

Beachfront Jurisdictional Line Stakeholder Workgroup

Final Report

May 2019



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Executive Summary

The South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC OCRM) is required by South Carolina Law to establish and review the position of the state's beachfront jurisdictional lines every seven to ten years. The purpose of these jurisdictional lines is to delineate the extent of DHEC OCRM's direct permitting authority for activities within the defined beaches and beach/dune system critical areas. South Carolina's beachfront jurisdictional lines enable DHEC OCRM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems.

On May 3, 2018, [Act 173](#), the Beachfront Management Reform Act, was signed by Governor Henry McMaster. The Act established the position of the jurisdictional baselines and setback lines for the 2018 establishment cycle. Act 173 also includes a section that requires DHEC OCRM to promulgate regulations to guide implementation of future line review processes.

To initiate input into this process, DHEC OCRM convened a Beachfront Jurisdictional Line Stakeholder Workgroup (Workgroup) between October 2018 and February 2019. The Workgroup was tasked with providing recommendations to DHEC OCRM to: 1) clarify the definition of a primary oceanfront sand dune, and 2) develop strategies to qualify and measure "extraordinary erosion" as referenced in [S.C. Code of Laws § 48-39-280\(E\)\(4\)](#).

The Workgroup examined an extensive amount of background information and available data to assist with member participation and discussion. A summary of this information is provided under the Background section of this report. Details of the Workgroup's discussions are documented under the section Workgroup Findings.

The following are the final recommendations of the Workgroup. These final recommendations will assist DHEC OCRM with formulating regulations to implement the provisions of the Beachfront Management Reform Act.

Recommendation 1

*For the purposes of establishing the beachfront jurisdictional baseline within the standard zone and stabilized inlet zone, **primary oceanfront sand dunes** constitute the most seaward dune ridge adjacent to the Atlantic Ocean that is nearly continuous for 500 linear feet*; typically exhibits the presence of stable, native vegetation; and has a dune height of 3 feet as measured from the seaward toe to the crest of the dune. The primary oceanfront sand dune is typically not scarped, eroded, or overtopped by the highest*

predicted astronomical tides but may be inundated by storm surge, which normally accompanies major coastal storm events.

Emergency berms that have been created as temporary barriers do not constitute a primary oceanfront sand dune unless the berm is situated along the historical footprint of the natural dune system and exhibits the characteristics of the defined primary oceanfront sand dune.

***Nearly continuous sand dunes** are defined as generally undissected dune ridges but may exhibit minimal breaks such as those resulting from pedestrian and/or emergency vehicle access points.

Recommendation 2

In standard and stabilized inlet zones, if the primary oceanfront sand dune is located more than 200 feet landward of the current line of stable vegetation, the jurisdictional baseline should be established seaward of the primary dune a distance equal to 30% of the measured distance from the primary dune to the current line of stable vegetation.

Recommendation 3

In standard and stabilized inlet zones on developed beachfronts, if no primary oceanfront sand dune exists, the upland location of the crest of the primary dune should be located by using the ideal dune analysis¹ of a volumetric calculation for a 3-foot-high reference dune. After this analysis is completed, the baseline should be established at the crest of the ideal dune. If the ideal dune analysis establishes the baseline landward of a habitable structure, then the baseline should be placed at either the seaward edge of the habitable structure or the landward edge of the active beach, whichever is further landward. The baseline should not be set seaward of its position established by Act 173.

In standard and stabilized inlet zones on essentially undeveloped beachfronts, if no primary oceanfront sand dune exists, the baseline should be established at the current line of stable vegetation.

¹ The ideal dune analysis is currently in regulation (S.C. Code Ann. Regs. 30-21(H)(2)) and has been used in previous line review processes.

Recommendation 4

At the initiation of a jurisdictional line review cycle, communities may submit a request for an extension of the jurisdictional line review for their community if they have an issued DHEC OCRM Critical Area Permit that is in effect for a renourishment project, or a federal renourishment project with an associated state-issued Coastal Zone Consistency Certification. The purpose of the extension is to allow construction of the renourishment project to be completed and the beach/dune system to begin to stabilize. The community requesting the extension must demonstrate that 1) funds are encumbered to complete the renourishment project, and 2) the project will be initiated within one (1) year as demonstrated through a ratified agreement with a construction contractor. Local governments are encouraged to communicate with DHEC OCRM regarding pending renourishment projects, including during the update of the community's Local Comprehensive Beachfront Management Plan. This coordination would inform the development of the jurisdictional line review schedule.

Recommendation 5

DHEC OCRM should evaluate and implement provisions for extraordinary erosion on an island or beach geographic scale. DHEC OCRM should implement a framework to coordinate with local governments and other government entities to obtain pre- and post-storm data to assist with 1) establishing typical erosion along an island or beach, and 2) determining when extraordinary erosion events have occurred along an island or beach.

Introduction

South Carolina's beaches are dynamic places, with inherent variability. Some beachfront shorelines accrete or gain sand while other shorelines erode. These changes to the coastline occur over time and are due to ocean currents, fluctuating tides and sea levels, tropical and extratropical weather systems, as well as beach use and maintenance activities. South Carolina beaches function as critical habitat for wildlife and are vital to the state's coastal tourism industry. In recognition of the vulnerability and importance of the beach/dune system, the General Assembly enacted the Beachfront Management Act in 1988, which established a comprehensive statewide beachfront management program. [S.C. Code of Laws § 48-39-280](#) requires the Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC OCRM) to establish and periodically review the beachfront jurisdictional lines, referred to as the baseline and the setback line. The purpose of these jurisdictional lines is to delineate the extent of DHEC OCRM's direct permitting authority for activities within the defined beaches and beach/dune system critical areas. South Carolina's beachfront jurisdictional lines enable DHEC OCRM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems.

