2021

City of Folly Beach Local Comprehensive Beachfront Management Plan

Initial Beachfront Management Plan, Adopted in 1992

Local Comprehensive Beachfront Management Plan, Adopted in 2015

This Version (5-Year Update) Adopted by the City of Folly Beach on July 13, 2021

ELKO COASTAL CONSULTING INC

2021 FOLLY BEACH LOCAL COMPREHENSIVE BEACH MANAGEMENT PLAN

5-Year Update, Prepared for:

The City of Folly Beach, SC

P.O. Box 48, Folly Beach, SC 29439

Prepared by:

Elko Coastal Consulting, Inc.

P.O. Box 1451, Folly Beach, SC 29439

(843) 371-782

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Cover Photo: June 6, 2020 photo taken from the Folly Beach Pier looking west

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1. INTRODUCTION

In accordance with the State Beachfront Management Act, the City of Folly Beach has prepared this 5-year update to its Local Comprehensive Beach M1anagement Plan (LCBMP) in coordination with the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (SCDHEC-OCRM). This document will help the City to become a more resilient coastal community. This Plan updates the 2015 LCBMP.

1.1 PURPOSE

The purposes of this Plan are to:

- fulfill the requirements of the Beachfront Management Act for a local beach management plan,
- inventory existing beach conditions and summarize current issues,
- maintain eligibility for State beach renourishment funding,
- serve as an important planning and decision-support tool for present and future ordinances and policies that preserve, manage or regulate the beach and dune system on Folly Beach;
- sustain a long-term beach preservation strategy that serves to enhance the environmental quality, recreational appeal, and storm-protection value of Folly's most important economic asset; and
- coordinate this LCBMP with the city's other long-term plans to ensure consistency between the numerous plans and policy documents.

Rather than be reactive, relying on the federal renourishment projects to restore the beach when erosion becomes an emergency situation, in 2015, the City of Folly Beach made a commitment through the LCBMP to proactively manage the beach in an effort to mitigate severe erosion in the future. By monitoring beach performance, and managing erosion issues between federal renourishment projects, the City aims to use this plan as a long-term beach preservation strategy with a goal to address chronic erosion issues to avoid emergency situations and the use of more aggressive coastal management tools. In the long-term the City's goal in 2015 was to avoid total loss of the restored beach and dune system between periodic renourishments. Numerous beachfront management strategies, described herein, have mitigated this risk to some extent. As such, the City now aims to sustain a holistic, long-term beach preservation and enhancement strategy to increase resilience through a variety of approaches. One approach is to implement the recommendations of the 2018 Dune Management Plan (Appendix 7.5) to sustain a wide beach and continuous dune system along the entire island.

1.2 HISTORY OF FOLLY'S BEACH MANAGEMENT PLANNING EFFORTS

The City of Folly Beach through Edge & Associates, Inc., submitted a Local Comprehensive Beach Management Plan to the state on December 18, 1991. The plan was approved in 1992. This was an important and proactive era in the history of the coastal management of Folly

Beach. Following publication of the 1987 U.S. Army Corps of Engineers (USACE) Section 111 report that found the majority of the erosion on Folly Beach was attributable to the Charleston Harbor jetties, Folly Beach became exempt from portions of the state Beach Management Act and the City signed a Local Cooperation Agreement with the USACE for periodic renourishment. A detailed history is provided later in the plan.

In 2015, the City finished a complete revision of the LCBMP that represented a major improvement over the 1992 plan. Significant changes were captured in the document including physical changes to the development of the island, ordinance, zoning, and comprehensive plan updates, and erosion mitigation efforts, such as beach renourishment. In addition, the City's proactive approach to beach preservation was documented in this long-term plan that leverages many coastal management tools available to address erosion issues.

In addition to serving as a planning tool for ongoing beach preservation efforts, the 2015 LCBMP was the first in a series of six long-term plans adopted by the City between 2015 and 2019 (Section 4.2.1). Along with the 2015 Comprehensive Plan, it kick-started a new era of proactive planning in contrast to previous City approaches.

This plan is a 5-year update of the 2015 LCBMP. It summarizes significant land use and zoning updates, most of which occurred during a coastal building moratorium in 2018. It also summarizes progress that has been made toward beachfront management goals presented in the 2015 LCBMP like increased regional sediment management collaboration with USACE and a local Dune Management Plan.

1.2.1 CITY OF FOLLY BEACH EXEMPTION, BEACH MANAGEMENT ACT

The exemption from portions of the Beach Management Act is unique to the City of Folly Beach. It is described here because it affects many beach management concepts discussed in subsequent portions of this plan.

There is no setback line on Folly Beach in accordance with S. C. Code of Law Sec. 48-39-290(E). The basis of this exemption is the Section 111 study conducted by the Corps that demonstrated that beach erosion on Folly Beach was attributable, in large part, to the construction of the Charleston Harbor jetties, rather than the natural process of erosion (Section 5.2.1). The jetties, constructed in 1898, and subsequent deepening of the shipping channel, have significantly reduced sand transport to Folly Beach.

A baseline at Folly Beach was established by agreement between the City and the former S. C. Coastal Council (now S. C. Department of Health and Environmental Control ("SCDHEC") in 1994 along the exposed beachfront rock revetments with the exception of the northeast end. Along the northeast end, the line was drawn along the seaward side of undeveloped super-beachfront lots (Section 1.3.3). SCDHEC's beachfront permitting jurisdiction is limited to areas seaward of the baseline. Other S.C. beachfront communities have both a setback line and a baseline. Unlike other coastal communities where lines are updated every 7 to 10 years, the baseline on Folly Beach has not been subject to periodic readjustment.

A 2013 ruling by the SCDHEC Board clarified SCDHEC's permitting jurisdiction on Folly Beach. The Board concluded that the SCDHEC has no jurisdiction landward of the baseline on Folly Beach. [1]

Another element of the Folly Beach exemption is that existing armoring structures (i.e., seawalls, bulkheads and revetments) can be rebuilt even if damaged more than 50%. The State code specifically states that erosion control devices exempt must not be constructed seaward of their existing location, increased in dimension, or rebuilt out of materials different from that of the original structure.[2] As described in Section 4.2.5, the City has a strictly enforced seawall ordinance to ensure properly engineered erosion control device installation when approved behind the baseline. Along the rest of the S.C. coast, armoring structures cannot be rebuilt if damaged more than 50%.

In the spirit of proactive beachfront management (see Section 1.3.4), the City complied with S. C. Code Ann. Sec. 48-39-320 in the development of the 2015 and 2020 LCBMPs. Although the City of Folly Beach is exempt from portions of the Beachfront Management Act, the City wants to proactively protect their most important asset and coordinate its efforts with the state. The City recognizes the importance of the beach from environmental, economic, and storm protection perspectives. Further, the City believes the plan to be an important tool for meeting the needs of Folly Beach for many generations to come.

1.3 OVERVIEW OF MUNICIPALITY/HISTORY OF BEACH MANAGEMENT APPROACHES

The City of Folly Beach, SC, is located 4 miles southwest of the entrance to Charleston Harbor and downdrift of the Charleston Harbor jetties. The island is approximately 6 miles in length and runs in a general northeast/southwest direction. It is bordered on the northeast by Lighthouse Inlet and Morris Island and on the southwest by the Stono River Inlet and Kiawah Island, as shown in Figure 1. The Folly River runs along the landward side of the island. Nearly all of Folly Beach's shoreline is armored with rock revetments and groins.

1.3.1 OVERVIEW OF MUNICIPALITY

Folly Beach is a small island community within Charleston County, SC. The town has a modest permanent residency. According to the City's Comprehensive Plan, the 2019 population of Folly Beach is estimated at 2,894. This represents an additional 277 people moving to the island since 2010 which translates to almost a 10% increase in total population.

Despite the small permanent residency, Folly Beach is the community of choice for many residents of the Charleston area for enjoying marine recreation. Folly Beach is the closest and most publicly accessible beach for the City of Charleston and the Tri-County area of Berkeley, Dorchester, and Charleston counties. The Berkeley-Charleston-Dorchester Council

[1] Herbert and Stacey Weiss, Requestors v. SCDHEC, Final Review Conference 7/11/13.

[2] S.C. Code Ann. § 48-39-300

of Governments reports that, the daily average of vehicles that pass the traffic station at Sol Legare and Folly Road is 10,600.

In the 1930s, construction of hotels and boardwalks were completed to accommodate the visitors. More than 15,000 people reportedly attended the 1937 fireworks show on the island. Of the 18.6 sq. miles of area associated with the City, 6.4 sq miles (>1/3) is considered waterfront, making Folly Beach an excellent location for a wide variety of waterfront activities. Like many other beachfront communities adjacent to large cities, property in the communities comes at a premium and tourism drives the health of the local economy. 2019 Census Bureau data shows that the median value of a single-family home on Folly was $569,900. The mean income for Folly was $90,361. The rule of thumb for housing affordability is that no more than 30% of income should go towards housing costs. In 2019, 28% of full-time residents pay more than 30% of their incomes toward mortgages and rents.

FIGURE 1. MAP OF THE CITY OF FOLLY BEACH AND SURROUNDING COASTAL REGION

Charleston County Park and Recreation Commission (CCPRC) operates three properties on Folly Beach: the Folly Beach County Park (FBCP) on the west end of the island, the Edwin S. Taylor Folly Beach Fishing Pier (FBFP) in the center, and Lighthouse Inlet Heritage Preserve on the northeast end. CCPRC also owns two beachfront lots on the 2nd block east. At the time of the 2021 LCBMP update, the FBFP was closed to the public for a full replacement. The new concrete pier is scheduled to reopen in approximately Spring 2023. Overall, Folly Beach has

52 public accesses, ample public parking within 1,000 ft of the beach and a county park on each end and the middle; thus, the island's beaches are extremely publicly accessible.

1.3.2 HISTORY OF BEACH MANAGEMENT APPROACHES

Erosion control has been the city's primary beach management objective since the 1970's when the first erosion committee was formed by council. Since the 1990's, the city has relied on federal beach renourishment. Both the city and the federal government have made long-term commitments to beach nourishment as the primary erosion management tool through a 1992 Local Cooperation Agreement (LCA). The present 50-year agreement expires in 2042. At the time of publication of this 2021 update, USACE has published a draft feasibility report for the project to be reauthorized for another 50 years entitled the "Integrated General Reevaluation Report and Environmental Assessment for the City of Folly Beach" (USACE 2020).

Since the 3-mile-long Charleston Harbor jetties were built in the late 1800's, Morris and Folly Islands, located downdrift, have experienced severe erosion due to the interruption of sediment bypassing around the harbor's previously expansive ebb tidal delta. Most of the sand that formerly bypassed Charleston Harbor and was transported to Folly Beach now either accumulates on the north side of the jetties or is dredged from the entrance channel and disposed offshore, which has led to a slow erosion of the island. This erosion led to the loss of some beachfront homes and coastal roads throughout the 1940s and 1950s (Levine et. al., 2009).

In an attempt at erosion management, the South Carolina State Highway Department installed 48 timber and rock groins along Folly Beach. Private armoring structures have been constructed along nearly all the beachfront. Pursuant to Folly's exemption from portions of the Beachfront Management Act, property owners are still permitted to build seawalls on properties landward of the baseline according to the City's regulations in ordinance 151.23.

The first federal beach nourishment project was constructed on Folly Beach in 1993. Section 5.2.1 provides a history of the city's efforts to obtain a federal project authorization and subsequent renourishment projects.

1.3.3 DEVELOPMENT OF SUPER-BEACHFRONT LOTS

During the 1960s, a beachfront road called Benke Drive existed seaward of today's East Ashley Drive. The area was accretional and lots on either side of the road were platted and deeded to individual owners. By the 70's and into the 80's, these beachfront lots and Benke Drive had been lost to erosion and were underwater. Along the row of recognizable beachfront lots, *seawalls and bulkheads existed* on most properties along East Ashley Drive to manage erosion. In some cases, the owners of these beachfront homes also owned the Benke Drive lot that was underwater on its ocean front side.

In the mid-1980s, the area once again became accretional when a sand bar bypassed Lighthouse Inlet and attached to the northeast end of the island. In fact, following Hurricane Hugo in September 1989, sand was scraped from the road after the beach was overtopped in this area and trucked to other parts of the island to build temporary sand dunes. In 1992,

surveys acquired during the federal beach nourishment project confirmed significant accretion on the northeast end. *The state baseline was drawn through the yet-undeveloped Benke Drive lots, leaving room for future development*. The baseline appears to have been drawn along the post-Hugo escarpment line.

The new baseline meant that twenty-eight (28) of the Benke Drive lots, now known as "super-beachfront" lots, were now available to be sold or developed by current owners. Folly Beach City Council hoped to prevent the development, and began looking for money to purchase the lots to do so. The city approached a number of state and federal agencies seeking financial assistance. There was agreement that the lots shouldn't be developed, but funding to purchase the lots was not available.

The City resisted issuing permits, and eventually a number of lawsuits were threatened. This was around the time of the *Lucas* decision, and there was a real threat that preventing development would be construed as a regulatory taking, for which the City would then have to pay compensation.[3] The first building permit for a super-beachfront lot was issued in 1997.

These super-beachfront lots have become a concern for the City for a number of reasons. On a national scale, the development of these lots has been blamed on beach nourishment with the argument that nourishment encourages unsound beachfront development. For the federal beach project, these properties have been subject to severe erosion and storm damage leading up to the most recent renourishments (see Section 5.2.3). At the local level, some property owners behind the super-beachfront lots are disgruntled that construction was permitted in front of their (previously) beachfront homes.

In an effort to avoid future development of this nature, the City had taken several proactive steps at the time of the 2015 LCBMP, including donation of super-beachfront lots to the Folly Land Trust. Since 2015, Chapter 168 of the City Ordinances required nonconforming lots of the same ownership that are adjacent to be developed as one parcel. The City now requires 20 ft of street frontage for access to developed lots. Finally, the City required that new construction meet current setbacks and obtain a permit for on-site septic system, which in some cases is not possible on the remaining lots. Since that time, significant zoning and land-use regulations have been implemented (Section 1.3.4) that should prevent the development of additional super-beachfront lots in the future.

1.3.4 2015-2020 PARADIGM SHIFT TO PROACTIVE PLANNING

During the decades that followed the exemption from portions of the Beachfront Management Act (Section 1.2.1), the City became somewhat less proactive and more dependent on the federal renourishment project to address beach erosion issues.

Recall the exemption means there are no state setbacks for beachfront development and no prohibitions on erosion control structures. The exemption was a huge achievement for City leaders at the time but it fostered opposition to local regulations that might encourage increased state-imposed development restrictions. That mind set, combined with the

[3] *Lucas v. S.C. Coastal Council*, 505 U.S. 103 (1992).

confidence that the beach would always be there, and that, even if it wasn't, the City could always reinforce and add to shore armoring, created an attitude of complacency in the face of increasing erosion, sea level rise and climate change. Renourishment planning and funding became the primary goal of the City to the exclusion of most other considerations.

The tide began to change for long-term coastal planning on Folly Beach in 2010 when the zoning code was repealed and rewritten to include a 5- to 10-foot beachfront setback from the state baseline. Following a problematic federal renourishment effort in 2013, the City recognized the need to once again become proactive and take the lead in long-term beach preservation planning. In the mid-2010's, the City formed new beach management committees, hired a coastal management consultant, developed a beach monitoring plan, proposed a long-term beach preservation budget, applied for and received coastal access grants, conducted a drainage study on the east side with a grant from the County, and created the Folly Beach Nature Conservancy to acquire vulnerable beachfront lots.

In the last five years, there has been a major paradigm shift in the Folly Beach community. Where coastal development regulations were once a taboo topic and additional ordinances were difficult to pass, City leaders now embrace proactive planning. Since the 2015 Comprehensive Plan first directed the City to look at improving resiliency, staff and elected officials have been on a continuous journey of strengthening coastal land use regulations.

Since the adoption of the 2015 LCBMP, the City adopted five additional long-term plans which establish goals and objectives to manage the effects of climate change and sea level rise. The goals identified in these plans range from broad directives such as "studying the viability of living shorelines" to specific projects such as groin rehabilitation and drainage system modifications. They include:

- 2015 Comprehensive Plan,
- 2017 Sea Level Rise Adaptation Plan: Primary source document for the City's climate work,
- 2018 Dune Management Plan (Appendix 7.4): Represents a major shift in policy for the city to lessen its reliance on seawalls by augmenting (and in some cases replacing) armoring with a dune system. It included a 40-foot setback and buffer from the state baseline that is protected from development or redevelopment. This change impacts 2/3 of all beachfront homes to some degree,
- 2018 Strategic Plan, and
- 2019 Marshfront Management Plan: Based on the format of the LCBMP and the first official recognition for the city that marsh, and not the beach, will be the area where the effects of sea level rise are greatest. It identifies the marshfront as a primary target for regulation, protection, and restoration. It included a 15-foot setback and buffer from the critical line that is protected from development or redevelopment.

Each of these plans was developed in collaboration with the community through continuous stakeholder engagement. Community support for sweeping environmental reform was strong. On May 30th 2018, City Council approved a coastal building moratorium on the development of lots on either the beach or the marsh. The moratorium was in place until mid-February 2019. During this time, action items for the Dune and Marshfront Management

Plans were agreed upon and city leaders implemented the recommendations in real-time via new ordinances.

As a result of this proactive planning process, twenty-five new land use regulations were adopted by the City between 2015 and 2020. Most were adopted during the nine-month moratorium and included ordinances for setbacks, buffers, septic tanks, marsh island development, dune protection, seawalls, construction elevations and other regulations related to building along the beach and marshfront. They are described in detail in Section 4.2.4. For example, the City merged substandard, super-beachfront lots (Section 1.3.3) with the same owner with the lots behind them, thereby reducing the likelihood of future super-beachfront houses in front of the existing row of beachfront houses. Overall, the effort was an exceptionally progressive and efficient process of implementing adaptation actions by the City.

1.4 CURRENT BEACH MANAGEMENT ISSUES

The greatest challenge affecting beach management for the City of Folly Beach is chronic beach erosion and the preservation of the beach system for storm protection, economic, and ecosystem benefits. The entire island is subject to chronic erosion with the northeast end as the most critical present hot spot.

1.4.1 FOLLY BEACH FEDERAL BEACH NOURISHMENT PROJECT

As mentioned in Section 1.3, the City's primary erosion mitigation tool is the federal beach nourishment project that provides periodic renourishment at an 85% federal cost. Beach nourishment addresses the lack of sand causing chronic beach erosion; thus, it serves as the foundation of beach preservation planning. A detailed history of the Folly Beach federal beach nourishment project is provided in Section 5.2.1. The City's plan to sustain the federal program into the future is detailed in Section 6.1.1.

1.4.2 OTHER BEACH MANAGEMENT ISSUES

Dilapidated timber-pile groins, many of which were installed by SC DOT in the mid-1900's, have been identified as a local beach management issue. These structures have become relatively ineffective at their original intent, which was to trap sand and stabilize the beach. In addition, they pose a safety hazard to humans, may interfere with turtle nesting and hatchlings, and they unnecessarily interfere with beach construction work. Rehabilitation of eighteen dilapidated groins along the central portion of the island has contributed to a reduction in erosion rates. This is discussed in more detail in Sections 5.1.1 and 5.2.

The city is challenged to manage engineered sand dunes in order to balance the needs of storm protection, ecosystem restoration, and recreational beach space. The 2018 Dune Management Plan (Appendix 7.4) recommends a continuous line of defense along the beachfront while maintaining at least 50-ft of recreational beach space from the toe of the dune to the high tide line.

All of the properties on Folly Beach, with the exception of the commercial district and certain planned residential developments (e.g., Sunset Point), are on septic sewage. Consequently, every developed beachfront property contains a septic tank. Exposed septic tanks on the beach could pose a beach management issue in the case of extreme erosion in the wake of a major disaster like Hurricane Sandy. The 2017 Folly Beach Sea Level Rise Adaptation Plan recommended a septic vulnerability study which has been initiated in partnership with North Carolina Sea Grant.

Vehicular traffic is a concern on the approach to Folly Beach, particularly on holidays and summer weekends. Folly Road is the only route for traffic to enter and leave the island.

Since the 2015 LCBMP, litter has become an important beach management issue for Folly Beach. The SCDHEC-OCRM, in collaboration with the Charleston Chapter of the Surfrider Foundation and the Folly Green Team, implemented a Cigarette Litter Reduction Pilot Study in 2016. The project, funded by the National Marine Sanctuary Foundation and the National Oceanic and Atmospheric Administration (NOAA), was designed to enhance awareness and promote proper disposal of cigarette litter on the beach. Many other initiatives have been spawned such as increased beach sweeps, an island-wide plastic and Styrofoam ban, and a 2021 ban on smoking on the beach.

1.4.3 OTHER EROSION MANAGEMENT OPTIONS

Due to the erosional nature of Folly Beach, and the delay in appropriated federal renourishment funds, property owners have been compelled to construct erosion control structures on private lands. Between 2010 and 2013, a number of seawalls were built landward of the state jurisdictional baseline on the northeast end of Folly Beach to halt erosion of private property and protect residential structures. The majority of the Folly Beach shoreline is armored with seawalls that have been in place for decades. Most of the seawalls (with the exception of those along the northeast end) act as a buried, redundant level of storm protection, only to be exposed under unusual and severely-erosional circumstances when the entire beach and dune system is lost.

While the federal government agrees that the jetties cause more than half of the City's erosion[4], the City also wishes to consider other erosion control alternatives that could extend the life of the sand on the beach between periodic renourishments. Because most erosion control approaches manage the flow of sand and much of the sand Folly would normally receive is trapped by the Harbor, Folly must be prepared to manage the sand placed by renourishment in a way that preserves the beach for shore protection, recreation, and natural habitats. To this end, this plan considers a spectrum of erosion control possibilities and identifies several approaches that the City would like to study more closely and consider adopting.

The City of Folly Beach has and/or will consider the following approaches to erosion control: rehabilitation of existing groins, other erosion control devices once a demonstrated history of utility has been demonstrated elsewhere, large-scale beach nourishment, filling erosional

[4] See discussion, Section 5.2.1

hot spots between periodic renourishment events (small scale), dune restoration including planting native vegetation and installing sand fencing, and property acquisition if necessary.

1.4.4 ENVIRONMENTAL PROTECTION

The final major goal of the beachfront management plan is the protection of natural habitats and the sand dune system. In addition to providing storm and erosion protection, the beach and sand dune system provide important habitats including loggerhead and leatherback turtle and piping plover nesting grounds. The city has been designated as a critical loggerhead sea turtle habitat and intends to continue protecting this species and their offspring. A 2015 Economic Analysis (Rhodes and Pan, 2015) concluded that Charleston area households would collectively place an annual **$2 million value** on protecting the marine turtle species that depend upon Folly Island's front beach area as nesting habitat.

2. INVENTORY OF EXISTING CONDITIONS

2.1 GENERAL CHARACTERISTICS OF THE BEACH

Folly Beach is a barrier island, approximately 6 miles long, extending from Lighthouse Inlet to the entrance to the Folly River. With the exception of large properties on each end of the island managed by the Charleston County Parks and Recreation Commission, the island is developed with mostly single-family homes. The Center St./downtown beachfront area contains commercial buildings and a fishing pier. Few vacant lots remain along the beachfront, but thanks to robust zoning, redevelopment has not changed the character of the island. With the exception of several super-beachfront lots that were developed on the northeast end of the island, reduced sediment supply rather than development, is the primary cause of beach and dune system loss. A detailed discussion of the local beach morphology, including short- and long-term beach and dune changes is provided in Section 5.

2.2 GENERAL LAND USE PATTERNS

The primary land use classification in the City of Folly Beach is low density residential. The largest zoning district is Residential Single Family (RSF) which covers approximately 85 percent of the island. Although there are scattered properties containing more than one residential unit that have been grandfathered, there are no commercial or high-density residential uses located in the RSF district. The standard lot size in this district is 10,500 square ft and the average density is 4 units per acre.

In 2010, the maximum size of a home allowed on a standard Folly Beach lot was reduced from 4,500 heated square ft to 3,600 heated square ft. Maximum lot coverage was reduced from 50% to 35% of the lot's high ground. In 2014, the City increased side setbacks from 5' to 10' and required all new driveways to be constructed with pervious surfaces. Finally, the City passed an ordinance which requires that all new construction be built to V-Zone flood standards even if located in A-Zones.

Higher density residential uses are clustered in the center of the island and along the causeway leading from the mainland. Historically, each wave of multifamily housing led to greater restrictions on the allowable density of future projects. The first condominium project in the City was constructed in 1996 with an allowable density of 32 units per acre. The current maximum density is 12 units per acre. The area available for future multifamily construction has also been gradually reduced over time. Currently no future multifamily construction is allowed on Folly Island and is limited to properties on the causeway.

The commercial core of the island is roughly 2 blocks wide and 6 blocks long. Commercial uses include retail, lodging, bars, and restaurants. The largest physical and most intense commercial use is the Tides Hotel which is located on the beach at the end of Center Street. Growth of the commercial district is extremely restricted. Steady reductions in lot coverage allowances combined with increased parking requirements and a commitment to prevent the expansion of commercial zoning districts have all served to limit actual and potential expansion of the business district.

2.2.1 BEACH USES

Users enjoy Folly's recreational beach much in the same way as other public beaches in South Carolina, for sunbathing, swimming, surfing, kite boarding, surf fishing, dog walking, bicycling, walking and running. Since the 2014 renourishment, users have been combing the beach for shark's teeth and shells pumped in by the dredge. The Pier at Center Street is used for fishing, thus swimming is prohibited within 500 ft. Surfing and boating are prohibited within 3 blocks of the center street pier to promote a safe swim zone. Beach chairs and umbrellas are offered along this central commercial district. Bonfires, alcohol, storage of boats, driving and camping are prohibited on the beach. The preserved lands on either end of the island are popular with naturalists. The City must be notified of all gatherings of 25 persons or more on the beach.

2.2.2 ECONOMIC BENEFITS AND VALUES OF THE BEACH

The City of Folly Beach contributes tax revenue in the form of property, income, sales, accommodation, and hospitality taxes. Further, the City's beach and accompanying rental properties create a number of jobs in fields like hospitality, retail, property management, property service (cleaning, landscaping), and City government. More indirectly, the beach is one of the most publicly accessible beach recreation areas in South Carolina and further provides valuable habitat area for endangered species.

The following economic information was collected and analyzed by the Office of Tourism Analysis (OTA) at the College of Charleston (Rhodes and Pan, 2015). The estimated jobs, income, and sales generated include both direct and secondary effects in the Tri-County area, not Folly Beach alone. Where possible, statistics were updated to reflect 2020-21 values in the 5-year LCBMP update.

Visitor survey data indicates that about 60% of all Charleston area visitors rated beaches as an important factor in deciding to visit the Charleston area. Nearly **1 million** non-residents visited Folly Beach at least once while in the Charleston area during 2014. Of the visitors coming from outside Charleston, Berkeley, and Dorchester Counties, 92%, resided in other

states or countries (mainly Canada) with about 27% coming from South Atlantic states such as North Carolina (8%), Florida (7%) and Georgia (4%)

The City's front beach area, like other natural amenities or resources in the Charleston area, is especially important because of its ability to attract non-resident visitors to the area. These non-resident visitors inject new money into the local and state economy through their spending on goods and trip related services (e.g. hotel lodging, restaurant meals). Moreover, these new dollars subsequently ripple through the local and state economy producing secondary economic benefits that increase jobs and income for residents.

The average trip spending for non-resident Folly Beach visitors in the Charleston area that used paid accommodations (e.g. hotels, beach rental) was $1,160 per person. The 2014 total economic impacts including multiplier effects, estimated spending by Charleston visitors attributable to the Folly Island beach area generated approximately **$117 million** in sales, which generated over **1,100 jobs** and nearly $39 million in income.

Since 2009 total annual gross sales by Folly Beach's various businesses (e.g. restaurants, retail stores, beach house rental) which annually averaged about $66 million during the previous three years increased at an annual average rate of **11%**. This sales growth rate was substantially higher than any other beach community in the Charleston area.

It was also estimated that Charleston area visitor spending attributable to the City including its beach areas generated approximately **$22 million** in annual tax revenues for the federal, state, and local governments during 2014. Also, these tax revenues not only include the usual tourist type taxes (e.g. accommodation taxes, etc.) but include various property taxes and other indirect taxes paid by tourism-oriented businesses.

Folly Beach's accommodations revenues generated approximately $942,000 in state accommodation taxes (A-taxes) and $1,300,000 in local A-taxes in FY2019-20. The SC Department of Revenue annually distributes about $100,000 of the state A-tax revenues to support tourism related economic development in other, mainly rural, counties that do not have a significant tourist-based economy.

The City has approximately $83.6 million in assessed value for all property for the year 2020. This will result in an expected collection of approximately $2.6 million in property taxes for the City in FY2021.

The recreational opportunities offered by Folly Beach's front beach also provide substantial non-market oriented economic benefits at both the regional and state level. For example, the annual economic value, not the economic impact, of the front beach for recreational beach users was nearly **$4.5 million** in 2014.

2.3 BEACHFRONT DEVELOPMENTS AND ZONING

Land fronting the beach on Folly Island falls into three zoning districts. At either end of the island are large parcels zoned Conservation (CN) (Figure 2). The CN zoning allows for very limited development of boardwalks and other structures and is intended to maintain

property in an undeveloped state. The CN properties are currently owned and operated by Charleston County Parks and Recreation and account for approximately 20% of the total shoreline of the island.

Property between either end of the island and the central commercial district is exclusively zoned RSF and consists of only single-family housing. Home sizes on the front beach range from small cottages to large estate sized houses. The current maximum allowable square footage is 3,600 heated square ft. A handful of homes are built to the prior maximum allowable size of 4,500 square ft, but the majority of the houses on front beach are still 3,000 square ft or less. The RSF properties account for approximately 70% of the beachfront.

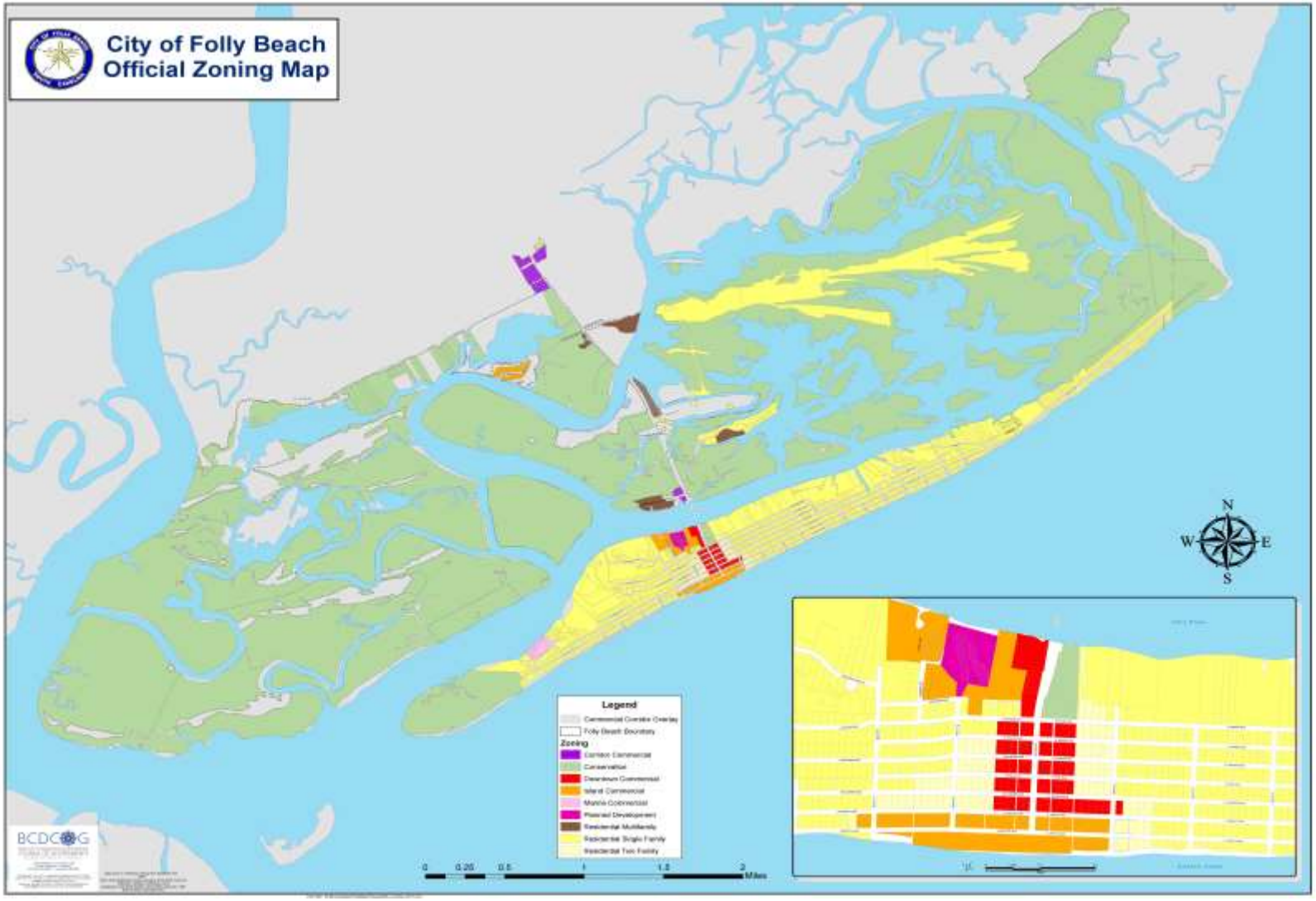

FIGURE 2. CITY OF FOLLY BEACH CURRENT LAND USE MAP.

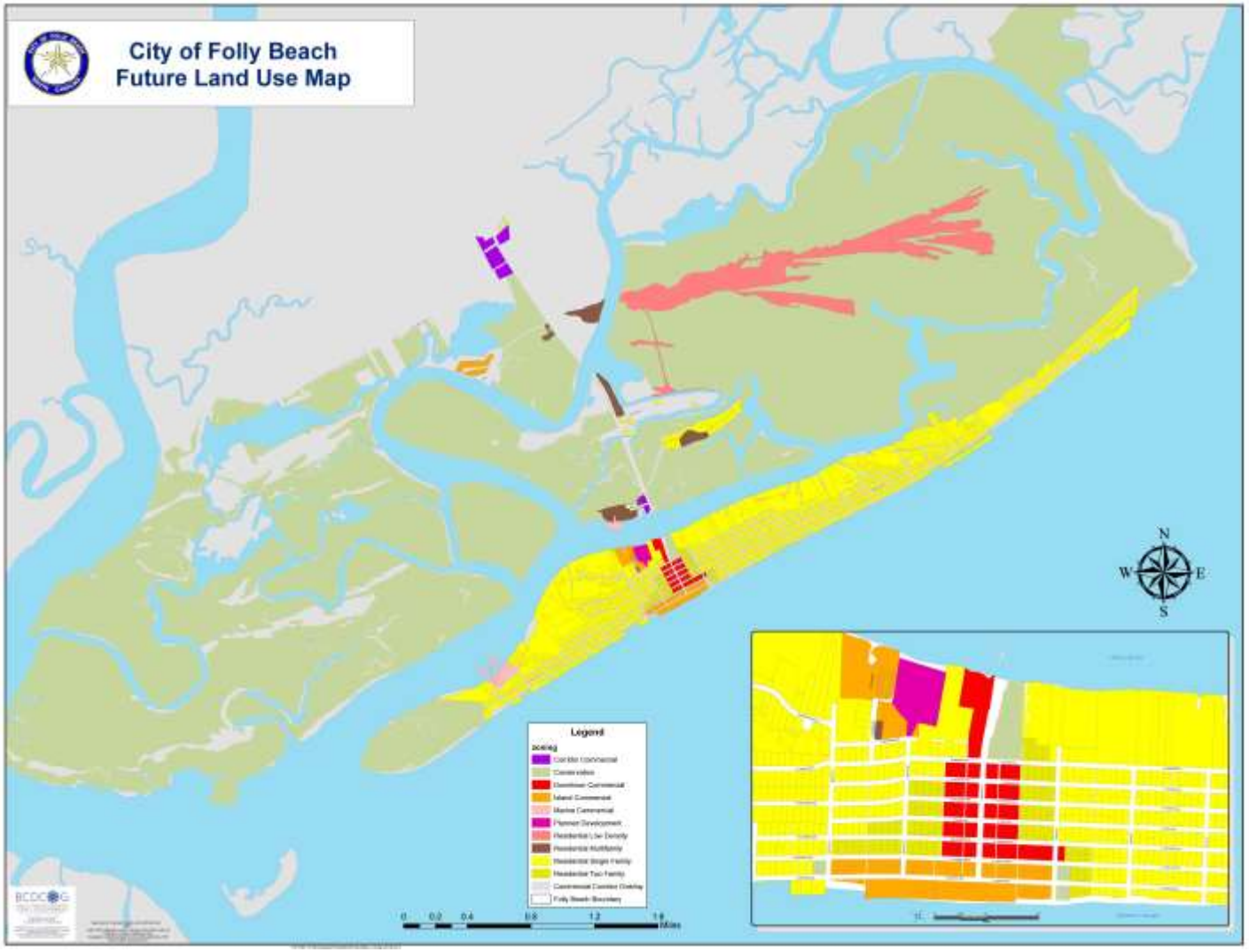

FIGURE 3. CITY OF FOLLY BEACH FUTURE LAND USE.

The remaining 10% percent of the beachfront area is zoned Island Commercial (IC). The IC district consists primarily of multifamily developments. Individual properties range from 96 to 4 units. This area is also the location of the largest structure on Folly Beach, the 9 story Tides Hotel.

In 2010, the setback from the state baseline was increased from 0 ft to a minimum of 5 ft (maximum 10 ft) and the critical line setback was increased from 5 ft to 10 ft. In 2020, a Dune Management Area (DMA) was established 40 ft from the state baseline and the critical line setback was increased to 15 ft.

As noted above, the City of Folly Beach is exempt from the state beachfront setback area restrictions, but carefully regulates beachfront development with zoning and land use regulations. The beachfront is primarily zoned for Single Family Residential with very limited commercial and multifamily uses. There are 6 multifamily developments totaling approximately 4.25 acres and 132 units. The largest oceanfront multifamily development is Charleston Oceanfront Villas (built in 1995) with approximately 94 units on roughly 3 acres. The remaining 5 multifamily properties were constructed between 1995 and 2005 and consist of small buildings ranging from 4 to 12 units each on .25 acre lots. There are 2 commercial developments totaling approximately 3.8 acres: The Tides Hotel (a 132 room full service hotel built in the late 1980s), and the Folly Beach Fishing Pier and Tackle shop which was built in 1995.

Because current land use restrictions prohibit multifamily or commercial development beyond 2nd Street East and 3rd Street West and there are currently no vacant properties with commercial or multifamily zoning, the City does not anticipate further commercial or multifamily development (Figure 3).

2.3.1 BEACHFRONT STRUCTURAL INVENTORY

Appendix 7.1 inventories the number of beachfront lots located seaward of the ocean front road (either Ashley or Arctic, whichever is more seaward) on Folly Beach (Table 9). They are based on certain classifications and include 321 Single Family; 124 Condominium Units; 1 Governmental Building; 1 Hotel; 3 Recreational; 2 Religious; 13 Residential Duplex/Triplex; 4 Small Apartments; 2 Vacant Commercial Lots; and 14 Vacant (developable) Residential Lots, as well as 7 pools, and 179 erosion control structures. There are a number of undevelopable beachfront lots as well, for example, those that have been donated to the Folly Beach Nature Conservancy and those that lie within the DMA (Section 4.2.1.3) which are not included in this structural inventory. Lacking a setback line, the most seaward oceanfront road was selected as a starting point for this inventory. Maps of the structural inventory are also included in Appendix 7.1.

2.4. NATURAL RESOURCE AND ECOLOGICAL HABITATS

The beach and dune system along Folly Beach provides important habitat for benthic organisms in the surf zone, for nesting sea turtles and shorebirds on the beach, and for native dune vegetation, such as sea oats and panic grass, and other coastal fauna. The U.S. Fish and Wildlife Service designated loggerhead critical habitat on Folly Beach in 2014. The red knot

was listed as a threatened subspecies in 2014 but critical habitat for this species has not been designated.

Following the 2005, 2014, and 2018 federal renourishment projects, as well as the 2013 CCPRC project at FBCP, dune vegetation and sand fencing were installed (see Section 1.3) with goals of restoring a robust vegetated dune system to provide storm protection with "green infrastructure," retain sand in the beach/dune system, reduce road maintenance, and attract native flora and fauna (Elko, 2013).

2.4.1 THREATENED AND ENDANGERED SPECIES

Threatened and endangered species in Charleston County, South Carolina that have been listed by the US Fish and Wildlife Service (USFWS) are shown in Table 1. Any major beach alteration activity (including nourishment) requires consultation with USFWS and NOAA National Marine Fisheries Service to ensure no adverse effects on these listed species or their listed or proposed critical habitat. In fact, beach nourishment has restored approximately 23 acres of critical loggerhead sea turtle and red knot habitat on Folly Beach since 1992.

