



**Line Report: Proposed Baseline and Setback Line
Little Capers Island, Beaufort County
October 6, 2017**

Background

South Carolina Code of Laws §48-39-280, as amended, requires the Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (OCRM or Department) to establish and periodically review the position of the two lines of beachfront jurisdiction (the baseline and the setback line) once every seven to ten years. For all oceanfront land that is developed or potentially could be developed, the average annual shoreline change rate, also known as the average long-term erosion rate, is also reviewed during this timeframe. The purpose of these jurisdictional lines is to implement §48-39-280(A), which states:

“A forty-year policy of retreat from the shoreline is established. The department must implement this policy and utilize the best available scientific and historical data in the implementation. The department must establish a baseline which parallels the shoreline for each standard erosion zone and each inlet erosion zone. Subject to Section 48-39-290(D), the baseline established pursuant to this section must not move seaward from its position on December 31, 2017.”

The baseline is the more seaward of the two jurisdictional lines. Seaward of the baseline, permitted activities are limited to wooden walkways, small wooden decks, fishing piers, golf courses, normal landscaping, groins, activities authorized by emergency orders, beach renourishment projects, and structures authorized by a special permit. The setback line is the landward line of beachfront jurisdiction. Between the baseline and setback line, the Department exercises regulatory permitting authority for such activities as habitable structures and associated infrastructure, decks, gazebos, other public access structures, and sand dune management. Seaward of the setback line, construction of new shore-parallel erosion control structures (i.e. seawalls, revetments or bulkheads) is prohibited. However, existing erosion control structures may be maintained or repaired with prior authorization by the Department.¹

As part of the process of delineating these jurisdictional lines, the Department has collected beach survey data statewide since 1988 at monitoring stations that are typically spaced 2,000 feet apart. Sections of the coast that are not likely to be developed, such as Cape Romain National Wildlife Refuge, are not surveyed. Surveys begin landward of the primary oceanfront sand dune, if one exists, and extend down the beach and offshore. In addition to this beach erosion monitoring data, the Department utilizes recent dune field topographic data such as Light Detection and Ranging (LIDAR), elevation measurements collected with a survey-grade GPS unit, vegetation measurements collected with a mapping-grade GPS unit, current and historical aerial photographs dating back at least 40 years that show the shoreline location, and previous shoreline change analysis data or reports. These data were viewed and analyzed using ESRI's Geographic Information System (GIS) software.

¹ S.C. Code Ann. §48-39-290(A).

Process for Establishing the Baseline Position

To establish the baseline position, the shoreline must first be classified as an inlet zone or a standard zone. Areas that are close to inlets with non-parallel offshore bathymetric contours and non-parallel historical shoreline positions are classified as inlet zones, while all other areas are classified as standard zones. Inlet zone classifications are further refined as either unstabilized, or stabilized by jetties, groins, or seawalls.

In stabilized inlet zones and standard zones, the baseline is located at the crest of the primary oceanfront sand dune using beach survey data or dune field topographic data such as LIDAR. The primary oceanfront sand dune is defined as a dune with a minimum height of 3 feet, as measured vertically from the crest to the toe of the dune. This dune must also form a continuous line for 500 shore parallel feet.² If the shoreline has been altered naturally or artificially by the construction of erosion control devices, groins, or other man-made alterations, the baseline must be established where the crest of the primary oceanfront sand dune would be located if the shoreline had not been altered.³

To calculate a dune crest position at an armored⁴ location, the volume of sand on the beach seaward of the erosion control structure is determined from survey data and then compared to the volume of sand from a nearby unarmored reference profile that displays a representative sand dune. The reference profile is overlaid on the armored profile in such a way that the measured sand volumes match, and then the dune crest position can be transferred from the reference profile to the armored profile. This calculated dune crest position then becomes the baseline.

In unstabilized inlet zones, the baseline is established at the most landward shoreline position at any time during the past 40 years, unless the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. This baseline position is established by analyzing shorelines created from historical aerial photographs or shoreline data collected in the field, and identifying the most landward shoreline position.⁵

Process for Establishing the Setback Line Position

The setback line position is dependent on the baseline position and the average annual shoreline change rate, also known as the average long-term erosion rate. The shoreline change rate is calculated using available historical shoreline data and GIS software. The setback line is established landward of the baseline a distance which is 40 times the average annual shoreline change rate or not less than 20 feet.⁶

During this line review, the shoreline change rate calculation was performed using AMBUR (Analyzing Moving Boundaries using R), a tool available through the R-forge statistical environment. Shoreline change analysis was performed every 200 feet. Once the shoreline change rates were calculated, they were analyzed and grouped using the ESRI ArcGIS spatial statistics tool called 'Grouping'. The values within each group were averaged to obtain an

² S.C. Code Regs. 30-1(D)(43).