Beachfront Management Reform Act

On May 3, 2018, [Act 173](#), the Beachfront Management Reform Act, was signed by Governor Henry McMaster. The Act established the position of the jurisdictional baselines and setback lines for the 2018 establishment cycle. As a result, the 2018 jurisdictional baselines and setback lines established by the Act do not move landward from their positions set during the 2008-2012 establishment cycle.

Act 173 established the baseline location as the most seaward location of either the baseline established during the 2008-2012 establishment cycle, or the baseline proposed by DHEC OCRM on October 6, 2017. Similarly, Act 173 established the setback line as the most seaward location of either the setback line established during the 2008-2012 establishment cycle, or the setback line proposed by DHEC OCRM on October 6, 2017.

Act 173 also includes a section that requires DHEC OCRM to promulgate regulations to guide implementation of future line review processes. Specifically, Section 8 reads, "[t]he Department of Health and Environmental Control must promulgate regulations to implement the provisions of this act, including regulations that the department will use to locate a primary oceanfront sand dune as defined by Section 48-39-10, by January 14, 2020."

To initiate input into this process, DHEC OCRM convened a Beachfront Jurisdictional Line Stakeholder Workgroup (Workgroup) between October 2018 and February 2019. The Workgroup was tasked with providing recommendations to DHEC OCRM to: 1) clarify the definition of a primary oceanfront sand dune, and 2) develop strategies to qualify and measure “extraordinary erosion” as referenced in [S.C. Code of Laws § 48-39-280\(E\)\(4\)](#).

The final recommendations of the Workgroup, which are documented in this report, will assist DHEC OCRM with formulating regulations to implement the provisions of the Beachfront Management Reform Act. DHEC OCRM will provide notice to the public of the formal regulatory development process including opportunities for public input.

Beachfront Jurisdictional Line Stakeholder Workgroup

Charge

DHEC OCRM established the Beachfront Jurisdictional Line Stakeholder Workgroup to develop recommendations that can be used to formulate regulations for implementing future jurisdictional line review processes. Through a consensus-driven process, this workgroup was charged with providing recommendations to clarify the regulatory definition for primary oceanfront sand dunes, and develop strategies to qualify and measure "extraordinary erosion" as referenced in [S.C. Code of Laws § 48-39-280\(E\)\(4\)](#).

Participants

Thirteen members participated in the Workgroup representing various backgrounds and constituencies including local governments and community associations, the real estate community, academic institutions, private-sector consultants, and non-profit organizations. Workgroup participants and affiliations are provided below. Participant biographies can be found on the DHEC webpage [Beachfront Jurisdictional Line Stakeholder Workgroup](#).

- Mr. C.W. “Rocky” Browder III of the Town of Hilton Head Island
- Ms. Blanche Brown of Debordieu Colony Community Association
- Ms. Emily Cedzo of the Coastal Conservation League
- Mr. Ray E. Chandler of Chandler and Jennings
- Mayor Jane S. Darby of the Town of Edisto Beach
- Ms. April Donnelly, J.D. of The Nature Conservancy
- Mr. Josh Eagle, J.D. of the University of South Carolina School of Law
- Mr. Bill Eiser of Eiser Coastal Consulting
- Dr. Jean Ellis, Ph.D. of the University of South Carolina Department of Geography
- Mr. Ryan Fabbri of the Town of Pawleys Island

- Dr. Timothy W. Kana, P.G., Ph.D. of Coastal Science and Engineering
- Dr. Michael Katuna, Ph.D. of the College of Charleston Department of Geology and Environmental Geosciences
- Mr. Nick Kremydas, Esq. of South Carolina Realtors

Summary of Workgroup Activities

A series of eight workgroup meetings were held between October 2018 and February 2019. Meetings were open to the public. All meetings were held from 10:00 a.m. to 2:00 p.m. at the DHEC OCRM office in North Charleston, except for the final meeting, which was held at the Charleston Main Library in downtown Charleston. Meetings were facilitated by DHEC staff from the Office of Environmental Affairs and the Bureau of Water. Each workgroup member was provided with a binder containing materials and resources designed to familiarize the participants with each other and their charge, as well as provide background information to assist with member participation and discussion. Additional details including agendas and meeting notes can be found for each meeting on the DHEC webpage [Beachfront Jurisdictional Line Stakeholder Workgroup](#).

Background

Beachfront Management

History, Policy, and the Beach/Dune System

In 1977, the South Carolina General Assembly enacted the Coastal Tidelands and Wetlands Act (now known as the Coastal Zone Management Act) “[t]o protect and, where possible, to restore and enhance the resources of the State’s coastal zone for this and succeeding generations.” The Act created a new state agency, the South Carolina Coastal Council, and charged it with the responsibility of administering and enforcing the statute. This legislation, however, proved ineffective for managing the beach/dune system because regulatory authority over these areas given to the Coastal Council was not sufficient. From the State’s beaches, the Coastal Council could regulate landward only to the primary oceanfront sand dune or to the highest uprush of the waves where no such dune existed. Lacking adequate authority, the Coastal Council was unable to prevent structures from being sited unwisely close to the eroding shore, thus making them extremely vulnerable to the effects of storms and high tides.

