



**Line Report: Proposed Baseline and Setback Line
Hunting 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.

Hunting Island Baseline

Hunting Island is a State Park located in Beaufort County between Fripp Island and Fripp Inlet to the southwest and Harbor Island and Johnson Creek Inlet to the northeast.

Southern Unstabilized Inlet Zone Adjacent to Fripp Inlet

The southern end of the island adjacent to Fripp Inlet is classified as an unstabilized inlet zone which extends from Fripp Inlet to OCRM Monument 1890. In this zone, the baseline is set at the most landward point of erosion in the last 40 years. Because this end of Hunting Island is highly erosional, the baseline is set at the vegetation line position collected by OCRM staff in January 2017. At the transition between the unstabilized inlet zone and the standard zone, the island was completely overwashed by Hurricane Matthew in October 2016. Since then, it overwashes daily at high tide. Therefore, the baseline wraps the upland areas to the north and south, and the overwash area in between is considered to be located seaward of the baseline. At the southern end of this unstabilized inlet zone adjacent to Fripp Inlet, the baseline also wraps the upland, and any land or water areas to the southwest of the wrapped baseline are considered to be located seaward of the baseline.

Central Standard Zone

The central portion of the island from OCRM Monument 1890 to a point midway between OCRM Monuments 1820 and 1810 is classified as a standard zone. As stated above, at the southern end of the standard zone, the island was completely overwashed by Hurricane Matthew in October 2016. Since then, it overwashes daily at high tide. Therefore, the baseline wraps the upland in this area, and the areas that were overwashed are considered to be located seaward of the baseline. Continuing north in the standard zone, between OCRM Monuments 1880 and 1830, there are no primary dunes and the baseline is set at the vegetation line position collected by OCRM staff in January 2017.

North of the lighthouse around OCRM Monument 1830, the baseline moves landward of a wetland area and is located on the crest of a primary dune identified in 2015 LIDAR data. The baseline remains on the primary dune until the beach zone transitions from a standard zone to a stabilized inlet zone at a point midway between OCRM Monuments 1820 and 1810.

Northern Stabilized Inlet Zone Adjacent to Johnson Creek Inlet

The northern end of the island adjacent to Johnson Creek Inlet is classified as a stabilized inlet zone due to the presence of a terminal groin. From where the stabilized inlet zone begins to a point approximately 200 feet north of OCRM Monument 1810, there are no primary dunes and the baseline is set at the vegetation line position collected by OCRM staff in January 2017. For the remainder of the shoreline to Johnson Creek Inlet, the baseline is set at the primary dune crest as identified in 2015 LIDAR data and verified in the field by OCRM staff in August 2016 with survey-grade GPS equipment.

Hunting 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)
From the south end of Cabin Road north 428 feet	^	N/A	20
North 161 feet along Cabin Road	-3.4074	40	136
North for 41 feet along Cabin Road	-6.9586	40	278
Transition north for 29 feet, then north 1,471 feet along Cabin Road	-12.2357	40	489
Transition north for 180 feet, then north 300 feet along Cabin Road	-10.542	40	422
After 1,200 foot gap, north 316 feet along Cabin Road	-10.542	40	422
Transition north for 186 feet, then north 1,811 feet along Cabin Road	-9.2019	40	368
Transition north for 183 feet, then north 5,334 feet along Cabin Road and Hunting Island Drive	-7.8653	40	315
Transition north for 236 feet, then north 3,504 feet along N Beach Road	-9.9663	40	399
Transition north for 136 feet, then north 3,214 feet	-12.7696	40	511
Transition north for 307 feet, then North 2,094 feet to the north end of Campground Road	-14.5853	40	583
Transition north for 215 feet, then north for 805 feet	-15.8763	40	635
Transition north for 26 feet, then north 110 feet	-17.7924	40	712
Transition north for 19 feet, then north 63 feet	-20.4651	40	819
Transition north for 17 feet, then north 78 feet	-7.5752	40	303
Transition for 22 feet, then wrapping the north end of Hunting for 147 feet	-9.2341	40	369
Wrapping the north end of Hunting for 38 feet	-1.773	40	71
Wrapping the north end of Hunting for 858 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.