistance to relocate certain of the condominium buildings by contacting the North Carolina Division of Emergency Management ("NCDEM"), the Natural Heritage Trust Fund and DCM, and requested the Town of Kure Beach apply for beach access and/or FEMA grants.

26. In July 2004 the Town of Kure Beach was awarded a $3.6 million FEMA grant to acquire a portion of the property on the ocean-side where some of the buildings comprising The

Riggings are located, once these buildings were relocated across the street. The grant included $2.7 million dollars from FEMA, with the individual unit owners of The Riggings being required to contribute the remaining $900,000.

27. In March 2005 Riggings HOA was working with architects and surveyors to finalize plans to rebuild across the street and to remove the current structures. It also had contractors ready to start construction once the planning was complete.

28. In its most recent variance order, dated April 25, 2005, CRC said the sandbags were to be removed "prior to the expiration of the FEMA grant." (Stipulated Exhibit 6, at 145-51)

29. In order to comply with the provisions of the grant, Riggings HOA was required to obtain the unanimous consent of the unit owners. On May 1, 2006, Riggings HOA notified the Town of Kure Beach that twenty-four of the homeowners of The Riggings had voted not to accept the FEMA pre-disaster grant. Although it is not certain why each individual owner voted as he or she did, among the reasons owners may have voted against the grant were:

a. Each unit owner would have been required to contribute approximately $125,000 toward the cost of relocation and reconstruction. Some homeowners lacked the financial capability to relocate.

b. There was no guarantee in the grant contract that the provisions of the grant, particularly the provision regarding the use of the oceanfront property, would not change.

c. Some owners had been informed by the holders of their mortgages that no relocation of the units could occur without their consent, and some of those lenders had expressed concerns about whether that consent would be given.

30. Subsequently, DCM was notified on June 20, 2006, by the State Hazard Mitigation Officer of NCDEM that the grant had been terminated, notwithstanding its June 30, 2007 expiration date, and had been closed out June 1, 2006.

31. The Carolina / Kure Beach Renourishment Project of 2007 included a large part of Carolina Beach and 98 percent of Kure Beach, but again fell approximately 1,500 feet short of The Riggings.

32. Sometimes sandbags at The Riggings are buried under sand and sometimes they are exposed. This depends on the beach profile, which can change quickly.

33. A former member of the U.S Army Corps of Engineers is on record as stating that the Riggings sandbags have not had any deleterious effect on surrounding property nor have they come into contact with the Atlantic Ocean except during major storm events.

34. Whether the public can walk along the beach without detouring landward around the sandbags depends on the beach profile at the time, but even at high tide the public can get around the sandbags by going between the sandbags and The Riggings buildings closest to the ocean.

35. The Riggings HOA proposes that the sandbags remain in place until such time as their proposed Habitat Enhancement Project, a copy of which is incorporated herein by reference, and/or a renourishment project, either privately or publicly funded, has been completed.

36. Petitioner filed its fifth request for a variance in 2006. In conjunction with resolving two other legal cases, Petitioner and DCM Staff agreed to a set of stipulated facts in 2007, and the variance request was heard at the Commission's January 17, 2008 meeting. The Commission

found against the request of all four variance factors, and denied the variance through a written order dated January 31, 2008 (Stipulated Exhibit 6, at 172-85)

37. On March 7, 2008, a Petition for Judicial Review was timely filed by Petitioners pursuant to N.C. Gen. Stat. § 150B-45. On February 20, 2009, the Honorable Superior Court Judge Jay Hockenbury found that the CRC's denial of the Riggings variance request was i) based on an error of law, ii) was made upon unlawful procedure, iii) was not supported by substantial evidence in the record, and iv) was arbitrary and capricious. The court reversed the Commission's Order and remanded the matter back to Commission pursuant to the instructions contained in his Order. The CRC did not appeal from that Order, and the matter was remanded back to the Commission. (Stipulated Exhibit 6, at 199 - 212)

38. On April 29, 2009, Petitioner's variance request was reheard by the Commission. The Commission agreed with Petition on the second and third variance factors, but disagreed with Petitioner on the first and fourth variance factors. Accordingly, the Commission denied the variance through a May 21, 2009 Final Order. (Stipulated Exhibit 6, at 236-47)

39. On June 17, 2009, Petitioner timely filed a Petition for Judicial Review pursuant to N.C. Gen. Stat. § 113A-123 and § 150B-45, which was heard by Judge Hockenbury on March 12-13, 2012. Following that hearing, Judge Hockenbury entered a June 1, 2012 Order holding in pertinent part the Commission erred in concluding: (1) the Petitioner did not demonstrate strict application of 15A NCAC 7H.1705 would result in unnecessary hardship to the Riggings Property; and (2) that Petitioner did not meet the fourth element of the variance request: that the variance is consistent with the spirit, purpose, and intent of the rules, standards or order; will secure public safety and welfare; will preserve substantial justice and that the Commission's

decision is not supported by substantial evidence and there is substantial evidence to grant the variance. On some other matters, Judge Hockenbury found in the Commission's favor. Judge Hockenbury reversed the Commission's Order and remanded the matter back to Commission for a new hearing, consistent with the mandates and instructions contained within his Order. (Stipulated Exhibit 6, at 260-81)

40. On June 27, 2012, the Commission gave written notice of appeal to the North Carolina Court of Appeals, appealing Judge Hockenbury's June 1, 2012 Order. On June 29, 2012, Petitioner gave written notice of cross-appeal. Following Oral Arguments on April 10, 2013, the majority of the three judge panel of the North Carolina Court of Appeals ruled on August 6, 2013, affirming Judge Hockenbury's ruling. Judge Bryant filed a Dissenting Opinion. (Stipulated Exhibit 1)

41. On September 10, 2013, the Commission filed its Notice of Appeal based on the dissenting opinion of the Court of Appeals panel, and also petitioned the Court for discretionary review as to all other issues resolved adversely to the Commission. On September 24, 2013, The Riggings conditionally petitioned the Court for discretionary review as to the issues resolved adversely to the Riggings. (Stipulated Exhibit 2)

42. On January 24, 2014, the Supreme Court allowed both of the petitions for discretionary review of the Court of Appeals decision and the appeal. (Stipulated Exhibit 3)

43. On December 19, 2104 following oral argument, an equally divided panel of the North Carolina Supreme Court, with Justice Robert Hunter abstaining due to his participation on the panel of the Court of Appeals, affirmed the decision of the Court of Appeals. (Stipulated Exhibit 4)

44. The Petitioner's variance has been remanded back to the Commission, as noted in the April 9, 2015 letter to DCM Staff Counsel and Petitioner's Counsel from Commission Counsel Lucasse. (Stipulated Exhibit 5)

STIPULATED EXHIBITS

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

1. Decision of the NC Court of Appeals and Dissent, August 6, 2013;
2. CRC's Notice of Appeal and Petition & Riggings' Conditional Petition to the Supreme Court, September 10, 2013;
3. Supreme Court's Order granting both petitions, January 23, 2014;
4. Decision of the NC Supreme Court, December 19, 2014;
5. CRC Counsel's April 9, 2015 letter to DCM Counsel and Riggings' Counsel;
6. The Record on Appeal to the NC Court of Appeals (297 pages);
7. PowerPoint presentation.

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 the requirements in N.C.G.S. § 113A-120.1(a) and 15 NCAC 07J .0703(f) which must be found before a variance can be granted as set forth below.

A. Strict application of the rules relating to temporary erosion control structures will cause Petitioner unnecessary hardships.

The Commission affirmatively finds that strict application of 15A NCAC 7H. 0308(a)(2) and 15A NCAC 7H.1705 would cause Petitioner unnecessary hardship. The rules relating to temporary erosion control structures are designed to allow the temporary use of sandbags to counteract erosion, "but only to the extent necessary to protect property for a short period of time until the threatened structures can be relocated or until the effects of a short-term erosion event is

reversed." 15A NCAC 7M .0200. Without the variance, Petitioner would not be able to keep the sandbags to protect their condominiums. In its recent variance request, Petitioner requests additional time to develop its proposed Habitat Enhancement Project and/or a renourishment project. In addition, Petitioner states, if a variance is granted and the sandbags are allowed to remain at the Site, this "will permit the residents of the Riggings Condominium time to explore alternative options . . . such as private renourishment of the beach." (Attachment C to Staff Recommendation at 3)

The Commission, in its May 21, 2009 Final Agency Order, disagreed with Petitioner on this factor, and held that "Petitioner ha[d] not demonstrated that strict application of Rules 15A NCAC 7H .0308(a)(2) and 15A NCAC 7H .1705(a)(7) will result in an unnecessary hardship, as required by N.C.G.S. § 113A-120.1(a)" (CRC's May 21, 2009 order, p. 6). While acknowledging Petitioner's hardships from erosion and its resulting use of sandbags since 1985, along with Petitioner's lack of success in its efforts to relocate the structures or be included in the Corps' renourishment project, the Commission concluded that another variance from sandbag time limits to allow their continued use on the site for a time-period without an end point would not result in "unnecessary" hardships.

The Superior Court's June 1, 2012 Order on Judicial Review reversed the Commission, and held that the Commission's conclusion that "erosion is stable" was not supported by the record, was contradicted by the Stipulated Facts, and held that "even though the rate of erosion has decreased, there still is erosion of the shoreline at The Riggings." (June 1, 2012 Order, p. 9) The Superior Court also determined that the Commission's "unnecessary hardship" analysis improperly focused on the Riggings owners and their actions, and not on their property.

The Court of Appeals noted that there was a mutual disagreement of the parties of the meaning of the Stipulated Facts concerning the statements "erosion is stable" and "the rate of erosion is stable" and concluded that erosion was still occurring at the property. (Court of Appeals Decision, p. 16) The Court went on to hold that the Commission improperly based its consideration of this factor on the property owners, and not the property, in its unnecessary hardships analysis. (Id., pp. 18-19)

The 3-3 split at the Supreme Court (with Justice Hunter not participating) upheld the Court of Appeals decision "without precedential value" for the Court of Appeals' reasoning. Given these appellate decisions and analysis, DCM did not recommend the Commission find against Petitioner on this variance factor.

For the reasons set forth above, the Commission affirmatively finds that strict application of the rule providing for the temporary use of sandbags would cause Petitioner unnecessary hardship in light of Petitioner's request for time for the residents of the Riggings Condominium time to explore alternative options . . . such as private renourishment of the beach." For these reasons, the Commission affirmatively finds that Petitioner has met the first factor without which a variance cannot be granted.

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 hardship results from conditions peculiar to the property. Specifically, Petitioner's property is located between the Fort Fisher revetment and the intertidal coquina rock outcropping. Based on the physical features adjacent to the Site, in the Commission's Final Agency Order dated May 21, 2009, the Commission held,

> The CRC concludes as a matter of law that Petitioner has demonstrated any hardship which might result from strict application of the time limits for use of sandbags as a temporary erosion measure, if any, would be from conditions peculiar to Petitioner's property such as the location, size, or topography of the property.

(CRC's May 21, 2009 order, pp. 8-9). As the Commission has previously found in Petitioner's favor on this variance factor, DCM recommended that the Commission again find in Petitioner's favor on this variance factor for the same reasons outlined in the Commission's May 21, 2009 Final Agency Order, and as directed by the Superior Court's June 1, 2012 Order on Judicial Review which was upheld by the Court of Appeals and the Supreme Court.

For these reasons, the Commission affirmatively finds that Petitioner has demonstrated that this hardship results from conditions peculiar to the property and has met the second factor required for the grant of its request for a variance.

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

In the Commission's In the Commission's Final Agency Order dated May 21, 2009, the Commission held,

> The CRC concludes as a matter of law that Petitioner has demonstrated any hardship which might result from strict application of the time limits for use of sandbags as a temporary erosion measure, if any, would not result from actions the Petitioner has taken. (SF 20-21, 25-31)

(CRC's May 21, 2009 order, p. 9) As the Commission has previously found in Petitioner's favor on this variance factor, DCM recommended that the Commission again find in Petitioner's favor on this variance factor for the same reasons outlined in the Commission's May 21, 2009 Final Agency Order, and as directed by the Superior Court's June 1, 2012 Order on Judicial Review which was upheld by the Court of Appeals and the Supreme Court.

For these reasons, the Commission affirmatively finds that Petitioner has demonstrated that the hardships do not result from actions taken by Petitioner. Therefore, Petitioner has met the third factor required for the grant of its request for a variance.

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.

In order to receive a variance, Petitioner must demonstrate (a) that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, (b) that it will secure public safety and welfare, and (c) that it will preserve substantial justice. The principal purpose of the Temporary Erosion Control Structure Rule is to give Petitioner some time, but not an unlimited amount of time, to protect its property from erosion. *See* 15A NCAC 7H .0308(a)(2) and 15A NCAC 7H .1705(a)(7).

The Commission, in its May 21, 2009 Final Agency Order, disagreed with Petitioner on this factor, and held that "The proposed variance is inconsistent with the spirit, purpose, and intent of the CRC"s rules because sandbags are intended to be a temporary erosion control structure and this sandbag revetment has been in place for almost 24 years." (May 21, 2009 Final Agency Order, p. 10) The Commission also held that the variance did not preserve public safety and welfare as it was difficult for the public to use this portion of the Public Trust Area because of the sandbags on the beach. (*Id.* p. 10) Finally, the Commission held that a variance would not preserve substantial justice because both the legislature and the Commission's express directive was that sandbags could only be used as a temporary erosion control structure. (*Id.*, p. 10)

The Superior Court's June 1, 2012 Order on Judicial Review reversed the Commission, and held that in addition to the Commission's focus on 15A NCAC 7M.0202(a) which limits

erosion control measures so that they are consistent with and minimize impacts to the public use of the beach, the Commission should give more weight to the factors in N.C.G.S. 113A-102, specifically focusing on minimizing the loss of private resources to erosion and reducing potential debris from the "potential destruction of The Riggings that can harm other structures and/or inhibit public access to the beach. (June 1, 2012 Order, pp. 16-18) The 2-judge majority opinion of the Court of Appeals upheld the Superior Court, but Judge Bryant drafted a separate dissent, questioning the majority's application of the standard of review and stating that the Commission's decision on the fourth variance factor was supported by "substantial evidence" as required. (Court of Appeals Dissent, pp. 2-4) The dissent concluded that the majority improperly substituted its own judgement for that of the Commission. (*Id.*)

The 3-3 split at the Supreme Court (with Justice Hunter not participating) resulted in the Court of Appeals decision being upheld "without precedential value." In light of this appellate history, DCM recommended that the Commission find in Petitioner's favor on this variance factor as long as reasonable and appropriate conditions and safeguards are included in the final agency decision.

REASONABLE AND APPROPRIATE CONDITIONS AND SAFEGUARDS

N.C.G.S. 113A-120.1(b) provides, "The Commission may impose reasonable and appropriate conditions and safeguards upon any variance it grants." The Superior Court noted this provision with approval in its June 1, 2012 Order. (*See* Order at p. 8) In the current request, "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." (Stipulated Fact 35)

In its recommendation, DCM suggested that the Commission include conditions to safeguard the beach in front of The Riggings. Specifically, Petitioner shall remove any existing visible sandbag debris based on 15A NCAC 7H .0308(a)(G) which requires that "Prior to completing any erosion response project, all exposed remnants of or debris from failed erosion control structures must be removed by the permittee." In addition, Petitioner shall ensure that any new sandbags placed shall be installed in conformance with the Commission's sandbag rules, with the exception of the time limits in .0308(a)(2)(F). Instead, DCM recommended that the Commission place as a condition on its grant of Petitioner's variance request a time limit of up to five (5) years from the date of the variance order for the replacement of any sandbag structures. Finally, DCM requested the Commission require that the HOA submit an annual written update of progress on alternative solutions to the Commission's Executive Secretary. Such a condition would allow the Commission and Staff to follow Petitioner's progress in seeking long-term solutions to address erosion at The Riggings, and could provide an opportunity for the Commission and Staff to suggest other avenues for addressing erosion as Petitioner moves toward achieving its proposed "Habitat Enhancement Project, and/or a renourishment project, either privately or publically funded."

During the hearing on the variance request, Petitioner's counsel agreed that the conditions proposed by DCM be included in any variance granted by the Commission.

For the reasons provided above, which include the conditions proposed by DCM, the Commission affirmatively finds that Petitioner's request to keep the sandbags for a limited period of time is consistent with the spirit, purpose, and intent of the Commission's Temporary Erosion Control Structure Rule, will be protective of public safety and welfare, and will preserve

substantial justice by balancing private property interests with the longstanding right of the public to use the ocean beaches as long as Petitioner meets the conditions included in the variance.

ORDER

THEREFORE, the requested variance from 15A NCAC 7H. 0308(a)(2) and 15A NCAC 7H .1705(a)(7) is GRANTED subject to the following conditions:

1. Petitioner shall remove all exposed remnants of or debris from failed erosion control structures as required by 15A NCAC 7H .0308(a)(G) prior to completing any erosion response project;

2. Petitioner shall ensure that any new sandbags placed shall be installed in conformance with the Commission's sandbag rules, with the exception of the time limits in .0308(a)(2)(F);

3. The temporary sandbags authorized by this variance may only be left in place for a period of five (5) years from the date of this final agency decision (up to December 11, 2020);

4. The Board of the HOA shall submit a detailed annual written update to the Commission including information regarding the steps it has taken and the progress made on finding and implementing alternative solutions to address erosion at The Riggings. This annual update shall be provided on December 11 to the Executive Secretary of the Coastal Resources Commission at the following address:

   Division of Coastal Management
   400 Commerce Avenue
   Morehead City, NC 28557

The granting of this variance does not relieve Petitioner of the responsibility to obtain other required permits from the proper permitting authority. This variance is based upon the Findings of Facts set forth above, the stipulated facts and exhibits which make up the record, and the arguments presented. The Commission reserves the right to reconsider the grant of this variance if there is a material change to any of the facts upon which it was granted. .

This the 11th day of December 2015. 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:

Riggings Homeowners, Inc.
Dawn Gual, Registered Agent
P.O. Box 1124
Carolina Beach, NC 28428

Certified Mail/ Return Receipt Requested

William G. Wright
Shipman & Wright, L.L.P.
575 Military Cutoff Road, Suite 106
Wilmington, NC 28405

U.S. Mail and Electronically at
wwright@shipmanlaw.com

Christine A. Goebel, Esq.
Assistant Attorney General
N.C. Department of Justice

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 ~~11th~~ 14th day of December, 2015.

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

SHIPMAN & WRIGHT, L.L.P.

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Angelique Adams

James T. Moore

Gregory M. Katzman

Jillian C.S. Blanchard

Writer's email: wwright@shipmanlaw.com

December 7, 2018

VIA USPS FIRST CLASS MAIL

RECEIVED

DEC 10 2018

DCM-MHD CITY

Braxton Davis
Executive Secretary of Coastal Resources Commission
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Re: Annual Update on Alternative Solutions to Address Erosion at the Riggings

To the Honorable Coastal Resources Commission:

Please allow this letter to serve as the annual report by my clients The Riggings Homeowners, Inc. ("the Riggings HOA") in satisfaction of the condition of the Variance issued by the Coastal Resources Commission's (CRC) Final Agency Decision issued on December 11, 2015 seeking alternative solutions for erosion.

Since the last annual report, the North Carolina General Assembly has enacted Session Law 2018-114. Session Law 2018-114 amends N.C. Gen. Stat. section 113A-114 and provides at subsection (c1) in pertinent part:

> (c1) The Commission may authorize the repair or replacement of a temporary erosion control structure that was originally permitted prior to July 1, 1995, if the Commission finds that (i) the structure is located adjacent to an intertidal marine rock outcropping designated by the State as a Natural Heritage Area . . . and (ii) 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.

The Riggings clearly meet all of the requirements of S.L. 2018-114. Pursuant to 15A NCAC 07J.0201, the Commission has delegated to the Division of Coastal Management

("DCM") the responsibility for issuing CAMA permits. Prior to the enactment of the S.L. 2018-114, DCM would have been required to deny a future request (beyond the present variance) for a permit to repair or replace the Riggings' sandbag structure as such a request would not have complied with the five (5) year time limit in 15A NCAC 7H.1705(a)(7). Accordingly, the Riggings would have likely been required to seek another variance from the Commission in the future. The impact of the session law is that now a permit to repair or replace the existing sandbags can be issued by DCM even if it would have been time barred (since that limitation is part of the rule from which the Commission granted a variance) as long the Riggings HOA's request complies with the remaining requirements in the rules. In sum, The Riggings will not need a variance for their sandbags to remain in place beyond five (5) years of the 2015 variance so long as they comply with the remaining rules. Accordingly, my clients are notifying the Commission that the Riggings HOA intends for the permanent solution to the erosion issues in front of its complex to be the repair and replacement of the existing sandbag structure on site.

Given the material change in circumstances and facts under which the variance was granted, the Riggings HOA respectfully requests that it no longer be required to report to the Commission on an annual basis. Please do not hesitate to have staff or your counsel contact me if the Commission needs additional information or if staff or your counsel would like to discuss this matter further. I look forward to the Commission's thoughts on this request.

With best wishes I am,

Sincerely,

William G. Wright

cc: Mary Lucasse via e-mail
Christine A. Goebel via e-mail

RECEIVED
DEC 10 2018
DCM-MHD CITY

Legal Update
(MLL revised February 5, 2019)

I. MULTISTATE LITIGATION

United States District Court for the District of South Carolina, Charleston Division:
Two cases were filed by various conversation groups, including NC Coastal Federation, and South Carolina local governments against the National Marine Fisheries Service (NMFS) and the US Secretary of Commerce seeking declaratory and injunctive relief to challenge NFMS's grant of "incidental harassment authorizations (IHAs)" pursuant to the Marine Mammal Protection Act allowing five companies to conduct seismic testing to explore the Atlantic ocean floor from FL to ME for potential oil and gas resources. North Carolina, along with Maryland, Connecticut, Delaware, Maine, New Jersey, New York, Massachusetts Virginia, and South Carolina moved to intervene. North Carolina is represented by attorneys Marc Bernstein and Ryan Park from the NC AG's office. The five companies also moved to intervene. On Jan 18, 2019, Judge Gergel granted the Federal Defendants' motion to stay and issued an injunction enjoining the Federal Defendants, as well as non-party BOEM, and any other federal agency or entity from taking action to promulgate permits, otherwise approve, or take any other official action regarding the pending permit applications for oil and gas surveys in the Atlantic based on the five IHAs issued by the NMFS to Spectrum Geo Inc., TGS-NOPEC Geophysical Company, Inc., Ion GeoVentures (and subsidiary GX Technology Corporation), WesternGeco LLC and CGG. The injunction remains in effect until funds have been appropriated for the Department of Justice and all Federal Defendants, the Court has received the Federal Defendants' responses to the pending motions to intervene, and the Court has ruled on those motions. The Federal Defendants have filed their response to the pending motions to intervene asking that certain conditions be imposed if the Court is inclined to grant intervention. Other parties may file a reply. We are waiting for the Court's ruling.

II. PETITIONS FOR JUDICIAL REVIEW

New Hanover County Superior Court:
Town of Wrightsville Beach v. CRC and Grand View Holdings, LLC, 17 CVS 004392. Petitioners requested review of the Commission's denial of its request for a hearing to challenge DCM's issue of CAMA Major Development Permit No. 110-17. This permit authorized the development of eight additional slips at an existing two-slip docking facility adjacent to the Intercoastal waterway near the Heide Trask Bridge. The Town objected to the pier expansion based on concerns that increased boat traffic would impact its sewer force main located in the bed of the Intercoastal Waterway. The sewer force main transports waste from the Town to the Cape Fear Sewage Plant. The permitted pier is located above the sewer main in two places. The Permittee intervened. All parties are represented and have filed briefs in support of their positions. The parties are still working towards settlement but have scheduled the hearing for April 22, 2019 to move the case forward if no settlement is reached.

III. OFFICE OF ADMINISTRATIVE HEARINGS (OAH):

***Sunset Beach Taxpayers Association and NC Coastal Federation v. DCM (*16 EHR 7974**)** and ***Sun's Set LLC v. DCM* (16 EHR 8032). These contested cases are stayed.** The cases involve an appeal of DCM's issuance of Major CAMA Permit No 70-16 for the development of infrastructure for a 21-lot residential project at the western end of Sunset Beach in Brunswick County. On Dec. 8, 2017, the Parties in a related superior court action to quiet title requested the case be placed on inactive status to give the State time to acquire funding to purchase the property. Since then, the General Assembly allocated $2.5 million for the purchase. The developer and the NC Department of Administration are negotiating settlement terms including the value of the property. DOA has hired local counsel for a title opinion and then will move on to an appraisal.

Legal Update
(MLL revised February 5, 2019)

Gwendolyn Smuts, Marvin Tignor, and Bell Sadler v. DEQ (18 EHR 07490, 07391, 07392). The Chair granted three of the seven petitions requesting third party hearings to challenge CAMA Minor Permits issued for construction of two 12-bedroom homes in the Town of Southern Shores on the grounds that petitioners have alleged that the CAMA Minor Permits are not consistent with the Town's current land use plan. Petitioner Sadler withdrew her petition shortly after filing in OAH. Petitioners whose requests for hearings in OAH were denied did NOT file petitions for judicial review. I am representing DEQ along with Assistant Attorney General Sarah Zambon. We have requested the cases be consolidated and the permit holder has moved to intervene. We are waiting for the Administrative Law Judge's ruling on these motions and have sent out written discovery requests and requests for admissions. The current hearing date is scheduled for the week of the Commission's April meeting. We plan to request a different hearing date so as not to inconvenience staff or the Commission.

IV. VARIANCES:

Riggings Homeowners, Inc. (CRC-VR-15-08). At this meeting, the Commission will consider Petitioners' request to amend the variance issued by this Commission by Final Agency Decision dated December 11, 2015 to delete the reporting requirement.

Michael and Catherine Zito (CRC-VR-18-04). During its November 2018 meeting, the Commission considered Petitioners' request for a variance to rebuild a home destroyed by fire in 2016. The proposed variance would have allowed construction oceanward of the erosion setback. Petitioners received the final agency decision denying the variance on December 31, 2018. Petitioner did not file a petition for judicial review within 30 days and the file has been closed.

IV. REQUEST FOR MODIFICATION OF DEVELOPMENT LINE

At your last meeting, the Commission denied the Town of Oak Island's request for modification of the existing development line established in 2016. The Town received the Final Agency Decision denying the request on January 2, 2019. Petitioner did not appeal by filing a petition for judicial review of the decision within 30 days. The Town may, upon presentation of additional material facts, return to the Commission for consideration of other proposed amendments to its development line.

V. REQUESTS FOR 3RD PARTY HEARINGS IN OAH:

Since your last meeting, the Commission Chair has considered one request by a third-party for a hearing in OAH to challenge permits issued by DCM. Specifically:

Vickie J. Hall, CMT 18-22: This request sought a hearing to contest CAMA General Permit No. 73301 issued on November 27, 2018 authorizing construction of a replacement bulkhead at the property located at 607 Neuse Harbour Boulevard, New Bern, Craven County, North Carolina adjacent to the Neuse River. The final agency decision denying the request was served on or before January 2, 2018. Petitioner was required to file a petition for judicial review by Feb 4, 2019. Since no appeal was filed, the case has been closed.

VI. SUMMARY OF VARIANCES AND 3RD PARTY HEARING REQUESTS RECEIVED IN 2018 COMPARED TO PAST YEARS *(Charts with more information on issues attached)*

Variances received in 2017 and 2018

2017 Variance Tally - 8 Requests: • 1 from Elizabeth City Office • 5 from Wilmington Office • 2 from Morehead City Office	2 granted in part 1 denied in part, 1 remanded and later w/drawn at Pet's request 3 withdrawn or not acted on at Pet's request 1 resolved by DCM without decision 1 postponed to 2018 and later denied
2018 Variance Tally - 8 Requests: • 4 from Elizabeth City Office • 4 from Wilmington Office	4 granted (1 with conditions), 2 denied, 1 incomplete, and not considered 1 continued to 2019 at Petitioners' request

CAMA 3rd Party Appeals 2000-2018

YEAR	3RD PARTY APPEALS FILED	GRANTED	DENIED	OTHER DISPOSITION*	FILED IN OAH	JUDICIAL REVIEW OF DENIAL
2000	23	0	23	0	NA	1
2001	15	0	12	3	NA	0
2002	12	0	10	2	NA	0
2003	20	10	10	0	5	4
2004	28	6	18	4	6	2
2005	28	9	10	9	11	4
2006	26	10	14	2	4	2
2007	40	19	17	4	19	8
2008	18	1	16	1	1 (dismissed)	4
2009	14	0	12	2	0	2
2010	12	0	11	1	1	3
2011	14	1	10	3	0	4
2012	9	0	8	1	0	1
2013	14	1	11	1	1	1
2014	8	1	7		1	0
2015	16	1	13	2	1	0
2016	5	2	3		2 (consolidated)	0
2017	10	1	8	1	0	2
2018	22	3	19	1	3 (1 dismissed)	0

Summary of CAMA 3rd Party Hearing Requests – 2018

22 Petitions filed challenging 8 permits	**Breakdown:** 19 Denied 3 Granted	LPO Town of SS (Eliz. City) 7 of 22 (1 permit)	Morehead City 1 of 22	Wilmington 14 of 22 (5 permits)

Case	**Date**	**Petitioners**	**County**	**Granted**	**CCH or PJR**	**Issue**
I8-01 to 18-10	Apr 4	McDowell, Murray, Fife Trust, Sexton, Price Trust, Schlichter, Tate, Keener, Moul, Ikalowych *(Atty Matt Nichols)*	Brunswick	No	No	SFR in Turtle Creek Subdivision private easement and covenants
18-11	Apr 26	McCormick Trust *(Atty McCormick)*	New Hanover	No	No	Finger pier
18-12	Aug 31	Norton *(Atty Matt Nichols)*	Onslow	No	No	Beach access, deck and gazebo
18-13	Sept 5	Walker McKnight	Brunswick	No		Construction of SFR near wetlands
18-14	Oct 31	Thomas Maier	New Hanover	No		Gazebo on dock
18-15	Nov 5	Sjoerdsma	Dare	No	No	Not consistent w/ LUP
18-16	Nov 5	Williams	Dare	No	No	Not consistent w/ LUP
18-17	Nov 7	Mackey	Dare	No	No	Not consistent w/ LUP
18-18	Nov 7	Royal	Dare	No	No	Not consistent w/ LUP
18-19	Nov 7	Sadler	Dare	Yes	Yes w/d	Not consistent w/ LUP
18-20	Nov 7	Tignor	Dare	Yes	Yes	Not consistent w/ LUP
18-21	Nov 8	Gwen Smuts	Dare	Yes	Yes	Not consistent w/ LUP
18-22	Dec 14	Vickie Hall	Craven	No	No	Construction of bulkhead

2018 Variance Tally with Issues
(Rev. Jan. 25, 2019)

8 Requests:
- 4 from Elizabeth City Office
- 4 from Wilmington Office

4 granted (1 with conditions),
2 denied,
1 incomplete,
1 continued to 2019 at Petitioners' request

Case	Petitioner	County	2018 Meeting	Commission's Decision	Outcome	Issues
17-03	Rick and Valerie Heasley	Brunswick	Feb 13	**Denied** request to build pool within ocean front setback from static vegetation line.	No appeal.	Ocean Hazard AEC Setback
18-01	Sandy Court Beach, LLC (attorney Charles Evans)	Dare	Feb 13	**Granted** request to enclosed 128 sf on landward side of house	No appeal	Ocean Hazard AEC Setback
18-02	West P. Hunter, Jr (attorney Todd Roessler)	Brunswick	Apr 10	**Granted** request to waive procedural requirement and to build within buffer conditioned on inclusion of storm water management plan	No appeal	30 foot buffer and request to waive obligation to seek local variance first
18-03	Dean & Marie-Elise Sackett (attorney Charles Evans)	Dare	Apr 10	**Granted** request to enclose 72.33 sf under roof on the landward side of house.	No appeal	Ocean Hazard AEC Setback
~~18-04~~	~~Stuart Jones~~	Dare		Did not consider	Incomplete	Issue unknown
18-04	Michael and Catherine Zito (attorney Chris Seawell)	Brunswick	Nov 27	**Denied** request to rebuild home destroyed by fire given 6 foot erosion rate/year and location of SE corner of house 12 feet landward of SVL within 180 foot setback		Ocean Hazard AEC Setback
18-05	Tom and Judy Lampley (attorney Charles Evans)	Perquimans		Continued to 2019		NOV 30 foot buffer
18-06	Town of Caswell Beach (attorney Justin Humphries)	Brunswick	Nov 27	**Granted variance** to install dune infiltration system in setback to improve road safety by removing water from road. Rebuild and vegetate dune after installed.		Ocean setback

2017 Variance Tally with Issues
(rev. Jan. 25, 2019

8 Requests:
- 1 from Elizabeth City Office
- 5 from Wilmington Office
- 2 from Morehead City Office

2 granted in part,
1 denied in part,
1 remanded and later w/drawn at Pet's request
3 withdrawn or not acted on at Pet's request
1 resolved
1 postponed to 2018 and later denied

Case	Petitioner	County	2017 Meeting	Commission's Decision	Outcome	Issues
16-11	Andy and Deb Thexton	Pender	Feb 8	**Remand** for more facts on Town's nourishment plans, seller's disclosures, need for variance from Town, location of septic, and CAMA setback.	Petitioner w/d Request after receiving DCM's exemption letter for proposed repair (less than 50 %).	Ocean Hazard AEC Setback: Request to elevate and retrofit existing structure within setback w/ FEMA grant.
16-12	Sam and Ann Ennis	Pender			On Feb 6, 2017, Petitioner withdrew request for variance before it was heard by Commission.	Ocean Hazard AEC Setback: Request to elevate and retrofit structure w/in setback using FEMA grant.
17-01	Tucker Holden, LLC (Att'y Benedict Del Re)	Brunswick			On April 5, 2017, Petitioner withdrew request after DCM's approved rev. plans allowed as repair	30 Foot Buffer
17-02	Sanitary Fish Market & Restaurant, Inc. (Att'y Merrie Jo Alcoke)	Carteret	April 26	**Granted** request to construct access stairs to convert 2nd story roof area to public use.		Urban waterfront rules limiting new structures w/ non-water dependent purpose.
17-03	Rick and Valerie Heasley	Brunswick	Deferred to 2018	Deferred request for pool within setback (SVL) at Pet's request	Denied at Feb 2018 Meeting. No appeal.	Ocean Hazard Setback

2017 Variance Tally with Issues
(rev. Jan. 25, 2019

8 Requests:

- 1 from Elizabeth City Office
- 5 from Wilmington Office
- 2 from Morehead City Office

2 granted in part,
1 denied in part,
1 remanded and later w/drawn at Pet's request
3 withdrawn or not acted on at Pet's request
1 resolved
1 postponed to 2018 and later denied

Case	Petitioner	County	2017 Meeting	Commission's Decision	Outcome	Issues
17-04	John W. Hopkins	Carteret		No decision on request to construct single family residence with impervious surface in 30 foot buffer	Resolved by DMC after reviewing NHW call. Determined plan consistent w/ CAMA	30 foot buffer
17-05	Kenneth A. Simpler (Att'y Chris Seawell)	Dare		No action on request for V from 15A NCAC 07H .0304 to expand hotel by enclosing 1,232 sf on ground floor. Proposed plan not consistent with FEMA.	Petitioner has not moved forward with request.	Ocean Hazard Setback
17-06	Michael and Mary Drummond (Att'y Clark Wright)	Pender	Nov 7	**Granted** Request for V from 15A NCAC 7H .0306(a) (9) to enclose 37 sf on landward side of house **Denied** request for V from 15a NCAC 7H .0309 to increase porch area by 137 sf more than 500 sf allowed in ocean setback.	No Appeal	Ocean Hazard Setback

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

February 8, 2019

MEMORANDUM **CRC-19-04**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: Town of Wrightsville Beach Static Vegetation Line Exception Reauthorization

Background:

Petitioner, the Town of Wrightsville Beach ("Town"), is requesting that its static line exception be reauthorized by the Coastal Resources Commission based on the information found within the attached five-year progress report. The granting of reauthorization by the Commission would result in the continued application of 15A NCAC 07H.0306(a)(8) to proposed development projects along the affected area of the town, which would allow the existing first line of stable and natural vegetation to be used in measuring setbacks rather than the more restrictive static or pre-project vegetation line described in 07H.0305(f) and 07H.0306(a)(1).

The Town's original static line exception was granted by the Commission on September 9, 2009, and reauthorized on May 13, 2014.The Commission's rule at 15A NCAC 07J.1204(b) indicates that the 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)(1) through (d)(4)." Specifically, these four criteria require a showing by the Petitioner of (1) a summary of all beach fill projects in the area proposed for the exception, (2) plans and related materials showing the design of the initial fill projects, and any past or planned maintenance work, (3) documentation showing the location and volume of compatible sediment necessary to construct and maintain the project over its design life, and (4) identification of the financial resources or funding sources to fund the project over its design life. 15A NCAC 07J.1204(b) also states that the Commission shall consider design changes to the initial large-scale beach fill project, design changes to the location and volume of compatible sediment, and changes in the financial resources or funding sources necessary to fund the large-scale beach fill project.

Based on the Town's 5-year progress report and additional exhibits attached, Staff recommends that the conditions in 15A NCAC 07J.1201(d)(1) through (d)(4) have been met, and there have been no changes in the last five years that should result in the Town's static line exception being revoked. Staff recommends that the Commission renew the Town's static line exception for another five years.

The following information is attached to this memorandum:

Attachment A: Relevant Procedural Rules
Attachment B: Staff's Report to the Coastal Resources Commission
Attachment C: Petitioner's 5-Year Progress Report
Attachment D: New Hanover County Interlocal Agreement for Contingency Plan Beach Nourishment

ATTACHMENT A: Relevant Procedural Rules

SECTION .1200 – STATIC AND VEGETATION LINE EXCEPTION PROCEDURES

15A NCAC 07J .1201 REQUESTING THE STATIC LINE EXCEPTION

(a) A petitioner subject to a static vegetation line pursuant to 15A NCAC 07H .0305 may petition the Coastal Resources Commission for an exception to the static vegetation line in accordance with the provisions of this Section. A "petitioner" shall be defined as:

(1) Any local government;
(2) Any group of local governments involved in a regional beach fill project;
(3) Any qualified homeowner's association defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one mile of ocean shoreline; or
(4) A permit holder of a large-scale beach fill project.

(b) A petitioner shall be eligible to submit a request for a static vegetation line exception after 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 vegetation 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 vegetation 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 vegetation line exception request shall be made in writing by the petitioner. A complete static vegetation 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 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 vegetation 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 vegetation 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 vegetation 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;

Amended Eff. April 1, 2016.

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.

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 shall be 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 shall be set in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established on state owned lands or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

(4) The ocean hazard setback shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

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

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

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

Decks, roof-covered porches, and walkways shall not be 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.

(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. 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 shall be 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 require 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, and commercial 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)(5) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)(5)(A) of this Rule; and

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

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

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

(8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot where development is proposed, the structure shall be landward of the ocean hazard setback or development line, whichever is more restrictive.

(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.

(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.

(11) 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 in accordance with 15A NCAC 07J .1300.

(12) In order to allow for development landward of the large-scale beach fill project that cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (a)(1) and (a)(5) of this Rule, a local government, group of local governments involved in a regional beach fill project, or qualified "owners' association" as defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline, may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception shall apply 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)(5)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner, and the boundaries of the large-scale beach fill project. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;

(B) Development setbacks shall be calculated from the shoreline erosion rate in place at the time of permit issuance;

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

(D) With the exception of swimming pools, the development defined in Rule .0309(a) of this Section shall be allowed oceanward of the static vegetation line; and

(E) Development shall not be eligible for the exception defined in Rule .0309(b) of this Section.

(b) No development shall be permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that 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 shall be 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 as documented by the local historic commission, the North Carolina Department of Natural and Cultural Resources, or the National Historical Registry.

(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 the 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. The acknowledgement shall state that 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 shall require permit approval. Structures relocated with public funds shall comply with the applicable setback line and 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 shall 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 pursuant to 15A NCAC 07H .0308(a)(2).

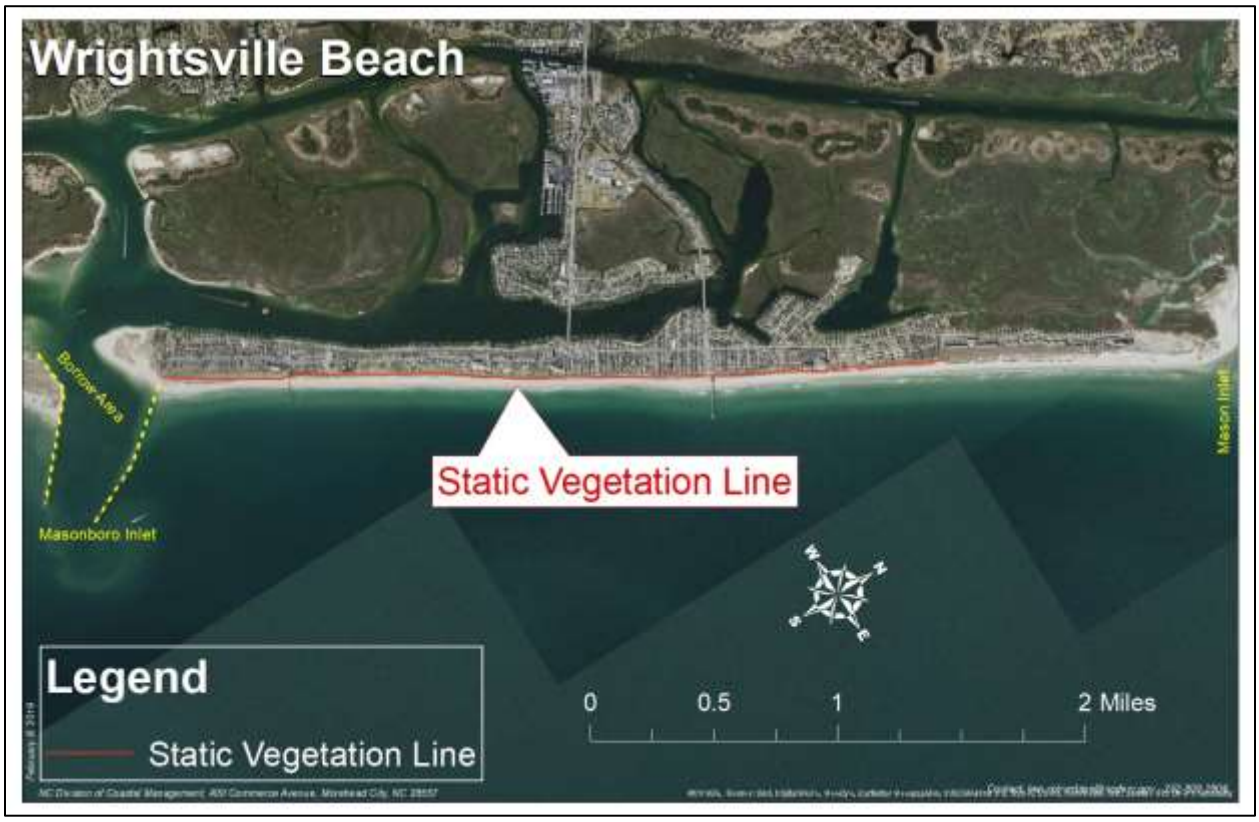
History Note: *Authority G.S. 113A-107; 113A-113(b)(6); 113A-124;*
Eff. September 9, 1977;
Amended Eff. December 1, 1991; March 1, 1988; September 1, 1986; December 1, 1985;
RRC Objection due to ambiguity Eff. January 24, 1992;
Amended Eff. March 1, 1992;
RRC Objection due to ambiguity Eff. May 21, 1992;
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, 2017; February 1, 2017; April 1, 2016; September 1, 2013.

Attachment B: Staff's Report to the Coastal Resources Commission

I. Description of the Affected Area

Currently, the static line at Wrightsville Beach extends approximately 2.3 miles from just north of North Ridge Lane (northern end of the static line) to just south of Sprunt Street (southern end of the static line) (see Figure 1). The static line was determined by DCM Staff using 1980 aerial photographs, and staff located the static line along the vegetation line shown on those photographs. The current average annual erosion setback for the affected area is 2.0 feet per year. There are 13 vacant residentially-zoned oceanfront lots in the area with the static line exception. Since September 9, 2009, when the static line exception was granted, only one CAMA permit has been issued under the static line exception. North of Chadbourn Street, the static line is the most restrictive measurement line for setbacks, but no new homes have been constructed in this area.

Figure 1. Town of Wrightsville Beach Static Vegetation Line.



II. Summary of Past Nourishment Projects and Future Project Maintenance

Wrightsville Beach has had a long history of oceanfront development and beach fill projects. The first beach fill project was authorized by Congress in 1962, and work began in 1965.

The project was reevaluated in September 1982 by the USACE, and was reauthorized in 1986. The reauthorization extended Federal cost sharing for the life of the project (50 years per the USACE),

and the first work under this reauthorization began in 1991, resulting in a current project authorization through 2041. In 1986, another project placed sand on both Masonboro Island and Wrightsville Beach using sediment from the inlet area between the two jetties and extending into Banks Channel. Since 1986, beach fill projects have occurred approximately every four years, beginning in 1991, using a combination of federal, state, and local funding sources.

III. Summary of Petitioner's Evidence Supporting the Four Factors

The Commission's rule at 15A NCAC 07J.1204(b) indicates that the 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)." Specifically, these four criteria require a showing by the Petitioner of (1) a summary of all beach fill projects in the area proposed for the exception, (2) plans and related materials showing the design of the initial fill projects, and any past or planned maintenance work, (3) documentation showing the location and volume of compatible sediment necessary to construct and maintain the project over its design life, and (4) identification of the financial resources or funding sources to fund the project over its design life.

15A NCAC 07J.1204(b) also states that the Commission shall consider design changes to the initial large-scale beach fill project, design changes to the location and volume of compatible sediment, and changes in the financial resources or funding sources necessary to fund the large-scale beach fill project. Staff's summary and analysis of Petitioner's response to these four criteria and any design changes or funding changes in the last five years follows.

A. Summary of fill projects in the Area-First factor per 15A NCAC 07J.1201(d)(1)

The Town's original static line exception application report (CP&E, 2009) lays out the summary of beach fill projects in the area as follows:

Project Nourishment History

Since 1986, sand bypassing from the Masonboro inlet and renourishment of the Wrightsville Beach project have been accomplished approximately every four years using a combination of Federal O&M funds, Federal Construction General Funds, and non-Federal cost share contributions from the State and New Hanover County. The one exception was in 2006 when additional Federal and State emergency supplement funds were made available which augmented normal funding. In accordance with the PL 99-662 authorization, Federal O&M pays for 46% of the nourishment required for Wrightsville Beach with funding for the remaining 54% the responsibility of nonfederal interests. The non-federal share is normally provided by the State and New Hanover County. New Hanover County funds are derived from the room occupancy tax while State funds are appropriated by the NC General Assembly.

The most recent project occurred in February/March 2018. Table 1 provides a history of each nourishment event including the nourishment dates, borrow source, placement area, volumes, and cost of the operation.

Table 1. *Summary of beach nourishment projects at Wrightsville Beach. Dates marked with an asterisk (*) are maintenance projects that have occurred after the initial Static Vegetation Line Exception was approved by the CRC in September 2009.*

Nourishment Dates	Borrow Area [(1)]	Placement Area [(2)]	Pay Yardage (CY)	Cost of Operation
Feb-Jul 1965	Banks Channel	0 to 40	2,933,100	$739,339
Mar-Jul 1966	Deposition Basin	30 to 130	319,408	$436,242
Oct 1966	Behind Shell Is.	120 to 140	42,700	$50,697
Mar – May 1970	S. End Banks Ch.	60 to 140	1,436,533	$578,545
Mar – May 1980	S. End Banks Ch.	60 to 140	540,715	$1,159,936
Dec 1980-Apr 1981	Masonboro Inlet	60 to 140	1,249,699	$4,427,792
Apr – Jun 1986	Masonboro Inlet	60 to 140	898,593	$1,331,715
Jan – May 1991	Masonboro Inlet	60 to 140	1,016,684	$2,682,412
Mar – Jun 1994	Masonboro Inlet	82 to 146	619,031	$1,973,591
Mar – Apr 1998	Masonboro Inlet	60 to 140	1,116,573	$2,890,256
Mar – May 2002	Masonboro Inlet	60 to 140	783,691	$2,463,983
Jan – Apr 2006	Masonboro Inlet	60 to 140	531,717	$4,810,290
Feb-Mar 2010*	Masonboro Inlet	75 to 160	450,000	$2,8000,000
Jan-May 2014*	Masonboro Inlet	75 to 160	700,000	$6,150,000
Feb – Mar 2018*	Masonboro Inlet	75 to 160	842,000	$1,040,000

5-Year Progress Report: Fill Projects

Three additional beach nourishment projects have taken place since the Commission granted the Town of Wrightsville Beach a Static Vegetation Line Exception in September 2009. 1) A project was constructed between February and March 2010, during which 450,000 cubic yards of sand was placed on the beach; 2) the second was constructed between January and May 2014, during which 700,000 cubic yards of material was placed on the beach, and; 3) a third project was constructed between February and March 2018, with 842,000 cubic yards of material placed on beach.

<u>2010 Project:</u>

Table 2 and Figures 2, 3, and 4 below summarize the 2010 project and project boundary.

Table 2*. Summary of Wrightsville Beach 2010 Coastal Storm Damage Reduction Project*.

Construction Date	2/17/2010 to 3/2/2010
Contract Award	November 23, 2009
Borrow Volume	450,000 cubic yards
Project Cost	$2.8M
Project Design Maps	Provided

Figure 2. *2010 project boundary area between stations 75+00 (left transect) to 160+00 (right transect).*

Figure 3. *2010 Project beach profile at Station 95+00; and before/after construction photos.*

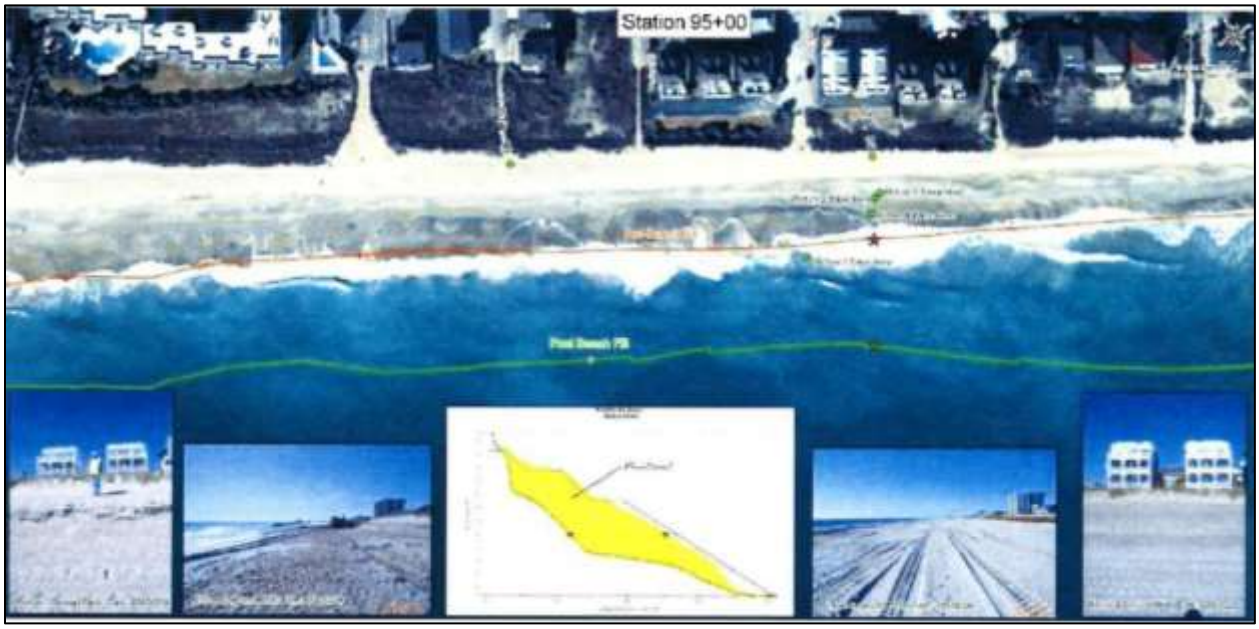
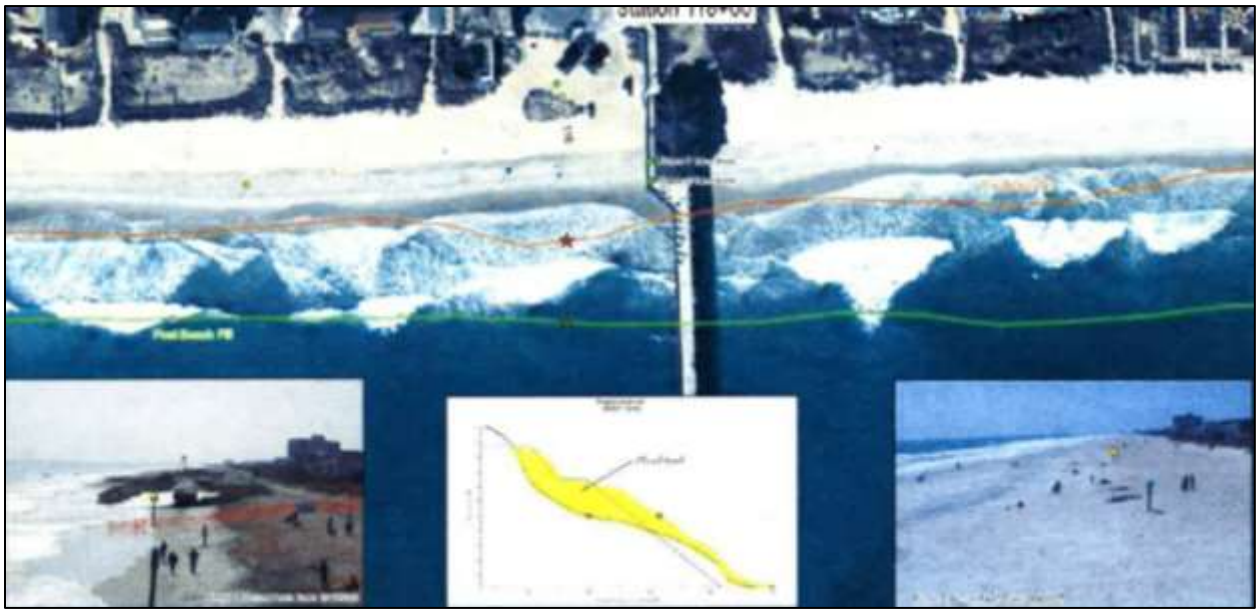


Figure 4. *2010 Project beach profile at Station 118+00; and before/after construction photos.*



2014 Project:

Table 3 and Figures 5, 6, 7, and 8 below show the boundary and summarize the 2014 project. All fill material came from the Town's permitted borrow site (Masonboro Inlet). The sediment trap in Masonboro Inlet was established to capture material transported over the weir section of the north jetty, and has been used since 1986. No changes were required.

Table 3. *Wrightsville Beach 2014 Coastal Storm Damage Reduction Project.*

Construction Date	January 2014 to May 2014
Contract Award	December 2013
Borrow Volume	700,000 cubic yards
Project Cost	$6.15M
Project Design Maps	Provided

Figure 5. *2014 pre-construction project boundary area between stations 75+00 (left transect) to 160+00 (right transect).*

Figure 6. *2014 beach profile at Stations 95+00 and 99+00 with before/after construction phots. The basemap is pre-project aerial imagery.*

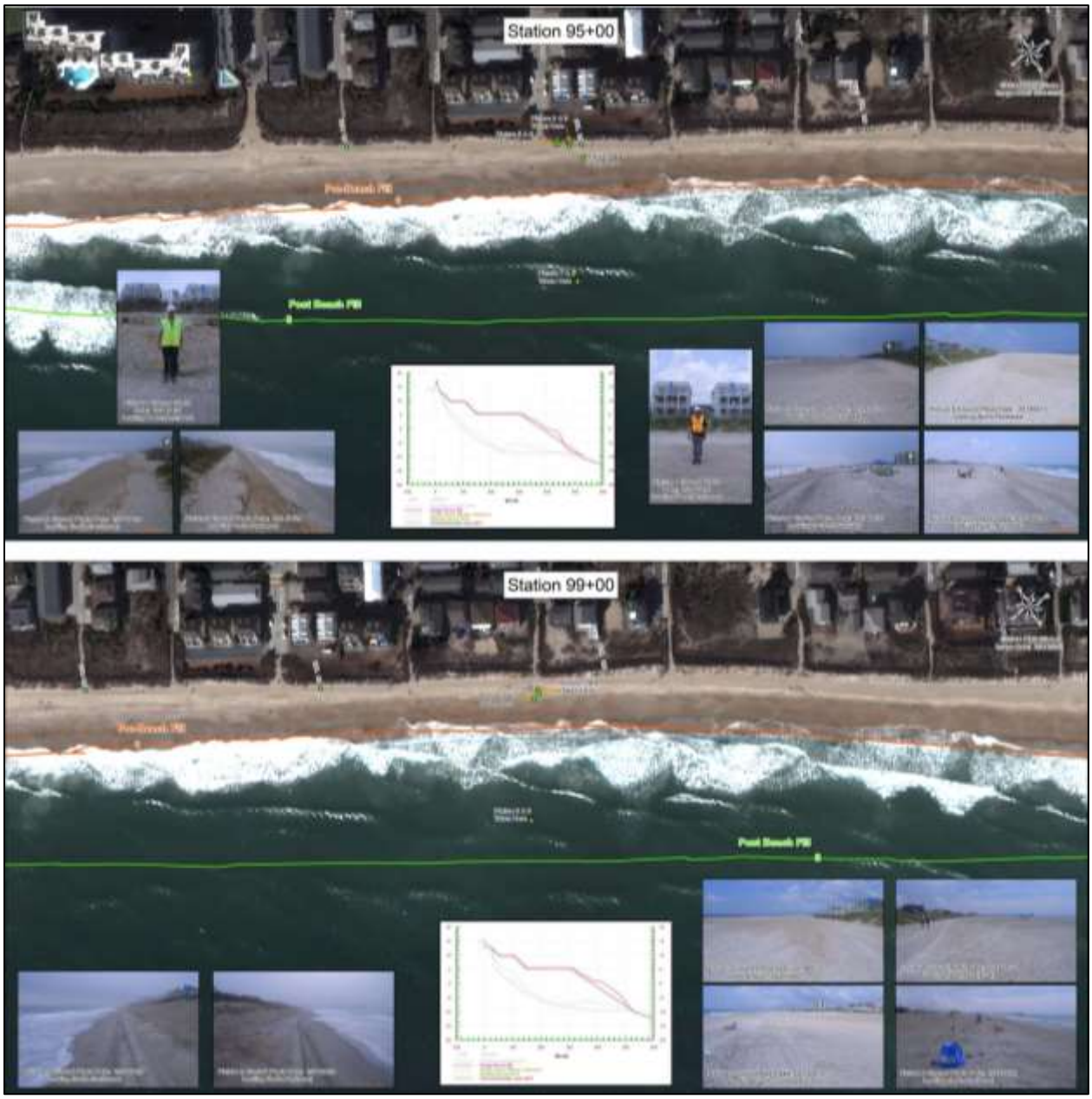
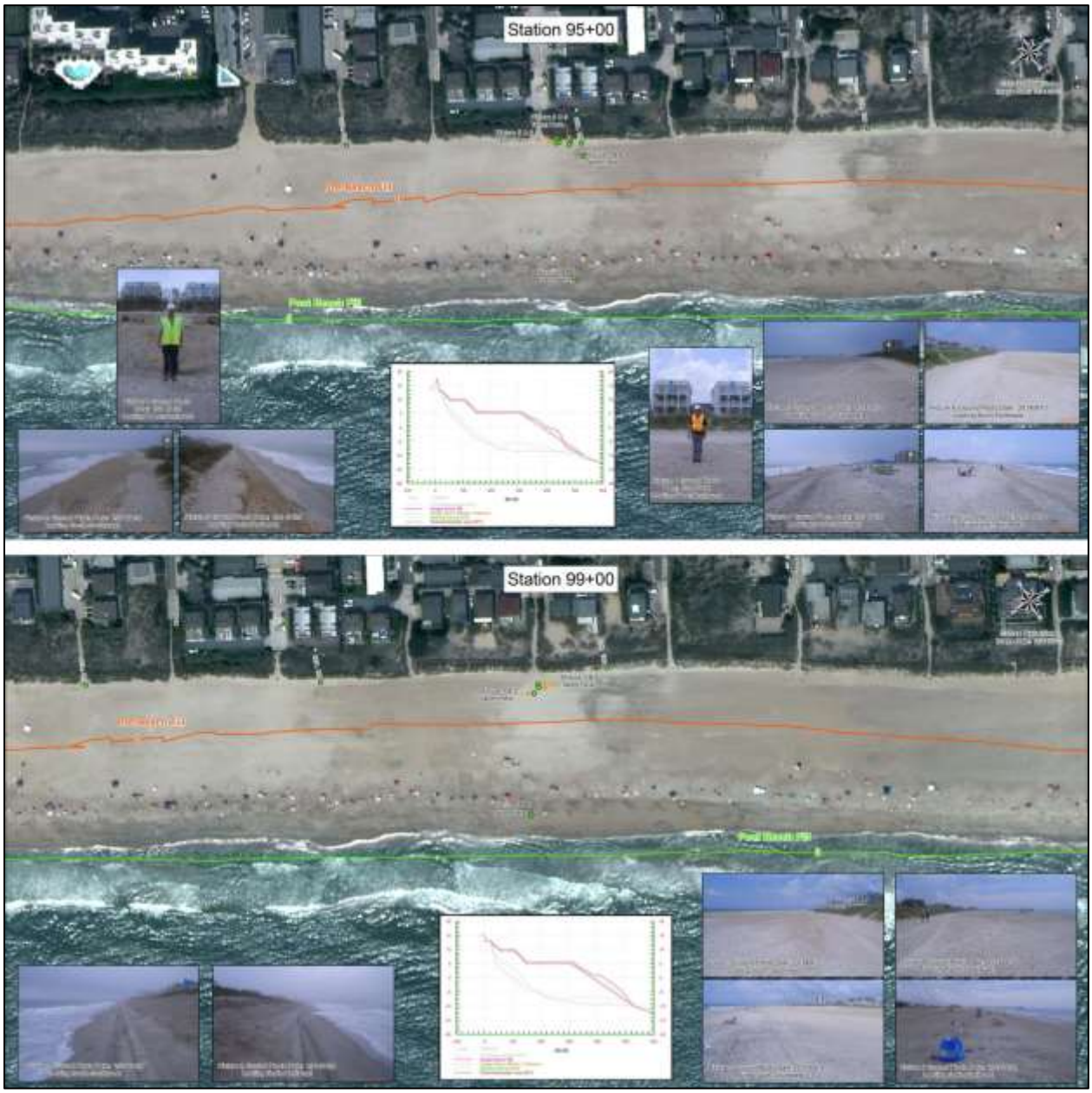


Figure 7. *2014 project area after the placement of beach fill.*

Figure 8. *2014 beach profile at Stations 95+00 and 99+00 with before/after photos. The basemap is post-project aerial imagery.*



2018 Project:

Table 4 and Figures 9, 10, 11, 12, and 13 below summarize the 2018 project and project boundary. The sediment trap in Masonboro Inlet was established to capture material transported over the weir section of the north jetty, and has been used since 1986. No changes were required.

Table 4. *Wrightsville Beach 2018 Coastal Storm Damage Reduction Project.*

Construction Date	February to March 2018
Contract Award	October 2017
Borrow Volume	842,000 cubic yards
Project Cost	$10.4M
Project Design Maps	Provided

Figure 9. *2018 project boundary area and borrow site (Masonboro Inlet).*

Figure 10. *2018 project boundary between Stations 75+00 (left transect) to 160+00 (right transect).*

Figure 11. *2018 beach profile at Station 95+00 with before and after photos.*

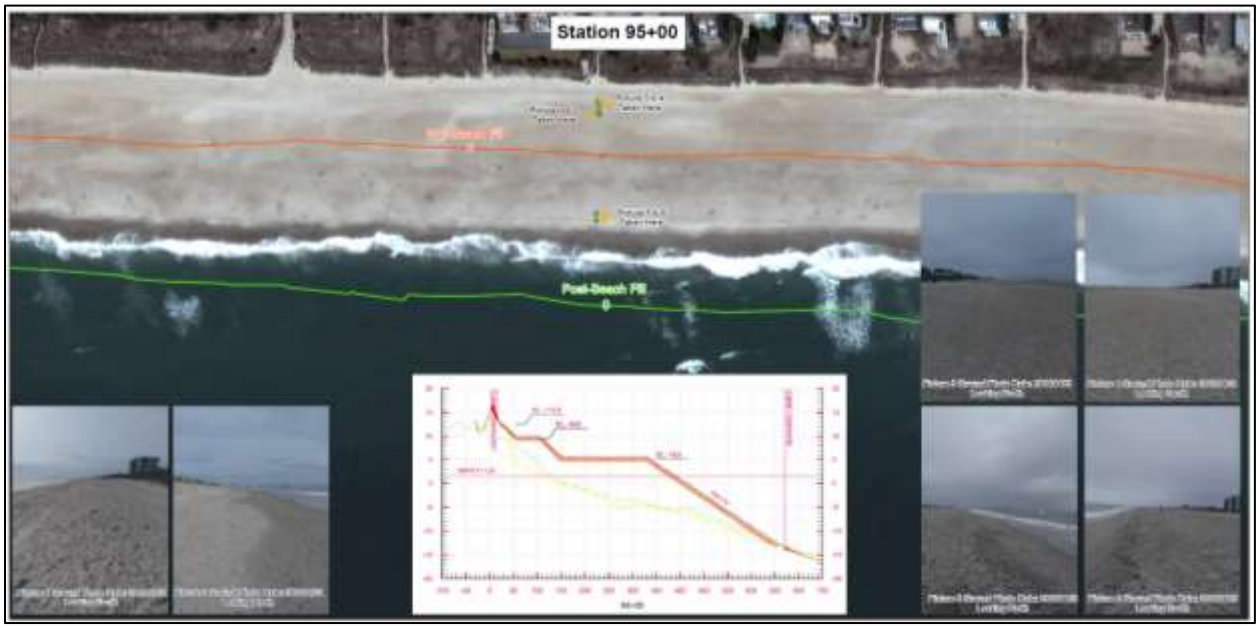


Figure 12. *2018 beach profile at Station 119+00 with before and after photos.*

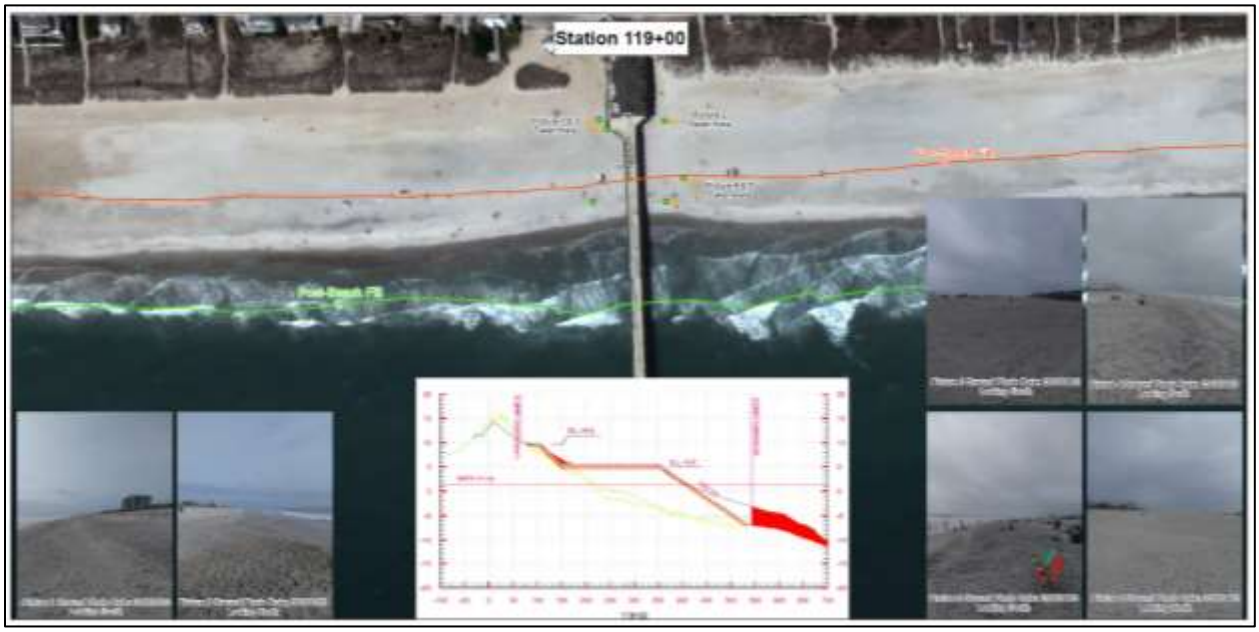
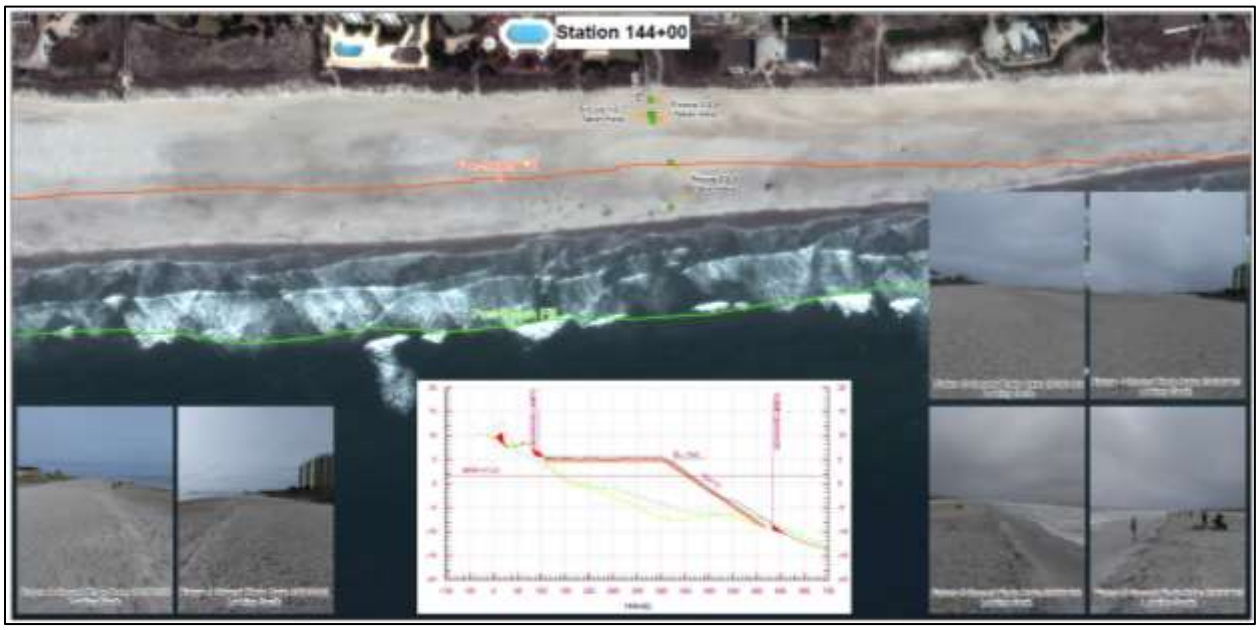


Figure 13. *2018 beach profile at Station 144+00 with before and after photos.*



B. Design of the initial fill projects and past/planned maintenance - Second factor per 15A NCAC 07J.1201(d)(2)

The Town's original static line exception application report (CP&E, 2009) provides information about the design of the beach fill project for Wrightsville Beach, and how that project has performed in the past. Since 2009, subsequent projects have performed consistently with those detailed in the 2009 report.

5-Year Progress Report: Project Design and Performance

There have been no design changes to the initial large-scale beach fill project following the granting of the static line exception in September 2009 by the Commission.

C. Compatible Sediment-Third factor per 15A NCAC 07J.1201(d)(3)

The Town's original static line exception application report (CP&E, 2009) provides information about the availability of compatible sediment for future beach fill projects. Since 1986, material from within Masonboro Inlet has been used to maintain beach fill projects. At the time of the most recent project in 2018, no changes were required.

5-Year Progress Report: Compatible Sediment

It appears to Staff that the sediment standard of less than 10% fines, used by the USACE and currently by DCM for permitting federal projects, can be met by the current borrow area in the channel between the north and south jetties, and extending into Banks Channel. This source has been compatible and large enough to satisfy past fill projects. Additionally, the USACE has begun looking at alternative sources offshore and on the south side of the ebb tide delta off Masonboro Island should the current source of sand prove to be insufficient to meet project needs. There have been no design changes to the location and volume of compatible sediment following the granting of the static line exception by the Commission in September 2009.

D. Financial Resources-Fourth factor per 15A NCAC 07J.1201(d)(4)

New Hanover County has a 3% room occupancy tax that is used to fund beach nourishment and tourism activities in the County. Sixty percent (60%) of the funds collected go toward beach nourishment. At the present time, the balance is approximately $37.5 million with annual collections totaling around $3.4 million in 2017 for CSDR projects, and has historically grown by approximately 3% per year since 1984.

Currently, the New Hanover County Ports Waterways and Beach Commission (PW&B Commission) manages beach nourishment funds and make recommendations to the Board on the use of the funds. In addition to the Wrightsville Beach project, New Hanover County has two other federal storm damage reduction projects it supports; namely, Carolina Beach and Kure Beach. Federal funding for beach nourishment projects has been difficult to obtain in recent years as more often than not these funds have not been included in the President's budget. As a result, local representatives have had to add the funds to the House and Senate versions of the appropriations bill. State funding for the projects, which is budgeted through the NC Division of Water Resources, has been fairly reliable, but given the recent budget deficits in North Carolina, continued State support could also present problems for future operations. Based on this, the PW&B Commission has evaluated three funding scenarios involving future funding from the federal government and State of North Carolina. The three scenarios are:

Scenario 1: All three projects will continue to receive funding from the federal government and the State at the same level as in the past. Under this scenario, the federal government will cover 65% of the cost of periodic nourishment and nonfederal interests responsible for the remaining 35%. The State's share of the nonfederal portion is authorized up to 75% and the local (County) share 25% of the non-federal costs. Scenario 1 assumes the State will contribute the maximum allowed under State Law or 75% of the non-federal costs which is equal to 26.25% of the total cost for periodic nourishment. The 25% local share of the nonfederal cost is equivalent to 8.75% of the total cost of periodic nourishment. Federal O&M funds will continue to pay for 46% of the nourishment costs to mitigate for the impacts of the Masonboro Inlet jetties.

Scenario 2: Federal funding support for the projects will end but O&M funds to mitigate for the impacts of the Masonboro Inlet jetties will continue. The State will contribute 75% of the normal 35% local share or 26.25% of the periodic nourishment costs allocated to the Wrightsville Beach project. New Hanover County will fund the balance of the periodic nourishment costs or 73.75% of the total cost of periodic nourishment for all three County projects.

Scenario 3: Federal funding and State funding for the Wrightsville Beach project will end but federal O&M funding to mitigate for the impacts of the Masonboro Inlet project will continue. The County will assume responsibility for 100% of the cost of periodic nourishment of the Wrightsville Beach project and 100% of the nourishment costs for the other two County projects.

Under Scenario 1, sufficient funds will be available to continue nourishment of the Wrightsville Beach project and the other two County projects well beyond the 25-year requirement stipulated in 15A NCAC 07J.1201.

In 2014, the PW&B Commission concluded that under Scenario 2, State funds combined with the County funds would be able to completely fund all three County projects well beyond the 25 years required by 15A NCAC 07J.1201. Under Scenario 3 in which all funding would be provided by the County, funds generated by the room occupancy tax would be sufficient to support all three projects through the year 2041 and possibly 2044. Based on the three funding scenarios, the Wrightsville Beach project will continue to receive periodic nourishment well beyond the 25 years required for the static line exception.

5-Year Progress Report: Financial Resources

The primary funding mechanism (Federal Project Cooperation Agreement) remains current for the Wrightsville Beach Coastal Storm Damage Reduction Project. A second federal funding mechanism is now in place in the form of contributing authority approved by Congress in 2012. The contributing authority option allows the non-federal sponsor the option of augmenting federal funding shortfalls. As a local funding strategy, an interlocal agreement has been approved between New Hanover County and each beach community. The agreement sets percentages of financial participation (attached) in the event shortfalls occur within federal and state budgets. Considering only funding at current intervals and historical placement volumes, ample funding should be available for the Wrightsville Beach Coastal Storm Damage Reduction Project for the foreseeable future (greater than 25 years). New Hanover County currently has approximately $37.5 million in room occupancy tax reserve funding for future local match or local participation in beach projects. Annual collections totaled an estimated $3.4 million in 2017 for CSDR projects and, historically,

the fund has grown by approximately 3% per year since 1984. The Town of Wrightsville Beach has placed an additional $2.7 million in a Capital Improvement Fund to augment room occupancy tax funds and is committed to setting aside additional funds in future budgets. Staff also notes that while 25 years of funding must be shown through this process, the Commission will have the opportunity to re-evaluate the static line exception and the necessary requirements every five years, and can address any major changes in future funding.

IV. Staff's Recommendation

The Commission, through 15A NCAC 07J.1204(c), directs Staff to provide a recommendation to the Commission whether the conditions defined in 15A NCAC 07J.1201(d)(1) through (d)(4) have been met and whether any design or funding changes in the last five years should result in the static line exception being revoked. Based on the Town's 5-year progress report and additional exhibits attached, Staff recommends that the conditions in 15A NCAC 07J.1201(d)(1) through (d)(4) have been met, and there have been no changes in the last five years that should result in the Town's static line exception being revoked. Staff recommends that the Commission renew the Town's static line exception for another five years.

V. References

Coastal Planning & Engineering (CP&E), 2009. Wrightsville Beach, NC Static Line Exception Application Report. Prepared for Town of Wrightsville Beach, NC, June 2009.

USACE, 1982. Feasibility Report and Environmental Assessment on Shore and Hurricane Wave Protection, Wrightsville Beach, North Carolina, U.S. Army Corps of Engineers, Wilmington District, September 1982.

USACE, 2000. Special Report – Impact of Federal Navigation and Storm Damage Reduction Projects on Masonboro Island, NC, U.S. Army Engineer District, Wilmington, NC, October 2000.

ATTACHMENT C: Petitioner's 5-Year Progress Report

TOWN OF WRIGHTSVILLE BEACH, NC

REVIEW OF THE LARGE SCALE BEACH-FILL PROJECT AND APPROVED STATIC LINE EXCEPTION PURSUANT TO 15A NCAC 07J .1204

Prepared by: Town of Wrightsville Beach

December 1, 2018

Bill Blair, Ill
Mayor

Darryl Mills
Mayor Pro Tem

Hank Miller
Alderman

Elizabeth King
Alderman

Lisa Weeks

Tim Owens

TOWN OF WRIGHTSVILLE BEACH
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December 13, 2018

NC Division of Coastal Management
Attn: Braxton Davis, Director
400 Commerce Avenue
Morehead City, NC 28557

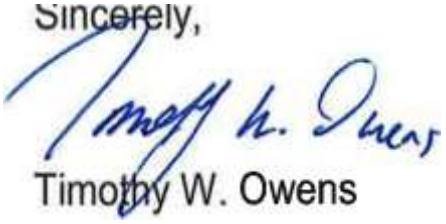
Dear Mr. Davis,

The Town of Wrightsville Beach filed a request for a static line exception from the CRC on July 13, 2009. The case was heard by the CRC and later approved on September 9, 2009. Pursuant to 15A NCAC 07J .1204, the Town of Wrightsville Beach is required to provide a progress report to the Coastal Resources Commission at intervals no greater than every 5 years from the initial authorization in order to renew its findings for conditions defined in 15A NCAC 07J .1201 (d) (1) through (d)4. The Coastal Resources Commission will also consider conditions as outlined in 15A NCAC 07J .1204(b)(1) through (3).

Attached is information that is being submitted as a progress report for the Town's Static Line Exception. I believe that you will find that it meets all of the criteria required by the North Carolina Administrative Code as outlined above. Since the Town received the static line exception, the Town has had 3 storm damage reduction project completed by the US Army Corps of Engineers. The Town continues to value the importance of storm damage reduction projects and the importance that they play in protecting local infrastructure, property and the Town's tourism economy.

Thank you for your assistance with this matter. If you have any questions, please contact me at (910)239-1770.

Sincerely,



Timothy W. Owens
Town Manager

Wrightsville Beach, NC
Static Line Exception 5 Year Review

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LIST OF FIGURES/TABLES

PURPOSE

The Town of Wrightsville Beach applied for and received an exception from the static line pursuant to NCGS 113A-107, 113(b)(6), 1 13A-124 and 15A NCAC 7J .1200 from the North Carolina Coastal Resources Commission on August 27, 2009. 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).

This document has been created for submittal to the NC Coastal Resources Commission for the review of conditions as it relates to the Town's static line exception reauthorization.

PROJECT AUTHORIZATION AND HISTORY

(Text and Figures taken from Wrightsville Beach Static Line Exception Report, Coastal Planning and Engineering, Inc. June 2009)

The Town is located primarily on a barrier island located in New Hanover County, North Carolina. The island is approximately 1.2 square miles in size (excluding Harbor Island) and is approximately 4.5 miles long and 0.25 miles wide. It is generally oriented in a north-south direction. It is bounded on the north by Mason Inlet and to the south by Masonboro Inlet. Mason Inlet was relocated in 2002 moving the inlet system 3,000 feet closer to the north and away from threatened structures on the north end of Wrightsville Beach and Shell Island Resort. Masonboro Inlet is a navigational channel and there are jetties on either side of the channel. The north jetty was installed in 1966 and the south jetty was installed in 1980.

Currently, the static line extends for approximately 2.3 miles from just north of North Ridge Lane (northern end of the static line) to just south of Sprunt Street (southern end of the static line). The static line was determined by DCM Staff using 1980 aerial photographs and staff located the static line along the vegetation line shown on those photographs. The current average annual erosion setback factor for the affected area is 2.0 feet per year. Based on New Hanover County's GIS images with 2006 aerial photographs overlain with parcel boundaries, the affected area is a highly developed area with an estimated 6 vacant oceanfront lots located in the affected area.

Wrightsville Beach has had a long history of oceanfront development and of beach fill projects. The first beach fill project was authorized by Congress in 1962 and work began in 1965. The north jetty was completed in 1966 with additional fill associated with its construction. The next project was in 1970 along the northern portion of the project area. Following Hurricane David in 1979, the next projects were in April of 1980 to repair the northern portion of the project area and then a larger restoration project in late-1980 through April 1981 which used sediment from between the north and south jetties after the south jetty was installed in 1980.

The project was reevaluated in September 1982 by the United States Army Corps of Engineers (USACE), and was reauthorized in 1986. The reauthorization extended federal cost sharing for the life of the project (50 years per USACE), and the first work under this reauthorization began in 1991, resulting in a current project authorization through 2041. In 1986, another project placed sand on both Masonboro Island and Wrightsville Beach using sediment from the borrow area between the two jetties and extending into Banks Channel. Since 1986, beach fill projects have occurred approximately every four years, beginning in 1991, using a combination of federal, state, and local funding sources.

PROJECT DESIGN TEMPLATE

(Text and Figures taken from Wrightsville Beach Static Line Exception Report, Coastal Planning and Engineering, Inc. June 2009)

The Wrightsville Beach federal storm damage reduction project was originally authorized by Public Law 87-874 in 1962 (H.D. 511, 87th Cong. 2nd session.). The project covers 14,000 feet of ocean shoreline extending north from Masonboro Inlet (Figure 1). While not part of the authorized project, a 1,000-foot to 2,000-foot transition fill is normally included at the north end for engineering performance purposes. The cross-sectional configuration of the authorized project consists of a 25-foot wide dune at elevation 12.5 feet above NAVD fronted by a 50-foot wide storm berm at elevation 9.5 feet above NAVD (Figure 2). A plan layout of the project showing its footprint is provided in Figures 3a and 3b. Periodic nourishment of the project is performed approximately every 4 years.

A reevaluation of the Wrightsville Beach project was made in September 1982 with the results provided in a report entitled Feasibility Report and Environmental Assessment on Shore and Hurricane Wave Protection, Wrightsville Beach, North Carolina (USACEI 982). The reevaluation report led to the reauthorization of the project by the Water Resources Development Act of 1986 (PL 99-662). The re-authorization extended Federal cost sharing for periodic beach nourishment for the life of the project. This has been interpreted by the Corps of Engineers (USACE) to mean 50 years from the initiation of construction under the new authority. Initial construction under the PL 99-662 occurred in 1991. Based on this USACE interpretation of the PL 99-662 reauthorization, federal funding for periodic nourishment of the Wrightsville Beach project is authorized through the year 2041. The 1986 reauthorization acknowledged the Federal navigation project at Masonboro Inlet (USACE, 1977) was responsible for 46% of the volumetric erosion along the Wrightsville Beach project and this impact would be mitigated through Federal funds for sand bypassing. Sand bypassing at Masonboro Inlet is accomplished by removing material from a dredged sediment trap that begins about 2,500 feet into Banks Channel and includes most of the area between the two jetties. Material enters the sediment trap by passing over the weir section of the north jetty.

The 1991 nourishment operation will be used in this static line exception renewal as the project construction start date. Therefore, the Wrightsville Beach project has been in existence for 22 years and satisfies the minimum requirement of 5 years as specified in 15A NCAC 07J .1201. Also

as specified in 15A NCAC 07J .1201, this application will provide information that demonstrates the project will continue to be maintained until at least the year 2041 or 25 years from the date of the exception application. Given the existing federal authority that extends through 2041 and the likelihood the project could be reauthorized yet again, maintenance of the project is expected to continue well beyond 2039.

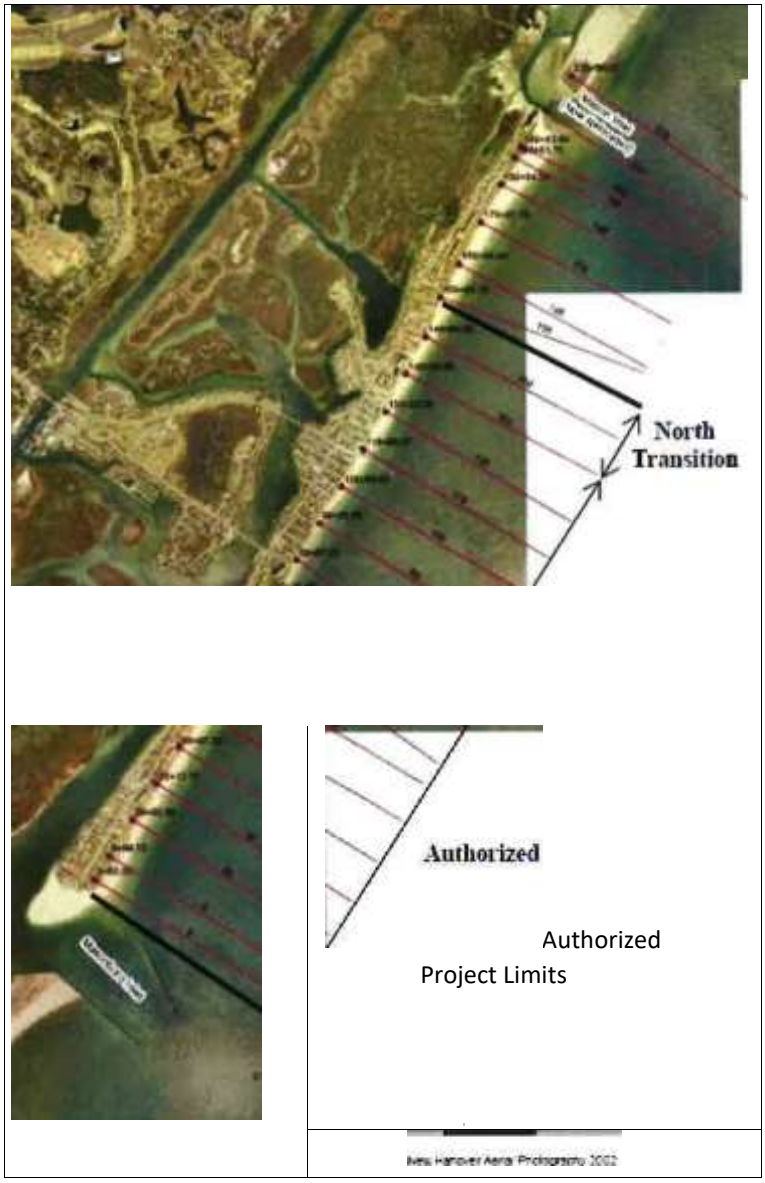


Figure 1. Wrightsville Beach project limits and USACE Baseline Stations.

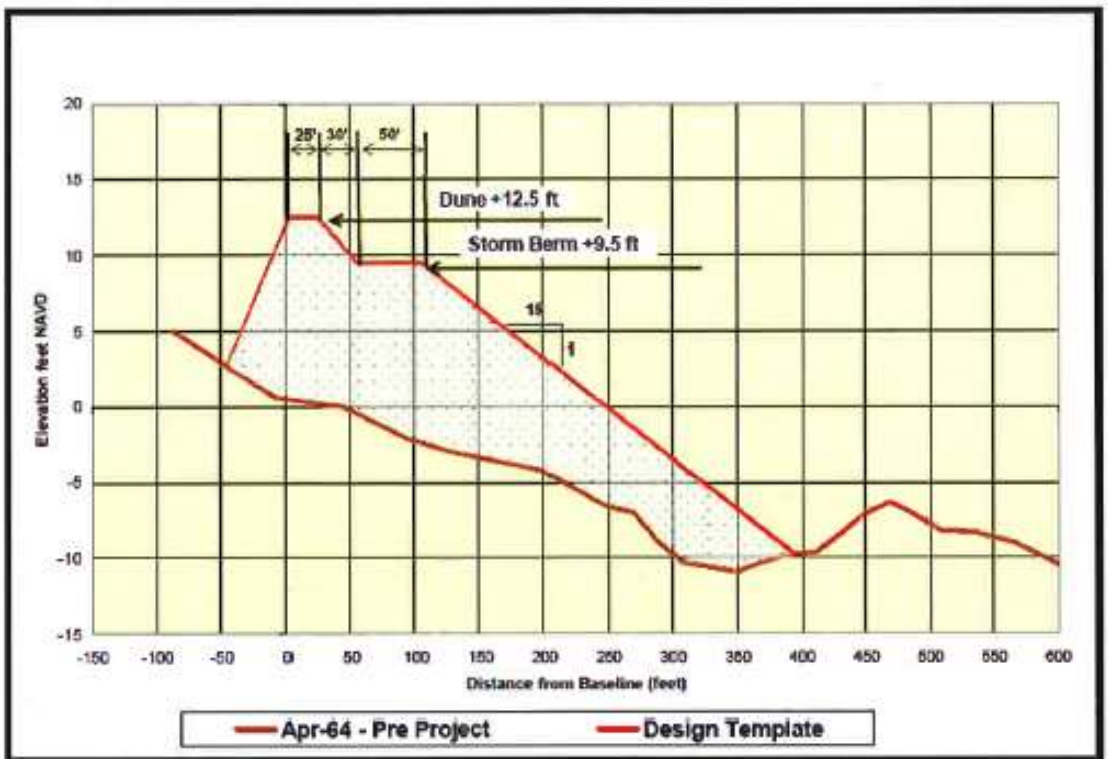


Figure 2. Wrightsville Beach authorized cross-section.

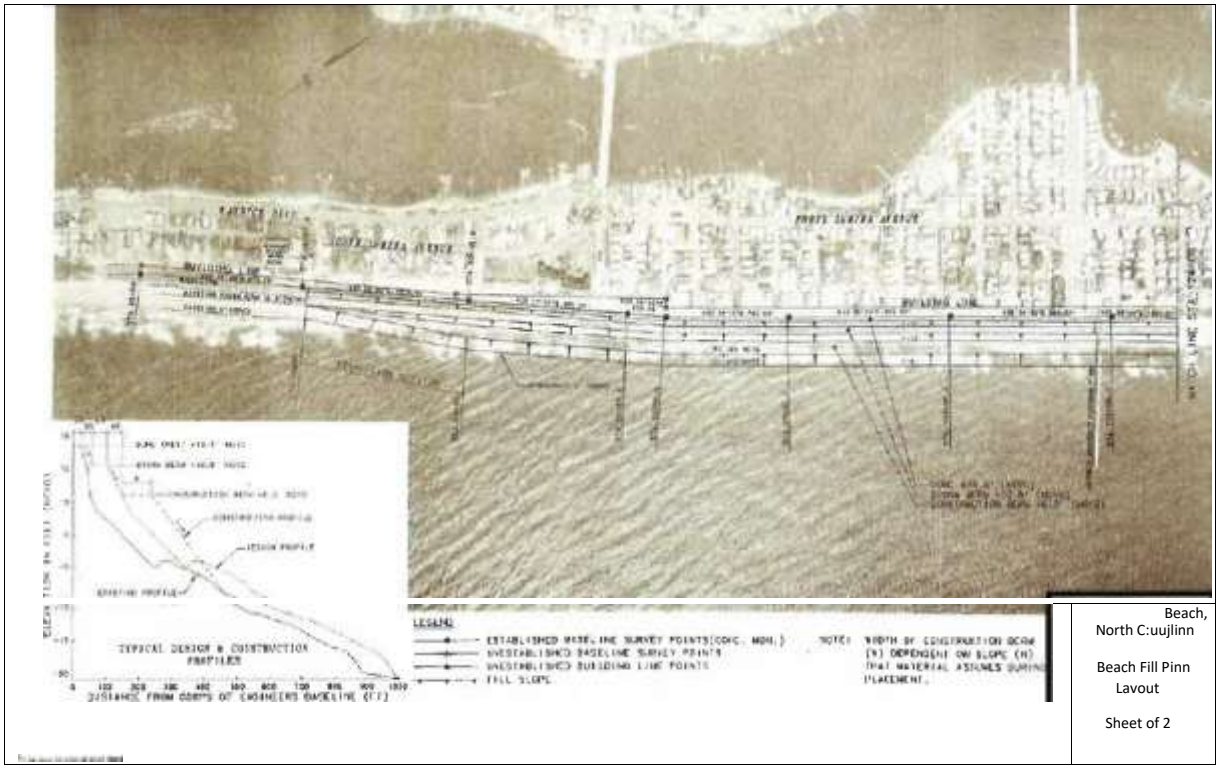


Figure 3a — Wrightsville Beach, NC — Beach Fill Plan.

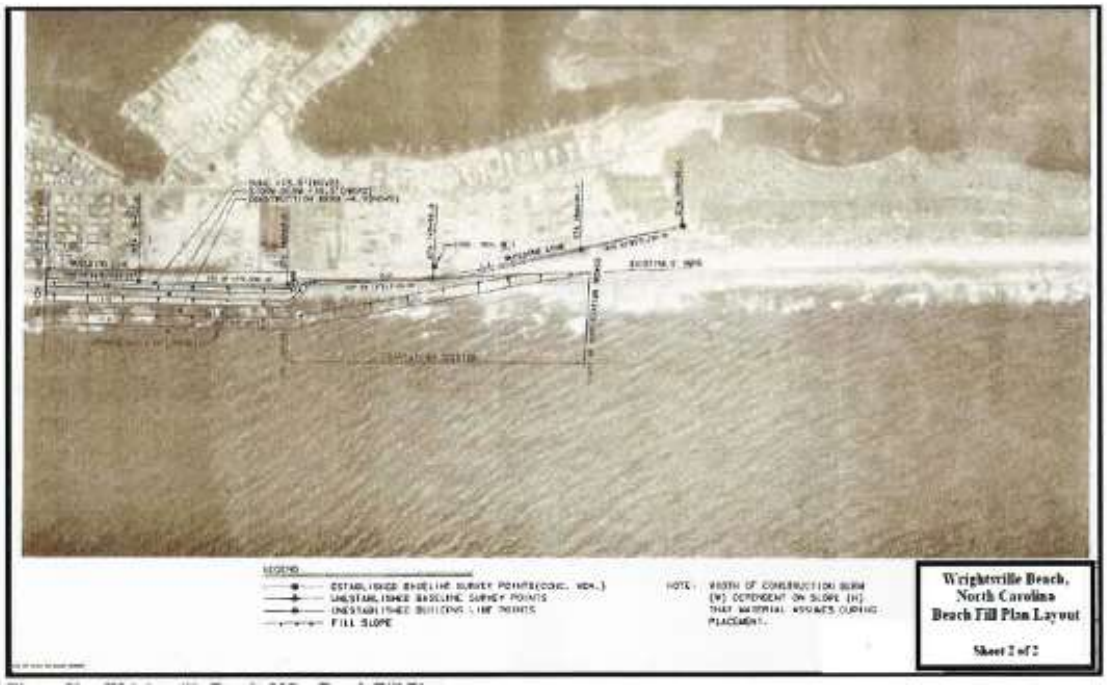


Figure 3b Wrightsville Beach, NC —Beach Fill Plan.

PAST PROJECT SPECIFIC DATA

Table 1. Wrightsville Beach Nourishment History

Nourishment Dates	Borrow Area [1]	Placement Area (stas.)[2]	Pay Yardage (cy)	Cost of Operation
Feb – Jul 65	Banks Channel	0 to 140	2,933,100	$739,339
Mar – Jul 66	Deposition Basin	30 to 130	319,408	$436,242
Oct 66	Behind Shell Is.	120 to 140	42,700	$50,697
Mar – May 70	S. End Banks Ch.	60 to 140	1,436,533	$578,545
Mar – May 80	S. End Banks Ch.	60 to 140	540,715	$1,159,936
Dec 80 – Apr 81	Masonboro In.	60 to 140	1,249,699	$4,427,792
Apr – Jun 86	Masonboro In.	60 to 140	898,593	$1,331,715
Jan – May 91	Masonboro In.	60 to 140	1,016,684	$2,682,412
Mar – Jun 94	Masonboro In.	82 to 146	619,031	$1,973,591
Mar – Apr 98	Masonboro In.	60 to 140	1,116,573	$2,890,256
Mar – May 02	Masonboro In.	60 to 140	783,691	$2,463,983
Jan – Apr 06	Masonboro In.	60 to 140	531,717	$4,810,290

[1] The Masonboro Inlet borrow area includes the southern 2,500 feet of Banks Channel.
[2] Stations in 100's feet.

Table 2. Wrightsville Beach Funding Sources

Nourishment Dates	Federal Funding Source				Non-Federal	Cost of Operation
	CG	PL84-99	Sec 111	O&M		
Feb–Jul 65	$496,836				$242,503	$739,339
Mar–Jul 66	$167,826			$175,925	$79,667	$436,242
Oct 66	$ 12,397			$ 32,375	$5,925	$50,697
Mar–May 70	$142,888	$202,412		$173,475	$59,770	$578,545
Mar–May 80		$520,424	$129,200		$510,312[1]	$1,159,936
Dec 80– pr 81	$850,239			$2,591,271	$986,282	$4,427,792
Apr–Jun 86				$676,415	$655,300	$1,331,715
Jan–May 91	$897,468			$1,022,848	$762,096	$2,682,412
Mar–Jun 94	$605,042			$970,004	$398,545	$1,973,591
Mar–Apr 98	$903,987			$1,436,812	$549,457	$2,890,256
Mar–May 02	$756,726			$1,207,196	$500,061	$2,463,983
Jan–Apr 06[1]	$2,478,679			$1,075,018	$1,256,593	$4,810,290

[1] The 2006 operation included both Federal and State Emergency Supplemental Funds.

RECENT PROJECT DATA AND FIGURES

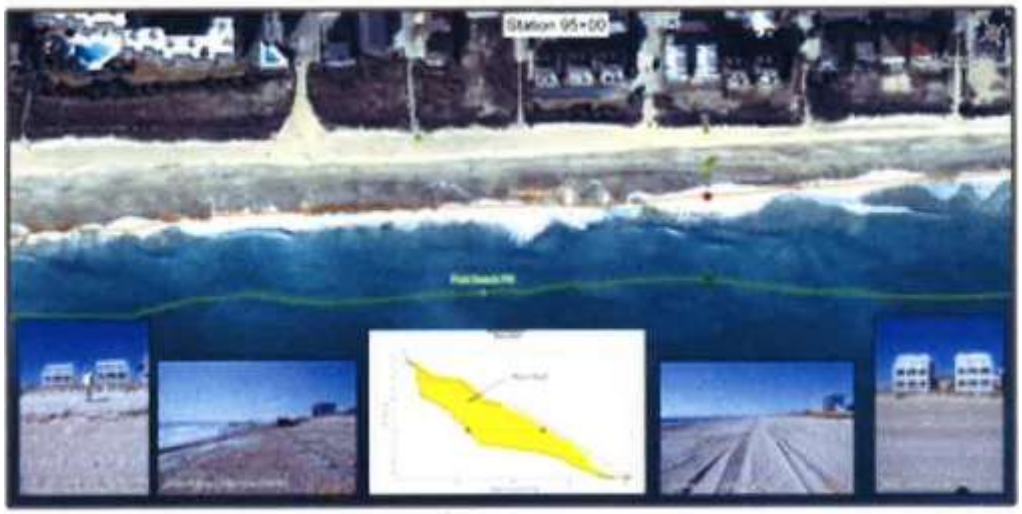
Wrightsville Beach 2010 Coastal Storm Damage Reduction Project

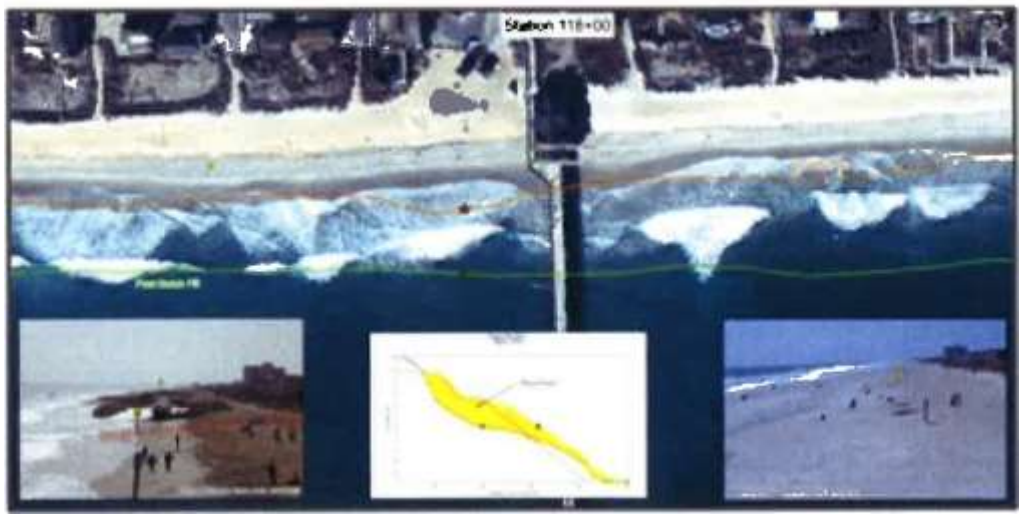
Construction Date	2/17/2010 to 3/2/2010
Contract Award	November 23, 2009
Borrow Volume	450,000 CY
Project Cost	$2.8M
Project Design Maps	Provided

2010 Project Boundary

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

2010 Project Boundary and Beach Profile (large copies of maps below provided as an attachment)





Proposed Wrightsville Beach 2014 Coastal Storm Damage Reduction Project

Construction Date	January 2014 to May 2014
Contract Award	December 2013
Borrow Volume	700,000 cy
Project Cost	$6.15 M
Project Design Maps	Attached
All sand for the project will come from the current borrow site within Masonboro Inlet. The sediment trap in Masonboro Inlet has been used since 1986. The area was established to capture material transported over the weir section of the Masonboro Inlet north jetty to facilitate sand bypassing to both Wrightsville Beach and Masonboro Island.	

WRIGHTSVILLE BEACH 2018 COASTAL STORM DAMAGE REDUCTION PROJECT

Construction Date	February to March 2018
Contract Award	October 2017
Beach Fill Placement	842,000 cubic yards
Total Project Costs	$10.4 million
Project Placement Map	Attached
Note: The sand for the project came from the current borrow site and sediment trap within Masonboro Inlet and Banks Channel. The sediment trap, used since 1986, captures material transported over the northern jetty weir section to facilitate sand bypassing to both Wrightsville Beach and Masonboro Island-	

Wrightsville Beach — 2018 Project Map

Review of the Large-Scale Beach Fill Projects and Approved Static Line Exceptions

As previously stated, the North Carolina Coastal Resources Commission is to review the status of Large-Scale Beach Fill Projects and approved Static Line Exceptions at least every 5 years pursuant to 15A NCAC 07J .1204.

FINDINGS

15A NCAC 07J .1204 REVIEW OF THE LARGE-SCALE BEACH-FILL PROJECT AND APPROVED STATIC LINE EXCEPTIONS

(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 07
.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;

There have been no design changes following the granting of the static line exception in 2009 by the Coastal Resource Commission. New Hanover County, on behalf of Wrightsville Beach, have received a local permit for the project using the same design as the US Army Corps of Engineers Project. The purpose of a locally held authorization would be in the event that Federal funding is not available.

(2) Design changes to the location and volume of compatible sediment, as defined by 15A NCAC 07 H .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

There have been no design changes to the location and volume of compatible sediment following the granting of the static line exception in 2009. New Hanover County received a local permit for the project using the same design as the US Army Corps of Engineers Project

The US Army Corps of Engineers has completed vibracore sampling of several potential offshore borrow sites. While these areas appear promising, the Corps of Engineers has not received adequate funding to complete the final analysis of the areas. The Town plans on asking the Corps to consider funding the completion of this project.

(3) Changes in the financial resources or funding sources necessary to fund the largescale beach fill project(s) defined in15A NCAC 07J .1201 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.

The primary funding mechanism (Federal Project Cooperation Agreement) remains current for the Wrightsville Beach Coastal Storm Damage Reduction Project. A second federal funding mechanism is now in place in the form of contributing authority approved by Congress in 2012. The contributing authority option allows the non-federal sponsor the option of augmenting federal funding shortfalls.

As a local funding strategy, an Inter-local agreement has been approved between New Hanover County and each beach community. The agreement sets percentages of financial participation (attached) in the event shortfalls occur within federal and state budgets. Considering only funding at current intervals and historical placement volumes, ample funding should be available for the Wrightsville Beach Coastal Storm Damage Reduction Project for the foreseeable future (greater than 25 years).

New Hanover County currently has approximately $37.5M in room occupancy tax reserve funding for future the local match or local participation in beach projects. Annual collections total an estimated $3.4M in 2017 for CSDR projects and, historically, the fund has grown by approximately 3% per year since 1984. The Town of Wrightsville Beach has placed an additional $2.7M in a Capital Improvement Fund to augment Room Occupancy Tax funds and is committed to setting aside additional funds in future budgets.

ORIGINAL

STATE OF NORTH CAROLINA

NEW HANOVER COUNTY

INTERLOCAL AGREEMENT FOR CONTINGENCY PLAN BEACH NOURISHMENT

This Interlocal Agreement ("Agreement") is made Dec 8, 2011 by and between the County of New Hanover, North Carolina, a body corporate and politic (hereinafter referred to as the "County") and the Municipalities of Wrightsville Beach, Carolina Beach, and Kure Beach, bodies politic and corporate (hereinafter referred to as the "Towns").

PURPOSE

WHEREAS, the ocean beaches located within the corporate boundaries of Wrightsville Beach, Carolina Beach and Kure Beach (herein collectively the "Town Beaches") are a valuable resource bringing economic, environmental, cultural and recreational benefits to people of the United States, including those in the State of North Carolina; and

WHEREAS, the financing and maintenance of the Town Beaches has been and remains an appropriate function of the Federal and State governments; and

WHEREAS, maintenance of the Town Beaches through United States Army Corps of Engineers nourishment projects funded primarily by the Federal and State governments has accordingly been successfully performed for many decades; and

WHEREAS, the maintenance of Town Beaches is vital to continued economic, environmental and cultural well-being of the County and Town; and

ORIGINAL

WHEREAS, critical to the Municipalities of Wrightsville Beach, Carolina Beach, and Kure Beach is demonstrating the long-term feasibility of financing plans for the maintenance of their ocean beaches, in order to preserve their status as or to establish eligibility for designation as a Static Vegetation Line Exception community under regulations promulgated by the State's Coastal Area Management Act; and

WHEREAS, the ongoing availability of Federal and State funding for Corps of Engineers managed beach nourishment projects remains uncertain; and

WHEREAS, County and Towns accordingly seek to establish contingency plans to address various scenarios wherein Federal or State monies may not be available for beach nourishment; and

WHEREAS, County and Towns also seek to provide for the potential use of sixty percent (60%) of the first three percent (3%) of the Room Occupancy Tax available for beach nourishment (subsequent references to the "use of Room Occupancy Tax" shall mean use of the portion of the Room Occupancy Tax available for beach nourishment as defined hereinabove) and local general revenues, as necessary, for funding of either a portion of Corps managed beach nourishment or County managed beach nourishment projects if Federal or State funds are unavailable or insufficient for such purposes; and

WHEREAS, County and Towns are jointly seeking approval by State and Federal Agencies of a contingent Nourishment Plan for the Town Beaches, and the State, in anticipation of such a plan, is prepared to complete/review any necessary environmental studies, and State and Federal Agencies involved in the have indicated that they strongly prefer and require that units of local government work on and submit one mutual plan for beach nourishment without individual towns seeking separate funding or individual beach nourishment projects except in emergencies. Provided that nothing contained in this Agreement shall be construed to limit or restrict the authority of Wrightsville Beach, Carolina Beach, and Kure Beach to continue to participate in and seek funding for their existing Corps managed beach nourishment programs; and

ORIGINAL

WHEREAS, it is within the contemplation of the Parties hereto and State agencies involved in the approval process that the U.S. Army Corps of Engineers and other Federal approval agencies will issue one permit for the Town Beaches. Use of said permit is contingent upon Federal and/or State funding being unavailable or insufficient for Corps managed projects; and

WHEREAS, County and Towns now desire to enter into an agreement that provides a planning mechanism, plan, and compact among the parties for a contingent beach nourishment program for the Town Beaches (hereinafter referred to as the or "Plan"), which utilizes available funds from the County's Room Occupancy Tax together with the general revenue of the respective locality and any State and Federal funding secured for the
Master Nourishment Plan; and

WHEREAS, County and Towns now desire to enter into an agreement addressing local funding sources should Federal and State monies be unavailable or insufficient to finance nourishment projects for the Town Beaches; and

WHEREAS, under this Agreement it is contemplated that the County as the lead sponsor, with the assistance of its Wilmington/New Hanover County Port, Waterway and Beach Commission, and consultants hired by the County, in consultation with the Towns, will prepare the Master Nourishment Plan for approval by the Towns. Upon written approval by all of the Towns of such Plan, the Plan will then be implemented under this Agreement with the County being the designated permittee for beach nourishment; and

WHEREAS, notwithstanding this Agreement or any provisions therein, the Parties agree to support and continue efforts to procure Federal and State funding for beach nourishment projects.

NOW THEREFORE, County and Towns to NCGS 160A-17 and Part 1 of Article 20 of Chapter 160A of the North Carolina General Statutes, hereby contract and agree as follows:

1. Purpose. This agreement seeks to address the following different potential scenarios:
    a. Those situations in which Federal or State funding for beach nourishment for Corps managed projects for Town Beaches is reduced.

ORIGINAL

b. Those situations in which no Federal or State funding for beach nourishment for Town Beaches is available. In such event the County and Towns would proceed under the contingent plan and permit process set-forth herein.

County and Towns enter into this Agreement in order to prepare, approve and carry out the Master Nourishment Plan providing for acquisition of one permit for nourishment of the Town Beaches and identification of the source of tax funds and other revenues to be used to implement such plan. The Master Nourishment Plan shall not include navigational or harbor dredging where the dredged materials is not used for beach nourishment.

2. Development of Master Nourishment Plan. The County, using available Room Occupancy Tax revenues, will over the next 18 to 36 months develop the Master Plan in consultation with State and Federal Agencies, the Towns, consulting engineers, and the Wilmington/New Hanover County Port, Waterway and Beach Commission, and submit the same to the Towns for consideration and approval by all of the Towns. Concurrently the County will submit for a State and Federal permit to carry out and complete the Plan. The Master Plan shall not be effective until approved by all of the Towns in writing. The final approved plan will contain the following principles and encompass and cover the following subjects, goals and objectives:

   a. Easements and Rights-of-Way. Each Town shall be responsible for providing the staging areas, sites or necessary lands, easements, and rights-of-way required for the development, construction, and maintenance of those elements of the Master Nourishment Plan to be implemented within the Town. No Town will be obligated to provide sites, staging areas or facilities for nourishment that will take place in another party's jurisdiction. However, the plan will provide that Towns may cooperate in providing staging areas and access to the beach for beach construction equipment regardless of where the beach construction activity is taking place when joint nourishment projects are undertaken.

   b. Public Beach Access and Parking. The Towns shall be responsible for securing, constructing, and maintaining any and all access/parking facilities stipulated as

ORIGINAL

a condition of receiving State or Federal funding. All public beach accesses and parking facilities must be secured prior to issuing a notice to proceed for each construction event.

c. Funding Contingency. Each party's participation in a nourishment project with a Master Nourishment Plan will be contingent on such party, in its sole discretion, being able to fund its portion of the project. Each Town is required to anticipate the need for the local share and to either budget for the same over a period of years, provide for and conduct place tax districts or similar means of funding the local share. Failure to meet local funding needs by one or more Towns could result in the County passing over a project of the Town due to lack of funding.

d. Construction Administration. The County may serve in the role as lead administrator for any nourishment event associated with the Master Nourishment Plan.

3. Cost-sharing for Corps-Managed Projects or Projects Implemented Under the Master Nourishment Plan. In the event Federal and State funding is insufficient to pay the costs of any beach nourishment project, the Room Occupancy Tax will pay any shortfall in funding for such project up to a maximum of 82.5% of the total project costs. If after payment of Room Occupancy Tax funds in an amount equal to 82.5% of the total project costs a shortfall remains, such shortfall shall be paid by the Town in which such project is located up to a maximum of 17.5% of the total project costs.

4. Ownership and Use of Nourished Beaches. The ownership and use of beaches nourished under this Agreement are subject to the State Lands Act.

5. Withdrawal, Termination. Modifications, Amendments, and Binding Effects. The commitment of each Town to provide public beach access, parking or any other lands or rights-of way, or any rules or regulations with respect to use of the same, as a party to this agreement, is expressly conditioned on Federal and State laws, regulations, or

ORIGINAL

interpretations thereof, as of the date of approval of this agreement by signatories herewith. If there are amendments, changes or interpretations to Federal or State law or regulations, which are adopted after this Agreement is approved which affect a party's rights and obligations in this Agreement, any party that chooses not to meet the requirements shall have a right to withdraw from this Agreement at any time.

Once approved by the County and all of the Towns, this Agreement shall remain in effect until June 30, 2015 and be binding on the Parties regardless of changes in the composition of boards of the respective units of local government that are parties hereto. This Agreement shall automatically renew for subsequent periods of four years unless any party gives notice in to all other parties at least 180 days before the expiration of the then current term of its desire that the Agreement not renew at its termination. In such event, the Agreement shall terminate at the end of its then current term.

Once approved, no party may withdraw except that a Town upon twelve (12) months Written notice to the County and other Towns may withdrawal. Withdrawal of a party as provided in this paragraph shall not cause the Agreement to terminate. The Agreement shall only be terminated as provided in the preceding paragraph.

6. Any amendment of modification to this Agreement shall require the written consent of all Parties.

ORIGINAL

IN WITNESS WHEREOF, the patties have executed this Agreement

New Hanover County Contract #12-

TOWN OF CAROLINA BEACH

ATTEST:

By: _____
Mayor

Town Clerk

TOWN OF KURE BEACH

ATTEST:

By: _____
Mayor

Town Clerk

ORIGINAL

COUNTY OF NEW HANOVER

ATTEST:

By: Ted Davis Jr
Chairman of the Board

Sheila L. Schult
Clerk to the Board

NEW HANOVER COUNTY • NORTH CAROLINA • ESTABLISHED 1729 •

TOWN OF WRIGHTSVILLE BEACH

ATTEST:

Mayor

Sylvia J. Holleman
Town Clerk

TOWN OF WRIGHTSVILLE BEACH INCORPORATED 1899 STATE OF NORTH CAROLINA

Approved as to form/County Attorney

6

ORIGINAL

TOWN OF CAROLINA BEACH

ATTEST:

By: _____
Mayor

_____
Town Clerk

TOWN OF KURE BEACH

ATTEST:

By: _____
Mayor

_____
Town Clerk

NORTH CAROLINA

NEW HANOVER COUNTY

I, Teresa P. Elmore, a Notary Public of the State and County aforesaid certify that Sheila L. Schult acknowledged that she is Clerk to the Board of Commissioners of New Hanover County and that by authority duly given and as the act of the Board the foregoing instrument was signed in its name by its Chairman, sealed with its corporate seal and attested by herself as its Clerk.

WITNESS my hand and official seal this 8 day of Dec, 2011.

Teresa P Elmore
Notary Public

My commission expires: TERESA P. ELMORE NOTARY PUBLIC - NORTH CAROLINA NEW HANOVER COUNTY My Commission Expires 4-15

ORIGINAL

NORTH CAROLINA

NEW HANOVER COUNTY

I, Virginia A. Houser, a Notary Public of the State and County aforesaid certify that Sylvia J. Holleman acknowledged that she is Clerk to the Board of Alderman of Wrightsville Beach and that by authority duly given and as the act of the Board the foregoing instrument was signed in its name by its Mayor, sealed with its corporate seal and attested by herself as its Clerk.

WITNESS my hand and official seal this 17th day of November, 2011.

Virginia A. Houser
Notary Public

VIRGINIA A. HOUSER NOTARY PUBLIC NEW HANOVER COUNTY, NC

My commission expires: 5/3/12

NORTH CAROLINA

NEW HANOVER COUNTY

I, Iris D. Salke Melinda N. Prusa, a Notary Public of the State and County aforesaid certify that Melinda N. Prusa acknowledged that she is Clerk to the Town Council of Carolina Beach and that by authority duly given and as the act of the Council the foregoing instrument was signed in its name by its Mayor, sealed with its corporate seal and attested by herself as its Clerk.

WITNESS my hand and official seal this 15 day of November, 2011.

Iris D. Salke
Notary Public

OFFICIAL SEAL
Notary Public, North Carolina
County of New Hanover
IRIS D. SALKE
My Commission Expires 2-3-2014

My commission expires: 2-3-2014

ORIGINAL

NORTH CAROLINA

NEW HANOVER COUNTY

I, Sheila L. Schult, a Notary Public of the State and County aforesaid certify that Nancy Avery acknowledged that she is Clerk to the Town Council of Kure Beach and that by authority duly given and as the act of the Council the foregoing instrument was signed in its name by its Mayor, sealed with its corporate seal and attested by herself as its Clerk.

WITNESS my hand and official seal this 18th day of November, 2011.

SHEILA L. SCHULT NOTARY PUBLIC NEW HANOVER CO. NC

Sheila L. Schult
Notary Public

My commission expires: 3/17/2013

ORIGINAL

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

February 7, 2019

MEMORANDUM **CRC-19-05**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: CRC Science Panel's 2019 Inlet Hazard Area (IHA) Update Report & Staff's Proposed Amendments to IHA Rules 15A NCAC

Background:

The establishment of Areas of Environmental Concern (AEC) is authorized under the NC Coastal Area Management Act (CAMA) of 1974 (NCGS 113A-100 et seq.) and forms the foundation of the North Carolina Coastal Resources Commission's (CRC) permitting program for regulating coastal development. Rules defining three specific ocean hazard AECs appear in 15A NCAC 07H.0300: 1) Ocean Erodible, 2) Inlet Hazard, and 3) Unvegetated Beach AECs. The inlet hazard area (IHA) AEC is defined in 15A NCAC 07H.0301(3) as locations that "are especially vulnerable to erosion, flooding and other adverse effects of sand, wind, and water because of their proximity to dynamic ocean inlets."

Unlike other CRC jurisdictional areas, IHA boundaries are defined in a report referenced in the CRC's rules at 7H.0304(2). The current IHA boundaries correspond to maps originally developed by Priddy and Carraway (1978) for all of the State's then-active inlets. The report designating the IHA boundaries was adopted by the CRC in 1979, with minor amendments since that time.

The original IHA boundaries were based on statistical analysis (and to a lesser extent previous inlet location) of historical shoreline movement identified on multiple aerial photosets. In most cases, the statistical methods used in the 1978 study identified the landward-most shoreline position (99% confidence interval) projected to occur between 1978 and 1988. Originally, the Commission anticipated that these boundaries were to be updated at the end of the 1980s. However, due to a combination of factors, that update did not occur.

It was not until the late 1990s, after the CRC's Science Panel on Coastal Hazards was formed, that the need to update IHAs became more of a focal point of discussion. The following is a summarized timeline from 1998 to 2019:

- **1998-1999:** the newly-formed Science Panel recommended to the CRC that the IHAs were outdated and should be updated. The Science Panel recommended that DCM hire staff to work on inlet hazards data collection and analysis.

- **November 2002:** DCM hired a Coastal Hazards GIS Specialist to support all oceanfront and inlet data collection, mapping, and analysis efforts.

- **2004-2008:** data collection and mapping in preparation for updating IHAs. DCM worked extensively with the Science Panel to develop inlet delineation methodologies.

- **2009:** DCM synthesized data and study results into a report.

- **May & July 2010**: DCM presented a proposed IHA boundary update to the CRC.

- **2010-2012**: Given the concern over the increased size of the proposed IHAs, there were many questions about IHA rules, and if "risk" was the same for all areas within the proposed IHAs. Because there were unanswered questions related to IHA development standards, in addition to several key issues consuming much of the Commission's and Science Panel's time (i.e., the terminal groin and oceanfront erosion rate update studies), the IHA boundary update was temporarily put on hold.

- **2012**: The General Assembly directed the CRC to study the feasibility of creating a new AEC for the lands adjacent to the mouth of the Cape Fear River. Session Law 2012-202 required the CRC to consider the unique coastal morphologies and hydrographic conditions of the Cape Fear River region, and to determine if action is necessary to preserve, protect, and balance the economic and natural resources of this region through the elimination of current overlapping AECs by incorporating appropriate development standards into one single AEC unique to this location. During this study, the CRC found that while the Cape Fear River inlet did present a unique set of challenges, other inlets may have similar issues. The Commission therefore decided to undertake a comprehensive review of inlet-related issues, with the expectation of developing additional management tools that would allow the CRC to more proactively address the issues confronted by local governments in these dynamic areas.

- **February 2014**: The CRC asked the Science Panel to review a recommendation to remove IHA status from Mad Inlet, which had been naturally closed for some time. From this effort, the Panel made two recommendations that were presented to the CRC: 1) Mad Inlet was not at risk of reopening so IHA status should be removed; and, 2) current IHAs were severely out of date and needed to be updated.

- **September 2014**: DCM presented a report to the Commission that was prepared following a series of stakeholder meetings, entitled, "NC Coastal Resources Commission Inlet Management Study Findings and Policy Options." Stakeholders made several recommendations to the CRC that pertained specifically to IHAs: 1) The CRC should task the Science Panel to complete the development of methods to define revised IHAs and potential inlet and near-inlet setback lines for CRC review; and, 2) The IHAs should be eliminated and incorporated into the Ocean Erodible Area (OEA) while applying the same development standards currently utilized in the OEA.

- **May 2016**: Staff proposed to the CRC to pick up work on the IHAs, and to update inlet shoreline change rates that were presented in 2010 – CRC unanimously approved.

- **July 2016**: At the CRC meeting in Beaufort, the Commission issued the following scope of work to the Science Panel:

    1) **Develop a methodology for calculating inlet shoreline change rates:** The Science Panel chose the linear regression method to measure shoreline change at inlets. This method incorporates multiple shorelines, versus the end-point method currently used on the oceanfront which only uses two shorelines (early and current). Inlet shoreline changes rates have not historically been used for determining construction setbacks at inlets.

    2) **Re-evaluate points along the oceanfront shoreline where inlet processes no longer influence shoreline position:** When the Science Panel first started working on updating IHA boundaries in 2005, the Panel evaluated changes in shoreline position over time to determine the location along the shoreline where inlet-related processes no longer have a dominant influence on the shoreline's position.

    3) **Present results at a CRC Meeting.**

- **November 2018:** At the CRC meeting in Ocean Isle, the Science Panel Co-Chair, Mr. Bill Birkemeier, presented the Panel's updated proposed IHA boundaries, and described the methods utilized by the Panel to map them.

- **February 2019:** The Science Panel's final IHA report will be submitted to the CRC: "*Inlet Hazard Area Boundary 2019 Update: Science Panel Recommendations to the North Carolina Coastal*

Resources Commission." In addition, Staff will present proposed rule amendments pertaining to development standards within IHAs.

Staff's Summary of Proposed IHA Boundaries Relative to Existing Boundaries:

At most inlets, the proposed IHAs boundaries would expand farther away from the inlet along the oceanfront-inlet shoreline, and farther landward compared to existing IHA boundaries (see Tables 1, 2, & 3). This expansion of the IHA often encompasses areas that have historically been part of the Ocean Erodible Area (OEA) AEC. However, unlike the oceanfront OEA limit where the landward distance is measured from the first line of stable and natural vegetation, the IHA boundary is measured landward from the landward-most location of historical vegetation lines (hybrid-vegetation line).

For the purposes of illustrating how the proposed IHAs compare with existing AECs within the Ocean Hazard Area, Staff calculated the total land area included within the proposed IHAs that are not currently within one of the existing Ocean Hazard AECs (areas over marsh, ocean waters, or inlet channels were excluded). All inlets combined, there are approximately 152 acres proposed for inclusion that are not currently within an Ocean Hazard AEC (see Table 4).

Table 1. This table illustrates the acres of parcels within or intersecting both the existing IHA and proposed IHA. Negative values represent an acreage reduction, while positive values represent an acreage increase. Also note that Masonboro Inlet at Wrightsville Beach does not currently have a designated IHA.

Location	Existing IHA (acres)	2018-Proposed IHA (acres)	Difference (acres)	Increase-Reduction (%)
Tubbs Inlet *at Sunset Beach*	182	96.8	-85.2	-46.8%
Tubbs Inlet *at Ocean Isle*	123.5	84.3	-39.2	-31.7%
Shallotte Inlet *at Ocean Isle*	64.6	216.6	+152	235.3%
Shallotte Inlet *at Holden Beach*	290.5	569.3	+278.8	96.0%
Lockwood Folly Inlet *at Holden Beach*	64.1	189.5	+125.4	195.6%
Lockwood Folly Inlet *at Oak Island*	126.7	229.7	+103	81.3%
Carolina Beach Inlet *at Carolina Beach*	177.5	346	+168.5	94.9%
Carolina & Masonboro Inlets *at Masonboro Island*	75.6	535.5	+459.9	608%
Masonboro Inlet *at Wrightsville Beach*	0	90.8	+90.8	100.0%
Mason Inlet *at Wrightsville Beach*	267.6	125.5	-142.1	-53.1%
Mason Inlet *at Figure Eight*	267.6	165.6	-102	-38.1%
Rich Inlet *at Figure Eight*	156.2	253.6	+97.4	62.4%
Rich Inlet *at Lea-Hutaff Island*	117.7	409	+291.3	247.5%
New Topsail Inlet *at Lea-Hutaff Island*	517.1	414.4	-102.7	-19.9%
New Topsail Inlet *at Topsail Beach*	256.9	427.4	+170.5	66.4%
New River Inlet *at N. Topsail Beach*	85.2	144.8	+59.6	70.0%
Bogue Inlet *at Emerald Isle*	136.1	429.5	+293.4	215.6%
TOTAL:	**2908.6**	**4728.3**	**+1359.5**	**47.0%**

Table 2. *This table illustrates the number of structures (residential and commercial combined) within or intersecting either the existing IHA and proposed IHA that have a heated-area greater than 5,000 square feet. Negative values represent a reduction, while positive values represent an increase.*

Structures > 5,000 square feet	IHA (current)	IHA (2018 proposed)	Difference
Tubbs Inlet *at Sunset Beach*	0	0	0
Tubbs Inlet *at Ocean Isle*	**5**	**4**	**-1**
Shallotte Inlet *at Ocean Isle*	0	**1**	**1**
Shallotte Inlet *at Holden Beach*	**5**	**9**	**4**
Lockwood Folly Inlet *at Holden Beach*	0	0	0
Lockwood Folly Inlet *at Oak Island*	0	0	0
Carolina Beach Inlet *at Carolina Beach*	0	0	0
Masonboro Inlet *at Wrightsville Beach*	0	**1**	**1**
Mason Inlet *at Wrightsville Beach*	**1**	**1**	0
Mason Inlet *at Figure Eight*	**9**	**5**	**-4**
Rich Inlet *at Figure Eight*	**2**	**9**	**7**
Rich Inlet *at Lea-Hutaff Island*	0	0	0
New Topsail Inlet *at Lea-Hutaff Island*	0	0	0
New Topsail Inlet *at Topsail Beach*	0	0	0
New River Inlet *at N. Topsail Beach*	0	**11**	**11**
Bogue Inlet *at Emerald Isle*	**2**	0	**-2**
TOTAL:	**24**	**41**	**17**

Table 3. This table illustrates the number of lots (residential commercial combined) within, or intersecting either the existing IHA and proposed IHA, with less than 15,000 square feet (0.334 acres). Negative values represent a reduction, while positive values represent an increase.

Lots < 15,000 sqft. (0.334 acres)	IHA (current) # of Parcels	IHA (2018 proposed) # of Parcels	Difference
Tubbs Inlet *at Sunset Beach*	156	16	-140
Tubbs Inlet *at Ocean Isle*	20	3	-17
Shallotte Inlet *at Ocean Isle*	146	403	257
Shallotte Inlet *at Holden Beach*	15	173	158
Lockwood Folly Inlet *at Holden Beach*	52	156	104
Lockwood Folly Inlet *at Oak Island*	49	116	67
Carolina Beach Inlet *at Carolina Beach*	0	17	17
Masonboro Inlet *at Wrightsville Beach*	NA	9	9
Mason Inlet *at Wrightsville Beach*	0	0	0
Mason Inlet *at Figure Eight*	4	7	3
Rich Inlet *at Figure Eight*	8	16	8
Rich Inlet *at Lea-Hutaff Island*	3	0	-3
New Topsail Inlet *at Lea-Hutaff Island*	3	1	-2
New Topsail Inlet *at Topsail Beach*	230	238	8
New River Inlet *at N. Topsail Beach*	137	542	405
Bogue Inlet *at Emerald Isle*	71	108	37
TOTAL:	**894**	**1805**	**911**

Table 4. This table illustrates the total land area (acres), number of structures, and number of structures with a heated square footage greater than 5,000 that are currently not within one of the existing Ocean Hazard AECs.

Inlet & Location	Land Area Currently Not Inside OH AEC (acres)	# of Structures Currently Not Inside OH AEC	Structures >5,000 HSQFT Currently Not Inside OH AEC
Tubbs Inlet - Sunset Beach	0	0	0
Tubbs Inlet - Ocean Isle	0	0	0
Shallotte Inlet - Ocean Isle (Amended)	3.4	10	0
Shallotte Inlet - Holden Beach	76.4	126	4
Lockwood Folly Inlet - Holden Beach	2.3	0	0
Lockwood Folly Inlet - Oak Island	6.2	9	0
Carolina Beach Inlet - Carolina Beach	5.7	9	0
Masonboro Inlet - Wrightsville Beach	9.4	0	0
Mason Inlet - Wrightsville Beach	0.2	0	0
Mason Inlet - Figure Eight	2.2	0	0
Rich Inlet - Figure Eight	21.3	25	3
New Topsail Inlet - Topsail Beach	2.3	14	0
New River Inlet - N. Topsail Beach	5.3	10	0
Bogue Inlet - Emerald Isle	17.3	40	6

The Panel acknowledged that risks associated with coastal hazards are variable across each inlet hazard area, and felt it was important to identify subzones within proposed IHAs with greatest potential to be influenced by erosion. Termed and defined by the Science Panel, a "30-Year Risk Line" was initially introduced to the CRC in 2010 as a method for delineating the landward extent of those areas within the proposed IHAs where the Science Panel believed the risk to be greatest. Like the landward boundary of the IHA, the "30-Year Risk Line" distance was calculated for each transect by multiplying the shoreline change rate times 30 measured from the landward-most location of historical vegetation lines (hybrid-vegetation line).

It is important to remind the Commission that the terms "30- & 90-Year Risk Lines" are utilized by the Science Panel to describe their process of identifying areas with greatest potential to be influenced by both long- and short-term inlet related processes. These terms do not appear in CRC rule language. The 90-Year Risk Line is the same as the landward boundary of the proposed IHA; however, a 90' setback line from the existing first line of stable and natural vegetation (FLSNV) may not coincide with the 90-Year Risk Line because the latter is measured from a hybrid vegetation line. At present the minimum oceanfront construction setback is 60' from the FLSNV; which could be seaward or landward of the 30-Year Risk Line in the Science Panel's report.

Summary of Current Inlet Hazard Area Rules:

In 1981, the Commission began to recognize that inlet areas were more hazardous than the rest of the oceanfront, noting that out of the 70 structures impacted by erosion, 60 were near inlets. In addition to setbacks from the first line of stable and natural vegetation, the Commission included density restrictions, lot- and structure-size limits, a public access provision, a prohibition on beach bulldozing and the creation of new dunes, and a prohibition on permanent erosion control structures outside of public projects. Additionally, because shoreline change rates have historically not been calculated for inlet areas, the setback factor in the adjacent OEA is applied within the entire IHA.

Current IHA rules have remained relatively unchanged since adoption in 1981. The following is a summary of rules specific to IHAs:

1. **15A NCAC 07H .0304** (AECs Within Ocean Hazard Areas):
    - 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.

2. **15A NCAC 07H .0310** (Use Standards for Inlet Hazard Areas):
    - set back from the first line of stable natural vegetation a distance equal to the setback required in the adjacent ocean hazard area;

- density of no more than one commercial or residential unit per 15,000 square feet of land area on lots subdivided;
- residential structures of four units or less or non-residential structures of less than 5,000 square feet total floor area shall be allowed within the inlet hazard area, (not including roads and bridges);
- public rights of access to the public trust lands and waters in Inlet 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;
- Access roads and the replacement of existing bridges are allowed (Added in 1995).
- Residential piers and small-scale erosion control structures are allowed along shorelines exhibiting features of estuarine shorelines (Clarified in 1995).

3. **15A NCAC 07H .0308** (Specific Use Standards for Ocean Hazard Areas):
    - No new dunes shall be created in inlet hazard areas.

4. **15A NCAC 07H .1800** (General Permit to Allow Beach Bulldozing in the Ocean Hazard AEC)
    - This general permit shall not apply to the Inlet Hazard AEC

5. **15A NCAC 7H .0309(b)** Use Standards for Ocean Hazard Areas:
    - Exception, in which certain lots platted prior to June 1, 1979 are eligible for an exception to the oceanfront setback rules, is not applicable to the IHA.

Summary of Proposed Inlet Hazard Area Rule Amendments:

Some may recall that during the 2010 IHA update proposal, progress was eventually halted in part due to many unanswered questions related to what rule changes were envisioned for development standards within the proposed IHAs, especially given the increased size of the proposed areas. For this reason, staff proposed the following rule language concepts at your November 2018 meeting, to be considered by the Commission:

- All existing structures within the new IHAs be grandfathered; and clarify that the existing grandfathering provisions contained within 15A NCAC 07H .0306(a)(5) apply within IHAs.
- All lots under 15,000 square feet, platted after July 23, 1984 or before the effective date of these amendments, would be grandfathered with respect to density restrictions.
- Remove the distinction between "residential" and "commercial" structures and limit all new and expanded construction to a maximum of 5,000 square feet of heated space.
- Remove restrictions on the number of units allowed in a structure.
- Use the calculated shoreline change rates inside the IHAs, instead of the rates from the adjacent OEAs to determine construction setbacks. Consistent with current practice, setbacks would be measured from first line of stable and natural vegetation.

Staff amended existing rule language to be consistent with the concepts listed above, and a draft version is attached for the Commission to consider.

Because shoreline change rates were calculated for each inlet, Staff is proposing that these rates be used to calculate blocked erosion rates for the purpose of establishing inlet area setback factors utilizing a similar method of smoothing and blocking that is applied on the oceanfront. Staff will also present setback scenarios that illustrate existing setback requirements compared to setbacks based on inlet shoreline change rates. With the exceptions of Ocean Isle at Shallotte Inlet, and North Topsail Beach at New River Inlet, setback scenarios using inlet shoreline change rates are generally similar to existing setback requirements (see Table 5).

Table 5. This table illustrates a comparison of setback requirements within the area of the newly proposed IHAs, using existing adjacent setback factors (SBF), 2019 updated adjacent SBFs, and setback calculated using inlet shoreline change rates. The number represents the blocked shoreline change rate, or setback factor, starting from the IHA-OEA boundary, and moving towards the inlet.

Structure Summary (Existing IHA)	Existing SBFs (2013 update study)	2019 SBFs	2019 IHA SBFs
Tubbs Inlet - Sunset Beach	2	2	2
Tubbs Inlet - Ocean Isle	2	2	2
Shallotte Inlet - Ocean Isle	6.5	5	2, 3, 5, 8, 12, 16, 18, 16, 13
Shallotte Inlet - Holden Beach	2	2	2, 5
Lockwood Folly Inlet - Holden Beach	7	6	2, 3, 4, 3, 2, 5
Lockwood Folly Inlet - Oak Island	2	2	2
Carolina Beach Inlet - Carolina Beach	6.5	7	2
Masonboro Inlet - Wrightsville Beach	2	2	2
Mason Inlet - Wrightsville Beach	2	2	2
Mason Inlet - Figure Eight	2	2	2
Rich Inlet - Figure Eight	2	2	2
New Topsail Inlet - Topsail Beach	2	2	2
New River Inlet - N. Topsail Beach	2	2	2, 4.5, 8, 7, 8
Bogue Inlet - Emerald Isle	2	2	4.5, 2

Staff's Proposal to the Commission

Staff is seeking the Commission's consideration of approval of the Science Panel's proposed Inlet Hazard Area Update report and maps, and proposed rule amendments.

Attachment A: Rules Pertaining to Inlet Hazard Areas & Staff's Proposed Rule Amendments.
Attachment B: CRC Science Panel's 2019 Proposed Inlet Hazard Area Update Maps.
Attachment C: Inlet Hazard Area Boundary 2019 Update: Science Panel Recommendations to the North Carolina Coastal Resources Commission (final report).

Appendix A: Rules Pertaining to Inlet Hazard Areas & Staff's Proposed Rule Amendments:

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 the 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 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 180 ~~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 or in 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.

(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 migrates, 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~~ "Inlet Hazard Area Boundary, 2019 Update: Science Panel Recommendations to the North Carolina Coastal Resources Commission" are incorporated by reference and are hereby designated as Inlet Hazard Areas, except for:

(a) inlets providing access to a State Port via a channel maintained by the United States Army Corps of Engineers

~~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 Environmental Quality, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Item (1) of this Rule.

For the purposes of this Rule, Inlet Hazard Area setback factors are based on the long-term average annual shoreline change rates calculated using methods detailed in the report entitled "Inlet Hazard Area Boundary, 2019 Update: Science Panel Recommendations to the North Carolina Coastal Resources Commission". Inlet Hazard Area setback factors are depicted on maps entitled "2019 Inlet Setback Factors" and approved by the Coastal Resources Commission on MONTH DAY, YEAR (except as such rates may be varied in individual contested cases or in declaratory or interpretive rulings). In all cases, Inlet Hazard Area construction setback factors shall be no less than two where accretion rates are measured, or erosion rates are less than two feet per year. The maps are available without cost from any Local Permit Officer or the Division of Coastal Management or at the website referenced in Item (1) of this Rule.

(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 due to 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 Item (1) 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 until the vegetation has re-established in accordance with 15A NCAC 07H .0305(a)(5). At the expiration of the time specified or the re-establishment of the vegetation, 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. July 1, 2016; September 1, 2015; May 1, 2014; February 1, 2013; January 1, 2010; February 1, 2006; October 1, 2004; April 1, 2004; 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 shall be 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 shall be set in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established on state owned lands or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

(4) The ocean hazard setback shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule ~~.0304 of this Section~~ 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 shall not be 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.

(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. 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 shall be 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 require 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, and commercial 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)(5) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)(5)(A) of this Rule; and

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

(6) If a primary dune exists in the AEC on or landward of the lot where the development is proposed, the development shall be landward of the crest of the primary dune, the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line, or measurement

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

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

(8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot where development is proposed, the structure shall be landward of the ocean hazard setback or development line, whichever is more restrictive.

(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.

(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.

(11) 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 in accordance with 15A NCAC 07J .1300.

(12) In order to allow for development landward of the large-scale beach fill project that cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (a)(1) and (a)(5) of this Rule, a local government, group of local governments involved in a regional beach fill project, or qualified "owners' association" as defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline, may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception shall apply 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)(5)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner, and the boundaries

of the large-scale beach fill project. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;

(B) Development setbacks shall be calculated from the shoreline erosion rate in place at the time of permit issuance;

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

(D) With the exception of swimming pools, the development defined in Rule .0309(a) of this Section shall be allowed oceanward of the static vegetation line; and

(E) Development shall not be eligible for the exception defined in Rule .0309(b) of this Section.

(b) No development shall be permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that 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 shall be 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 as documented by the local historic commission, the North Carolina Department of Natural and Cultural Resources, or the National Historical Registry.

(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 the 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. The acknowledgement shall state that 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 shall require permit approval. Structures relocated with public funds shall comply with the applicable setback line and 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 shall 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 pursuant to 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, 2017; February 1, 2017; April 1, 2016; September 1, 2013.

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, 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 07M .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 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.

(C) 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 property owner shall be responsible for removal of the temporary structure within 30 days of the end of the allowable time period.

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

to be actively pursuing a beach nourishment, inlet relocation or stabilization project if it has:

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

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

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

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

If beach nourishment, inlet relocation or stabilization is rejected by the sponsoring agency or community, or ceases to be actively planned for a section of shoreline, the time extension is void for that section of beach or community and existing sandbags are subject to all applicable time limits set forth in Part (F) of this Subparagraph.

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

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

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

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

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

(M) An imminently threatened structure may be protected only once, regardless of ownership, unless the threatened structure is located in a community that is actively pursuing a beach nourishment project, or in an Inlet Hazard Area and in a community that is actively pursuing an inlet relocation or stabilization project in accordance with (G) of this Subparagraph. Existing temporary erosion control structures located in Inlet Hazard Areas may be eligible for an additional eight year permit extension provided that the structure

being protected is still imminently threatened, the temporary erosion control structure is in compliance with requirements of this Subchapter and the community in which it is located is actively pursuing a beach nourishment, inlet relocation or stabilization project in accordance with Part (G) of this Subparagraph. In the case of a building, a temporary erosion control structure may be extended, or new segments constructed, if additional areas of the building become imminently threatened. Where temporary structures are installed or extended incrementally, the time period for removal under Part (F) or (G) of this Subparagraph shall begin at the time the initial 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 section of sandbags shall begin at the time that 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(c) Structural Accessways:

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

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

(A) The accessway is exclusively for pedestrian use;

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

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

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

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

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

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

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

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

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

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

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

15A NCAC 07H .0309 USE STANDARDS FOR OCEAN HAZARD AREAS: EXCEPTIONS

(a) The following types of development shall be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of the Subchapter if all other provisions of this Subchapter and other state and local regulations are met:

(1) campsites;

(2) driveways and parking areas with clay, packed sand or gravel;

(3) elevated decks not exceeding a footprint of 500 square feet;

(4) beach accessways consistent with Rule .0308(c) of this Subchapter;

(5) unenclosed, uninhabitable gazebos with a footprint of 200 square feet or less;

(6) uninhabitable, single-story storage sheds with a foundation or floor consisting of wood, clay, packed sand or gravel, and a footprint of 200 square feet or less;

(7) temporary amusement stands;

(8) sand fences; and

(9) swimming pools.

In all cases, this development shall be permitted only if it is landward of the vegetation line or static vegetation line, whichever is applicable; involves no alteration or removal of primary or frontal dunes which would compromise the integrity of the dune as a protective landform or the dune vegetation; has overwalks to protect any existing dunes; is not essential to the continued existence or use of an associated principal development; is not required to satisfy minimum requirements of local zoning, subdivision or health regulations; and meets all other non-setback requirements of this Subchapter.

(b) Where application of the oceanfront setback requirements of Rule .0306(a) of this Subchapter would preclude placement of permanent substantial structures on lots existing as of June 1, 1979, buildings shall be permitted seaward of the applicable setback line in ocean erodible areas, but not inlet hazard areas or unvegetated beach areas, if each of the following conditions are met:

(1) The development is set back from the ocean the maximum feasible distance possible on the existing lot and the development is designed to minimize encroachment into the setback area;

(2) The development is at least 60 feet landward of the vegetation line or static vegetation line, whichever is applicable;

(3) The development is not located on or in front of a frontal dune, but is entirely behind the landward toe of the frontal dune;

(4) The development incorporates each of the following design standards, which are in addition to those required by Rule .0308(d) of this Subchapter.

(A) All pilings shall have a tip penetration that extends to at least four feet below mean sea level;

(B) The footprint of the structure shall be no more than 1,000 square feet, and the total floor area of the structure shall be no more than 2,000 square feet. For the purpose of this Section, roof-covered decks and porches that are structurally attached shall be included in the calculation of footprint;

(C) Driveways and parking areas shall be constructed of clay, packed sand or gravel except in those cases where the development does not abut the ocean and is located landward of a paved public street or highway currently in use. In those cases concrete, asphalt or turfstone may also be used;

(D) No portion of a building's total floor area, including elevated portions that are cantilevered, knee braced or otherwise extended beyond the support of pilings or footings, may extend oceanward of the total floor area of the landward-most adjacent building. When the geometry or orientation of a lot precludes the placement of a building in line with the landward most adjacent structure of similar use, 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, static vegetation line or measurement line, whichever is applicable, a distance no less than 60 feet.

(5) All other provisions of this Subchapter and other state and local regulations are met. If the development is to be serviced by an on-site waste disposal system, a copy of a valid permit for such a system shall be submitted as part of the CAMA permit application.