In 1986, the Blue Ribbon Committee on Beachfront Management was formed in response to the growing recognition that the existing law was inadequate to protect the fragile beach/dune resource. The Committee determined that the beach/dune system was in a state of crisis. The report concluded that “over fifty-seven miles of our beaches are critically eroding. This erosion is threatening the continued existence of our beach/dune system and thereby threatening life, property, the tourist industry, vital State and local revenue, marine habitat, and a national treasure” ([S.C. Code Ann. Regs. 30-1\(C\)](#)).

In 1988, in response to the Blue Ribbon Committee report, the South Carolina Beachfront Management Act ([S.C. Code of Laws § 48-39-250 et seq.](#)) was enacted by the South Carolina General Assembly. The Beachfront Management Act established a comprehensive statewide beachfront management program and included several key legislative findings, which are:

- the importance of the beach and dune system in protecting life and property from storms, providing significant economic revenue through tourism, providing habitat for important plants and animals, and providing a healthy environment for recreation and improved quality of life of all citizens;
- unwise development has been sited too close to and has jeopardized the stability of the beach/dune system;

- the use of armoring in the form of hard erosion control devices such as seawalls, bulkheads, and rip-rap to protect erosion-threatened structures has not proven effective, has given a false sense of security, and in many instances, has increased the vulnerability of beachfront property to damage from wind and waves while contributing to the deterioration and loss of the dry sand beach;
- inlet and harbor management practices, including the construction of jetties which have not been designed to accommodate the longshore transport of sand, may deprive downdrift beach/dune systems of their natural sand supply;
- it is in the state's best interest to protect and promote increased public access to beaches for visitors and South Carolina residents alike;
- a coordinated state policy for post-storm management of the beach and dunes did not exist and that a comprehensive beach management plan was needed to prevent unwise development and minimize adverse impacts.

The Beachfront Management Act then established eight state policies to guide the management of ocean beaches:

1. Protect, preserve, restore, and enhance the beach/dune system;
2. Create a comprehensive, long-range beach management plan and require local beach management plans for the protection, preservation, restoration, and enhancement of the beach/dune system, each promoting wise use of the state's beachfront to include a gradual retreat from the system over a forty-year period;
3. Severely restrict the use of hard erosion control devices and encourage the replacement of hard erosion control devices with soft technologies which will provide for the protection of the shoreline without long-term adverse effects;
4. Encourage the use of erosion-inhibiting techniques which do not adversely impact the long-term well-being of the beach/dune system;
5. Promote carefully planned nourishment as a means of beach preservation and restoration where economically feasible;
6. Preserve existing public access and promote the enhancement of public access for all citizens including the handicapped and encourage the purchase of lands adjacent to the Atlantic Ocean to enhance public access;
7. Involve local governments in long-range comprehensive planning and management of the beach/dune system in which they have a vested interest; and
8. Establish procedures and guidelines for the emergency management of the beach/dune system following a significant storm event.

DHEC OCRM is responsible for implementing these policies through a comprehensive management program that includes research and policy development, state and local planning, regulation and enforcement, restoration, and extension and education activities.

Beachfront Jurisdictional Lines

Purpose and Definitions

S.C. Code of Laws § 48-39-280 requires DHEC OCRM to establish and periodically review beachfront jurisdictional lines. There are two lines of beachfront jurisdiction - the baseline and the setback line. The **baseline** is the more seaward (towards the ocean) of the two jurisdictional lines, while the **setback line** is the landward (towards the land) line. The purpose of these lines is to delineate the extent of DHEC OCRM's direct permitting authority for activities within the defined beaches and beach/dune system critical areas. South Carolina's beachfront jurisdictional lines enable DHEC OCRM to implement laws and regulations that support the state's beachfront management goals and protect vulnerable shorelines and natural ecosystems.

Implications on Beachfront Structures

The beachfront jurisdictional lines delineate the beach/dune system critical area in which DHEC OCRM has direct permitting authority. These lines do not create a "no-build" area. Repairs, reconstruction, and new construction are allowed under certain conditions, and with authorization from DHEC OCRM. A summary of the implications on homes and pools located seaward of the setback line or baseline is provided below.

Homes fully or partially seaward of the setback line (S.C. Code of Laws § 48-39-290(B)(1))

- Existing homes may remain.
- Homes destroyed beyond repair may be reconstructed up to the total square footage of the original structure.
- New homes may be constructed up to 5,000 square feet of heated space within the setback area.
- Construction and repair activities require notification to DHEC OCRM.

Pools fully or partially seaward of the setback line (S.C. Code of Laws § 48-39-290(B)(3))

- Existing pools may remain.
- Pools damaged or destroyed beyond repair may be rebuilt to pre-existing dimensions with DHEC OCRM authorization.

- New pools are not permitted unless they are located behind an existing functional erosion control structure, such as a seawall or revetment, and receive prior written approval from DHEC OCRM.

Homes fully or partially seaward of the baseline (S.C. Code of Laws § 48-39-290(D))

- Existing homes that are partially or fully seaward of the baseline may remain.
- Homes may be repaired to pre-existing square and linear footage.
- New construction and reconstruction of homes destroyed beyond repair may be allowed up to 5,000 square feet through a special permit if certain criteria are met.

