



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON C. DAVIS
Director

November 15, 2018

MEMORANDUM

CRC-18-25

TO: Coastal Resources Commission
FROM: Ken Richardson, *Shoreline Management Specialist*
SUBJECT: Consideration of Unvegetated Beach Designation – Surf City & North Topsail Beach

Background:

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 because of a hurricane or other major storm event. Under 15A NCAC 07H .0304(3)(b) the Commission may apply the Unvegetated Beach designation to an area that is suddenly unvegetated as a result of a storm; this 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.

The Measurement Line is established by DCM, and approximates the location at which the vegetation line is expected to reestablish using the following methodology:

- (A) Determine the distance the vegetation line receded at the closest vegetated site to the proposed development site; and
- (B) 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 15A NCAC 07H .0305

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 imagery.



The last Unvegetated Beach designation made by the CRC was for Hatteras Village following Hurricane Isabel in September 2003. This Unvegetated Beach AEC remained active for approximately ten years (November 2013), until the CRC determined that the first line of stable and natural vegetation had re-established.

Consideration of Unvegetated Beach Designation – Surf City & North Topsail Beach:

Hurricane Florence (September 2018) severely impacted the oceanfront dune system along portions of Surf City and North Topsail Beach, and completely washed away the primary frontal dune along with any established vegetation. The geographic extent of the affected areas makes it impossible to interpolate a vegetation line in the field from adjacent post-storm vegetation across an area of unvegetated beach; and as previously mentioned, a Measurement Line cannot be established until an Unvegetated Beach AEC is first designated by the CRC.

The extent of an Unvegetated Beach AEC is determined by the Commission, and guidance for mapping a Measurement Line within this AEC is defined in Rule 15A NCAC 07H .0305(a)(9). However, after careful review of the rule language, it was determined by staff that additional clarity may be necessary, and therefore, we will be seeking the Commission's guidance for future application of the rule. In the meantime, Staff concluded that there may be two options for the Commission to consider for the affected areas (Surf City and North Topsail Beach) on Topsail Island:

- 1) Measurement Line Option 1: measure the vegetation recession distance using pre- and post-storm imagery (2016-2018) for approximately 1,000 feet on each side of the unvegetated beach area. DCM determined that the first line of stable and natural vegetation receded an average of 20.7 feet (see Attachment A, Figure 1).
- 2) Measurement Line Option 2: Because the rule specifies that the Measurement Line in every case be located landward of the average width of the beach from pre-storm imagery, and does not indicate where to measure from, Staff calculated an average of the difference between pre- and post-storm beach width and determined that distance to be 52.9 feet; which is 32.2 feet greater than the average recession distance (see Attachment A, Figure 2).

Staff Request:

To establish a reference feature (Measurement Line) for purpose of measuring oceanfront construction setbacks in areas where there is no vegetation due to Hurricane Florence, Staff is asking the Commission to consider and approve the following:

- 1) Designate an Unvegetated Beach Area of Environmental Concern, to remain in effect until stable and natural vegetation has re-established; and
- 2) Confirm and approve the method for delineating a Measurement Line
 - a. Calculate the average pre- and post-storm vegetation recession distance and measured that from the pre-storm vegetation line, or



- b. Calculate the average difference between pre- and post-storm beach width and measure that distance from pre-storm vegetation.

ATTACHMENT A: Maps Illustrating Extent of Proposed Unvegetated Beach at Surf City and North Topsail Beach

ATTACHEMENT B: Current Rules Pertaining to Unvegetated Beach AEC and Measurement Line



