



**Line Report: Proposed Baseline and Setback Line  
Hilton Head 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.<sup>1</sup>

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.

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<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup>

To calculate a dune crest position at an armored<sup>4</sup> 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.<sup>5</sup>

## 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.<sup>6</sup>

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

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<sup>2</sup> S.C. Code Regs. 30-1(D)(43).

<sup>3</sup> S.C. Code Ann. §48-39-280(A)(1).

<sup>4</sup> S.C. Code Ann. §48-39-250(5).

<sup>5</sup> S.C. Code Ann. §48-39-280(A)(2).

<sup>6</sup> 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.

## **Hilton Head Island Baseline**

Hilton Head Island is located in Beaufort County between Calibogue Sound to the southwest and Port Royal Sound to the northeast.

### *Southern Unstabilized Inlet Zone Adjacent to Calibogue Sound*

At the southwestern end of the island, the portion of Sea Pines Plantation bordering on Calibogue Sound is an unstabilized inlet zone, which extends from the Lands End terminal groin to OCRM Monument 1409. In this zone, the baseline is set at the most landward point of erosion in the last 40 years. Specifically, the baseline position is comprised of vegetation line data collected by OCRM staff in December 2016 and historical vegetation line positions from 1977 and 1978.

### *Central Standard Zone*

Northeast of the southern unstabilized inlet zone, a 8.5-mile long standard zone extends from OCRM Monument 1409 in Sea Pines Plantation to OCRM Monument 1469, which is just south of the Folly. This area includes South Forest Beach, North Forest Beach, and Palmetto Dunes. Beginning at OCRM Monument 1409 and extending northeast for approximately 1,200 feet, the baseline is set at the vegetation line position collected by OCRM staff in December 2016. Along this reach of shoreline, there were no primary dunes on which to place the baseline.

From that point to OCRM Monument 1469, the baseline is set on the primary dune crest identified in LIDAR data from 2015 and verified in the field by OCRM staff in June and July 2016 using survey-grade GPS equipment.

### *Stabilized Inlet Zone South of the Folly*

Immediately south of the Folly, there is a short stabilized inlet zone between OCRM Monument 1469 and the inlet. This area is considered a stabilized inlet zone due to the presence of the small terminal groin on the south side of the inlet. In this zone, the baseline is set on the primary dune crest as identified in LIDAR data from 2015 and verified in the field by OCRM staff in June and July 2016 using survey-grade GPS equipment.

### *Unstabilized Inlet Zone North of the Folly*

Immediately north of the Folly, there is a short unstabilized inlet zone between the inlet and OCRM Monument 1472. In this zone, the baseline is set at the most landward point of erosion in the last 40 years. Specifically, the baseline is set at the 1982 shoreline position.

### *Northern Standard Zone*

Moving north, a 1.3-mile long standard zone extends from OCRM Monument 1472 to OCRM Monument 1478. In this zone, the baseline is set on the primary dune crest as identified in

LIDAR data from 2015 and verified in the field by OCRM staff in June and July 2016 using survey-grade GPS equipment.

*Northern Unstabilized Inlet Zone Adjacent to Port Royal Sound*

Finally, at the northeastern end of the island, an unstabilized inlet zone extends from OCRM Monument 1478 to the mouth of Fish Haul Creek adjacent to Port Royal Sound. This area includes all of the Port Royal Plantation shoreline. In this zone, the baseline is set at the most landward point of erosion in the last 40 years. Specifically, the baseline position is comprised of vegetation line data collected by OCRM staff in December 2016, and historical vegetation line positions from 1977, 1993, and 1998.

**Hilton Head 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)
Transition for 57 feet, then wrapping the south end of Hilton Head to Black Skimmer Road	^	N/A	20
Transition north for 183 feet, then north to Surf Scoter Road	-1.0662	40	43
Transition north for 205 feet, then from Atlantic Pointe Drive north for 3,387 feet	-1.8918	40	76
Transition north for 191 feet, then north for 793 feet	-0.7949	40	32
Transition north for 203 feet, then north to Seahawk Lane	^	N/A	20
Transition north for 195 feet, then north for 1,184 feet	-1.0955	40	44
Transition north for 207 feet, then from the north end of Shipyard Drive north for 2,838 feet	-2.0957	40	84
Transition north for 195 feet, then north to the intersection of Ocean Lane and Carnoustie Road	-3.4642	40	139
Transition north for 181 feet, then north for 919 feet	-4.2995	40	172
Transition north for 187 feet, then from Dune House Lane to the north end of Collier Beach Road	-4.8642	40	195
After a 623 foot break, transition north for 187 feet, then from the south end of Burkes Beach to Sweet Grass Manor	-3.3708	40	135
Transition north for 205 feet, then north for 614 feet to Admiral's Drive	-2.1643	40	87
Transition north for 203 feet, then north for 1,173 feet	-1.0801	40	43
Transition north for 203 feet, then from Sea Horse Way to the north end of Coggins Point Road	^	N/A	20
Transition north for 190 feet, then north for 986 feet	-0.5916	40	24
Transition north for 188 feet, then north for 1,188 feet to Wagener Place	^	N/A	20
Transition north for 209 feet, then north from Wagener Place to the north end of Fort Walker Drive	-0.8372	40	34
Transition for 42 feet, then wrapping around the north end of Hilton Head for 203 feet	-1.8778	40	75
Transition for 33 feet, then wrapping around the north end of Hilton Head for 34 feet	-6.918	40	277

\* 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.