Pools fully or partially seaward of the baseline (S.C. Code of Laws § 48-39-290(D))

- Existing pools may remain.
- Pools damaged or destroyed beyond repair may be reconstructed, upon obtaining a permit, if they are located behind an existing functional erosion control structure.
- No new pools can be permitted.

Special Permits: Construction seaward of the baseline (S.C. Code of Laws § 48-39-290(D))

A special permit is an individual critical area permit which is given additional consideration because the requested activity is seaward of the baseline. Between 1990 and 2018, there have been 75 special permit requests. DHEC OCRM has issued 74 special permits.

Establishing Beachfront Jurisdictional Lines

South Carolina law requires DHEC OCRM to establish and review the position of the two lines of beachfront jurisdiction every seven to ten years. The average annual erosion rate for all oceanfront land that is developed or potentially could be developed is also reviewed during this time frame.

The process for establishing the baseline varies depending upon the designated beach zone. There are three beach zones including standard zones, stabilized inlet zones, and unstabilized inlet zones (Figure 1).



Figure 1. Designated beach zones for Sullivan’s Island and Isle of Palms, SC.

In standard zones, which are not influenced by inlet dynamics, the baseline is established at the location of the crest of the primary oceanfront sand dune. In standard erosion zones in which the shoreline has been altered naturally or artificially by the construction of erosion control devices, the baseline must be established by DHEC OCRM using the best scientific and historical data, to determine where the crest of the primary oceanfront sand dune for that zone would be located if the shoreline had not been altered ([S.C. Code of Laws § 48-39-280\(A\)\(1\)](#)). In standard zones where there is no natural primary dune, the baseline location can be determined based on existing natural dunes in the area. An average or “ideal” dune is then calculated and superimposed on beaches without natural dunes ([S.C. Code Ann. Regs. 30-21\(H\)\(2\)](#)).

In stabilized inlet zones, which are stabilized by jetties, terminal groins, or other structures, the baseline is established in the same manner as described above for standard zones ([S.C. Code of Laws § 48-39-280\(A\)\(3\)](#)).

In unstabilized inlet zones, which are not stabilized by jetties, terminal groins, or other structures, the baseline is set at the most landward point of erosion at any time during the past forty 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 ([S.C. Code of Laws § 48-39-280\(A\)\(2\)](#)).

DHEC OCRM is also required to establish the setback line landward of the baseline a distance which is forty times the average annual erosion rate or not less than twenty feet from the baseline for each erosion zone based upon the best historical and scientific data adopted by

the department as a part of the State Comprehensive Beach Management Plan ([S.C. Code of Laws § 48-39-280\(B\)](#)).

South Carolina's Beach/Dune System

Beach Profile

A typical beach profile, starting at the ocean and moving landward, includes the nearshore surf zone where waves break, an intertidal zone between the low tide line and high tide line, a dry sand berm, and a dune system (Figure 2). The berm is dry under normal conditions and is where beachgoers typically lay their beach towels or set up their umbrellas. The berm and dunes may be affected by waves during astronomical high tide events or coastal storms.

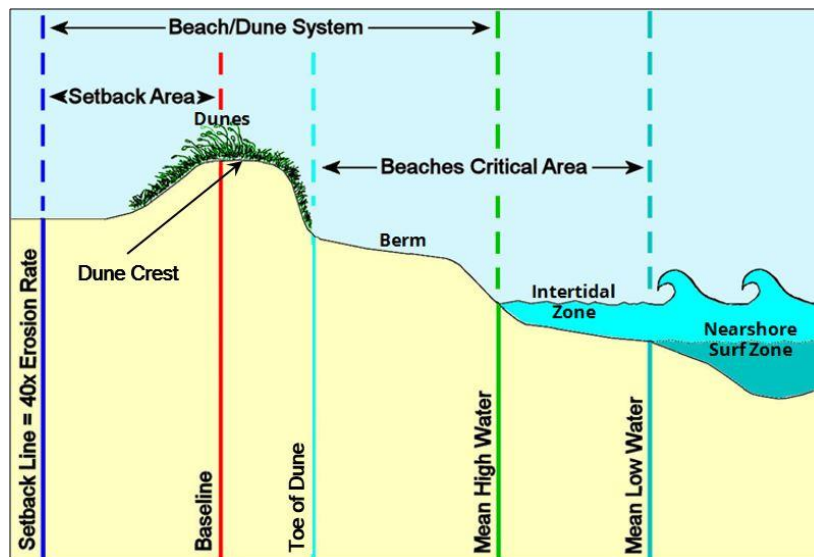


Figure 2. Cross-section of a typical beach profile, including the State's jurisdictional baseline and setback line in a standard zone or stabilized inlet zone.

The beach profile along a shoreline can change dramatically with the seasons throughout the year. During the fall and winter, strong winds and stormy weather from hurricanes, tropical storms, and nor'easters cause large, powerful waves to form. As these waves pound the beach, sand erodes and is either deposited on offshore sand bars, deposited farther offshore outside of the sand sharing system, or deposited landward of the former dune line if the beach is overwashed. During the spring and summer, smaller long-period waves push sand from the sand bars back onto the beach and accretion (build up) can occur. The cycle of fall and winter erosion and spring and summer accretion is not always balanced. A strong storm can erode the beach significantly and deposit the sand sufficiently far offshore or in deep enough water that smaller waves are not able to transport the sand back to the

shoreline. In this case, the erosion rate will exceed the accretion rate, and the net result will be a narrower beach. Similarly, if overwash occurs and sand is deposited farther landward, the sand will be lost from the system unless it is manually relocated back to the beach. On the other hand, if a strong storm does not impact the beach for several years, the accretion rate can exceed the erosion rate, and the net result may be a wider beach. These cyclical changes to the beach profile are very site-specific and can also be influenced by astronomical high tides, extended periods of onshore winds, coastal engineering projects, and sea level rise.