~~(c) Reconfiguration and development of lots and projects that have a grandfather status under Paragraph (b) of this Rule shall be allowed provided that the following conditions are met:~~

~~(1) Development is setback from the first line of stable natural vegetation a distance no less than that required by the applicable exception;~~

~~(2) Reconfiguration shall not result in an increase in the number of buildable lots within the Ocean Hazard AEC or have other adverse environmental consequences.~~

~~For the purposes of this Rule, an existing lot is 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. The footprint is defined as the greatest exterior dimensions of the structure, including covered decks, porches, and stairways, when extended to ground level.~~

~~(d)~~(c) The following types of water dependent development shall be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of this Section if all other provisions of this Subchapter and other state and local regulations are met:

(1) piers providing public access; and

(2) maintenance and replacement of existing state-owned bridges and causeways and accessways to such bridges.

~~(e)~~(d) Replacement or construction of a pier house associated with an ocean pier shall be permitted if each of the following conditions is met:

(1) The ocean pier provides public access for fishing and other recreational purposes whether on a commercial, public, or nonprofit basis;

(2) Commercial, non-water dependent uses of the ocean pier and associated pier house shall be limited to restaurants and retail services. Residential uses, lodging, and parking areas shall be prohibited;

(3) The pier house shall be limited to a maximum of two stories;

(4) A new pier house shall not exceed a footprint of 5,000 square feet and shall be located landward of mean high water;

(5) A replacement pier house may be rebuilt not to exceed its most recent footprint or a footprint of 5,000 square feet, whichever is larger;

(6) The pier house shall be rebuilt to comply with all other provisions of this Subchapter; and

(7) If the pier has been destroyed or rendered unusable, replacement or expansion of the associated pier house shall be permitted only if the pier is being replaced and returned to its original function.

~~(f)~~(e) In addition to the development authorized under Paragraph (d) of this Rule, small scale, non-essential development that does not induce further growth in the Ocean Hazard Area, such as the construction of single family piers and small scale erosion control measures that do not interfere with natural oceanfront processes, shall be permitted on those non-oceanfront portions of shoreline that exhibit features characteristic of an Estuarine Shoreline. Such features include the presence of wetland vegetation, and lower wave energy and erosion rates than in the adjoining Ocean Erodible Area. Such development shall be permitted under the standards set out in Rule .0208 of this Subchapter. For the purpose of this Rule, small scale is defined as those projects which are eligible for authorization under 15A NCAC 07H .1100, .1200 and 07K .0203.

~~(g)~~(f) Transmission lines necessary to transmit electricity from an offshore energy-producing facility may be permitted provided that each of the following conditions is met:

(1) The transmission lines are buried under the ocean beach, nearshore area, and primary and frontal dunes, all as defined in Rule 07H .0305, in such a manner so as to ensure that the placement of the transmission lines involves no alteration or removal of the primary or frontal dunes; and

(2) The design and placement of the transmission lines shall be performed in a manner so as not to endanger the public or the public's use of the beach.

History Note: *Authority G.S. 113A-107(a); 113A-107(b); 113A-113(b)(6)a; 113A-113(b)(6)b; 113A-113(b)(6)d; 113A-124;*
Eff. February 2, 1981;
Amended Eff. June 1, 2010; February 1, 2006; September 17, 2002 pursuant to S.L. 2002-116; August 1, 2000; August 1, 1998; April 1, 1996; April 1, 1995; February 1, 1993; January 1, 1991; April 1, 1987.

15A NCAC 07H .0310 USE STANDARDS FOR INLET HAZARD AREAS

(a) ~~Inlet areas~~ Inlet Hazard Areas as defined ~~by~~ in Rule ~~.0304 of this Section~~ 15A NCAC 07H .0304 are subject to inlet migration, rapid and severe changes in watercourses, flooding and strong tides. Due to this extremely hazardous nature of the Inlet Hazard Areas, all development within these areas shall be permitted in accordance with the following standards:

(1) ~~All development in the inlet hazard area shall be set back from the first line of stable natural vegetation a distance equal to the setback required in the adjacent ocean hazard area~~ The Inlet Hazard Area setback for development shall be measured in a landward direction from the first line of stable and natural vegetation, the static vegetation line, or the measurement line, whichever is applicable;

(2) 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 in accordance with 15A NCAC 07H .0306 (5);

~~(2)~~(3) Permanent structures shall be permitted at a density of no more than one ~~commercial or residential~~ unit per 15,000 square feet of land area on lots subdivided or created after July 23, 1981 or before June 20, 2019;

~~(3)~~(4) Only ~~residential~~ structures ~~of four units or less or non-residential structures of~~ less than 5,000 square feet total floor area shall be allowed within the ~~inlet hazard area~~ Inlet Hazard Area, except that access roads to those areas and maintenance and replacement of existing bridges shall be allowed;

~~(4)~~(5) Established common-law and statutory public rights of access to the public trust lands and waters in Inlet 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;

~~(5)~~(6) All other rules in this Subchapter pertaining to development in the ~~ocean hazard areas~~ Ocean Hazard Areas shall be applied to development within the Inlet Hazard Areas.

(b) The ~~inlet hazard area~~ Inlet Hazard Area setback requirements shall not apply to the types of development exempted from the ocean setback rules in 15A NCAC 7H .0309(a), nor, to the types of development listed in 15A NCAC 7H .0309(c).

(c) In addition to the types of development excepted under Rule .0309 of this Section, small scale, non-essential development that does not induce further growth in the Inlet Hazard Area, such as the construction of single-family piers and ~~small scale~~ small-scale erosion control measures that do not interfere with natural inlet movement, may be permitted on those portions of shoreline within a designated Inlet Hazard Area that exhibit features characteristic of Estuarine Shoreline. Such features include the presence of wetland vegetation, lower wave energy, and lower erosion rates than in the adjoining Ocean Erodible Area. Such development shall be permitted under the standards set out in Rule .0208 of this Subchapter. For the purpose of this Rule, small scale is defined as those projects which are eligible for authorization under 15A NCAC 7H .1100, .1200 and 7K .0203.

History Note: *Filed as a Temporary Amendment Eff. October 30, 1981, for a period of 70 days to expire on January 8, 1982;*

Filed as an Emergency Rule Eff. September 11, 1981, for a period of 120 days to expire on January 8, 1982;
Authority G.S. 113A-107; 113A-113(b); 113A-124;
Eff. December 1, 1981;
Amended Eff. April 1, 1999; April 1, 1996; December 1, 1992; December 1, 1991; March 1, 1988.

APPENIX B: CRC Science Panel's 2019 Proposed Inlet Hazard Area Update Maps

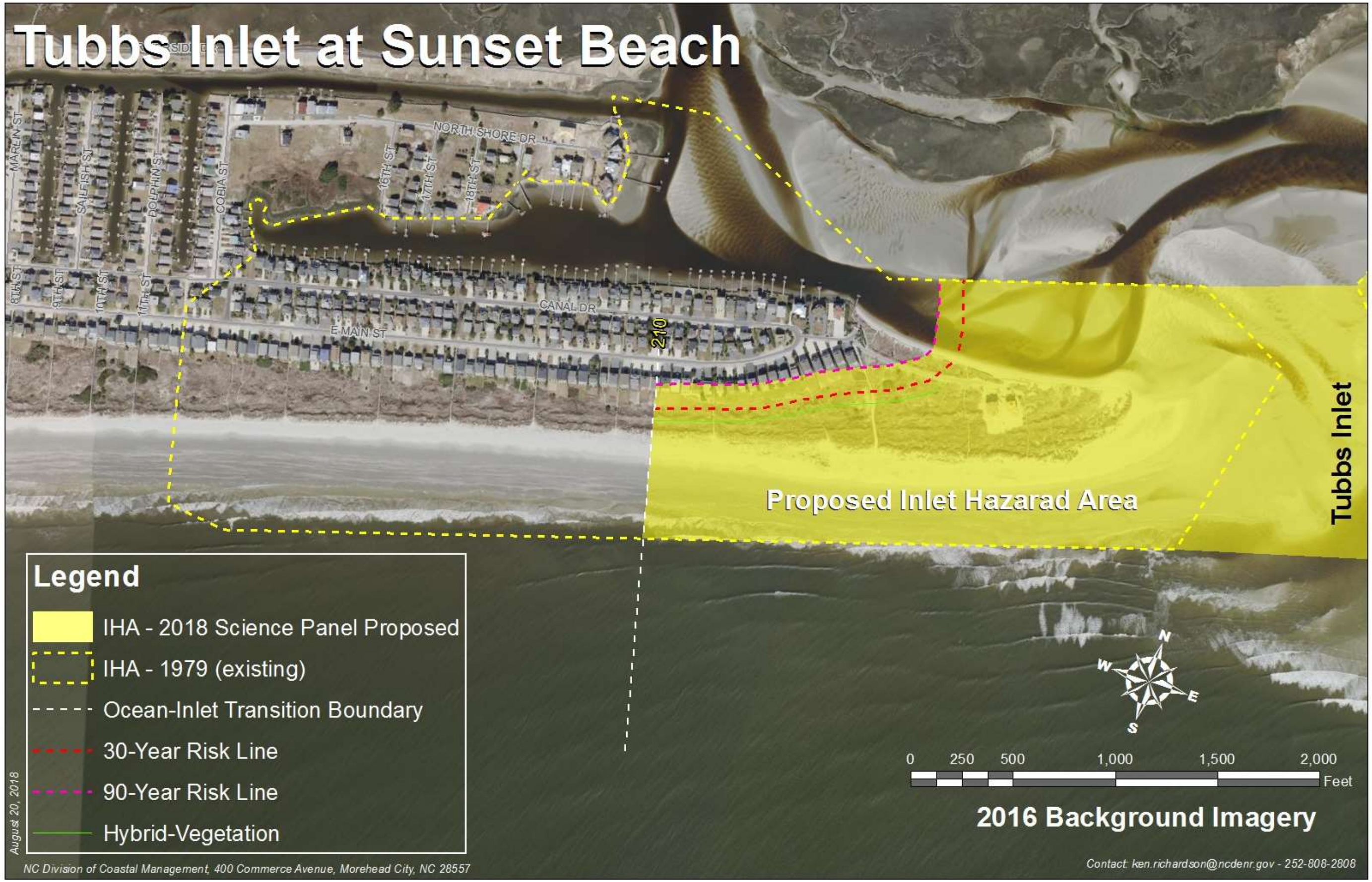
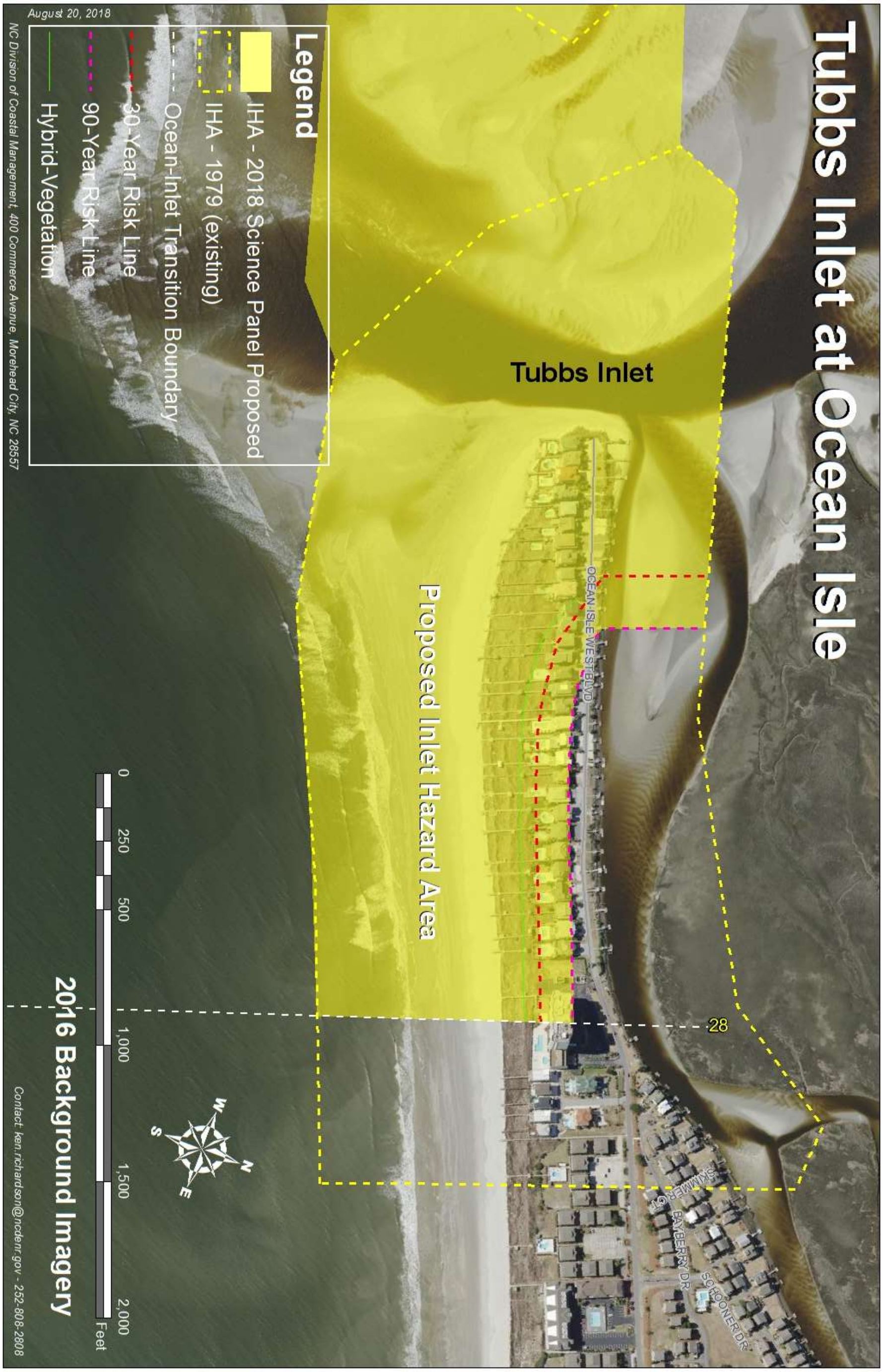


Figure 1. Proposed IHA Boundary at Tubbs Inlet - Sunset Beach

Figure 2. Proposed IHA Boundary at Tubbs Inlet - Ocean Isle



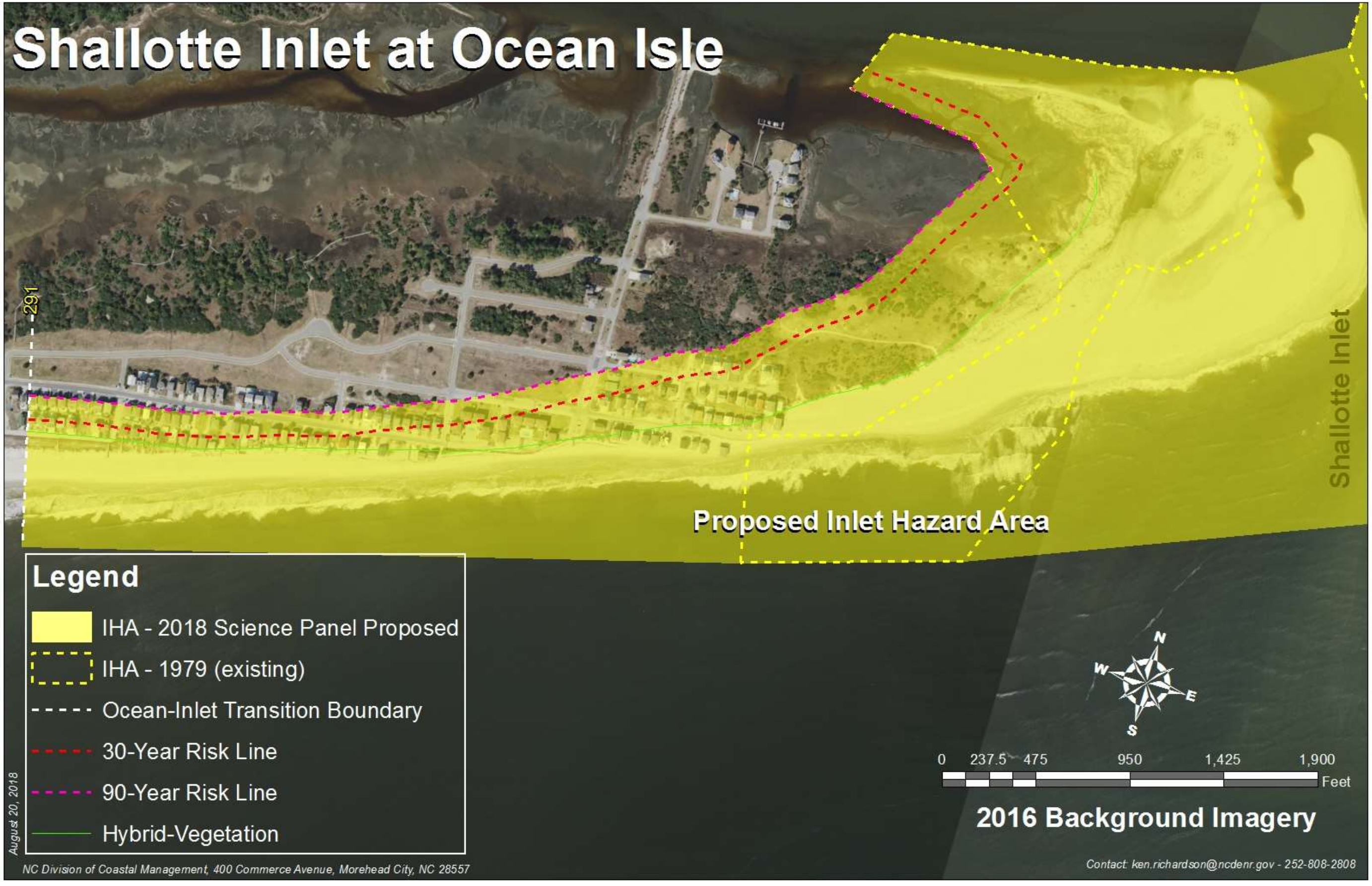


Figure 3. Proposed IHA Boundary Update at Shallotte Inlet - Ocean Isle

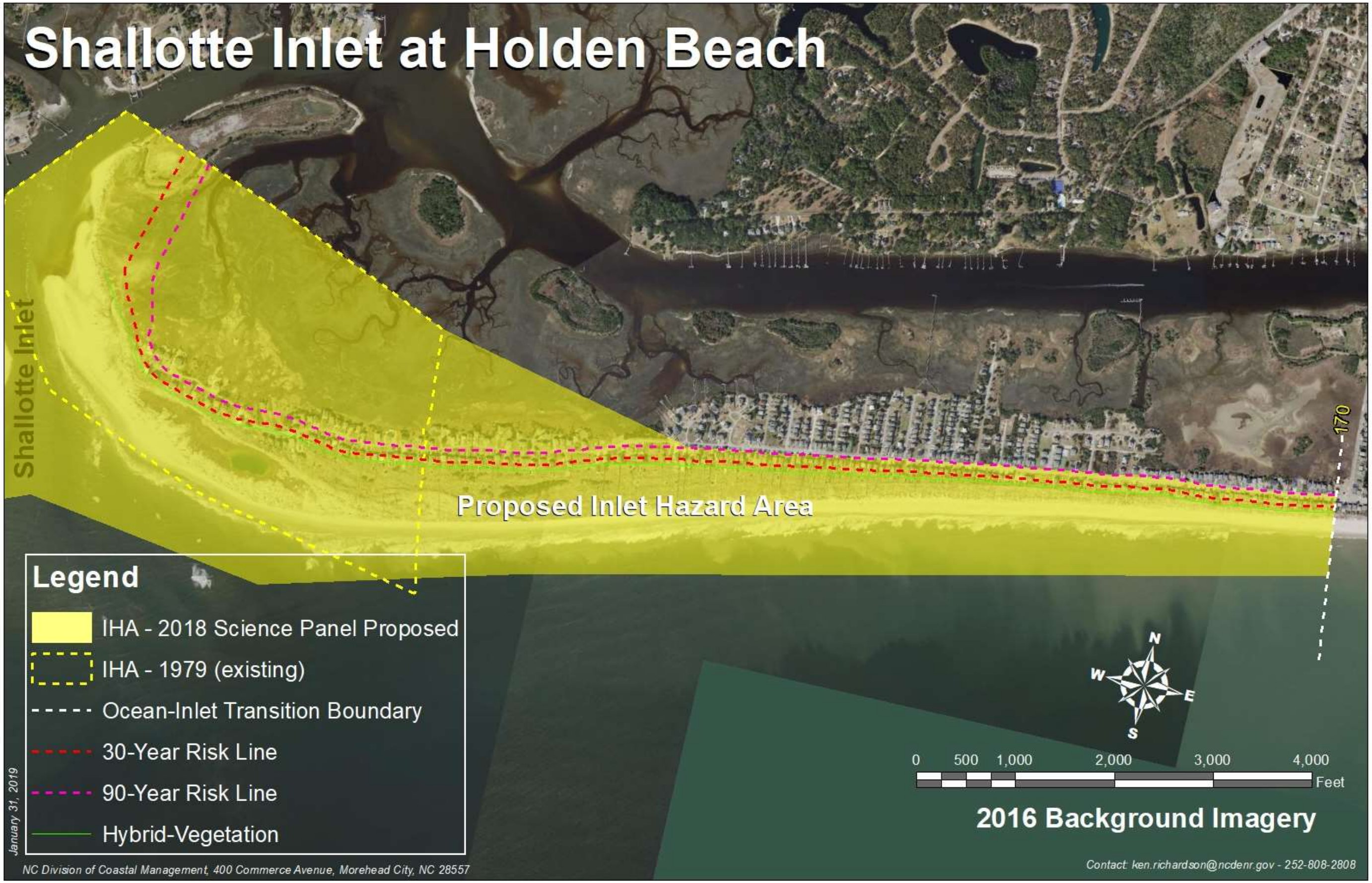


Figure 4. Proposed IHA Boundary Update at Shallotte Inlet - Holden Beach

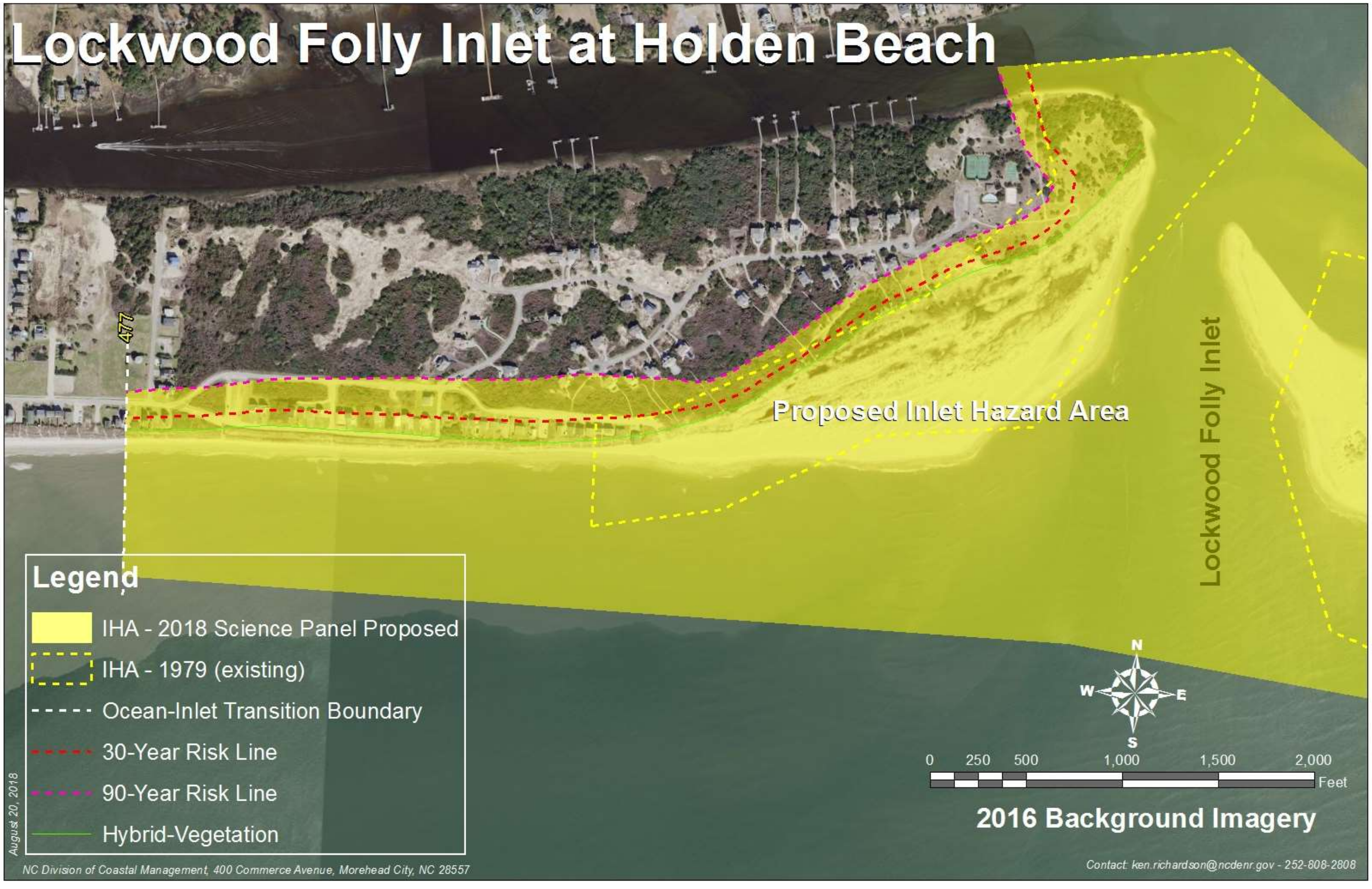


Figure 5. Proposed IHA Boundary Update at Lockwood Folly Inlet - Holden Beach

Figure 6. Proposed IHA Boundary Update at Lockwood Folly Inlet - Oak Island

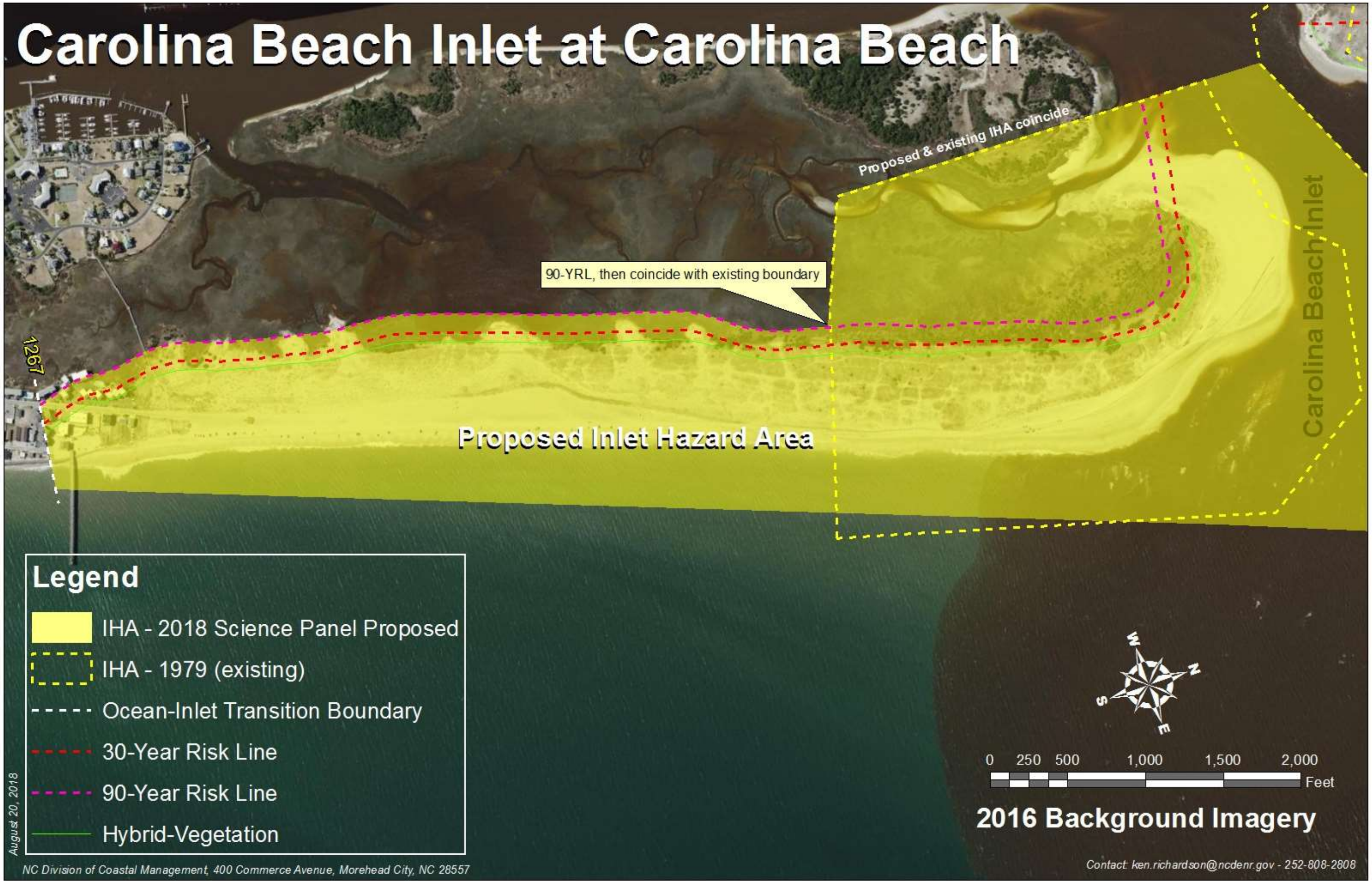


Figure 7. Proposed IHA Boundary Update at Carolina Beach Inlet - Carolina Beach

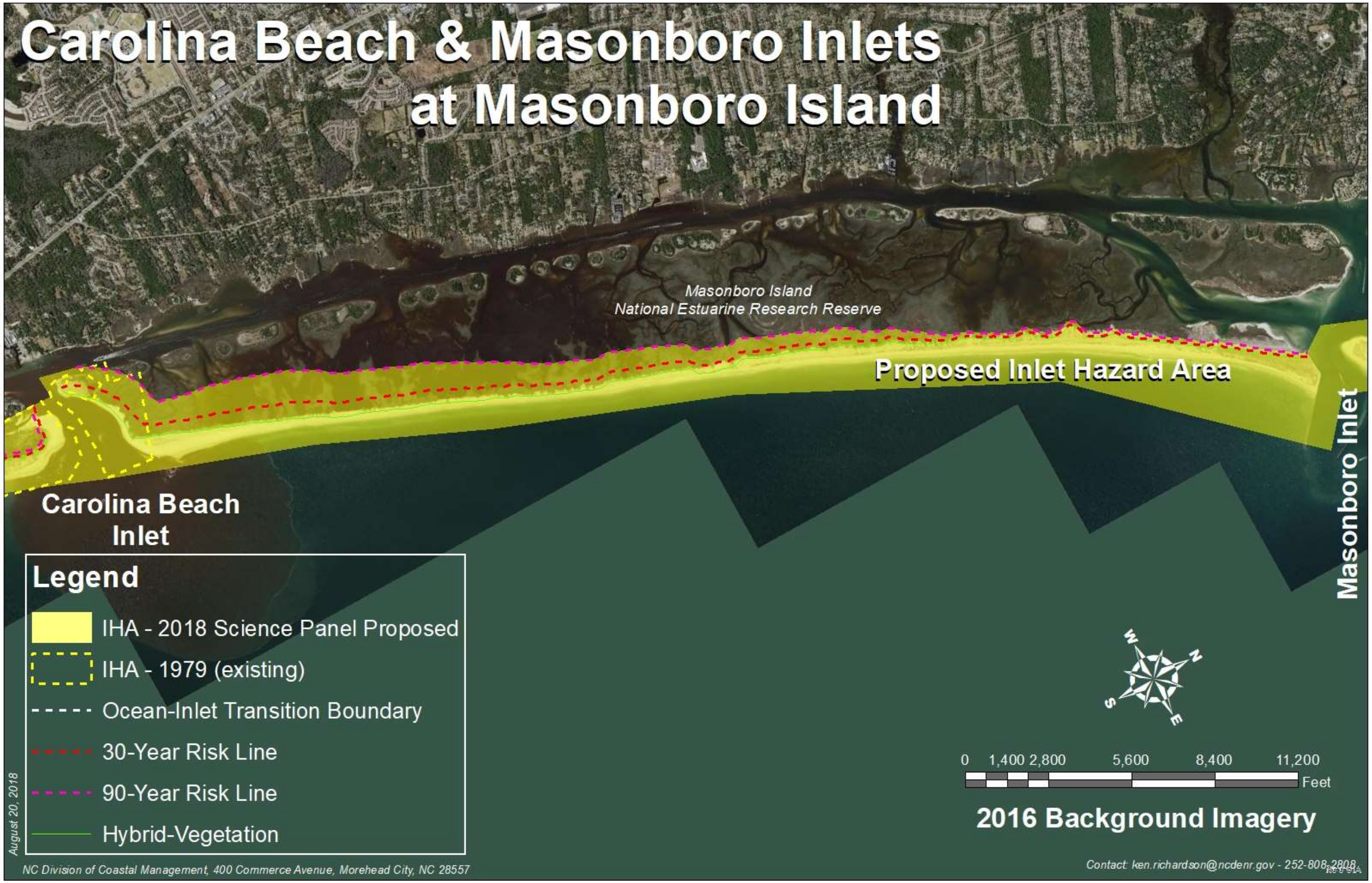


Figure 8. Proposed IHA Boundary Update at Carolina Beach & Masonboro Inlets – Masonboro Island

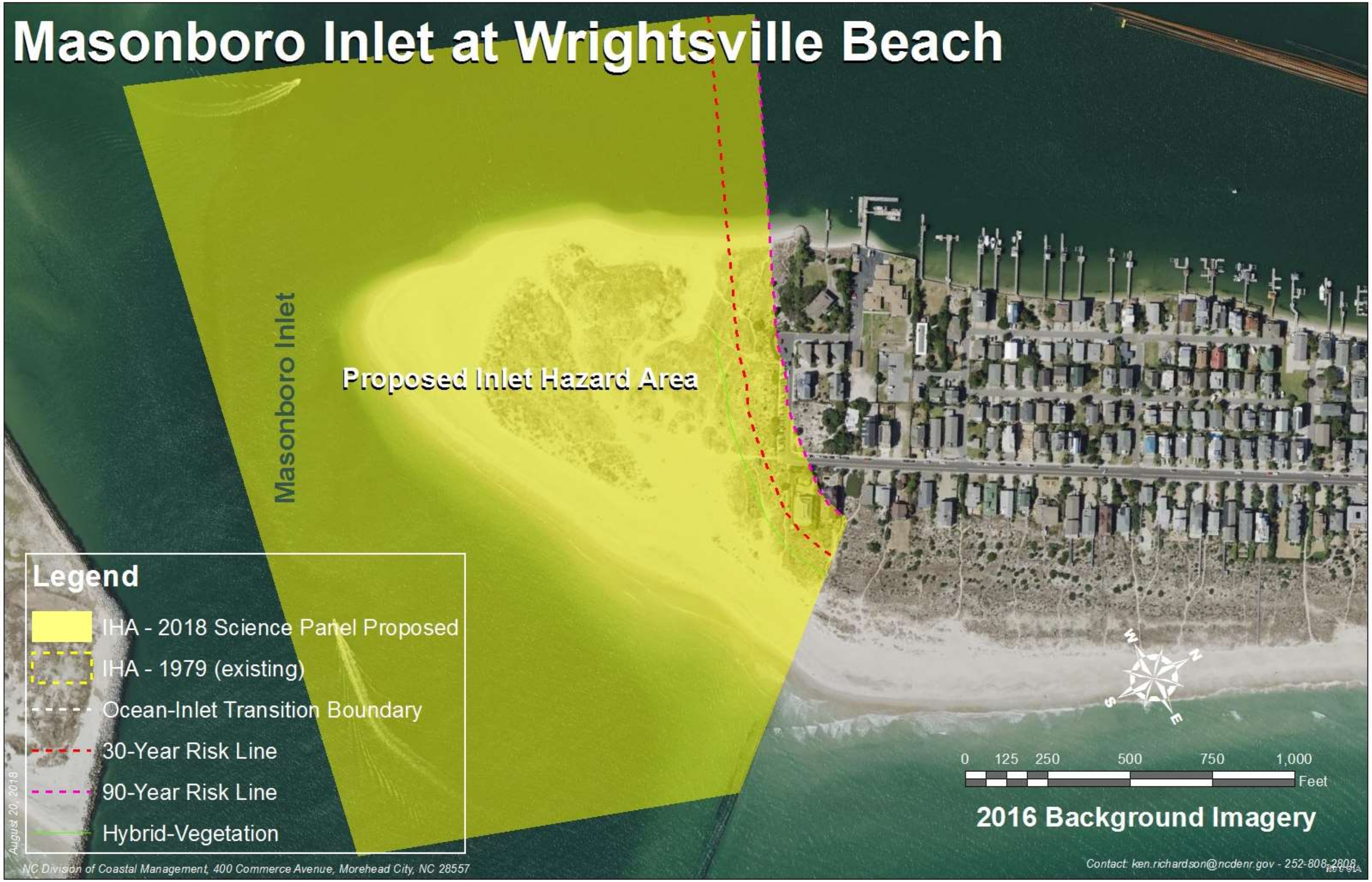


Figure 9. Proposed IHA Boundary Update at Masonboro Inlet - Wrightsville Beach

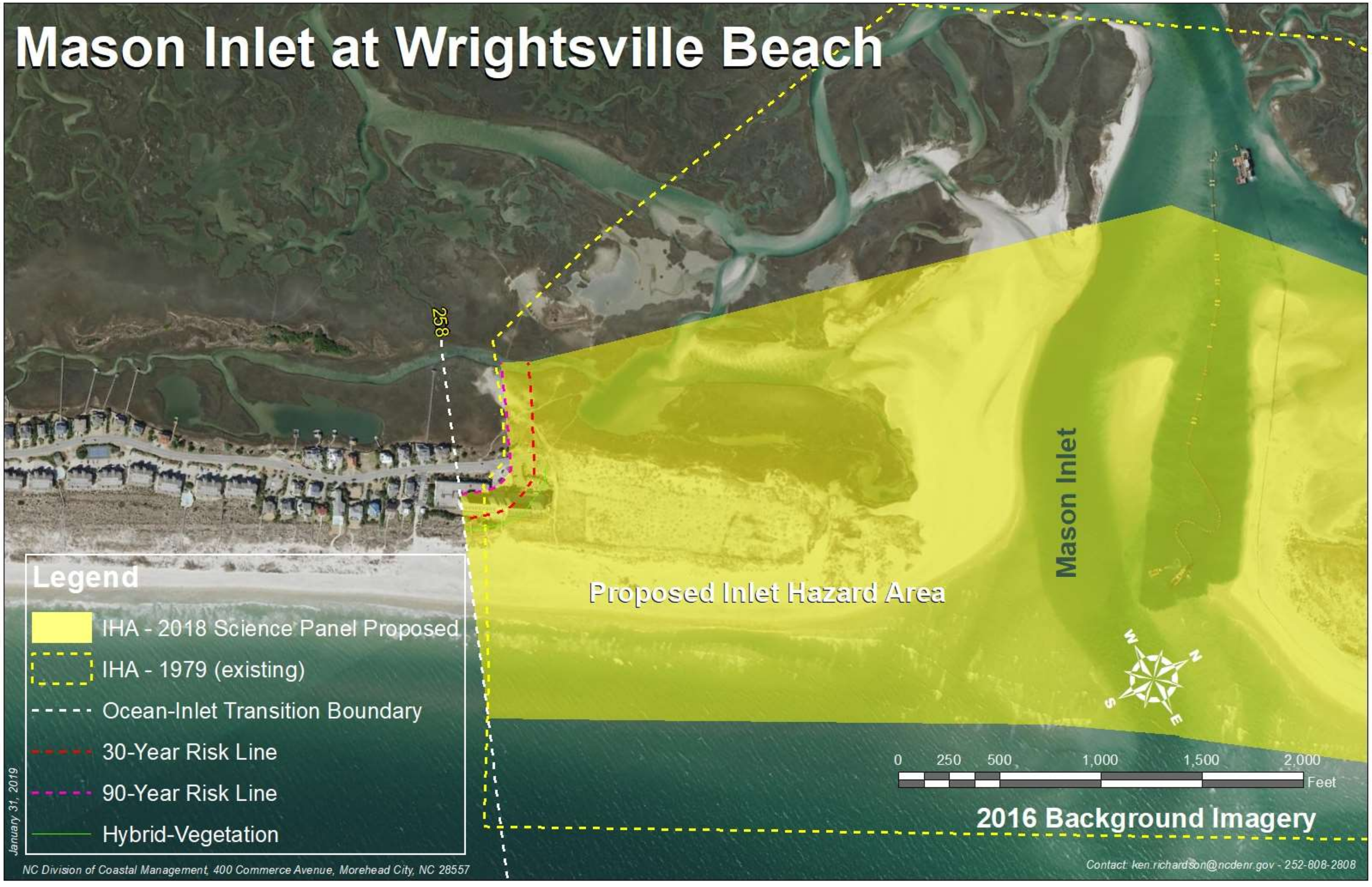


Figure 10. Proposed IHA Boundary Update at Mason Inlet - Wrightsville Beach

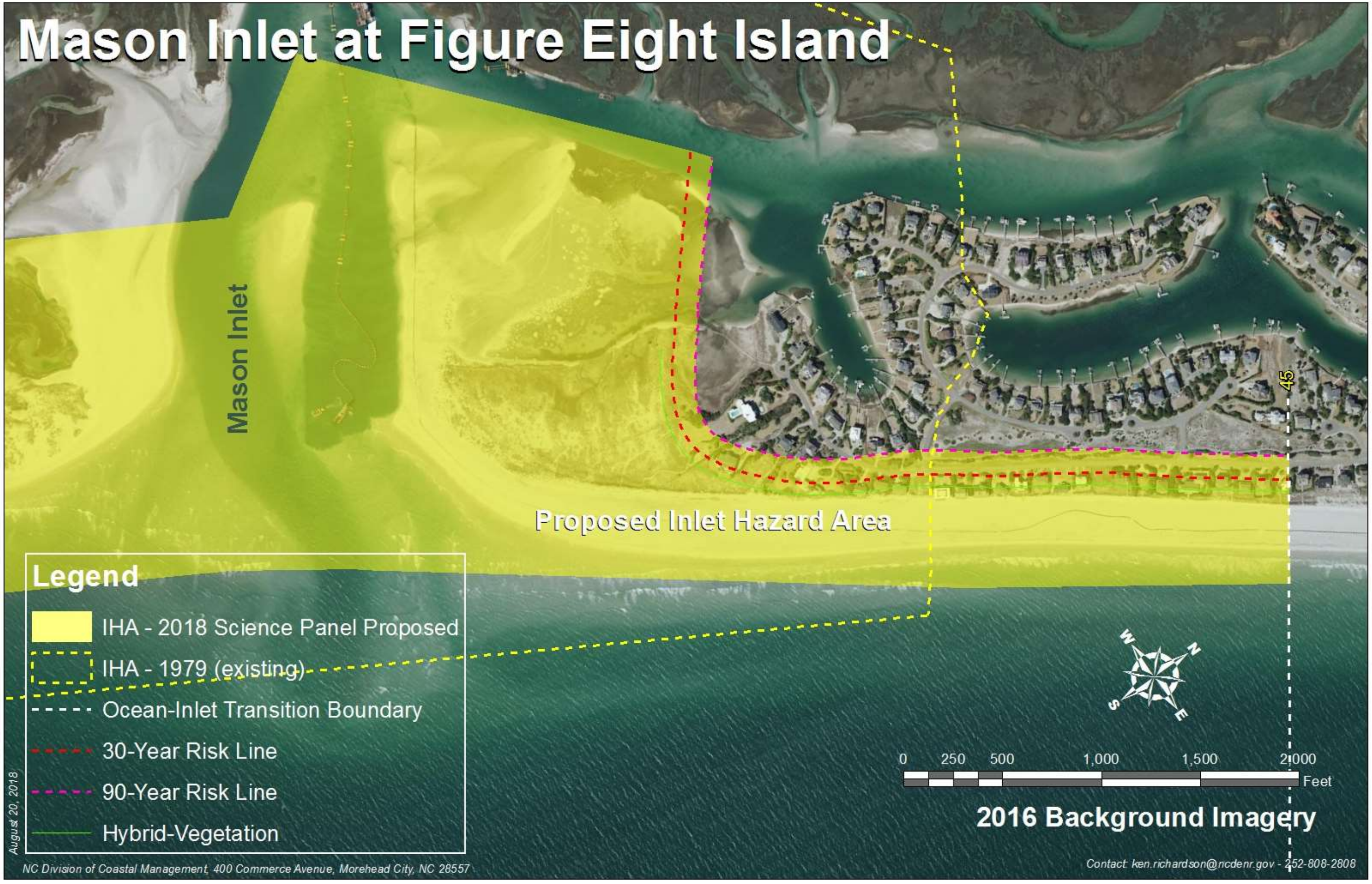


Figure 11. Proposed IHA Boundary Update at Mason Inlet - Figure Eight Island

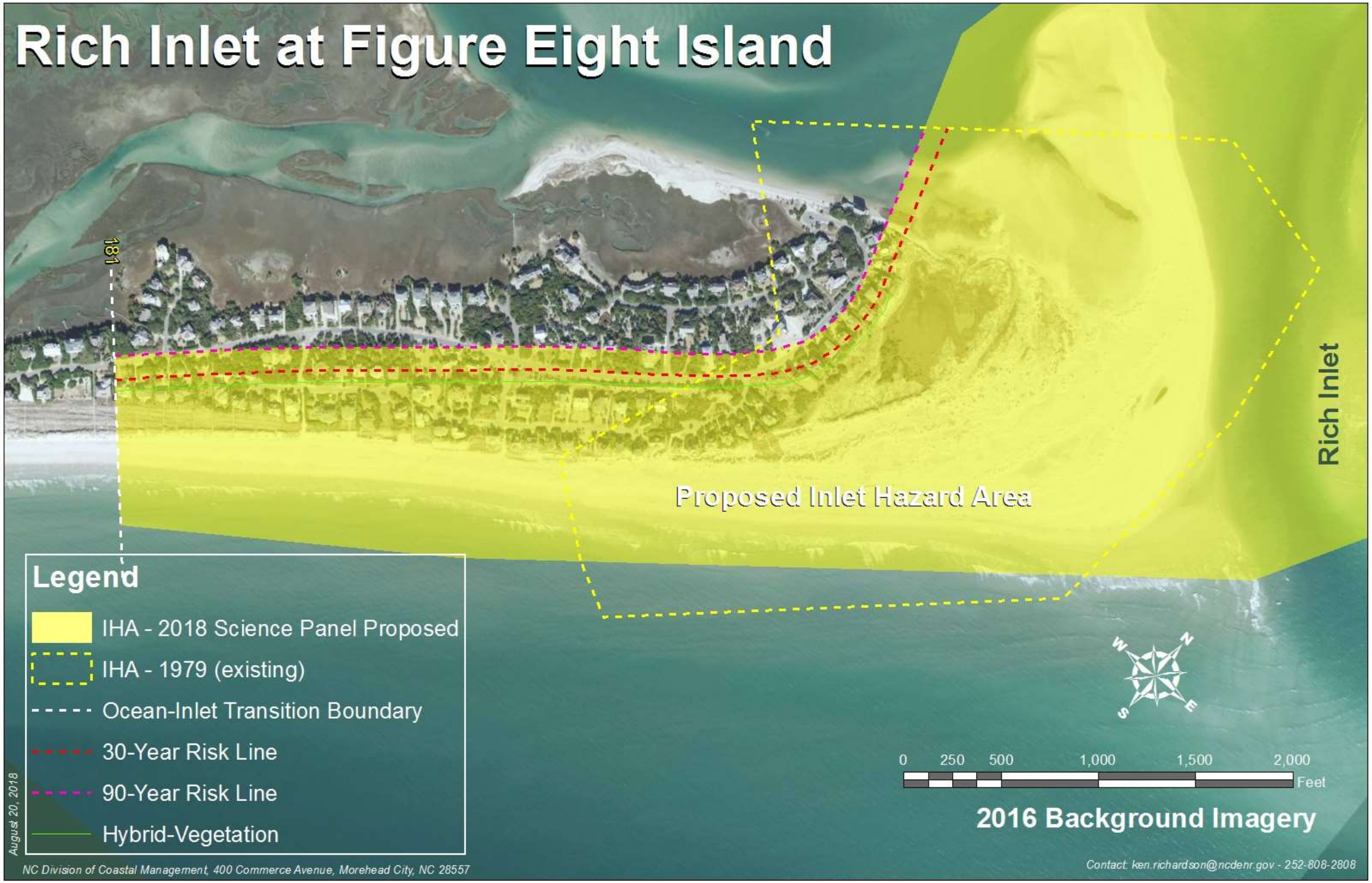


Figure 12. Proposed IHA Boundary Update at Rich Inlet - Figure Eight Island

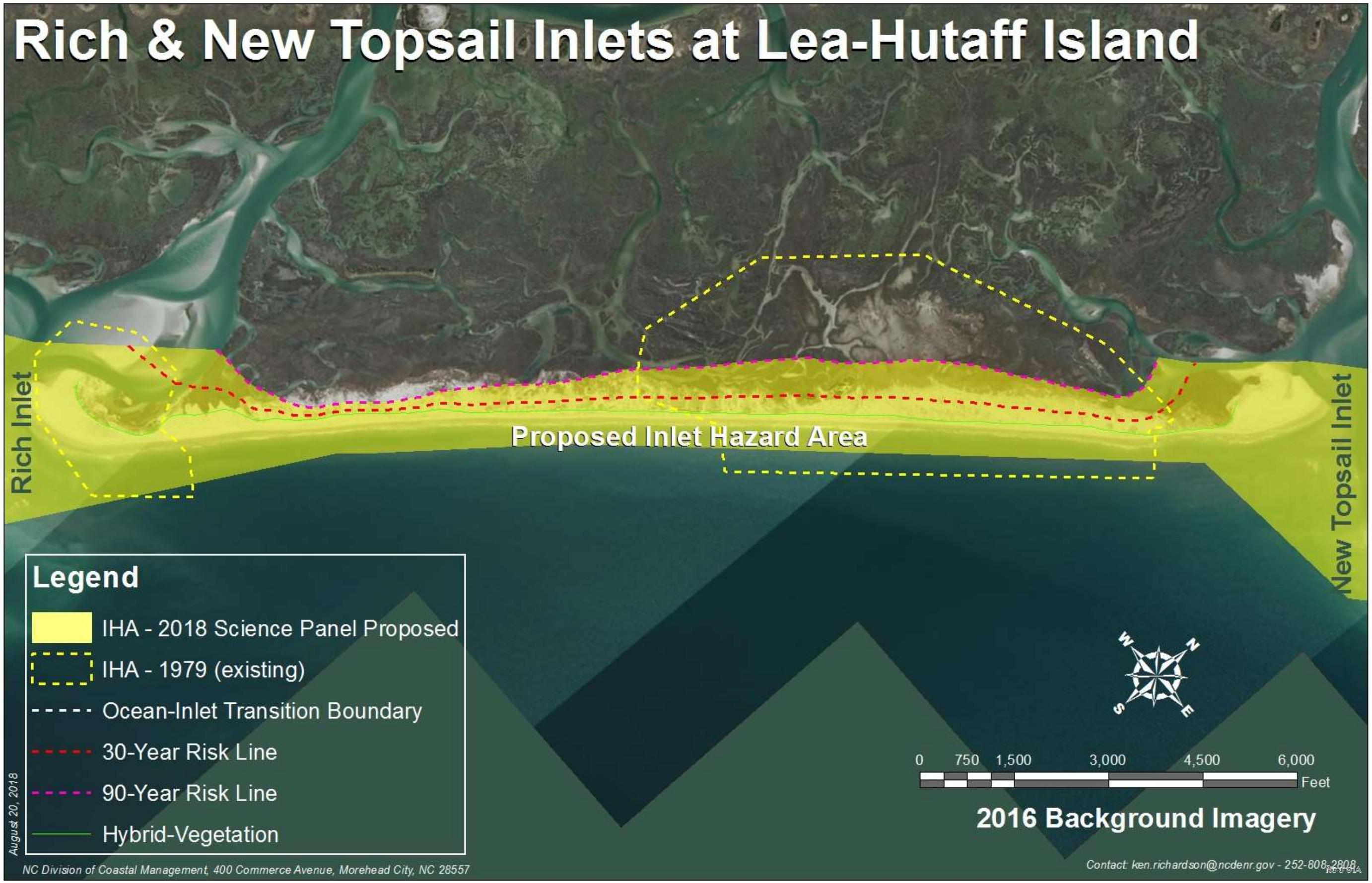


Figure 13. Proposed IHA Boundary Update at Rich & New Topsail Inlets at Lea-Hutaff Island

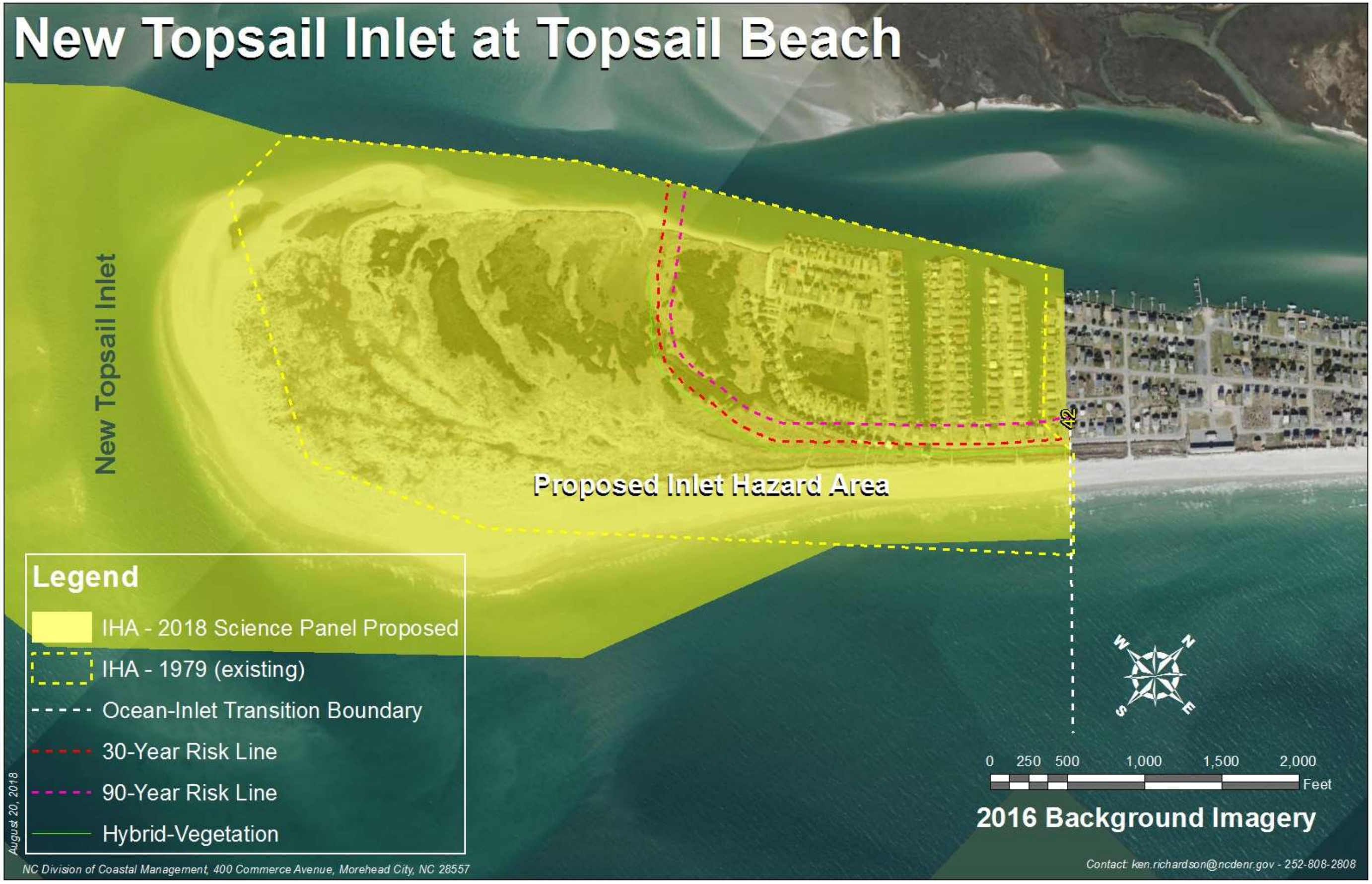


Figure 14. Proposed IHA Boundary Update at New Topsail Inlet - Topsail Beach

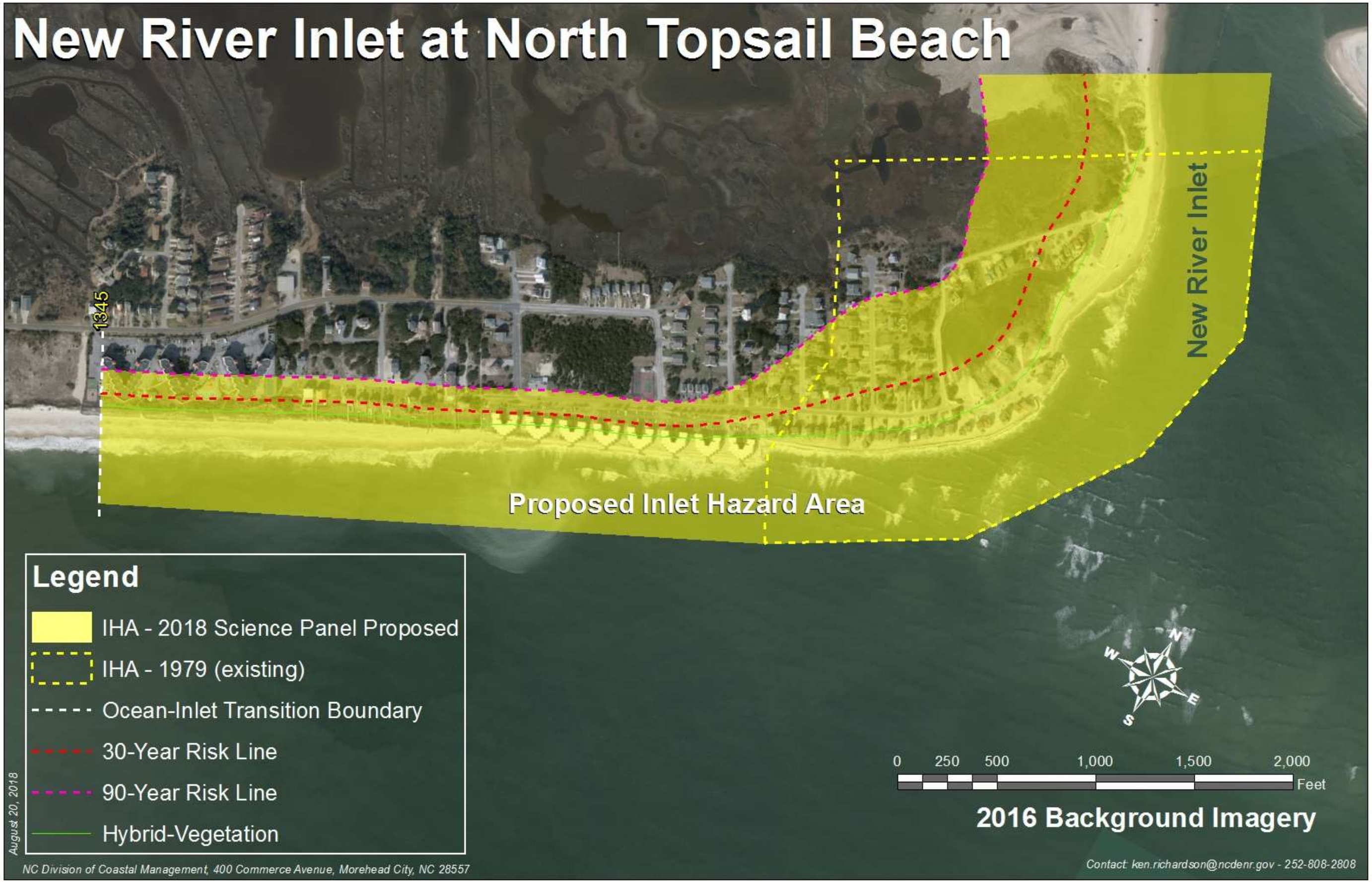


Figure 15. Proposed IHA Boundary Update at New River Inlet - North Topsail Beach

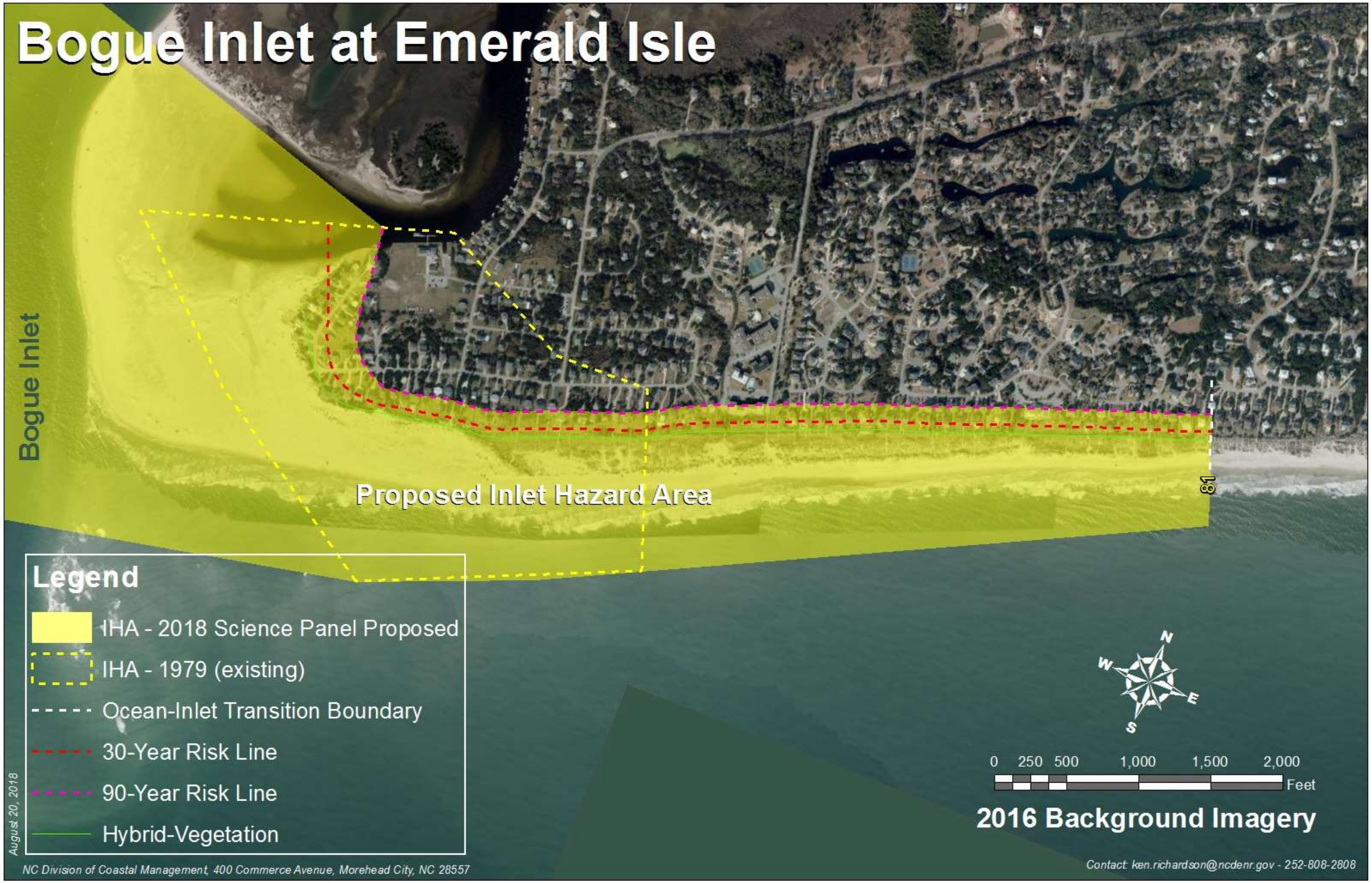


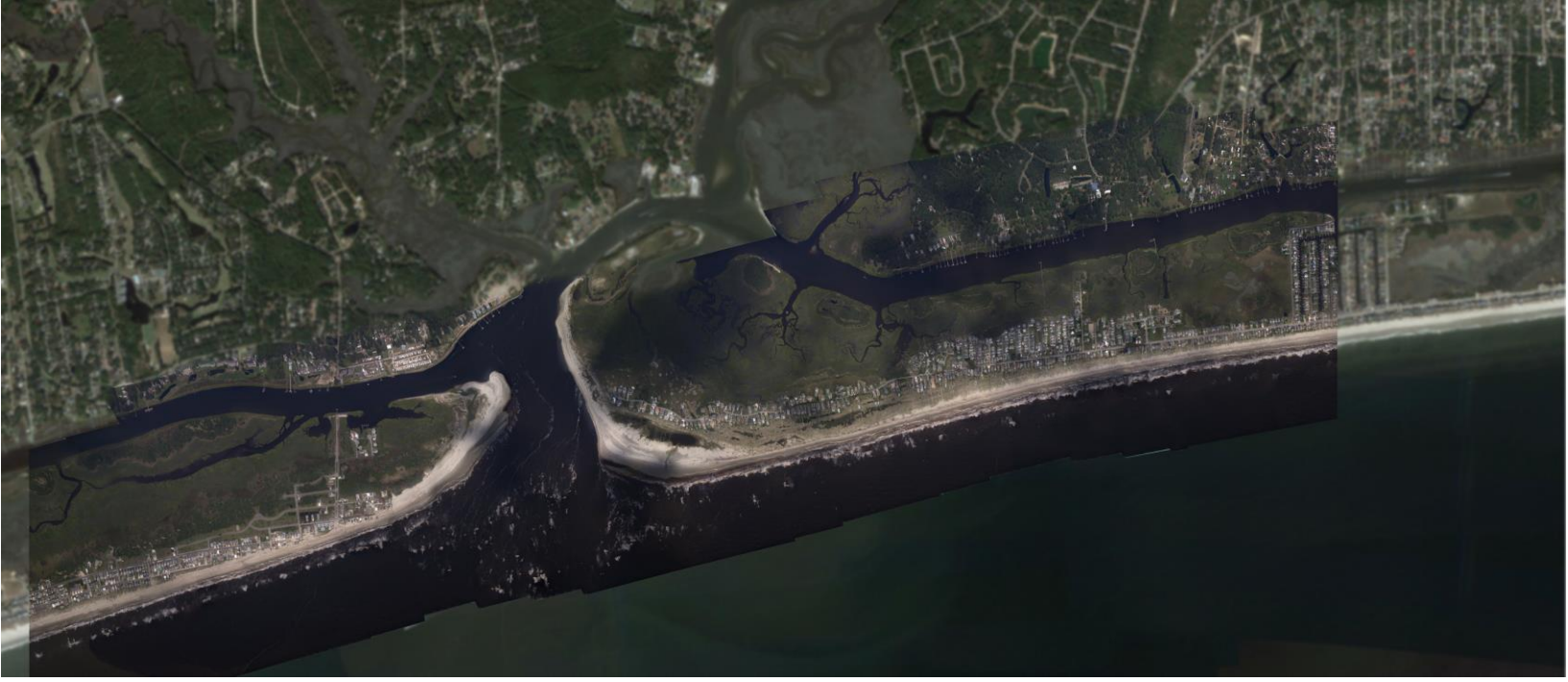
Figure 16. Proposed IHA Boundary Update at Bogue Inlet - Emerald Isle

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

Attachment C: Inlet Hazard Area Boundary 2019 Update: Science Panel Recommendations to the North Carolina Coastal Resources Commission (final report).

North Carolina Department of Environmental Quality | Division of Coastal Management
Morehead City Office | 400 Commerce Avenue | Morehead City, North Carolina 28557
252.808.2808

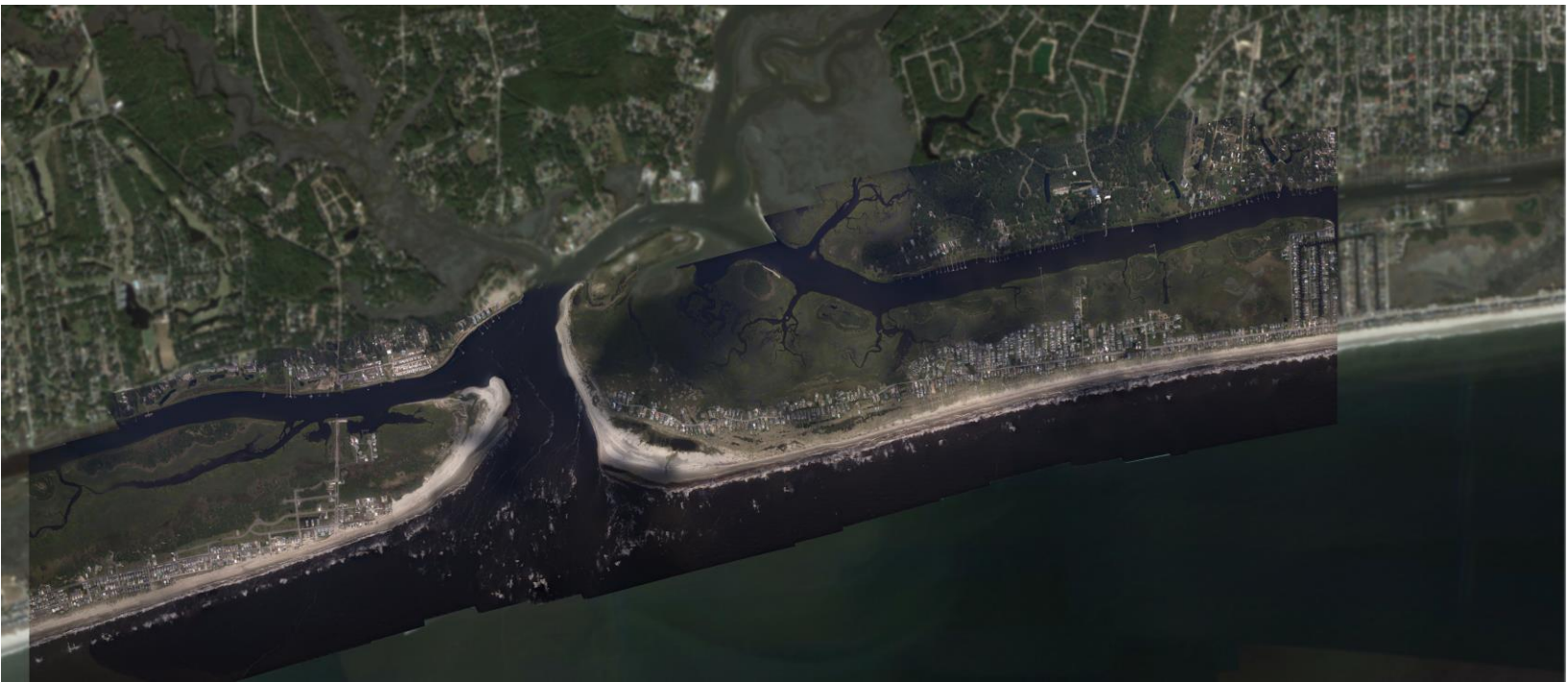


Inlet Hazard Area Boundary, 2019 Update:

Science Panel Recommendations to the North Carolina Coastal Resources Commission

February 12, 2019

NC Coastal Resources Commission's Science Panel on Coastal Hazards
& NC Division of Coastal Management



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Acknowledgments

The Inlet Hazard Area (IHA) boundaries in use today were adopted in 1979. The North Carolina Coastal Resources Commission's (CRC) Science Panel on Coastal Hazards first recommended the need to update the IHA boundaries in 1999 and an earlier report was prepared and presented, but not adopted, in 2010. This present effort responds to a CRC 2016 request to update the IHA boundaries. It is a result of a close collaborative effort between the Science Panel and the Division of Coastal Management (DCM). The Science Panel members provided their inlet knowledge and experience and guided the development of the final methodology used. The DCM, led by Mr. Ken Richardson, developed all the statistics and maps, kept track of the changes and prepared the first draft of the report. His efforts were supported by the DCM staff, including Mr. Mike Lopazanski, Mr. Tancred Miller and Dr. Braxton Davis. Members of the Science Panel include: Mr. Steve Benton (DCM retired); Mr. Bill Birkemeier (USACE Field Research Facility retired, Science Panel Co-Chair); Dr. Bill Cleary (UNC Wilmington emeritus); Mr. Tom Jarrett, PE (Coastal Planning and Engineering); Dr. Margery Overton (Science Panel Co-chair, NC State University); Dr. Charles "Pete" Peterson (UNC Chapel Hill Institute for Marine Sciences); Mr. Spencer Rogers (NC Sea Grant); Mr. Greg "Rudi" Rudolph (Carteret County Shore Protection Office); and Dr. Beth Sciaudone, PE (NC State University).

The authors also extend gratitude to the NC Department of Transportation Photogrammetry Unit whose collaborative efforts provided much of the historical aerial orthophotos necessary to study historical shoreline trends.

The authors also extend appreciation to the numerous and diverse stakeholders that contributed ideas and concepts that added to the quality and accuracy of what this report intends to achieve. Finally, the authors wish to thank the past and current members of the CRC, whose unending support of their staff (DCM) and overall guidance on coastal policy and issues continues to protect and preserve the North Carolina coast for current and future generations.

NC Coastal Resource Commission's July 2016 Scope of Work for the Science Panel:

The CRC presented three tasks to the Science Panel:

1) Develop inlet shoreline change rate calculation methodology.
2) Re-evaluate points along the oceanfront shoreline where inlet processes are the dominant influence over shoreline position.
3) Present results at CRC meeting.

Executive Summary

The first North Carolina Inlet Hazard Areas (IHA) were developed in 1978 to recognize that shorelines adjacent to inlets are more dynamic than those along the oceanfront. At the time, the novel shoreline analysis methodology used the historic migration of inlet shorelines along the coast to define IHAs. Since that time, research has shown that in addition to inlet migration, the oscillations of ocean shoreline adjacent to the inlet are also a significant threat to development. Forty years later, some of the inlets have significantly changed. Several inlets (Mad Inlet, Old Topsail Inlet, and New/Corncake Inlet) have closed completely with little chance of reopening. Others (New Topsail and Shallotte Inlets) have moved outside the limits of the original IHA boundaries. In 2004, the Science Panel on Coastal Hazards began working on revising the IHA methodology, which led to initial recommendations in 2010. Most recently in 2016, the Panel was retasked by the North Carolina Coastal Resources Commission to develop an inlet shoreline change rate calculation methodology and update the IHAs.

Inlet shorelines behave differently than oceanfront shorelines not influenced by inlets. Although dynamic and locally unique, most inlets can be classified as either *migrating* in the net longshore sand transport direction, *oscillating* around a general location, or both. The shorelines inside the inlet, between the two islands, can migrate much faster than most other landforms. New Topsail Inlet has been moving south approximately 90 feet per year since the 1930s. Mason Inlet was moving at 365 feet per year before it was relocated and stabilized.

Inlet oscillations occur both directly on the inlet shoreline, between the two islands, and on the ocean shorelines near the inlet. The locations of the inlet shorelines and the width of the inlet are constantly modified by changes in wave height/direction, storms and other factors. In 2013-2014, Tubbs Inlet between Sunset Beach and Ocean Isle Beach widened from around 560 feet to more than 1700 feet, widening by a factor of 3 in less than 2 years. The inlet width has since been narrowing and is likely to return to its previous width.

Oceanfront shorelines near inlets have long-term erosion rates approximately 5 times greater than other oceanfront shorelines. Much larger oscillations in the oceanfront shoreline near inlets can also occur over several years or decades. These fluctuations are most often caused by movements in the primary ebb channel through the offshore bar. As the channel moves closer to one island, sections of that shoreline accrete while the other island erodes near the inlet. When the channel shifts by natural processes or dredging, the oceanfront process reverses. The island previously losing then gains, while the other side of the inlet loses what it previously gained and sometimes more. The oscillations may not contribute to the long-term erosion rate but can be a short-term threat to coastal development.

In 2010, the Panel developed draft IHAs for each of the developed inlets. Public comments criticized the effort in part because then-present IHA rules were not appropriate for the much larger redefined areas. Also, no proposed rule changes were presented to accompany draft boundary updates. The 2010 drafts were also criticized because of the increased size of the draft IHAs, and the fact that inlet risk within the areas varied considerably. In comparison, when

defined as a simple box along the shoreline, the Ocean Erodible Area (OEA) component of the Ocean Hazard Area (OHA) is like the IHA. However, the published erosion rates within the OHA identify the relatively higher risk closer to the shoreline.

In response to the public comments on the 2010 IHA drafts, the panel developed the Inlet Hazard Area Method (IHAM) to define the IHA and to identify two risk lines that are calculated similarly to the CRC's OEA mapping. Away from inlets, the existing vegetation line can be a useful indicator of the long-term erosion trend, offering several advantages in defining the Ocean Hazard Area. However, the migrations and oscillations near the inlets make the vegetation line too volatile to be an effective management tool. A primary finding of this report is that the vegetation line is not a reliable reference feature for certain management purposes near inlets. The dynamic oscillations near inlets were found to be better represented by a fixed, Hybrid-Vegetation Line based on the most landward limits of all vegetation lines over the study period. The Science Panel recommends fixed IHA development boundaries, like the Static Vegetation and Development lines used for large-scale (>300,000 cubic yards) beach nourishment projects.

The IHAM defines the landward limit of the IHA by multiplying 90 years times the annual inlet-shoreline erosion rate, measured landward from the Hybrid-Vegetation Line. This calculation is like that already applied in defining the landward limit of the Ocean Erodible Area and Ocean Hazard Area outside the IHA. A second line, the 30-Year Risk Line, has been mapped similarly to the minimum oceanfront setback distance of 30 times the erosion rate for identifying higher-risk areas. Because inlet shorelines behave differently than non-inlet areas, there are several important differences in how the erosion rates are measured and how they are applied in mapping compared to the non-inlet shorelines:

- The alongshore boundary of the IHA is identified by an increase in shoreline change variability compared to adjacent shoreline that is not influenced by the inlets.
- The erosion rates were analyzed using linear regression, a statistical method that takes advantage of the growing database of North Carolina shorelines and that better reflects the dynamic nature of inlets (rather than the endpoint method used in the OEA).
- Time periods for analysis were selected on an inlet-by-inlet basis, based on the available shoreline images that best represented the recent history of the inlet shoreline.
- The IHAM assumes homogeneous, erodible sediments. In areas where the IHAM does not reflect the influence of underlying geology and dune topography, the Panel used professional judgement and their knowledge of each inlet to aid in the delineation of the landward IHA boundary.

The maps in this report present the Panel's recommended IHA for each of the developed inlet shorelines where the inlet risk is equal to or more important than the long-term erosion and storm impacts. Because inlet oscillations make the existing vegetation line a poor indicator of future conditions, the proposed boundaries are fixed relative to the Hybrid-Vegetation Line. The Science Panel on Coastal Hazards recommends that the CRC consider updating subsequent IHA boundaries every five years, to coincide with updates to oceanfront erosion rates and Ocean Erodible Area boundaries. This 2019 report is submitted as a replacement for the 2010 report on the panel's recommendations.

1.0 Introduction

Ocean and inlet shorelines represent the dynamic interface between sea and land. Inlet shorelines are constantly moving under the combined and powerful influences of nature (tide, wind, current and waves) and engineering practices (dredging, beach nourishment, inlet closure/relocation, erosion control structures). Tidal inlets are an important and dynamic feature of barrier island coasts. They connect ocean to sound, promote habitat, facilitate navigation, improve water quality and support recreation. Inlets may open and close or migrate with the alongshore sediment transport. Although inlets are each locally unique, they can be separated based on dynamics – some inlets migrate along the coast while others oscillate back and forth around a central position. In some instances, an inlet will oscillate over the short-term as it migrates over the long-term.

- *Migrating Inlets* move alongshore with the prevailing longshore current and sand transport, persistently accreting on one side and forcing the other inlet shoreline to erode. Migration rate will vary with the conditions and may reverse in direction.
- *Oscillating Inlets* can be identified by a multi-year reversing pattern of erosion on one side and accretion on the other. Over a period of years or decades the erosion patterns may reverse. What was previously eroding recovers while the previous accretion disappears. Oscillations are most often caused by shifts in the alignment of the channel through the offshore bar as it naturally oscillates from one side of the inlet to the other. An Oscillating Inlet remains in the same general location because of various reasons, which may include a natural balance in sediment transport, underlying geology scoured by relic river channels or manmade dredging.

These migrations and oscillations affect not only the inlet shorelines between the two islands but also oceanfront shorelines near the inlets, sometimes seemingly distant from the inlet. Primary influences on the oceanfront are the size of the inlet's offshore shoal and the dynamic locations of the tidal channels through the bar. In general, the ocean shorelines near the inlets have higher long-term erosion rates than other ocean shorelines. In an analysis of the DCM 70-year shoreline database, Rogers (2015) examined shoreline change rates inside and outside the Panel's draft Inlet Hazard Area (IHA) boundaries statewide. Of North Carolina's 310 miles of shoreline, 77 percent of the shoreline was outside the IHAs and 23 percent within. The non-inlet oceanfront shorelines were eroding at a median rate of 0.9 feet per year, while the inlet shorelines were eroding at 4.3 feet per year, or approximately five times faster than the non-inlet oceanfront. Ocean inlet systems are highly dynamic balances, with waves and currents attempting to fill the gap in the islands, being opposed by daily tidal currents and periodic storms attempting to enlarge the opening.

One way to appreciate just how dynamic inlets are is to examine their movement through time. While difficult to show in a print report, it is easy to visualize online using the historic inlet atlas animation developed by North Carolina Sea Grant and available using the following link:

https://ncseagrant.ncsu.edu/program-areas/coastal-hazards/inlet-atlas/

Shorelines inside the inlet can migrate much faster than other oceanfront shorelines. New Topsail Inlet has been migrating south at around 90 feet per year since the 1930s. Mason Inlet was migrating at 365 feet per year before it was relocated and stabilized in 2002. Inlet shorelines also oscillate much faster than non-inlet shorelines. In 2013-4, Tubbs Inlet between Sunset Beach and Ocean Isle Beach widened from around 560 feet to more than 1700 feet, widening by a factor of 3 in less than two years. The inlet width has since been narrowing and is likely to return to its previous width. These oscillations do not necessarily increase the long-term erosion rate but still add to the short-term risk to development. The IHA is designed to identify these dynamic inlet areas.

1.1 Establishment of Inlet Hazard Areas

The establishment of Areas of Environmental Concern (AECs) as authorized under the NC Coastal Area Management Act (CAMA) of 1974 (GS 113A) forms the foundation of the North Carolina Coastal Resources Commission's (CRC) permitting program for regulating coastal development. Rules define the Ocean Hazard Area AEC, including three components: 1) Ocean Erodible; 2) Inlet Hazard; and 3) Unvegetated Beach (NCAC 15A 07H.0304). The Inlet Hazard Area (IHA) AEC is defined as locations that "are especially vulnerable to erosion, flooding and other adverse effects of sand, wind, and water because of their proximity to dynamic ocean inlets." [NCAC 15A 07H.0304(2)]

The IHA maps in use today are based on analysis by Priddy and Carraway (1978). They utilized aerial photographs spanning 1940 through 1977 to analyze 23 inlets, of which 19 are still active. The number of photos at each inlet ranged from 6 to 32. Measurements were made on the photos themselves with a spatial resolution of 300 feet alongshore. An inlet shoreline change rate was computed using both linear and quadratic equations to determine the best-fit shoreline change rate for each inlet. A landward limit to the IHA was established at the point where the 1% chance that shoreline position would exceed the defined hazard area at any time within the decade (1978-1988). At inlets where the regression methods could not be used, the IHA boundaries were established by using the methods of Fisher (1962, 1967) to map previous inlet territory. IHA boundaries were not designated for Masonboro Inlet, Drum Inlet, the southwestern side of Ocracoke Inlet, and Oregon Inlet because they were excluded from requirements listed in the NC Coastal Plan (NC Department of Natural Resources and Community Development, 1977). The Inlet Hazard Areas developed for the 19 developed inlets in the study by Priddy and Carraway were presented to the CRC as IHA boundary recommendations and adopted in 1979. Minor amendments followed in 1981.

In 1998, the CRC Science Panel on Coastal Hazards identified the need to update the methodology for defining the IHA (Oct 21, 1998 Science Panel meeting minutes) and in their short-term recommendations to the CRC (Fisher, 1999) stated:

> *Inlet Hazard Areas are coastal zones that are especially vulnerable to migration, erosion, flooding, and other adverse effects of sand, wind, and water because of*

their proximity to dynamic tidal inlets. Each of North Carolina's inlets is unique and there are distinct differences in the history and behavior of inlets in different coastal compartments of the state. Current Inlet Hazard Areas are based upon original studies conducted over twenty years ago. The Inlet Hazard Areas need revision to incorporate updated knowledge.

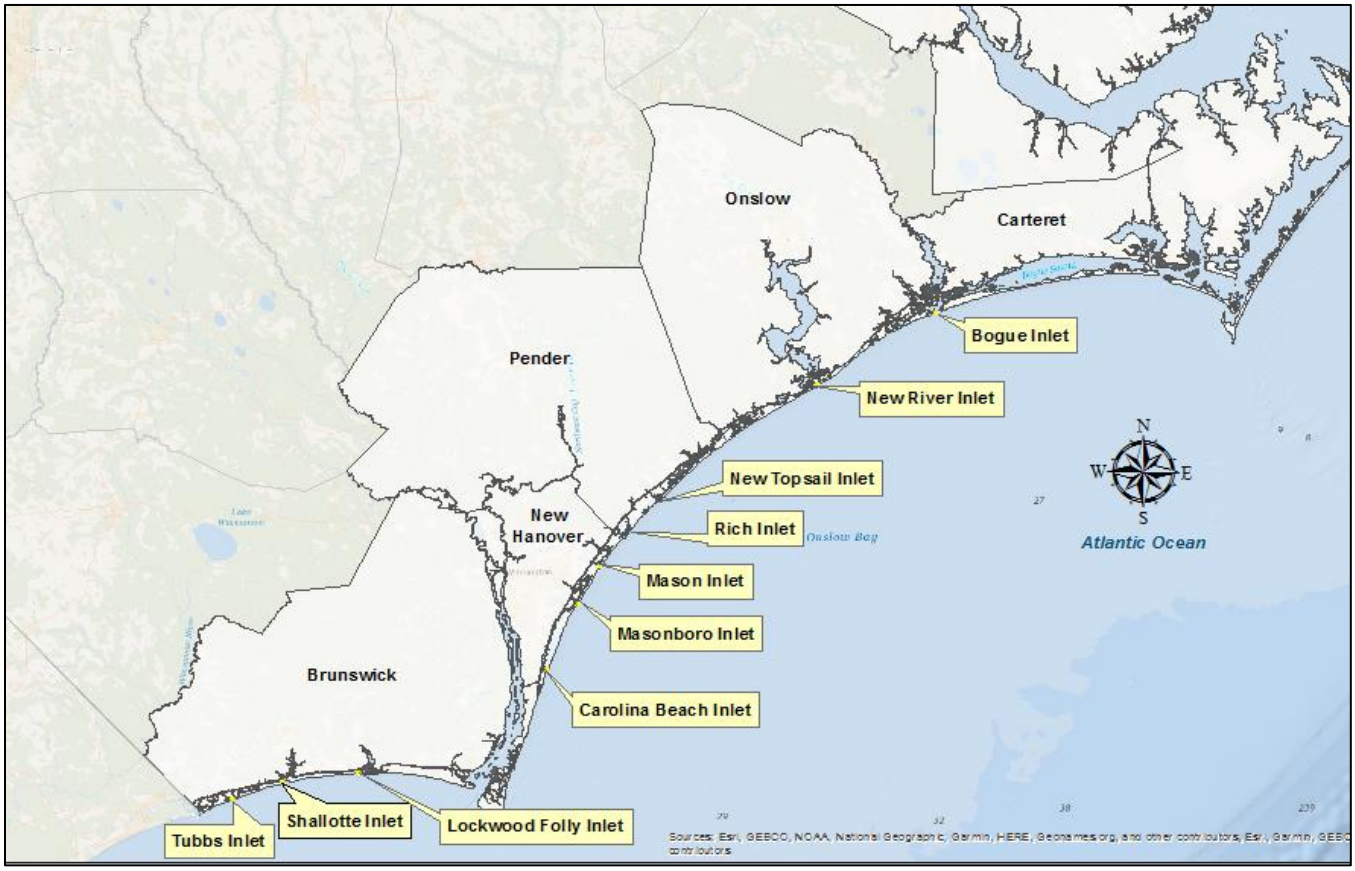
The Panel recommends that the delineation of the Inlet Hazard Areas be revised after a review of site-specific studies of each inlet by a group of experts. The hazard zone delineation shall consider such factors as previous inlet territory, structurally weak areas along migration pathways, unusually low and narrow sections of barriers prone to breaching, external influences such as jetties and channelization, and increased erosion extending along adjacent shorelines.

Later research has shown that in addition to inlet migration addressed in the original IHA analysis, the oscillations in the ocean shoreline adjacent to the inlet have also been a significant threat to development (Cleary, 1999). After 40 years some of the inlets significantly changed. Three of the tidal inlets from the 1978 study have closed naturally: Mad Inlet, Old Topsail Inlet and New/Corncake Inlet. New Topsail and Shallotte Inlets have moved outside the limits of the original IHA boundaries. Little River Inlet, located in South Carolina just over the SC/NC border has since been stabilized and no longer requires an IHA for the NC side.

In 2004, the Science Panel on Coastal Hazards began working on revising the IHA methods leading to initial recommendations by DCM to the CRC in 2010. This effort stalled after extensive public comment, in part because existing IHA rules were perceived as being overly restrictive in the larger redefined areas. Public comments on the 2010 draft also questioned the increased IHA size and raised concerns that inlet risk within the IHA varied considerably. The Science Panel, DCM and CRC have agreed that IHA rules should be revised to better accommodate the oceanfront expansions proposed in the latest draft maps.

In 2016, the Science Panel on Coastal Hazards was again asked by the Coastal Resources Commission to develop an updated methodology to delineate inlet hazard areas. The purpose of this report is to present that new methodology, the Inlet Hazard Area Method (IHAM), and to recommend revised IHA boundaries for the ten active and developed tidal inlets in North Carolina. The inlets considered include Tubbs, Shallotte, Lockwood Folly, Carolina Beach, Masonboro, Mason, Rich, New Topsail, New River, and Bogue Inlets (Figure 1). The Cape Fear River Entrance and Beaufort Inlet are proposed to be separately managed in a new State Ports Inlet Management AEC and were not included in this report. The shorelines adjacent to Brown's, Bear, Barden, Drum, Ocracoke, Hatteras and Oregon inlets are publicly owned, with a low potential for future development. Thus, they were not included in this report.

Figure 1. Study area includes Tubbs, Shallotte, Lockwood Folly, Carolina Beach, Masonboro, Mason, Rich, New Topsail, New River and Bogue Inlets. At least one side of each inlet is developed.



To address public comments on the previously drafted 2010 IHAs, the Panel has developed the recommendations in this report to be similar to the management resources provided in the Ocean Erodible Area component of the Ocean Hazard Area. The OEA is defined by the long-term erosion rates that vary along the shoreline. The landward limit of the OEA is defined by a line determined by multiplying 90 times the local annual erosion rate (or 2 feet/year, 180 feet if greater) measured from the vegetation line at the time of construction. The largest buildings, greater than 100,000 square feet, are required to be landward of the OEA. To reflect the increased erosion hazard closer to the ocean, a seaward line is determined by multiplying 30 times the local erosion rate landward of the vegetation line and used as a setback line for buildings smaller than 5,000 square feet.

This report recommends similar 30- and 90-Year *Risk Lines* to define the IHA at each inlet. The Science Panel found that the vegetation line does not reflect long-term inlet changes, but that the *Hybrid-Vegetation Line*, which is mapped from the same historical aerial photography as the local erosion rates, can be used. The Hybrid-Vegetation Line is a fixed line allowing the 30- and 90-Year Risk Lines to be mapped as fixed lines like the present IHA boundaries and the various fixed management lines available when larger beachfill projects are constructed (Static

Vegetation Lines, Static Vegetation Lines Exceptions and Development Lines). The results cover a smaller area than proposed in 2010 and differentiate the risk with two lines in the IHA.

1.2 Report Organization

This report is organized in four chapters with three appendices. Chapter 2 describes the methodology used. Chapter 3 describes the analysis and the recommended IHA for each inlet. Chapter 4 provides recommendations.

Acronyms used in the report are listed in Appendix A. Appendix B lists definitions for key terms. Appendix C provides maps for each proposed IHA, which duplicate the IHA maps provided in Chapter 3 but are larger in scale.

2.0 Methodology

The Inlet Hazard Area Method (IHAM) was developed through close collaboration between the North Carolina Division of Coastal Management (DCM) and the Coastal Resources Commission's (CRC) Science Panel on Coastal Hazards. It defines a series of statistical and analytical steps to be used to develop an initial IHA. Those steps are then confirmed or modified based on additional knowledge of each inlet.

The IHAM major steps include:

1) Map historic vegetation lines and delineate a Hybrid-Vegetation Line that represents the landward-most position of all vegetation lines, for use as a reference line in determining the landward boundary of the IHA.
2) Map shorelines and generate change rate and standard deviation of shoreline position statistics.
3) Use the standard deviation to define the alongshore extent of inlet influence.
4) Compute the 30- and 90-Year Risk Lines, which are mapped relative to the Hybrid-Vegetation Lines.
5) Use professional knowledge of inlet processes, geomorphology and engineering activities to modify the IHA as needed.

2.1 Hybrid-Vegetation Line:

Away from inlets, the existing vegetation line is a useful reference feature for the long-term erosion trend. However, the dynamic oscillations or higher variability near inlets are not reflected in the most recent vegetation line and are better represented by a Hybrid-Vegetation Line, which is based on the landward limits of the historic vegetation lines over the period of study.

The Hybrid-Vegetation Line (HVL) represents the landward-most position of all vegetation lines mapped at each inlet (Figure 2). The HVL is most often a composite of landward-most segments from multiple dates, or in some instances may represent only a single date. The HVL is significant because in an inlet environment where erosion and accretion can occur rapidly, it represents the landward-most position of where the hazard once existed. A spatial 5-*transect* running average was applied to blend together different date segments by averaging each transect-HVL intersection with the two transects to the left and right. Figure 3 is an example of the HVL computation from Lockwood Folly Inlet at Holden Beach.

In addition to providing an improved reference feature for defining the IHA, the HVL was the most effective of several methods tested by the Panel to incorporate the higher variability of the inlet shorelines into the IHA boundaries.

Figure 2. The smoothed HVL (red line) is made up of landward-most segments of all vegetation lines (green line) by using a 5-transect running average statistical method to smooth the raw HVL (yellow line).

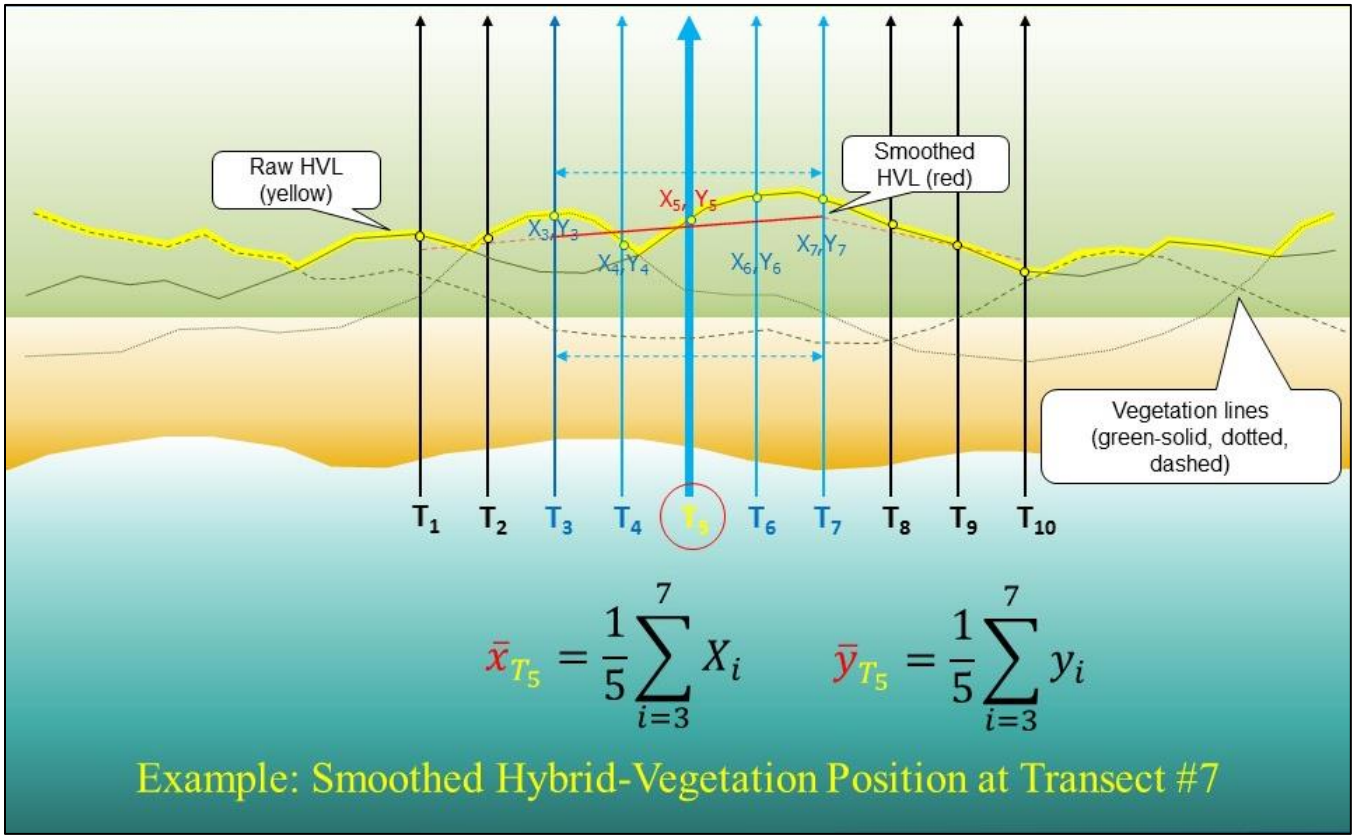
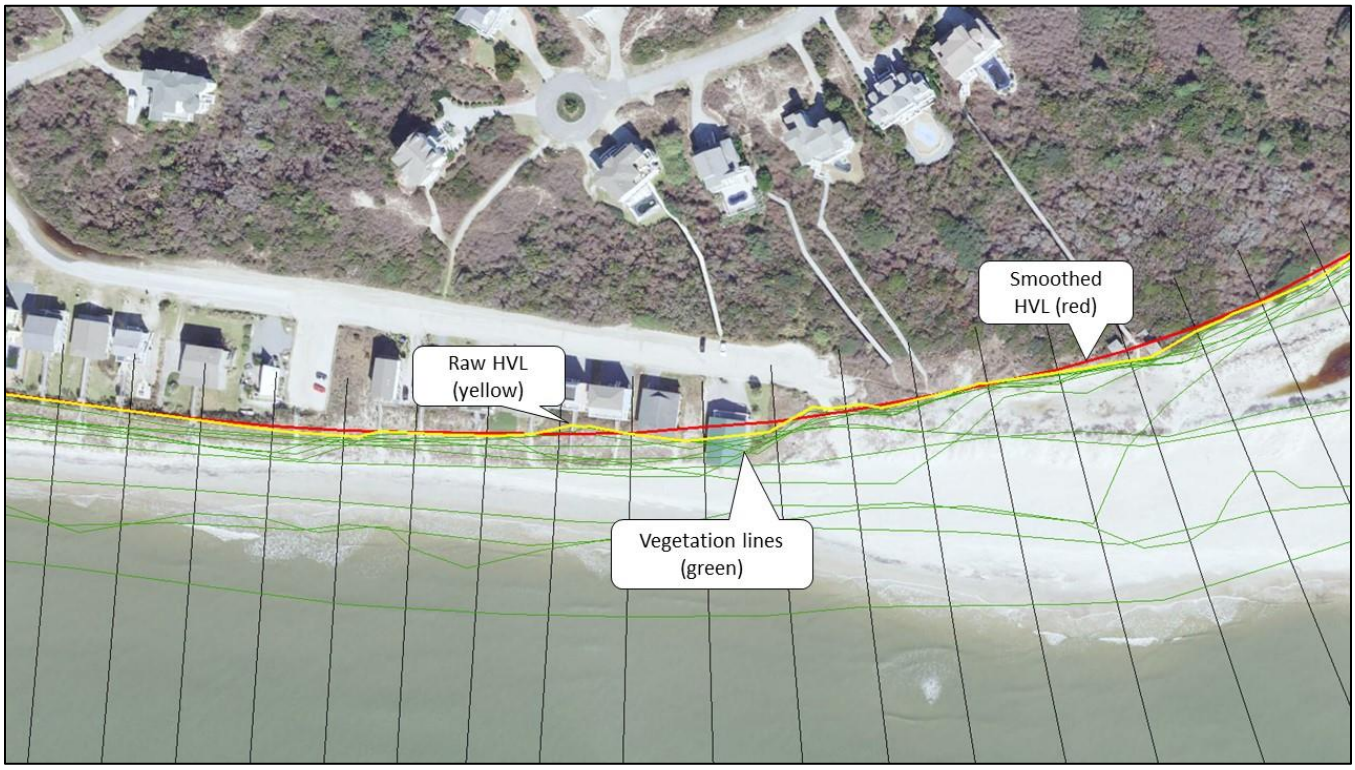


Figure 3. Example showing individual vegetation lines (dark-green lines), the raw Hybrid-Vegetation Line (yellow line), which is the landward-most position of all vegetation lines, and the smoothed Hybrid-Vegetation Line (red line) using a 5-point running average at Holden Beach at Lockwood Folly Inlet.



2.2 Shoreline Data

DCM's growing database of oceanfront and inlet shorelines facilitated this study by allowing many different approaches to be tried and tested. Most of the shorelines used were mapped using historic orthophotography to digitize the wet-dry line (Figure 4), considered a proxy for the Mean High Water (MHW) line. Three shorelines represented the location of MHW - either derived from lidar (1997 and 2004), or NOS T-Sheets (either from the 1930s or 1940s). Two studies carried out by DCM (Limber et al., 2007a; 2007b) indicated that the lidar-derived MHW line could be used interchangeably with the wet-dry shorelines.

Although shoreline data existed between 1930 and 2016, the temporal focus here is on shorelines between 1970 and 2016 for several reasons:

- The 1930 to 1940 shorelines were excluded at most inlets because of uncertainties on the hydrodynamics at each inlet associated with the construction and maintenance dredging of the Atlantic Intracoastal Waterway (AIWW) and other waterways. This specifically affected the inlets in the southern portion of the State, where one to four shorelines were excluded.

- Shorelines based on photography taken immediately or within one year after major storms or beach nourishment projects were excluded.
- The primary imagery used were NC DOT shoreline images between 1970 and 2000.

These criteria resulted in the number of shorelines used, ranging between 10 and 24 at each inlet.

Oceanfront and inlet shorelines were analyzed along a series of numbered, shore-perpendicular transects spaced at 25-meter (82-foot) intervals using USGS's Digital Shoreline Analysis System (DSAS) with ESRI's ArcGIS. Due to the curvature of inlet shorelines where there is a transition from the oceanfront into the inlet throat, transects were cast from an onshore baseline to create radial transects that retained shore-perpendicular orientation and spacing. These radial transects were used to compute shoreline changes inside the inlet.

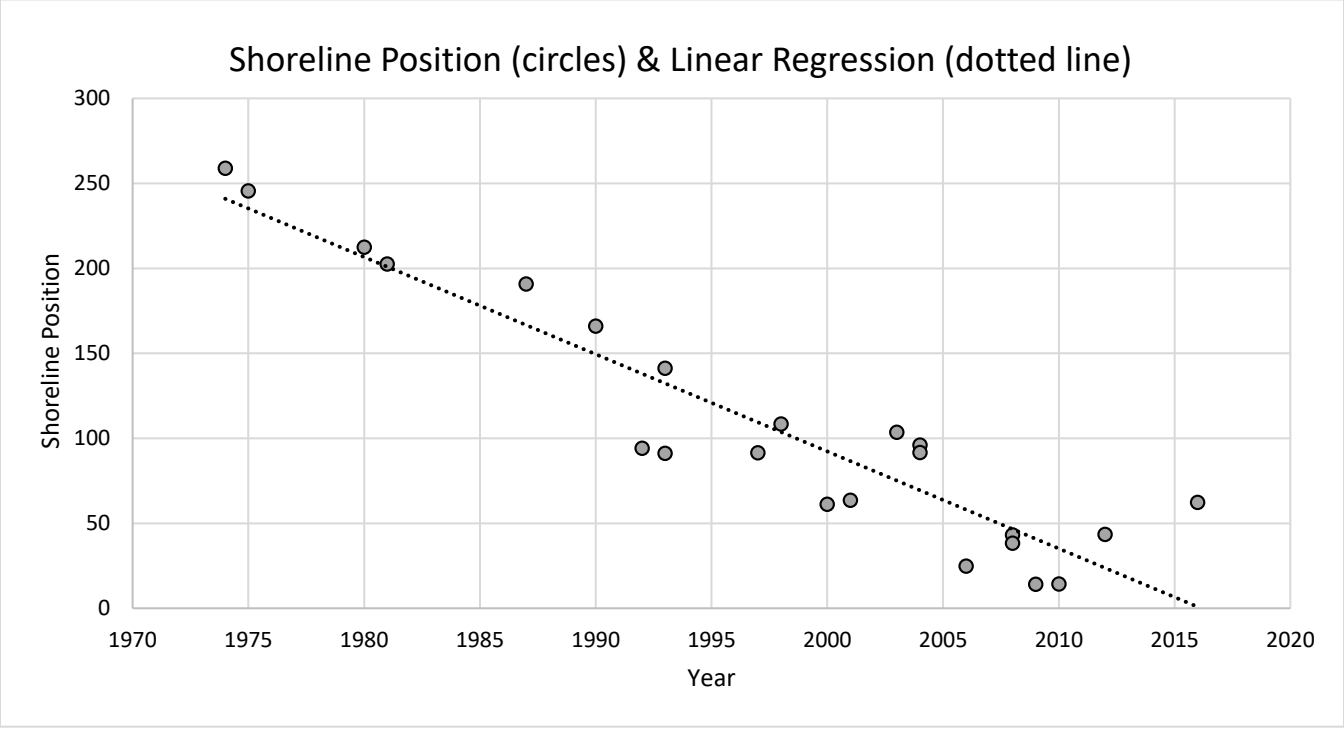
Figure 4. Interpretation of the "wet-dry" shoreline using orthophotography.

2.3 Shoreline Change Rates: Linear Regression

DCM has calculated long-term oceanfront shoreline change (erosion/accretion) rates since 1979 using the end-point method, which is based on the change between the earliest and most recent dates. Any short-term change between those dates, no matter how significant, is not directly captured. Because inlet shorelines are constantly moving and fluctuating in position, the end-point method is less effective in capturing the dynamics of an inlet or for quantifying its long-term trends. Instead, linear regression, a statistical measure using multiple shorelines, was used for this study (Thieler et al., 2009).

At each transect, there are a series of shoreline-transect intersections that represent the shoreline's position through time. Linear regression minimizes the distance between the known values (actual shoreline positions) and a best-fit regression line (Figure 5). The slope of this line is the Linear Regression Rate (LRR) of shoreline change or the local erosion or accretion rate.

Figure 5. Relative shoreline position as a function of time (circles). The slope of the best fit, dotted line is the linear regression rate (LRR) of shoreline change (in this case, it is eroding at 19 feet per year).



The benefits of linear regression include (Dolan et al., 1991):

- All data are used, regardless of changes in trend or accuracy.
- The method is purely computational.
- The calculation is based on accepted statistical concepts.
- The method is easy to employ.

Although the linear regression method is less sensitive to individual points, it is susceptible to outliers; it assumes that the computed trend is linear, and it tends to underestimate the rate of change relative to other statistics, such as the end-point rate (Dolan et al., 1991; Genz et al., 2007).

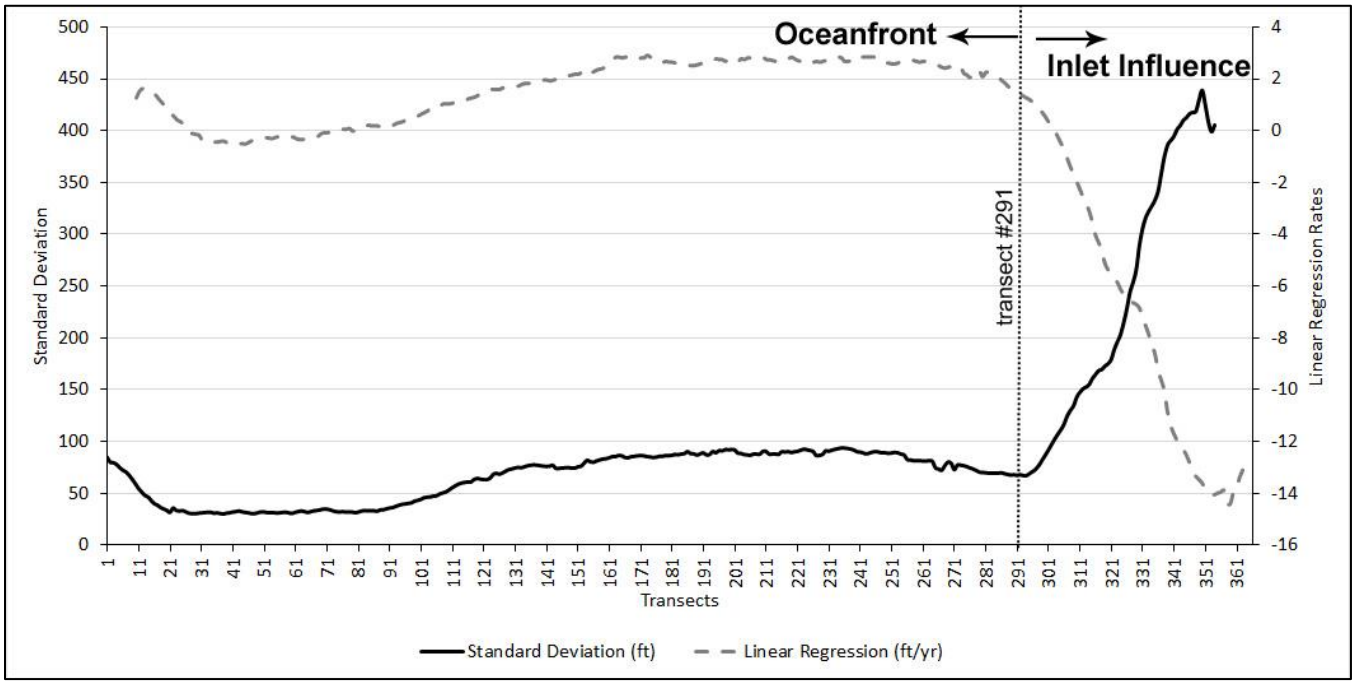
Once computed, the linear regression rate was then smoothed as described previously for the HVL (Figure 2); but instead of averaging 5 transects, a 17-transect running-average alongshore was used. This follows the DCM blocking computation used for the OEA shoreline rates and further smooths the alongshore variation in the shoreline change rate.

2.4 Using Standard Deviation of Shoreline Position to Identify the Alongshore IHA Boundary

The alongshore IHA boundary represents the location along the oceanfront shoreline where inlet related processes begin to have a dominant influence compared to other oceanfront processes. Since inlet shorelines are generally more dynamic than oceanfront shorelines, this boundary was identified by using the standard deviation of shoreline position and, to a lesser degree, the alongshore variation in the erosion/accretion rate (the LRR) between transects. The standard deviation of shoreline position is a measure of the extent of shoreline variation (i.e., the back and forth movement of the shoreline) at each transect.

Figure 6, which plots the alongshore variation in the Standard Deviation and the LRR, illustrates the methodology that was used. The inlet is on the right-hand side whereas the left-hand side of the graph represents the non-inlet oceanfront shoreline. For this location, transect-291 (vertical dashed line) represents a sharp change in both plotted lines. To the right of transect-291, the shoreline is dominated by inlet hydrodynamics, and to the left it is dominated by oceanfront processes. Therefore, transect-291 is identified as the alongshore boundary for the Inlet Hazard Area on the left side of this inlet.

Figure 6. The LRR and the standard deviation of shorelines plotted relative to the alongshore transect numbers. Transects are spaced 82 feet (25 meters) apart. The vertical dashed line at transect-291 separates inlet influence from the oceanfront.



2.5 The 30- and 90-Year Risk Lines:

The hazard risk varies within the IHA. To identify areas at greater risk, the 30- and 90-Year Risk Lines were developed based on the inlet-shoreline erosion rates, similarly to the minimum and maximum OEA boundaries, which are determined by multiplying 30 and 90 times a setback factor based on shoreline change rates, with a minimum rate of change of 2 feet of erosion/year. Within the IHA, the 90-Year Risk Line is used to define its landward extent. The location on each transect is measured landward of the Hybrid-Vegetation Line. The computation of the 90-Year Risk Line is based on the shoreline erosion rate (the LRR) or a minimum rate of -2 feet/year if the shoreline is accreting or eroding at a slower rate.

The 30-Year Risk Line is an intermediate line that defines a higher level of risk closer to the shoreline. It is computed similarly to the 90-Year Risk Line, but by using a multiplier of 30 and measured relative to the Hybrid-Vegetation Line.

2.6 Modifications to the Computed Inlet Hazard Area

The IHAM as described above worked well at most of the inlets, requiring no additional modification. However, as Priddy and Carraway (1978) and Overton and Fisher (2004) found in their studies, the IHA defined for some inlets required additional modifications based on how well the computed IHA fit the unique character of each inlet. This is not surprising considering that the IHAM is based only on historic shoreline positions, assumes uniformly erodible material and assumes that past shoreline changes can be used to estimate changes further landward. These are usually, but not always, good assumptions. Some of the issues considered included:

- the stabilizing impact of engineering activities including the AIWW;
- local geomorphology and underlying geology known to be less erodible;
- locations within an inlet where the minimum erosion rate of 2 feet per year was considered unrealistic;
- migrating, low-elevation, ephemeral swash bars, which overly magnify the dynamic nature of the inlet and unrealistically impact the 30- and 90-Year Risk Lines;
- instances where the radial transects within the inlet throat, when extended landward to mark the 30- and 90-Year Risk Lines, intersected with other transects, each with a different erosion rate;
- instances where the break in the standard deviation separating inlet influence from the oceanfront was not clear or occurred too close to the inlet based on other observations of coastal change; and
- cases where 30- and/or 90-Year Risk Lines were unrealistically mapped too far landward based on knowledge of the recent stability of the barrier island that was not reflected in the observed LRR.

In these cases, the Panel used their professional knowledge of each inlet to aid in the delineation of the IHA boundaries. In some cases, they refined the shoreline dates used in the analysis or moved the IHA boundary to a more appropriate location based on the underlying geology. Specific details are provided in the descriptions for each of the inlets.

3.0 Inlet Hazard Area Recommendations

This chapter delineates the Inlet Hazard Area recommendations for each inlet. The history of the inlet is briefly described. The relevant analysis details of the IHAM and any modifications are outlined for each side of the inlet. Maps locating the Panel's recommended Inlet Hazard Area for each side of the inlet are presented. Larger scale copies of these maps can be found in Appendix C.

3.1 Tubbs Inlet

Tubbs Inlet is a relatively small migrating inlet that was recognized on early 1700's maps. Throughout much of its early history the inlet migrated westward along an 8,600-foot pathway, at a rate between 50 and 65 feet per year. In January 1970, the inlet was relocated 3,200 feet eastward to a position that approximated its 1938 location. Following relocation, the inlet began migrating eastward toward Ocean Isle.

Causes of the migration reversal are complex, making the inlet difficult to predict. Around the time of relocation feeder channels behind both sides of the inlet were altered by dredging for land development. Other sections of the channels connecting to the AIWW shoaled and became hydraulically less efficient. More recently the inlet's migration may have been influenced by the 1980 construction of the dual navigation jetties at Little River Inlet, then 4 miles to the southwest, and the natural closing of Mad inlet in 1997, then 3 miles to the southwest. The inlet shoreline can be considered at least widely oscillating and may be establishing a migration to the northeast.

When the existing IHA boundary was established in 1979, shortly after the inlet was relocated, there was not enough data at the time to forecast how natural processes and adjacent shorelines would respond to the inlet's relocation, so the IHA boundary was simply mapped to encompass both the new and former locations of the inlet.

3.1a Sunset Beach side of Tubbs Inlet

Tubbs and Mad Inlets were presumed to have had a combined influence on making Sunset Beach one of a few accreting islands in North Carolina (Cleary & Marden, 1999). The northeastward migrating spit on Sunset Beach retreated 1100 feet around 2013 but was quickly recovering by 2017. There are no erosion control structures on Sunset Beach.

Because of the relocation and the dredging of feeder channels behind both Sunset Beach and Ocean Isle for land development around the time of the inlet relocation, 1970 and 1971 data were excluded, and only shoreline data after 1971 (starting with the 1981 data set) were used in

applying the IHAM (Figures 7, 8). The oceanfront shoreline boundary of inlet influence is inlet transect-210 (Figure 9). The 90-Year Risk Line is the recommended landward boundary (Figure 10).

Figure 7. Tubbs Inlet at Sunset Beach. Vegetation Lines mapped: 1981, 1992, 1993, 1998, 2003, 2004, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1981, 1993, 1998, 2003, 2004.

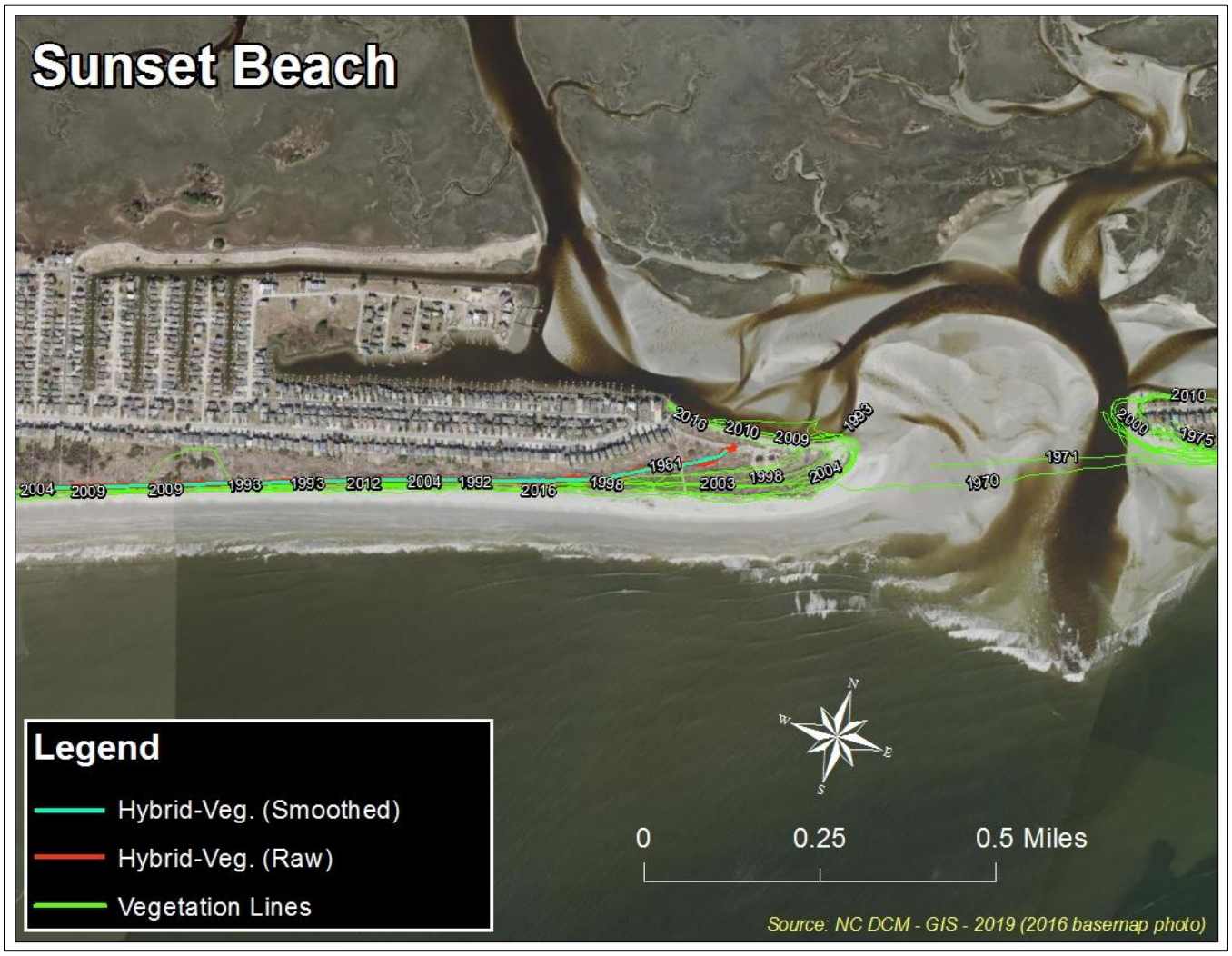


Figure 8. Tubbs Inlet at Sunset Beach. Shorelines included in the analysis: 1981, 1992, 1993, 1997, 1998, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

Figure 9. Based on standard deviation of shoreline position at Tubbs Inlet-Sunset Beach, transect-210 is recommended as the inlet-ocean transition boundary. Negative Linear Regression Rates indicate erosion, while positive values represent accretion (right axis).

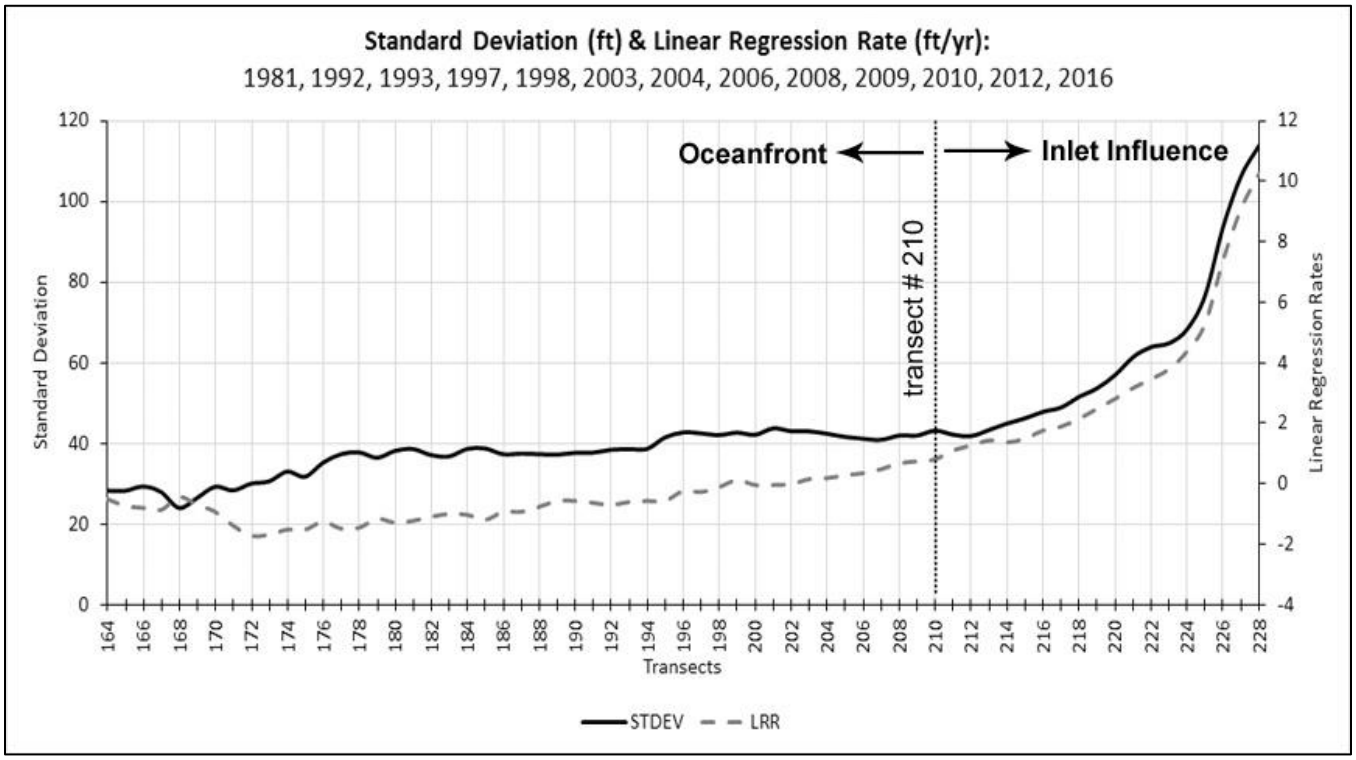
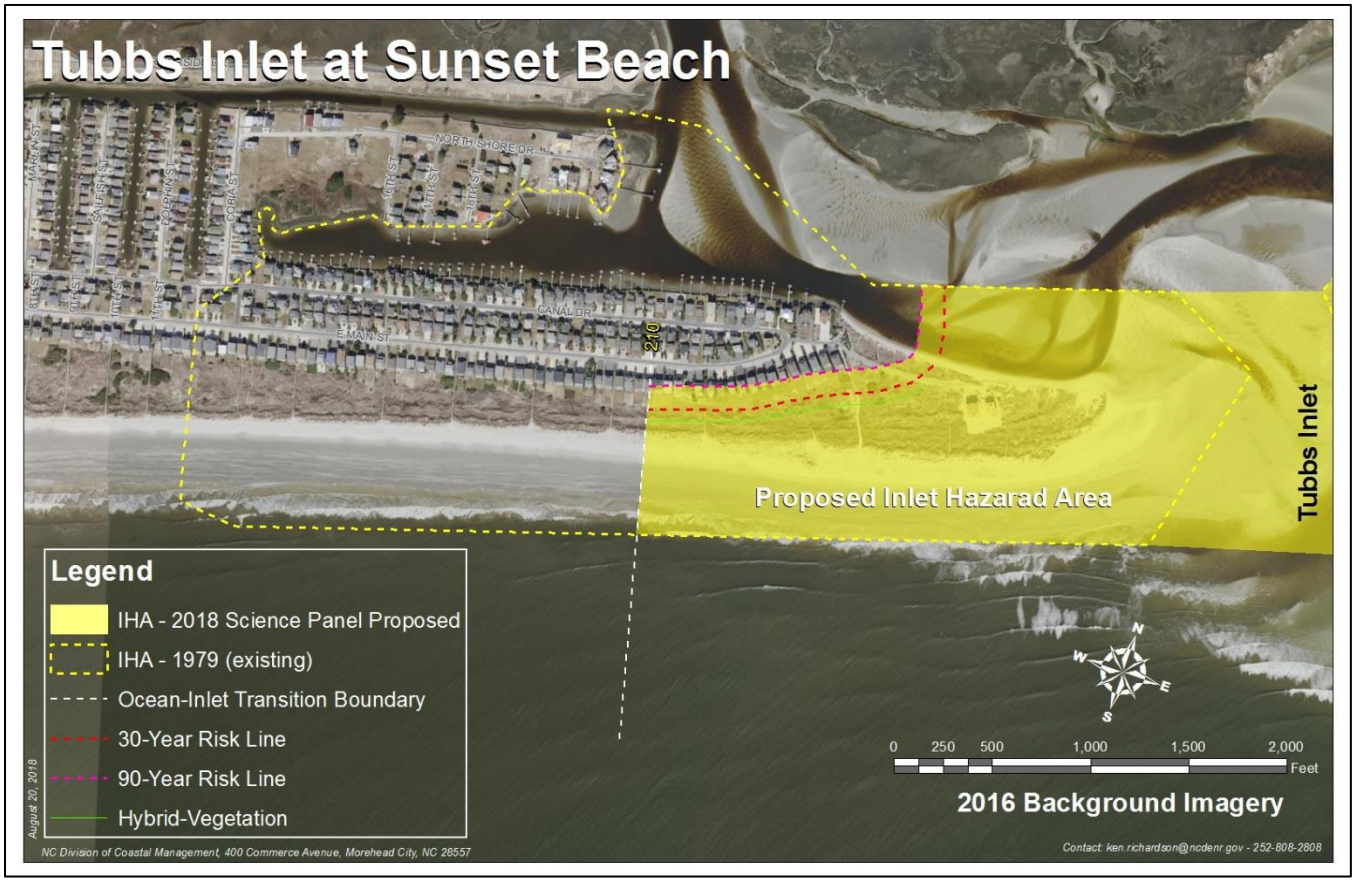


Figure 10. Tubbs Inlet at Sunset Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.1b Ocean Isle side of Tubbs Inlet

Since relocation, Tubbs Inlet has been migrating toward Ocean Isle at a highly irregular rate. The inlet shoreline has been armored with sandbags. Farther northeast, the ocean shoreline has accreted following the relocation. The vegetation and shoreline data for Ocean Isle at Tubbs inlet are shown in Figures 11 and 12.

Using the IHAM, transect-28 is the boundary of inlet influence (Figure 13); the recommended landward boundary is the 90-Year Risk Line (Figure 14).

Figure 11. Tubbs Inlet at Ocean Isle. Vegetation Lines mapped: 1974, 1975, 1980, 1981, 1987, 1990, 1992, 1993, 1998, 2000, 2001, 2003, 2004, 2009, 2010, 2012, 2016. Vegetation line segments making up the hybrid-vegetation Line: 1980, 1981, 1990, 1993, 2000.

Figure 12. Tubbs Inlet at Ocean Isle. Shorelines included in the analysis: 1974, 1975, 1980, 1981, 1987, 1990, 1992, 1993, 1997, 1998, 2000, 2001, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

Figure 13. Based on standard deviation of shoreline position at Tubbs Inlet-Ocean Isle Beach, transect-28 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

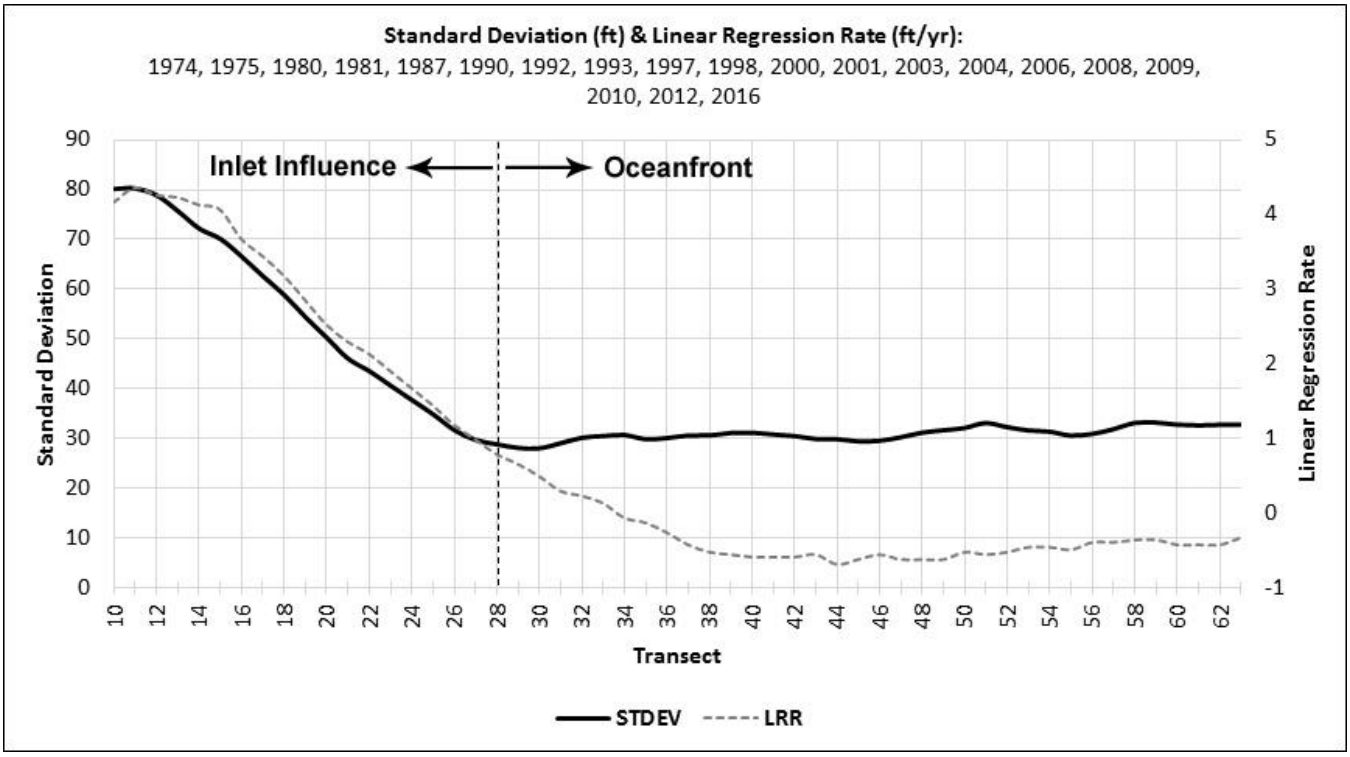
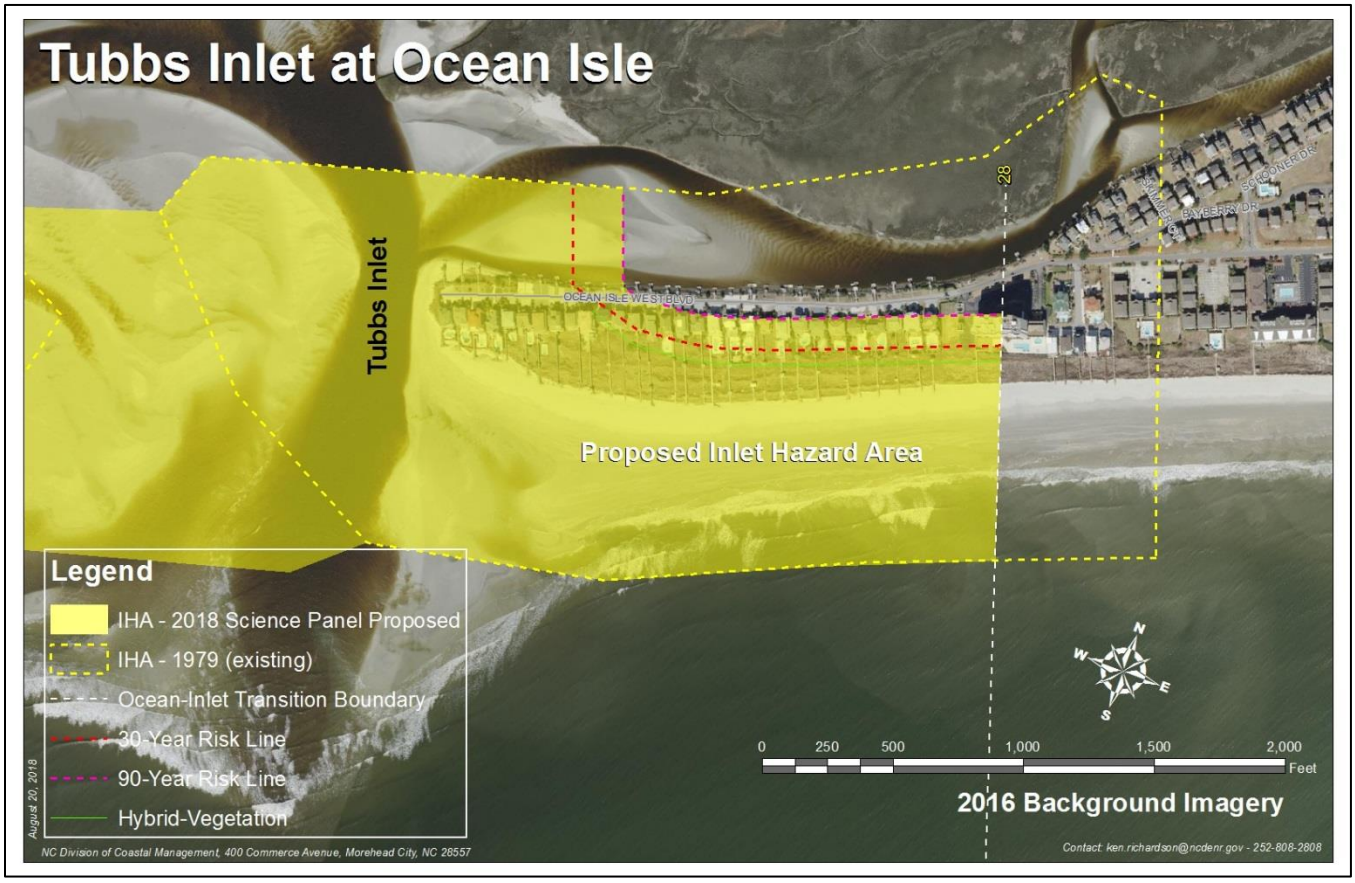


Figure 14. Map of Tubbs Inlet at Ocean Isle Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.2 Shallotte Inlet

Shallotte Inlet has oscillating inlet shorelines with oscillating oceanfront shorelines on both sides of the inlet. It was charted as early as 1672. Seismic data from the nearshore area indicate the inlet is a permanent feature related to the paleo-channel of the ancestral Shallotte River. Since 1938 the throat position of the ebb (main) channel has shifted within a 900 feet wide corridor. Although the position of the ebb channel within the throat has not changed appreciably, its seaward portion across the ebb-tidal delta has shifted widely, approximately 13,000 feet across the offshore shoal.

The historic reorientation and repositioning of the outer bar channel from the southwest to the southeast facilitated changes in the shape of the ebb-tidal delta and its effect on the adjacent oceanfront shorelines. Since the late 1960's the ebb channel has generally been aligned in an SE-ESE direction, which has favored the accretion along the Holden Beach shoulder that has led to the bulbous shape of the western end of the island. By contrast, during the same interval, the Ocean Isle oceanfront shoreline has experienced chronic long-term erosion.

When the Shallotte inlet ebb channel orientation is positioned towards Holden Beach, the updrift shoulder of Ocean Isle experiences erosion (and vice versa). The bulbous shape of Holden Beach shoreline has been present since 1974. If the ebb channel becomes more westerly, then this accreted sand is expected to erode. Ocean Isle had the same bulbous shape between 1938 and 1958 before the ebb channel shifted and caused erosion at the eastern end of Ocean Isle. If the ebb channel once again re-orients itself toward Ocean Isle, the bulbous shape will return to Ocean Isle, and Holden Beach will erode.

In 2001, the US Army Corps of Engineers constructed a beach nourishment project along 17,000 feet of Ocean Isle Beach extending west from Shallotte Boulevard. Material used to construct the project was obtained from a borrow area in Shallotte Inlet that extended from near the AIWW, seaward to approximately the 17-foot depth contour. In essence, the borrow area created a new ebb channel oriented perpendicular to the adjacent shorelines. The location of the Shallotte Inlet channel was based on historic positions and alignments of the inlet's ocean bar channel, which seemed to have positive impacts on the east end of Ocean Isle Beach. The Shallotte Inlet borrow area has been used to provide sand for periodic nourishment of Ocean Isle.

3.2a Ocean Isle Beach side of Shallotte Inlet

Numerous sandbag revetments have been constructed along the 5,000 feet of developed shoreline adjacent to the inlet. Closest to the inlet the beach road is now 4th Street, 1st through 3rd Streets having been eroded.

Although the channel's midpoint has been relatively stable since 1938, the shoulders of both Ocean Isle Beach and Holden Beach have experienced erosion and accretion. The impact of Hurricane Hazel in 1954 caused the reorientation of the channel to move in a more easterly direction, which made Ocean Isle Beach experience accelerated erosion. Therefore, shoreline data beginning in 1933 was used for the statistical analysis (Figures 15, 16). Inlet transect-291 is the boundary along the oceanfront shoreline where inlet processes start to affect the shoreline's position (Figure 17). Because of the high erosion rates near the inlet (upwards of ~15 ft/yr), the Panel decided, based on the underlying geology and surface dune topography, that the 90-yr Risk Line mapped using the IHAM fell too far inland, into an area where an increased inlet threat is unlikely. The Panel recommends moving the 90-Year Risk Line and establishing the landward limit of the recommended IHA closer to the 30-Year Risk Line (Figure 18).

Figure 15. Shallotte Inlet at Ocean Isle. Vegetation Lines mapped: 1970, 1974, 1975, 1980, 1981, 1987, 1990, 1992, 1993, 1998, 2000, 2001, 2003, 2004, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1998, 2000, 2001, 2003, 2004, 2008, 2009, 2010, 2012, 2016.

