Line Report: Proposed Baseline and Setback Line  
Kiawah Island  
October 6, 2017  
Revised May 3, 2018  
Revised December 18, 2019  
Revised February 11, 2020

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.

**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, terminal groins, or other structures.

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. 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.

To calculate a dune crest position at an armored 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

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2 S.C. Code Regs. 30-1(D)(43).
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 annual shoreline change rate. This rate was multiplied by 40 to generate the setback distance from the baseline.

**Kiawah Island Baseline**

Kiawah Island is a 10-mile long barrier island in Charleston County, located between Seabrook Island and Captain Sam’s Inlet to the southwest and Stono Inlet and Folly Beach to the northeast.

**Southern Unstabilized Inlet Zone Adjacent to Captain Sam’s Inlet**

The section of shoreline from the mouth of Captain Sam’s Spit to OCRM Monument 2625 near Beachwalker Park is classified as an unstabilized inlet zone. 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 a wet/dry shoreline position from 1983 and historical vegetation line positions from 1988 and 1998.

**Central Standard Zone**

The central portion of Kiawah Island between OCRM Monument 2625 and OCRM Monument 2740 is classified as a standard zone. In this zone, the baseline is set at the primary dune crest as identified in 2010 LIDAR data and verified in the field in August, September, and November 2016 by OCRM staff using survey-grade GPS equipment.

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**Northern Unstabilized Inlet Zone Adjacent to Stono Inlet**

At the northeastern end of the island, the section of shoreline from that starts between OCRM Monument 2735 and 2745E, and extends to the end of the island at Stono Inlet is classified as an unstabilized inlet zone. 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 August 2016, a wet/dry shoreline position from 1983, and historical vegetation line positions from 1977, 1988, 1998, 2006, and 2011.

**Kiawah Island Setback Line**

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

<table>
<thead>
<tr>
<th>Location Description</th>
<th>Shoreline Change Rate (ft/year) *</th>
<th>Multiplier</th>
<th>Setback Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrapping the south end of Kiawah north to Boardwalk #2</td>
<td>^</td>
<td>N/A</td>
<td>20</td>
</tr>
<tr>
<td>Transition north for 200 feet, then north for 390 feet</td>
<td>-0.8304</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Transition north for 198 feet, then north for 382 feet</td>
<td>-1.2405</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Transition north for 196 feet, then north for 380 feet</td>
<td>-1.5008</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Transition north for 196 feet, then north for 414 feet</td>
<td>-1.8219</td>
<td>40</td>
<td>73</td>
</tr>
<tr>
<td>Transition north for 215 feet, then north for 221 feet to Boardwalk #8-A</td>
<td>-2.0655</td>
<td>40</td>
<td>83</td>
</tr>
<tr>
<td>Transition north for 215 feet, then from Boardwalk #8 north for 398 feet</td>
<td>-2.3645</td>
<td>40</td>
<td>95</td>
</tr>
<tr>
<td>Transition north for 188 feet, then north for 1,844 feet</td>
<td>-2.7273</td>
<td>40</td>
<td>109</td>
</tr>
<tr>
<td>Transition north for 196 feet, then from Low Oak Woods Road north for 3,423 feet</td>
<td>-2.9206</td>
<td>40</td>
<td>117</td>
</tr>
<tr>
<td>Transition north for 201 feet, then north for 605 feet</td>
<td>-2.5532</td>
<td>40</td>
<td>102</td>
</tr>
<tr>
<td>Transition north for 195 feet, then north for 797 feet</td>
<td>-2.2903</td>
<td>40</td>
<td>92</td>
</tr>
<tr>
<td>Transition north for 206 feet, then north for 412 feet</td>
<td>-1.9039</td>
<td>40</td>
<td>76</td>
</tr>
<tr>
<td>Transition north for 201 feet, then north for 401 feet</td>
<td>-1.5246</td>
<td>40</td>
<td>61</td>
</tr>
<tr>
<td>Transition north for 192 feet, then north for 1,030 feet</td>
<td>-1.1831</td>
<td>40</td>
<td>47</td>
</tr>
<tr>
<td>Transition north for 222 feet, then north for 839 feet to Nicklaus Lane</td>
<td>-0.8308</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Transition north for 185 feet, then north for 526 feet</td>
<td>-0.6336</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>Transition north for 182 feet, then north and wrapping the north end of Kiawah</td>
<td>^</td>
<td>N/A</td>
<td>20</td>
</tr>
</tbody>
</table>

* 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.
Addendum 1

Act # 173 of 2018 known as the “Beachfront Management Reform Act” was signed into law on May 3, 2018 by Governor Henry McMaster. In accordance with the Act, the state’s beachfront jurisdictional lines, administered by DHEC’s Office of Ocean and Coastal Resource Management, have been established for all beachfront areas of the state as follows.

The baseline is established at the most seaward position of either the current baseline set during the 2008 through 2012 cycle; or the baseline proposed by the department on October 6, 2017.

The setback line is established at the most seaward position of either the current setback line set during the 2008 through 2012 cycle; or the setback line proposed by the department on October 6, 2017.

These jurisdictional lines will be in effect until the completion of the establishment cycle initiating on or after January 1, 2024.

Additional information including survey packets with coordinates is available through the DHEC State Beach Jurisdictional Lines web page at: www.scdhec.gov/beachfrontlines

Addendum 2: December 2019

The shoreline change rates, also known as the long term erosion rates (LTER), provided above, are based on distances along the beach from south to north. The above shoreline change rates only include the erosional areas along a beach that have a setback distance greater than the minimum of 20 feet. Shoreline change rates for all areas (erosional and accretional) are now available through DHEC OCRM’s Beachfront Jurisdictional Lines web application (https://gis.dhec.sc.gov/shoreline/). Shoreline change rates for specific segments of the beach can be obtained by locating and clicking on the setback line within the web application. Additional instructions are provided within the web application.

Please note that for the 2016-2018 jurisdictional line review cycle, the baselines and setback lines were established by Act 173 of 2018. The setback line is typically established landward of the baseline a distance of 40 times the shoreline change rate (or long term erosion rate). However, the setback distance established by Act 173 may not reflect the published shoreline change rate.
Addendum 3: February 2020

PLEASE BE ADVISED: Baselines and setback lines for Captain Sam's Spit on Kiawah Island are pending litigation for the 2016-2018 establishment cycle. Until such time as the baselines and setback lines are finalized in this area, the 2008-2012 baselines and setback lines are in effect pursuant to SC Code of Laws Section 48-39-280(C).