³ S.C. Code Ann. §48-39-280(A)(1).

⁴ S.C. Code Ann. §48-39-250(5).

⁵ S.C. Code Ann. §48-39-280(A)(2).

⁶ S.C. Code Ann. §48-39-280(B).

annual shoreline change rate. This rate was multiplied by 40 to generate the setback distance from the baseline.

Little Capers Island, Beaufort County Baseline

The areas in Beaufort County generally known as Little Capers Island consist of several small upland areas connected by low sandy spits that are backed by marsh and frequently overwashed. These small upland areas are segmented by tidal creeks that empty into the ocean. This area is bounded by Trenchards Inlet to the southwest and Pritchards Inlet to the northeast.

Unstabilized Inlet Zone

Little Capers Island is an unstabilized inlet zone, and the baseline is set at the most landward point of erosion in the last 40 years. The baseline for this entire area is set at the vegetation line position collected by OCRM staff in January 2017.

Little Capers Island, Beaufort County Setback Line

The following table identifies average annual shoreline change rates, from south to north.

Location Description	Shoreline Change Rate (ft/year) *	Multiplier	Setback Distance (ft)
Wrapping the south end of Little Capers north for 2,306 feet	^	N/A	20
Transition north for 192 feet, then north for 42 feet	-9.8987	40	396
Transition north for 140 feet, then north for 29 feet	-13.7598	40	550
Transition north for 14 feet, then north for 77 feet	-16.3317	40	653
North for 107 feet	-23.1611	40	926
North for 16 feet	-38.4905	40	1,540
Transition north for 17 feet, then north for 26 feet	-42.4706	40	1,699
Transition north for 35 feet, then north for 226 feet	-22.4577	40	898
Transition north for 21 feet, then north for 1,336 feet	-24.9221	40	997
Transition north for 123 feet, then north for 228 feet	-24.1856	40	967
Transition north for 2 feet, then north for 1,229 feet	-22.6534	40	906
After 640 foot break, north for 624 feet	-20.9342	40	837
Transition north for 235 feet, then north for 306 feet	-20.4693	40	819
Transition north for 92 feet, then north for 2,099 feet	-20.1585	40	806
Transition north for 467 feet, then north for 694 feet	-19.0243	40	761
Transition north for 324 feet, then north for 356 feet	-18.0073	40	720
Transition north for 122 feet, then north for 254 feet	-17.1994	40	688
Transition north for 101 feet, then north for 222 feet	-16.0207	40	641
Transition north for 37 feet, then north for 78 feet	-15.1995	40	608
Transition north for 32 feet, then north for 919 feet	-14.5859	40	583
North for 822 feet	-13.6441	40	546
After 307 foot break, north for 1,073	^	N/A	20
Transition north for 143 feet, then north for 87 feet	-1.019	40	41
Transition north for 62 feet, then north for 178 feet	-3.6581	40	146
Transition north for 17 feet, then north for 15 feet	-4.6164	40	185
North for 102 feet	-5.5497	40	222
North for 550 feet	-7.2712	40	291
Transition north for 154 feet, then north for 122 feet	-6.4528	40	258
Transition north for 175 feet, then north for 131 feet	-5.4395	40	218
North for 160 feet	-4.2265	40	169
North for 75 feet	-3.0246	40	121

Location Description	Shoreline Change Rate (ft/year) *	Multiplier	Setback Distance (ft)
North for 85 feet	-2.131	40	85
North for 466 feet	-1.2957	40	52
Transition north for 123 feet, then north for 359 feet	-2.0455	40	82
Transition north for 136 feet, then north for 1,078 feet	^	N/A	20

* A negative number indicates erosion.

^ When this symbol is present, it indicates that the minimum setback is required. The shoreline change rate in these areas is between -0.5 and +31.0 ft/year.

Final Product

Once the location of these proposed new beachfront jurisdictional lines is determined, this “line report” is prepared documenting how the new line positions were established. The proposed lines are then released for a 30-day public comment period, and a public hearing is held for public review and comment on the proposed line positions. The proposed lines are also made available for public review on the South Carolina Beachfront Jurisdiction viewer (<https://gis.dhec.sc.gov/shoreline>). Once the lines are adopted as final, the final versions can also be seen on the South Carolina Beachfront Jurisdiction viewer. The line coordinates are also made available on the DHEC web site in a format that allows them to be downloaded and imported into computer-generated plats by surveyors.