Figure 16. Shallotte Inlet at Ocean Isle. Shorelines included in the analysis: 1933, 1938, 1944, 1970, 1974, 1975, 1980, 1981, 1987, 1990, 1992, 1993, 1997, 1998, 2000, 2001, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

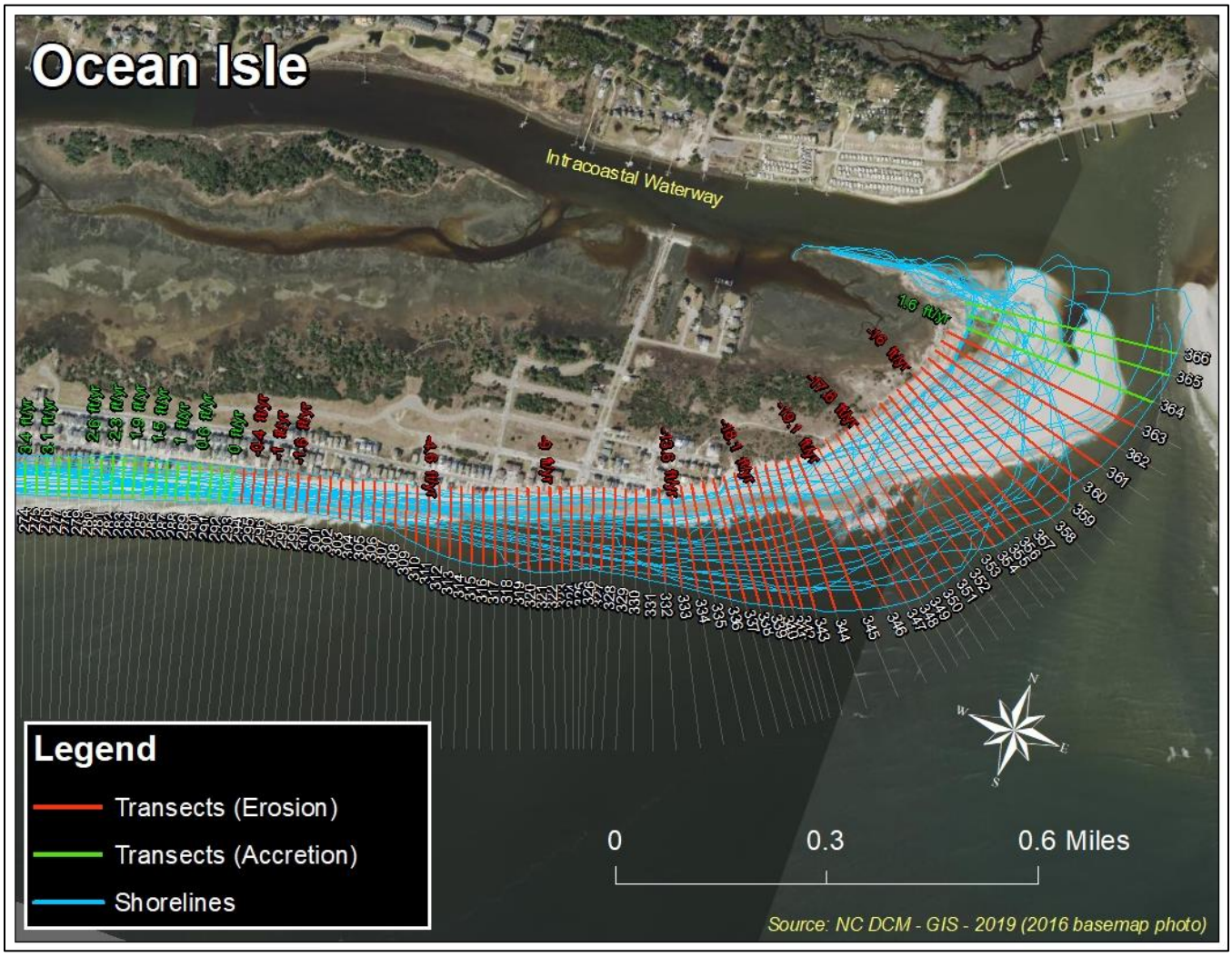


Figure 17. Based on the standard deviation of shoreline position at Shallotte Inlet-Ocean Isle Beach, transect-291 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

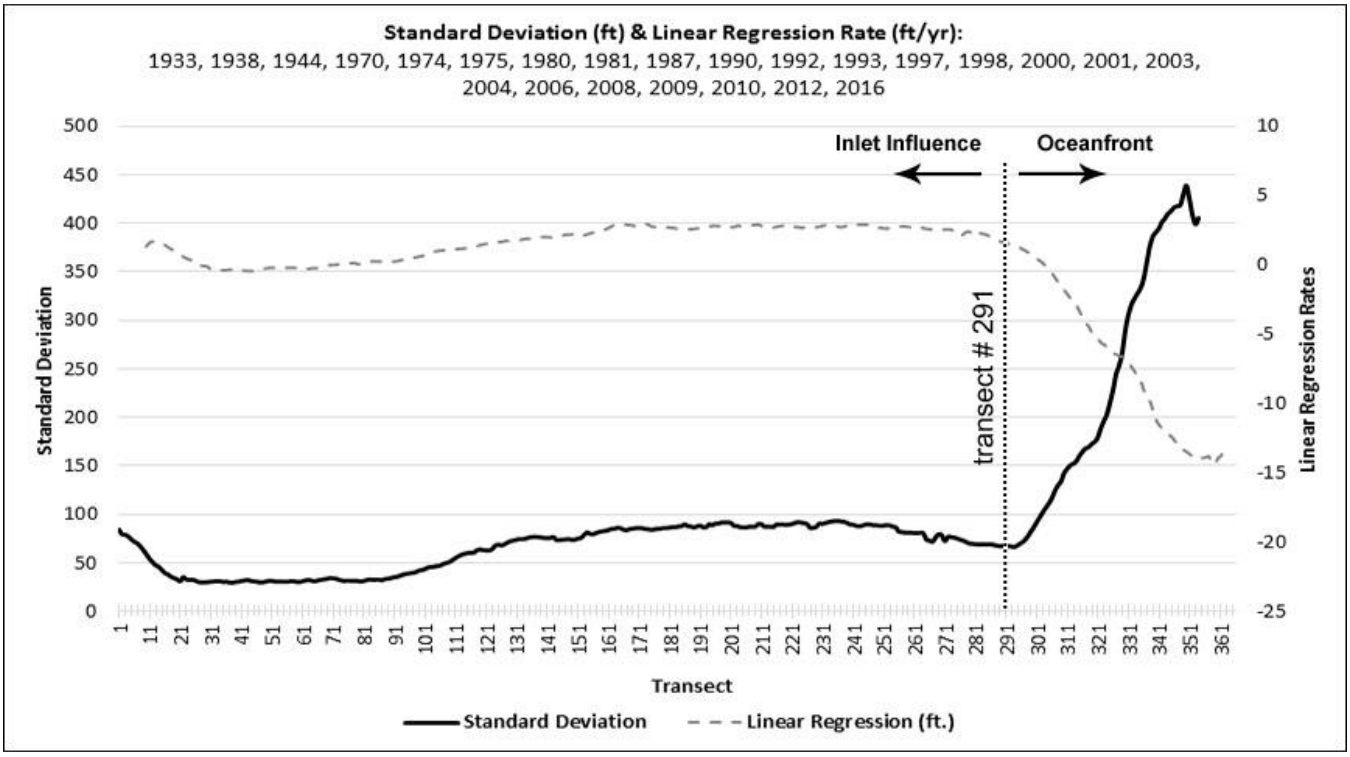
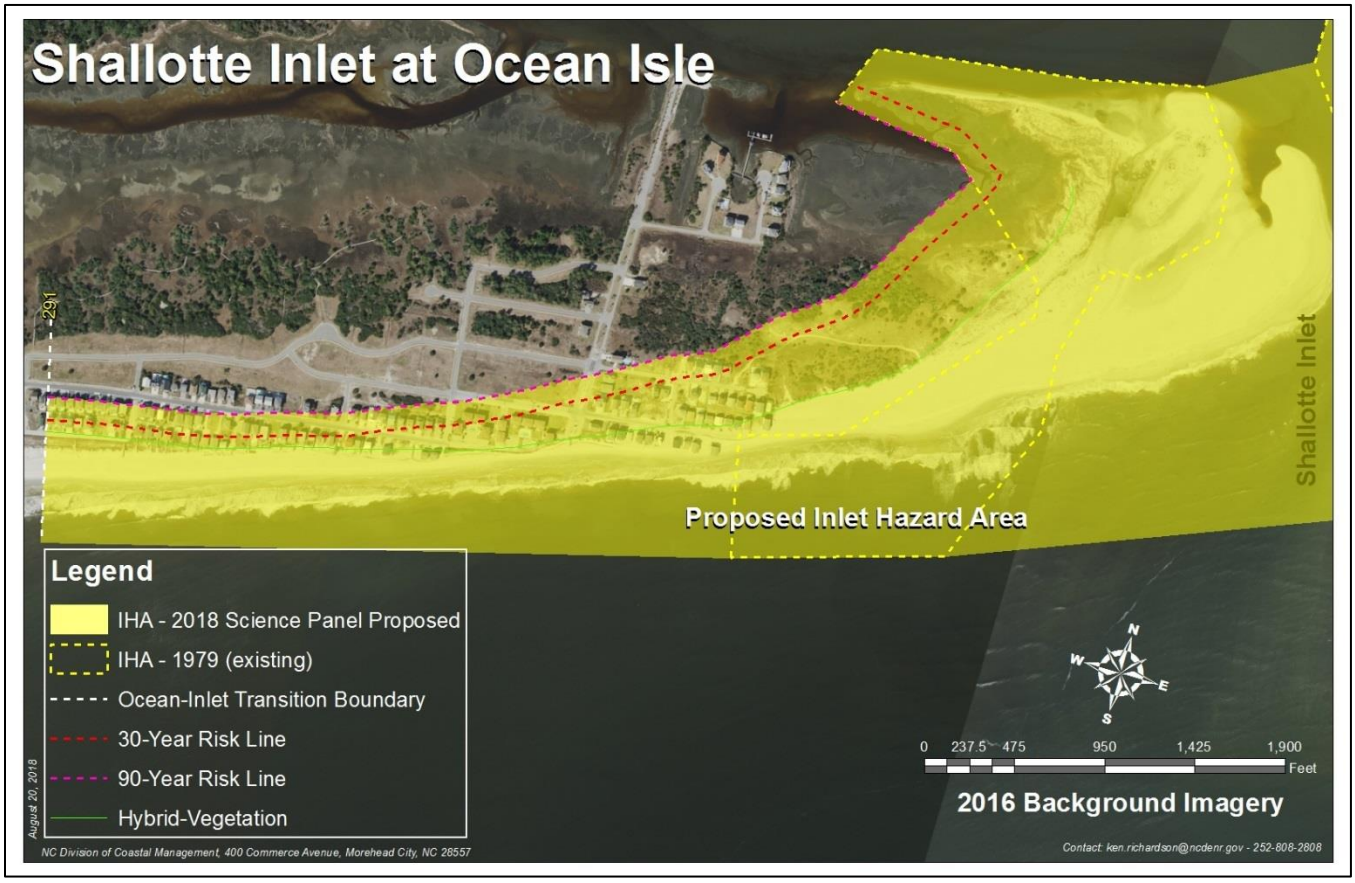


Figure 18. Shallotte Inlet at Ocean Isle Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30-Year Risk Line and modified 90-Year Risk Lines.



3.2b Holden Beach side of Shallotte Inlet

The vegetation and shoreline data for the Holden Beach side of Shallotte inlet are shown in Figures 19 and 20. Using the IHAM, transect-170 is the boundary of inlet influence along the oceanfront shoreline (Figure 21). The accretional cycle caused by the ebb channel alignment close to the Holden Beach shoreline, which began in the 1970s, results in an underestimate of the difference between the 30- and 90-Year Risk Lines closer to the inlet. To compensate for this, beginning at transect-90, the Panel adjusted the landward boundary to follow the existing IHA boundary and to connect with the inlet end of the 90-Year Risk Line (Figure 22).

Figure 19. Shallotte Inlet at Holden Beach. Vegetation Lines mapped: 1970, 1981, 1992, 1993, 1998, 2003, 2004, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1970, 1981, 1992, 1993, 1998, 2003, 2004, 2008, 2009, 2010.

Figure 20. Shallotte Inlet at Holden Beach. Shorelines included in the analysis: 1970, 1981, 1992, 1993, 1997, 1998, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

Figure 21. Based on the standard deviation of shoreline position at Shallotte Inlet-Holden Beach, transect-170 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

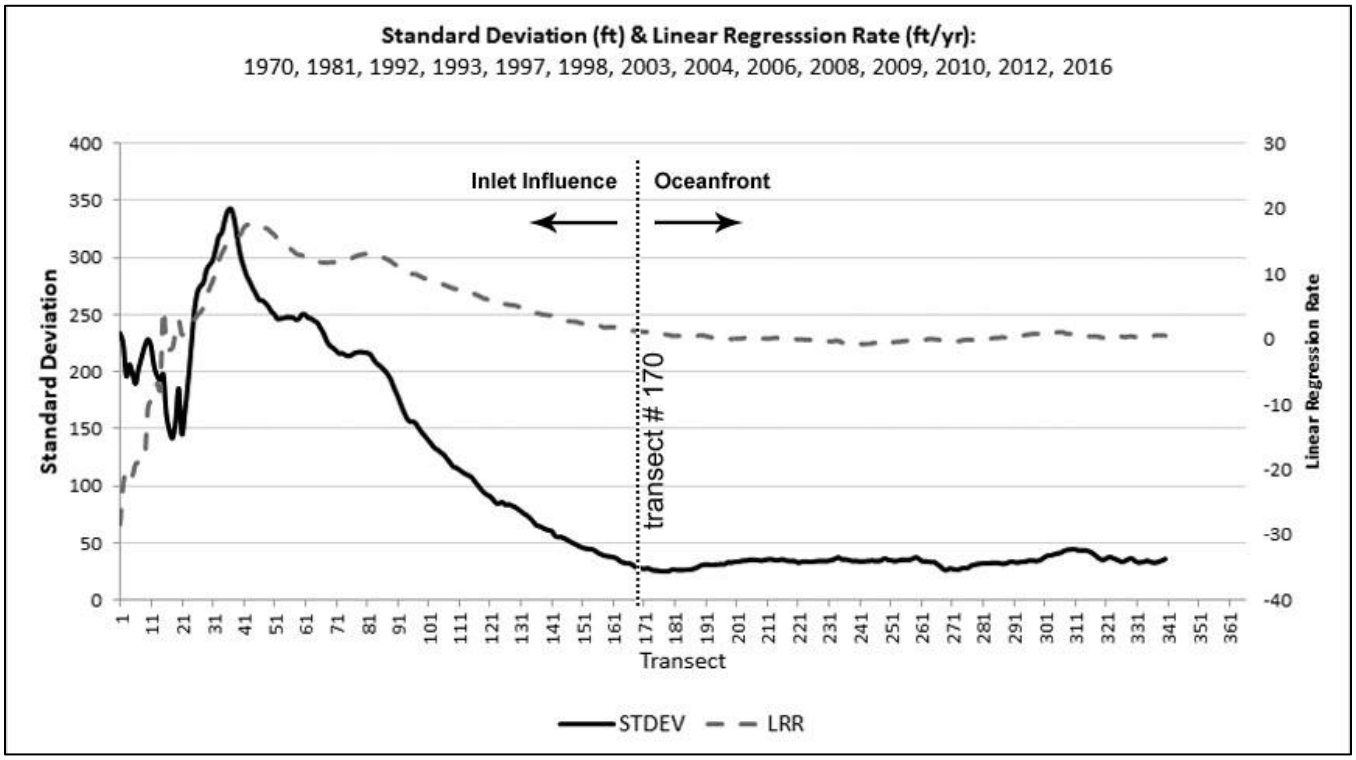
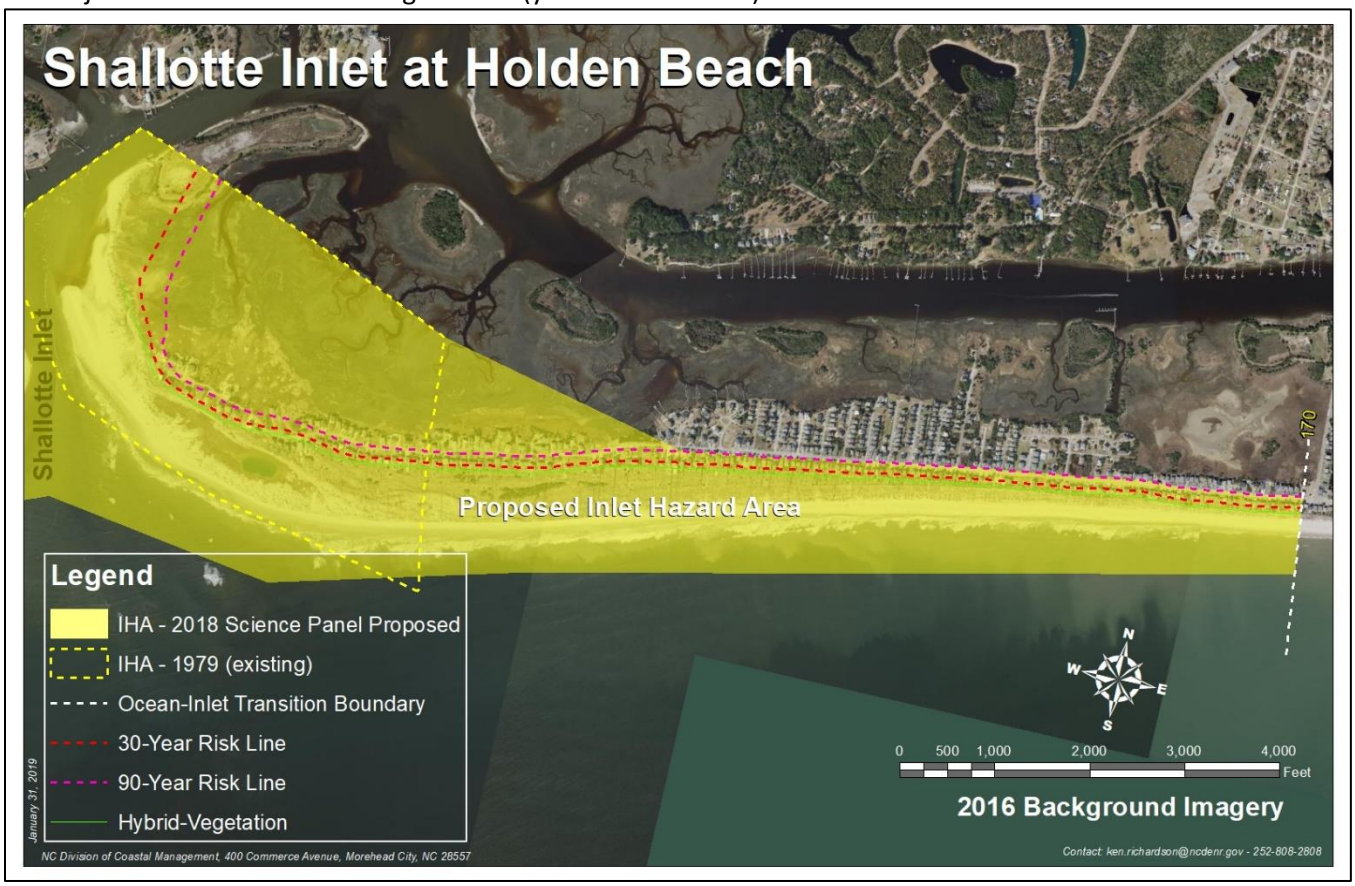


Figure 22. Shallotte Inlet at Holden Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines. Black dashed line indicates Transect-90 where the IHA boundary was adjusted to match the existing IHA line (yellow dashed line).



3.3 Lockwood Folly Inlet

Lockwood Folly Inlet, like nearby Shallotte Inlet, is an oscillatory inlet with wide oscillations in the adjacent oceanfront shorelines. It was charted as early as 1672. Seismic data from the inner-continental shelf suggest the inlet is a permanent feature related to the paleo-channel of the ancestral Lockwood Folly River that extends across the hard bottom-dominated shoreface. Since 1938 the throat position of the ebb channel has shifted east and west within a 420 feet wide corridor. Although the throat segment of the ebb channel has been confined to a relatively narrow zone, the outer segment of the channel has migrated to the southwest and the southeast across a 7,250 feet wide length of the oceanfront shorelines. Because of the complex pattern of movement of the ebb channel across the outer bar, the symmetry of the ebb delta has continually been altered as has the protective wave-sheltering effect of the shoals on the ocean shorelines.

The contrasting patterns of change along the Holden Beach and Oak Island oceanfront shorelines directly reflect the influence of the ebb channel's position, its alignment and the attendant shape changes of the ebb-tidal delta. In general, the pre-dominant historic southeasterly alignment of

the ebb channel has promoted much of the long-term chronic erosion along Holden Beach involving hundreds of feet of shoreline retreat and by contrast the hundreds of feet of progradation along Oak Island.

Lockwood Folly Inlet is an authorized Federal shallow-draft navigation project. The navigation channel is periodically maintained by dredging.

3.3a Holden Beach side of Lockwood Folly Inlet

Vegetation and shoreline data between 1970 and 2016 illustrate the effects on the shoreline of low-elevation swash bars consistently welding onto the ocean shoreline near the inlet (Figures 23, 24). The shoreline more distant from the inlet has been eroding. Sandbag revetments have been installed to armor roads and houses along 2,000 feet of developed shoreline adjacent to the inlet.

Using the IHAM, transect-477 is recommended as the boundary of inlet influence along the oceanfront shoreline (Figure 25). Because use of the 17-point running average of the shoreline change rate can be problematic across a sharp transition between eroding and accreting sections, the Panel used the unsmoothed erosion rates starting at inlet transect-540 and ending at transect-547 to establish the Risk Lines. The recommended boundary of the IHA is the 90-Year Risk Line (Figure 26).

Figure 23. Lockwood Folly Inlet at Holden Beach. Vegetation Lines mapped: 1971, 1978, 1988, 1993, 1998, 2003, 2004, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1971, 1988, 1993, 1998, 2003, 2004.

Figure 24. Lockwood Folly Inlet at Holden Beach. Shorelines included: 1970, 1971, 1978, 1988, 1993, 1997, 1998, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

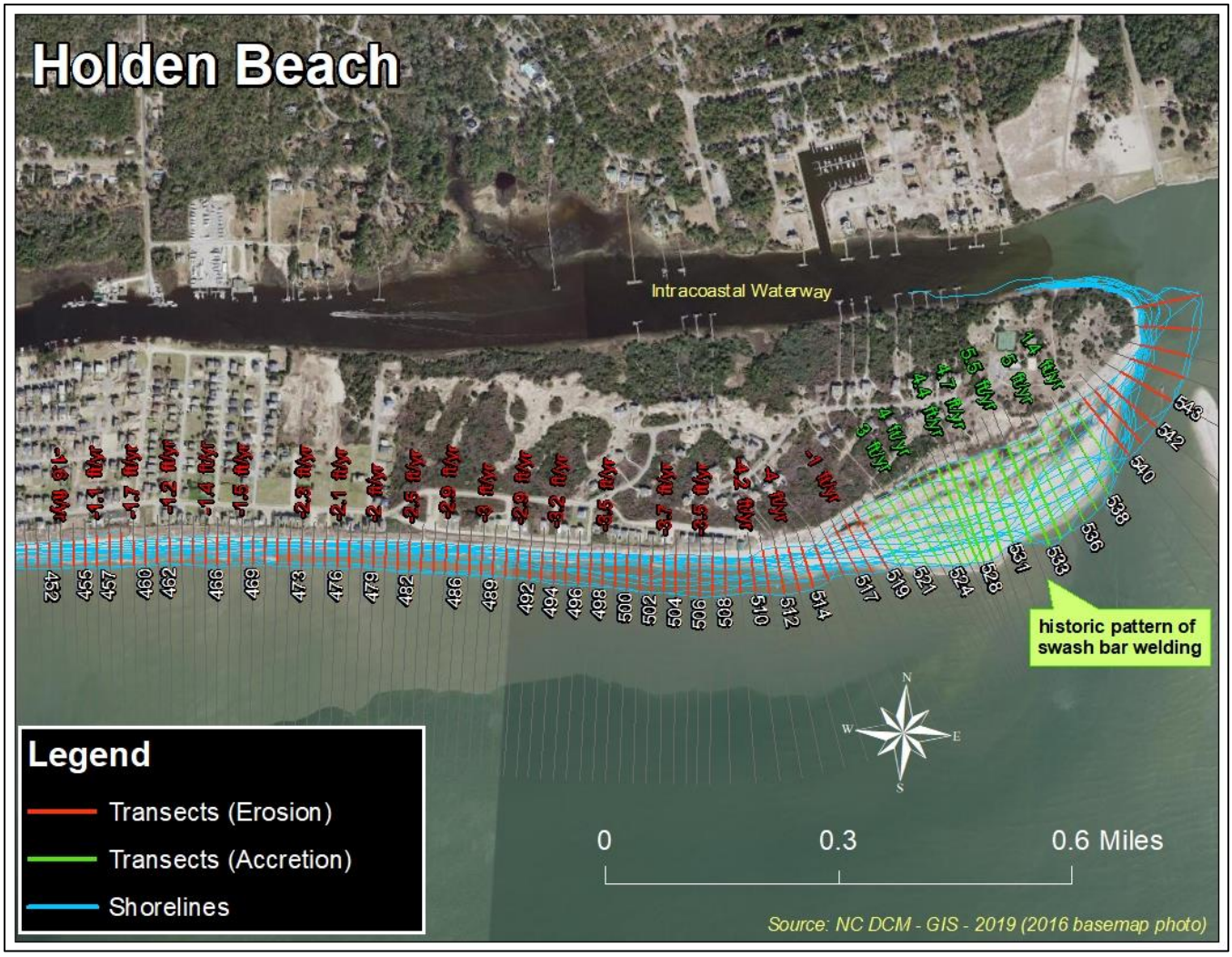


Figure 25. Based on the standard deviation of shoreline position at Lockwood Folly Inlet-Holden Beach, transect-477 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

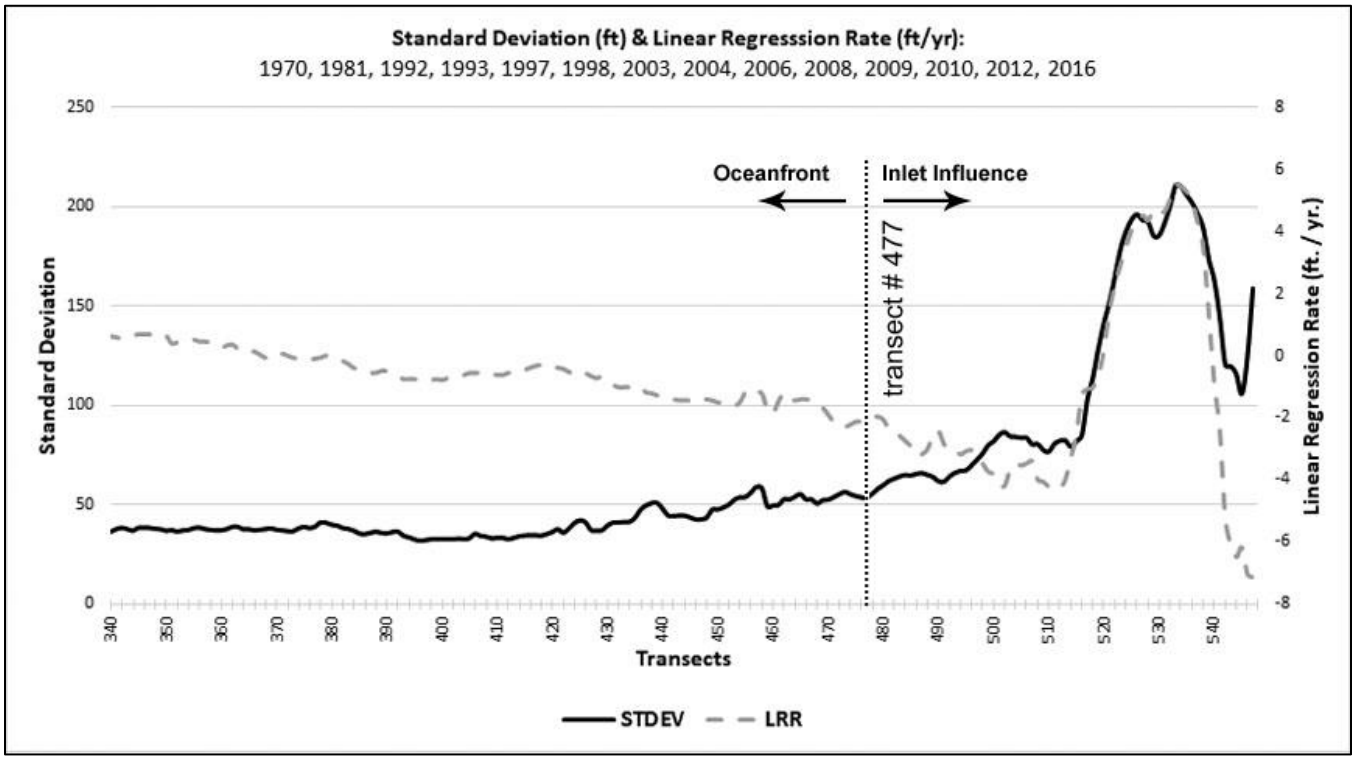
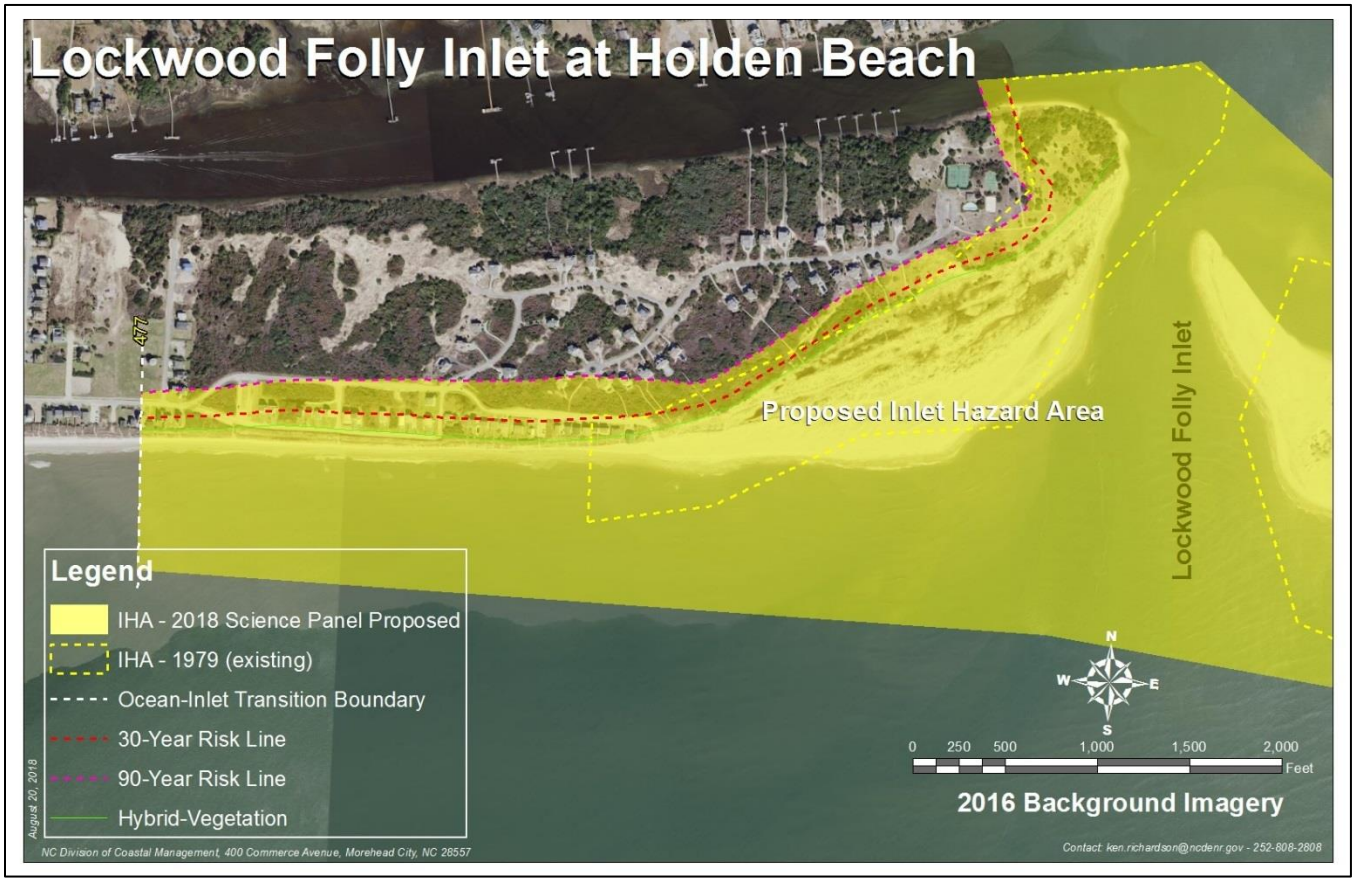


Figure 26. Lockwood Folly Inlet at Holden Beach Hybrid Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.3b Oak Island side of Lockwood Folly Inlet

Oak Island experienced severe erosion between 1974 to 1984 (Cleary and Marden, 1999) causing building failures and relocations; partial loss of the loop road; and the construction of various erosion control structures. Analysis of longer-term data (1971-2016) demonstrate the shoreline's recovery resulting in extensive long-term accretion. Some of the lots that previously lost buildings were redeveloped after 2000. Several of the new houses that were threatened by a local shift in the ebb channel in 2014-6 were armored with sandbags. Vegetation and shoreline data for the Oak Island side of Lockwood Folly Inlet are shown in Figures 27 and 28.

Using the IHAM, the standard deviation suggests that inlet influence extends to at least transect-85. However, the shoreline change, or LRR, appears to be influenced and remains high to transect-70 (Figure 29). An accretionary dune feature exists centered around transect-63 and the visible landward dip in the HVL ending at transect-70. Transect-70 is recommended as the IHA boundary to include the accretionary dunes influenced by the inlet. The recommended landward IHA boundary is the 90-Year Risk Line (Figure 30).

Figure 27. Lockwood Folly Inlet at Oak Island. Vegetation Lines mapped: 1971, 1974, 1975, 1978, 1979, 1980, 1987, 1988, 1990, 1993, 1998, 2000, 2003, 2004, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1971, 1987, 1988, 1990, 1993, 2016.

Figure 28. Lockwood Folly Inlet at Oak Island. Shorelines included: 1970, 1971, 1974, 1975, 1978, 1979, 1980, 1981, 1987, 1988, 1990, 1993, 1997, 1998, 2000, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

Figure 29. At Lockwood Folly Inlet-Oak Island, inlet transect-70 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

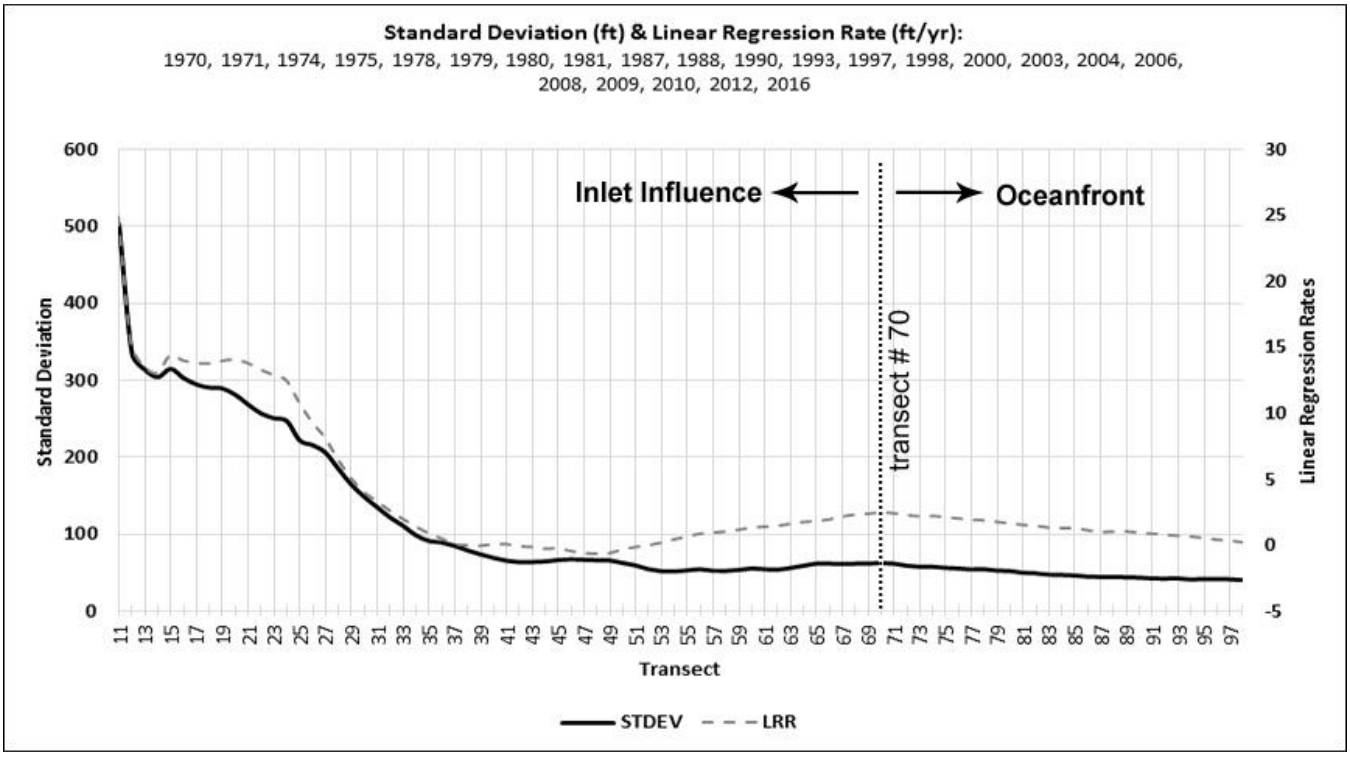
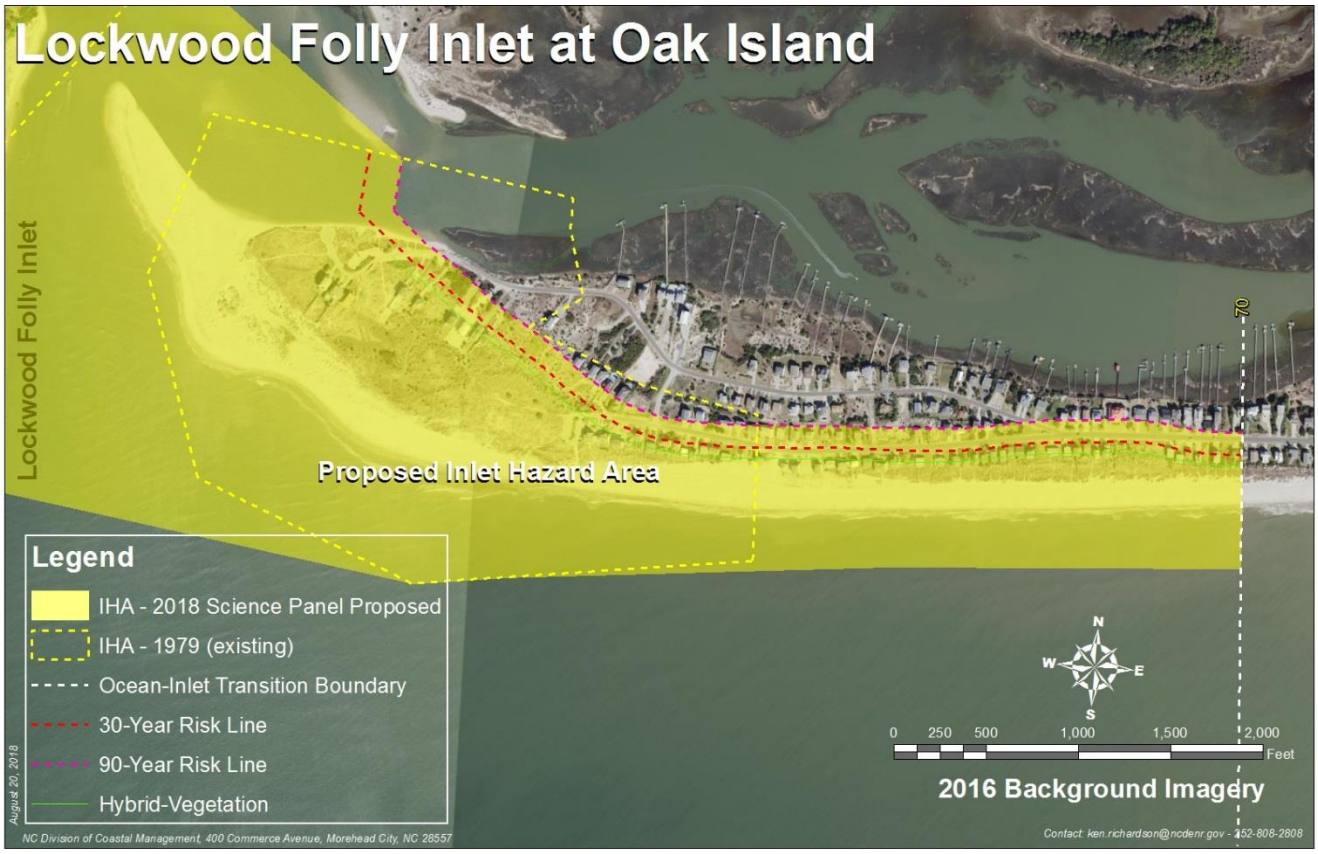


Figure 30. Lockwood Folly Inlet at Oak Island Hybrid Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.4 Carolina Beach Inlet

Carolina Beach Inlet is an oscillatory inlet that was opened by private interests in 1952, at a location approximately 7,500 feet northeast of the Town of Carolina Beach. The inlet was opened along the closure zone of former Sugarloaf Inlet, a short-lived inlet of the late 19th Century. Carolina Beach inlet is an authorized Federal shallow-draft navigation project that connects the open ocean and the AIWW through a short, narrow and relatively deep navigation channel. The inlet also provides a connection to the Cape Fear River across the mainland via Snows Cut. Since the 1970s the navigation channel has been regularly used as a borrow source for a US Army Corps of Engineers beach nourishment project along sections of Carolina Beach. During the past 50 years the inner and outer segments of the main channel have shifted toward Masonboro Island as much as 475 feet. After the opening of the inlet, the adjacent oceanfront shorelines along both Carolina Beach and Masonboro Island began to erode at rapid rates that ultimately led to a significant landward offset of Carolina Beach. As part of the US Army Corps of Engineers project a rock revetment was constructed to protect the northern 1,800 feet of development. The chronic erosion was related to the reduced rate of sand bypassing at the inlet as the ebb-tidal

delta continued to impound sand. The reduced rate of bypassing also severely impacted updrift Masonboro Island, where the oceanfront has retreated approximately 500 feet since 1962.

3.4a Carolina Beach side of Carolina Beach Inlet

Vegetation and shoreline data for the Carolina Beach side of Carolina Inlet are shown in Figures 31 and 32. Using the IHAM, transect-1267 is the boundary of inlet influence along the oceanfront shoreline (Figure 33). The 90-Year Risk Line is recommended as the landward boundary until it intersects with the 1979 IHA boundary closer to the inlet to include the sand spit along the inlet channel (Figure 34).

Figure 31. Carolina Beach Inlet at Carolina Beach. Vegetation Lines mapped: 1971, 1974, 1977, 1984, 1992, 1998, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1971, 1974, 1977, 1984, 1992, 1998, 2002, 2006, 2008, 2009, 2012.

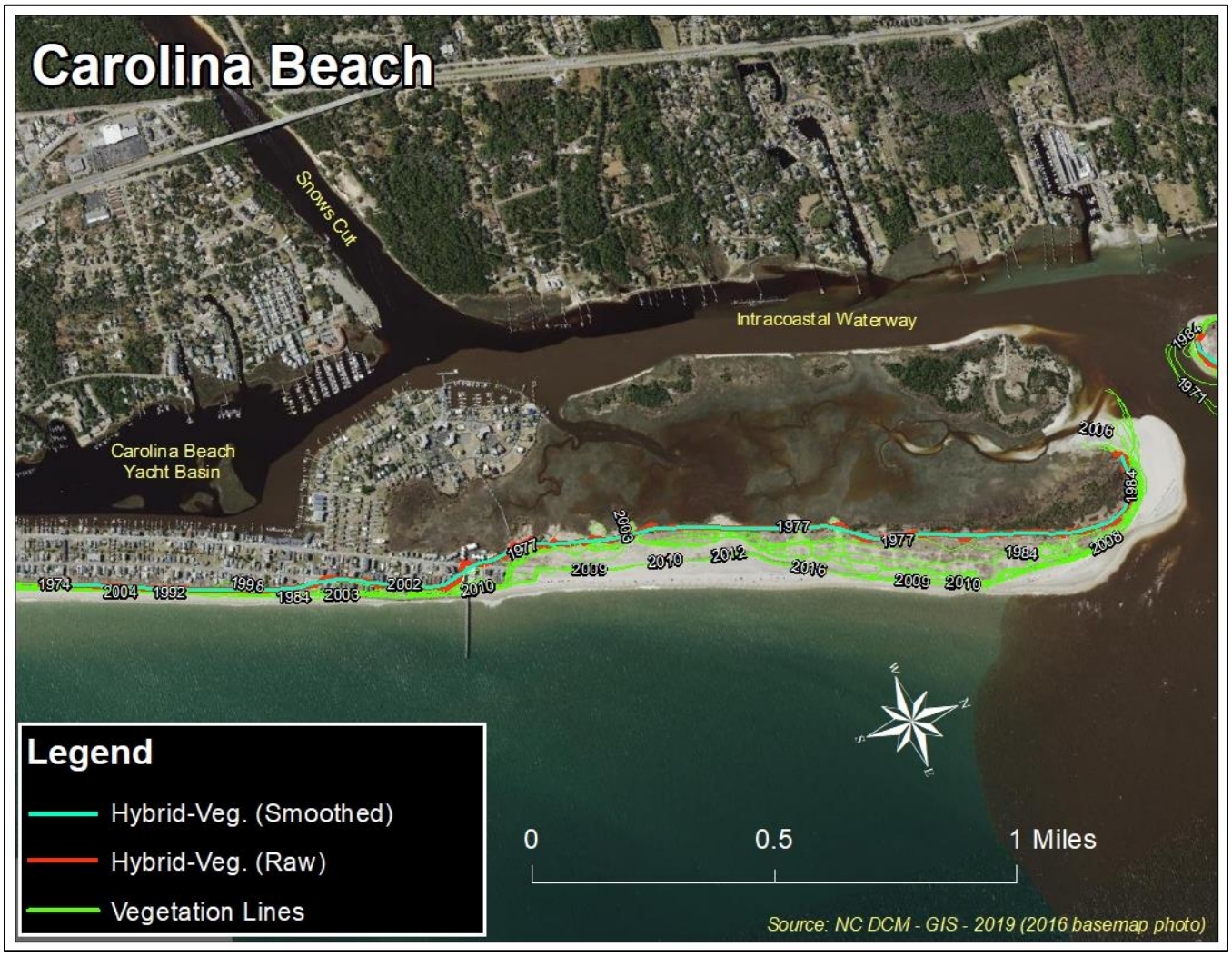


Figure 32. Carolina Beach Inlet at Carolina Beach. Shorelines included in the analysis: 1971, 1973, 1974, 1977, 1984, 1992, 1997, 1998, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

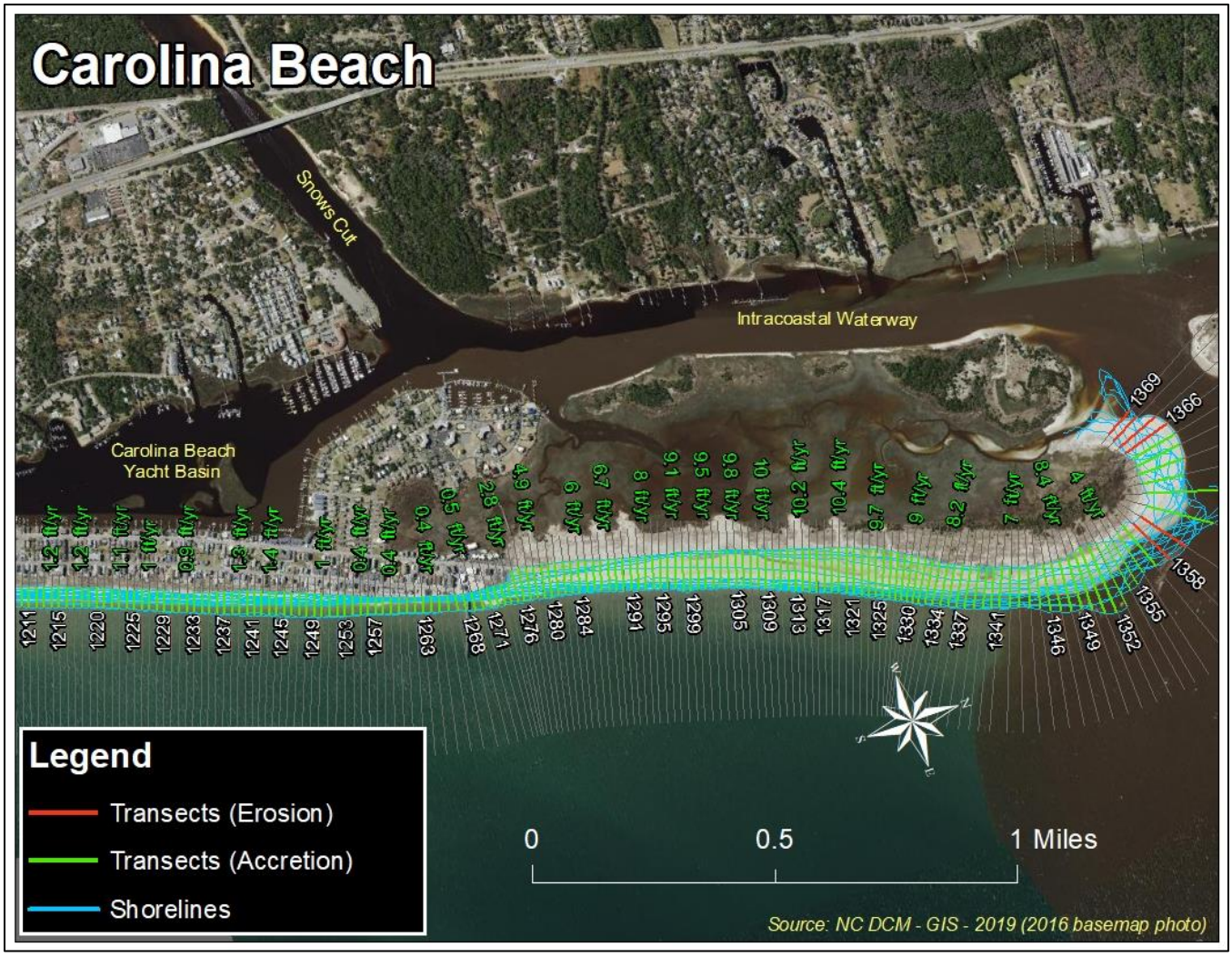


Figure 33. Based on the standard deviation of shoreline position at Carolina Beach Inlet-Carolina Beach, transect-1267 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

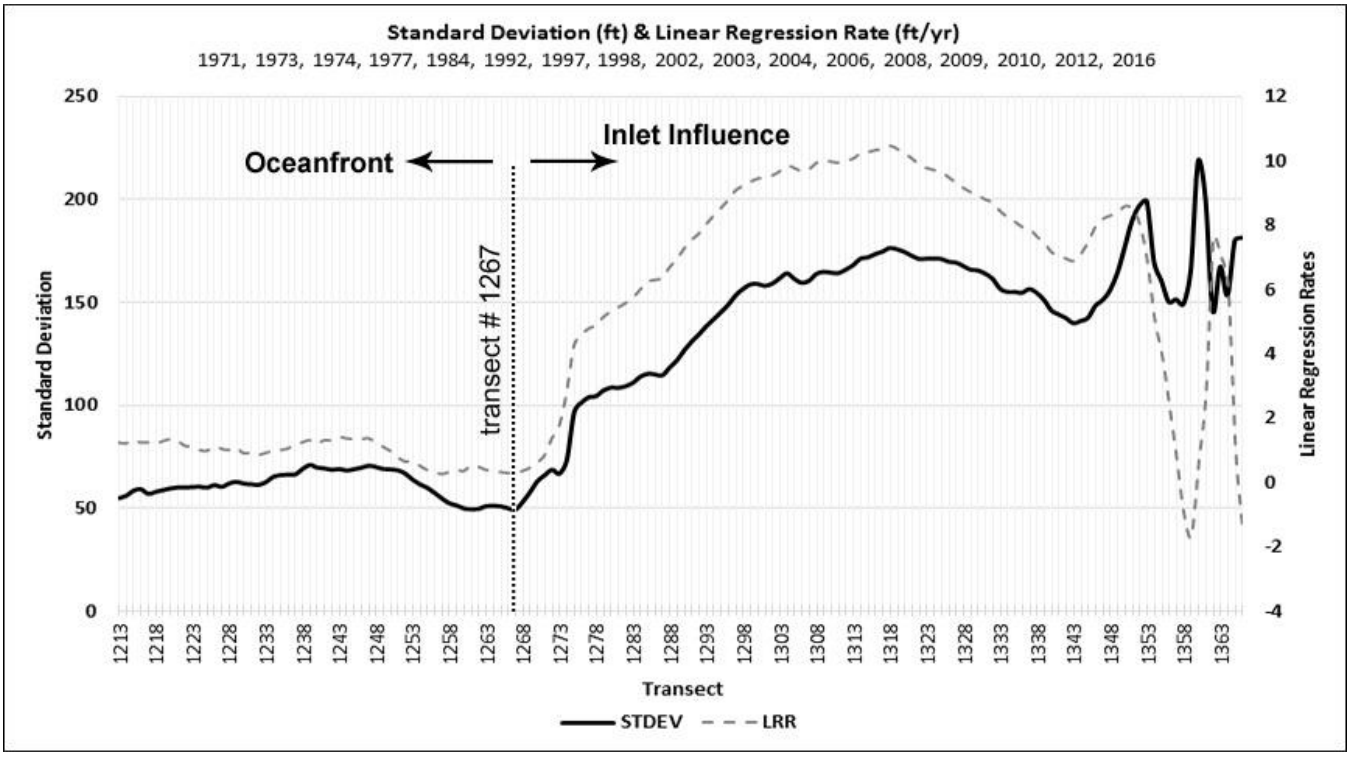
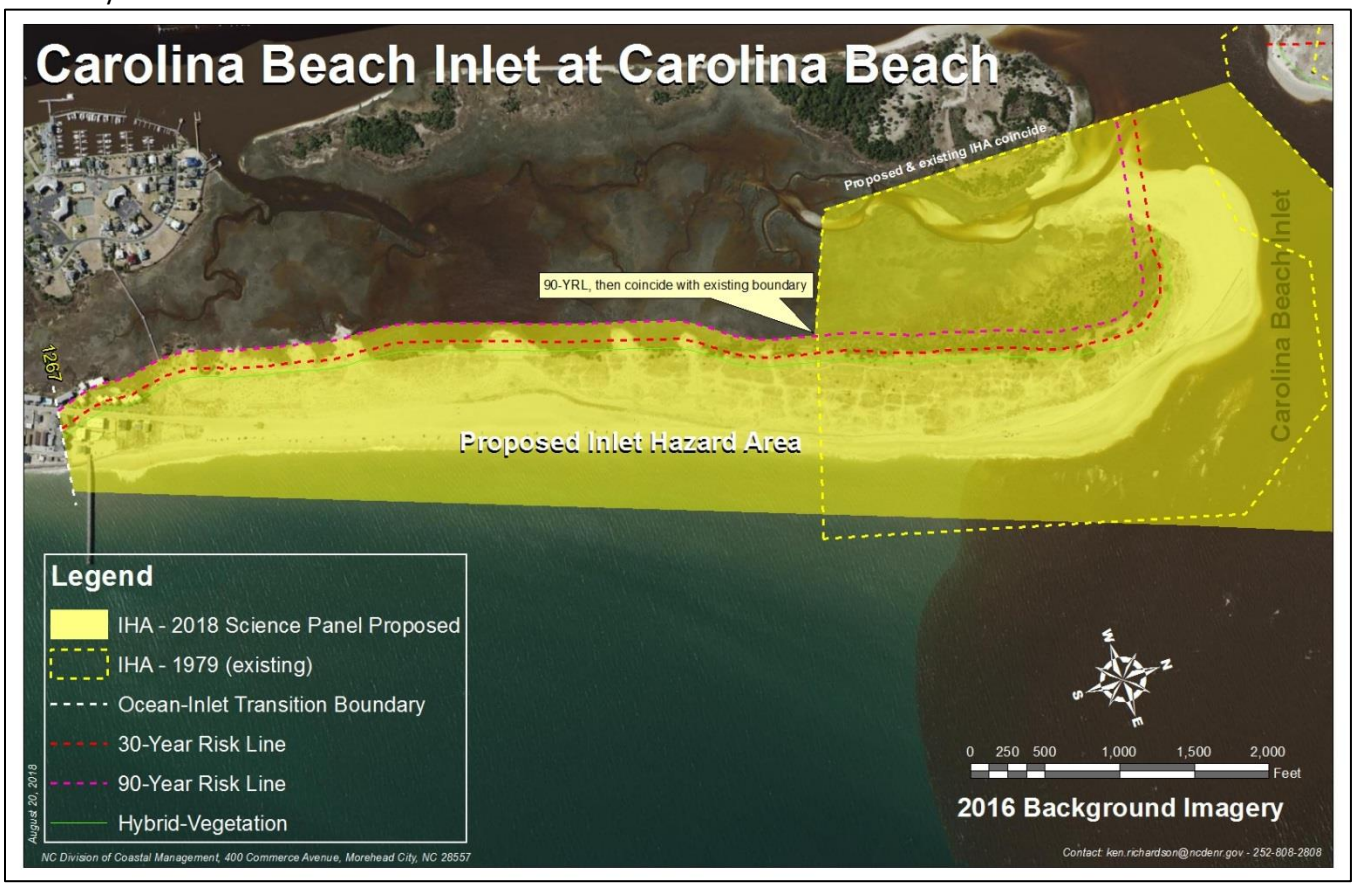


Figure 34. Carolina Beach Inlet at Carolina Beach Hybrid Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.4b Masonboro Island side of Carolina Beach Inlet

Carolina Beach Inlet is bordered on the north by uninhabited Masonboro Island, a narrow, low-lying and dynamic barrier island characterized by extensive overwash, a 1954 breach during Hurricane Hazel, and a wide back-barrier marsh. The entire island is affected by both Carolina Beach Inlet and Masonboro Inlet to the north. This can be seen in the vegetation and shoreline data shown in Figures 35 and 36, which illustrate the high rates of erosion occurring within Carolina Beach Inlet and along most of the oceanfront. The erosion is a consequence of sediments not bypassing the Masonboro Inlet jetties from the north. Accretion is occurring at the north end of the island in an area that is within the depositional fillet of and protected by the Masonboro Inlet south jetty.

Using the IHAM, the standard deviation in shoreline position was examined along the Masonboro Island oceanfront and it is high everywhere, being lowest at transect-376 and increasing toward each inlet (Figure 37). Based on that finding and considering that the 90-Year Risk Line falls into the back-barrier marsh, the recommended IHA extends along the entire length of Masonboro Island (Figure 38).

Figure 35. Carolina Beach and Masonboro Inlets at Masonboro Island. Vegetation Lines mapped: 1971, 1974, 1977, 1984, 1992, 1998, 2000, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1974, 1977, 1984, 1998, 2000, 2002, 2003, 2004, 2006, 2008, 2010, 2012, 2016.

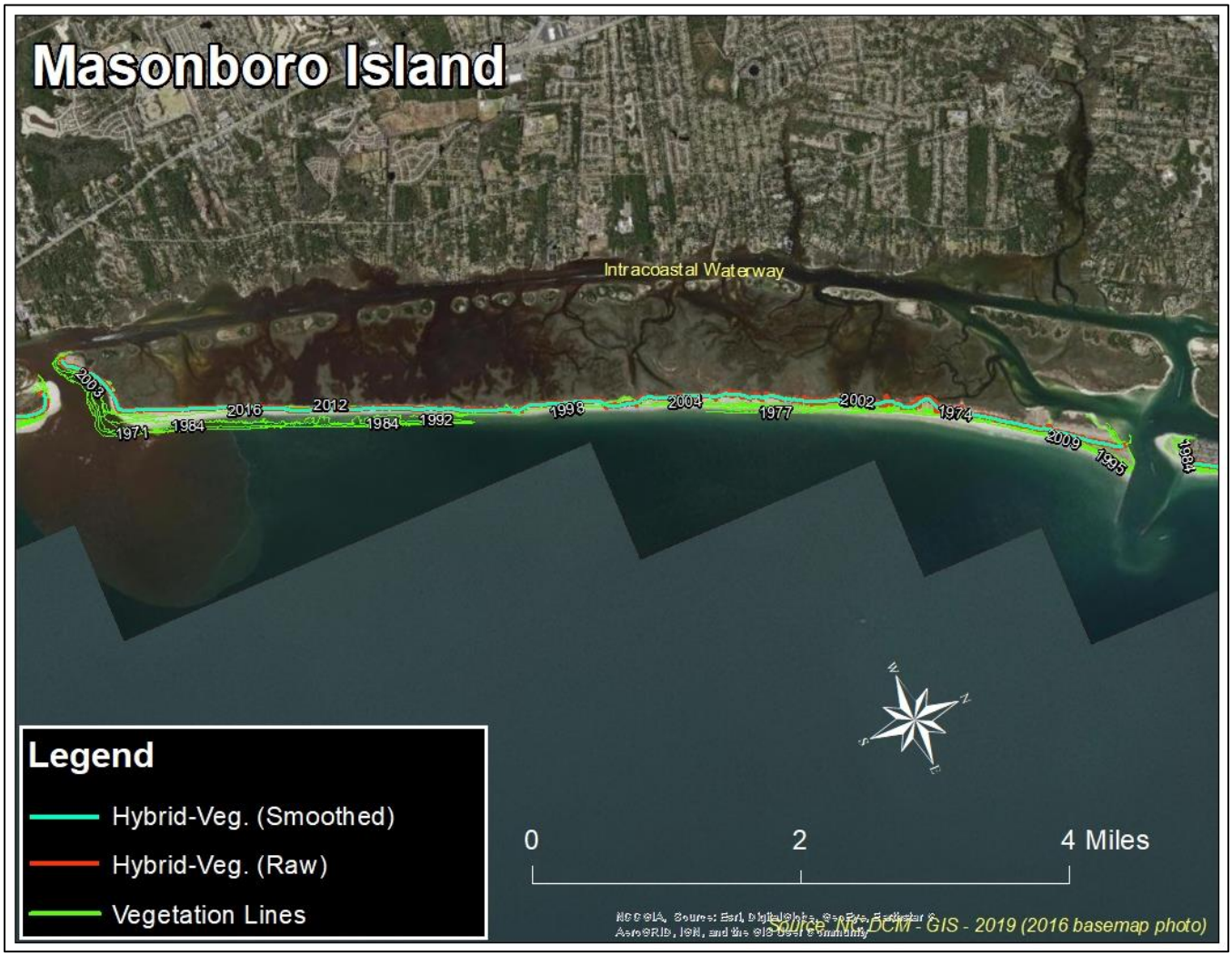


Figure 36. Carolina Beach and Masonboro Inlets at Masonboro Island. Shorelines included in the analysis: 1971, 1974, 1977, 1984, 1992, 1997, 1998, 2000, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

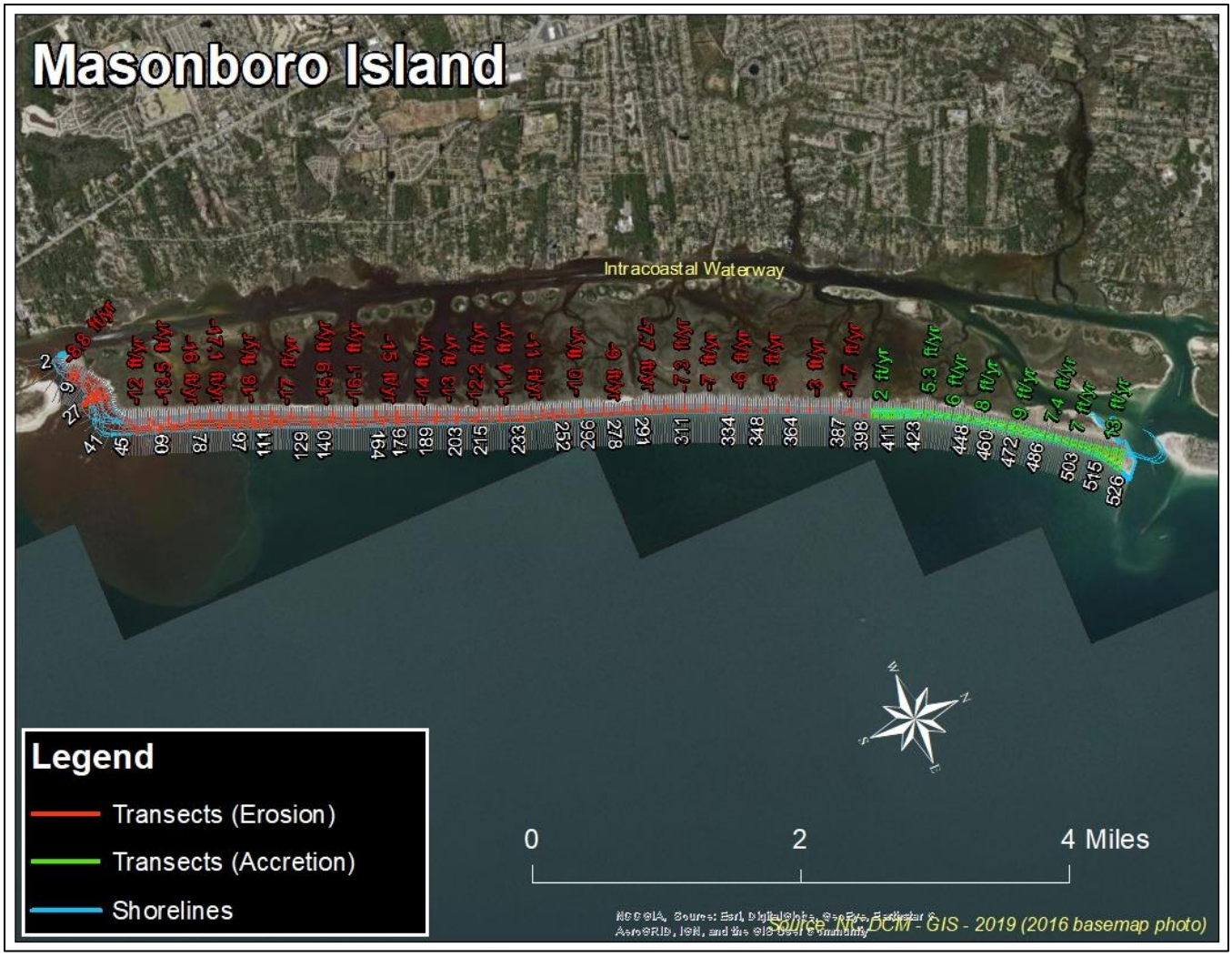


Figure 37. Masonboro Island Standard Deviation of Shoreline Change and Linear Regression Rates. Because both Carolina Beach Inlet (left) and Masonboro Inlet (right) influence Masonboro Island's entire shoreline, the recommended IHA includes Masonboro Island in its entirety. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

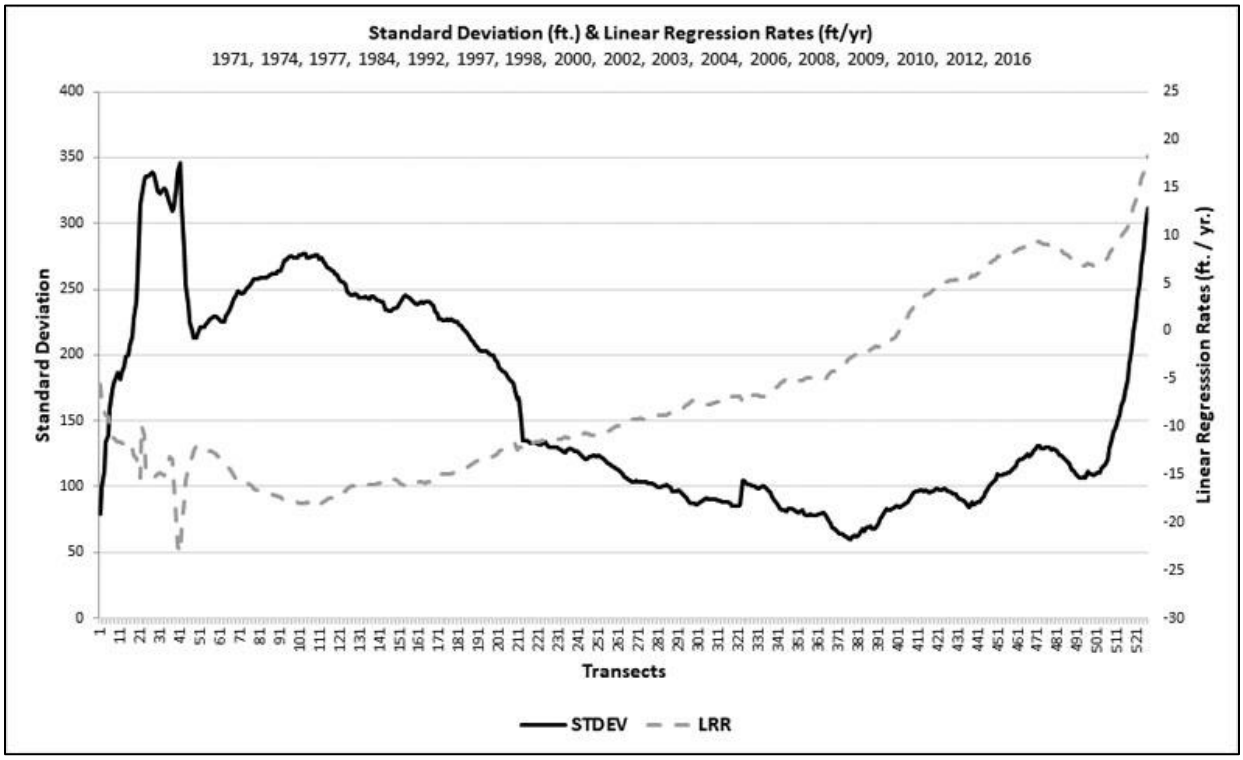
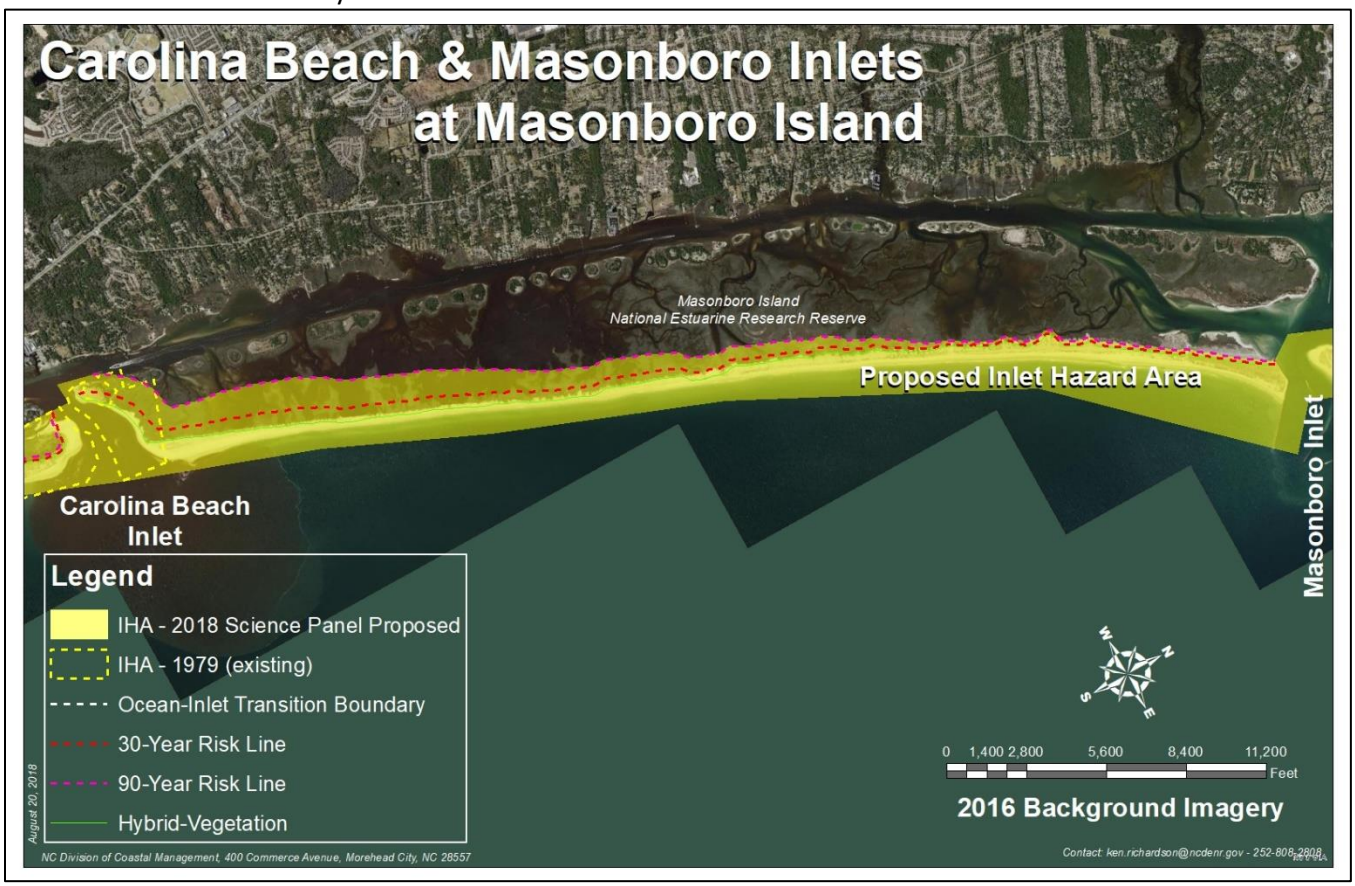


Figure 38. Carolina Beach and Masonboro Inlets at Masonboro Island Hybrid Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.5 Masonboro Inlet

Masonboro Inlet is a migrating inlet that is now stabilized. It was documented on historic charts from 1733 and likely opened in a storm in the early 1700s approximately 7,650 feet northeast of its current location. Since completion of the AIWW (ca. 1930) the inlet and the tidal basin have been modified by a variety of projects on Wrightsville Beach designed to mitigate the oceanfront erosion, dredge and landfill along the sound and improve navigation. In May 1950, a navigation project was authorized by Congress that proposed the construction of a 14-foot deep by 400-foot wide channel across the ebb-tidal delta flanked by twin jetties and a series of access channels to the AIWW. A single northern weir-jetty was completed in 1966. The south jetty was constructed in 1981.

In the first decade after construction, the north jetty trapped sand extending at least a mile north of the jetty with up to 400 feet of accretion near the jetty. Since then, the low weir has stabilized the ocean shoreline changes by allowing excess sand from the north to be transported inside the jetty, preventing additional entrapment north of the jetty.

The Wrightsville Beach Storm Damage Reduction Project (dune and beach nourishment), completed in 1965, initially involved the placement of approximately 3.0 million cubic yards of material along the oceanfront, extending from the weir-jetty northward to the closure zone of Moore's Inlet, approximately 2.5 miles north. Since that time an additional 13 million cubic yards of beach fill has been used to renourish the oceanfront beach north of the accretion caused by the jetty. Sand accumulating in the inlet area and adjacent navigation channels is periodically dredged for nourishment to the north, backpassed onto Wrightsville Beach and less frequently bypassed to the south onto Masonboro Island as mitigation for the jetty system.

Following construction of the north jetty, the north end of Masonboro Island experienced rapid oceanfront erosion as the sheltered inlet shoreline rapidly migrated north, narrowing the inlet and eventually eroding the inlet shoreline on Wrightsville Beach. By the initiation of construction of the south jetty, erosion threatened the street at the south end of Wrightsville Beach. The shifting navigation channel threatened to undermine sections of the new north jetty. Those changes initiated plans to complete the other half of the originally designed twin jetties.

Construction of the south jetty in 1980 trapped sand on the northern oceanfront of Masonboro Island, reversing the rapid erosion that followed construction of the north jetty. Within the next decade, the fillet created south of the new jetty accreted over 420 feet and eventually stabilized. The fillet has stabilized at least 3000 feet of Masonboro Island shoreline immediately south of the jetty.

Construction of the south jetty simultaneously blocked the sand transport driving the migration of the northern tip of the island and navigation channel. After sand transport from the south was terminated, the remaining primary sand transport into the inlet was over the weir in the north jetty. That reversed the prior erosion on the Wrightsville Beach inlet shoreline inside the jetties. Over the decade following construction of the south jetty, the tip of the island accreted more than 1300 feet into the inlet. The spit eventually interfered with the navigation channel alignment and threatened to undermine the south jetty. In 1996 the US Army Corps of Engineers began removing the southern 400 feet of spit. The material is now regularly removed for beachfill in Wrightsville Beach or jetty mitigation on Masonboro Island.

Since construction of the second jetty, the ebb-tidal delta has enlarged, extended seaward and steepened. The emplacement of the jetties and the consequent increase in the tidal prism has increased sediment entrapment within the ebb-tidal delta and along the fillets. The twin jetties have cut off all natural bypassing across the inlet. The only bypassing is by the irregular dredging to Masonboro Island. Although several thousand feet of ocean shoreline on the north end of Masonboro Island has accreted or stabilized due to the fillet of the south jetty, the end of natural bypassing and the limited volume of dredged mitigation bypassing has accelerated erosion on much of the rest of the island.

3.5a Masonboro Island side of Masonboro Inlet

As discussed in Section 3.4b, the Masonboro Island side of Masonboro Inlet is included in the island-wide recommended IHA for Masonboro Island. The northern tip of Masonboro Island was removed by dredging after the construction of the south jetty in 1980. The jetty now armors the entire inlet shoreline.

3.5b Wrightsville Beach side of Masonboro Inlet

Vegetation and shoreline data for Wrightsville Beach at Masonboro Inlet are shown in Figures 39 and 40. After the north jetty construction caused an initial accretion, the ocean shoreline has been relatively stable since the 1970s for more than a mile north of the structure. Prior to construction of the north jetty and beach nourishment in 1965, the NC General Assembly declared the oceanfront dunes and beach, including all sand trapped by the jetty, were state-owned. Construction of the south jetty in 1980 reversed the previous northward migration of the inlet. Because of this, only shorelines since 1992 were used for analysis.

Using the IHAM, transect-16 was first identified as separating inlet from oceanfront influence. However, transect-12 is the terminus point of the north inlet jetty, and its standard deviation is only slightly higher. The recommended IHA boundary is the jetty (Figure 41). The 30- and 90-Year Risk Lines and IHA boundary are within the north jetty inlet shoreline (Figure 42).

Figure 39. Masonboro Inlet at Wrightsville Beach. Vegetation Lines mapped: 1992, 1995, 1998, 2000, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1992, 1998, 2000, 2002, 2003, 2004, 2009, 2010.

Figure 40. Masonboro Inlet at Wrightsville Beach. Shorelines included: 1973, 1974, 1977, 1984, 1992, 1995, 1997, 1998, 2000, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016.

Figure 41. At Masonboro Inlet-Wrightsville Beach, the standard deviation of shoreline position has a break in slope around transect-16. Transect-12 is the anchor point of the north inlet jetty, and since its standard deviation is only slightly higher it is recommended as the IHA boundary between inlet and oceanfront influence. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

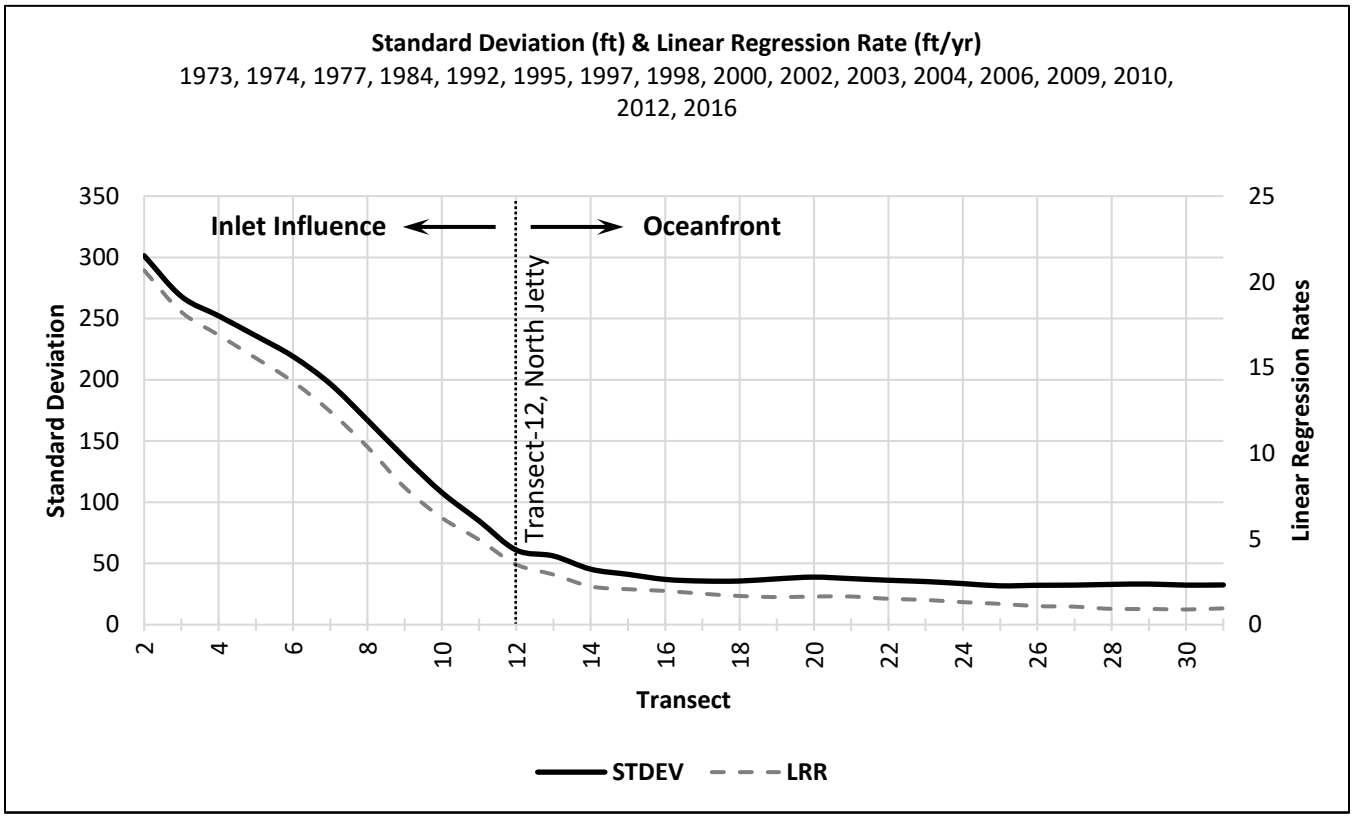
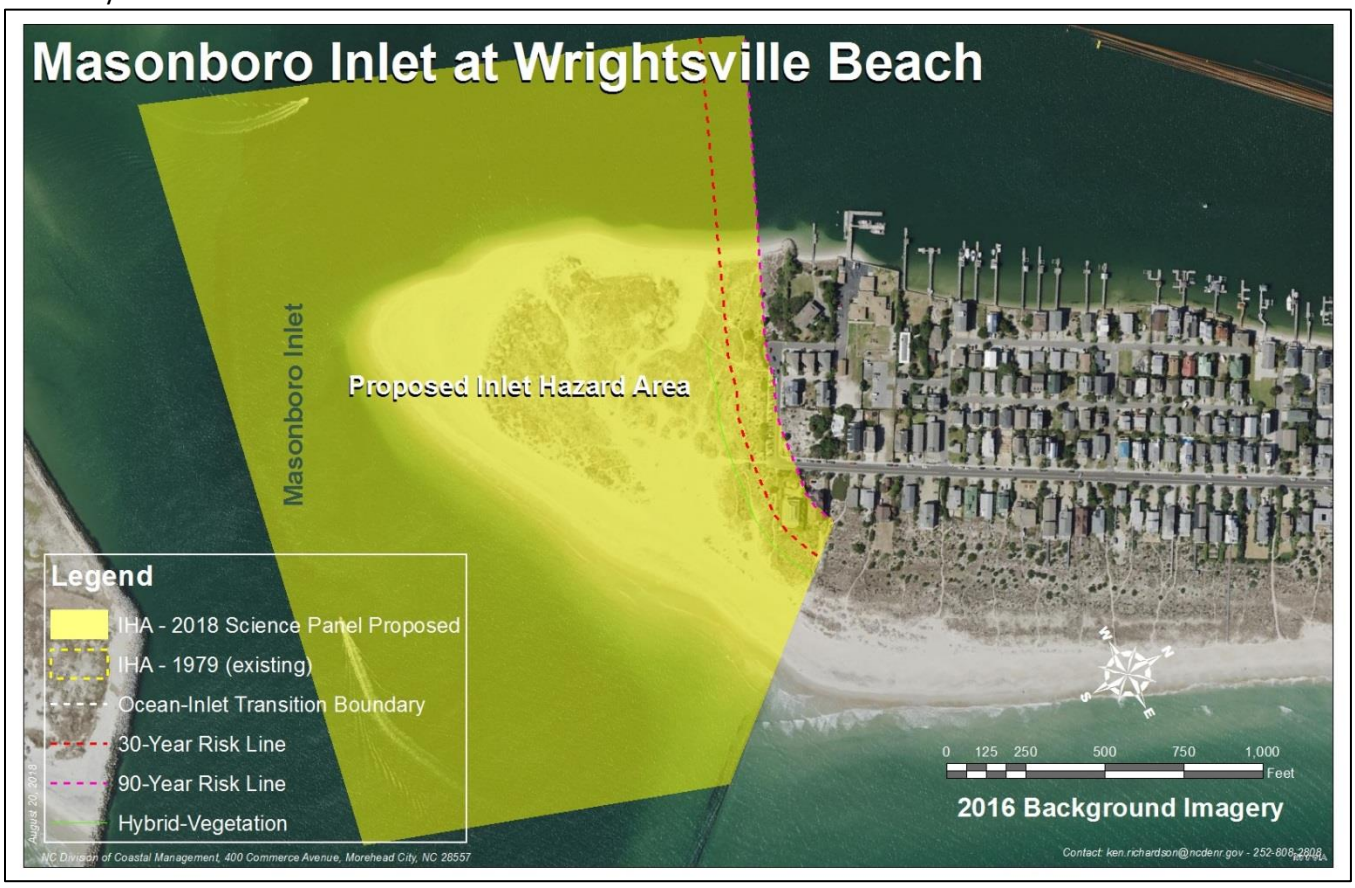


Figure 42. Masonboro Inlet at Wrightsville Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.6 Mason Inlet

Mason Inlet is a small migrating system that opened in the early 1880s 1.8 miles northeast of its current location. The rate of inlet migration varied over decadal scales and there have been short-term reversals in the migration direction. During the period between 1974 and 1997 the inlet migrated southward 3,600 feet, at an average rate of 160 feet per year. Actual rates have ranged from 6 and 310 feet per year with the highest rates coinciding with significant shoaling of both the channel and within the back-barrier area. In 1997 the inlet threatened buildings on the north end of Wrightsville Beach and the southern inlet shoreline was hardened with a large geotextile tube revetment, which remains in place. Infilling of sound-side channels stemmed from the migration of the inlet and the associated juxtaposition of the flood-tidal delta and Mason Creek. The near closure of Mason Creek, the primary channel connection to the AIWW, led to a dramatic reduction of the tidal prism and accelerated the migration rate. Both oceanfront shorelines near the inlet are also oscillating.

In 2002, the inlet was relocated approximately 2,800 feet to the northeast on Figure Eight Island. Since that time the inlet location and feeder channels have been maintained by periodic dredging, which has maintained the increased tidal prism and slowed the natural migration rate.

During the period from the mid-1960s to the early 1980s, the planform of the updrift oceanfront shoreline along Figure Eight Island was concave seaward. The bulbous nature of the shoreline near the inlet reflected the positive influence of the relatively large ebb-tidal delta whose wave-sheltering effect extended approximately 5,000 feet updrift on Figure Eight Island. The overlapping ebb platform protected and frequently nourished the shoreline with the attachment of large swash bars. During the 1970s, progradation extended and widened the beach by 300 feet. As migration continued, the zone of bar attachment also shifted southward. The former shoreline reaches that had accreted began to rapidly erode as the barrier lengthened and the planform changed accordingly. The erosion hot-spot is currently located approximately 3,500 feet northeast of the inlet where beach nourishment and sand bag revetments have been placed.

3.6a Wrightsville Beach side of Mason Inlet

The vegetation and shoreline data for the Wrightsville Beach side of Mason Inlet are shown in Figures 43 and 44. Using the IHAM, transect-258 is the southern boundary of inlet influence along the oceanfront shoreline, near the current IHA boundary (Figure 45). The 90-Year Risk Line is recommended as the landward IHA boundary (Figure 46).

Figure 43. Mason Inlet at Wrightsville Beach. Vegetation Lines mapped: 1971, 1977, 1984, 1987, 1992, 1995, 1998, 2000, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016. Vegetation line segments making up the hybrid-vegetation line: 1971, 1977, 1984, 1987, 1998, 2000, 2002, 2003, 2006, 2009, 2010.

Figure 44. Mason Inlet at Wrightsville Beach. Shorelines included: 1971, 1973, 1974, 1977, 1984, 1987, 1992, 1995, 1997, 1998, 2000, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016.

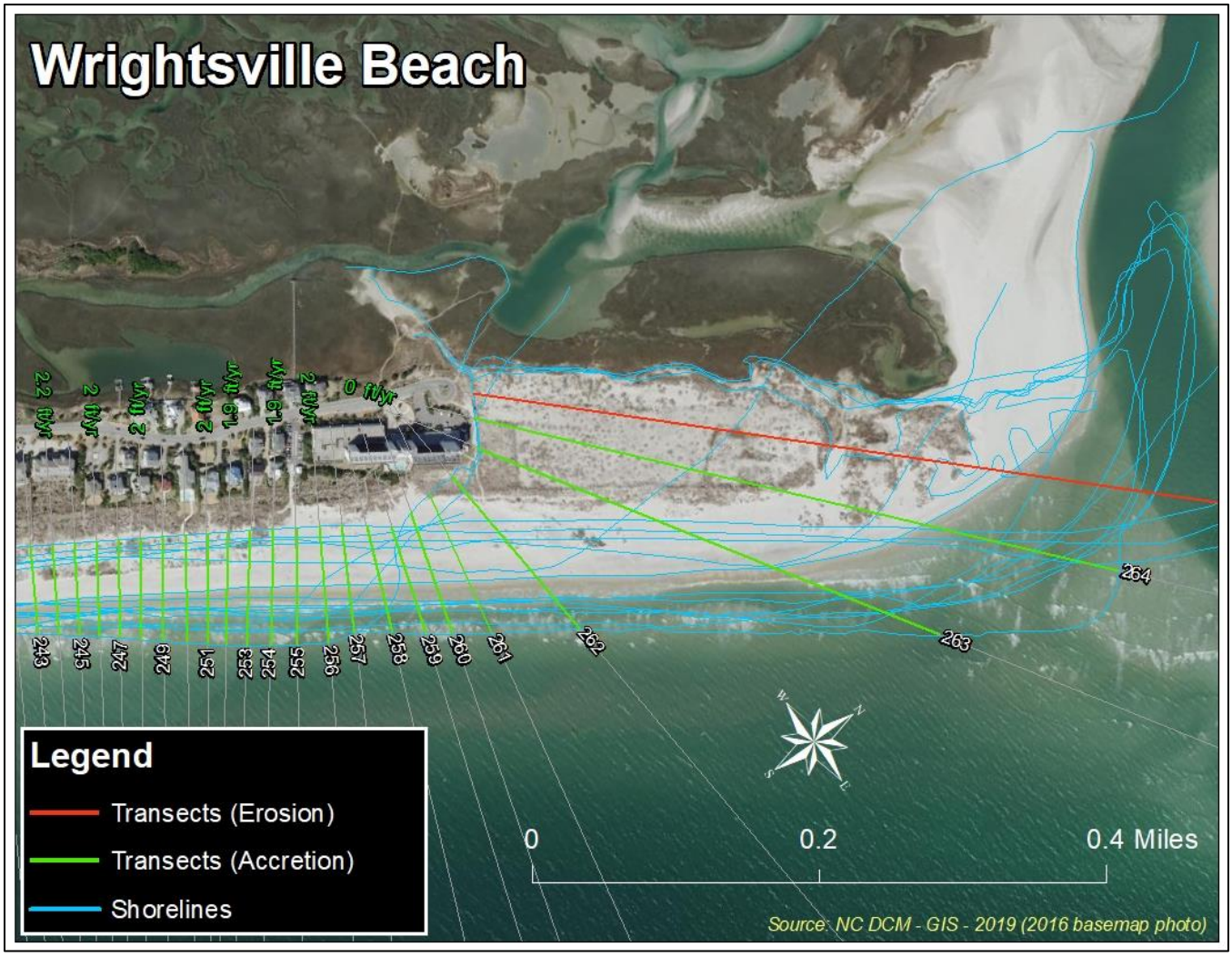


Figure 45. Based on the standard deviation of shoreline position at Mason Inlet-Wrightsville Beach, transect-258 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

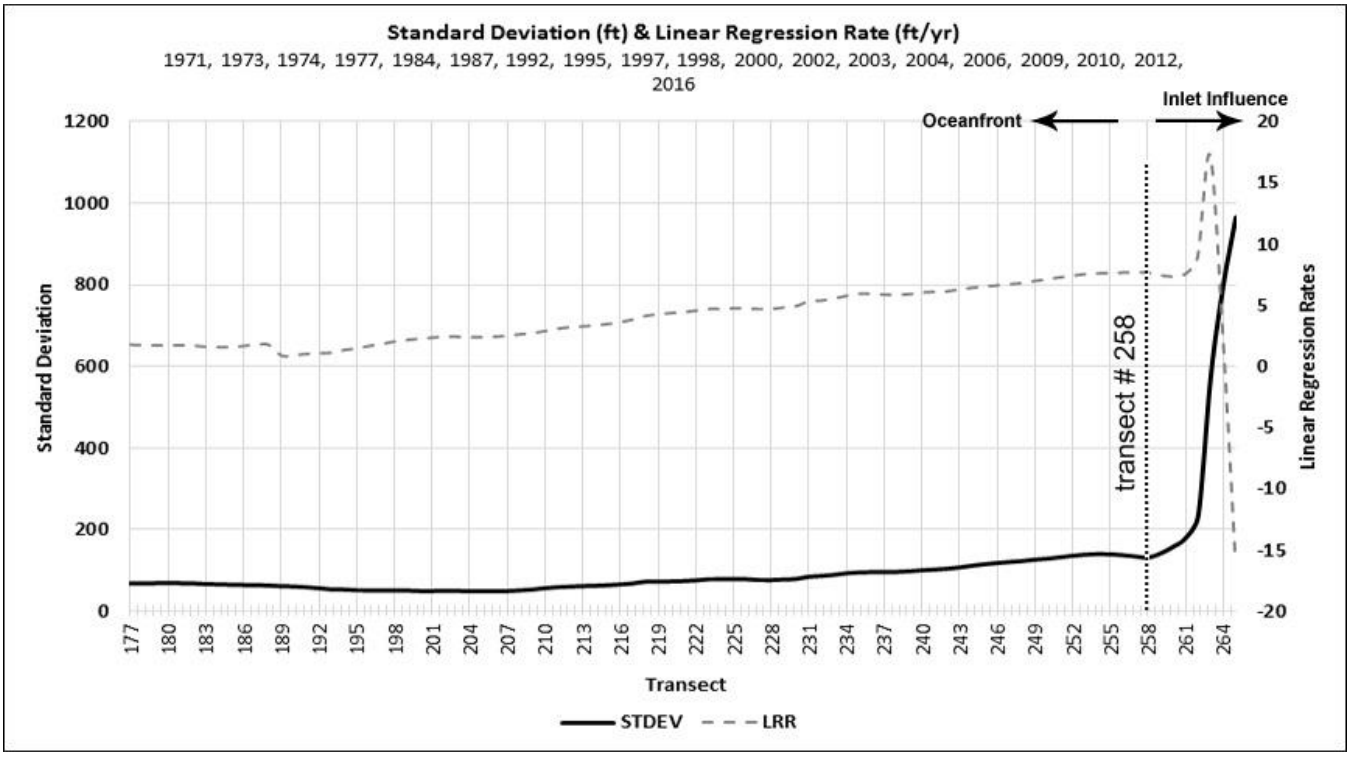
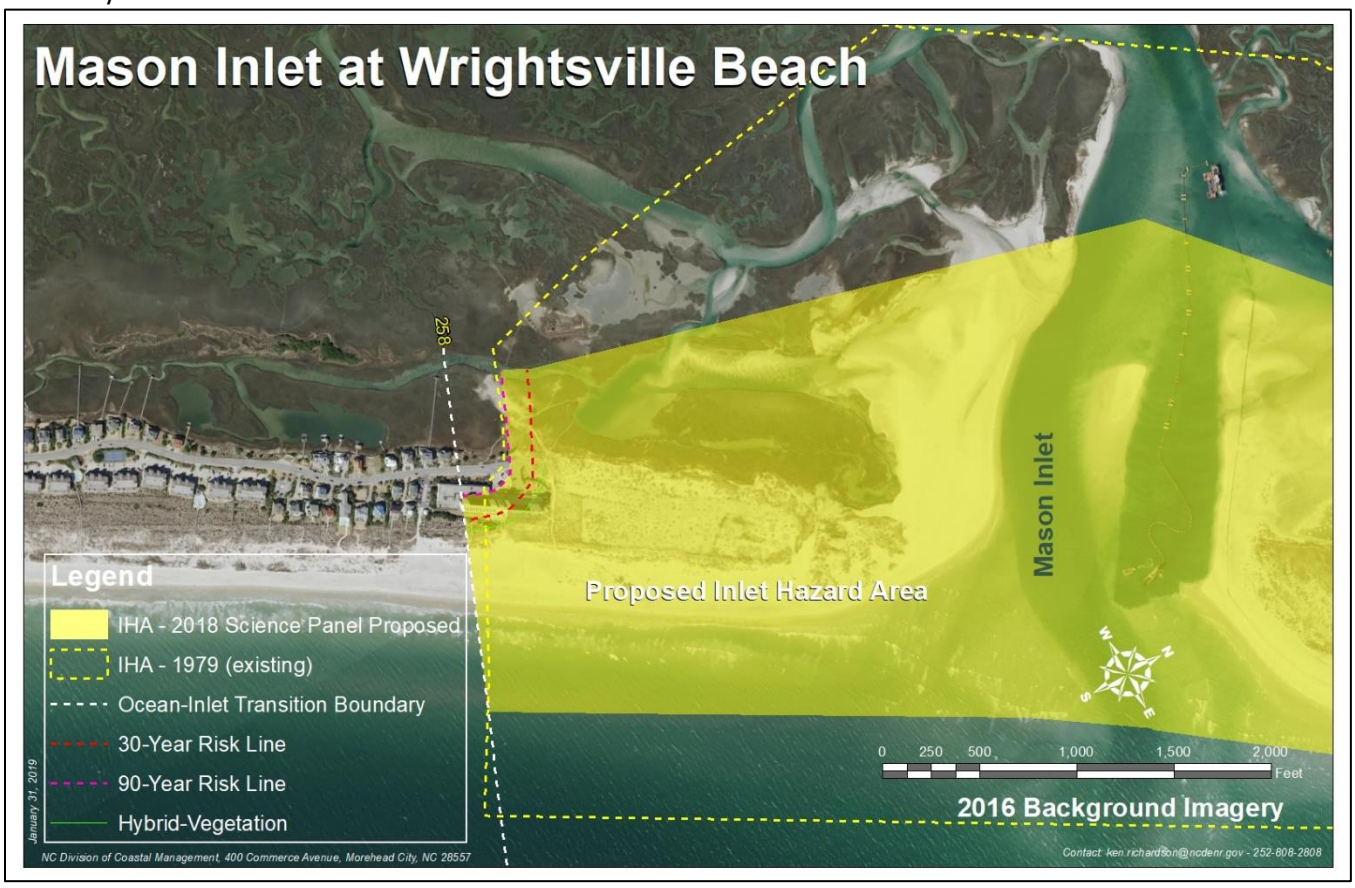


Figure 46. Mason Inlet at Wrightsville Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.6b Figure Eight Island side of Mason Inlet

The vegetation and shoreline data for the Figure Eight Island side of Mason Inlet are shown in Figures 47 and 48. Although the IHAM identified transect-31 as the inlet-ocean boundary (Figure 49), the Panel agreed that the risk related to the inlet actually extended further north. It is expected that without regular management, the inlet related erosional risk would encompass the area up to transect-45, which is approximately the start of truncated dunes, indicating relative stability of the oceanfront shoreline's position over time with continued nourishment. This stability can also be seen in the shoreline change rate (LRR), which stabilizes after transect-45 (Figure 49). The recommended landward boundary is the 90-Year Risk Line (Figure 50).

Figure 47. Mason Inlet at Figure Eight Island. Vegetation Lines mapped: 1971, 1973, 1977, 1987, 1992, 1998, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1971, 1977, 1998, 2002, 2004, 2012.

Figure 48. Mason Inlet at Figure Eight Island. Shorelines included in the analysis: 1971, 1973, 1977, 1987, 1992, 1998, 2002, 2003, 2004, 2006, 2009, 2010, 2012, 2016.

Figure 49. Based on the increased potential for erosion at Mason Inlet-Figure Eight Island, transect-45 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

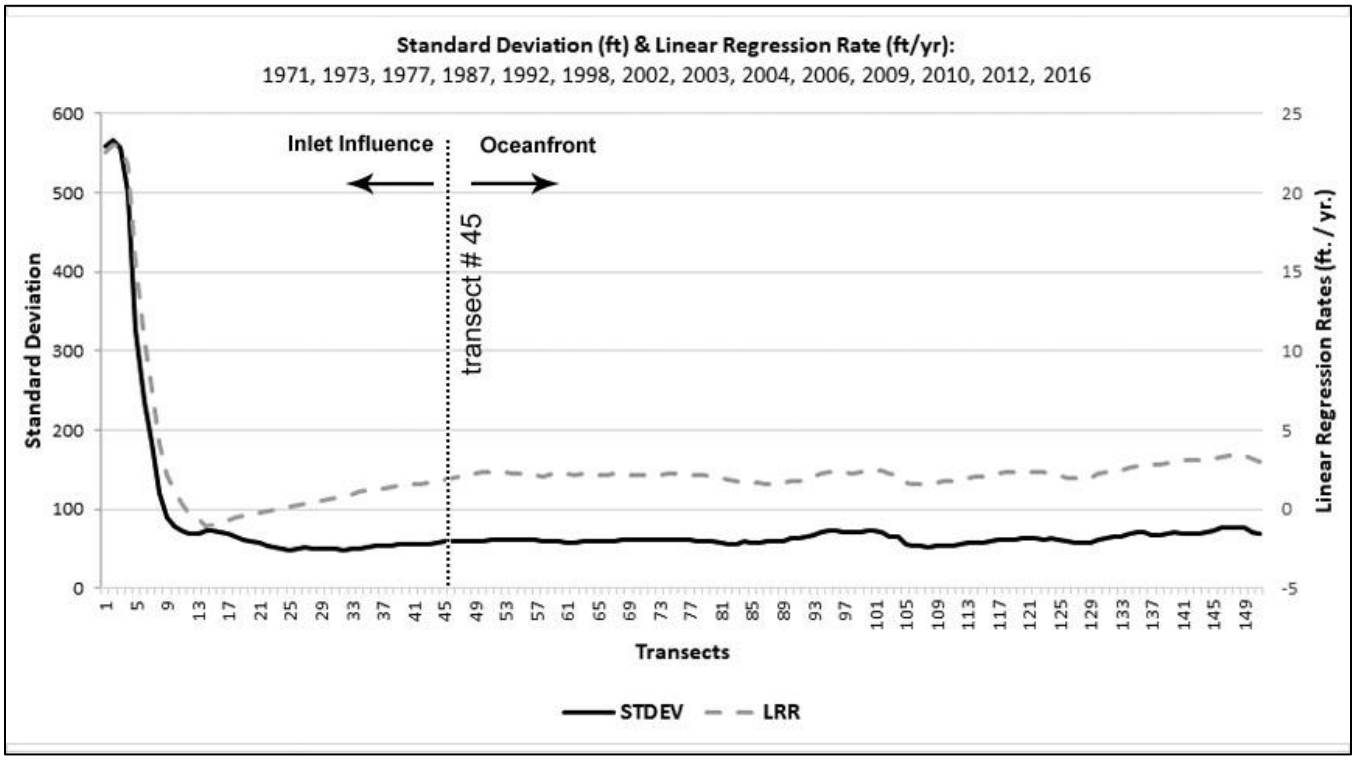
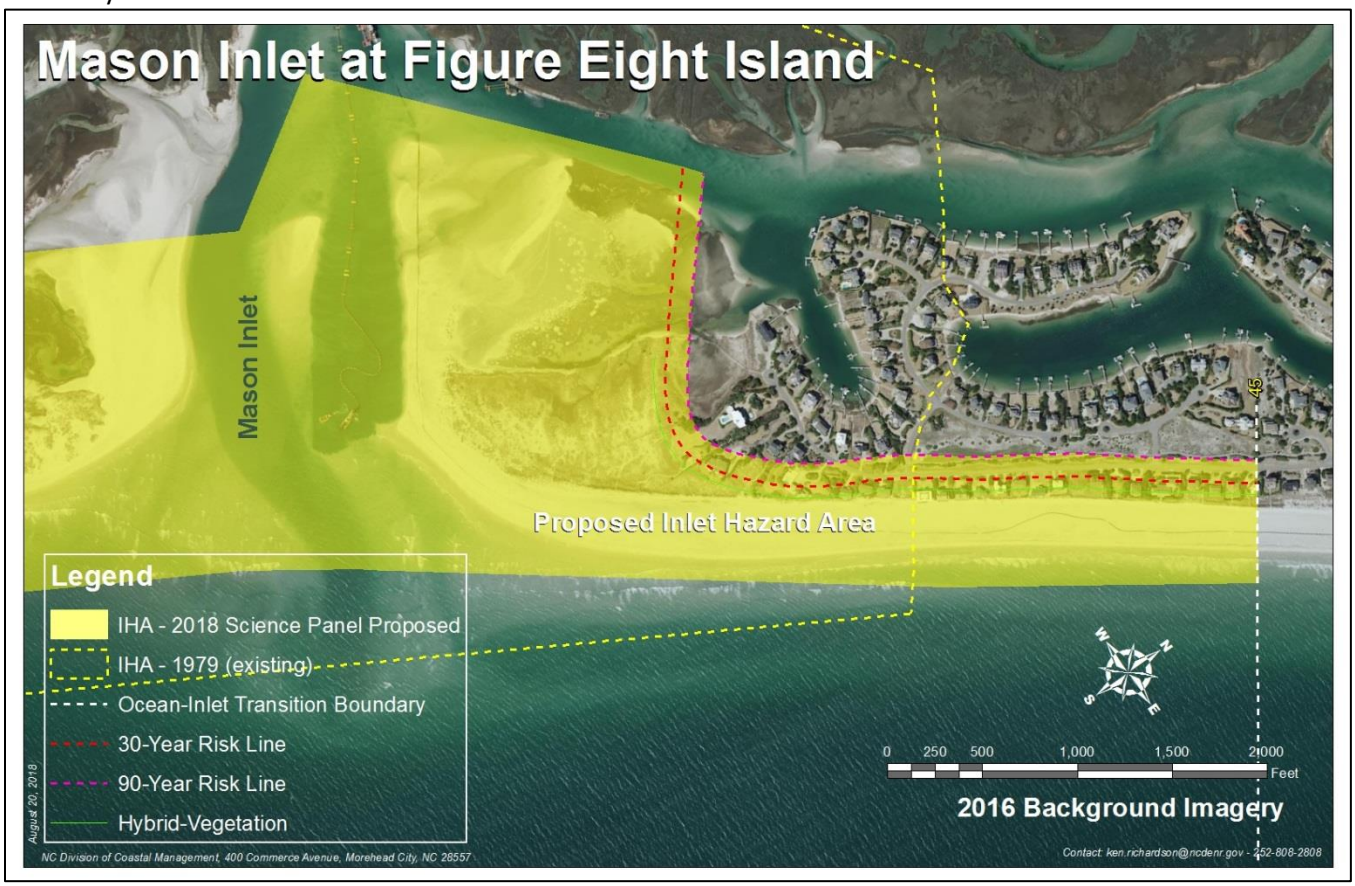


Figure 50. Map of Mason Inlet at Figure Eight Island Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.7 Rich Inlet

Rich Inlet is an oscillatory inlet that drains a bar-built estuary and adjacent Futch Creek. Both oceanfront shorelines near the inlet are also widely oscillating. The inlet has been identified on charts dating from the 1700s. Its origin is related to an incised paleo-channel. The inlet has been relatively stable during the past 80 years as determined by the length of its migration pathway (1,500 feet) when compared to the inlet's width (1,800-4,000 feet). Migration rates and direction have been highly variable. The inlet's variability is directly related to the continual and often rapid (NE or SW) reorientation and repositioning of the offshore ebb channel. As the ebb channel deflects across the offshore shoal, the ebb-tidal delta's position, shape and areal extent are continually changing. Channel deflection episodes have caused the adjacent barrier shorelines to erode or prograde, as the wave-sheltering effect of the ebb-tidal delta has decreased or increased with the size and shape of the ebb-tidal delta.

In late 1994 a major ebb-tidal breaching event occurred that led to a 1,200 feet northeasterly repositioning of the inlet and a 3,800 feet northeasterly movement of the bar channel. The dramatic shift altered the "breakwater effect" along Figure Eight Island that was previously

afforded by the ebb-tidal delta during the previous 50 years. Additionally, the zone of swash bar attachment shifted to the northeast.

The chronic oceanfront erosion that ensued (1997-2012) along the northern 3,000 feet of the Figure Eight Island shoreline ranged from 100 to 580 feet and averaged approximately 280 feet. Due to the poor performance of the nourishment efforts used to mitigate the erosion, an 1,800 feet-long reach was eventually armored with sandbags. In October 2004, both the throat and bar channel segments shifted to the southwest and by June 2012, the throat segment migrated 950 feet at an average rate of 120 feet per year. By contrast, the outer bar channel segment shifted southwest 2,700 feet at a rate of 330 feet per year between 2011 and 2012; the highly asymmetric ebb-tidal delta provided a significant wave-sheltering effect that promoted shoreline progradation that averaged 90 feet.

Additionally, the 2012 breaching event that repositioned the ebb channel 2,530 feet to the northeast provided the downdrift bypassing of a large volume of sand. This bypassing caused large swash bars to attach to Figure Eight Island by 2015, which in turn caused the ocean shoreline to prograde an average of 190 feet. Since 2012, the ebb channel has deflected 940 feet to the northeast and reconfigured the ebb-tidal delta. By 2016, the ebb channel within the throat migrated 820 feet back to the southwest, which led to the erosion of 280 feet of shoreline along the Figure Eight Island spit's inlet.

3.7a Figure Eight Island at Rich Inlet

The vegetation and shoreline data for Figure Eight Island at Rich Inlet are shown in Figures 51 and 52. Because it is an outlier, the 1958 post-hurricane vegetation line was not included in the analysis. To better reflect the shoreline oscillations, shorelines beginning in 1934 were considered. Using the IHAM, the standard deviation suggests that inlet influence extends to at least transect-163. However, transect-181, closer to the inlet, is located near the start of a primary dune line that has remained unchanged for the time period. It also falls within a peak in shoreline accretion (LRR). Based on their knowledge of the inlet, the Panel recommends transect-181 as the boundary of inlet influence along the oceanfront shoreline (Figure 53). The 90-Year Risk line is recommended as the landward limit of the IHA. (Figure 54).

Figure 51. Rich Inlet at Figure Eight Island. Vegetation Lines mapped: 1938, 1949, 1958, 1971, 1977, 1980, 1984, 1992, 1998, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 1984, 1998, 2002, 2006, 2009, 2010, 2012, 2016.

Figure 52. Rich Inlet at Figure Eight Island. Shorelines included: 1934, 1938, 1944, 1949, 1958,1971, 1973, 1977, 1980, 1984, 1992, 1998, 2002, 2003, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

Figure 53. Based on the shoreline change rate and stable primary dune line, transect-181 at Rich Inlet-Figure Eight Island is recommended as the inlet-ocean transition boundary. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

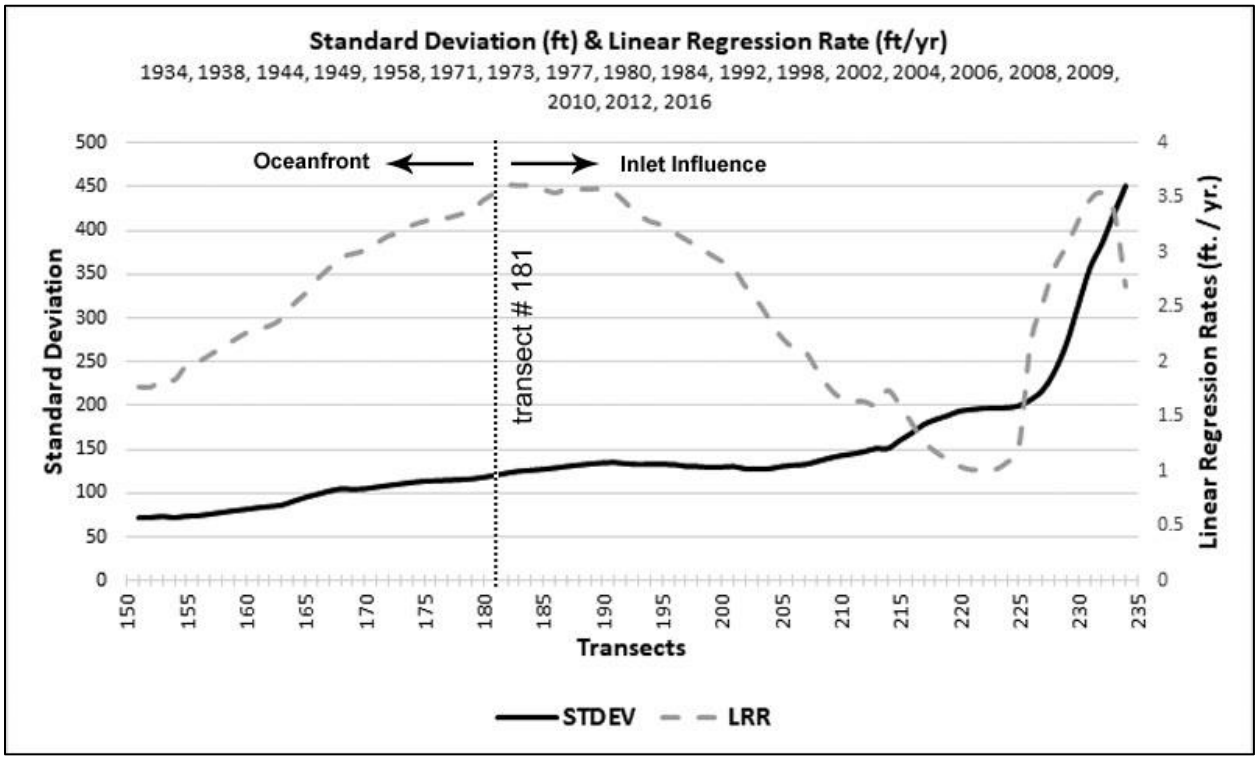
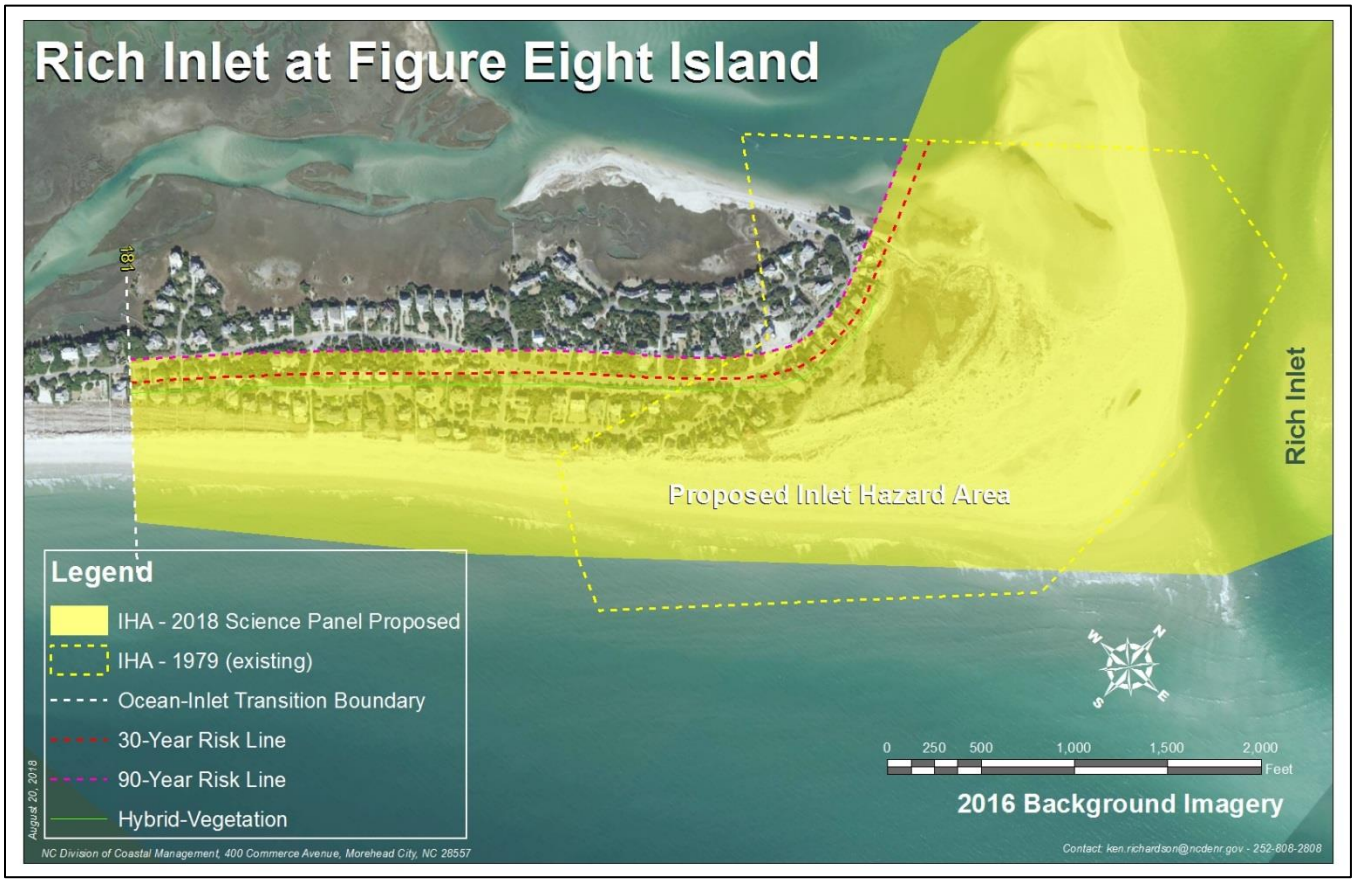


Figure 54. Rich Inlet at Figure Eight Island Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.7b Lea-Hutaff Island side of Rich Inlet

The Lea and Hutaff Islands (also referred to as Coke and No-Name islands) were joined in 1997 by the closure of Old Topsail Inlet. The resulting Lea-Hutaff Island is strongly influenced by the adjacent Rich and New Topsail Inlets. Because of the closure, pre-1997 shorelines were excluded from the analyses. The vegetation and shoreline data are shown in Figures 55 and 56. The standard deviation of shoreline change and linear shoreline regression rate is shown in Figure 57. Based on their narrow and low-lying topography, lack of dune ridges and regular and extensive overwash, the Panel recommends that the boundary of the IHA include the entire island (Figure 58).

Figure 55. Rich and New Topsail Inlets at Lea-Hutaff Island. Vegetation Lines mapped: 1997, 1998, 2000, 2004, 2006, 2008, 2009, 2010, 2012, 2016. Vegetation line segments making up the Hybrid-Vegetation Line: 2016.

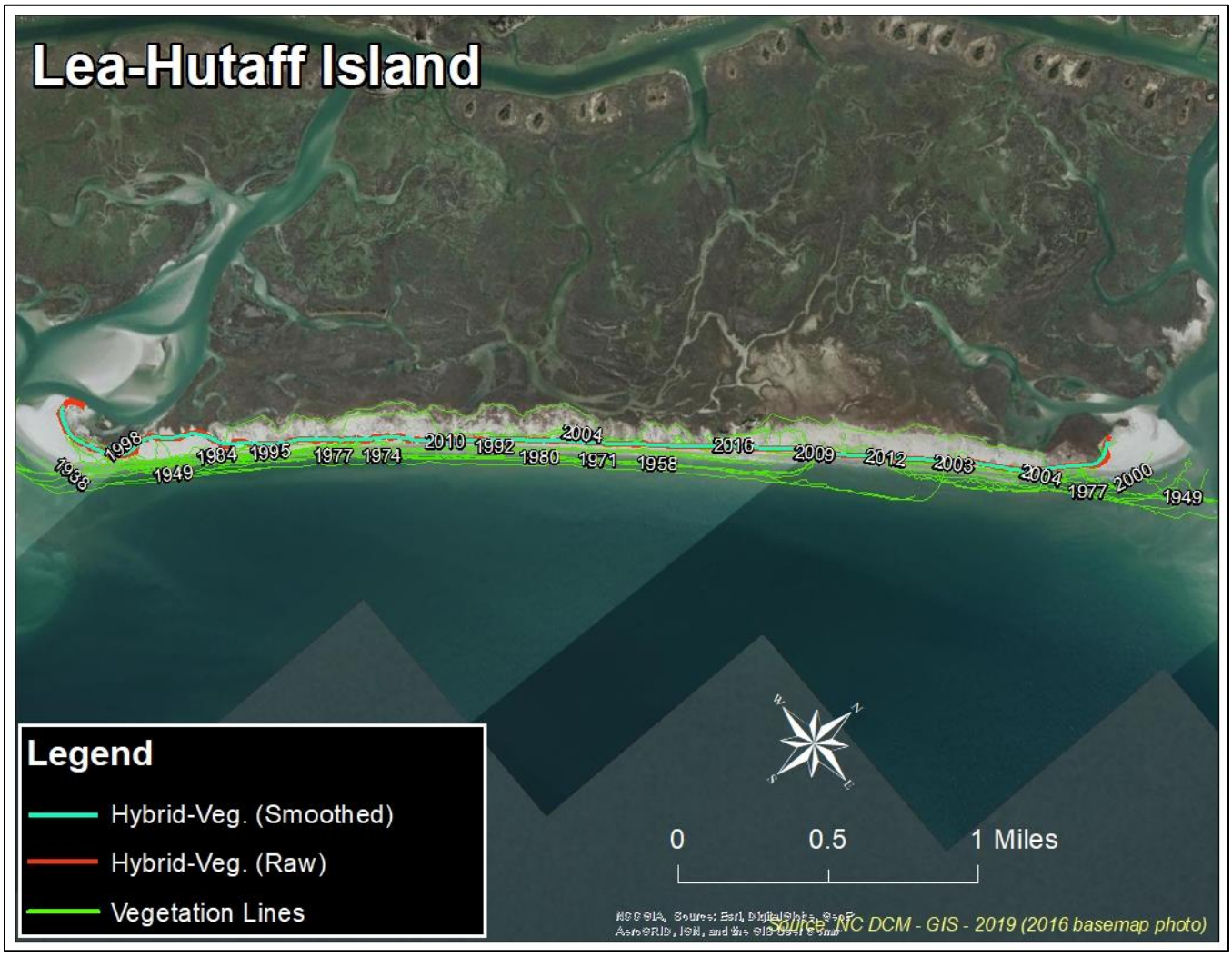


Figure 56. Shorelines included in the analysis: 1997, 1998, 2000, 2004, 2006, 2008, 2009, 2010, 2012, 2016.

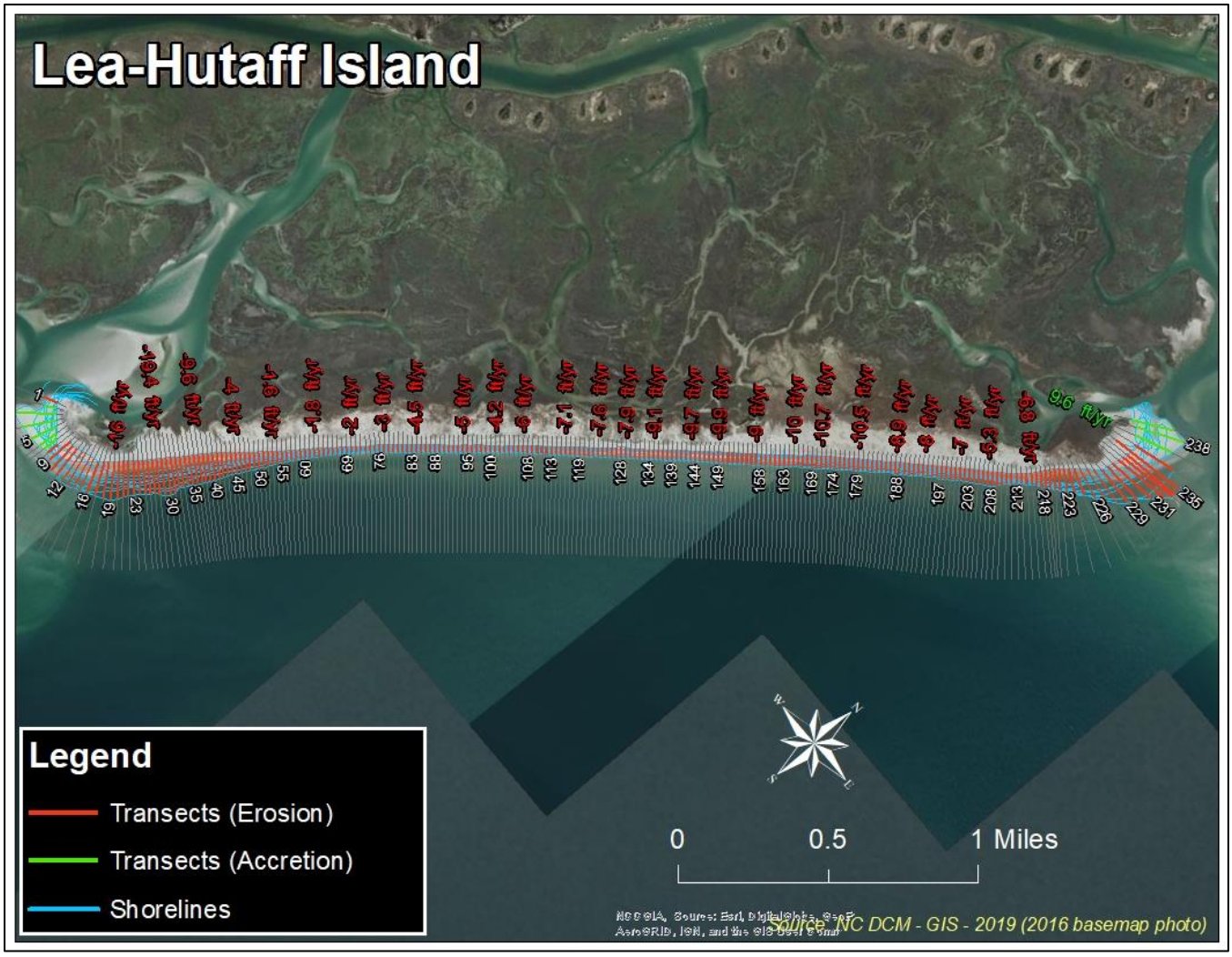


Figure 57. Because Lea and Hutaff Island welded together in 1997, have low topography and are heavily influenced by both Rich and New Topsail Inlets, the Panel recommends including all Lea-Hutaff Island in the IHA. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

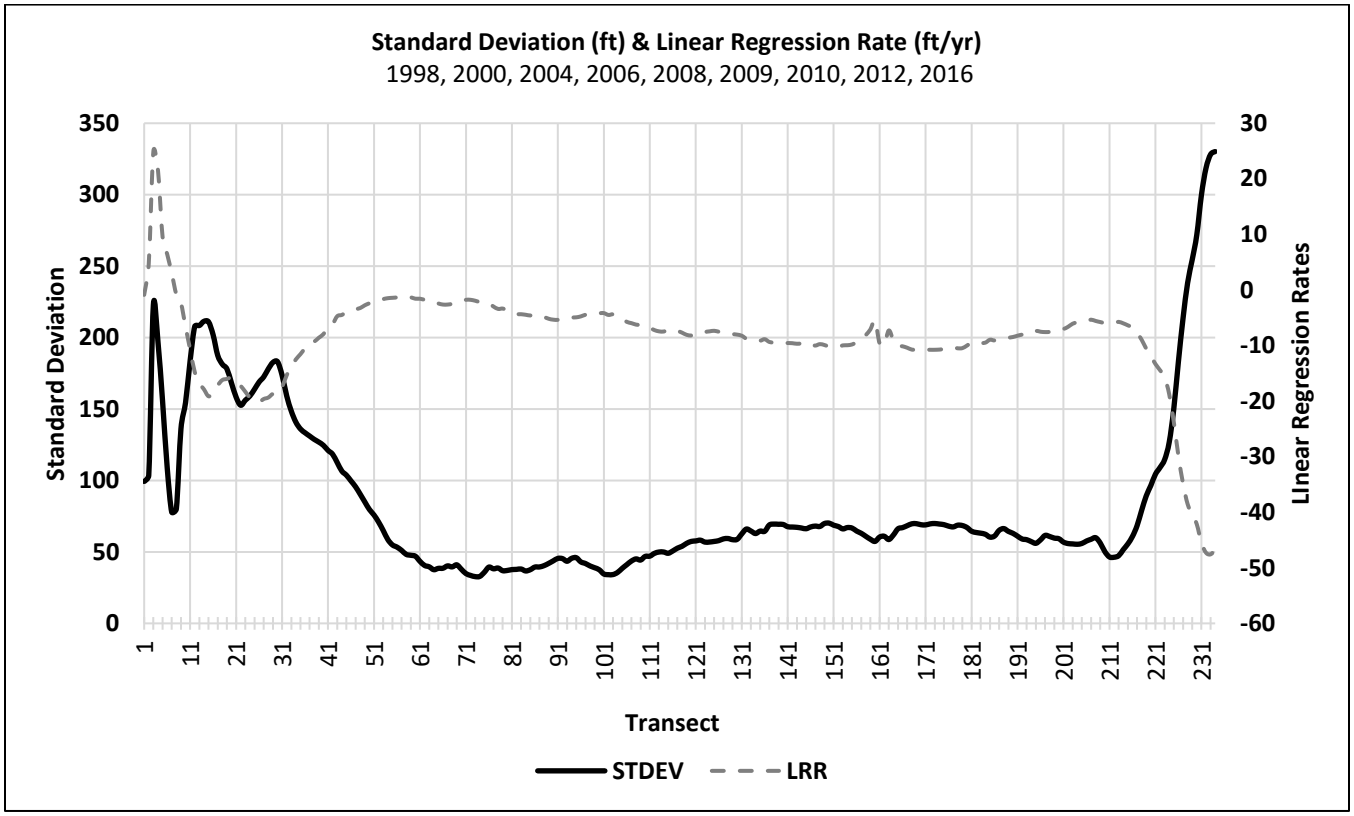
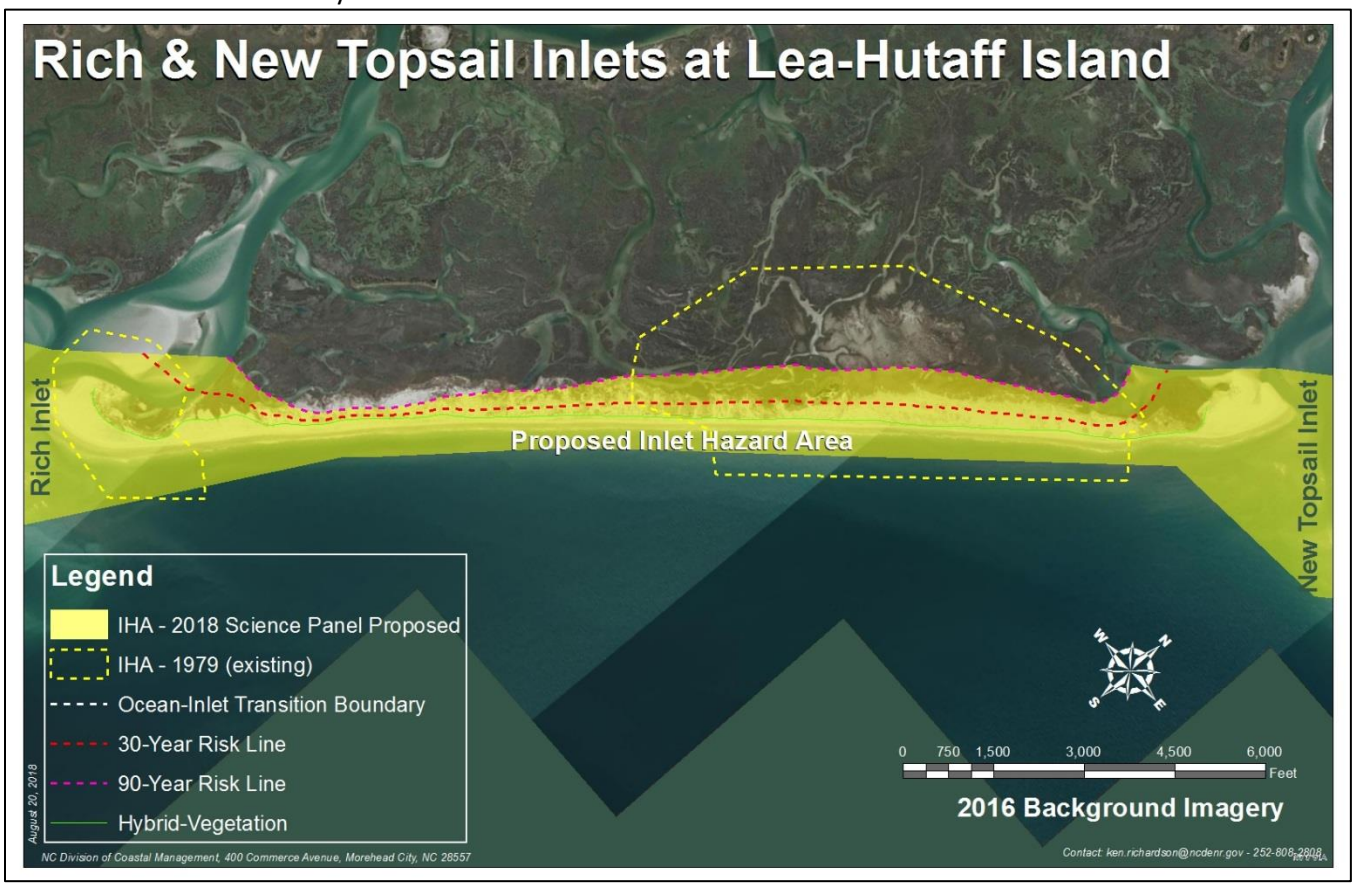


Figure 58. Rich and New Topsail Inlets at Lea-Hutaff Island Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.8 New Topsail Inlet

New Topsail Inlet is historically the most persistent migrating inlet in North Carolina, having migrated 6.2 miles to the southwest. The earliest land grants record the existence of New Topsail Inlet as early as 1726. Between 1938 and 2009, the ebb channel within the throat migrated 6,300 feet to the southwest at an average rate of 90 feet per year. Migration direction and rates were highly variable. More recently, between 2010 and 2014 the channel reversed its migration direction and shifted 590 feet toward Topsail Beach at an average rate of 150 feet per year. By August 2016, the ebb channel had been repositioned an additional 1,000 feet to the northeast during a breaching event in the offshore channel.

The inlet's minimum width has fluctuated considerably from 1,000 feet (1984) to 2,300 feet (1995). The mean inlet minimum width for the past 70 years was 1,600 feet. It typically narrows due to spit growth on both shoulders, which often marks a shift in the migration direction. Cyclical deflection and reorientation of the offshore ebb channel has occurred numerous times since 1938. Reorientation of the channel is due to storm-related ebb delta breaching events, which result in sand bypassing to Topsail Beach.

The inlet-related variables that control shoreline change patterns are the migration direction and rate, the channel alignment across the offshore ebb platform and the attendant shape of the ebb tidal delta. The planform of Topsail Beach curves seaward near the inlet, due to the attachment of swash bars that perpetuate this maximum accretion zone as the inlet migrates to the southwest. During the period between 1949 and 1962, the inlet migrated southward 180 feet, at a rate of 14 feet per year. As a result, the zone of maximum accretion (swash bar attachments) incrementally shifted toward the inlet approximately 3,500 feet. As migration occurred, the planform of the trailing shoreline was altered as erosion commenced along the former zone of maximum progradation.

3.8a Lea-Hutaff Island side of New Topsail Inlet

The 1979 IHA shoreline boundary for Lea Island is now located near the inlet shoreline of Topsail Beach; no longer on Lea Island. As discussed in Section 3.7b above, this area is included in the island-wide proposed IHA for Lea-Hutaff Island.

3.8b Topsail Beach side of New Topsail Inlet

New Topsail Inlet's rapid migration results in a reduction of risk on the north side as the inlet moves south. Since a migration reversal is unlikely, in such cases it is recommended to limit the inlet analysis to the most recent 30 years. For the Topsail Beach side of New Topsail Inlet, the computation of the Hybrid-Vegetation Line used the full record (1971-2016) on the oceanfront but was limited to an approximate 30-year data record (1984-2016) within the inlet. Because of the rapid migration, the inlet Hybrid-Vegetation Line is defined by one date, the 1984 vegetation line (Figure 59). It is recommended that this 30-year adjustment should be reevaluated during each IHA update. If the inlet continues to migrate, the IHA should move south with the inlet.

Shoreline data for Topsail Beach are shown in Figure 60. Using the IHAM, the standard deviation suggests that inlet influence extends to transect-27 (Figure 61). However, in order to include the area most prone to erosion hazards associated with storm-enhanced inlet processes, transect-42 is recommended as the IHA boundary. From transect-42, the boundary extends landward, north of the canal at Trout Avenue to Topsail Sound connecting with the back boundary of the current IHA (Figure 62).

Figure 59. New Topsail Inlet at Topsail Beach. Vegetation Lines mapped: 1971, 1974, 1977, 1984, 1992, 1995, 1997, 1998, 2000, 2003, 2004, 2008, 2009, 2010, 2011, 2012, 2016. To account for the inlet's rapid migration, the Hybrid-Vegetation Line within the inlet was based on a ~30-year period (1984-2016); all vegetation lines were considered on the oceanfront.

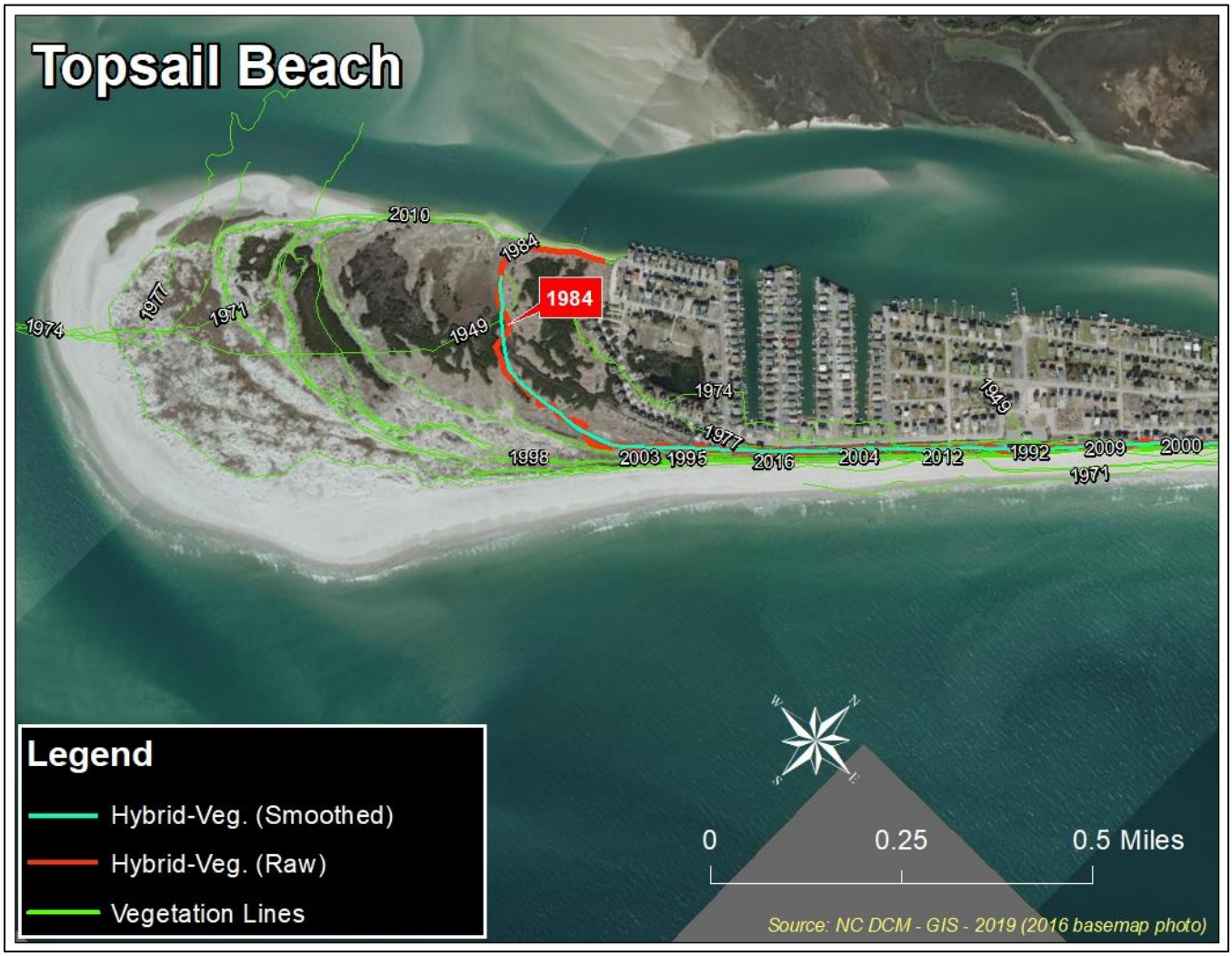


Figure 60. New Topsail Inlet at Topsail Beach Shorelines included: 1971, 1973, 1974, 1976, 1984, 1992, 1995, 1997, 1998, 2000, 2003, 2004, 2006, 2008, 2009, 2010, 2011, 2012, 2016.

Figure 61. At New Topsail Inlet-Topsail Island, transect-42 is recommended as the inlet-ocean transition boundary in order to include the area most prone to erosion hazards associated with storm-enhanced inlet processes. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

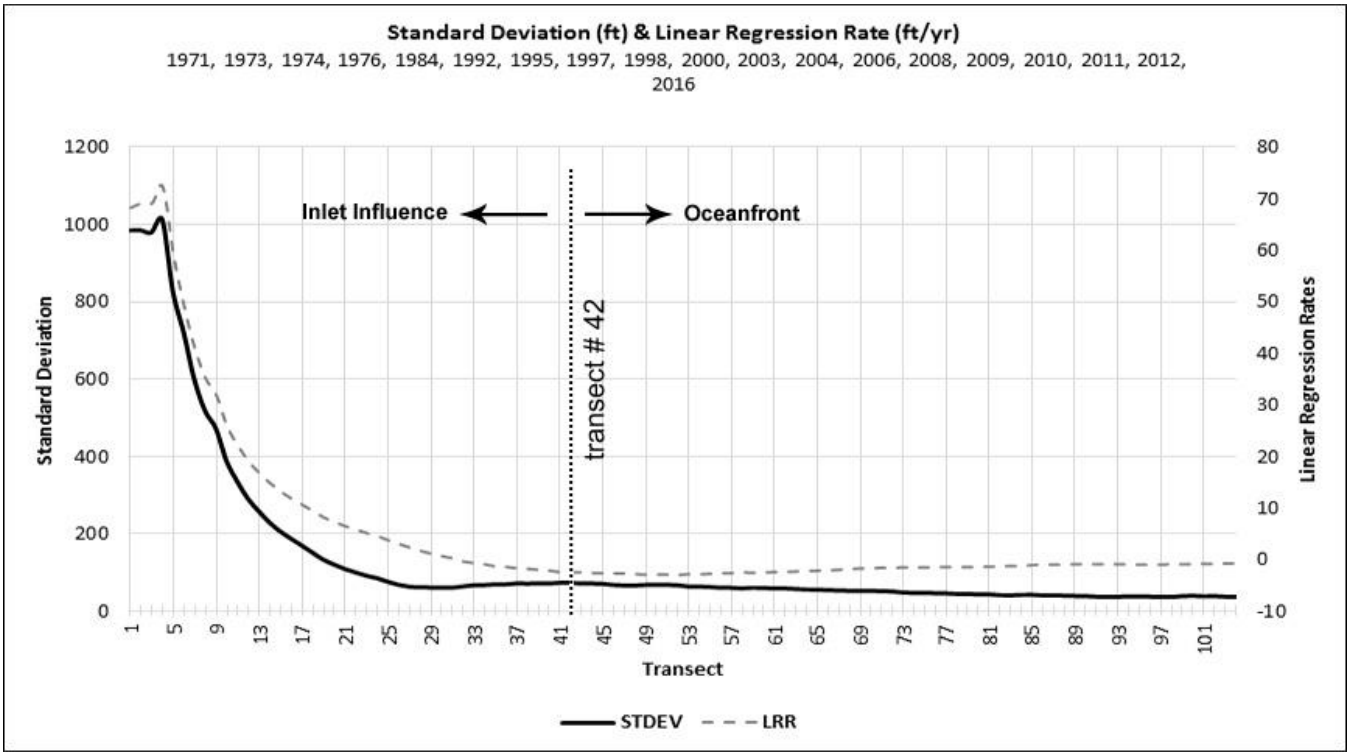
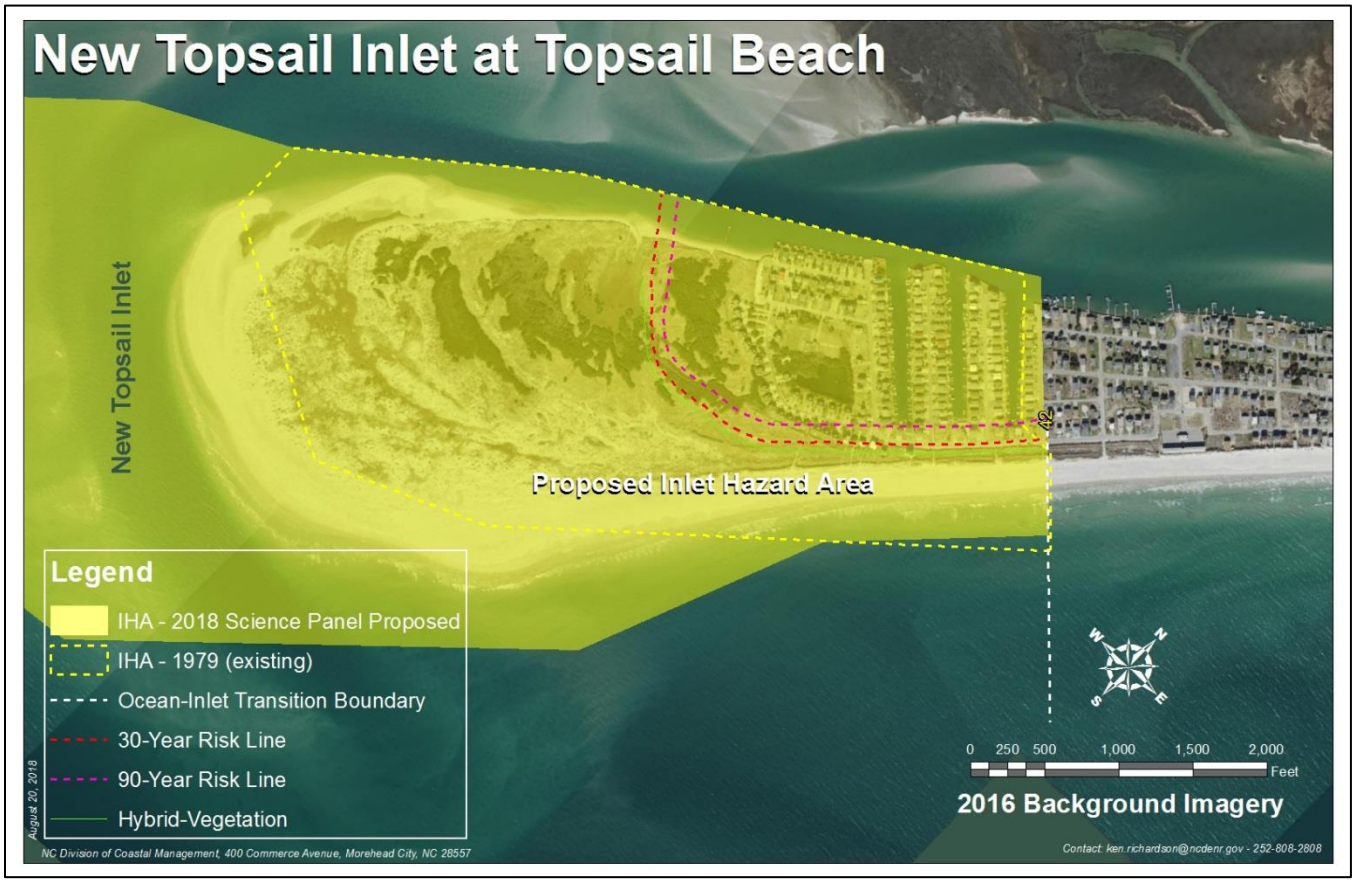


Figure 62. New Topsail Inlet at Topsail Beach Hybrid-Vegetation Line and the recommended IHA boundary at inlet transect-42 to define the boundary of inlet influence along the oceanfront shoreline. It is recommended that the IHA boundary cross the island by extending transect-42 landward following Trout Avenue, beside the northernmost canal, to Topsail Sound.



3.9 New River Inlet

New River Inlet is a migrating inlet that drains New River and the adjacent estuaries. Its origin is related to the location of the incised paleo-channel of New River. Although navigation channel improvements within the marsh occurred between 1885-1940, the inlet was basically unmodified when major system-wide modifications began in 1940. The US Army Corps of Engineers excavated a channel, 6-foot depth by 90 feet wide extending 2.3 miles from the AIWW to the inlet gorge. Concurrently the ebb channel was relocated approximately 1,700 feet to the northeast of its 1938 position. The new hydraulic connections substantially increased the tidal prism and the retention capacity of the ebb-tidal delta. The inlet is an authorized Federal shallow-draft navigation channel which, along with the access channel, has been periodically maintained since 1963. Side-cast dredging of the bar channel began in 1964.