Sand dunes are critically important prior to and during a storm event. During these erosional events, dunes are the first line of defense against incoming storm wave energy. When dune sand is not available, waves can erode upland and damage houses and infrastructure. Even small dunes that are three feet tall can mean the difference between simple beach erosion and the destruction of private property. Sand dune continuity is also an important factor to consider for adequate storm protection. If there are large gaps or many small gaps in a dune, storm surge will penetrate the dune system through these weak points and result in additional damage to the dune or structures and infrastructure located landward of the dune.

Sediment Transport

The beaches of South Carolina are comprised of sand-sized sediment. Three mechanisms are primarily responsible for transporting sediment in the alongshore direction (shore-parallel) and cross-shore direction (shore perpendicular). **Bedload transport** occurs as sediment particles bounce or roll along the bottom (“bed”) of the shoreface as a result of wave action or currents. **Suspended load transport** occurs as sediment particles become entrained within the water column itself and are then transported by waves and currents. **Aeolian transport** occurs as fine sediment particles on the beach are moved by the wind. Aeolian transport is the primary process that drives coastal dune formation. Sediment particles need to be sufficiently small to be picked up and transported by the wind. Dry sand is needed for dunes to form, and the beach can only experience infrequent inundation. If inundated too frequently, the sand particles will remain too wet and consolidated for the wind to move them.

Sand Dune Formation

In South Carolina, sand dunes along the beaches are generally under 10 feet tall from the seaward toe to the crest and may exist as isolated hummocks, linear dune ridges, or groups of dunes of varying sizes and orientations called dune fields (Figure 3). The type of dune

features that form is a function of sand availability, dominant wind speeds and directions, and history of erosion or accretion.



Figure 3. Dune hummock at Folly Beach, SC (top left); Dune ridge at Hunting Island, SC (top right); Dune field at Kiawah Island, SC (center).

As the wind blows across a dry sand beach, it moves sand particles until the wind speed decreases and the sand deposits on the beach or the wind encounters an object that causes the sand to deposit on the beach. Dune vegetation and sand fencing are both effective dune builders because they cause windblown sand to deposit and accumulate (Figure 4). Dune vegetation is particularly effective because the foliage of the plants causes the sand to build up above the surface of the dune while the root systems of the plants hold the sand together beneath the surface. Unvegetated sand is more easily eroded by waves than vegetated sand because the unvegetated sand has no plant roots to bind the sand together.



Figure 4. Sand fencing and dune vegetation at Isle of Palms, SC.

Data and Resources

DHEC OCRM utilizes the best available science and collects and maintains a number of spatial datasets for the purpose of managing the state's beachfront. Annually, beach profiles are collected at an existing network of approximately 400 survey monuments located along the developed sections of the ocean coastline. This dataset has been collected since the early 1990s and includes horizontal and vertical data for the beach/dune system, the intertidal zone, and bathymetric portions of the beach profile extending seaward 3,000 feet.

DHEC OCRM maintains a database of historic vegetation and wet/dry shorelines. These are collected in the field and are also generated by digitizing shorelines from aerial imagery and topographic sheets. DHEC OCRM also maintains a database of historic imagery and has access to current aerial imagery through the National Agriculture Imagery Program (NAIP) and Pictometry® Imagery.

DHEC OCRM has access to the data resources from other state agencies, such as the South Carolina Department of Natural Resources.

DHEC OCRM also works with its federal partners to obtain a number of datasets including Light Detection and Ranging (LIDAR) elevation maps. Many spatial datasets, including imagery and elevation, are available through NOAA's Digital Coast website.

Workgroup Findings

Primary Oceanfront Sand Dune

Primary Dune Characteristics

The Workgroup was provided with the current regulatory definition of “primary oceanfront sand dunes” found in [S.C. Code Ann. Regs. 30-1\(D\)\(43\)](#):

“Those dunes which constitute the front row of dunes adjacent to the Atlantic Ocean, are partially or wholly seaward of the setback line, are not landward of an existing functional erosional control device, and have a minimum height of thirty-six (36) inches, as measured vertically from the crest to the toe of the dune. For purposes of establishing the baseline, this dune must also form a continuous line for 500 shore parallel feet.”

The Department uses the definition of the primary oceanfront sand dune to establish the baseline in standard and stabilized inlet zones; therefore, the definition is applicable in those areas.

In addition, the Workgroup was provided with a series of photographs representing various beach/dune systems throughout the state.

The Workgroup determined that the following characteristics should be considered when identifying a primary dune: relative height, the presence of established dune vegetation, continuity, noticeable slopes on the seaward and landward dune faces, proximity to the ocean, proximity to the dry sand beach, and sand composition. The Workgroup determined that a feature should not be considered a primary dune if it is newly created, is scarped by chronic erosion, has little elevation change landward of a scarp, has little elevation change above the beach face, or has large and frequent gaps that make it discontinuous.

The Workgroup recognized the variability of South Carolina’s dunes and took these considerations into account as they discussed different scenarios that may be encountered. The Workgroup identified three dune scenarios that exist in standard zones or stabilized inlet zones along South Carolina’s beaches, which are discussed below.