TABLE 1. CHARLESTON COUNTY, SOUTH CAROLINA AT-RISK, CANDIDATE, THREATENED AND ENDANGERED SPECIES (FROM USFWS, 2020)

CHARLESTON COUNTY

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibians	Frosted flatwoods salamander (T, CH)	*Ambystoma cingulatum*	January 1-April 30	Larvae present in breeding ponds
	Gopher frog (ARS)	*Lithobates capito*	Breeding: October-March	Call survey: February-April
Birds	American wood stork (T)	*Mycteria americana*	February 15-September 1	Nesting season
	Bachman's warbler (E)	*Vermivora bachmanii*	May 1-June 15	Breeding
	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Black-capped petrel (ARS)	*Pterodroma hasitata*	April-October	Offshore water primarily
	Eastern black rail (P)	*Laterallus jamaicensis jamaicensis*	April-June	Minimum of five surveys/survey point
	Piping plover (T, CH)	*Charadrius melodus*	July 15-May 1	Migration and wintering
	Red-cockaded woodpecker (E)	*Picoides borealis*	March 1-July 31	Nesting season
	Red knot (T)	*Calidris canutus rufa*	August 1-May 31	Migration and wintering
	Saltmarsh sparrow (ARS)	*Ammospiza caudacuta*	Fall/winter	Fall/winter surveys
Crustaceans	None Found			
Fishes	Atlantic sturgeon* (E)	*Acipenser oxyrinchus**	February 1-April 30	Spawning migration
	Shortnose sturgeon* (E)	*Acipenser brevirostrum**	February 1-April 30	Spawning migration
Insects	Frosted elfin (ARS)	*Callophrys irus*	March - June	
	Monarch butterfly (ARS)	*Danaus plexippus*	August-December	Overwinter population departs: March-April
Mammals	Finback whale* (E)	*Balaenoptera physalus**	November 1-April 30	Off the coast
	Humpback whale * (E)	*Megaptera novaengliae*	January 1-March 31	Migration off the coast
	Northern long-eared bat (T)	*Myotis septentrionalis*	Year round	Winter surveys not as successful
	Right whale* (E)	*Balaena glacialis*	November 1-April 30	Off the coast
	Sei whale* (E)	*Balaenoptera borealis*		
	Sperm whale* (E)	*Physeter macrocephalus*		
	Tri-colored bat (ARS)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
	West Indian manatee (T)	*Trichechus manatus*	May 1-November 15	In coastal waters
Mollusks	None Found			

CHARLESTON COUNTY

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Plants	American chaffseed (E)	*Schwalbea americana*	May-August	1-2 months after a fire
	Boykin's lobelia (ARS)	*Lobelia boykinii*	May-July/August	
	Canby's dropwort (E)	*Oxypolis canbyi*	Mid-July-September	
	Ciliate-leaf tickseed (ARS)	*Coreopsis integrifolia*	August-November	
	Pondberry (E)	*Lindera melissifolia*	February-March	
	Seabeach amaranth (T)	*Amaranthus pumilus*	July-October	
Reptiles	Eastern diamondback rattlesnake (ARS)	*Crotalus adamanteus*	Most of the year	Peak: April-November
	Green sea turtle ** (T)	*Chelonia mydas* **	May 1-October 31	Nesting and hatching
	Kemp's ridley sea turtle ** (E)	*Lepidochelys kempii***	May 1-October 31	In coastal waters
	Leatherback sea turtle ** (E)	*Dermochelys coriacea* **	May 1-October 31	Nesting and hatching
	Loggerhead sea turtle ** (T, CH)	*Caretta caretta* **	May 1-October 31	Nesting and hatching
	Southern hognose snake (ARS)	*Heterodon simus*	Most of the year	
	Spotted turtle (ARS)	*Clemmys guttata*	February-mid April	

* Contact National Marine Fisheries Service (NMFS) for more information on this species.
** The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species.
ARS Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS* Species that are either former Candidate Species or are emerging conservation priority species.
BGEPA Federally protected under the Bald and Golden Eagle Protection Act
C FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species.
CH Critical Habitat
E Federally Endangered
P or P – CH Proposed for listing or critical habitat in the Federal Register
S/A Federally protected due to similarity of appearance to a listed species
T Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

2.4.2 TURTLE NESTING

Folly Beach is designated by the United States Fish and Wildlife Service as critical nesting habitat for federally protected endangered and threatened sea turtles. Sporadic nest protection efforts existed prior to 1997, but consistent, long-term data was not collected until the Folly Beach Turtle Watch (FBTW) Program was organized.

Since 1997, loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) sea turtles nesting on Folly Beach have been protected by a dedicated group of volunteers who are trained and permitted by the South Carolina Department of Natural Resources (SCDNR) Endangered Marine Turtle Conservation Program to identify, access, relocate, monitor, inventory and report data for nests laid on its ocean and inlet beaches. During this time, Folly Beach has been home to over 1,350 loggerhead nests and 3 leatherback nests.

Usually in mid-May, 3-foot-long female sea turtles weighing about 250-300 pounds crawl ashore during the night on Folly Beach to begin the ancient ritual of nesting in the dry sand margin above the high tide line. With rear flippers, they dig a chamber about 6" in diameter and 18" deep, then deposit an average of 120 eggs, cover them with sand, and crawl back to the water. The process takes approximately an hour and a half, and is repeated at two-week intervals until mid-August, resulting in an individual turtle laying between 4 and 7 nests during one season. The females will then typically take 2-3 years off before returning, usually to the same general area, to begin a new nesting season. About 55 days after a nest is laid, hatchlings will emerge during the night and quickly find their way across the beach to the water where they begin their long swim to the floating sargassum seaweed in the Gulf Stream. Night nesting and hatching is typical, but daytime nesting and hatching has been observed.

Nest success is highly dependent on site selection. Tidal flooding and erosion have a negative effect on nest success. The Folly Beach Turtle Watch volunteers are trained and licensed to assess nest sites and relocate eggs if necessary, to ensure successful development. Nest relocation involves selecting an appropriate site, digging a new egg chamber, then carefully transferring the clutch to the new nest. All nests, *in situ* or relocated, are staked, taped, and marked with an orange SCDNR "Protected Nest" sign so that the location can be monitored until after the nest has hatched.

Since 1998, volunteers have assessed over 2,200 sea turtle crawls, found 1,359 nests, and relocated 736 of those nests. The lowest number of nests (20) were laid in 2007, and the highest number (145) in 2019 (Figure 4). Additional data are presented in Table 2 and Table 3 that show comparisons of total nests to total false crawls, and *in situ* nests to relocated nests. Both of these comparisons are indicators of the condition of the nesting habitat.

The condition of sea turtle nesting habitat on Folly Beach changes rapidly and significantly with continuous tidal erosion, the construction of sea walls and granite rip-rap by front beach property owners, periodic beach nourishment projects to protect public and private investments, increased vehicle traffic by beach management patrols and permitted vendors, foot traffic through developing dune lines, artificial lighting from beach front homes and public utilities, litter, personal paraphernalia, and large open holes left on the beach overnight.

The City of Folly Beach has enacted several long-standing ordinances that help to reduce negative impact on nesting habitat (see paragraphs on "Protection of Loggerhead Sea Turtles", Folly Beach Code, Chapter 151: "Beach Preservation and Construction Provisions"). These include regulations pertaining to the destruction of sea oats, storage of watercraft on the beach, dune protection during construction, maintenance of public walkovers, artificial light associated with pre-existing and new construction, the planting of invasive beach vitex, construction and maintenance of seawalls, and vehicular traffic on the beach. Folly Beach Code, Chapter 117 ("Short Term Rentals") ensures that a summary of pertinent local ordinances is included in rental agreements and posted in rental units, and Folly Beach Code, Chapter 166 ("Development Standards") reinforces the City's support for reducing illumination of the beach front.

Recent additional ordinances include prohibition of single use plastic bags, balloons, and Styrofoam articles from the beach (Chapter 151.08, 2016), abandoning holes on the beach (Chapter 151.09, 2019), abandonment of personal property left on beach after sunset (Chapter 151.14, 2015), and seawall construction during turtle season (Chapter 151.23, 2020).

TABLE 2. SEA TURTLE NESTING AND RELOCATION DATA FOR THE CITY OF FOLLY BEACH FROM 1998 TO 2020

	Total Nests	Total Nests In Situ	Total Nests Relocated	% Relocated
1998	38			
1999	60	31	29	48.3%
2000	51	29	22	43.1%
2001	51	29	22	43.1%

2002	44	11	33	75.0%
2003	50	13	37	74.0%
2004	22	10	12	54.5%
2005	37	6	31	83.8%
2006	55	25	30	54.5%
2007	20	5	15	75.0%
2008	63	12	51	81.0%
2009	35	14	21	60.0%
2010	54	13	41	75.9%
2011	82	33	49	59.8%
2012	74	16	58	78.4%
2013	108	22	86	79.6%
2014	22	2	20	90.9%
2015	98	43	55	56.1%
2016	88	52	36	40.9%
2017	71	52	19	26.8%
2018	34	19	15	44.1%
2019	145	107	38	26.2%
2020	57	41	16	28%
Totals	**1,359**	**623**	**736**	**54.2%**

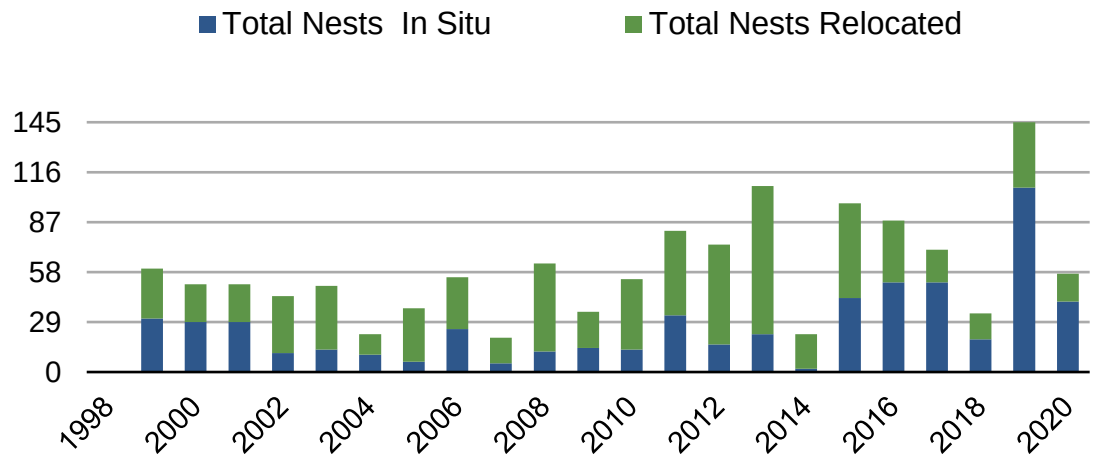

FIGURE 4. IN SITU AND RELOCATED TURTLE NESTS ON FOLLY BEACH SINCE 1998.

TABLE 3. SEA TURTLE CRAWL DATA FOR THE CITY OF FOLLY BEACH FROM 1998 TO 2020.

	Total Nests	Total False Crawls	Total Crawls	% False Crawls
1998	38			
1999	60	34	94	36.2%
2000	51	29	80	36.3%
2001	51	11	62	17.7%
2002	44	13	57	22.8%

2003	50	55	105	52.4%
2004	22	19	41	46.3%
2005	37	29	66	43.9%
2006	55	24	79	30.4%
2007	20	21	41	51.2%
2008	63	26	89	29.2%
2009	35	19	54	35.2%
2010	54	16	70	22.9%
2011	82	46	128	35.9%
2012	74	62	136	45.6%
2013	108	71	179	39.7%
2014	22	24	46	52.2%
2015	98	91	189	48.1%
2016	88	70	158	44.3%
2017	71	48	119	40.3%
2018	34	28	62	45.2%
2019	145	106	251	42.2%
2020	57	46	103	44.7%
Totals	**1,359**	**888**	**2,209**	**40.2%**

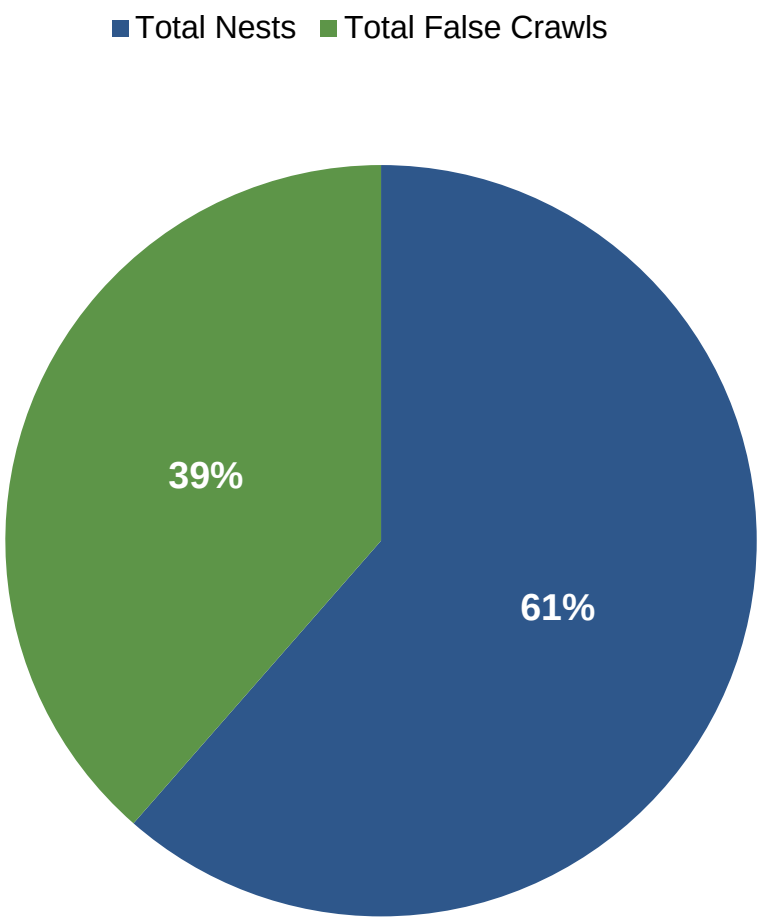

FIGURE 5. AVERAGE OF THE TOTAL NESTS AND FALSE CRAWLS FOR THE CITY OF FOLLY BEACH FROM 1998 TO 2020.

Other negative impacts on nesting habitat and nest success on Folly Beach include natural predation by ghost crabs and fire ants. Raccoons are often a problem on more remote beaches where sea turtle nests must be screened to prevent egg loss, but Folly Beach has not had to adopt that method of protection.

Most other nest protection concerns on Folly Beach are associated with humans. Visitors come to Folly Beach hoping to watch sea turtles nest and hatch. Their quests often involve night-time beach walking and "nest sitting" accompanied by flashlights, cellphones, flash cameras, food, beach chairs, and dogs. These human practices have the negative effect of causing sea turtles to leave the beach before nesting or abandon nest digging, and causing the disorientation of hatchlings. All turtles need a quiet, dark, unobstructed beach to emerge from the ocean, nest, and find the ocean successfully. Humans, unfortunately, too often intervene in an effort to provide unnecessary, and sometimes harmful, "help."

Folly Beach Turtle Watch Program has published a brochure on "Folly's Turtles" to help educate beach goers about how to help sea turtles by respecting their needs for a dark, quiet, unobstructed beach. FBTW volunteers also conduct educational sessions for all ages -- in schools and assisted living facilities, at library story times, during community festivals and

civic organization meetings, and daily on the beach during regular patrols and at nest inventories.

Beginning in 2018, FBTW leadership team meets with all beach front property managers, FB Public Safety, FB Public Works, DNR, and CCP&R to discuss the upcoming season as well as provide turtle pamphlets and "lights out" door signs that are placed in all beach front rentals. Property managers are contacted first to make them aware of any light or equipment issues. The FBTW team has had an excellent working relationship with both Public Safety and Public Works.

In 2010, with additional training and management from SCDNR Endangered Marine Turtle Conservation Program, Folly Beach nest protection volunteers, along with other South Carolina and North Carolina groups, began participation in a sea turtle genetics study conducted by the University of Georgia (UGa). The now 5-year study involves the sacrifice of one egg from each loggerhead nest. The shell is placed in a preservative-filled vial and sent to the UGa lab for maternal DNA analysis. The results have enabled researchers to track the nesting behavior of individual female turtles and to learn more precisely than tagging studies where the turtles are nesting, how many nests each turtle lays and, when linked to egg count data, the success of the nests over time, place and environmental events. The DNA tracking data is providing important answers to the size, health and distribution of the loggerhead sea turtle nesting population in SC.

Other species of sea turtles, all of which are endangered and federally protected, are present along South Carolina's coast: green (*Chelonia mydas*), Kemps ridley (*Lepidochelys kempi*i) and hawksbill (*Eretmochlys imbricata*). While green and Kemps nests have been laid on other South Carolina beaches, none have yet been recorded on Folly Beach. Green and Kemps ridley turtles have, however, been caught by fishermen on the Pier or stranded on Folly Beach. FBTW volunteers also participate in the Sea Turtle Salvage and Stranding Network to document all stranded (alive and dead) sea turtles. Data collected is added to the international database maintained by seaturtle.org.

The first priority of the FBTWP will always be the conservation of our program. Through coordinated efforts between FBTW and the City of Folly, we will continue to educate visitors and residents regarding sea turtle protection and beach habitat. The City will actively enforce all existing ordinances and building codes that protect the dunes and vegetation, that regulate seawalls, revetments, and bulkheads, that prevent artificial lighting, and that eliminate litter and private property being left on the beach overnight.

The City will also consider turtle nesting when reviewing erosion control methods, with a preference for soft erosion control. We will also continue to review building codes and zoning ordinances for possible additional restrictions on beachfront lots.

2.5. EXISTING PUBLIC ACCESS

Folly Beach contains a total of 52 public beach access points with at least 1,539 public parking spaces along the beachfront (Table 4). In addition, free on-street parking is available along most non-beachfront streets on the island, providing for additional parking when needed. The access locations are essentially evenly spaced along the island (Figure 6 and Figure 7). The majority of these access locations are street ends. Other beach access locations include

Folly Beach County Park, Folly Beach Fishing Pier, and Lighthouse Inlet Heritage Preserve at the northeast end of the island, also often referred to as the old Coast Guard Station.

Full and complete public access is provided along the entire beachfront. All areas of the beachfront are within 0.25 miles of a public access point, much of the beach having multiple access points within the 0.25-mile threshold. The USACE draft feasibility study (Section 5.3.1) came to the same conclusion (Figure 8).

This beach access inventory assists the city in management of existing facilities and future improvements. The city prides itself on being one of the most accessible beaches in the state with as many parking spaces available as possible, but ADA access and facilities improvement continues along the access points.

The City formed a Parking Committee in 2020 that recommended a comprehensive parking and traffic study in FY 2022. Additionally, the City is pursuing a SCDOT encroachment permit to increase paid parking throughout the island to support increased amenities and maintenance on Folly Beach. These increased services may include: additional sanitation collections on Saturday and Sunday at the beach walkovers throughout the summer, repairs and improvements to beach accesses and walkovers, maintenance of parking areas and restroom facilities, road shoulder maintenance, beach patrol, public safety services (water rescue, emergency medical calls, missing persons), traffic control, parking enforcement, and funding for periodic beach renourishment.

TABLE 4. BEACH ACCESS POINTS, PARKING, FACILITIES ON FOLLY BEACH

Location	Unpaid Parking	Paid Parking	Total Parking	Restrooms	Showers	Pathway Type & Notes
Folly Beach County Park	0	211 (8 ADA)	211	Yes	Yes	Wooden ramps, sand paths, rubber mat
10 W	10	15	25	No	No	Boardwalk/Ramp and Stairs
910 W	5	0	5	No	No	Sand Path
9 W	11	8 (3 ADA)	19	No	No	Boardwalk and Stairs; ADA walkover
810 W	11	0	11	No	No	Boardwalk and Stairs
8 W	6	16	22	No	Yes	Boardwalk and Stairs
7 W	6	13	19	No	No	Boardwalk and Stairs
610 W	13	0	13	No	No	Sand Path and Stairs
6 W	18	19	37	No	No	Boardwalk and Stairs
510 W	9	0	9	No	No	Sand Path and Stairs
5 W	10	20	30	No	No	Boardwalk and Stairs; Wave Watch playground w/in 500 ft
4 W	10	17	27	No	No	Boardwalk and Stairs
310 W	8	0	8	No	No	Rubber Mat and Boardwalk/Ramp
3W + City Ocean Park	3	31	34	Yes	Yes	Boardwalk and Stairs
210 W	31	0	31	No	No	Boardwalk and Stairs

110 W	43	0	43	No	No	Paved
Charleston County Pier	0	81 (4 ADA)	81	Yes	Yes	Boardwalk and Stairs
110 E	25	0	25	No	No	Sand Path
2 E	10	10	20	No	No	Sand Path
210 E	29	0	29	No	No	Boardwalk and Stairs
3 E	15	10	25	No	No	Boardwalk and Stairs
4 E	22	16	38	No	No	Boardwalk and Stairs
410 E	40	0	40	No	No	Sand Path and Stairs
5 E	12	14	26	No	No	Boardwalk and Stairs; Pirate's Cove Playground 0.2 mi away by the street
510 E	25	0	25	No	No	Boardwalk and Stairs
6 E	13	5	18	No	No	Boardwalk and Stairs
610 E	25	0	25	No	No	Sand Path
7 E	20	0	20	No	No	Boardwalk and Stairs
710 E	25	0	25	No	No	Boardwalk and Stairs
8 E	27	0	27	No	No	Boardwalk and Stairs
810 E	30	0	30	No	No	Sand Path
9 E	16	8	24	No	No	Boardwalk and Stairs
10 E	51	6	57	No	No	Boardwalk and Stairs
1010 E	35	0	35	No	No	Sand Path
11 E	24	4	28	No	No	Boardwalk and Stairs
1110 E	30	0	30	No	No	Sand Path
12 E	17	3	20	No	No	Boardwalk and Stairs
1210 E	20	0	20	No	No	Sand Path and Stairs
13 E	23	0	23	No	No	Boardwalk and Stairs
14 E	20	0	20	No	No	Sand Path
15 E	11	20	31	No	No	Boardwalk and Stairs
1510 E	0	20	20	No	No	Boardwalk and Stairs
1522 E	0	20	20	No	No	Boardwalk and Stairs
1550 E	0	30	30	No	No	Boardwalk and Stairs
1560 E	0	30	30	No	No	Boardwalk and Stairs
1561/1563 E	4 (ADA)	0	4	Yes	Yes	ADA ramp
1587 E	0	20	20	No	No	Boardwalk and Stairs
1640 E	39	0	39	No	No	Boardwalk and Stairs
1670 E	14	11 (3 ADA)	25	No	No	Boardwalk; ADA Ramp
1690 E	25	0	25	No	No	Boardwalk and Stairs
Summer Place	19	21	40	No	No	Boardwalk and Stairs
TOTAL	860	679	1539			

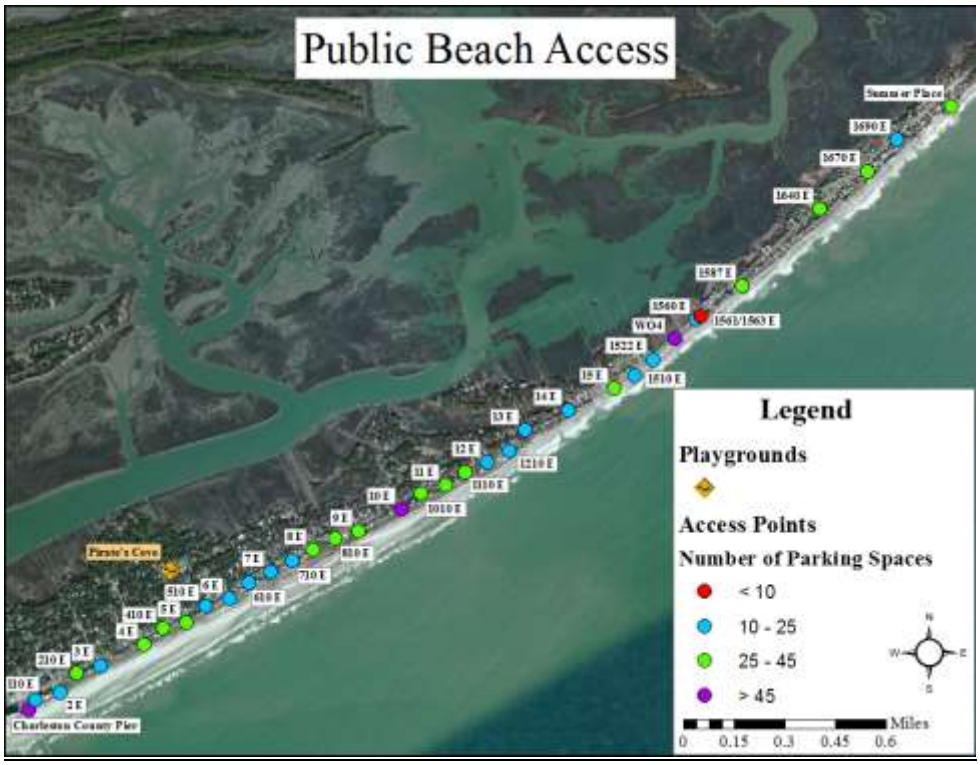

FIGURE 6. MAP OF PUBLIC BEACH ACCESS LOCATIONS ALONG THE NORTHEASTERN HALF OF FOLLY BEACH.

FIGURE 7. MAP OF PUBLIC BEACH ACCESS LOCATIONS ALONG THE SOUTHWEST HALF OF FOLLY BEACH.

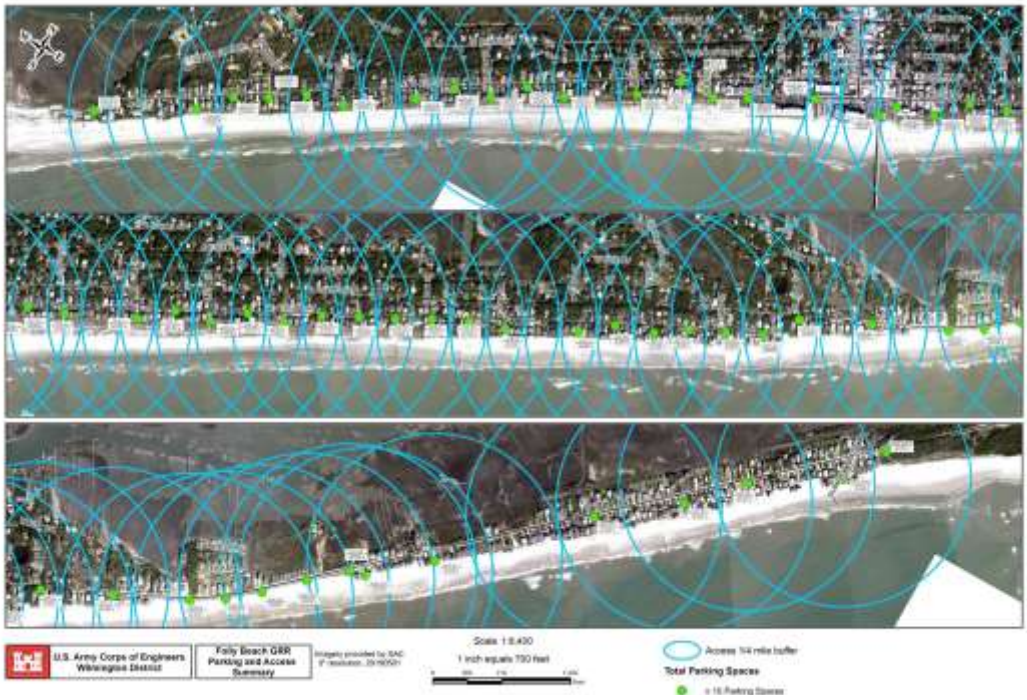

FIGURE 8. OVERVIEW OF FULL AND COMPLETE PUBLIC ACCESS (FROM USACE 2020).

2.6 COMMUNITY RATING SYSTEM

As of 2021, the City of Folly Beach is a Class 4 community in the Community Rating System (CRS), a voluntary program administered by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program (NFIP) that rewards communities for engaging in activities that reduce flood risk with discounts on flood insurance premiums. The CRS Verification Report (Appendix 7.4) provides details on the categories for which the City receives credit. The City is working on a September 2021 audit during which staff hopes to attain Class 3 status.

3. BEACHFRONT DRAINAGE PLAN

The City of Folly Beach encourages residents and developers to adhere to the guidelines and best management practices (BMP) described in the Charleston County Stormwater Program. This program of permitting standards and procedures has been adopted to address regulations pertaining to the Clean Water Act and specifically the National Pollutant Discharge Elimination System (NPDES).

An increased interest in the water quality of South Carolina's beaches in 1996 spawned the South Carolina Department of Health and Environmental Control (DHEC) to begin coliform testing. The water quality from Folly's beaches is monitored on an ongoing basis. This monitoring system tests for Enterococcus (Federal standard for water quality at public salt water beaches) levels at eight (8) sites semimonthly at the following locations within the City limits. The public can check water quality on Folly Beach using the DHEC S.C. Beach Access Guide: https://gis.dhec.sc.gov/beachaccess/.

1. 1690 E Ashley Ave.
2. 1561 E Ashley Ave.
3. 11th St E
4. 5th St E
5. Tides Hotel
6. 3rd St W
7. 8th St W
8. Folly Beach Park

The City of Folly Beach has employed the Storm Water Management Program since October 2007 with the assistance and guidance of Charleston County Public Works Department. These BMP implement stormwater management by utilizing simple, structural and nonstructural methods along with or in place of traditional stormwater management structures when applicable. Folly currently has no stormwater outfalls and, as part of this plan, a policy is proposed to prohibit future outfalls or other means of direct discharge to the beach. Also, the City has reviewed its site development requirements and adopted building codes that minimize the amount of impervious cover to 35% of the high ground, regulating the amount of runoff produced.

Folly Beach will also work with all interested parties to maintain and restore sand dunes along the shoreline as a means of reducing or eliminating the potential for direct discharge to the beach. Property owners must contain and/or direct discharges such as pool overflows away from the beachfront and into a pervious area.

The City contracted an island-wide drainage study that was completed in 2020. The purpose of the study was to provide an overview of the existing drainage conditions and to provide conceptual changes to the existing stormwater system and stormwater program to help alleviate some flooding. Ponding of water at various locations (low areas of roads and yards) and coastal erosion results during heavy rainfall events and/or coastal storms.

The City faces a number of problems with the current drainage system including low topographic relief, large areas that lack stormwater drainage features and limitations of the

system to drain based on rising tidal flooding and sea level rise. Often times, stormwater will pond until the tide changes and groundwater levels recede. Large areas of the island lack stormwater collection systems, allowing the increased runoff from development to exceed the natural infiltration capacity of the soil. These issues are further compounded by a high water table. The study recommended adding or increasing piping and ditching to the stormwater system.

4. BEACH MANAGEMENT AND AUTHORITIES

4.1 STATE AUTHORITIES

4.1.1 OVERVIEW OF STATE POLICIES (BEACHFRONT MANAGEMENT ACT)

The Beachfront Management Act includes several key legislative findings, including (summarized):

· 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

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

8. Establish procedures and guidelines for the emergency management of the beach/dune system following a significant storm event.

SCDHEC-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.

4.1.2 BEACHFRONT SETBACK AREA

Under Section 48-39-280 of the Beachfront Management Act, as amended, SCDHEC-OCRM is required to establish and periodically review (once every seven to ten years) the position of the two lines of beachfront jurisdiction, the baseline and the setback line, as well as the average annual erosion rate for all oceanfront land that is developed or potentially could be developed. As explained in Section 1.2.1, the City of Folly Beach is exempt from this portion of the Beachfront Management Act.

There is no setback line on Folly Beach in accordance with S.C. Code of Laws § 48-39-290(E), which states: "The provisions of this section and Section 48-39-280 do not apply to an area in which the erosion of the beaches located in its jurisdiction is attributed to a federally authorized navigation project as documented by the findings of a Section 111 Study conducted under the authority of the federal Rivers and Harbors Act of 1968, as amended by the federal Water Resources Development Act of 1986, and approved by the United States Army Corps of Engineers." A Section 111 Study determined that most of Folly Beach's erosion issues are a direct result of the construction of the Charleston Harbor jetties, which trap sand on the northern side on Sullivan's Island but prevent the sand from reaching Folly Beach.

According to SCDHEC-OCRM (2019), "Per S.C. Code of Laws § 48-39-290(E), "the baseline determined by the local governing body and the department is the line of erosion control devices and structures and the department retains its jurisdiction seaward of the baseline." Where erosion control devices and structures are not present, the baseline is set either at the seaward edge of the road right of way in the case of the "pocket lots."

It is worth noting that the purpose of these jurisdictional lines is to implement § 48-39-280(A) of the statute, which reads as follows:

"A policy of beach preservation 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 that parallels the shoreline for each standard erosion zone and each inlet erosion zone."

The City requires new structures to be setback in relation to the SCDHEC-OCRM baseline. On Folly Beach this line is generally concurrent with the Perpetual Easement Line (PEL; see Section 5) which demarcates the limits of the federal beach nourishment project on Folly Beach. The current setback from the baseline for habitable structures is 40 ft. It is important to note that the City required no setback from the baseline prior to 2006. All existing structures built closer than the current required setback are considered to be legally nonconforming. This means that upon their destruction or abandonment they must be made to conform and honor the setback. See Section 4.2.6 for City regulations.

As noted above, city setbacks and lot coverage rules are based upon the area landward of the baseline. New construction on beachfront "pockets lots" that are completely seaward of the baseline will require a variance from the City which can only be granted after the developer obtains a state permit to build seaward of the baseline.

4.2. LOCAL GOVERNMENT AND AUTHORITIES

The City of Folly has jurisdiction over lands within its boundaries and is responsible for planning, zoning, building regulation, code enforcement, floodplain management, emergency services, etc. According to Title 5, Chapter 7 of the South Carolina Code of Laws, the municipal jurisdiction extends one-mile seaward of the high tide line.

4.2.1 MUNICIPALITY'S COMPREHENSIVE PLANNING DOCUMENTS

As discussed previously, the City has several long-term planning documents relative to beachfront management. They include the following which are described in detail in this section.

- 2017 Sea Level Rise Adaptation Plan,
- 2018 Dune Management Plan (Appendix 7.5),
- 2018 Strategic Plan, and
- 2019 Marshfront Management Plan.

4.2.1.1 MUNICIPALITY'S COMPREHENSIVE PLAN

The Planning Commission and City Council updated the Comprehensive Plan in late 2015 based on this LCBMP, both of which are required to be updated every 5 years. This LCBMP provided important Natural Resources planning guidance and the city considers it an advantage that the plans are scheduled to be updated in the same year into the future. The 2015 update to the Comprehensive Plan identified several goals that focus either directly or indirectly on the preservation and protection of the beach (Table 5).

During the 2021 5-year update, the City was again concurrently updating the Comprehensive Plan which will contain a resilience element which includes recommendations from the plans described in this section.

TABLE 5. GOALS FOR NATURAL RESOURCES PER THE 2015 COMPREHENSIVE PLAN OF THE CITY OF FOLLY BEACH.

Goal	Implementation
NR1) Eliminate existing encroachments on sensitive water fronts, marshes, wetlands, and riparian areas while encouraging environmentally sensitive development to protect the environments that define the beauty of Folly Beach.	Vigorous enforcement of ordinances such as setbacks, sand dune disturbance, and impervious surfaces. Incorporate recognized Green Building Practices into the Folly Beach Building Code.
NR2) Research and evaluate alternatives to renourishment while implementing a systematic method of building beach preservation funds to assure the availability of the City's portion of costs for future beach renourishments or alternative methods of erosion management.	Budget so that funds will be available for potential renourishment projects taking place every six (6) years (or as needed) while also setting aside money for property acquisition. Work with the Sea Grant Consortium and other competent authorities to conduct a survey of current best practices for shoreline management and a review of current legal issues related to beach preservation.
NR3) Develop and implement a city program to collect and analyze data to systematically estimate quarterly and annual beach visitations.	Task the Folly Beach Tourism and Visitor Promotion Committee with devising a method to more accurately measure quarterly and annual beach visitation statistics.
NR4) Reduce the effects of erosion by allowing the beach to migrate more naturally.	Consider regulations regarding the rebuilding of seawalls that are damaged.
NR6) Increase efforts wildlife.	Enforce sea turtle lighting ordinances by working with lighting issues related to large oceanfront parcels such as the Tides and Oceanfront Villas. Develop an educational program to increase public awareness of wildlife issues. Create development standards that focus on maintaining natural habitat.

Source: Folly Beach Planning Commission.

4.2.1.2 2017 SEA LEVEL RISE ADAPTATION PLAN

Through an award provided by the S.C. Sea Grant Consortium, the City of Folly Beach collaborated with research and outreach professionals to develop a sea level rise adaptation report. Using a participatory approach, this project explored potential adaptation actions for making the City more resilient over time.

Long-term data from the National Oceanographic and Atmospheric Administration (NOAA) tide gauge at Charleston, SC document 12 inches (1 foot) of sea level rise since its installation in 1921. Folly Beach is already being impacted by rising seas, particularly during "King" tide events when stormwater drainage systems backup and flood low-lying roads and yards.

The report highlights several adaptation options within five categories to make the City of Folly Beach more resilient to sea level rise and coastal flooding. The categories include: Water Infrastructure Management, Land Management, Education, Transportation Adaptation, and Coordination, Collaboration, and Cooperation.

The report includes the following recommendations. Each item includes recommended actions in the near-, medium-, and long-term ranges.

1. The City of Folly Beach should plan for 3 ft of sea level rise over the next 50 years, or by 2066

2. City Council should consider the Sea Level Rise Adaptation Actions, which were prioritized by stakeholders and the public as follows:

a. Drainage Management Plan

b. Septic Vulnerability Assessment

c. Marshfront Management Plan

The City has addressed these recommendations by conducting an island-wide drainage study and publishing a marshfront management plan. Both include additional recommendations towards a septic vulnerability assessment.

4.2.1.3 2018 DUNE MANAGEMENT PLAN

The City of Folly Beach Dune Management Plan is hereby incorporated into the LCBMP (Appendix 7.5). The plan developed recommendations to restore and preserve the dune system along the City's beachfront through a proactive, planned approach. Numerous City planning documents recommended the development of this plan. Dune restoration is one of several beach preservation approaches endorsed by the LCBMP in conjunction with periodic renourishment.

The objectives and recommendations of this plan are driven by five overarching goals:

1. Establish a dune management area (DMA)

2. Enhance storm protection

3. Re-establish a natural dune ecosystem where possible

4. Implement strategic dune walkover/access path management

5. Manage dunes to maximize recreational benefits

This plan recommended the establishment of a 40-ft wide DMA landward of the PEL, or the state baseline if no PEL is present. Permissible improvements within the DMA include seawalls, appropriate plantings and/or sand fencing, beach compatible sand, and walkovers. Above grade structures, septic tanks, or non-native landscaping are not permitted. City rules on beachfront development are detailed in Section 4.1.2.

The plan aims to enhance storm protection by establishing a continuous line of defense along the beachfront in the form of seawalls at 8-ft or dunes at 10-ft above NAVD88. Sea oats (Uniola paniculata), bitter panicum (Panicum amarum), and railroad vine are the recommended native vegetation. A strategic approach to public and private beach access through the dunes includes requiring all new and improved walkovers extend to the toe of vegetation and maintaining adequate ADA and vehicular access for public safety. Finally, to balance the needs of storm protection, ecosystem restoration, and recreational beach space, the plan recommends at least 50 ft of beach space from the pre-nourishment storm high tide line to the toe of the dune for habitat and recreational space.

4.2.1.4 2018 STRATEGIC PLAN

City Council updates the Strategic Plan annually. It was last updated in January 2021. The Plan identifies the City's goals and plans for the next five years, and is used to identify high-priority budget items and to guide City Council, the Mayor, and staff in managing and prioritizing City projects. Beach preservation was the top legislative priority for the 2021-2022 fiscal year.

4.2.1.5 2019 MARSHFRONT MANAGEMENT PLAN

The city's 2017 Sea Level Rise Adaptation Report recognized that despite the vulnerability of the marshfront, little investment has been made in planning, management, or protection along the vital marsh shorelines of the community. The Marshfront Management Plan (MMP) is an adaptive management effort developed in conjunction with a 2018 waterfront building moratorium and aimed to develop recommendations to guide planning efforts along the city's marshfront.

Beach- and marshfront construction came to a halt while City officials developed both this MMP and a Dune Management Plan (Appendix 7.5), which guided the implementation of a number of new ordinances to better manage coastal development in Folly Beach, SC. This was an unprecedented, progressive, and efficient process of implementing adaptation plans into action in real time.