Between 1945 and 1962, the inlet migrated 490 feet to the southwest at an average rate of 29 feet per year. From 1962 to 1974, the inlet shifted 530 feet southwest at an average rate of approximately 41 feet per year. During the following period (1974-1990) the inlet migrated 120 feet southward at approximately 7 feet per year. During this period, the orientation of the outer bar channel caused the ebb-tidal delta to be offset to the southwest. During this period the North Topsail Beach (NTB) oceanfront prograded an average of 180 feet. However, the inlet configuration changed as the outer bar channel shifted to an ESE-SE alignment. As a result, the ebb-tidal delta shifted toward Onslow Beach and the former accretion zone began to erode at rapid rates. During the past 25 years, chronic erosion has been the norm along the North Topsail Beach shoreline while the inlet has migrated southward 140 feet, at a rate of approximately 9 feet per year. Sandbag revetments now armor more than 3,000 feet of the developed shoreline near and on the inlet.

In an effort to mitigate the erosion along the oceanfront shoreline, the ebb channel was realigned by dredging in 2013 to a near shore-normal alignment in order to cause a reconfiguration of the ebb-tidal delta and to restore the breakwater effect it once afforded end of North Topsail Beach in the 1980's. Beach nourishment was placed on the shoreline at that time but was eroded rapidly near the inlet.

Only the North Topsail Beach side of New River Inlet is considered here as the Onslow Beach side of the inlet is owned and operated by the US Marine Corps Base, Camp Lejeune.

3.9a North Topsail Beach side of New River Inlet

The vegetation and shoreline data for the North Topsail Beach side of the New River Inlet are shown in Figures 63 and 64. Using the IHAM, inlet transect-1345 is defined as the boundary of inlet influence along the oceanfront shoreline (Figure 65). The recommended landward boundary is the 90-Year Risk Line (Figure 66).

Figure 63. New River Inlet at North Topsail Beach. Vegetation Lines mapped: 1971, 1974, 1977, 1984, 1992, 1995, 1998, 2000, 2003, 2004, 2006, 2009, 2010, 2012, 2016, and; vegetation line composite segments making up the Hybrid-Vegetation Line: 1971, 1974, 1998, 2000, 2016.

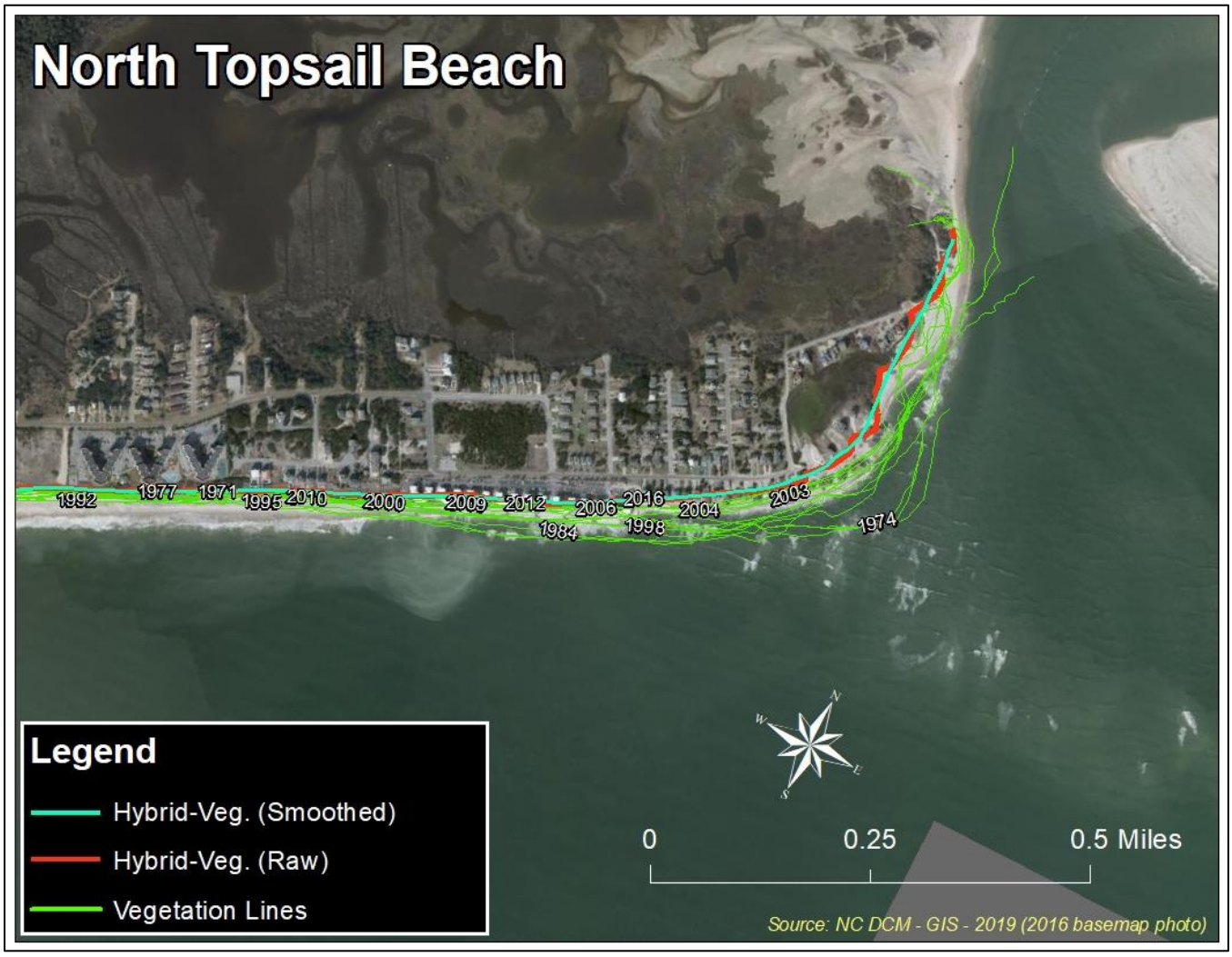


Figure 64. New River Inlet at North Topsail Beach. Shorelines included: 1971, 1973, 1974, 1977, 1984, 1992, 1995, 1997, 1998, 2000, 2003, 2004, 2006, 2009, 2010, 2012, 2016.

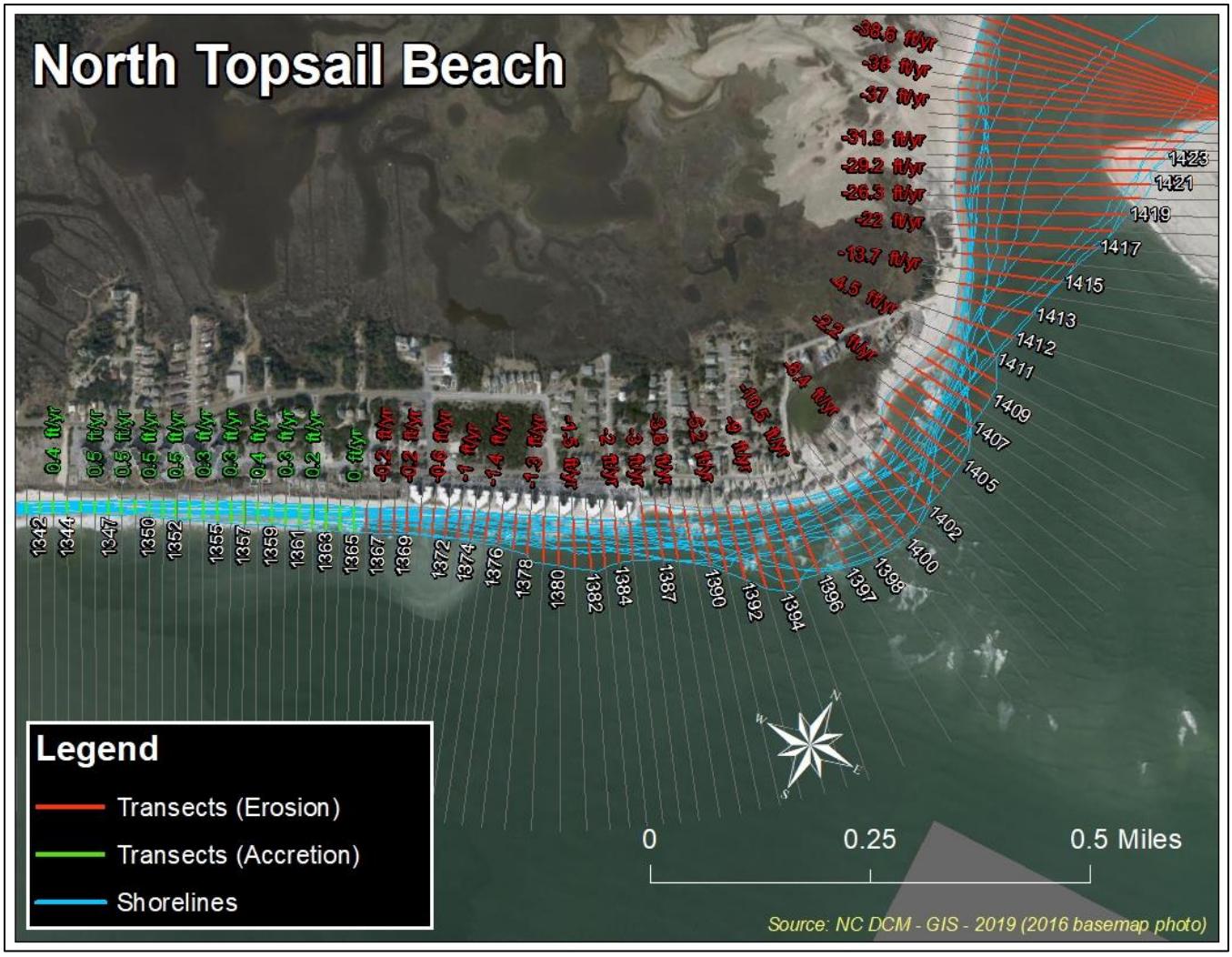


Figure 65. Based on the standard deviation of shoreline position at New River Inlet at North Topsail Beach, transect-1345 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

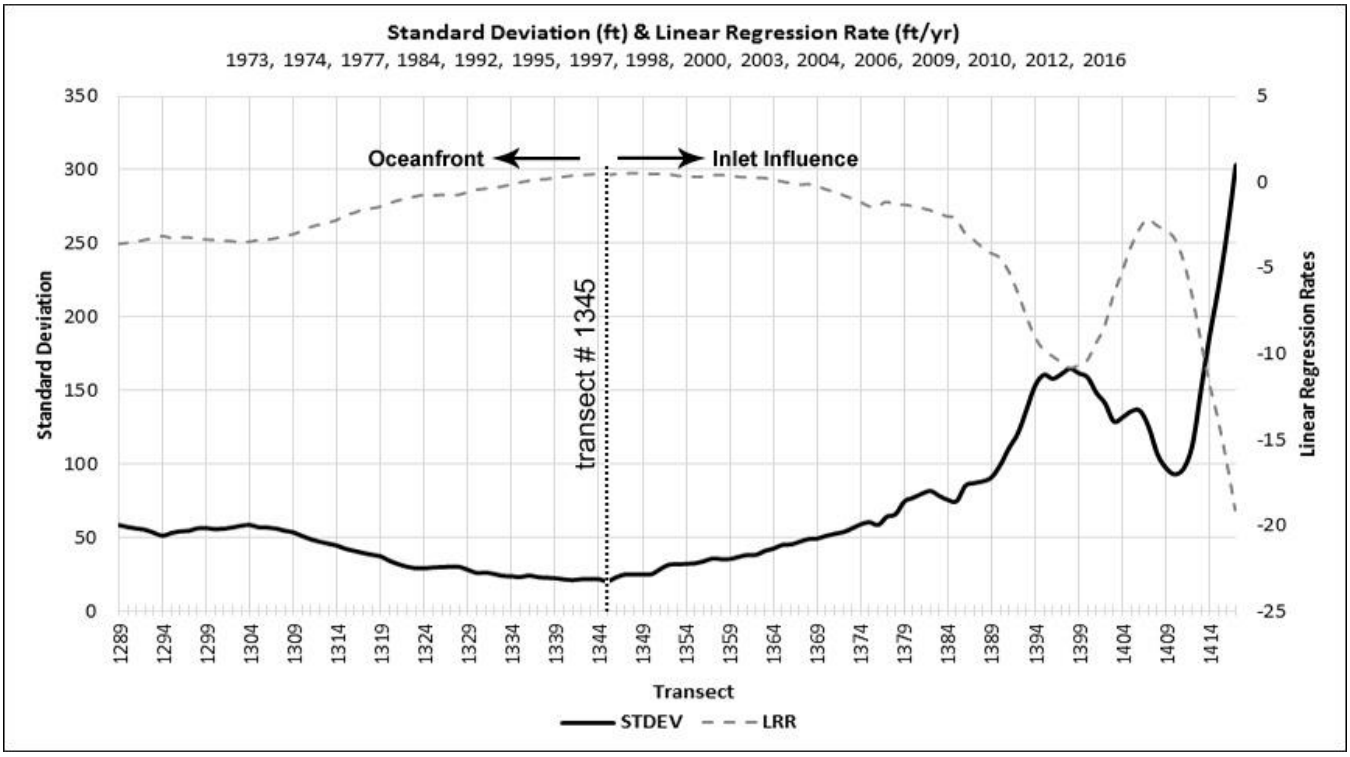
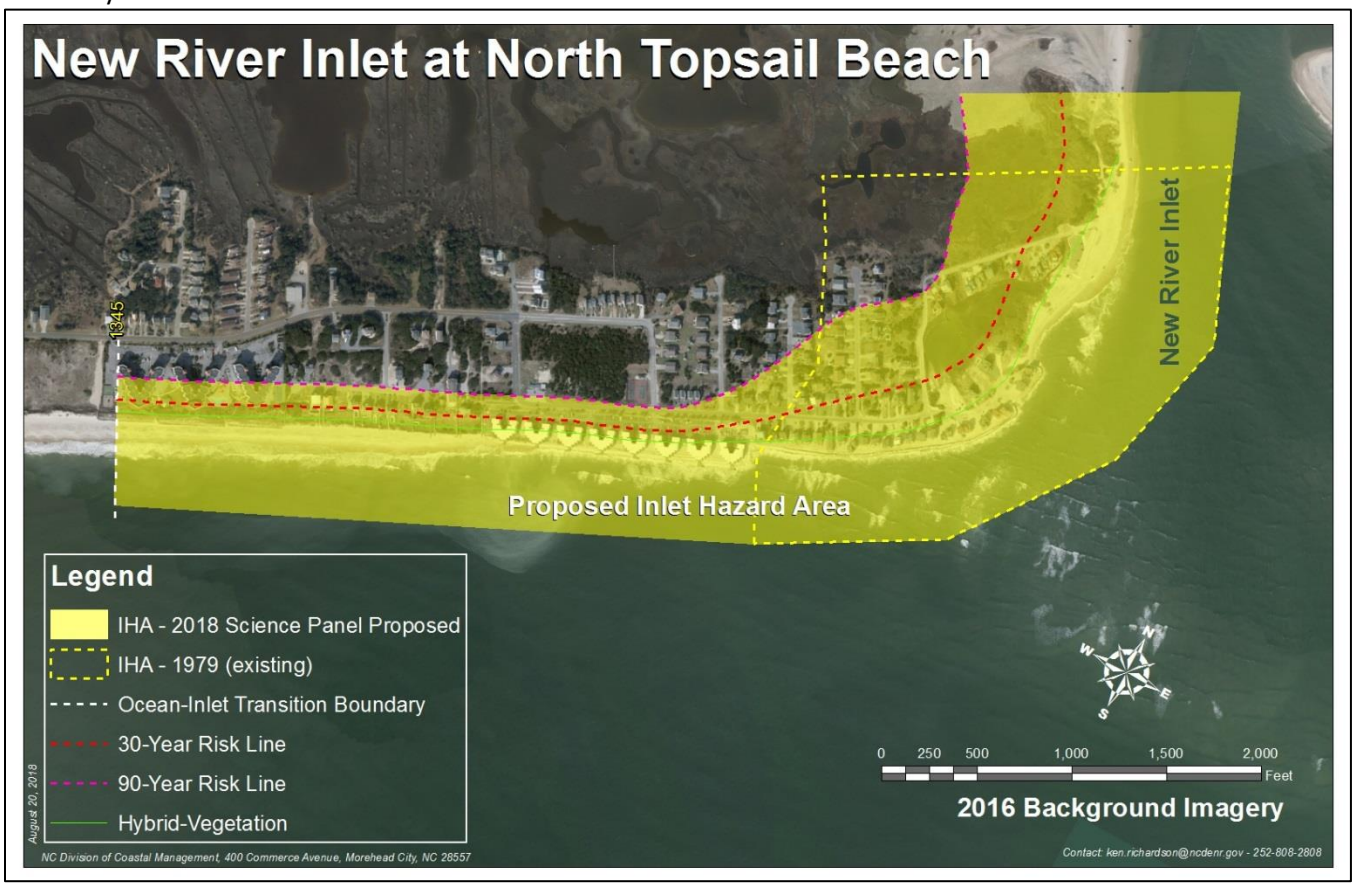


Figure 66. New River Inlet-North Topsail Beach Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



3.10 Bogue Inlet

Bogue Inlet is an oscillatory inlet that has been open continuously and in the same general location since the first map of coastal North Carolina was produced in 1585. Bogue Inlet is one of the larger inlets in southeastern North Carolina and drains an expansive estuary as well as the White Oak River Basin. The general inlet floodway is stable, and its position is controlled by the ancestral location of White Oak River. The inlet width and both ocean shorelines near the inlet have oscillated widely during the study period.

During the past 70 years the inlet's width ranged from 3,800 to 8,300 feet and averaged 6,200 feet; depths in the ebb channel have fluctuated between 16 and 30 feet. The main offshore ebb channel is highly unstable and has a history of rapid migration along its 10,200-foot-long pathway. The migration rate and direction have varied considerably.

The orientation and position of the ebb platform channel have changed repeatedly. During the past 50 years, the outer bar channel has generally been aligned in a southeast-to-south-southwest orientation. The channel movement and orientation, coupled with the migration of

the landward segments of the channel, have dictated much of the change along both the inlet and oceanfront shorelines. Breaching of the ebb-tidal delta has led to rapid repositioning of the ebb channel. The most dramatic natural realignment event occurred between October 1938 and July 1949 when the ebb channel was repositioned approximately 3,000 feet east of its 1938 position. A similar but smaller-scale event occurred in the mid-1970s. Between 2000 and 2010 approximately 1,500 feet of the Emerald Isle inlet shoreline was armored with sandbag revetments.

In March 2005, the ebb channel was artificially relocated approximately 3,200 feet westward to mitigate the chronic erosion along the Bogue Banks inlet shoreline. Between October 2006 and April 2014, the ebb channel migrated toward Bogue Banks a net distance of 1,400 feet, and subsequently shifted westward 380 feet. The average eastward migration rate was 150 feet per year.

The inlet variables that control the behavior of the oceanfront shorelines are the position and alignment of the ebb channel, which ultimately dictate the shape of the ebb-tidal delta. The symmetry of the outer bar in turn controls its breakwater and natural nourishment effects along the adjacent oceanfront shorelines. The natural coastwise progradation that has occurred along Bogue Banks during various periods is directly attributable to the easterly migration of the ebb channel and the changing shape of the ebb-tidal delta. By contrast, the historic recession along Bear Island has reflected the negative influence of the ebb channel as it tracked eastward toward Bogue Banks. Since 1946, the US Army Corps of Engineers has maintained a 3.1-mile-long, 6.5-foot-deep channel connecting the inlet to the AIWW.

3.10a Emerald Isle side of Bogue Inlet

The vegetation and shoreline data for the Emerald Isle side of Bogue Inlet are shown in Figures 67 and 68. Using the IHAM, inlet transect-81 defines the boundary of inlet influence along the oceanfront shoreline (Figure 69). The 90-Year Risk Line is recommended as the landward boundary of the IHA (Figure 70).

Figure 67. Bogue Inlet at Emerald Isle. Vegetation Lines mapped: 1971, 1976, 1987, 1992, 1998, 2003, 2004, 2006, 2009, 2010, 2012, 2016, and; vegetation line composite segments making up the Hybrid-Vegetation Line: 1971, 1976, 1987, 1992, 1998, 2004, 2006, 2009, 2010, 2012.

Figure 68. Shorelines included in the analysis: 1949, 1956, 1958, 1960, 1971, 1973, 1976, 1987, 1992, 1997, 1998, 2003, 2004, 2006, 2009, 2010, 2012, 2016.

Figure 69. Based on standard deviation of relative shoreline position at Bogue Inlet-Emerald Isle, transect-81 is recommended as the inlet-ocean transition boundary along the shoreline. Negative Linear Regression rates indicate erosion, while positive values represent accretion (right axis).

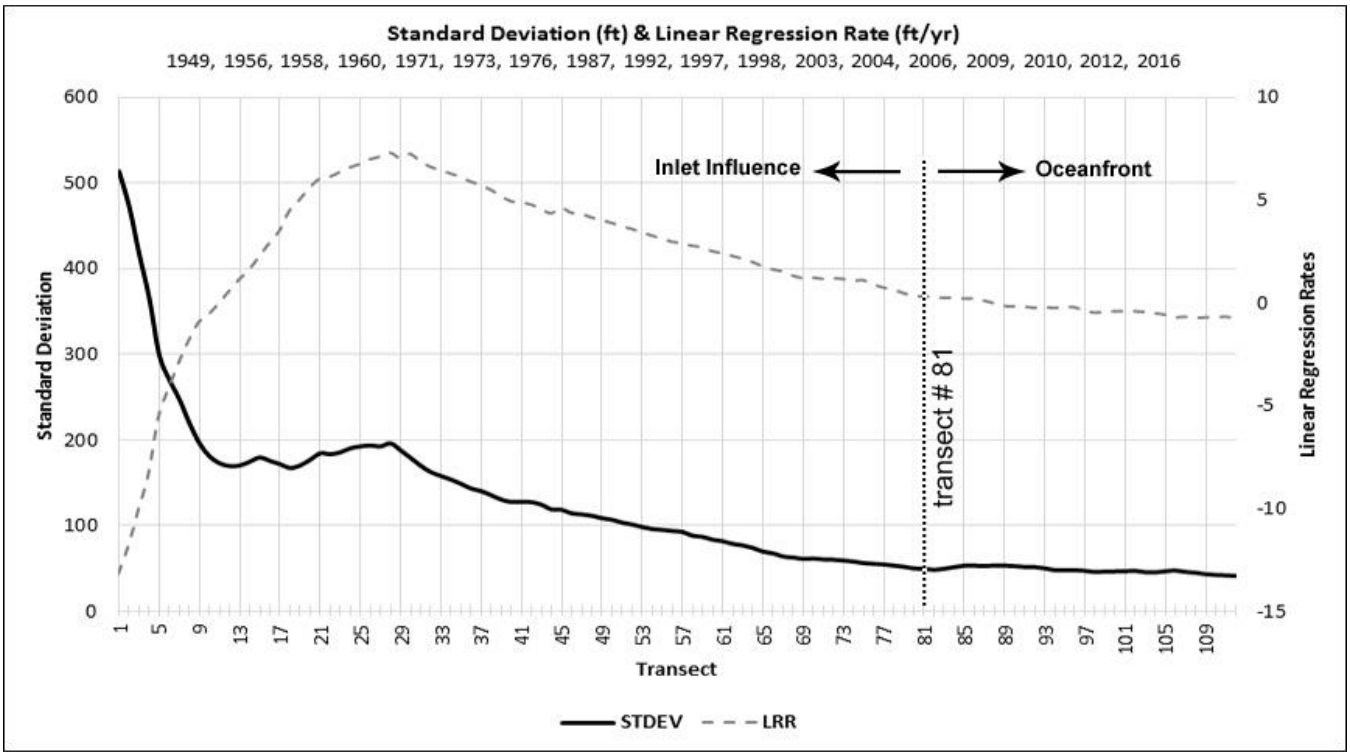
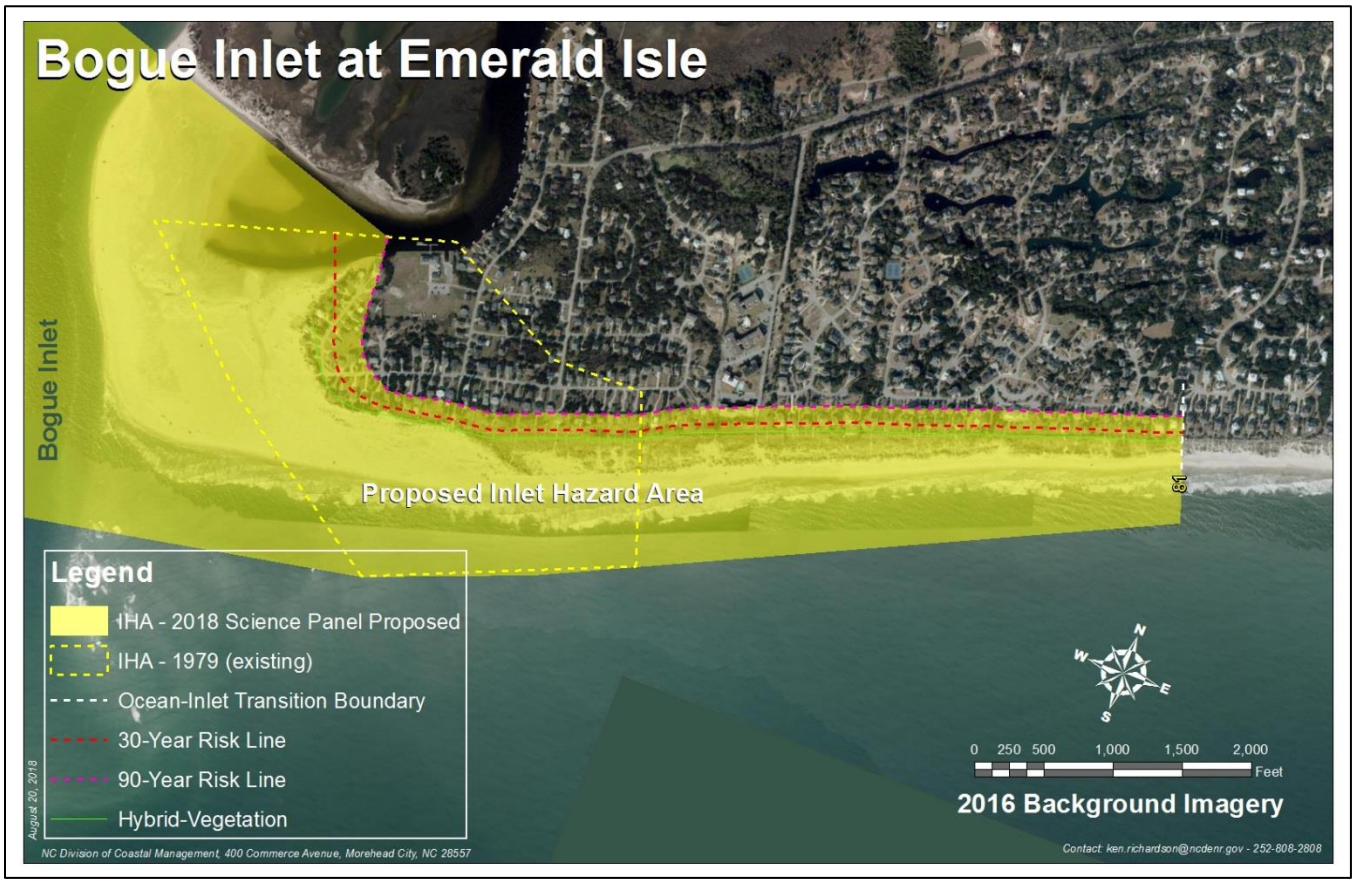


Figure 70. Bogue Inlet at Emerald Isle Hybrid-Vegetation Line and the recommended IHA boundary with the 30- and 90-Year Risk Lines.



4.0 Recommendations

The Inlet Hazard Area Method (IHAM) outlined and applied here is an objective methodology for calculating inlet shoreline change rates and for delineating the Inlet Hazard Areas (IHA) and areas within the IHA at greatest risk of experiencing inlet related erosion. Given the uniqueness of each inlet, it is important that the IHAM combines both accurate shoreline change data with variability statistics with detailed, professional knowledge of the underlying inlet geology and hydrodynamics. IHA boundaries have been proposed for the 10 developed North Carolina Inlets.

Given the potential for conditions at inlets to rapidly fluctuate over both the short- and long-term, the Science Panel on Coastal Hazards also recommends that the CRC consider updating the IHA every five years, coinciding with the oceanfront erosion rate and Ocean Erodible Area updates. Recommended issues to evaluate in the next update include:

- a more detailed analysis of the effect of including dates after construction of the AIWW but prior to 1970;
- the effect of various running averages in smoothing transect points alongshore;
- evaluate more effective ways to establish inlet transects;
- continue to evaluate the effectiveness of the IHA in managing near-inlet development.

Other issues may arise to consider in future updates as the Inlet Hazard Areas are implemented.

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Appendix A: List of Acronyms

AEC	Area of Environmental Concern
AIWW	Atlantic Intracoastal Waterway
CAMA	NC Coastal Area Management Act of 1974
CRC	NC Coastal Resources Commission
CSC	NOAA Coastal Services Center
DCM	NC Division of Coastal Management
DOT	Department of Transportation
EP	End-Point (Shoreline Change Rate Methodology)
GIS	Geographic Information System
GS	General Statute
HVL	Hybrid-Vegetation Line
IHA	Inlet Hazard Area
IHAM	Inlet Hazard Area Method
lidar	Light Detection and Ranging
LRR	Linear Regression (Shoreline Change Rate Methodology)
MLW	Mean Low Water
MHW	Mean High Water
NC	North Carolina
NCAC	NC Administrative Code
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
OEA	Ocean Erodible Area
T-sheet	Topographic Sheet
US	United States
USGS	US Geological Survey
30-YRL	30-Year Risk Line
90-YRL	90-Year Risk Line

Appendix B: Definition of Key Terms

Vegetation Lines (Veglines): Vegetation lines were interpreted as the First Line of Stable and Natural Vegetation (*FLSNV*). Although a few were mapped in the field using a mapping grade GPS, most vegetation lines were digitized using Geographic Information Systems (GIS) and orthorectified imagery.

Hybrid-Vegetation Line (HVL, Hybrid-Veg): This line represents the landward-most position of all vegetation lines at each inlet. The Hybrid-Vegetation Line is most often a composite containing landward-most segments from multiple vegetation lines, or at some locations, may represent only a single date.

Smoothed Hybrid-Vegetation Line: This line was digitized using the smoothed point locations where the Hybrid-Vegetation Line intersects transects. Point coordinates for each intersection were smoothed using a 5-point running average to minimize landward-oceanward cusping, or "jagged" segments along the Hybrid-Vegetation Line. This line served as the starting point, or baseline, from which landward measurements were cast along each transect.

Transects: These measurements are spaced 25 meters (82.03 feet) apart and cast perpendicular to the trending direction of all shorelines. Transects are used when calculating shoreline change rates at specific locations. Transects were cast using GIS and the US Geological Survey's Digital Shoreline Analysis System (DSAS).

Linear Regression Shoreline Change Rates: Shoreline change rates are calculated using multiple shorelines. A linear regression rate-of-change statistic is determined by fitting a least-squares regression line to all shoreline points for a transect. The regression line is placed so that the sum of the squared residuals (determined by squaring the offset distance of each data point from the regression line and adding the squared residuals together) is minimized. The linear regression rate is the slope of the line. The method of linear regression includes these features: (1) All the data are used, regardless of changes in trend or accuracy; (2) the method is purely computational; (3) the calculation is based on accepted statistical concepts; and (4) the method is easy to employ (Dolan et al., 1991). However, the linear regression method is susceptible to outlier effects and tends to underestimate the rate of change relative to other statistics, such as EPR (Dolan et al., 1991; Genz et al., 2007). In conjunction with the linear regression rate, the standard error of the estimate (LSE), the standard error of the slope with user-selected confidence interval (LCI), and the R-squared value (LR2) are reported. Linear Regression was used to calculate inlet shoreline change rates.

End-Point Shoreline Change Rates: This shoreline change rate is calculated by measuring the distance between two shorelines (early and current) and dividing by the time period. This method has been used on the oceanfront since 1979.

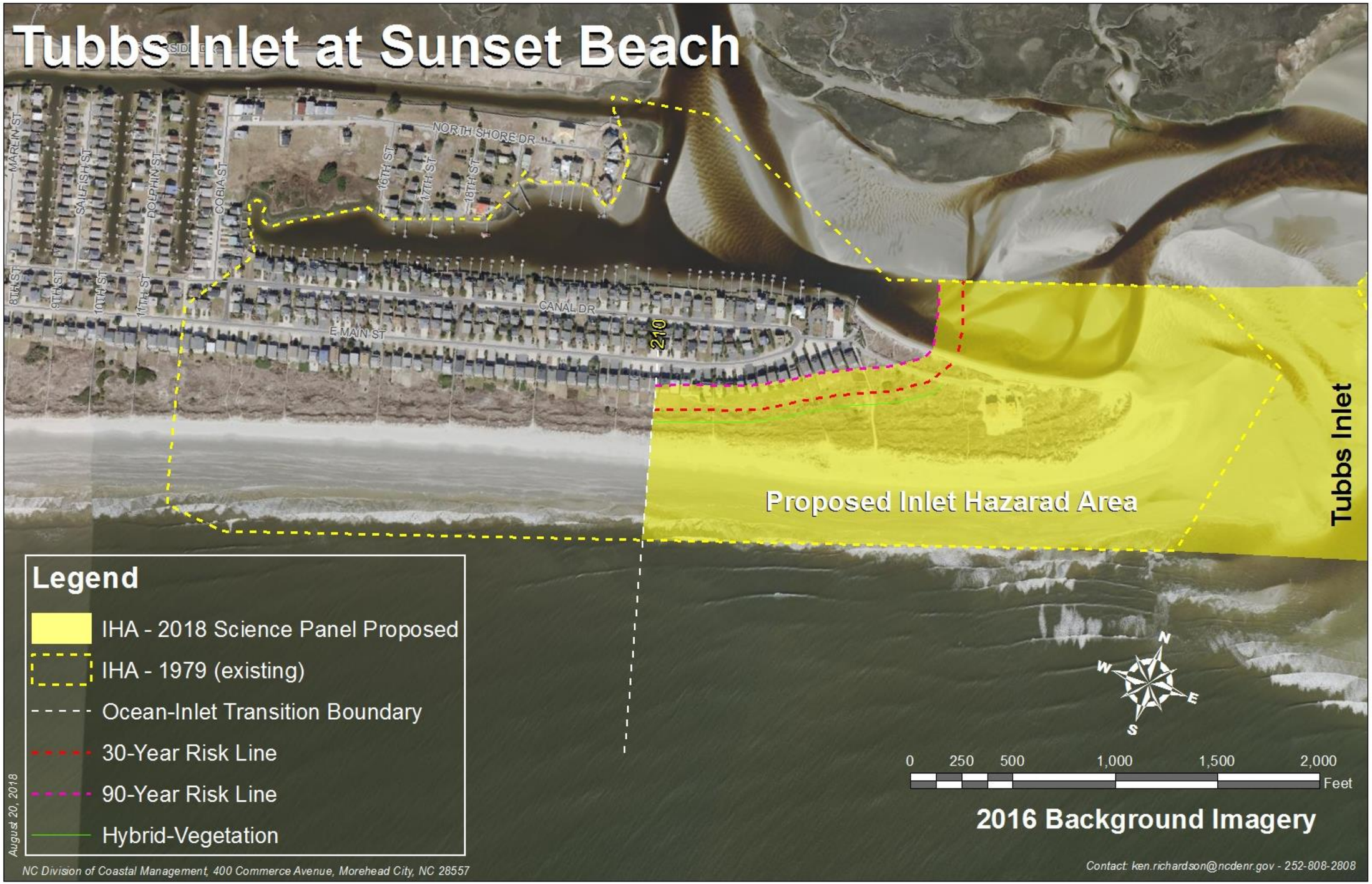
Ocean Erodible Area (OEA): The OEA is an Area of Environmental Concern (AEC) defined in NC's Coastal Resource Commission's Rules (15A NCAC 07H. 0300). This is the area where there exists a substantial possibility of excessive erosion and significant shoreline fluctuation. The oceanward

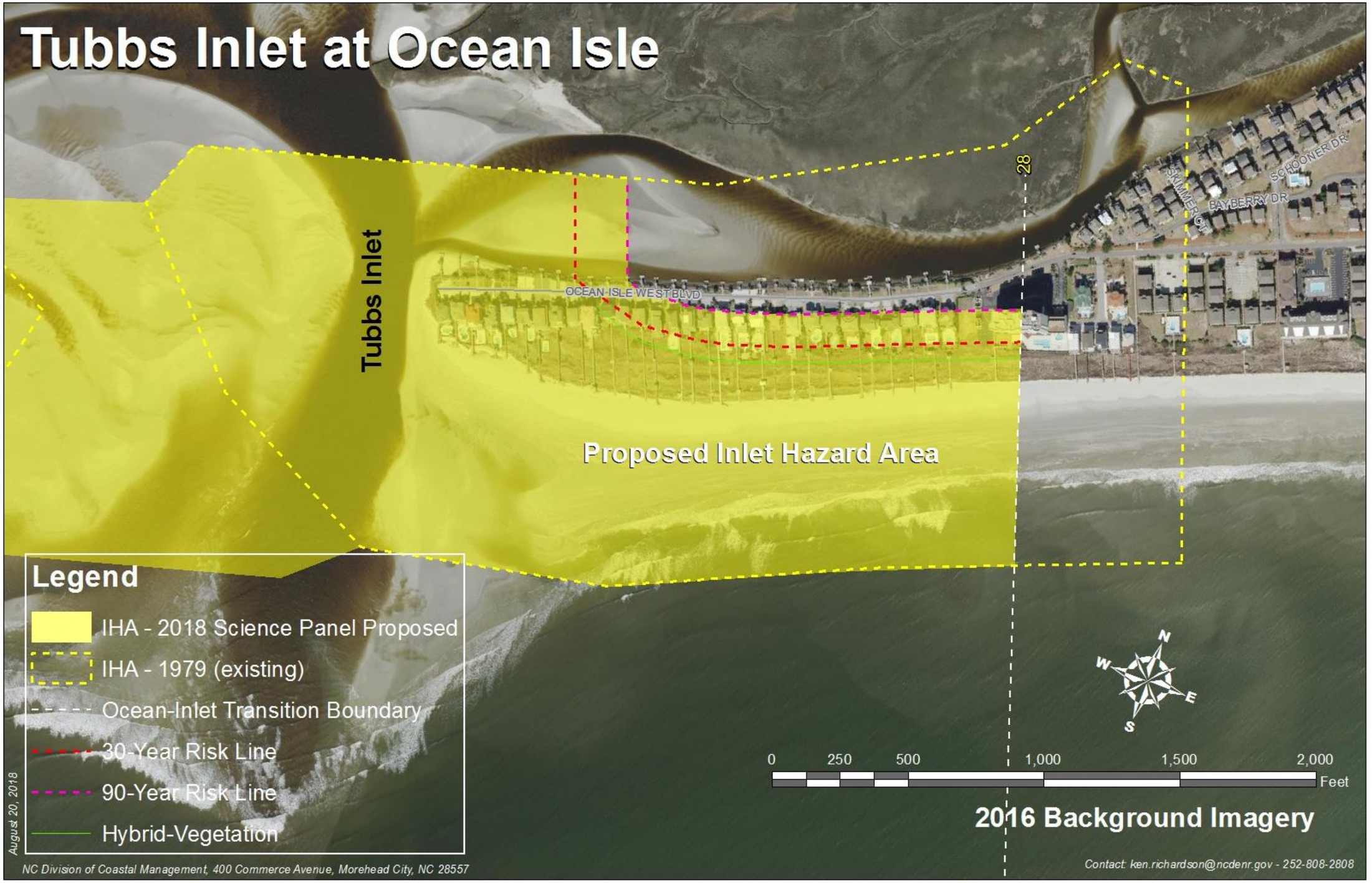
boundary of this area is the mean low water line. The landward extent of this area is the distance landward from the first line of stable and natural vegetation to the recession line established by multiplying the long-term annual erosion rate times 90; provided that, where there has been no long-term 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 and natural vegetation (15A NCAC 07H. 0304 (1)).

Inlet Hazard Area (IHA): Is an Area of Environmental Concern (AEC) defined in NC's Coastal Resource Commission's Rules (15A NCAC 07H. 0300). These 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 migrates, 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 (15A NCAC 07H. 0304 (2)). Current rule language also states: "*In all cases, the IHA shall not be an extension of the adjacent OEAs and in no case shall the width of the IHA be less than the width of the adjacent OEA.*" The reason for referencing current rule language is because at the June 29, 2018 Science Panel meeting, panel members agreed that this is an important consideration and that the IHA should match the OEA at a minimum, but not less than.

Appendix C: Proposed Inlet Hazard Area Maps

Tubbs Inlet at Sunset Beach




Tubbs Inlet at Ocean Isle
Tubbs Inlet
OCEAN ISLE WEST BLVD
28
SKIMMER CT
BAYBERRY DR
SCHOONER DR
Proposed Inlet Hazard Area
Legend
IHA - 2018 Science Panel Proposed
IHA - 1979 (existing)
Ocean-Inlet Transition Boundary
30-Year Risk Line
90-Year Risk Line
Hybrid-Vegetation
August 20, 2018
NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557
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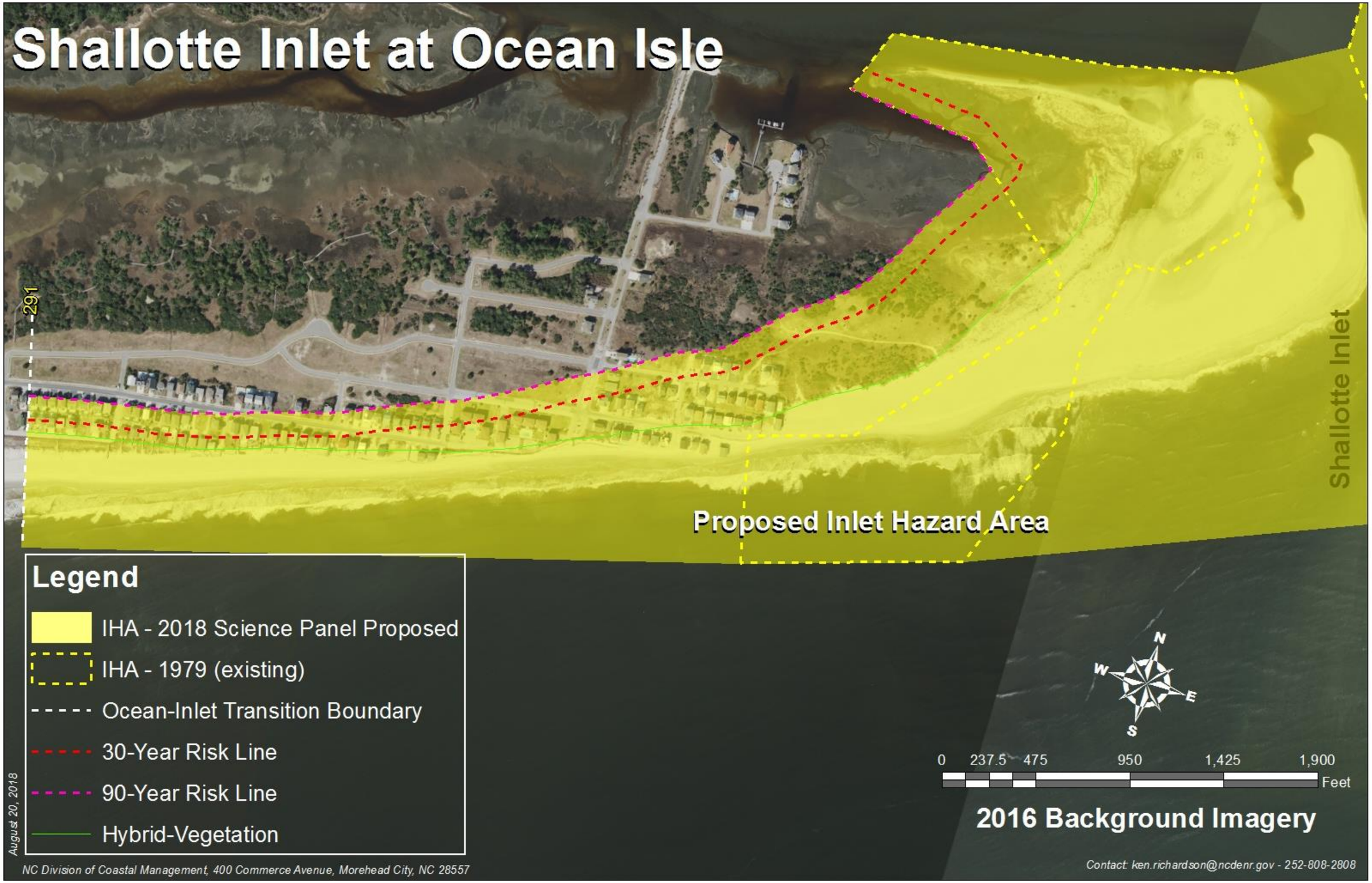
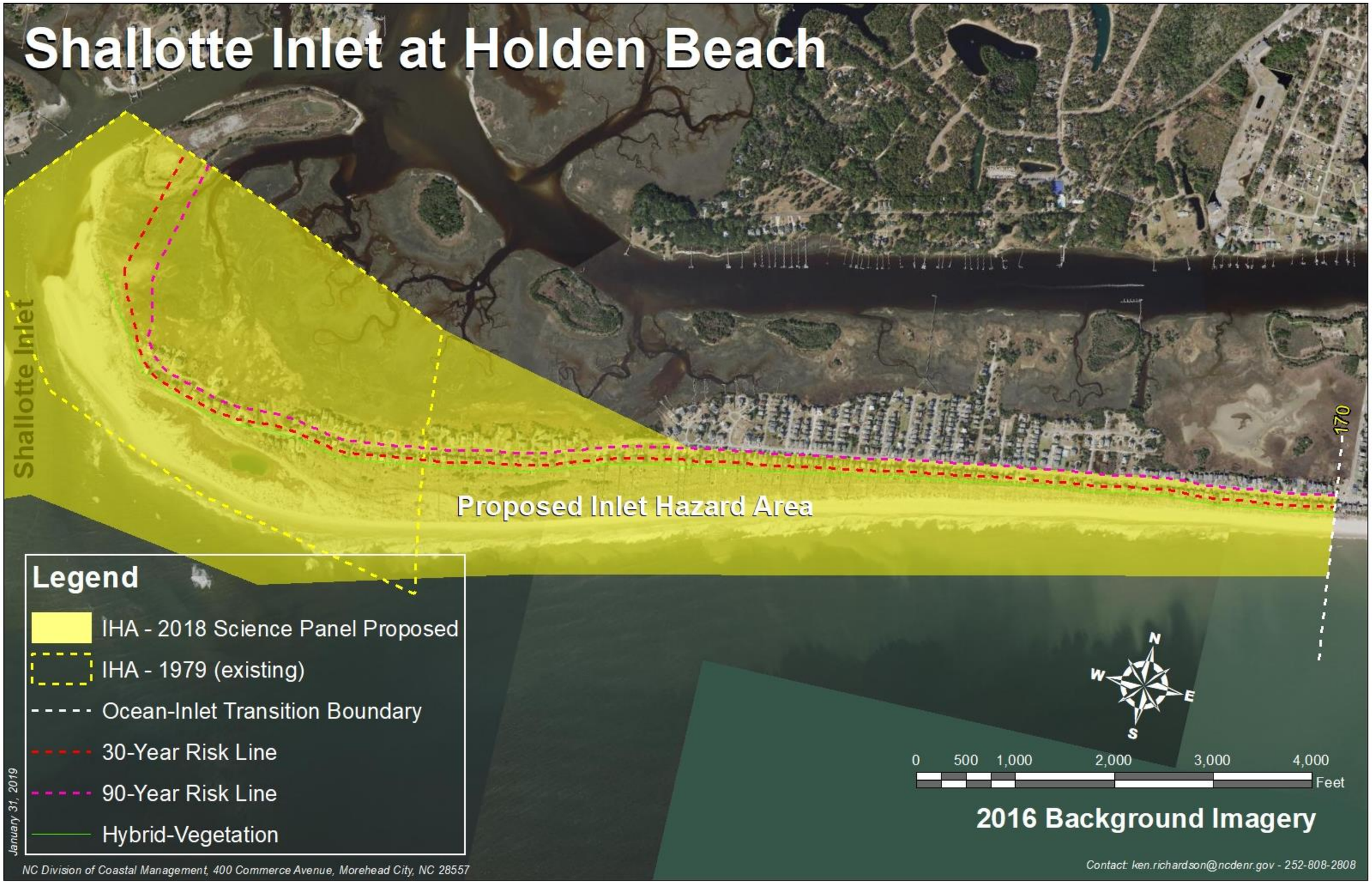
1,000
1,500
2,000
Feet
2016 Background Imagery
Contact: ken.richardson@ncdenr.gov - 252-808-2808

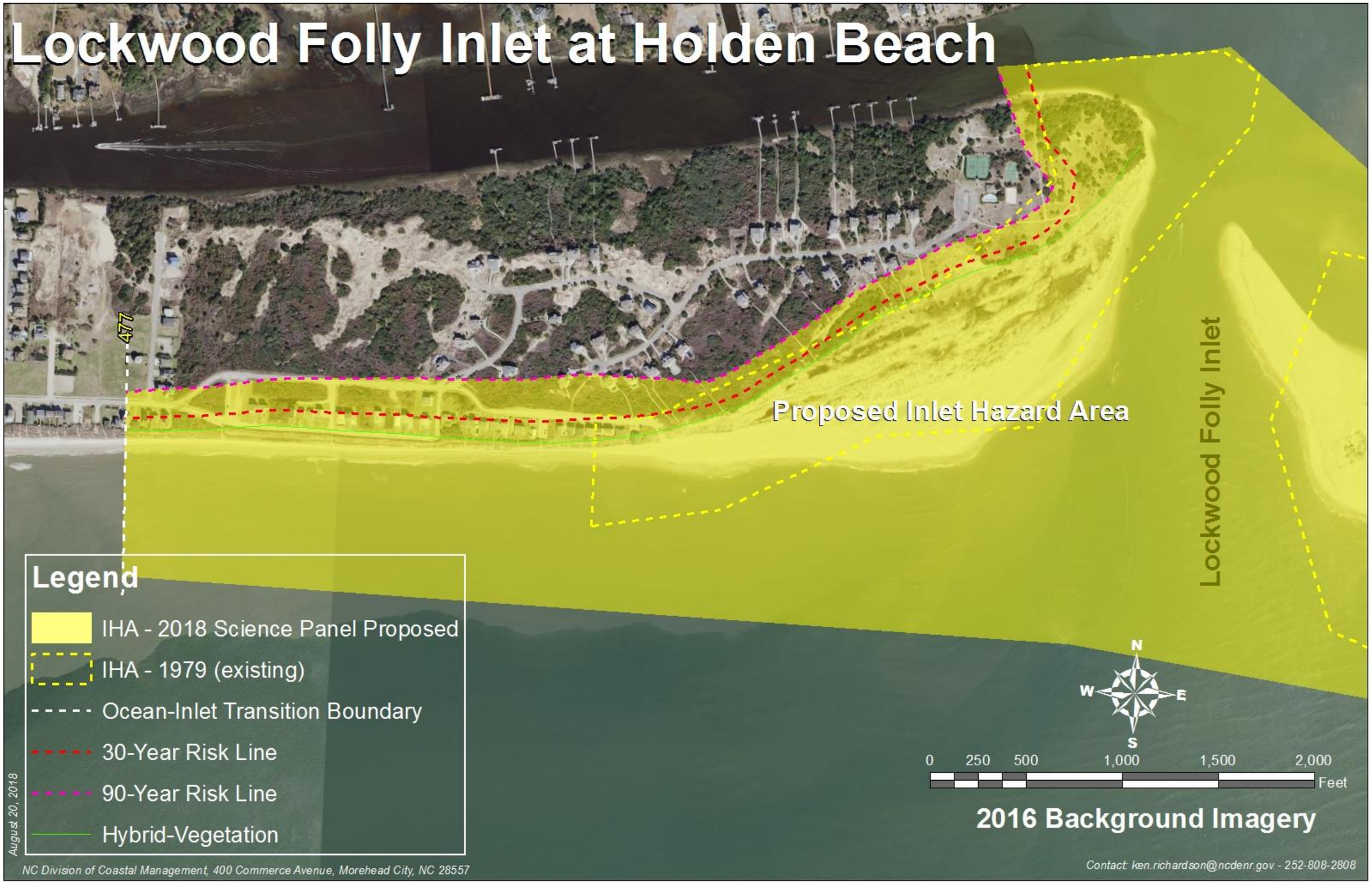
Shallotte Inlet at Ocean Isle



Shallotte Inlet at Holden Beach

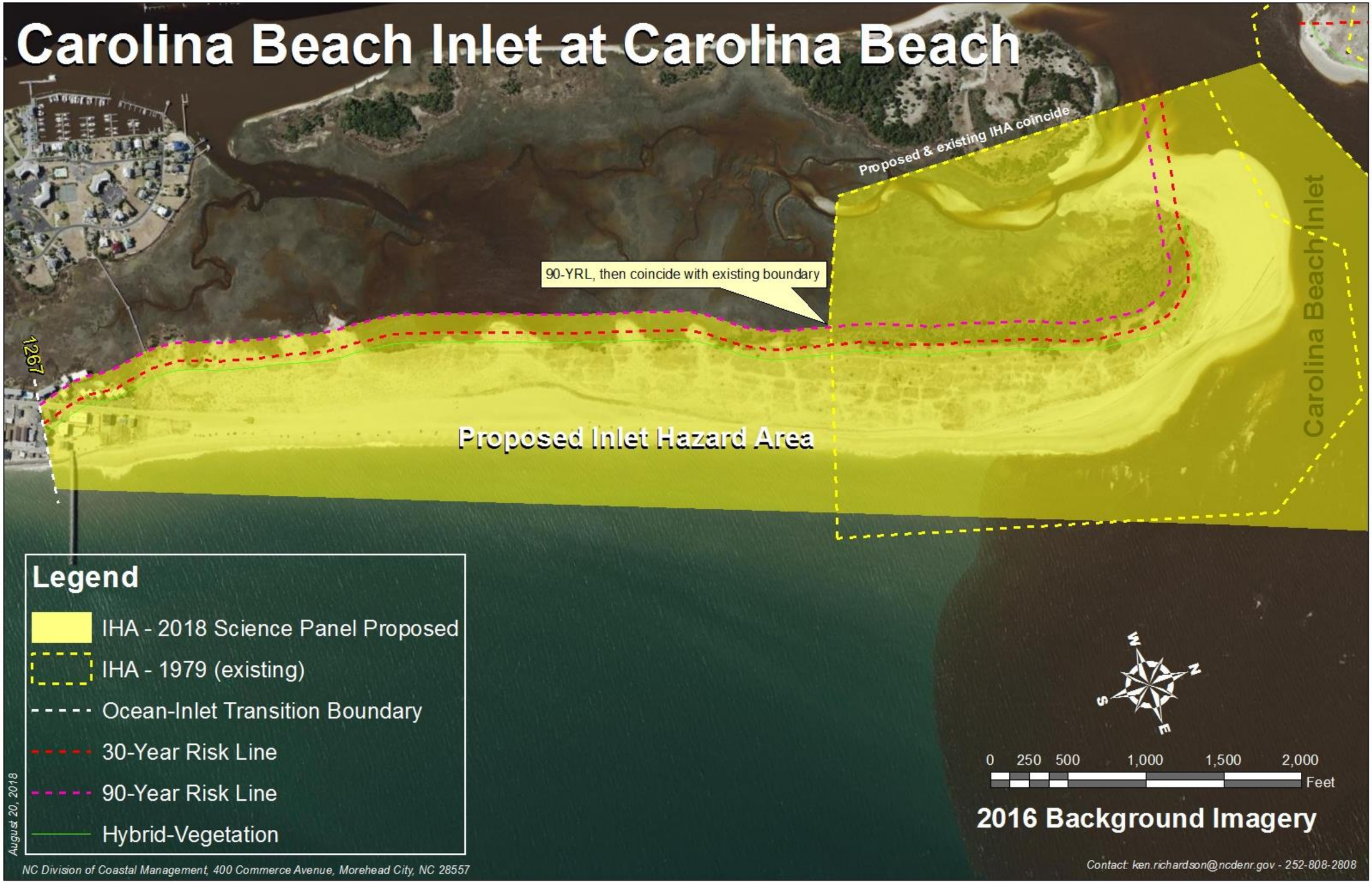


Lockwood Folly Inlet at Holden Beach



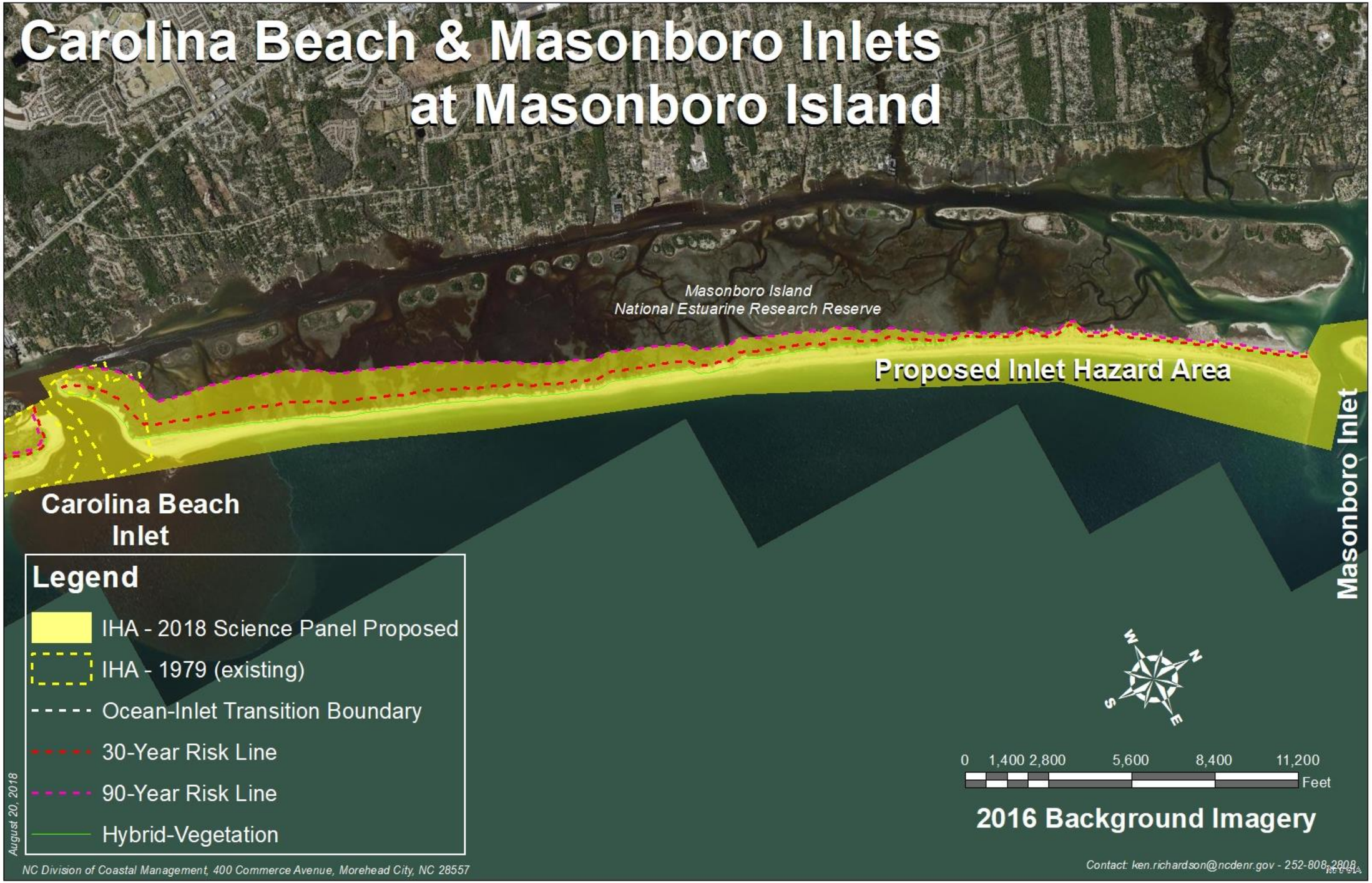
Lockwood Folly Inlet at Oak Island

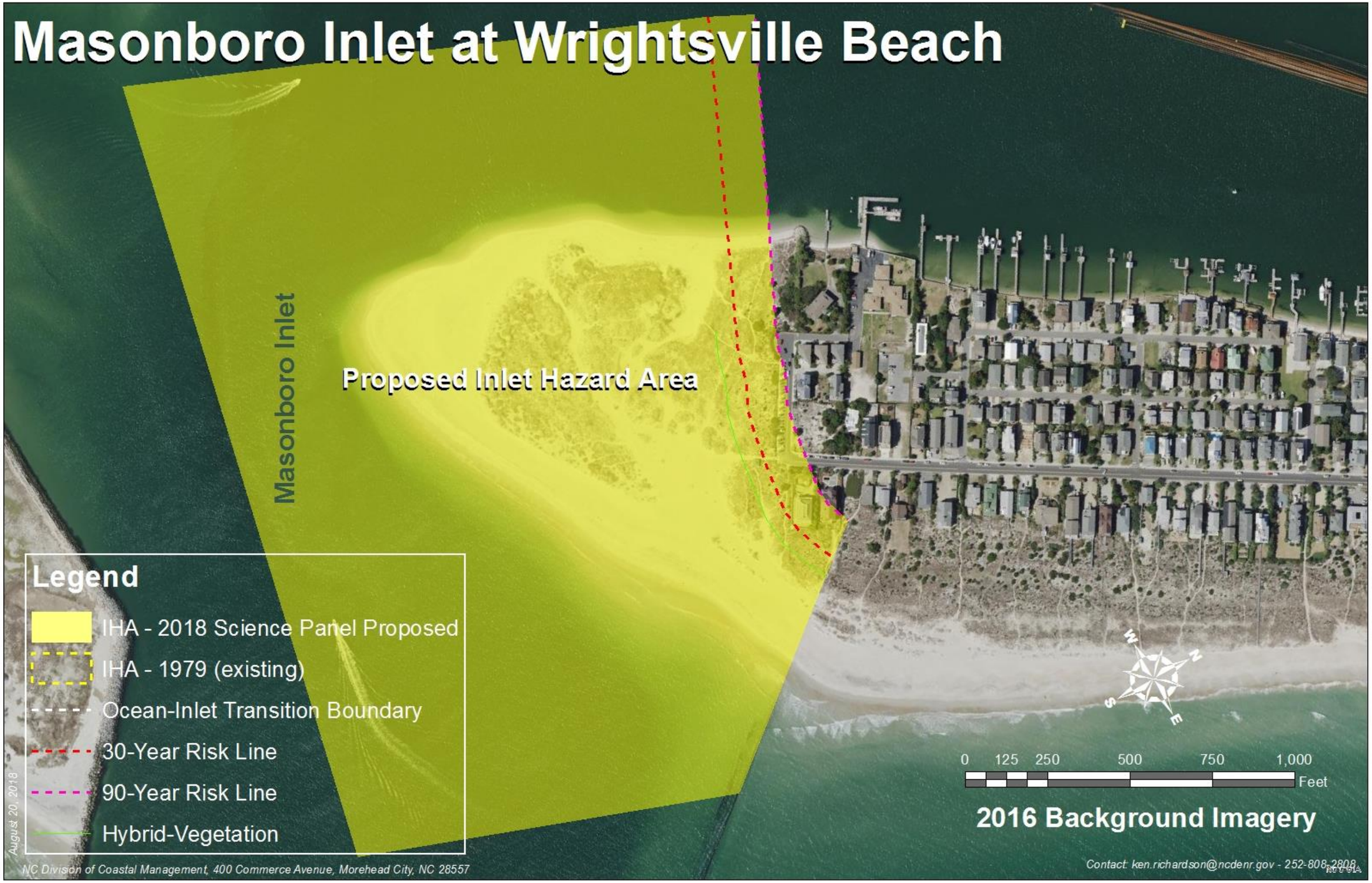
Carolina Beach Inlet at Carolina Beach



NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557
Contact: ken.richardson@ncdenr.gov - 252-808-2808

Carolina Beach & Masonboro Inlets at Masonboro Island




Masonboro Inlet at Wrightsville Beach
Proposed Inlet Hazard Area
Masonboro Inlet
Legend
IHA - 2018 Science Panel Proposed
IHA - 1979 (existing)
Ocean-Inlet Transition Boundary
30-Year Risk Line
90-Year Risk Line
Hybrid-Vegetation
August 20, 2018
NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557
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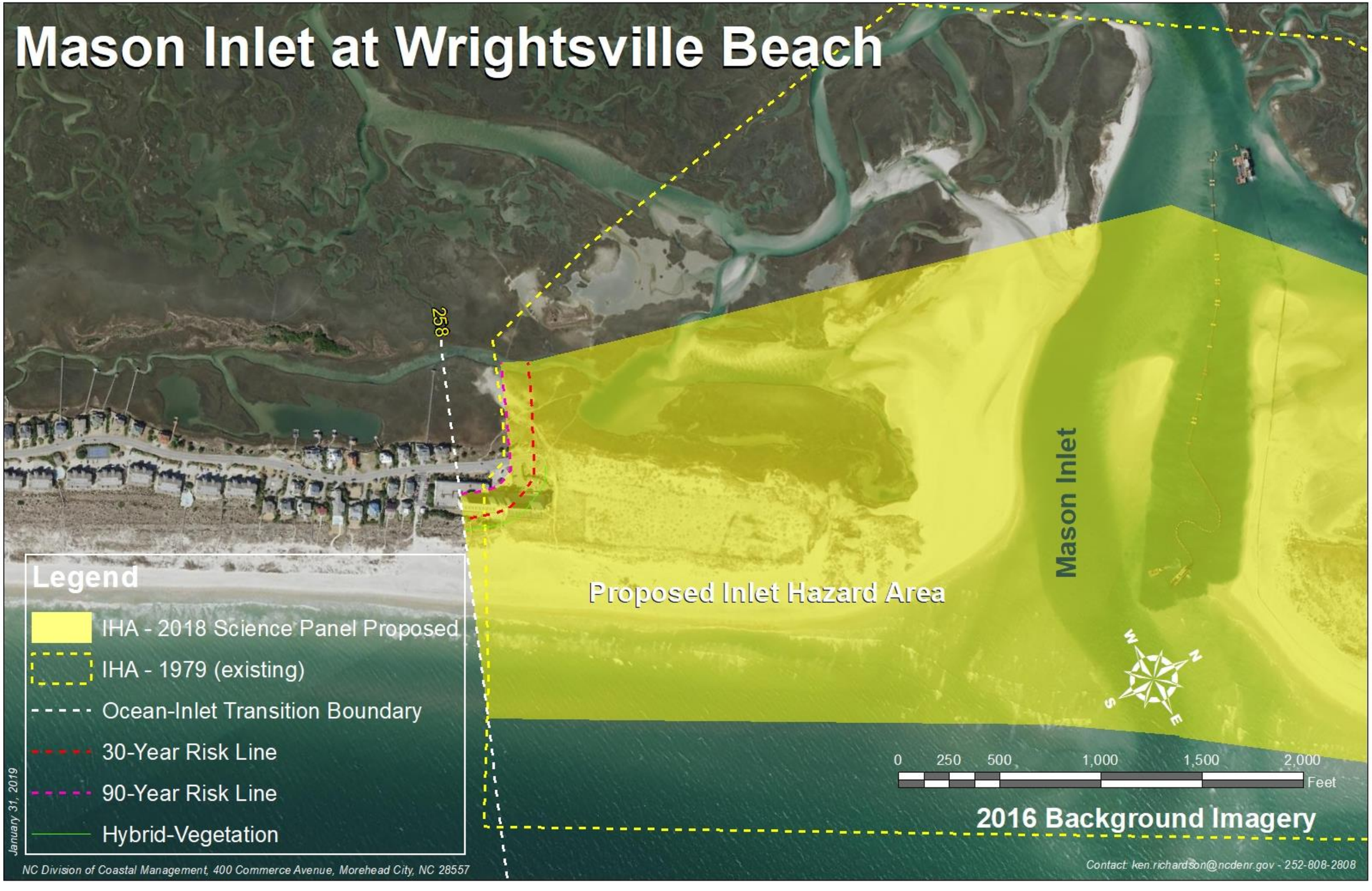
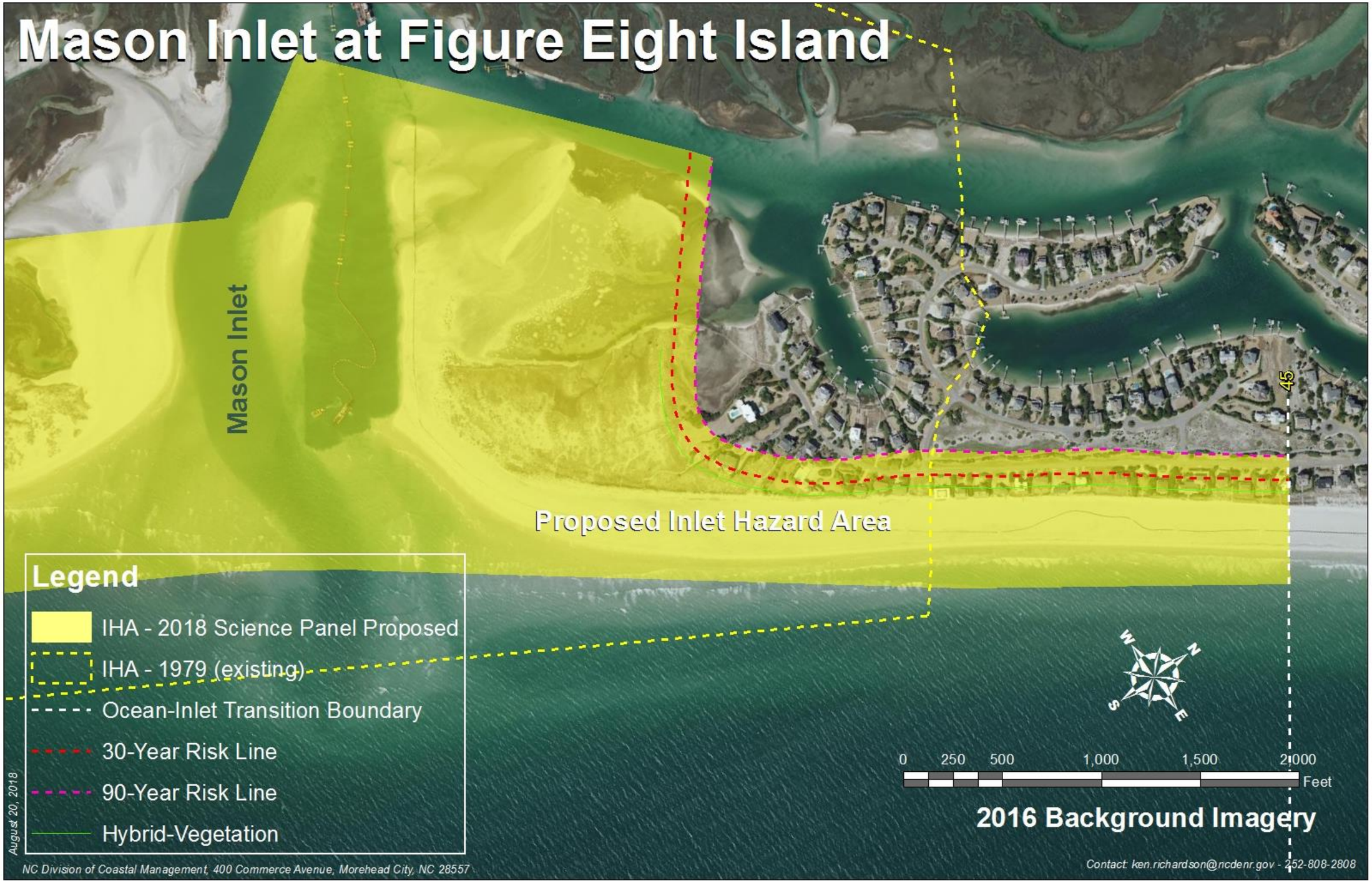
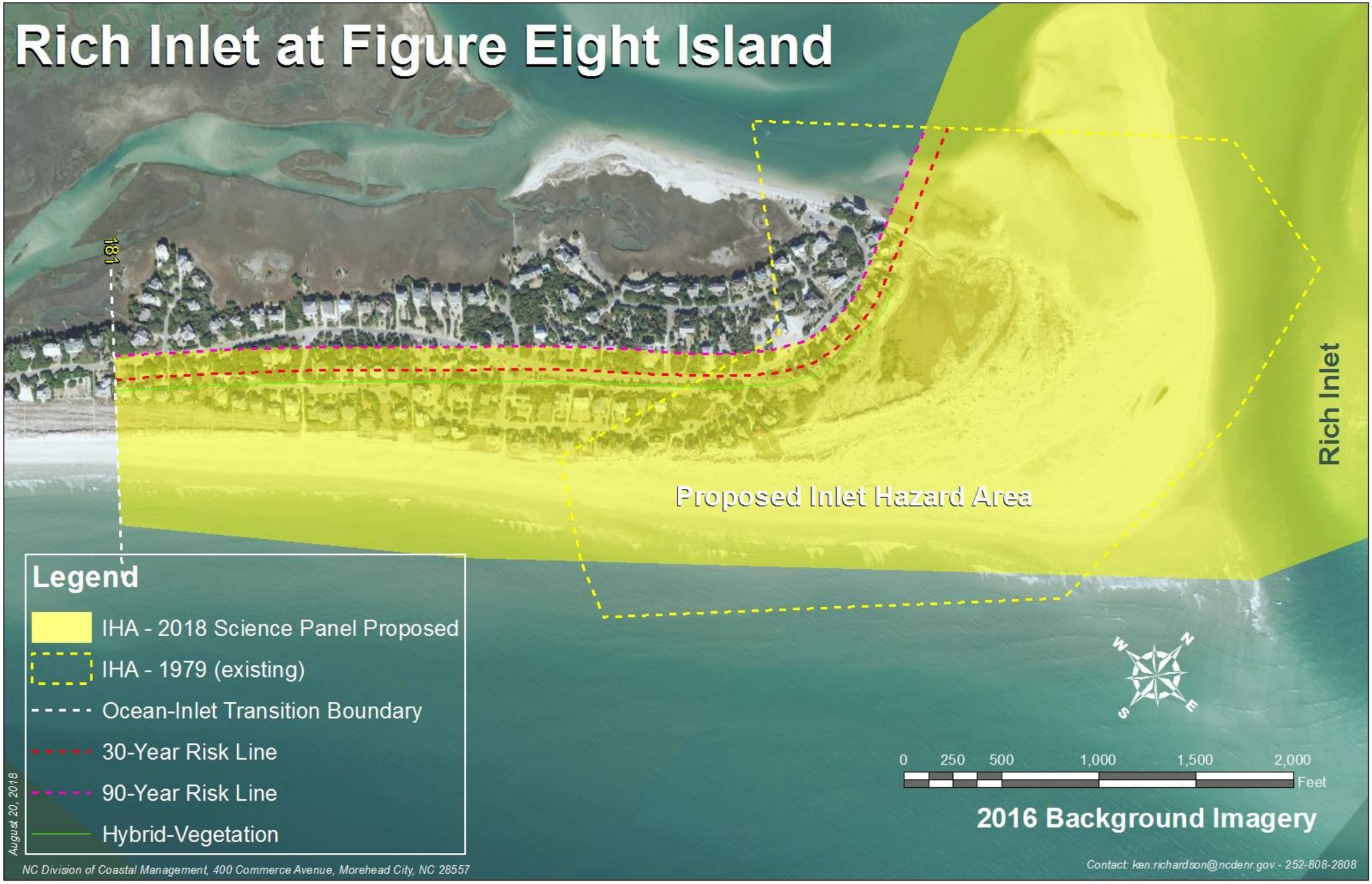
Feet
2016 Background Imagery
Contact: ken.richardson@ncdenr.gov - 252-808-2808

Mason Inlet at Wrightsville Beach



Mason Inlet at Figure Eight Island




Rich Inlet at Figure Eight Island
181
Rich Inlet
Proposed Inlet Hazard Area
Legend
IHA - 2018 Science Panel Proposed
IHA - 1979 (existing)
Ocean-Inlet Transition Boundary
30-Year Risk Line
90-Year Risk Line
Hybrid-Vegetation
August 20, 2018
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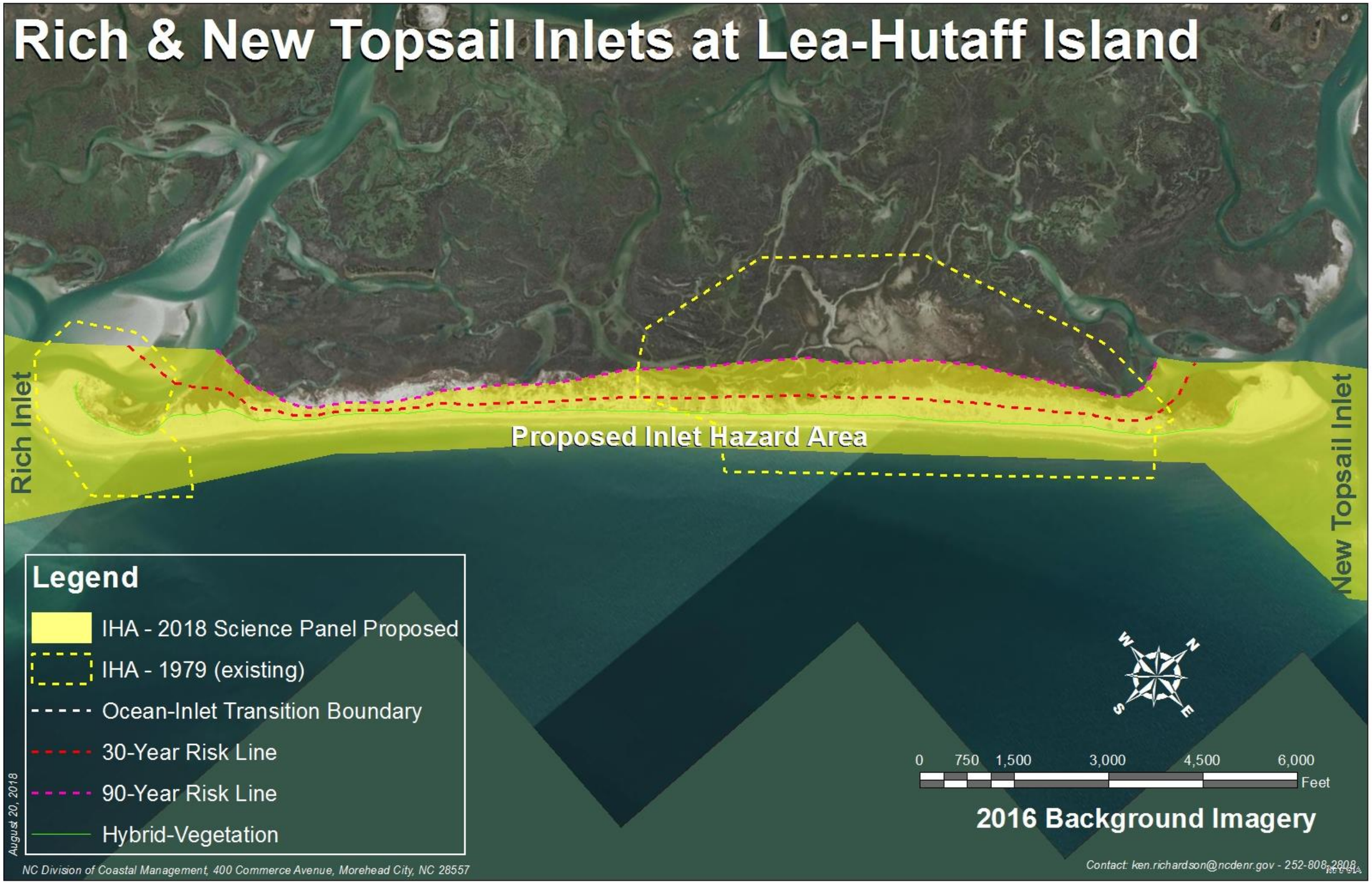
Contact: ken.richardson@ncdenr.gov - 252-808-2808


Rich & New Topsail Inlets at Lea-Hutaff Island
Rich Inlet
New Topsail Inlet
Proposed Inlet Hazard Area
Legend
IHA - 2018 Science Panel Proposed
IHA - 1979 (existing)
Ocean-Inlet Transition Boundary
30-Year Risk Line
90-Year Risk Line
Hybrid-Vegetation
August 20, 2018
NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557
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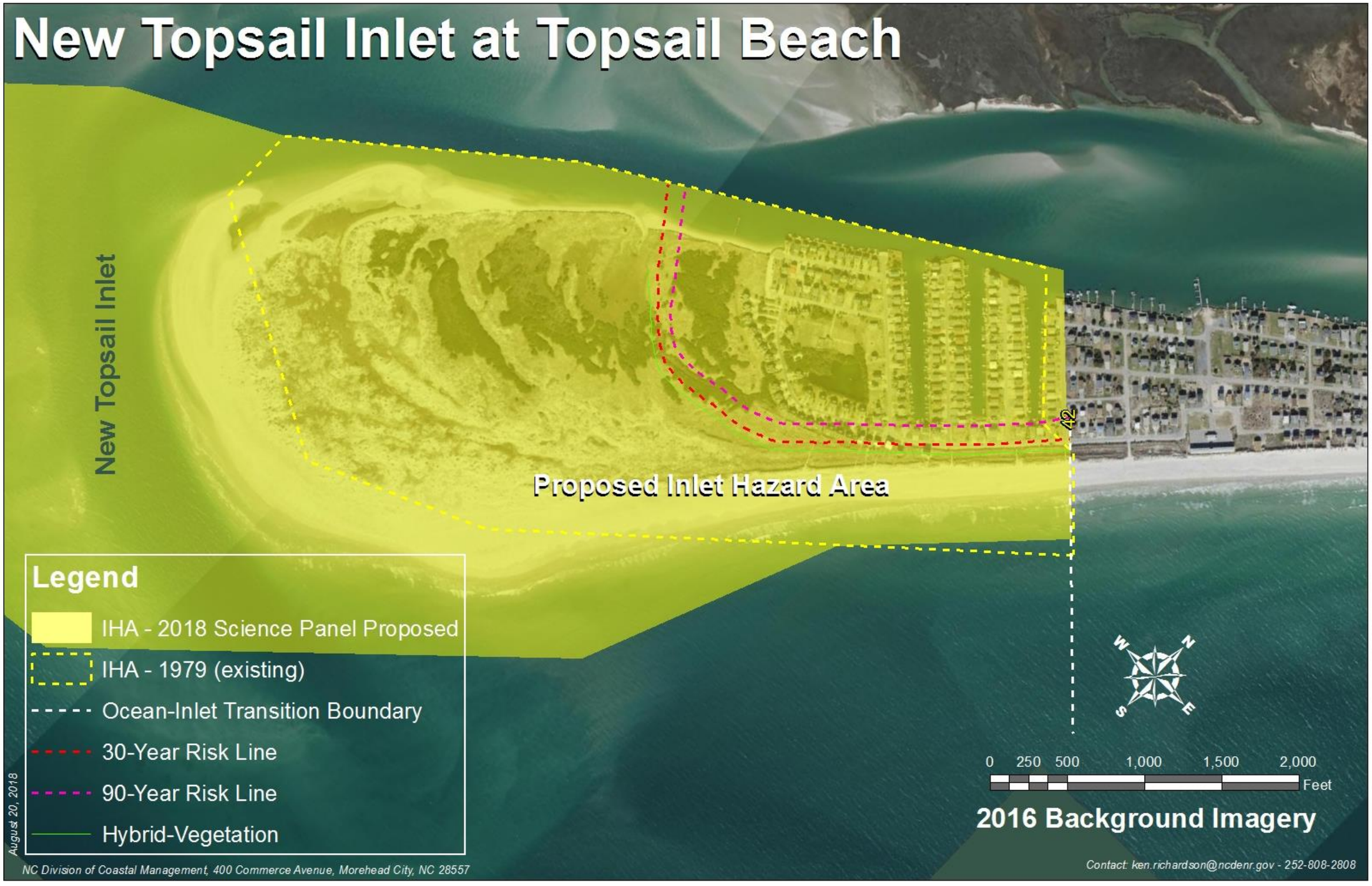
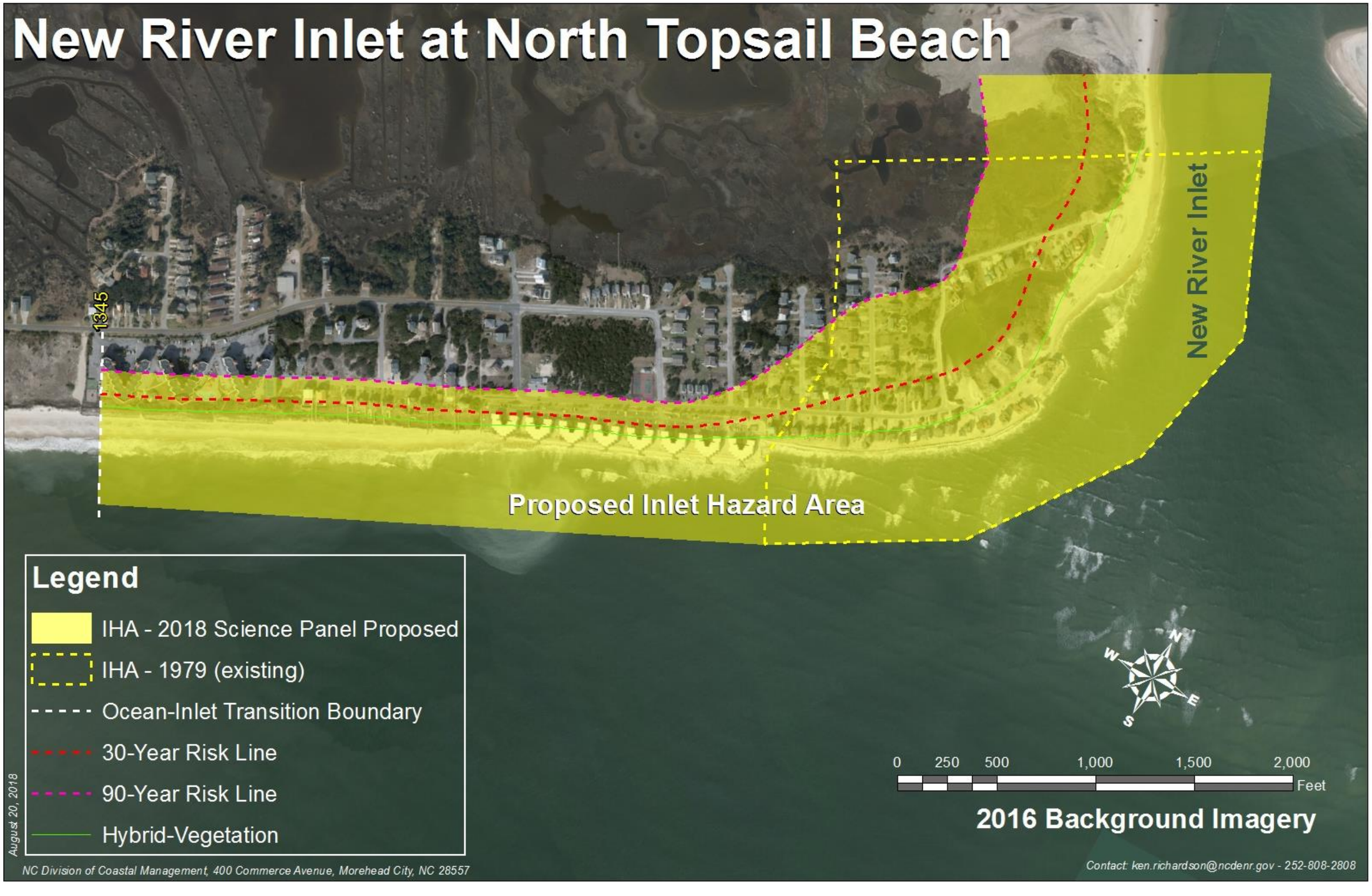
2016 Background Imagery
Contact: ken.richardson@ncdenr.gov - 252-808-2808

New Topsail Inlet at Topsail Beach



New River Inlet at North Topsail Beach



Bogue Inlet at Emerald Isle

Bogue Inlet

Proposed Inlet Hazard Area

Legend

- IHA - 2018 Science Panel Proposed
- IHA - 1979 (existing)
- Ocean-Inlet Transition Boundary
- 30-Year Risk Line
- 90-Year Risk Line
- Hybrid-Vegetation

August 20, 2018

NC Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557

N W E S

0 250 500 1,000 1,500 2,000

Feet

2016 Background Imagery

Contact: ken.richardson@ncdenr.gov - 252-808-2808

Note from the Codifier: The notices published in this Section of the NC Register include the text of proposed rules. The agency must accept comments on the proposed rule(s) for at least 60 days from the publication date, or until the public hearing, or a later date if specified in the notice by the agency. If the agency adopts a rule that differs substantially from a prior published notice, the agency must publish the text of the proposed different rule and accept comment on the proposed different rule for 60 days. Statutory reference: G.S. 150B-21.2.

TITLE 14B – DEPARTMENT OF PUBLIC SAFETY

***Notice** is hereby given in accordance with G.S. 150B-21.2 that the Alarm Systems Licensing Board intends to amend the rule cited as 14B NCAC 17 .0203.*

Link to agency website pursuant to G.S. 150B-19.1(c): *https://www.ncdps.gov/dps-services/permits-licenses/alarm-system-licensing-board*

Proposed Effective Date: *May 1, 2019*

Public Hearing:
Date: *January 30, 2019*
Time: *2:00 p.m.*
Location: *Alarm Systems Licensing Board, 3101 Industrial Dr., Suite 104, Raleigh, NC 27609*

Reason for Proposed Action: *The Board is fee funded and is not supported by the General Fund of the State of North Carolina. The Board has seen a fund balance decrease of approximately $50,000 in the last year; therefore, it is necessary to increase the licensing fee in order to cover costs. The Board is increasing the licensing application fee from three hundred seventy-five dollars ($375.00) to five hundred dollars ($500.00), an amount allowed pursuant to N.C.G.S. 74D-7. The Board has approximately 400 licenses; therefore, the $125 increase to the licensing fee will result in approximately $50,000 increased revenue.*

Comments may be submitted to: *Phil Stephenson, Field Services Supervisor, 3101 Industrial Drive, Suite 104, Raleigh, NC 27609, phone (919) 788-5320, fax (919) 715-0370, email Phillip.Stephenson@ncdps.gov*

Comment period ends: *March 18, 2019*

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 17 - ALARM SYSTEMS LICENSING BOARD

SECTION .0200 – PROVISIONS FOR LICENSEES

14B NCAC 17 .0203 FEES FOR LICENSES

(a) Application license fees shall be as follows:
- (1) one hundred fifty dollars ($150.00) non-refundable initial application fee;
- (2) ~~three hundred seventy-five dollar ($375.00)~~ five hundred dollar ($500.00) biennial fee for a new or renewal license;
- (3) one hundred fifty dollars ($150.00) branch office license fee;
- (4) one hundred dollars ($100.00) late renewal fee to be paid in addition to the renewal fee if the license has not been renewed on or before the expiration date.

(b) Fees shall be paid as follows:
- (1) if the application is submitted by hand delivery, U.S. Mail, or delivery services, payment shall be by check or money order made payable to the Alarm Systems Licensing Board; or
- (2) if the application if submitted online, payment shall be by credit card, e-check or other form of electronic funds.

Authority G.S. 74D-7.

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 rules cited as 15A NCAC 07H .2701, .2704, .2705 and 15A NCAC 07J .0409.*

Link to agency website pursuant to G.S. 150B-19.1(c): *https://deq.nc.gov/permits-regulations/rules-regulations/proposed-main*

Proposed Effective Date: *June 1, 2019*

Public Hearing:
Date: *February 28, 2019*
Time: *1:15 p.m.*
Location: *Carteret County Historical Society Museum, 1008 Arendell Street, Morehead City, NC 28557*

Reason for Proposed Action:
15A NCAC 07*H* .2701, .2704, .2705: *Session Law 2018-136 Section 5.13 directs the CRC to adopt rules to revise the Commission's general permit for the construction of riprap sills for wetland enhancement in estuarine and public trust waters in order to make the general permit consistent with the US Army Corps of Engineers regional general permit for living shorelines.*

15A NCAC 07J .0409: *These amendments address procedural matters, clarifications and inconsistencies with other CRC development rules.*

Comments may be submitted to: *Braxton Davis, 400 Commerce Avenue, Morehead City, NC 28557*

Comment period ends: *March 18, 2019*

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** *15A NCAC 07H .2701, .2704, .2705*
☐ **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** *15A NCAC 07J .0409*

CHAPTER 07 - COASTAL MANAGEMENT

SUBCHAPTER 07H - STATE GUIDELINES FOR AREAS OF ENVIRONMENTAL CONCERN

SECTION .2700 – GENERAL PERMIT FOR THE CONSTRUCTION OF ~~RIPRAP SILLS FOR WETLAND ENHANCEMENT IN ESTUARINE AND PUBLIC TRUST WATERS~~ MARSH SILLS

15A NCAC 07H .2701 PURPOSE
A general permit pursuant to this Section shall allow for the construction of ~~riprap~~ marsh sills for wetland enhancement and shoreline stabilization in estuarine and public trust waters as set out in ~~Subchapter~~ 15A NCAC 07J .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.

Authority G.S. 113A-107; 113A-118.1.

15A NCAC 07H .2704 GENERAL CONDITIONS
(a) Structures authorized by a permit issued pursuant to this Section shall be ~~riprap or stone~~ marsh sills conforming to the standards in these Rules.
(b) Individuals shall allow authorized representatives of the Department of ~~Environment and Natural Resources (DENR)~~ 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 ~~riprap or stone~~ marsh 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~~ 15A NCAC 07H .0200, and local land use plans current at the time of authorization.

Authority G.S. 113A-107; 113A-118.1.

15A NCAC 07H .2705 SPECIFIC CONDITIONS
(a) A general permit issued pursuant to this Section shall be applicable only for the construction of ~~riprap or stone~~ marsh 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~~ The landward edge of the sill shall be positioned no ~~more than 5~~ greater than 30 feet waterward ~~of the waterward depth contour of locally growing wetlands or to mid-tide depth contour,~~ of the normal high water or normal water level or five feet waterward of the existing wetlands, whichever distance 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 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 ~~and existing or planted wetlands~~ including wetlands and tidal inundation 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~~ 12 inches above ~~mean~~ normal high water, normal water level, or the height of the adjacent wetland substrate, whichever is ~~greater.~~ higher.

~~(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 Marine Fisheries and the National Marine Fisheries Service.~~ N.C. Division of Coastal Management.

~~(j)~~(g) The ~~riprap~~ sill structure shall not exceed a slope of a ~~one foot rise over a two foot horizontal distance and a minimum slope of a one and a half foot rise over a one foot horizontal distance.~~ one and a half foot horizontal distance over a one foot vertical rise. The width of the structure on the bottom shall ~~be no wider than 15~~ not exceed 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 narrow~~ 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 ~~mean~~ normal 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.~~ edge, as defined in 15A NCAC 07H .1205(t). Additionally, the sill shall not interfere with the exercise of riparians 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 ~~mean~~ normal high water ~~level.~~ or normal water level and must be maintained for the life of the structure.

~~(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 ~~riprap~~ sill 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 ~~of any native submerged aquatic vegetation~~ other than that necessary for the construction and proper bedding of the sill structure is authorized by this general permit.

(p) Sills shall not be constructed within any native submerged aquatic vegetation. If submerged aquatic vegetation is present within a project area, a submerged aquatic vegetation survey should be completed during the growing season of April 1 through September 30. All sills shall have a minimum setback of 10 feet from any native submerged aquatic vegetation.

(q) Sills shall not be constructed within any habitat that includes oyster reefs or shell banks. All sills shall have a minimum setback of 10 feet from any oysters, oyster beds, or shell banks.

~~(v)~~(r) 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 result 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)~~(s) The ~~riprap~~ sill material shall consist of clean ~~rock~~ rock, marl, oyster shell, or masonry materials such as granite or broken ~~concrete.~~ Concrete or other materials that are approved by the N.C. Division of Coastal Management. ~~Riprap~~ Sill material shall be free of loose sediment or any ~~pollutant.~~ Pollutant, including exposed rebar. The ~~structures~~ sill material shall be of sufficient size and slope to prevent its movement from the ~~site~~ approved alignment 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) 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 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.~~

Authority G.S. 113A-107; 113A-118.1.

SUBCHAPTER 07J - PROCEDURES FOR PROCESSING AND ENFORCEMENT OF MAJOR AND MINOR DEVELOPMENT PERMITS, VARIANCE REQUESTS, APPEALS FROM PERMIT DECISIONS, DECLARATORY RULINGS, AND STATIC LINE EXCEPTIONS

SECTION .0400 - FINAL APPROVAL AND ENFORCEMENT

15A NCAC 07J .0409 CIVIL PENALTIES

(a) Purpose and Scope. These Rules provide the procedures and standards governing the assessment, remission, settlement and appeal of civil penalties assessed by the Coastal Resources Commission and the Director pursuant to G.S. 113A-126(d).

(b) Definitions. The terms used herein shall be as defined in G.S. 113A-103 and as follows:

(1) "Act" means the Coastal Area Management Act of 1974, G.S. 113A-100 through 134, plus amendments.

(2) "Delegate" means the Director or other employees of the Division of Coastal Management, or local permit officers to whom the Commission has delegated authority to act in its stead pursuant to this Rule.

(3) "Director" means the Director, Division of Coastal Management.

(4) "Respondent" means the person to whom a notice of violation has been issued or against whom a penalty has been assessed.

(5) "Person" is defined in the Coastal Area Management Act, G.S. 113A-103(9).

(c) Civil penalties may be assessed against any person who commits a violation as provided for in G.S. 113A-126(d)(1) and (2).

(d) Investigative costs. Pursuant to G.S. 113A-126(d)(4a) the Commission or Director may also assess a respondent for the costs incurred by the Division for investigation, inspection, and monitoring associated with assessment the civil penalty. Investigative costs shall be in addition to any civil penalty assessed. For a minor development violation, investigative costs shall not exceed one-half of the amount of the civil penalty assessed or one thousand dollars ($1,000), whichever is less. For a major development violation, investigative costs shall not exceed one-half of the amount of the civil penalty assessed or two thousand five hundred dollars ($2,500), whichever is less. The Division shall determine the amount of investigative costs to assess based upon factors including the amount of staff time required for site visits, investigation, enforcement action, interagency coordination, and for monitoring restoration of the site.

(e) Notice of Violation. The Commission hereby authorizes employees of the Division of Coastal Management to issue in the name of the Commission notices of violation to any person engaged in an activity which constitutes a violation for which a civil penalty may be assessed. Such notices shall set forth the nature of the alleged violation, shall order that the illegal activity be ceased and affected resources be restored in accordance with ~~15A NCAC 07J .0410.~~ Rule .0410 of this Section. The notice shall specify the time by which the restoration shall be completed as ordered by the Division. The notice shall be delivered ~~personally or~~ by registered or certified mail, return receipt requested.

(f) Civil Penalty Assessment.

(1) The Commission hereby delegates to the Director the authority to assess civil penalties according to the procedures set forth in Paragraph (g) of this Rule.

(2) ~~The Director shall~~ If restoration of affected resources is not required, the Director may issue a notice of assessment within ~~30~~ 90 days from the date of the Notice of Violation. If restoration of affected resources is required, the Director may issue a Notice of Assessment within 60 days after the Division determines that restoration of the adversely impacted resources is ~~complete.~~ complete or due date of restoration completion.

(3) The notice of assessment shall specify the reason for assessment, how the assessment was calculated, when and where payment shall be made, and shall inform the respondent of the right to appeal the assessment by filing a petition for a contested case hearing with the Office of Administrative Hearings pursuant to G.S. 150B-23. The notice shall be delivered ~~personally or~~ by registered or certified mail, return receipt requested.

(g) Amount of Assessment.

(1) Civil penalties shall not exceed the maximum amounts established by G.S. 113A-126(d).

(2) If any respondent willfully continues to violate by action or inaction any rule or order of the Commission after the date specified in a notice of violation, each day the violation continues or is repeated shall be considered a separate violation as provided in G.S. 113A-126(d)(2).

(3) In determining the amount of the penalty, the Commission or Director shall consider the factors contained in G.S. 113A-126(d)(4).

(4) Pursuant to Subparagraph ~~(g)(3) of this Rule,~~ (3) of this Paragraph, penalties for major development violations, including violations of permit conditions, shall be assessed in accordance with the following criteria.

(A) Major development which could have been permitted under the Commission's rules at the time the notice of violation is issued shall be assessed a penalty equal to two times the relevant CAMA permit application fee, plus investigative costs.

(B) Major development which could not have been permitted under the Commission's rules at the time the notice of violation is issued shall be assessed an amount equal to the relevant CAMA permit application fee, plus a penalty pursuant to Schedule A of this Rule, plus investigative costs. If a violation affects more than one area of environmental concern (AEC) or coastal resource as listed within Schedule A of this Rule, the penalties for each affected AEC shall be combined. Any structure or part of a structure that is constructed in violation of existing Commission rules shall be removed or modified as necessary to bring the structure into compliance with the Commission's rules.

SCHEDULE A
Major Development Violations

Size of Violation (sq. ft.)

AREA OF ENVIRONMENTAL CONCERN AFFECTED	≤ 100	101-500	501-1,000	1001-3000	3001-5000	5001-8000	8001-11,000	11,001-15,000	15,001-20,000	20,001-25,000	>25,000
ESTUARINE WATERS OR PUBLIC TRUST AREAS (1)	$250	$375	$500	$1,500	$2,000	$3,500	$5,000	$7,000	$9,000	$10,000	$10,000
Primary Nursery Areas	$100	$225	$350	$850	$1,350	$2,850	$4,350	$3,000	$1,000	n/a	n/a
Mudflats and Shell Bottom	$100	$225	$350	$850	$1,350	$2,850	$4,350	$3,000	$1,000	n/a	n/a
Submerged Aquatic Vegetation	$100	$225	$350	$850	$1,350	$2,850	$4,350	$3,000	$1,000	n/a	n/a
COASTAL WETLANDS	$250	$375	$500	$1,500	$2,000	$3,500	$5,000	$7,000	$9,000	$10,000	$10,000
COASTAL SHORELINES	$250	$350	$450	$850	$1,250	$2,450	$3,650	$5,250	$7,250	$9,250	$10,000
Wetlands (2)	$100	$200	$300	$700	$1,100	$2,300	$3,500	$4,750	$2,750	$750	n/a
ORW-Adjacent Areas	$100	$200	$300	$700	$1,100	$2,300	$3,500	$4,750	$2,750	$750	n/a
OCEAN HAZARD SYSTEM (3)(4)	$250	$350	$450	$850	$1,250	$2,450	$3,650	$5,250	$7,250	$9,250	$10,000
Primary or Frontal Dune	$100	$200	$300	$700	$1,100	$2,300	$3,500	$4,750	$2,750	$750	n/a
PUBLIC WATER SUPPLIES (5)	$250	$350	$450	$850	$1,250	$2,450	$3,650	$5,250	$7,250	$9,250	$10,000

NATURAL AND CULTURAL RESOURCE AREAS (6)	$250	$350	$450	$850	$1,250	$2,450	$3,650	$5,250	$7,250	$9,250	$10,000

(1) Includes the Atlantic Ocean from the normal high water mark to three miles offshore.

(2) Wetlands that are jurisdictional by the Federal Clean Water Act.

(3) If the AEC physically overlaps another AEC, use the greater penalty schedule.

(4) Includes the Ocean Erodible, ~~High Hazard Flood Area,~~ Inlet Hazard Area, and Unvegetated Beach Area.

(5) Includes Small Surface Water Supply, Watershed and Public Water Supply Well Fields.

(6) Includes Coastal Complex Natural Areas, Coastal Areas Sustaining Remnant Species, Unique Geological Formations, Significant Coastal Archaeological Resources, and Significant Coastal Historical Architectural Resources.

(C) Assessments for violations by public agencies (i.e. towns, counties and state agencies) shall be determined in accordance with Parts (g)(4)(A) and (B) of this Rule.

(D) Willful and intentional violations. The penalty assessed under Parts (g)(4)(A) and (B) of this Rule shall be doubled for willful and intentional violations except that the doubled penalties assessed under this Subparagraph shall not exceed ten thousand dollars ($10,000) or be less than two thousand dollars ($2,000) for each separate violation. A violation shall be considered to be willful and intentional when:

(i) The person received written instructions from one of the Commission's delegates that a permit would be required for the development and subsequently undertook development without a permit; or

(ii) The person received written instructions from one of the Commission's delegates that the proposed development was not permissible under the Commission's rules, or received denial of a permit application for the proposed activity, and subsequently undertook the development without a permit; or

(iii) The person committed previous violations of the Commission's rules; or

(iv) The person refused or failed to restore a damaged area as ordered by one of the Commission's delegates. If necessary, the Commission or Division shall seek a court order to require restoration.

(E) Assessments against contractors. Any contractor or subcontractor or person or group functioning as a contractor shall be subject to a notice of violation and assessment of a civil penalty in accordance with Paragraph (f) of this Rule. Such penalty shall be in addition to that assessed against the landowner. When a penalty is being doubled pursuant to ~~Part (g)(4)(D)~~ Part (D) of this Subparagraph and the element of willfulness is present only on the part of the contractor, the landowner shall be assessed the standard penalty and the contractor shall be assessed the doubled penalty.

(F) Continuing violations.

(i) Pursuant to G.S. 113A-126(d)(2), each day that the violation continues after the date specified in the notice of violation for the unauthorized activity to cease or restoration to be completed shall be considered a separate violation and shall be assessed an additional penalty.

(ii) Refusal or failure to restore a damaged area as ordered shall be considered a continuing violation and shall be assessed an additional penalty. When resources continue to be affected by the violation, the amount of the penalty shall be determined according to ~~Part (g)(4)(B) of this Rule.~~ Part (B) of this Subparagraph. The continuing penalty period shall be calculated from the

date specified in the notice of violation for the unauthorized activity to cease or restoration to be completed and run until:

(I) the Division's order is satisfied, or

(II) the respondent enters into good faith negotiations with the Division, or

(III) the respondent contests the Division's order in a judicial proceeding by raising a justiciable issue of law or fact therein.

The continuing penalty period shall resume if the respondent terminates negotiations without reaching an agreement with the Division, fails to comply with court ordered restoration, or fails to meet a deadline for restoration that was negotiated with the Division.

(5) Pursuant to Subparagraph (g)(3) of this Rule, civil penalties for minor development violations, including violations of permit conditions, shall be assessed in accordance with the following criteria:

(A) Minor development which could have been permitted under the Commission's rules at the time the notice of violation is issued shall be assessed a penalty equal to two times the relevant CAMA permit application fee, plus investigative costs.

(B) Minor development which could not have been permitted under the Commission's rules at the time the notice of violation is issued shall be assessed an amount equal to the relevant CAMA permit application fee, plus a penalty pursuant to Schedule B of this Rule, plus investigative costs. If a violation affects more than one area of environmental concern (AEC) or coastal resource as listed within Schedule B of this Rule, the penalties for each affected AEC shall be combined. Any structure or part of a structure that is constructed in violation of existing Commission rules shall be removed or modified as necessary to bring the structure into compliance with the Commission's rules.

SCHEDULE B
Minor Development Violations

Size of Violation (sq. ft.)

AREA OF ENVIRONMENTAL CONCERN AFFECTED	≤ 100	101-500	501-1,000	1001-3000	3001-5000	5001-8000	8001-11,000	11,001 - 15,000	15,001 - 20,000	20,001 - 25,000	>25,000
COASTAL SHORELINES	$225	$250	$275	$325	$375	$450	$525	$625	$750	$875	$1,000
ORW- Adjacent Areas	$125	$150	$175	$225	$275	$350	$425	$375	$250	$125	n/a
OCEAN HAZARD SYSTEM (1)(2)	$225	$250	$275	$325	$375	$450	$525	$625	$750	$875	$1,000
Primary or Frontal Dune	$125	$150	$175	$225	$275	$350	$425	$375	$250	$125	n/a
PUBLIC WATER SUPPLIES (3)	$225	$250	$275	$325	$375	$450	$525	$625	$750	$875	$1,000
NATURAL AND ULTURAL RESOURCE AREAS (4)	$225	$250	$275	$325	$375	$450	$525	$625	$750	$875	$1,000

(1) Includes the Ocean Erodible, ~~High Hazard Flood Area,~~ Inlet Hazard Area, and Unvegetated Beach Area.

(2) If the AEC physically overlaps another AEC, use the greater penalty schedule.

(3) Includes Small Surface Water Supply, Watershed and Public Water Supply Well Fields.

(4) Includes Coastal Complex Natural Areas, Coastal Areas Sustaining Remnant Species, Unique Geological Formations, Significant Coastal Archaeological Resources, and Significant Coastal Historical Architectural Resources.

(C) Violations by public agencies (e.g. towns, counties and state agencies) shall be handled by the local permit officer or one of the Commission's delegates within their respective jurisdictions except that in no case shall a local permit officer handle a violation committed by the local government they represent. Penalties shall be assessed in accordance with Parts ~~(g)(5)(A) and (B) of this Rule.~~ (A) and (B) of this Subparagraph.

(D) Willful and intentional violations. The penalty assessed under Parts ~~(g)(5)(A) and (B) of this Rule~~ (A) and (B) of this Subparagraph shall be doubled for willful and intentional violations except that the doubled penalties assessed under this Subparagraph shall not exceed one thousand dollars ($1,000.00) for each separate violation. A violation shall be considered to be willful and intentional when:

(i) The person received written instructions from the local permit officer or one of the Commission's delegates that a permit would be required for the development and subsequently undertook development without a permit; or

(ii) The person received written instructions from the local permit officer or one of the Commission's delegates that the proposed development was not permissible under the Commission's rules, or received denial of a permit application for the proposed activity, and subsequently undertook the development without a permit; or

(iii) The person committed previous violations of the Commission's rules; or

(iv) The person refused or failed to restore a damaged area as ordered by the local permit officer or one of the Commission's delegates. If necessary, a court order shall be sought to require restoration.

(E) Assessments against contractors. Any contractor or subcontractor or person or group functioning as a contractor shall be subject to a notice of violation and assessment of a civil penalty in accordance with Paragraph (f) of this Rule. Such penalty shall be in addition to that assessed against the landowner. When a penalty is being doubled pursuant to Part ~~(g)(5)(D)~~ (D) of this Subparagraph and the element of willfulness is present only on the part of the contractor, the landowner shall be assessed the standard penalty and the contractor shall be assessed the doubled penalty.

(F) Continuing violations.

(i) Pursuant to G.S. 113A-126(d)(2), each day that the violation continues after the date specified in the notice of violation for the unauthorized activity to cease and restoration to be completed shall be considered a separate violation and shall be assessed an additional penalty.

(ii) Refusal or failure to restore a damaged area as ordered shall be considered a continuing violation and shall be assessed an additional penalty. The amount of the penalty shall be determined according to Part ~~(g)(5)(B) of this Rule.~~ (B) of this Subparagraph. The continuing penalty period shall be calculated from the date specified in the notice of violation for the unauthorized activity to cease and restoration to be completed and run until:

(I) the Commission delegate's order is satisfied, or

(II) the respondent enters into good faith negotiations with the local permit officer or the Division, or

(III) the respondent contests the local permit officer's or the Division's order in a judicial proceeding by raising a justiciable issue of law or fact therein.

The continuing penalty period shall resume if the respondent terminates negotiations without reaching an agreement with the local permit officer or the Division, fails to comply with court ordered restoration, or fails to meet a deadline for restoration that was negotiated with the local permit officer or the Division.

(h) Hearings and Final Assessment. Final decisions in contested case hearings concerning assessments shall be made by the Commission. The final decision shall be based on evidence in the official record of the contested case hearing, the administrative law judge's recommended decision, any exceptions filed by the parties and oral arguments. Oral arguments shall be limited to the facts in the official record.

(i) Referral. If any civil penalty as finally assessed is not paid, the Director on behalf of the Commission shall request the Attorney General to commence an action to recover the amount of the assessment.

(j) Reports to the Commission. Action taken by the Director shall be reported to the Commission at the next meeting. Such reports shall include information on the following:

(1) respondent(s) against whom penalties have been assessed;

(2) respondent(s) who have paid a penalty, requested remission, or requested an administrative hearing;

(3) respondent(s) who have failed to pay; and

(4) cases referred to the Attorney General for collection.

(k) Settlements. The Commission hereby delegates to the Director the authority to enter into a settlement of a civil penalty appeal at any time prior to decision in an administrative contested case hearing. Such settlements shall not require the approval of the Commission and shall not be considered a final Commission decision for purposes of G.S. 113A-123.

(l) Any settlement agreement proposed subsequent to a final Commission decision in the contested case shall be submitted to the Commission for approval.

Authority G.S. 113A-124; 113A-126(d).

TITLE 20 – DEPARTMENT OF STATE TREASURER

***Notice** is hereby given in accordance with G.S. 150B-21.2 that the Supplemental Retirement Board of Trustees and the Department of State Treasurer intends to adopt the rules cited as 20 NCAC 11 .0101 and .0102.*

Link to agency website pursuant to G.S. 150B-19.1(c): *https://www.nctreasurer.com/inside-the-department/opengovernment/proposed-rules/pages/default.aspx*

Proposed Effective Date: *June 1, 2019*

Instructions on How to Demand a Public Hearing: *(must be requested in writing within 15 days of notice): Any person may request a public hearing on the proposed rules by submitting a request in writing no later than January 30, 2019 to Laura Rowe, Rulemaking Coordinator, Department of State Treasurer, 3200 Atlantic Avenue, Raleigh, NC 27604.*

Reason for Proposed Action: *The Supplemental Retirement Board and the Department of State Treasurer do not receive any appropriations to operate the NC 401(k) Plan, the NC 457 Plan, or the NC 403(b) Program. Instead, to the knowledge of the Department, the operational expenses of the Board and the Department have historically been funded through an administrative fee charged to participants who opt to enroll in the Supplemental Retirement Plans. The Board and the Department will use the administrative fee receipts to fund the administration of the Plans, including Departmental personnel costs and investment consulting and auditing fees.*

Comments may be submitted to: *Laura Rowe, 3200 Atlantic Avenue, Raleigh, NC 27604, email dst.ncac@nctreasurer.com*

Comment period ends: *March 18, 2019*

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**

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

CRC-19-06

February 1, 2019

MEMORANDUM

TO: Coastal Resources Commission

FROM: Ken Richardson

SUBJECT: Fiscal Analysis and Amendments to 15A NCAC 07H .0304 and .0305 for the Designation of Unvegetated Beach Areas of Environmental Concern and Measurement Lines

Due to Hurricane Florence's impacts to the vegetation line on the beaches of the Towns of Surf City and North Topsail Beach, the Commission at the November 2018 meeting approved temporary Unvegetated Beach AEC designations in these locations. The proposed amendments to 7H .0304 and .0305 also remove unnecessary and redundant language and provide clarity to the intent of the rule.

The Unvegetated Beach Area of Environmental Concern (AEC) is defined in 15A NCAC 07H .0304(3), and is one of three AECs within the Ocean Hazard system. An Unvegetated Beach can be designated by the Commission in areas where no stable and natural vegetation is present, including areas that have suddenly become unvegetated due to a hurricane or other major storm event. Under 15A NCAC 07H .0304(3)(b), the Unvegetated Beach designation may be for a specific period of time, or until stable and natural vegetation has re-established. Once the CRC designates an Unvegetated Beach, Division of Coastal Management (DCM) staff can establish a Measurement Line (15A NCAC 07H .0305(a)(9)) to serve as the reference feature from which oceanfront construction setbacks are measured until vegetation has re-established.

Hurricane Florence (September 2018) severely impacted the oceanfront dune system along portions of Surf City and North Topsail Beach, completely washing away the primary frontal dune along with any established vegetation. The geographic extent of the affected areas makes it impossible to identify a vegetation line by using interpolation and adjacent vegetation; the proposed amendments are to designate the affected portions of Surf City and North Topsail Beach as Unvegetated Beach AECs. In conjunction with the designation, DCM staff establishes a measurement line that is to be used as a reference feature in the determination of oceanfront development setbacks. The Measurement Line is established by determining the degree to which the pre-storm vegetation line retreated in adjacent areas and applying that amount of recession to the designated area utilizing aerial imagery.

15A NCAC 07H .0305 defines the physical features of the ocean hazard areas while 15A NCAC 07H .0305(a)(9) describes the protocol for establishing a Measurement Line. Staff is also proposing amendments to 07H .0305(a)(9) to clarify how the Measurement Line is to be established in accordance with Commission and staff discussion at the November meeting.

The attached draft revisions to 15A NCAC 07H. .0304 and .0305 and fiscal analysis are provided below for consideration by the Commission. **Staff recommends that the Commission approve the fiscal analysis and the rule revisions for permanent rulemaking**. I look forward to discussing these amendments at our upcoming meeting.

ATTACHMENT A: Fiscal & Regulatory Impact Analysis
ATTACHMENT B: 15A NCAC 07H .0304 AECS Within Ocean Hazard Areas
ATTACHMENT C: 15A NCAC 07H .0305 General Identification and Description of Landforms

ATTACHMENT A: Fiscal & Regulatory Impact Analysis

Areas of Environmental Concern

15A NCAC 07H .0304 and .0305

Prepared by

Daniel Govoni
NC Division of Coastal Management
(252) 808-2808 Ext. 233

January 23, 2019

Basic Information

Agency	DEQ, Division of Coastal Management (DCM) Coastal Resources Commission (CRC).
Title	Designation of Unvegetated Beach Area of Environmental Concern (AEC) and Measurement Line Amendments
Citation	15A NCAC 07H .0304 and 15A NCAC 07H .0305
Description of the Proposed Rule	7H .0304 defines and establishes AECs that are within the Ocean Hazard Areas along the State's Atlantic Ocean shoreline. Ocean Hazard Area AECs include the Ocean Erodible Area, Inlet Hazard Area and the Unvegetated Beach Area. 7H .0305 defines physical features of Ocean Hazard Areas.
Agency Contact	Daniel Govoni Coastal Policy Analyst Daniel.Govoni@ncdenr.gov (252) 808-2808 ext. 233
Authority	113A-107(a) & (b); 113A-118.1
Necessity	Due to Hurricane Florence's impacts to the beaches of the Towns of Surf City and North Topsail Beach; the Coastal Resources Commission is proposing to amend its administrative rules in order to reflect physical changes in the ocean shoreline that influence the permitted citing of oceanfront development. These amendments also remove unnecessary and redundant conditions and provides clarity to the intent of the rule. These changes will serve the public interest by protecting life and property from destructive forces and by preventing confusion of the regulated community.
Impact Summary	State government: No Local government: No Federal government: No Private property owners: Yes Substantial impact: No

Summary

The Unvegetated Beach Area of Environmental Concern (AEC) is defined in 15A NCAC 07H .0304(3) and is one of three AECs within the Ocean Hazard system. An Unvegetated Beach can be designated by the CRC in areas where no stable and natural vegetation is present, including areas that have suddenly become unvegetated due to a hurricane or other major storm event. Under 15A NCAC 07H .0304(3)(b) the Unvegetated Beach designation may be for a specific period of time, or until stable and natural vegetation has re-established. Once the CRC designates an Unvegetated Beach, the Division of Coastal Management can establish a Measurement Line (15A NCAC 07H .0305(a)(9)) to serve as the reference feature from which oceanfront construction setbacks are measured until vegetation has re-established.

Hurricane Florence (September 2018) severely impacted the oceanfront dune system along portions of Surf City and North Topsail Beach, completely washing away the primary frontal dune along with any established vegetation. The geographic extent of the affected areas makes it impossible to identify a vegetation line by conventional means; and the CRC is proposing to designate the affected portions of Surf City and North Topsail Beach as an Unvegetated Beach AEC.

15A NCAC 07H .0305 defines the physical features of the ocean hazard areas while 15A NCAC 07H .0305(a)(9) describes the protocol for establishing a Measurement Line. Amendments are proposed for 15A NCAC 07H .0305(a)(9) to remove the unnecessary and redundant conditions and to also provide clarity to the implementation of the rule.

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 to 15A NCAC 07H .0304 are necessary for the Division to implement the Coastal Resources Commission's administrative rules as they apply to any proposed oceanfront development in the proposed Unvegetated Beach AEC. The Division has determined that the nonconforming status of structures within the proposed Unvegetated Beach AEC will not be affected as they currently did not meet the minimum setback requirement measured from pre- Hurricane Florence First Line of Stable and Natural Vegetation or from the proposed Measurement Line. 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 and there will be no financial impacts to local government.

Description of Rule Amendment

The Division of Coastal Management utilizes the First Line of Stable and Natural Vegetation as a reference feature in the application of oceanfront setbacks used to site oceanfront development. The Unvegetated Beach Area of Environmental Concern (AEC) is defined in 15A NCAC 07H .0304(3) and is one of three AECs within the Ocean Hazard system. An Unvegetated Beach can be designated by the CRC in areas where no stable and natural vegetation is present, including areas that have suddenly become unvegetated due to a hurricane or other major storm event. In conjunction with the designation, the Division of Coastal Management establishes a measurement line that is to be used as a reference feature in the determination of oceanfront development setbacks. The Measurement Line is established by determining the degree to which

the pre-storm vegetation line retreated in adjacent areas and applying that amount of recession to the designated area utilizing aerial imagery.

15A NCAC 07H .0304 is being amended to temporarily designate the areas Surf City and North Topsail Beach as an Unvegetated Beach AEC. This proposed designation shall continue until such time as stable and natural vegetation has reestablished pursuant to Sub-Item 3(a) of this Rule. These areas were severely impacted by Hurricane Florence and the existing vegetation line was destroyed making it impractical to utilize it as reference feature in the application of oceanfront setbacks. Additional amendments to 15A NCAC 07H. .0304 include language consistent with the ocean hazard setback provisions of 15A NCAC 07H. .0306 and with amendments to the Coastal Area Management Act which allow the construction of terminal groins.

15A NCAC 07H .0305 is being amended to remove unnecessary and redundant conditions and provide clarity to the implementation of the rule.

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 are 56 oceanfront structures within the proposed Unvegetated Beach Area of Environmental Concern. None of the 56 oceanfront structures met the minimum oceanfront setback measured from the pre-Hurricane Florence vegetation line, their non-conforming status will not change as a result of the establishment of a measurement. Establishment of the measurement is necessary as the reference feature used to determine the setback compliance status of oceanfront structures in this area until natural and stable vegetation reestablishes itself.

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. While the DOT maintained road within the unvegetated beach area is within the oceanfront setback, DOT actions regarding the roadbed would likely be considered maintenance and repair and not affected by the establishment of a measurement line.

Local Government:

DCM does not anticipate any increased costs to Local Governments as a result of the proposed rule amendments as there on no local government facilitates in the area.

Division of Coastal Management:
The designation of an Unvegetated Beach AEC and delineation of a measurement line are routine actions of the Division to establish permitting jurisdiction for regulatory purpose. The Division does not foresee any change in permit requests and does anticipate 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 to 15A NCAC 07H .0304 are necessary for the Division to implement the Coastal Resources Commission's administrative rules as they apply to any proposed oceanfront development in the proposed Unvegetated Beach AEC. The Division has determined that the nonconforming status of structures within the proposed Unvegetated Beach AEC will not be affected as they currently did not meet the minimum setback requirement measured from pre-Hurricane Florence First Line of Stable and Natural Vegetation or from the proposed Measurement Line. The purpose of these amendments is to allow DCM staff or a Local Permitting officer the ability to answer any permitting questions or deny any permit applications regarding the expansion of an existing house or development of undeveloped lot located in the proposed Unvegetated Beach AEC. Without the proposed Unvegetated Beach AEC, DCM is unable to reference a feature in the determination of oceanfront development setbacks.

ATTACHMENT B: 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 the 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 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~~ 180 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 or in 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.

(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 migrates, 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~~ jetties, terminal groins 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 Environmental Quality, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Item (1) 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 due to 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 Item (1) 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 until the vegetation has re-established in accordance with 15A NCAC 07H .0305(a)(5). At the expiration of the time specified or the re-establishment of the vegetation, the area shall return to its pre-storm designation.

The Commission designates as temporary unvegetated beach areas those oceanfront areas of Surf City and North Topsail Beach in which the vegetation line as shown on the United States National Oceanic and Atmospheric Administration imagery dated September 17, 2018 was destroyed as a result of Hurricane Florence in September 2018. The designation AEC boundaries can be found on the Division's website referenced in Item (1) of this rule. This designation shall continue until such

time as stable and natural vegetation has reestablished, or until the area is permanently designated as an unvegetated beach area pursuant to Sub-Item 3(a) of this Rule.

ATTACHMENT C: 15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This Paragraph 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. Primary dunes extend 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 the first mound of sand located landward of the ocean beach that has stable and natural vegetation present.

(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. Planted 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 and 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 project construction shall be defined as the "static vegetation line". The "onset of project 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 the contract date will be considered the onset of construction. 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.

(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(3) of this Section. ~~Procedures for determining the measurement line in areas designated pursuant to Rule .0304(3) 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(3)(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 average distance the pre-storm vegetation line receded at the closest vegetated site adjacent to the area designated by the Commission as the unvegetated beach AEC; and ~~to the proposed development site; and~~

(B) mapping a line equal to the average recession determination in (A), measured in a landward direction from the first line of stable and natural vegetation line on the most recent pre-storm aerial photography in the area designated as an unvegetated beach AEC.~~locating the line of stable and 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 (a)(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 development lines approved by the CRC, the vegetation line or measurement line shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of Rule .0306(a)(2) of this Section.

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined in 15A NCAC 07I .0500, an 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, 2016; April 1, 2008; August 1, 2002; August 1, 1998.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

February 4, 2019

MEMORANDUM **CRC-19-07**

TO: Coastal Resources Commission

FROM: Ken Richardson, *Shoreline Management Specialist*

SUBJECT: Ocean Erodible AEC and Setback Factor Update Study based on 2019 Long-Term Average Annual Shoreline Change Rates

Background

Since 1980, the Division of Coastal Management has updated its oceanfront shoreline change rates approximately once every five years for calculating both oceanfront development setbacks and the landward boundary of the Ocean Erodible Area of Environmental Concern (15A NCAC 07H .0306 and 07H .0304). The last update became effective on January 31, 2013 and is now due to be updated.

Additionally, shoreline change rates are required to be updated every five years to keep North Carolina compliant with Federal Emergency Management Administration (FEMA) guidelines for the Community Rating System (CRS). This ensures that property owners in coastal communities that participate in the National Flood Insurance Program are eligible for fifty (50) additional CRS points, which can reduce insurance rates.

The Commission's setback rules are used to site oceanfront development based on the size of the structure according to the graduated setback provisions in 15A NCAC 7H .0306(a). In areas where there is a high rate of erosion, buildings must be located farther from the shoreline than in areas where there is less erosion. The construction setback equation depicted in Table 1 is used to site oceanfront development and determine the extent of the CRC's jurisdictional area for the Ocean Erodible Area of Environmental Concern (OEA) - the area where there is a substantial possibility of shoreline erosion. A minimum setback factor of two (2) is applied if the erosion rate is less than two feet per year or where there is accretion (see Table 1). This method of siting oceanfront development was initially established by the Coastal Resources Commission (CRC) in 1979.

***Table 1**. This table demonstrates an example of minimum construction setbacks based on structure size and the minimum setback factor of 2.*

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

Summary of 2019 Shoreline Change Rates and Setback Factors

Average annual long-term shoreline change rates are calculated using the "end-point" methodology. This technique of calculating shoreline change rates is consistent with earlier studies and the results can be compared to those from previous studies. Applying the end-point method to the 2019 update study, Staff used the earliest (1933-1962) and most current shorelines (2016) to calculate change rates by measuring distance between the two shorelines (shore-transect intersect) and dividing by time. Raw shoreline change rates are statistically "smoothed and blocked" with neighboring transects to group adjacent shoreline segments that have similar rates into segments that can be assigned a single erosion rate. A "segment" of shoreline is defined as a portion of beach with statistically similar erosion rates and a minimum length of approximately 1,300 feet (400 meters).

Of the 304.5 miles of oceanfront shoreline analyzed, results show that approximately 69 percent of the shoreline is experiencing some degree of erosion, while 30 percent is accreting either due to beach nourishment or natural processes. Of the eroding portions of shoreline, 22.7 percent is eroding at rates less than two feet per year, while 22.9 percent is eroding between two and five feet per year (Table 2). The 2019 statewide mean shoreline change rate is approximately -2 feet per year, which is consistent with previous studies.

Table 2. *This table illustrates a summary of length of shoreline (and percentage) and calculated shoreline change rates. The first row shows approximately 92 miles of oceanfront shoreline with measured accretion; the second row shows approximately 210 miles with measured erosion; and then subsequent rows show a breakdown of erosion from the total length of shoreline with measured erosion (210 miles).*

Shoreline Change Rate Summary:	Miles	%
Accretion (all)	91.6	30.1%
Erosion (all)	209.5	68.8%
Erosion 2ft/Year or Less (>0, <=2)	69.3	22.7%
Erosion 2 to 5 Feet/Year (>2, <=5)	69.7	22.9%
Erosion 5 to 8 Feet Year (>5, <=8)	42.8	14.1%
Erosion More Than 8 Feet/Year	27.6	9.1%
Data Gaps (missing shoreline segment)	1.9	0.6%

The mean shoreline change rate for a segment of beach determines the Ocean Hazard Area Setback Factor. Although the 2019 calculated Setback Factors show similar trends compared to the overall average of all the past six studies (see Table 3), there was a slight erosion rate increase for portions of the coastline north of Cape Lookout, resulting in an increase in the average statewide setback factor. More specifically, erosion rate increases were identified at those areas adjacent to inlets and capes, and along the National Seashore north of Cape Lookout. The following table is a statewide comparison of shoreline length and Setback Factors for all six studies (1980-2016):

Table 3. *This table is a comparison of oceanfront Setback Factors (SBF) that were calculated using long-term average annual shoreline change rates. Values show the length of shoreline (miles and %) for categorized setback factors (far-left column). Total shoreline mileage is the length of shoreline analyzed and should not be interpreted as a "shrinking" or "expanding" shoreline. Of the 304.5 miles, 2 miles of shoreline were considered to have "no data," meaning that only one shoreline was available.*

Erosion Rate Studies	2016	2011	2003	1992	1986	1980
Miles (total)	**304.5**	307.4	312	300	237	245
SBF = 2	**175.1 (57.5%)**	190.2 (61.9%)	193 (62%)	165 (59%)	144 (61%)	149 (61%)
SBF = 2.5 to 5	**66.5 (21.8%)**	62.1 (20.2%)	64 (20%)	54 (19%)	43 (18%)	52 (21%)
SBF = 5.5 to 8	**38.2 (12.6%)**	31.5 (10.2%)	28 (9%)	30 (11%	20 (8%)	22 (9%)
SBF > 8	**22.6 (7.4%)**	20.8 (6.8%)	27 (9%)	32 (11%)	22 (9%)	22 (9%)

The setback rule applies when oceanfront property owners are seeking a Coastal Area Management Act (CAMA) permit for development of new a structure, to expand an existing structure, or to replace an existing structure (requiring more than fifty percent repair) along the ocean shoreline. Based on this analysis, 7,579 existing structures (86.4%) adjacent to the Atlantic shoreline will experience no change in development setback factors, while 984 oceanfront structures (11.2%) will experience an increase in construction setback factors. Table 4 depicts the number of properties affected by changes in erosion rates. Where proposed erosion rates would increase setback factors, it is worth noting that all are located in regions that have historically had relatively high erosion rates. The highest erosion rates are primarily centered around those inlets that have not been regularly engineered for purposes of navigation or erosion control (Brunswick County); and in areas where high erosion is the result of direct impact from persistent nor'easter storms (Dare County).

Table 4. *Count of structures adjacent to Atlantic oceanfront shoreline by county. Values represent the number of structures and percentages to demonstrate how the proposed update will influence construction setback factors for those structures. Data are based on 2016 NC 911 Orthophotos and 2018 county tax office information.*

Location	Total Structures	No Rate Change	% No Change	Lower Rates	% Lower Rates	Higher Rates	% Higher Rates
Brunswick County	2,022	1,842	91.1%	110	5.4%	70	3.4%
New Hanover County	847	825	97.4%	11	1.2%	11	1.2%
Pender County	760	760	100%	0	0%	0	0%
Onslow County	607	558	91.9%	2	<1%	47	7.7%
Carteret County	1,257	1,256	99.9%	0	0%	1	<1%
Hyde County	0	0	100%	0	0%	0	0%
Dare County	2,539	1,750	68.9%	75	2.9%	714	28.1%
Currituck County	745	588	78.9%	16	2.1%	141	18.9%
TOTALS:	**8,777**	**7,579**	**86.4%**	**214**	**2.4%**	**984**	**11.2%**

About 984 properties will experience an increased construction setback factor ranging from one-half foot to three feet per year. These properties have historically had relatively high erosion rates, with small fluctuations, since the first study was done in 1980.

Table 5. *This table illustrates locations where calculated Setback Factors (SBFs) increased between 2009 and 2016. Although an increase of 3 feet per year was the highest increase in areas adjacent to oceanfront structures, most areas with oceanfront structures only increased by factors ranging between 0.5 and 1.0 feet per year.*

Community	Transect Location	Historical Notes	SBF Change (from 2009 to 2016)	Structure Count	% of Total w/ Higher SBFs
Avon	7316 to 7382	Historical Setback Factors (2 to 6 ft./yr.)	1 to 2	130	13.2%
Bald Head Island	South Beach (998-1000) & (1056-1083)	Historical Setback Factors (4 to 15 ft./yr.)	0.5 to 2.5	17	1.7%
Buxton	7174 to 7189	Historical Setback Factors (5 to 8.5 ft./yr.)	0.5 to 1.5	35	3.6%
Currituck County	9884 to 10065	Historical Setback Factors (2 to 11.5 ft./yr.)	0.5 to 1.5	65	6.6%
Hatteras Village	6776 to 6864	Historical Setback Factors (2 to 5 ft./yr.)	0.5 to 1.5	50	5.1%
Holden Beach	519 to 548	Historical Setback Factors approaching Lockwood Folly Inlet (2.5 to 7.5 ft./yr.)	0.5 to 1.0	53	5.4%
Kill Devil Hills	8963 to 8987	Historical Setback Factors (2 to 6.5 ft./yr.)	0.5 to 1.5	52	5.3%
Kitty Hawk	9059 to 9108	Historical Setback Factors (2 to 4 ft./yr.)	0.5 to 1.0	90	9.1%
Kure Beach	1398 to 1412	Historical Setback Factors (2 to 5.5 ft./yr.)	0.5 to 1.0	11	1.1%
Nags Head	8504 to 8779	Historical Setback Factors (2 to 10 ft./yr.)	0.5 to 1.0	276	28.0%
North Topsail Beach	2926 to 2959	Historical Setback Factors (2 to 3.5 ft./yr.)	0.5 to 1.0	45	4.6%
Salvo-Waves-Rodanthe	7881 to 7959	Historical Setback Factors (2 to 3.5 ft./yr.)	0.5 to 3.0	81	8.2%
Sanderling-Corolla	9784 to 9831	Historical Setback Factors (2 to 7 ft./yr.)	1	76	7.7%
Public Lands				*3*	0.3%

Summary of Fiscal Analysis

If erosion rates were not updated in 2019, the loss of fifty CRS points would not have an immediate negative impact on those communities listed below in Table 6. However, several communities are scheduled to be reevaluated by NFIP in 2019 and 2020, and at that time could potentially benefit by having fifty points awarded and saving five percent in premiums as a direct result of NC updating erosion rates. Although this update alone does not guarantee a community will save five percent in premiums, the 50-points awarded could mean the difference between higher and lower NFIP Classes.

Table 6. *List of oceanfront communities participating in CRS. This table illustrates their current CRS Class, Special Flood Hazard Area (SFHA) Premium discount percentages, CRS points, and point score scenario subtracting 50 points. Based on current points, none of the listed communities would be impacted by the loss of fifty points. It should be noted that those communities identified with an asterisk (*) have an assigned CRS Class that does not correspond to their CRS Points because they did not meet FEMA's prerequisites during their last evaluation; therefore, could not be placed in the Class tier based on scored points.*

	Community	**Current CRS Class**	**% Discount for SFHA(1)**	**% Discount for Non-SFHA**	**CRS Points**	**CRS Points (-50)**	***CRS Class Change if Points Lost***
1	Atlantic Beach	8	10	5	1365	*1315*	*No*
2	Carolina Beach	6	20	10	2058	*2008*	*No*
3	Caswell Beach	6	20	10	2240	*2190*	*No*
4	Duck	7	15	5	1664	*1614*	*No*
5	Emerald Isle	7	15	5	1906	*1856*	*No*
6	Holden Beach	8	10	5	1181	*1131*	*No*
7	Kill Devil Hills	6	20	10	2305	*2255*	*No*
8	Kitty Hawk	6	20	10	2116	*2066*	*No*
9	Kure Beach	8	10	5	1114	*1064*	*No*
10	Nags Head	6	20	10	2076	*2026*	*No*
11	North Topsail Beach*	*5**	25	10	*3600*	*3550*	*No**
12	Oak Island*	*7**	15	5	*2258*	*2208*	*No**
13	Ocean Isle Beach*	*8**	10	5	*2088*	*2038*	*No**
14	Pine Knoll Shores	6	20	10	2134	*2084*	*No*
15	Southern Shores	6	20	10	2153	*2103*	*No*
16	Sunset Beach*	*7**	15	5	*2109*	*2059*	*No**
17	Topsail Beach	5	25	10	2597	*2547*	*No*
18	Wrightsville Beach	7	15	5	1768	*1718*	*No*

About 984 properties will experience an increased construction setback factor ranging from one-half foot to three feet per year. These properties have historically had relatively high erosion rates, with small fluctuations, since the first study was done in 1980. These property owners could be negatively impacted by this change if their home is destroyed by more than fifty percent, and if they are unable to meet the required construction setback as measured from the first line of stable-natural vegetation. It is important to note that this still may not preclude them from rebuilding should their home be destroyed due to a number or grandfathering provisions found within the CRC's rules.

In addition, two hundred and fifteen (215) existing structures adjacent to the Atlantic shoreline will experience a reduced construction setback factor, ranging between 0.5 to 5 feet per year. Although purely speculative, these properties could potentially be permitted and allowed re-development or expansion of the existing structure if new setback requirements can be met and depending on the size of the new construction. These property owners could potentially benefit by being able to expand or re-develop their property to a greater extent possible than what is currently allowed under the existing setback factors. It is not possible to estimate the exact value of this benefit without knowing how many property owners would choose to undertake expansion or redevelopment, or knowing specifics related to construction plans; however, it is estimated that this is an overall positive net influence if compared to existing more restrictive setback requirements.

This update will not have a cost impact on NC DOT and local government projects, or the DCM permit review process or receipts.

Staff Recommendation

The 2018 update study report has been completed and the fiscal analysis has been approved by Office of State Budget and Management (OSBM). DCM staff are recommending that the Commission's approve the report, the updated oceanfront setback factors, the fiscal analysis, and rule amendments.

ATTACHMENT A: CRC Rules Pertaining to Oceanfront Shoreline Change Rates and Setback Factors

ATTACHMENT B: Fiscal Analysis for the 2019 Update of Oceanfront Shoreline Change Rates and Setback Factors

ATTACHMENT C: North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study

ATTACHMENT A: CRC's Rules Pertaining to Oceanfront Shoreline Change Rates and Setback Factors & Proposed Amendments

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 the 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 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 180 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 "North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study" ~~"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 or in 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.

(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 migrates, 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 Environmental Quality, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Item (1) 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 due to 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 Item (1) 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 until the vegetation has re-established in accordance with 15A NCAC 07H .0305(a)(5). At the expiration of the time specified or the re-establishment of the vegetation, 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. July 1, 2016; September 1, 2015; May 1, 2014; February 1, 2013; January 1, 2010; February 1, 2006; October 1, 2004; April 1, 2004; 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 shall be 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 shall be set in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new development be sited seaward of the development line.

(3) In no case shall a development line be created or established on state owned lands or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

(4) The ocean hazard setback shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

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

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

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

Decks, roof-covered porches, and walkways shall not be 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.

(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. 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 shall be 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 require 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, and commercial 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)(5) of this Rule;

(iv) the structure as replaced meets the minimum setback required under Part (a)(5)(A) of this Rule; and

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

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

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

(8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot where development is proposed, the structure shall be landward of the ocean hazard setback or development line, whichever is more restrictive.

(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.

(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.

(11) 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 in accordance with 15A NCAC 07J .1300.

(12) In order to allow for development landward of the large-scale beach fill project that cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (a)(1) and (a)(5) of this Rule, a local government, group of local governments involved in a regional beach fill project, or qualified "owners' association" as defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline, may petition the Coastal Resources Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception shall apply 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)(5)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner, and the boundaries of the large-scale beach fill project. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

(A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;

(B) Development setbacks shall be calculated from the shoreline erosion rate in place at the time of permit issuance;

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

(D) With the exception of swimming pools, the development defined in Rule .0309(a) of this Section shall be allowed oceanward of the static vegetation line; and

(E) Development shall not be eligible for the exception defined in Rule .0309(b) of this Section.

(b) No development shall be permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that 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 shall be 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 as documented by the local historic commission, the North Carolina Department of Natural and Cultural Resources, or the National Historical Registry.

(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 the 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.

The acknowledgement shall state that 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 shall require permit approval. Structures relocated with public funds shall comply with the applicable setback line and 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 shall 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 pursuant to 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, 2017; February 1, 2017; April 1, 2016; September 1, 2013.

15A NCAC 07J .0210 REPLACEMENT OF EXISTING STRUCTURES

Replacement of structures damaged or destroyed by natural elements, fire or normal deterioration is considered development and requires CAMA permits. Replacement of structures shall be permitted if the replacements is consistent with current CRC rules. Repair of structures damaged by natural elements, fire or normal deterioration is not considered development and shall not require CAMA permits. The CRC shall use the following criteria to determine whether proposed work is considered repair or replacement.

(1) NON-WATER DEPENDENT STRUCTURES. Proposed work is considered replacement if the cost to do the work exceeds 50 percent of the market value of an existing structure immediately prior to the time of damage or the time of request. Market value and costs are determined as follows:

(a) Market value of the structure does not include the value of the land, value resulting from the location of the property, value of accessory structures, or value of other improvements located on the property. Market value of the structure shall be determined by the Division based upon information provided by the applicant using any of the following methods:

(i) appraisal;

(ii) replacement cost with depreciation for age of the structure and quality of construction; or

(iii) tax assessed value.

(b) The cost to do the work is the cost to return the structure to its pre-damaged condition, using labor and materials obtained at market prices, regardless of the actual cost incurred by the owner to restore the structure. It shall include the costs of construction necessary to comply with local and state building codes and any improvements that the owner chooses to construct. The cost shall be determined by the Division utilizing any or all of the following:

(i) an estimate provided by a North Carolina licensed contractor qualified by license to provide an estimate or bid with respect to the proposed work;

(ii) an insurance company's report itemizing the cost, excluding contents and accessory structures; or

(iii) an estimate provided by the local building inspections office.

(2) WATER DEPENDENT STRUCTURES. The proposed work is considered replacement if it enlarges the existing structure. The proposed work is also considered replacement if:

(a) in the case of fixed docks, piers, platforms, boathouses, boatlifts, and free standing moorings, more than 50 percent of the framing and structural components (beams, girders, joists, stringers, or pilings) must be rebuilt in order to restore the structure to its pre-damage condition. Water dependent structures that are structurally independent from the principal pier or dock, such as boatlifts or boathouses, are considered as separate structures for the purpose of this Rule;

(b) in the case of boat ramps and floating structures such as docks, piers, platforms, and modular floating systems, more than 50 percent of the square feet area of the structure must be rebuilt in order to restore the structure to its pre-damage condition;

(c) in the case of bulkheads, seawalls, groins, breakwaters, and revetments, more than 50 percent of the linear footage of the structure must be rebuilt in order to restore the structure to its pre-damage condition.

History Note: *Authority G.S. 113A-103(5)b.5.; 113A-107(a),(b);*
Eff. July 1, 1990;
Amended Eff. August 1, 2007.

North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study

Methods Report

N.C. Department of Environmental Quality - Division of Coastal Management

Updated: 1/16/2019

The purpose of this study is to update ocean hazard construction setback factors and Ocean Erodible Area of Environmental Concern; which are based on long-term average annual shoreline change rates.

CONTENTS

INTRODUCTION

The purpose of this study is to update ocean hazard construction Setback Factors and the Ocean Erodible Area of Environmental Concern which are based on the long-term average annual oceanfront shoreline change rates, commonly referred to as "erosion rates." Initially established by the Coastal Resource Commission (CRC) under the Coastal Area Management Act (CAMA) in 1979, the long-term average annual shoreline change rates have been updated periodically since 1980, with the last update study completed in 2011, and effective on January 31, 2013. Oceanfront construction Setback Factors are used to site oceanfront development and determine the landward extent of the Ocean Erodible Area (OEA) within the Ocean Hazard Area of Environmental Concern (AEC), or the area where there is a substantial possibility of excessive shoreline erosion.

The coast of North Carolina continually changes in response to wind, waves, and fluctuating sea levels, as well as human influences. These coastal processes redistribute sand within the dune, beach, and nearshore systems. Geographic, geological and oceanographic differences collectively influence sediment availability, distribution, and transport, which when better understood can help to explain why trends of erosion and accretion differ along all portions of N.C.'s barrier island shorelines. Both short- and long-term changes can be dramatically different depending on where changes are measured and how much time passes between storm events. Factors used to try and predict short-term changes are less understood than those affecting long-term changes for a variety of reasons. Short-term changes are easily influenced by storm events and require routine monitoring, analyses, and modeling using high-resolution data to anticipate changes and anticipate where erosion will be the most extreme. Although factors affecting long-term changes are complex, the positions of the shoreline over a longer period can reveal trends in shoreline movement - unless beaches are nourished on a periodic cycle (NCDCM, 2016).

Because beaches gain sand (accrete), and lose sand (erode) through a variety of natural forces and human actions and can erode rapidly during a single event (hurricane), Ocean Hazard Setback Factors are established in an effort to minimize losses of life and property resulting from

storms, long-term erosion, prevent encroachment of permanent structures on public beach areas, preserve the natural ecological conditions of the barrier dune and beach systems, and reduce public costs of inappropriately sited development.

