



NORTH CAROLINA  
Environmental Quality

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**MEMORANDUM**

**CRC-18-18**

**TO:** Coastal Resources Commission  
**FROM:** Ken Richardson, *Shoreline Management Specialist*  
**SUBJECT:** Review of Ocean Hazard AEC Setback Lines

**Ocean Hazard AEC**

The Ocean Hazard Setback for siting oceanfront development is measured in a landward direction from the first line of stable and natural vegetation (vegetation line), the static vegetation line, or the measurement line. Setback distance is calculated by multiplying a Setback Factor (a.k.a. “erosion rate”) times a graduated variable that corresponds to the size of the proposed structure (*see Table 1*). The Setback Factor represents the statistically smoothed and blocked, average annual, long-term shoreline change rates, which are updated approximately every 5 years. For purposes of establishing a minimum construction setback, “2” is the default minimum Setback Factor, which includes those areas with erosion rates less than 2 feet/year and areas where accretion is measured.

Oceanfront Setback Factors were established by the Coastal Resources Commission (CRC) under the Coastal Area Management Act (CAMA) in 1979 to minimize losses of life and property resulting from storms and long-term erosion, while also 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. To accomplish the management objectives for the Ocean Hazard Area, Setback Factors serve two purposes: 1) to properly site oceanfront development, and; 2) to determine the landward-most extent of the Ocean Erodible Area of Environmental Concern (OEA) - the area where there is a substantial possibility of future shoreline erosion.



**Table 1.** Setback Factors & graduated setback.

<b>Structure Size</b>	<b>Setback (feet)</b>	<b>example “setback factor = 2”</b>
< 5,000 sqft.	Minimum 60 feet, or 30 x setback factor	$2 \times 30 = 60 \text{ feet}$
$\geq 5,000$ sqft.	Minimum 120 feet, or 60 x setback factor	$2 \times 60 = 120 \text{ feet}$
$\geq 10,000$ sqft.	Minimum 130 feet or 65 x setback factor	$2 \times 65 = 130 \text{ feet}$
$\geq 20,000$ sqft.	Minimum 140 feet or 70 x setback factors	$2 \times 70 = 140 \text{ feet}$
$\geq 40,000$ sqft.	Minimum 150 feet or 75 x setback factor	$2 \times 75 = 150 \text{ feet}$
$\geq 60,000$ sqft.	Minimum 160 feet or 80 x setback factor	$2 \times 80 = 160 \text{ feet}$
$\geq 80,000$ sqft.	Minimum 170 feet or 85 x setback factor	$2 \times 85 = 170 \text{ feet}$
$\geq 100,000$ sqft.	Minimum 180 feet or 90 x setback factor	$2 \times 90 = 180 \text{ feet}$

North Carolina’s oceanfront shoreline changes rates have historically been calculated using the End-Point method since the first study was conducted in 1979. This method uses the earliest and most current shoreline 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, or number of years, between the two shorelines. Since the current method used to calculate shoreline change rates has been consistent since 1979, it provides the CRC with results that can be generally compared to those from previous studies. With the advancement of mapping technology and a greater inventory of shoreline data, results from methods that can incorporate multiple (more than two) shorelines will be compared during the 2018-2019 update.

Additionally, because setbacks can help preserve spaces that can serve as undeveloped buffer areas for storms, the U.S. Federal Emergency Management Administration (FEMA) currently uses North Carolina’s erosion rate updates to award Community Rating System (CRS) points to qualified coastal communities. The CRS is used by FEMA to assess flood insurance rates for these communities. FEMA’s current policy allows North Carolina’s oceanfront erosion rate update to account for fifty (50) CRS points only if the state’s erosion rates are updated every five years. Loss of these points could potentially result in increased flood insurance rates for certain coastal communities.

## **Setback Lines**

Oceanfront Setback Lines for development are measured in a landward direction from the vegetation line, the static vegetation line, or the measurement line.

- A. Vegetation Line, or First Line of Stable & Natural Vegetation (FLSNV)** The FLSNV is the primary reference feature for measuring oceanfront setbacks. This line represents



the boundary between the normal dry-sand beach, and the more stable uplands. If the vegetation has been planted, it may be considered “stable” when most of the plant stems are from continuous rhizomes rather than planted individual root sets. Planted vegetation may be considered “natural” when most of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are like adjacent areas that are naturally occurring.

While the vegetation line has been used as an oceanfront setback measurement line since 1979, the CRC has previously determined that when vegetation moves oceanward after a beach nourishment project, this represents an artificial situation that should not be considered “stable and natural” and therefore should not be used for measuring oceanfront setbacks. In 1995, the CRC codified a method of measuring setbacks on nourished beaches that utilizes the surveyed pre-project existing vegetation line, which became known as the “Static Vegetation Line.”