Community engagement was the foundation of the MMP. Stakeholder concerns were communicated to the city planners, prioritized by stakeholders, and voted on by the public to finalize the plan's recommendations. Marshfront management concerns were grouped into four categories: upland, regulatory, marsh-related, and education. The top concerns for each category were decreased flood protection value with increasing water levels (upland), the lack of a map of the critical line (regulatory), the marsh response to sea level rise (marsh-related), and the education of marshfront property owners and residents.

To address these concerns, the MMP and the concurrent planning process served to help implement management actions that included fifteen (15) new ordinances that provided regulatory updates and zoning changes, a marshfront structural inventory, a historic marsh shoreline change analysis, marsh restoration projects, and engagement and education. These short-term management actions directly address the stakeholders' upland marsh management concerns. The regulatory and zoning ordinances also have a positive effect on the marsh and indirectly address some of the stakeholders' marsh-related management concerns, such as marsh response to sea level rise (by establishing setbacks and marsh

buffers). Partnerships with local community groups, as well as state and federal agencies, facilitated implementation of the short-term actions.

The MMP also describes future marshfront management opportunities such as mapping of the marshfront critical line, a more detailed inventory of habitable marshfront structures and bulkheads including their distance from the critical line, a marsh mitigation bank fund, a detailed outline of how other communities handle marshfront management, continued public education and engagement, and a septic vulnerability assessment.

4.2.2 MUNICIPALITY'S HAZARD MITIGATION PLAN

The City of Folly Beach has adopted Charleston County's Regional Hazard Mitigation Plan. The City shares the goal of minimizing future losses of life and property associated with hazard events. The plan identifies several mitigation goals and plans including continued enforcement of the International building codes, fire codes, and international floodplain regulations, coordination of Charleston County's stormwater management program, enforcement of existing zoning codes, prohibition of manufactured homes and strictly enforced building codes in the "V" flood zone. In addition, the City of Folly Beach promotes citizen education and information relating to floods and other hazards, and continued emergency response training.

The city took the first step toward addressing the issues of flood and hazard mitigation in its 2017 Sea Level Rise Adaptation Plan, developed in coordination with the South Carolina Sea Grant Consortium, the Carolinas Integrated Sciences and Assessments Program at the University of South Carolina, and Elko Coastal Consulting. The plan is discussed in detail below.

4.2.3 MUNICIPALITY'S DISASTER PREPAREDNESS AND EVACUATION PLAN

The City of Folly Beach has a detailed Emergency Preparedness Plan that outlines the steps required by each department in the City annually, within 48 hours of a predicted emergency event, 24 hours of a predicted event, during an emergency, and after an emergency. Annually, each department is required to review supplies, aid agreements, applicable contracts, emergency contact information, FEMA employee training certifications, and operational plans.

In the event of a predicted emergency (hurricane, tornado, flood), the Mayor and Emergency Management Team will assess the projected severity level to determine whether an evacuation of citizens and staff is necessary. Because Folly is a barrier island, it may be necessary to evacuate all staff and equipment, even emergency responders in the event of a significant emergency. In this event, citizens will be required to evacuate from the City for their own safety.

Prior to an emergency (if possible), emergency responders will be notified of the increased mobilization schedule. Staff will also begin notifying citizens of necessary public precautionary measures. Departments will begin mobilizing equipment, setting up housing and aid stations, and debris collection sites at that time, depending on the severity

determinations made. During this time, all employees will begin to log and detail work performed to prepare for an emergency, in accordance with FEMA regulations.

After an emergency, staff will follow procedures outlined for resuming City operations. If the City has been evacuated or citizens ordered to seek shelter, first responders and public works employees, the Mayor, and the Emergency Management Team will make the determination as to when it is safe for staff, citizens, and business owners to return or emerge. The administration will rely on pre-assembled emergency kits to reestablish business operations, depending on existing conditions at the time. All electronic systems are backed up and all employees have manual options and cash available should electronic systems be unavailable. Citizens will be notified via emergency callout systems, the City website, and local media of when the City is considered safe and/or operational after an emergency event.

Since the 2015 LCBMP, the City adopted new regulations (150.010) to reduce storm hazards on construction sites by prohibiting delivery of additional construction material and securing and/or removing on-site materials.

4.2.4 BEACHFRONT DEVELOPMENT REGULATIONS

As described in Section 1.3.4, twenty-five new land use regulations have been adopted by the City since 2015. Most were adopted during the nine-month moratorium in 2018-19 and included ordinances for setbacks, buffers, septic tanks, marsh island development, dune protection, seawalls, construction elevations and other regulations related to building along the beach and marshfront. While there is no state setback line on Folly Beach, these improvements help to better manage beachfront development.

- A Dune Management Area (DMA) was established 40 ft landward of the state baseline. The only allowable new construction inside the DMA are erosion control devices (166.04-04).
- Substandard, super-beachfront lots (Section 1.3.3) with the same owner as the lots behind them were merged, thereby reducing the likelihood the future construction of super-beachfront houses in front of the existing row of beachfront houses (168.04-01).
- Lot coverage was limited to 35% of high ground, exclusive of critical area (165.01-02 Table 165.01)
- Maximum house size was reduced to 3,600 heated square ft (166.05-03(C)(1))
- All nonconforming and noncompliant structures were limited to less than 50% improvement in 10 years (168.02-07, 168.03-07 respectively)
- Marsh setback was changed to a 15 ft undisturbed buffer (166.04-03)
- Multifamily development is no longer an allowable use on beachfront properties (164.01 Table of Allowable Uses)
- The minimum lot size has doubled to 10,500 sq ft of contiguous high ground (165.01-02, Table 165.01)
- The seawall ordinance was amended to address structures within the DMA and marsh setback. Beachfront seawalls must have a top elevation of 8’ NAVD88 and covered with sand and vegetation to a height of 10’ NAVD88 (151.23).

- All private dune walkovers must not exceed three ft in height or six ft in width (151.25). For a property owner to apply for a private dune walkover permit, they must apply for a building permit with a site plan illustrating the walkover.
- Beachfront property owners must maintain private property landward of the baseline in a manner that does not compromise the integrity of the public beach (151.60). This discourages private property loss behind the baseline.
- The entire chapter on septic tanks was repealed and rewritten. New and improved septic tanks must be located as landward as possible from the baseline or critical line, and never within the DMA (55.05).
- Lots adjacent to the state baseline must have 20 ft of access to an open, public street (pending Ordinance 24.20)

These revised regulations would preclude existing vulnerable development from being rebuilt in the same way if it were destroyed. For example, if Folly Beach were significantly impacted by a major hurricane, the rebuilding process would result in smaller, elevated homes with larger setbacks, which will benefit the City's ranking in FEMA's Community Rating System (CRS). Additionally, if super-beachfront homes are substantially destroyed, only one house can be rebuilt on the merged beachfront lots.

The City also created the Folly Beach Nature Conservancy in 2001 as a land-holding agency to accept donations of threatened or fragile property, primarily in beachfront areas. To date, the Nature Conservancy acquired ten undeveloped beachfront lots. In addition, the City owns several dozen submerged lots along the beachfront. This transfer from private to public ownership will help prevent unwise beachfront development in the future, further mitigating for the example described in Section 1.3.3, Development of Super Beachfront Lots.

Since 2015, two notable legal actions have occurred that relate to beachfront development. First, the South Carolina Environmental Law Project (SCELP) challenged ownership of new land created artificially through renourishment, arguing that artificial renourishment cannot create private land from what was in public ownership. Under South Carolina's Public Trust Doctrine, the state owns all land below the average highwater mark and keeps this land in trust for the benefit of all the citizens of the state. When private property borders a shoreline, the boundary between public trust property and private property is not fixed. Rather, beachfront property owners possess title to land "at risk of loss to the State by natural forces." In short, private properties bordering the beach and ocean will contract and expand as the average high tide mark shifts over time through natural forces. The lawsuit claims that super beachfront property lost to the ocean over time is not put back in private hands as a result of renourishment regardless of the deeded parcel lines. At the time of publication, this case had been dismissed and SCELP was briefing for appeal.

The second legal action was a settlement between the City and two beachfront property owners at 1301 and 1303 E. Arctic Ave. The settlement involved a land swap. The owners' property was essentially intersected by a public right-of-way. Leaving an undevelopable super-beachfront lot on the seaward side of the right-of-way. The City "swapped" the owners the more landward right-of-way for the more seaward private property. The result was that the developed beachfront lots increased in size and two new Nature Conservancy lots were donated.

4.2.5 REGULATIONS ON BEACH AND SHORELINE PROTECTION

Despite the baseline on Folly Beach being essentially an armored wall necessitated by erosion from the jetties, the City of Folly Beach has adopted numerous beach and shoreline protection regulations, as summarized in Section 4.2.4. the City of Folly Beach has beach management ordinances specific to erosion control. Please find copies of the ordinances in Appendix 7.2.

4.2.6 OTHER REGULATIONS ON BEACH MANAGEMENT

The City of Folly Beach has a number of other beach management ordinances that affect the use of the beach (Appendix 7.2).

- Vehicles: sections 71.02 and 151.01 prohibit vehicle access to the beach
- Sea Turtle Protection: section 151.47, 48, and 49 restrict beachfront lighting
- Dog Management: sections 95.08 and 95.18 set out rules for dog management including leash requirements, and preventing animals on the dunes, picking up after dogs, and limiting the times that dogs can be on the beach from May 1 through September 30 each year.
- Swimming and Surfing: section 151.04 establishing a swimming zone free of surfers and watercraft in the first three blocks east and west of the pier, section 151.05 implements surfing restrictions in certain areas, and 151.04 also authorizes lifeguards to enforce beach safety rules
- Watercraft: section 151.05 regulates the launching of jet skis and other watercraft
- Fire: section 90.03 prohibits fires on the beach other than gas grills, and open fires for cooking if approved as part of a special event.
- Alcohol: section 111.04 prohibits the consumption of alcohol on the beach or other public place
- Glass, plastic and foam: section 151.08 prohibits glass, plastic, and Styrofoam containers on the beach
- Waste and Litter: City operating procedure provides garbage pickup twice a week, collection of yard trash and man-made items twice a week, and recycling pick-up every other Monday; the City also provides extra runs after holidays and in public parking areas during the high season
- Vendors and Franchise Agreements: section 151.60 prohibits sales or vending on the beach other than operators with a special franchise from the City to rent beach chairs, umbrellas, and motorized watercraft.
- Smoking: section 151.15 prohibits smoking on the beach, at beach accesses and both sides of East Ashley Ave at the Washout.

5. EROSION CONTROL MANAGEMENT

Prior to completion of the Charleston Harbor jetties, the massive shoals at the harbor entrance likely functioned as a natural mixed-energy ebb tidal delta. The channel paralleled the Morris Island shoreline, but likely migrated to some extent, thereby breaching the shoals and allowing for periodic sediment bypassing downdrift. Average longshore sediment transport rates for this region ranges from 122,000 to 200,000 cy/yr (Brunn, 1995; USACE, 1987; Edge et al, 1994). Folly Beach has been deprived of between 14 and 23 million cubic yards of sediment since jetty completion in 1896.

Edge (1992) states that the loss of the ebb shoal from Charleston Harbor increased wave energy to Folly Beach by approximately 100%. The result of this increased wave energy and aforementioned reduced sediment supply has been chronic shoreline erosion.

5.1. SHORELINE CHANGE ANALYSIS

The Beachfront Management Act defines three shoreline zones. A standard zone is a segment of shoreline which is not directly influenced by an inlet or associated shoals. An unstabilized inlet zone is a segment of shoreline along or adjacent to a tidal inlet which is directly influenced by an inlet and its associated shoals and which is not stabilized by jetties, terminal groins, or other structures. A stabilized inlet erosion zone is a segment of shoreline along or adjacent to a tidal inlet which is directly influenced by the inlet and its associated shoals and which is stabilized by jetties, terminal groins, or other structures.

All of the developed beachfront on Folly Beach is classified as a standard erosion zone. The northeast end of the island adjacent to Lighthouse Inlet is classified as a stabilized inlet zone. At the time of publication, the southwest end of the island at Folly Beach County Park was classified as an unstabilized inlet zone, however this area may stabilize due to the 2013 construction of a terminal groin in this location.

5.1.1 BEACH PROFILES

Thirty-one permanent beach profile monuments have been installed by SCDHEC-OCRM along Folly Beach (dots on Figure 9). The monuments are survey benchmarks, which are permanent metal disks in the ground with information stamped on the face that mark a specific point that can be consistently reoccupied. On Folly Beach, these survey benchmarks begin with monument 2801 at the southwest end of the island at Folly Beach County Park and adjacent to the Folly River and end at monument 2895 at Lighthouse Inlet. The lines illustrated in Figure 9 extending offshore from the monuments are the profile line along which surveyors collect elevation measurements. These measured beach profiles describe a cross-section of the topography and bathymetry of the land surface along the dry beach and nearshore/sand bar regions (e.g., Figure 10). By surveying the same line routinely, scientists can measure the change in sand volume or shoreline position, for example.

FIGURE 9. AERIAL PHOTO OF FOLLY BEACH ILLUSTRATING THE PERPETUAL EASEMENT LINE (PEL), MONUMENT LOCATIONS, AND STATE BEACH MANAGEMENT ZONES.

Monuments 2890 to 2828 (Figure 9) from just south of Center Street and the pier to the northeast end have been surveyed routinely between 1988 and 2020, and monuments 2825 to 2803 along the southwest end were surveyed since 1998. Beach profile data sources used in this plan include: 1) the SCDHEC-OCRM Beach Erosion Research & Monitoring Profile Viewer (BERM viewer: https://gis.dhec.sc.gov/bermexplorer/), 2) Coastal Carolina University beach profiles, and 3) data and monitoring reports submitted to the City by Elko Coastal Consulting, who has been surveying beach profiles on Folly Beach since 2015. The monuments on the far ends of the island, 2895 and 2801 are not included in the analysis.

For purposes of this plan, representative beach profiles from the following SCDHEC-OCRM Beach Zones (Figure 9) from south to north are discussed:

1) Unstabilized Inlet Zone (Folly Beach County Park): Benchmark 2805
2) Standard Zone 1 (Southwest portion): Benchmark 2815
3) Standard Zone 2 (Center St./Pier vicinity): Benchmark 2828
4) Standard Zone 3 (Northeast portion): Benchmark 2865
5) Stabilized Inlet Zone: Benchmark 2890

Historic beach profile data and plots presented herein were created with the Coastal Carolina University Profile Management and Analysis System (PMAS) are credited to the Coastal

Carolina University with collection of the data and the USGS, USACE, and SCDHEC-OCRM for funding the data collection as described in Harris et al. (2007). More recent beach profile data were produced by Elko Coastal Consulting and the volume change statistics presented were calculated using the SCDHEC-OCRM BERM viewer.

The following figures that accompany the beach profile plots show the volumes of sand that were measured above roughly the -5 ft contour (NAVD88) and seaward of the SCDHEC-OCRM baseline for the years 1988-2012 or 1999-2012, whichever was available, and 2015-2019. Figure 9 depicts the 5 zones and the representative benchmark locations.

UNSTABILIZED INLET ZONE (FOLLY BEACH COUNTY PARK): BENCHMARK 2805

Beach profile data from benchmark 2805 (Figure 10) characterize the southwest end of Folly Beach where dredged material from the Folly River was placed beneficially in 1997 (CSE, 2001), 2003 and 2006 (USACE, 2014). After 2006, this region was characterized by uninhibited shoreline recession. There were no revetments, seawalls, groins, or terminal structures in the County Park, allowing erosion to engulf park facilities and roads. Prior to the 2013 project described in Section 5.2.1, this region was overwashing into the marsh leaving peat exposed on the shoreface (Figure 11). Unit volumes had dropped below 20 cy/ft (Figure 12) and the region was characterized by severe erosion.

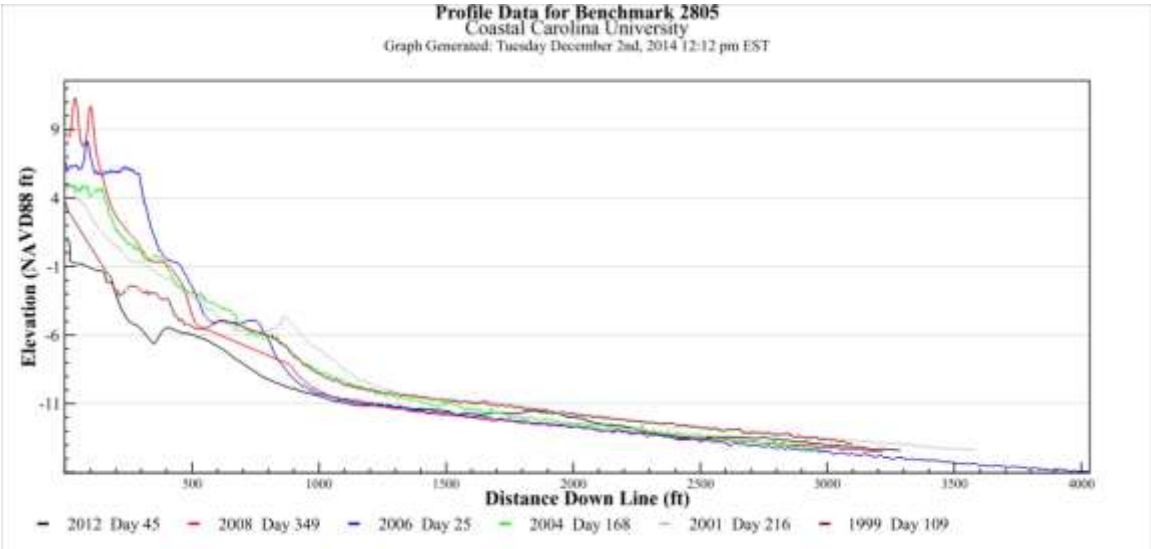

FIGURE 10. BEACH PROFILES FOR BENCHMARK 2805 FROM SELECTED SURVEY DATES BETWEEN 1999 AND 2012.

FIGURE 11. EROSIONAL CONDITIONS IN APRIL 2013 PRIOR TO NOURISHMENT AT THE FOLLY BEACH COUNTY PARK.

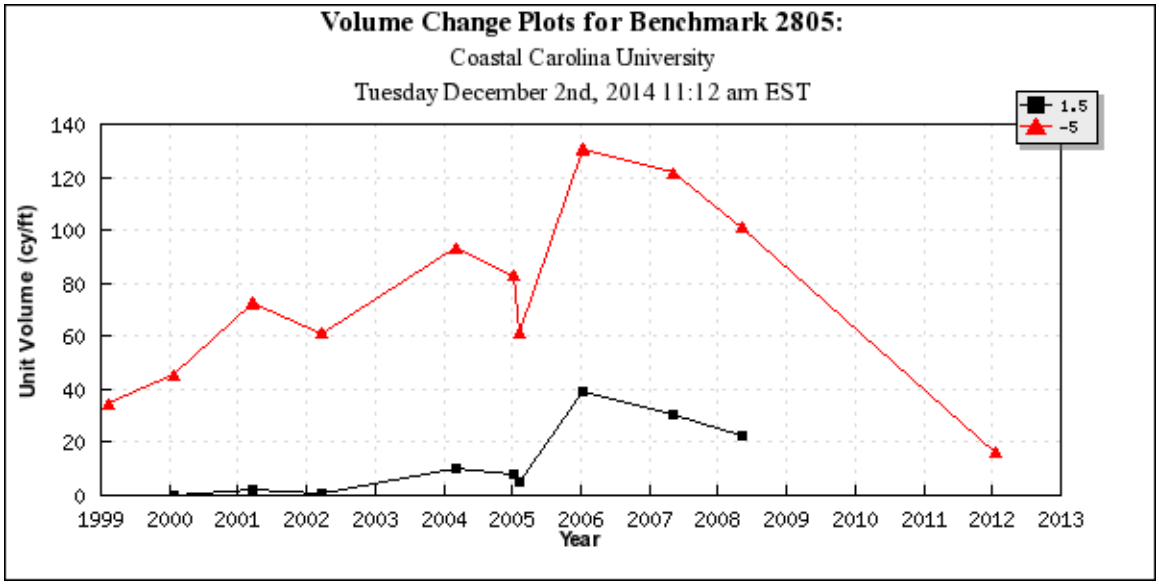

FIGURE 12. VOLUME CHANGE DATA MEASURED ABOVE MHW AND ABOVE -5 FT NAVD88 FOR BENCHMARK 2805 FROM 1999 TO 2012.

The terminal groin and commitment to beach nourishment by the Charleston County Park and Recreation Commission helped to reduce erosion dramatically in this zone over the last

five years (compare Figure 11 to Figure 13. Implementation of the Folly Beach County Park Dune Management Plan (Elko 2013) has resulted in significant dune growth at this profile. Prior to renourishment, the maximum elevation here was around 1 ft NAVD88 (Figure 10). Today, the elevation of the primary dune is nearly 15 ft NAVD88 (Figure 14). According to the BERM viewer, this profile gained nearly 74 cy of volume above -5 NAVD88 between 2014 and 2019.

FIGURE 13. AERIAL VIEW LOOKING NORTHEAST OF THE FOLLY BEACH COUNTY PARK NEAR PROFILE 2802 ILLUSTRATING THE WIDE BEACH AND HIGH DUNE SYSTEM THAT HAS BEEN RESTORED SINCE 2013.

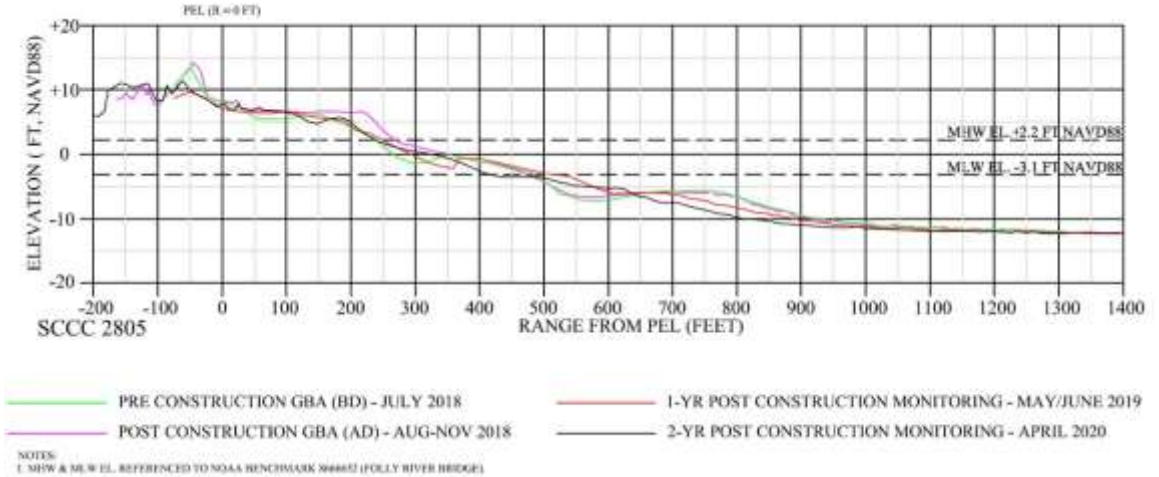

FIGURE 14. BEACH PROFILE DATA FOR 2805 FROM 2018 TO 2020, FOLLOWING THE 2018 RENOURISHMENT PROJECT.

STANDARD ZONE 1 (SOUTHWEST PORTION): BENCHMARK 2815

Despite a history of past erosion as described in the next section, southwestern Folly Beach has been stable to accretional as a result of the federal nourishment project since 1999. Beach profiles indicate a well-developed beach and dune system with robust offshore sand bars (Figure 15). Unit volumes in this healthy zone are around 100 cy/ft (Figure 16). Performance has been similarly stable over the last five years with no significant change to the dune system (Figure 17). The 2014 project increased unit volumes in this zone to nearly 150 cy/ft; whereas, the 2018 project increased volumes to 131 cy/ft (Figure 18). Erosion has occurred during the last two years, but the pre-nourishment volume has not yet been reached.

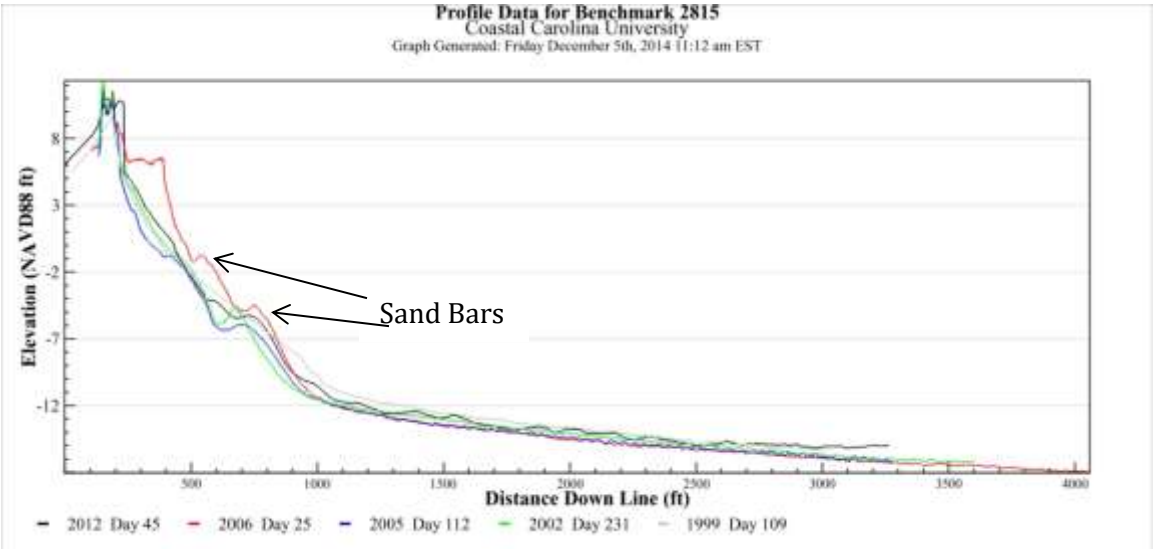

FIGURE 15. BEACH PROFILES FOR BENCHMARK 2815 FROM SELECTED SURVEY DATES BETWEEN 1999 AND 2012.

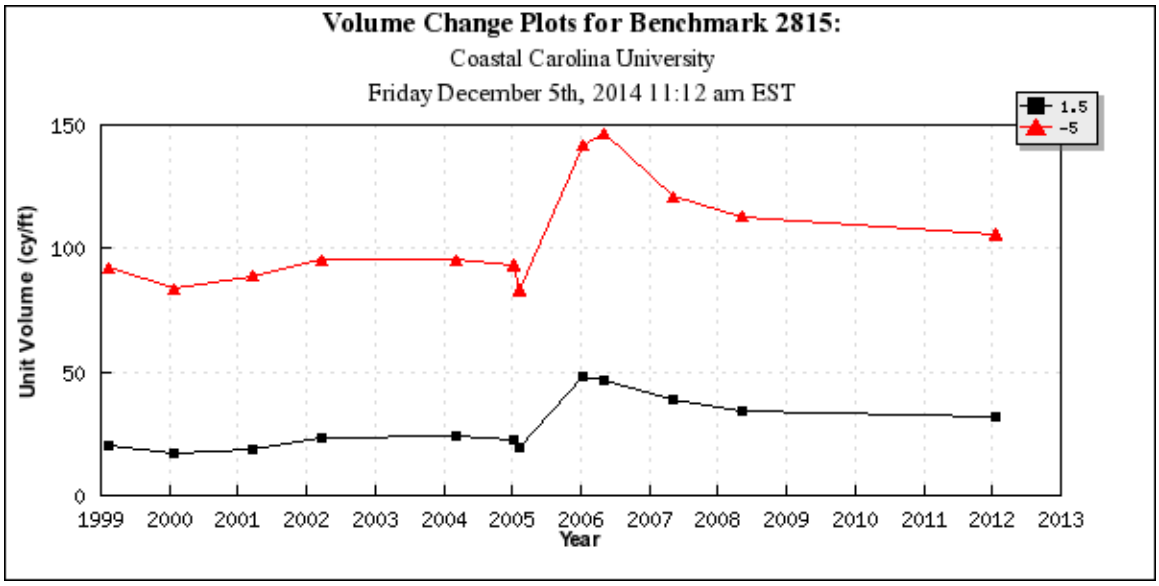

FIGURE 16. VOLUME CHANGE DATA MEASURED ABOVE MHW AND ABOVE -5 FT NAVD88 FOR BENCHMARK 2815 FROM 1999 TO 2012.

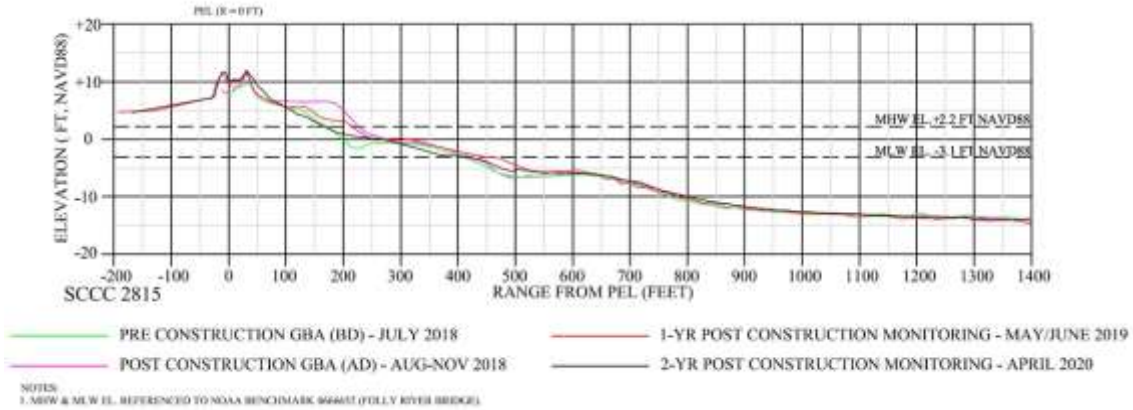

FIGURE 17. BEACH PROFILE DATA FOR 2815 FROM 2018 TO 2020, FOLLOWING THE 2018 RENOURISHMENT PROJECT.

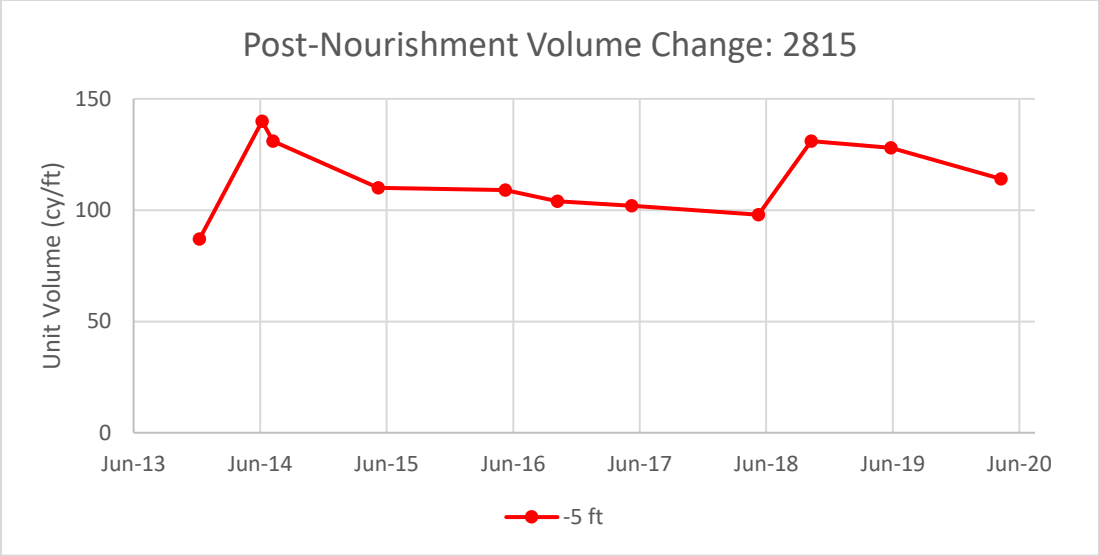

FIGURE 18. VOLUME CHANGE DATA MEASURED ABOVE -5FT NAVD88 FOR 2815 FROM 2013 TO MAY 2020, INCLUDING TWO RENOURISHMENT EVENTS IN JUNE 2014 AND FALL 2018.

STANDARD ZONE 2 (CENTER ST./PIER VICINITY): BENCHMARK 2828

Beach profile data from benchmark 2828 characterizes the relatively stable nature of the central portion of the island, where nine dilapidated groins, located north of the present-day Tides property, were rehabilitated as part of the 1993 federal beach nourishment project. The seaward deteriorated portions were removed and replaced with steel sheet pile and a concrete cap. Beach profile data indicate that the rehabilitated groins have retained nourished sand as designed (Figure 19).

The unit volume example figure for this segment displays a different response to nourishment than other segments. In each of the other segments, nourishment is followed by nearly exponential decrease in beach volume (see Standard Zone 3). In this segment, unit volumes have increased since the initial nourishment in 1993 (Figure 20) when the dilapidated groins in this region were rehabilitated. Nourished material does not erode rapidly after placement. Rather, unit volumes were stable to slightly accretional after nourishment events in 1993, 2005, and 2007. As of 2012, this healthy region was characterized by a unit volume of roughly 100 cy/ft and dune elevations of up to 15 ft (Figure 21). While the 2014 project added little volume the unit volume was increased to 170 cy/ft during the 2018 project (Figure 23). This provides quantitative evidence of the effectiveness of the rehabilitated structures in stabilizing the beach and extending the life of the nourished sand.

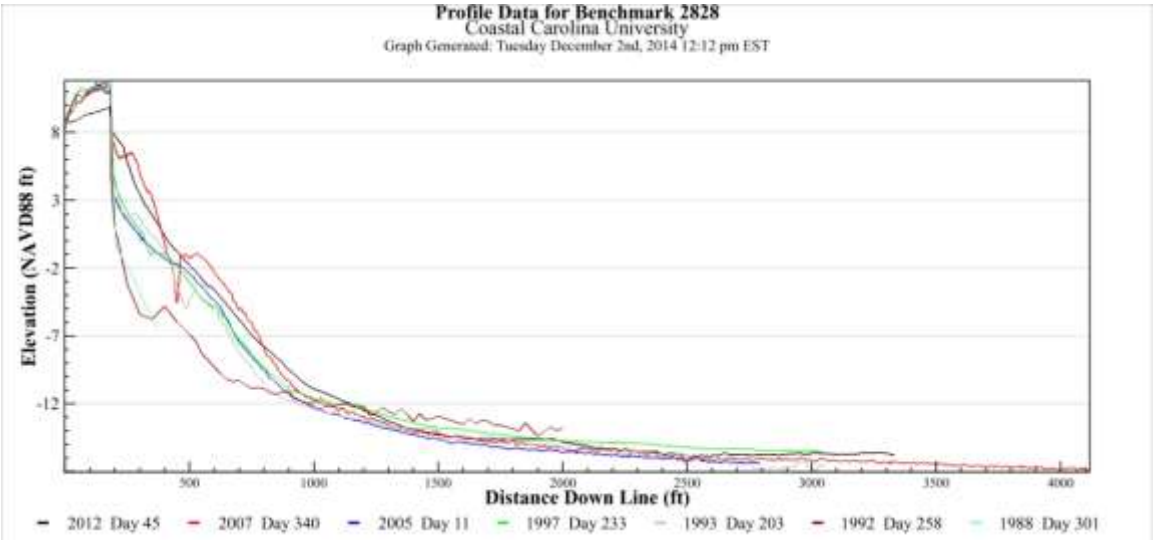

FIGURE 19. BEACH PROFILES FOR BENCHMARK 2828 FROM SELECTED SURVEY DATES BETWEEN 1988 AND 2012.

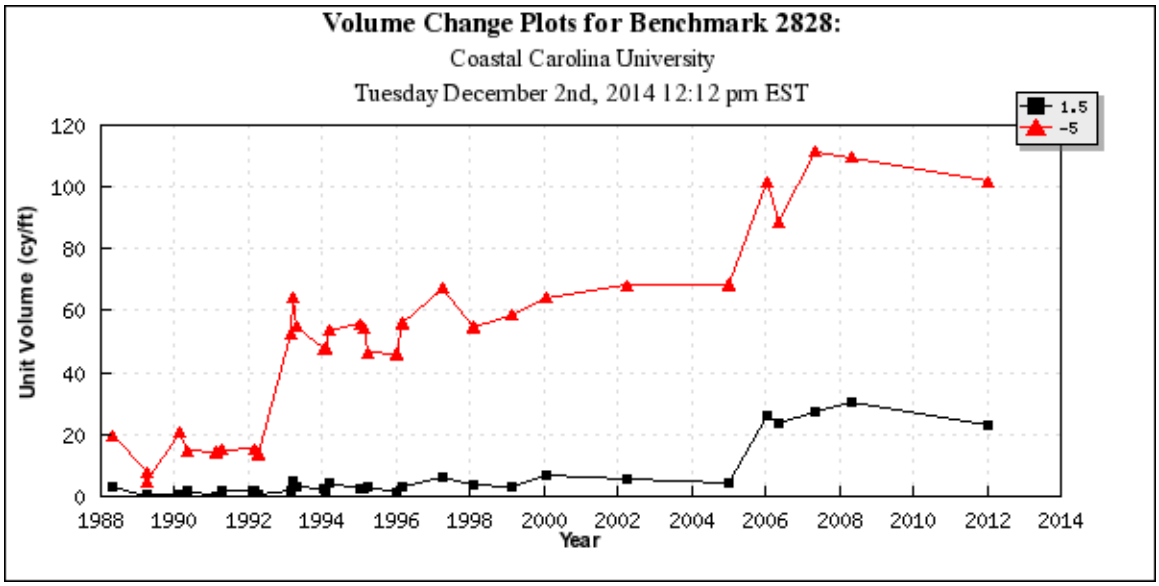

FIGURE 20. VOLUME CHANGE DATA MEASURED ABOVE MHW AND ABOVE -4.9 FT NAVD88 FOR BENCHMARK 2828 FROM 1988 TO 2012.

FIGURE 21. VIEW OF THE CENTRAL PORTION OF FOLLY BEACH LOOKING NORTHEAST FROM THE PIER AFTER NOURISHMENT IN THE SUMMER OF 2020.

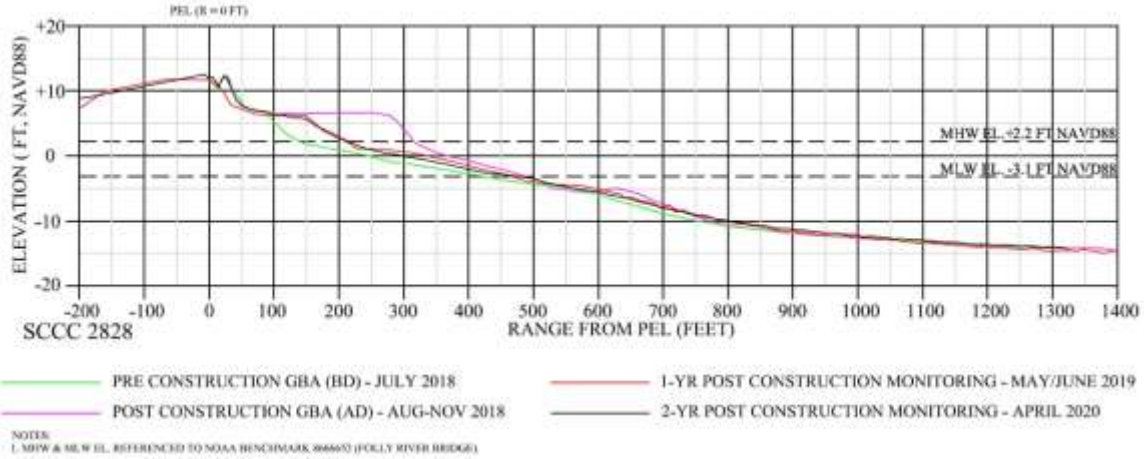

FIGURE 22. BEACH PROFILE DATA FOR 2828 FROM 2018 TO 2020, FOLLOWING THE 2018 RENOURISHMENT PROJECT.

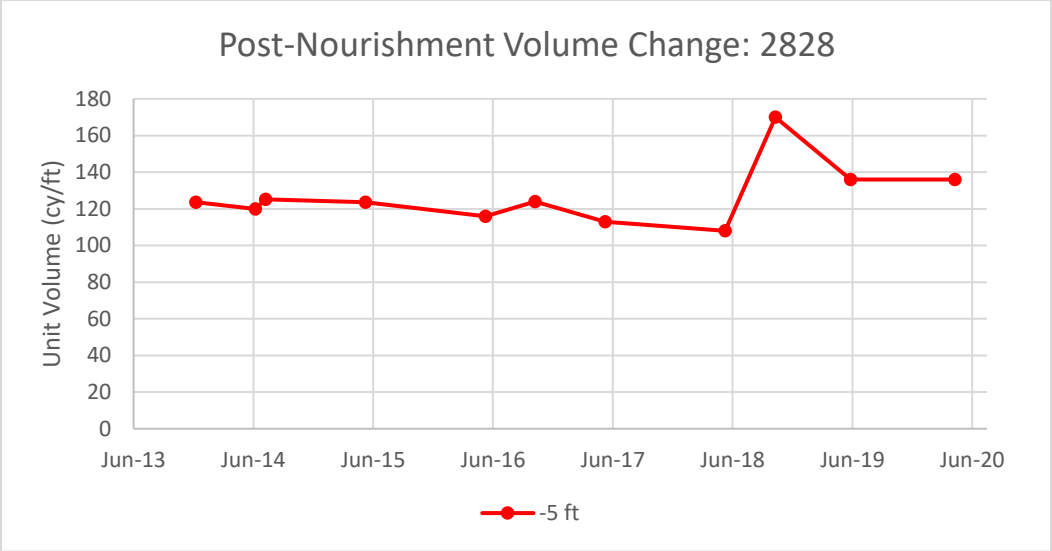

FIGURE 23. VOLUME CHANGE DATA MEASURED ABOVE -5FT NAVD88 FOR 2828 FROM 2013 TO MAY 2020, INCLUDING TWO RENOURISHMENT EVENTS IN JUNE 2014 AND FALL 2018.