Since the first study in 1979 (Tafun, Rogers, and Langfelder, 1979), North Carolina's oceanfront shoreline change rates have been calculated using the end-point method. This method uses the earliest and most current shorelines and shore-perpendicular transects, where the distance between the two shorelines is measured at each transect. Raw shoreline position change rates are then calculated by dividing distance between the two shorelines (shore-transect intersect) by time, or number of years between the two shorelines (Figure 1). To calculate Setback Factors, these data are then "smoothed" using a 17-point running average, and "blocked" to identify shoreline segments, or "blocked areas" that have similar rates.

Technological advances in Geographic Information Systems (GIS) have made calculation of end-point rates a relatively time-efficient process compared to techniques employed in earlier studies. Raw end-point rates were calculated using Environmental Systems Research Institute's (*ESRI*) *ArcGIS 10.6 ArcMap* GIS software with the United States Geological Survey's (USGS) Digital Shoreline Analysis System (DSAS) 4.3.4730 (Thieler, Himmelstoss, Zichichi, and Ergul, 2009) extension for *ArcMap*. The GIS tool requires three essential spatial data map layers; an early shoreline, a current shoreline, and a transect map layer perpendicular to the two shorelines.

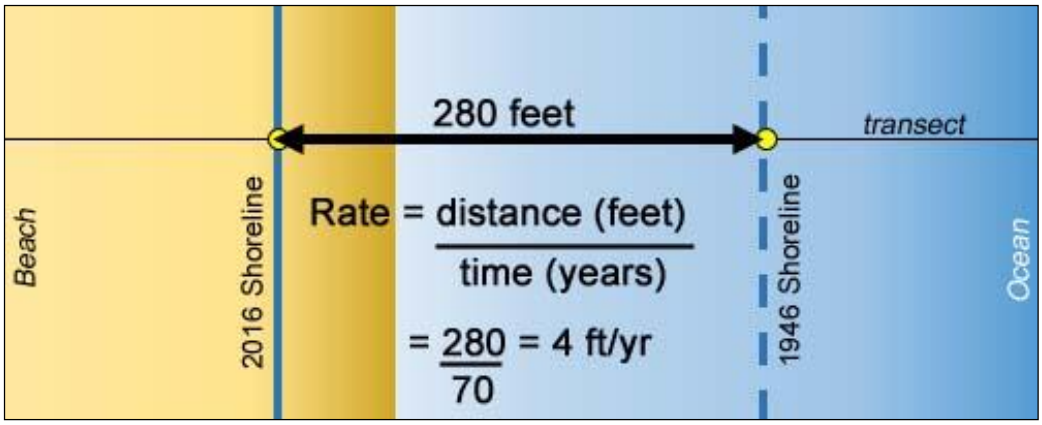


Figure 1. This example illustrates a shore-perpendicular transect where there is 280 feet between the early (1946) shoreline and current (2016) shoreline, and a period of 70 years. The shoreline change rate in this example is equal to 4 feet/year (where rate = distance/time = 280/70 = 4 ft/yr.). Since the most recent shoreline moved landward from its early position, the results would indicate erosion.

Shoreline Identification

When interpreted from aerial photography, North Carolina's oceanfront shoreline is defined as the "wet-dry line". This "line in the sand" references an interpretation where the wet sand ends and the dry sand begins and is typically distinguished by contrasting sediment color or shade, hence "wet-dry" (Figures 2 and 3). Wet-dry shoreline interpretation is the most readily identifiable and considered in the worst case to be between high and low tides (*e.g.*, Crowell, Leatherman, and Buckley, 1991; Dolan R. , Hayden, May, and May, 1980; Overton and Fisher, 2003).

Figure 2. Interpretation of the "wet-dry" shoreline is illustrated here

Figure 3. Wet-dry shoreline interpreted using imagery.

The early shoreline used in this study is also the same shoreline used in 2003 Overton and Fisher study, and the 2011 NC Division of Coastal Management (DCM) studies and was digitized by the North Carolina State University (NCSU) Kenan Natural Hazards Mapping Program. It represents a composite of both Mean High Water (MHW) shorelines digitized from National Ocean Survey Topographic Surveys (NOS T-sheets) (1933-1952), and wet-dry line interpretations made from historical (1940-1962) imagery (Overton and Fisher, 2003). Use of NOS T-sheet shorelines is

accepted by other researchers and has been adopted by the USGS in their shoreline erosion studies. A statewide set of NOS T-sheets for a single year do not exist; therefore, early dates do vary between 1933 and 1952. For approximately 30 miles of the state's oceanfront shoreline (north of Oregon Inlet to North Carolina/Virginia State line) T-sheets were not available when the early shoreline was digitized. For this portion of the coast, a collection of early photography (1940–1962) was used to digitize a wet-dry shoreline. By using this early shoreline, consistent comparisons at each transect can be made between the multiple shoreline change rate studies (Appendix B).

The most current shoreline used in this study is a wet-dry interpretation digitized at a map scale of 1:1,000 utilizing 2016 North Carolina color imagery (6-inch pixel resolution). However, at Onslow Beach and Brown's Island, 2017 imagery (1-meter pixel resolution) was available and used due to an imagery data gap in 2016.

Transect Locations

Transects used in this study are generally perpendicular to the shoreline, spaced 50 meters (approximately 164 feet) apart, and spatially consistent with those used in the 1992, 2003 and 2011 update studies. It is expected that they are also spatially like those established by Dr. Robert Dolan in his early shoreline erosion rate studies since they have similar spacing and end-point coordinates (Dolan, Hayden, and Heywood, 1978); however, it is not possible to confirm since they did not exist in a digital form prior to the 1992 study (Overton and Fisher, 2003). For this reason, only comparison of ocean hazard Setback Factors from this and earlier studies can be made, and not the actual shoreline change rates.

Study Area

North Carolina's wave-dominated barrier island coastline is defined by a series of prominent cuspate forelands (Cape Fear, Cape Lookout, and Cape Hatteras) (Hoyt, 1971) and embayments (Long Bay and Onslow Bay) with approximately 320 miles of oceanfront shoreline (Figure 4).

Approximately 66% of this shoreline is located on predominate east-facing beaches, while 34% are on southerly-facing beaches.

Beaches in North Carolina, are in a state of constant fluctuation due to normal erosional actions of wind, water, and sediment supply. The region's geologic makeup is a significant factor regarding sediment supply: North Carolina's northern coast is flatter and more sediment rich than the steeper, sediment-poor southern coast. North Carolina's combination of simple and complex barrier islands, shoreface orientation, and inlet systems also influence the sediment budgets among the state's beaches (Riggs & Ames, 2003). Some inlets, for example, tend to migrate in the same general direction over time, while others oscillate back and forth. This difference influences whether the beaches adjacent to the inlets experience chronic or short-term erosion or accretion and presents enormous management challenges and costs for property owners, local governments, and the state.

In 2016, annual significant wave heights in Long Bay ranged 1.1 to 18.2 feet and averaged 3.3 feet at buoy station 41108; in Onslow Bay heights ranged 1.2 to 21.2 feet and averaged 4.5 feet at buoy station 41159; and north of Cape Hatteras heights ranged 1.0 to 17.7 feet and averaged 4.0 feet at buoy station 44100 (National Oceanic and Atmospheric Administration, 2018). In one study using 2006 NOAA data (Limber, List, and Warren, 2007a.), semidiurnal tides ranged on average from approximately 3.3 feet along the northern coast to approximately 4.9 feet near the North Carolina/South Carolina border. Regional and local beach morphology is controlled by a combination of prevailing oceanographic conditions (Ashton, 2001), periodic storm events (Morton and Sallenger, 2003), inlet-related processes (Fenster and Dolan, 1996), and by underlying, antecedent geology (Riggs, Cleary, and Snyder, 1995).

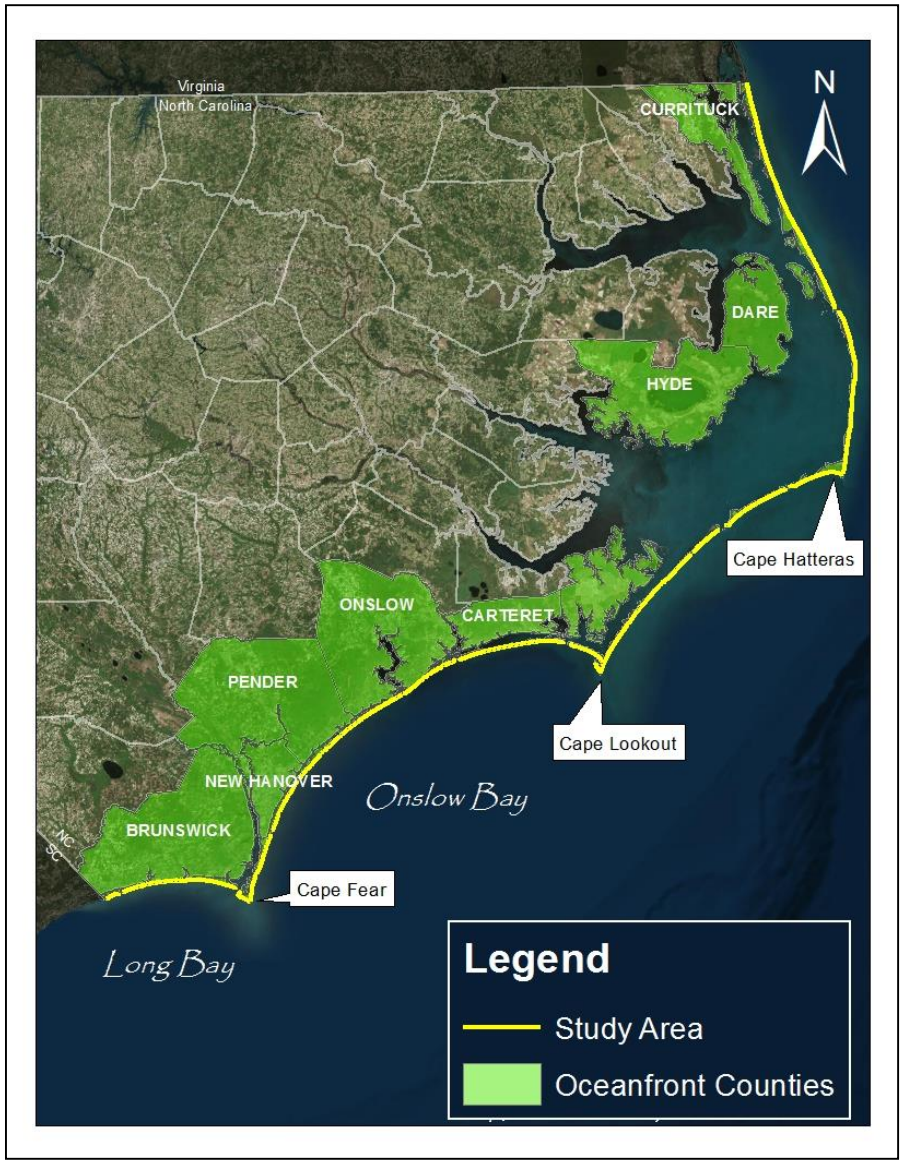


Figure 4. Study Area

The following sections detail the methodology and summarize findings for each island or oceanfront town starting at Sunset Beach in the south and ending in the north at the North Carolina-Virginia state line. Large maps (11 x 17 inch) are in Appendix A, and graphs illustrating rates calculated in this study relative to those calculated in the 2003 and 2011 studies are in Appendix B.

METHODOLOGY

Shoreline Preparations for Digital Shoreline Analysis System (DSAS)

Prior to the release of DSAS v4.2, shorelines were required to be digitized with the same spatial orientation. For example, when digitizing a shoreline on an east-west barrier island, all shorelines were required to consistently start from either the east or west side of the island so that each would have the same spatial left and right orientation. With the release of DSAS v4.2, this digitizing requirement was no longer necessary. DSAS does however require data to be managed within a personal Geodatabase in meter units in a projected coordinate system (Universal Transverse Mercator). In addition, there are specifications for naming and formatting attributes for shoreline, transect, and baseline GIS data.

Shoreline data require "DATE_" and "UNCERTAINTY" fields (Table 1). The "DATE" field stores the shoreline date and is referenced by DSAS when calculating the erosion rate according to the distance divided by time formula; and the "UNCERTAINTY" field accounts for positional uncertainties associated with natural influences (wind, waves, tide) or digitizing and measurement uncertainties. These fields must be created in GIS using the format shown in the table below.

Attribute Name	Attribute Data Type	Format
DATE_	Text	Field length = 10 Format = mm/dd/yyyy
UNCERTAINTY	Any numeric field	Double (*used in this study*)

Table 1. Attribute fields required by DSAS for shoreline GIS data.

Baseline and Transect Preparations for DSAS

Transects used in this study are believed to be geographically consistent with those defined in N.C.'s first erosion rate study (Tafun, Rogers, and Langfelder, 1979; Dolan, Hayden, and Heywood, 1978), and utilized in subsequent update studies thereafter. However, not until the 1992 update study (Benton, Bellis, Overton, Fisher, Hench, and Dolan, 1997) were these data were used in a

GIS environment, and not until the 2003 study (Overton and Fisher, 2003) that they were created as vector GIS data.

DSAS does require transect data to have several attribute fields associated with each unique identifier: *OBJECTID, SHAPE, BASELINEID, GROUP, TRANSORDER, PROCTIME, AUTOGEN, STARTX, STARTY, ENDX, ENDY,* and *AZIMUTH* (Thieler, Himmelstoss, Zichichi, and Ergul, 2009) (Table 2). When transects are cast from a baseline these attributes fields are automatically generated by DSAS. For transects not cast using DSAS (i.e. pre-existing transects like those used in this study), a few attributes (*BASELINEID*, *GROUP*, and *TRANSORDER)* are defined by the analyst prior to initiating the calculation.

Attribute Name	Data Type	Purpose
BASELINEID	Long Integer	DSAS can assign these values if left empty. Baseline segments with an ID equal to zero will be ignored by DSAS; no transects cast and will not be included in the analysis.
GROUP	Long Integer	Values in this field are assigned by DSAS and are based on analyst input for grouping transects. This field is used to aggregate shoreline data and the resulting measurement locations established by the transects into groups.
TRANSORDER	Long Integer	Can be assigned by DSAS, or the analyst. Each transect must have its own unique number. This field is used to sort transect data in a predetermined order

Table 2. Attribute fields required by DSAS for transect GIS data.

DSAS baselines are digitized by the analyst and serve as a starting point for casting shore-perpendicular transects and can be digitized either onshore or offshore at an offset-distance from all shorelines defined by the analyst. Although this study used pre-existing transects, DSAS still requires a baseline to be specified and contain specific attributes (Table 3).

Attribute Name	Data Type	Purpose
ID	Long Integer	DSAS uses this value to determine the ordering sequence of transects when the baseline contains multiple segments.
Group	Long Integer	Used for data management purposes to aggregate transects based on physical variations alongshore (i.e. shoreline type)
OFFshore	Short Integer	Used by DSAS to determine which direction to cast transects. A value of "0" indicates that the baseline is onshore, or landward of the input shorelines. A value of "1" indicates that the baseline is offshore, or seaward of the input shorelines.
CastDir	Short Integer	Used in conjunction with "OFFshore." A value of "0" will result in transects being cast to the left of the baseline based on segment flow. A value of "1" will result in the transect being cast to the right of the baseline based on segment flow direction.

Table 3. Attribute fields required by DSAS for baseline GIS data.

Digital Shoreline Analysis System (DSAS) and Statistical Analysis

As previously mentioned, all data used must be managed within a Personal Geodatabase using ArcGIS (ArcMap and ArcCatalog). The Geodatabase is a Microsoft Access® database designed to store and serve spatial data and provides data structure to enforce topology rules, or spatial data relationships. Additionally, DSAS requires data to be in meters, rather than feet (Figure 5). For purposes of presenting results in this report, data are converted from meters to feet.

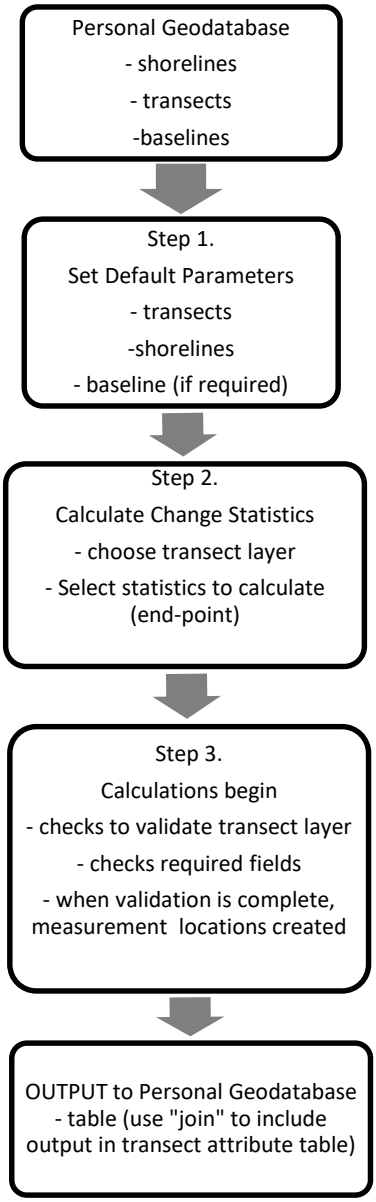


Figure 5. DSAS Workflow

Once the data were stored in the Geodatabase and properly attributed, DSAS is used within ArcMap as a GIS Extension to calculate shoreline change rates. First, data parameters were established by opening the *Set Default Parameters* user dialog (Figures 6 and 7), then selecting the *Shoreline Calculation Settings* tab. Required parameters include identifying the shoreline layer, selecting the date (*DATE*) and uncertainty fields (default 4.4 meters), then selecting Intersection Parameters (*Closest Intersection*). The intersection point defines which part of the

shoreline to analyze where a single transect might intersect the same shoreline twice (*e.g.* inlets and spits). Closest Intersection was selected to avoid using shoreline segments not considered to be oceanfront.

Figure 6. DSAS toolbar - Set/Edit Parameters

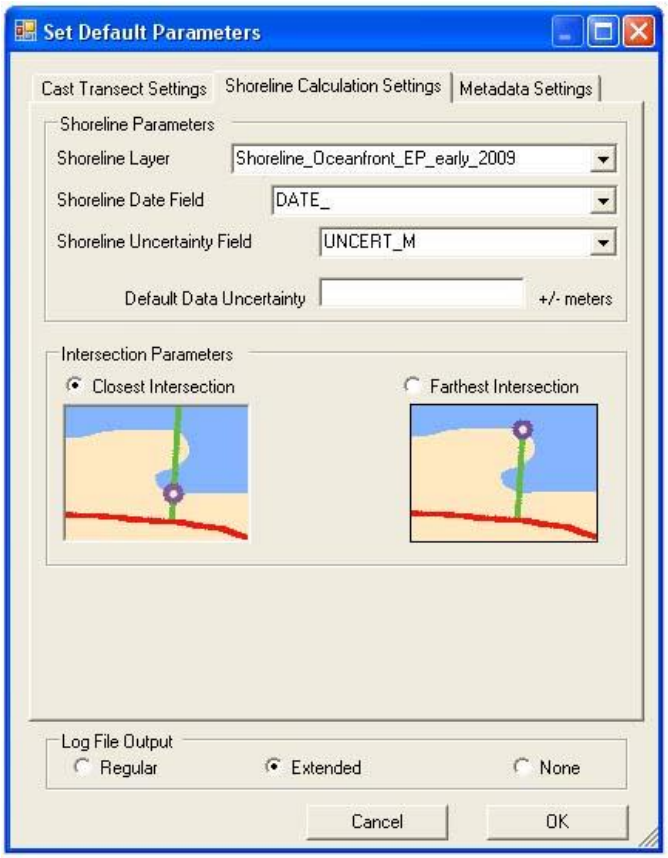


Figure 7. DSAS Set Default Parameter

Transect data layer were identified using the *DSAS Toolbar* and selecting it from the *Transect Layer* dropdown menu (Figure 8). This menu will only list qualified transect layers from the ArcMap document. If the transect layer is not properly attributed (*BASELINEID, GROUP, TRANSORDER*) it will not be recognized as a qualified option.

Figure 8. DSAS toolbar – will list qualified transect layers within ArcMap project.

With default parameters established and a transect layer identified, the last step is to select the output statistics (Figures 9 and 10). Once the *Calculate Change Statistics* dialog window opens, the only requirements are to: 1) select statistics to calculate; 2) apply confidence interval (accepted default 95 percent), and; 3) start calculation algorithms.

Figure 9. DSAS toolbar - Calculate Shoreline Change Statistics.

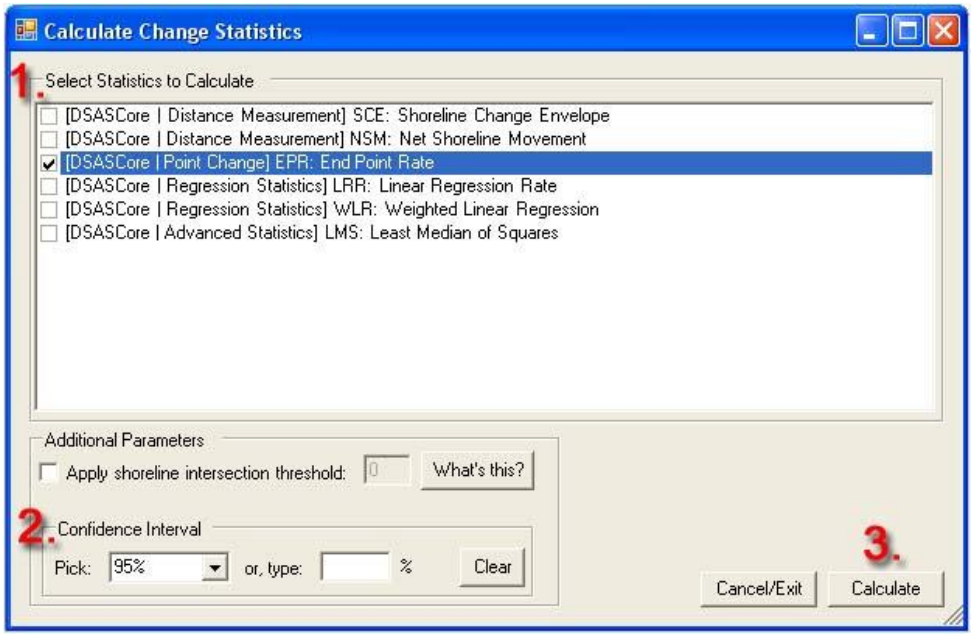


Figure 10. DSAS Calculate Change Statistics.

Long-term average annual shoreline change rates were calculated at 9,802 transects (approximately 305 miles of shoreline). No rates were calculated at 66 transects (approximately 2 miles of shoreline) because of "missing" shoreline segments. These gaps in the shoreline data are specific to areas where inlets have either closed (*e.g.* Madd, Corncake, Moore's, and Old Topsail inlets) or have changed significantly due to accretion or erosion (*e.g.* New Topsail Inlet at Topsail Beach). For example, where early data might show a shoreline at an active inlet, current data will show a complete shoreline (not separated by channel) if the inlet has closed; thus, resulting in only one shoreline for that specific location.

DSAS generates raw end-point shoreline change rate data as a table inside the Geodatabase. To perform spatial queries, the tabular data must be joined to the transect GIS data by common attributes *(TRANSORDER* and *OBJECTID*) using ArcMap. Additional data processing (smoothing and blocking) required data to be imported into a Microsoft Excel 2016® spreadsheet to take advantage of its available math functions.

Long-Term Average Annual Shoreline Change Rate Calculations

Smoothing

Smoothing raw data has been applied in all previous studies, and effectively filters short-term dynamic shoreline phenomena such as beach cusps, smaller sand waves, and the attachment of landward migrating portions of offshore bar systems. Cusps and similar features range in size from approximately 5 feet to 5,000 feet and have a life span ranging from days (smaller features) to seasons or years (larger sand waves) (Dolan and Ferm, 1968) (Davis, 1978). Bars generally range around 328 feet in length with migration and attachment rates ranging from seasons to years (Davis, 1978). Variations associated with larger, longer lived features such as capes are not filtered by the smoothing.

The procedure for spatially smoothing shoreline change rate data is a simple moving average, or running mean technique described by Davis, 1973. Commonly referred to as "17-point running average," this technique by default consists of at least 17 transects (approximately 0.5 miles of

shoreline), and an average is calculated for each of the 17 transects, each time centered on the ninth transect (with 8 transects on each side). This spatially averaged value is the "smoothed rate." Approaching inlets, the number of transects used in the average is decreased by two (dropping one from each side of the centered transect calculation) until the end transect is reached. The last value is calculated by taking the weighted average using the last two transects.

$$R_s = (2 \times T_1 + T_2) / 3$$

***R_s** = smoothed rate*

***T_1** = erosion rate at last transect adjacent to the inlet*

***T_2** = erosion rate at second to last transect adjacent to inlet*

As can be seen in Figure 11, results from smoothing are most noticable in areas experiencing accelerated erosion or accretion (*e.g.* near inlets).

Blocking

The technique of "blocking" smoothed rate data creates spatially uniform rate segments. In other words, blocking groups neighboring transects along the same shoreline segment that have similar smoothed shoreline change rates. This allows for management of like sections of shoreline that have the same or similar shoreline change rates, rather than having to refer rates at each individual transect. Blocked shoreline change rate data serve as Setback Factors (historically referred to as "erosion rates"), and used to calcualte the construction setback within Ocean Hazard AEC, and to calculate the landward boundary of the Ocean Erodible Area (OEA) (Figure 11).

Blocking procedures, itemized below, represent refinments and clarifications of procedures established by and used in all previous update studies. These refinements and clarifications are the result of improved accuracy of the data brought about by improvements in the shoreline delineation methodology and quantitative requirements that allow for increased repeatabiltiy of results. Transect spacing was reduced from 328 (100 meters) and 984 feet (~300 meters) (1980

Dolan study) to 164 feet (50 meters) in subsequent studies; and in the 2003 Overton and Fisher update study, the minimum number of transects required for blocking was reduced by half (from 16 to 8). In areas experiencing an accelerated change in rates, this refinement resulted in smaller blocked groups. The following list describes the process, or "rules" of blocking:

1. Group "like" erosion rate segments based on rate at transect (*e.g.,* 2.0, 2.2, 2.1, 2.5, 2.6, 2.1, . . . 2.9) and use the mean of each segment as the blocked rate. Transitioning at one-foot intervals are prefered for rate block boundaries. Fractional rates are rounded down to the nearest foot, or half foot interval for segments dominated by a half foot value and do not have values greater than the next highest one foot interval (*e.g.*, a rate segment equal to 5.4 would be rounded to 5.0; and 5.7 would be rounded to 5.5).

2. Blocked shoreline change rate segments must be comprised of at least eight (8) transects. In areas experiencing rapid erosion or accretion (*e.g.,* approaching inlets), it is not always possible achieve a one-foot transition from one blocked rate segment to the next, thus making it necessary to evaluate segments based on its mean so that transitions from one blocked segement to the next was as near to the one-foot interval as feasible.

3. In areas where blocked segments transition from one value to another (*e.g.*, from 3 to 4 feet per year) a determination must be made to select the transect that will serve as a delineation between the change in values. The lower rate would be applied towards the higher blocked segment.

4. Where two blocked boundaries meet and divide a property or parcel, the lower of the two blocked rates is applied in the direction of the higher rate in order to give the property owner the benefit of the lower rate. Where a large parcel containing multi-family structures was divided by a transition boundary, the lower of the two blocked rates is applied towards the higher rate so that no structure was split and also giving the structure the benefit of the lower rate.

5. For segments that result in measured accretion, or where measured erosion rates are less than two (2.0) feet per year, they are assigned the default minimum, a blocked rate value (Setback Factor) of two (2) in accordance with the minimum Ocean Hazard setback of 60 feet, or 30 times the Setback Factor based on blocked shoreline change rates (15A NCAC 07H .0306(a)(2)(A).

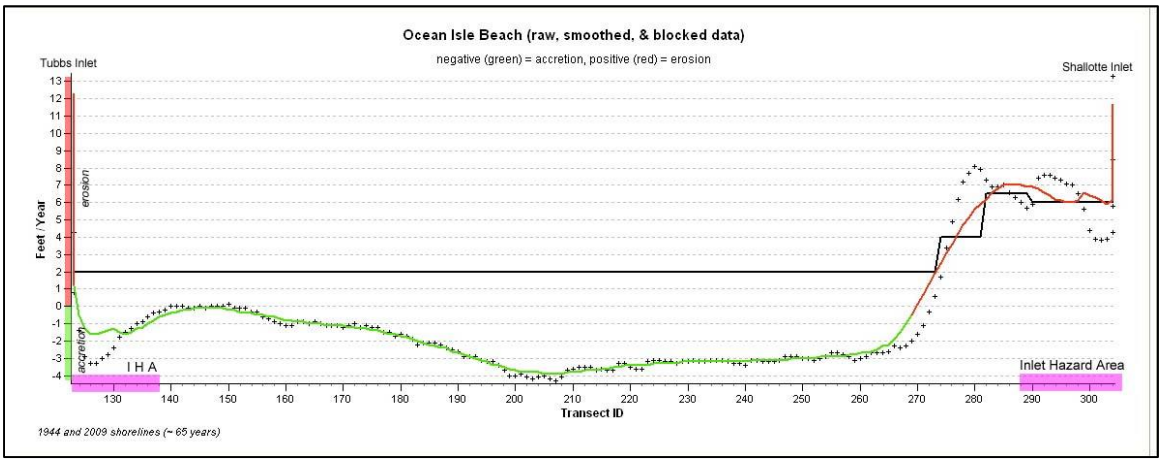


Figure 11. Example of Raw (points), Smoothed (solid green and red line), and Blocked (solid black line) data.

RESULTS

A statistical summary of the blocked shoreline change rates (Setback Factors) was calculated for this study, just as done in previous studies. These data are presented in below (Table 4). The percentages of shorelines are computed by dividing the number of miles of shoreline mapped in a given category (*e.g.*, Accreting) by the total number of miles of shoreline in a category (*e.g.*, south-facing). For purposes of this study, "south-facing" beaches are defined as those with shorelines, or beach faces, generally perpendicular and between South-East and South-West (135° – 225°); while "east-facing" between North-East and South-East (45° – 135°).

Statewide, the average blocked erosion rate value, or setback factor is 3.7, which is a slight increase (<1.0 ft.) relative to the average (3.4) calculated in the 2011 DCM update study using the 2009 shoreline. The average shoreline change rate for this study was 2.1 feet per year (erosion), and the median was 1.6 feet per year (erosion).

Table: 4A	Shoreline Length & Measured Erosion and Accretion Rate Comparison		
	South-Facing Beach Miles (% of total shoreline length)	**East-Facing Beach** Miles (% of total of total shoreline length)	**Statewide Totals** Miles (% of total shoreline length)
Miles of Shoreline Mapped & Analyzed	103.7 (34.1%)	200.8 (65.9%)	304.5
Measured Accretion	45.8 (44.2 %)	53.6 (26.3%)	103.7 (34.1%)
Measured Erosion	56.3 (54.3%)	147.1 (72.2%)	200.9 (65.4%)
No Output (*missing one of two shorelines*)	0.8 (<1%)	2.8 (1%)	2.8 (>1%)
Table: 4B	**Shoreline Change Rate Statistical Comparison**		
	South-Facing Beach (ft./yr.)	**East-Facing Beach** (ft./yr.)	**Statewide** (ft./yr.
Average Shoreline Change Rate (ft/yr.)	2.8 ft/yr. (erosion)	<1.0 ft/yr. (erosion)	2.1 ft/yr. (erosion)
Median Shoreline Change Rate (ft/yr.)	<1.0 ft/yr. (erosion)	2.5 ft/yr. (erosion)	1.6 ft/yr. (erosion)
Table: 4C	**Setback Factor Comparison (Minimum = 2 feet)**		
	South-Facing Beach Miles (% of total shoreline length)	**East-Facing Beach** Miles (% of total of total shoreline length)	**Statewide Totals** Miles (% of total shoreline length)
Setback Factor (=2 ft)	76.5 (73.8%)	98.3 (49.0%)	174.6 (57.3%)
Setback Factor (between 2.5 & 5.0 ft)	13.0 (12.5%)	52.9 (26.3%)	67.1 (22.1%)
Setback Factor (between 5.5 & 8.0 ft)	9.5 (9.2%)	29.7 (14.8%)	38.7 (12.7%)
Setback Factor (>8.0 ft)	3.9 (3.8%)	18.5 (9.2%)	22.7 (7.4%)
Average Setback Factor (ft)	3.0	4.0	3.5
Median Setback Factor (ft)	2.0	3.0	2.0

Table 4. Summary of shoreline change rates and Setback Factors. **(4A)** Summarizes length of shoreline mapped and analyzed, and percentages of shoreline where either accretion or erosion was measured. **(4B)** Summarizes average and median shoreline change rates for south and east-facing beaches, and statewide totals. Although these values do include all measured accretion, the statewide values reflected erosion overall. **(4C)** Summarizes length of shoreline and percentage of the total shoreline, and its calculated Setback Factor. Because of migrating or closed inlets, not all locations near inlets had two shorelines (no early or 2016 shoreline). As a result, the analysis could not be performed for less than 1% of the total study area. Therefore, lengths and percentages in Table 4 when summed, may not always equal one hundred percent. It is important to note that the minimum setback factor is 2 as referenced in Rule *15A NCAC 07H.0306(a)(2)(A)*. A setback factor equal to 2 means that erosion is less than two feet per year, or accretion was measured. Setback factors greater than 2 do correspond to calculated erosion rates.

	2016 South Facing Miles (% of total)	2009 South Facing Miles (% of total)	Change (miles)
Miles of Shoreline Mapped/Analyzed	103.7 (34.1%)	103.9	0.2 (decrease)
Setback Factor (2 ft)	76.5 (73.8%)	77.3 (74.4%)	0.8 (decrease)
Setback Factor (2.5 to 5.0 ft)	13.0 (12.5%)	13.8 (13.3%)	0.8 (decrease)
Setback Factor (5.5 to 8.0 ft)	9.5 (9.2%)	9.0 (8.7%)	0.5 (increase)
Setback Factor (>8.0 ft)	3.9 (3.8%)	3.6 (3.5%)	0.3 (increase)

Table 5. 2018 update study summary of blocked shoreline change rates (Setback Factors), and comparison of change from previous study (2011) for south-facing beaches. This table is an illustrative comparison of total length of shoreline mapped and analyzed, and its calculated construction Setback Factor, where sixty feet is the minimum construction setback (2 ft. x 30 = 60 ft.). Length shown in the row labeled "Setback Factor (2 ft)" is inclusive of length of all accreting sections of shoreline, and those calculated to be eroding at two feet per year or less.

	2016 East Facing Miles (% of total)	2009 East Facing Miles (% of total)	Change (miles) from 2009 to 2016
Miles of Shoreline Mapped/Analyzed	200.8 (65.9%)	203.5	2.7 (decrease)
Setback Factor (2 ft)	98.3 (49.0%)	112.8 (55.4%)	14.5 (decrease)
Setback Factor (2.5 to 5.0 ft)	52.9 (26.3%)	48.3 (23.7%)	4.6 (increase)
Setback Factor (5.5 to 8.0 ft)	29.7 (14.8%)	22.4 (11.0%)	7.3 (increase)
Setback Factor (>8.0 ft)	18.5 (9.2%)	17.2 (8.5%)	1.3 (increase)

Table 6. 2018 update study summary of blocked shoreline change rates (setback factors), and comparison of change from previous study (2011) for east-facing beaches. This table is an illustrative comparison of total length of shoreline mapped and analyzed, and its calculated construction Setback Factor, where sixty feet is the minimum construction setback (2 ft. x 30 = 60 ft.). Length shown in the row labeled "Setback Factor (2 ft)" is inclusive of length of all accreting sections of shoreline, and those calculated to be eroding at two feet per year or less.

Shoreline change rates and setback factors calculated in this study can be compared to those presented in the 2011, and 2003 update study reports (NC DCM, 2011; Overton and Fisher, 2003) because they exist in digital and GIS format, and use the same early shoreline. However, setback factors from these studies (2018, 2011, and 2003) can only be generally compared to those calculated in earlier studies for several reasons: (1) there is a difference in the miles of shoreline analyzed (due to starting and stopping points near inlets and capes), (2) the early shoreline date used in the 1997 study (and earlier) is not the same as the one used in the 2003, 2011, and this study and; (3) changing the required minimum number of transects from 16 to 8 in the 2003 Overton and Fisher update study, and space-reduction between transects from 328 and 984 feet (100 and 300 meters) to 164 feet (50 meters) are refinements made in the blocking methodologies that may influence setback factor statistics only when comparing this and 2011, 2003 studies to earlier studies (1998, 1992, 1986, and 1980). Preliminary analysis of the data continues to show remarkable consistency with earlier updates (Table 7).

Statewide Totals Summary	**2016** Miles (% of total)	**2009** Miles (% of total)	**1998** Miles (% of total)	**1992** Miles (% of total)	**1986*** Miles (% of total)	**1980*** Miles (% of total)
Miles of Shoreline Mapped/Analyzed	**304.5**	**307.4**	**312**	**300**	**237***	**245***
Setback Factor (2 ft/yr.)	174.6 (57.3%)	190.2 (61.9%)	193 (62%)	165 (55%)	144 (61%)	149 (61%)
Setback Factor (2.5 to 5.0 ft/yr.)	67.1 (22.1%)	62.1 (20.2%)	64 (21%)	54 (18%)	43 (18%)	52 (21%)
Setback Factor (5.5 to 8.0 ft/yr.)	38.7 (12.7%)	31.5 (10.2%)	28 (9%)	30 (10%)	20 (8%)	22 (9%)
Setback Factor (>8.0 ft/yr.)	22.7 (7.4%)	20.8 (6.8%)	27 (8%)	32 (10.7%)	22 (9%)	22 (9%)
Insufficient Data	*1.4 (<0.5%)*	*2.8 (<1%)*	*0*	*19 (6%)*	*8 (4%)*	*0*

Table 7. Summary of blocked shoreline change rates (Setback Factors) for all studies. This table is an illustrative comparison of total length of oceanfront shoreline mapped and analyzed, and its calculated construction Setback Factor for each of the six studies; where sixty feet is the minimum construction setback (2 ft. x 30 = 60 ft.). Length shown in the row labeled "Setback Factor (2 ft)" is inclusive of length of all accreting sections of shoreline, and those calculated to be eroding at two feet per year or less. Where the year ends with an asterisk (*) in the table header, that total shoreline distance is less compared to others because some, or all, of the National Seashore was not mapped for that study (i.e. Shackleford Banks, Core Banks).

(*) this study did not include the entire oceanfront shoreline (Core Banks or Shackelford Banks).

South-Facing Shoreline Dates	2016 Miles (% of total)	2009 Miles (% of total)	1998 Miles (% of total)	1992 Miles (% of total)	1986* Miles (% of total)	1980* Miles (% of total)
Miles of Shoreline Mapped/Analyzed	103.7 (34.1%)	103.9	96	106.8	82	80
Setback Factor (2 ft)	76.5 (73.8%)	77.3 (74.4%)	69 (72%)	58.4 (55%)	59 (72%)	70 (82%)
Setback Factor (2.5 to 5.0 ft)	13.0 (12.5%)	13.8 (13.3%)	14 (14%)	14.4 (13%)	12 (15%)	12 (14%)
Setback Factor (5.5 to 8.0 ft)	9.5 (9.2%)	9.0 (8.7%)	9 (9%)	5.9 (6%)	3 (4%)	3 (4%)
Setback Factor (>8.0 ft)	3.9 (3.8%)	3.6 (3.5%)	5 (5%)	9 (8%)	7 (9%)	0 (0%)

Table 8. South-facing beach summary of blocked shoreline change rates (Setback Factors) for all studies. This table is an illustrative comparison of total length of shoreline mapped and analyzed, and its calculated construction Setback Factor for each of the five studies, were sixty feet is the minimum construction setback (2 ft. x 30 = 60 feet). Length shown in the row labeled "Setback Factor (2 feet)" is inclusive of length of all accreting sections of shoreline, and those calculated to be eroding at two feet per year or less. Where the year ends with an asterisk (*), in the table header, that total shoreline distance is less compared to others because some, or all, of the National Seashore was not mapped for that study (i.e. Shackleford Banks, Core Banks).

East-Facing Shorelines	2016 Miles (% of total)	2009 Miles (% of total)	1998 Miles (% of total)	1992 Miles (% of total)	1986* Miles (% of total)	1980* Miles (% of total)
Miles of Shoreline Mapped/Analyzed	200.8 (65.9%)	203.5	216	192.8	155	160
Setback Factor (2 ft)	98.3 (49.0%)	112.8 (55.4%)	124 (58%)	89 (46%)	85 (55%)	78 (49%)
Setback Factor (2.5 to 5.0 ft)	52.9 (26.3%)	48.3 (23.7%)	50 (23%)	39.9 (21%)	31 (20%)	40 (25%)
Setback Factor (5.5 to 8.0 ft)	29.7 (14.8%)	22.4 (11.0%)	19 (9%)	24.3 (13%)	17 (11%)	20 (12%)
Setback Factor (>8.0 ft)	18.5 (9.2%)	17.2 (8.5%)	22 (10 %)	23.4 (12%)	15 (10%)	23 (14%)

Barrier Island Summaries

The following graphs show oceanfront shoreline change rate data (raw, smoothed, and blocked) at each transect for all NC barrier islands. For purpose of this study and illustrating raw and smoothed with blocked data, positive rate values identify measured erosion (*positive = erosion*) while negative values represent measured accretion (*negative = accretion*). The black points, or crosshairs, are the raw data; the green and/or red lines are the smoothed data; and the bold-black line is the blocked data (setback factors). Units for the vertical axis are feet per year, and the horizontal axis corresponds to transect numbers.

Table 9. East-facing beach summary of blocked shoreline change rates (Setback Factors) for all studies. This table is an illustrative comparison of total length of shoreline mapped and analyzed, and its calculated construction Setback Factor for each of the five studies, where sixty feet is the minimum construction setback (2 ft. x 30 = 60 feet). Length shown in the row labeled "Setback Factor (2 feet)" is inclusive of length of all accreting sections of shoreline, and those calculated to be eroding at two feet per year or less. Where the year ends with an asterisk (*), in the table header, that total shoreline distance is less compared to others because some, or all, of the National Seashore was not mapped for that study (i.e. Shackleford Banks, Core Banks).

Bird Island and Sunset Beach

Bird Island and Sunset Beach are North Carolina's southern-most beaches and considered to have low sloping south-facing beaches with approximately 3.3 miles of combined oceanfront shoreline. Sunset Beach has been naturally accreting and has not required any nourishment projects (Figure 12). Several factors have had significant influences in defining today's shoreline position; a navigation jetty constructed at Little River inlet (left side of graph), the closing of Madd inlet (transect IDs 35-40), and engineering (end of island and inlet configuration) of Tubbs Inlet prior to 1970. There was no change in blocked erosion rate factors since 2.8 miles (86.7 percent) of its shoreline resulted in measured accretion with only minor erosion (2 feet per year, or less) in the area adjacent to Tubbs Inlet for a shoreline distance equal to distance of 0.3 miles, or 11.4 percent of its oceanfront shoreline; therefore, the calculated setback factors for both Bird Island and Sunset Beach is 2 feet per year (Figures 12 & 13).

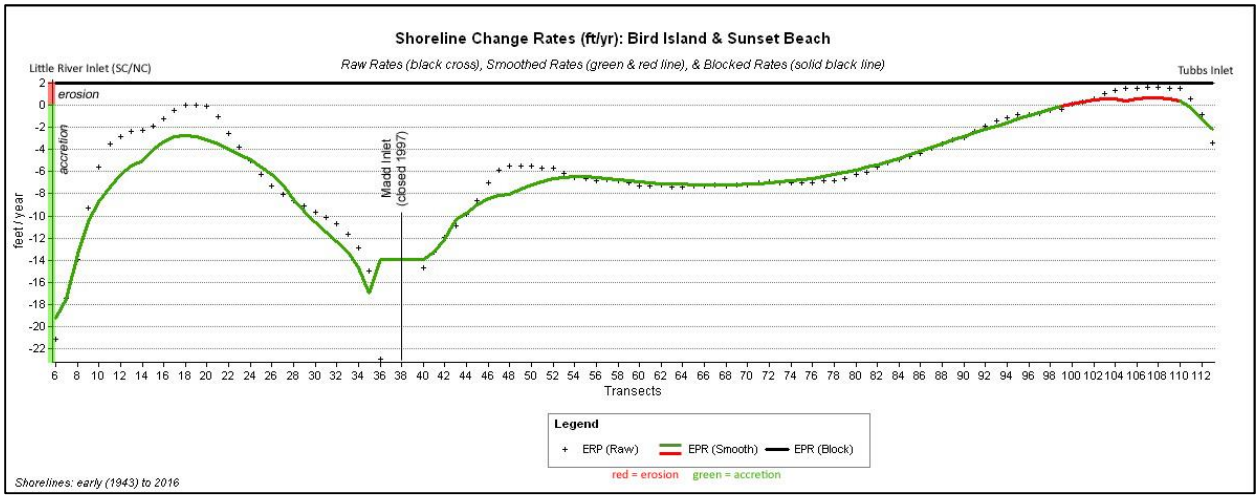


Figure 12. Bird Island and Sunset Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

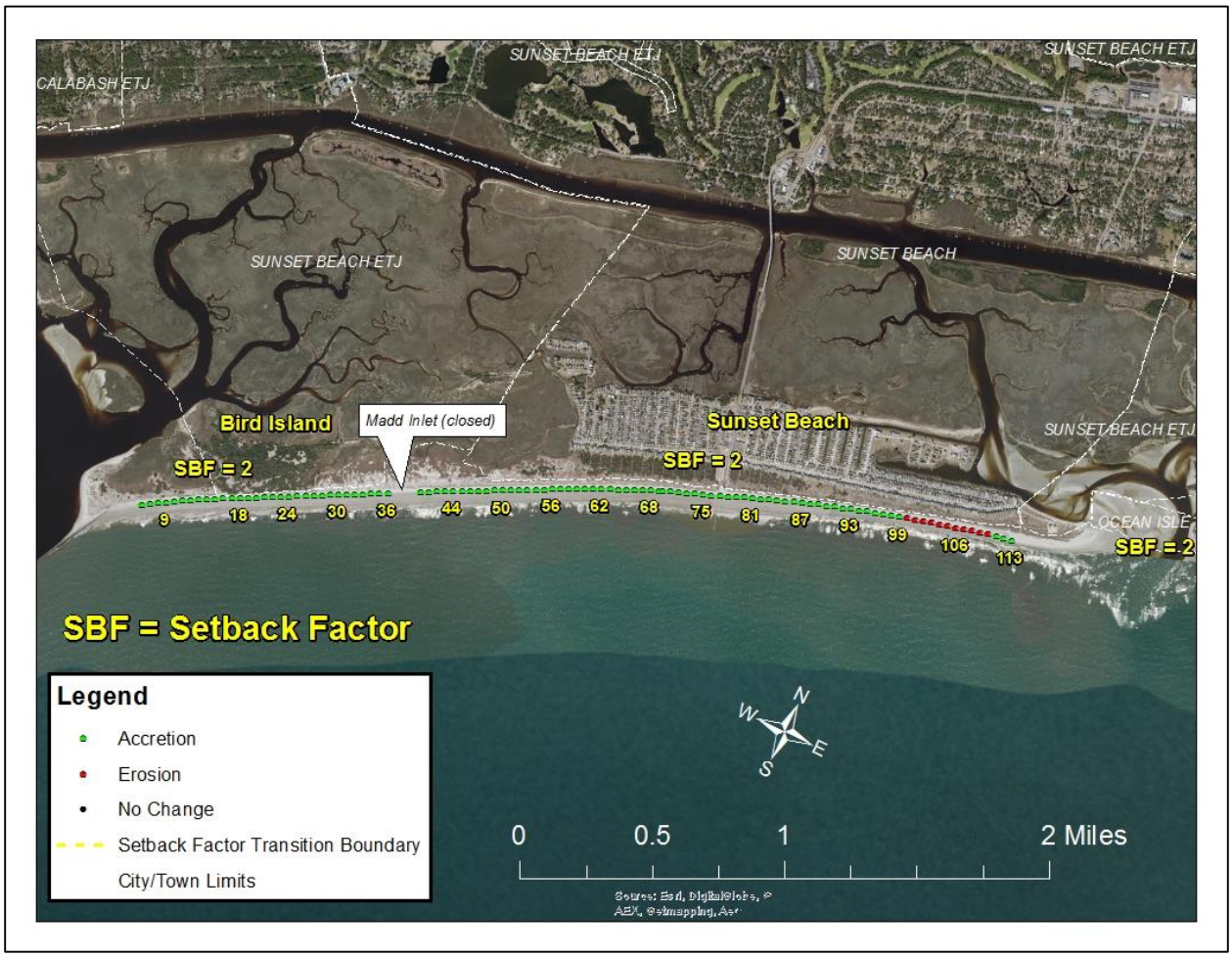


Figure 13. Bird Island & Sunset Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Ocean Isle Beach

Ocean Isle Beach is considered low sloping and south-facing, with approximately 5.7 miles of oceanfront shoreline. Approximately 4.6 miles (80.6 percent) of this shoreline resulted in measured accretion, while 1.0 miles (18.3 percent) is eroding (Figure 14). Ocean Isle has received several nourishment projects since the 2000s which had immediate post-project influences on shoreline position, and potentially influenced degree of measured accretion. Those areas are adjacent to inlets (Tubbs and Shallotte) located on each shoulder of the barrier island. Most of the island resulted in a calculated Setback Factor of 2 feet per year, while a small portion adjacent to Shallotte Inlet continued to see factors greater than 2 (up to 5 ft./yr.) (Figure 14 and 15). Overall, Setback Factors remained the same or slightly lower compared to the 2011 study.

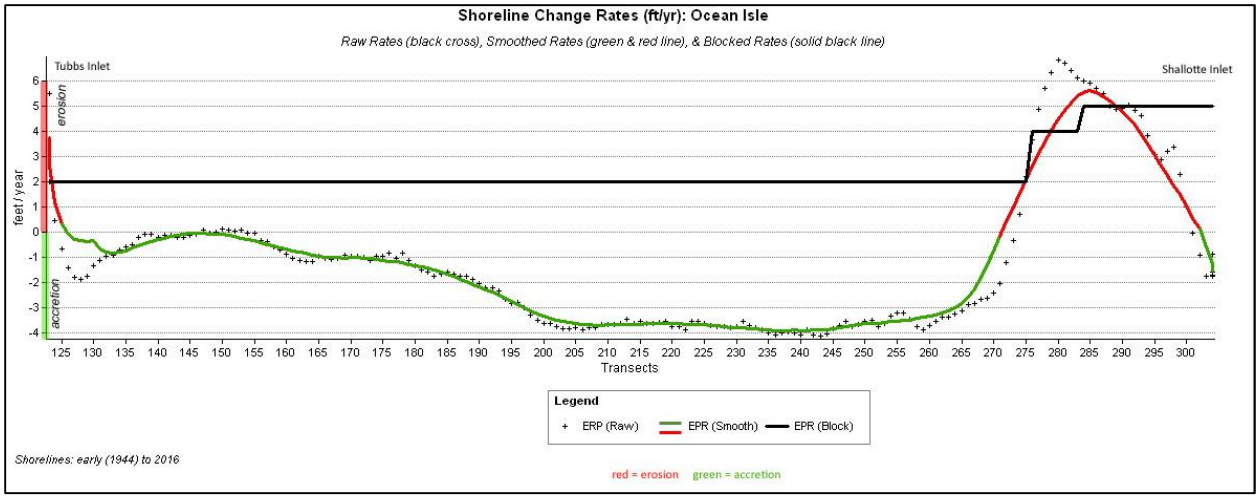


Figure 14. Ocean Isle shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

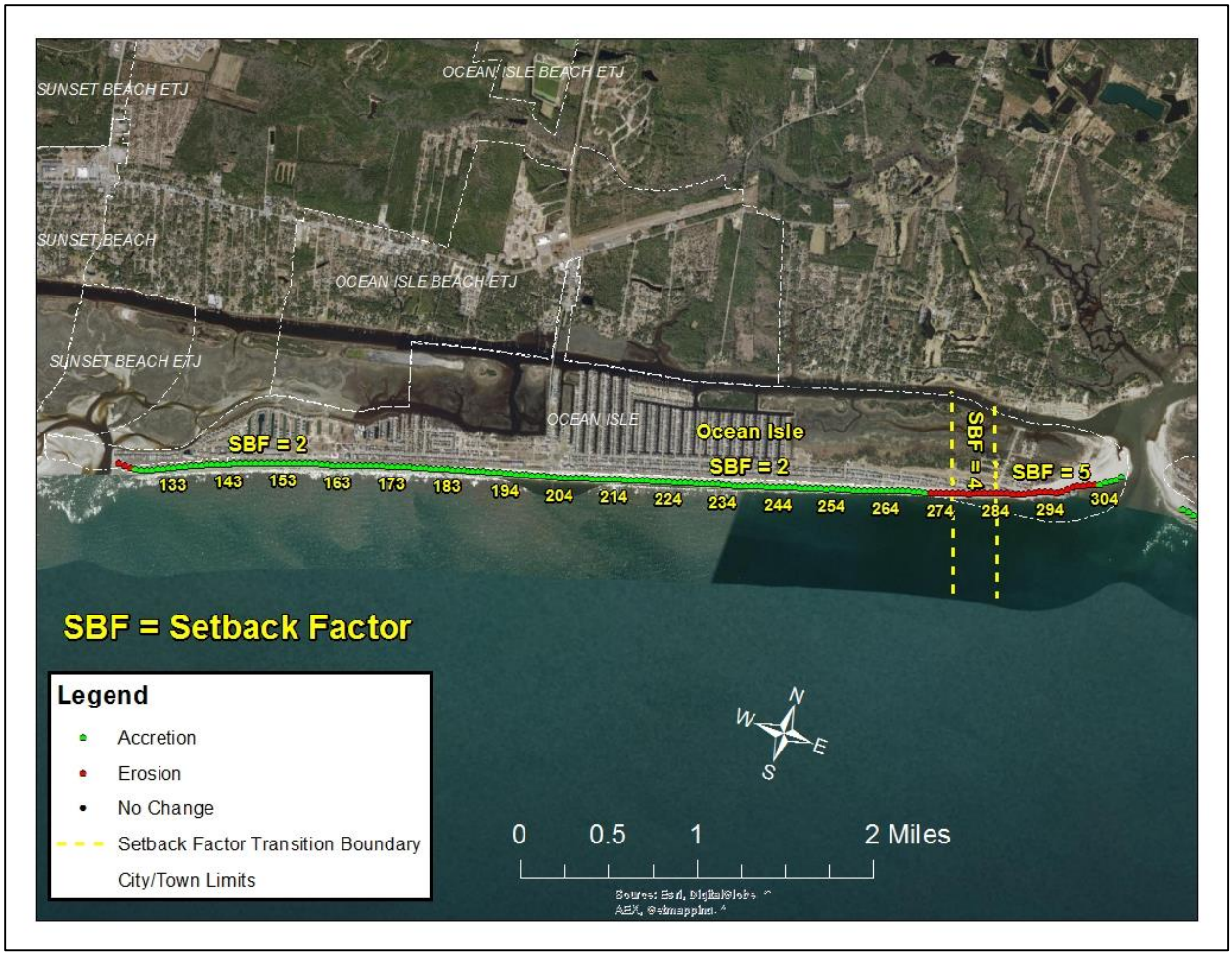


Figure 15. Ocean Isle Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Holden Beach

Holden Beach is considered low sloping and a south-facing, with approximately 8.0 miles of oceanfront shoreline. Approximately 2.0 miles (24.8 percent) of this shoreline resulted in measured accretion, while 6.0 miles (74.8 percent) is eroding (Figure 16). Although down slightly from the 2011 study (58.9 percent), still most (54.7 percent) of the measured erosion is 2 feet per year or less. In 2017, Holden Beach placed approximately 1.3 million cubic yards of sand along four miles of its oceanfront shoreline, and it is the first project since 2006 and 2009. Although this project could have some measured influence on the next update study, this update was not influenced by recent nourishment. The area on Holden Beach with the highest erosion is adjacent to Lockwood Folly Inlet (located on right side of the graph) where setback factors

transition from 2 to 6 approaching Lockwood Folly Inlet (Figures 16 & 17). Overall, where factors were two feet per year in 2011, they continue to be two, however, Setback Factors are slightly higher adjacent to Lockwood Folly Inlet (range from 2 to 6 ft./yr.).

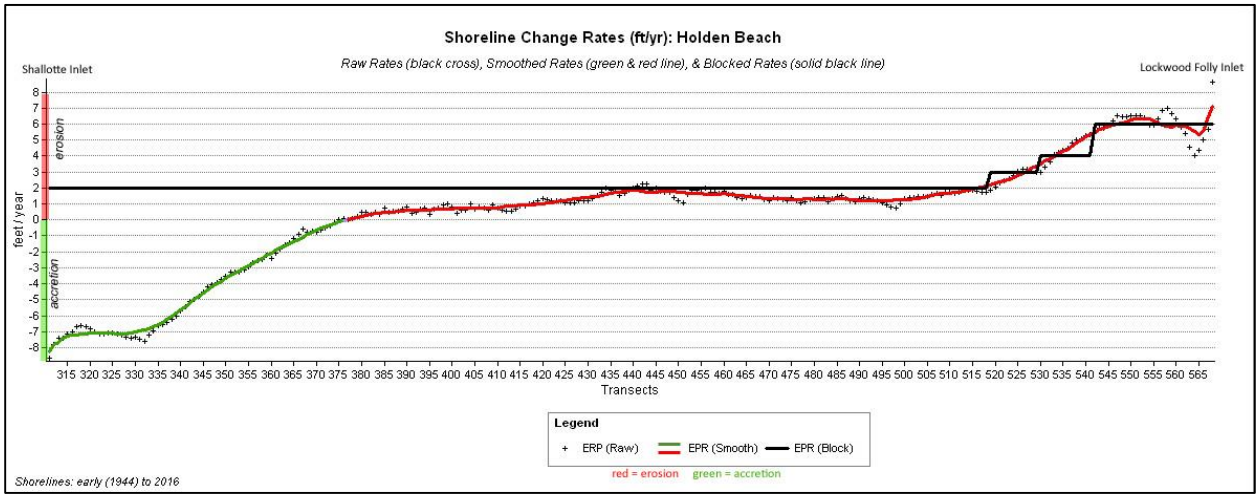


Figure 16. Holden Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

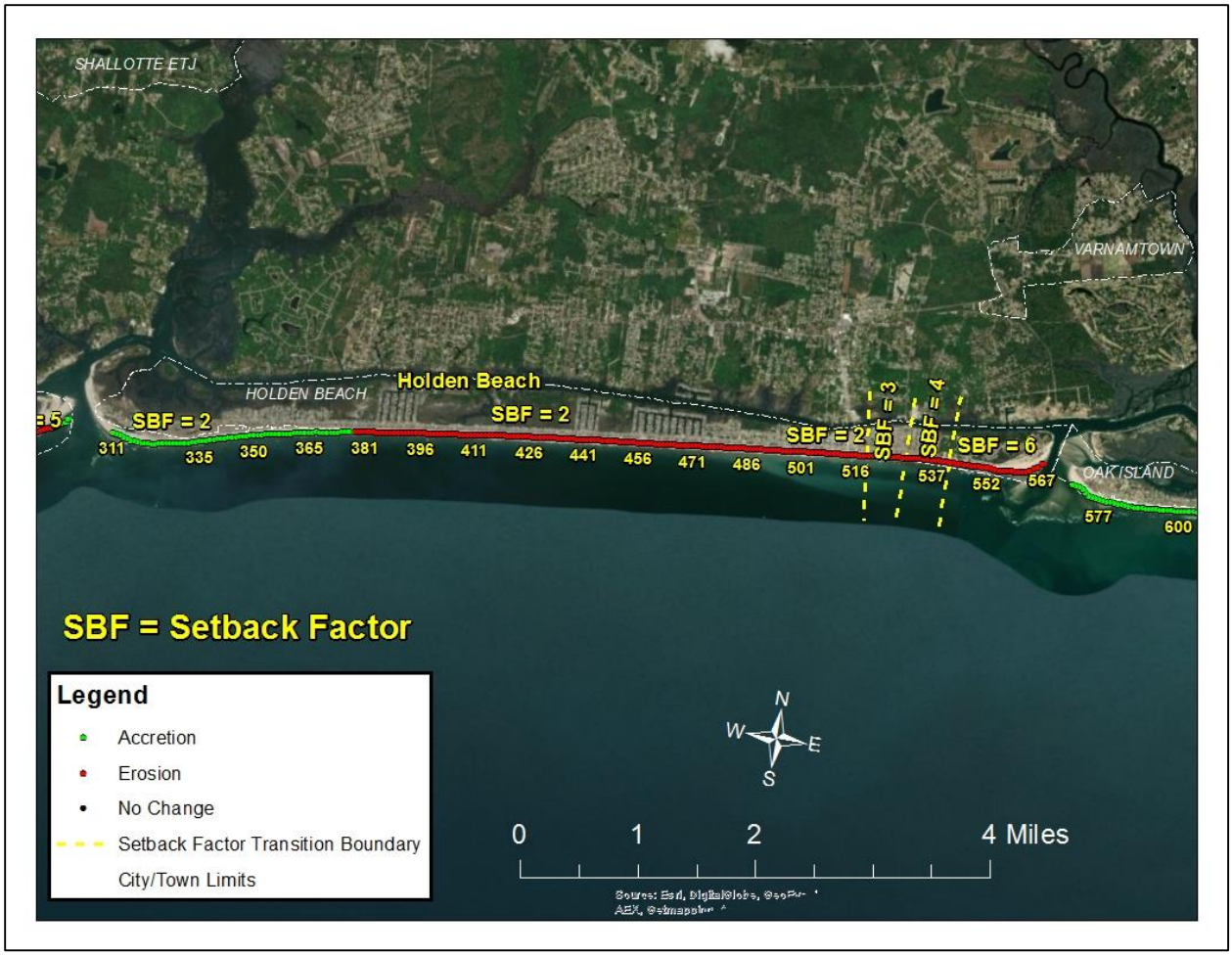


Figure 17. Holden Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Oak Island

The Town of Oak Island has a south-facing beach with approximately 9.3 miles of oceanfront shoreline. Approximately 6.5 miles (70.7 percent) resulted in measured accretion, while the remaining 2.6 miles (28.6 percent) demonstrated measured erosion (Figure 18). Although the maximum measured erosion was 2.5 feet per year (transect # 861, near Oak Island/Caswell Beach Town limits), the average is less than 1.0 foot per year. The setback factor for the entire oceanfront shoreline is two (2) (Figure 19).

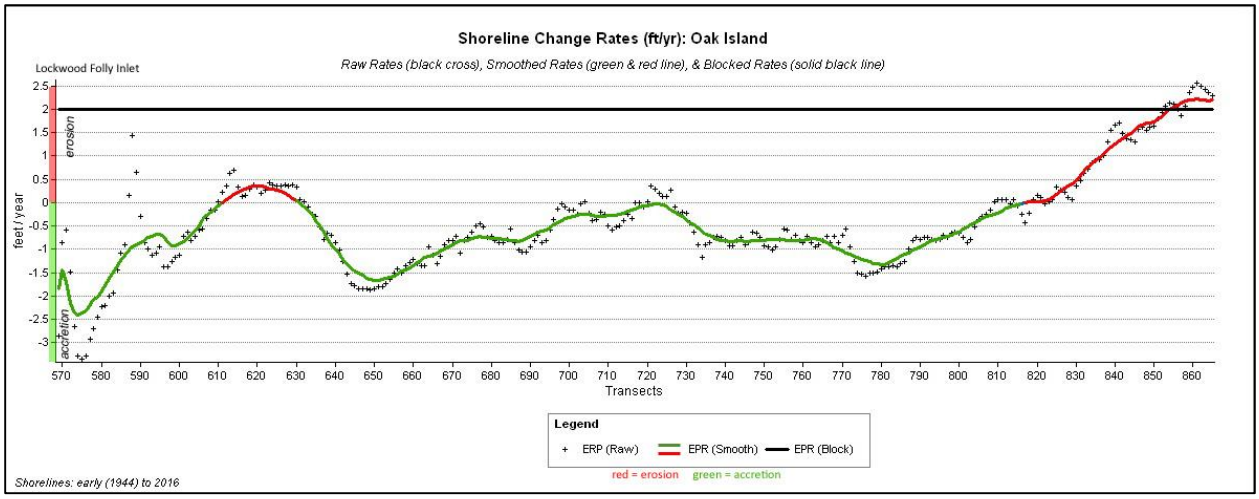


Figure 18. Oak Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

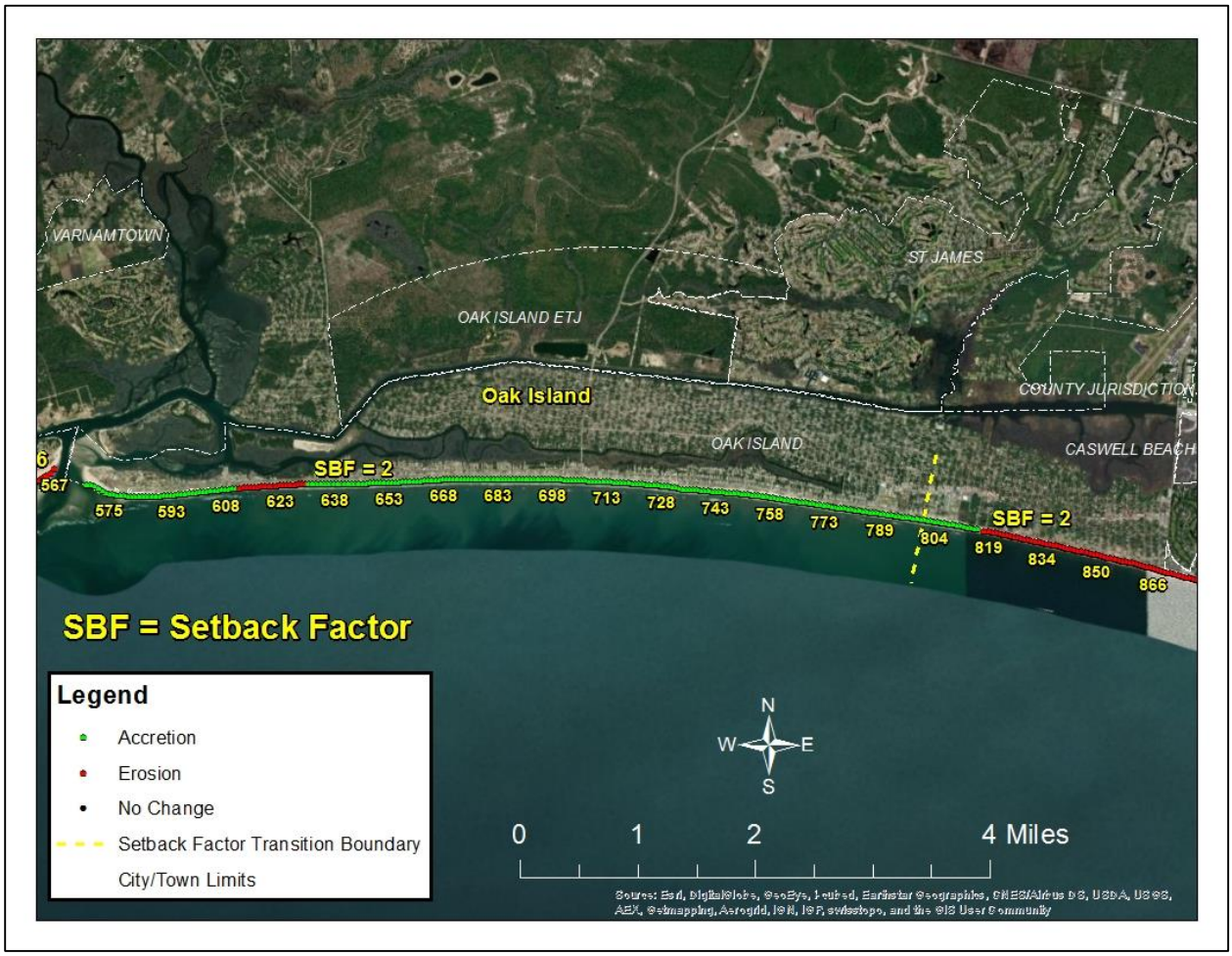


Figure 19. Oak Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Caswell Beach and Fort Caswell

Caswell Beach and Fort Caswell have combined oceanfront shorelines totaling 3.5 miles. Approximately 2.3 miles (65.5 percent) resulted in measured accretion, while 1.2 miles (34.5 percent) resulted in measured erosion (Figure 20). The average shoreline change rate was just under two feet per year (1.6), and the calculated setback factor is two (2) (Figure 21).

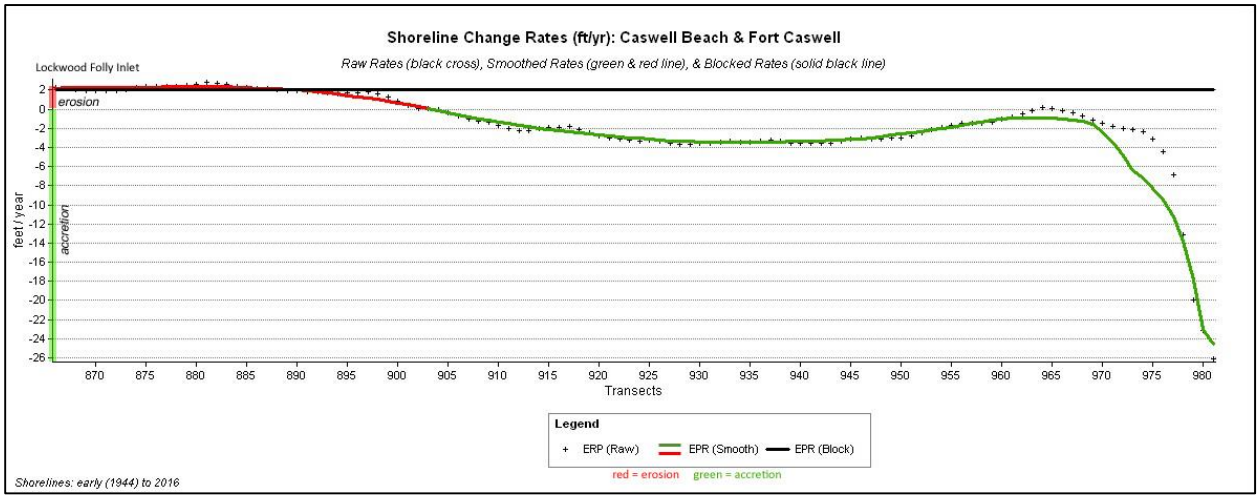


Figure 20. Caswell Beach and Fort Caswell shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

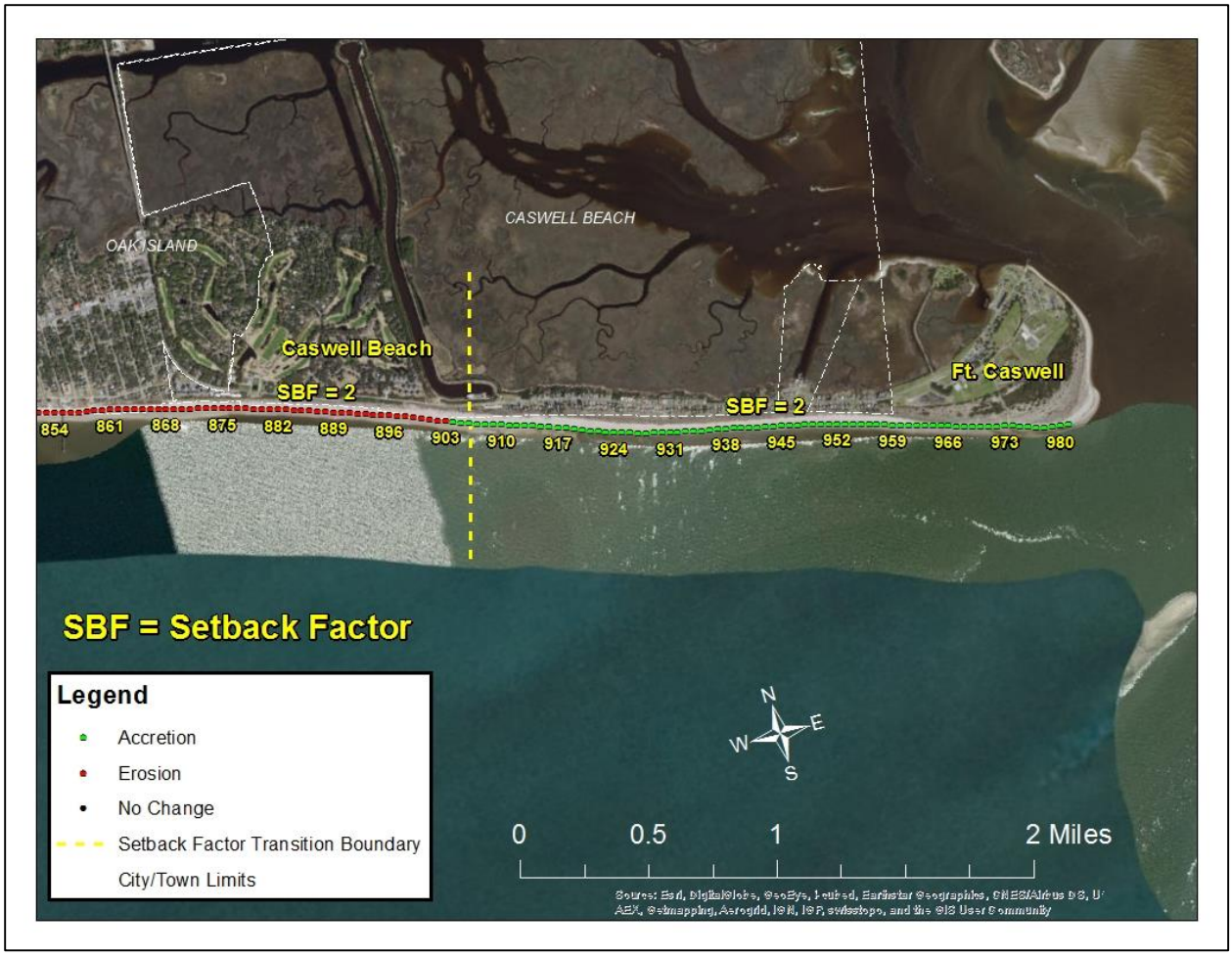


Figure 21. Caswell Beach and Fort Caswell. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Bald Head Island

Bald Head Island's "south-beach" is the last south-facing shoreline in Brunswick County just before transitioning to east-facing beaches at Cape Fear. This 3.2-mile oceanfront shoreline is the region's most dynamic, the state's second most dynamic developed shoreline, and has demonstrated consistently high erosion rates throughout all studies. However, with the completion of the terminal groin on south-beach and adjacent to the Cape Fear Inlet (near transect #985) in 2015, continued routine maintenance of beach east of the groin, and the groin field in the same region, all appear to have collectively lower rates slightly compared to previous studies for the approximate one-half mile segment of the shoreline at the west end of south-beach (average 3.4 feet per year). Overall, shoreline change rates for south-beach are generally

consistent with those from earlier studies where the average erosion rate is 3.9 feet per year (Figure 22). Blocked shoreline changes rates (setback factors) ranged between 2 and 13 and averaged approximately 4 feet per year. Setback factors did decrease for approximately 0.4 miles (13.6 percent) of shoreline (adjacent to terminal groin), but this shoreline position is dominated by erosional processes and resulted in an increase in setback factors for 0.9 miles of shoreline (28.2 percent) (Figures 22 and 23).

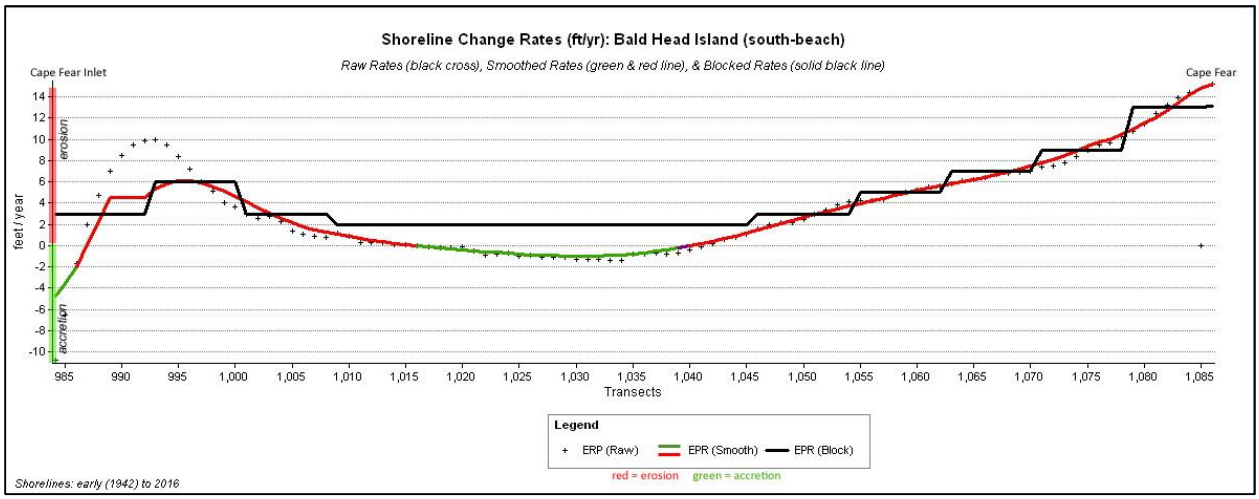


Figure 22. Bald Head Island ("south-beach") shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

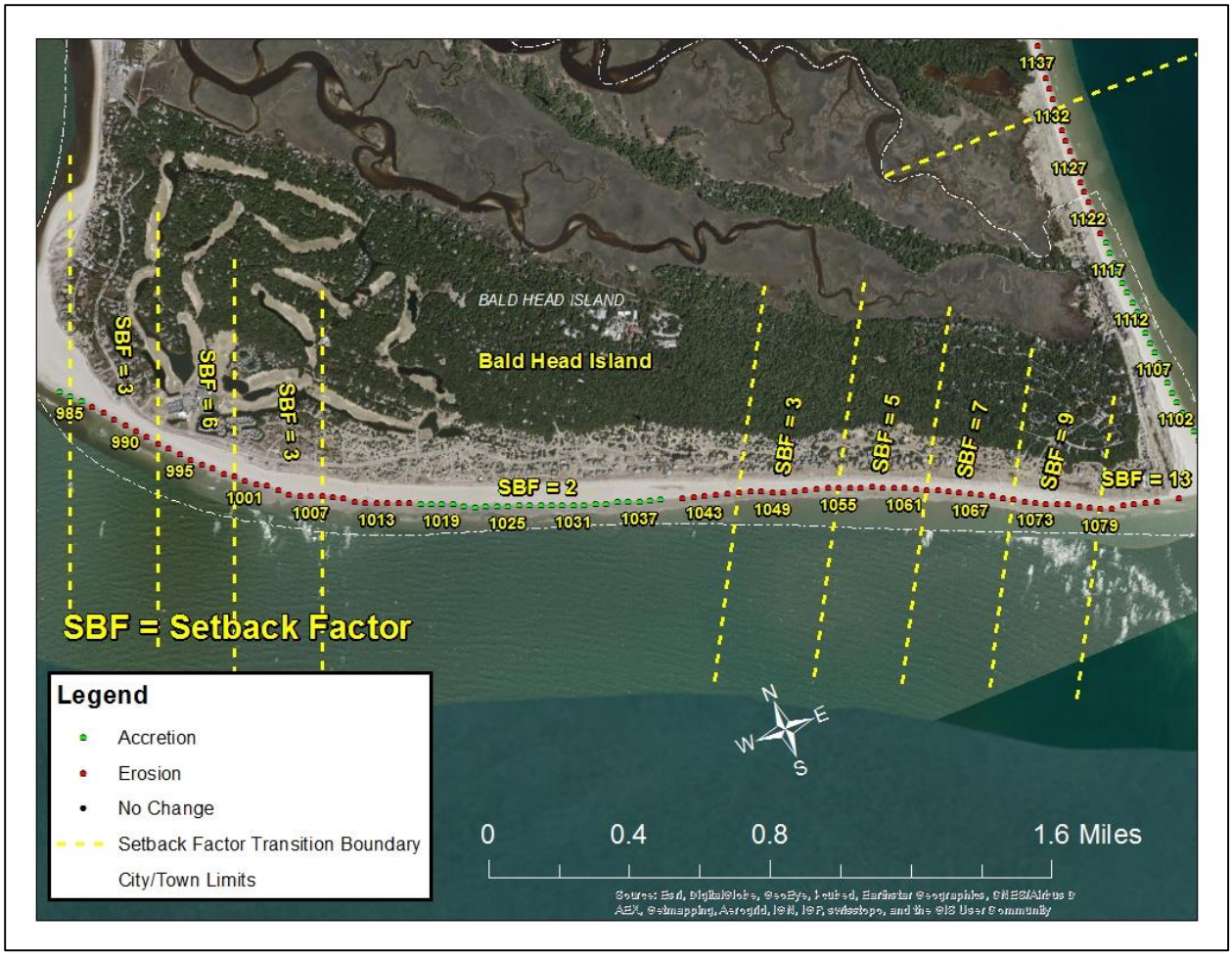


Figure 23. Bald Head Island's south-beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Moving from Bald Head Island's south beach to east beach while rounding Cape Fear the data show an erosion-accretion pivot point along the shoreline. Bald Head Island's east beach under normal conditions has been demonstrated through the data to be accretional with shoreline change rate factors equal to two feet per year, and setback factors equal to two (Figures 24 and 25).

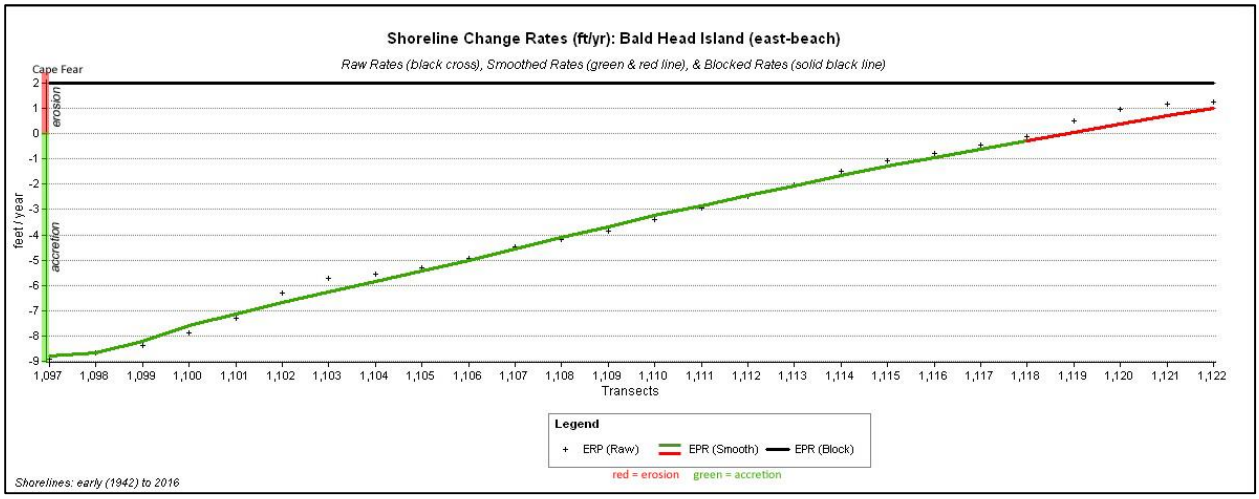


Figure 24. Bald Head Island's east-beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

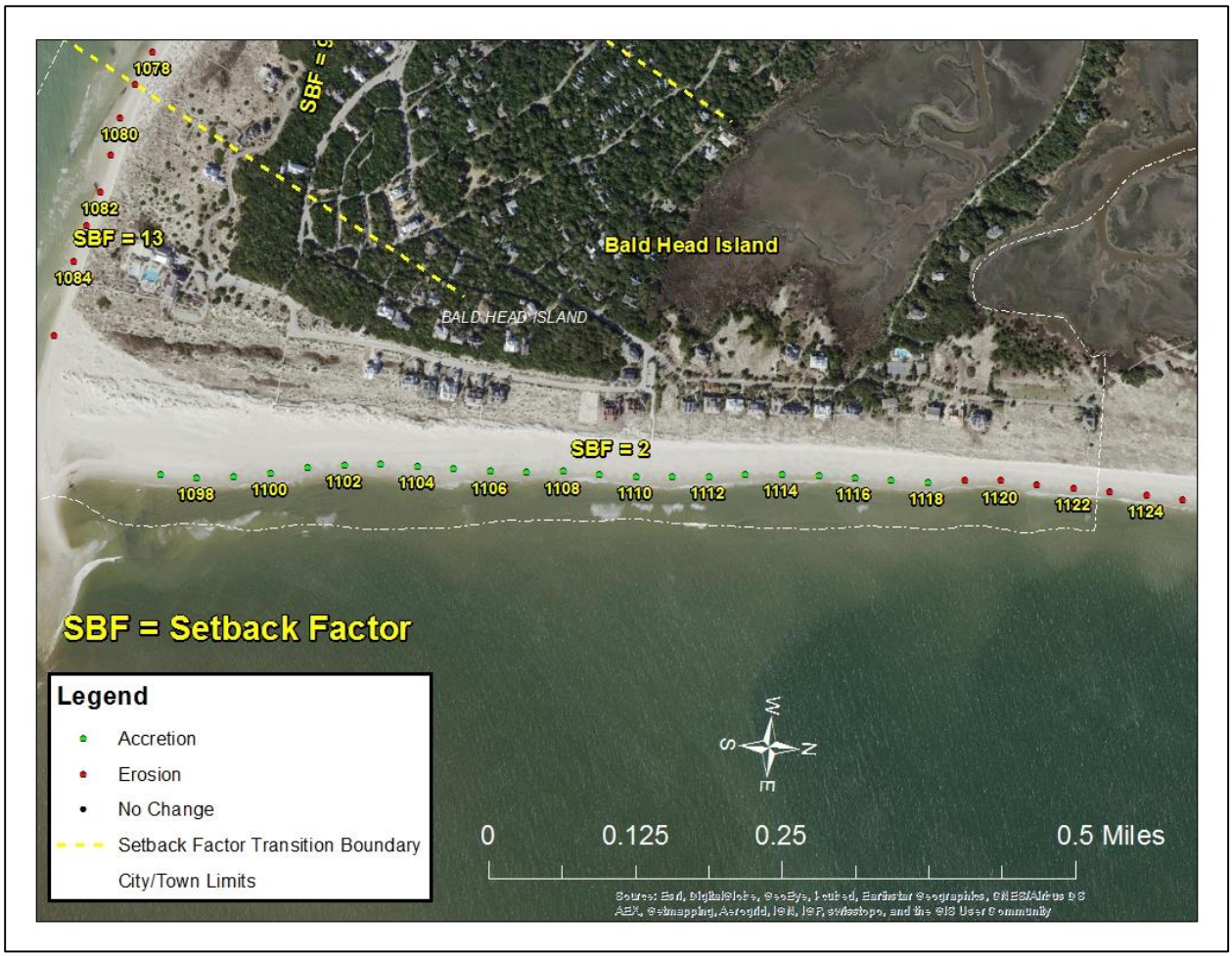


Figure 25. Bald Head Island's east-beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Zeke's Island and Fort Fisher State Park

Moving northward towards the now closed Corncake Inlet, which formally separated Bald Head and Zeke's islands, the oceanfront shoreline at Zeke's Island and Fort Fisher State Park demonstrates consistent erosional characteristics. The extent of this shoreline segment is 8.4 miles, where 3.4 miles (41.1 percent) of this shoreline demonstrates accretional characteristics, while 4.9 miles (58.9 percent) is eroding. The average shoreline change rate is less 1 foot per year (erosion) with a median rate of 2.6 feet per year (erosion), and blocked shoreline change rates (setback factors) ranging between 2 and 8 with an average 4.0 feet per year (Figures 26, 27, and 28).

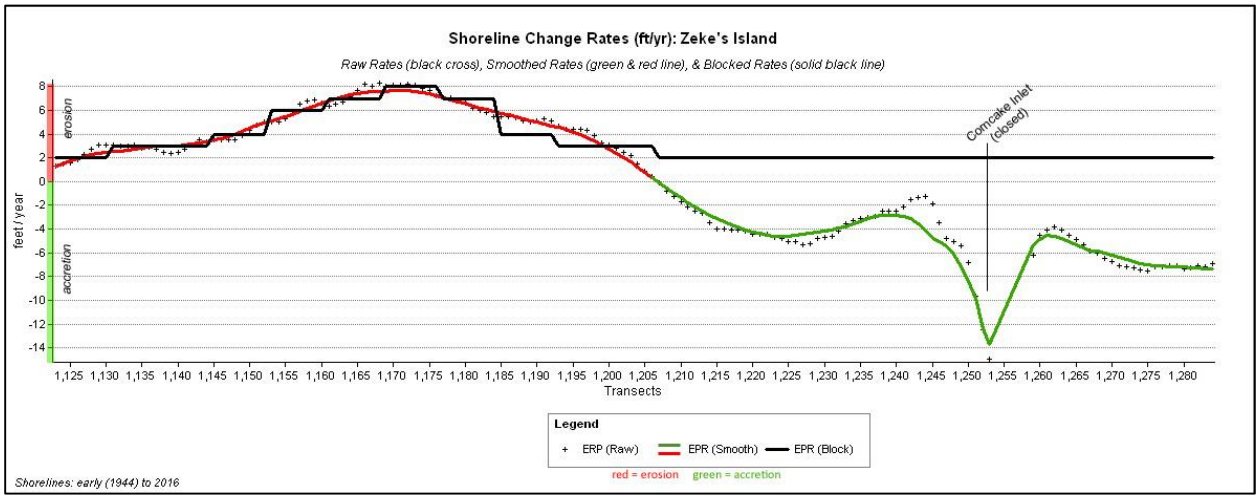


Figure 26. Zeke's Island (between Bald Head Island and Fort Fisher) shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

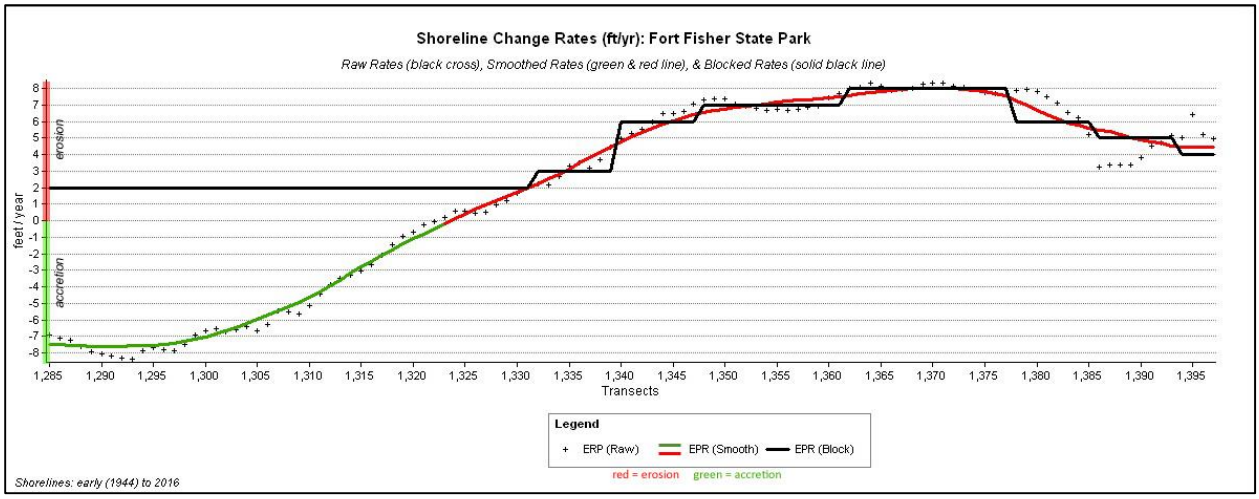


Figure 27. Fort Fisher State Park shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

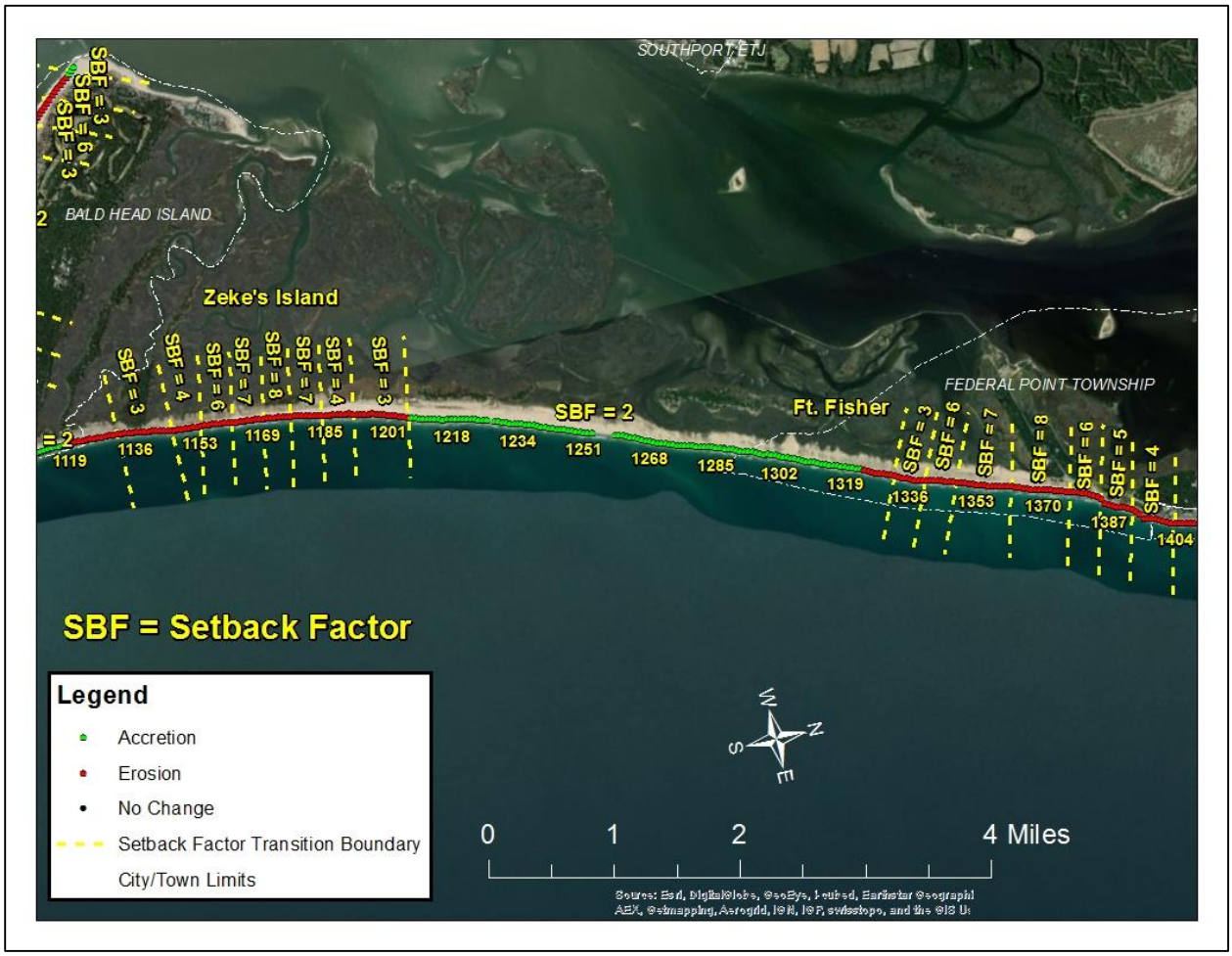


Figure 28. Zeke's Island and Fort Fisher State Park. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Kure Beach

Kure Beach is an east-facing beach with 2.9 miles of oceanfront shoreline where approximately one mile (35.1 percent) resulted in measured accretion, and the remaining 1.8 miles (63.8 percent) measured erosion (Figure 29). The highest rates at Kure beach are located adjacent to Fort Fisher State Park and the Town's limit where erosion rates peaked at 6.4 feet per year and resulted in a setback factor of four. Compared to the 2011 study, there was a slight decrease for a 500 feet section of shoreline near Fort Fisher State Park, while the remaining 2.8 miles of shoreline experienced no change in setback factor values (Figures 29 and 30).

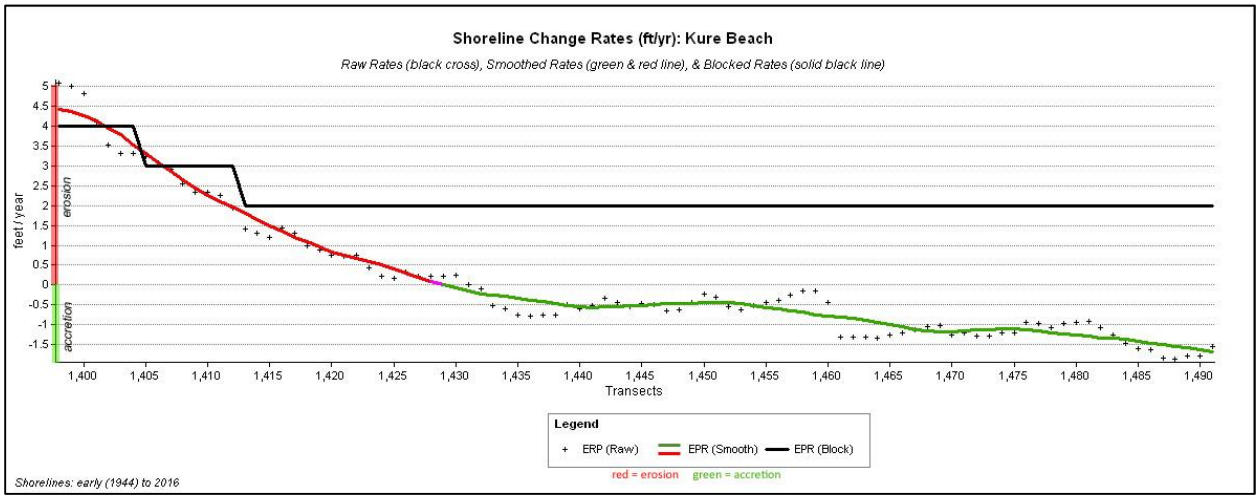


Figure 29. Kure Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

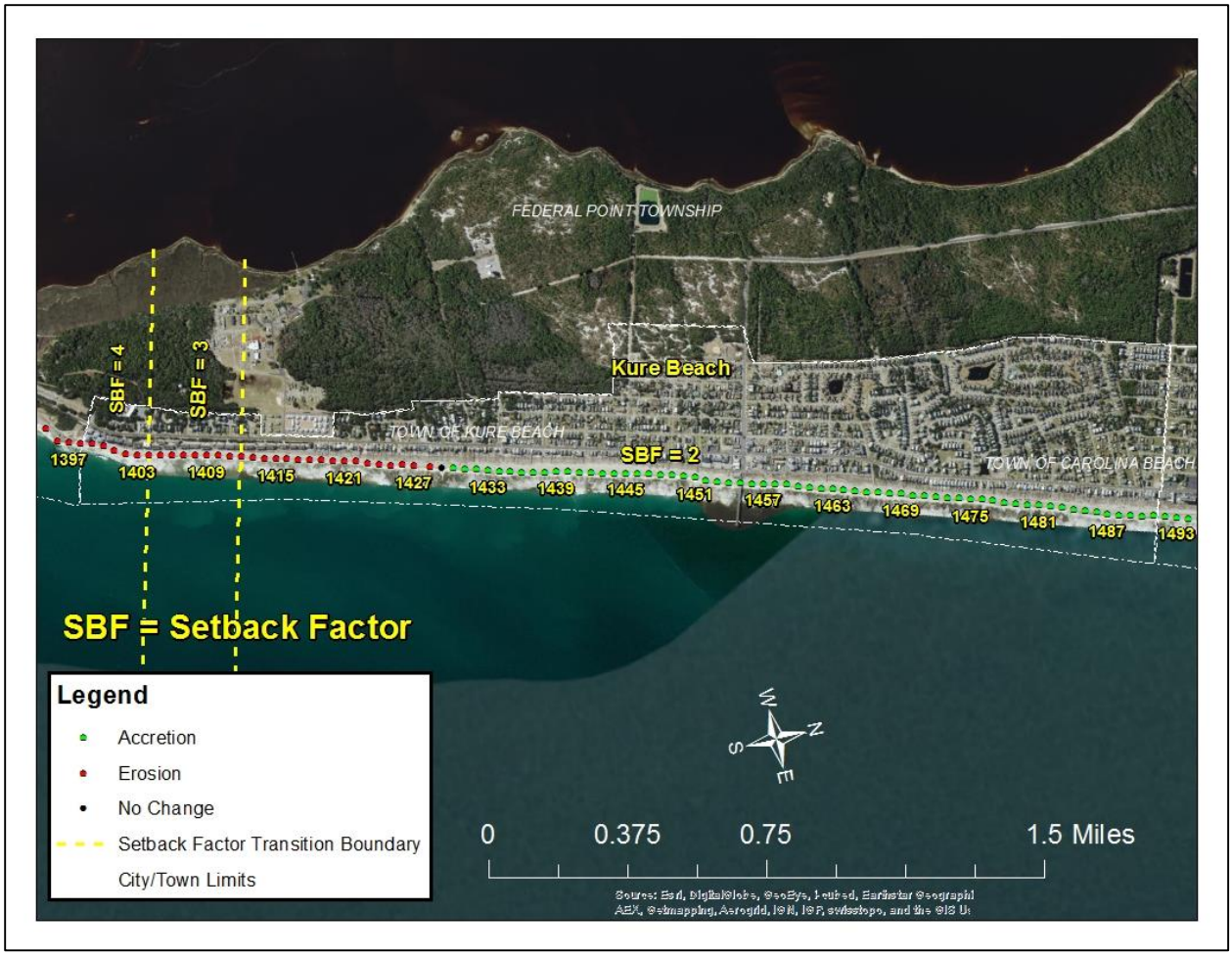


Figure 30. Kure Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Carolina Beach

Carolina Beach is and east-facing beach with approximately four miles of oceanfront shoreline where 2.5 miles (65.1 percent) resulted in measured accretion, while the remaining 1.3 miles (34.1 percent) resulted in measured erosion. The average blocked erosion rate at Carolina Beach is 2.5, however, for most of the developed shoreline, the setback factor is 2. (Figure 31 and 32).

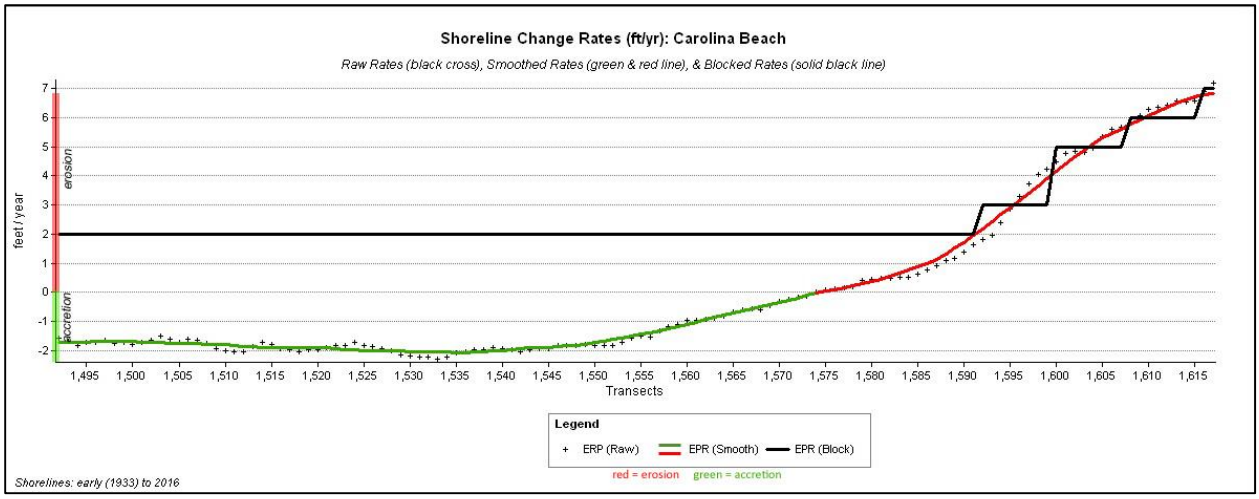


Figure 31. Carolina Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

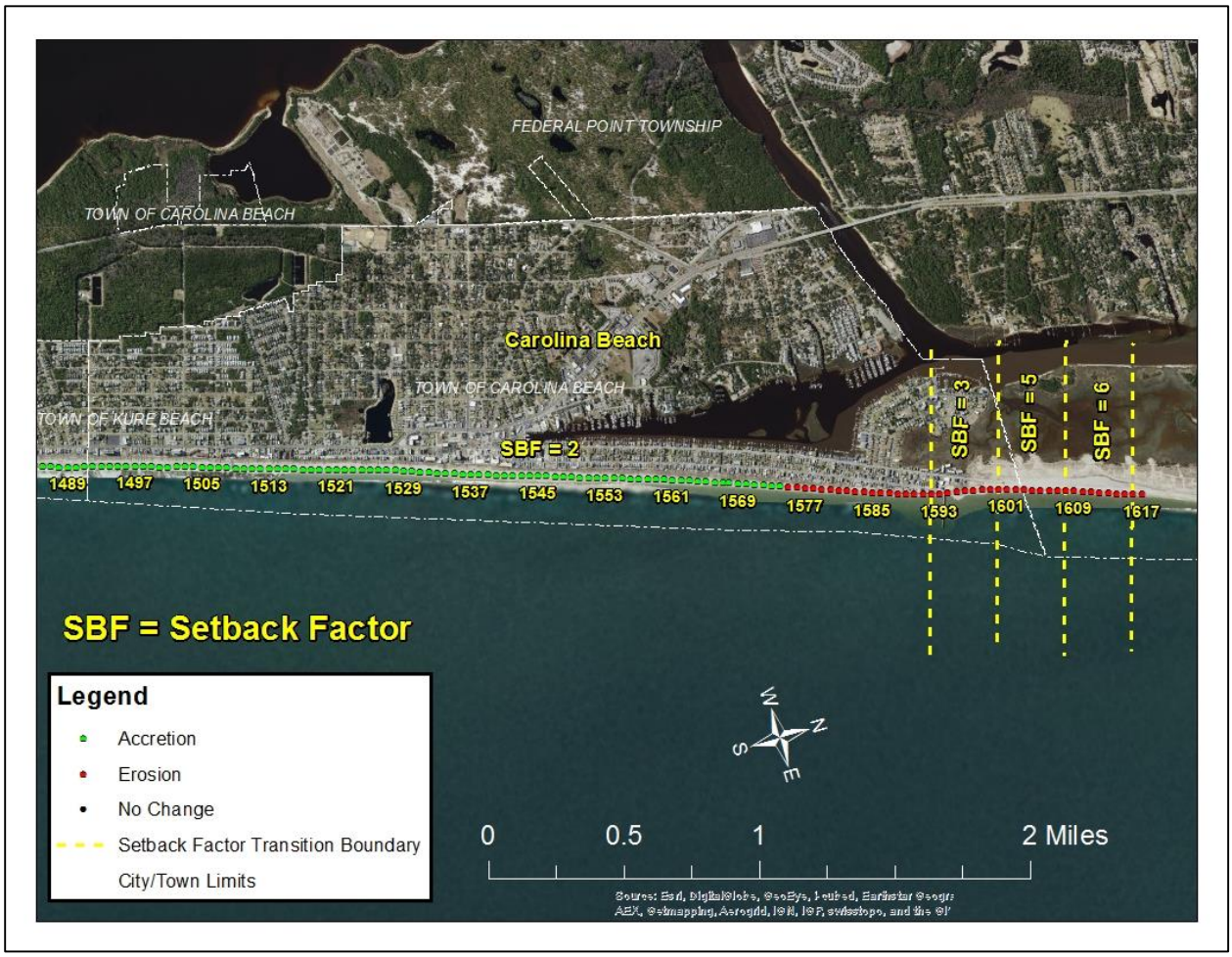


Figure 32. Carolina Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Masonboro Island

Masonboro Island is an undeveloped barrier island. Its oceanfront shoreline is east facing and extends 7.8 miles with Carolina Beach inlet on its southern end (left side on the graph) and Masonboro inlet on its northern flank (right side on the graph). Approximately 7.7 miles (98.4 percent) of its shoreline resulted in measured erosion, while the remaining 0.1 miles (1.6 percent) resulted in measured accretion. The area with measured accretion is adjacent to the rock navigation jetty at Masonboro inlet where the fillet is regularly maintained; thus, artificially reducing shoreline change. The average blocked erosion rate at Masonboro Island is 7.0 feet per year, the maximum is 14 feet per year, and the minimum is two feet per year (Figure 33 and 34). The highest erosion factor occurs on the end adjacent to Carolina Beach Inlet.

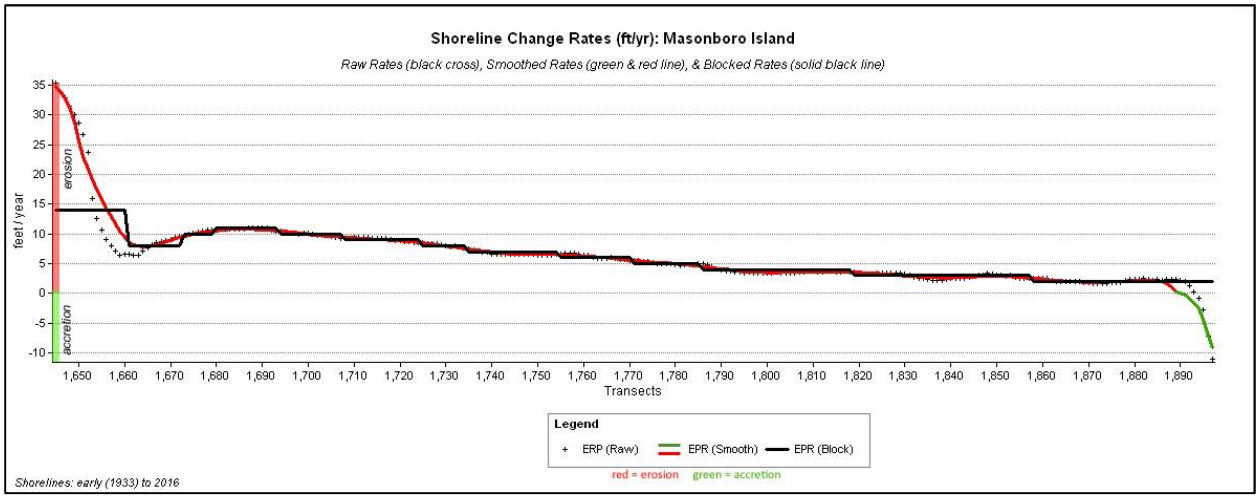


Figure 33. Masonboro Island Bird Island and Sunset Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

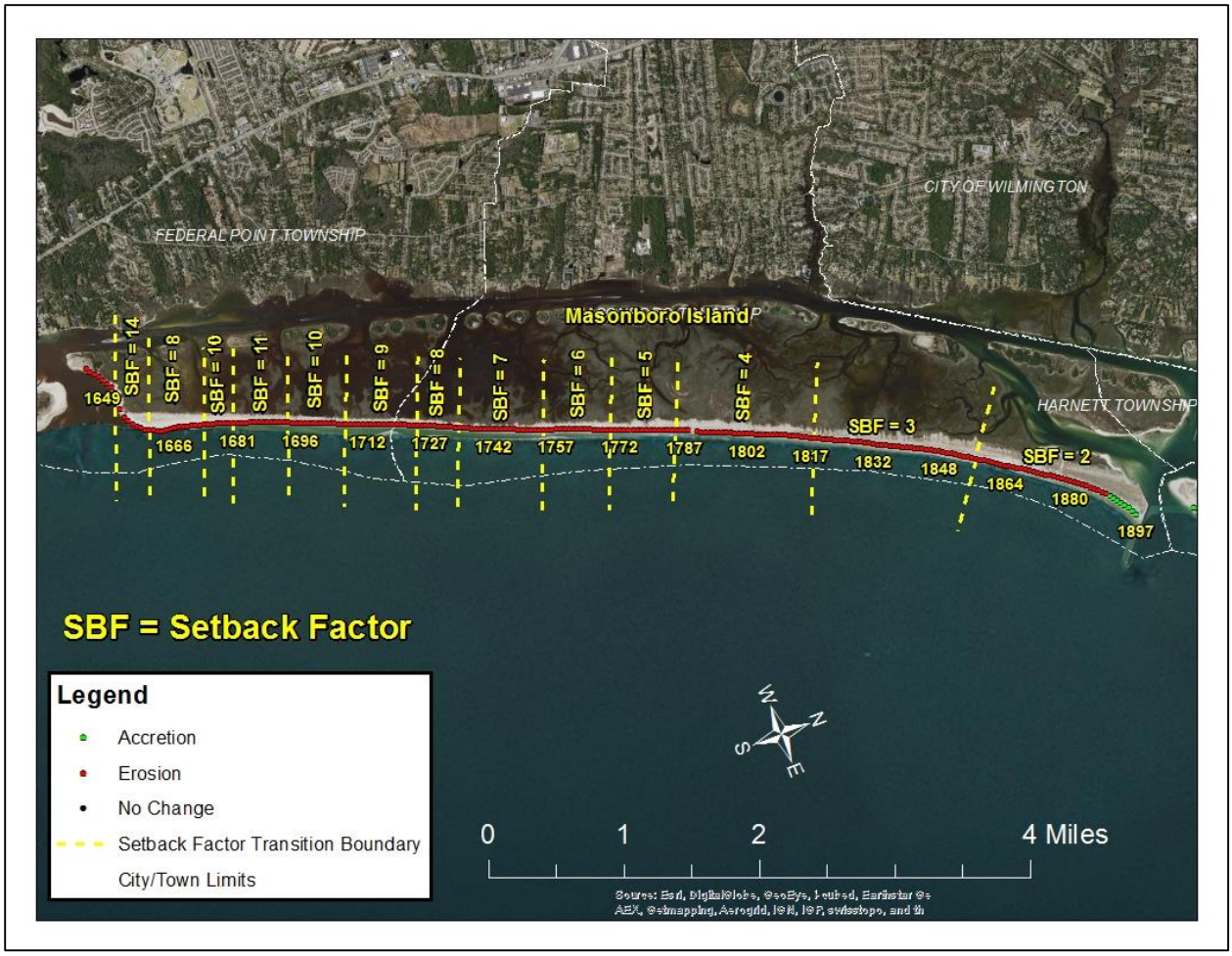


Figure 34. Masonboro Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Wrightsville Beach

Wrightsville Beach has approximately 4.5 miles of oceanfront shoreline, is east-facing, and flanked by two inlets (Masonboro and Mason). Masonboro Inlet is hardened with two rock navigational jetties (one on each side). Wrightsville Beach is routinely maintained as part of a USACE Storm Damage Reduction project. As a result, approximately 4.0 miles (95.6 percent) of its shoreline resulted in measured accretion, while the remaining 0.1 miles (2.2 percent) resulted in measured erosion. The average, maximum, and minimum blocked erosion rate at Wrightsville Beach is two feet per year (Figure 35 and 36). There is a data gap because the early shoreline reflects a time (1933) when Moore's Inlet was open.

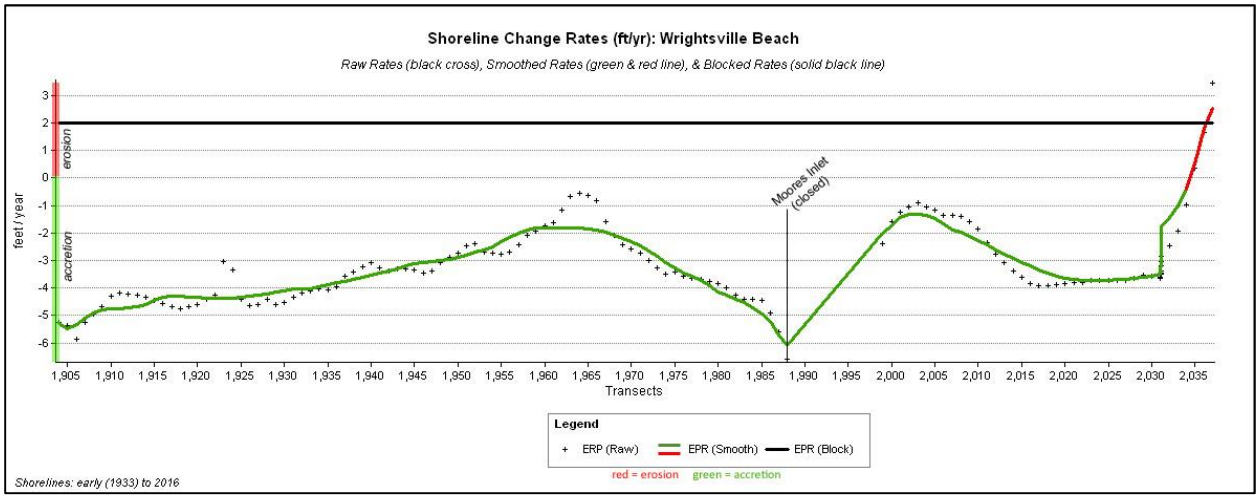


Figure 35. Wrightsville Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

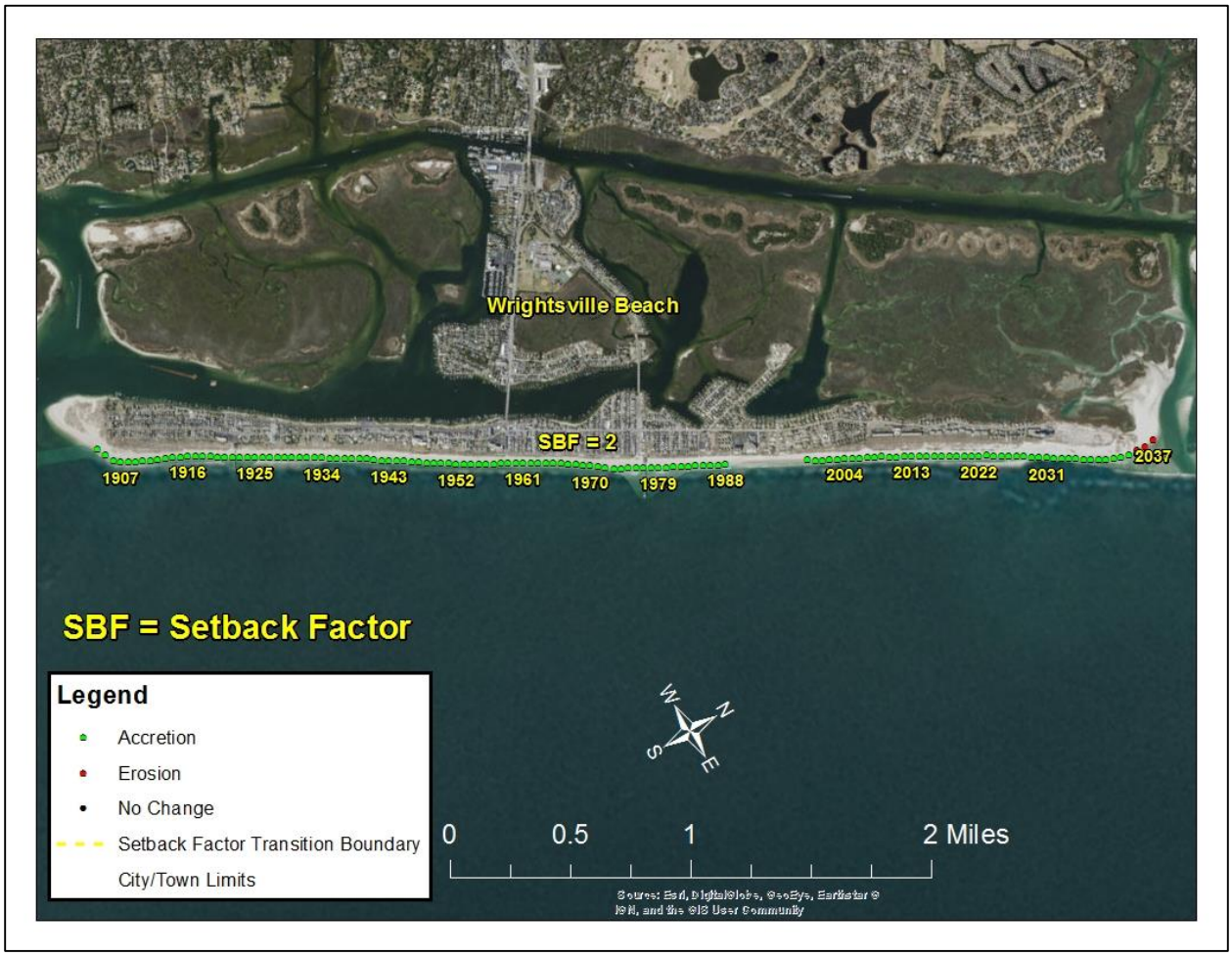


Figure 36. Wrightsville Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Figure Eight Island

Figure Eight Island has approximately 3.6 miles of oceanfront shoreline, is east facing, and flanked by two inlets (Mason and Rich). Approximately 3.6 miles (100 percent) of its shoreline resulted in measured accretion. Erosion was minimized, and accretion measured high as a direct result of beach nourishment. The setback factor for all of Figure Eight Island's oceanfront is two feet per year (Figure 37 and 38).

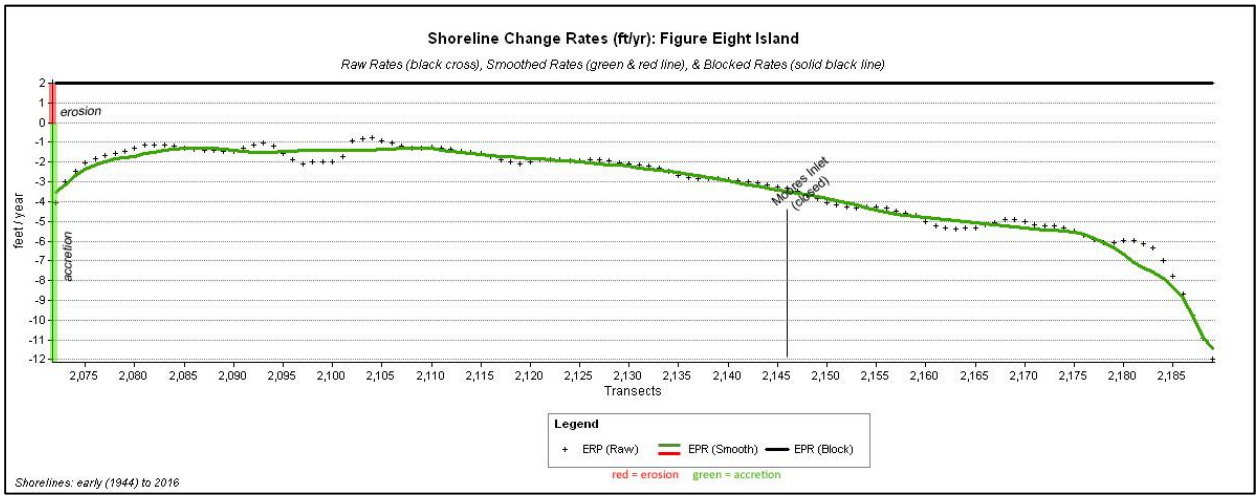


Figure 37. Figure Eight Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

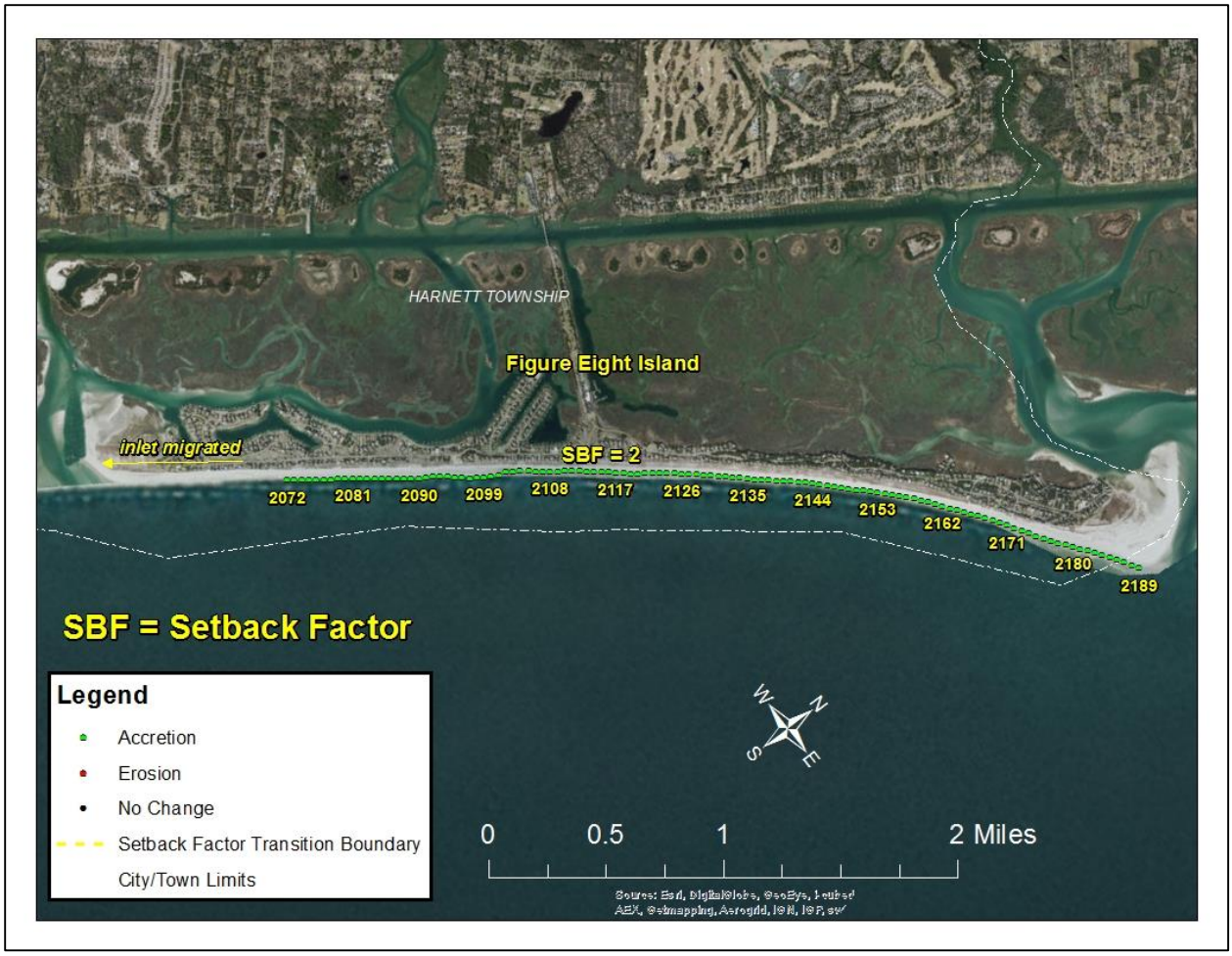


Figure 38. Figure Eight Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Lea-Hutaff Island

Lea-Hutaff Island has approximately 3.6 miles of oceanfront shoreline, is east-facing, and flanked by two inlets (Rich and New Topsail). Nearly all its oceanfront shoreline, 3.2 miles (89 percent) resulted in measured erosion characterized as eroding based on results, while the remaining 0.8 miles (22 percent) contains a data gap because of the closure of Old Topsail Inlet, which once separated Lea and Hutaff Islands. The average blocked erosion rate is 9.0 feet per year, the maximum is 10.0 feet per year near New Topsail Inlet (Figure 39 and 40).

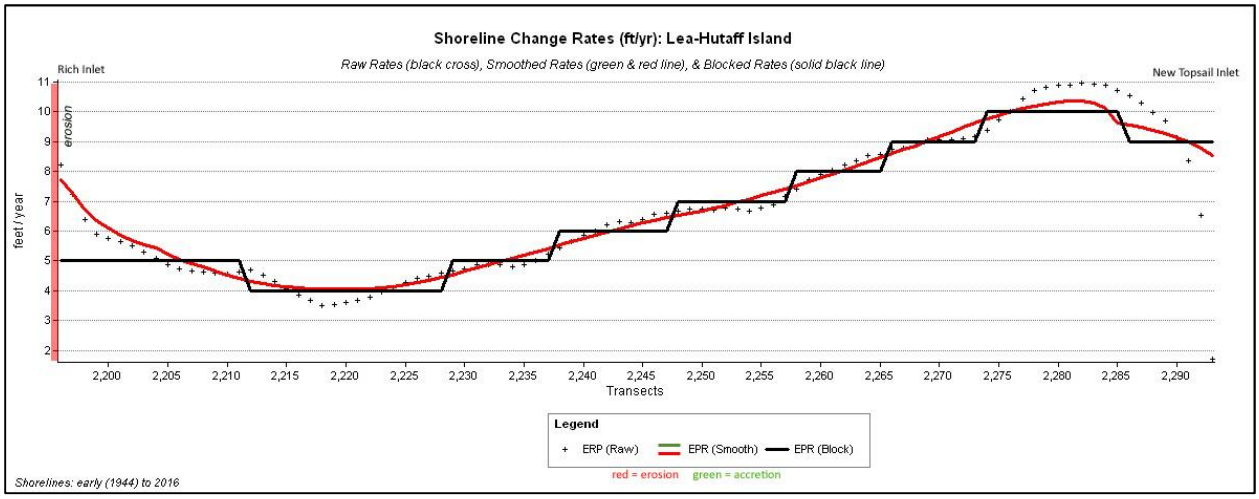


Figure 39. Lea-Hutaff Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

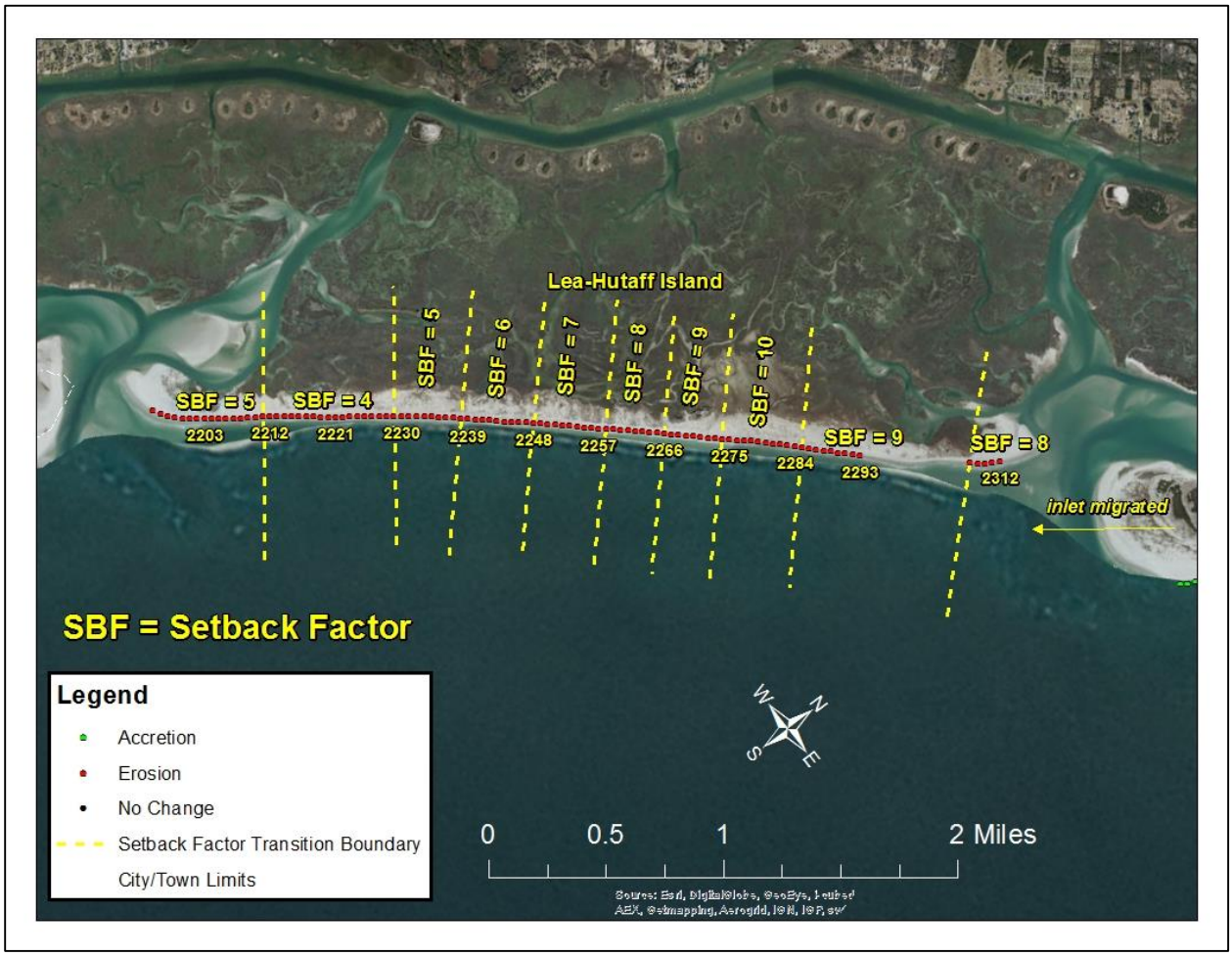


Figure 40. Figure Eight Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Topsail Beach

Topsail Island has approximately 22 miles of oceanfront shoreline and is an east-facing barrier island flanked by two inlets (New Topsail and New River). Topsail Beach makes up 28.1 percent (4.8 miles) of its shoreline, Surf City 27.3 percent (6.0 miles), and North Topsail Beach 50.1 percent (11.1 miles).

Approximately 3.9 miles (85.1 percent) of Topsail Beach's ocean shoreline resulted in measured accretion, while 0.5 mile (12.2 percent) resulted in measured erosion. The Town's most recent large-scale beach nourishment project was completed in 2011, which likely reduced actual erosion and increased accretion rates. The average shoreline change rate is 3.6 feet per year (accretion), and the blocked shoreline change rate (Setback Factor) is two feet per year (Figure 41 and 42).

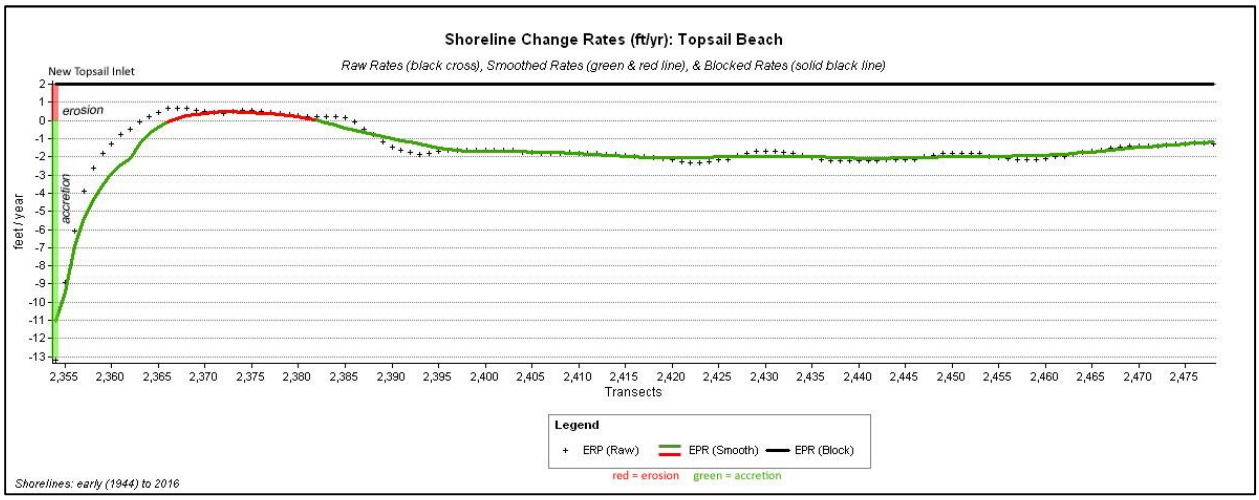


Figure 41. Topsail Beach. shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

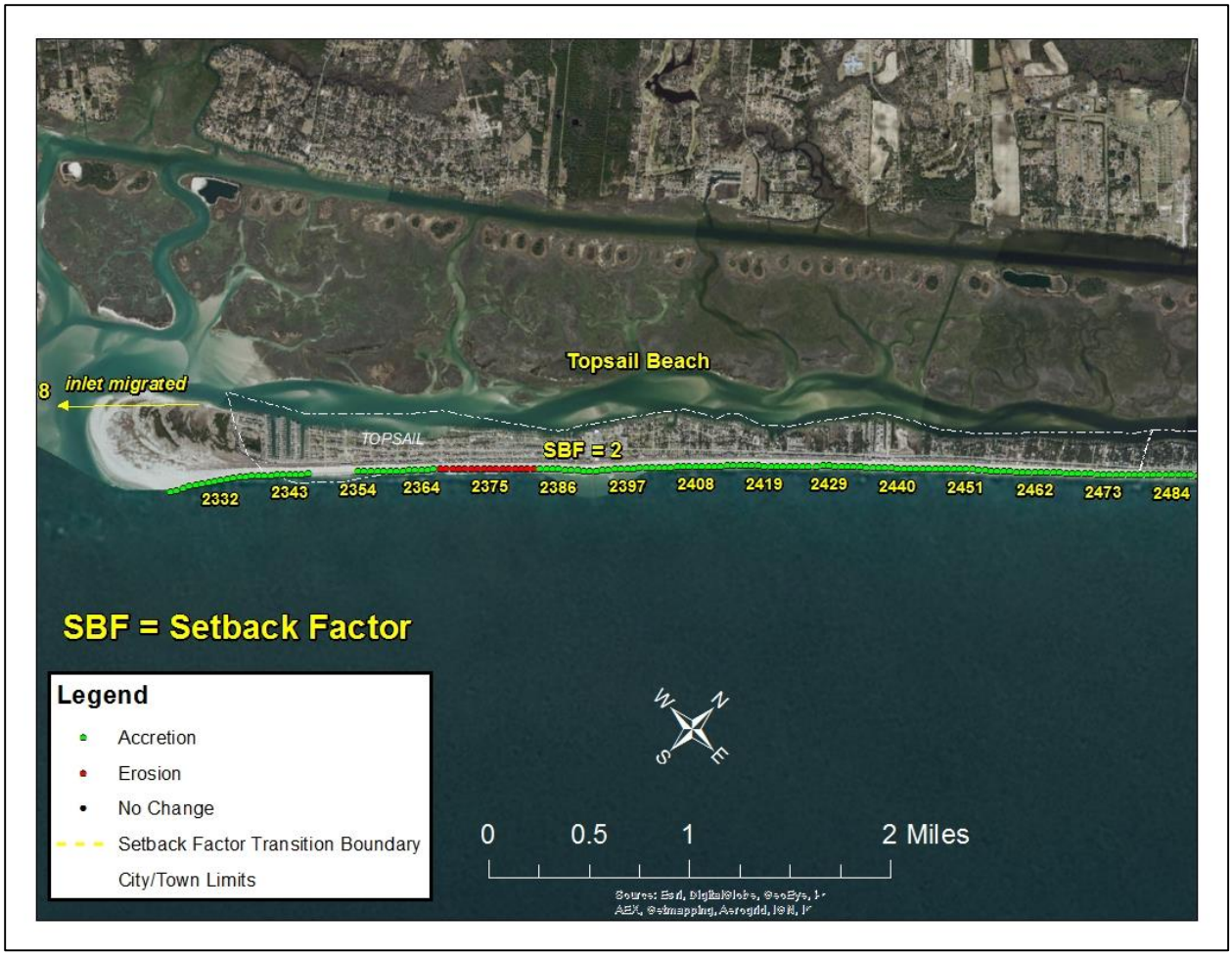


Figure 42. Topsail Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Surf City

At Surf City, approximately 4.9 miles (82.3 percent) of its shoreline resulted in measured accretion, while 0.9 mile (15.1 percent) resulted in measured erosion. The average shoreline change rate is less than 1 foot per year (accretion), and the blocked shoreline change rate (Setback Factor) is two feet per year (Figure 43 and 44).

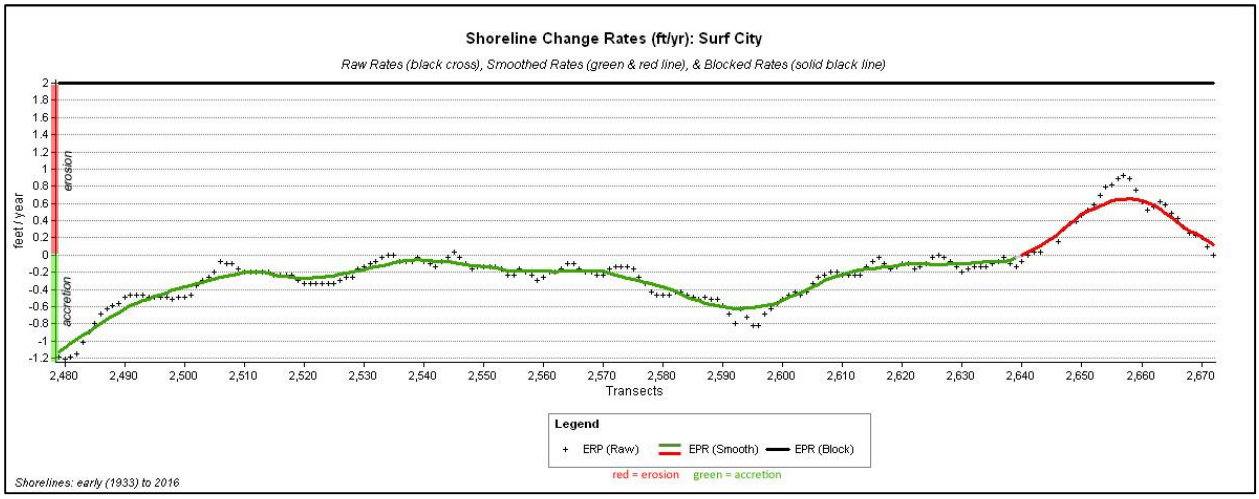


Figure 43. Surf City shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

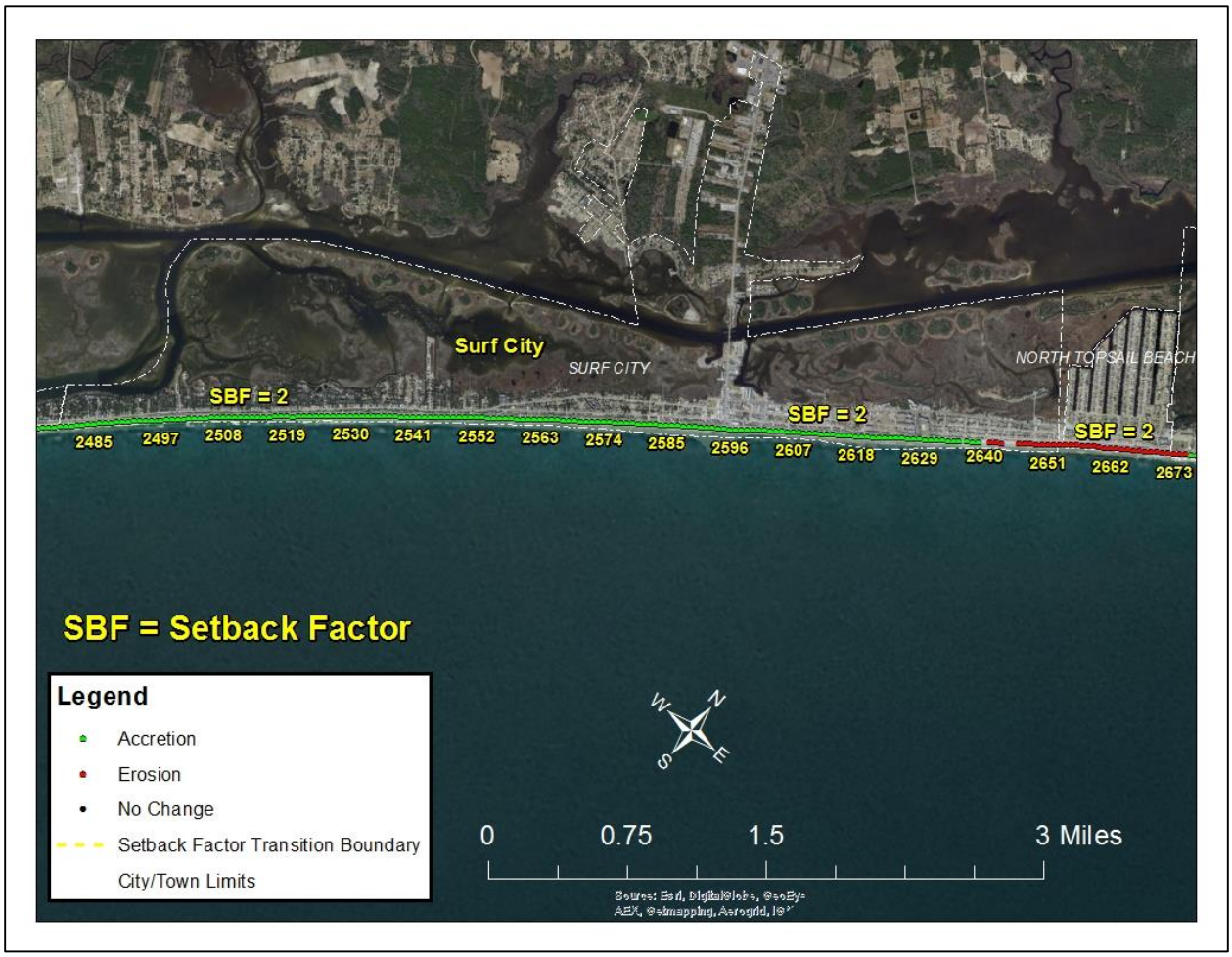


Figure 44. Surf City. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

North Topsail Beach

At North Topsail Beach, approximately 9.3 miles (83.8 percent) of its shoreline resulted in measured erosion, while 1.7 miles (15.4 percent) resulted in measured accretion. The average shoreline change rate is 1.1 feet per year (erosion), and most of the Town's shoreline (7.4 miles) resulted in a blocked shoreline change rate (setback factor) equal to 2.0 feet per year, and a setback factor equal to 3 for a segment of shoreline nearing New River Inlet (Figure 45 and 46). The area adjacent to New River Inlet has experienced the highest erosion, however, the setback factor is equal to 2 feet per year because existing rules (15A NCAC 07H.0304) require that the setback factor immediately adjacent to an Inlet Hazard Area (IHA) be applied throughout the IHA.