**B. Static Vegetation Line (SVL):** The SVL is established in areas within the boundaries of a large-scale beach fill project (>300,000 cubic yards) and represents the vegetation line that existed within one year prior to the onset of project construction. A static line is established in coordination with the Division of Coastal Management. Once a static line is established, setbacks are measured from either the static line or the vegetation line, whichever is more landward. In addition, once a static line is established it does not expire.

The CRC’s static line rule was based on three primary issues: 1) evidence that nourished beaches can have higher erosion rates than natural beaches, 2) no assurance that funding for future nourishment projects would be available for maintenance work as the original project erodes away, and 3) structures could be more vulnerable to erosion damage since their siting was tied to an artificially-forced system. The intent of the static line provisions has been to recognize that beach nourishment is an erosion response necessary to protect existing development but should not be a stimulus for new development on sites that are not otherwise suitable for building.

**C. Static Vegetation Line Exception:** Over time, the Commission found that some communities had demonstrated a long-term commitment to beach nourishment and maintenance of their nourished beaches. Due to this long-term commitment, beach vegetation had become stable and migrated oceanward of the static line. In many cases, proposed development on lots within these communities could meet the required setback from the new vegetation line but could not be permitted since they did not meet the setback from the static vegetation line.



To recognize local government efforts to address erosion through a documented long-term commitment to beach nourishment, and to offer relief from the static line requirements, the CRC adopted Static Vegetation Line Exception procedures in 2009. The Static Vegetation Line Exception allows a community to measure setbacks from the vegetation line rather than the static line, but includes certain limitations and conditions.

To be eligible for this exception, a community must petition the CRC by providing a beach management plan that describes the project area and design; identify sediment sources; identify funding sources to maintain the initial large-scale project; and, provide an update on project effectiveness and how it will continue to be maintained. The plan must be updated and presented to the CRC every 5 years for reauthorization. Under the exception, development must meet the required setback from the vegetation line, no portion of a building or structure can be oceanward of the landward-most adjacent neighbor or an average line of construction is determined by DCM, and no swimming pools may be permitted seaward of static line.

**D. Development Line:** In 2016, the Commission provided a second alternative to the Static Line by promulgating “Development Line” procedures. The Development Line allows use of the vegetation line for setback determinations, with local governments setting the oceanward limit of structures, subject to CRC approval. Unlike with the Static Line Exception, there is no requirement for a demonstrated long-term commitment to beach nourishment or beach management plan. The following conditions are required:

1. Development line is mapped by the community using an average line of construction and must be referenced in local ordinance(s).
2. Represents the seaward-most allowable limit of oceanfront development.
3. Must be approved by the CRC. Once approved, only the community can request a change.
4. Development must meet the applicable setback from the vegetation line.
5. No swimming pools may be permitted seaward of the static line.

Currently there are twenty-one North Carolina communities with a static line. Eight of those communities have CRC-authorized Static Vegetation Line Exceptions, and four of them have CRC-approved Development Lines (*see Table 2*).



**Table 2.** List of Communities with Static Vegetation Lines, SVL Exceptions and Development Lines.

<b>Community</b>	<b>SVL</b>	<b>SVL Exception</b>	<b>DVL</b>
<b>Ocean Isle</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Oak Island</b>	<b>Yes</b>	<i>No</i>	<b>Yes</b>
<b>Caswell Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Bald Head Island</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Kure Beach</b>	<b>Yes</b>	<i>No</i>	<b>Yes</b>
<b>Carolina Beach</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Wrightsville Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Figure Eight Island</b>	<i>No</i>	<i>No</i>	<b>Yes</b>
<b>Topsail Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>North Topsail Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Emerald Isle</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Indian Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Salter Path</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Pine Knoll Shores</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Atlantic Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Buxton</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Rodanthe</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Nags Head</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Kill Devil Hills</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Kitty Hawk</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Southern Shores</b>	<b>Yes</b>	<i>No</i>	<i>No</i>

**E. Measurement Line:** A Measurement Line represents the post-storm location of a vegetation line if a storm causes overwash or a loss of vegetation so that not enough vegetation exists to determine oceanfront setbacks. This line is located by using the most current pre-storm aerial photography to map the pre-storm vegetation line, and then moving it landward a distance equal to the average width of the beach recession caused by the storm. Measurement lines are generally temporary until the vegetation is re-established to the point where it can once again be used for determining oceanfront setbacks but may also be permanently designated by the CRC.



<b>Key Differences</b>	<b>SVL Exception</b>	<b>DVL</b>
Approved by CRC	✓	✓
Measure Setbacks from FLSNV (not SVL)	✓	✓
Mapped & Managed by Community	✗	✓
CRC Reauthorization Required	✓	✗
Structures could potentially move seaward of adjacent structure	✗	✓
Beach Management Plan Required	✓	✗
Swimming Pools Seaward of SVL	✗	✗
Eliminates Static Vegetation Line	✗	✗