STANDARD ZONE 3 (NORTHEAST PORTION): BENCHMARK 2865

The northeast portion of Folly Beach has a history of past erosion, except for a few years of stable to accretional conditions around 1990. Here, this area is defined between 12th St. E., where Arctic Ave. ends, and Ashley becomes the beachfront road to the northeast, and the stabilized inlet zone at Lighthouse Inlet. This area includes the "Washout" which extends from 1409 E. Ashley to 1569 E. Ashley, and is the only part of Folly Beach with no development on the beachfront side of the beachfront road. The Washout was reportedly overwashed and open as an inlet during Civil War times.

Beach profile data from benchmark 2865 characterize the erosional nature of this standard zone along the northeast portion of Folly Beach (Figure 24). Here, beach nourishment and dilapidated erosion control structures alleviate severe shoreline retreat. Prior to the initiation of the federal nourishment project, unit volumes hovered around 30 cy/ft. Injections of sediment from federal renourishment events in 1993, 2005, and 2007 are obvious on Figure 25. Based on the available data, unit volumes have been stabilized by nourishment and structures between 40 and 60 cy/ft.

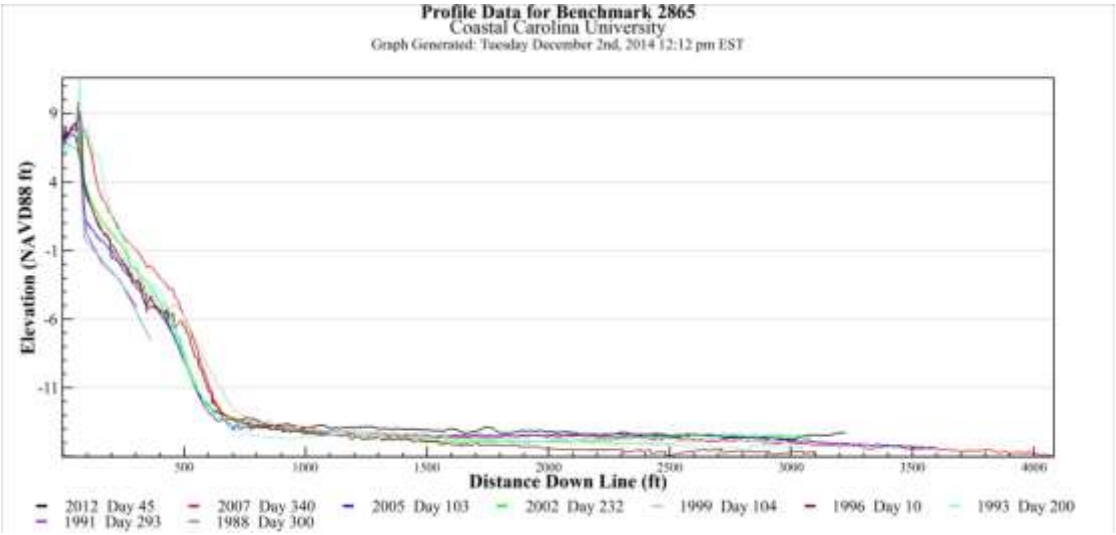

FIGURE 24. BEACH PROFILES FOR BENCHMARK 2865 FROM SELECTED SURVEY DATES BETWEEN 1988 AND 2012.

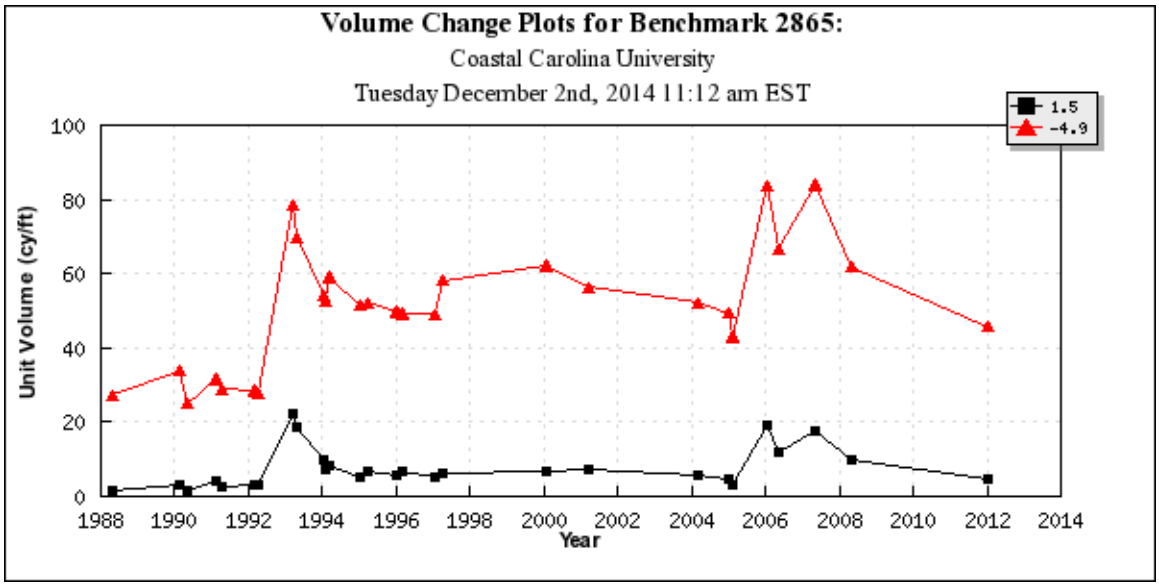

FIGURE 25. VOLUME CHANGE DATA MEASURED ABOVE MHW AND ABOVE -4.9 FT NAVD88 FOR BENCHMARK 2865 FROM 1988 TO 2012.

This northeast area contains a number of erosion control structures including timber and rubble-mound groins along the ocean and Lighthouse Inlet shorelines, and a terminal structure at the northeast end installed by the U.S. Coast Guard (Edge & Assoc., 1991). In the early 1990's, the City was engaged in a number of lawsuits in a failed attempt to prohibit the development of super-beachfront lots, defined as those beachfront lots located seaward of the lots fronting Ashely Avenue (see Section 1.3.3).

Three months after completion of the 2013-14 federal nourishment project, the average mean high water (MHW) beach width in this section was 92.5 ft. Dunes are absent near the

northernmost developed properties at Sumter Drive, where exposed seawalls dominate the backbeach (Figure 26).

The 2014 project added a similar volume of sediment as past projects, bringing up the total until volume to just over 80 cy/ft; whereas, the 2018 renourishment brought the unit volume up to 130 cy/ft (Figure 28). Rapid post-nourishment volume loss was recorded after the 2018 project, but two years after nourishment in May 2020, about 70 cy/ft remains at this location, which is better performance than for all previous nourishment projects.

Excepting the bypassing of a sand bar from Lighthouse Inlet, high rates of shoreline erosion will likely persist in this area, resulting in an erosional hot spot where beach nourishment sands will rapidly erode. As a result, dune stabilization will be difficult until a sandy beach can be established and preserved. Critical erosion is expected to continue in this area due to the lack of sediment supply entering from the northeast.

FIGURE 26. EXPOSED SEAWALL AT SUMTER AVE. ALONG THE NORTHEASTERN PORTION OF FOLLY BEACH PRIOR TO THE FEDERAL RENOURISHMENT PROJECT IN 2014.

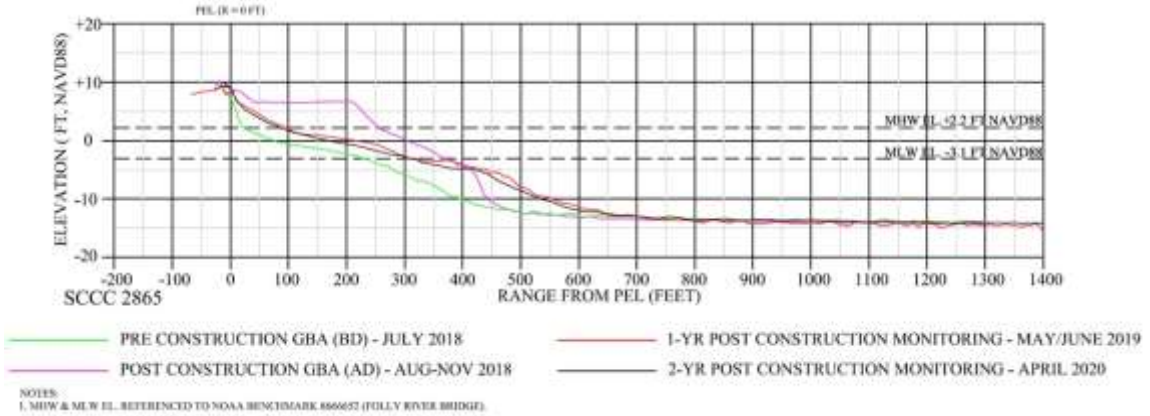

FIGURE 27. BEACH PROFILE DATA FOR 2865 FROM 2018 TO 2020, FOLLOWING THE 2018 RENOURISHMENT PROJECT.

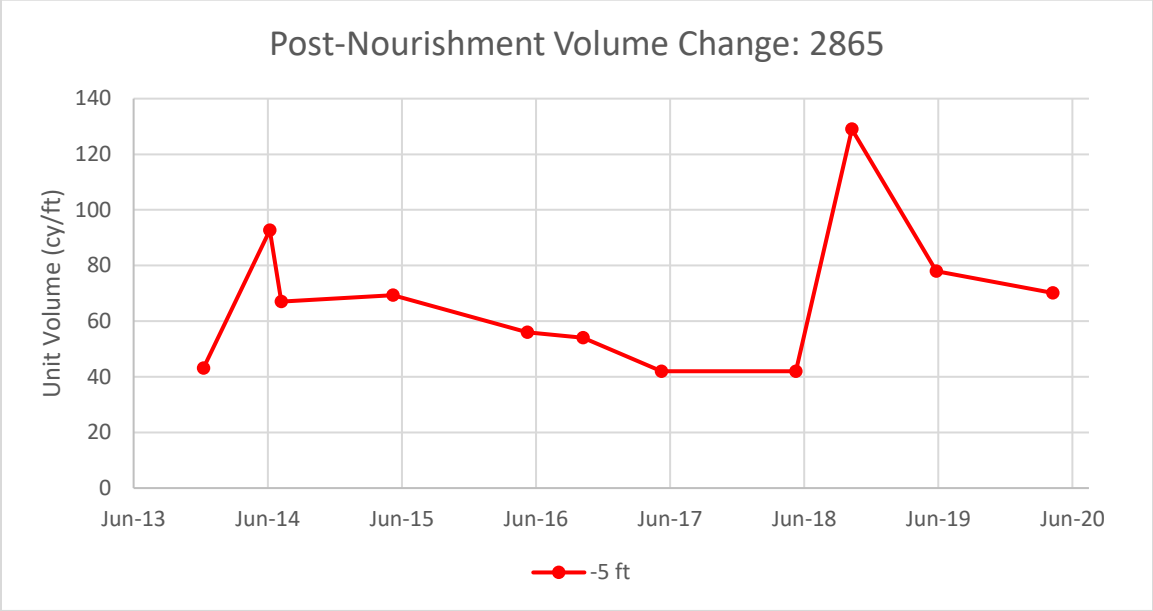

FIGURE 28. VOLUME CHANGE DATA MEASURED ABOVE -5FT NAVD88 FOR 2865 FROM 2013 TO MAY 2020, INCLUDING TWO RENOURISHMENT EVENTS IN JUNE 2014 AND FALL 2018.

STABILIZED INLET ZONE: BENCHMARK 2890

Beach profile data from benchmark 2890 confirm a shoal attachment event between 1992 and 1994 that supplied considerable sediment to northeastern Folly Beach (Figure 29). Unit volumes measured to -4.8 ft NAVD88 exceeded 250 cy/ft from 1992 to 1996 (Figure 30), after which erosion began to dominate this region. A lesser, yet still significant, increase in volume was measured in 2007-2008. Unit volumes approached 100 cy/ft, likely due to longshore spreading of nourished sediment from the federal project. Similar increases were measured following the 2014 and 2018 projects (Figure 32).

The beach profile data indicate that in the absence of shoal bypassing or renourishment, this zone exhibits erosional tendencies. Dune crests in this zone are as high as 20 ft NAVD88 (Figure 29 and Figure 31).

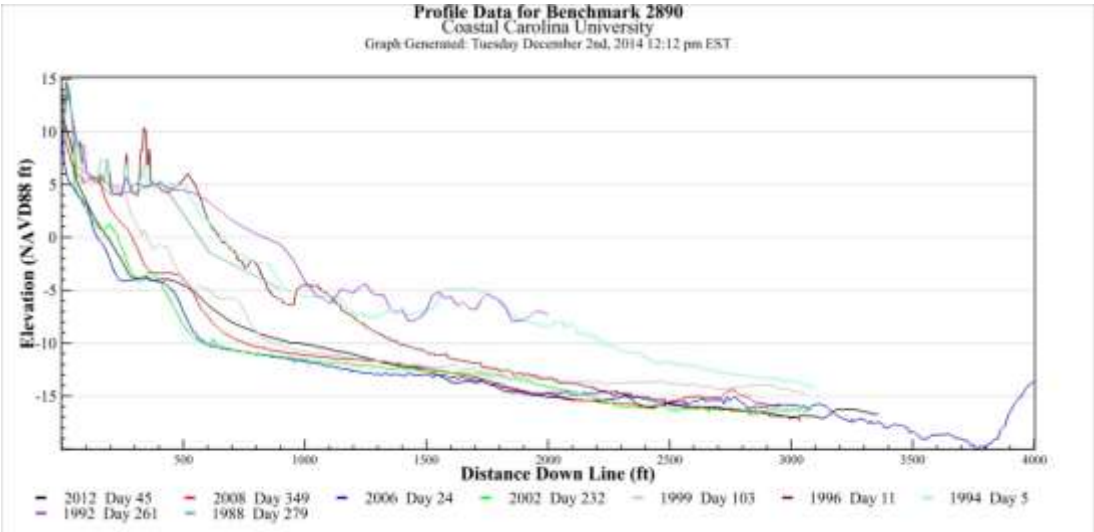

FIGURE 29. BEACH PROFILES FOR BENCHMARK 2890 FROM SELECTED SURVEY DATES BETWEEN 1988 AND 2012.

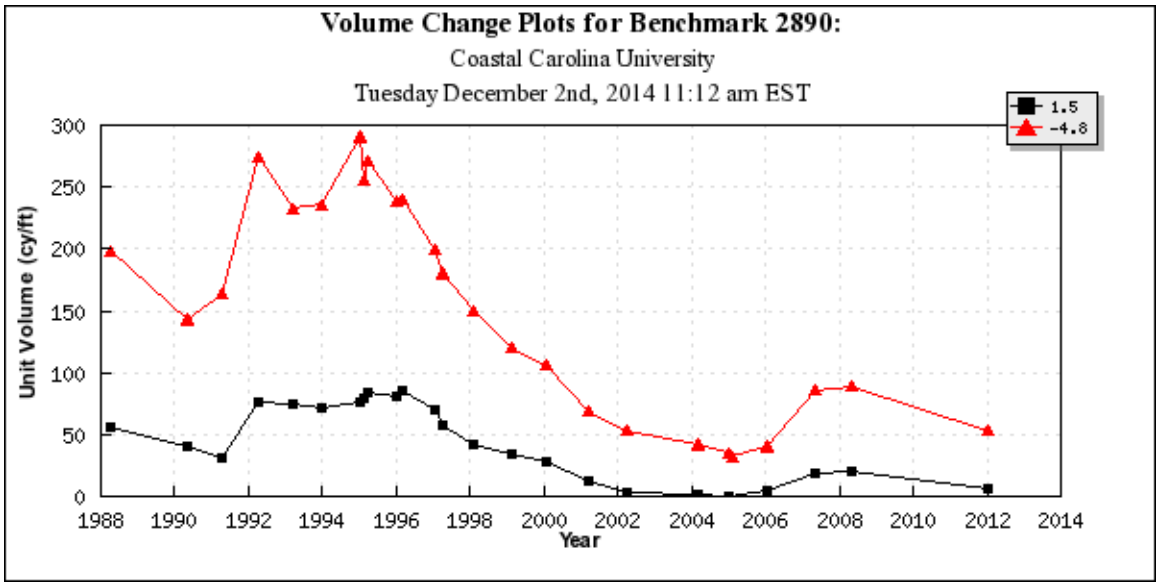

FIGURE 30. VOLUME CHANGE DATA MEASURED ABOVE MHW AND ABOVE -4.8 FT NAVD88 FOR BENCHMARK 2890 FROM 1988 TO 2012.

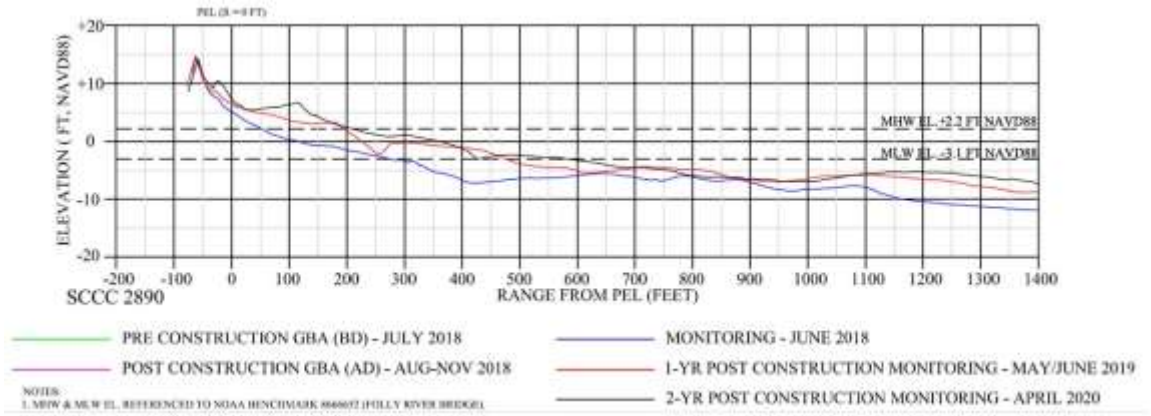

FIGURE 31. BEACH PROFILE DATA FOR 2890 FROM 2018 TO 2020, FOLLOWING THE 2018 RENOURISHMENT PROJECT.

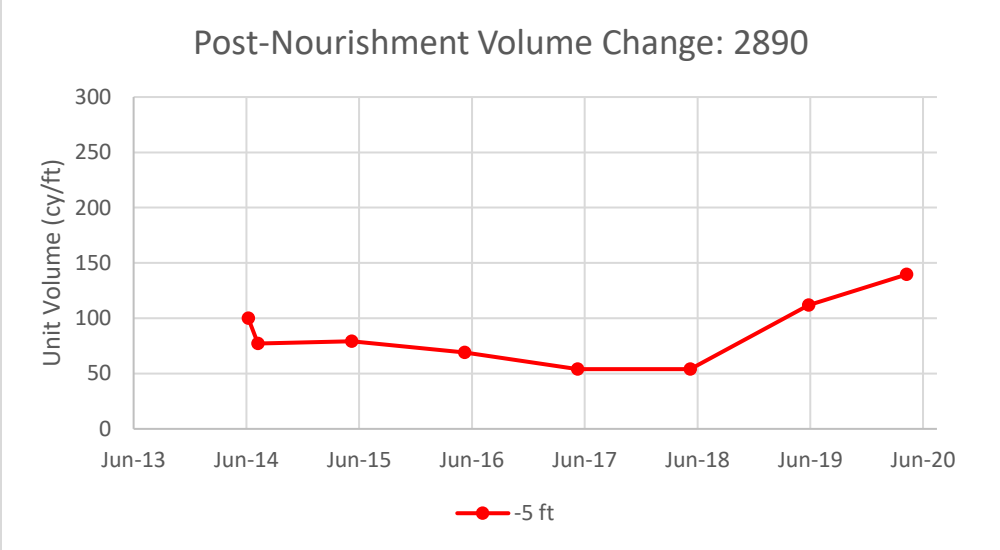

FIGURE 32. VOLUME CHANGE DATA MEASURED ABOVE -5FT NAVD88 FOR 2890 FROM 2013 TO MAY 2020. THE VERTICAL AXIS LIMIT IS SET TO 300 CY/FT FOR COMPARISON TO FIGURE 30.

5.1.2 LONG-TERM SHORELINE CHANGE RATES

SCDHEC-OCRM has conducted studies of long-term shoreline change rates along the SC coast, which show the average annual erosion or accretion that has occurred since 1873. For Folly Beach, the shoreline change rates were updated in 2019. In other parts of the state, the updated long-term erosion rates are used to adjust the position of the setback line periodically. The baseline on Folly Beach is fixed and there is no setback line. Average annual shoreline change rates, from south to north, given in ft per year, are listed in Table 6. These average shoreline change rates represent the number of ft the shoreline moves each year, with negative numbers indicating erosion or shoreline retreat.

TABLE 6. AVERAGE ANNUAL SHORELINE CHANGE RATES FOR FOLLY BEACH, LISTED FROM SOUTHWEST TO NORTHEAST, FROM SCDHEC-OCRM (2019).

Location Description	**Shoreline Change Rate (ft/year)**
From the parking lot at Folly Beach County Park north for 2,564 ft to 9th Street W.	-5.0452**
Transition north for 192 ft, then north for 4,854 ft to the Charleston Oceanfront Villas	-3.5041
Transition north for 189 ft, then north for 2,815 ft to 3rd Street E.	-1.0793
Transition north for 277 ft, then north for 4,186 ft	^
Transition north for 195 ft, then from 9th Street E. north for 8,496 ft	-1.5371
Transition north for 194 ft, then north for 7,037 ft to the north end of Folly	^
Transition for 185 ft, then wrapping the north end of Folly for 1,215 ft	-3.9885

**Terminal groin installed here in 2013.

^ Shoreline change rates between -0.5 and +31.0 ft/year, indicating stable to accretional conditions.

UNSTABILIZED INLET ZONE & STANDARD ZONE 1

Some of the highest long-term erosion rates on the island are along the southwest portion of the island and include the county park as well as the developed shoreline south of the present-day Tides property. Although Standard Zone 1 has been relatively stable in the last several decades (see Figure 9) as a result of the federal nourishment project, the area experienced significant shoreline retreat from the late 1800s to the early 1900s likely as a result of jetty construction. This highly erosional region extended roughly from southwest of the seawall fronting the present-day Tides property between 2nd and 3rd St. W. (2825) and Folly Beach County Park (2805). The average long-term shoreline change rates for these zones range from -3.5 to -5 ft/yr (Table 7). Since 1854, the shoreline in this region has migrated over 1,000 ft landward (Figure 33 & Figure 34). The southwest end has the most rapid long-term shoreline erosion rates on the island.

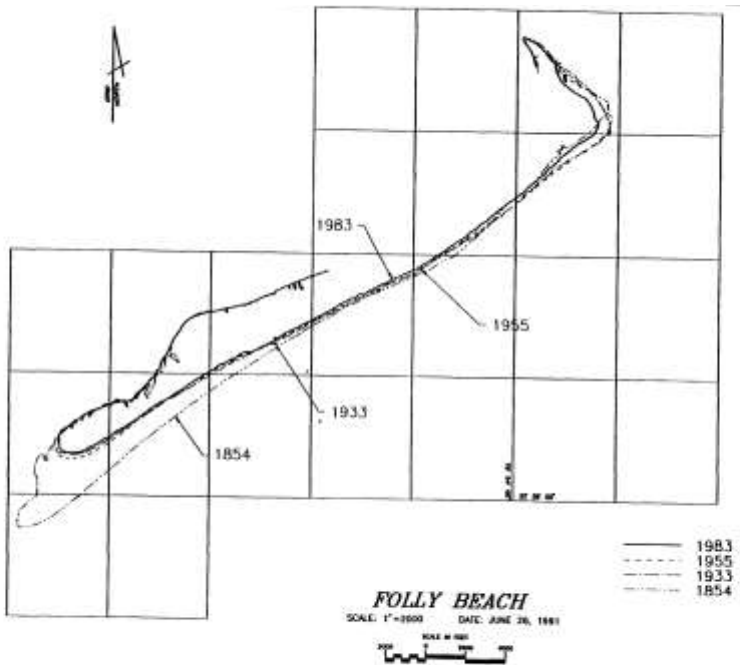

FIGURE 33. HISTORIC SHORELINE POSITIONS ON FOLLY BEACH (FROM EDGE & ASSOC, 1991).

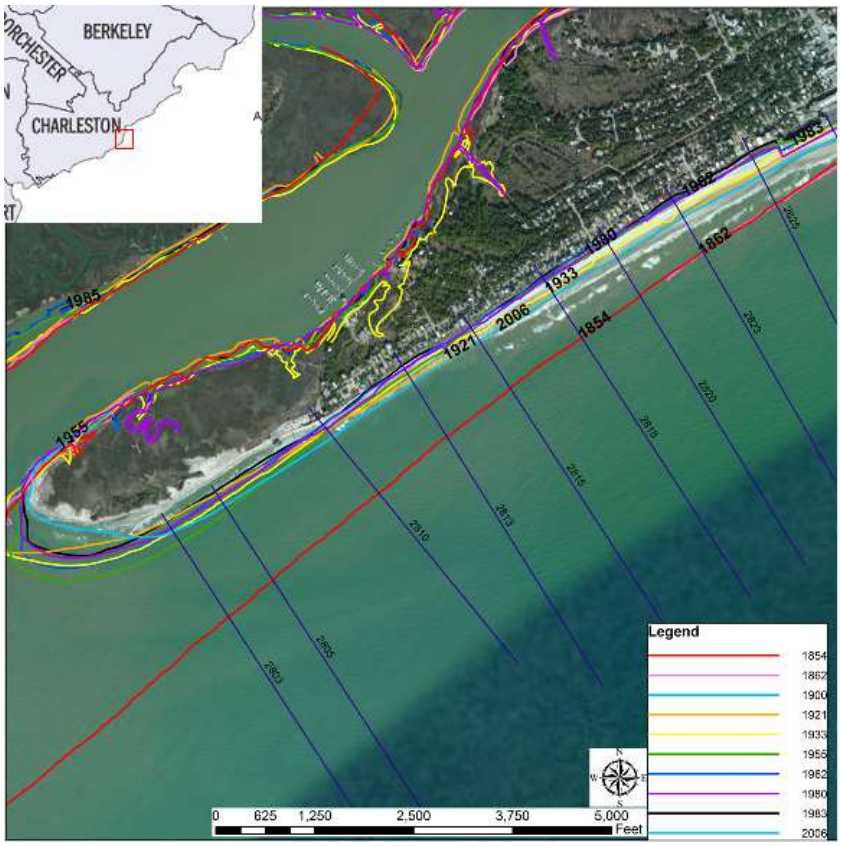

FIGURE 34. HISTORIC SHORELINES FOR THE UNSTABILIZED INLET ZONE AND STANDARD ZONE 1 ALONG THE SOUTHWESTERN PORTION OF FOLLY BEACH.

STANDARD ZONE 2 (CENTER ST./PIER VICINITY)

This zone extends from Center St. (2828) to the change in shoreline orientation at 12th St. E., where Artic Ave. ends, and Ashley becomes the beachfront road to the northeast (2860). Shoreline change rates have been reduced by rehabilitated groins and periodic nourishment in this region (Table 7). The area between 3rd and 9th Street East has stable to positive shoreline change according to SCDHEC-OCRM (2019; Table 7).

The 2006 shoreline is farther seaward than most of the shorelines from the 1900's (Figure 35). Although this shoreline represents a post-nourishment condition, it is also attributable to the rehabilitated structures in this region, which have helped stabilize the nourished material, resulting in a wide beach.

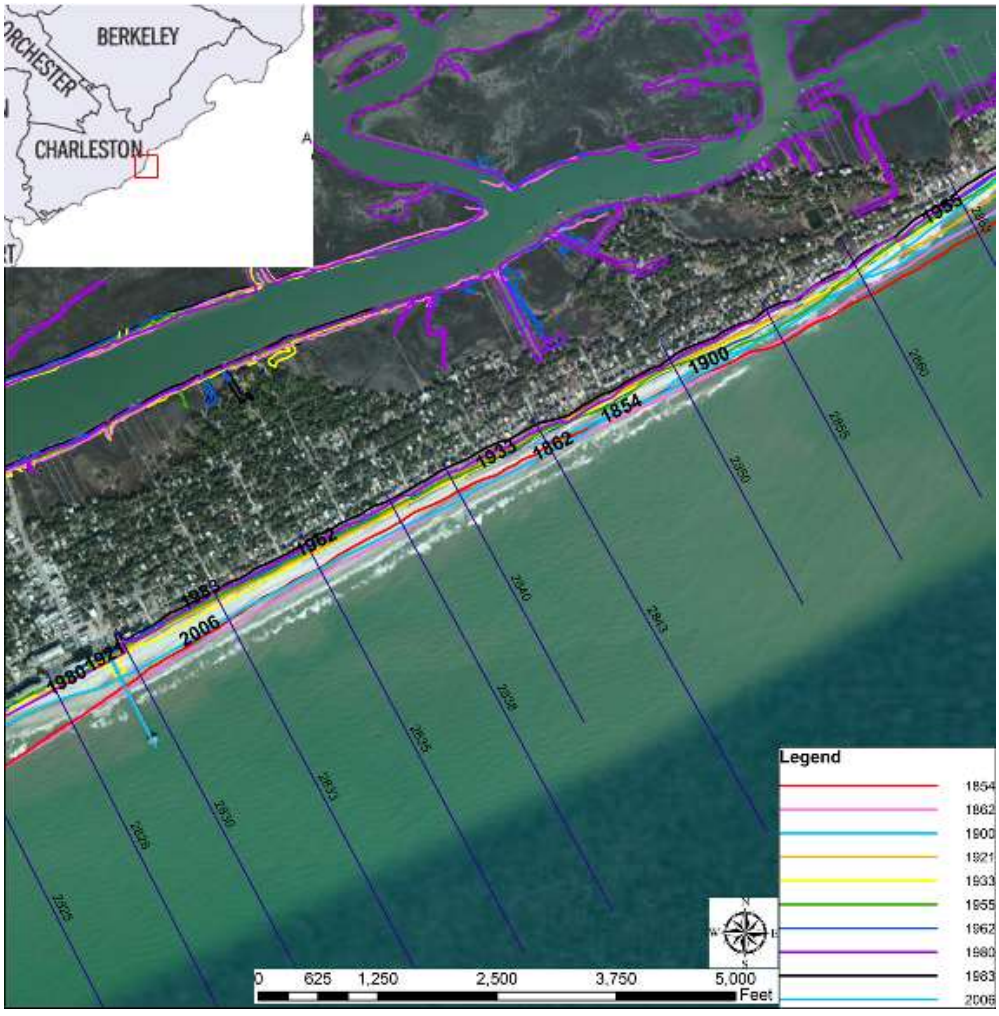

FIGURE 35. HISTORIC SHORELINES FOR STANDARD ZONE 2 ALONG THE CENTER PORTION OF FOLLY BEACH.

STANDARD ZONE 3 (NORTHEAST PORTION)

This area is defined between the southwest end of the Washout (2863) and Summer Place. (2885). The shoreline orientation of the northeast portion of the island has always been slightly different from the rest of the island (Figure 33).

Despite high rates of short-term erosion, the average long-term shoreline change rate in this zone ranges from -1.5 ft/yr to stable/accretional (Table 7). The northernmost development on the island near Summer Place and benchmark 2885 is the area of the most significant present-day erosional hot spot; however, the long-term shoreline change rate for that area is actually stable to positive indicating historic accretion (Figure 36), likely associated with ebb shoal bypassing from Lighthouse Inlet.

FIGURE 36. HISTORIC SHORELINES FOR STANDARD ZONE 3 AND THE STABILIZED INLET ZONE ALONG THE NORTHEASTERN PORTION OF FOLLY BEACH.

STABILIZED INLET ZONE

This zone has been historically accretional and exhibits multiple dune lines in an accreting beach ridge pattern (Figure 36). This morphology is typical of shorelines adjacent to tidal inlets that receive periodic inputs of sediment via shoal bypassing. According to SCDHEC-OCRM, the average annual shoreline change rate in this region is about -4 ft/yr (Table 7).

5.2. BEACH ALTERATION INVENTORY

Most of the Folly Beach beachfront is lined with seawalls that were constructed to protect private property. Many of these seawalls are now buried. There are presently 50 groins along Folly Beach in various conditions. Please see Appendix 7.1 for the structural and beach alteration inventory maps and tables.

Nine groins from roughly 9th St. E. to the Washout were rehabilitated in 2018. The terminal groin at Folly Beach County Park was built in 2013. Both groin projects are described in detail in Section 5.2.1. The nine groins in the vicinity of Center Street were rehabilitated in 1993 and are in fairly good condition. The remaining 40 groins on the island are in poor to non-functional condition (Figure 37).

FIGURE 37. PHOTO OF A DILAPIDATED TIMBER-PILE GROIN ON FOLLY BEACH.

Following damage caused by Hurricane Matthew, FEMA provided the City with funding to repair a 95-ft-long section of the revetment at the Washout in 2020. SCDOT Class F Rip Rap, which is large armor stone about 2.5 ft in diameter, was used for the repair. The repair was topped with beach sand and planted with native dune grass.

Prior to the initial federal nourishment, the native mean grain size on Folly Beach was characterized as 0.17 mm. This estimate was based on analyses of 14 beach profiles. The sand was characterized as well-sorted with a maximum carbonate content of 5% (Hales et al., 1991).

5.2.1 HISTORY OF BEACH RENOURISHMENT EFFORTS

Erosion control has been the City's primary beach management objective since the 1970's when the first erosion committee was formed by council. Prior to this time, the city relied on seawalls and groins to manage beach erosion. At this time, there was not government-level agreement that the Charleston Harbor jetties influenced Folly's erosion and the city was attempting to sue the federal government for erosion damages.

In 1979, the state of South Carolina appropriated $440,000 for Folly beach erosion abatement. This was the first time state funds were allocated for erosion. In December 1979, a National Science Foundation-funded forum of coastal experts concluded that the jetties contributed significantly to erosion on Folly Beach by blocking longshore sediment transport. The forum also recommended that the state funds were not substantial enough for the needed beach nourishment project. As a result, the city used the funds to increase its recreational resource value in hopes of improving the likelihood of future federal funding. The state funds were used to improve the city's 52 beach access points, including the construction of 27 new dune walkover structures. The final result of the forum was the city dropping the lawsuit against the federal government and instead requesting that the USACE conduct a study to determine the relationship between the Charleston Harbor jetties and the severe erosion issues described in Section 1.3.

After six years of intense technical give and take and countless meetings between the city and the USACE to negotiate different views of the facts, the USACE completed a feasibility study in 1985 that recommended restoration and periodic renourishment of 16,860 ft (3.2 mi) of the central section of Folly Beach. Borrow areas were identified in Lighthouse and Stono Inlets (USACE, 1985). The Folly Beach Shore Protection project was authorized by Section 501 of Public Law 99-662 (WRDA86) in which the original authorizing language read as follows:

SEC. 501(a). The project for shoreline protection, Folly Beach, South Carolina: Report of the Chief of Engineers, dated March 17, 1981, at a total cost of $7,040,000, with an estimated first Federal cost of $3,870,000 and an estimated first non-Federal cost of $3,170,000.

Section 111 of the 1968 River and Harbor Act provides authority for the Corps of Engineers to develop and construct projects for prevention or mitigation of damages caused by Federal navigation work. In 1987, Folly's Section 111 study determined that approximately 57 percent of the erosion of Folly Beach was due to the construction and continued operation of the Charleston Harbor Federal navigation project (USACE, 1987). As a result of this determination, the cost sharing percentages were adjusted to 85 percent federal versus 15 percent non-federal (City of Folly Beach). In addition, 57 percent of the federal cost for periodic renourishment is provided by the Navigation business line, while the remaining 43 percent of the Federal cost is provided by the Flood Risk Management business line. The separation of federal funding sources often makes it difficult to obtain enough Congressionally- or Administratively-appropriated federal funding to construct the project during a fiscal year.

The 1986 authorization was modified by Public Law 102-104 (WRDA92). The authorized project provides for restoration of approximately 5.34 linear miles of beach on Folly Island (USACE, 1991). The amended authorizing language reads as follows:

SEC. 105. The project for shoreline protection for Folly Beach, South Carolina, authorized by section 501(a) of the Water Resources Development Act of 1986 (Public Law 99-662; 100 Stat.4136), is modified to authorize the Secretary to construct hurricane and storm protection measures based on the Charleston District Engineer's Post Authorization Change Report dated May 1991, at an estimated total initial cost of $15,283,000, with an estimated Federal cost of $12,990,000 and an estimated non-Federal cost of $2,293,000, and an annual cost of $647,000 for periodic beach nourishment over the life of the project, with an estimated annual Federal cost of $550,000 and an estimated non-Federal annual cost of $97,000.

1993 FEDERAL NOURISHMENT PROJECT

The Local Cooperation Agreement (LCA) between the USACE and the City was executed on September 14, 1992 which allowed for the initial construction of the 5.34-mile-long federal shore protection project in 1993. The project extended from just southwest of the Coast Guard station on the northeast end of the island to the County Park on the southwest end. The project provided a protective berm with a top width of 15 ft and elevation of 9.0 ft NGVD. Nine of the original groins, along the central portion of the island, were authorized for rehabilitation during the 1993 project. These groins are inventoried in Section 2.3

The 2.7 million cubic yard 1993 project was constructed by T.L. James and Co. from January to May 1993 at a cost of approximately $11.7 million (Table 7). Included in the cost of the 1993 nourishment project was an additional 35 cubic yards per linear foot of material placed between the groins after a nor'easter storm in March (O&M Manual, 1993).

Sand for this initial renourishment was removed from the lower Folly River landward of Stono Inlet and Folly Beach County Park. This area had been previously dredged through the Corps navigation channel maintenance program with the material placed on the County Park as a beach disposal project. Much smaller volumes of material were removed during those efforts. This area has always been within the Coastal Barrier Resource Act (CBRA) System Unit M07, but Fish and Wildlife Service had granted a public interest exemption for the first projects that was later rescinded. The City hopes to be able to seek an exemption again for this area using a more precise scope of sand and by better factoring in natural resource impacts.

Prior to construction of this initial nourishment, a Perpetual Easement Line (PEL) was established along the landward edge of the project at this time. The line was established along seawalls or the eroded dune/edge of vegetation demarking the line between the publicly funded renourished beach and the upland private property. Where needed, two types of easements were acquired from property owners: 1) quit claim deeds for the "wet" beach from Mean High Water (MHW) to low water, and 2) easements for the land from the MHW line to the PEL (B. Peeples, personal communication, February 2015).

TABLE 7. HISTORY OF SAND PLACEMENT ON FOLLY BEACH INCLUDING MAINTENANCE DISPOSAL ON FOLLY BEACH COUNTY PARK AND TRADITIONAL NOURISHMENT. PROJECTS ARE FEDERAL UNLESS OTHERWISE NOTED.

Year	Length (ft)	Volume (cy)	Cost	Sand Source	Project Type
2018	27,984	1,200,000	$17,125,689	Folly River	Nourishment
2014	27,984	1,400,000	$30,962,306	offshore	Nourishment

2013	1,800	415,000	$2,259,400	Folly River	Non-Federal Nourishment, Folly Beach County Park (FBCP)
2007	10,000	485,000	$6,748,501	Offshore	Emergency Nourishment
2006	1,500	84,354	$432,491	Folly River	Navigation Maintenance, sand placed at FBCP
2005	28,880	2,338,000	$12,115,200	Offshore	Nourishment
2003	1,500	127,202	$517,430	Folly River	Navigation Maintenance, sand placed at FBCP
2000	2,000	101,513	$307,610	Folly River	Navigation Maintenance, sand placed at FBCP
1998	2,000	40,000	$120,000	Folly River	Navigation Maintenance, sand placed at FBCP
1993	28,195	2,695,900	$11,700,000	Folly River	Nourishment
1990	1,500	200,000	$500,000	Folly River	Navigation Maintenance, sand placed at FBCP
1990	1,500	40,000	$100,000	Folly River	Navigation Maintenance, sand placed at FBCP
1988	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1987	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1986	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1985	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1984	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1983	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
1982	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP

1979	1,500	43,651	$76,143	Folly River	Navigation Maintenance, sand placed at FBCP
Totals	**146,843**	**9,476,177**	**$86,935,691**		

2005 FEDERAL RENOURISHMENT PROJECT

The Corps constructed the first renourishment of Folly Beach in 2005 after the project was approved for PL 84-99 (FCCE) assistance beach rehabilitation due to damages during the 2004 hurricane season. The City requested that the project be fully renourished in conjunction with the emergency rehabilitation. A dredging contract was awarded to Weeks Marine for $12,115,200 for placement of 2.3 million cubic yards of sand from offshore Borrow Area A over 5.34 miles of shoreline. Construction was completed in December 2005 (USACE, 2006).