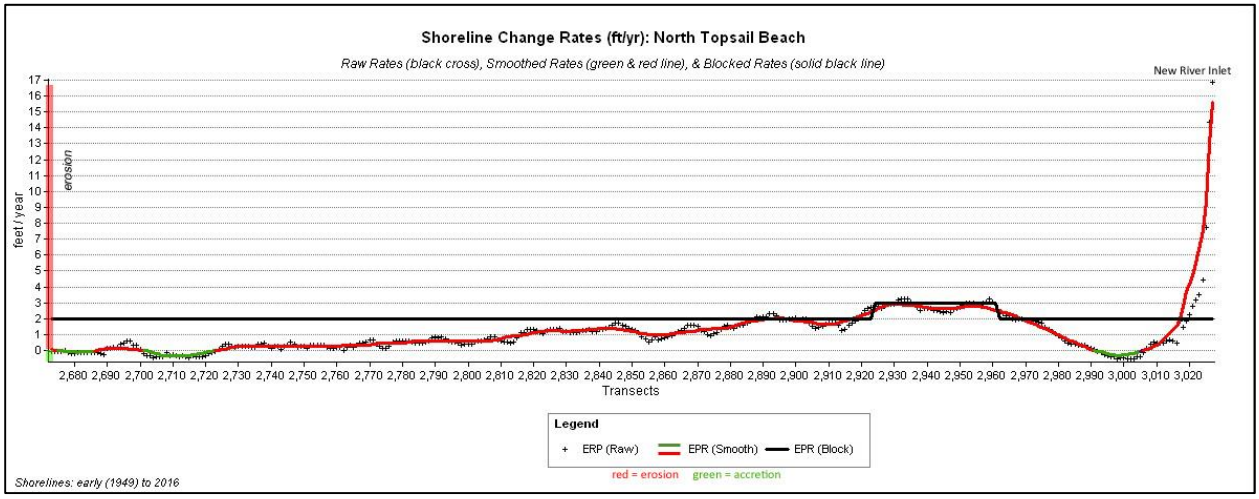


Figure 45. North Topsail Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

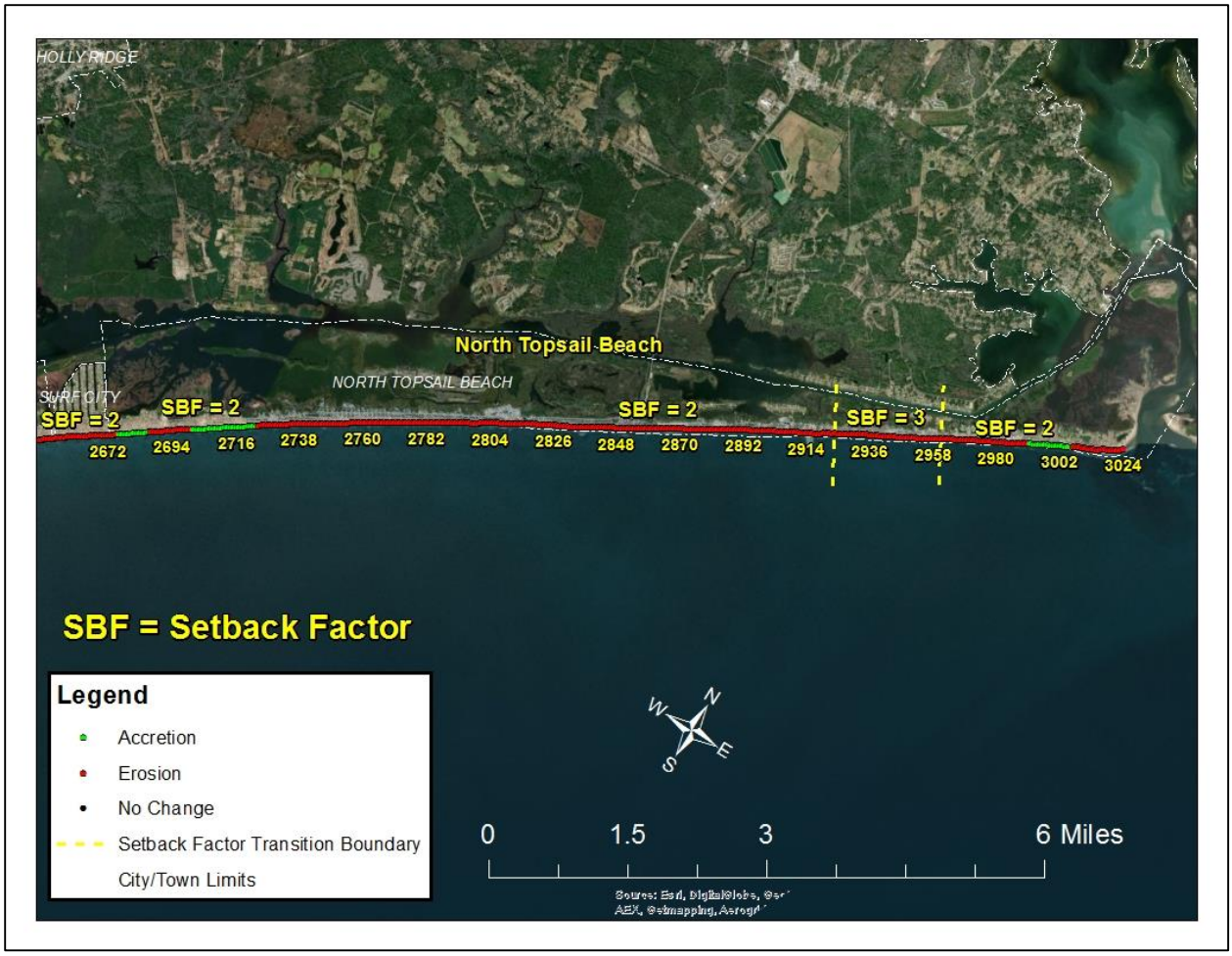


Figure 46. North Topsail Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Onslow Beach

Onslow Beach has approximately 7.3 miles of oceanfront shoreline and is east-facing. Approximately 6.1 miles (83.5 percent) of its shoreline resulted in measured erosion, while 0.8 miles (11.4 percent) resulted in measured accretion. The average blocked erosion rate is 5 feet per year, the maximum is 11 feet per year, and the minimum is two feet per year (Figure 47 and 48). Rates for Onslow Beach were calculated using a 2017 shoreline, and not 2016, because there was a data gap in the 2016 shoreline.

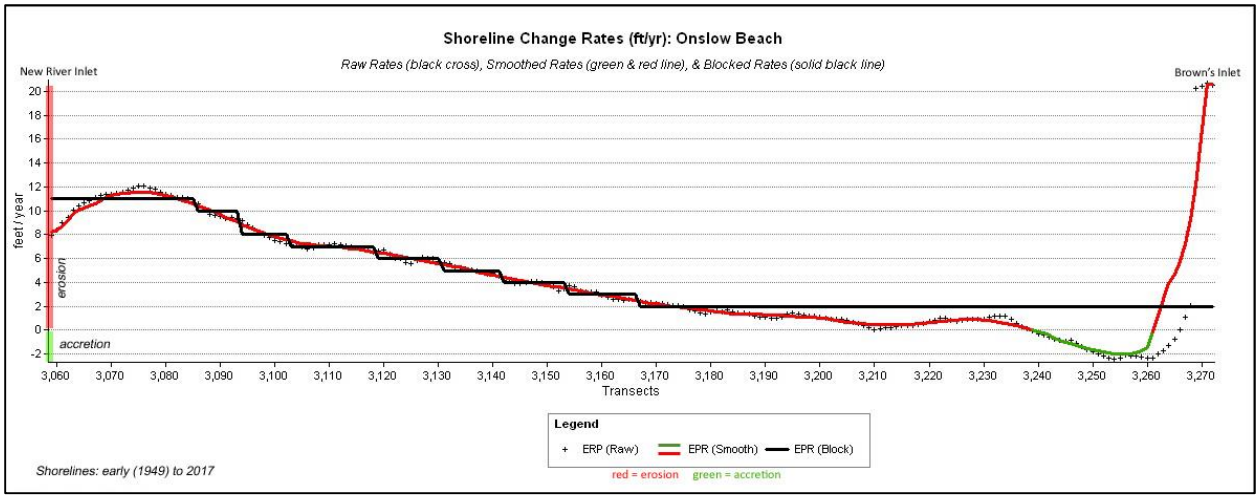


Figure 47. Onslow Beach shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

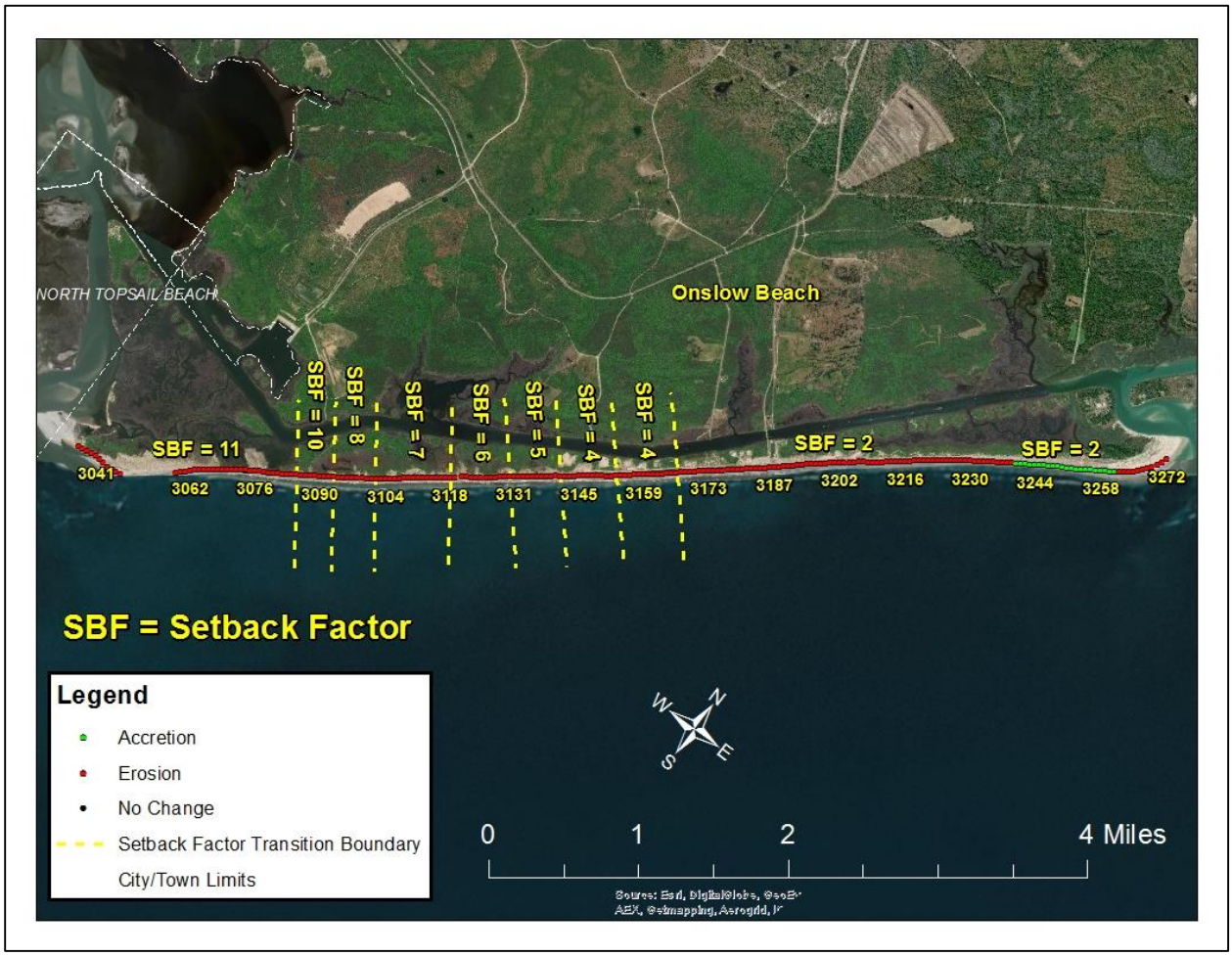


Figure 48. Onslow Beach. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Brown's Island

Brown's Island is an undeveloped barrier island and marks the transition point, moving up the coast from Cape Fear to Cape Lookout, where the beach begins facing a southerly direction. This island's oceanfront shoreline is approximately 3.3 miles long, with approximately 3.1 miles (94.3 percent) of shoreline with measured erosion, while 0.1 mile (3.8 percent) resulted in measured accretion. The average shoreline change rate is 3.5 feet per year (erosion), and blocked shoreline change rate (setback factor) is 4.0 feet per year (Figure 49 and 50).

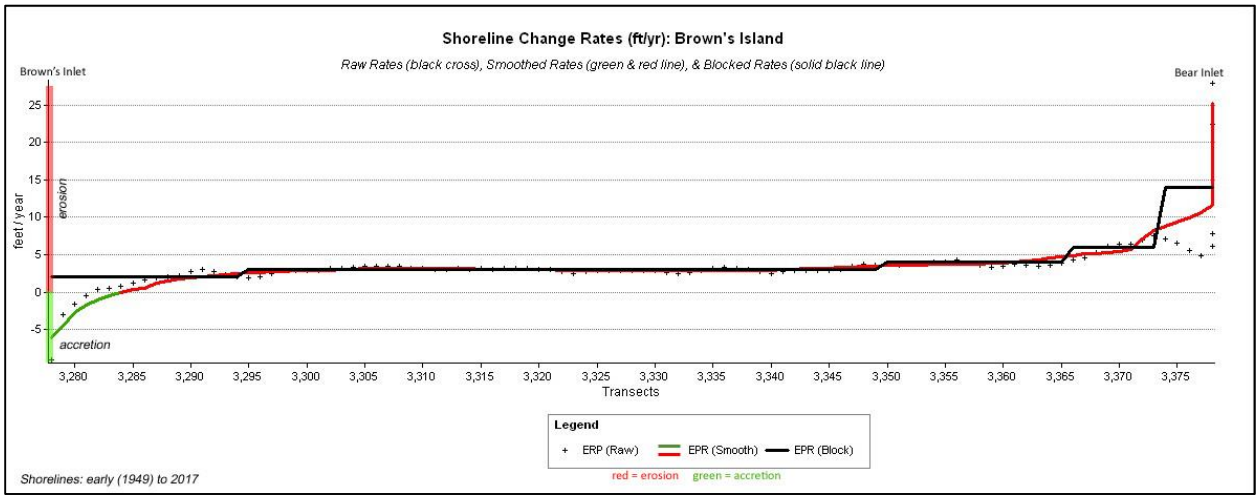


Figure 49. Brown's Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

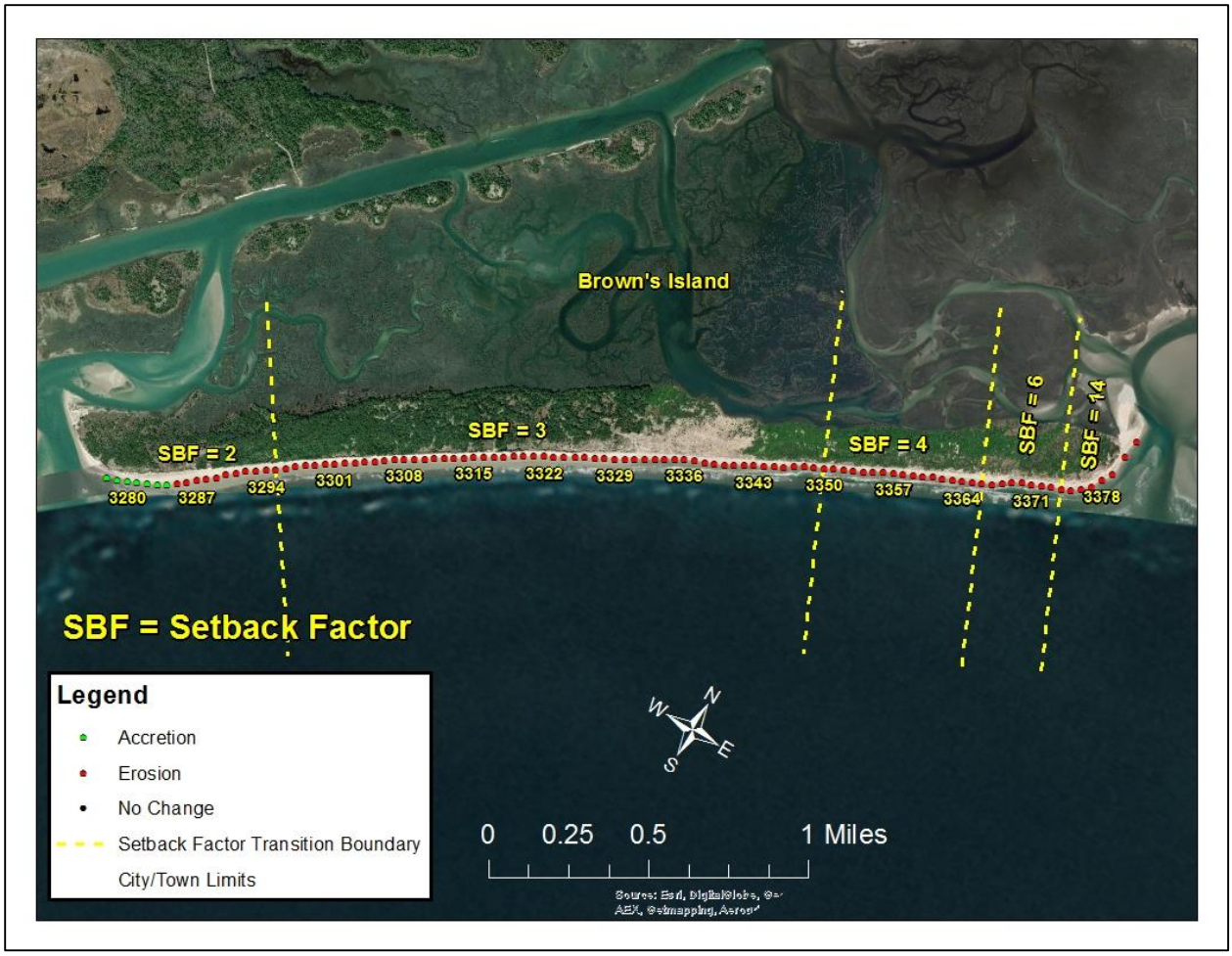


Figure 50. Brown's Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Bear Island (Hammocks Beach State Park

Bear Island (Hammocks Beach State Park) is an undeveloped south facing barrier island with approximately 3.0 miles of oceanfront shoreline. Approximately 2.4 miles (78.6 percent) of its shoreline resulted in measured erosion, while 0.6 of a mile (21.4 percent) resulted in measured accretion. The average shoreline change rate is less than 1 foot per year (accretion), and the blocked shoreline change rate (setback factor) is 3 feet per year, the maximum is 4.5 feet per year, and the minimum is two feet per year (Figure 51 and 52).

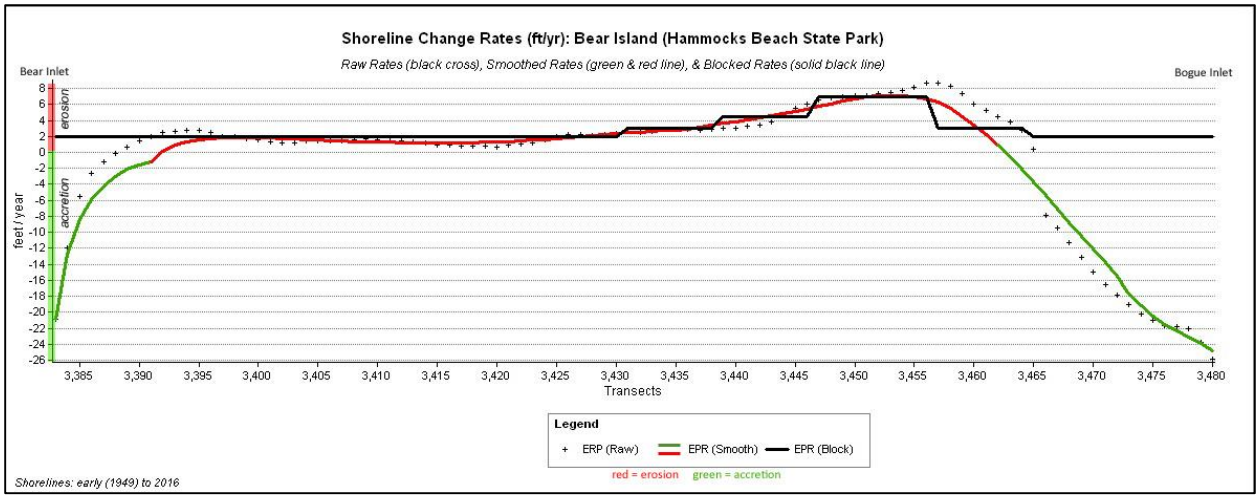


Figure 51. Bear Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

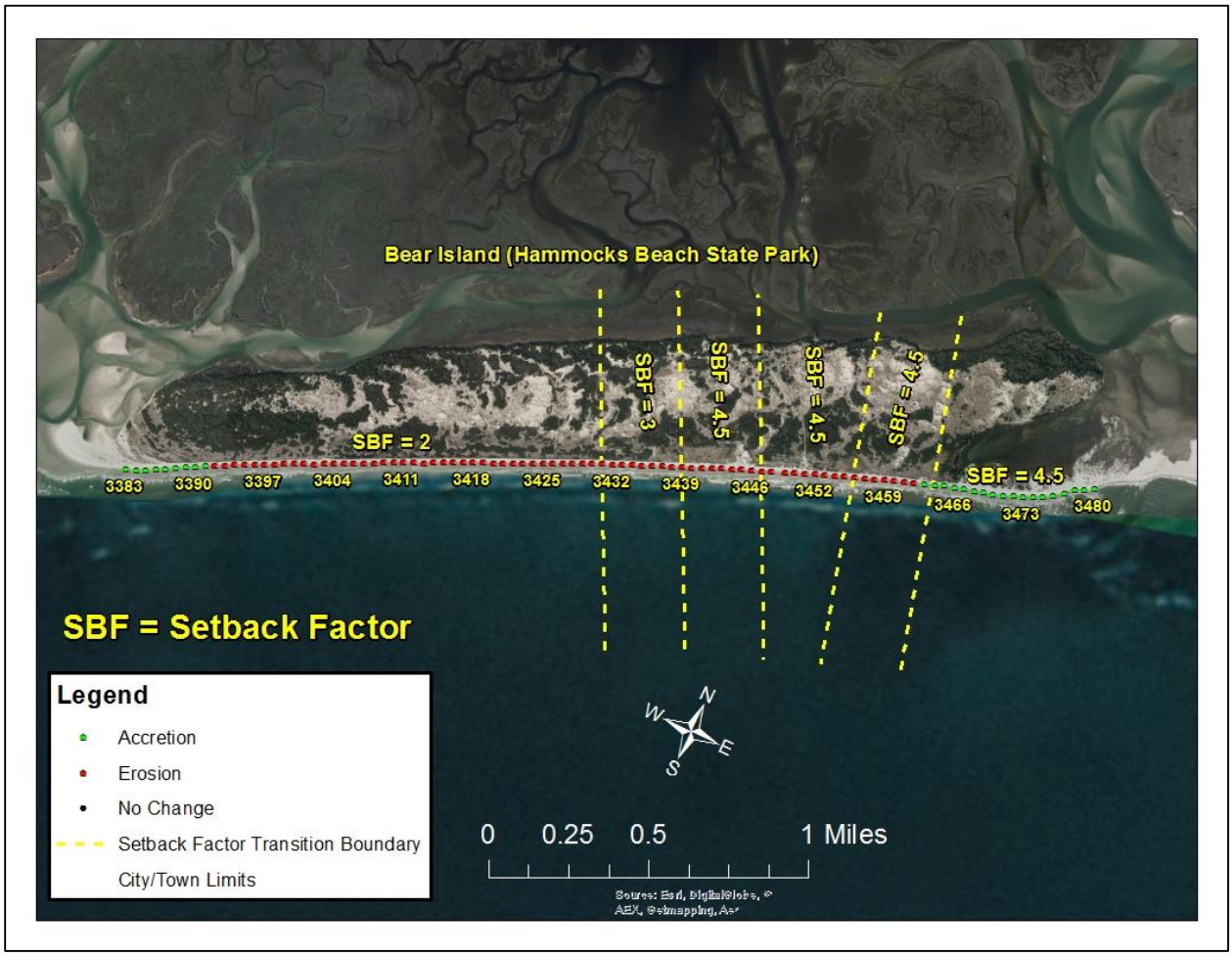


Figure 52. Bear Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Emerald Isle

Bogue Banks is a south-facing barrier island with nearly 25 miles of oceanfront shoreline and is comprised of five townships and a state park. Emerald Isle makes up approximately 11.2 miles (49 percent) of its shoreline, Indian Beach 1.7 miles (approximately 7 percent), Salter Path 0.8-mile, Pine Knoll Shores 4.8 miles (19.2 percent), and Atlantic Beach and Fort Macon State Park 6.1 miles (24.4 percent). It is also flanked by two inlets (Bogue and Beaufort).

At Emerald Isle, approximately 7.7 miles (69.1 percent) of its ocean shoreline resulted in measured accretion, while 3.4 miles (30.1 percent) resulted in measured erosion. The average shoreline change rate is 0.3 feet per year (accretion), the blocked shoreline change rate (setback factor) is 2.0 feet per year for all Emerald Isle's oceanfront (Figure 53 and 54).

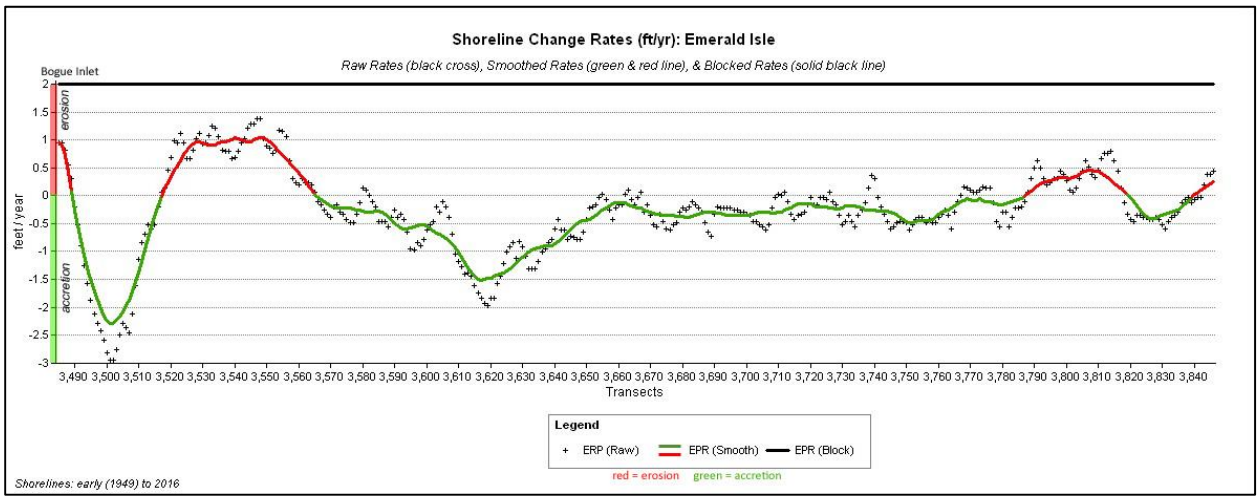


Figure 53. Emerald Isle shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

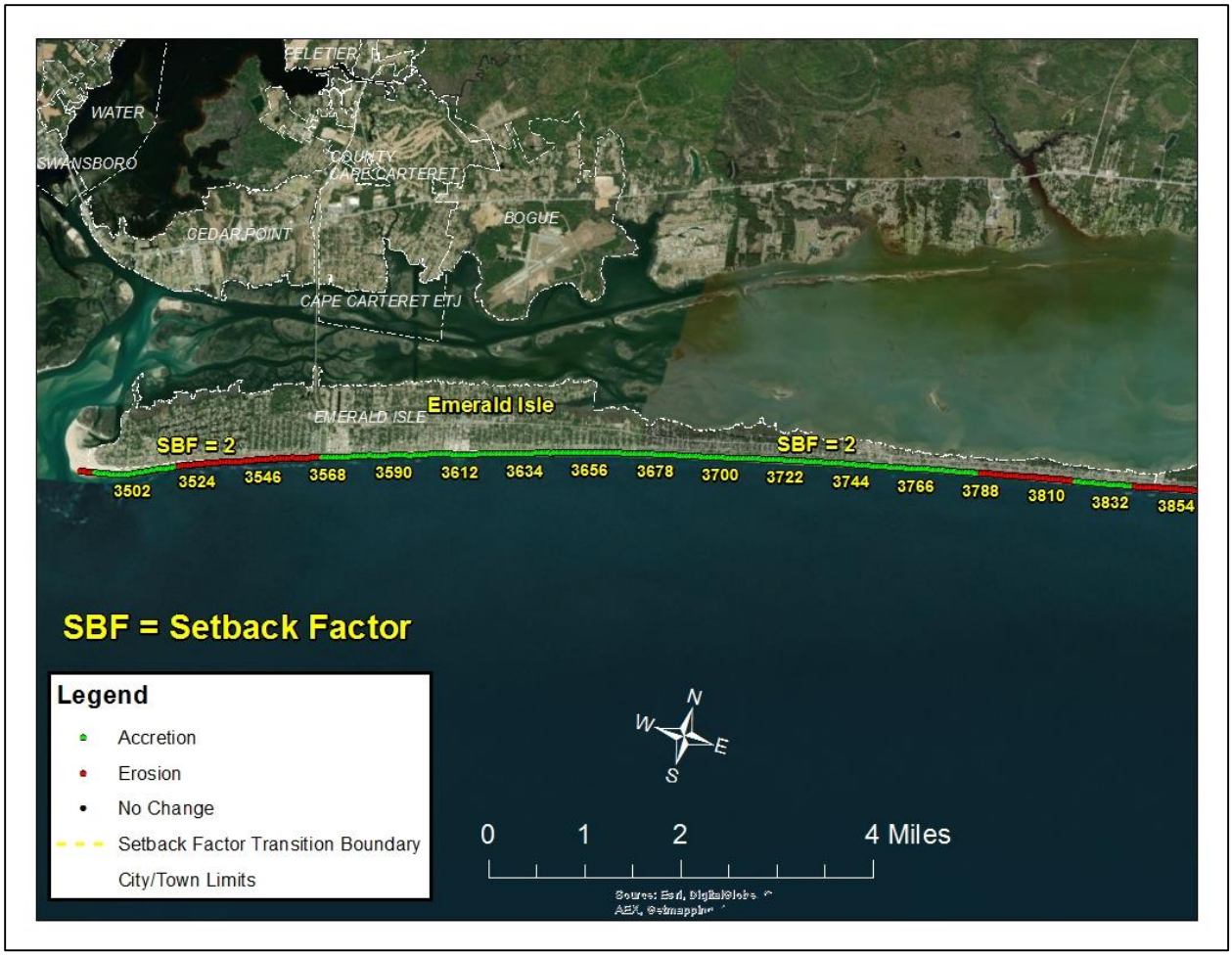


Figure 54. Emerald Isle. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Indian Beach & Salter Path

At Indian Beach, approximately 1.7 miles (100 percent) of its shoreline resulted in measured erosion, while no accretion was measured. Although erosion was measured, the average is less than 1 foot per year, and the blocked shoreline change rate (setback factor) is 2 feet per year for all Indian Beach (Figure 55 and 56).

At Salter Path, approximately 100 percent (0.8 mile) of its shoreline resulted in measured erosion (less than two feet per year). The average blocked shoreline change rate is two feet per year (Figure 55 and 56).

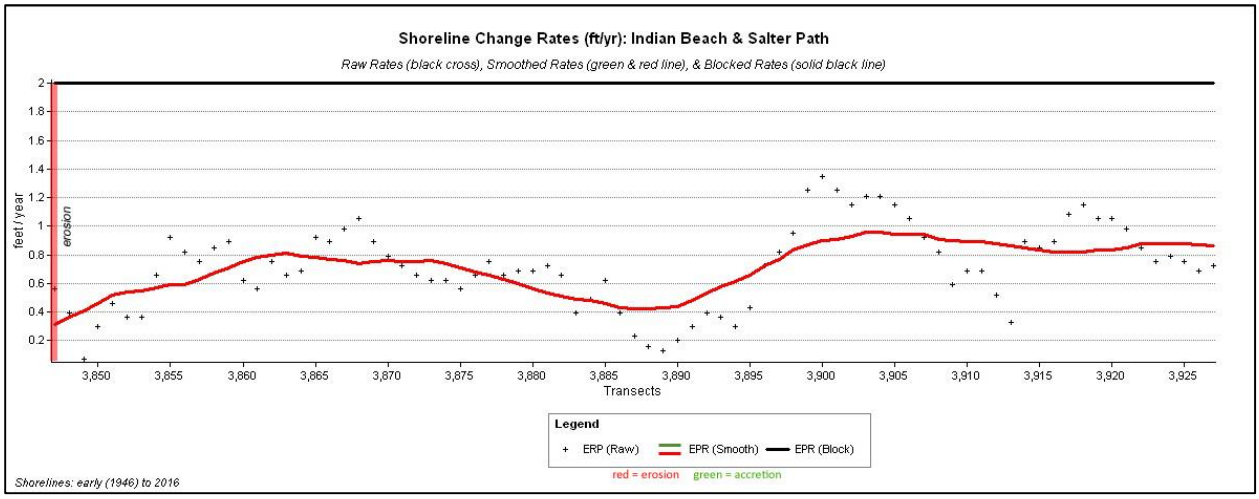


Figure 55. Indian Beach and Salter Path shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

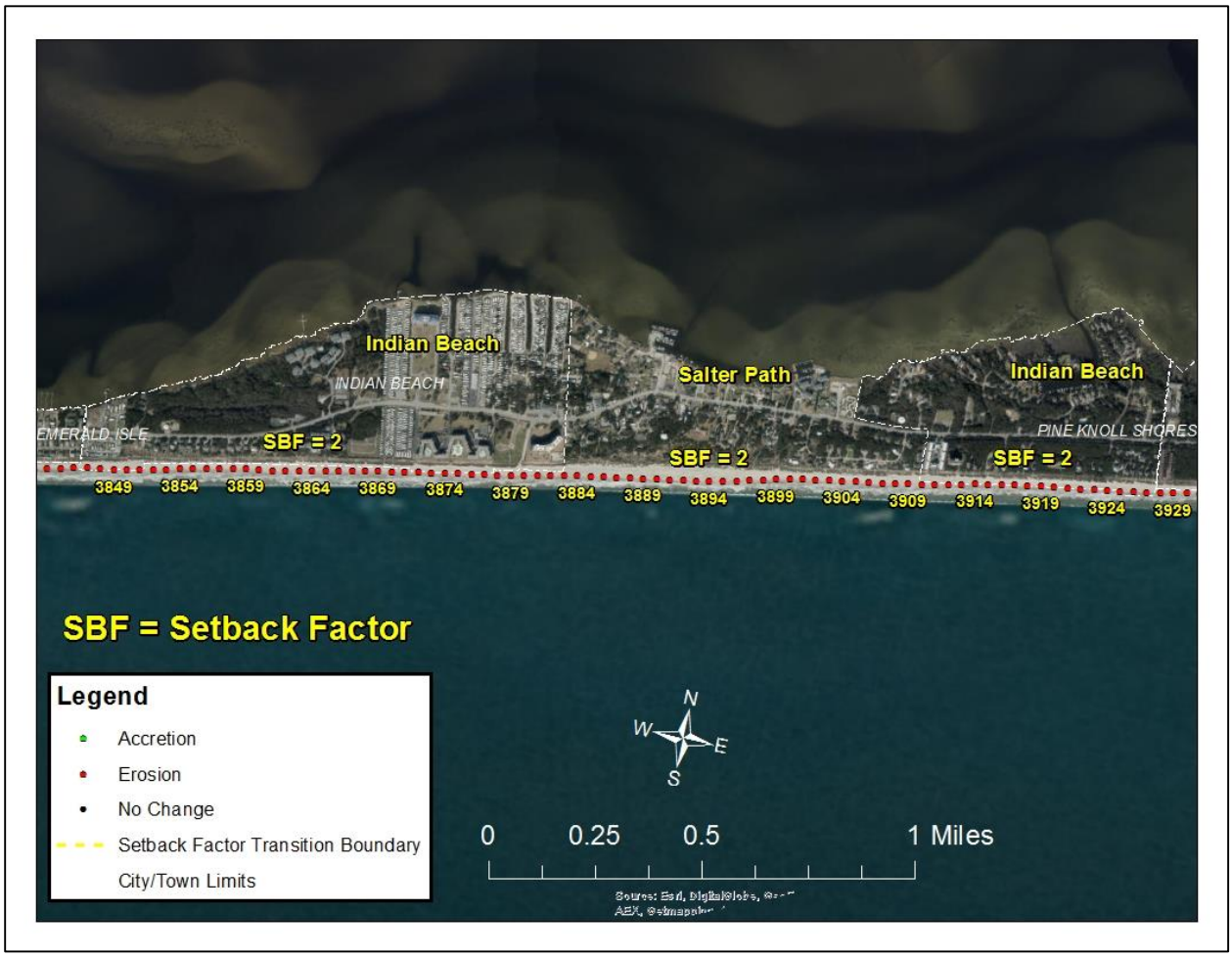


Figure 56. Indian Beach and Salter Path. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Pine Knoll Shores

At Pine Knoll Shores, approximately 3.5 miles (72.9 percent) of its shoreline resulted in measured erosion, while 1.1 miles (23.9 percent) resulted in measured accretion. The average shoreline change rate is less than 1 foot per year (erosion), and the blocked shoreline change rate is two feet per year (Figure 27).

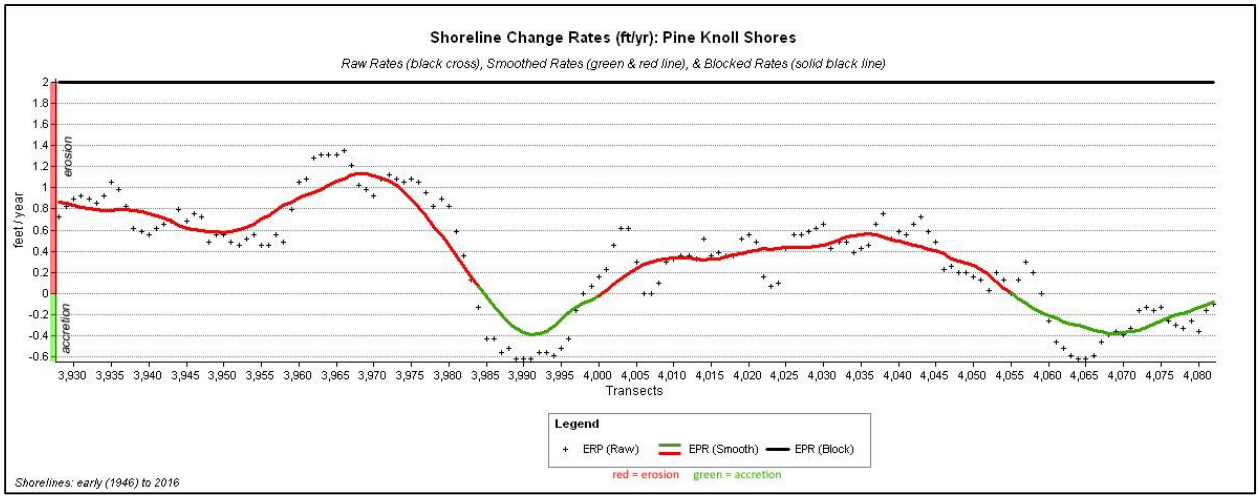


Figure 57. Pine Knoll Shores shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

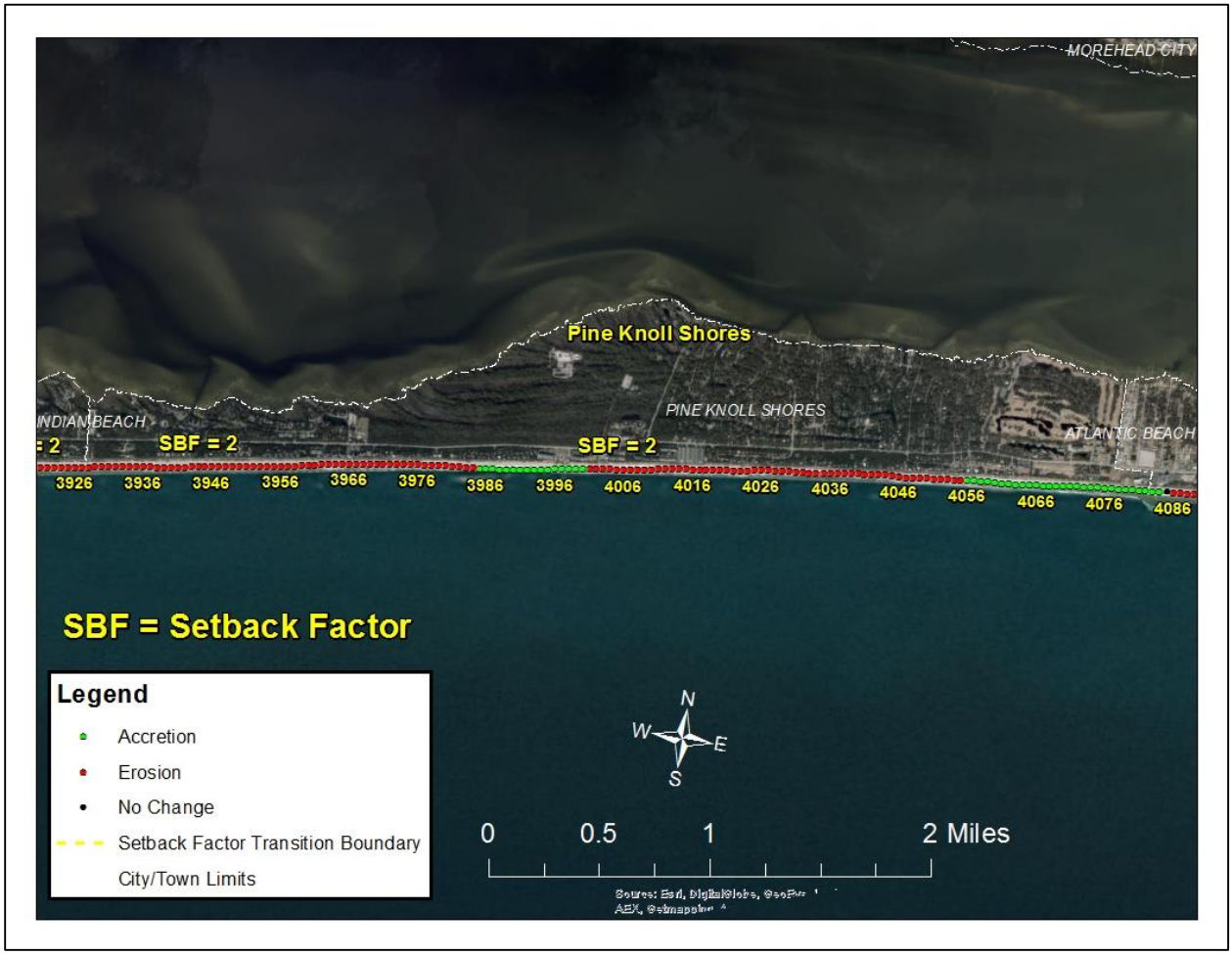


Figure 58. Pine Knoll Shores. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Atlantic Beach and Fort Macon State Park

At Atlantic Beach and Fort Macon, approximately 5.1 miles (84.2 percent) of its shoreline resulted in measured accretion, while 0.9 miles (15.3 percent) resulted in measured erosion. Both shorelines receive regular beach fill because of maintaining Morehead City Port channel (Beaufort Inlet), which significantly reduces erosion rates and artificially increased accretion. blocked shoreline change rate (setback factor) is two feet per year for all Atlantic Beach and Fort Macon (Figure 27).

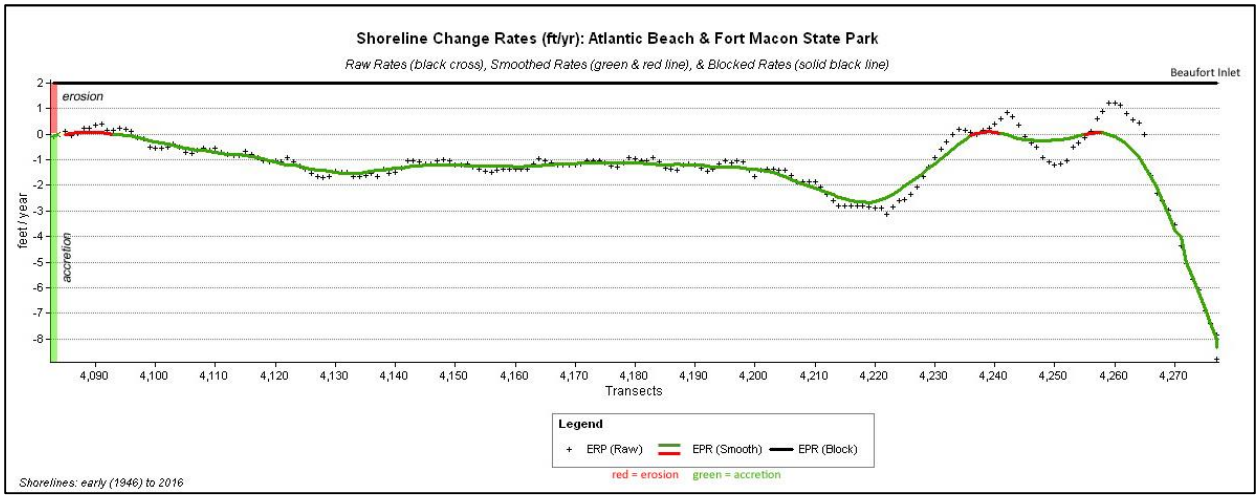


Figure 59. Atlantic Beach and Fort Macon State Park shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

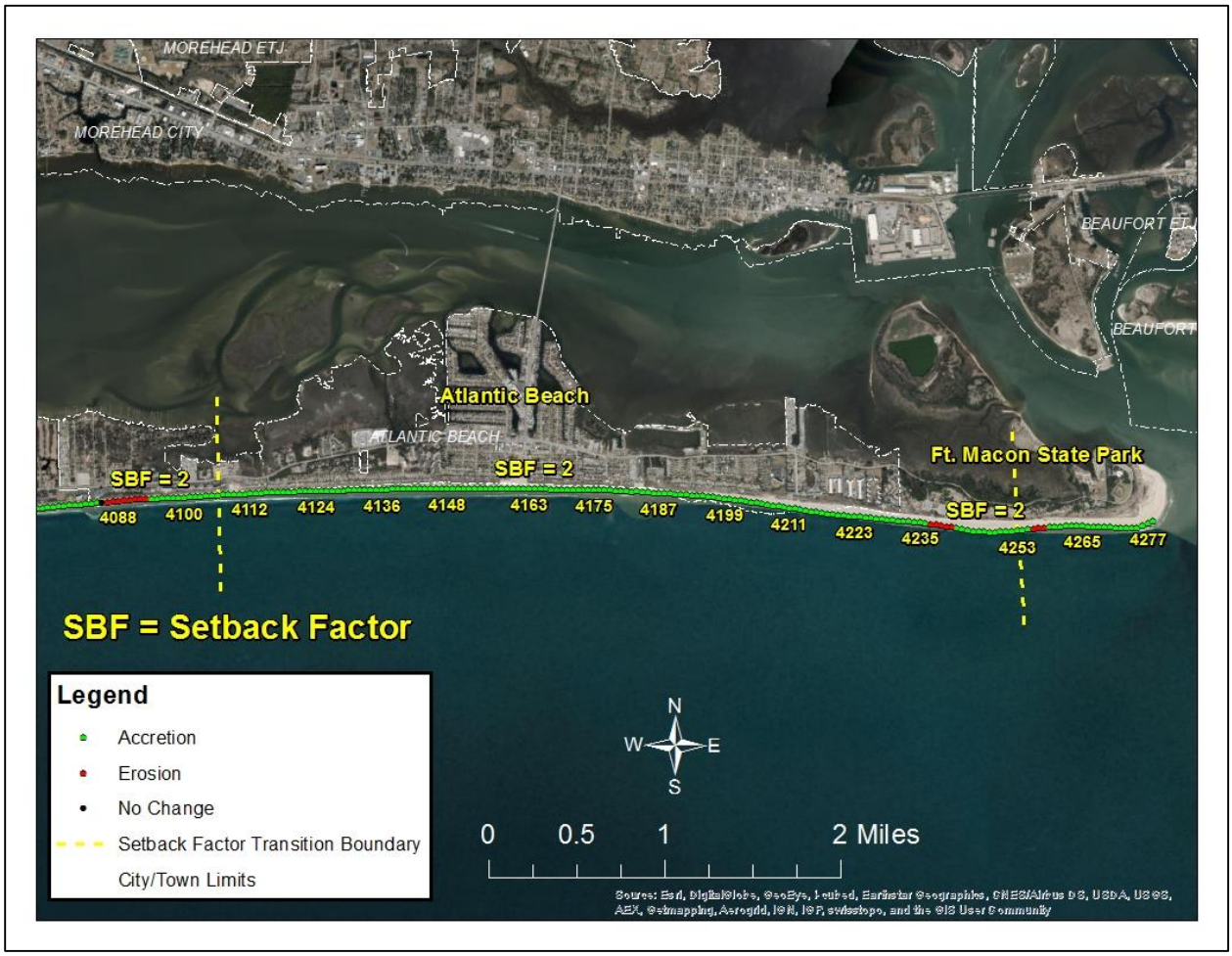


Figure 60. Atlantic Beach and Fort Macon State Park. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Shackleford Banks

Shackleford Banks is an undeveloped south-facing barrier island with approximately 8.1 miles of oceanfront shoreline and is flanked by two inlets (Beaufort and Barden). Approximately 6.4 miles (79 percent) of its shoreline resulted in measured erosion, while 1.7 miles (21 percent) resulted in measured accretion. Although the shoreline adjacent to Beaufort Inlet has been eroding at significant rates in recent years, the 2016 shoreline is nearing the same location as the early shoreline (1946); although small, still resulting in measured accretion. The average shoreline change rate is 2.7 feet per year (erosion), and blocked rate (setback factor) is 4.0 feet per year (Figure 61 and 62).

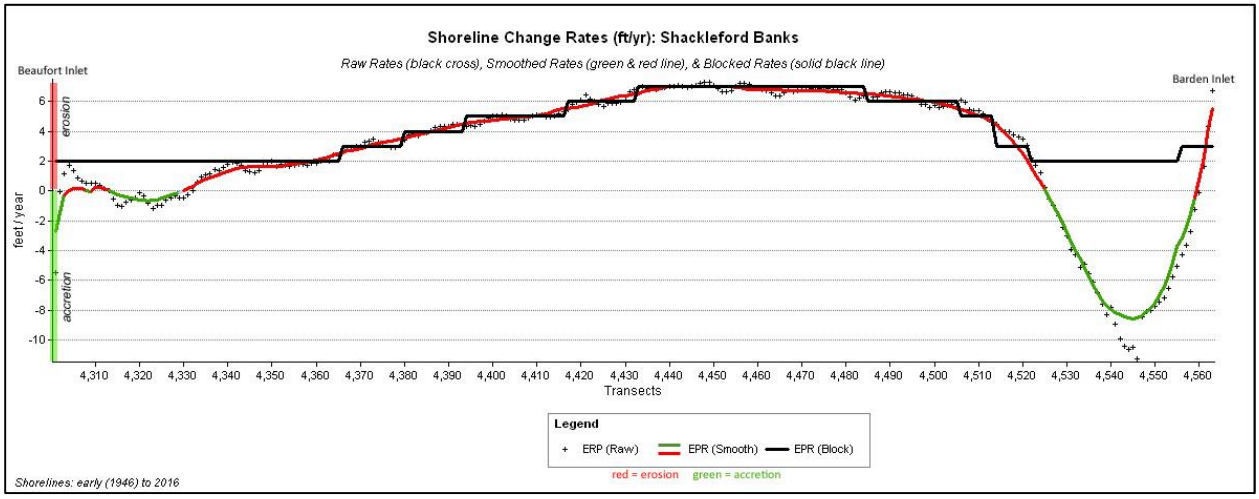


Figure 61. Shackleford Banks shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

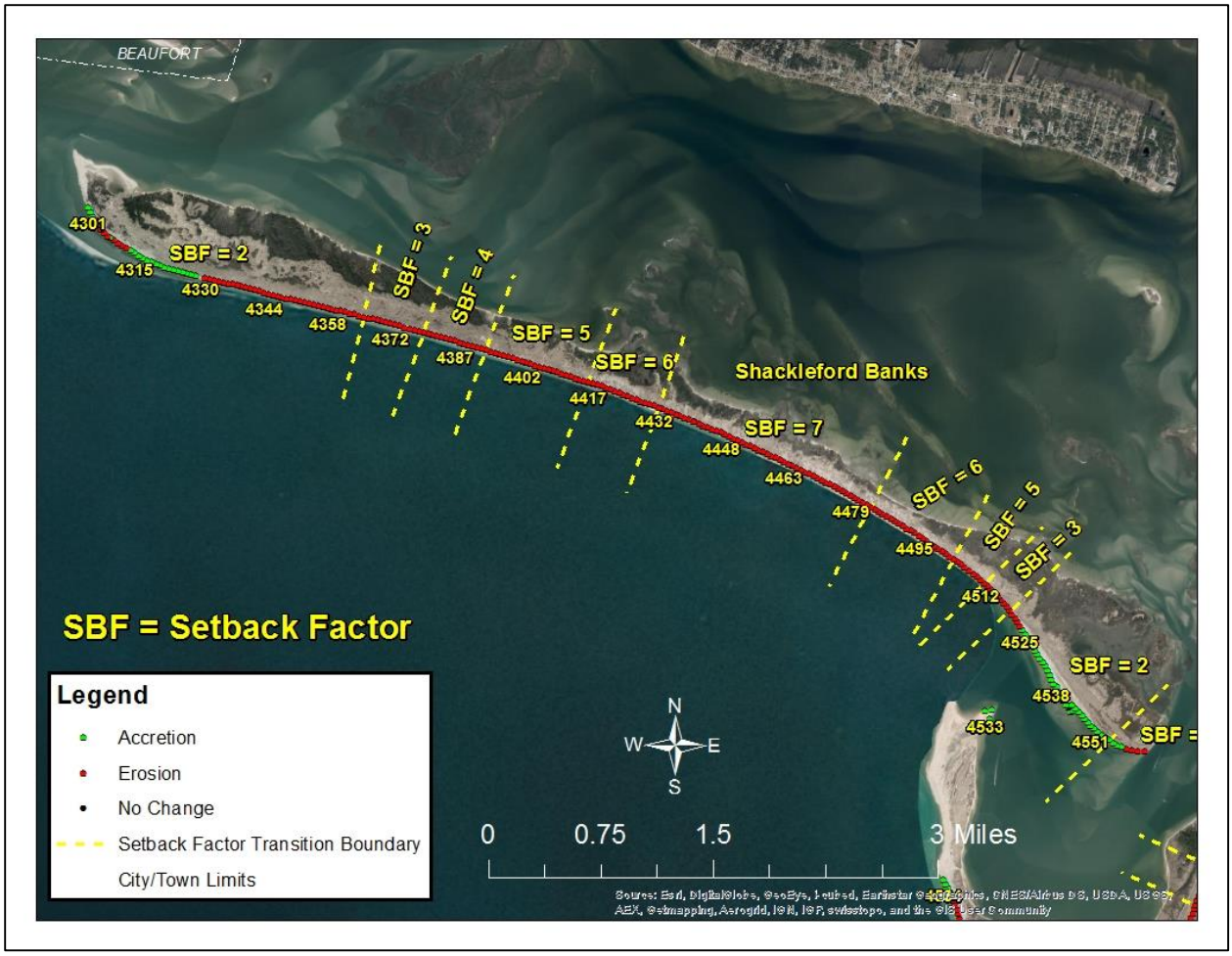


Figure 62. Shackleford Banks. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Cape Lookout

At Cape Lookout starting at Barden Inlet moving towards the point at the cape is an undeveloped south-facing portion of the Core Banks, with approximately 2.4 miles of oceanfront shoreline. Approximately 2.0 miles (83.1 percent) of its shoreline resulted in measured erosion, while 0.3 of a mile (15.6 percent) resulted in measured accretion. The average shoreline change rate is 5.3 feet per year (erosion), and 6.0 feet per year blocked rate (setback factor) (Figure 63 and 64).

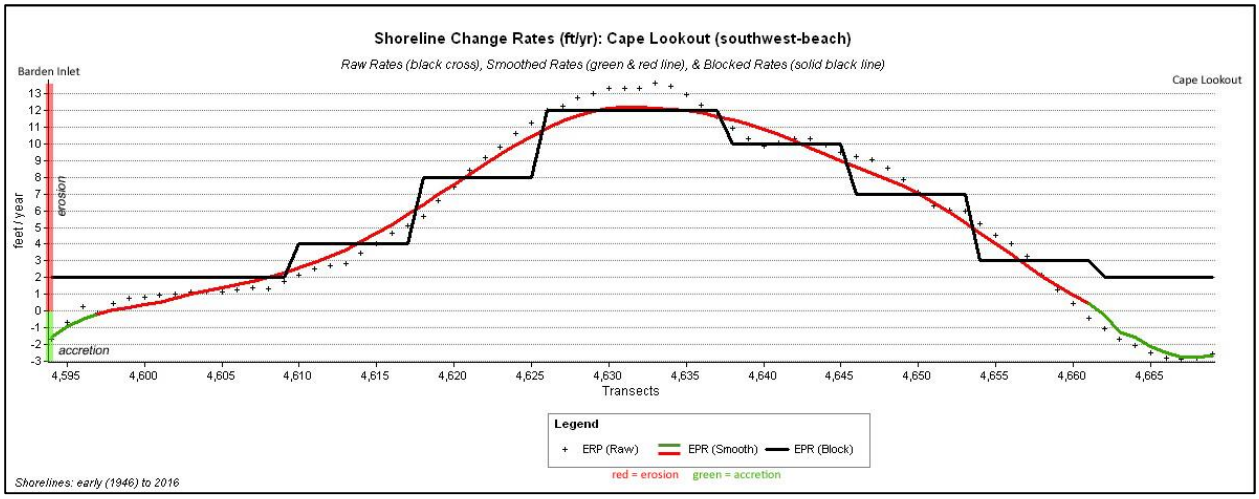


Figure 63. Cape Lookout shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

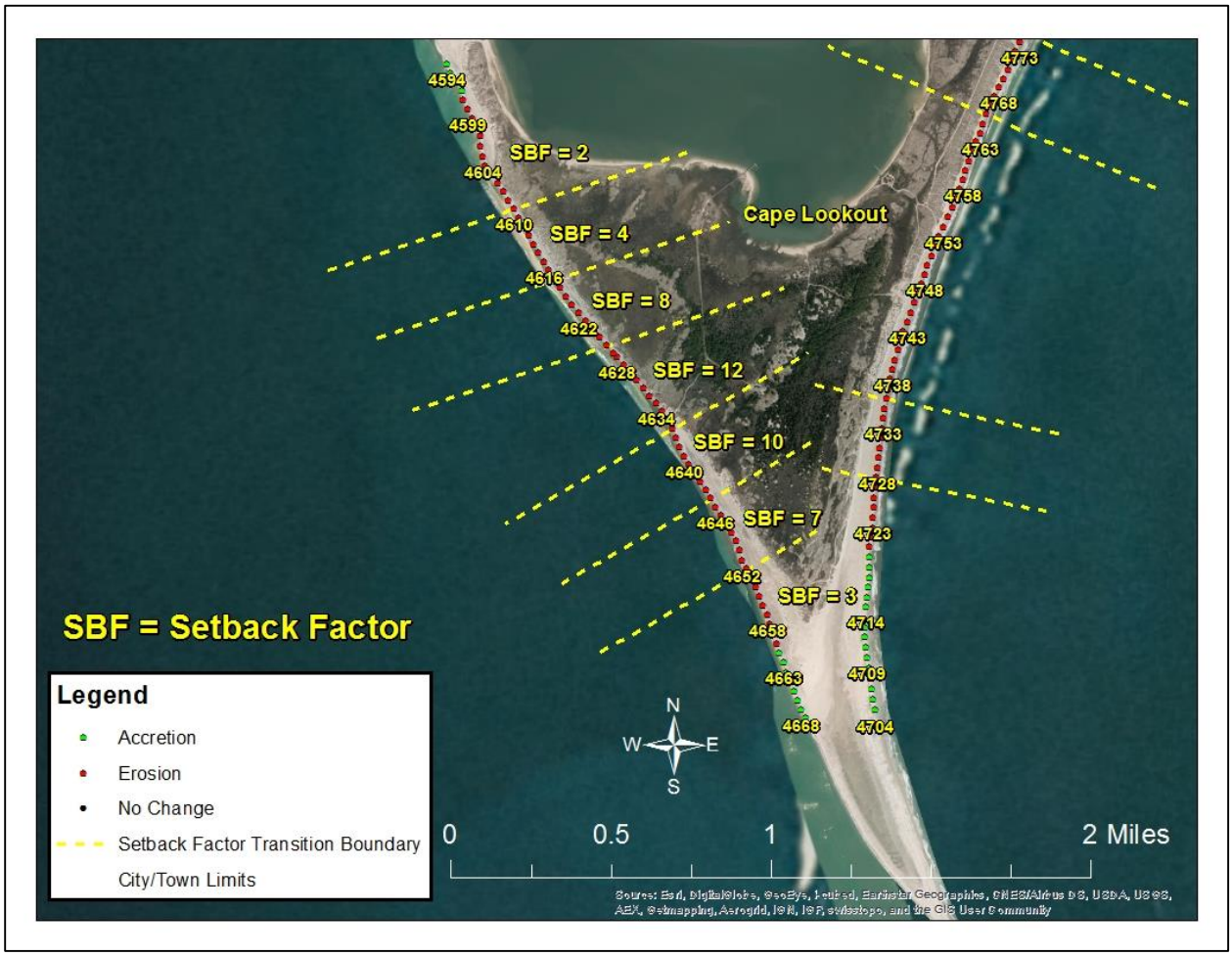


Figure 64. Cape Lookout (south-west beach). Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Cape Lookout starting at the point at the cape and moving towards Drum Inlet is an undeveloped east facing portion of the Core Banks with approximately 20.9 miles of oceanfront shoreline. Approximately 18.2 miles (87.1 percent) of its shoreline resulted in measured erosion, while 2.1 miles (10.2 percent) resulted in measured accretion. The average shoreline change rate is 4.3 feet per year (erosion), and blocked rate (setback factor) is 5.0 feet per year (Figure 65 and 66).

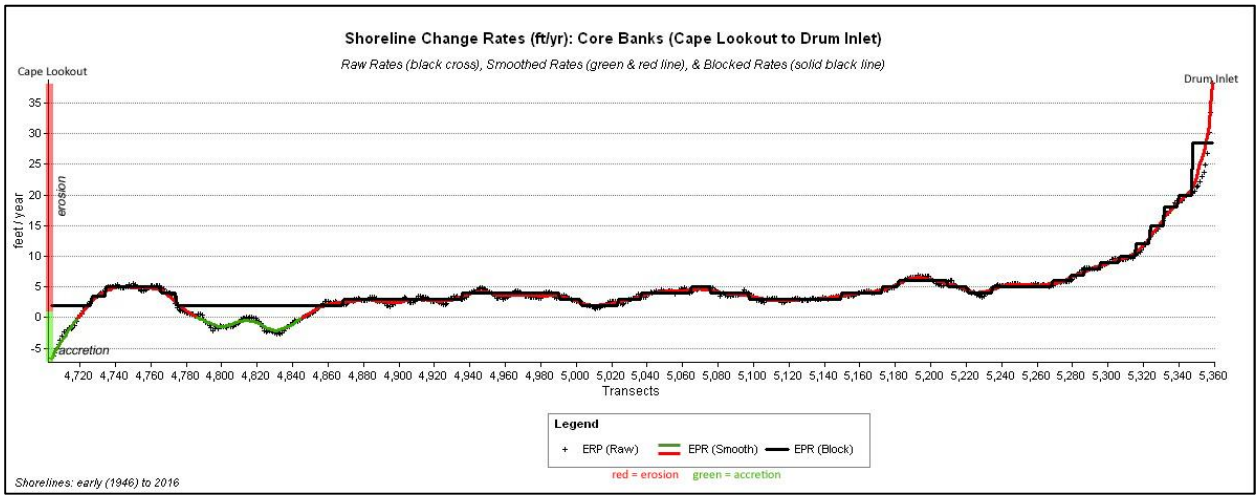


Figure 65. Cape Lookout to Drum Inlet shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

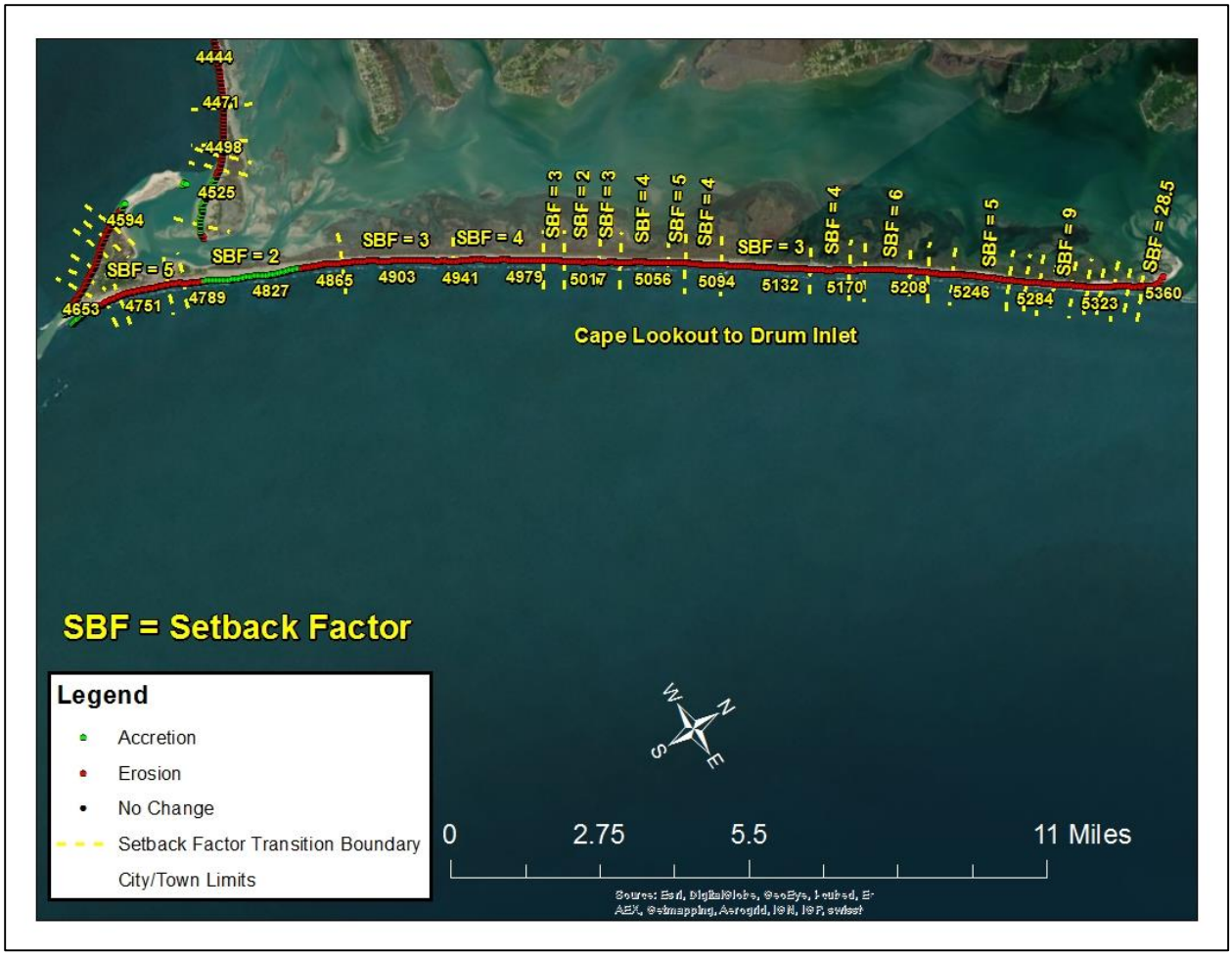


Figure 66. Cape Lookout to Drum Inlet. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Core Banks from Drum Inlet to Ocracoke Inlet is the remaining undeveloped east-facing portion of the Core Banks with approximately 21.5 miles of oceanfront shoreline. Approximately 18.8 miles (91.8 percent) of its shoreline resulted in measured erosion, while 1.4 miles (7.1 percent) resulted in measured accretion. The average shoreline change rate is 4.8 feet per year, and average blocked rate (setback factor) is 5.0 feet per year, ranging from 5 to 12 (Figure 67 and 68).

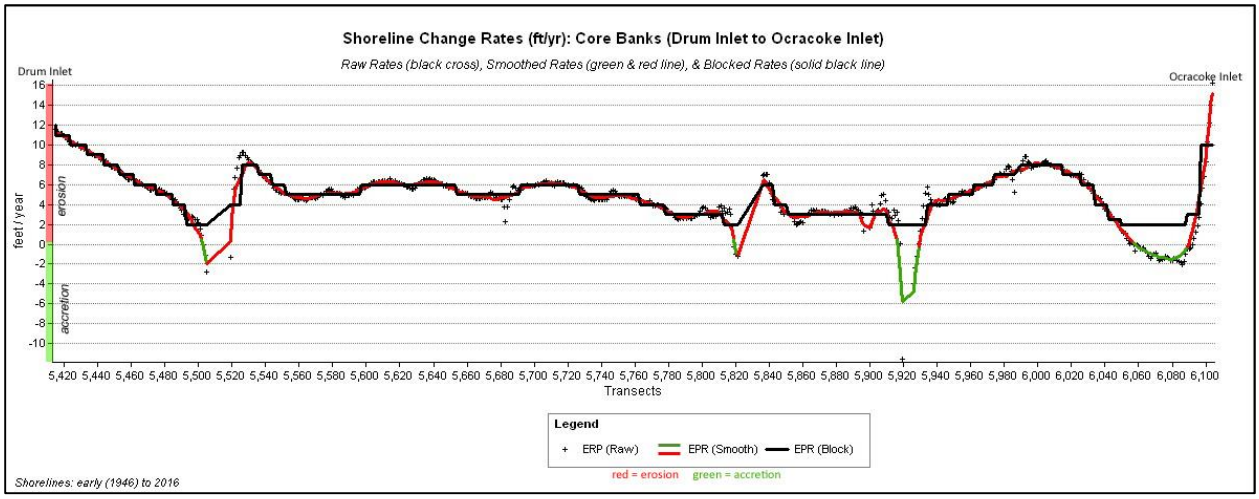


Figure 67. Core Banks (Drum Inlet to Ocracoke Inlet) shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

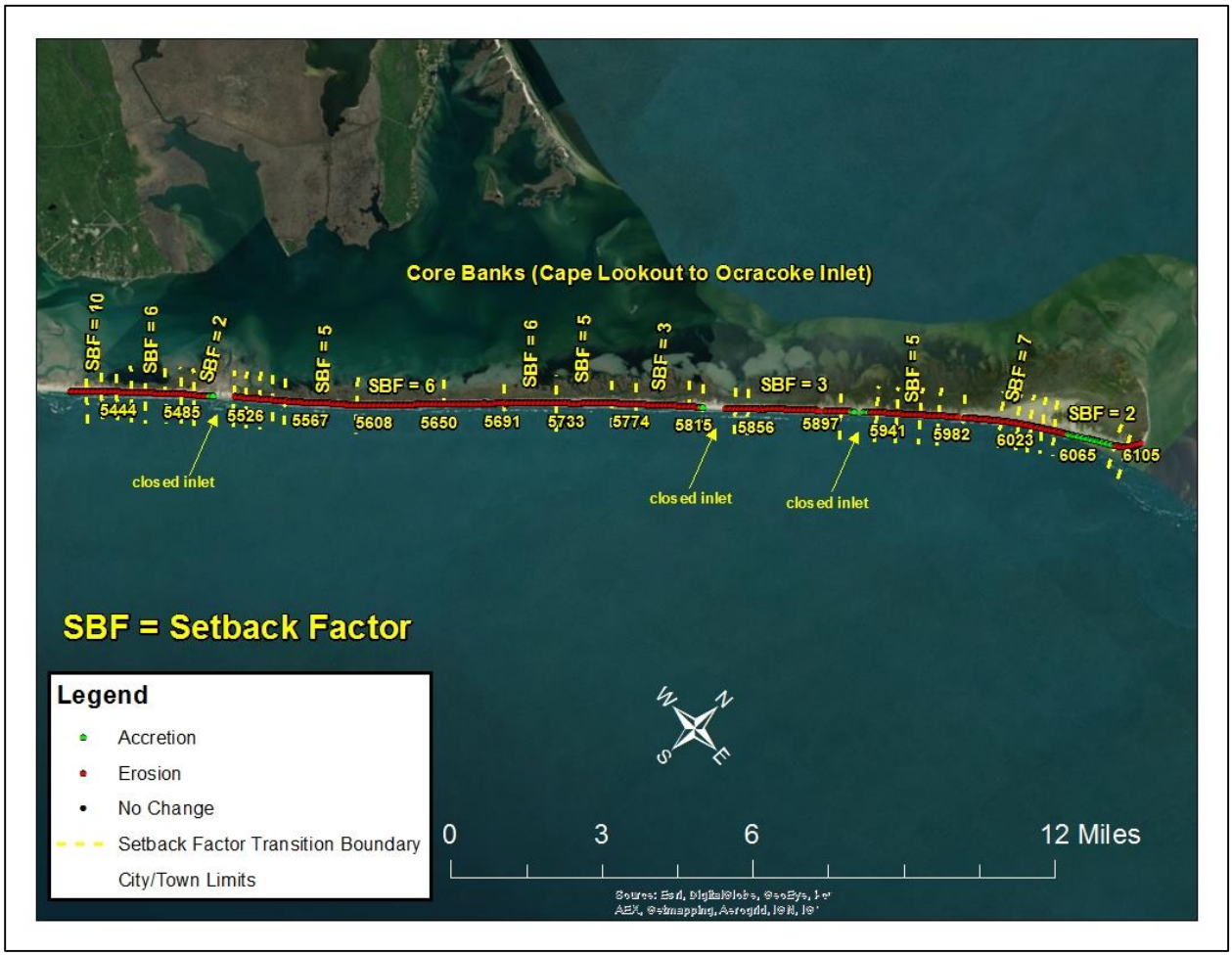


Figure 68. Core Banks (Drum Inlet to Ocracoke Inlet). Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Ocracoke Island

Ocracoke Island marks the transitional point from east to south facing beaches moving south to north approaching Cape Hatteras. Ocracoke's oceanfront is undeveloped, and its shoreline is approximately 16.3 miles in length. Approximately 11.5 miles (70.9 percent) of its shoreline resulted in measured erosion, while 4.2 miles (26.1 percent) resulted in measured accretion. The average shoreline change rate is 3.2 feet per year, and average blocked rate (setback factor) is 4.0 feet per year, ranging between (Figure 69 and 70).

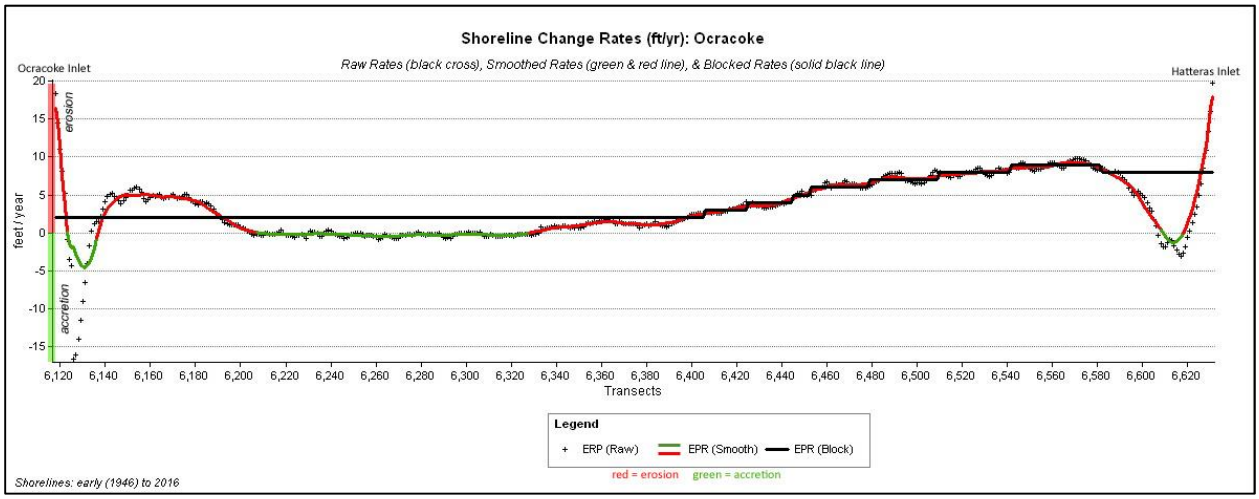


Figure 69. Ocracoke Island shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

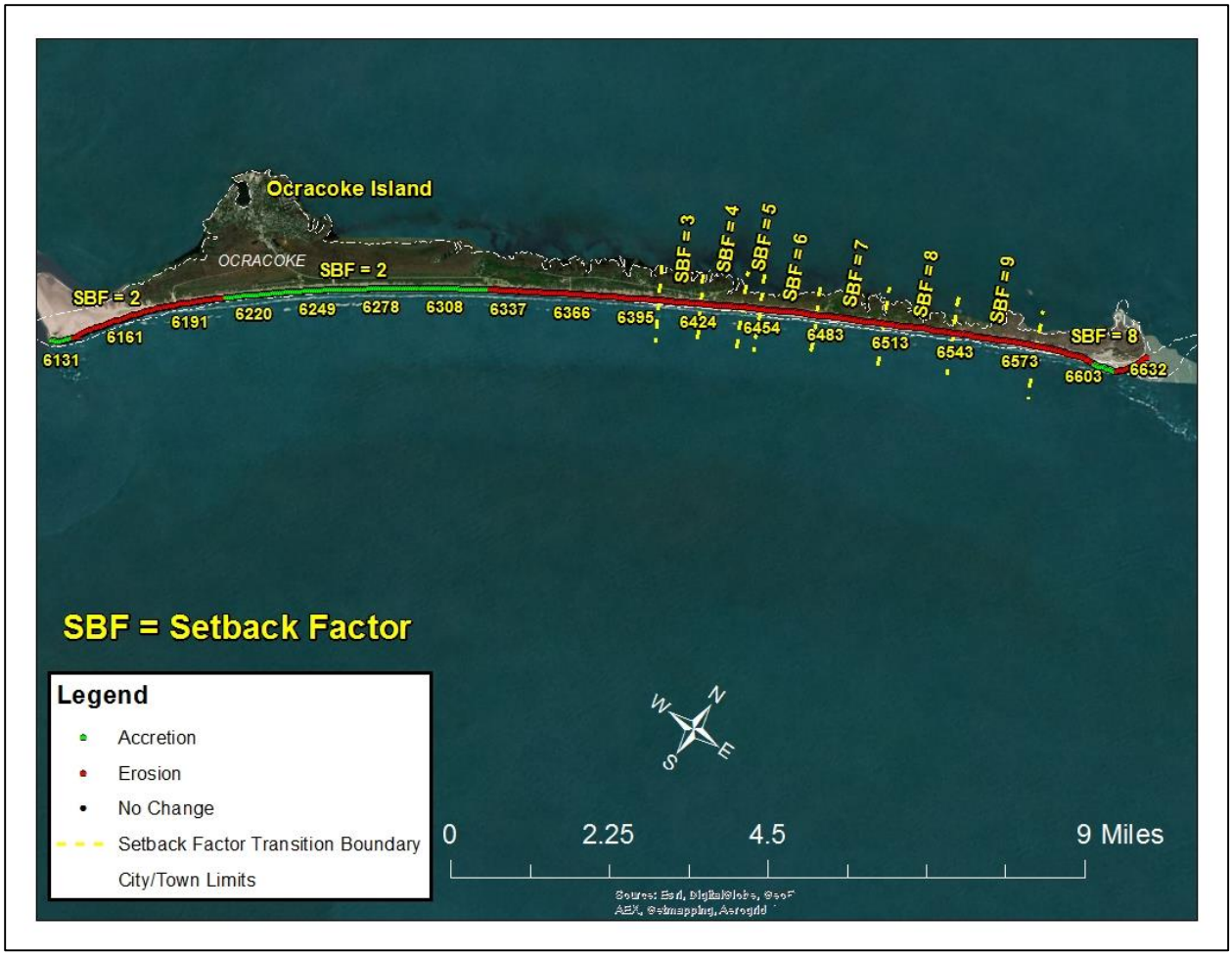


Figure 70. Ocracoke Island. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Cape Hatteras

Hatteras from Ocracoke Inlet to Cape Hatteras (includes Hatteras Village) has a south-facing shoreline and is approximately 12.9 miles in length. Approximately 6.8 miles (53.6 percent) of its shoreline resulted in measured erosion, while 5.4 miles (42.5 percent) resulted in measured accretion. The average shoreline change rate is 8.2 feet per year (erosion), and average blocked rate (setback factor) is 4 feet per year, ranging between 2 and 12 feet per year. (Figure 71 and 72).

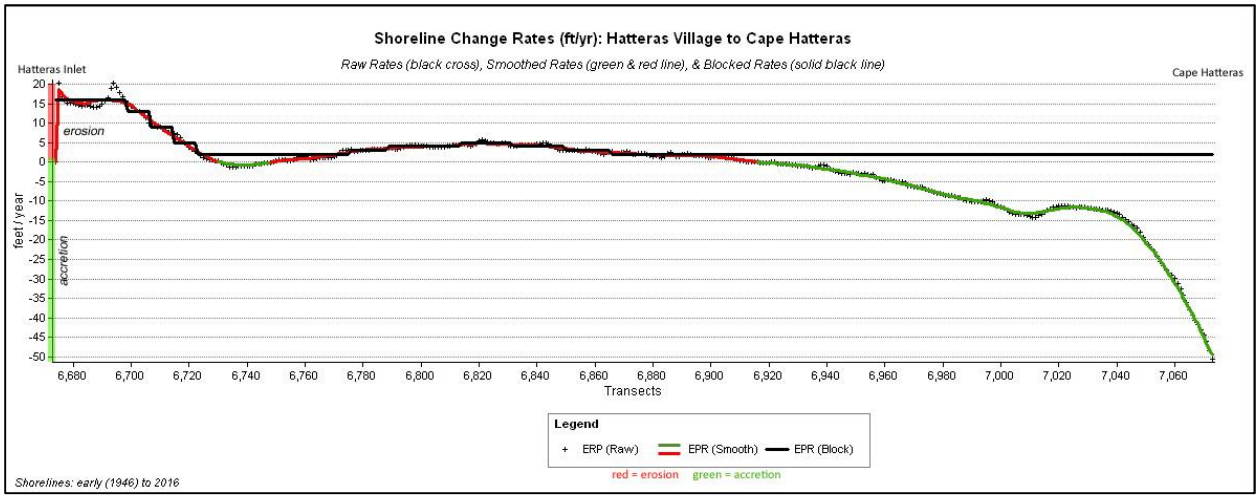


Figure 71. Cape Hatteras (at Hatteras Village) shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

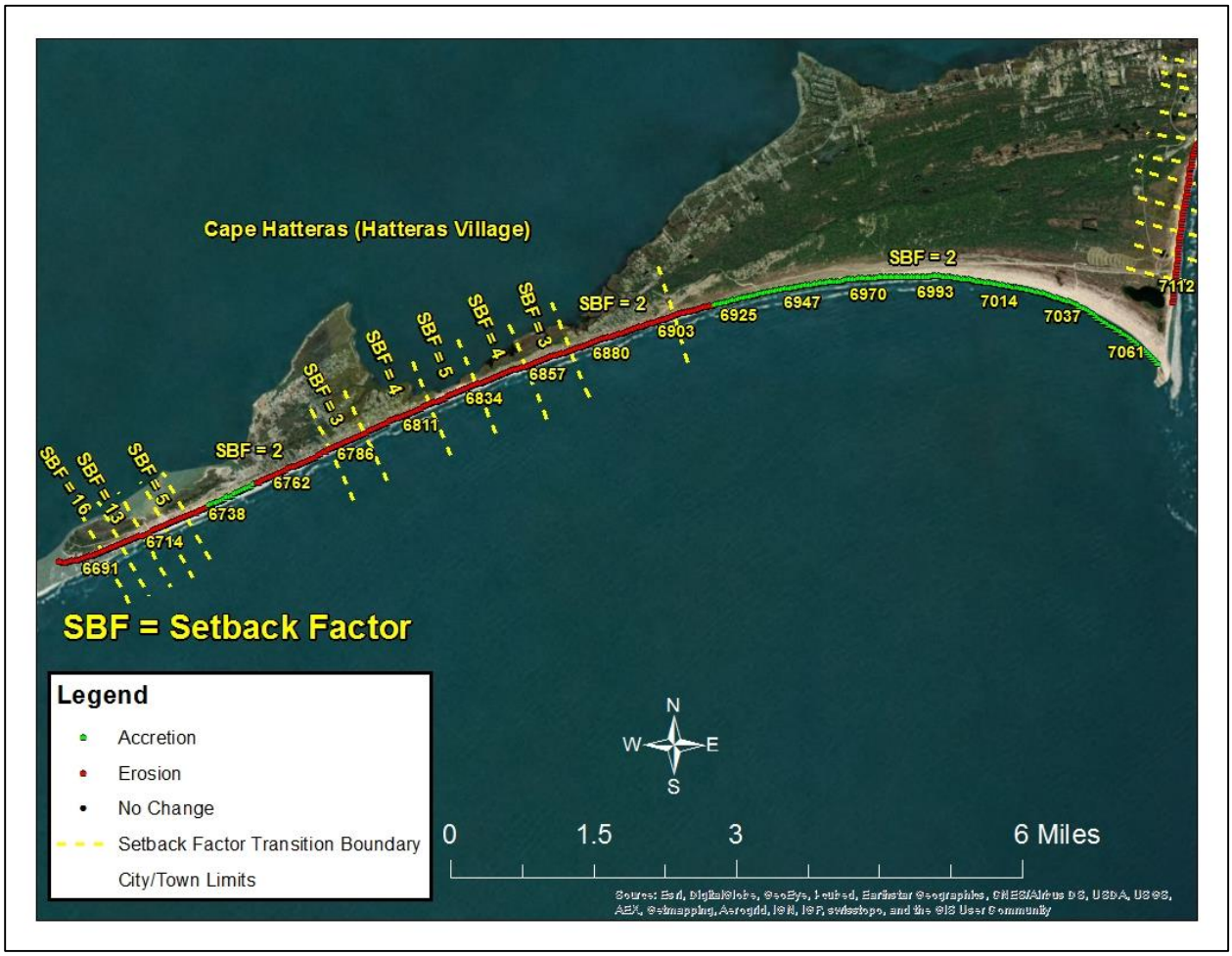


Figure 72. Cape Hatteras (at Hatteras Village). Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Cape Hatteras and Buxton

At the Outer Banks from Cape Hatteras to Buxton, the oceanfront shoreline is on an east-facing beach with a combined length of approximately 5.3 miles. This entire segment of shoreline segment resulted in measured erosion with an average shoreline change rate of 8.3 feet per year, and 8.0 feet per year average blocked rate (setback factor). Setback factors range between 3.0 and 12.0 (Figure 73 and 74).

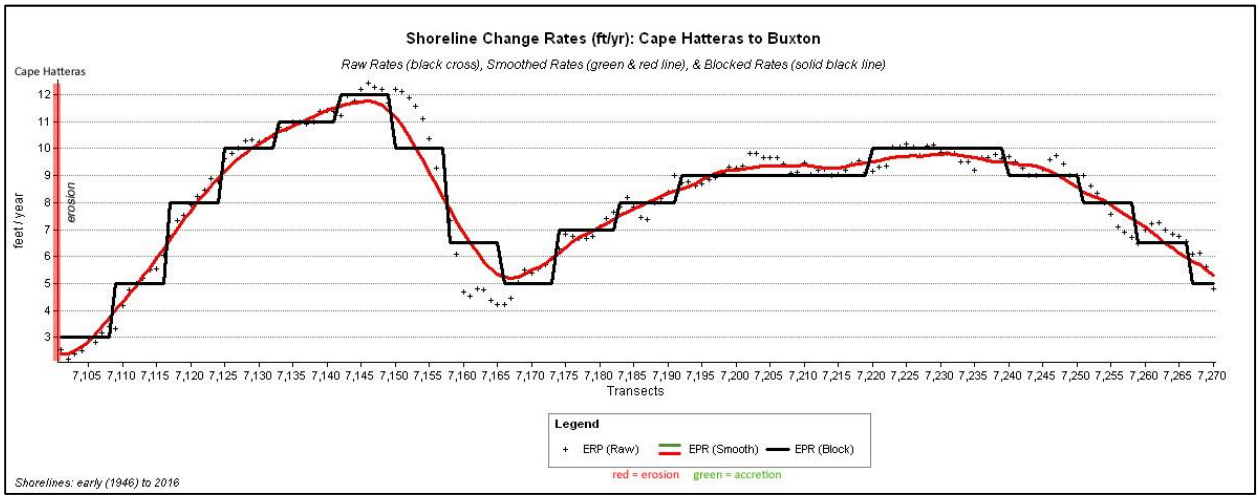


Figure 73. Cape Hatteras and Buxton shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

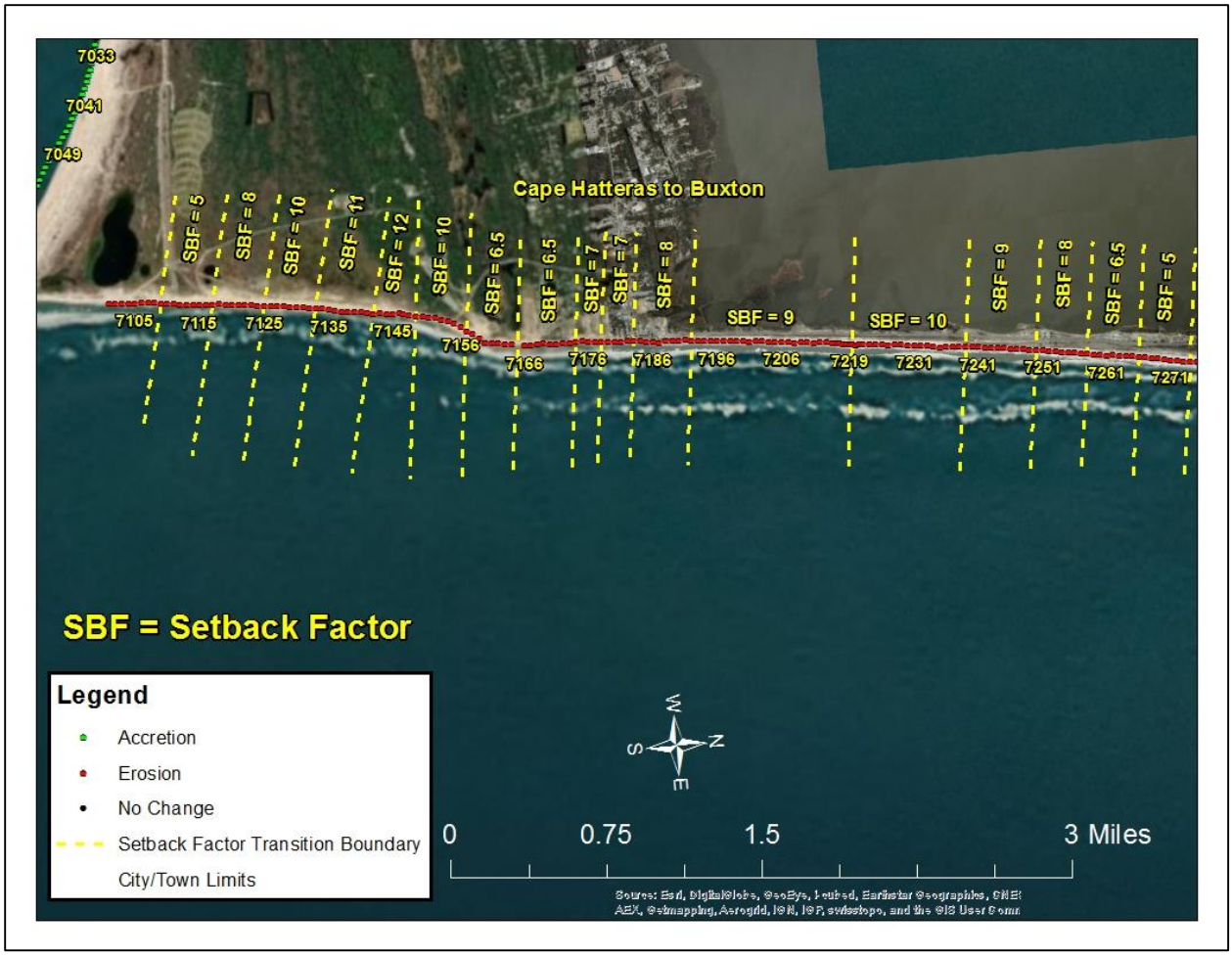


Figure 74. Cape Hatteras to Buxton. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

National Seashore (Outer Banks at Avon)

The shoreline segment adjacent to Avon is approximately 4.9 miles in length, and approximately 4.0 miles (82.4 percent) of Avon's shoreline resulted in measured erosion, while the remaining 0.8 miles (17.6 percent) resulted in measured accretion. The average shoreline change rate is 2.4 feet per year (erosion), and the average blocked rate is 3.0 feet per year, with a range between 2 and 6 feet per year (Figure 75 and 76).

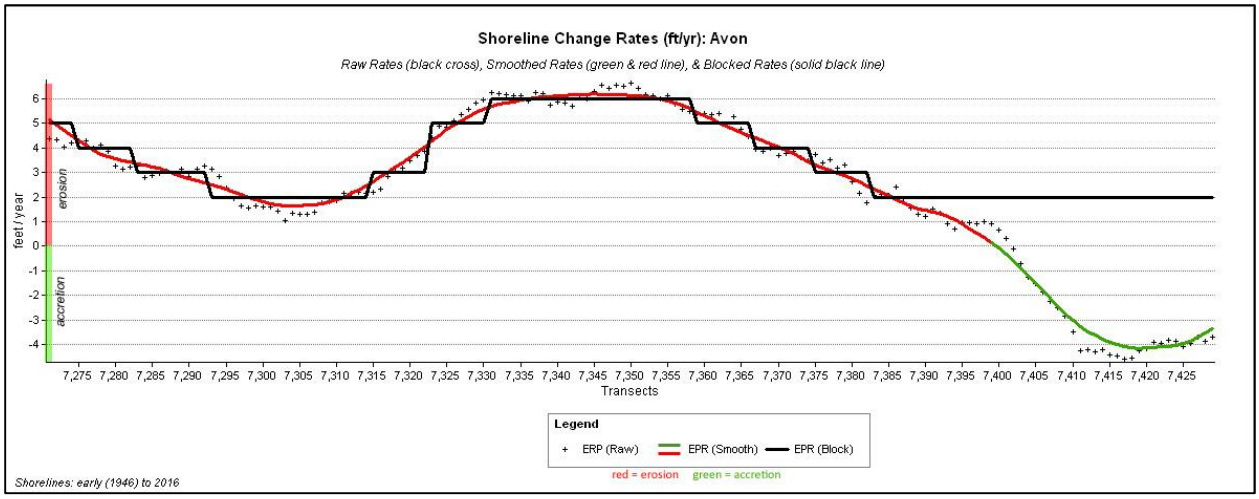


Figure 75. Avon shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

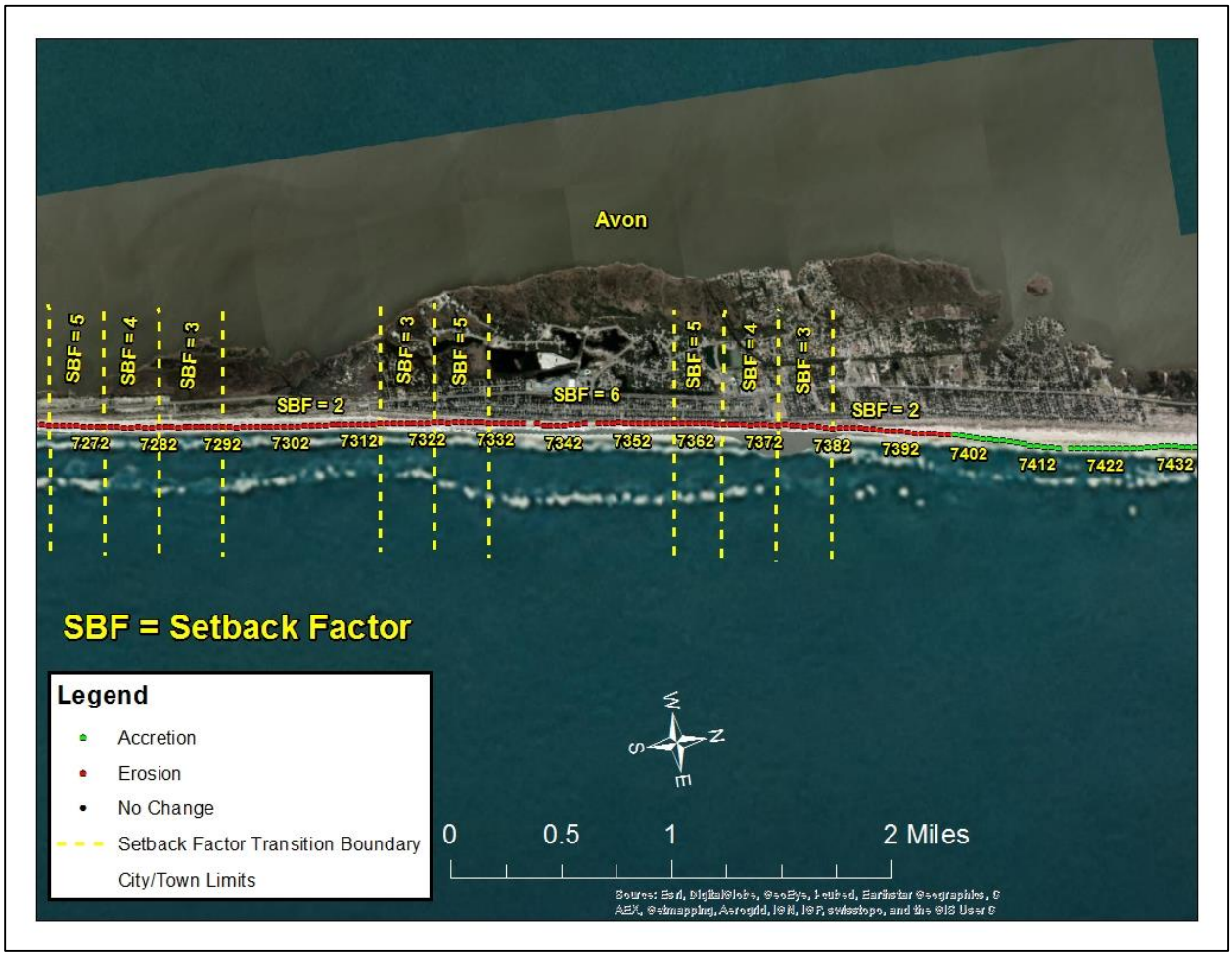


Figure 76. Avon. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

National Seashore (Outer Banks between Avon and Salvo)

The area along the National Seashore between Avon and Salvo has an east-facing beach with approximately 11.2 miles of ocean shoreline. Approximately 8.5 miles (75.8 percent) of this shoreline resulted in measured erosion, while the remaining 2.7 miles (24.2 percent) of shoreline resulted in measured accretion. The average shoreline change rate is 1.9 feet per year (erosion), and the average blocked rate (setback factor) is 3.0 feet per year, with a range between 2.0 and 6.0 feet per year (Figure 77 and 78).

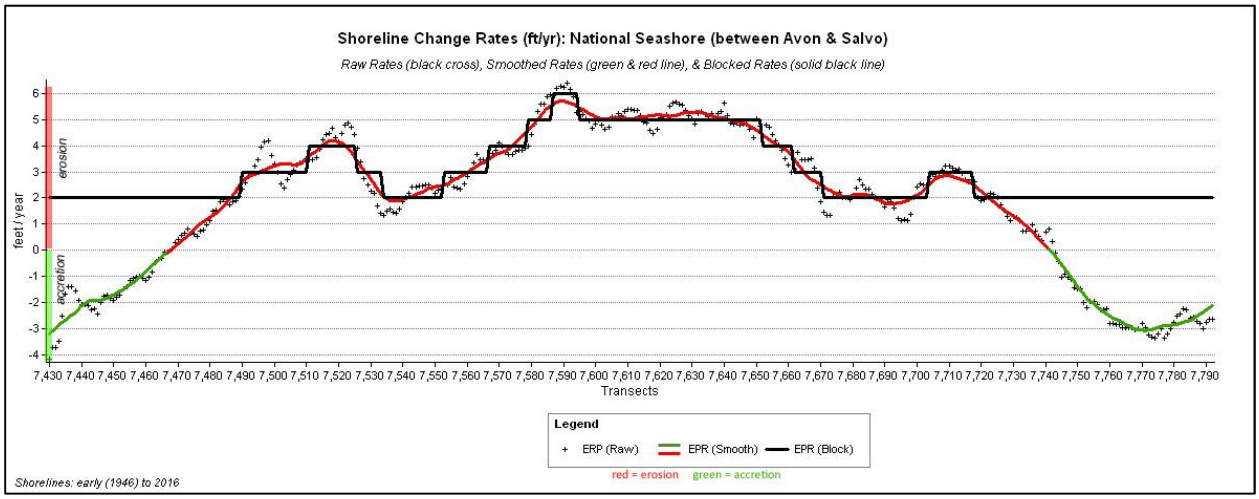


Figure 77. National Seashore between Avon and Salvo shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

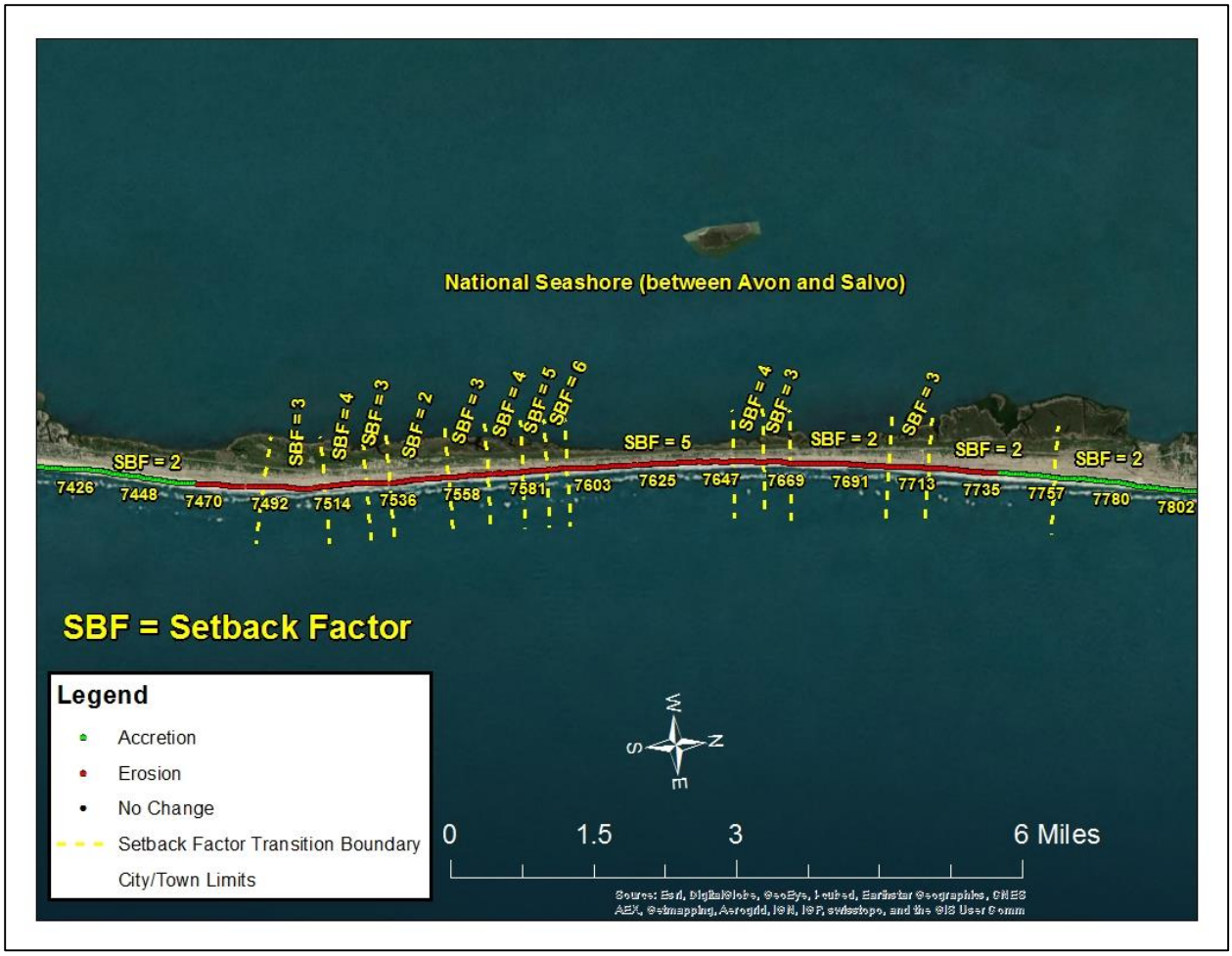


Figure 78. National Seashore between Avon and Salvo. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Salvo to Rodanthe

The area along the National Seashore at Salvo and Rodanthe has an east-facing beach with approximately 6.5 miles of ocean shoreline. Approximately 4.9 miles (76.2 percent) of this shoreline resulted in measured erosion, while the remaining 1.5 miles (22.9 percent) of shoreline resulted in measured accretion. The average shoreline change rate is 5.3 feet per year (erosion), and the average blocked rate (setback factor) is 6.0 feet per year, with a range between 2.0 and 13.0 feet per year (Figure 79 and 80).

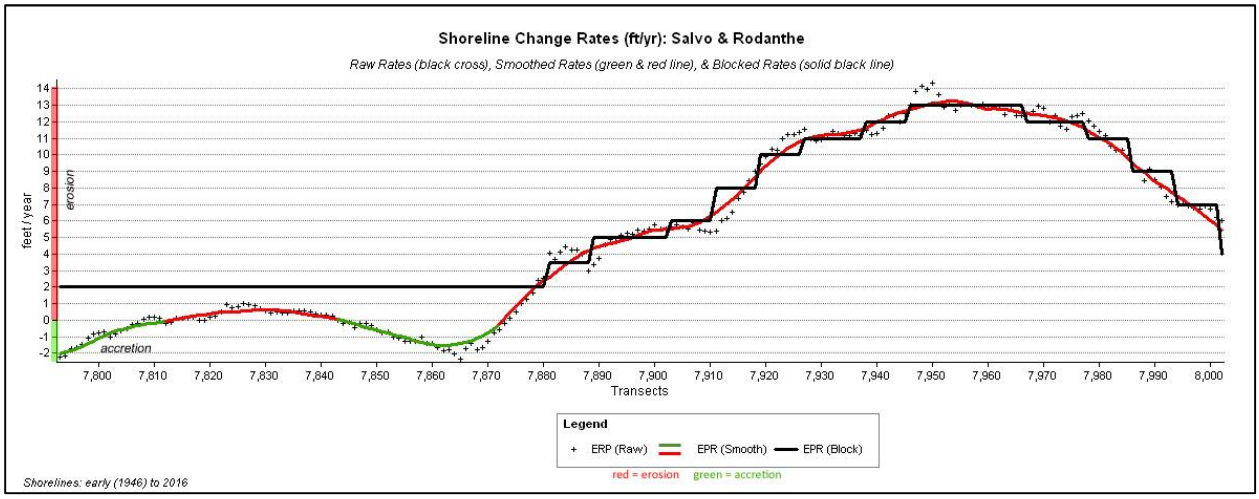


Figure 79. Salvo to Rodanthe shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

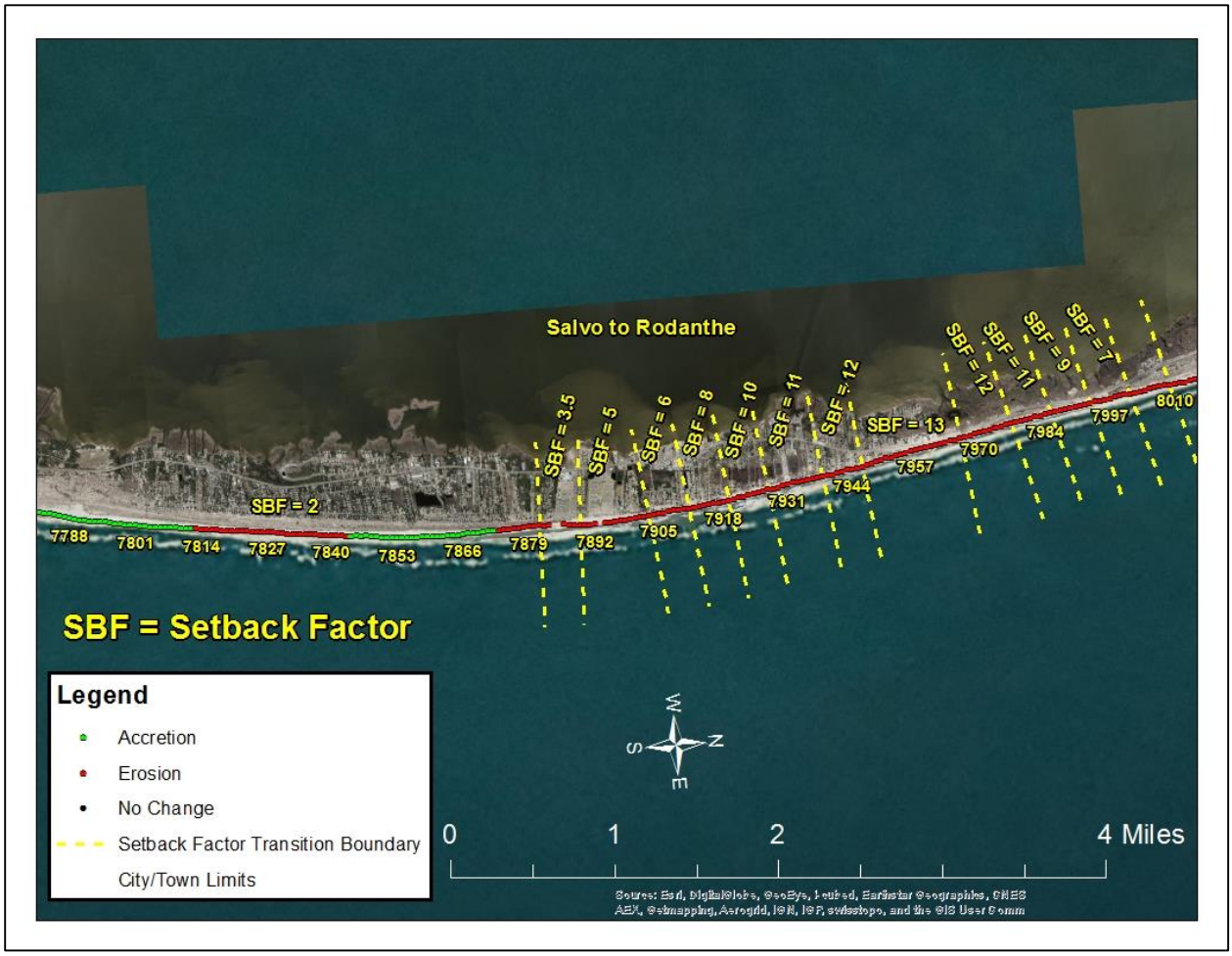


Figure 80. Salvo to Rodanthe. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

National Seashore between Rodanthe and Oregon Inlet (Pea Island)

At the Outer Banks from Rodanthe to Oregon Inlet, or Pea Island National Seashore, is an east-facing beach with approximately 10.8 miles of oceanfront shoreline. Approximately 9.1 miles (85 percent) of this shoreline resulted in measured erosion, while the remaining 1.6 miles (14.7 percent) resulted in measured accretion. The average shoreline change rate is 5.8 feet per year, and the average blocked rate (setback factor) is 7.0 feet per year with a range between 2 and 22 feet per year (Figure 81 and 82).

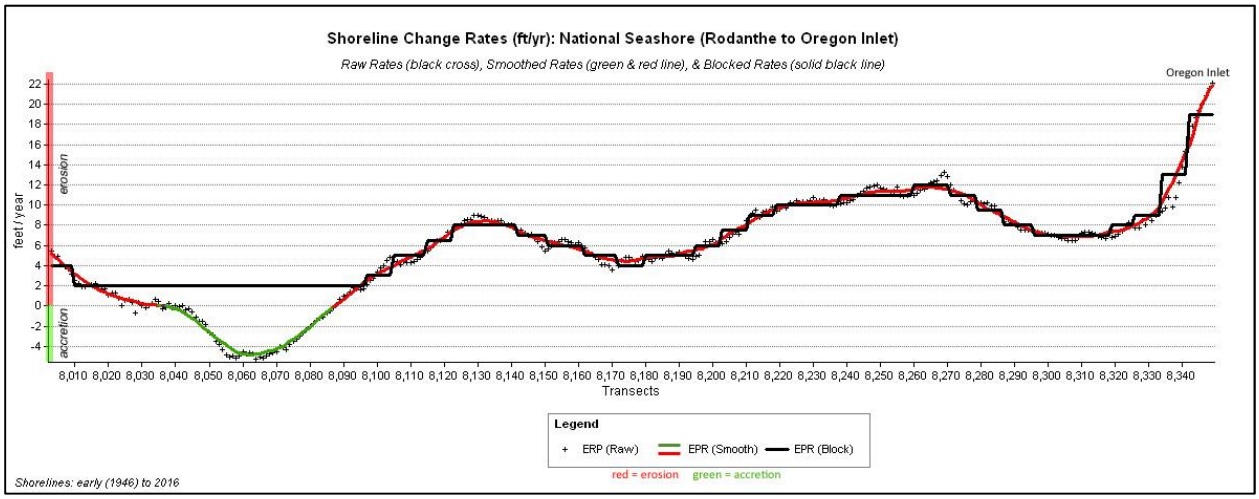


Figure 81. National Seashore between Rodanthe and Oregon Inlet (Pea Island) shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

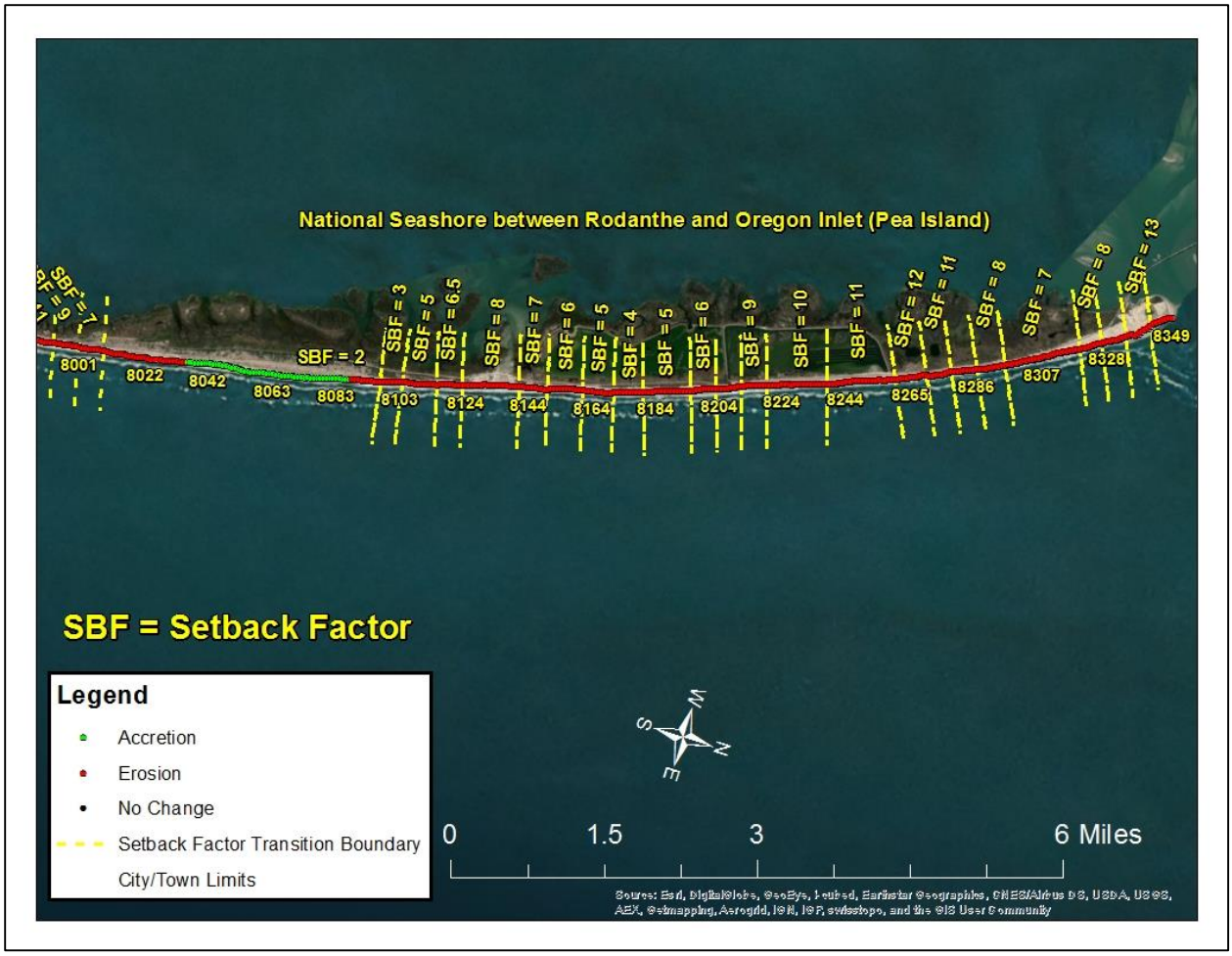


Figure 82. National Seashore between Rodanthe and Oregon Inlet (Pea Island). Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

National Seashore between Oregon Inlet and Nags Head (Boddie Island)

The National Seashore from Oregon Inlet to Nags Head (includes Boddie Island) has an east-facing shoreline and is approximately 4.6 miles long. Approximately 4.2 miles (90.7 percent) of this shoreline resulted in measured erosion, while the remaining 0.4 of a mile (9.3 percent) of shoreline resulted in measured accretion. The average shoreline change rate is 6.7 feet per year (erosion), and the average blocked rate is 8.0 feet per year with a range between 2 and 11 feet per year (Figure 83 and 84).

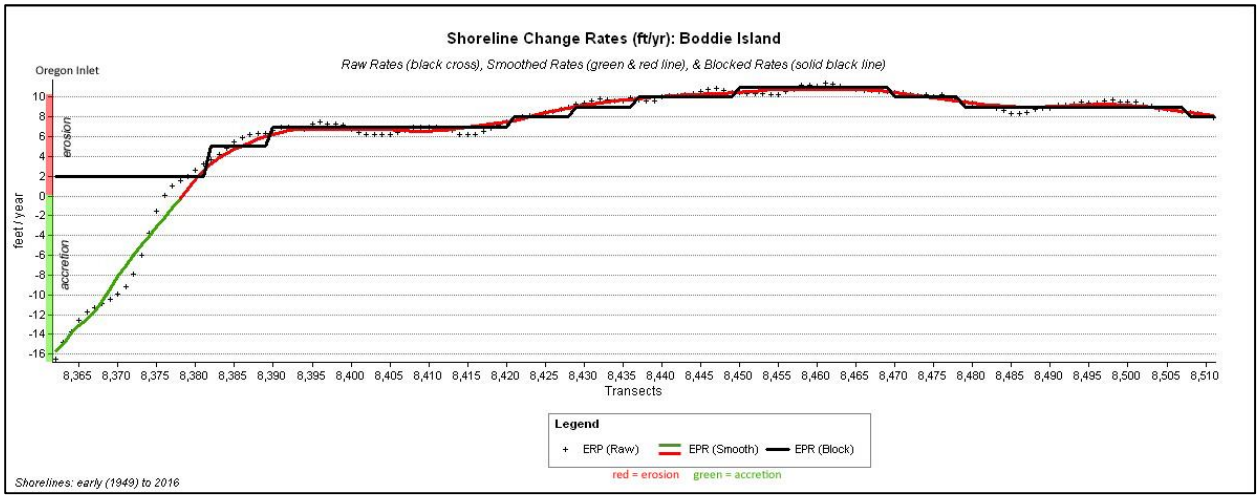


Figure 83. National Seashore between Oregon Inlet and Nags Head (Pea Island) shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

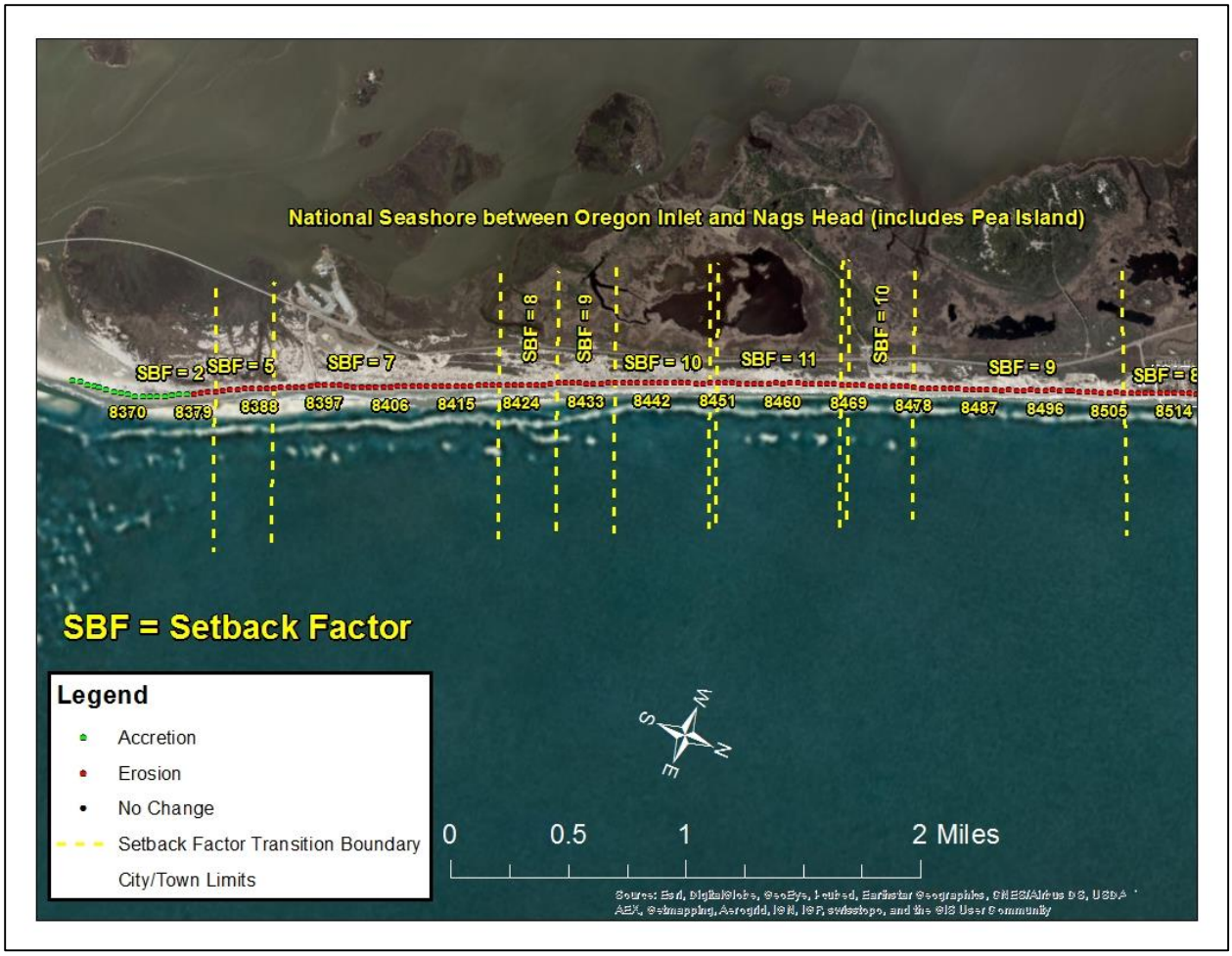


Figure 84. National Seashore between Oregon Inlet and Nags Head (Pea Island). Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Nags Head

Nags Head has an east-facing beach and its shoreline is approximately 11.2 miles long. Nearly all 11.2 miles (99.7 percent) of this shoreline resulted in measured erosion. Although the average shoreline change rate is less than 1 foot per year (erosion), the average blocked rate (setback factor) is 3 feet per year with a range between 2 and 8 feet per year (Figure 85 and 86).

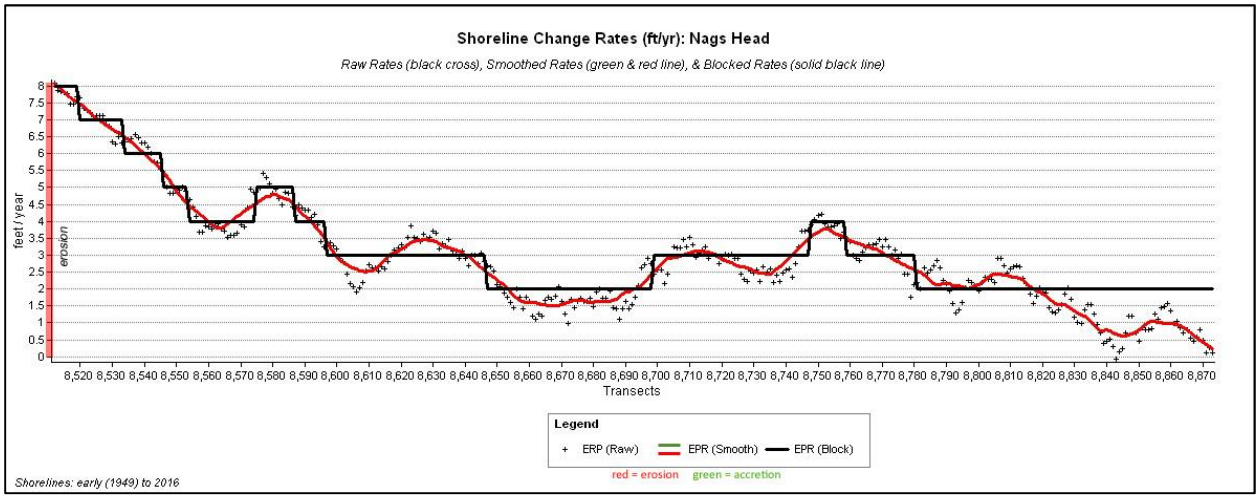


Figure 85. Nags Head shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

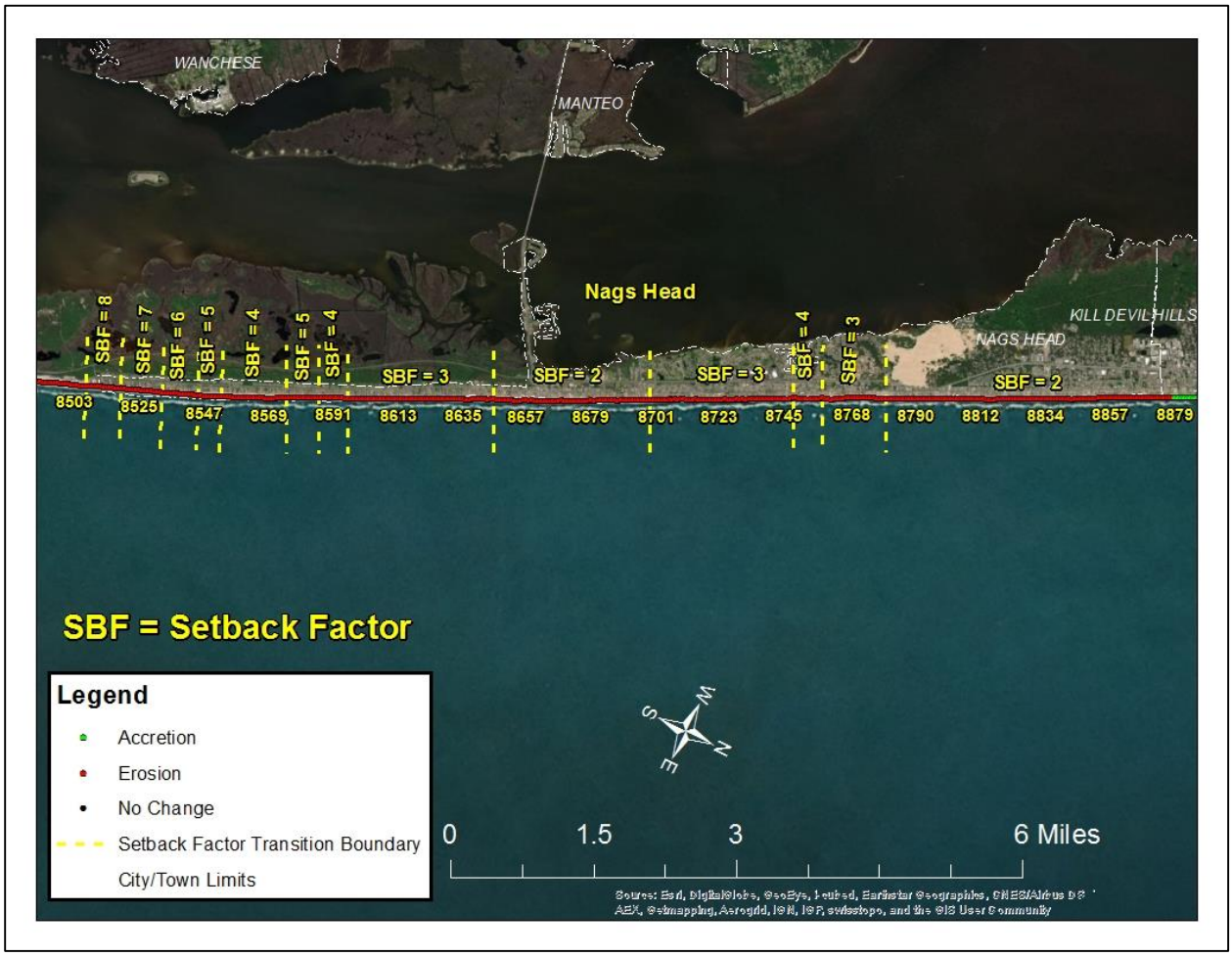


Figure 86. Nags Head. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Kill Devil Hills

Kill Devil Hills has an east-facing beach and its shoreline is approximately 4.7 miles long. Approximately 2.7 miles (56.9 percent) of its ocean shoreline resulted in measured erosion, and 1.9 miles (40.5 percent) resulted in measured accretion. The average shoreline change rate is less than 1 foot per year (erosion), and the average blocked rate is 2.0 feet per year with a range between 2 and 4 feet per year (Figure 87 and 88).

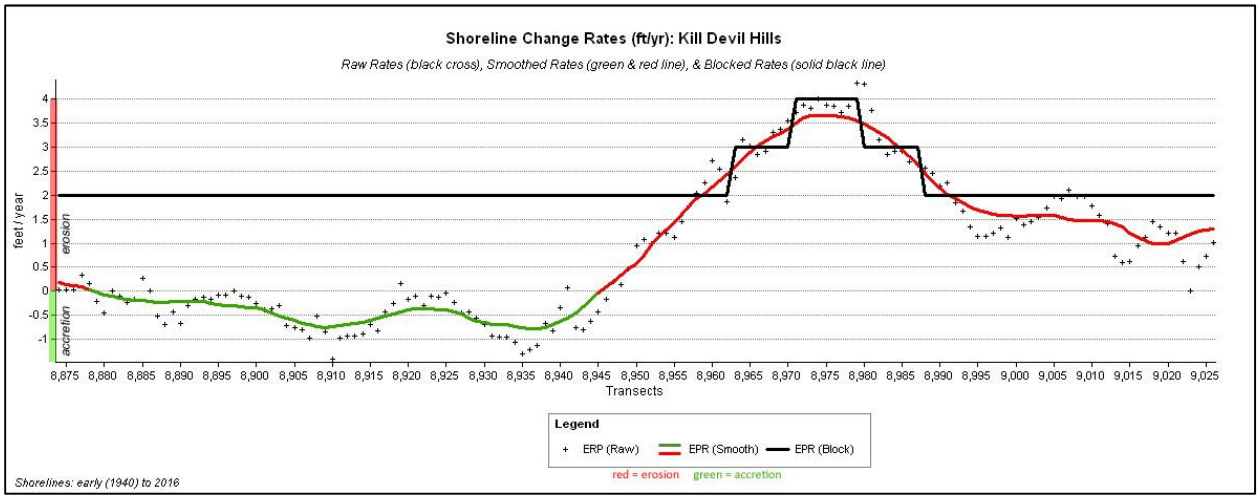


Figure 87. Kill Devil Hills shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

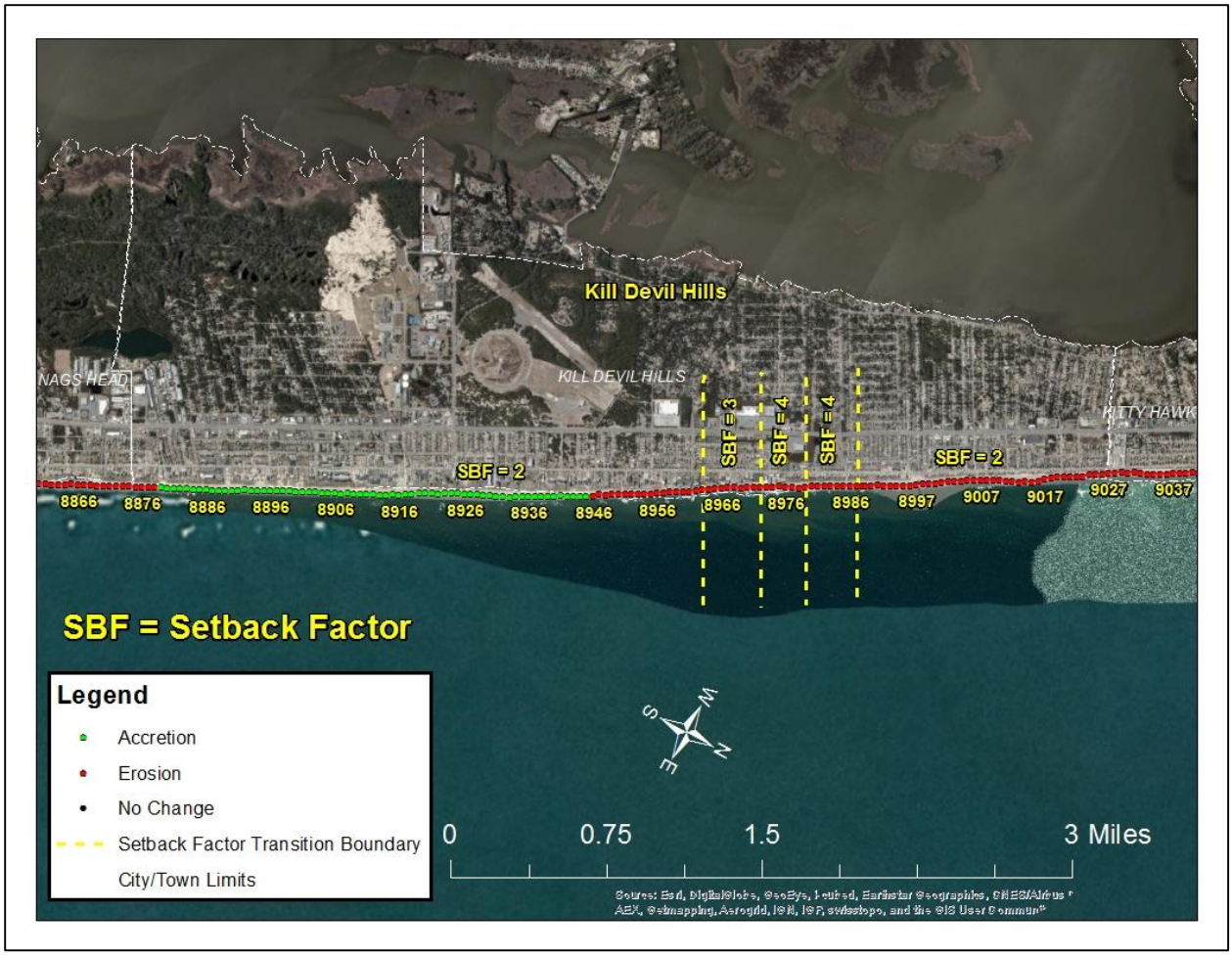


Figure 88. Kill Devil Hills. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Kitty Hawk

Kitty Hawk has an east-facing beach and its shoreline is approximately 3.5 miles long that resulted in measured erosion for the entire length. The average shoreline change rate 2.2 feet per year (erosion), and the average blocked rate (setback factor) is 2.0 feet per year with a range between 2 and 3 feet per year (Figure 89 and 90).

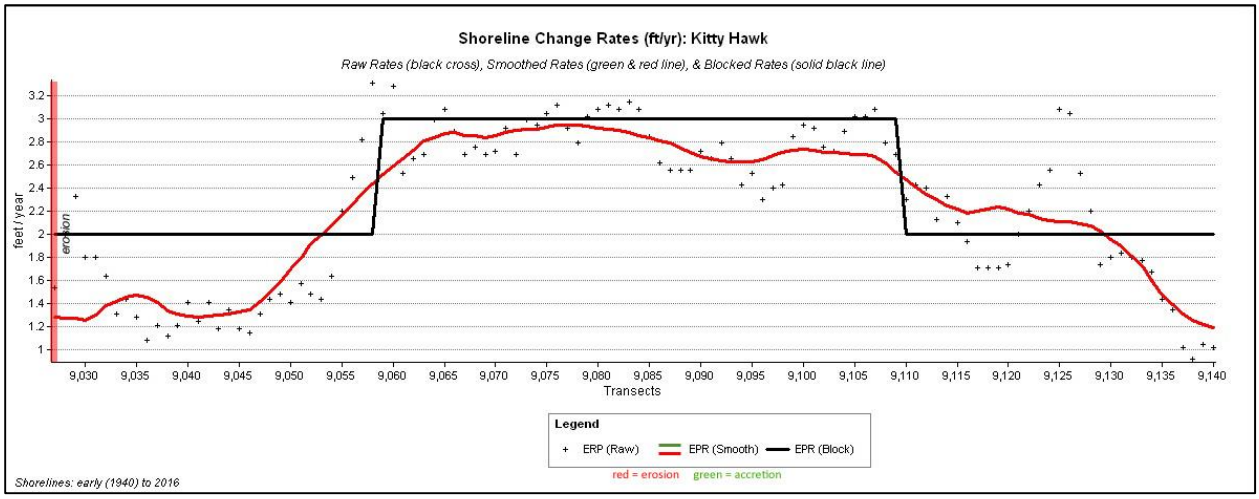


Figure 89. Kitty Hawk shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

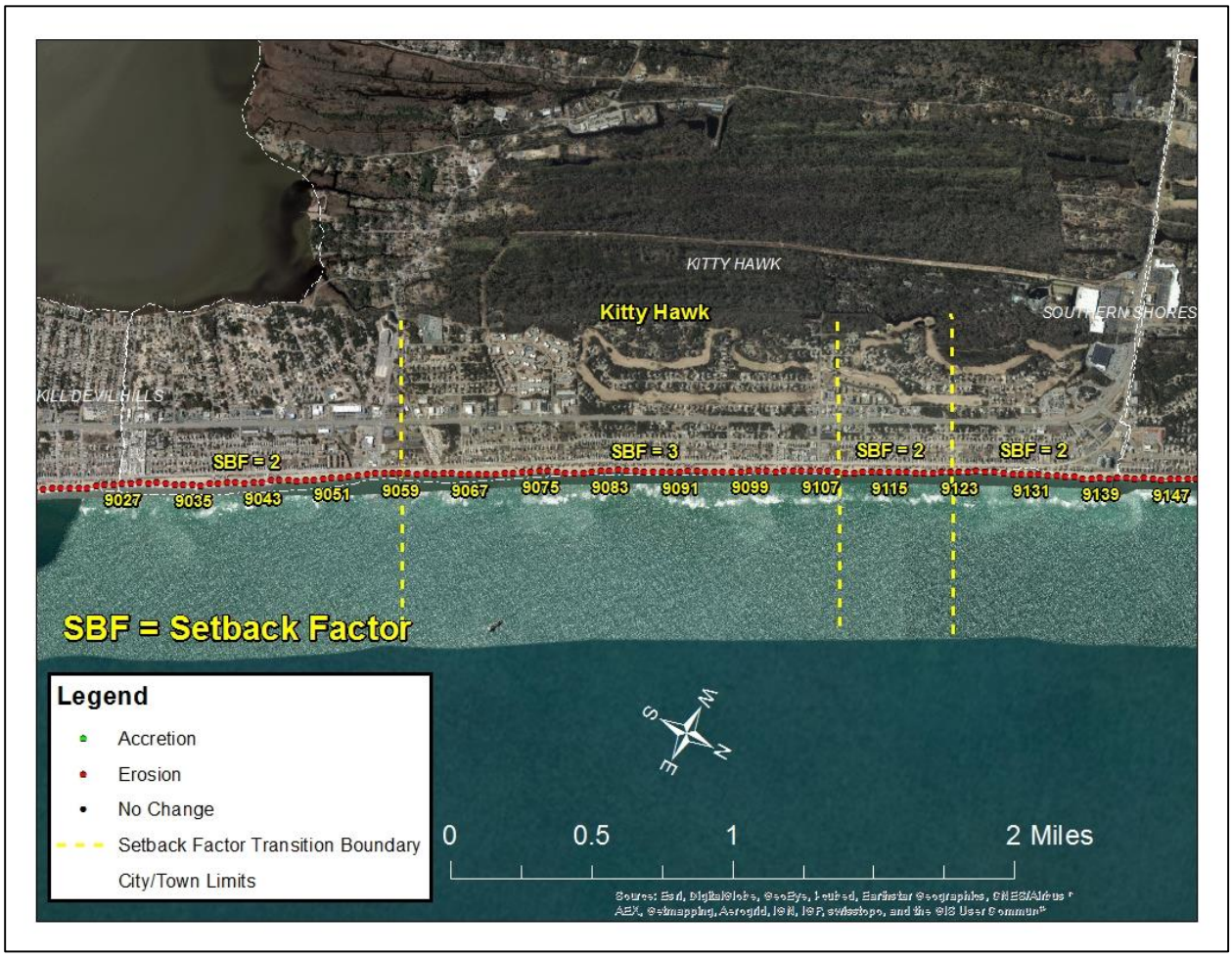


Figure 90. Kitty Hawk. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Southern Shores

Southern Shores has an east-facing beach and its shoreline is 4.5 miles long. Approximately 4.0 miles (88 percent) of it shoreline resulted in measured erosion, while the remaining 0.5 mile (11 percent) resulted in measured accretion. The average shoreline change rate 0.5 feet per year (erosion), and the blocked rate (setback factor) is 2.0 feet per year for Southern Shore's entire ocean shoreline (Figure 91 and 92).

