



**Line Report: Proposed Baseline and Setback Line
Daufuskie Island
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.

Daufuskie Island Baseline

Daufuskie Island is located in Beaufort County to the south of Hilton Head Island, between Mungen Creek to the southwest and Calibogue Sound to the northeast. The island is only accessible by ferry or boat, and the entire island is classified as an unstabilized inlet zone.

Unstabilized Inlet Zone

There is a 4,000-ft long wooden bulkhead along the shoreline of the Melrose Tract that is no longer intact and functional. For the entire island, the baseline is set at the most landward point of erosion in the last 40 years. At the southern end of the island, from the Bloody Point terminal groin to a point approximately 1,100 feet to the north along the shoreline, the baseline is set at the vegetation line collected by OCRM staff in the field in December 2016. Then, for a shoreline distance of approximately 600 feet, the baseline is set at the 1977 vegetation line position. Then, for a shoreline distance of approximately 500 feet, the baseline is set at the 1998 vegetation line position. For the remainder of Daufuskie Island, the baseline is set at the vegetation line collected by OCRM staff in the field in December 2016. At the northeastern end of the island, the baseline wraps and terminates near a marsh and tidal creek area. Any land or water areas to the northeast of the wrapped baseline are considered to be located seaward of the baseline.

Daufuskie Island 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 Daufuskie for 228 feet along Fuskie Lane	^	N/A	20
Transition north for 33 feet, then north for 30 feet along Fuskie Lane	-1.4193	40	57
North for 65 feet along Fuskie Lane	-3.0586	40	122
North for 55 feet along Fuskie Lane	-6.0834	40	243
Transition north for 76 feet, then north for 619 feet along Fuskie Lane	-7.9045	40	316
Transition north for 34 feet, then north for 89 feet along Fuskie Lane	-5.9195	40	237
Transition north for 79 feet, then north for 2,183 feet along Fuskie Lane	-3.4022	40	136
Transition north for 204 feet, then for 3,107 feet to the north end of Cresting Wave Lane	-4.1843	40	167
Transition north for 240 feet, then north for 2,103 feet	-5.0711	40	203
Transition north for 263 feet, then north for 588 feet to the north end of Beauregard Boulevard	-6.4794	40	259
Transition north for 308 feet, then north for 3,032 feet to Captain Monroe Lane	-7.4058	40	296
Transition north for 148 feet, then north for 603 feet	-6.2253	40	249
Transition north for 167 feet, then north for 352 feet along Avenue of Oaks	-5.2374	40	210
Transition north for 176 feet, then north for 802 feet along	-4.196	40	168

Location Description	Shoreline Change Rate (ft/year) *	Multiplier	Setback Distance (ft)
Avenue of Oaks			
Transition north for 214 feet, then north for 1,642 feet along Avenue of Oaks	-2.4752	40	99
Transition north for 213 feet, then north for 601 feet to the north end of Avenue of Oaks	-1.1659	40	47
Transition north for 188 feet, then north for 1,042 feet wrapping around the north end of Daufuskie	^	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.