2007 FEDERAL RENOURISHMENT PROJECT

As a result of damages from Hurricane Ophelia in 2005, during construction of the above project, the Folly Beach Shore Protection Project again received FCCE funds to repair storm damages. The City elected only to restore the northern 1.9 miles of the project, which were eligible to be repaired at 100% federal cost. The federal storm damage repair project was built in 2007 with 490,000 cubic yards of sand. Great Lakes Dredge and Dock was awarded the contract for $6.7 million (USACE, 2014).

2014 FEDERAL RENOURISHMENT PROJECT

The 2014 renourishment was constructed by Great Lakes Dredge and Dock Company at a cost of $30.7 million with the cutterhead dredge "The Alaska". The placement of 1.4 million cubic yards of sediment was completed in June 2014.

The borrow area for the 2014 project was located 3 miles offshore in federal waters, which is considered outer-continental shelf (OCS) sand resources. Thus, a three-party agreement between the USACE, the Bureau of Ocean Energy Management (BOEM), and the City of Folly Beach was required for use of these OCS resources (USACE/BOEM, 2014).

Dune vegetation and sand fencing installation were included in the 2005 and 2014 projects. Sea oats (*Uniola paniculata*) and bitter panicum/panic grass (*Panicum amarum*) were installed along most of the project area. Sand fence was installed in individual V-shaped sections open to the shoreline, with 8 ft spacing between Vs. Much of the fencing and vegetation eroded before the 2014 project began.

2013 FOLLY BEACH COUNTY PARK RENOURISHMENT PROJECT & TERMINAL GROIN

In addition to the federal project, the CCPRC constructed a renourishment of Folly Beach County Park which was completed in late June 2013. The dry beach width was increased by as much as 500 ft with 415,000 cubic yards of sand, which was hydraulically pumped from the Folly River by Marinex Construction. A 745 ft terminal groin, located approximately 1,850 ft southwest of the southernmost timber-pile groin on Folly Beach, was constructed by TIC at the southwest end of the project to limit sand losses. In addition, the park road was rebuilt with small limestone pebbles. Total project cost was $3.46 million (65% sand, 35%

structure) (CSE, 2013). Vegetation and sand fencing were also installed after construction of this project (Elko, 2013). Mitigation will be required if monitoring surveys show a direct negative impact of the terminal groin on Skimmer Flats or if erosion rates on Folly Beach spit exceed the historic rate of 15 cubic yards per foot per year.

2018 FEDERAL RENOURISHMENT PROJECT & LOCAL GROIN REHABILITATION

As a result of damages from Hurricanes Joaquin, Matthew, and Irma, in 2015, 2016, and 2017 respectively, the Folly Beach Shore Protection Project again received FCCE funds to repair storm damages. Renourishment was constructed by Marinex Construction, Inc. at a cost of $17.1 million with the cutterhead dredge "The Savannah". The placement of 1.2 million cubic yards of sand. Renourishment began in July and was completed in December 2018.

In contrast to the offshore borrow areas for the 2014 project, sand for the 2018 project was dredged from the Folly River. The use of the Folly River borrow area resulted in considerable cost savings with a unit cost of $9 to $12 per cubic yard, depending on location, and a total mobilization of $3.5 million. Compare the cost of this $17.1 million project to the $30.7 million project constructed in 2014 to understand the implication of using an inlet borrow area, which is protected and closer to the beach, than an exposed borrow area, farther offshore.

In conjunction with the 2018 renourishment, the City conducted a groin rehabilitation project along one mile of beach between 8th St. E. and the Washout (14th St. E.). The contractor was Crowder Construction Company and the cost was $2.1 million. Fifty percent of the project cost was covered by the state.

The goal of the groin rehabilitation project was to hold renourished sand on the beach longer (reduce erosion). This section of beach is located adjacent and to the northeast of 9 groins that were rehabilitated in 1993 in the vicinity of the pier. The project linked this healthy beach (2nd St. W. to 7th St. E.) with the region to the northeast (8th to 14th St. E.), which erodes quickly after renourishment. The project increased the sand holding capability of 9 additional groins located between 8th St. E. and 14th St. E. This resulted in 18 continuous rehabilitated groins extending from southwest of the pier to 14th St. E., just southwest of the Washout.

This project did not reproduce the capped sheet pile groins that exist near the pier; rather, the rehabilitated groins are "low-profile" following the natural grade/slope of the beach. The rehabilitated groins were not lengthened; they were strengthened by sand tightening with armor stone and grout. Additional armor stone was added to rock salvaged from the existing groins, and placed in a prism section along the entire length of the structure (along both the existing rock and timber-pile portions).

BEACH PERFORMANCE MONITORING

According to the 1993 federal Operations and Maintenance (O&M) Manual, which is a part of the City's long-term agreement with the USACE, the City is responsible for post-nourishment monitoring. The City is committed to maintaining the 9 groins near the center of the island, conducting visual inspections, and collecting annual surveys at existing state benchmarks to monitor the performance of the 2018 federal nourishment project.

One objective of collecting this information was to provide the City with the tools to mitigate severe erosion and total loss of the public restored beach in the future. Based on monitoring data and anticipated erosion trends, the City and the Corps have successfully planned for the next federal renourishment project, including obtaining federal funds and required state/federal permits, in advance of the erosion of private lands.

5.2.2 EMERGENCY ORDERS AND SANDBAGS

SCDHEC-OCRM does not consider long-term, chronic erosion as an "emergency." Emergency situations before or after a storm event often prompt local governments to issue Emergency Orders, which allow property owners to construct temporary barriers against wave uprush through one or a combination of the following erosion mitigation techniques: sandbagging, sand scraping, or minor renourishment. Property owners being protected by sandbags are responsible for the maintenance of the bags to ensure that they remain in place and in good repair, and they are also responsible for the complete removal of the bags.

As outlined in Section 5.2.1, numerous federal emergency beach nourishment projects have been constructed on Folly Beach in response to major storm damage from named tropical storms and hurricanes. The most recent emergency renourishment was built in 2018.

Since the publication of the 2015 LCBMP, the City of Folly Beach has not had any specific emergency orders; however, the state has issued blanket emergency orders following hurricane impacts in 2016-2018. The order let local governments allow property owners along the immediate beachfront to conduct minor renourishment, sand scraping or install sandbags to provide temporary protection to beachfront structures from wave uprush. Also, DHEC issued emergency general permits for post-storm activities, which involve the repair and reconstruction of structures in the tidelands and coastal waters critical area. Past known emergency orders on Folly Beach are summarized in Table 8.

TABLE 8. CITY OF FOLLY BEACH EMERGENCY ORDERS

Date	Type	Location
1/97	Sand Scraping, Renourishment	Folly Beach County Park
5/99	Sand Scraping, Renourishment	Folly Beach County Park
12/02	Sandbags, Sand Scraping, Renourishment	#2 Summer Place Lane
3/04	Sandbags, Sand Scraping, Renourishment	#2 Summer Place Lane
8/11	Sand Scraping, Renourishment	1709B East Ashley
1/13	Sandbags, Sand Scraping, Renourishment	1 Dreamchaser Lane
4/13	Renourishment	1319 East Ashley

The temporal extent of emergency orders reflects times when the federal renourishment project was needed. The spatial extent reflects the erosional hot spots on the northeast and southwest ends of the island. These orders provide good evidence that the federal nourishment alone has not achieved the goals of a comprehensive beach management plan, and a proactive, long-term beach preservation strategy is needed on Folly Beach.

5.2.3 PREVIOUS HURRICANE OR STORM EVENTS

Hurricane Hugo is the storm of record along the Charleston County coast. According to a post-storm assessment of the South Carolina developed coast following the impact of Hurricane Hugo, fifty percent of all the buildings destroyed were fronted by dry beaches less than 3 m wide and dune fields less than 15 m wide (Thieler and Young, 1991). Dune fields greater than 30 m wide protected beachfront property. 85% of Folly Beach washed over during Hugo.

More recently, federal rehabilitation efforts have been funded through the Flood Control and Coastal Emergency Act (FCCE) (PL 84-99), which gives the USACE authority to conduct emergency management activities. The renourishment projects that received PL 84-99 assistance shed light on significant storm events that have altered Folly Beach.

A series of winter storms in January and February 1998 resulted in severe erosion of Folly Beach County Park, located at the southwestern end of the island. PL 84-99 assistance funded the placement of 55,000 cubic yards of material at the County Park at a cost of $315,100.

During the 2004 hurricane season Folly Beach was impacted by a series of five tropical storms and a strong northeaster with offshore wave heights ranging up to 25 ft with the passage of Hurricane Charlie. Storm damages to the shore protection project resulted in the loss of 552,000 cubic yards of material from the project reach, 100,000 cubic yards of which were lost from the protective berm (USACE, 2006). This led to the first federal renourishment of Folly Beach in 2005.

Hurricane Ophelia was a Category 1 storm that sat offshore of Charleston, SC from September 10-13, 2005. This was during construction of the federal renourishment project and subjected the project to several days of high wave energy resulting in shoreline retreat of 150 ft. Approximately 470,000 cubic yards of freshly placed beach sand was eroded by the storm. The USACE published a Project Impact Report (USACE, 2005) making the project eligible for FCCE funds to repair the damage to the eastern 1.9 miles of the project.

More recently, erosion caused by Hurricane Irene in August 2011 (Figure 38 and Figure 39) and Hurricane Sandy in October 2012 (Figure 40 and Figure 41) resulted in critical conditions along the northeastern portion of the island and at the County Park on the southwest end. Unfortunately, the USACE did not receive FCCE funds to repair damages caused by these storm events.

FIGURE 38. FOLLY BEACH COUNTY PARK DURING HURRICANE IRENE IN 2011.

FIGURE 39. NORTHEAST PORTION OF FOLLY BEACH DURING HURRICANE IRENE IN 2011.

FIGURE 40. FOLLY BEACH COUNTY PARK AFTER HURRICANE SANDY IN DECEMBER 2012.

FIGURE 41. PROPERTY DAMAGE ON THE NORTHEAST PORTION OF FOLLY BEACH DUE TO EROSION CAUSED BY HURRICANE SANDY IN 2012.

Since 2015, numerous hurricanes have impacted Folly Beach. Hurricane Joaquin resulted in a historic flooding event across the Carolinas from October 1-5, 2015. Nearby Mount Pleasant, SC recorded 26.9 inches of rain the first five days of October 2015. In addition, tides were high due to the recent perigean spring (King) tide and persistent onshore winds,

exacerbating flooding along the coast. Although the wind and wave heights alone at Folly Beach were not extraordinary, the long duration of the high storm surge associated with Hurricane Joaquin combined with the wind and waves, produced an extraordinary storm event with record storm surge at Folly Beach. The elevated water levels at Folly Beach allowed wave energy to erode the upper beach berm and the primary dune line over an exceptionally long duration.

One year later, Hurricane Matthew, made landfall near McClellanville, 30 mi north of Charleston, SC, as a Category 1 hurricane. The passage of Matthew caused huge waves and surge, and resulted in prolonged exposure to storm conditions from October 7-10, 2016. The NOAA tide gauge in Charleston Harbor recorded a 6.14ft NAVD88 tide. Beach erosion on Folly was severe. The revetment that protects the only access road to the northeast end of the island was overtopped (Figure 42). This resulted in sand and rock debris covering the road and significant damage to the revetment. The city was fortunate that the state guard and the county provided equipment and staff to assist in the debris removal and clean up. FEMA provided funding to repair the revetment, which was temporarily stabilized, then fully rehabilitated in 2020.

FIGURE 42. FOUR PHOTOGRAPHS OF THE POST-MATTHEW CONDITION OF THE BEACH AND EAST ASHLEY DR AT THE WASHOUT, TAKEN ON OCT 9, 2016.

In 2017, Hurricane Irma made landfall in Southwest Florida as a Category 3 hurricane on September 10 then travelled toward Folly Beach. The Folly Beach pier wind station observed gusts of 85 mph and sustained winds of 58 mph. The NOAA tide gauge in Charleston Harbor recorded a 6.78ft NAVD88 tide, the third highest on record.

5.3. DISCUSSION OF EROSION CONTROL ALTERNATIVES

The City of Folly Beach has relied on the federal nourishment project to mitigate chronic erosion, but has experienced private property loss and damage due to delayed federal funding from Congress. The following elements are either being implemented or are under consideration as erosion control alternatives on Folly Beach.

5.3.1 BEACH RENOURISHMENT

Beach nourishment is the City's primary tool to address severe erosion per Section 5.2.1. The next federal project is scheduled for 2024, and the USACE has recently completed a draft feasibility study for the federal project. The study is called a General Reevaluation Report (GRR), and is a 100% federally-funded effort, with the City of Folly Beach as the non-federal study partner and member of the Project Delivery Team. It will result in a new 50-year project that should be congressionally authorized in 2022. The draft study recommends a 12-year renourishment interval with a 35 to 50 ft wide berm and a 15ft NAVD88 dune. The City has concerns with numerous elements of the proposed project, including the renourishment interval and the benefit cost ratio and has expressed these concerns to USACE leadership and through public comments. These concerns highlight the importance of planning for a multi-faceted approach to beachfront management with the federal nourishment project as one of several erosion control measures.

Since 2015, the City has also expressed interest in exploring regional sediment management (RSM) options to reduce downdrift impacts from Charleston Harbor. Potential options include the beneficial placement of both new work and maintenance dredged material from the planned Charleston Harbor Deepening Project in the downdrift littoral system, jetty modifications, and sand sharing or bypassing from the updrift side of the harbor downdrift.

As a result, the USACE utilized the Folly River as a borrow area for the 2018 renourishment. In addition, the USACE is planning a 2021 project to beneficially place sand from the Folly River maintenance dredging in a submerged nearshore berm off the northeast end of the island. The city is hopeful that these RSM efforts will have positive outcomes and that similar projects may continue in the future.

5.3.2 OTHER MEASURES

In December 2014, Folly Beach residents voted to pass a referendum to add 1% to the local accommodations tax. The additional tax was authorized by the South Carolina Beach Preservation Act and revenues collected are for the purpose of (re)nourishment, maintenance, erosion mitigation, and monitoring of beaches, dune restoration and maintenance, including planting of grass, sea oats or other vegetation useful in preserving the dune system, and maintenance of public beach accesses.

In addition to funding the local share of ongoing federal renourishment projects and studies, this beach preservation fund will be reserved for the following measures:

- Dune restoration (vegetation, sand fencing)
- Repair and maintenance of eroded hot spots
- Groin repair and rehabilitation
- Other erosion mitigation technologies
- Property acquisition
- Consultants to assist with beach preservation planning
- Beach Access Improvements

A small percentage of the beach preservation fund may be to be used to obtain properties that may become uninhabitable and/or located on the active beach due to severe erosion. These funds are not intended for active property acquisition, but for emergency situations where the property owner is not responsive in removing the building and public ownership is the most reasonable solution to avoid future rebuilding on vulnerable parcels. This strategy could help the city mitigate for the situation described in Section 1.3.3 (Development of Super-Beachfront Lots).

If property acquisition becomes necessary, the City will be eligible to apply for pre-disaster hazard mitigation grant funding from FEMA through the state EMD office. A FEMA grant could be leveraged with beach preservation funds.

6. NEEDS, GOALS AND IMPLEMENTATION STRATEGIES

6.1. POLICY OF BEACH PRESERVATION

The Beachfront Management Act states very clearly that the policy of the state of South Carolina is to protect, preserve, restore and enhance the beach/dune system. This act also calls for promoting wise use and development of the state's beachfront by implementing regulatory standards on the ocean side of the SCDHEC-OCRM setback line. Management strategies within this area include limiting the size of habitable structures, requiring oceanfront habitable structures and pools to be located as far landward on a lot as possible, prohibiting new shore-parallel erosion control structures, and promoting beach and dune restoration projects. The City of Folly Beach aims to implement these strategies to the greatest extent possible as described in this plan.

This plan outlines a long-term beach preservation strategy that includes beach nourishment, dune creation/stabilization through the use of fencing and vegetation, regional sediment management approaches, maintenance of existing groins, implementation of proven erosion mitigation techniques where applicable, property acquisition if needed, land management through zoning and development ordinances, conservation of publicly-owned shorelines, and public education to preserve the quality of Folly's most important asset. The goals of this program are to preserve the City's #1 economic engine, to provide a recreational beach, to discourage development from encroaching on the beach/dune system, to restore habitat, and to improve storm protection leading to coastal resilience. This strategy is consistent with the recommendations of the SCDHEC-OCRM Blue Ribbon Committee on Shoreline Management.

The City of Folly Beach has adopted development regulations which complement the State's policy of beach preservation as outlined in Section 4.2.4, as well as the use of beach preservation funds for property acquisition when needed.

6.1.1 FEDERAL SHORE PROTECTION PROJECT STRATEGY

As detailed in Section 5.2.1, the City completed an emergency federal renourishment in 2018. In the 2015 LCBMP, the City outlined three primary needs for renourishment planning that included 1): the immediate identification of a new sand source closer to shore to providing an adequate supply of sand at the lowest possible cost to the federal and City governments, 2) the identification of funding for the increased local cost share ($5 million in 2014) by working with State and other local governments who share an interest in continued beach preservation, and 3) annual beach monitoring surveys to provide more accurate and updated data on the state of the beach and the need for renourishment.

As of this 2020 update, the City has made significant progress toward all three needs. The Folly River borrow area was utilized in 2018 for renourishment and an additional USACE RSM project is underway. The City is active in the South Carolina Beach Advocates organization to assist with a dedicated state funding source for beach preservation. In addition, the residents of Folly Beach voted to approve a 1% increase to the local accommodations tax in December 2014 to create a beach preservation fund. The primary use

of these funds will be for the local share of future federal renourishment projects. Finally, the City is surveying the beach annually. Beach monitoring was discussed in Section 5.2.1.

Although the Folly Beach Shore Protection Project has been authorized by Congress, federal appropriations are not guaranteed. With an 85% cost share, the City intends to continue to advocate for federal funding but recognizes the risk. If federal funding were to become unavailable, the City would assess their present erosion mitigation needs using the best available science and engineering. Project funding would be obtained through a creative local financing model with a large state cost share, similar to other communities in South Carolina that do not have an authorized federal project.

6.1.2 OTHER BEACH MANAGEMENT STRATEGIES

Section 5.3.2 addressed a broad range of beach management strategies. This section describes how some of those strategies will be implemented.

Based on the results of Section 5.1, which indicate that the rehabilitated groins in the central portion of the island have been effective at retaining nourished sand, the city rehabilitated nine additional groins in 2018. Select rehabilitation projects can help to retain nourished material on the beach and extend the life of the federal nourishment projects. The City plans to apply for permits and set aside a portion of the beach preservation funds to rehabilitate additional groins in the future.

The City plans to consider other erosion control options such as filling erosional hot spots between periodic renourishment events (small scale) and property acquisition if necessary.

The 2018 Dune Management Plan (Appendix 7.5) provided a more comprehensive dune management strategy to better preserve existing dunes, build up new ones where feasible, and better manage beach access across the dunes for both City access points and private property access. In addition to the Dune Management Plan, the City adopted four additional long-term plans since the adoption of the 2015 LCBMP, which establish goals and objectives to manage the effects of climate change and sea level rise (see Section 4.2).

Other beach management issues mentioned in Section 1.4 included septic sewage and traffic. The 2017 Sea Level Rise Adaptation Plan addressed septic challenges on the island, which are being addressed through new ordinances, a research effort with Sea Grant, and modifications to the City's Comprehensive Plan. To address vehicular traffic issues, a redesign of Center Street was implemented since the 2015 plan to include turning lanes, which have improved traffic flow. Finally, this plan recommends that the City hire a staff person with GIS skills to assist with future mapping efforts.

6.2. STRATEGY FOR PRESERVING AND ENHANCING PUBLIC BEACH ACCESS

- identifying maintenance and improvement needs;
- developing funding sources to supplement maintenance activities;
- monitoring access volumes and developing methods to disseminate information on Town laws and policies;

- addressing concerns of property owners adjacent to beach access points;
- guarding against encroachments through use of setbacks and other zoning techniques; and
- continuing efforts to ensure beach renourishment and groin-field maintenance.

The Beach Preservation Fund and the City budget provide a source of funding to implement these recommendations.

7. APPENDICES

7.1. STRUCTURAL AND BEACH ALTERATION INVENTORY

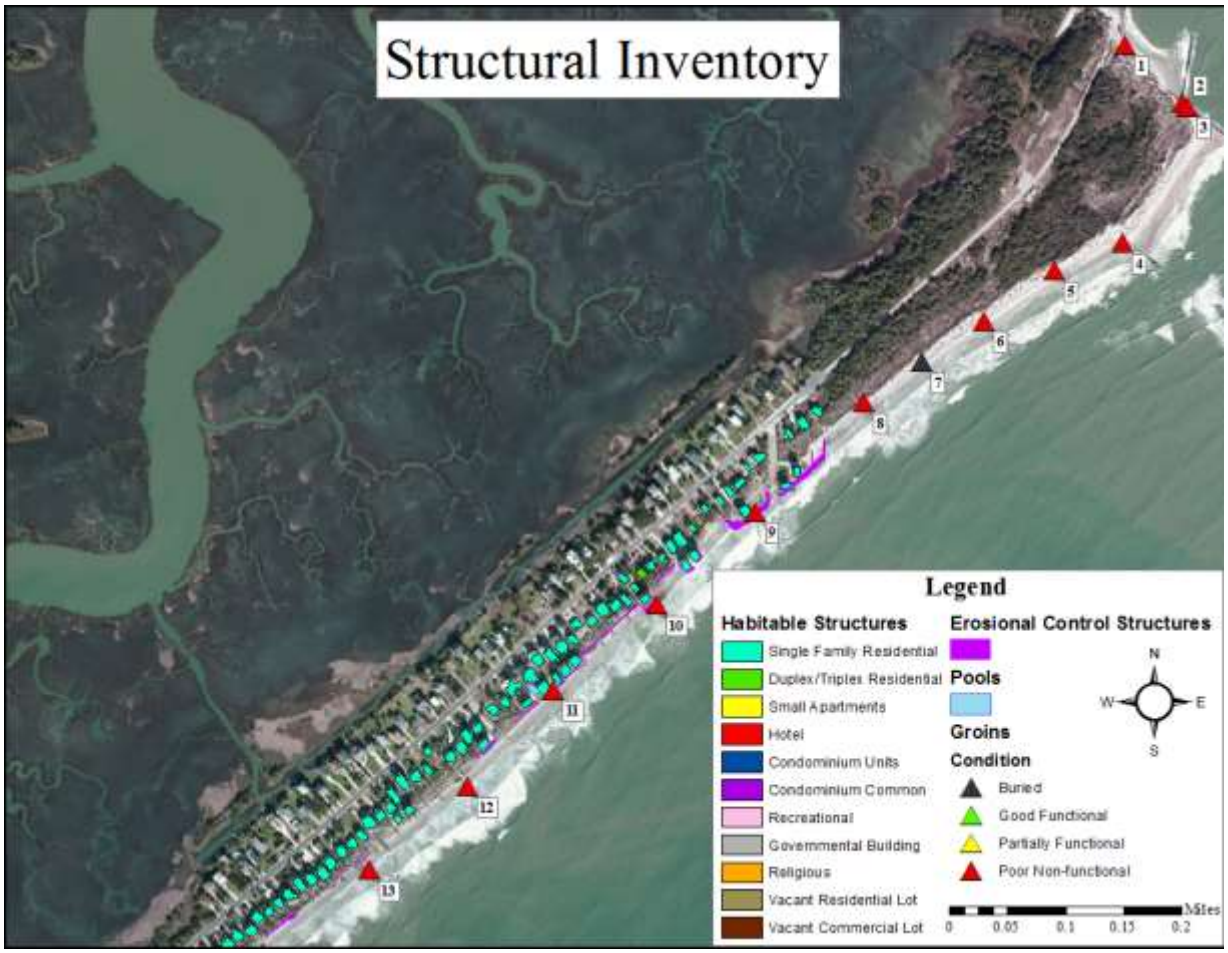

FIGURE 43. ONE OF FIVE STRUCTURAL INVENTORY MAPS ILLUSTRATING THE HABITABLE STRUCTURES, POOLS, EROSION CONTROL STRUCTURES AND GROINS DETAILED IN TABLE 9 AND TABLE 10 .

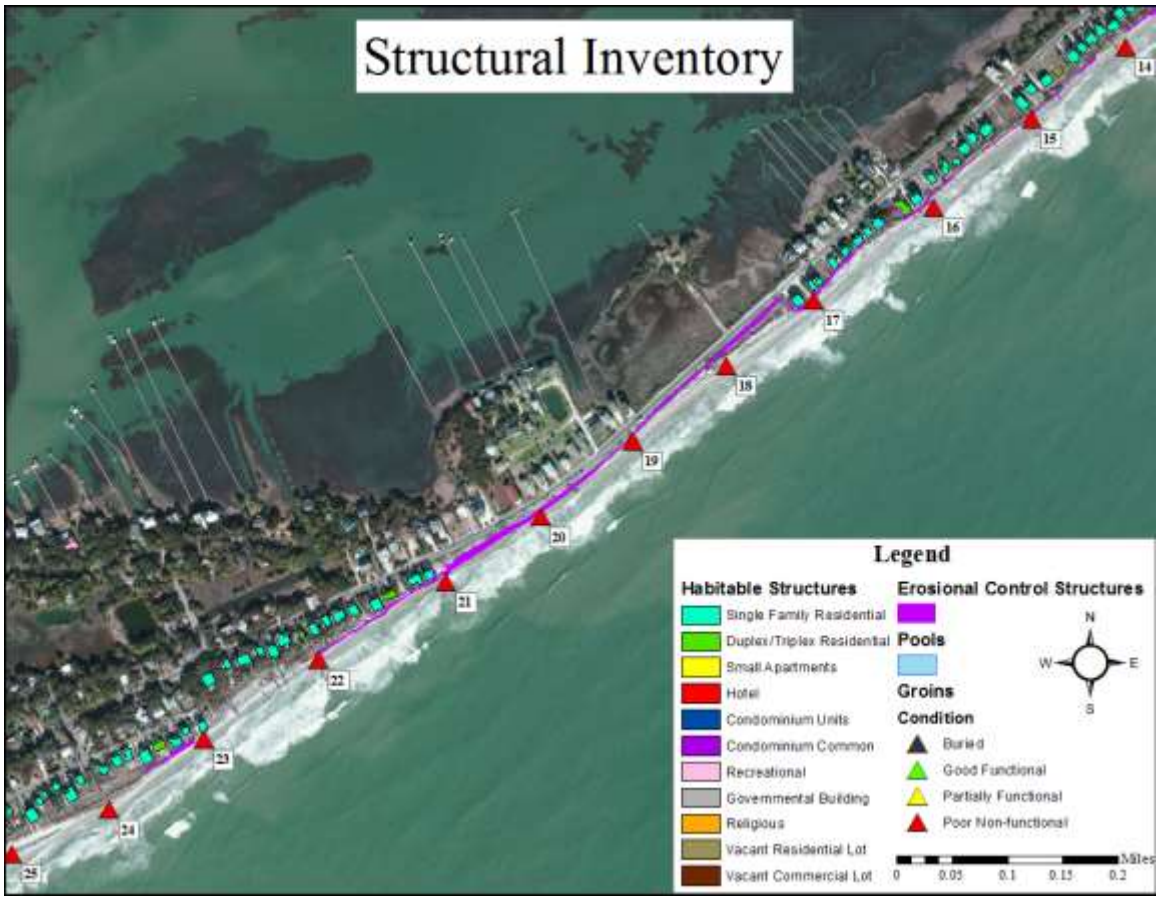

FIGURE 44. TWO OF FIVE STRUCTURAL INVENTORY MAPS ILLUSTRATING THE HABITABLE STRUCTURES, POOLS, EROSION CONTROL STRUCTURES AND GROINS DETAILED IN TABLE 9 AND TABLE 10.

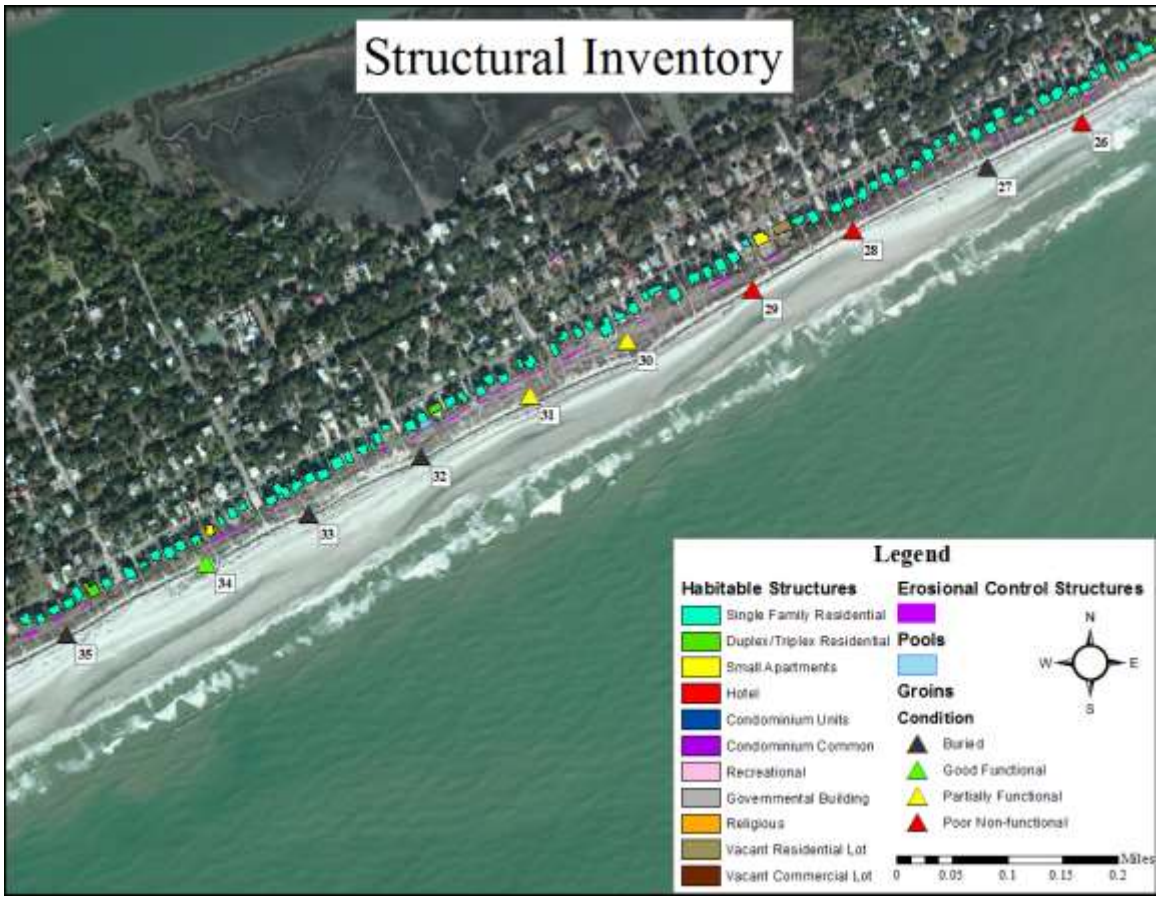

FIGURE 45. THREE OF FIVE STRUCTURAL INVENTORY MAPS ILLUSTRATING THE HABITABLE STRUCTURES, POOLS, EROSION CONTROL STRUCTURES AND GROINS DETAILED IN TABLE 9 AND TABLE 10.

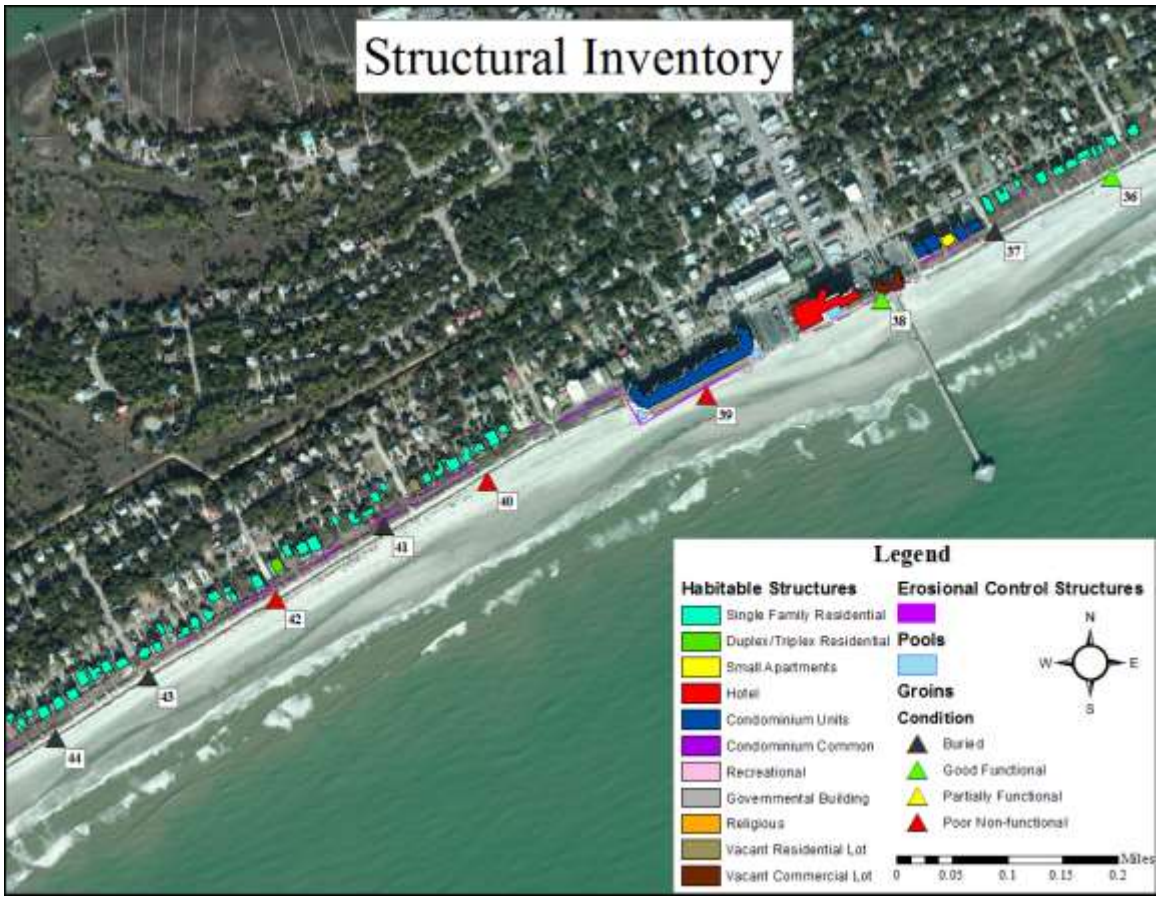

FIGURE 46. FOUR OF FIVE STRUCTURAL INVENTORY MAPS ILLUSTRATING THE HABITABLE STRUCTURES, POOLS, EROSION CONTROL STRUCTURES AND GROINS DETAILED IN TABLE 9 AND TABLE 10.

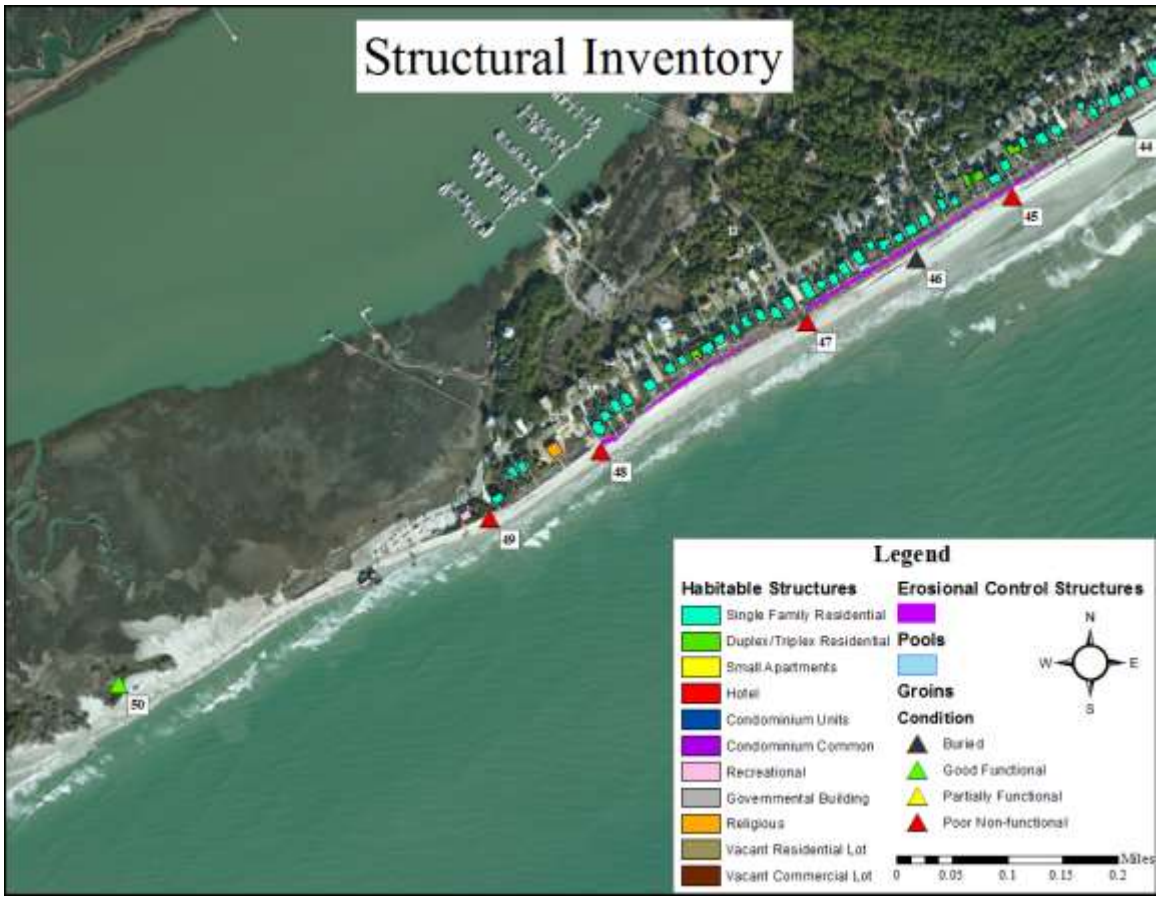

FIGURE 47. FIVE OF FIVE STRUCTURAL INVENTORY MAPS ILLUSTRATING THE HABITABLE STRUCTURES, POOLS, EROSION CONTROL STRUCTURES AND GROINS DETAILED IN TABLE 9 AND TABLE 10.

TABLE 9. STRUCTURAL INVENTORY THAT LINKS POOLS AND EROSION CONTROL STRUCTURES TO THEIR HABITABLE STRUCTURE (HERE, THE TERM "BASELINE" REFERS TO THE STRUCTURAL INVENTORY BASELINE OF THE SEAWARD MOST ROAD).