ATTACHMENT A: MAPS ILLUSTRATING EXTENT OF PROPOSED UNVEGETATED BEACH AT SURF CITY AND NORTH TOPSAIL BEACH

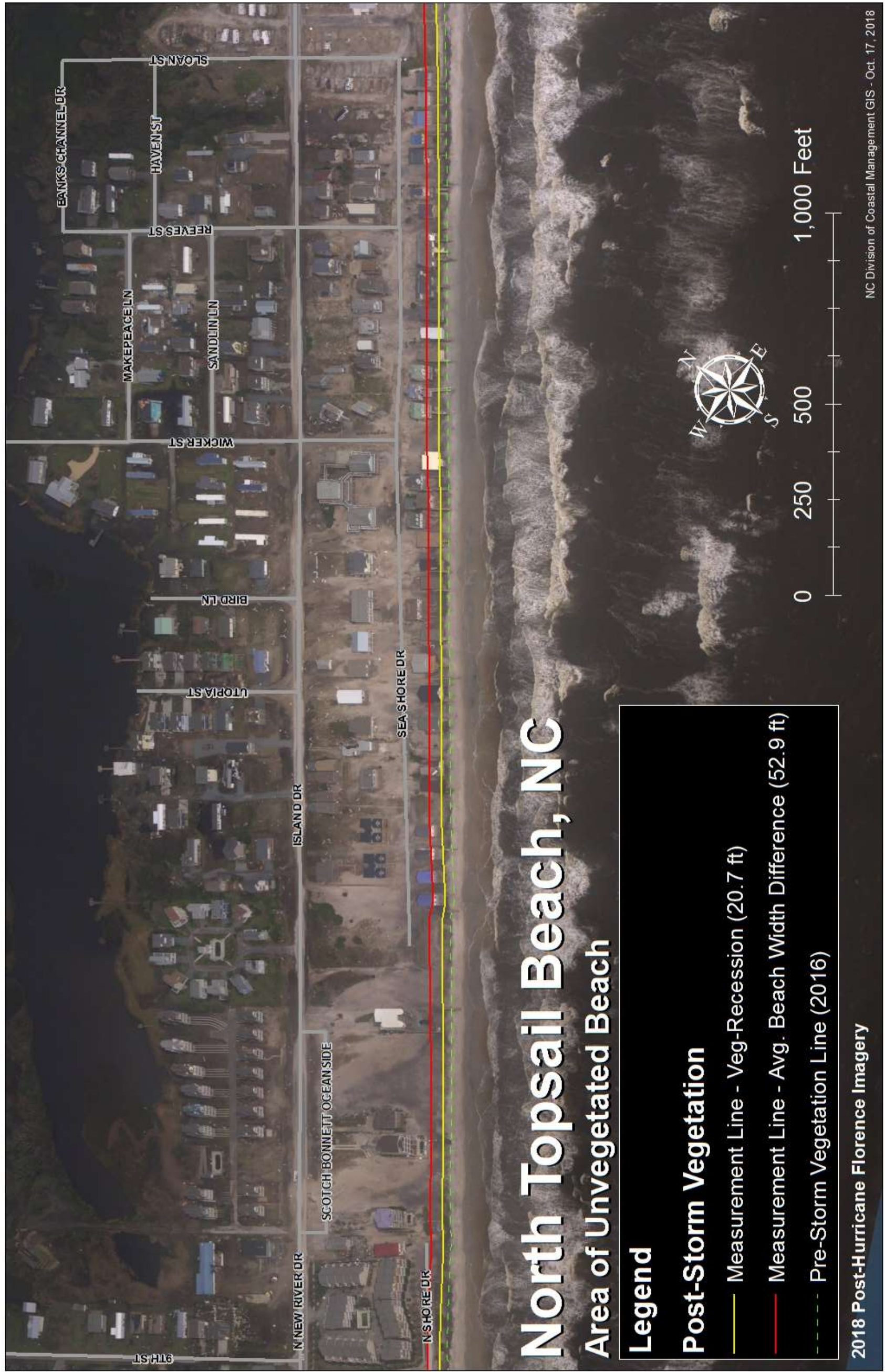




Figure 1. This map illustrates the extent of the proposed Unvegetated Beach AEC and Measurement Line alternatives at Surf City.



Figure 2. This map illustrates the extent of the proposed Unvegetated Beach AEC and Measurement Line alternatives at North Topsail Beach.





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ATTACHEMENT B: CURRENT RULES PERTAINING TO UNVEGETATED BEACH AEC AND MEASUREMENT LINE

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>.
- (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 .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 GS. 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 distance the vegetation line receded at the closest vegetated site to the proposed development site; and
- (B) 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*