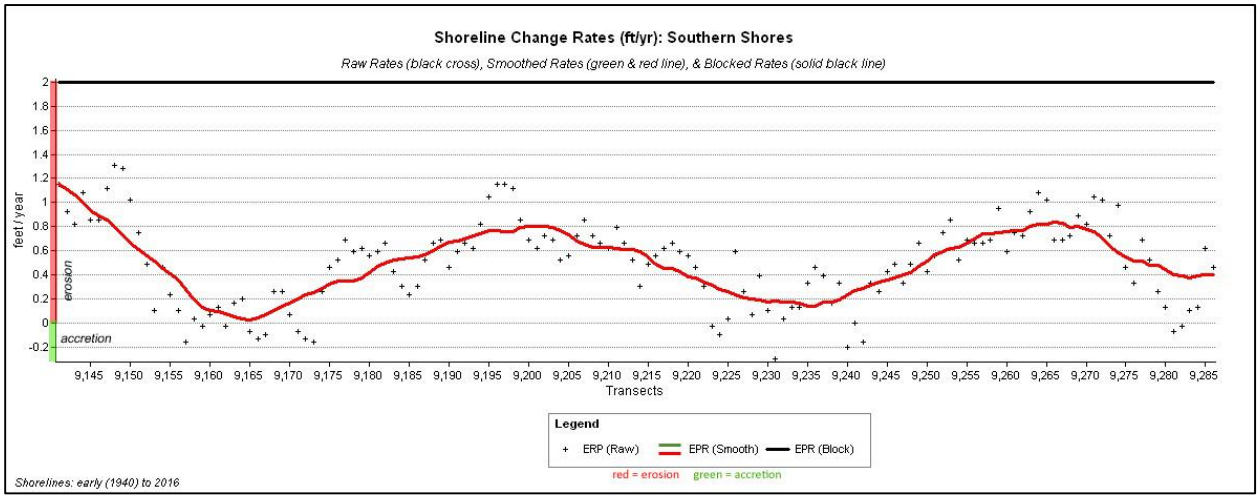


Figure 91. Southern Shores shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

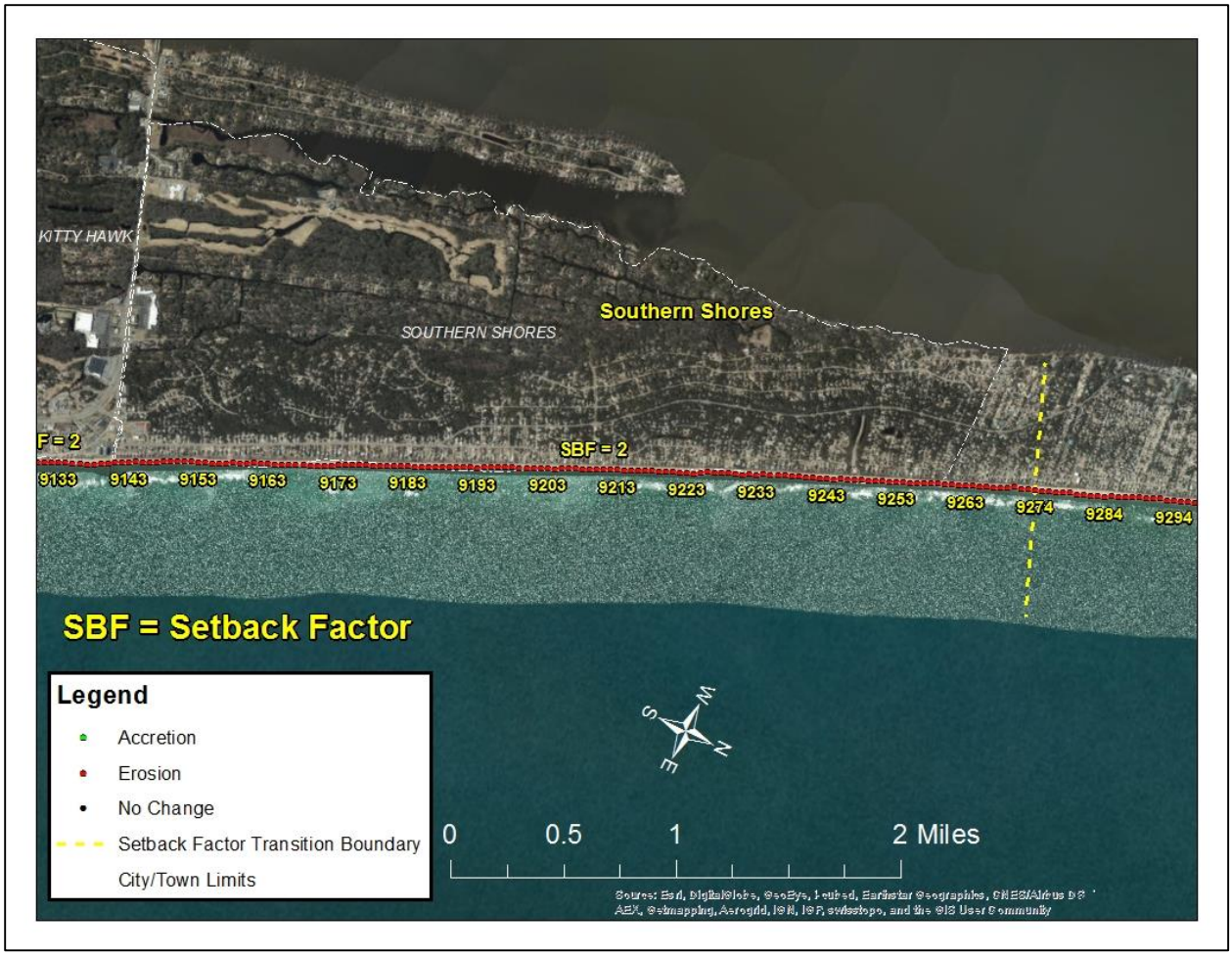


Figure 92. Southern Shores. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Duck

Duck has an east-facing beach and its shoreline is 1.8 miles long. Approximately 1.1 miles (64.4 percent) of it shoreline resulted in measured erosion, while the remaining 0.6 mile (33.9 percent) resulted in measured accretion. The average shoreline change rate is less than 0.5 feet per year (erosion), and the blocked rate (setback factor) is 2.0 feet per year for Duck's entire ocean shoreline (Figure 93 and 94).

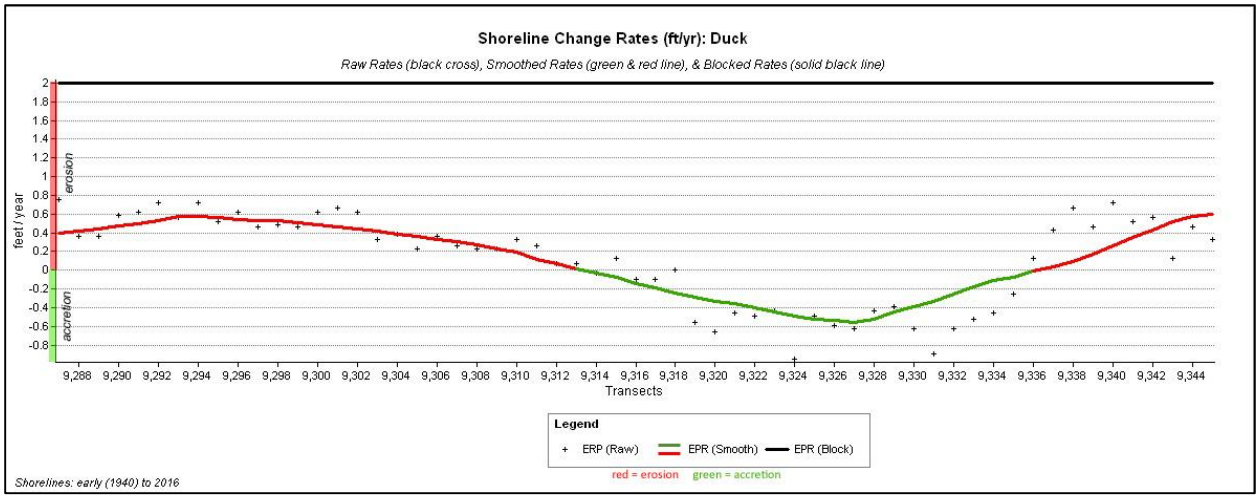


Figure 93. Duck shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

Figure 94. Duck. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Corolla

Corolla has an east-facing beach and its shoreline is 15.1 miles long. Approximately 13.6 miles (90.1 percent) of it shoreline resulted in measured erosion, while the remaining 1.5 mile (9.9 percent) resulted in measured accretion. The average shoreline change rate less than 1.3 feet per year (erosion), and the blocked rate (setback factor) is 2.0 feet per with a range between 2 and 4 feet per year (Figure 95 and 96).

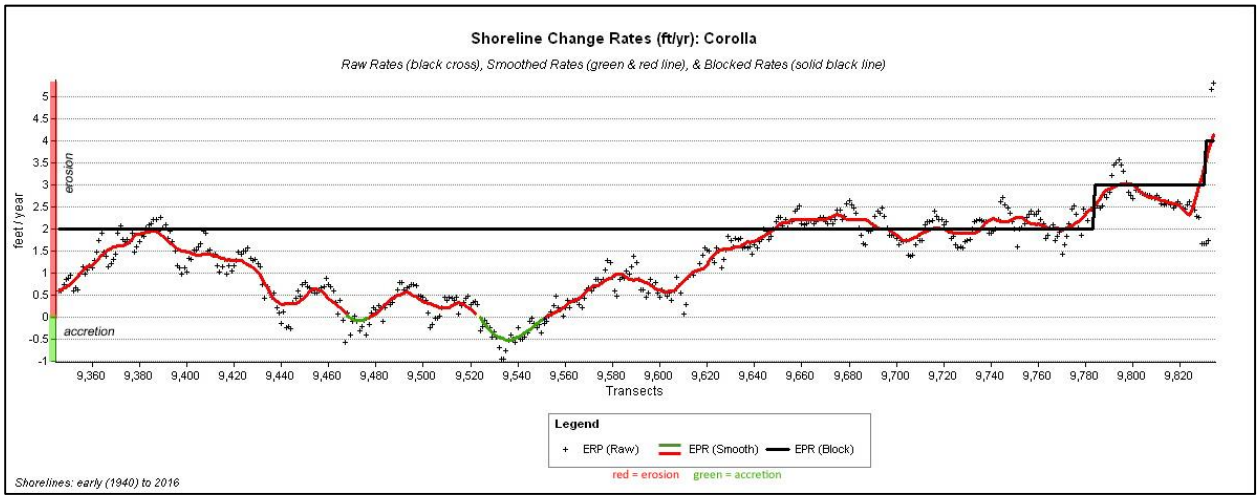


Figure 95. Corolla shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

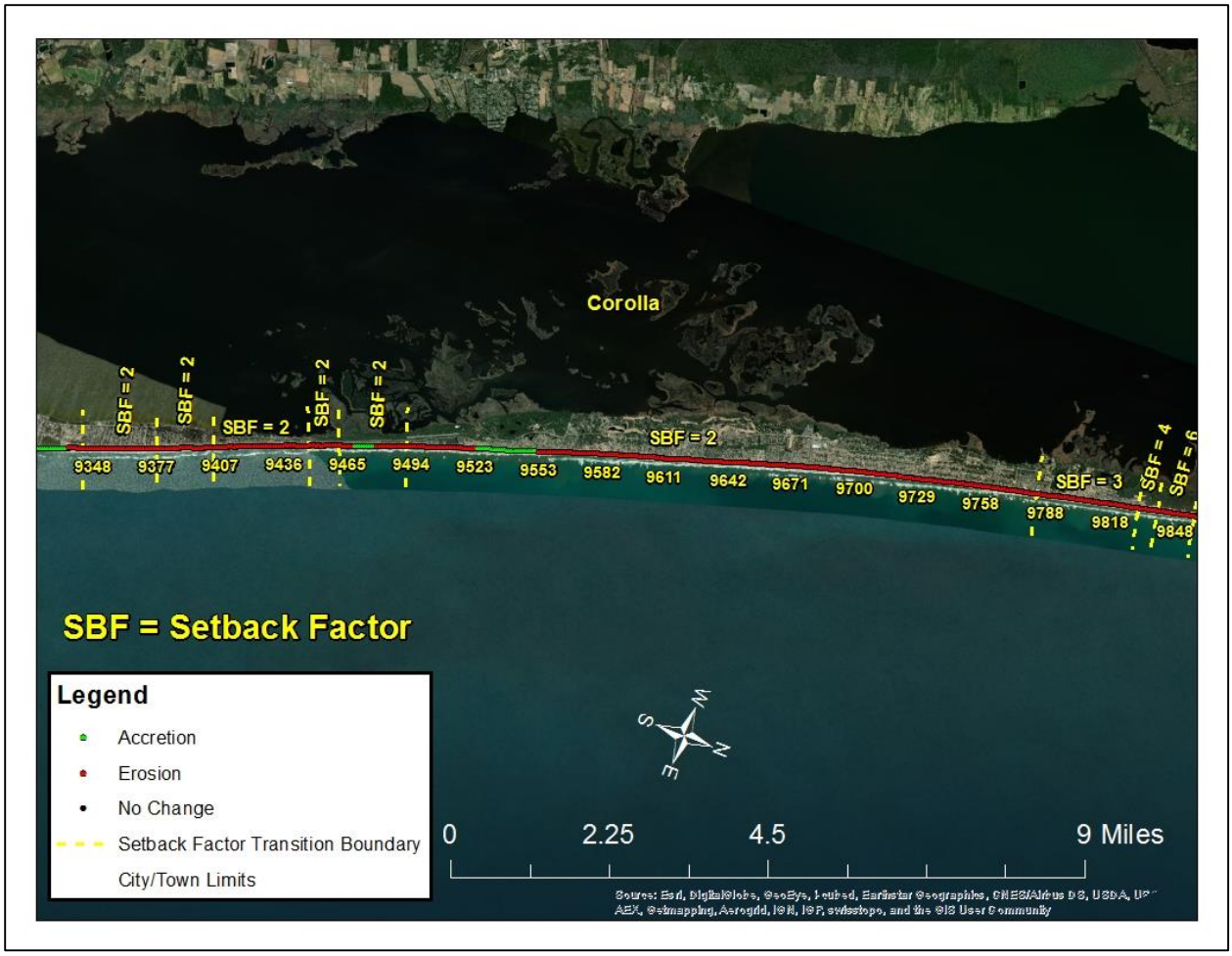


Figure 96. Corolla. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

Corolla to NC-VA State Line

The northern-most section of NC's ocean shoreline extends from Corolla to the NC-VA State line. This segment of shoreline is 10.9 miles in length. Approximately 8.1 miles (53.8 percent) of the shoreline resulted in measured erosion, while 2.7 miles (18.3 percent) of this shoreline resulted in measured accretion. The average shoreline change rate is 3.8 feet per year (erosion), and the average blocked rate (setback factor) is 5 feet per year, with a range between 2 and 8 feet per year (Figure 97 and 98).

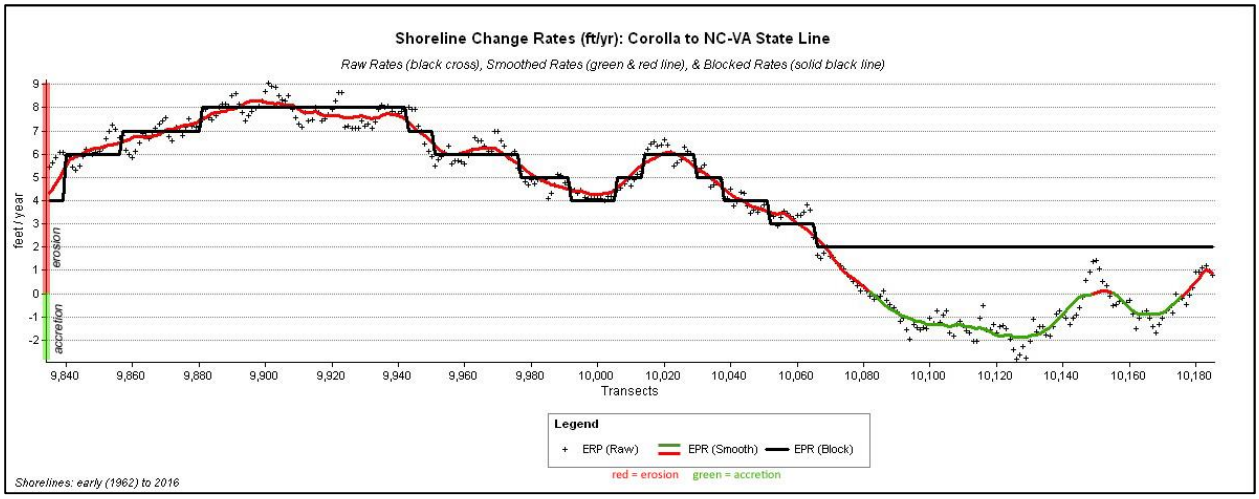


Figure 97. Corolla to NC-VA State line shoreline change rates and blocked rates (setback factors). Black-points represent all (erosion and accretion) raw rates; smoothed rates are represented by the solid green (accretion) and red (erosion) line; and the solid black line represents blocked rates (setback factors).

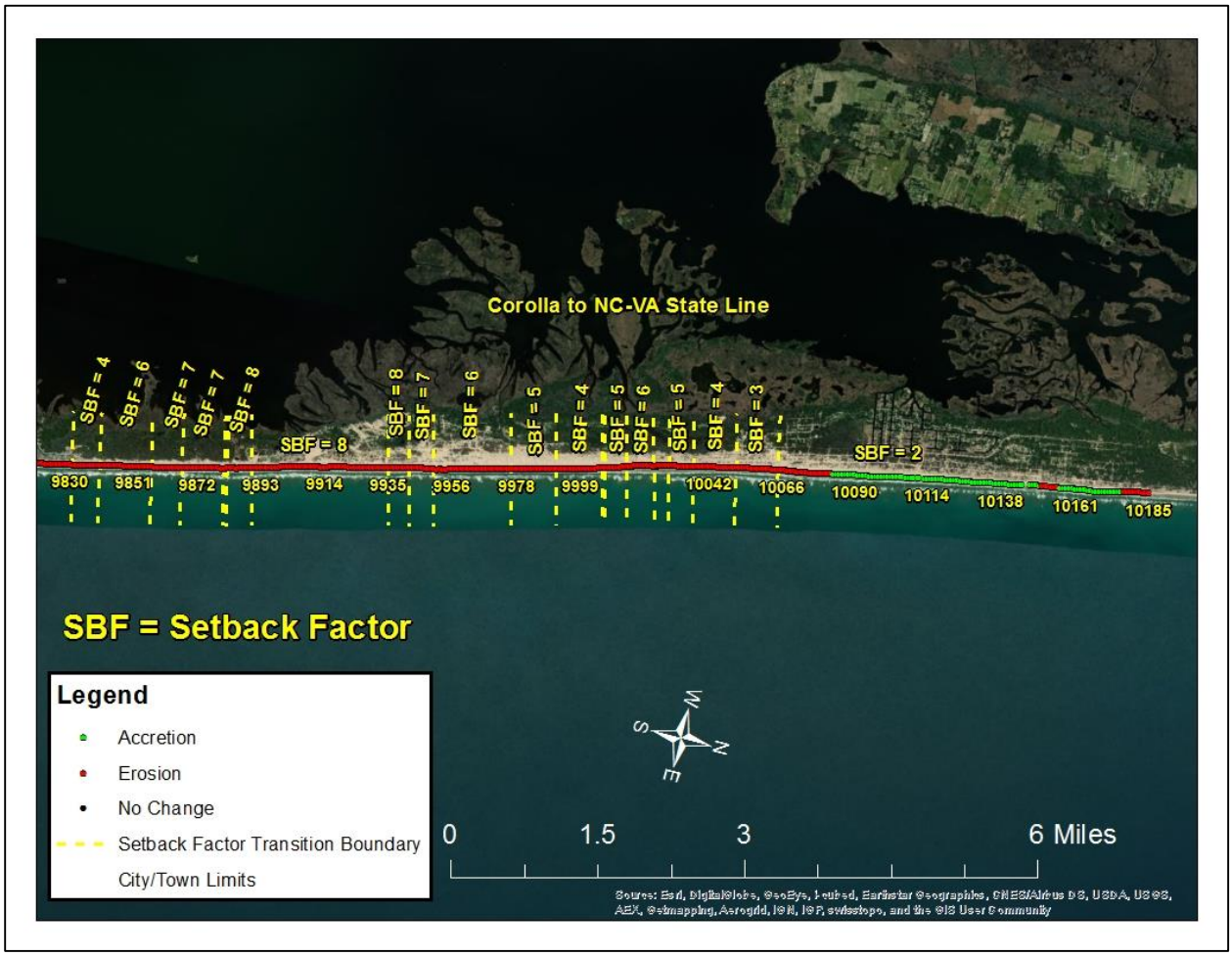


Figure 98. Corolla to NC-VA State line. Points represent transect-shoreline intersections on the 2016 shoreline; and number labels correspond to graph's x-axis transect numbers.

SUMMARY

Setback Factors and shoreline change rates south of Cape Lookout were generally consistent with those calculated in previous studies, and although some locations north of Cape Lookout resulted in slightly higher rates than were calculated in the previous study (NC DCM, 2011), they are still consistent overall when compared to the collective results from all studies. Given that most oceanfront communities now have experience with nourishing some portion of their beach on at least one occasion, it is important to emphasize that where "accretion" is measured, there is a distinct chance that while this does serve to reduce storm damage and maintain a healthy public beach, long-term beach nourishment does artificially lower actual erosion rates, and may not be the result of natural accretion.

For nearly forty years, the State has calculated oceanfront shoreline change rates using the end-point method using two shorelines (early and current). Although this method can serve to measure long-term trends, it does not always include significant short-term changes like those currently being experienced on the shoulder of Shackleford Banks adjacent to Beaufort Inlet. In preparations for the next update study in 2024, the Division of Coastal Management will compare alternative methods that incorporate multiple shorelines.

This report, data, and maps, will be made available for download and viewing on the Division's website:

https://deq.nc.gov/about/divisions/coastal-management

or, Internet browser key word search "NC DCM"

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APPENDIX A: Oceanfront Setback Factors & Average Annual Long-Term Shoreline Change Rate Maps

2018 Ocean Erodible Area & Setback Factor Update

Sunset Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:16,328

0 1,200 2,400 4,800 Feet

0 0.25 0.5 1 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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Figure A 1. Sunset Beach & Bird Island Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Ocean Isle

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

Map Scale: 1:26,010

0 1,950 3,900 7,800 Feet

0 0.4 0.8 1.6 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 2. Ocean Isle Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Holden Beach

Photo: 2016 North Carolina

Legend

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
○ 2.0	2.0
● 2.1 - 3.0	2.1 - 3.0
● 3.1 - 4.0	3.1 - 4.0
● 4.1 - 5.0	4.1 - 5.0
● 5.1 - 6.0	5.1 - 6.0
● 6.1 -7.0	6.1 - 7.0
● 7.1 - 8.0	7.1 - 8.0
● > 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:34,000

0 2,550 5,100 10,200 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 3. Holden Beach Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Oak Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:40,490

0 3,050 6,100 12,200 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 4. Oak Island Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Caswell Beach & Fort Caswell

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:21,713

0 1,625 3,250 6,500 Feet

0 0.325 0.65 1.3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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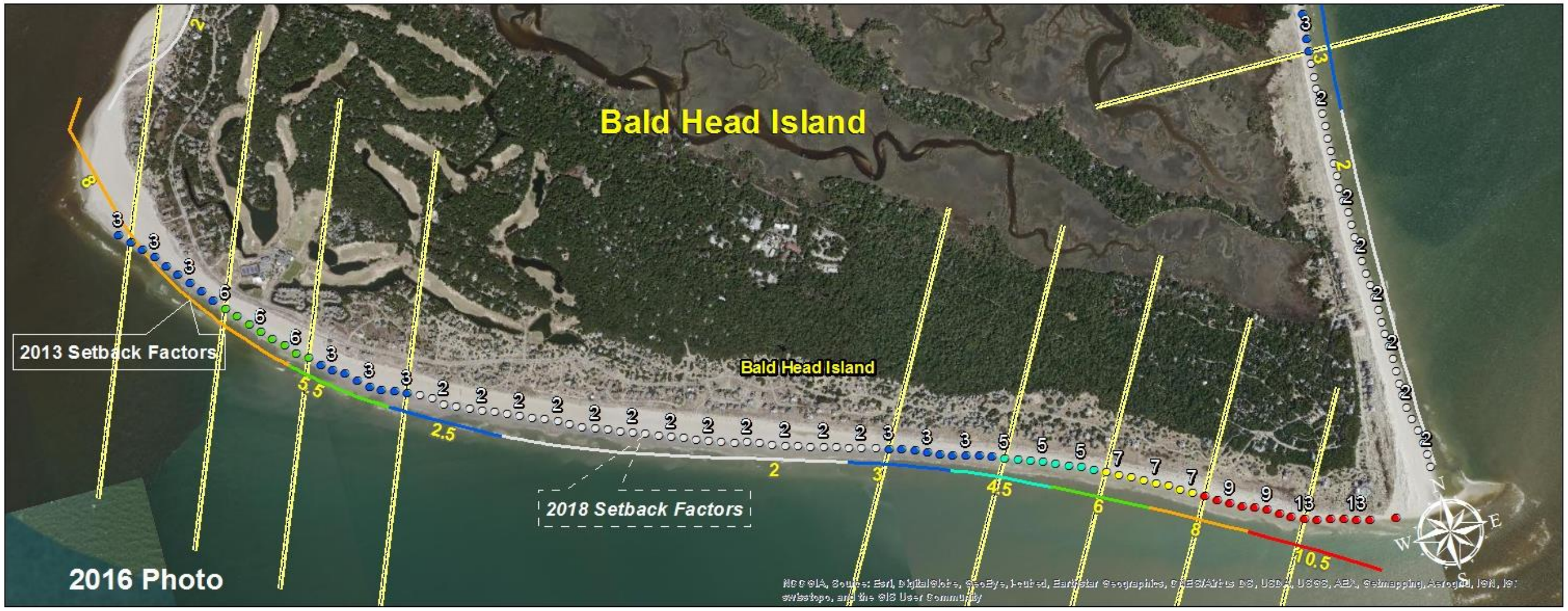
Figure A 5. Caswell Beach & Fort Caswell Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Bald Head Island (south-beach)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:15,433

0 1,150 2,300 4,600 Feet

0 0.225 0.45 0.9 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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Figure A 6. Bald Head Island (south-beach) Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Bald Head Island (east-beach)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:8,809

0 650 1,300 2,600 Feet

0 0.125 0.25 0.5 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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NC Division of Coastal Management - 2018

Ken Richardson - November 2018

Figure A 7. Bald Head Island (east-beach) Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Zeke's Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

Map Scale: 1:21,661

0 1,625 3,250 6,500 Feet

0 0.325 0.65 1.3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 8. Zeke's Island Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Fort Fisher State Park

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:15,984

0 1,200 2,400 4,800 Feet

0 0.225 0.45 0.9 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 9. Fort Fisher State Park Setback Factors

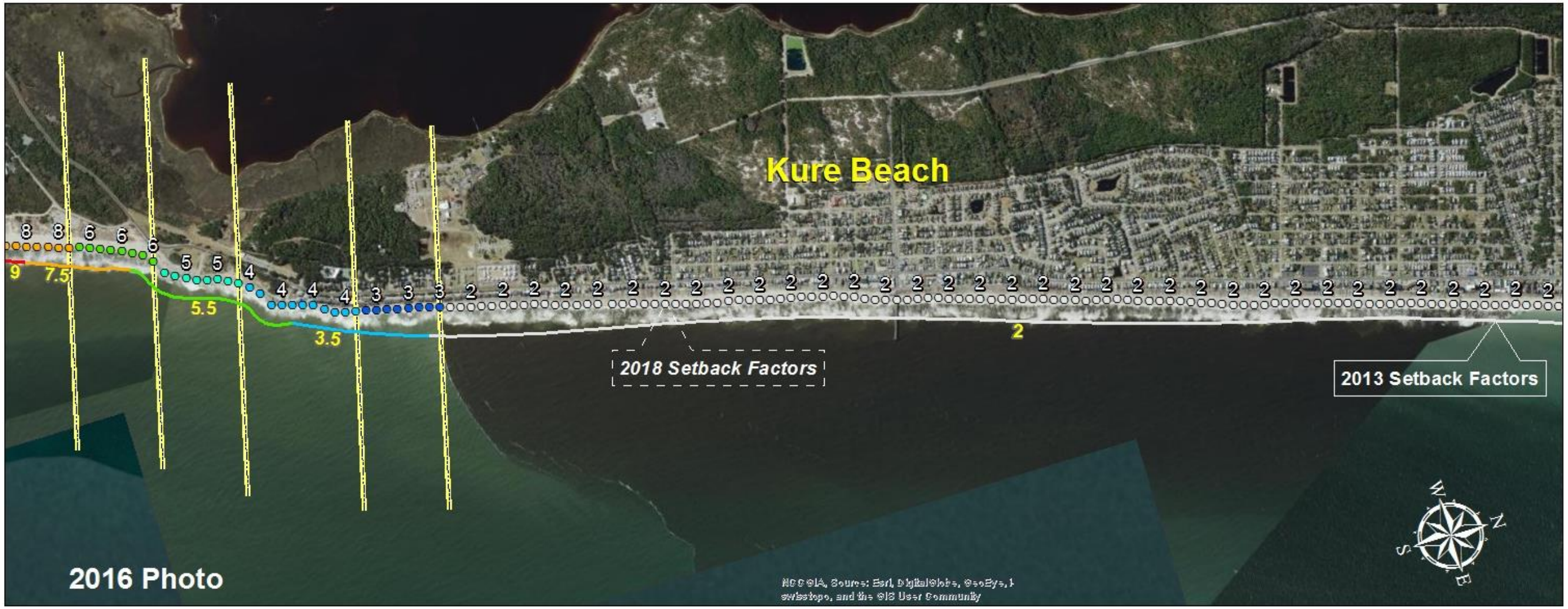
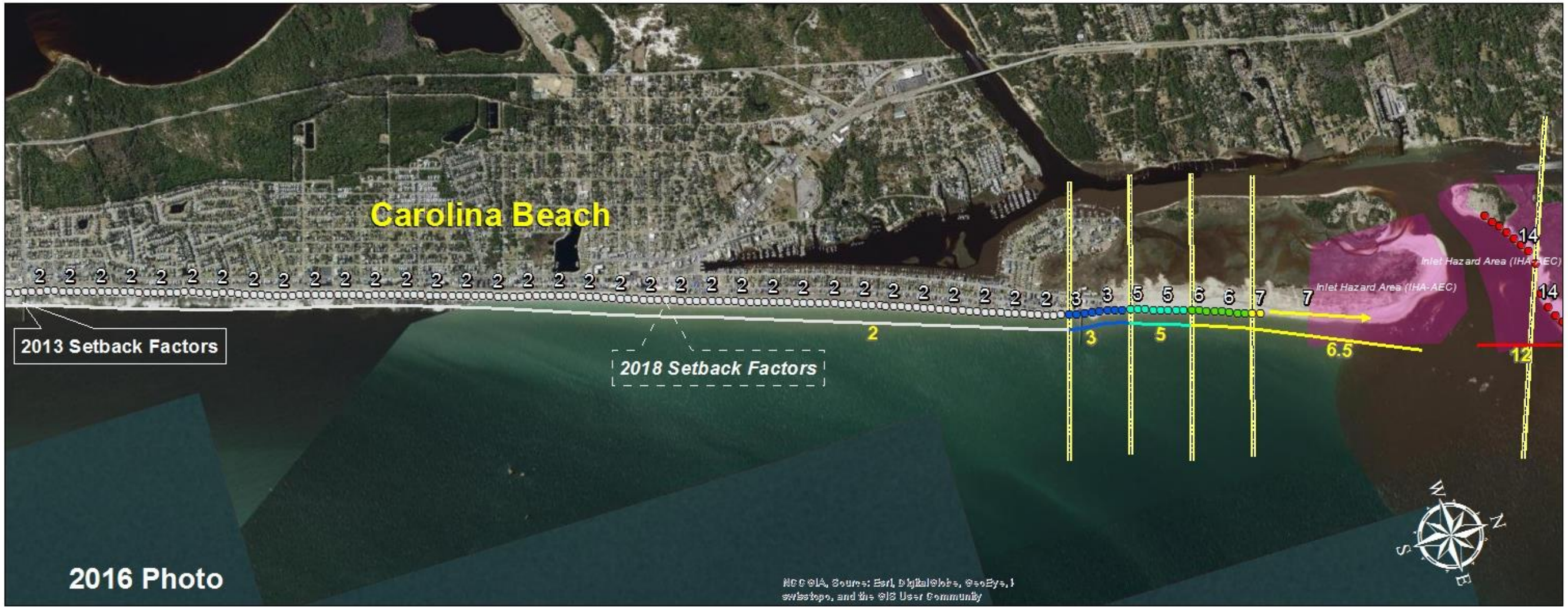


Figure A 10. Kure Beach Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Carolina Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

North Carolina Department of Environmental Quality (DEQ)

Vicinity Map

Map Scale: 1:25,691

0 1,900 3,800 7,600 Feet

0 0.375 0.75 1.5 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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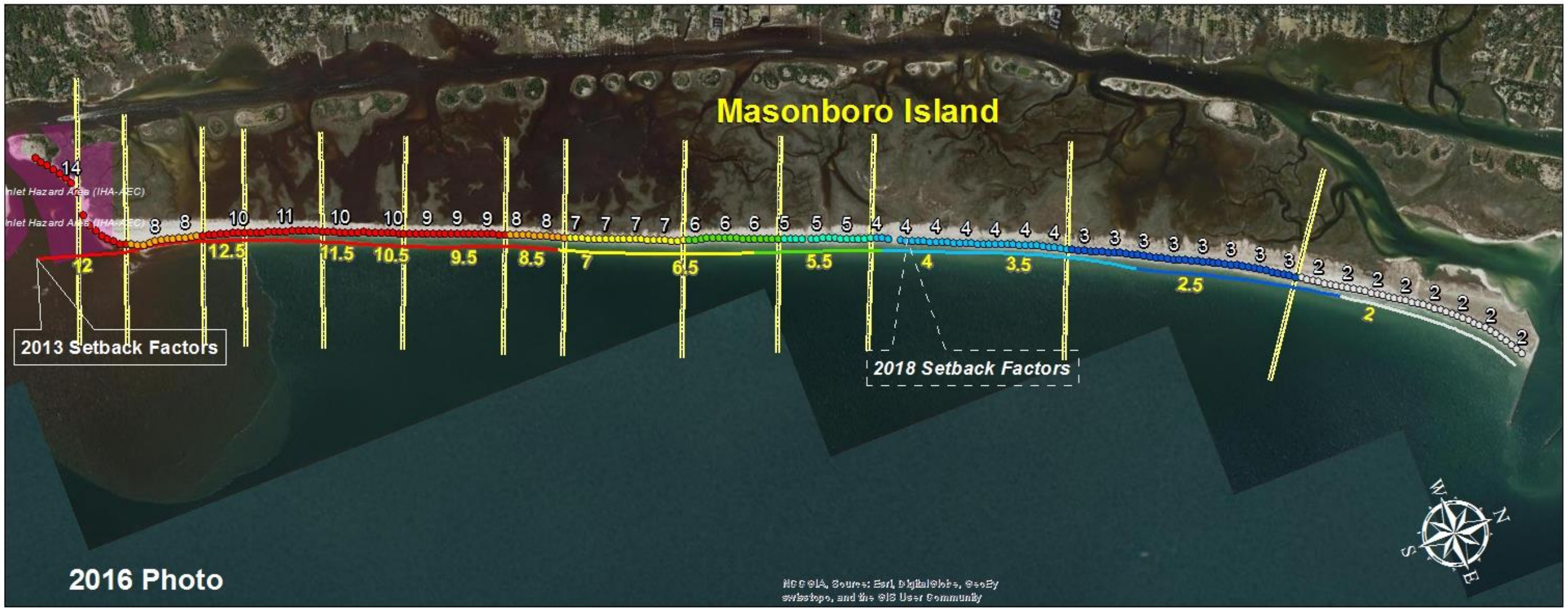
Figure A 11. Carolina Beach Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Masonboro Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:32,998

0 2,450 4,900 9,800 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

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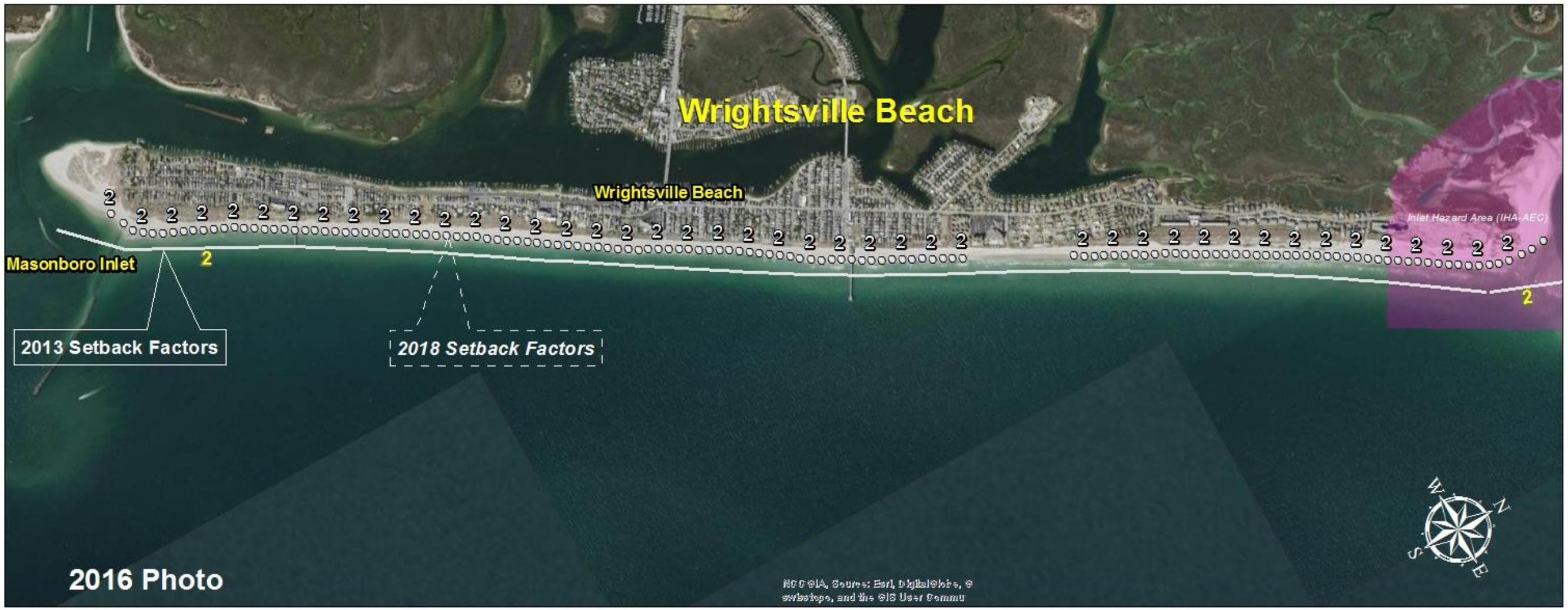
Figure A 12. Masonboro Island Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Wrightsville Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:19,411

0 1,450 2,900 5,800 Feet

0 0.275 0.55 1.1 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 13. Wrightsville Beach Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Figure Eight Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:22,175

0 1,650 3,300 6,600 Feet

0 0.325 0.65 1.3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

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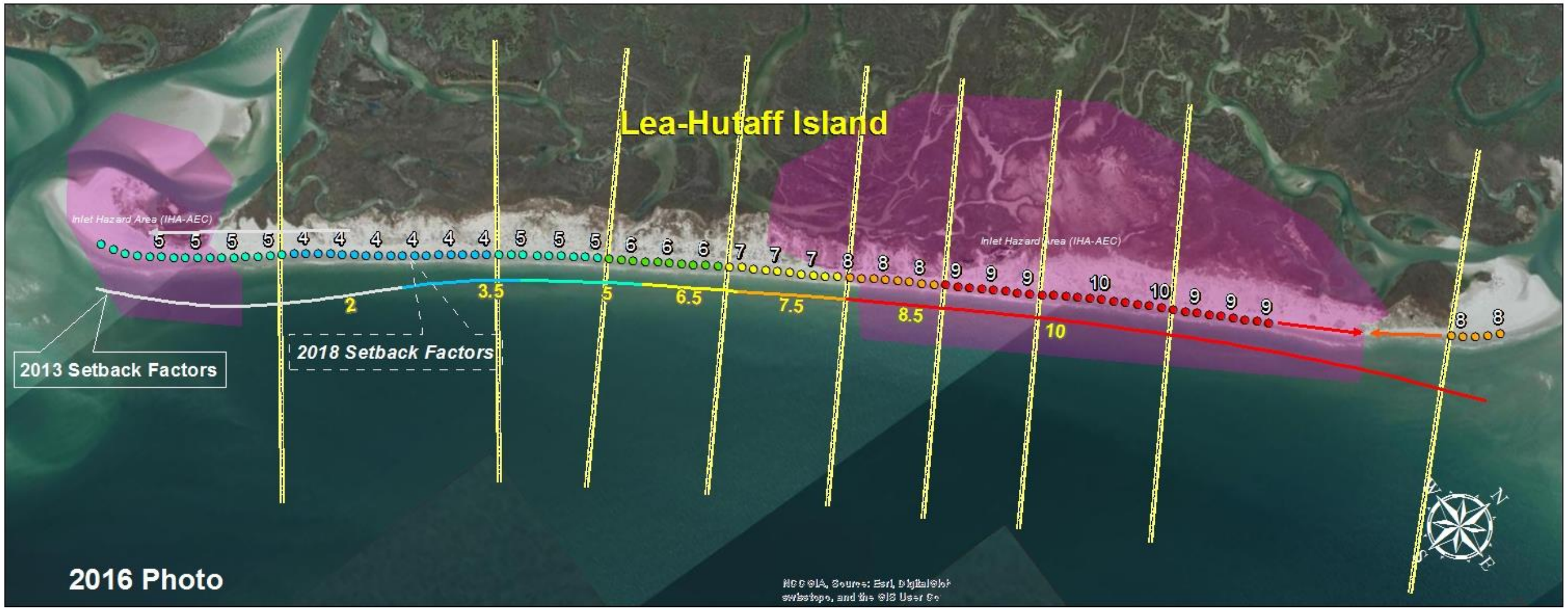
Figure A 14. Figure Eight Island Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Lea-Hutaff Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:16,294

0 1,200 2,400 4,800 Feet

0 0.25 0.5 1 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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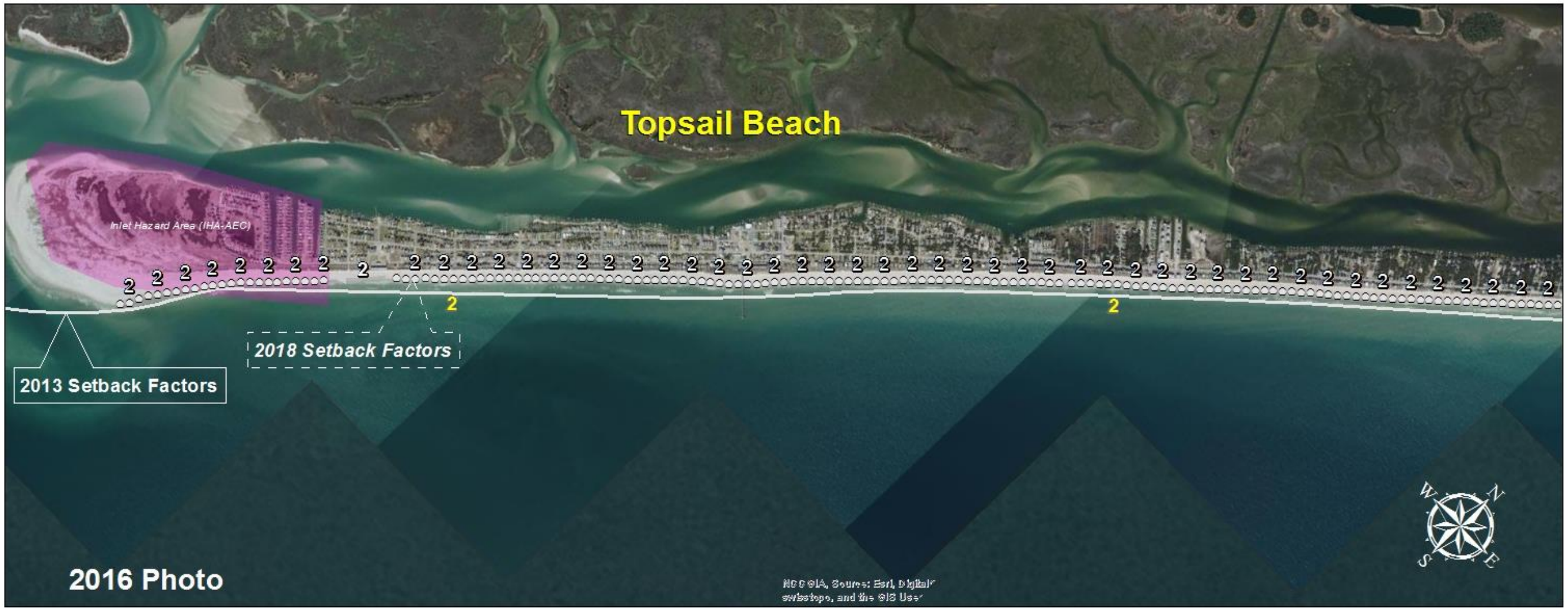
Figure A 15. Lea-Hutaff Island Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

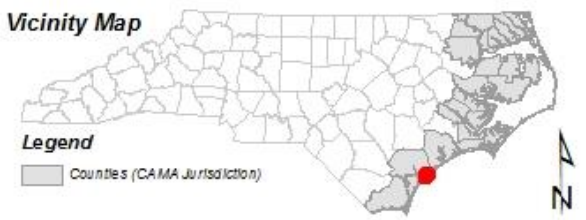
Topsail Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:21,375

0	1,600	3,200	6,400	Feet
0	0.325	0.65	1.3	Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 16. Topsail Beach Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Surf City

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

Map Scale: 1:25,145

0 1,875 3,750 7,500 Feet

0 0.375 0.75 1.5 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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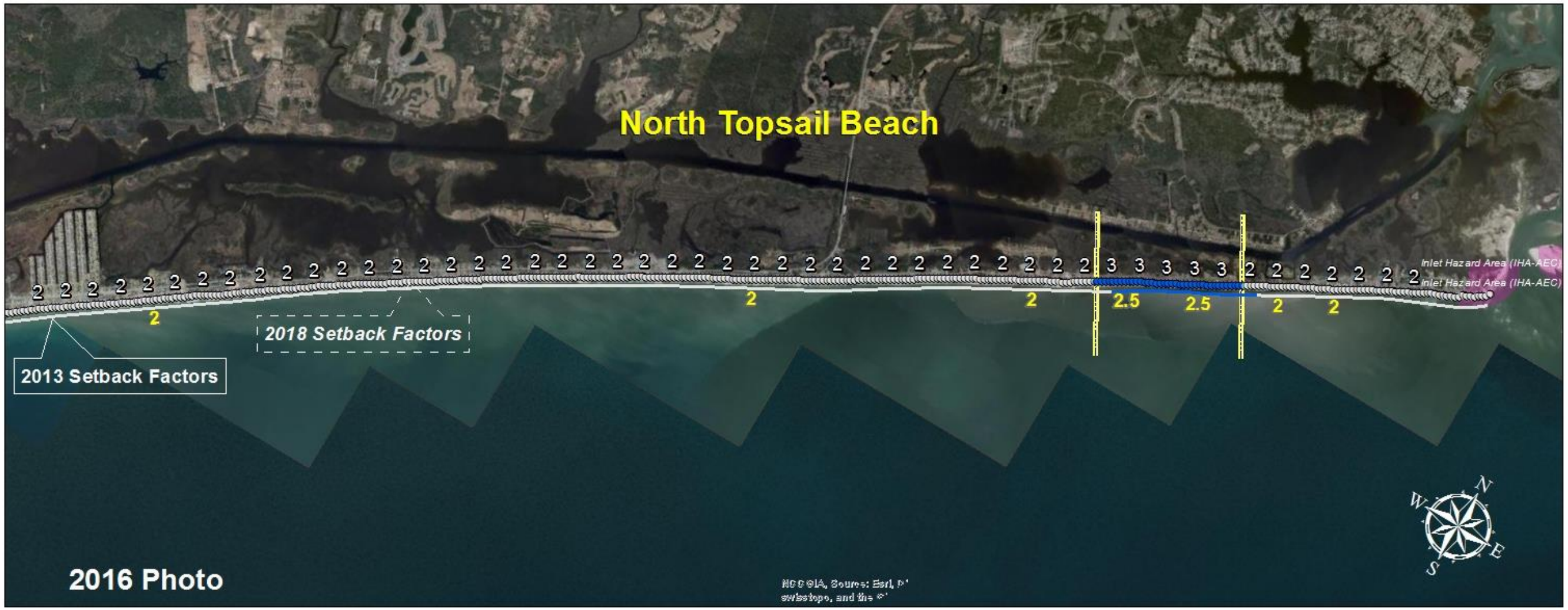
Figure A 17. Surf City Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

North Topsail Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	**2013 Setback Factors (ft/yr)**
○ 2.0	2.0
● 2.1 - 3.0	2.1 - 3.0
● 3.1 - 4.0	3.1 - 4.0
● 4.1 - 5.0	4.1 - 5.0
● 5.1 - 6.0	5.1 - 6.0
● 6.1 -7.0	6.1 - 7.0
● 7.1 - 8.0	7.1 - 8.0
● > 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 18. North Topsail Beach Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

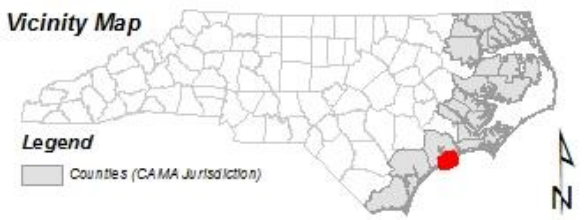
Onslow Beach

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:31,205

0	2,350	4,700	9,400	Feet
0	0.475	0.95	1.9	Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 19. Onslow Beach Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

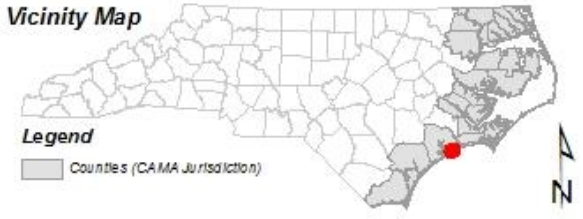
Brown's Island

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:14,140

0 1,050 2,100 4,200 Feet

0 0.2 0.4 0.8 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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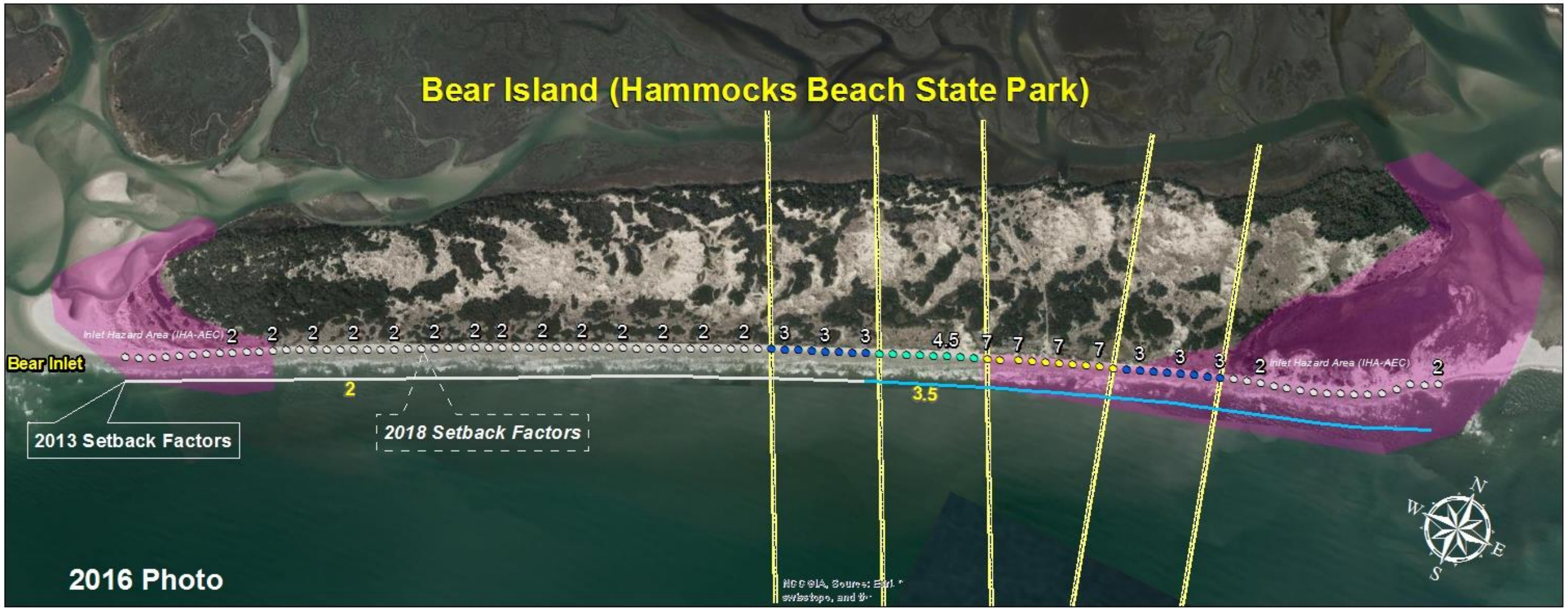
Figure A 20. Brown's Island Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Bear Island (Hammocks Beach State Park)

Legend Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

North Carolina Department of Environmental Quality (DEQ)

Vicinity Map

Map Scale: 1:14,575

0 1,100 2,200 4,400 Feet

0 0.225 0.45 0.9 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 21. Bear Island (Hammocks Beach State Park) Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

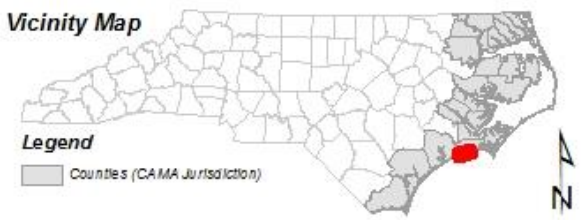
Emerald Isle

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:46,701

0 3,500 7,000 14,000 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 22. Emerald Isle Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Indian Beach & Salter Path

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:13,578

0 1,000 2,000 4,000 Feet

0 0.2 0.4 0.8 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 23. Indian Beach & Salter Path Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Pine Knoll Shores

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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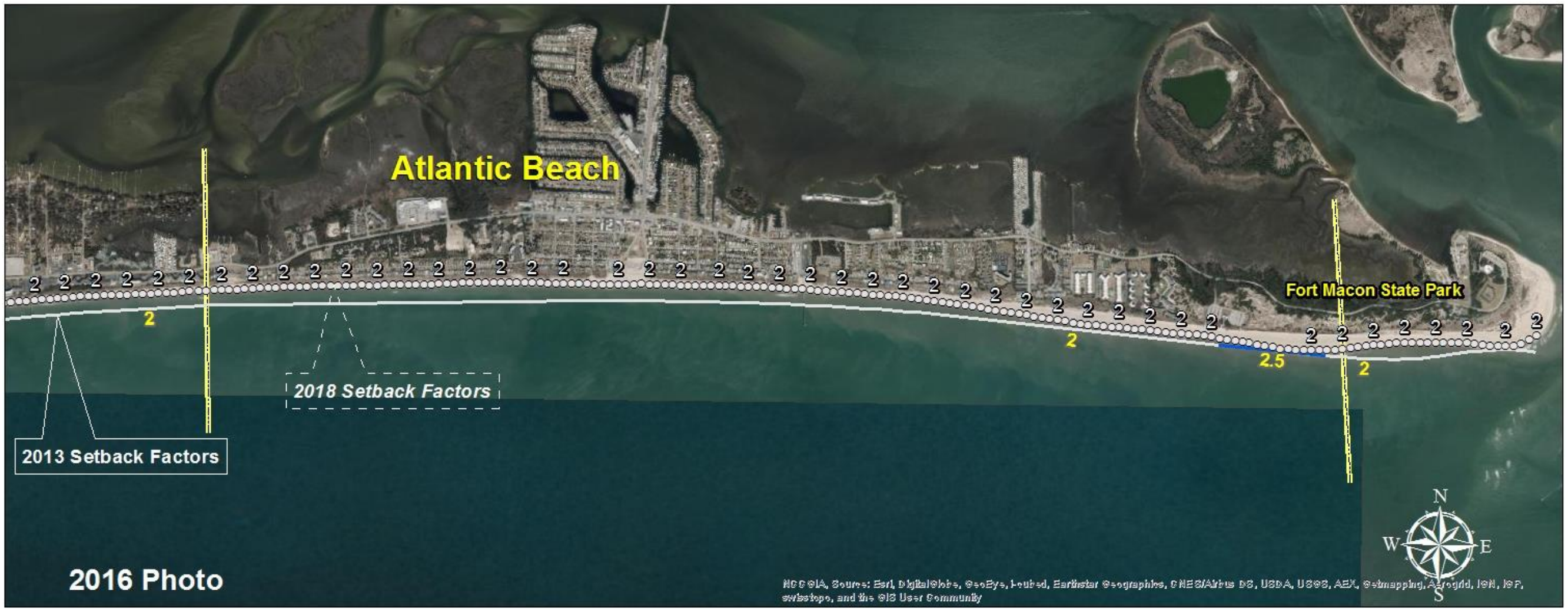
Figure A 24. Pine Knoll Shores Setback Factors



Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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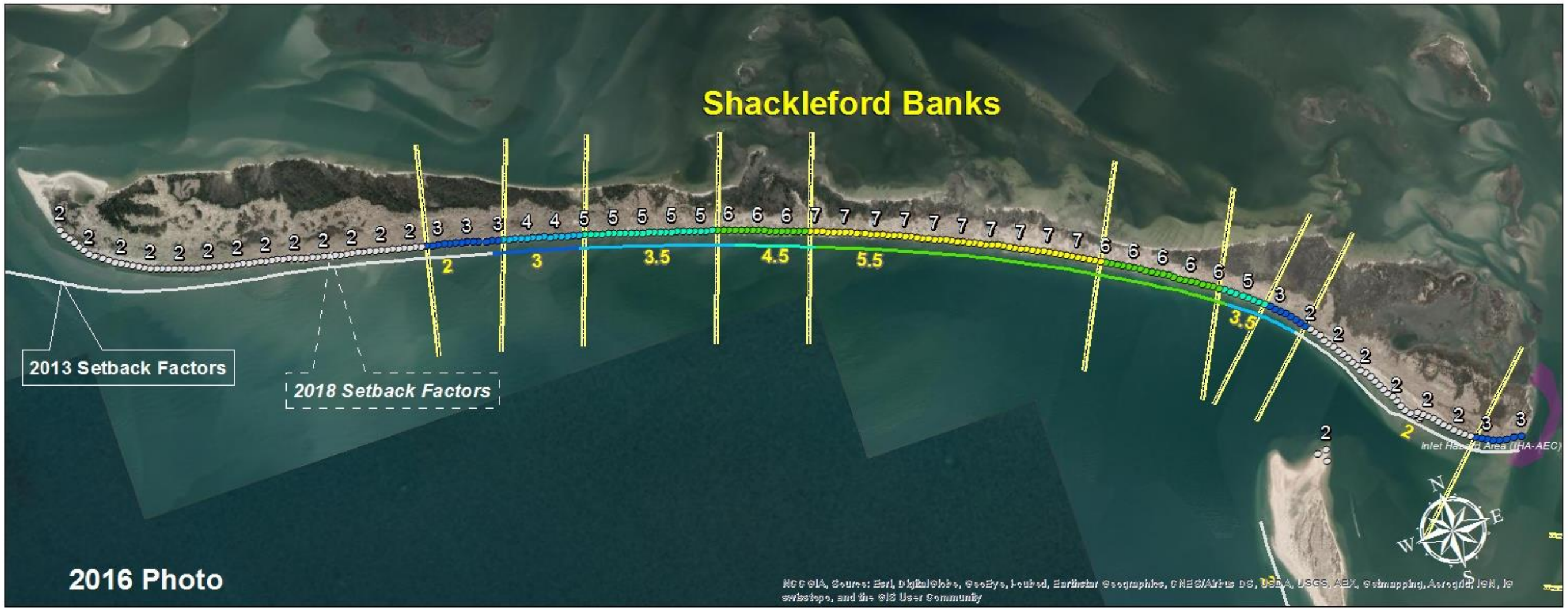
Figure A 25. Atlantic Beach & Fort Macon State Park Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

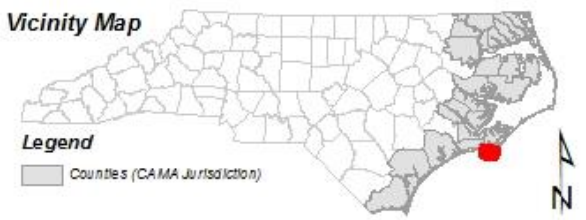
Shackleford Banks

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:33,948

0 2,550 5,100 10,200 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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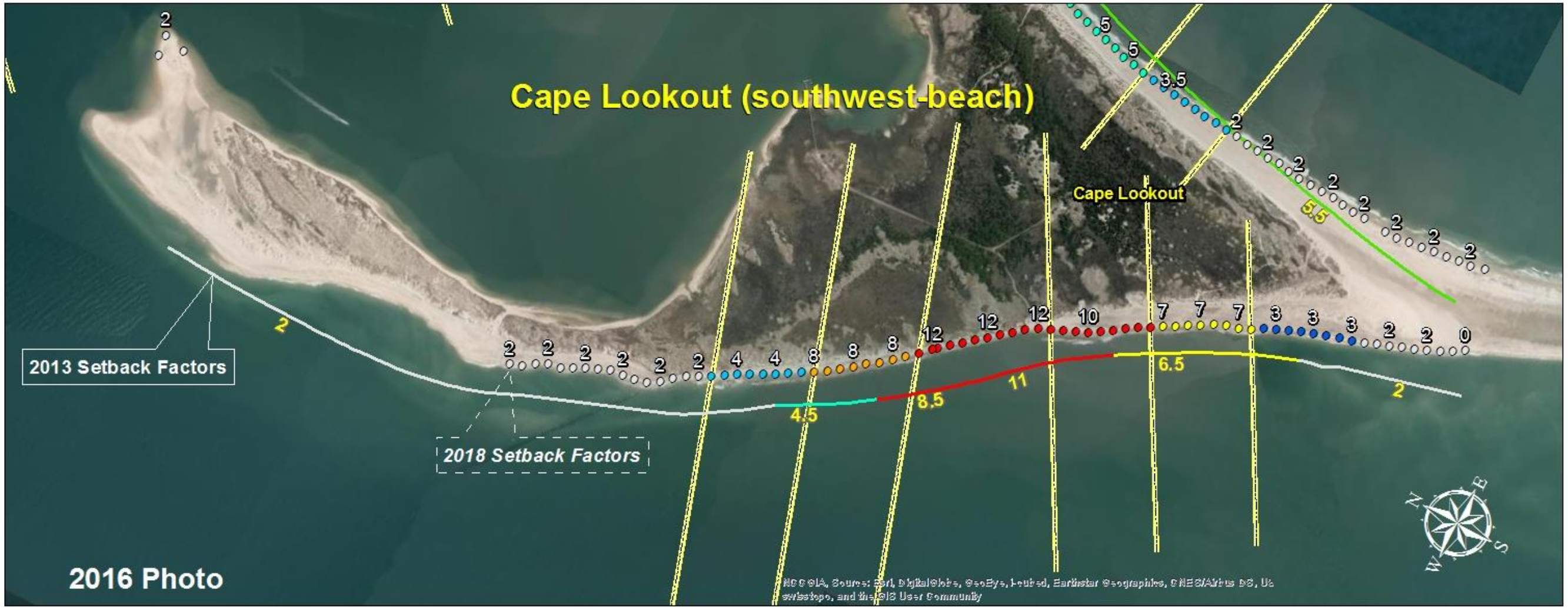
Figure A 26. Shackleford Banks Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Cape Lookout (southwest-beach)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:15,647

0 1,150 2,300 4,600 Feet

0 0.225 0.45 0.9 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 27. Cape Lookout (southwest-beach) Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

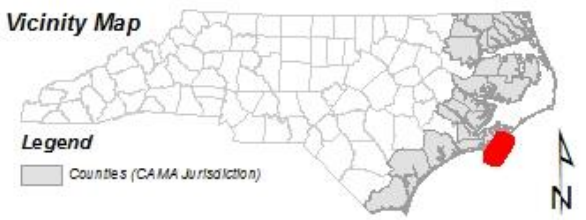
Core Banks (Cape Lookout to Drum Inlet)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map



Map Scale: 1:87,000

0 6,500 13,000 26,000 Feet

0 1.25 2.5 5 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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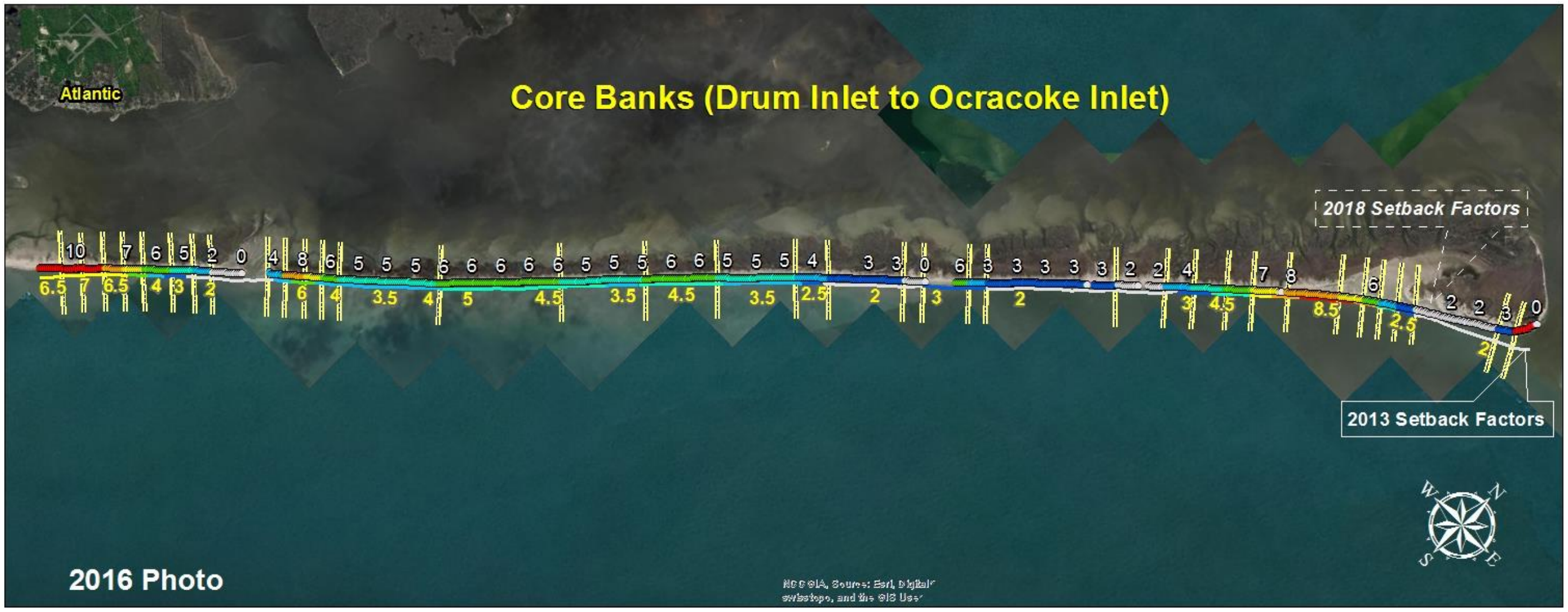
Figure A 28. Core Banks (Cape Lookout to Drum Inlet)



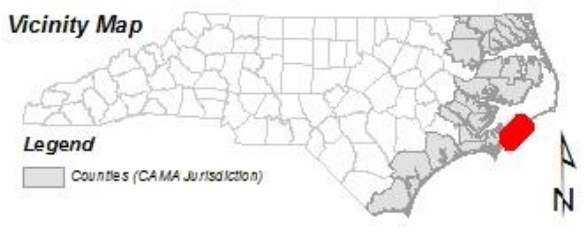
2018 Ocean Erodible Area & Setback Factor Update

Core Banks (Drum Inlet to Ocracoke Inlet)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area



Map Scale: 1:90,000

0 6,500 13,000 26,000 Feet

0 1.25 2.5 5 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 29. Core Banks (Drum Inlet to Ocracoke Inlet)

2018 Ocean Erodible Area & Setback Factor Update

Ocracoke

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:66,914

0 5,000 10,000 20,000 Feet

0 1 2 4 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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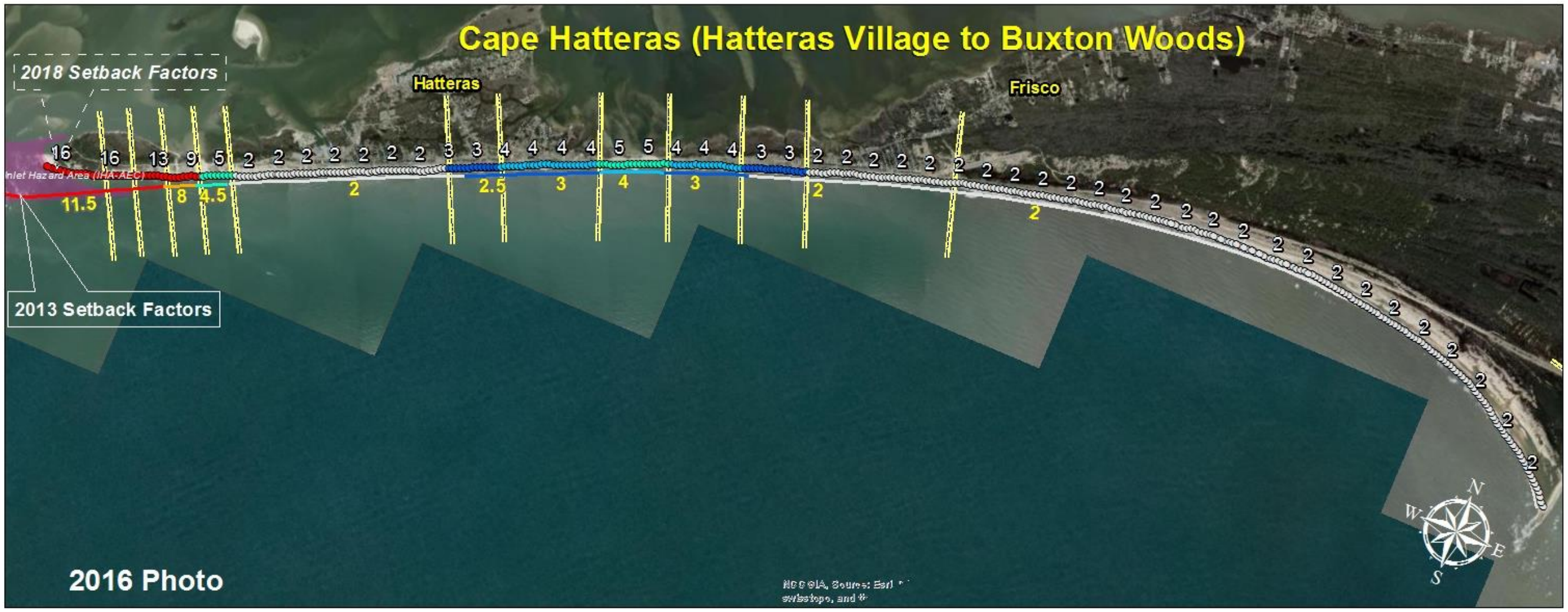
Figure A 30. Ocracoke Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Cape Hatteras (Hatteras Village to Buxton Woods)

Photo: 2016 North Carolina

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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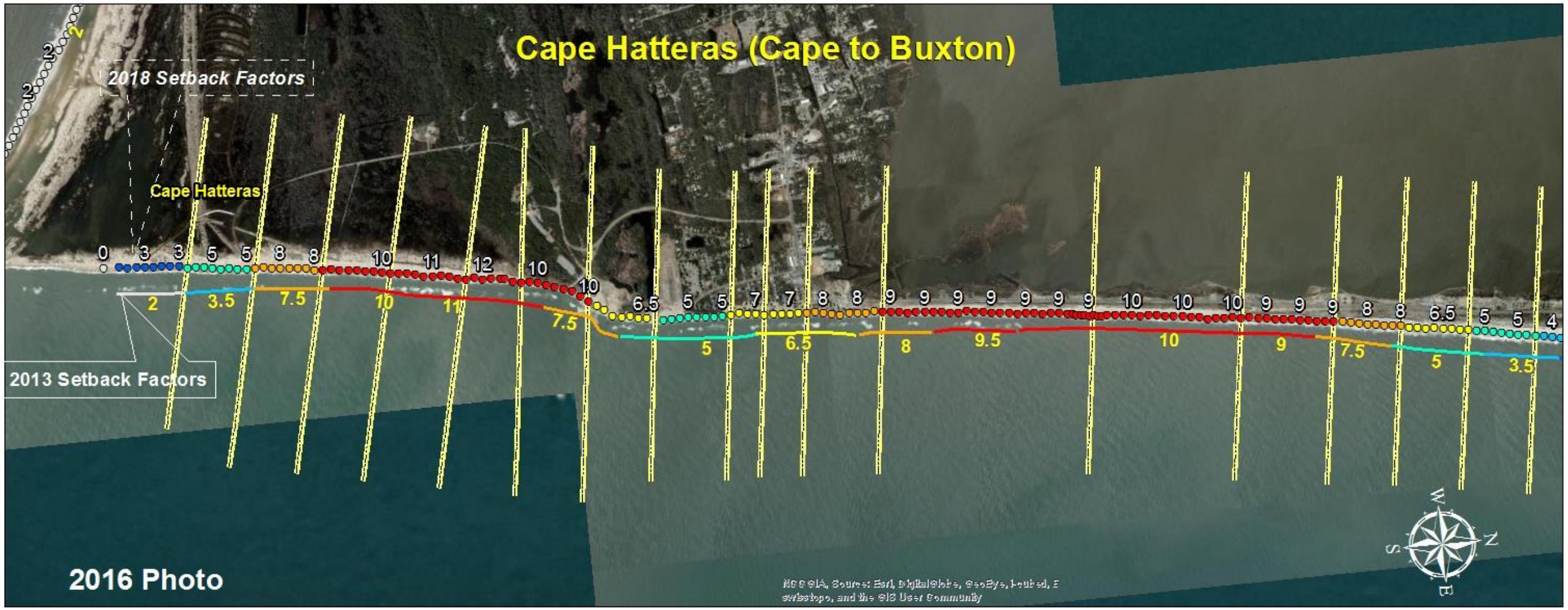
Figure A 31. Cape Hatteras (Hatteras Village to Cape) Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Cape Hatteras (Cape to Buxton)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:23,309

0 1,750 3,500 7,000 Feet

0 0.35 0.7 1.4 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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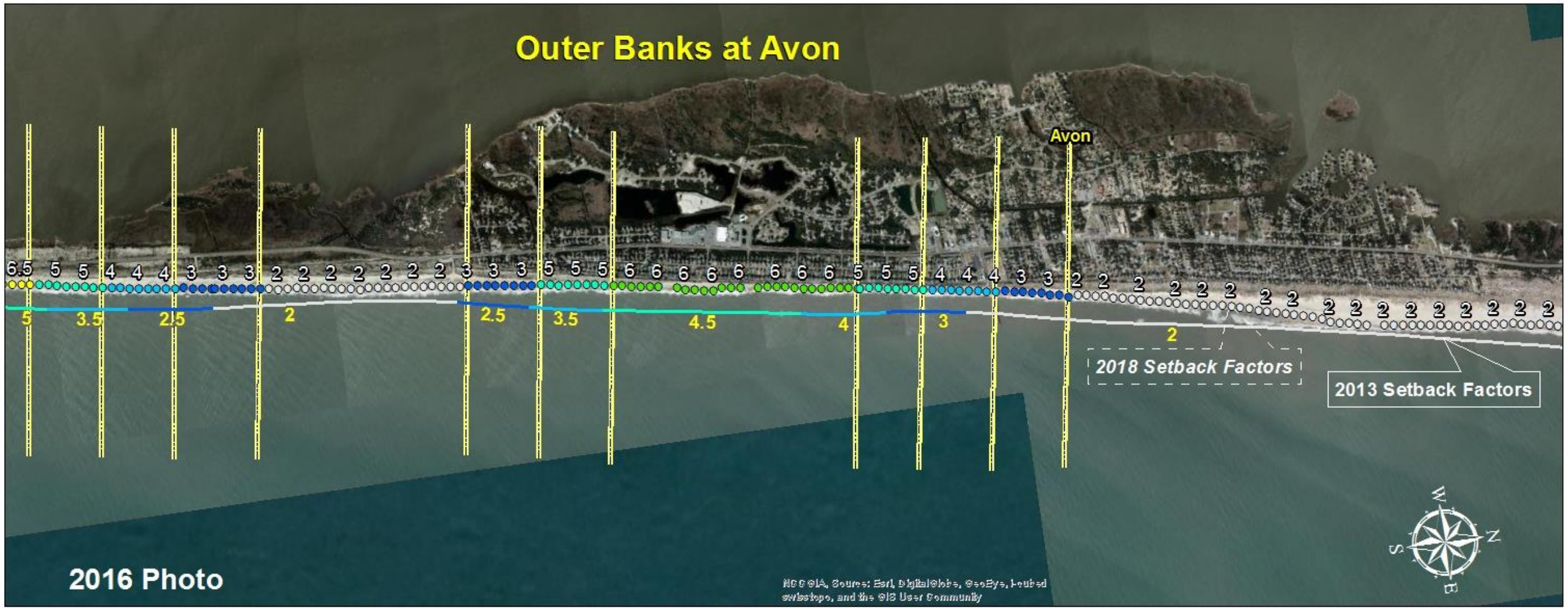
Figure A 32. Cape Hatteras (Cape to Buxton) Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Avon

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:21,670

0 1,625 3,250 6,500 Feet

0 0.325 0.65 1.3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 33. Outer Banks at Avon

2018 Ocean Erodible Area & Setback Factor Update

Outer Banks (between Avon & Salvo)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:49,644

0 3,750 7,500 15,000 Feet

0 0.75 1.5 3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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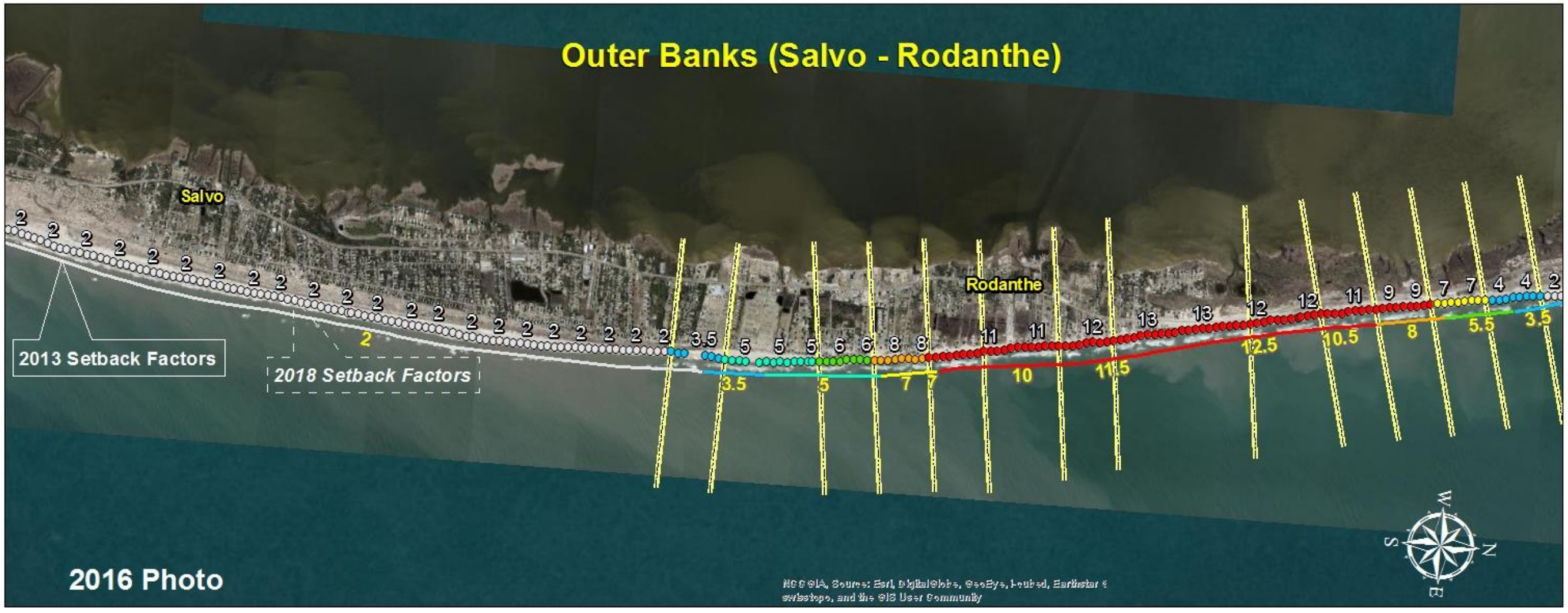
Figure A 34. Outer Banks (between Avon and Salvo) Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks (Salvo to Rodanthe)

Legend — Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend: Counties (CAMA Jurisdiction)

Map Scale: 1:28,620

0 — 2,150 — 4,300 — 8,600 Feet

0 — 0.425 — 0.85 — 1.7 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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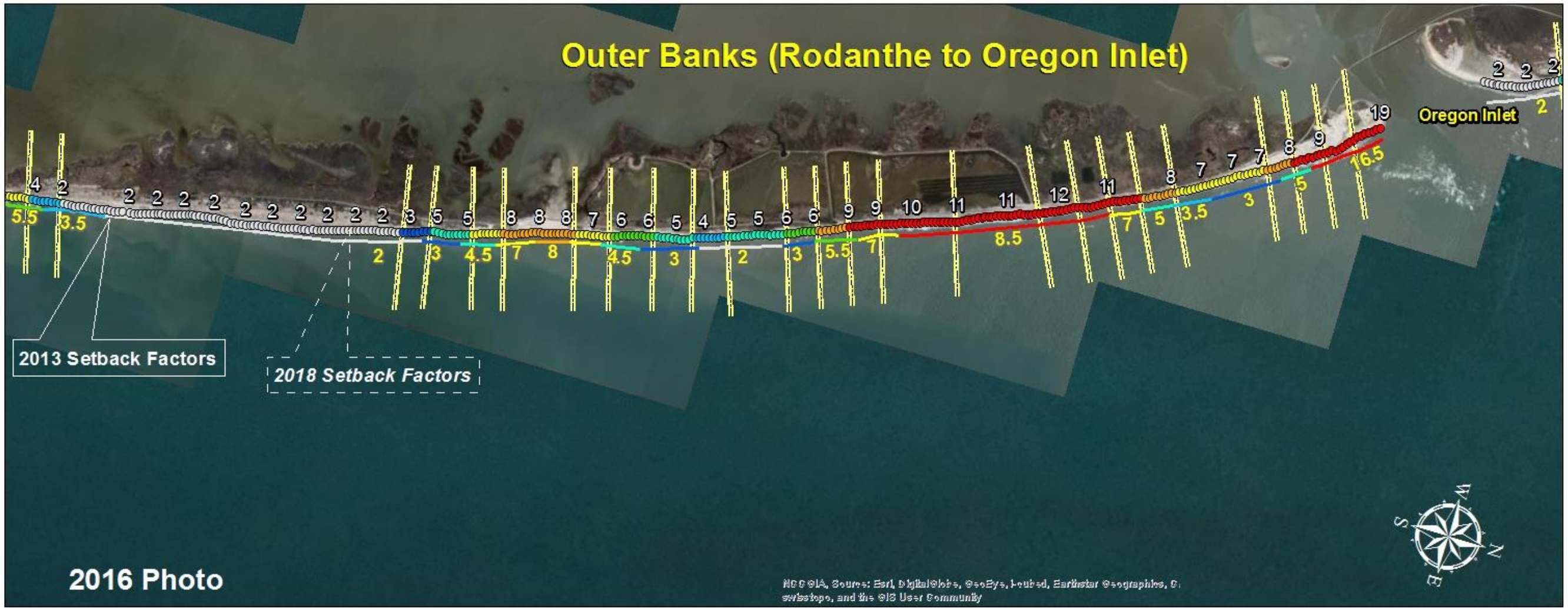
Figure A 35. Outer Banks at Salvo and Rodanthe Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks (Rodanthe to Oregon Inlet)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:50,000

0 3,750 7,500 15,000 Feet

0 0.75 1.5 3 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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Figure A 36. Outer Banks between Rodanthe and Oregon Inlet (Pea Island) Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Boddie Island (Oregon Inlet to Nags Head)

Legend Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

North Carolina Department of Environmental Quality (DEQ)

Vicinity Map

Map Scale: 1:23,677

0 1,750 3,500 7,000 Feet

0 0.35 0.7 1.4 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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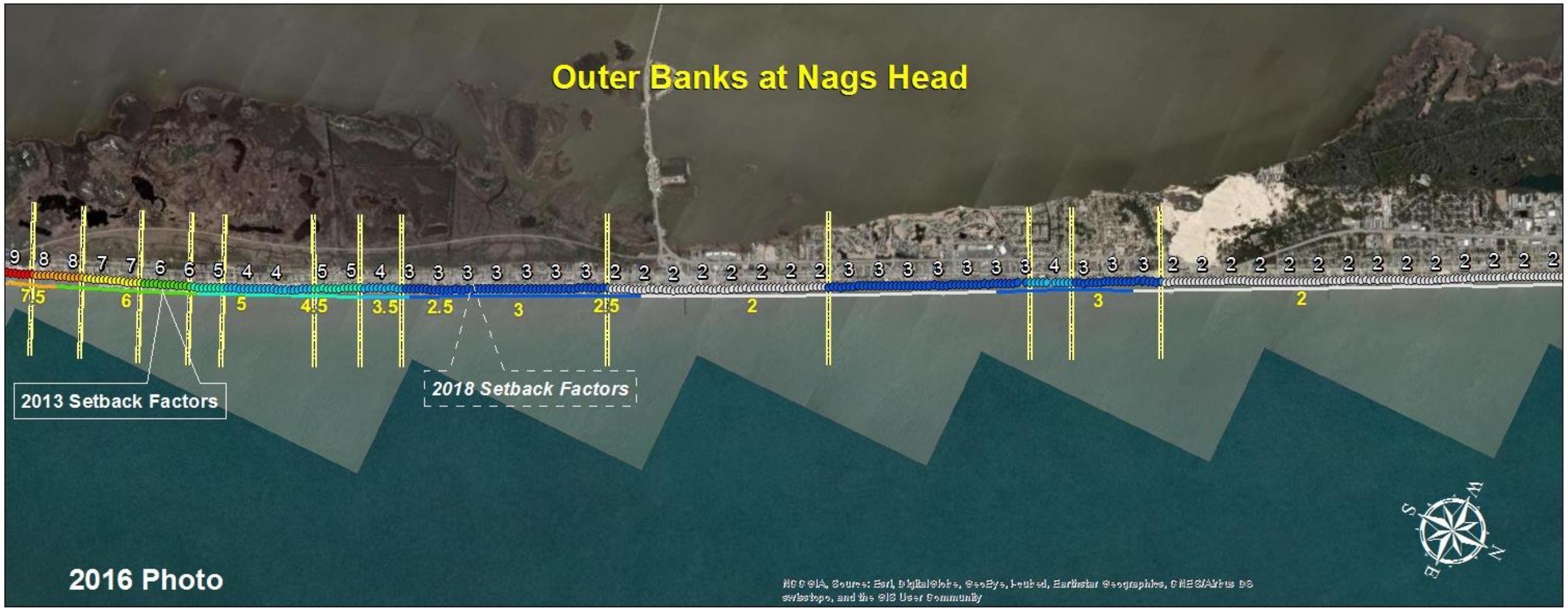
Figure A 37. Outer Banks at Boddie Island Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Nags Head

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Map Scale: 1:47,064

0 3,500 7,000 14,000 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

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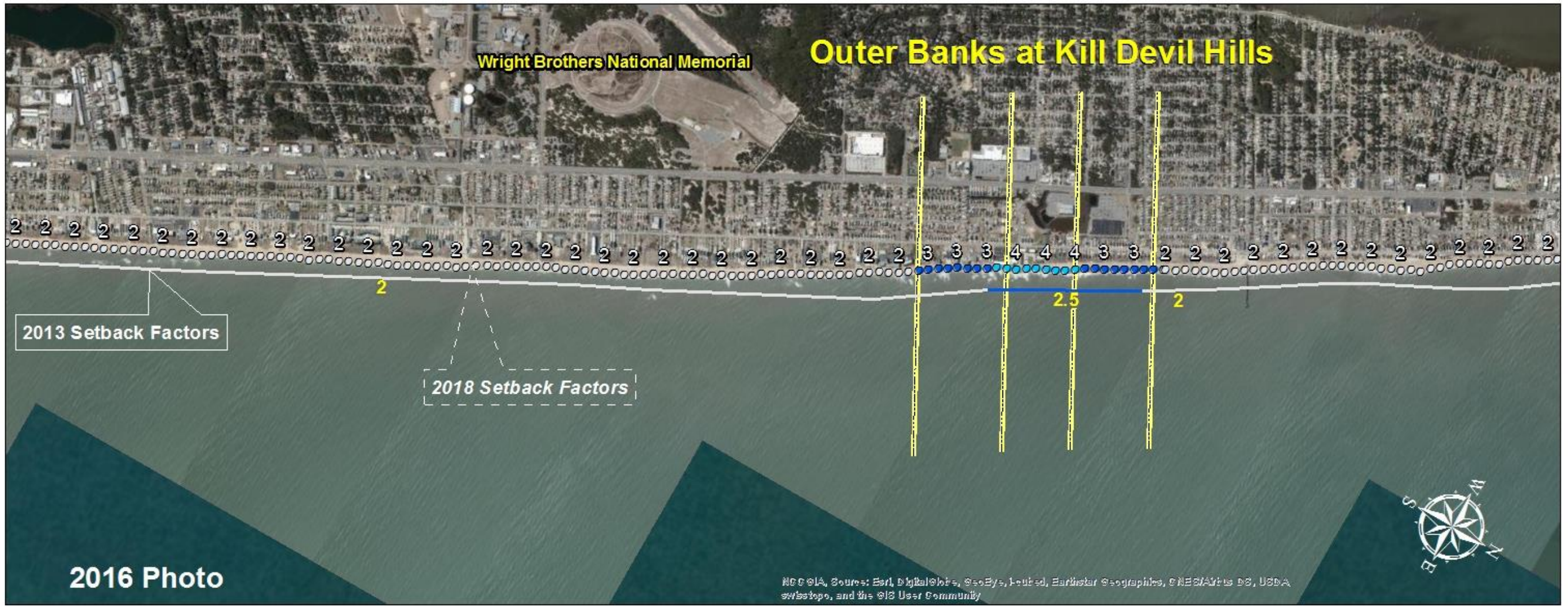
Figure A 38. Outer Banks at Nags Head Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Kill Devil Hills

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:19,996

0 1,500 3,000 6,000 Feet

0 0.3 0.6 1.2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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Figure A 39. Outer Banks at Kill Devil Hills Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Kitty Hawk

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:15,129

0 1,125 2,250 4,500 Feet

0 0.225 0.45 0.9 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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Figure A 40. Outer Banks at Kitty Hawk Setback Factors

2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Southern Shores

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:19,867

0 1,500 3,000 6,000 Feet

0 0.3 0.6 1.2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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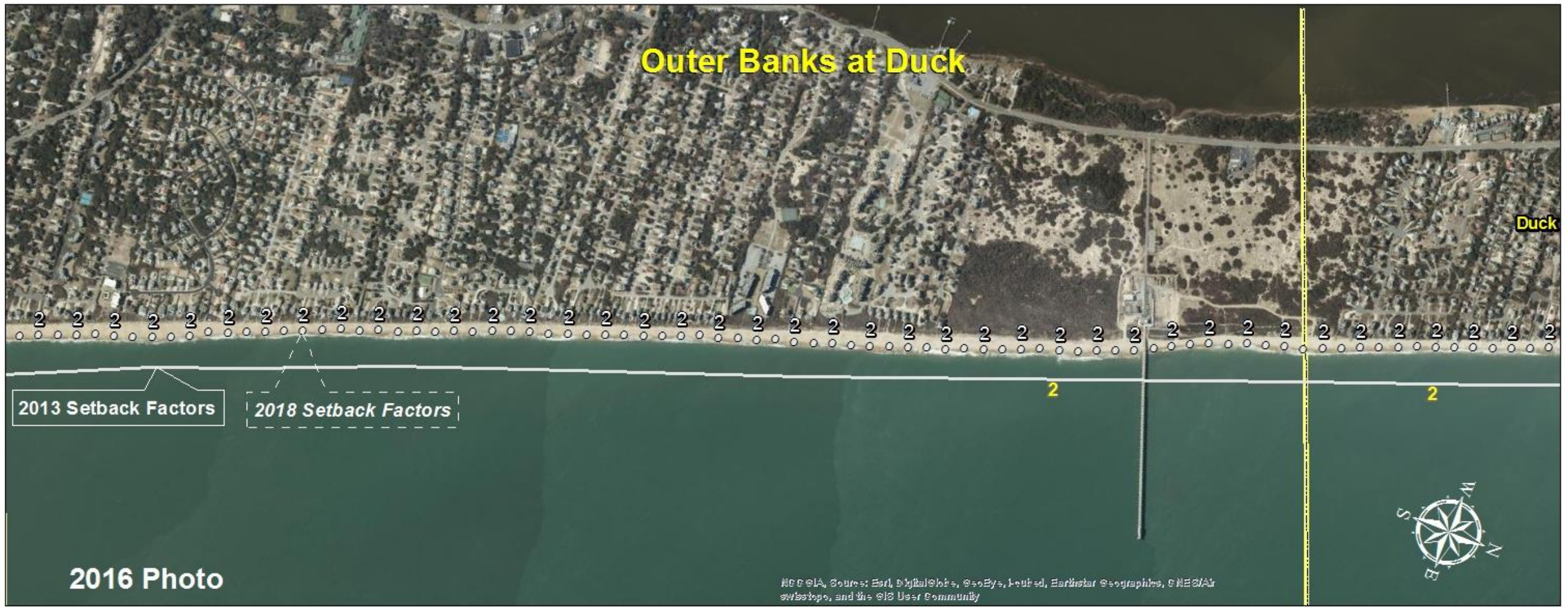
Figure A 41. Outer Banks at Southern Shores Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Duck

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:10,367

0 750 1,500 3,000 Feet

0 0.15 0.3 0.6 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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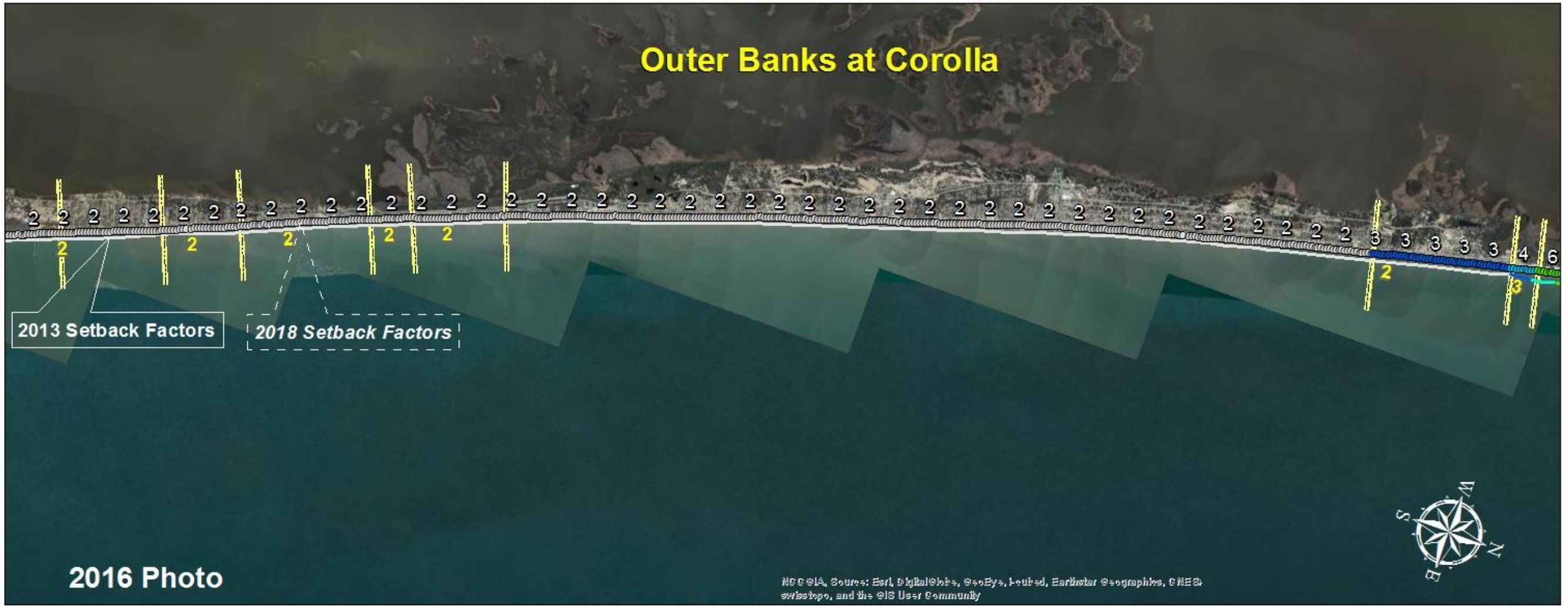
Figure A 42. Outer Banks at Duck Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks at Corolla

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Map Scale: 1:65,271

0 4,875 9,750 19,500 Feet

0 1 2 4 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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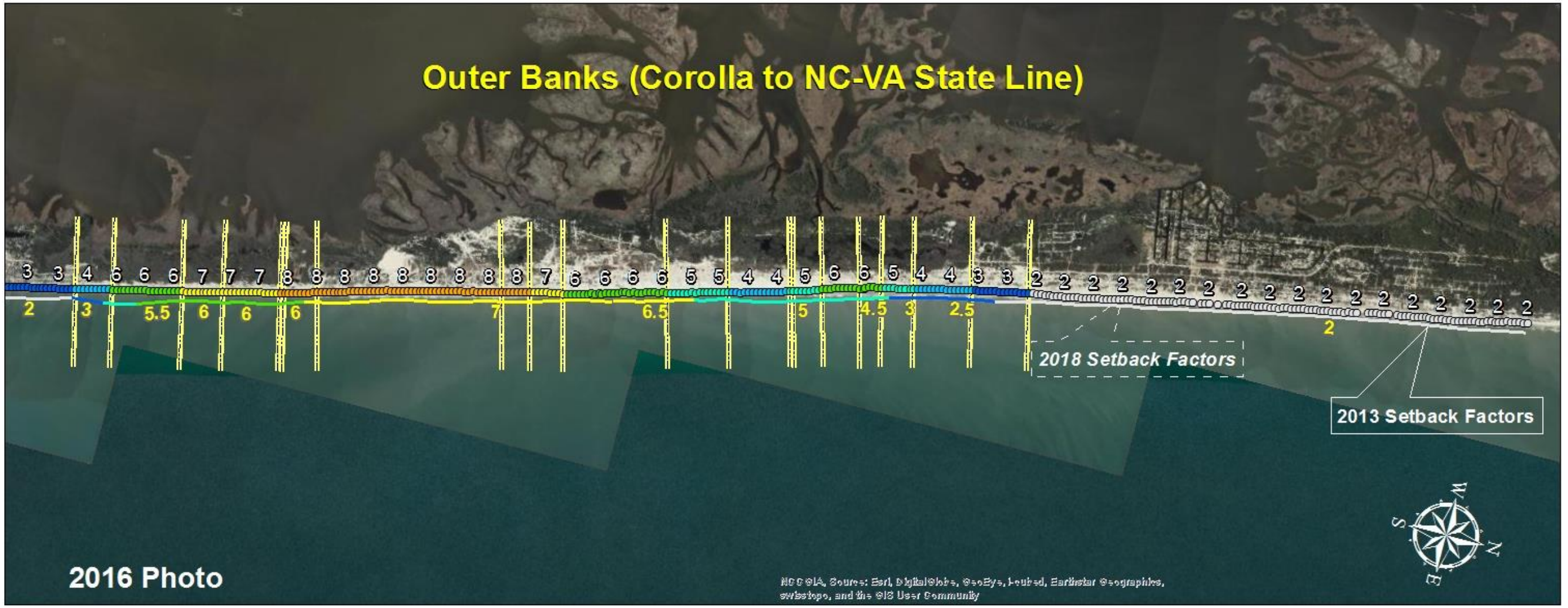
Figure A 43. Outer Banks at Corolla Setback Factors



2018 Ocean Erodible Area & Setback Factor Update

Outer Banks (Corolla to NC-VA State Line)

Legend

Photo: 2016 North Carolina

2018 Setback Factors (ft/yr)	2013 Setback Factors (ft/yr)
2.0	2.0
2.1 - 3.0	2.1 - 3.0
3.1 - 4.0	3.1 - 4.0
4.1 - 5.0	4.1 - 5.0
5.1 - 6.0	5.1 - 6.0
6.1 -7.0	6.1 - 7.0
7.1 - 8.0	7.1 - 8.0
> 8.0	> 8.0
Transition Boundary	Inlet Hazard Area

Vicinity Map

Legend

Counties (CAMA Jurisdiction)

N

Map Scale: 1:47,815

0 3,600 7,200 14,400 Feet

0 0.5 1 2 Miles

Horizontal Datum: NC State Plane NAD 83 Feet

Setback Factors on this map are based on long-term average annual shoreline change rates measured in feet per year using 2016 and early shorelines. Where erosion is less than 2 feet per year, or accreting, setback factors default to the minimum (2 ft/yr) as defined Rule 15A NCAC 07H..

The information presented here is not predictive, nor does it reflect short-term erosion potential. This map may not be suitable for property specific determination of erosion rate factors near rate transition boundaries due to its small scale. For site specific determinations contact your CAMA Local Permit Official, or regional Division of Coastal Management field office.

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Figure A 44. Outer Banks at Corolla to NC-VA State Line Setback Factors

APPENDIX B: Comparision of Average Annual Long-Term Shoreline Change Rates from 2003, 2011, and 2018 Update Studies Using Early Shoreline and 1998, 2009, and 2016 Shorleines

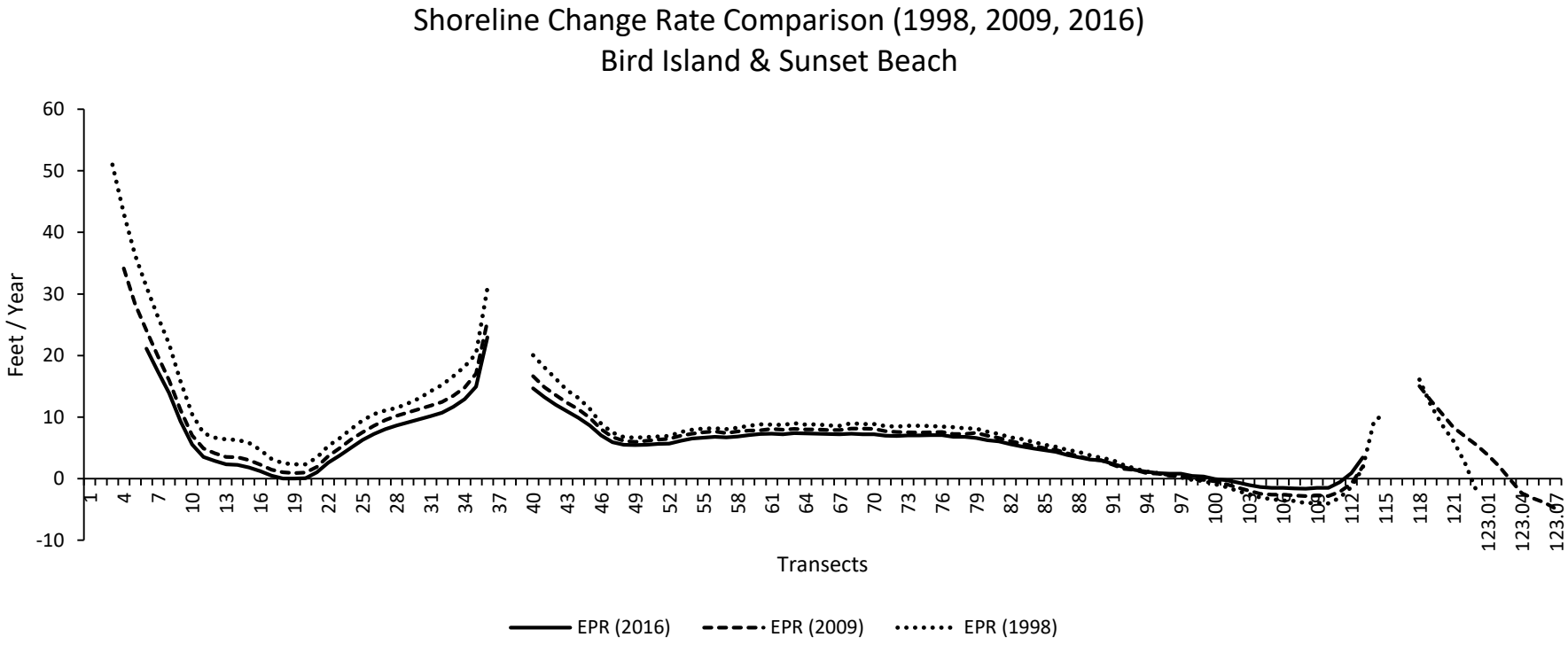

Figure B1. Shoreline change rate comparison at Sunset Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented west to east, Little River Inlet of left-side, Madd Inlet (now closed) at transects 35-40 and Tubbs Inlet or right-side. Transect numbers correspond to those labeled on map in the results summary section.

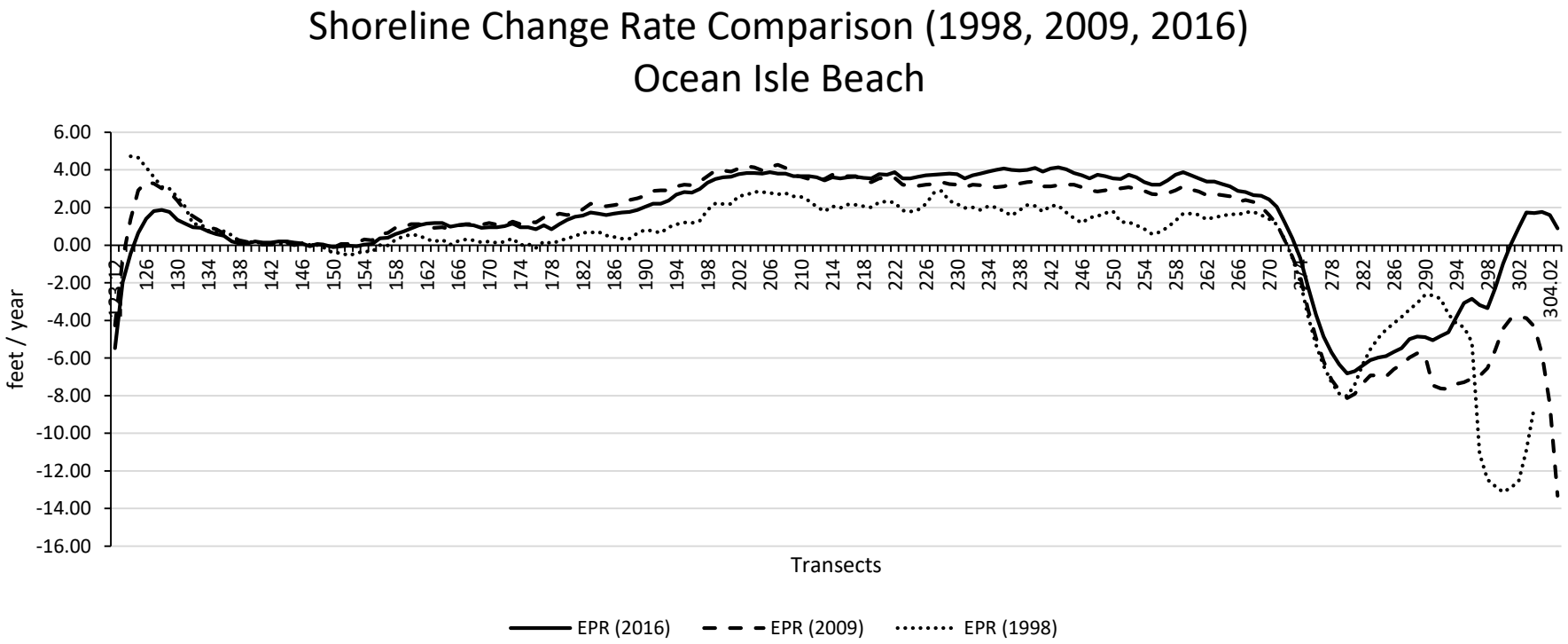

Figure B2. Shoreline change rate comparison at Ocean Isle using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented west to east, Tubbs Inlet on graph's lest side, Shallotte Inlet on right-side. Transect numbers correspond to those labeled on map in the results summary section.

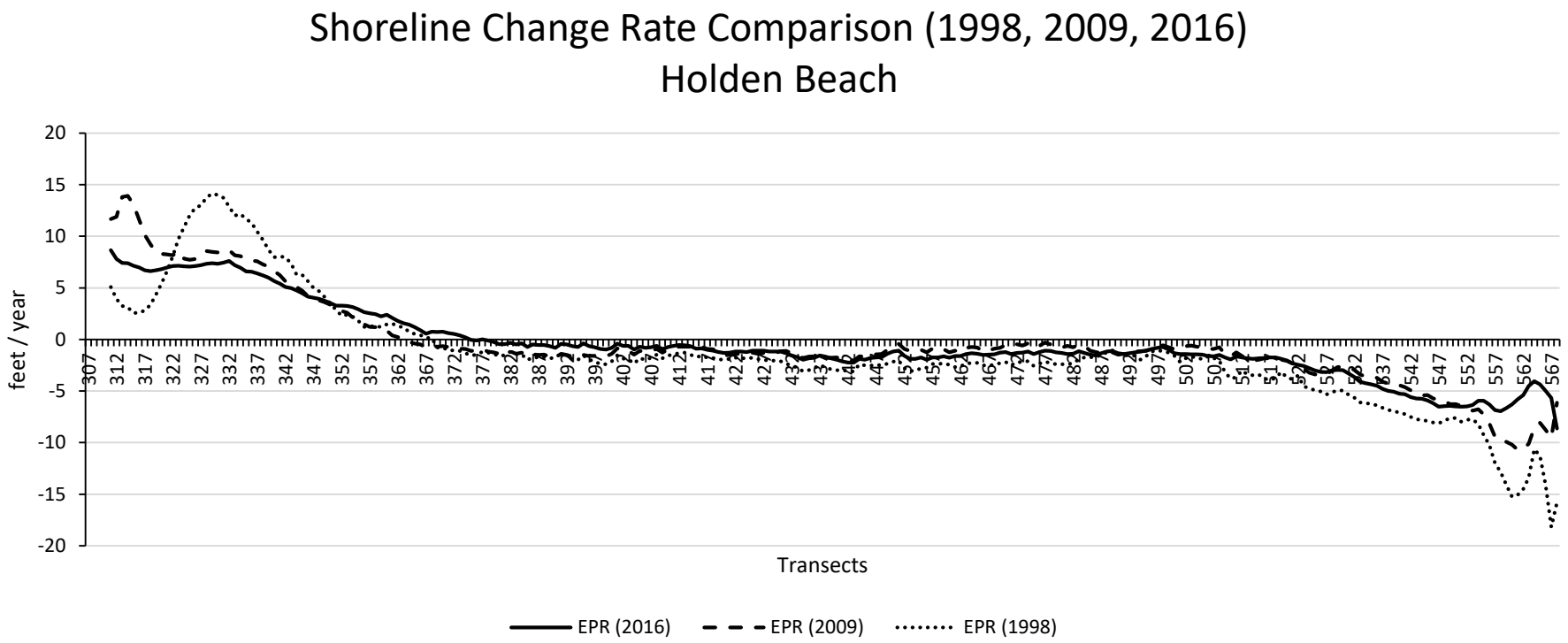

Figure B3. Shoreline change rate comparison at Holden Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented west to east with Shallotte Inlet on left-side and Lockwood Folly Inlet on right-side. Transect numbers correspond to those labeled on map in the results summary section.

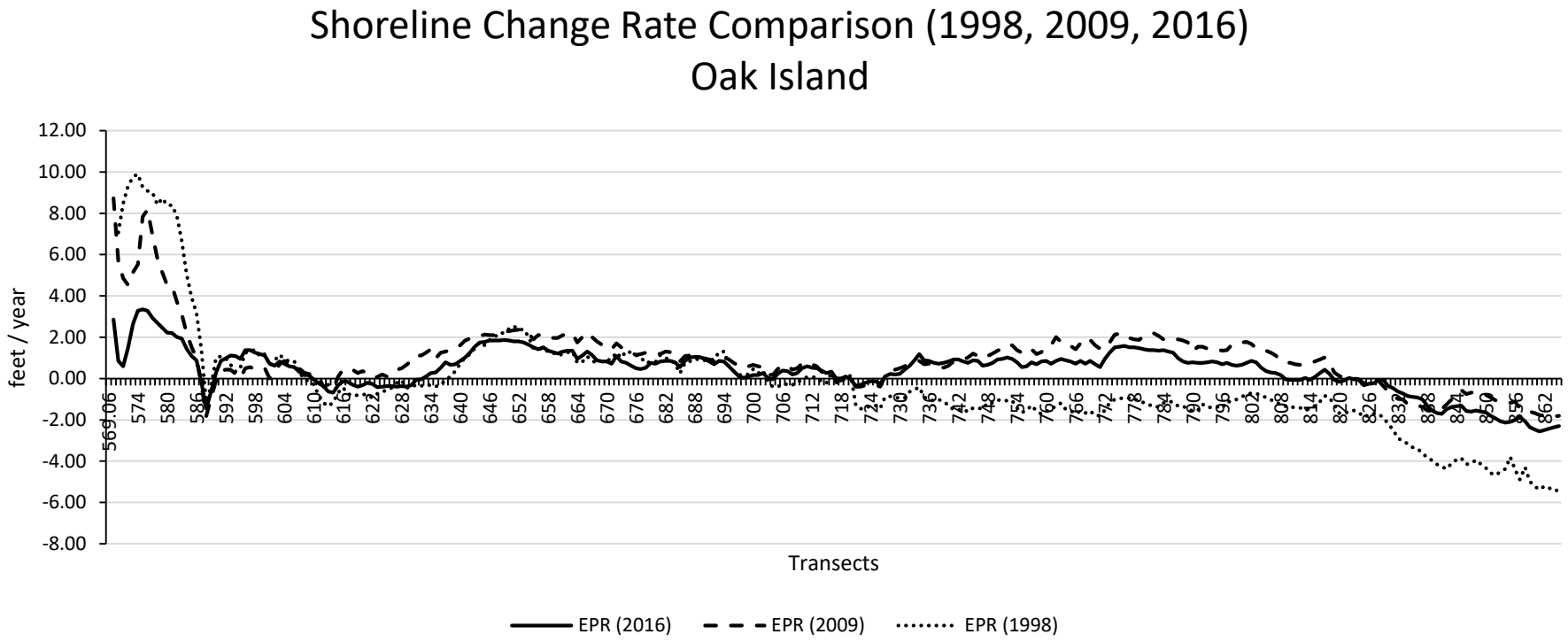

Figure B4. Shoreline change rate comparison at Oak Island using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from west to east with Lockwood Folly Inlet on left-side and Oak Island-Caswell Beach Town Limits on right-side. Transect numbers correspond to those labeled on map in the results summary section.

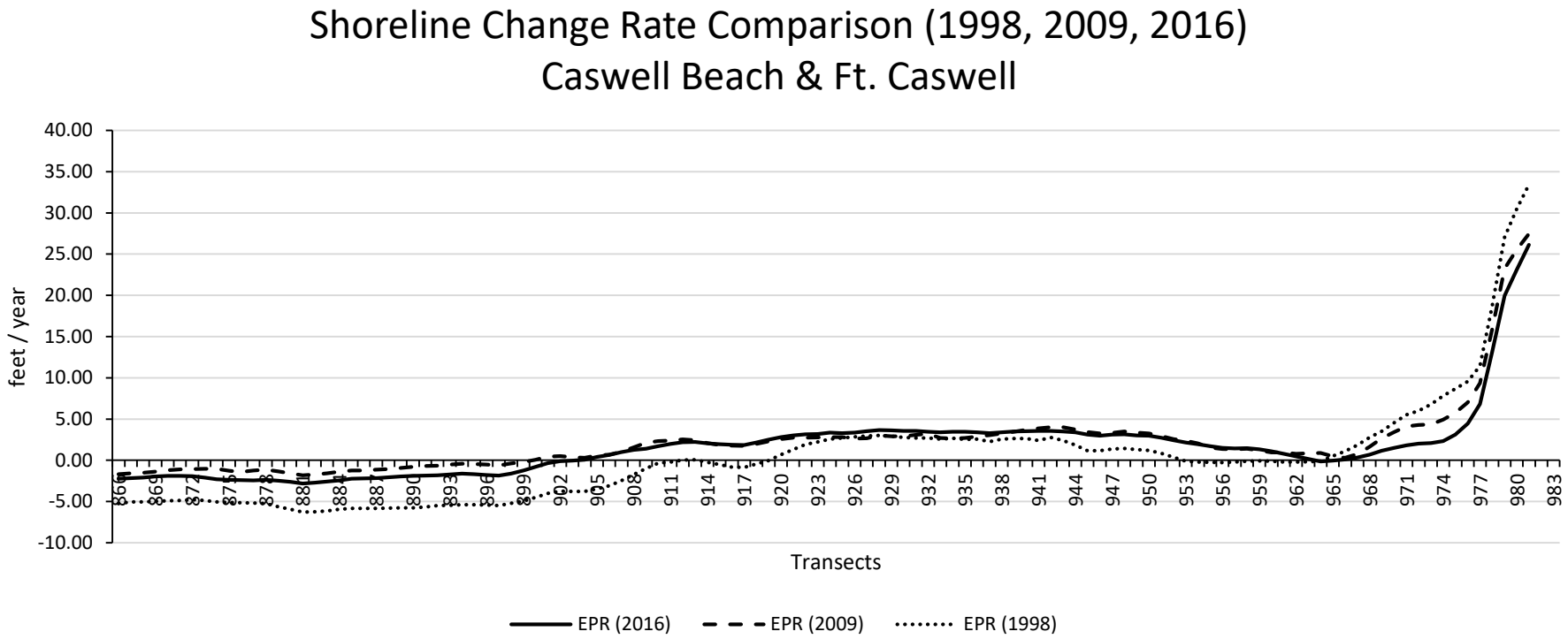

Figure B5. Shoreline change rate comparison at Caswell Beach and Fort Caswell using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from west to east with Oak Island-Caswell Beach Town Limits on left-side and Cape Fear Inlet on right-side. Transect numbers correspond to those labeled on map in the results summary section.

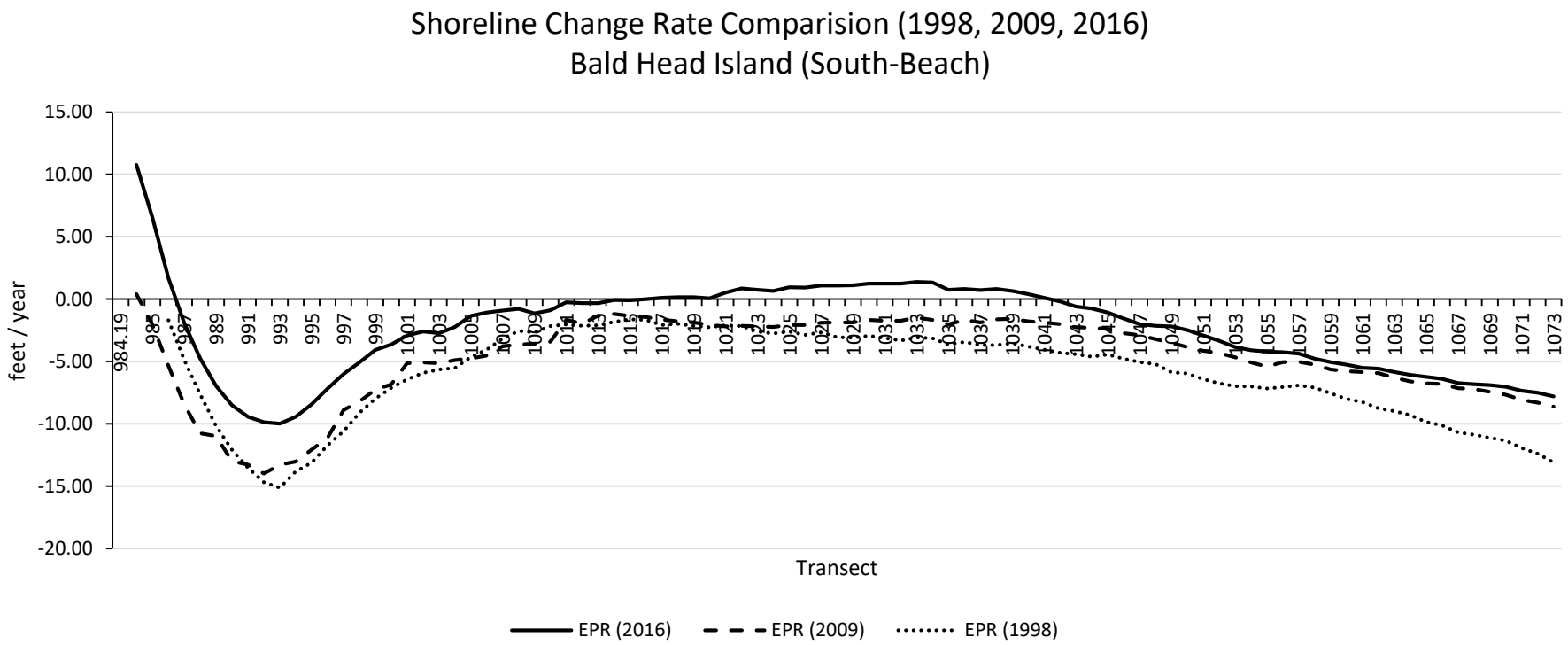

Figure B6. Shoreline change rate comparison at Bald Head Island (south-beach) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented with Cape Fear Inlet on graph's left-side and Cape Fear on south-beach on right-side. Transect numbers correspond to those labeled on map in the results summary section.

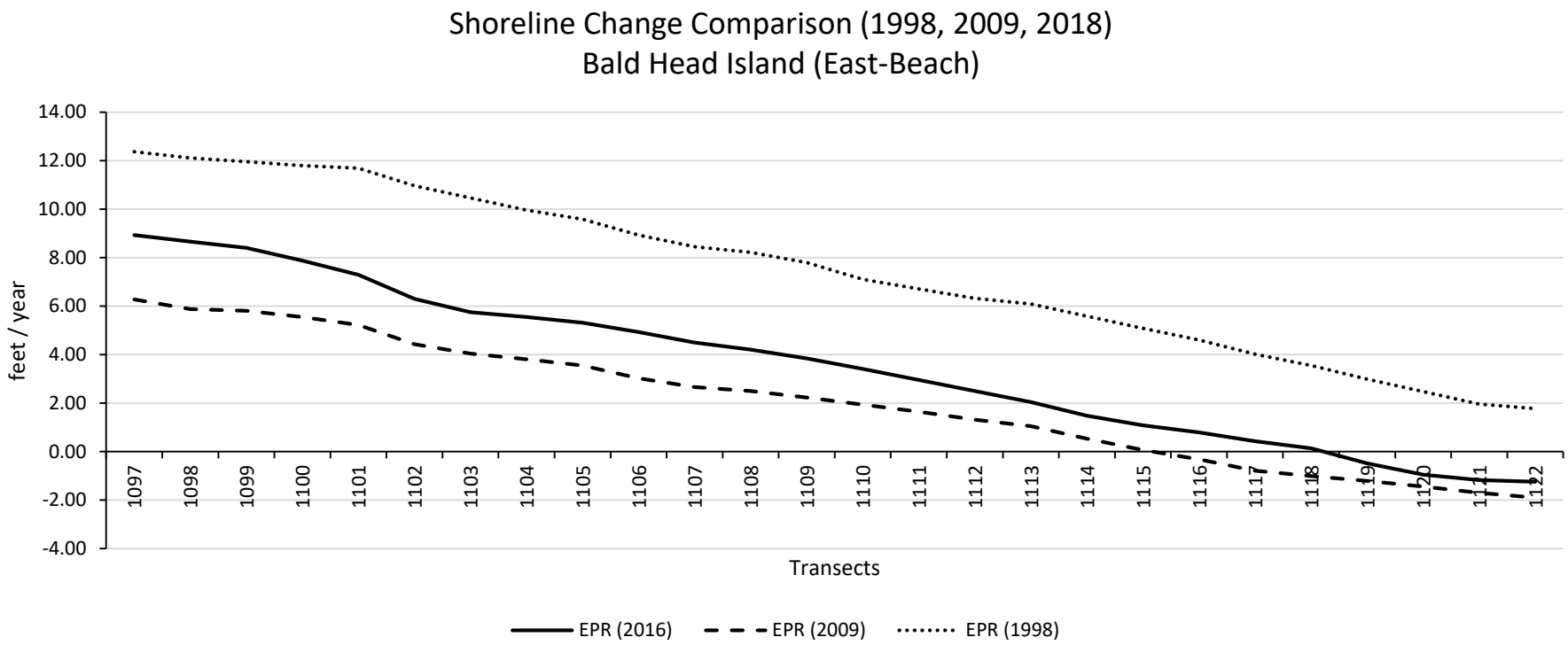

Figure B7. Shoreline change rate comparison at Bald Head Island (east-beach) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented with Cape Fear on left-side and Bald Head Island limits on right-side. Transect numbers correspond to those labeled on map in the results summary section.

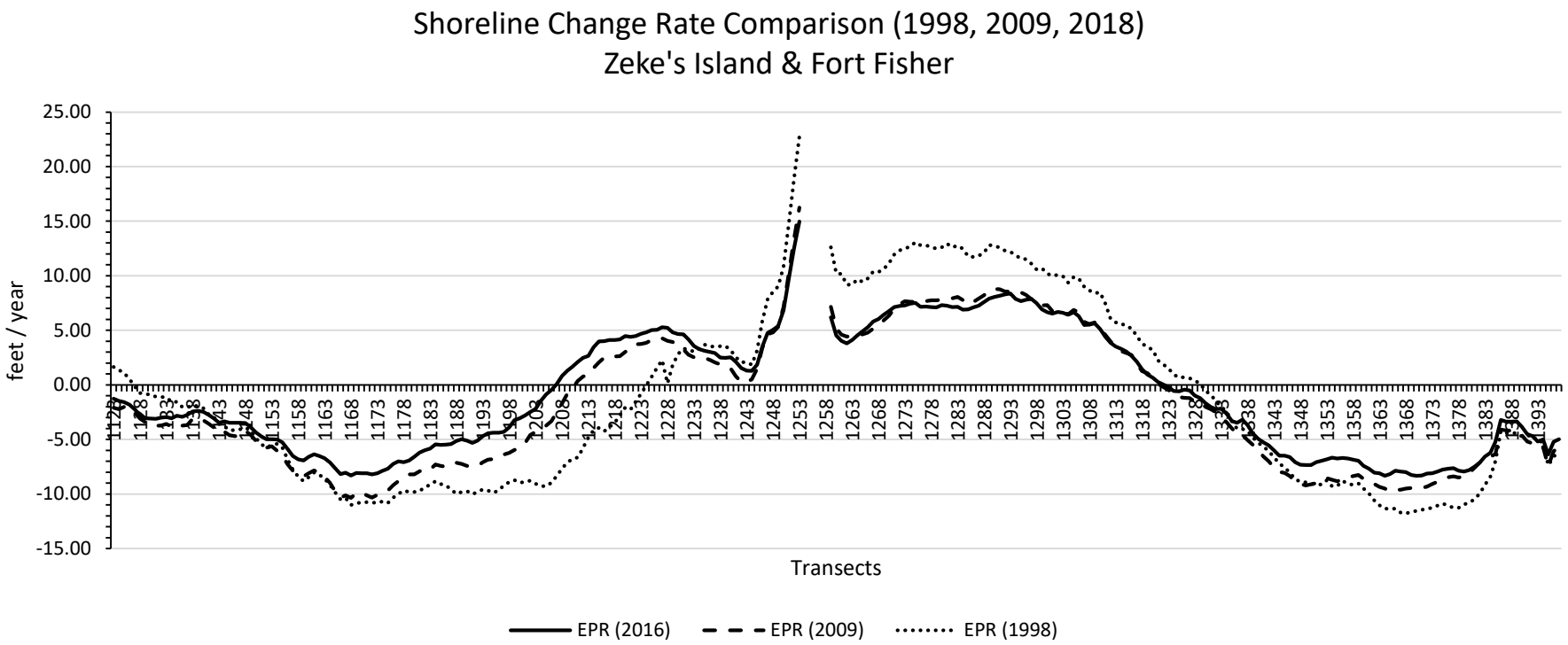

Figure B8. Shoreline change rate comparison at Zeke's Island and Fort Fisher State Park using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south (left-side) to north (right-side). Data gap reflects former Corncake Inlet location. Transect numbers correspond to those labeled on map in the results summary section.

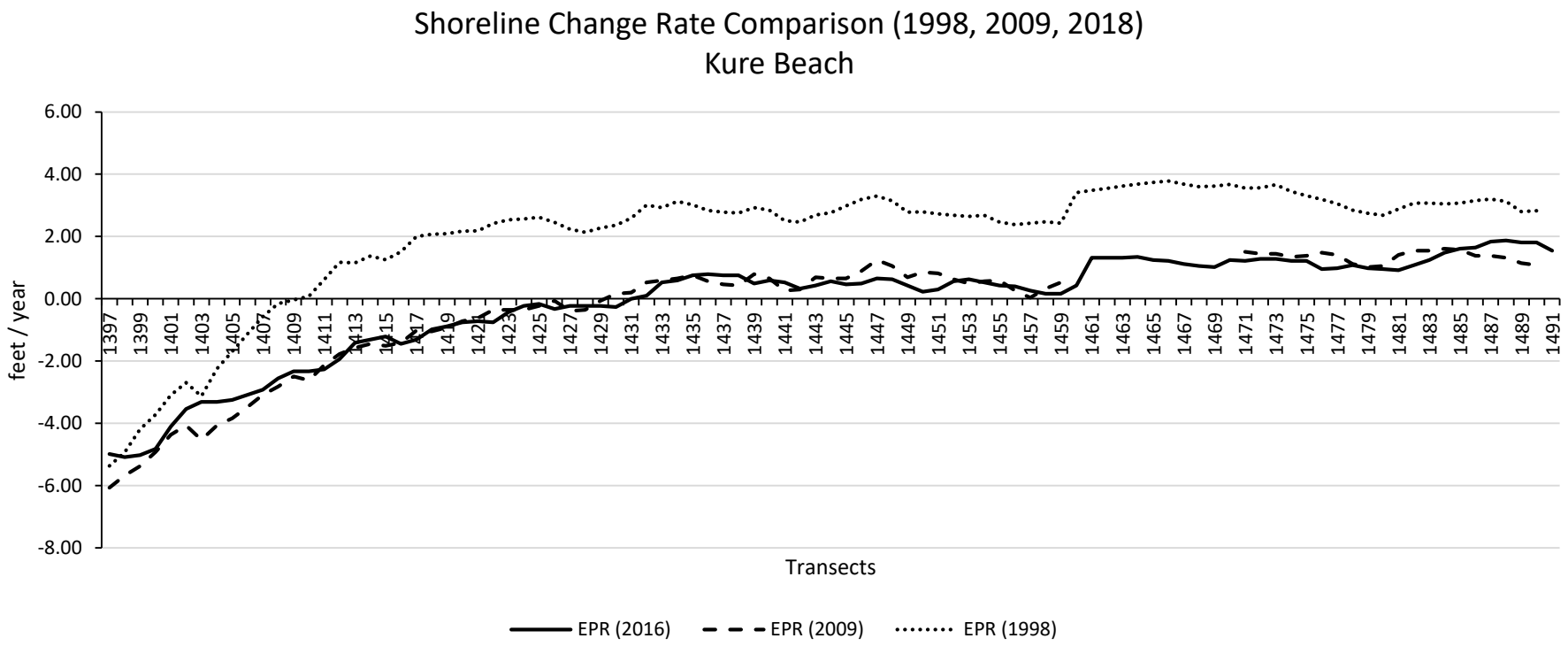

Figure 99. Shoreline change rate comparison at Kure Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south (left-side) to north (right-side) ending at Kure Beach and Carolina Beach Town Limits. Transect numbers correspond to those labeled on map in the results summary section.

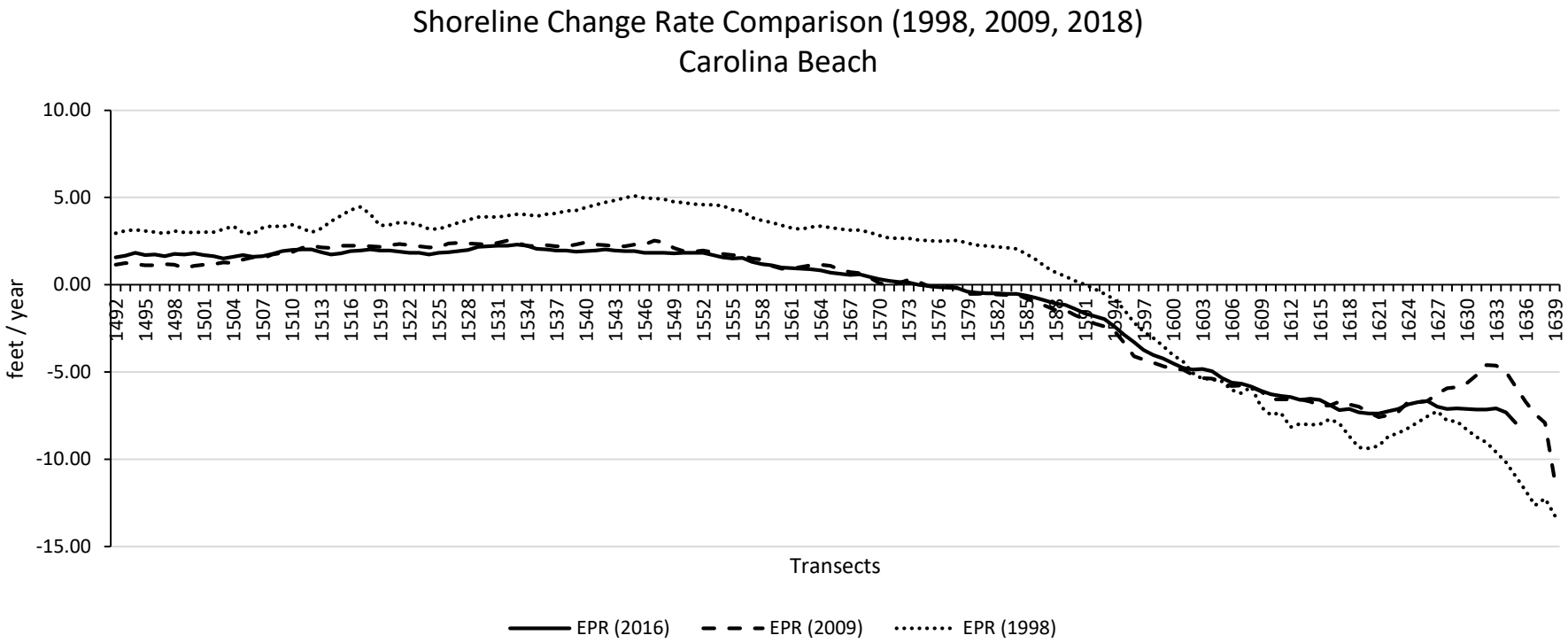

Figure B10. Shoreline change rate comparison at Carolina Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south (left-side) to north (right-side) ending at Carolina Beach Inlet. Transect numbers correspond to those labeled on map in the results summary section.

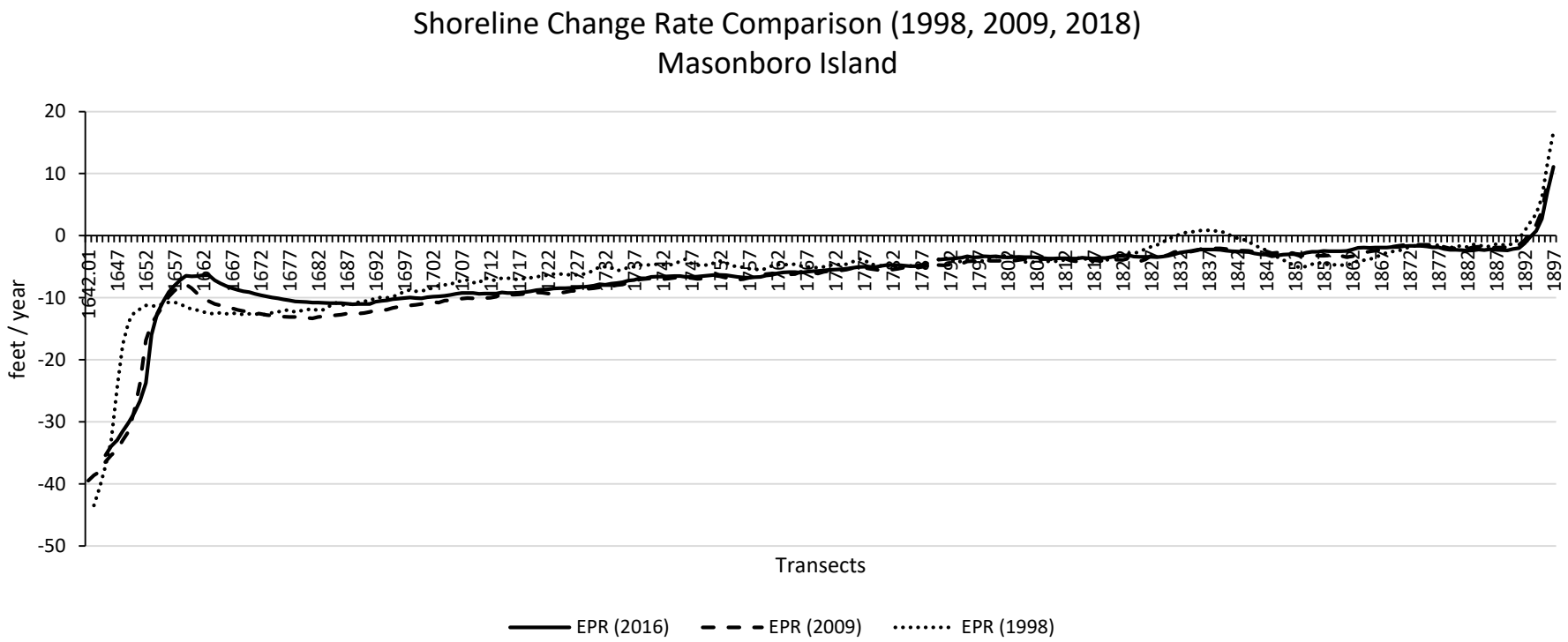

Figure B11. Shoreline change rate comparison at Masonboro Island using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Carolina Beach Inlet (graph left-side) to Masonboro Inlet (graph-right side). Transect numbers correspond to those labeled on map in the results summary section.

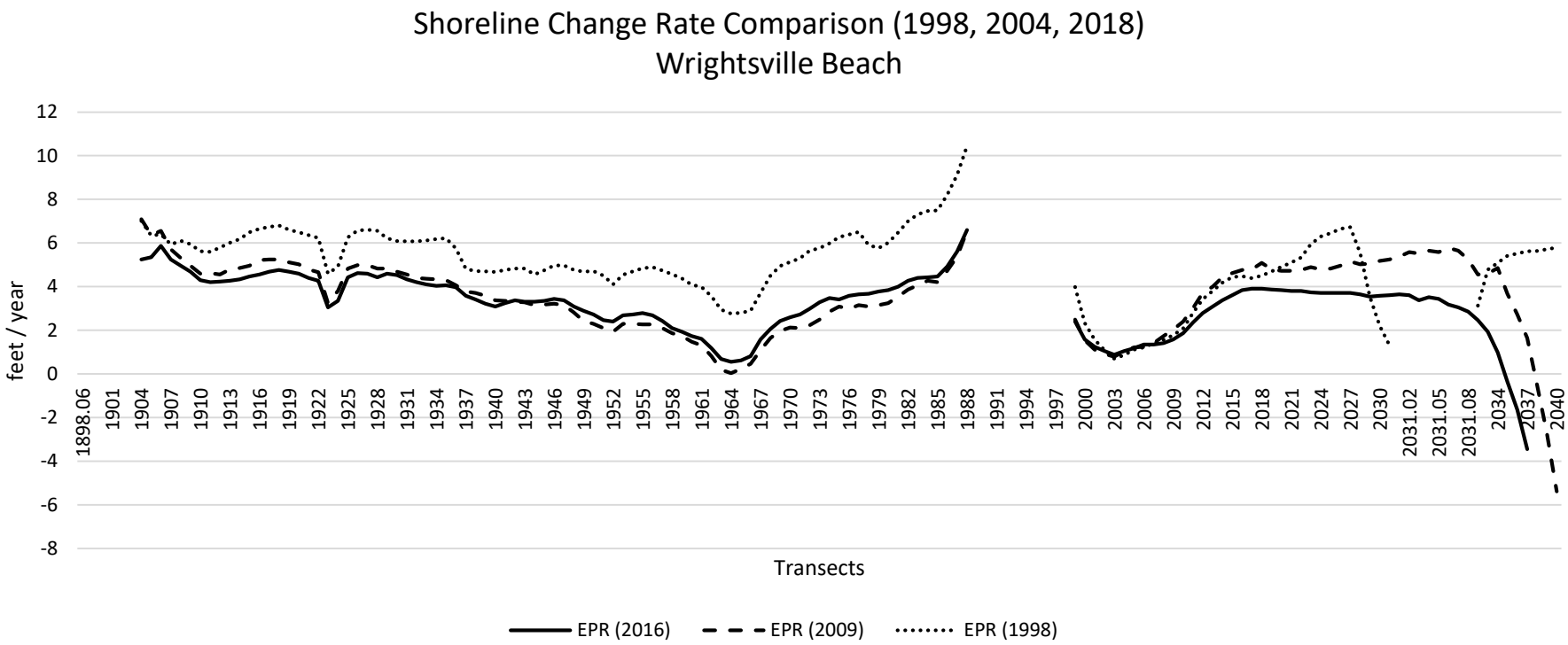

Figure B12. Shoreline change rate comparison at Wrightsville Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Masonboro Inlet (graph left-side) to Mason Inlet (graph right-side). The data gap between transects 1988 and 1998 is the former location of Moore's Inlet. Transect numbers correspond to those labeled on map in the results summary section.

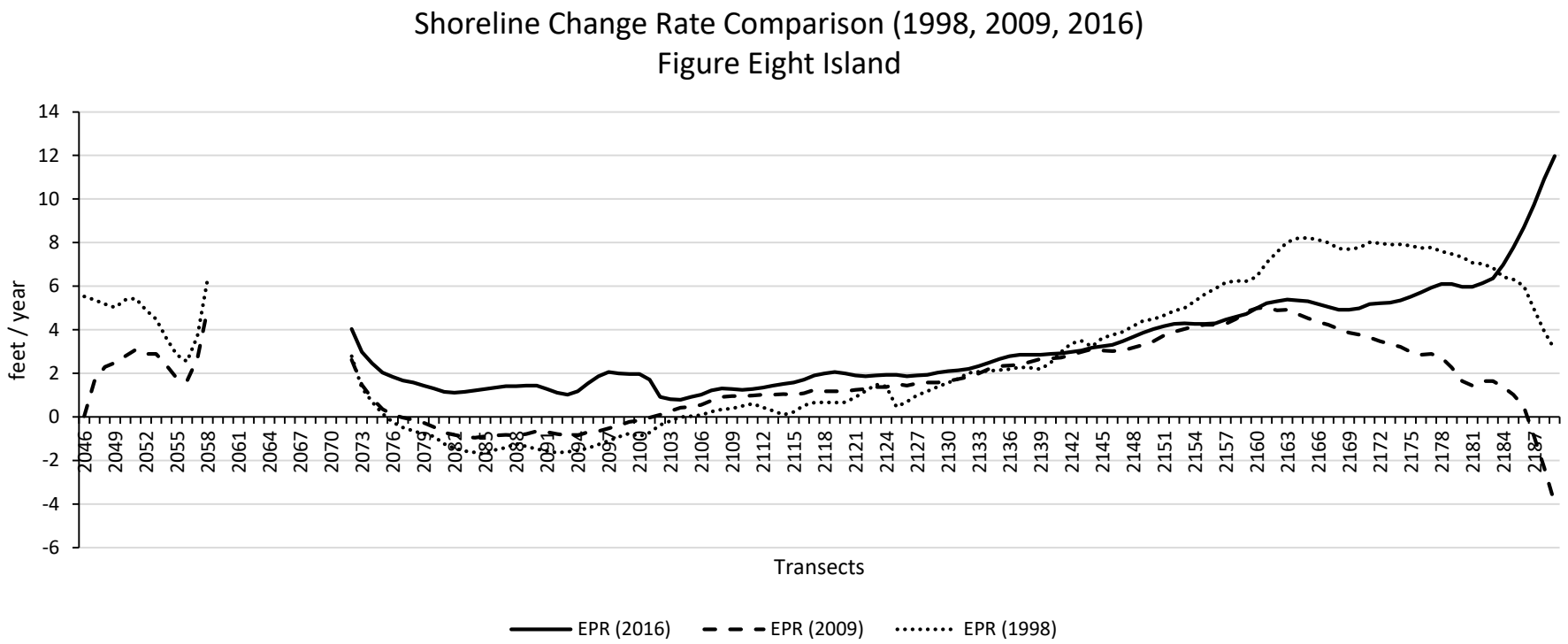

Figure B13. Shoreline change rate comparison at Figure Eight Island using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Mason Inlet (graph left-side) to Rich Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

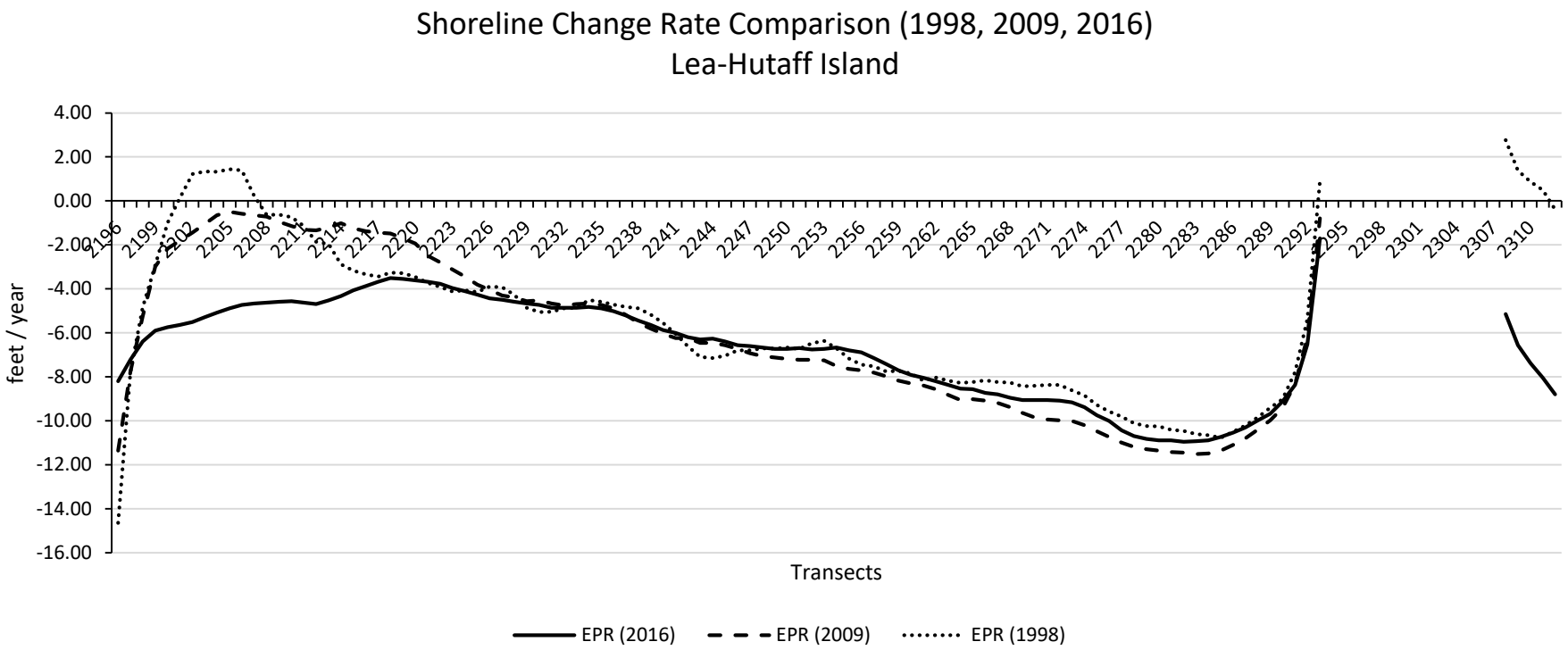

Figure B14. Shoreline change rate comparison at Lea-Hutaff Island using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Rich Inlet (graph left-side) to New Topsail Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

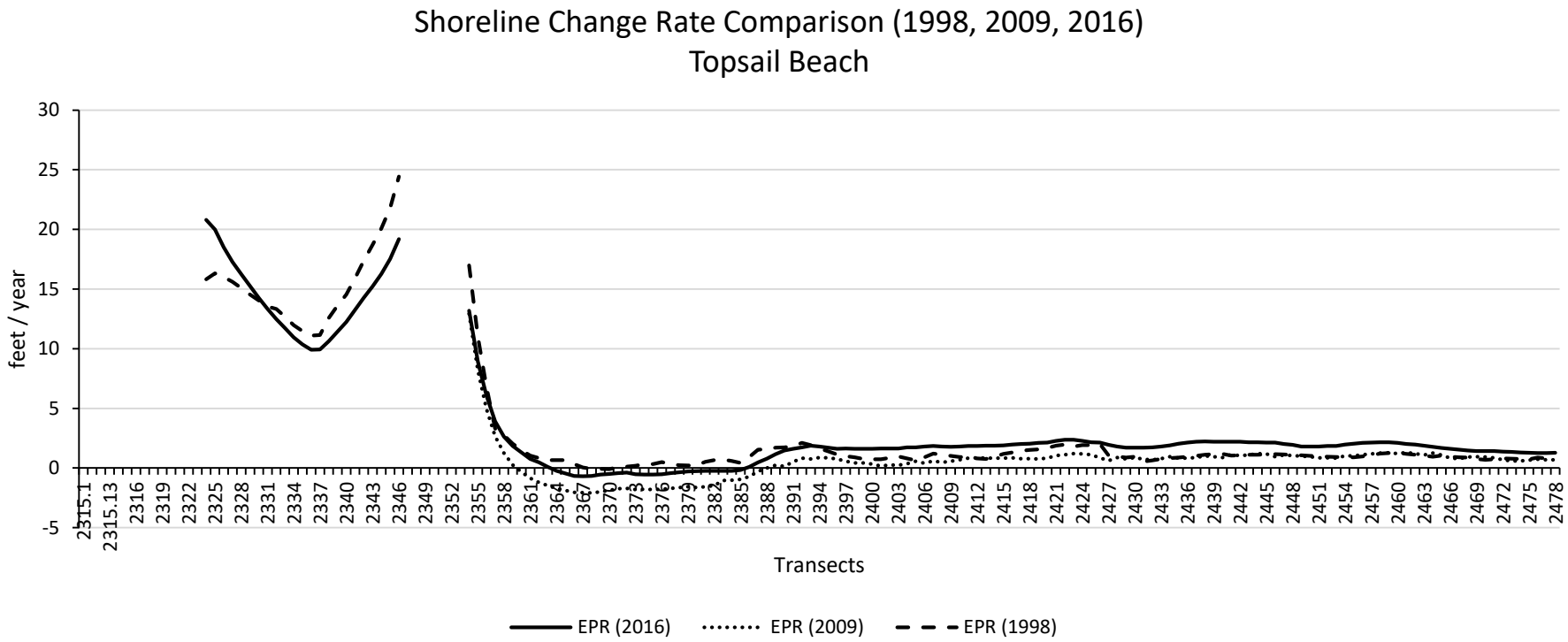

Figure B15. Shoreline change rate comparison at Topsail Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from New Topsail Inlet (graph left-side) to Topsail Beach-Surf City town limits. Transect numbers correspond to those labeled on map in the results summary section.