Address	Class Code	Parcel	Distance to Baseline (ft)	Erosional Control Structures	Seawall Distance to Baseline (ft)	Pool Distance to Baseline (ft)
201 ARCTIC W AVE	Condominium Common	3281400001	20.86		N/A	N/A
111 E ARCTIC AVE	Condominium Common	3281400003	64.38		N/A	N/A
113 E ARCTIC AVE	Condominium Common	3281400004	61.2		154.62	N/A
117 E ARCTIC AVE	Condominium Common	3281400006	67.91		N/A	N/A
121 E ARCTIC AVE	Condominium Common	3281400008	96.59		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400242	20.86		N/A	N/A

0 W ARCTIC AVE	Condominium Unit	3281400243	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400244	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400245	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400246	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400247	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400248	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400249	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400250	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400251	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400252	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400253	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400254	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400255	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400256	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400257	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400258	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400259	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400260	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400261	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400262	20.86	N/A	154.49
201 W ARCTIC AVE	Condominium Unit	3281400263	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400264	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400265	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400266	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400267	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400268	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400269	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400270	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400271	20.86	N/A	N/A

0 W ARCTIC AVE	Condominium Unit	3281400272	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400273	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400274	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400275	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400276	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400277	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400278	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400279	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400280	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400281	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400282	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400283	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400284	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400285	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400286	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400287	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400288	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400289	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400290	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400291	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400292	20.86	N/A	N/A
420 W ARCTIC AVE	Condominium Unit	3281400293	20.86	N/A	N/A
421 W ARCTIC AVE	Condominium Unit	3281400294	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400295	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400296	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400297	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400298	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400299	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400300	20.86	N/A	N/A

201 W ARCTIC AVE	Condominium Unit	3281400301	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400302	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400303	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400304	20.86		N/A	N/A
108 W ARCTIC AVE	Condominium Unit	3281400305	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400306	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400307	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400308	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400309	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400310	20.86	Seawall	19.89	N/A
0 W ARCTIC AVE	Condominium Unit	3281400311	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400312	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400313	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400314	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400315	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400316	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400317	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400318	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400319	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400320	20.86		N/A	N/A
304 W ARCTIC AVE	Condominium Unit	3281400321	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400322	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400323	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400324	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400325	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400326	20.86		N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400327	20.86		N/A	N/A
0 WEST ARCTIC AVE	Condominium Unit	3281400328	20.86		N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400329	20.86		N/A	N/A

0 W ARCTIC AVE	Condominium Unit	3281400330	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400331	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400332	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400333	20.86	N/A	N/A
201 W ARCTIC AVE	Condominium Unit	3281400334	20.86	N/A	N/A
408 W ARCTIC AVE	Condominium Unit	3281400335	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400336	20.86	N/A	N/A
0 W ARCTIC AVE	Condominium Unit	3281400337	20.86	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400340	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400341	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400342	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400343	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400344	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400345	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400346	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400347	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400348	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400349	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400350	96.59	N/A	N/A
121 E ARCTIC AVE	Condominium Unit	3281400351	96.59	N/A	N/A
111 E ARCTIC AVE	Condominium Unit	3281400373	64.38	152.86	N/A
111 E ARCTIC AVE	Condominium Unit	3281400374	64.38	N/A	N/A
111 E ARCTIC AVE	Condominium Unit	3281400375	64.38	N/A	N/A
111 E ARCTIC AVE	Condominium Unit	3281400376	64.38	N/A	N/A
111 E ARCTIC AVE	Condominium Unit	3281400377	64.38	N/A	N/A
111 E ARCTIC AVE	Condominium Unit	3281400378	64.38	N/A	N/A
117 E ARCTIC AVE	Condominium Unit	3281400379	67.91	152.54	N/A
117 E ARCTIC AVE	Condominium Unit	3281400380	67.91	N/A	N/A
117 E ARCTIC AVE	Condominium Unit	3281400381	67.91	N/A	N/A

117 E ARCTIC AVE	Condominium Unit	3281400382	67.91		N/A	N/A
117 E ARCTIC AVE	Condominium Unit	3281400383	67.91		N/A	N/A
117 E ARCTIC AVE	Condominium Unit	3281400384	67.91		N/A	N/A
113 E ARCTIC AVE	Condominium Unit	3281400453	61.2		N/A	N/A
113 E ARCTIC AVE	Condominium Unit	3281400454	61.2		N/A	N/A
113 E ARCTIC AVE	Condominium Unit	3281400455	61.2		N/A	N/A
113 E ARTIC AVE	Condominium Unit	3281400456	61.2		N/A	N/A
301 W ASHLEY AVE	Governmental Building	3281300086	25.8		22.95	N/A
1 CENTER ST	Hotel	3281400231	45.21	Seawall	204.72	155.13
0 W ASHLEY AVE	Recreational	3250000001	79.31		N/A	N/A
1017 W ASHLEY AVE	Religious	3251500014	89.91		N/A	N/A
1017 W ASHLEY AVE	Religious	3251500014	124.63		N/A	N/A
915 W ASHLEY AVE	Residential Duplex/Triplex	3251500019	64.52		157.91	N/A
719 W ASHLEY AVE	Residential Duplex/Triplex	3251600034	21.37		184.98	N/A
717 W ASHLEY AVE	Residential Duplex/Triplex	3251600035	48.46		186.09	N/A
711 ASHLEY W AVE	Residential Duplex/Triplex	3251600038	19.91		188.96	N/A
421 W ASHLEY AVE	Residential Duplex/Triplex	3281300068	63.8		N/A	N/A
317 E ARCTIC AVE	Residential Duplex/Triplex	3281500009	19.07		N/A	N/A
605 E ARCTIC AVE	Residential Duplex/Triplex	3281500034	35.94		132.45	N/A
1107 E ARCTIC AVE	Residential Duplex/Triplex	4391300004	55.97		N/A	N/A
1209 E ARCTIC AVE	Residential Duplex/Triplex	4391300016	45.88	Revetment/Wood Bulkhead	126.59	N/A
1403 E ASHLEY AVE	Residential Duplex/Triplex	4391300039	52.76	Revetment	110.44	N/A
1311 E ASHLEY AVE	Residential Duplex/Triplex	4391300045	52.67	Revetment	175.22	N/A
1581 E ASHLEY AVE	Residential Duplex/Triplex	4391400046	47.32	Revetment	43.95	N/A
1701 E ASHLEY AVE	Residential Duplex/Triplex	4391600048	87.55		N/A	N/A
1001 W ASHLEY AVE	Single Family	3251500016	65.89		173.95	N/A
919 W ASHLEY AVE	Single Family	3251500017	54.49		160.92	N/A
917 W ASHLEY AVE	Single Family	3251500018	54.23		155.57	N/A

913 W ASHLEY AVE	Single Family	3251500020	63.75		163.67	N/A
911 W ASHLEY AVE	Single Family	3251500021	57.68		163.03	N/A
909 ASHLEY W AVE	Single Family	3251500022	52.85		163.24	N/A
903 W ASHLEY AVE	Single Family	3251500023	86.16		N/A	N/A
1011 W ASHLEY AVE	Single Family	3251500029	76.83	Revetment	199.29	N/A
1009 W ASHLEY AVE	Single Family	3251500032	81.78	Rock Revetment	199.7	N/A
1007 W ASHLEY AVE	Single Family	3251500033	64.16	Rock Revetment	202.83	N/A
1005 W ASHLEY AVE	Single Family	3251500034	54.86	Rock Revetment	199.53	N/A
901 W ASHLEY AVE	Single Family	3251500035	76.84		N/A	N/A
1031 W ASHLEY AVE	Single Family	3251500051	54		N/A	N/A
1100 W ASHLEY AVE	Single Family	3251500058	64.18		N/A	N/A
907 W ASHLEY AVE	Single Family	3251500059	54.34		158.16	N/A
905 W ASHLEY AVE	Single Family	3251500060	53.23		N/A	N/A
1025 W ASHLEY AVE	Single Family	3251500062	75.54		N/A	N/A
819 W ASHLEY AVE	Single Family	3251600024	56.08		169.23	N/A
815 W ASHLEY AVE	Single Family	3251600025	99.5		171.01	N/A
813 W ASHLEY AVE	Single Family	3251600026	75.93		172.02	N/A
811 W ASHLEY AVE	Single Family	3251600027	63.14		173.47	139.17
809 W ASHLEY AVE	Single Family	3251600028	55.4		174.41	N/A
807 W ASHLEY AVE	Single Family	3251600029	88.3		176.15	N/A
805 W ASHLEY AVE	Single Family	3251600030	102.71		177.95	N/A
801 W ASHLEY AVE	Single Family	3251600031	88.09		180.95	N/A
723 W ASHLEY AVE	Single Family	3251600032	39.5		182.73	N/A
723 W ASHLEY AVE	Single Family	3251600032	62.54		182.73	N/A
721 W ASHLEY AVE	Single Family	3251600033	88.31		183.83	N/A
715 W ASHLEY AVE	Single Family	3251600036	99.6		187.22	N/A
713 W ASHLEY AVE	Single Family	3251600037	67.5		188.35	N/A
709 W ASHLEY AVE	Single Family	3251600039	17.07		189.42	N/A
703 W ASHLEY AVE	Single Family	3251600041	46.35		N/A	N/A

701 W ASHLEY AVE	Single Family	3251600042	49.19		N/A	N/A
817 W ASHLEY AVE	Single Family	3251600060	93.24		170.17	N/A
803 W ASHLEY AVE	Single Family	3251600080	92.61		179.79	N/A
621 W ASHLEY AVE	Single Family	3281300047	23.93		N/A	N/A
619 W ASHLEY AVE	Single Family	3281300048	60.6		N/A	N/A
617 W ASHLEY AVE	Single Family	3281300049	51.1		N/A	N/A
615 W ASHLEY AVE	Single Family	3281300050	73.89		N/A	N/A
613 W ASHLEY AVE	Single Family	3281300051	71.08		N/A	N/A
611 W ASHLEY AVE	Single Family	3281300052	75.15		N/A	N/A
609 W ASHLEY AVE	Single Family	3281300053	26.34		N/A	N/A
607 W ASHLEY AVE	Single Family	3281300054	26.25		N/A	N/A
605 W ASHLEY AVE	Single Family	3281300055	49.63		N/A	N/A
601 W ASHLEY AVE	Single Family	3281300056	78.4		N/A	N/A
521 W ASHLEY AVE	Single Family	3281300057	87.14		N/A	N/A
519 W ASHLEY AVE	Single Family	3281300058	97.74		N/A	N/A
517 W ASHLEY AVE	Single Family	3281300059	30.65		N/A	N/A
515 W ASHLEY AVE	Single Family	3281300060	59.52	Rock Revetment	169.85	N/A
513 W ASHLEY AVE	Single Family	3281300061	111.25		N/A	N/A
511 W ASHLEY AVE	Single Family	3281300062	87.66		N/A	N/A
509 W ASHLEY AVE	Single Family	3281300063	93.38		N/A	N/A
507 W ASHLEY AVE	Single Family	3281300064	36.83		N/A	N/A
505 W ASHLEY AVE	Single Family	3281300065	51.77		170.84	N/A
501 W ASHLEY AVE	Single Family	3281300067	75.5		163.85	N/A
419 W ASHLEY AVE	Single Family	3281300069	24.59		168.28	N/A
415 W ASHLEY AVE	Single Family	3281300070	50.98		167.88	N/A
409 W ASHLEY AVE	Single Family	3281300072	27.37		N/A	N/A
407 W ASHLEY AVE	Single Family	3281300073	60.01		N/A	N/A
405 W ASHLEY AVE	Single Family	3281300074	90.85		160.79	N/A
403 ASHLEY W AVE	Single Family	3281300075	32.59		161.25	N/A

401 ASHLEY W AVE	Single Family	3281300076	16.55		161.84	N/A
321 W ASHLEY AVE	Single Family	3281300078	80.2		162.2	N/A
319 W ASHLEY AVE	Single Family	3281300079	66.91		162.99	N/A
315 W ASHLEY AVE	Single Family	3281300081	78.2		163.73	N/A
313 W ASHLEY AVE	Single Family	3281300082	74.09		163.72	N/A
309 W ASHLEY AVE	Single Family	3281300083	68.51		N/A	N/A
307 W ASHLEY AVE	Single Family	3281300084	72.63		N/A	N/A
311 W ASHLEY AVE	Single Family	3281300129	87.42		N/A	N/A
413 W ASHLEY AVE	Single Family	3281300218	61.9		167.5	N/A
207 E ARCTIC AVE	Single Family	3281400012	18.54		N/A	N/A
211 E ARCTIC AVE	Single Family	3281400014	41.95		N/A	N/A
213 E ARCTIC AVE	Single Family	3281400015	55.36		N/A	N/A
215 E ARCTIC AVE	Single Family	3281400016	53.85		N/A	N/A
219 E ARCTIC AVE	Single Family	3281400018	48.08		N/A	N/A
221 E ARCTIC AVE	Single Family	3281400019	44.73		N/A	N/A
223 E ARCTIC AVE	Single Family	3281400020	54.93		N/A	N/A
225 E ARCTIC AVE	Single Family	3281400021	38.53		N/A	N/A
301 E ARCTIC AVE	Single Family	3281500001	45.9		N/A	N/A
307 E ARCTIC AVE	Single Family	3281500004	15.66		110.65	N/A
309 E ARCTIC AVE	Single Family	3281500005	50.77		N/A	N/A
311 E ARCTIC AVE	Single Family	3281500006	47.04	Revetment/Wood Bulkhead	104.67	N/A
313 E ARCTIC AVE	Single Family	3281500007	46.89		N/A	N/A
315 E ARCTIC AVE	Single Family	3281500008	12.85		113.29	N/A
319 E ARCTIC AVE	Single Family	3281500010	42.99		N/A	N/A
401 E ARCTIC AVE	Single Family	3281500011	40.31		N/A	N/A
403 E ARCTIC AVE	Single Family	3281500012	55.63		N/A	N/A
405 E ARCTIC AVE	Single Family	3281500013	35.2		N/A	N/A
407 E ARCTIC AVE	Single Family	3281500014	42.65		N/A	N/A
409 E ARCTIC AVE	Single Family	3281500015	40.71		N/A	N/A
406 ARCTIC E AVE	Single Family	3281500016	60.58		N/A	N/A
415 E ARCTIC AVE	Single Family	3281500018	31.03		119.85	N/A
417 E ARCTIC AVE	Single Family	3281500019	18.82		119.89	N/A
419 E ARCTIC AVE	Single Family	3281500020	23.83		N/A	N/A
501 E ARCTIC AVE	Single Family	3281500021	59.87		114.64	N/A
503 E ARCTIC AVE	Single Family	3281500022	23.27		113.2	N/A
505 E ARCTIC AVE	Single Family	3281500023	42.24		N/A	N/A
507 E ARCTIC AVE	Single Family	3281500024	47.24		N/A	N/A
0 E ARCTIC AVE	Single Family	3281500025	57.94		N/A	N/A

513 E ARCTIC AVE	Single Family	3281500026	40.51		N/A	N/A
515 E ARCTIC AVE	Single Family	3281500027	38.48		N/A	N/A
517 E ARCTIC AVE	Single Family	3281500028	47.5	Wood Bulkhead	112.94	N/A
519 E ARCTIC AVE	Single Family	3281500029	53.42		N/A	N/A
521 E ARCTIC AVE	Single Family	3281500030	27.3	Wood Bulkhead	111.68	N/A
523 E ARCTIC AVE	Single Family	3281500031	10.1		N/A	N/A
601 E ARCTIC AVE	Single Family	3281500032	49.08	Revetment	122.78	N/A
603 E ARCTIC AVE	Single Family	3281500033	33.13		N/A	93.23
607 E ARCTIC AVE	Single Family	3281500035	36.6	Wood Bulkhead	119.17	N/A
607 E ARCTIC AVE	Single Family	3281500035	36.6	Concrete Seawall and Revetment	130.52	N/A
609 E ARCTIC AVE	Single Family	3281500036	38.49		N/A	N/A
611 E ARCTIC AVE	Single Family	3281500037	59.09	Wood Bulkhead	123.54	N/A
613 E ARCTIC AVE	Single Family	3281500038	30.79	Revetment	118.42	N/A
619 E ARCTIC AVE	Single Family	3281500041	31.29	Revetment	119.85	N/A
615 E ARCTIC AVE	Single Family	3281500217	51.69	Revetment	119.46	N/A
621 E ARCTIC AVE	Single Family	3281500218	35.41	Revetment	119.19	N/A
701 E ARCTIC AVE	Single Family	3281600001	35.31		129.24	N/A
702 ARCTIC E AVE	Single Family	3281600002	11.98		126.73	N/A
705 E ARCTIC AVE	Single Family	3281600003	23.64		124.66	N/A
707 E ARCTIC AVE	Single Family	3281600004	20.63		N/A	N/A
709 E ARCTIC AVE	Single Family	3281600005	47.04		N/A	N/A
711 E ARCTIC AVE	Single Family	3281600006	41.26		N/A	N/A
713 E ARCTIC AVE	Single Family	3281600007	43.89		140.74	N/A
708 ARCTIC E AVE	Single Family	3281600008	17.56		145.24	N/A
717 E ARCTIC AVE	Single Family	3281600009	26.95		N/A	N/A
719 E ARCTIC AVE	Single Family	3281600010	70.68		N/A	N/A
801 E ARCTIC AVE	Single Family	3281600011	49.92		N/A	N/A
803 E ARCTIC AVE	Single Family	3281600012	54.87		150.31	N/A
805 ARCTIC E AVE	Single Family	3281600013	49.27		148.9	N/A
807 E ARCTIC AVE	Single Family	3281600014	48.09		N/A	N/A
809 E ARCTIC AVE	Single Family	3281600015	23.99		N/A	N/A
817 E ARCTIC AVE	Single Family	3281600017	39.6		N/A	N/A
819 E ARCTIC AVE	Single Family	3281600018	52.8		N/A	N/A
901 ASHLEY E AVE	Single Family	3281600019	68.86		N/A	N/A
905 E ARCTIC AVE	Single Family	3281600020	75.53		N/A	N/A
907 E ARCTIC AVE	Single Family	3281600021	58.77	Wood Bulkhead	156.63	N/A
909 E ARCTIC AVE	Single Family	3281600022	58.95		N/A	N/A
911 E ARCTIC AVE	Single Family	3281600023	47.6		N/A	N/A
913 E ARCTIC AVE	Single Family	3281600024	60.62	Wood Bulkhead Questionable	143.18	N/A
915 E ARCTIC AVE	Single Family	3281600025	61.74		N/A	N/A
917 E ARCTIC AVE	Single Family	3281600026	35.32		N/A	N/A
919 E ARCTIC AVE	Single Family	3281600027	20.22		N/A	N/A

921 E ARCTIC AVE	Single Family	3281600028	29.83		N/A	N/A
1001 E ARCTIC AVE	Single Family	3281600029	54.53		N/A	N/A
1003 E ARCTIC AVE	Single Family	3281600030	65.13	Revetment	149.93	N/A
1005 E ARCTIC AVE	Single Family	3281600031	20.71	Wood Bulkhead Questionable	152.68	N/A
1007 E ARCTIC AVE	Single Family	3281600032	102.25		N/A	N/A
1009 E ARCTIC AVE	Single Family	3281600033	95.73		N/A	N/A
1011 ARCTIC E AVE	Single Family	3281600034	60.73		N/A	N/A
1013 E ARCTIC AVE	Single Family	3281600035	65.39		N/A	N/A
1015 E ARCTIC AVE	Single Family	3281600036	92.84		N/A	N/A
1017 E ARCTIC AVE	Single Family	3281600037	99.57	Revetment	163.61	N/A
1019 E ARCTIC AVE	Single Family	3281600038	70.21		N/A	N/A
1021 E ARCTIC AVE	Single Family	3281600209	61.86		N/A	N/A
1101 E ARCTIC AVE	Single Family	4391300001	91.82		N/A	N/A
1103 E ARCTIC AVE	Single Family	4391300002	86.31		N/A	N/A
1105 E ARCTIC AVE	Single Family	4391300003	47.52		N/A	N/A
1109 ARCTIC E AVE	Single Family	4391300005	28.85		N/A	N/A
1111 E ARCTIC AVE	Single Family	4391300006	76.3		N/A	N/A
1113 E ARCTIC AVE	Single Family	4391300007	44.63		N/A	N/A
1115 ARCTIC E AVE	Single Family	4391300008	30.4	Concrete Seawall	93.75	N/A
1119 ARCTIC E AVE	Single Family	4391300009	15.26		N/A	N/A
1121 E ARCTIC AVE	Single Family	4391300010	67.07		N/A	N/A
1110 ARCTIC E AVE	Single Family	4391300011	32		N/A	N/A
1201 E ARCTIC AVE	Single Family	4391300012	31.93		N/A	N/A
1203 E ARCTIC AVE	Single Family	4391300013	24.16		N/A	N/A
1205 E ARCTIC AVE	Single Family	4391300014	18.09		N/A	N/A
1207 E ARCTIC AVE	Single Family	4391300015	56.71	Revetment/Wood Bulkhead	129.36	N/A
1211 E ARCTIC AVE	Single Family	4391300017	55.85	Revetment/Wood Bulkhead	101.27	N/A
1213 E ARCTIC AVE	Single Family	4391300018	26.57	Revetment/Wood Bulkhead	85.16	N/A
1215 E ARCTIC AVE	Single Family	4391300019	47.72	Wood Bulkhead	95.62	N/A

1409 E ASHLEY AVE	Single Family	4391300036	47.84	Revetment/Wood Bulkhead	53.86	N/A
1407 E ASHLEY AVE	Single Family	4391300037	38.47	Revetment/Wood Bulkhead	91.82	N/A
1401 E ASHLEY AVE	Single Family	4391300040	60.31	Revetment	117.15	N/A
1319 E ASHLEY AVE	Single Family	4391300041	43.32	Revetment	133.83	N/A
1317 E ASHLEY AVE	Single Family	4391300042	42.79	Revetment	152.68	N/A
1315 E ASHLEY AVE	Single Family	4391300043	31.26	Revetment	163.01	N/A
1313 E ASHLEY AVE	Single Family	4391300044	44.49	Revetment	174.27	N/A
1309 E ASHLEY AVE	Single Family	4391300046	24.77	Wood Bulkhead	N/A	N/A
1307 E ASHLEY AVE	Single Family	4391300047	54.9		N/A	N/A
1305 ASHLEY E AVE	Single Family	4391300048	33.64		N/A	N/A
1301 E ASHLEY AVE	Single Family	4391300050	20.61		N/A	N/A
1219 E ASHLEY AVE	Single Family	4391300051	45.64		N/A	N/A
1303 E ASHLEY AVE	Single Family	4391300171	31.77		N/A	N/A
1561 E ASHLEY AVE	Single Family	4391400036	58.67	Revetment/Concrete Bulkhead	56.87	N/A
1563 E ASHLEY AVE	Single Family	4391400037	52.77	Revetment/Wood Bulkhead	100.84	N/A
1565 E ASHLEY AVE	Single Family	4391400038	70.89	Revetment	106.67	N/A
1569 E ASHLEY AVE	Single Family	4391400040	38.24	Revetment	88.4	N/A
1571 E ASHLEY AVE	Single Family	4391400041	44.14	Revetment	89.4	N/A
1573 E ASHLEY AVE	Single Family	4391400042	50.61	Revetment/Wood Bulkhead	89.1	N/A
1575 E ASHLEY AVE	Single Family	4391400043	42.56	Revetment/Wood Bulkhead	90.79	N/A
1577 E ASHLEY AVE	Single Family	4391400044	39.17	Revetment/Wood Bulkhead	85.74	N/A
1583 E ASHLEY AVE	Single Family	4391400047	80.79	Revetment	142.87	N/A
1587 E ASHLEY AVE	Single Family	4391500002	58.74	Revetment/Concrete Bulkhead	117.13	N/A
1589 E ASHLEY AVE	Single Family	4391500003	55.42	Revetment	135.54	N/A
1591 E ASHLEY AVE	Single Family	4391500004	76.22	Revetment	136.63	N/A
1593 E ASHLEY AVE	Single Family	4391500005	57.32	Revetment	137.87	N/A
1595 E ASHLEY AVE	Single Family	4391500006	41	Revetment	141.2	N/A
1597 E ASHLEY AVE	Single Family	4391500007	55.27	Revetment	144.55	N/A
1603 E ASHLEY AVE	Single Family	4391500009	59.12	Revetment	170.71	N/A

1605 E ASHLEY AVE	Single Family	4391500010	57.2	Revetment	176.59	N/A
1607 E ASHLEY AVE	Single Family	4391500011	77.57	Wood/Concrete Seawall	170.92	N/A
1613 E ASHLEY AVE	Single Family	4391500015	76.4	Revetment	174.25	N/A
1617 E ASHLEY AVE	Single Family	4391500016	73.77		N/A	N/A
1619 E ASHLEY AVE	Single Family	4391500017	64.78		N/A	N/A
1621 E ASHLEY AVE	Single Family	4391500018	102.92		N/A	N/A
1623 E ASHLEY AVE	Single Family	4391500019	73.22	Revetment	169.11	N/A
1625 E ASHLEY AVE	Single Family	4391500020	89.24	Revetment	181.9	N/A
1627 E ASHLEY AVE	Single Family	4391500021	93.98	Revetment	190.71	N/A
1629 E ASHLEY AVE	Single Family	4391500022	86.95		N/A	N/A
1631 E ASHLEY AVE	Single Family	4391500023	81.03		N/A	N/A
1633 E ASHLEY AVE	Single Family	4391500024	102.63		N/A	N/A
1635 ASHLEY E AVE	Single Family	4391500025	113.63	Revetment	210.87	N/A
1639 E ASHLEY AVE	Single Family	4391500026	112.37	Revetment	201.16	N/A
1639 E ASHLEY AVE	Single Family	4391500026	112.37	Revetment	203.56	N/A
1641 E ASHLEY AVE	Single Family	4391500027	105	Revetment	216.65	N/A
1645 E ASHLEY AVE	Single Family	4391500028	114.85		N/A	N/A
1647 E ASHLEY AVE	Single Family	4391500029	86.29		N/A	N/A
1649 E ASHLEY AVE	Single Family	4391500030	109.64		N/A	N/A
1651 E ASHLEY AVE	Single Family	4391500031	111.38		N/A	N/A
1653 E ASHLEY AVE	Single Family	4391500032	66.23		N/A	N/A
1655 E ASHLEY AVE	Single Family	4391500033	48.58		N/A	113.19
1657 E ASHLEY AVE	Single Family	4391500034	81.99		N/A	N/A
1659 E ASHLEY AVE	Single Family	4391500035	98.77		N/A	N/A
1661 E ASHLEY AVE	Single Family	4391500036	41.45		N/A	N/A
1663 E ASHLEY AVE	Single Family	4391500037	120.26		N/A	N/A
1665 E ASHLEY AVE	Single Family	4391500038	121.31		N/A	N/A
1667 E ASHLEY AVE	Single Family	4391500039	94.42		N/A	N/A
1669 E ASHLEY AVE	Single Family	4391500040	111.75		N/A	N/A

1 DREAMCHASER LN	Single Family	4391500041	188.42	Revetment/Wood Bulkhead	200.2	N/A
1643 E ASHLEY AVE	Single Family	4391500092	118.19	Revetment	207.09	N/A
0 ASHLEY E AVE	Single Family	4391500094	76.34	Revetment	157.57	N/A
1651 E ASHLEY AVE	Single Family	4391500095	178.79		N/A	N/A
0 E ASHLEY AVE	Single Family	4391500096	179.31		N/A	N/A
1673 E ASHLEY AVE	Single Family	4391600034	88.49	Revetment	193.15	N/A
1675 E ASHLEY AVE	Single Family	4391600035	108.19		N/A	N/A
1677 E ASHLEY AVE	Single Family	4391600036	71.78		N/A	N/A
1679 E ASHLEY AVE	Single Family	4391600037	82.08		N/A	119.77
1681 E ASHLEY AVE	Single Family	4391600038	59.38		N/A	N/A
1683 E ASHLEY AVE	Single Family	4391600039	76.75		N/A	N/A
1685 E ASHLEY AVE	Single Family	4391600040	84.46		N/A	N/A
1687 E ASHLEY AVE	Single Family	4391600041	99.11	Revetment	194.07	N/A
1689 E ASHLEY AVE	Single Family	4391600042	57.84	Revetment	194.66	N/A
2176 ASHLEY E AVE	Single Family	4391600043	96.44	Revetment	195.16	N/A
1693 E ASHLEY AVE	Single Family	4391600044	84.92	Revetment	195.65	N/A
1695 E ASHLEY AVE	Single Family	4391600045	117.02	Revetment	196.13	N/A
1697 E ASHLEY AVE	Single Family	4391600046	120.5	Revetment	196.6	N/A
1699 E ASHLEY AVE	Single Family	4391600047	115.04		N/A	N/A
1703 E ASHLEY AVE	Single Family	4391600049	87.95	Revetment	179.05	N/A
1705 E ASHLEY AVE	Single Family	4391600050	103.84	Revetment	176.22	N/A
1707 E ASHLEY AVE	Single Family	4391600051	80.31		N/A	N/A
1709 E ASHLEY AVE	Single Family	4391600052	78.89		N/A	N/A
1711 E ASHLEY AVE	Single Family	4391600053	89.42		N/A	N/A
1715 E ASHLEY AVE	Single Family	4391600055	62.41	Revetment	177.47	N/A
1717 E ASHLEY AVE	Single Family	4391600056	78.63		N/A	N/A
1719 E ASHLEY AVE	Single Family	4391600057	72.14		N/A	N/A
1721 E ASHLEY AVE	Single Family	4391600058	86.72		N/A	N/A
1723 E ASHLEY AVE	Single Family	4391600059	50.92		N/A	N/A
1 SUMMER PL	Single Family	4391600060	189.01	Revetment/Wood Bulkhead	173.12	N/A

1709 E ASHLEY AVE	Single Family	4391600065	188.38	Revetment/Wood Bulkhead	191.92	N/A
1707 E Ashley Ave B	Single Family	4391600066	190.96	Revetment/Wood Bulkhead	192.89	N/A
1699 B E ASHLEY AVE	Single Family	4391600070	186.49	Revetment	212.78	N/A
1685 B E ASHLEY AVE	Single Family	4391600077	179.46	Revetment	230.06	N/A
1683 B E ASHLEY AVE	Single Family	4391600078	181.84	Revetment	227.63	N/A
1681 B E ASHLEY AVE	Single Family	4391600079	178.14	Revetment	230.51	N/A
1679 B E ASHLEY AVE	Single Family	4391600080	173.44	Revetment/Wood Bulkhead	214.44	148.99
1677 B E ASHLEY AVE	Single Family	4391600082	182.72	Revetment	221.64	N/A
1737 E ASHLEY AVE	Single Family	4391600091	60.87		N/A	N/A
1731 E ASHLEY AVE	Single Family	4391600096	63.87		N/A	N/A
1733 E ASHLEY AVE	Single Family	4391600097	66.93		N/A	N/A
1727 E ASHLEY AVE	Single Family	4391600099	51.88		N/A	N/A
2 SUMMER PL	Single Family	4391600100	231.49	Revetment/Wood Bulkhead	235.7	N/A
4 SUMMER PL	Single Family	4391600101	211.56	Revetment/Wood Bulkhead	212.81	N/A
6 SUMMER PL	Single Family	4391600102	211.56	Revetment/Wood Bulkhead	212.81	N/A
115 E ARCTIC AVE	Small Apartments	3281400005	92.7		153.51	N/A
413 E ARCTIC AVE	Small Apartments	3281500017	46.69		119.81	N/A
811 E ARCTIC AVE	Small Apartments	3281600016	25.77	Rock Revetment	151.4	N/A
201 E ARCTIC AVE	Vacant CCPRC lot	3281400009	16.47		N/A	N/A
101 W ARCTIC AVE	Vacant Commercial Lot	3281400232	146.52	Concrete Seawall	203.19	N/A
1003 W ASHLEY AVE	Vacant Residential Lot	3251500015				
623 W ASHLEY AVE	Vacant Residential Lot	3281300046				
503 W ASHLEY AVE	Vacant Residential Lot	3281300066				
323 W ASHLEY AVE	Vacant Residential Lot	3281300077	75.88		161.93	N/A
209 E ASHLEY AVE	Vacant Residential Lot	3281400013				

305 E ASHLEY AVE	Vacant Residential Lot	3281500003				
617 E ASHLEY AVE	Vacant Residential Lot	3281500039				
815 E ARCTIC AVE	Vacant Residential Lot	3281600189	31.77		N/A	N/A
1217 E ASHLEY AVE	Vacant Residential Lot	4391300052				
1567 E ASHLEY AVE	Vacant Residential Lot	4391400039				
1599 E ASHLEY AVE	Vacant Residential Lot	4391500008			N/A	N/A
1611 E ASHLEY AVE	Vacant Residential Lot	4391500013	85.78	Revetment/Wood Bulkhead	174.37	N/A
1601 E ASHLEY AVE	Vacant Residential Lot	4391500097			N/A	N/A
1713 E ASHLEY AVE	Vacant Residential Lot	4391600054	81.53		N/A	N/A

TABLE 10. INVENTORY OF GROINS ON FOLLY BEACH. THE GROINS ARE ILLUSTRATED IN FIGURE 43 THROUGH FIGURE 47.

Groin	Length (ft)	Build date	Built by	Rebuild date	Rebuilt by	Material	Condition
1	230	1962	US Coast Guard	none	none	riprap	Poor Non-functional
2	315	1962	US Coast Guard	none	none	riprap	Poor Non-functional
3	400	1976	US Coast Guard	none	none	riprap	Poor Non-functional
4	300	1970	US Coast Guard	none	none	riprap	Poor Non-functional
5	180	1970	US Coast Guard	none	none	riprap	Poor Non-functional
6	150	1970	US Coast Guard	none	none	riprap/ wood	Poor Non-functional
7	130	1973	US Coast Guard	none	none	riprap/ wood	Buried
8	180	1973	US Coast Guard	none	none	riprap/ wood	Poor Non-functional
9	160	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
10	190	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
11	240	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional

12	215	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
13	215	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
14	250	1950's-1960's	SCDOT	none	none	riprap/ wood	Poor Non-functional
15	200	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
16	135	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
17	230	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
18	270	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
19	275	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
20	230	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
21	255	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
22	285	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
23	190	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
24	170	1949	SCDOT	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
25	140	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
26	145	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
27	105	1947	City of Folly Beach	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Buried
28	170	1950's-1960's	SCDOT	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional
29	215	1950's-1960's	SCDOT	2018	City/Crowder Gulf	grouted armor stone/marine mattress	Poor Non-functional

30	250	1950's-1960's	SCDOT	1993	Corps	sheetpile	Partially Functional
31	250	1950	A J Peloquin	1993	Corps	sheetpile	Partially Functional
32	245	1950's-1960's	SCDOT	1993	Corps	sheetpile	Buried
33	240	1950's-1960's	SCDOT	1993	Corps	sheetpile	Buried
34	235	1950's-1960's	SCDOT	1993	Corps	sheetpile	Good Functional
35	235	1950's-1960's	SCDOT	1993	Corps	sheetpile	Buried
36	215	1950's-1960's	SCDOT	1993	Corps	sheetpile	Good Functional
37	200	1950's-1960's	SCDOT	1993	Corps	sheetpile	Buried
38	120	1950's-1960's	SCDOT	1993	Corps	sheetpile	Good Functional
39	175	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
40	235	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
41	240	1950's-1960's	SCDOT	none	none	riprap	Buried
42	245	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
43	190	1950's-1960's	SCDOT	none	none	riprap	Buried
44	210	1950's-1960's	SCDOT	none	none	riprap	Buried
45	160	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
46	165	1950's-1960's	SCDOT	none	none	riprap	Buried
47	200	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
48	225	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
49	220	1950's-1960's	SCDOT	none	none	riprap	Poor Non-functional
50	740	2013	Chas Co PRC	none	none	Sheetpile-riprap	Good Functional

7.2. COPIES OF LOCAL LAWS AND ORDINANCES

Excerpts from the Folly Beach Code of Ordinances

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§ 71.01 DRIVING ON THE BEACH.

It shall be unlawful to operate a motor vehicle on the beach, dunes, or vehicle accesses to the beach unless authorized by the Department of Public Safety or City Council.
(Ord. 27-12, passed 10-23-12; Am. Ord. 28-17, passed 10-10-17)

§ 90.03 GRILLS, FIRE PITS, OYSTER ROASTS AND OTHER OUTDOOR BURNING.

(A) *Burning on public property.* Any form of burning is prohibited on public property, including the beach, beach accesses, parking areas, and protected lands (e.g., dunes and wetlands), except as follows:

(1) Gas grills may be used on the beach and in any areas designated by the Department of Public Safety for gas grills in the Folly River Park and other parks and playgrounds;

(2) Permanently mounted grills maybe used if they are provided in a city or county park; and

(3) Special events on public property may use outdoor fires for cooking in other than designated areas if permits are issued by the Resident Fire Marshal or Building Official.
(Ord. 09-14, passed 11-11-14)

§ 95.18 REMOVAL OF WASTE.

The owner or person responsible for any animal on the streets, the beach or any public property shall be responsible for removing any waste deposited.
(`95 Code, § 6-3-27) (Ord. 5-93, passed 6-1-93)

§ 111.04 POSSESSION AND CONSUMPTION.

(A) (1) No shopkeeper, storekeeper, soda fountain operator, restaurant operator, grocery store keeper or any person licensed to sell alcoholic beverages shall allow removal of open containers of alcoholic beverages from the premises.

(2) No described operator shall allow open containers on premises, except an operator who has a consumption on premises license.

(B) (1) No person shall purchase alcoholic beverages from any place licensed to sell alcoholic beverages in open containers except if the establishment has a consumption on premises license.

(2) Any alcoholic beverages purchased on the premises must be consumed on the premises.

(C) No person shall possess an open container of beer or an alcoholic beverage on the streets, beach or other public property. Non-alcoholic beverages are allowed on the beach in paper or plastic cups. Any cans or bottles must remain in the cooler at all times provided they may be removed briefly for the purpose of transferring the contents to a paper or plastic cup. Kegs, small or large, are considered cans and shall not be allowed on the beach.

(D) This section shall not apply to activities that have been reviewed by the staff Special Event Committee and approved by City Council or activities held at either the Folly River Park or the Community Center. During such events, it is prohibited to possess glassware or glass bottles in the festival area and restaurants are strictly prohibited from permitting any glass bottles or glassware to leave the premises into the festival area. Any violation of this will result in penalties as prescribed in § 10.99.

(`95 Code, § 7-2-4) (Am. Ord. 23-11, passed 7-12-11; Am. Ord. 24-12, passed 9-11-12; Am. Ord. 15-15, passed 8-11-15; Am. Ord. 30-19, passed 10-8-19) Penalty, see § 10.99

§ 113.04 SPECIAL REVENUE FUND.

(A) An interest-bearing, segregated and restricted fund, known as the Beach Preservation Fund is established.

(B) All revenues received from the municipal accommodations fee shall be deposited into this fund. All principal and accrued interest in this fund shall be expended only as permitted by this chapter.

(Ord. 2-98, passed 2-3-98; Am. Ord. 18-14, passed 9-9-14)

§ 113.05 DISTRIBUTION OF FUNDS.

(A) All funds placed in the Local Tax Fund, including accrued interest, shall be designated as follows: $60,000 shall be applied annually to pay a portion of the debt service on the Folly River Park, $195,000 shall be transferred annually to the General Fund, with the balance to be dedicated to the Beach Preservation Fund, all of which is to benefit the citizens of Folly Beach and tourists who come to visit as set forth in S.C. § 6-1-730.

(B) After the debt service on the Folly River Park has been paid in full, the annual local accommodation taxes allotted to the debt service of the park will be dedicated to the Beach Preservation Fund.

(Ord. 2-98, passed 2-3-98) (Am. Ord. 33-11, passed 12-13-11; Am. Ord. 06-13, passed 4-2-13; Am. Ord. 18-14, passed 9-9-14; Am. Ord. 05-15, passed 6-9-15)

§118.03 COMMERCIAL ACTIVITY ON THE PUBLIC BEACH.

(A) There are hereby designated two sections of the public beach, Section One and Section Two. No commercial activity is permitted in Section One or Section Two of the public beach except as expressly provided for herein.

(1) Section One is the area between 3rd West and 3rd East. The commercial activities allowed within Section One are as follows:

(a) Beach chair and umbrella rentals provided by vendors operating under a franchise agreement with the city. No more than two franchises shall be allowed.

(b) Personal watercraft rental vendors operating under a franchise agreement with the city. No more than one franchise shall be allowed. Personal watercraft rentals which shall meet the following standards:

1. The franchisee shall possess on-site proof of current registration (certificate of numbers) for each personal watercraft (PWC).

2. All employees shall be CPR certified, and the franchisee shall have an automated external defibrillator ("AED") on site. The vendor shall also have a safety plan in coordination with Charleston County Parks and Recreation lifeguards.

3. The vendor shall have one CPR certified employee with no additional responsibilities than to watch the watercraft from shore.

4. Watercraft shall be kept in safe working condition.

5. Failure to adhere to these standards will result in revocation of the franchise agreement and business license.

(2) Section Two is the balance of the public beach. The commercial activities allowed within Section Two are as follows:

(a) Beach chair and umbrella rentals provided by vendors operating under a franchise agreement with the city. No more than two franchises shall be allowed.

(b) Surf and paddleboard lessons and camps.

1. Surf and paddleboard lessons are limited to a maximum of five students. Lessons do not require a franchise agreement but must obtain permission from City Council and a business license annually. Permission from City Council will only be considered if proof of the safety standards and certifications of division (A)(2)(b)3. is presented to Council. Lessons must occur outside of Section One and the washout (1500 block) and do not have exclusive right to any section of the beach.

2. Surf and paddleboard camps involving more than five students must have a franchise agreement with the city. There will be a maximum of four surf camp franchises per year on the beach and two paddleboard camp franchises, with location determined by city staff in coordination with franchise holder. Camps must not exceed 40 students and can only operate between the hours of 8:00 a.m. to 1:00 p.m. Camps must comply with the safety standards and certifications of division (A)(2)(b)3.