Dune Scenario #1: Dune Meets Regulatory Definition of “Primary Dune”

The first scenario is the presence of a dune which meets the regulatory definition of a “primary oceanfront sand dune” found in [S.C. Code Ann. Regs. 30-1\(D\)\(43\)](#) and cited above. In these areas, there is a dune landward of the beach which is at least 3 feet tall and 500 feet long. The Workgroup discussed the height requirement, length requirement, dune continuity, dune vegetation, dune functions, and emergency berms that are scraped from the beach and constructed after storms.

As an alternative to the 3-foot height requirement, the Workgroup considered other metrics for defining a primary dune, including elevations above certain contours or above certain datums like Mean Higher High Water (MHHW). After reviewing examples of elevation contours for beaches throughout the state, the Workgroup determined that there is not a single elevation number or range of elevations that would represent a primary dune due to the variability along the coast. The Workgroup also discussed whether dune height should be measured from the landward toe of the dune to the dune crest or from the seaward toe of the dune to the dune crest. Since one of the functions of the primary oceanfront sand dune is to limit the impacts of storm surge approaching from the seaward side of the dune, it was determined that the dune height should be measured from the seaward toe to the crest. The Workgroup also considered raising the height requirement. Some members indicated that a 3-foot dune was not adequate, and encouraged the group to consider whether a 3-foot dune would be sufficient to protect landward structures. Other members’ viewpoint was that a 3-foot dune would be sufficiently protective.

The Workgroup considered whether a primary dune should have a different length than the current 500-foot requirement. DHEC OCRM staff provided several examples to show that 500 feet covers approximately five parcels along most beachfront communities. The Workgroup also discussed whether small breaks in the dune caused by beach access paths, dune walkover structures, or emergency vehicle access points should be considered breaks that interrupt the continuity of the dune and therefore result in disqualifying it as a primary dune. The Workgroup agreed that these beach access features should not disqualify the dune from being considered a primary dune for the purposes of setting the baseline. The Workgroup also agreed that changing the language from “continuous line for 500 shore parallel feet” to “nearly continuous for 500 linear feet” would help clarify this point.

The Workgroup also discussed dune vegetation as a function of dune stability. It was noted that vegetated dunes are inherently more stable than unvegetated dunes because the foliage of the plants causes the sand to build up above the surface of the dune while the root

systems of the plants hold the sand together beneath the surface. Vegetation is also a good indicator that a sand dune has existed for more than a few months. If an emergency berm is constructed following a storm event, the berm may exhibit some of the characteristics of a primary dune (e.g. at least 3 feet tall and 500 feet long), but it will not be vegetated and it may not persist in that location for long. For the purposes of setting the baseline, the Workgroup generally agreed that a dune should also typically exhibit the presence of stable, native vegetation to be considered a primary dune.

The Workgroup considered whether a dune feature can be scarped, entirely eroded away, or overtopped during storms or high tide events and still be considered a primary dune. One function of primary dunes is to protect structures located on the landward side from waves and storm surge. If a dune feature is impacted by normal, predicted high tide events (including seasonal astronomical high tides), the Workgroup agreed that the dune feature should not be considered a primary dune for the purposes of setting the baseline. However, if a dune feature is not impacted by normal, predicted high tide events but is scarped, entirely eroded away, or overtopped during major coastal storms, the Workgroup agreed that the dune may still qualify as a primary dune.

The Workgroup drafted the following recommendation for Scenario #1 areas where a dune exists that meets the regulatory definition of “primary dune”:

Recommendation: For the purposes of establishing the beachfront jurisdictional baseline within the standard zone and stabilized inlet zone, **primary oceanfront sand dunes** constitute the most seaward dune ridge adjacent to the Atlantic Ocean which is nearly continuous for 500 linear feet*; typically exhibits the presence of stable, native vegetation; and has a dune height of 3 feet as measured from the seaward toe to the crest of the dune. The primary oceanfront sand dune is typically not scarped, eroded, or overtopped by the highest predicted astronomical tides but may be inundated by storm surge which normally accompanies major coastal storm events.

Emergency berms that have been created as temporary barriers do not constitute a primary oceanfront sand dune unless the berm is situated along the historical footprint of the natural dune system and exhibits the characteristics of the defined primary oceanfront sand dune.

****Nearly continuous sand dunes*** are defined as generally undissected dune ridges but may exhibit minimal breaks such as those resulting from pedestrian and/or emergency vehicle access points.

The recommendation above summarizes general agreement achieved by the Workgroup in Scenario #1 areas. However, a concern was raised that by clarifying the primary dune definition, it becomes more restrictive. For instance, dune vegetation is not mentioned in the current regulatory definition, but it is included in the recommendation above. The majority of members felt the recommended changes accurately capture the Workgroup's discussions and provide both clarity and flexibility for identifying primary dunes and setting the baseline in these areas.

Dune Scenario #2: Low-Elevation, Wide Dune Field with Larger Dune Landward

The second scenario includes areas with a low-elevation, wide dune field seaward of the primary oceanfront sand dune. These stretches of beach have a primary dune, but it is significantly landward of the current line of stable vegetation.

The Workgroup discussed several options for setting the baseline under this scenario, including using the primary dune definition, utilizing elevation contours, utilizing a buffer distance from a feature such as the vegetation line, and utilizing a buffer/contour combination.