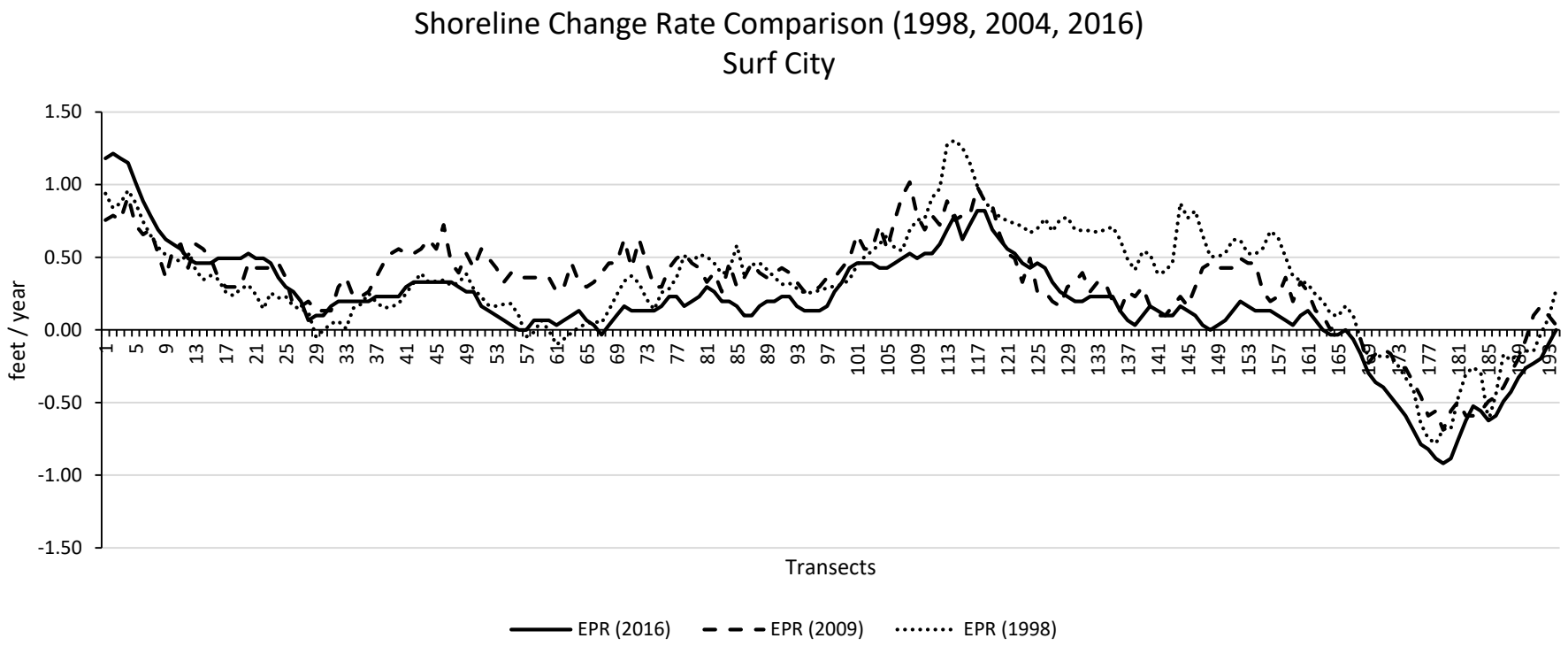

Figure B16. Shoreline change rate comparison at Surf City using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Topsail Beach-Surf City Town limits (graph left-side) to Surf City-North Topsail Beach Town limits (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

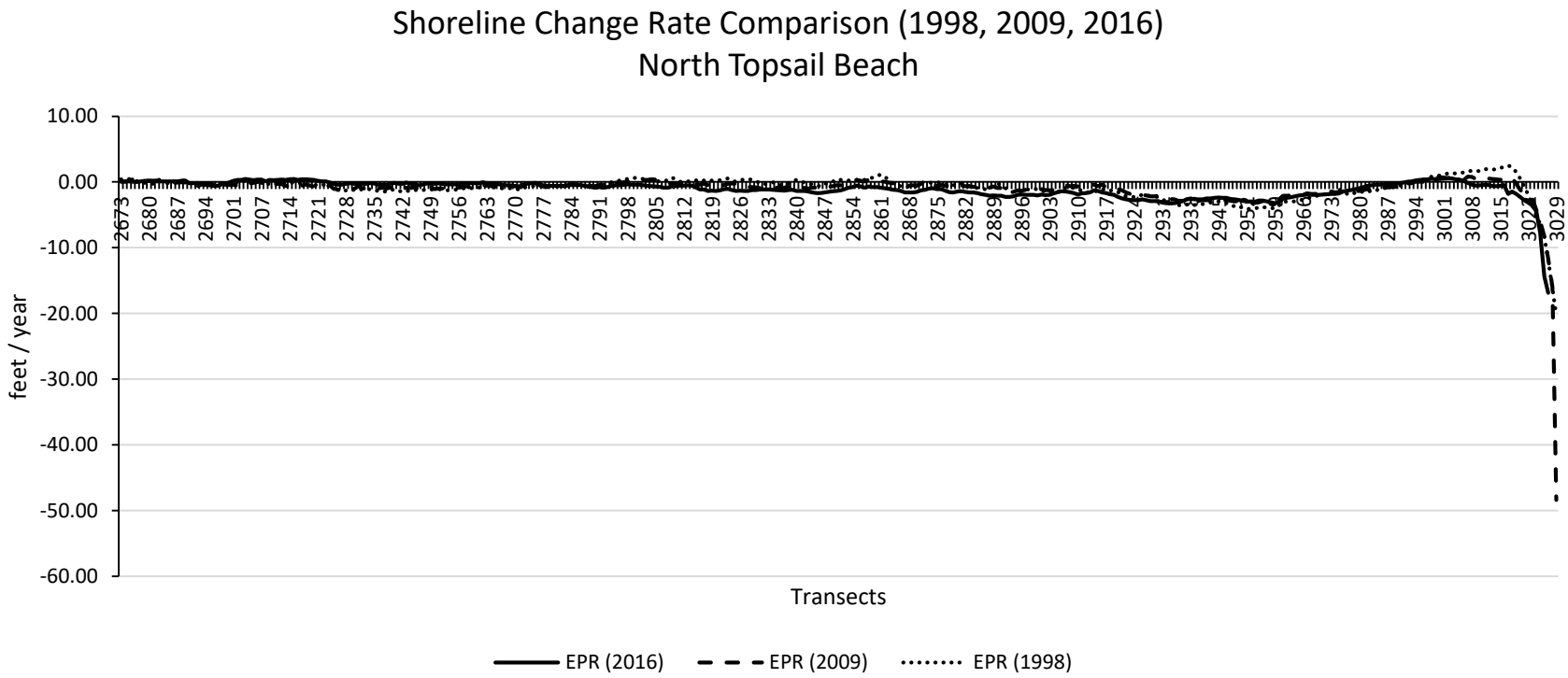

Figure B17. Shoreline change rate comparison at North Topsail Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Surf City-North Topsail Beach town limits (graph left-side) to New River Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

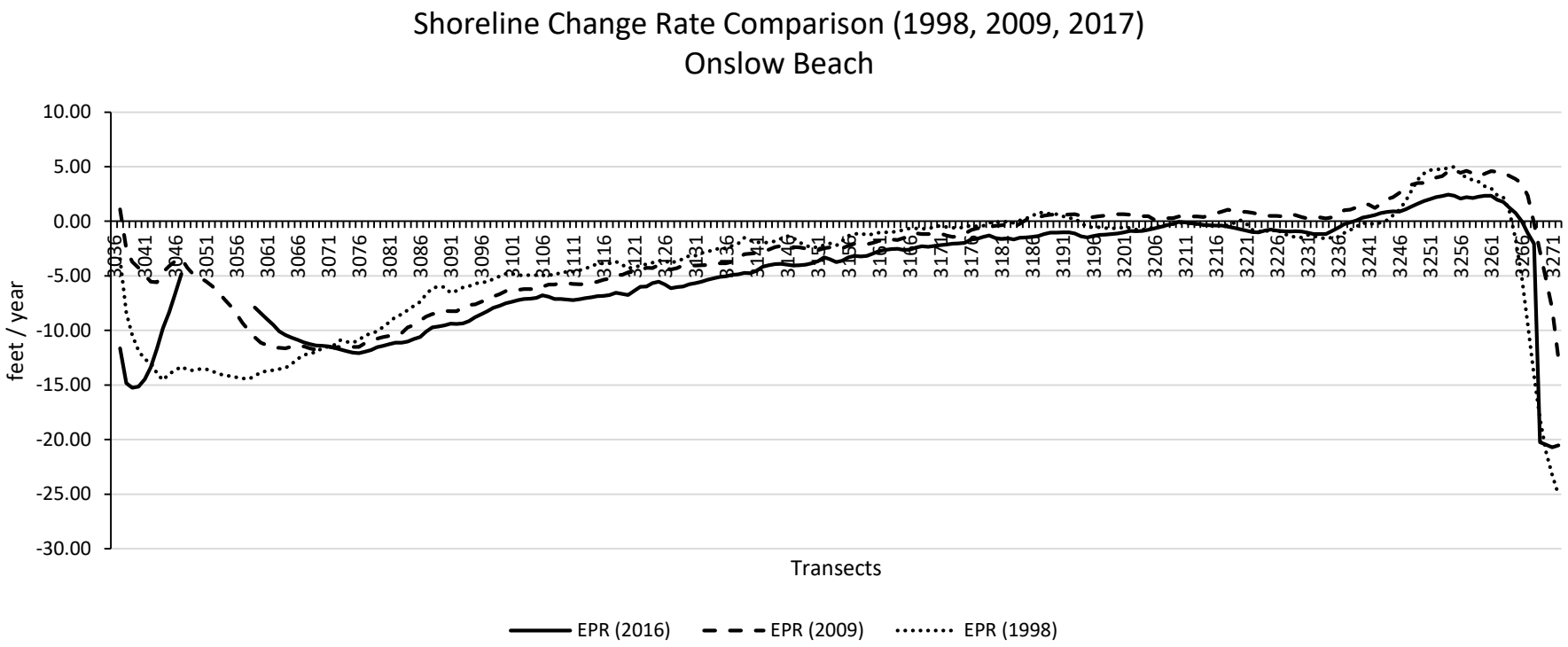

Figure B18. Shoreline change rate comparison at Onslow Beach using early shoreline and 1998, 2009, and 2017 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from New River Inlet (graph left-side) to Brown's Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

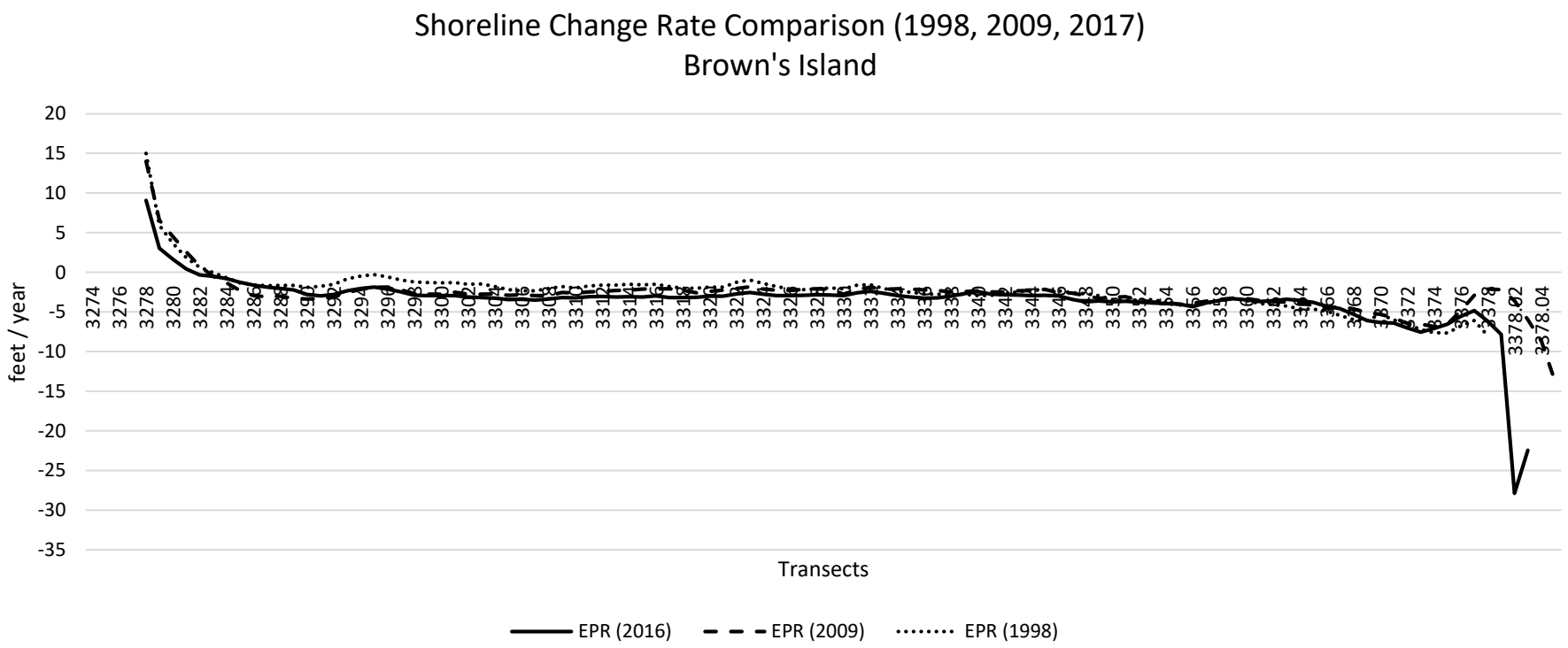

Figure B19. Shoreline change rate comparison at Brown's Island using early shoreline and 1998, 2009, and 2017 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Brown's Inlet (graph left-side) to Bear Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

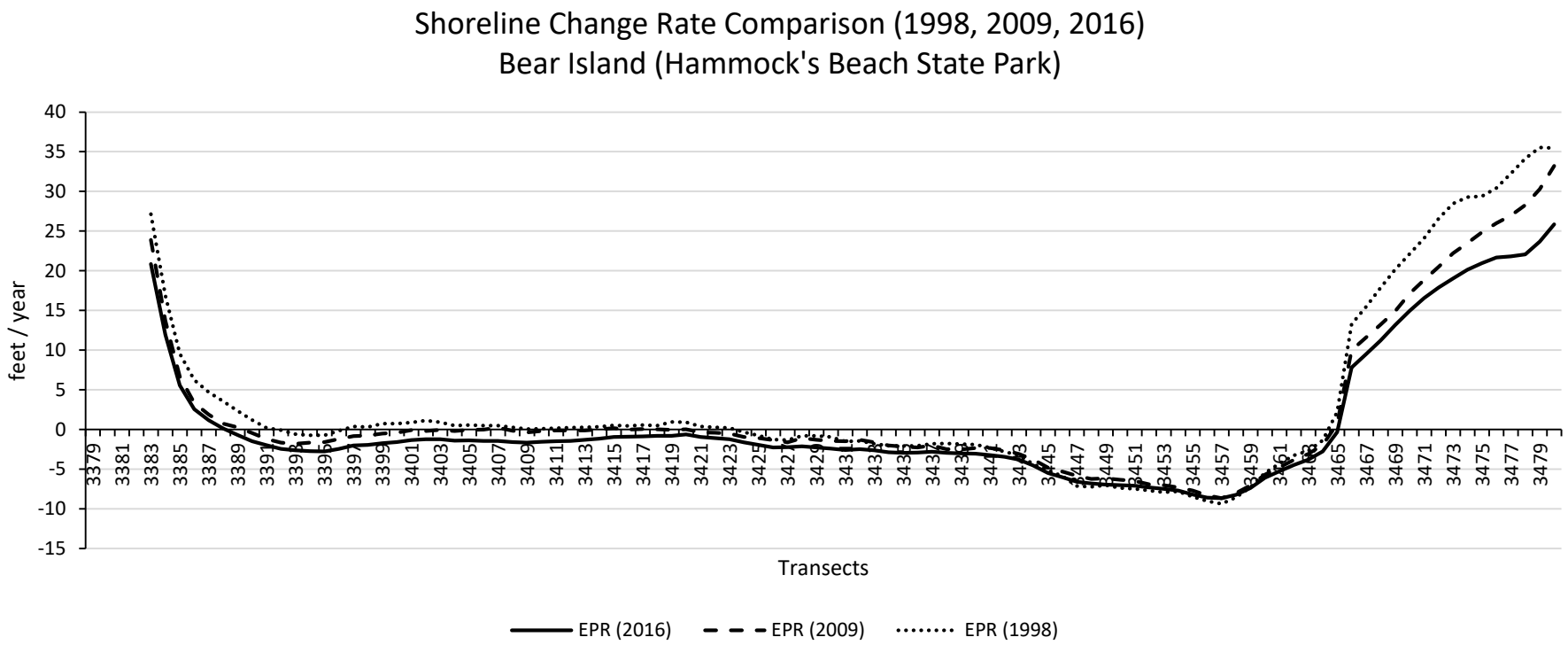

Figure B20. Shoreline change rate comparison at Bear Island (Hammocks Beach State Park) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Bear Inlet (graph right-side) to Bogue Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

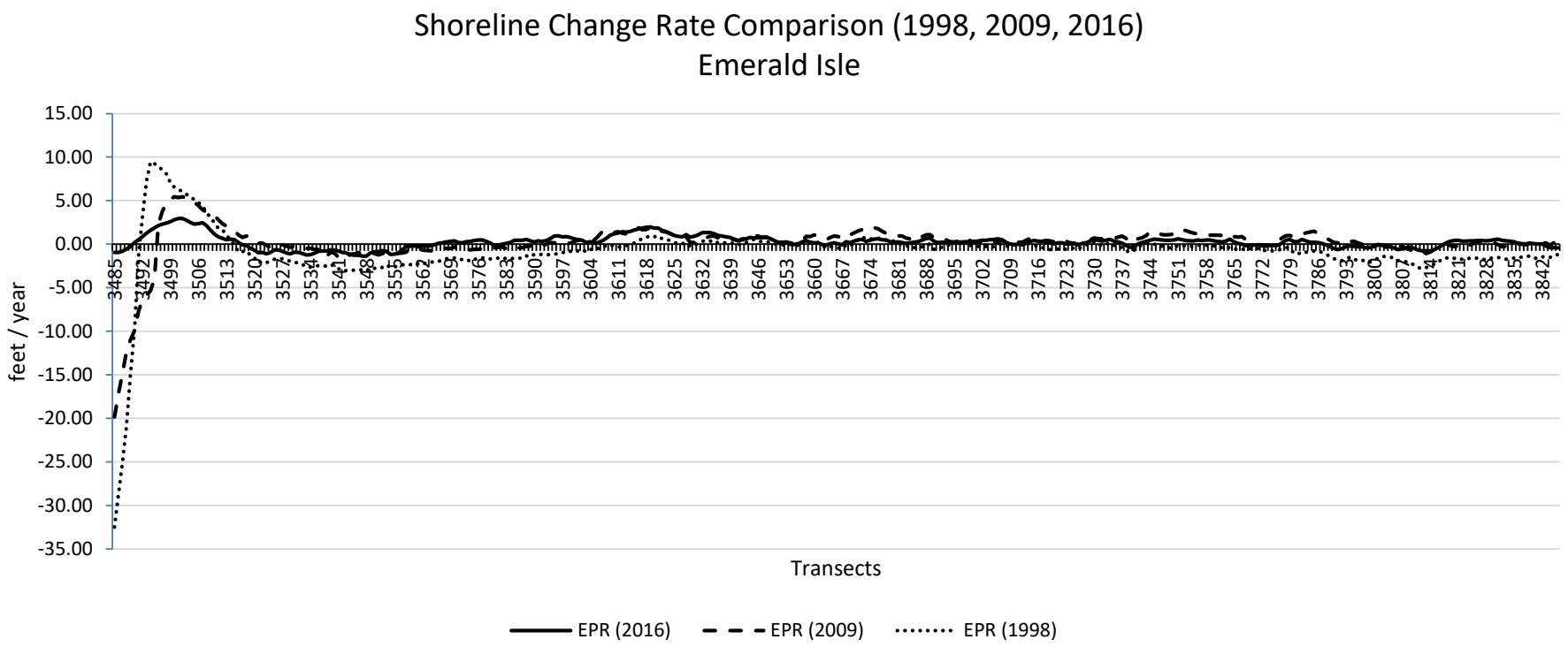

Figure B21. Shoreline change rate comparison at Emerald Isle using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Bogue Inlet (graph left-side) to Emerald Isle-Indian Beach town limits. Transect numbers correspond to those labeled on map in the results summary section.

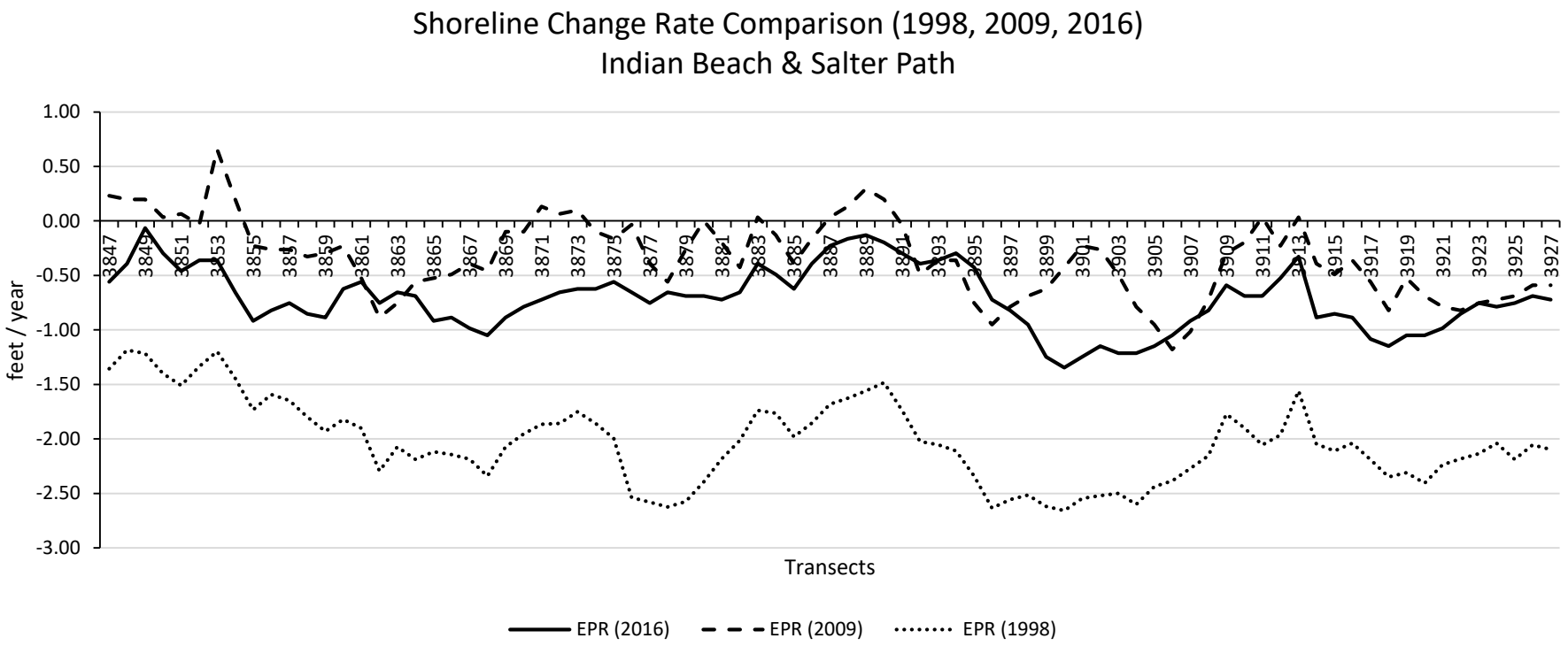

Figure B22. Shoreline change rate comparison at Indian Beach and Salter Path using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Emerald Isle-Indian Beach town limits (graph left-side) to Indian Beach-Pine Knoll Shores town limits (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

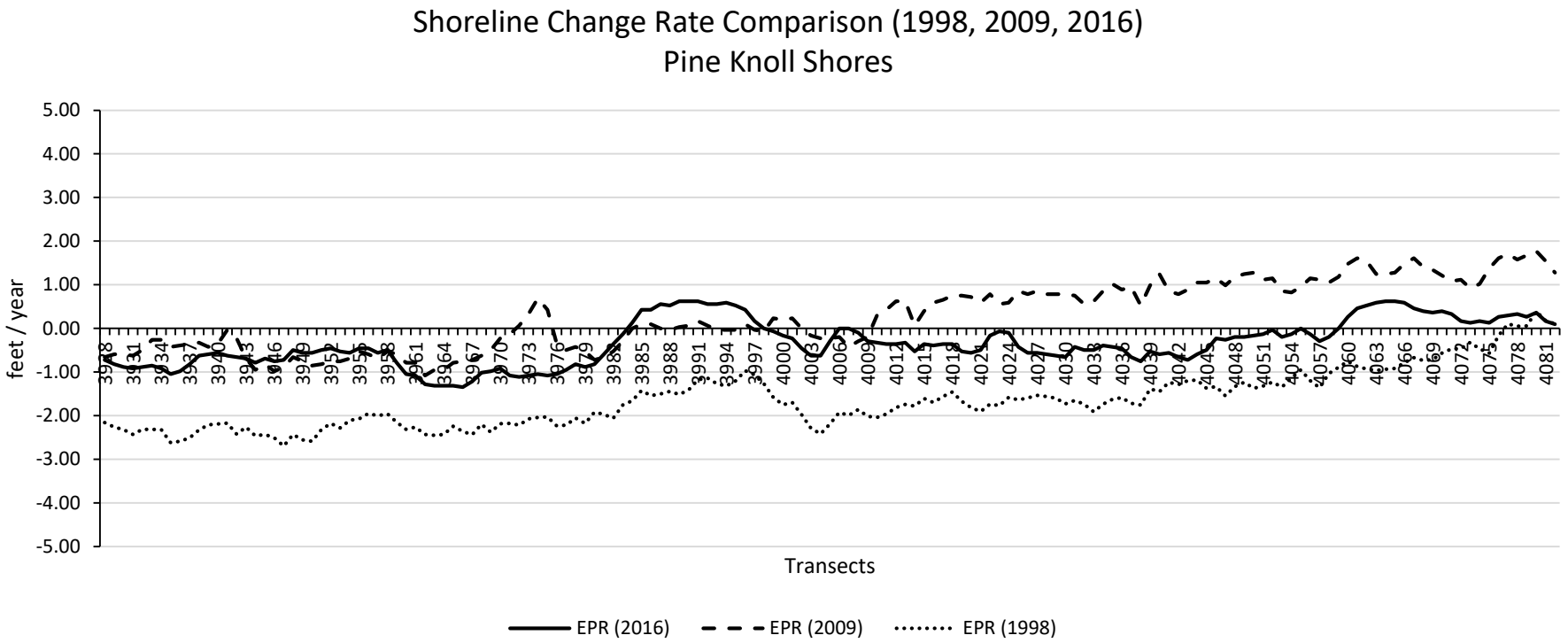

Figure B23. Shoreline change rate comparison at Pine Knoll Shores using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Indian Beach-Pine Knoll Shores town limits (graph left-side) to Pine Knoll Shores-Atlantic Beach town limits (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

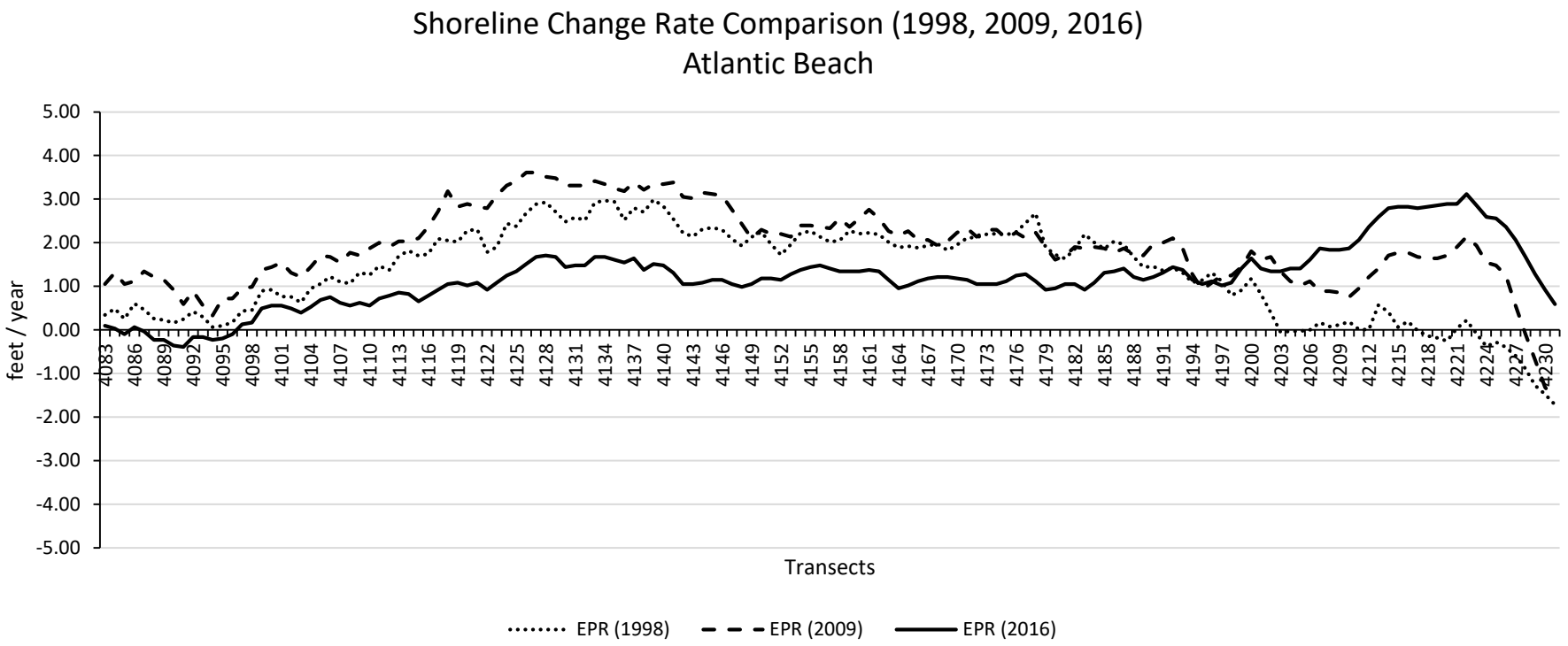

Figure B24. Shoreline change rate comparison at Atlantic Beach using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Pine Knoll Shores-Atlantic Beach town limits (graph left-side) to Fort Macon State Park (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

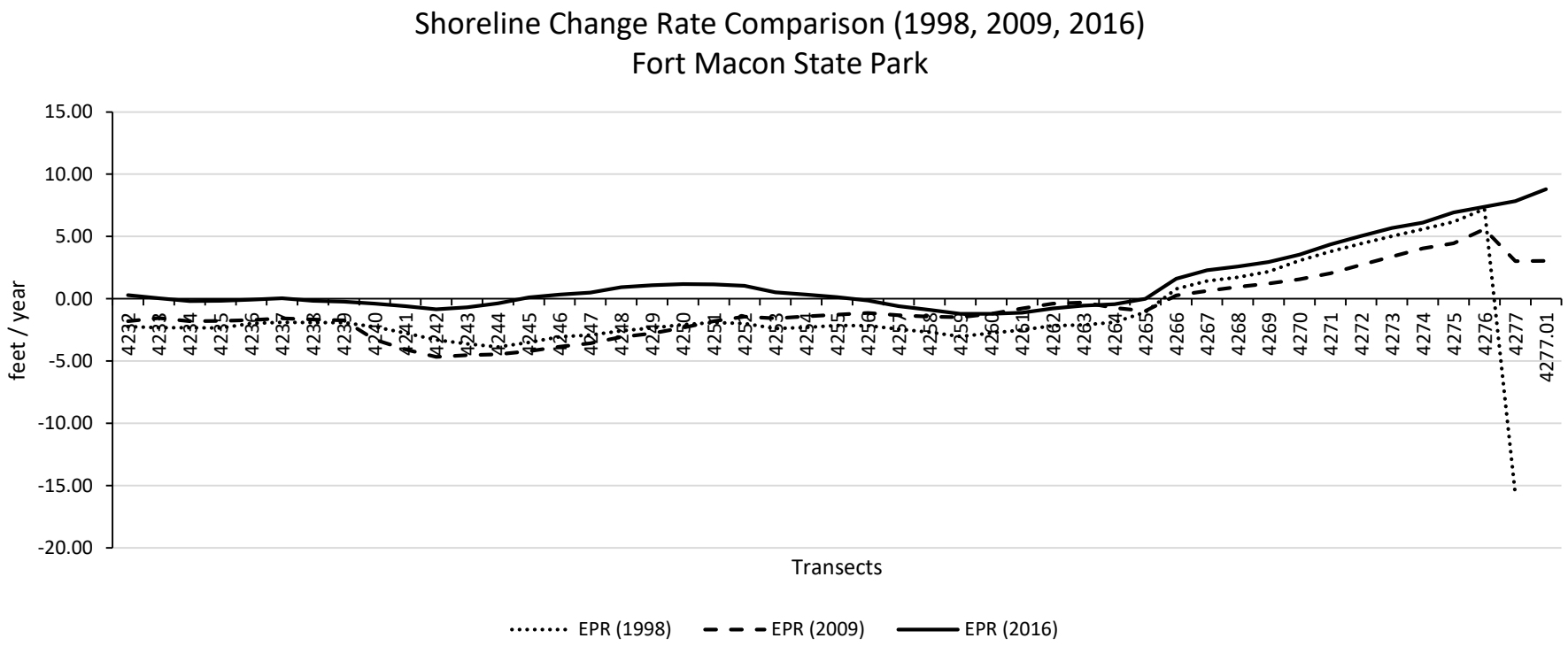

Figure B25. Shoreline change rate comparison at Fort Macon State Park using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Atlantic Beach-Fort Macon State Park boundary (graph left-side) to Beaufort Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

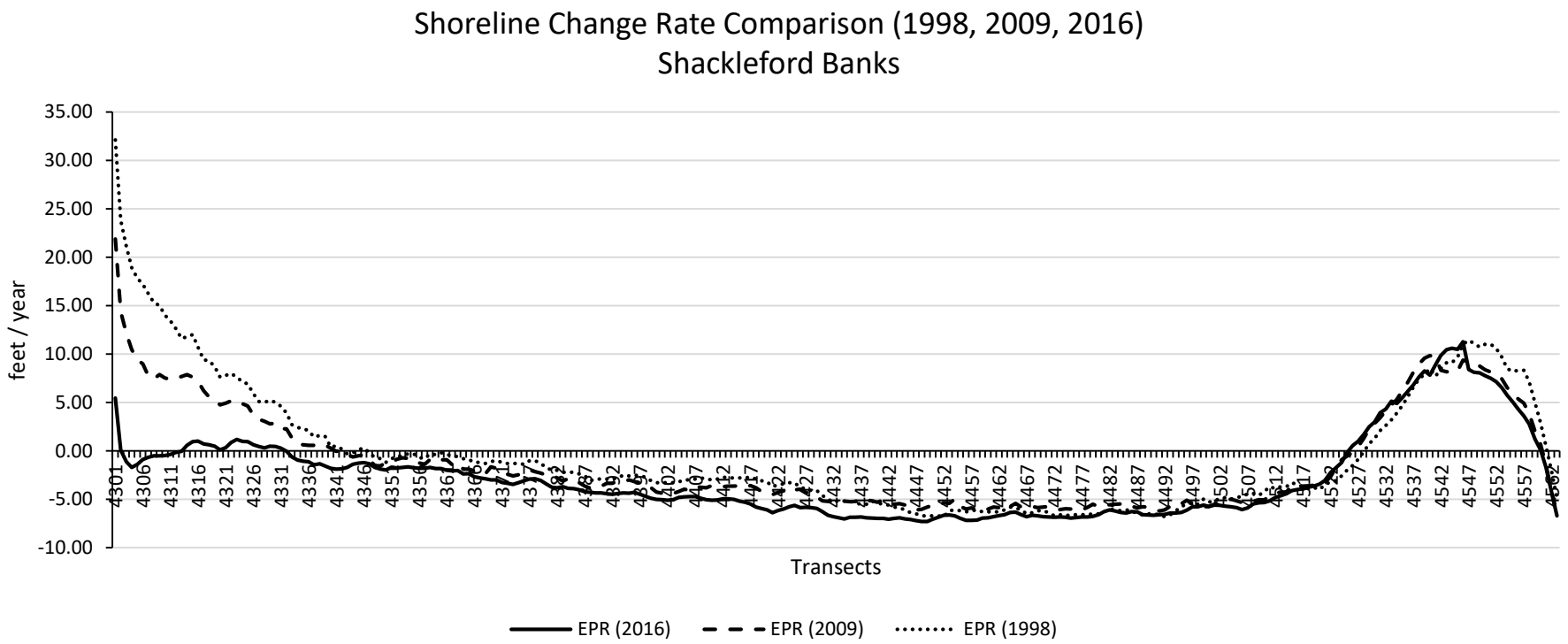

Figure B26. Shoreline change rate comparison at Shackleford Banks using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Beaufort Inlet (graph left-side) to Barden Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

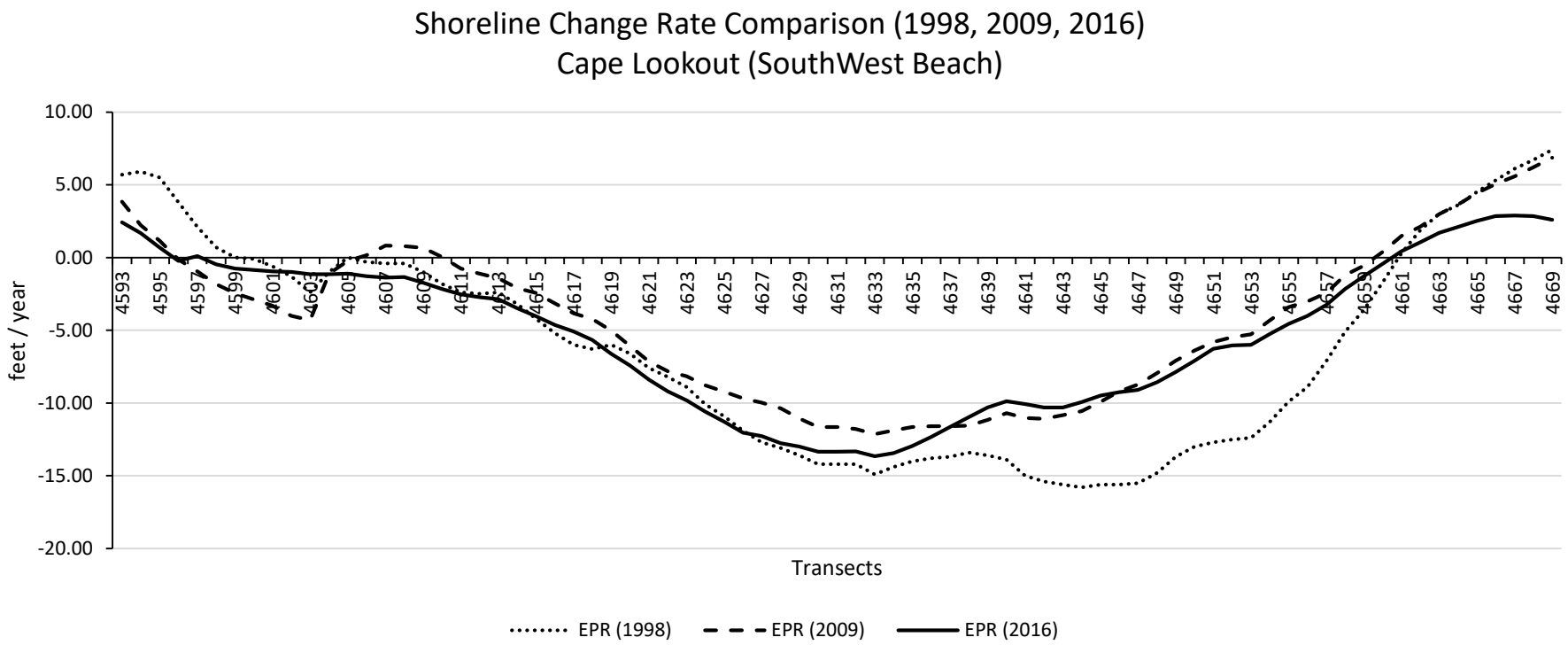

Figure B27. Shoreline change rate comparison at Cape Lookout (southwest-beach) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from Barden Inlet (graph left-side) to Cape Lookout (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

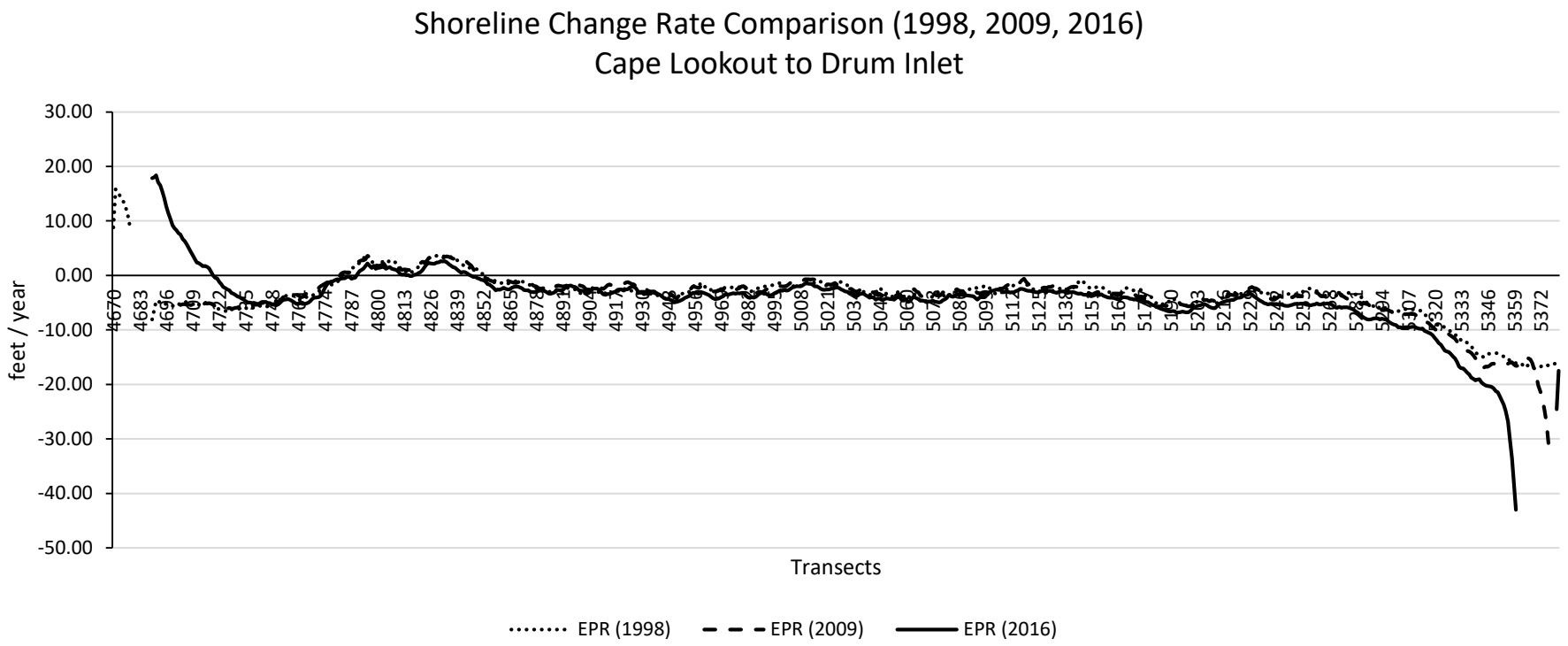

Figure B28. Shoreline change rate comparison at Core Banks (from Cape Lookout to Drum Inlet) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph is oriented from south to north, with Cape Lookout on graph's left-side, and Drum Inlet on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

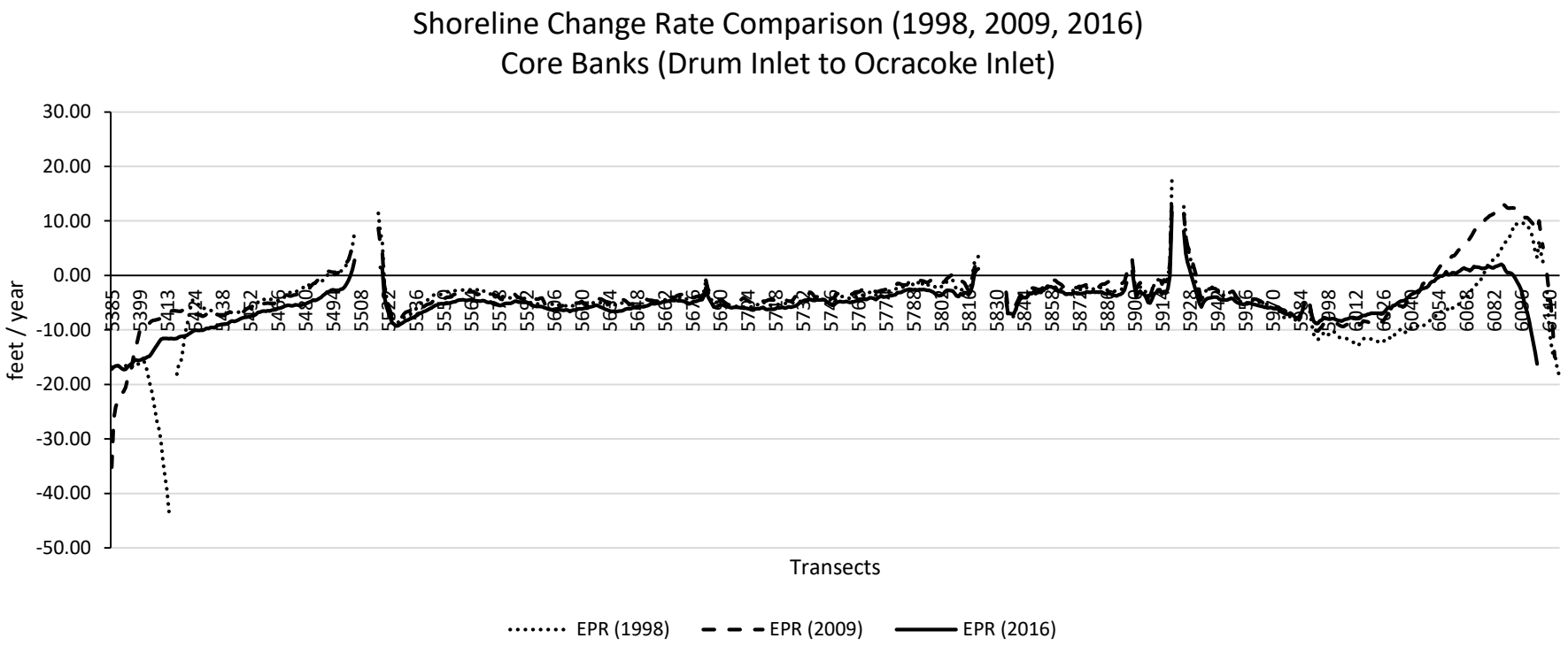

Figure B29. Shoreline change rate comparison at Core Banks (from Drum Inlet to Ocracoke Inlet) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south to north, with Drum Inlet on left-side and Ocracoke Inlet on right-side. Data gaps represent form inlet locations. Transect numbers correspond to those labeled on map in the results summary section.

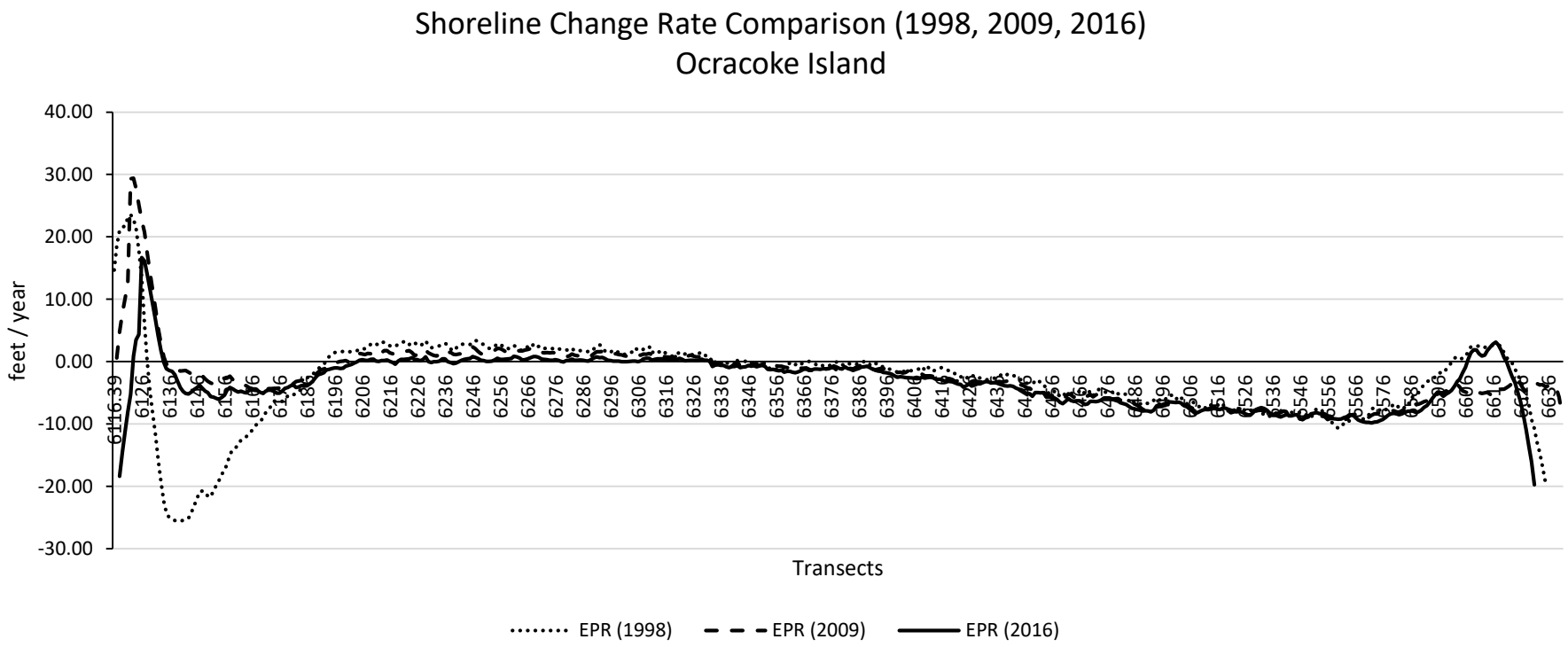

Figure B30. Shoreline change rate comparison at Ocracoke Island using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from Ocracoke Inlet (graph left-side) to Hatteras Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

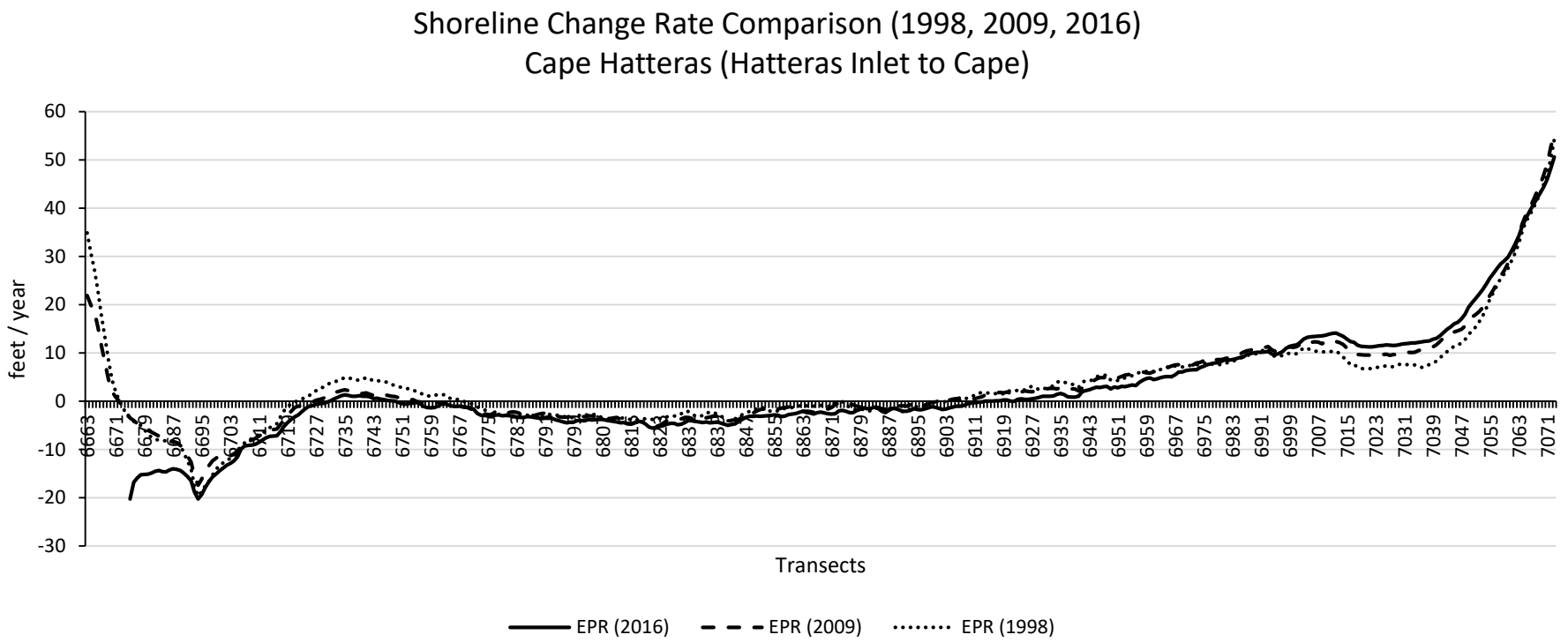

Figure B31. Shoreline change rate comparison at Cape Hatteras (from Hatteras Inlet to Cape) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from Hatteras Inlet (graph left-side) to Cape Hatteras (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

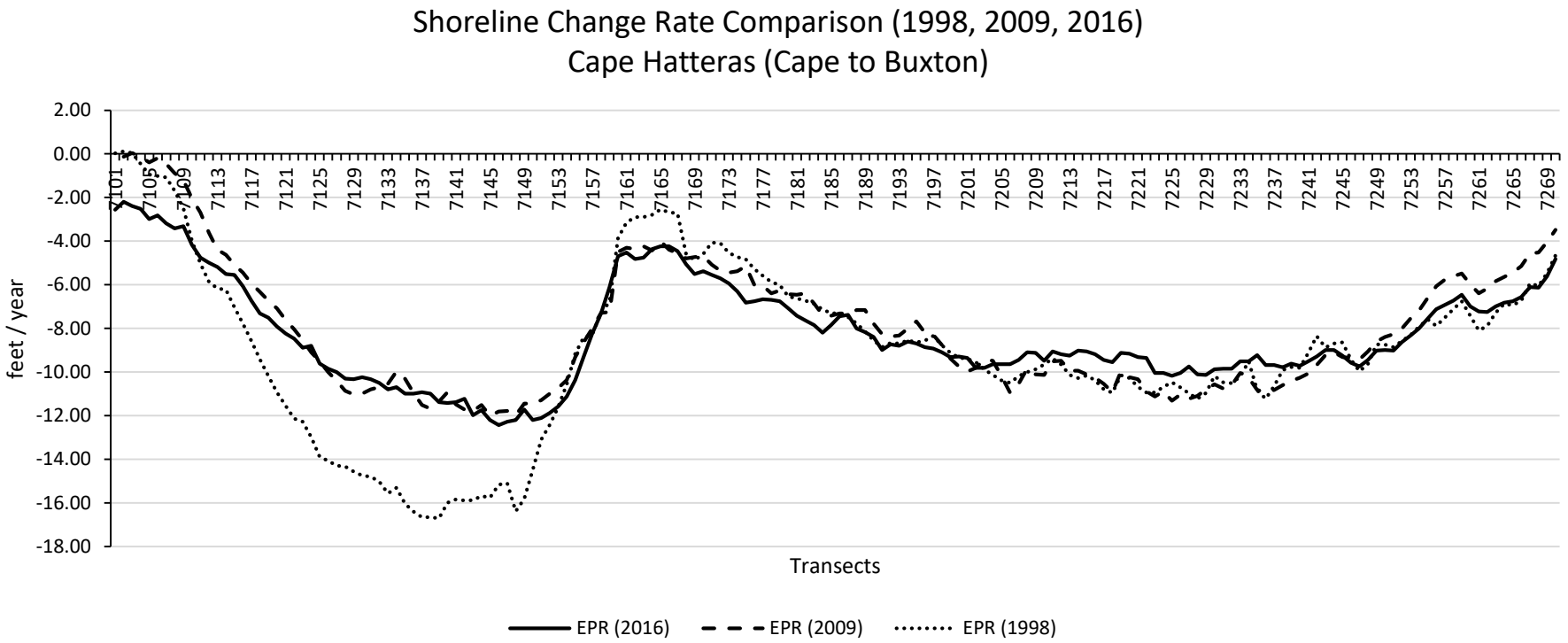

Figure B32. Shoreline change rate comparison at Cape Hatteras (from Cape to Buxton) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from Cape Hatteras (graph left-side) to north of Buxton (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

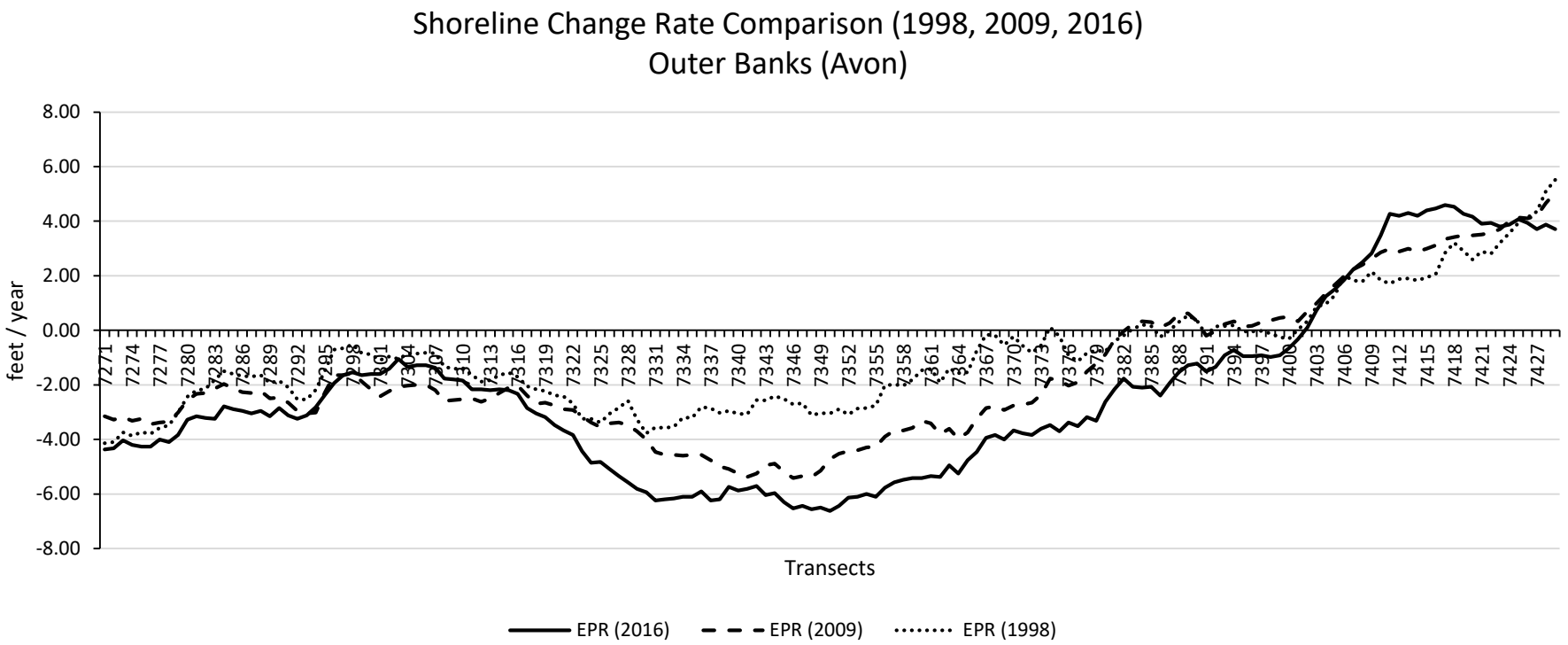

Figure B33. Shoreline change rate comparison at Outer Banks at Avon using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south (graph left-side) to north at Avon (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

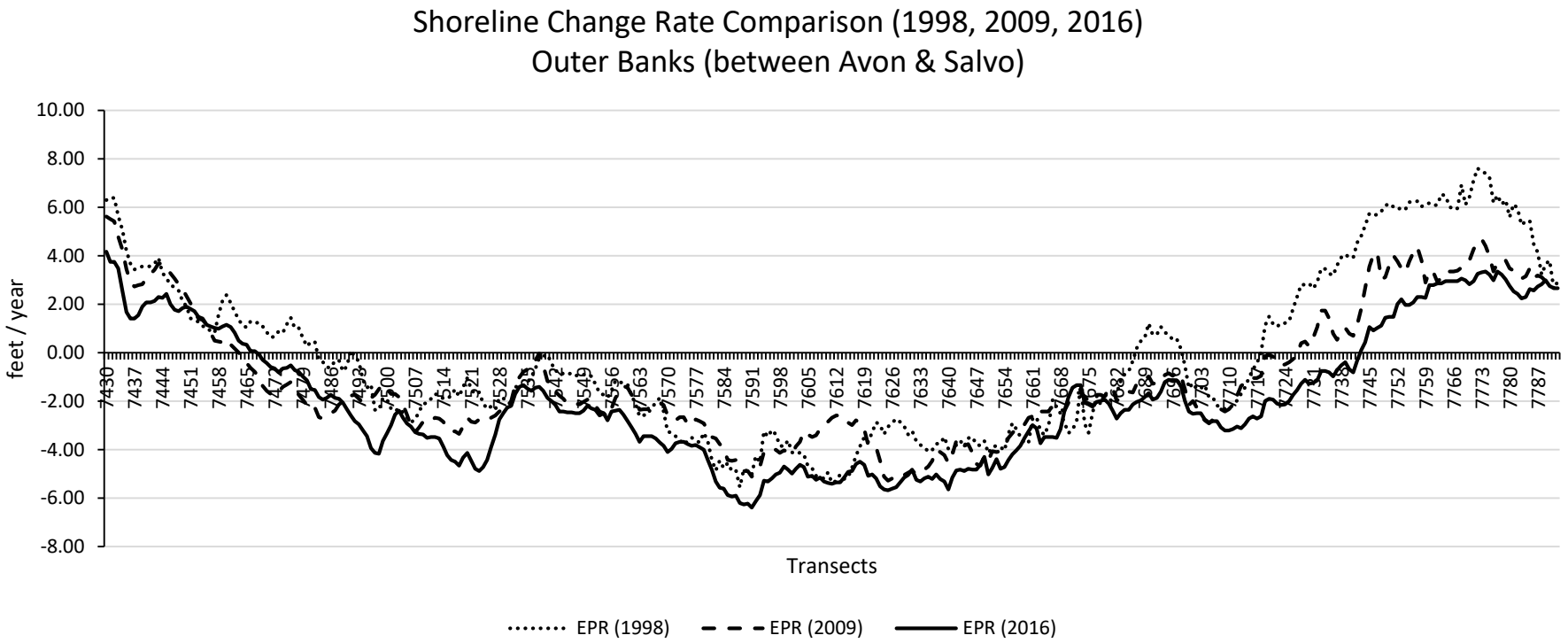

Figure B34. Shoreline change rate comparison at Outer Banks between Avon and Salvo using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south (graph left-side) to north (graph right-side) between Avon and Salvo. Transect numbers correspond to those labeled on map in the results summary section.

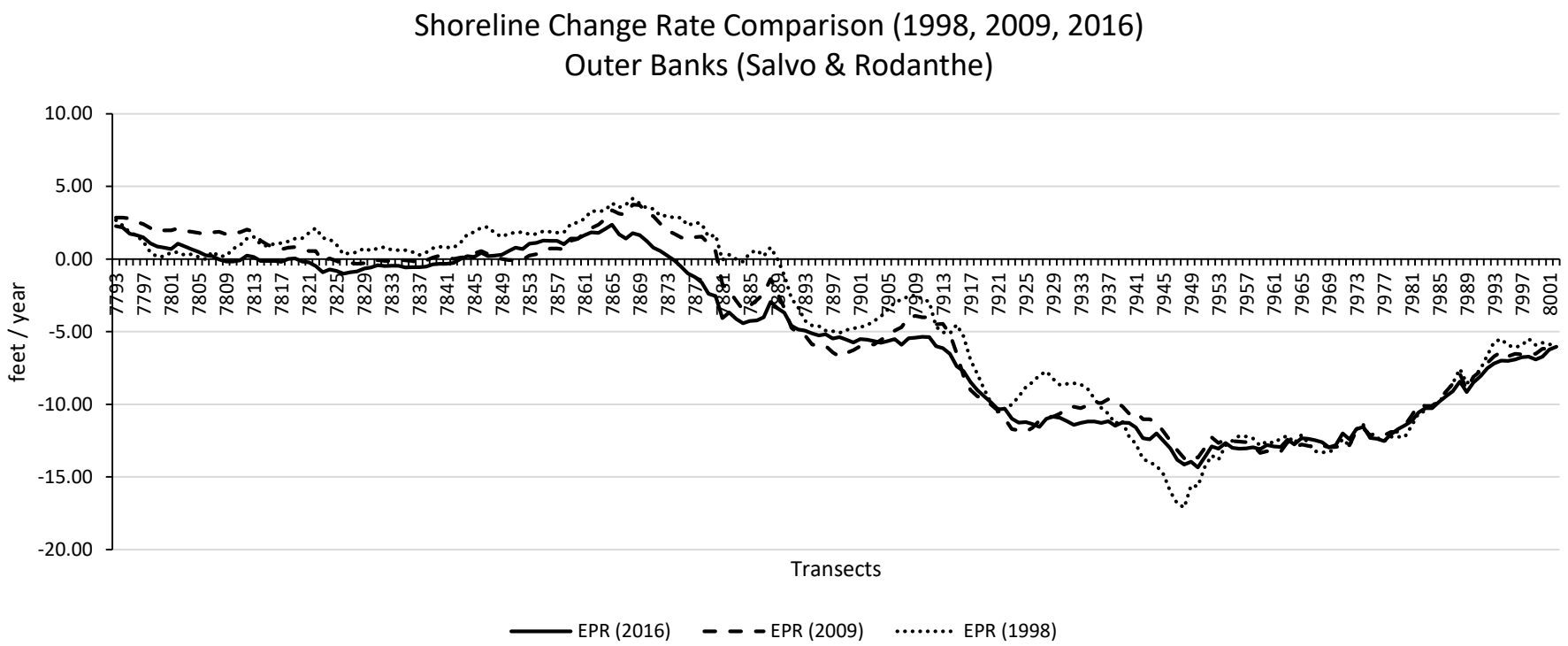

Figure B35. Shoreline change rate comparison at Outer Banks at Salvo and Rodanthe using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Graph oriented from south (left-side) to north (right-side) and includes Salvo and Rodanthe. Transect numbers correspond to those labeled on map in the results summary section.

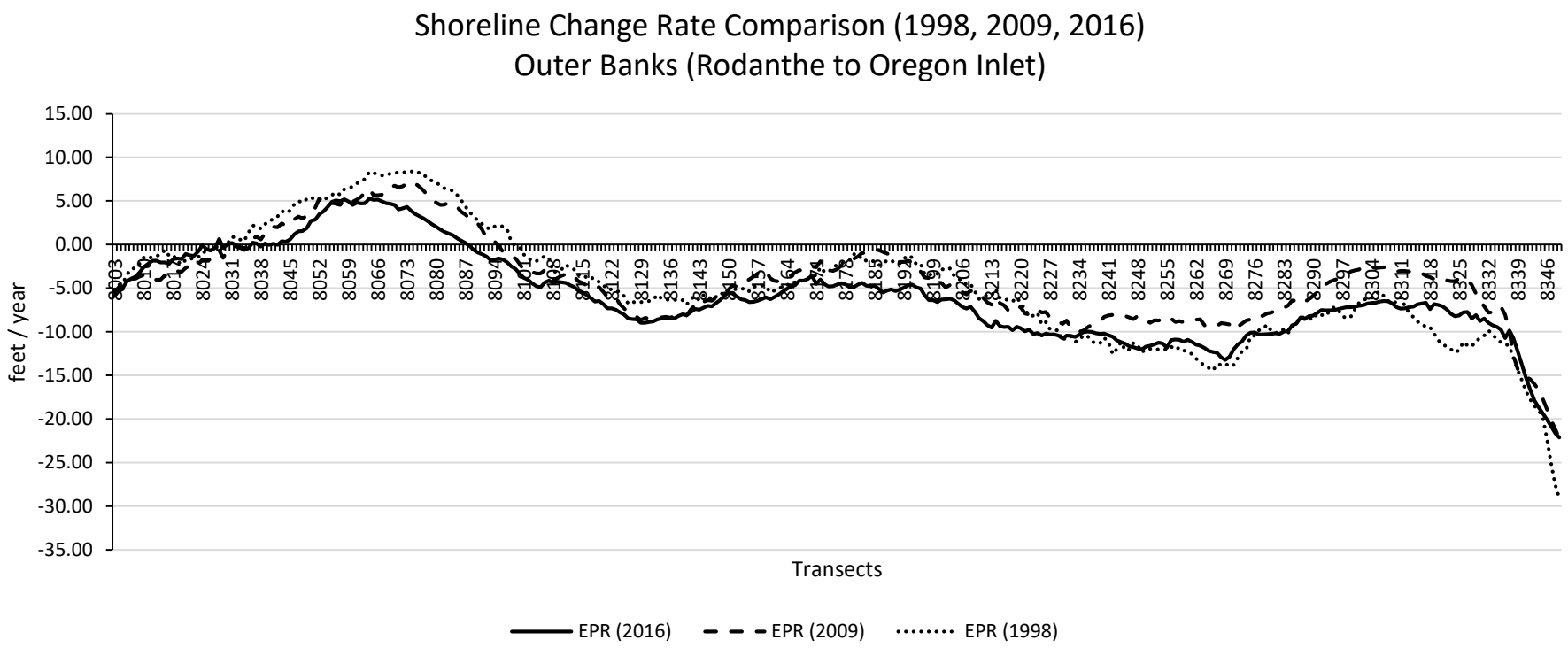

Figure B36. Shoreline change rate comparison at Outer Banks from Rodanthe to Oregon Inlet (Pea Island) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from Rodanthe (graph left-side) to Oregon Inlet (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

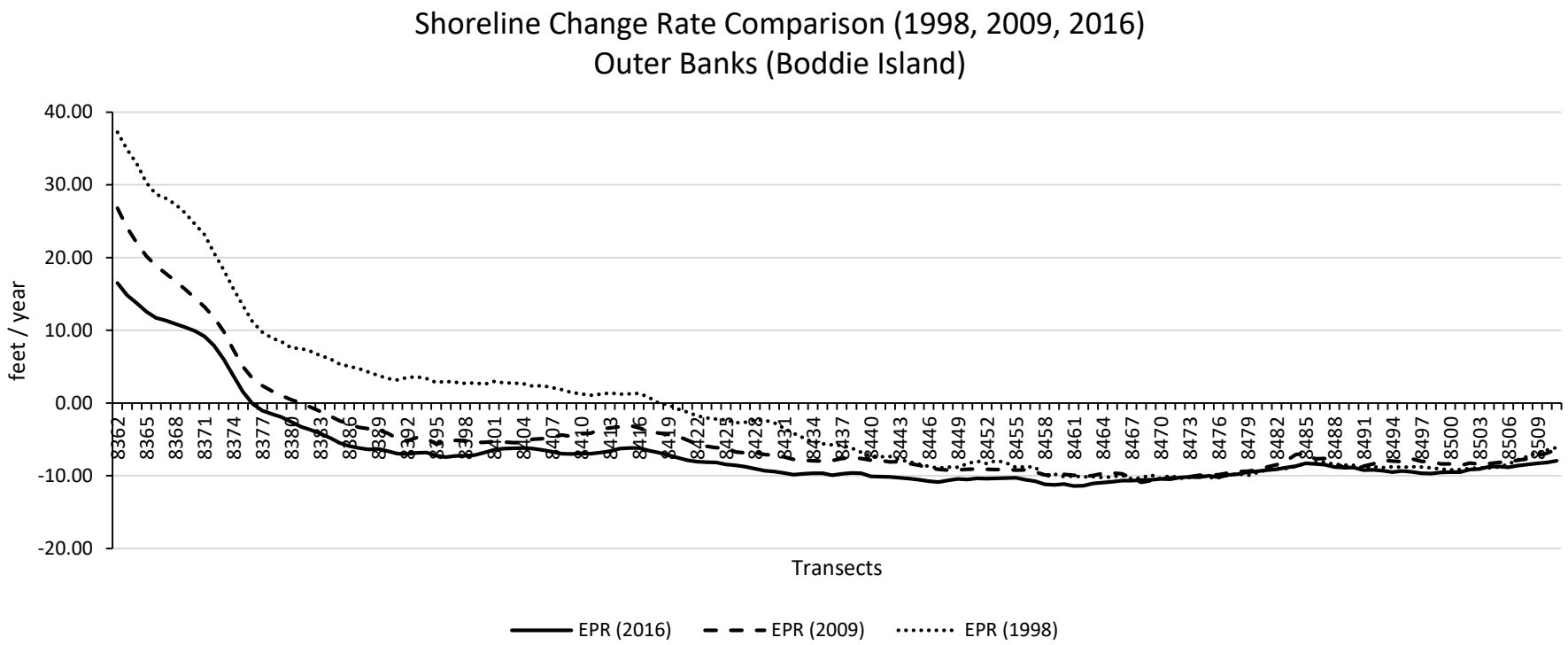

Figure B37. Shoreline change rate comparison at Outer Banks from Oregon Inlet to Nags Head (Boddie Island) using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south (graph left-side) to north (graph right-side) and includes Boddie Island. Transect numbers correspond to those labeled on map in the results summary section.

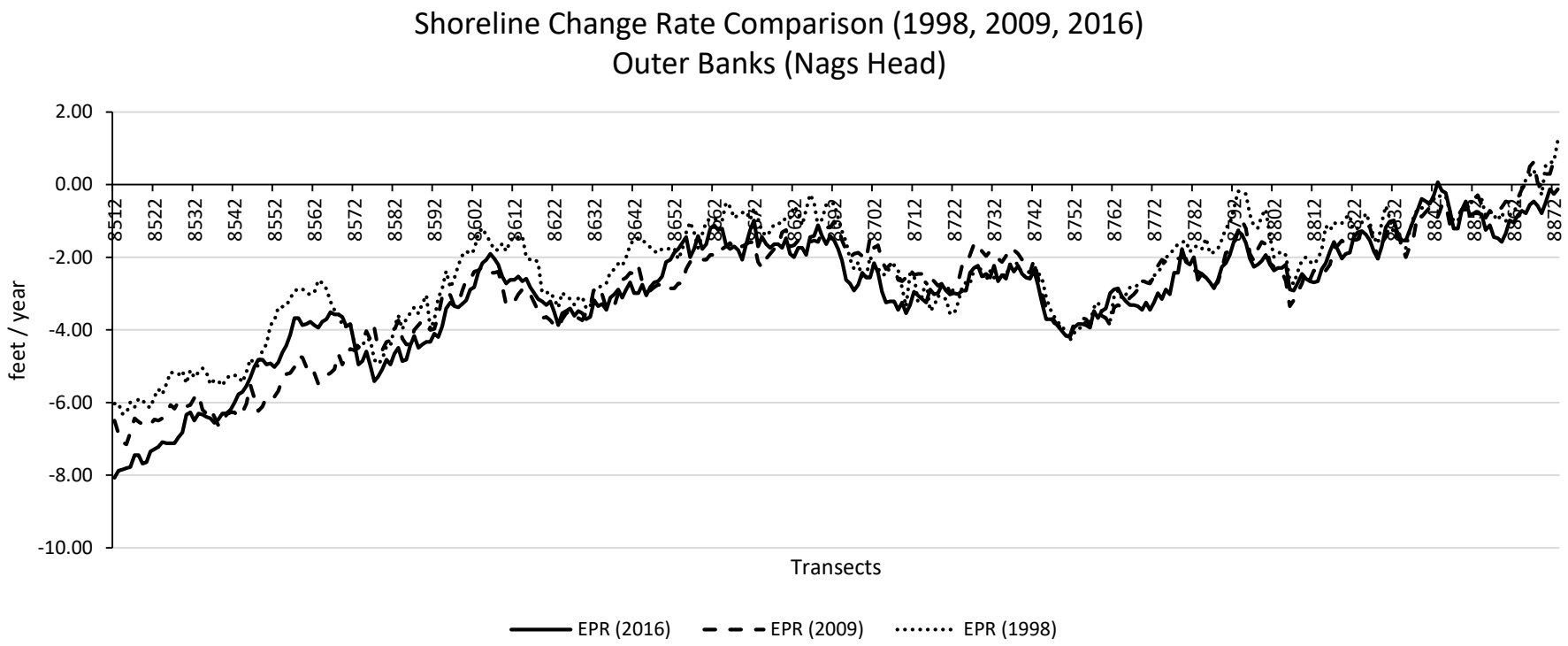

Figure B38. Shoreline change rate comparison at Outer Banks at Nags Head using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from Nag Head's southern limit (graph left-side) to its northern limit (graph right-side). Transect numbers correspond to those labeled on map in the results summary section.

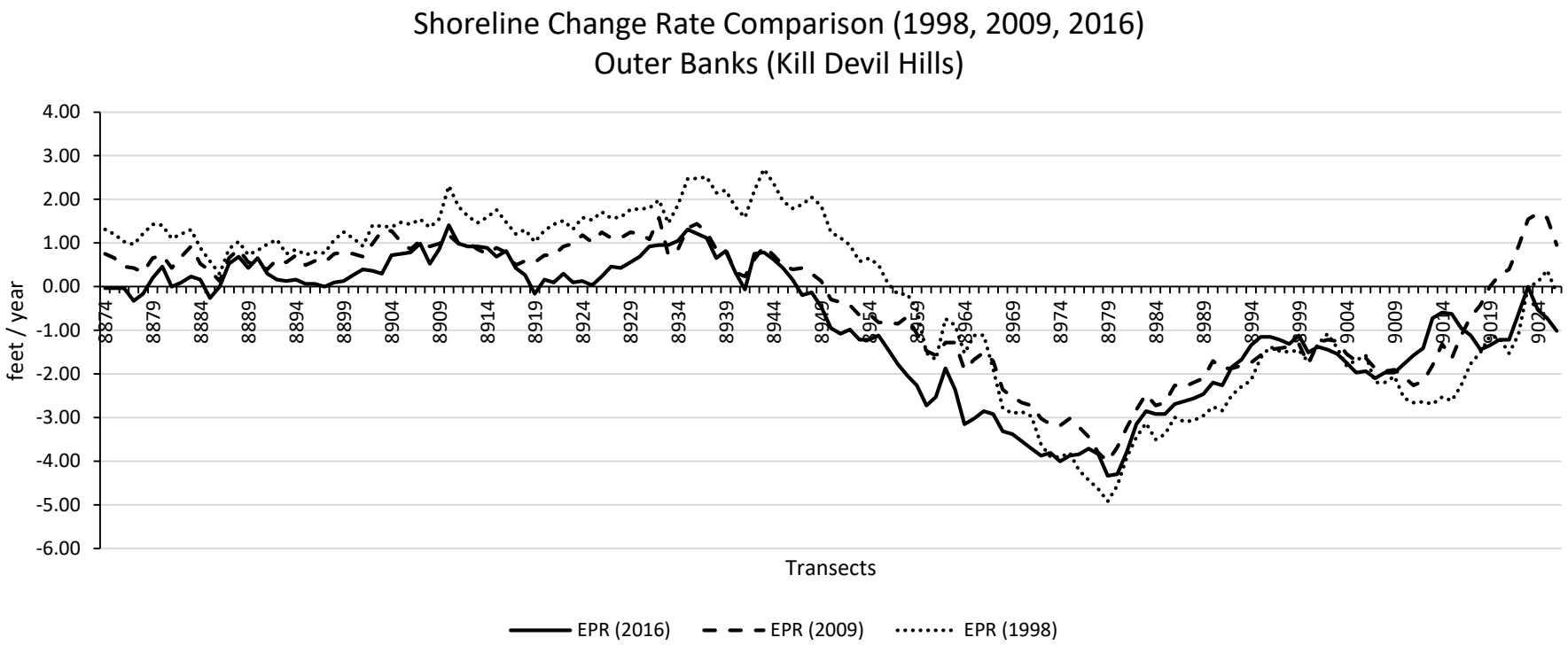

Figure B39. Shoreline change rate comparison at Outer Banks at Kill Devil Hills using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north, with Nags Head-Kill Devil Hills town limits on graph's left-side and Kill Devil Hills-Kitty Hawk town limits on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

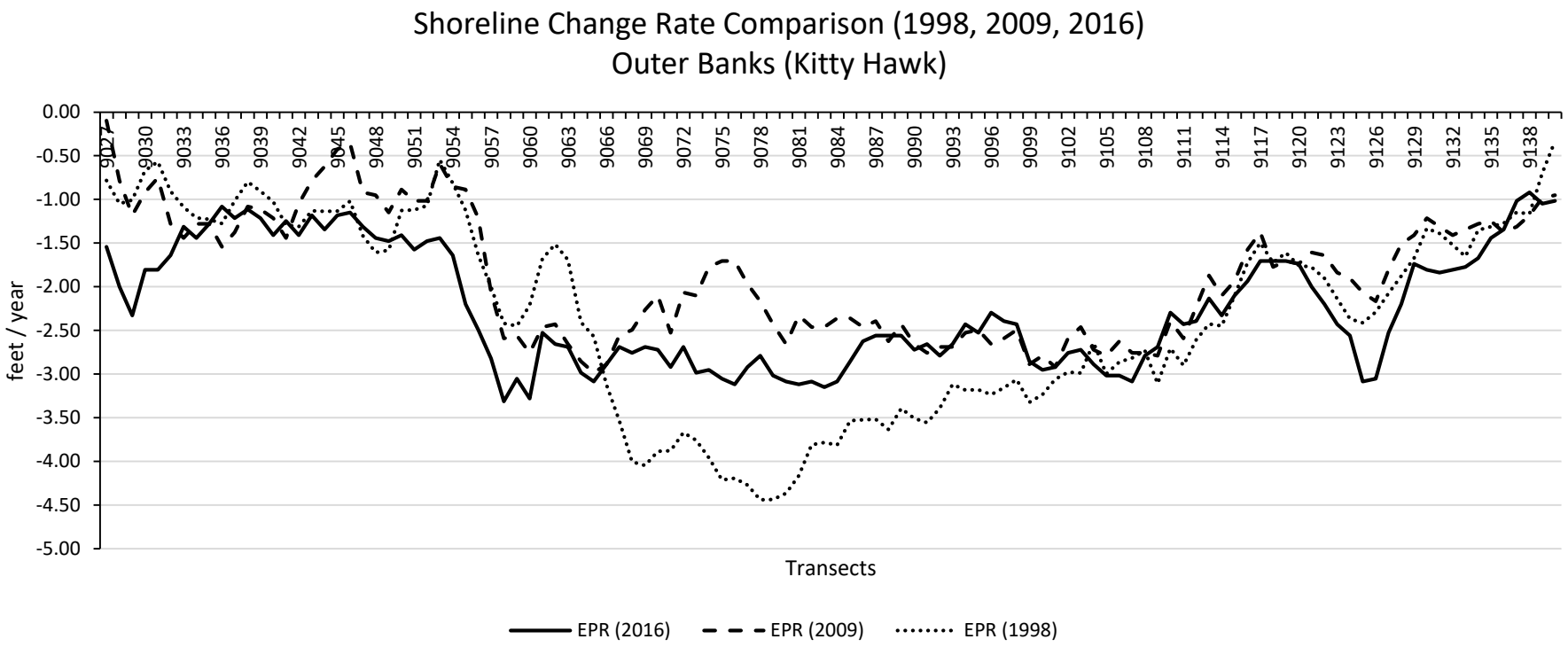

Figure B40. Shoreline change rate comparison at Outer Banks at Kitty Hawk using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north, with Kill Devil Hills-Kitty Hawk town limits on graph's left-side, and Kitty Hawk-Southern Shores town limits on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

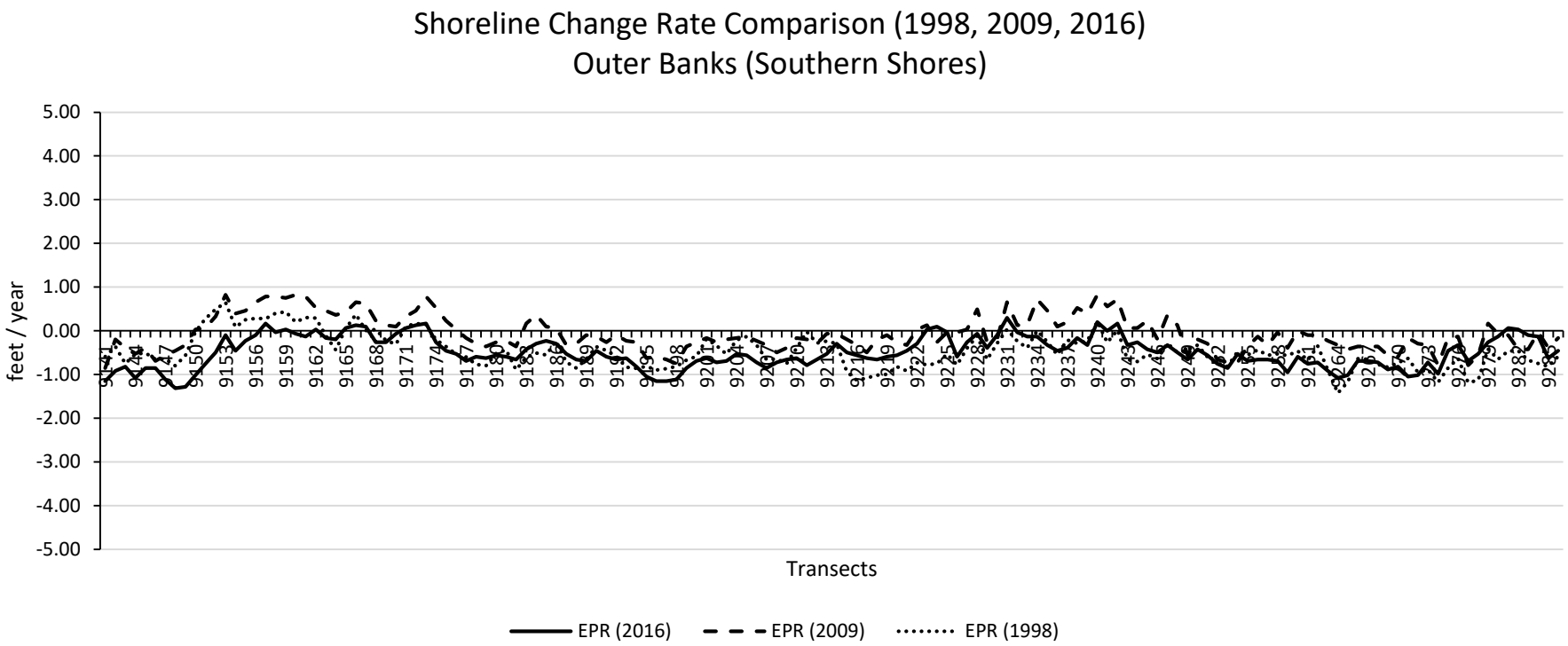

Figure B41. Shoreline change rate comparison at Outer Banks at Southern Shores using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north, with Kitty Hawk-Southern Shores town limits on graph's left-side, and Southern Shores-Duck town limits on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

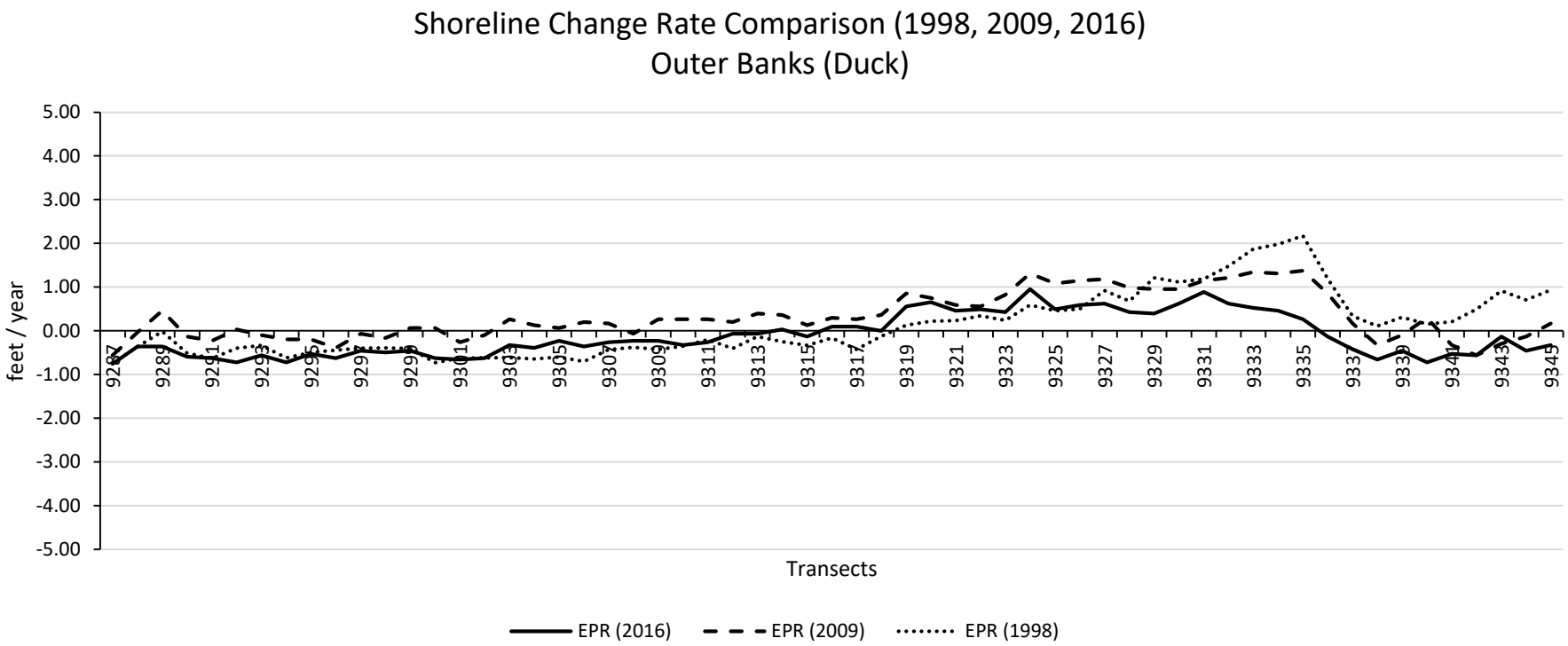

Figure B42. Shoreline change rate comparison at Outer Banks at Duck using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north, with Southern Shores-Duck town limits on graph's left-side and Duck-Corolla limits on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

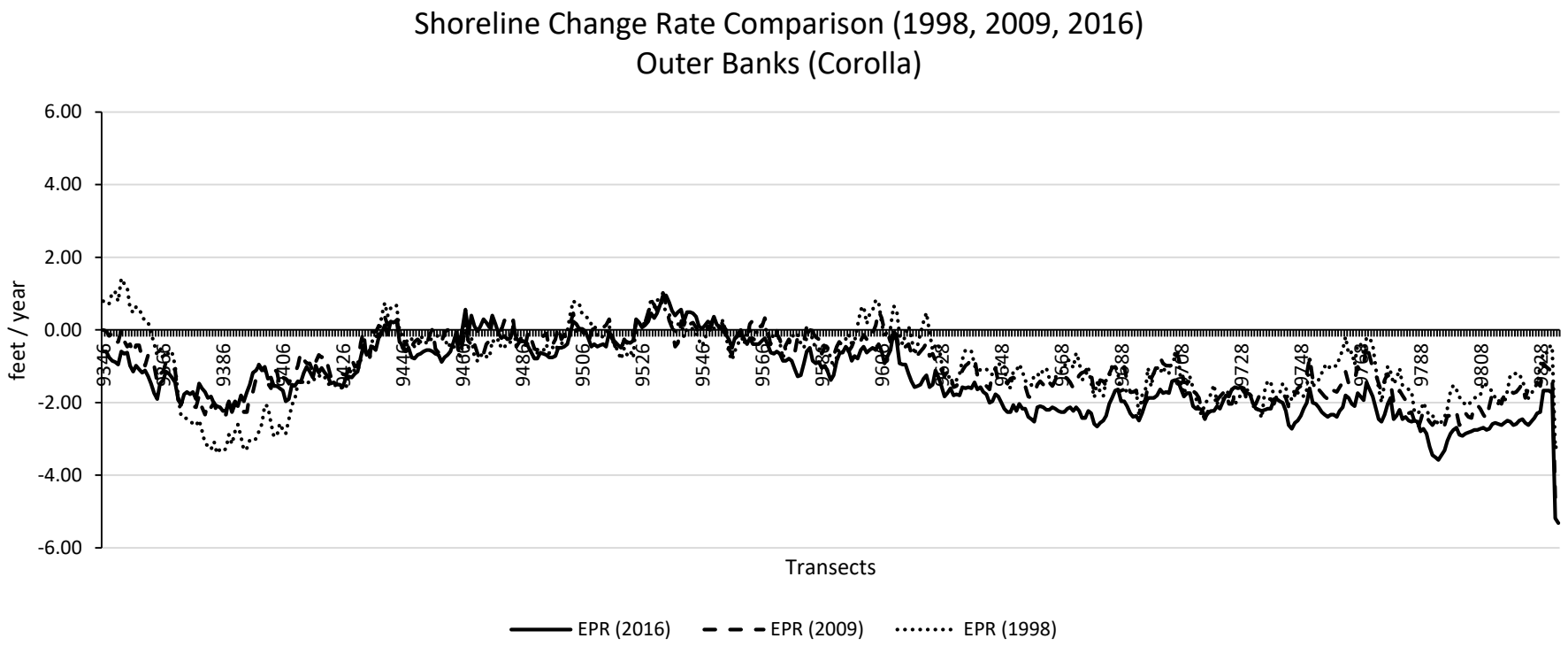

Figure B43. Shoreline change rate comparison at Outer Banks at Corolla using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north, with Duck-Corolla boundary on graph's left-side, and Corolla's northern limit on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

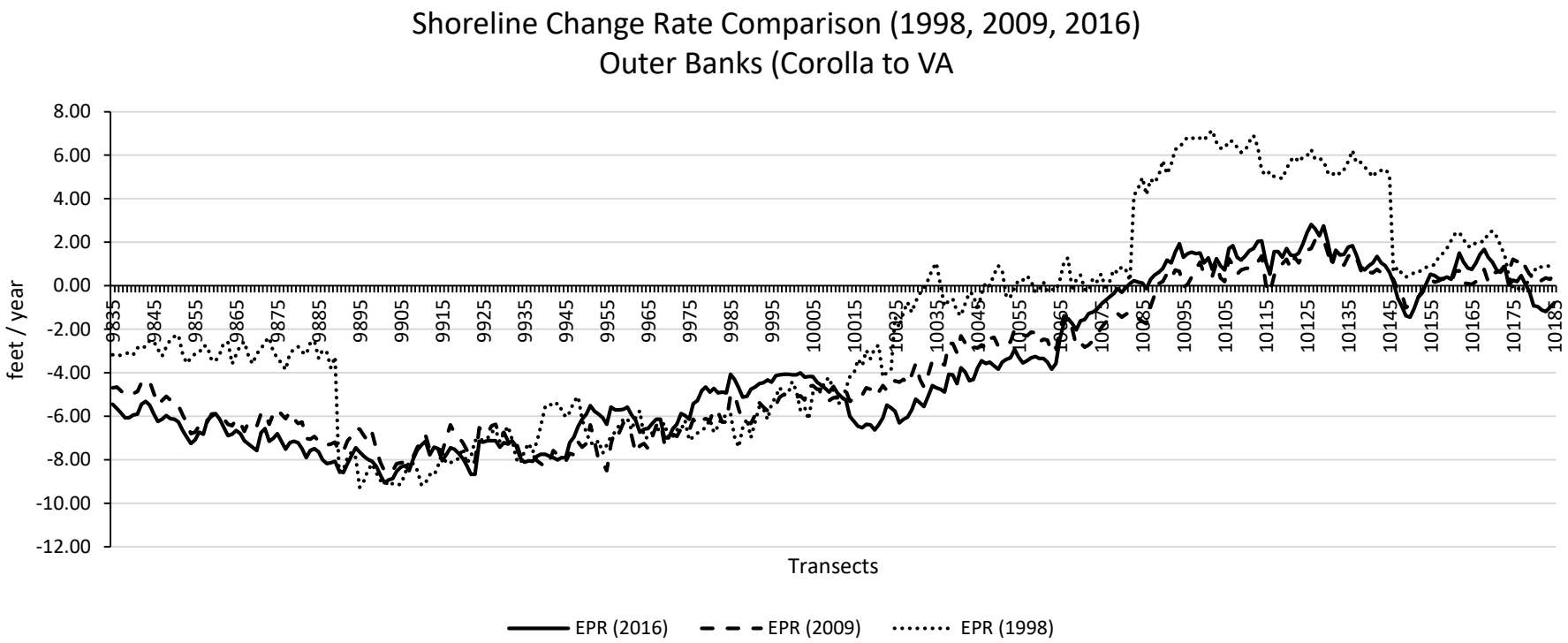

Figure B44. Shoreline change rate comparison at Outer Banks from Corolla to NC-VA State Line using early shoreline and 1998, 2009, and 2016 shorelines. On this graph, negative vales represent erosion, and positive values represent accretion. Oriented from south to north from Corolla (graph's left-side) to NC-VA state line on graph's right-side. Transect numbers correspond to those labeled on map in the results summary section.

Fiscal Analysis

North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study

2019 Draft Erosion Rates and Amendments to 15A NCAC 7H .0304(1)(a)

Prepared by

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Policy & Planning Section
NC Division of Coastal Management
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February 6, 2019

Basic Information

Agency	DEQ, Division of Coastal Management (DCM) Coastal Resources Commission
Title	AREAS OF ENVIRONMENTAL CONCERN (AECS) WITHIN OCEAN HAZARD AREAS
Citation	15A NCAC 7H .0304(1)
Description of the Proposed Rule	7H.0304 defines and establishes Areas of Environmental Concern (AECs) within the Ocean Hazard Areas along the State's Atlantic Ocean shoreline. Ocean Hazard Area AECs include the Ocean Erodible Area, Inlet Hazard Area and the Unvegetated Beach Area.
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 proposed amendments to 15A NCAC 7H .0304(1) reflect the five-year update of the state's oceanfront erosion rates. Erosion rates are used to establish construction setbacks for development within the Ocean Erodible Area – Areas of Environmental Concern (OEA-AEC). The proposed rule change is in the public interest as it will minimize the loss of property and human life by establishing development setbacks between oceanfront structures and the Atlantic shoreline.
Impact Summary	State government: No Local government: No Substantial impact: No Federal government: No

Summary

The Coastal Resources Commission (CRC) seeks to amend its administrative rules governing oceanfront development setbacks. Oceanfront construction setbacks are based on long-term average annual erosion rates referenced in the report "2011 Average Annual Shoreline Rate Update" (15A NCAC 7H .0304(1)(a)) adopted by the Commission May 5, 2011. The current oceanfront erosion rates were adopted by reference and became effective in 2013. The proposed amendment would update these rates using new data and analysis referenced in a new report *2019 Oceanfront and Long-term Average Annual Erosion Rate Update Study*. The purpose of updating oceanfront erosion rates is to protect life and property from hazards associated with coastal erosion.

Development sited directly adjacent to the ocean shoreline may be vulnerable to erosion and the CRC seeks to minimize the loss of property and human life by establishing 'setbacks' that specify the minimum distance between a structure and the shoreline. These updated erosion rates will be used to calculate construction setbacks and apply to property owners seeking to redevelop or construct new structures; or those needing repairs in excess of fifty percent of market value per 15A NCAC 07J.0210(1). If repairs to a structure are less than fifty percent, the owner is not required to obtain a Coastal Area Management Act (CAMA) permit.

Updating the erosion rates also keeps North Carolina in compliance with FEMA (Federal Emergency Management Administration) guidelines for the Community Rating System (CRS). These updated rates will ensure that property owners in coastal communities that participate in the National Flood Insurance Program are given fifty CRS points to maintain insurance rates at their current level. The loss of these points could increase insurance rates by up to five percent for some policyholders.

The potential economic impacts of this proposed rule change are twofold. First, although there is not an immediate positive or negative impact on CRS points for oceanfront communities, the ability to influence future FEMA CRS evaluations, and potentially increase or decrease flood insurance premiums still remains. Second, of the total oceanfront structures (8,777) that are adjacent to the Atlantic shoreline, approximately 7,579 (86.4%) will experience no change in their construction setback should they need to be rebuilt for any reason. Of the total structures, 215 (2.4%) will see reduced construction setbacks, while 983 (11.2%) will see higher construction setbacks compared to current requirements based on the 2013 update study.

Assessing the specific impact of the interaction between erosion rates and NC's setback requirements on structure values is difficult for several reasons: 1) coastal shorelines are viewed by many as desirable locations to live, and erosion hazards are often overlooked when the risks are not extreme and beach nourishment maintains a wide healthy beach (Below, Beracha, Skiba, 2015); 2) local government ordinances often include additional property boundary setbacks requirements and may restrict re-development, and; 3) there are numerous other important variables (i.e., amenities, quality of construction, size, location) that have a very important effect on property value. We believe the overall impact, if any, would be difficult to quantify accurately, and any attempt would be purely speculative.

This proposal will have no impact on Department of Transportation projects or on DCM permit income.

The proposed effective date of these rules is June 20, 2019.

Introduction and Purpose

Since 1980, the Coastal Resources Commission has updated its oceanfront erosion rates approximately once every five years with the most recent iteration effective on January 31, 2013 based on 2009 data.

The proposed erosion rates have been developed using the end-point methodology. This technique of calculating shoreline change rates is consistent with earlier studies and provides results that can be compared to those from previous studies. The end-point method uses the earliest and most current shoreline (2016) data points where they intersect at any given shore-perpendicular transect. The distance between the two shorelines (shore-transect intersect) is then divided by the time (number of years), between the two shorelines. Rates at each measured location on the shoreline are then statistically "smoothed and blocked" with neighboring transects in order to group adjacent shoreline segments that have similar rates into one shoreline segment. A "segment" of shoreline is defined as a portion of beach with statistically similar erosion rates and a minimum length of approximately 1,300 feet (400 meters). The mean erosion rate for a segment of beach serves as the ocean hazard setback factor.

Although oceanfront shorelines are in a constant state of flux, both eroding and accreting as a result of natural and engineering processes, setback factors based on calculated shoreline change rates in this latest study show similar trends to those in previous updates (see Table 1).

Statewide Totals Summary	**2016** Miles (% of total)	**2009** Miles (% of total)	**1998** Miles (% of total)	**1992** Miles (% of total)	**1986*** Miles (% of total)	**1980*** Miles (% of total)
Miles of Shoreline Mapped/Analyzed	304.5	307.4	312	300	237*	245*
Setback Factor (2 ft./yr.)	174.6 (57.3%)	190.2 (61.9%)	193 (62%)	165 (55%)	144 (61%)	149 (61%)
Setback Factors (2.5 to 5.0 ft./yr.)	67.1 (22.1%)	62.1 (20.2%)	64 (21%)	54 (18%)	43 (18%)	52 (21%)
Setback Factors (5.5 to 8.0 ft./yr.)	38.7 (12.7%)	31.5 (10.2%)	28 (9%)	30 (10%)	20 (8%)	22 (9%)
Setback Factors (>8.0 ft./yr.)	22.7 (7.4%)	20.8 (6.8%)	27 (8%)	32 (10.7%)	22 (9%)	22 (9%)
Insufficient Data	*1.4 (<0.5%)*	*2.8 (<1%)*	*0*	*19 (6%)*	*8 (4%)*	*0*

Table 1. Comparison of oceanfront setback factors from 1980 to 2016. Percentages are based on length of shoreline and its calculated setback factors, or ocean hazard setback. For example, the table row containing "Setback Factor (2 ft./yr.) is the length of oceanfront shoreline with a setback factor equal to 2. The last row labeled "Insufficient Data" show the length of shoreline where only one shoreline was available (i.e. migrating, open or closed inlets), therefore rates could not be calculated.

Statewide, the average blocked erosion rate value is3.7 feet per year, which is a slight increase (0.3 ft.) compared to the 2011 DCM update study using the 2009 shoreline (3.4 feet per year). The calculated average shoreline change rate for this 2019 study was 2.1 feet per year (erosion), and the median was 1.6 feet per year (erosion). The results are generally consistent with those of earlier erosion studies.

The main uses of the updated erosion rates will be as factors in the calculation of construction setbacks. As structures sited adjacent to the ocean shoreline may be vulnerable to erosion and water intrusion, the CRC seeks to minimize the loss of property and human life by establishing 'setbacks' that specify the minimum distance between a structure and the shoreline.

Where there is a high rate of erosion, structures must be located farther from the ocean shoreline than in locations where the shoreline is experiencing less erosion. The construction setback equations in Table 2 are used to site oceanfront development and determine the extent of the Ocean Erodible Area of Environmental Concern (OEA) - the area where there is a substantial possibility of excessive shoreline erosion. A minimum factor of two (2) is applied if the erosion rate is less than two feet per year or where the shoreline is accreting (see Table 2). The use of oceanfront setbacks based erosion rates was initially established by the Coastal Resources Commission (CRC) under the Coastal Area Management Act (CAMA) in 1979 and have be used along the coast since that time.

Construction Setback Using Minimum Setback Factor

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

Table 2. This table demonstrates an example of minimum construction setback based on structure size and minimum setback factor of 2 ft./yr.

Calculations with the new shoreline change rates show that of the 304.5 miles analyzed, 59.3 percent (180 miles) of the state's analyzed shoreline will experience no change in oceanfront setback factors while 8.5 percent (25.9 miles) of analyzed oceanfront shoreline will receive reduced setback factor values. The remaining 32.2 percent (98 miles) of analyzed shoreline will receive higher construction setback factors; however, 77 miles, nearly 79 percent, of the 98 miles is either Federal or State owned land where oceanfront development is minimal. Based on 2016 data, there are 8,777 oceanfront structures located adjacent to the Atlantic shoreline. Of these, approximately eighty-six percent (86%) of their owners will see no change in construction setback factor values, or reduced setback factors.

National Flood Insurance Rate Calculations

Calculating shoreline change rates for the purpose of updating construction setback factors every five years can affect the cost of some flood insurance premiums. Communities that regulate new development in their floodplains are eligible to participate in the National Flood Insurance Program (NFIP) qualifying for federally backed flood insurance. The Community Rating System (CRS) is an assessment tool used by the NFIP to reduce flood insurance premiums based upon action taken by a community beyond the NFIP's minimum standards for floodplain regulation. The objective of the CRS is to reward communities for current efforts, as well as to provide an incentive for new flood protection activities. Communities are classified based of the number of points they accumulate through flood preparedness activities, flood damage reduction work, and public information activities.

The reduction in flood insurance premium rates is provided according to a community's CRS classification, as shown Table 3. To reduce premiums by five percent (5%), a community must quality for five hundred (500) CRS points and be at least a Class 9 community on a class scale of one to ten (see Table 3). For each additional five hundred points, another five percent in savings is applied for communities with Special Flood Hazard Areas (SFHA). The maximum number of CRS points a community can qualify for is 4,500 with a potential savings of forty-five percent in their flood insurance premiums; these communities are considered by the U.S. Federal Emergency Management Administration (FEMA) to be Class 1.

FEMA's Community Rating System (CRS)

CRS Community Class	Points	SFHA	Non-SFHA
1	4,500	45%	10%
2	4,000	40%	10%
3	3,500	35%	10%
4	3,000	30%	10%
5	2,500	25%	10%
6	2,000	20%	10%
7	1,500	15%	5%
8	1,000	10%	5%
9	500	5%	5%
10	0	0	0

Table 3. Higher points correlate to reduced flood insurance premiums for communities with Special Flood Hazard Areas (SFHA).

The NFIP uses North Carolina's erosion rate updates to award Community Rating System (CRS) points to qualified coastal communities. FEMA's current policy allows North Carolina's oceanfront erosion rate update to account for fifty (50) CRS points only if the states erosion rates are updated once every five years. The current erosion rates, set in 2013, are due for an update in order to meet NFIP requirement. Loss of these points could potentially result in a five percent increase in flood insurance premiums depending upon the communities CRS classification.

Description of Rule Update

Rule 15A NCAC 7H .0304(1) describes Areas of Environmental Concern (AEC) within Ocean Hazard Areas (OEA). The proposed amendment will reference the updated erosion rate report and maps "North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study"

The draft amendment is located in Appendix A.

Cost or Neutral Impacts

Private Property Owners:

The oceanfront setback rules applies when oceanfront property owners are seeking a Coastal Area Management Act (CAMA) permit for construction of new a structure, or replacement of an existing structure requiring more than fifty percent (50%) repair or re-construction within the Ocean Erodible AEC. Based on analysis of the 2019 study, 7,579 (86.4%) of existing structures adjacent to the Atlantic shoreline will experience no change in its development setback factor, while 984 (11.2%) of oceanfront structures will experience an increase in construction setback factors. Table 4 depicts the number of properties affected by changes in erosion rates. Where proposed erosion rates would increase setback factors, it is worth noting that all these properties are in areas with known historically high erosion rates. "High erosion rate" is relative and considered by the NC DCM to be any rate greater than two feet per year. The highest erosion rates are primarily found in the vicinity of inlets that have not been regularly engineered for purposes of navigational safety, or erosion control (Brunswick County); and in areas where shoreline position is significantly influenced by persistent seasonal North-Easterly storms (Dare County

Analysis of the 2019 report show 984 oceanfront structures receiving an increased construction setback factor ranging from one-half a foot to three feet per year. These properties have historically had an associated high erosion rate with small fluctuations since the first study was done in 1980. These property owners could be negatively impacted by this change if their home is destroyed by more than fifty percent, and if they are unable to meet the required construction setback as measured from the first line of stable-natural vegetation. It is important to note that this does not preclude them from rebuilding should their home be destroyed as there are a number or grandfather provisions related to structure size (15A NCAC 07H .0306(a)(5)(L)) and (15A NCAC 07H .0306(a)(12).

The reference feature for measuring oceanfront development setbacks, the first line of stable and natural vegetation, is not mapped by the NC DCM since it is dynamic and can change with the frequency and severity of storms and other factors common the ocean shorelines. The location of the first line of stable and natural vegetation can also be influenced by a community's decision to construct a beach nourishment project. In time, the vegetation may respond and grow seaward with the beach, thus changing the point of reference from which the construction setback is measured. In a situation where a structure was destroyed and could not meet the construction setback, they still could potentially rebuild a structure on its original footprint and square footage if the structure meets certain grandfathering conditions (15A NCAC 07H .0306(a)(5)(L)).

Isolating or predicting the impact of state setback requirements on oceanfront property is difficult, if not impossible, since there are many statistically independent criteria that affect structure values.

To examine these types of changes, economists use hedonic price models to decompose the total structure value into measurements for individual aspects of the structure such as size, age, number of bathrooms, location, and nearby amenities. Existing research indicates that erosion risks may decrease the value of oceanfront property but that this effect is overshadowed by the much larger positive value homebuyers place on being located directly next to the ocean.[1] Our ability to analyze this change is also complicated by different local construction ordinances which typically have additional structure setback distances that are measured from points of reference not presented in this document, but can potentially limit size or placement of a proposed structure on a lot. It is true that as the erosion rate increases, construction setback increases; however, depending on size of lot and structure, local government construction requirements (lot-side and street setback) in instances of home damage exceeding 50 percent of the structure value, the property owner may still be able to repair the structure to its original size.

In the long-term, an increased setback factor may protect any existing or new structures from beach erosion. This may provide the property owners and the greater public with benefits.

As demonstrated in the following table, these impacts are not distributed equally among the oceanfront counties. Despite having the highest erosion rates, property owners in Brunswick and Dare Counties will see the most reductions in oceanfront setback factors. Although the rates are higher in these counties, it is important to note that NFIP does not consider the actual erosion rate value when they evaluate flood insurance rates. NFIP only considers that fact that the State of North Carolina did, or did not, update its erosion rates utilizing new data. NFIP requires this update to occur approximately once every five years. If the state does not, NFIP can then discredit fifty CRS points from all NC oceanfront communities with property inside a Special Flood Hazard area. On the oceanfront, these areas are defined by the Velocity Zone, or V-Zone, and vary in size based on coastal region. In some areas this zone may extend across an entire barrier island, while in others it may only contain first or second row property. NC's erosion rates are not used to delineate V-Zone boundaries.

[1]Bin, O. and Kruse J.B. "Real Estate Market Response to Coastal Flood Hazards" *Natural Hazards Review*, 7:4. 2006.; Hindsley, P. "Applying Hedonic Property Models in the Planning and Evaluation of Shoreline Management" Presented at the Coastal Society's 22nd International Conference in Wilmington North Carolina June 13, 2010.

Count of Structures Adjacent to Atlantic Shoreline & Associated Change in Erosion Rates

Location	Total Structures	No Rate Change	% No Change	Lower Rates	% Lower Rates	Higher Rates	% Higher Rates
Brunswick County	2,022	1,842	91.1%	110	5.4%	70	3.4%
New Hanover County	847	825	97.4%	11	1.2%	11	1.2%
Pender County	760	760	100%	0	0%	0	0%
Onslow County	607	558	91.9%	2	<1%	47	7.7%
Carteret County	1,257	1,256	99.9%	0	0%	1	<1%
Hyde County	0	0	100%	0	0%	0	0%
Dare County	2,539	1,750	68.9%	75	2.9%	714	28.1%
Currituck County	745	588	78.9%	16	2.1%	141	18.9%
TOTALS:	**8,777**	**7,579**	**86.4%**	**214**	**2.4%**	**984**	**11.2%**

Table 4. Count of structures adjacent to Atlantic oceanfront shoreline by county. Values represent the number of structures and percentages to demonstrate how the proposed update will influence construction setback factors for those structures. Data are based on 2016 NC 911 Orthophotos and 2018 county tax office information.

NC Department of Transportation (DOT):

Pursuant to G.S. 150B-21.4, DCM DOT permitting staff reported that the proposed amendment to 7H.0304 will not affect environmental permitting for the NC Department of Transportation. Development such as roads, parking lots, and other public infrastructure such as utilities continue to have a minimum setback factor of sixty feet (60) or thirty (30) times the shoreline setback factor (whichever is greater) as defined by 07H.0306(a)(2)(I). In the event NC DOT needs to build or maintain a road located within an Ocean Hazard AEC, DOT actions regarding the roadbed would likely be considered maintenance and repair and not affected by changes in the oceanfront setback factors

Local Government:

Public infrastructure (roads, parking lots, & utilities) have a minimum setback factor of sixty feet (60) or thirty (30) times the shoreline erosion rate (whichever is greater) as defined by 07H.0306(a)(2)(I). In the event that local governments need to replace or rebuild public infrastructure within an Ocean Hazard AEC, the proposed amendments will not change the CRC's approach to permitting that activity.

Division of Coastal Management:

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

Benefits

Private Citizens:

Two hundred and fifteen (215) existing structures adjacent to the Atlantic shoreline will receive a reduced construction setback factor. This reduction ranges between 0.5 to 5 depending on the location of the first line of stable and natural vegetation in those areas. Although purely speculative, these properties could potentially be permitted and allowed re-development or expansion of the existing structure if new setback requirements can be met, and depending on the size of the new construction. These property owners could potentially benefit by being able to expand or re-develop their property to a greater extent possible than what is currently allowed under the existing setback factors. It is not possible to estimate the exact value of this benefit without knowing how many property owners would choose to undertake expansion or redevelopment, or knowing specifics related to construction plans; however, it is estimated that this is an overall positive net influence if compared to existing more restrictive setback requirements.

In the event that erosion rates were not updated in 2019, the loss of fifty CRS points would not have an immediate negative impact those communities listed in Table 5. However, several communities are scheduled to be reevaluated by NFIP in 2019 and 2020, and at that time could potentially benefit by having fifty points awarded as a direct result of having updated erosion rates, and potentially avoiding higher insurance premiums. Updating erosion rates alone does not guarantee a community will save five percent in premiums. However, the fifty points for updated erosion rates could make a difference for communities that are less than fifty points away from the next higher CRS classification.

Oceanfront Communities Participating in FEMA's Community Rating System Program[2]

	Community	Current CRS Class	% Discount for SFHA(1)	% Discount for Non-SFHA	CRS Points	CRS Points (-50)	*CRS Class Change if Points Lost*
1	Atlantic Beach	8	10	5	1365	*1315*	*No*
2	Carolina Beach	6	20	10	2058	*2008*	*No*
3	Caswell Beach	6	20	10	2240	*2190*	*No*
4	Duck	7	15	5	1664	*1614*	*No*
5	Emerald Isle	7	15	5	1906	*1856*	*No*
6	Holden Beach	8	10	5	1181	*1131*	*No*
7	Kill Devil Hills	6	20	10	2305	*2255*	*No*
8	Kitty Hawk	6	20	10	2116	*2066*	*No*
9	Kure Beach	8	10	5	1114	*1064*	*No*
10	Nags Head	6	20	10	2076	*2026*	*No*
11	North Topsail Beach*	*5**	25	10	*3600*	*3550*	*No**
12	Oak Island*	*7**	15	5	*2258*	*2208*	*No**
13	Ocean Isle Beach*	*8**	10	5	*2088*	*2038*	*No**
14	Pine Knoll Shores	6	20	10	2134	*2084*	*No*
15	Southern Shores	6	20	10	2153	*2103*	*No*
16	Sunset Beach*	*7**	15	5	*2109*	*2059*	*No**
17	Topsail Beach	5	25	10	2597	*2547*	*No*
18	Wrightsville Beach	7	15	5	1768	*1718*	*No*

Table 5. List of oceanfront communities participating in CRS. This table illustrates their current CRS Class, Special Flood Hazard Area (SFHA) Premium discount percentages, CRS points, and point score scenario subtracting 50 points. Based on current points, none of the listed communities would be impacted by the loss of fifty points. It should be noted that those communities identified with an asterisk (*) have an assigned CRS Class that does not correspond to their CRS Points because they did not meet FEMA's prerequisites during their last evaluation; therefore, could not be placed in the Class tier based on scored points.

[2] NFIP Flood Insurance Manual, 2018. (2018, October). October 2018 NFIP Flood Insurance Manual, Appendix F: Community Rating System. Retrieved January 23, 2019, from https://www.fema.gov, and;
Todd, Katherine. "RE: [External] RE: CRS Point Question." Message to Ken Richardson. 23 January 2019. E-mail.

Cost/Benefit Summary

Although updating rule 15A NCAC 7H .0304(1) to reference the proposed erosion rate report does not have an immediate negative or positive impact to community NFIP CRS points and Class ranking, this update does contribute to an annual cost savings for property owners living in oceanfront communities by the avoidance of a five percent (5%) increase in flood insurance rates due to the Coastal Resources Commission not updating its oceanfront setback factors. In addition, approximately 215 properties will experience reduced construction setbacks which may allow for a greater level of property development or redevelopment than under the previous setback calculations. This has an un-quantified, but positive, option value for these property owners.

References

Below, S., Beracha, E., Skiba, H. (2015). *Land Erosion and Coastal Home Values*. Journal of Real Estate Research, 37(4), 499-536.

Appendix A

DRAFT AMENDMENTS TO 15A NCAC 07H .0304 AECS WITHIN 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 the 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 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 180 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 "North Carolina 2019 Oceanfront Setback Factors & Long-Term Average Annual Erosion Rate Update Study" ~~"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 or in 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.

(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 migrates, 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 Environmental Quality, Division of Coastal Management, 400 Commerce Avenue, Morehead City, North Carolina or at the website referenced in Item (1) 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 due to 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 Item (1) 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 until the vegetation has re-established in accordance with 15A NCAC 07H .0305(a)(5). At the expiration of the time specified or the re-establishment of the vegetation, 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. July 1, 2016; September 1, 2015; May 1, 2014; February 1, 2013; January 1, 2010; February 1, 2006; October 1, 2004; April 1, 2004; August 1, 1998.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

CRC-19-08

February 13, 2019

MEMORANDUM

TO: Coastal Resources Commission

FROM: Jonathan Howell

SUBJECT: Proposed Rule Language for 15A NCAC 07K.0214 – Shellfish Leases Exemption

Since 2015, the number of shellfish leases applications processed by the NC Division of Marine Fisheries has increased from approximately 10 per year to approximately 50 per year. In the past, most of these applications were for bottom leases with limited bottom gear associated with clams and oyster cultch. In recent years, approximately half of the lease request are intended for stacked cages and/or water column equipment that are more intensive uses of public trust waters and submerged lands.

Considering the Coastal Resources Commission's authority for regulating development in Public Trust and Estuarine Waters, the Divisions of Marine Fisheries and Coastal Management agreed in 2016 that DCM should have a formal consulting role in the review of proposed shellfish leases. Through this arrangement, DCM has been reviewing shellfish leases and providing comments to DMF, similar to the commenting roles of the DMF Marine Patrol, Shellfish Sanitation, and Fisheries Management staff. The review process has now been in place for two complete shellfish leasing cycles and has proven to be useful in the review of shellfish lease applications.

Through informal comments, DCM has been recommending that DMF establish buffers between leases and adjacent coastal wetlands, avoid impacts to navigation, and limit boundary markers to less than 4 inches diameter, among other similar comments. To build on lessons learned over the past two years, DCM Staff are now proposing CRC rule language in the form of an exemption, which will provide clarity to DMF and the public applying for a shellfish lease in determining when a CAMA permit is required. Staff believes formalizing this exemption will reduce unnecessary gear, staging areas, and pilings by requiring an additional permit review by multiple agencies for any leases that exceed the thresholds outlined below. Staff looks forward to reviewing the proposed shellfish lease exemption at our upcoming meeting in Morehead City.

Proposed 15A NCAC 7K .0214 Exemption for Shellfish Leases

15A NCAC 07K .0214 EXEMPTION FOR SHELLFISH LEASES

Structures and gear associated with a shellfish aquaculture lease issued by the Secretary pursuant to G.S. 113-202, 113-202.1, and 113-202.2 are exempt from CAMA permit requirements provided the following criteria are met:

(1) All posts, including anchoring and marking posts, are less than 4" in diameter;

(2) Floating platforms are limited to floating upweller systems, and no portion of a platform is proposed to be used as a storage or staging area.

(3) No wave baffles or other structures are proposed for the purpose of wave attenuation;

(4) No docking facilities, slips, or fixed platforms are proposed;

(5) All structures and fishing gear associated with the shellfish aquaculture lease are located a minimum of 20 feet from the waterward edge of any coastal wetland vegetation that borders the waterbody;

(6) No enclosed or roofed structures are installed; and

(7) No shore-based electric, water or other utilities are used to service the lease.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

CRC-19-12

February 13, 2019

MEMORANDUM

TO: Coastal Resources Commission

FROM: Courtney Spears

SUBJECT: Major Permit Renewals

As currently written, 15A NCAC 07J .0403 requires that all issued Major permits expire on December 31st of the third year following permit issuance. For example, all Major permits issued in 2019 carry an expiration date of December 31, 2022. 15A NCAC 07J .0404 allows for one relatively automatic two-year permit renewal, with additional renewals available for projects where substantial development, either within or outside the Area of Environmental Concern, has begun and is continuing on a permitted project.

The number of active CAMA Major permits is increasing each year, as new permits are issued and permits for existing long-term development projects (i.e. subdivisions, large-scale-commercial development, multi-phased beach nourishment projects, maintenance dredging projects) continue to be renewed. The increasing number of active projects is leading to an additional workload for Division staff, as there is a corresponding increase in the number of permit renewals that must be processed each year. The Division therefore recommends that the Commission consider the following changes to the Rules governing permit renewals:

a) **Lengthen the initial expiration date for most new Major Permits to five years from the date of permit issuance, as opposed to the current expiration dates of December 31st of the third year following permit issuance**. This rule change would benefit permittees by giving them more time to initiate or complete their projects. This lengthened expiration date would also reduce workloads of Division staff, by reducing the number of renewal requests processed each year. Finally, by changing the expiration date calculation to five years from the date of issuance, all permits would be valid for the same amount of time, as opposed to the current system whereby the amount of time a permit is active is dependent on when during a given year the permit is issued. For example, a new permit issued in early January of 2019 will be valid until December 31,

2022 or almost 4 full years, whereas a new permit issued in late December of 2019 will also be valid until December 31, 2022, or slightly more than three years.

b) **Eliminate the ability to obtain a single two-year renewal when permitted development has not begun**. Under existing rules, 15A NCAC 07J .0404(b), a single two-year renewal may be issued to a permit holder in cases where development has not been initiated prior to the original expiration date of the permit, essentially allowing a permit holder five years from the date of permit issuance to initiate the permitted development. The proposed rule change extending the expiration date of a permit to five years from the date of issuance effectively incorporates this two-year renewal, and eliminates the necessity that a permit holder apply for this first renewal.

c) **Lengthen the initial expiration date for publicly-sponsored, multi-phased beach nourishment projects to 10 years from the date of permit issuance, and allow for 10-year renewals.** This rule change would acknowledge the multi-phased nature of these types of projects, some of which are designed to be implemented for periods up to 50 years, by extending the original expiration date for these types of projects to 10 years. Subsequent renewals would then be issued for 10 years.

d) **Eliminate the provisions of 15A NCAC 07J .0404(b), which allow for the circulation of renewal requests to commenting State agencies when the requests do not meet the criteria for permit renewal**. Staff believe this provision is unworkable given the length of time some of these permits may have been active, possible alterations of site characteristics over the active life of the permit, and the lack of any defined criteria upon which to make a determination on whether or not to issue the renewal following agency re-circulation. In addition, the work involved in reviewing and compiling documentation that needs to be circulated to other state and federal agencies is, in many cases, similar to that required for the circulation of a new permit application.

e) **Consolidate and clarify language relating to when "substantial development" on a project has begun for the purposes of authorizing renewals.**

15A NCAC 07J .0403 DEVELOPMENT PERIOD/COMMENCEMENT/CONTINUATION

(a) New dredge and fill permits and CAMA ~~permits, excepting~~ Major permits shall expire five years from the date of permit issuance, with the exception of publicly-sponsored, multi-phased beach nourishment projects, which shall expire ten years from the date of permit issuance. Minor permits, except those authorizing ~~–~~beach bulldozing when authorized through issuance of a CAMA minor permit, shall expire on December 31 of the third year following the year of permit issuance.

(b) ~~Pursuant to Subparagraph (a) of this Rule, a minor permit~~ CAMA minor permits authorizing beach bulldozing shall expire 30 days from the date of permit ~~issuance when issued to a property owner(s)~~ issuance. Following permit expiration, the ~~applicant~~ permit holder is entitled to request an extension in accordance with Rule .0404(a) of this Section.

(c) Development After Permit Expiration Illegal. Any development ~~done~~ undertaken after permit expiration shall be considered unpermitted and shall constitute a violation of G.S. 113A-118 or G.S. 113-229. Any development ~~to be done~~ to be undertaken after permit expiration shall require either a new permit, or renewal of the original permit according to ~~15A NCAC 7J .0404 with the exception of Paragraph (e) of this Rule.~~ 15A NCAC 7J .0404

(d) Commencement of Development in Ocean Hazard AEC. No development shall begin until the oceanfront setback requirement can be established. When the possessor of a permit or a ruling of exception is ready to begin ~~construction, he~~ development, they shall arrange a meeting with the appropriate permitting authority at the site to determine the oceanfront setback. This setback determination shall replace the one done at the time the permit was processed and approved and construction must begin within a period of 60 days from the date of that meeting. In the case of a ~~major~~ shoreline change within that ~~period~~ period, a new setback determination will be required before construction begins. Upon completion of the measurement, the permitting authority will issue a written statement to the permittee certifying the same.

~~(e) Continuation of Development in the Ocean Hazard AEC. Once development has begun under proper authorization, development in the Ocean Hazard AEC may continue beyond the authorized development period if, in the opinion of the permitting authority, substantial progress has been made and is continuing according to customary and usual building standards and schedules. In most cases, substantial progress begins with the placement of foundation pilings, and proof of the local building inspector's certification that the installed pilings have passed a floor and foundation inspection~~.

~~(f)~~(e) Any permit that has been suspended ~~pursuant to G.S. 113A-121.1 as a result of a contested case petition or~~ by order of superior court for a period longer than six months shall be extended at the ~~applicant's~~ permit holder's written request for a period equivalent to the period of permit suspension, but not to exceed the development period authorized under ~~Paragraph~~ Paragraph (a) or (b) of this Rule.

~~(g)~~(f) ~~An applicant~~ A permit holder may voluntarily suspend development under an active permit that is the subject of judicial review by filing a written notice with the Department once the review has started. ~~An applicant~~ A permit holder shall obtain an extension of said permit if the permitting authority finds:

(1) That the ~~applicant~~ permit holder notified the permitting authority in writing of the voluntary suspension;
(2) The period during which the permit had been subject to judicial review is greater than six months;
(3) The ~~applicant~~ permit holder filed a written request for an extension of the development period once the judicial review had been completed; and
(4) The ~~applicant~~ permit holder undertook no development after filing the notice of suspension. The period of permit extension shall be equivalent to the length of the judicial review proceeding, but not to exceed the development period authorized under Paragraph (a) of this Rule.

History Note: *Authority G.S. 113A-118;*
Eff. March 15, 1978;
Amended Eff. August 1, 2002; April 1, 1995; July 1, 1989; March 1, 1985; November 1, 1984.

15A NCAC 07J .0404 DEVELOPMENT PERIOD EXTENSION

(a) For CAMA minor permits authorizing beach bulldozing, the ~~applicant~~ permit holder is entitled to request a one-time ~~30-day~~ 30-day permit extension. No additional extensions shall be granted after the 30-day extension has expired. Notwithstanding this Paragraph, the ~~applicant~~ permit holder is eligible to apply for another minor permit authorizing beach bulldozing following expiration of the ~~30 days~~ 30-day permit extension.

~~(b) Where no development has been initiated during the development period, the permitting authority shall extend the authorized development period for no more than two years upon receipt of a signed and dated request from the applicant containing the following:~~

~~(1) a statement of the intention of the applicant to complete the work within a reasonable time;~~

~~(2) a statement of the reasons why the project will not be completed before the expiration of the current permit;~~

~~(3) a statement that there has been no change of plans since the issuance of the original permit other than changes that would have the effect of reducing the scope of the project, or, previously approved permit modifications;~~

~~(4) notice of any change in ownership of the property to be developed and a request for transfer of the permit if appropriate; and~~

~~(5) a statement that the project is in compliance with all conditions of the current permit.~~

~~Where substantial development, either within or outside the AEC, has begun and is continuing on a permitted project, the permitting authority shall grant as many two-year extensions as necessary to complete the initial development. For the purpose of this Rule, substantial development shall be deemed to have occurred on a project if the permittee can show that development has progressed beyond basic site preparation, such as land clearing and grading, and construction has begun and is continuing on the primary structure or structures authorized under the permit. For purposes of residential subdivision, installation of subdivision roads consistent with an approved subdivision plat shall constitute substantial development. Renewals for maintenance and repairs of previously approved projects may be granted for periods not to exceed 10 years~~.

~~(c) When an extension request has not met the criteria of Paragraph (b) of this Rule, the Department may circulate the request to the commenting state agencies along with a copy of the original permit application. Commenting agencies will be given three weeks in which to comment on the extension request. Upon the expiration of the commenting period the Department will notify the applicant promptly of its actions on the extension request.~~

~~(d) Notwithstanding Paragraphs (b) and (c) of this Rule, an extension request may be denied on making findings as required in either G.S. 113A-120 or G.S. 113-229(e). Changes in circumstances or in development standards shall be considered and applied to the maximum extent practical by the permitting authority in making a decision on an extension request.~~

~~(e) The applicant for a major development extension request must submit, with the request, a check or money order payable to the Department in the sum of one hundred dollars ($100.00).~~

~~(f) Modifications to extended permits may be considered pursuant to 15A NCAC 07J .0405.~~

(b) All other CAMA permits may be extended where substantial development, either within or outside the AEC, has begun and is continuing. The permitting authority shall grant as many two-year extensions as necessary to complete the initial development, with the exception that projects involving publicly-sponsored, multi-phased beach nourishment projects, shall be granted ten-year extensions to allow for continuing project implementation. Renewals for maintenance of previously approved dredging projects may be granted for periods not to exceed 10 years. For the purpose of this Rule, substantial development shall be deemed to have occurred on a project if the permittee can show that development has progressed beyond basic site preparation, such as land clearing and grading, and construction has begun and is continuing on the primary structure or structures authorized under the permit. In Ocean Hazard Areas, substantial development begins with the placement of foundation pilings, and proof of the local building inspector's certification that the installed pilings have passed a floor and foundation inspection. For residential subdivisions, installation of subdivision roads consistent with an approved subdivision plat shall constitute substantial development.

(c) To request extension pursuant to Paragraphs (a) and (b) of this Rule, the permit holder shall submit a signed and dated request containing the following:

(1) a statement of the completed and remaining work;

(2) a statement that there has been no change of plans since the issuance of the original permit other than changes that would have the effect of reducing the scope of the project, or, previously approved permit modifications;

(3) notice of any change in ownership of the property to be developed and a request for transfer of the permit if appropriate; and

(4) a statement that the project is in compliance with all conditions of the current permit

History Note: *Authority G.S. 113A-119; 113A-119.1; 113A-124(c)(8);*
Eff. March 15, 1978;
Amended Eff. August 1, 2002; August 1, 2000; April 1, 1995; March 1, 1991; March 1, 1985; November 1, 1984.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

CRC-19-09

February 5, 2019

MEMORANDUM

TO: Coastal Resources Commission

FROM: Kevin Hart

SUBJECT: Proposed Rule changes for 15A NCAC 07H.1900 General Permit to Allow Temporary Structures Within Coastal Shorelines and Ocean Hazard AECs

The Division of Coastal Management (DCM) has recently been in discussions with the scientific research community regarding when proposed research projects may need a CAMA permit. Over the past few years, the Division has seen more research projects involving structures in the water and CRC rules currently do not specifically acknowledge research or structures associated with research, regardless of scale. Since there is no General Permit available for the types of "development" activities typically associated with scientific research, DCM has historically requested the scientific research project applications be processed through the CAMA Major Permit process. This has resulted in problems for time-sensitive grant funding, delays and confusion among the research community. The development of General Permit rule language specific to research projects is the result of collaboration between DCM and the research community. The adoption of this rule language would assist in the management of research projects within Areas of Environmental Concern and provide regulatory flexibility to accommodate scientific research projects.

In 2017, DCM Staff met with researchers from UNC Institute of Marine Sciences, East Carolina University, University of North Carolina at Wilmington, UNC Coastal Studies Institute, NC Sea Grant, and the National Oceanic Atmospheric Administration to discuss the issue and gain insights on typical project sizes, duration, locations, materials, and concerns regarding derelict or abandoned projects.

Rather than incorporating DCM Staff concerns and the research communities' needs into a new permit, Staff recommend incorporating research projects into the existing GP 07H.1900 General Permit To Allow For Temporary Structures Within The Estuarine Shoreline and Ocean Systems

AECs. This permit was originally developed for short-term projects such as boat races, fishing tournaments, seasonal businesses, and the film industry.

The proposed amendments include:

- Identifying a specific party responsible for research projects.
- Increasing the permit timeframe to one year from 180 days.
- Including conditions to not impede existing public trust uses.
- Reducing the overall size limit from 1 acre to a cumulative size limit of 100 square meters.
- Modifying language to be consistent with other general permits.

DCM staff is requesting that the Coastal Resources Commission (CRC) begin the rulemaking process to modify NCAC 07H.1900 to include language and specific conditions related to research projects as requested by the research community and DCM staff.

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

Proposed amendments to 15A NCAC 7H .1900

SECTION .1900 – GENERAL PERMIT TO ALLOW FOR TEMPORARY STRUCTURES WITHIN ~~COASTAL SHORELINES~~ THE ESTUARINE AND OCEAN ~~HAZARD~~ SYSTEMS AECS

15A NCAC 07H .1901 PURPOSE

A permit under this Section shall allow for the placement of temporary structures within the estuarine ~~and public trust shorelines~~ and ocean ~~hazard~~ systems AECs according to the provisions provided in Subchapter 7J .1100 and according to the rules in this Section.

History Note: *Authority G.S. 113-229(c1); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. March 1, 1989;
Amended Eff. August 1, 2000.

15A NCAC 07H .1902 APPROVAL PROCEDURES

(a) The applicant ~~must~~ shall contact the Division of Coastal Management at the address provided in 15A NCAC 07A .0101 and complete an application ~~and complete a general permit application form~~ requesting approval for development. ~~Applicants shall provide information on site location, dimensions of the project area, proposed activity, name, address, and telephone number.~~ For temporary structures associated with scientific research, permit applicants shall be lead investigators on behalf of accredited educational institutions, or state or federal agencies.

(b) ~~The~~ If a temporary structure is to be located less than 400 feet waterward of normal high water or normal water level, or within the established pier head line as determined by the Division of Coastal Management, 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,~~ 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.~~ If DCM determines that the project exceeds the conditions established by this General Permit, DCM shall notify the applicant that a Major Permit application shall be required.

(c) No work shall begin until an onsite meeting is held with the applicant and a Division of Coastal Management representative to inspect and mark the site of construction of the proposed development. ~~Written authorization to proceed with the proposed development may be issued by the Division during this visit.~~ Temporary structures authorized by this General Permit may remain in place for a maximum of one year from the date of issuance. The project site shall be restored to pre-development conditions and all ~~All work must~~ structures shall be ~~completed and the structure~~ removed within ~~180 days following the day written authorization is issued.~~ one year of permit issuance, or by the date specified with the General Permit.

History Note: *Authority G.S. 113-229(cl); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. March 1, 1989;
Amended Eff. January 1, 1990.

15A NCAC 07H .1904 GENERAL CONDITIONS

(a) Temporary structures for the purpose of this general permit are those which are constructed or installed within the ~~ocean hazard or~~ estuarine and ocean system AECs and because of dimensions or functions ~~do not meet the criteria of the existing general permits (i.e. are not a bulkhead, pier, rip-rap, groin, etc.).~~ cannot be authorized by another General Permit within this Subchapter.
(b) There shall be no encroachment oceanward of the first line of stable vegetation within the ocean hazard AEC except for the placement of auxiliary structures such as signs, fences, posts, ~~pilings, etc.~~ or pilings.
(c) There shall be no fill or excavation activity below ~~the plane of mean~~ normal high water or normal water level. ~~associated with the structure.~~
(d) This permit ~~will~~ shall not be applicable to proposed ~~construction~~ development where the ~~Department~~ Division of Coastal Management has determined, based on ~~an initial a~~ 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) Individuals shall allow authorized representatives of the Department of ~~Environment and Natural Resources~~ Environmental Quality to make periodic inspections at any time necessary to ensure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed herein.
(f) This permit does not eliminate the need to obtain any other state, local or federal authorization, nor, to abide by regulations adopted by any federal, state, or local agency.
(g) Development carried out under this permit ~~must~~ shall be consistent with all local requirements, and local land use plans current at the time of authorization.

History Note: *Authority G.S. 113-229(c1); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. March 1, 1989;
Amended Eff. May 1, 1990; March 1, 1990;
RRC Objection due to ambiguity Eff. May 19, 1994;
Amended Eff. August 1,1998; July 1, 1994.

15A NCAC 07H .1905 SPECIFIC CONDITIONS

Proposed temporary structures ~~must~~ shall meet each of the following specific conditions to be eligible for authorization by the general permit:

~~(1)~~(a) All aspects of the structure shall be removed and the site returned to pre-project conditions at the ~~termination~~ expiration of this general permit.
~~(2)~~(b) There shall be no work within any productive shellfish ~~beds.~~ beds without authorization from the Division of Marine Fisheries.
~~(3)~~(c) The proposed ~~project~~ structure shall not involve the disturbance of any marsh, submerged aquatic vegetation, or other wetlands including excavation ~~and/or~~ or filling of these areas.
~~(4)~~(d) The proposed activity shall not ~~involve the disruption of normal~~ disrupt navigation and transportation channels and shall be ~~properly~~ marked to prevent being a hazard to navigation.
(e) The proposed structure shall not impede public access or other public trust uses.
~~(5)~~(f) The proposed ~~project~~ structure shall not ~~serve as a habitable place of residence.~~ be habitable.
~~(6)~~(g) There shall be no ~~adverse~~ disturbance of existing ~~dune structures.~~ dunes.
~~(7)~~(h) ~~Development carried out under~~ Temporary structures authorized by this permit shall not individually or cumulatively exceed ~~one acre in size in accordance with 15A NCAC 2H .1002(1) and 15A NCAC 2H .1003(a)(1).~~ 100 square meters in size.
(8)(i) ~~No sewage disposal system will be allowed without a permit authorized by either the Division of Environmental Health or the Division of Environmental Management.~~ Structures shall not be constructed in a designated Primary Nursery Area without approval from the Division of Marine Fisheries or the Wildlife Resources Commission.

History Note: *Authority G.S. 113-229(c1); 113A-107(a)(b); 113A-113(b); 113A-118.1;*
Eff. March 1, 1989;
Amended Eff. May 1, 1990.