3. All surf and paddleboard lessons and camps must adhere to the following safety standards.

a. Lessons and camps must have one instructor for every five students.

b. At least one instructor per ten students must be lifeguard, CPR, and first aid certified, with current certifications on file with the city. This certification requirement also applies to lessons, classes, and camps having less than ten students. There must be a first aid kit on site.

c. Each provider must carry liability insurance of at least $1,000,000 that names the City of Folly Beach as an additional insured.

d. Lesson and camp providers may not advertise on the beach, but franchise holders may have a tent no larger than ten ft by ten ft that includes the provider's name, logo, and contact information.

e. Failure to adhere to these standards will result in revocation of the franchise agreement and business license.

(B) Weddings and photography activities are allowed in Section One and Section Two and do not require a franchise agreement or City Council approval, but do require a current business license. However, these activities shall not interfere with the activities of approved franchisees.

(C) City Council may approve other lessons, classes, camps, or additional commercial activities in Section One or Section Two.

(D) A business license shall be obtained before any commercial activity on the public beach.

(Ord. 29-19, passed 9-10-19) Penalty, see § 118.99

CHAPTER 151: BEACH PRESERVATION AND CONSTRUCTION PROVISIONS

Section

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GENERAL PROVISIONS

§ 151.01 OPERATION ON BEACHES.

No motor vehicle shall be operated on the beach. This section shall not apply to authorized emergency vehicles. The beach shall be defined as being any area south of the last paved street adjacent to the Atlantic Ocean.

(`95 Code, § 8-2-2) Penalty, see § 151.99

§ 151.02 SAND DUNES; PROTECTION AND PRESERVATION.

It shall be unlawful to damage, destroy, alter, level or remove any sand dune or any part thereof within the city, or any vegetation, shrubbery, trees on the sand dune or beaches within the city without having first obtained a written permit from the city in accordance with the guideline and requirements of the City Council. The presence of any person, vehicle, cart or watercraft, on the sand dunes without permit shall be unlawful.

(`95 Code, § 9-3-6) Penalty, see § 151.99

§ 151.03 DESTRUCTION OF SEA OATS PROHIBITED.

It shall be unlawful for any person to cut, break or otherwise destroy sea oat plants or any part thereof on public or private property within the city. Any person violating the provision of this section shall be guilty of a misdemeanor and, upon conviction, shall be punished. Each violation shall constitute a separate offense.

(`95 Code, § 9-3-7) (Am. Ord. passed 11-2-79) Penalty, see § 151.99

Statutory reference:
Similar state law, see S.C. Code § 16-11-590

§ 151.04 CONGESTED AREAS; ENDANGERING CROWDS; SWIMMING ZONE.

(A) Any activity in a congested area on the front beach or other public area that endangers the safety of the crowd is prohibited, including surfing among swimmers and various ball games on the beach.

(B) There is hereby created a “swimming zone” which shall extend in the water area of the Atlantic Ocean from 3rd Street East to 3rd Street West. This zone is designated for the enjoyment and safety of individuals who want to swim, play, or just stand inthe ocean. No other activity shall be allowed in said zone. Said zone shall be hereinafter referred to as the swimming zone.

(C) Swimming must be within 50 yards of shore and no more than chest deep. This limitation does not apply to surfing. Swimmers and waders must be at least 200 feet from the pier or a distance set at the discretion of the lifeguards to ensure swimmers’ and waders’ safety.

(D) There shall be no surf fishing in the designated swimming zone. It shall be unlawful for any person to catch or take, or attempt to catch or take any shark or other marine animals that may endanger the public from designated swimming zone.

(E) There shall be persons duly appointed as ocean rescue lifeguards, or deputies or public safety officers who shall have the power and authority to supervise and regulate surf fishing, physical activities and swimming on front beach, strand and the Atlantic Ocean within the jurisdiction of the city, and in such areas shall have ther esponsibility to maintain peace and order. Such ocean rescue lifeguards, deputies or public safety officers shall have the power and authority to recall from the ocean waters and the surf adjoining the waters any person who shall be in the ocean waters a distance of more than 50 yards from the point where the waters adjoin the strand, or who shall be more than chest deep at any time, or when such person shall be in danger of drowning or becoming imperiled or may imperil the safety of others, all of which shall be determined in the discretion of such deputies, police officers or ocean rescue lifeguards authorized by them.

(F) Such personnel shall have the authority to recall from the ocean waters any person who shall be in the ocean waters at any distance at any time when the condition of the wind, water, weather or any hazard, including the physical or mental condition of the person in the ocean waters, shall be such, in the discretion of such personnel as described in this section, as to constitute a danger to the health, life, or safety of such person or other persons within such ocean waters.

(G) It shall be unlawful for any person to disobey the instructions of any ocean rescue lifeguard, deputy, or public safety officer authorized by the city with regard to activities on the beach and in the ocean.

(H) No unauthorized person shall climb, sit, stand or cause someone else to climb, sit or stand on any ocean rescue lifeguard station or ladder unless told to do so by an ocean rescue lifeguard or other city authorized personnel.

(I) No person shall tamper with lifesaving equipment, structures, signs or buoys on the beach or in the ocean.

(J) No person shall cause a false rescue or call for help when it is not needed, or to cause an ocean rescue lifeguard to enter the water upon a false rescue, or to leave his or her tower or to have his or her attention drawn to a false alarm.

(K) No person shall willfully resist, delay or obstruct any ocean rescue lifeguard in the discharge or attempt to discharge any duty of his or her position.

(L) Beach umbrellas and other beach paraphernalia which might obstruct the view of the ocean rescue lifeguard will be placed at a distance of at least ten feet to the rear (inland side) of the ocean rescue lifeguard stands. No obstruction shall be placed in such a position that it interferes with an ocean rescue lifeguard's ability to see the water and the ocean rescue lifeguard stands on either side of him or her. The ocean rescue lifeguard shall locate the ocean rescue lifeguard stand according to the tides to insure public safety for sun bathers and beach walkers and has the authority to direct any person to move any beach equipment if the ocean rescue lifeguard stand has to be moved because of the tide, so as to not violate this section.

(M) No person shall ride, use or otherwise employ a surfboard in or upon the Atlantic Ocean within 200 feet of any portion of any pier; nor shall a person ride, use or otherwise employ a boat or other vessel or otherwise be in or upon the Atlantic Ocean within 300 feet of any portion of any pier. The prohibition of this section shall not apply to ocean rescue lifeguards or other emergency personnel acting in the course of official duty.

(`95 Code, § 9-5-2) (Am. Ord. 14-08, passed 7-22-08; Am. Ord. 03-16, passed 3-8-15) Penalty, see § 151.99

§ 151.05 SURFBOARDS, SKIMBOARDS, PERSONAL WATERCRAFT, AND OTHER WATERCRAFT.

(A) No person shall use or assist anyone in using any device commonly known as a "surfboard", "skimboard", "paddle board","kayak", "kiteboard", "windsurfboard", or any other apparatus or device of a hard or solid nature similar to and used for the purposes for which the aforementioned are generally used (hereinafter collectively referred to as a surfboard) within the swimming zone from May 15 through September 15 between the hours of 10:00 a.m. and 6:00 p.m. In the event that surf conditions are deemed unsafe for swimming and posted as such by the appropriate authorities, surfboards are permitted in the swimming zone regardless of the date or time.

(1) From September 16 through May 14, there is no area where surfing is restricted on Folly Island, except surfing is always prohibited within 200 feet of any fishing pier which now exists or hereafter is erected or built.

(2) It shall be unlawful for any person to use a surfboard, sailboat, motor boat, personal watercraft (as defined below), or any other device or craft in a manner as to become or present a hazard to bathers, swimmers, surfers and other persons in the waters along the public beach or to fail, neglect, or refuse to keep his or her surfboard, sailboat, motorboat, or personal watercraft under reasonable control at all times.

(B) At all times of the year persons surfing are required to wear a surf leash attaching the surfboard to the surfer, which device is intended to prevent the surfboard from being separated from, getting away from, or out of the immediate control of the surfer.

(C) Personal watercraft defined. For the purpose of this section, the following definition shall apply unless the context clearly indicates or requires a different meaning.

PERSONAL WATERCRAFT. A boat less than 16 feet in length which:

(a) Has an outboard motor or an inboard motor which uses an internal combustion engine powering a water jet pump as its primary source of propulsion;

(b) Is designed with the concept that the operator and passenger ride on the outside surfaces of the vessel as opposed to riding inside the vessel;

(c) Has the probability that the operator and passenger, in the normal course of use, may fall overboard.

(d) A vessel commonly known as a "jet ski".

PERSONAL WATERCRAFT includes, without limitation, a vessel where the operator and passenger ride on the outside surfaces of the vessel, even if the primary source of motive propulsion is a propeller.

(D) Personal watercraft, whether commercial or personally owned, shall be launched and beached only at permitted sites. Permitted sites are defined as:

(1) The boat ramp on the Folly River;

(2) Two boat launching lanes, 50 feet wide each, shall be located, the first, east of the swimming zone directly oceanside of the 2nd Street East right-of- way and beach access, and the second, west of the swimming zone directly oceanside of the 3rd Street West right-of-way and beach access; and

(3) Any other location approved by City Council.

(E) All personal watercraft must go straight in and straight out of the launching lane, operating at idle speed and no faster than necessary to maintain control, and not generate or cause a wake or exceed five miles per hour, whichever is less. Commercial operators (hereinafter "vendors") must provide one employee within the launching lane to catch and release incoming and outgoing personal watercraft. These employees must be in the water when personal watercraft rented by their companies are approaching or exiting.

(F) All personal watercraft must be operated ocean side of the fishing pier, but within binocular viewing range of the vendor's observation point.

(G) All state ordinances regulating personal watercraft must be followed.

(H) No person under the age of 16 years shall operate a personal watercraft, unless such person has certification of completion of a boater safety course offered by the South Carolina Department of Natural Resources, or any other similar governmental entity from the person's home state. Persons age 16 and over must have a driver's license.

(I) Before a personal watercraft may be operated within the boundaries of the City of Folly Beach, all personal watercraft owners shall first apply for a motorized watercraft license for a fee of $25. The motorized watercraft license shall be a number assigned to all personal watercraft which shall be affixed to said personal watercraft in such a manner as to be visible from shore. In addition to the number, all vendors shall also affix the name of the business on both sides of the personal watercraft in six-inch letters of contrasting color with that of the personal watercraft. The motorized watercraft license also serves as permission for vendors to store commercial personal watercraft on the beach in an unobtrusive way during months when in business, provided permission is granted on an annual basis by the Code Enforcement Officer. Methods of storage must be approved by the Code Enforcement Officer as to location and appearance. Complaints by residents and property owners about the storage location, appearance, or maintenance may be taken into account as to whether permission is granted. All personal watercraft must be removed from the beach prior to any tropical storm or hurricane.

(J) All employees of vendors shall be certified in CPR. Vendors shall provide, maintain, and train all employees in the use of an automated external defibrillator ("AED") . CPR certification and proof of ownership of AED shall be presented when a vendor applies for a City of Folly Beach license.

(K) Vendors shall have one CPR certified employee with no additional responsibilities to watch their company's personal watercraft from shore with binoculars. Vendors shall also have one personal watercraft in reserve at all times to be used to assist, contact, or otherwise reach their company's personal watercraft.

(L) Vendors are required to enter into a contract with the City of Folly Beach (see § 151.60).

(M) Vendors shall adhere to certain requirements for renters of personal watercraft and to give minimum instruction to said renters. These requirements are more fully described in a contract between the city and the vendor.

(N) Alcohol and drug use are strictly prohibited by all employees of vendor prior to and while on duty, and all operators of personal watercraft.

(O) Insurance as set forth in the contract must be maintained by the vendor. A minimum of $1,000,000 in liability coverage is required.

(P) Personal watercraft expressly do not have the right of way. All personal watercraft must yield to swimmers, surfers, non-motorized boats, kiteboards, or boogie boards.

(Q) Personal watercraft are not permitted to be launched or beached when the ranking officer of the Folly Beach Public Safety Department or the Chief Lifeguard for the Charleston

County Parks and Recreation Commission deem their presence or operation to be unsafe. Such designation may be due to high surf, high wind, number of swimmers, or any other condition which would render the operation of personal watercraft unsafe.

(R) Commercial personal watercraft must be replaced by vendor every four years, or when such personal watercraft are deemed a threat to the environment by the Code Enforcement Officer, whichever is sooner. All commercial personal watercraft must be the most environmentally sensitive (as determined by miles per gallon of fuel, oil usage, discharge of fumes/contaminants, best engine capabilities, and any other environmental criteria in the industry at the time) available at the time of purchase by the vendor.

(S) Motorized vehicles used by vendor to transport personal watercraft or renters thereof may only be parked on the beach next to the area permitted for storage of the personal watercraft, if any, in an unobtrusive and secure manner, and as approved by the Code Enforcement Officer. Otherwise, motorized vehicles may not be parked or stored on the beach. Such vehicle must not cross any dunes and must have a low environmental impact. Use of motorized vehicles must be limited to business activities only, and routes taken must correlate closely to business need (such as transporting trailers with personal watercraft directly to the water or storage site, delivering riders to the launch lane.) Motorized vehicles may not be used by non-vendors to transport personal watercraft.

(T) Commercial personal watercraft and any motorized vehicles owned by a vendor must be available for use in emergencies by Public Safety or other emergency personnel.

(`95 Code, § 7-3-1) (Am. Ord. 2-95, passed 4-4-95; Am. Ord. 08-08, passed 8-26-08; Am. Ord. 11-12, passed 4-24-12) Penalty, see § 151.99

§ 151.06 RENTING RAFTS, FLOATS AND THE LIKE; PROHIBITED SIZES.

It shall be unlawful for any person to rent any life raft, float or other similar device which is larger than rafts known as one-man life rafts.

(`95 Code, § 7-3-2) Penalty, see § 151.99

§ 151.07 GROIN AND PIER AREAS; PROHIBITED ACTIVITIES.

(A) Surfing or swimming is hereby prohibited within 50 feet of any groin and within 200 feet of the pier. Fishing from or walking on any groin is also hereby prohibited.

(B) It shall be unlawful for any person involved in attempting to catch or take, or catch or take any shark or other marine animals that may endanger the public from the pier.

(C) Any person(s) who surf fishes outside of the swim zone or conducts fishing of any type from a pier at any time of the year, shall not fish in a manner that presents an unsafe condition to any beach goers, sun bathers, swimmers, or any other person and shall keep a safe distance from them.

(D) Any person who surf fishes must obtain a valid South Carolina issued surf fishing license in accordance with South Carolina state law.

(`95 Code, § 7-3-3) (Am. Ord. 03-98, passed 2-17-98; Am. Ord. 03-16, passed 3-8-16) Penalty, see § 151.99

§ 151.08 GLASS CONTAINERS, PLASTIC BAGS, BALLOONS, AND CERTAIN EXPANDED POLYSTYRENE FOAM PRODUCTS PROHIBITED ON BEACH.

(A) All glass containers and cans are prohibited on the beach, with the exception that cans are allowed in coolers. However, all cans must remain in the cooler at all times provided cans may be removed briefly for the purpose of transferring the contents to a paper or plastic cup.

(B) All single-use plastic carryout bags, all balloons, and all plates, bowls, cups, containers, lids, trays, coolers, ice chests, and similar articles that consist of expanded polystyrene foam (also known as "Styrofoam"™) are prohibited on the beach.

(`95 Code, § 7-3-4) (Ord. 84-22, passed 12-18-84; Am. Ord. 23-11, passed 7-12-11; Am. Ord. 31-16, passed10-18-16) Penalty, see § 151.99

Cross-reference:

See § 112.02 for definition of "single-use plastic carryout bag"

§ 151.09 HOLES ON THE BEACHFRONT.

(A) No persons shall dig any hole to a depth of greater than 12 inches.

(B) Anyone digging a hole or creating a structure on the beach must restore the sand to its natural condition before leaving the beach but in no case not later than 30 minutes prior to sunset as stated by the National Weather Service.

(C) (1) Shovels, except those that are intended for use by children, are prohibited on the beach. Metal shovels of any type are prohibited on the beach.

(2) Exemptions. Authorized persons to include: members of the Folly Turtle Watch performing work related to turtle habitats, city employees performing work related to beach preservation, and others approved by the city.

(D) Anyone in violation of the regulations listed above in divisions (A) through (C) will be subject to the general penalties stated in § 10.99)

(Ord. 21-19, passed 6-11-19) Penalty, see § 10.99

§ 151.10 RESERVED.

§ 151.11 STOWING BOATS AND WATERCRAFT ON BEACH.

(A) The purpose of this chapter is to protect the public health, safety and welfare by:

(1) Prohibiting long-term stowage of boats and other watercraft on the public beach, where their safe storage is threatened by storms, high tides, erosion and hurricanes;

(2) Prohibiting on-going destruction of the dune system from long-term boat and watercraft stowage on the beach.

(B) For the purpose of this section, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

BOAT or WATERCRAFT. Any wooden, fiberglass, plastic or metal raft, row boat, motorboat, sailboat, mobile cat, wind surfboard, catamaran, skull, kayak, jet ski or waverunner.

PUBLIC BEACH. All that area seaward of the ocean baseline, roughly defined as any area seaward of existing seawalls bordering the Atlantic Ocean, including all primary and secondary sand dunes, also to include any public access or public beach walkway.

(C) No person owning, possessing or controlling a boat or other watercraft shall place or allow it to be placed on the public beach for any period in excess of 12 hours or at any time after sunset.

(D) The bringing onto or removal from the beach of any boat or watercraft which results in damage to primary or secondary dunes, or damage to sea oat or dune vegetation, is prohibited.

Any boat or watercraft which is placed or located at any time atop any primary or secondary dunes shall be fined $500 and may be subject to immediate impoundment.

(E) The Public Safety Department is hereby authorized to remove and tow away, or have removed and towed away, any boat or watercraft in violation of this section. In addition to the penalties provided fro in § 151.99, the owner shall pay all costs incurred by the city or its designee in the impoundment and storage of such boat or watercraft.

(Ord. 11-95, passed 11-21-95; Am. Ord. 30-06, 7-25-06; Am. Ord. 24-10, as amended, passed 10-26-10; Am. Ord. 23-15, passed 12-8-15) Penalty, see § 151.99

§ 151.12 PLANTING OF BEACH VITEX.

(A) It shall be unlawful for any person to plant or cause to be planted Vitex rotundifolia, commonly known as Beach Vitex, on any property located in the city.

(B) If upon inspection, Beach Vitex is found to be planted or growing on any property located in the city, the city shall have the right to enter the property and remove the plant.

(C) No action shall be taken without due notification of the property owner.

(Ord. 44-05, passed 7-26-05) Penalty, see § 151.99

§ 151.13 LITTERING AND ABANDONMENT OF PERSONAL PROPERTY PROHIBITED ON THE BEACH.

(A) It shall be unlawful for any person to throw or leave any trash, rubbish or other debris of any kind whatsoever on the beaches of the city unless such trash, rubbish or other debris is deposited in a trash receptacle placed on or near the beach for such purpose.

(B) It shall be unlawful for any person to leave or abandon any personal property of any kind whatsoever on the beaches of the city unless such property is deposited in a trash receptacle placed on or near the beach for such purpose.

(Ord. 24-08, passed 8-26-08)

§ 151.14 USE OF THE BEACH.

(A) Tents, canopies, beach chairs, kites, volleyball nets, coolers, beach umbrellas, boats or other watercraft, and similar property, which are left on the beach after sunset, shall be deemed abandoned and the City of Folly Beach shall have the right to take possession of the property. The property shall belong to, and be subject to disposal by, the City of Folly Beach.

(B) No personal property, boat or other watercraft shall be located within 25 feet of any emergency beach access or any turtle nest.

(Ord. 24-08, passed 8-26-08; Am. Ord. 23-15, passed 12-8-15)

CONSTRUCTION PROVISIONS

§ 151.20 ACCESS TO BEACH DURING CONSTRUCTION; PROTECTION.

(A) Any individual or contractor who desires to use an access to the beach will place in the access portable metal or wood mats for the purpose of moving equipment or material on the beach.

(B) The contractor or individual will remove the mats as soon as he or she no longer needs them to move equipment or material.

(`95 Code, § 5-3-19) (Ord. 78-8, passed 7-18-78)

§ 151.21 BEACH PROTECTION; EROSION CONTROL LINE.

Upon approval of the erosion control line by the State Coastal Council, permits for erosion control structures will be provisioned so that structures will be located at the erosion control line as shown on the maps, hereby incorporated by reference and available at the Coastal Council office and at City Hall.

(`95 Code, § 5-3-20) (Ord. 83-10, passed 8-2-83)

§ 151.22 ALTERATIONS IN LINE.

(A) The erosion control line may be extended or modified as conditions warrant. Any change must be approved by the city and the State Coastal Council after a public notice period of 30 days.

(B) Changes will then be recorded on the base maps.

(`95 Code, § 5-3-21) (Ord. 83-10, passed 8-2-83)

§ 151.23 CONSTRUCTION STANDARDSFOR BULKHEADS, RIPRAP, SEAWALLS, REVETMENTS, AND RETAINING WALLS WITHIN 15 FEET OF THE CRITICAL LINE.

(A) For the purposes of this section, the following definitions shall apply:

BULKHEAD. A vertical erosion control device installed on high ground which is adjacent to the marsh front critical line as defined by OCRM.

RETAINING WALL. A vertical erosion control or stabilization device installed on high ground within 15 feet of the OCRM critical line.

REVETMENT. Sloping material installed seaward of a seawall facing the oceanfront baseline as defined by OCRM.

RIPRAP. Sloping material installed in front of a bulkhead on the side of the bulkhead facing the marsh front critical line as defined by OCRM.

SEAWALL. A vertical erosion control device installed on high ground which is adjacent to the oceanfront baseline as defined by OCRM.

(B) The following minimum construction standards are enacted.

(1) All erosion control structures placed wholly or partly within the Dune Management Area or the setback from the critical line must be maintained in an intact usable condition or removal may be sought at the owners expense.

(2) New or substantially improved seawalls and associated revetments on the beach constructed after March 1, 2019 and placed wholly or partly within the Dune Management Area must be constructed so that the top of the vertical seawall is at an elevation of eight feet NAVD 88. Any portion of the Dune Management Area disturbed for the repair of an existing seawall or the construction of a new or substantially improved seawall after March 1, 2019 shall be filled such that the finished grade of the area of disturbance is at an elevation of ten feet NAVD 88 and planted with appropriate vegetation as designated by the Building Official.

(3) New or substantially improved bulkheads, retaining walls, or associated riprap constructed within 15 feet of the critical line after March 1, 2019 and placed wholly or partly within the required setback from the critical line must be constructed so that the top of the vertical structure is no higher than the adjacent grade on the landward face. Any portion of the critical line setback disturbed for the repair of an existing bulkhead or the construction of a new or substantially improved bulkhead after March 1, 2019 shall be filled such that the finished

grade of the area of disturbance is at an elevation similar to the grade on the landward side and planted with appropriate vegetation as designated by the Building Official.

(4) Construction of bulkheads, seawalls, retaining walls within 15 feet of the critical line,and revetments as well as the placement of riprap shall require a permit from the city and proof of location behind the SCDHEC OCRM critical line or baseline in the form of a pre-construction survey with an OCRM certified critical line or baseline location and an as-built survey showing as-built improvement and the certified baseline or critical line as applicable.

(5) No portion of a bulkhead, riprap, seawall, retaining wall or revetment shall be placed seaward of the baseline or beyond the critical line without approval of SCDHEC OCRM.

(6) Bulkhead, riprap, seawalls, retaining walls within 15 feet of the critical line, and revetments shall be designed by a professional engineer, registered in the state and shall meet the following minimum standards:

(a) Bulkhead, retaining walls and seawall requirements.

1. Materials.

i. Reinforced concrete six inches thick designed with adequate reinforcement to achieve a 3,000 psi 28-day strength.

ii. Pressure treated wood three inches by ten inches or three inches by 12 inches tongue and groove, or a double thickness of two inches sheeting with staggered joints is acceptable for walls with a standing height of under four feet.

2. Depth of embedment. The depth of embedment of a bulkhead shall be at least equal the height of the wall above the ground. An allowance should be made to account for erosion scour after construction.

3. Tiebacks. Tiebacks shall be located at a spacing of eight feet or less and attached to secure anchors capable of withstanding a 2,000- pound pull. Tiebacks may be deleted if a revetment is placed seaward of the bulkhead.

4. Backfill. The bulkhead will be backfilled with a compacted clean granular material to provide adequate support. “Clean” shall mean no metal, wood or glass.

5. Protection from flanking. Bulkheads will either tie into adjacent bulkheads or will have an adequate return wall meeting the same requirements as the seaward wall.

6. Seawalls. No new vertical unfaced seawall shall be allowed on the ocean front. Any new vertical seawall surface must be faced with a sloping revetment.

(b) Revetments.

1. Materials. Broken pavement, blocks or bricks are not acceptable materials for the outer layer of a revetment. However, they may be used for under layers. The outside of a revetment shall consist of at least two layers of armor stones whose pieces shall range in weight from a minimum of ten pounds to a maximum of 250 pounds; at least 60% shall weigh more than 150 pounds.

2. Construction. Revetments shall be underlain with a commercial grade porous filter cloth designed for ocean erosion control and approved by the Building Official (i.e. Phillips 66 stock or equal), and placed on a slope no steeper than one vertical to two horizontal. The toe at the revetment shall extend at least two feet below the existing beach elevation and the ends shall be protected from flanking.

(c) Riprap.

1. Materials. Broken pavement, blocks or bricks are not acceptable.

2. Design. Riprap placement must be designed by a licensed marine contractor or a designed professional registered in the State of South Carolina.

(C) Adherence to these minimum standards will not guarantee that the bulkhead, riprap, seawall or revetment will withstand wave or tide forces or that it will protect against erosion. These standards are to prevent unsightly and inferior structures that would have little or no chance of success, and could possibly become a hazard or nuisance.

(D) Seawall construction activity from May 1 through October 31 is subject to the following requirements.

(1) The permit holder must contact the Folly Beach Turtle Watch Permit Holder each day prior to the commencement of work. The Folly Beach Turtle Watch Permit Holder will provide verification that there are no active turtle nests in the work area. Verification will be provided prior to 8:00 a.m.

(2) If an active nest is located in the work area, work must stop until the nest is relocated. If a turtle nest located in the work area is established before permitted work begins and can't be relocated, construction cannot begin until the nest hatches.

(3) The WORK AREA shall be defined as the area within 25 feet of the location of the seawall or the path used to access the site.

(`95 Code, § 5-3-22) (Ord. 83-10, passed 8-2-83; Am. Ord. 83-18, passed 1-3-84; Am. Ord. 84-29, passed 12-18-84; Am. Ord. 02-05, passed 1-25-05; Am. Ord. 10-15, passed 8-11-15; Am. Ord. 09-19, passed 2-11-19; Am. Ord. 26-19, passed 8-13-19; Am. Ord. 04-20, passed 6-9-20)

§ 151.24 SPECIAL REQUIREMENTS FOR CONSTRUCTION SEAWARD OF THE BASELINE.

If an applicant requests to build or rebuild a structure, including an erosion control structure or device, seaward of the proposed baseline that is not allowed otherwise, the city may issue a special permit to the applicant authorizing the construction or reconstruction upon verification from SCDHEC OCRM that the structure has received approval from the state. The structure shall not be constructed or reconstructed on a primary oceanfront sand dune or on the active beach. If the beach erodes to the extent the permitted structure becomes situated on the active beach, the permittee agrees to remove the structure from the active beach. However, the use of the property authorized under this provision, in the determination of the city, must not be detrimental to the public health, safety, or welfare.

(Ord. 28-98, passed - - 98; Am. Ord. 09-19, passed 2-11-19)

§ 151.25 DUNE WALKOVERS.

To protect the integrity of the front dune and to mitigate intrusion into ocean views from adjacent beachfront property, the following standards shall apply to the construction of new and replacement dune walkovers. These standards shall apply in addition to any and all regulations promulgated by the State Office of Ocean and Coastal Resources Management for dune walkovers incidental to residential uses on Folly Beach.

(A) Dune walkovers shall not be wider than six feet.

(B) Dune crossovers shall not be built more than three feet higher than required by beachfront management regulations, floodplain management standards, or other applicable requirements, or, in the absence of such requirements, no more than three feet above grade, excepting stairs and handicap access ramps leading to the first heated floor of the primary structure on the lot.

(C) Dune walkovers shall be constructed to extend beyond the toe of the seaward most dune.

(D) Observation decks shall be limited to 35 square feet in area. These may include benches, light storage, and other appurtenant features in accordance with OCRM and/or city floodplain management standards.

(E) Observation decks shall not be covered, roofed, or provided with any overhead structure.

(Ord. 05-06, passed 1-24-06; Am. Ord. 07-19, passed 2-11-19)

BEACH PRESERVATION

§ 151.35 AREAS OF PRESERVATION.

All portions of the city extending from the mean high water line to the primary dune through or to the first manmade object, whichever comes first, on property now platted on Folly Island and controlled by the city or the state shall be retained and preserved by the city in trust as an area of conservation for the purpose of protecting the ecology of the property, the adjoining property, and of the beaches of Folly Island, for enhancing the environment, and for the health, safety and welfare of the residents of the state.

(`95 Code, § 5-10-1)

§ 151.36 MAINTENANCE AND PRESERVATION.

(A) Any sand mined from the beach proper and placed on properties above defined shall henceforth and hereinafter be subject to the administration and police power of the City Council and shall not be subdivided into building lots.

(B) They shall be maintained and preserved for the benefit of all people in their natural state for the purpose of protecting the environment, ecology and health, safety and welfare of the city, property owners and residents of the state.

(`95 Code, § 5-10-2)

§ 151.37 CONSTRUCTION PROHIBITED IN CERTAIN AREAS.

No structure of any kind shall be constructed in the above defined area which is hereby established for conservation and preservation without the expressed written permission of the city and, where applicable, from Coastal Council.

(`95 Code, § 5-10-3) Penalty, see § 151.99

§ 151.38 DEFINITIONS.

For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

AREA OF CONSERVATION. Any sand placed on the above defined properties will remain in its natural state with no manmade, artificial changes other than additional sand dunes or approved dune walkover structures. City Council will promulgate regulations defining approved dune walkovers.

MAINTAINED AND PRESERVED. The city will utilize its administrative powers to prevent altering of this area in any way.

MEAN HIGH WATER. The line established by survey on a series of plats titled Plat Showing Perpetual Easement for Beach Renourishment, dated June 1, 1992, and as recorded in the RMC Office.

RETAINED AND PRESERVED. Property subject of this chapter shall not be subdivided in any manner into lots and that the city will utilize all legal means to guarantee that this natural habitat will be undisturbed.

TRUST. The city shall act as custodian of the natural habitat in an effort to maintain it as protection against erosion caused by the sea, and for the health, safety and welfare of the public.

(`95 Code, § 5-10-4)

§ 151.39 BEACH PRESERVATION FEE.

(A) The Beach Preservation Act of 2014 authorizes qualifying coastal municipalities to impose a beach preservation fee not to exceed 1% of the gross proceeds derived from the rental or charges for accommodations furnished to transients.

(B) The City of Folly Beach is a qualifying coastal municipality with shoreline on the Atlantic Ocean, a public beach, and a local accommodations tax not exceeding 1½%.

(C) An additional 1% beach preservation fee is hereby added to the accommodations tax for the purpose of nourishment, renourishment, maintenance, erosion mitigation, monitoring of beaches, dune restoration and maintenance, including planting of sea grass, sea oats or other vegetation useful in preserving the dune system, and maintenance of public beach accesses within the corporate limits of the City of Folly Beach.

(Ord. 12-14, passed 7-8-14)

Cross-reference:

Funding of Beach Preservation Fund, see §§ 38.03, 113.04 and 113.05

Municipal accommodations fee, see § 113.03

PROTECTION OF LOGGERHEAD SEA TURTLES

§ 151.45 DEFINITIONS.

For the purpose of this subchapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

ARTIFICIAL LIGHT. Any source of light emanating from a manmade device, including but not limited to, incandescent mercury vapor, metal halide, or sodium lamps, flashlights, spotlights, street lights, vehicular lights, construction or security lights.

BEACH. The area of unconsolidated material that extends landward from the mean low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves).

FLOODLIGHTS. Reflector type light fixture, attached directly to a building and is unshielded.

LOW PROFILE LUMINARIES. Light fixtures set on a base which raises the source of the light no higher than 48 inches off the ground, and designed in such a way that light is directed downward from a hooded light source.

NEW DEVELOPMENT. New construction and remodeling of existing structures when the remodeling includes alteration of exterior lighting.

PERSON. Any individual, firm, association, joint venture, partnership, estate, trust, syndicate, fiduciary, corporation, group or unit or federal, state, county or municipal government.

POLE LIGHTING. Light fixture set on a base or pole which raises the source of the light higher than 48 inches off the ground.

SHADING COEFFICIENT. A coefficient expressing that percentage of the incident radiation which passes through the window as heat.

SOLAR SCREEN. Screens which are fixed installations and permanently project shade over the entire glass area of the window. The screens must be installed outside of the glass and must have:

(1) A shading coefficient of .450 less;

(2) A minimum five-year warranty; and

(3) Performance claims supported by approved testing procedures and documentation.

TINTED OR FILMED GLASS. Window glass which has been covered with window tint or film such that the material has:

(1) A shading coefficient of .450 or less;

(2) A minimum five-year warranty;

(3) Adhesive as an integral part; and

(4) Performance claims which are sup- ported by approved testing procedures and documentation.

(Ord. 8-92, passed 4-21-92; Am. Ord. 11-97, passed 7-1-97; Am. Ord. 18-99, passed 7-13-99)

§ 151.46 PURPOSE.

The purpose of this subchapter is to protect the threatened loggerhead sea turtles which nest along the beaches of the city, by safeguarding the hatchlings from sources of artificial light.

(Ord. 8-92, passed 4-21-92; Am. Ord. 11-97, passed 7-1-97; Am. Ord. 18-99, passed 7-13-99; Am. Ord. 31-08, passed 12-30-08)

§ 151.47 NEW DEVELOPMENT.

(A) It is the policy of the city that no artificial light illuminate any area of the beaches of the city.

(B) To meet this intent, if lighting associated with construction or development can be seen from the beach, all building and electrical plans for construction of single family or multi-family dwellings, commercial or other structures, including electrical plans for parking lots, dune walkovers or other outdoor lighting for real property shall be in compliance with the following:

(1) Floodlights shall be prohibited. Wall mounted light fixtures shall be fitted with hoods so that no light illuminates the beach.

(2) Pole lighting shall be shielded in a way that light will be contained within arc of three to 73 degrees on the seaward side of the pole. Outdoor lighting shall be held to the minimum necessary for security and convenience.

(3) Low profile luminaries shall be used in parking lots and the lighting shall be positioned so that no light illuminates the beach.

(4) Dune crosswalks shall utilize low profile shielded luminaries. Only mushroom-type light fixtures, which direct light downward, shall be permitted. Such lighting shall also meet the following requirements:

(a) Fixtures shall be installed at least 25 feet apart and not more than one foot above the surface of the walkovers.

(b) Illumination shall be limited to 25 watts through the use of "bug" type bulbs.

(5) Lights on balconies shall be fitted with hoods so that lights will not illuminate the beach.

(6) Tinted or filmed glass shall be used in windows facing the ocean beginning at the first floor level of multi-story structures. Shade screens can be substituted for this requirement.

(7) (a) Temporary security lights at construction sites shall not be mounted more than 15 feet above the ground.

(b) Illumination from the lights shall not spread beyond the boundary of the property being developed, and in no case shall those lights illuminate the beach.

(C) The provisions of this section shall not apply to any structure for which a building permit has been issued by the Building Official, prior to the effective date of this subchapter.

(Ord. 8-92, passed 4-21-92; Am. Ord. 11-97, passed 7-1-97; Am. Ord. 18-99, passed 7-13-99; Am. Ord. 31-08, passed 12-30-08) Penalty, see § 151.99

§ 151.48 EXISTING DEVELOPMENT.

(A) It is the policy of the city that no artificial light illuminate any area of the beaches of the city.

(B) To meet this intent, lighting of existing structures which can be seen from the beach shall be in compliance with the following.

(1) Lights illuminating buildings or associated grounds for decorative, security, or recreational purposes shall be shielded or screened such that they are not visible from the beach and will be turned off after 10:00 p.m. until dawn during the period of May 1 to October 31 of each year.

(2) Lights illuminating dune crosswalks of any areas oceanward of the dune line shall be turned off from dusk to dawn during the period of May 1 to October 31 of each year.

(3) Motion detecting security lighting shall be permitted throughout the night so long as low profile luminaries are used and screened in a way that those lights do not illuminate the beach.

(4) Window treatments in windows facing the ocean at the first floor of single-story or multi-story structures are required so that interior lights do not illuminate the beach. The use of blackout draperies or shade screens are preferred. The addition of tint or film to windows or awnings is also encouraged, as is turning off unnecessary lights if the lights illuminate the beach.

(Ord. 8-92, passed 4-21-92; Am. Ord. 11-97, passed 7-1-97; Am. Ord. 18-99, passed 7-13-99; Am. Ord. 31-08, passed 12-30-08) Penalty, see § 151.99

§ 151.49 PUBLICLY OWNED LIGHTING.

Street lights and lighting at parks and other publicly owned beach access areas shall be subject to the following:

(A) Whenever possible, street lights shall be located so that the bulk of their illumination will travel away from the beach. These lights shall be equipped with shades or shields that will prevent backlighting and render them not visible from the beach.

(B) Lights at parks or other public beach access points shall be shielded or shaded or shall not be utilized during the period May to October 31 of each year.

(Ord. 8-92, passed 4-21-92; Am. Ord. 11-97, passed 7-1-97; Am. Ord. 18-99, passed 7-13-99) Penalty, see § 151.99

PROPERTY OWNER ELEVATION MAINTENANCE

§ 151.60 PURPOSE.

Public beach renourishment projects, including maintenance of adjacent private property, benefit and constitute an improvement for the entire city and also provide a significant and direct benefit to owners of the adjacent, private beachfront property. The purpose of this subchapter is:

(A) To safeguard the city's critical and significant commitment to and investment in beach renourishment and preservation;

(B) To abate any nuisance that might be created on private property by beach renourishment including ponding, or areas significantly lower than the elevation of the renourishment that could threaten the integrity of the renourished beach;

(C) To ameliorate and prevent public hazards, detrimental environmental impacts, adverse effects on the quality of a coastal resource, and disruption of access to a public coastal resource that might be created when private property adjacent to a renourishment is not also renourished or is otherwise maintained in a manner that is not compatible with the renourishment or compromises the integrity of the renourishment;

(D) To protect, preserve, restore, and enhance the beach/dune system that protects life and property; and

(E) To comply with requirements imposed by the U.S. Army Corps of Engineers or any other entity conducting beach renourishment.

(Ord. 31-17, passed 12-12-17)

§ 151.61 DUTY OF BEACHFRONT PROPERTY OWNERS.

It shall be the duty of every beachfront property owner to ensure that:

(A) The property is maintained in a manner that does not compromise the integrity of the public beach renourishment; and

(B) Any eroded areas of the beach that are on private property and landward of the perpetual easement line are brought into compliance with local, state, and Federal requirements if directed by the city. A property is considered to be compliant when the seaward most elevation of the property matches the elevation of the renourishment. Any action by the owner that compromises the integrity of the renourishment or failure of the property owner to maintain adequate elevation landward of the renourished beach is hereby deemed a nuisance. It is within the discretion of the Code Enforcement Officer, in consultation with the U.S. Army Corps of Engineers or any other entity conducting beach renourishment, to determine affected properties, the permissible options for eliminating the nuisance (which may include sand fill, dune restoration, or structural solutions), the necessary elevation, or any other necessary actions the owner must take to preserve the integrity of the public beach seaward of their property. Once the Code Enforcement Officer has made a determination that a property is in violation, the property owner has the burden of showing that the property has been brought into compliance through an elevation survey or through other action required by the Code Enforcement Officer.

(Ord. 31-17, passed 12-12-17)

§ 151.62 NOTICE TO PROPERTY OWNERS.

The Code Enforcement Officer will provide notice to property owners by certified mail or personal delivery of any upcoming renourishment for which they are expected to comply with this subchapter. The notice will provide the following information:

(A) That the property is subject to this subchapter;

(B) The anticipated date or date range of the renourishment of the beach adjacent to the property;

(C) A deadline, not less than 60 days from the date of the notice, for when the property must be brought into compliance;

(D) The minimum action that must be taken by the property owner to bring the property into compliance with the renourishment, such as the anticipated height to which the property must be elevated;

(E) The anticipated cost of filling the owner's property or otherwise bringing it into compliance with the renourishment if performed by the city and billed to the owner;

(F) That the property owner must inform the city within 20 days of the date of the notice whether the owner will address the identified nuisance by filling the property or by otherwise bringing the property into compliance with the renourishment, or, alternatively, will allow the city to bring the property into compliance and agree to pay associated costs; and

(G) If the property owner does not make an election within 20 days of the notice or does not bring the property into compliance with the renourishment by the deadline provided and to the satisfaction of the code enforcement officer, the city will fill the property or otherwise bring it into compliance, and bill the property owner for the associated costs of same.

