



**Line Report: Proposed Baseline and Setback Line
Singleton Swash to White Point Swash
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.

Singleton Swash to White Point Swash Baseline

The section of the Grand Strand in Unincorporated Horry County from Singleton Swash to White Point Swash includes the Shore Drive area, Arcadian Shores, campground region, and Briarcliffe Acres. This entire stretch of shoreline is classified as a standard zone, beginning at OCRM Monument 5510E at Singleton Swash and ending at White Point Swash just north of OCRM Monument 5590.

Shore Drive Standard Zone

The Shore Drive area runs from Singleton Swash to Lake Arrowhead Road. Within the Shore Drive area, several erosion control structures are present, and the baseline position was calculated using the volume calculation method. Using armored transects at AS1 (9500 Shore Drive), OCRM monument 5513E, AS2 (1502 Ocean Sands Court), AS4 (9650 Shore Drive), and a reference, unarmored transect at OCRM Monument 5580, calculations were performed to determine, if the shoreline were not armored, the location of the primary dune crest. At AS1, the primary dune crest would be located 30 feet landward of the erosion control structure. At OCRM monument 5513E, the primary dune crest would be located 34 feet landward of the erosion control structure. At AS2, the primary dune crest would be located 17 feet landward of the erosion control structure. At AS4, the primary dune crest would be located 11 feet landward of the erosion control structure. The erosion control structures were buffered by these distances to establish the baseline.

Arcadian Shores Standard Zone

The Arcadian Shores area runs from Lake Arrowhead Road to Lakeshore Drive. Within this area, the baseline is set using the volume calculation method where erosion control structures were present, as well as LIDAR from 2014. Using armored transects at AS5 (12-E Arcadian Drive), and a reference, unarmored transect at OCRM Monument 5580, calculations were performed to determine, if the shoreline were not armored, the location of the primary dune crest. At AS5, the primary dune crest would be located 55 feet landward of the erosion control structure. The erosion control structure was buffered by this distance to establish the baseline.

Campground Region Standard Zone

Within the campground region between Arcadian Shores and Briarcliffe Acres, the baseline is set using LIDAR from 2014.

Briarcliffe Acres Standard Zone

Within Briarcliffe Acres, the baseline is set using LIDAR from 2014, and was field verified by OCRM staff in September 2016.

Beach	Profile (Reference or Armored)	Monument # or Other ID	Upper Contour (ft)	Lower Contour (ft)	Calculated Volume (cy/ft)	X- Position to Match Volumes (ft)	X-Position of Dune Crest (ft)	X-Position Difference (ft) = landward offset from wall
Arcadian Shores	Armored	AS1	10.534	-4.675	80.198			30
Arcadian Shores	Reference	5580	13.723	-4.787	81.617	137.609	107.349	
Arcadian Shores	Armored	AS2	9.933	-4.95	89.039			18
Arcadian Shores	Reference	5580	12.316	-4.787	89.454	124.958	107.349	
Arcadian Shores	Armored	5513E	10.36	-4.652	79.674			35
Arcadian Shores	Reference	5580	13.967	-4.787	78.586	142.002	107.349	
Arcadian Shores	Armored	AS4	13.342	-4.962	94.153			12
Arcadian Shores	Reference	5580	13.552	-4.787	93.383	118.972	107.349	
Arcadian Shores	Armored	AS5	10.672	-4.798	67.987			55
Arcadian Shores	Reference	5580	7.459	-4.787	67.109	162.798	107.349	

Unincorporated Horry 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)
From the south end of Arcadian Shores near Singleton Swash to Swansea Court	^	N/A	20
North for 208 feet at Swansea Court	-0.5116	40	21
North for 199 feet	^	N/A	20
North for 400 feet	-0.5116	40	21
North for 201 feet	-0.7286	40	29
North for 203 feet	^	N/A	20
North for 409 feet to Ocean Lake Road	-0.5116	40	21
From Ocean Lake Road to Florida Trail	^	N/A	20
Transition north for 199 feet, then north from Greenville Trail to Memphis Trail	-0.5849	40	23
Transition north for 219 feet, then north From New York Tail to Lands End Boulevard	-0.7871	40	32
For 133 feet at Lands End Boulevard	-0.7583	40	30
Transition north for 174 feet, then north for 2,596 feet	-0.6182	40	25
Transition north for 196 feet, then north for 398 feet	^	N/A	20
Transition north for 199 feet, then north for 198 feet	-0.5621	40	23
North for 390 feet	^	N/A	20
North for 378 feet	-0.5621	40	23
Transition north for 188 feet, then north for 4,274 feet, then transition north for 155 feet to White Point Swash	^	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.