The Workgroup's feedback on using the primary dune definition indicated that equal application of a single statewide definition for the baseline may be difficult based on the diverse coastline.

The Workgroup reviewed the use of contour lines generated from 2016/2017 LiDAR data at a series of beachfront sites. Due to the variable nature of the beaches, the location of the contours varied, the contours were nonlinear, and it was difficult to identify a single contour that could be used as a baseline.

The Workgroup reviewed the use of buffers under this scenario. The Workgroup discussed creating different sized buffers from a number of locations, including the line of stable vegetation, the swash line, the wrack line, MHHW, and a contour line. It was noted that vegetation lines can change but may be more stable in Scenario #2 areas. The MHHW line is associated with a specific tidal datum updated every 19 years, which is longer than the jurisdictional line review timeframe. It is also difficult to identify the MHHW line from an aerial image or in the field.

The Workgroup consensus was that buffers were the preferred mechanism for setting the baseline in Scenario #2 areas. The Workgroup further indicated that the buffer should start

at the primary dune and extend seaward to capture the stability of the primary dune and the size of the dune field.

Recommendation: *In standard and stabilized inlet zones, if the primary oceanfront sand dune is located more than 200 feet landward of the current line of stable vegetation, the jurisdictional baseline should be established seaward of the primary dune a distance equal to 30% of the measured distance from the primary dune to the current line of stable vegetation.*

Dune Scenario #3: No Primary Dune and Limited or No Dune Field

The third scenario includes stretches of beach where there is no primary dune and limited to no dune field.

The Workgroup considered several options for setting the baseline under this scenario, including the ideal dune analysis, elevation contours, buffers, leaving the baseline where it is as of 2018, and placement of the baseline along the built environment. They also considered implementation of this scenario for developed beaches and essentially undeveloped beaches.

The ideal dune analysis is a volumetric comparison of a reference profile that has a primary dune to an adjacent profile without a primary dune and with little to no dune field. The Workgroup reviewed examples of the ideal dune analysis at sites along the SC coast that had no primary dune and limited to no dune field. Members of the Workgroup indicated that the ideal dune analysis is a quantifiable, measurable, defensible option, and is a methodology already included in the regulations ([S.C. Code Ann. Regs. 30-21\(H\)\(2\)](#)). It was noted that when using the ideal dune analysis, it is important to select an appropriate reference profile.

The Workgroup also reviewed the use of buffers in this scenario. They discussed different sized buffers from a number of locations, including the line of stable vegetation and the MHHW line. It was noted that using a stable line of vegetation only works where a vegetation line is present, and the MHHW line would be difficult to identify from aerial imagery or in the field.

The Workgroup reviewed the use of contour lines generated from 2016/2017 LiDAR data at a series of beachfront sites. Due to the variable nature of the beaches, the location of the contours varied, the contours were nonlinear, and it was difficult to identify a single contour that could be used as a baseline.

The Workgroup reviewed leaving the baseline at its current location. It was noted that in some areas, the established baseline is on active beach and leaving the baseline at its current

location may create additional stretches of beach where the baseline would be seaward of the high tide mark. In addition, DHEC OCRM is required by statute to establish baselines and setback lines during cycles that are not less than seven years, but not more than ten years following a previous establishment cycle and must be based upon the best available data ([S.C. Code of Laws § 48-39-280\(B\)](#)). Based on these discussions, the Workgroup did not recommend leaving the baseline in its current location indefinitely.

The Workgroup reviewed the placement of the baseline along the built environment. Discussion included defining the built environment, what would be a qualifying structure, and how to address the staggered placement of habitable structures and vacant lots.

General Workgroup consensus was that utilizing a combination of the ideal dune analysis, the built environment, and the location of the active beach would be the best technique for establishing the baseline in Scenario #3 areas.

Recommendation: *In standard and stabilized inlet zones on developed beachfronts, if no primary oceanfront sand dune exists, the upland location of the crest of the primary dune should be located by using the ideal dune analysis of a volumetric calculation for a 3-foot-high reference dune. After this analysis is completed, the baseline should be established at the crest of the ideal dune. If the ideal dune analysis establishes the baseline landward of a habitable structure, then the baseline should be placed at either the seaward edge of the habitable structure or the landward edge of the active beach, whichever is further landward. The baseline should not be set seaward of its position established by Act 173.*

Recommendation: *In standard and stabilized inlet zones on essentially undeveloped beachfronts, if no primary oceanfront sand dune exists, the baseline should be established at the current line of stable vegetation.*

The recommendations above for Scenario #2 and Scenario #3 areas summarize general agreement achieved by the Workgroup. However, a Workgroup member felt that these recommendations went outside of the initial charge of clarifying the primary dune definition. The majority of members believe, however, that the recommendations accurately capture the Workgroup's discussions, and provide both clarity and flexibility for identifying primary dunes and setting the baseline in these areas.

Beach Renourishment Considerations

The Workgroup engaged in facilitated discussion regarding the accomplishment of beach renourishment projects during the jurisdictional line review cycle and the effects of the

renourishment on baseline positions. The Workgroup contemplated the timing of renourishment projects, in particular permit issuance, project initiation and completion, and the length of time for beach stabilization to occur. Further discussion focused on how DHEC OCRM would determine the location of a primary dune on renourished beaches given that renourishment projects may not include a designed primary dune.

The Workgroup noted that communities with pending renourishment projects should have an option to request an extension in the line review process. A renourishment provision would be beneficial to beaches exhibiting Dune Scenario #3 (No Dune and Limited or No Dune Field). In addition, the Workgroup preferred the option of requesting an extension of the line review period until construction is completed and beach stabilization begins, rather than petitioning to revise the line position after renourishment is completed.

The Workgroup reached consensus on the following recommendation, which highlights the need for continued coordination between local governments and the state on planned renourishment projects. The recommendation also includes the encumbrance of funds and a one-year time period requirement for the initiation of a renourishment project in order for a community to request an extension of the line review cycle.

Recommendation: *At the initiation of a jurisdictional line review cycle, communities may submit a request for an extension of the jurisdictional line review for their community if they have an issued DHEC OCRM Critical Area Permit that is in effect for a renourishment project, or a federal renourishment project with an associated state-issued Coastal Zone Consistency Certification. The purpose of the extension is to allow construction of the renourishment project to be completed and the beach/dune system to begin to stabilize. The community requesting the extension must demonstrate that 1) funds are encumbered to complete the renourishment project, and 2) the project will be initiated within one (1) year as demonstrated through a ratified agreement with a construction contractor. Local governments are encouraged to communicate with DHEC OCRM regarding pending renourishment projects, including during the update of the community's Local Comprehensive Beachfront Management Plan. This coordination would inform the development of the jurisdictional line review schedule.*

Extraordinary Erosion

The Workgroup was provided with the language in the statute which references extraordinary erosion, which states:

“If an erosion zone incurs extraordinary erosion due to the impact of a storm system or event named by the National Weather Service after June 1, 2018, then data collected from the erosion zone within eighteen months of the date of impact of the storm system or event must not be used to locate the crests of primary oceanfront sand dunes or to establish baselines pursuant to subsection (A)(1) and (A)(3).” [S.C. Code of Laws § 48-39-280\(E\)\(4\)](#)

The Workgroup was presented with information about current long-term erosion rate calculations, and available datasets and tools. They also received information regarding the relationship between pre-storm beach conditions and storm damages and using the beach profile to interpret erosion and storm impacts.

The Workgroup discussed the characteristics that could be associated with extraordinary erosion, including changing beach topography, channels opening or closing, decimation of dune fields, total loss of the primary dune, wash over deposits, and destroyed structures. General consensus was that extraordinary erosion would display a combination of characteristics, rather than one.

The Workgroup also discussed the geographic scope to be considered. The consensus was that the application of extraordinary erosion should be by island or beach.

Workgroup discussion topics included the movement of sand through the beach/dune system and littoral zone, the timing of post-storm data collection, the impact of renourishment on erosion rate calculations, and the difference between typical erosion and extraordinary erosion. The Workgroup discussed the need to understand and capture typical erosion in order to be able to identify extraordinary erosion.

DHEC OCRM staff indicated that more frequent field data collections will be necessary to have a base knowledge of typical site conditions in order to compare post-storm conditions. Several members also indicated the need for DHEC OCRM to collect more frequent pre- and post-storm data, even in extraordinary erosion conditions, in order to have a complete knowledge base of beach conditions.

The Workgroup discussed which local beachfront communities collect pre-storm monitoring data on a regular basis, as a potential source of data. Data may also be available from

consultants, engineering firms, and academics. The question remained as to how the data would be assembled and analyzed.

The data type that should be used to identify extraordinary erosion was also discussed. Data types included sand volume changes, shoreline change rates, and dune height measurements. A consulting/engineering perspective of determining erosion was shared, including assessing the vegetation line, analyzing the volume of sand, and conducting deeper water profiles to evaluate if sand is still within the littoral system.

One Workgroup member suggested that in areas where a primary oceanfront sand dune is present, a beach zone should be considered to have experienced extraordinary erosion if the primary dune is destroyed during a single storm event. However, additional criteria should be explored to assist with determining extraordinary erosion, specifically for other scenarios such as areas without a primary dune.

Recommendation: DHEC OCRM should evaluate and implement provisions for extraordinary erosion on an island or beach geographic scale rather than by erosion zone. DHEC OCRM should implement a framework to coordinate with local governments and other government entities to obtain pre- and post-storm data to assist with 1) establishing typical erosion along an island or beach, and 2) determining when extraordinary erosion events have occurred along an island or beach.

Public Outreach and Education

Act 173 of 2018 provides instructions to DHEC OCRM on aspects of public outreach associated with the jurisdictional line establishment process. Steps in the process require specific timeframes for notice to ensure affected property owners and other interested parties have sufficient time to gather information. The Act also requires DHEC OCRM to make available information and raw data used to determine the location of the proposed lines and explanation for the determination. Process steps for new establishment cycles provided in Act 173 include:

- Staggering the establishment of baselines and setback lines by geographic area.
- Providing a tentative schedule of establishment for each geographic area at least 120 days prior to beginning a new cycle.
- Publishing proposed locations of baselines and setback lines at least 120 days prior to establishing the lines to receive public input.
- Holding at least one public hearing in the geographic area at least 90 days prior to establishing the lines.

- Accepting and reviewing data up to 30 days prior to establishing lines for a geographic area to determine if a proposed line should be revised.

The Workgroup discussed the importance of public outreach and education regarding the beachfront jurisdictional line revision process and the implications of the jurisdictional lines on private property. It was suggested that DHEC OCRM enhance its communication with the public on these topics and to work with local governments on additional opportunities to engage at the community level.

Acknowledgments

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