(Ord. 31-17, passed 12-12-17)

§ 151.63 RIGHT OF ENTRY.

When it is necessary to make an inspection to enforce the provisions of this subchapter, or if the property owner has not addressed the identified issues in a timely fashion, the code enforcement officer, the city, or its designee, has the right to enter the property:

(A) To inspect it;

(B) To determine what actions must be taken to bring the property into compliance with the renourishment; or

(C) To bring the property into compliance by filling the property in or otherwise addressing any other noticed issues. The city will provide at least 48 hours of notice of such entry to the occupants of the property or, at the option of the owner, directly to any owner that provides a method of immediate contact.

(Ord. 31-17, passed 12-12-17)

§ 151.64 PRESENTATION AND PAYMENT OF BILL; LIEN.

(A) If the property is filled or brought into compliance by the city, the code enforcement officer will present a bill to the property owner by certified mail or hand delivery. The bill will be based on the cost of filling the owner's property, including the cost of transporting and placing the sand, or otherwise bringing the property into compliance with the renourishment. The bill will set forth the amount owed by the property owner along with an explanation for how the amount was calculated. The property owner will have 60 days to pay the bill.

(B) If the property owner has not fully paid the bill within 60 days or made other arrangements with the code enforcement officer, the bill plus any costs of collection will constitute a lien against the property in the manner provided by law, and the city or code enforcement officer may undertake collection of the bill plus the costs of collection by any legal means, including filing a recorded lien against the property in the amount of the bill plus the costs of collection, initiating an action to collect on the bill plus the costs of collection or to

foreclose on the lien in the Charleston County Court of Common Pleas, or assessing a fee or tax against the property in the amount of the bill plus the costs of collection.
(Ord. 31-17, passed 12-12-17)

§ 151.65 REQUEST FOR HEARING.

If a property owner objects to any aspect of the notice or the requirements set forth therein, including any bill presented to the property owner for payment, the owner may request a hearing before the City Administrator within 20 days of the date of the notice. The City Administrator will then set a hearing to address any such objections within ten days of the request and will issue a ruling on any such objections. The City Administrator's ruling will be the final determination of the city.
(Ord. 31-17, passed 12-12-17)

§ 151.99 PENALTY.

(A) Any person violating any provision of this code for which no specific penalty is prescribed shall be subject to § 10.99.

(B) Any person altering the area that is the subject of §§ 151.35 through 151.38 by littering, destruction of vegetation or the artificial movement of the existing sand dunes shall subject to a $500 fine, and each day such exists shall constitute a separate offense. Violators will be required to replace altered sand dunes and replant the natural vegetation of the area.
(`95 Code, § 5-10-5) (Ord. 15-93, passed 9-7-93)

§ 153.03 RULES FOR ALL SPECIAL EVENTS.

(A) All special events on public or private property:

(1) Shall not have substantia! adverse effects or noise impacts on nearby properties;

(2) Shall not have temporary signs larger than 12 square feet (e.g., three feet x four feet) and shall promptly remove the signs when the event is over or as specified in an event permit or rental agreement;

(3) Shall not violate any conditions of approval that apply to a principal use on the site;

(4) Shall not disturb beach dunes or related vegetation;

(5) Shall not create an unreasonable risk of significant:

(a) Damage to public property, beyond normal wear and tear;

(b) Injury to persons;

(c) Unlawful disturbances or nuisances;

(d) Unsafe impediments or distractions to, or congestion of, vehicular or pedestrian travel;

(e) Additional and impracticable or unduly burdensome police, fire, trash removal, maintenance, or other public services demands; or

(f) Other adverse effects upon the public health, safety, or welfare;

(6) Shall not be of such a nature, size, or duration that the particular location requested cannot reasonably accommodate the event;

(7) Shall not be at a time and location that has already been permitted or reserved for other activities;

(8) Shall not leave any trash generated by the event on city property unless it is properly placed in appropriate trash or recycling containers; and

(9) Shall only use vendors that have City of Folly Beach business licenses.

(B) An applicant for permission to hold a special event on public property shall agree that, in the event that a special event is cancelled by the City of Folly Beach due to circumstances beyond the control of the city, including but not limited to acts of God or verifiable emergencies, the applicant's only recourse is either to reschedule the event or to receive a refund of any funds paid to the city by the applicant, and the applicant shall further agree that the city shall not be liable to the applicant for any losses, damages, obligations, liabilities, or expenses that may directly or indirectly arise from the cancellation of the event.

(Ord. 26-13, passed 2-25-14)

§ 153.04 ADDITIONAL RULES FOR WEDDINGS AND OTHER EVENTS ON THE BEACH.

(A) Wedding receptions are prohibited on the beach.

(B) Any items that are put on the beach for a wedding or other event (such as tents pulpits, chairs, plants, arbors, or decorations) as well as any other items that were left on the beach after the event, must be removed before sunset or before the tide reaches them, whichever is sooner.

(C) Fireworks and open fires, including tiki torches, are prohibited on the beach. Gas grills are permitted.

(D) Only environmentally safe materials may be thrown on the beach, such as bird seed or real flowers or flower petals (no rice).

(E) Access to the beach must be made through a public walkover, unless the event has permission to use a house or vacant lot on the front beach.

(F) Weddings and other events on the beach shall not impede the passage of pedestrians or patrol vehicles on the beach or public walkways to the beach.

(Ord. 26-13, passed 2-25-14) Penalty, see § 10.99

§ 153.05 EVERYONE IS REQUIRED TO GIVE THE DEPARTMENT OF PUBLIC SAFETY NOTICE OF SPECIAL EVENTS ON PRIVATE PROPERTY INVOLVING MORE THAN TWENTY-FIVE PEOPLE.

(A) (1) Any person who is planning to hold a special event on private property that will involve more than 25 people shall notify the Department of Public Safety. This is to ensure that if a problem arises with parking or otherwise, Public Safety will know who to contact. Such notice shall be given at least 24 hours before the event.

(2) Businesses, churches, and other organizations are not required to give notice of their regular-activities because such activities are not "special events."

(B) The notice shall include:

(1) The time, place, duration, and nature of the event and the number of expected participants; and

(2) The name and contact information, including cell phone numbers, of the person or persons who will be responsible for responding to complaints or handling problems.

(Ord. 26-13, passed 2-25-14)

§ 166.04-04 Dune Management Area.

(A) Applicability. Development on oceanfront lots in the city shall provide and maintain an undisturbed Dune Management Area in accordance with the standards in this section, unless exempted in accordance with § 166.04-04(B), Dune Management Area Exemptions.

(B) Dune Management Area exemptions. The following development shall be exempt from these standards:

(1) Beach walkovers, sand fencing, public piers, and erosion control devices, provided such features are configured to minimize the impact on beach and dune areas;

(2) Plantings of bitter panic grass, sea oats, or other beach compatible vegetation approved by the Building Official;

(3) Beach compatible sand;

(4) Temporary construction activities authorized by a building permit (See § 162.03-08); and

(5) Lawfully-established development, landscaping, or impervious surfaces in place prior to March 1, 2019. (However, any subsequent development, redevelopment, or land disturbing activities shall comply with the standards in this subsection).

(C) Standards.

(1) All development shall maintain a minimum setback of 40 feet from the perpetual easement line or, where no perpetual easement line exists, the OCRM baseline. For the purposes of this subsection, PERPETUAL EASEMENT LINE shall mean the landward edge of the federal beach renourishment project as defined by the Army Corps of Engineers.

(2) Mitigation of the Dune Management Area shall be required in the event of unauthorized disturbance of the Dune Management Area or prior to the issuance of a certificate of occupancy for new construction or substantial improvement of a structure located on a lot that is bounded by the PEL or the OCRM baseline where no PEL exists. Mitigation shall consist of:

(a) Raising any area within the first ten linear feet landward of the PEL or Baseline that is below an eight-foot NAVD88 elevation to an elevation of ten feet NAVD88; and

(b) Planting any non-vegetated area with appropriate beach compatible vegetation as approved by the Building Official.

(c) In previously-eroded areas, the Building Official is authorized to designate a more landward area of mitigation.

(3) No permit shall be issued for any new structure which proposes the use of a septic system which is located wholly or in part within Dune Management Area.

(Ord. 05-10, passed 3-23-10; Am. Ord. 16-19, passed 4-9-19)

§ 166.10-04 Design Standards For Exterior Lighting.

(H) Additional standards in beachfront areas. For purposes of protecting nesting sea turtle habitat, the following standards shall apply to all uses on lots adjacent to the beachfront;

(1) The source of illumination shall not be directly visible from the beach.

(2) Exterior lighting within sight of the beach shall be a maximum of 50 watts and designed with recessed fixtures.

(3) Low-intensity lighting set on a base no higher than 48 inches off of the ground shall be utilized in parking lots.

(4) Parking lots shall be sited so as to minimize headlight glare directed on the beach, or shall incorporate ground-level barriers to mitigate the effects of headlights on beach areas.

(Ord. 05-10, passed 3-23-10; Am. Ord. 06-19, passed 4-9-19)

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7.4. CITY OF FOLLY BEACH CRS VERIFICATION LETTER

7.5 CITY OF FOLLY BEACH DUNE MANAGEMENT PLAN

2018

City of Folly Beach Dune Management Plan

Prepared for:

Nicole Elko, Ph.D.
Elko Coastal Consulting, Inc.
and Alex Braud

1/2/2019

Contents

Executive Summary

The City of Folly Beach Dune Management Plan aims to develop recommendations for how to restore and preserve the dune system along the City's beachfront through a proactive, planned approach. Numerous city planning documents recommend the development of this plan, which will be incorporated into the state-required Local Comprehensive Beach Management Plan (LCBMP) during the next 5-year update in 2020. Dune restoration is one of several beach preservation approaches endorsed by the LCBMP in conjunction with periodic renourishment.

The objectives and recommendations of this plan are driven by five overarching goals:

1. Establish a dune management area (DMA)
2. Enhance storm protection
3. Re-establish a natural dune ecosystem where possible
4. Implement strategic dune walkover/access path management
5. Manage dunes to maximize recreational benefits

This plan recommends the establishment of a 40-ft wide DMA landward of the PEL. Permissible improvements within the DMA include seawalls, appropriate plantings and/or sand fencing, beach compatible sand, and walkovers. Above grade structures, septic tanks, or non-native landscaping are not permitted. The plan aims to enhance storm protection by establishing a continuous line of defense along the beachfront in the form of seawalls at 8-ft or dunes at 10-ft above NAVD88. Sea oats (*Uniola paniculata*), bitter panicum (*Panicum amarum*), and railroad vine are the recommended native vegetation. A strategic approach to public and private beach access through the dunes includes requiring all new and improved walkovers extend to the toe of vegetation and maintaining adequate ADA and vehicular access for public safety. Finally, to balance the needs of storm protection, ecosystem restoration, and recreational beach space, the plan recommends at least 50 ft of beach space from the pre-nourishment storm high tide line to the toe of the dune for habitat and recreational space.

Introduction

The goal of this plan is to develop recommendations for how to restore and preserve the dune system along the City's beachfront through a proactive, planned approach. The dune system is a public resource and important green infrastructure for Folly Beach providing storm protection, environmental, and aesthetic benefits. A dune management plan is needed to provide a linkage between the federal beach nourishment project, which represents a critical and significant commitment and investment by the City, to adjacent beachfront property and public infrastructure landward of the beach.

The dune system is spatially variable along Folly Beach, ranging from a robust system of several rows of established sand dunes along Central Folly, to structured areas (seawalls/revetments) along northeastern Folly, to other areas that are lower than the elevation of the nourished beach that could threaten the integrity of the federal project (Figure 1). The dune system has not been stable during the last several decades. The central portion of the island, which is now home to a robust dune system, was once critically eroded. Figure 2 and Figure 3 serve as reminders that there are seawalls and riprap buried under today's dunes along central Folly Beach. With sufficient sediment supply from the federal beach nourishment project, dune restoration efforts have been successful despite rising sea level over the last three decades. In contrast, Figure 4 depicts the wide dune system that was present along northeast Folly Beach during the 1990's when superbeachfront lot development began. Today, this dune area seaward of baseline and perpetual easement line (PEL) has been completely eroded.

This plan was developed over a number of years in response to chronic erosion, storm-induced erosion following the passage of Hurricanes Matthew and Irma in 2016 and 2017, and the loss of private lands landward of the federal renourishment project. The plan is a product of numerous meetings with City staff, the Planning Commission, and City Council. This plan will be incorporated into the state-required Local Comprehensive Beach Management Plan (LCBMP) during the next 5-year update in 2020.

Figure 1. Photo of the area landward of the federal beach project along northeastern Folly Beach where houses and low lying elevations occupy the area that was once a dune system.

Figure 2. Approximately 2nd St. E. looking northeast during the New Year's Day storm in 1986 (top – Courtesy Richard Beck) and the robust dune system present in 2017 (bottom). Arrows point to the same building.

Figure 3. Approximately 4th St. E. looking west approximately 1984 (Left – Courtesy Richard Beck) and several rows of restored dunes in 2017 (Right).

Figure 4. Google Earth images of northeast Folly Beach in the vicinity of Summer Place Lane in 1999 (top) and 2018 (bottom). Contrast the wide dune system present in 1999 with the erosional conditions of today. Orange line is the baseline/PEL.

Motivation

The City's long-term planning documents including but not limited to the 2015 Beachfront Management Plan, the 2015 Comprehensive Plan, and the 2018 Strategic Plan include recommendations that the City develop a dune management plan. For example, the 2018 Strategic Plan lists a dune management plan and future sand fencing/vegetation as a high priority through 2023. Other examples are cited below.

2015 Comprehensive Plan

In particular, Need#5 under the Protecting Natural Resources element states, "The City must protect the dune system from erosion and also development. The dunes are the first line of defense against erosion.**"**

Goal: Prevent the destruction and degradation of the dune system to protect the integrity of the renourishment project.

Implementation: Create buffer zones on top of setbacks to require planting sea oats and/or sand fencing during development and redevelopment. *Create a management plan for the dune areas*.

Enforcement of ordinances regulating sand dune disturbance is also recommended. Additionally, the Comp Plan states that the City will invest in dune walkover repairs to maintain excellent public access and protect the natural dune ecosystem.

The Comp Plan also recommends the elimination of existing encroachments on sensitive water fronts, marshes, wetlands, and riparian areas while encouraging environmentally sensitive development; full engagement with….other sensitive areas to balance access with protection; and the creation of buffer zones on top of setbacks to require planting vegetation during development and redevelopment.

2015 Local Comprehensive Beachfront Management Plan (LCBMP)

The goal of the 2015 State-Approved LCBMP is to "develop a long-term beach preservation strategy such that the restored beach **and dune system** is not lost between periodic renourishments." The LCBMP represents a proactive effort by the City to mitigate severe erosion in the future. Dune restoration, including planting native vegetation and installing sand fencing, is one of the approaches to erosion control that the LCBMP directs the City to consider.

The Federal Beach Nourishment Project

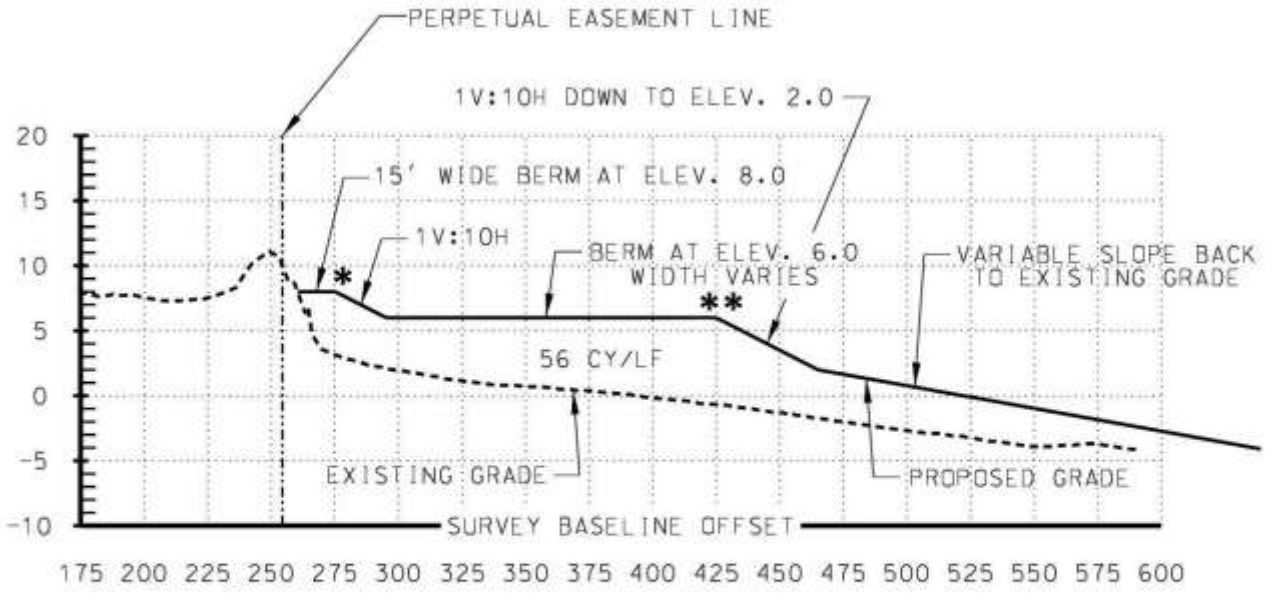
The federal Folly Beach Shore Protection project was authorized by Section 501 of Public Law 99-662 (WRDA86). A 50-year Local Cooperation Agreement (LCA) between the U.S. Army Corps of Engineers (USACE) and the City to maintain a 15-ft wide, 8-ft high storm berm (Figure 5) via beach nourishment remains in effect from 1992 until 2042. This project is referred to as the federal beach nourishment project.

Prior to construction of the initial phase of the federal beach nourishment project in 1993, a Perpetual Easement Line (PEL) was established along the landward edge of the beach project area (Figure 5). The line was established along seawalls or the eroded dune/edge of vegetation demarking the line between the publicly funded renourished beach and the upland private property.

Where needed, two types of easements were acquired from property owners: 1) quit claim deeds for the "wet" beach from Mean High Water (MHW) to low water, and 2) easements for the land from the MHW line to the PEL (B. Peeples, personal communication, February 2015). Concurrently, a very similar line was established as the state baseline.

8-ft berm

The federal beach nourishment project is designed with a protective 15-ft wide storm berm at elevation 8.0 ft NAVD88. This berm is hereafter referred to as the "8-ft berm." In some cases, a dune exists landward of the 8-ft berm and the project "ties into" the dune (Figure 5a). This is typical along central Folly Beach. Here, the PEL is in the dune field. In other cases, the beach is severely eroded and no dune exists landward of the 8-ft berm. In most instances, a seawall has been constructed on the beachfront property to limit private land loss, but in a few cases, no seawall exists and private land loss occurs between periodic renourishments (Figure 5b).



A

Note: Elevations are in feet and refer to NAVD 88.

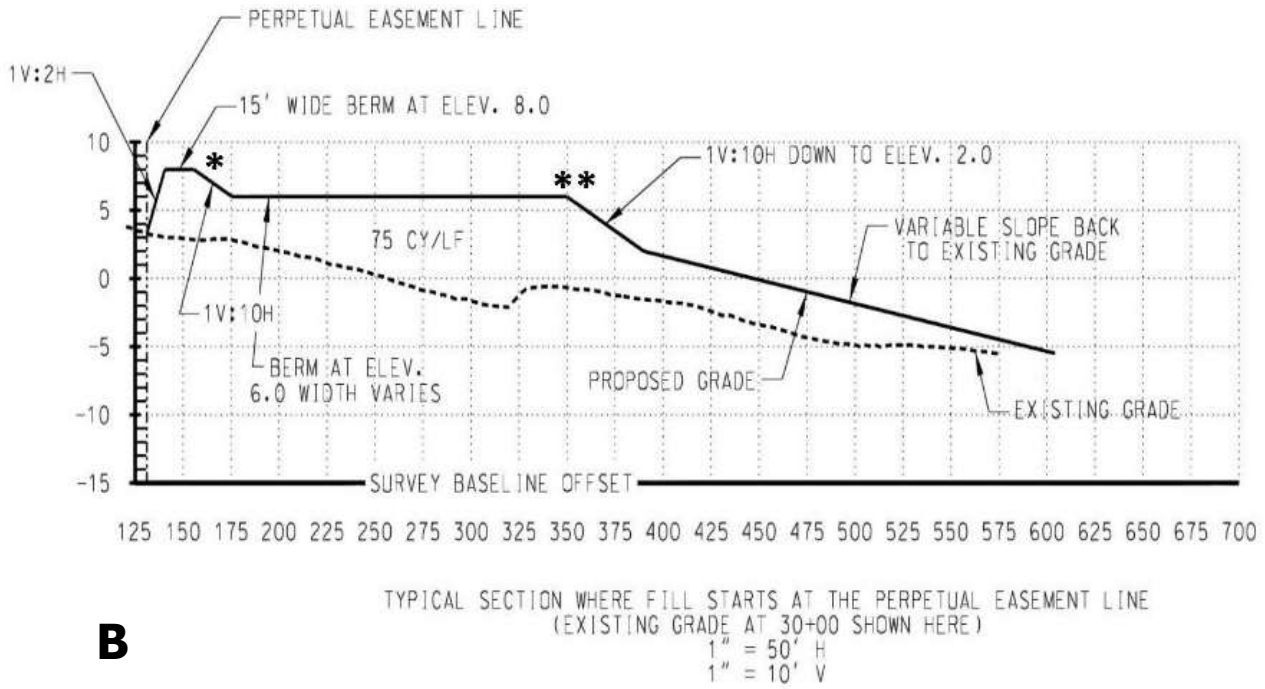


Figure 5. Example profile cross-sections of the federal project, illustrating the 8-ft berm, the PEL, and the existing grade landward of the PEL (from the 1991 USACE O&M manual). In most cases, a seawall exists at the PEL but some areas without a dune or seawall at the PEL (bottom example, B), private land loss occurs between periodic renourishments.

This private land loss compromises the integrity of the federal project and causes the beach to erode more quickly than it would otherwise. The Army Corps has made it clear that any properties that are allowed to erode behind the renourishment line may be skipped over during the next renourishment. To ensure the project provides its intended storm protection benefits, the private property landward of the 8-ft berm must be maintained at a similar elevation. The City of Folly Beach Ordinance 151.60 requires beachfront property owners to maintain this area.

Summary of beach and dune restoration

The first federal beach nourishment project was constructed on Folly Beach in 1993. Subsequent federal projects were constructed in 2005, 2007, 2014, and 2018. The 2005 and 2014 projects were planned periodic renourishments and received a full renourishment template (i.e., the entire developed beach was restored fully). The 2007 and 2018 projects were emergency storm damage repair projects, which only restored areas of the beach that were significantly damaged during prior year storms.

The 1993, 2005, and 2014 full renourishment projects included a federal dune restoration element that included the installation of sand fencing in a V-pattern and vegetation plantings. Sea oats (*Uniola paniculata*) and bitter panicgrass (*Panicum amarum*) were installed along most of the project area. Sand fence was installed in individual V-shaped sections open to the shoreline, with 8 ft spacing between Vs. Northeast of about 10th St. E., efforts to restore the dune have had limited success. However, dune restoration has had great success along central Folly Beach. As a result, the central portion of Folly Beach now has up to three rows of healthy dunes (see Figure

3).

In addition to the federal renourishment projects, several local projects have been constructed on Folly Beach in recent years. Charleston County Park and Recreation Commission funded a renourishment project of Folly Beach County Park in 2013. This project also included vegetation and sand fencing installation as recommended by a separate dune management plan (Elko, 2013).

Prior to the 2018 federal beach renourishment project, the City restored nine (9) deteriorated timber groins located between 8th St. E. and the Washout in an effort to retain nourished sand longer and restore the beach and dune system. Maintaining a dune northeast of the Washout has proven difficult due to high erosion rates.

The City maintains and supplements federal sand fencing during the time intervals between renourishment projects. The City also handles post-storm debris removal along the beach which often involves significant effort to remove destroyed sand fencing that had been installed in erosion prone regions. More recently, the City has maintained property behind the PEL and required private beachfront property owners to do the same (via Ordinance 151.60) to avoid compromising the integrity of the federal project.

Dune Management Issues

Dunes are coastal features created by the wind. Dunes are not stable if regularly impacted by wave energy, rather dunes function best in the long-term stable portion of the backbeach. Dunes provide valuable ecosystem, as well as storm-protection, benefits (Wang et al., 2006). They are also aesthetically pleasing and act as sand repositories. Sand dunes are a resilient coastal feature that, in the absence of long-term erosion, will build back following an erosive storm event.

Dunes are a prominent coastal feature along South Carolina's mixed-energy coast (Hayes, 1979). Drumstick barrier islands such as Bull's Island (Figure 7) are dominated by prograding beach ridges, which have developed in a dune-swale pattern. Swales are low-lying areas between multiple dune crests.

Dunes designed primarily for shore protection are often maintained as stable, linear structures, similar to a sedimentary dike, with little diversity of topography and vegetation. In contrast, natural dunes vary in elevation and width (Elko et al., 2002) and present a more hummocky landscape with blowouts, depositional lobes, low swales and high ridges that provide a more diverse mix of habitat types. The lack of diversity of topography and vegetation in engineered dunes in developed areas may limit their ability to provide the full suite of benefits provided by natural (i.e. geomorphologically and ecologically dynamic) dunes (Elko et al., 2016).

Dunes do not provide protection from long-term, chronic beach erosion. On undeveloped beaches, dunes naturally migrate landward under the pressure of erosion. On managed beaches, this natural migration is often constricted by development. Vegetation and the additional volume of sand that exists in the dune system are no match for destructive storm waves and strong longshore currents. Therefore, restored dunes must be located in the long-term stable portion of the beach. Sufficient beach width should be designed between the shoreline and the toe of the dune to accommodate natural shoreline fluctuations. Properly sited restored dunes are an excellent investment in "green infrastructure" at relatively low cost. Improperly located dunes, or an effort to establish dunes in areas that are frequently impacted by wave energy, will not only fail, but will also result in additional debris – that turn into projectiles during the storm and must be removed after a storm (Figure 6).

Common threats to the dunes include storm impacts, invasive, non-native vegetation, pedestrian trampling, unauthorized trimming and grading, homeless and vagrant activities, and man-made fires (City of Miami Beach and CMC, 2015).

Often, wooden structures are installed to ease public access, protect the dune, and limit maintenance. These objectives sometimes backfire when sediment input overtakes the structures as shown in Figure 8. Additionally, pieces of the structure destroyed during a storm can become projectiles causing further damage and increasing cleanup efforts. Shared walkovers can be effective at providing access, protecting the dune system, and limiting excessive structures. If sediment input is greater than pedestrian traffic, walkover structures may not be necessary (Figure 9).

Figure 6. Photo of sand fencing and walkover materials that were destroyed during the passage of Hurricane Irma, increasing the post-storm clean up effort. Photo taken on September 12, 2017 near 10th St. W, looking NE.

Figure 7. Digital orthophoto (1994) of Bull's Island illustrating prograding beach ridges in a dune-swale pattern.

Dune vegetation is highly adapted to tolerate the harsh conditions in oceanfront dunes and if planted properly will establish and trap sand. Improper planting and irrigation are common causes of failed dune vegetation (Rogers and Nash, 2003). Sea oats and bitter panicgrass should be planted very deep, during the spring or early summer, which is the early part of their growing season. Fixed irrigation systems are unnecessary as excessive irrigation can remove salt spray and encourage other plant species to invade the dune. Seedlings may require watering once a week until they are established. Irrigation after establishment is not necessary.

Figure 8. Sand dunes overtaking wooden structures.

Figure 9. Example of an effective access path through dunes where no dune walkover is needed.

Goals, Objectives and Recommendations

The following list of goals and objectives was developed from feedback from City staff, the Planning Commission, and City Council during multiple meetings. Specific recommendations are included with each goal. A summary of prioritized recommendations will be compiled following all public and City input sessions.

Dune Management Plan Goals

1. Establish a dune management area
2. Enhance storm protection
3. Re-establish a natural dune ecosystem where possible
4. Implement strategic dune walkover/access path management
5. Manage dunes to maximize recreational benefits

Goal 1 Establish a dune management area

This plan recommends the establishment of a dune management area to protect Folly's sand dunes. The dune management area is meant to address both those situations where the primary (most seaward) dune has been washed away and to acknowledge the benefits of maintaining the area behind any existing primary dunes as extra protection.

The dune management area shall be defined as the area beginning at the seawardmost limit of existing vegetation or at the 8 ft NAVD88 elevation (toe of dune) contour or the PEL, whichever is more seaward. The dune management line represents the private-public boundary, and is defined as the PEL or the seaward private property line, whichever is more landward. The landward limit of the dune management area shall be 40 feet landward of the dune management line.

An example map of the private portion of the proposed dune management area is shown in Figure 10. This example illustrates that the seaward boundary of the dune management area primarily coincides with the PEL along most of this map's extent, except for the area just above the top left corner of the legend. Here the seaward boundary of the dune management area transitions to the property line because it is more landward than the PEL.

The dune management area shall be a natural buffer, defined as a buffer that is maintained with native vegetation. As discussed in Goal 3, all new plantings in the management area shall be native vegetation. There are many public and private benefits to this natural buffer, including for the beachfront property owner: reduces erosion, creates privacy, reduces flooding and flood damage, preserves natural habitat, and saves homeowner money through reduced maintenance costs (i.e., keeping wind-blown sand off decks/pools).

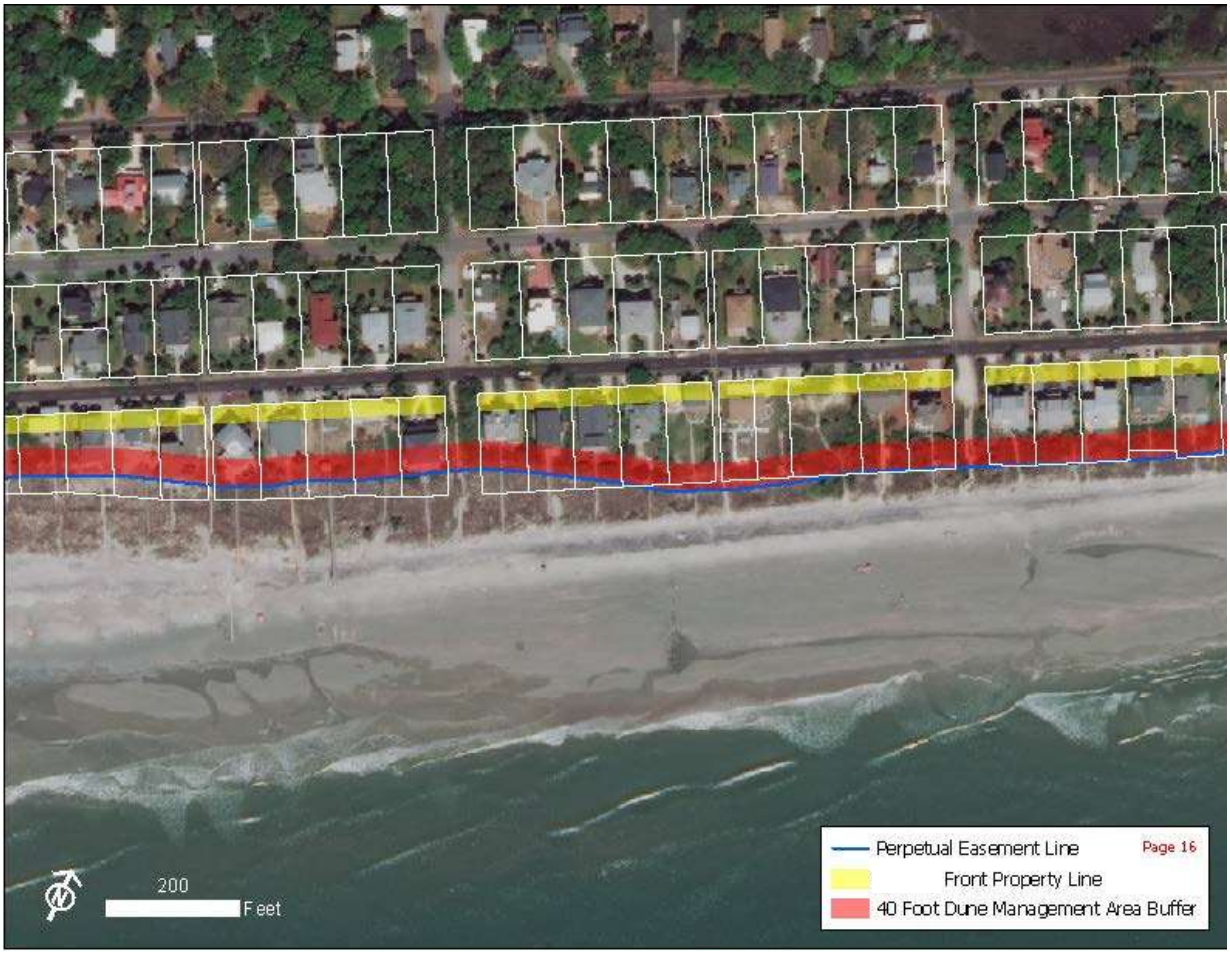


Figure 10. Example map of the red proposed 40-ft dune management area in the vicinity of 9th St. E. The dune management area also includes the portion of the dune system seaward of the blue line (not shaded). The yellow area is the front property line and is not relevant to this discussion.

Based on preliminary calculations, the average distance from the PEL to the habitable structure is 48.7ft.

Given that recent storm surges have exceeded the USACE 8-ft berm, a minimum 10-ft dune elevation is a more desirable elevation. As such, any damage to the dune management area or new construction will be required to meet this higher standard of a 10-ft elevation behind the PEL.

Objectives

1.1 Clarify definition of dunes in City Code

1.2 Establish a dune management area to manage the dune system holistically, not as separate public and private entities, and to preserve existing dunes on public and private property

1.3 Educate beachfront property owners about new regulations

Recommendations

a) To address objective 1.1, modify Section 151.02 of the Folly Beach Code of Ordinances, which prohibits destruction of sand dunes, to include the establishment of dune management area, defined above.
b) To address objective 1.2, implement the following:
    a. Limit improvements within the dune management area to seawalls/revetments, appropriate plantings and/or sand fencing, beach compatible sand, and walkovers. Do not allow above grade structures, septic tanks, or landscaping.
    b. Create a 40-foot setback from the PEL/or seaward property line.
    c. When seawalls/revetments are constructed within the dune management area:
        i. Clarify that there is no setback for the revetment/rock rip rap.
        ii. Require that both the new seawall and the revetment/rock rip rap area up to the PEL are reburied and the disturbed area filled to a 10' elevation and planted with appropriate vegetation.
    d. Require that any other disturbance of the dune management area, such as destruction of dunes, must be mitigated by filling the dune management area to 10' NAVD88 with beach-quality sand and adding appropriate plantings.
c) To address objective 1.3, provide informational materials to beachfront property owners following adoption of this plan and recommended ordinance/policy updates.
    a. Include maps like Figure 10 to illustrate the dune management area to beachfront property owners.
    b. An example of educational materials that was mailed to beachfront property owners upon adoption of Ordinance 151.60 is provided in Appendix B. It included information regarding the property owner's role in dune maintenance.
    c. Appendices C and D contain information on sand fencing and vegetation that should also be incorporated into public information materials.

Goal 2 Enhance storm protection

Some version of a continuous line of defense along the developed beachfront is intact along much of Folly Beach in the form of either a sand dune or mostly private structures (revetment or seawall). The exceptions are pedestrian access paths, some ADA access ramps, and a few private properties (including land trust lots) without seawalls. Thus, the barrier is not continuous in length or consistent in elevation. A storm barrier such as the 8-ft berm designed by the USACE at a minimum (10-ft would be ideal) would be in place all the time along the entire beachfront.

Hurricane Irma, a Category 5 hurricane at one point and a tropical storm by the time it impacted the Folly Beach region, resulted in a nearly 10 ft storm surge (National Weather Service, 2018). Irma resulted in prolonged exposure to storm conditions from September 10-12, 2017. The maximum storm tide (astronomical tide + storm surge) was 12.24 feet Mean Lower Low Water (MLLW) at Fort Pulaski, GA, which was the second highest level ever recorded. The peak storm tide in Charleston Harbor was 9.92 feet MLLW, which is the third highest on record. NAVD88 is about 3.14 ft higher than MLLW in Charleston (NOAA, 2018).

During the passage of Irma, publicly-owned beach access points, dune walk overs, and pedestrian and vehicle access paths were significant points of storm surge intrusion into the residential portions of Folly Beach. In every observed case, storm surge pushed inland until it encountered a significant structure whether that was a seawall, building, dune walkover, or a robust dune. Low-lying sand paths cut through dunes typically allowed storm surge to penetrate the residential part of the island. This has been frequently observed during recent hurricanes in South Carolina (Figure 11).

Figure 11. Example of storm surge entering the residential community through dune access paths. Photo taken during the passage of Hurricane Matthew in North Myrtle Beach, SC on October 8, 2016.

Based on these observations, the City proposes that beachfront lots with new construction, improvements, or to mitigate for damages to the dune management area, the elevation within this area should meet 10 ft (i.e., construct a 20-ft wide, 10-ft high restored dune). In the absence of new construction or damages, the dune management area must be maintained at a minimum 8 ft elevation. The average existing elevation within the Dune Management Area is 9.45 feet, so this proposal is reasonable and achievable.

Owners who are no longer interested in maintaining unbuildable beachfront property have the option to donate this land to the Folly Beach Nature Conservancy. The Folly Beach Nature Conservancy was created in 2001 as a land-holding agency to accept donations of threatened or fragile property, primarily in beachfront areas. To date, the Nature Conservancy acquired eight undeveloped beachfront lots, most of which are partially submerged. This action helps prevent unwise beachfront development in the future through the acquisition of vulnerable beachfront lots.

Objectives

2.1 Establish a continuous line of defense along the developed beachfront with minimal breaks that funnel storm surge to protect public infrastructure along the beachfront such as roads, power, water lines, access, parking, etc. and to reduce risk to vulnerable properties.

2.2 Provide information and options for beachfront homeowners to enhance storm protection on private property behind the PEL

Recommendations

a) To address objective 2.1, implement the following:
   - Require any new construction or substantial improvement on a beachfront lot to provide a 10' elevation berm within the dune management area that is planted with native vegetation.
   - Amend Section 151.23 to add a requirement that new or substantially improved seawalls be built to an elevation of at least 8' NAVD88. This would make sure that new walls are built to a height that matches the protective berm that is put in place during a renourishment.
   - Where possible, eliminate foot paths through dunes that create discontinuities by filling holes with sand and installing dune walkover structures.
   - Narrow beach access paths through the dunes to limit low-lying areas that will funnel storm surge by installing additional sand fencing and dune vegetation at seaward end of paths.
   - Work with SCDOT to maintain the revetment protecting East Ashley Avenue at the Washout

b) In the absence of new construction or dune damages, enforce and expand Ordinance 151.60: beachfront property owners must maintain a minimum level of protection to avoid compromising the integrity of the federal beach nourishment project by:
   - Building or repairing the existing seawall or revetment to a minimum elevation (at +8.0 ft NAVD88)
   - Hauling in beach-compatible sand to elevate the private land to at least +8.0 ft NAVD88.

- Expand to also require the planting of approved native dune vegetation, and sand fencing where appropriate (per Appendices C and D), in addition to the filling of any area that would fall inside the dune management area boundaries. This would further stabilize the areas behind the completed renourishment project and delay erosion behind the line between renourishment cycles.

c) To address objective 2.2, implement the following:
   - Educate property owners about the Folly Beach Nature Conservancy and potential benefits of donations. Consider incentives to pay up to a certain amount of legal fees, if needed, related to the donation.
   - Provide options for beachfront homeowners to i) grant a permanent easement to the City for the portion of the lot that requires filling or ii) deed the entire lot to the Folly Beach Nature Conservancy. Clarify that future maintenance, as described in b) above, would be handled by the City; however, the portion deeded would become public beach and the owner will no longer have exclusive use or ownership of the parcel. It is possible that granting the property to the City by deed or easement would result in the property being included in future renourishments by the Corps.

Goal 3 Restore a natural dune ecosystem where possible

Sea oats (Uniola paniculata) are the dominant dune vegetation in South Carolina (Stalter, 1972, 1974, 1984, 1985) and are recommended to be the prominent species to repopulate the restored dune in areas that are not prone to erosion or dune overwash. Bitter panicgrass (Figure 12) has also been included in previous dune restoration efforts on Folly Beach with great success, even outperforming sea oats in erosional areas with frequent wave/dune impacts. American Beachgrass is not recommended for Folly Beach.

Figure 12. Photo of bitter panicgrass.

As noted in the LCBMP, the beach and sand dune system provide important habitats including loggerhead and leatherback turtle and piping plover nesting grounds. The City has recently been designated as a critical loggerhead sea turtle habitat and intends to continue protecting this species and their offspring. A 2015 Economic Analysis (Rhodes and Pan, 2015) concluded that Charleston area households would collectively place an annual **$2 million value** on protecting the marine turtle species that depend upon Folly Island's front beach area as nesting habitat.

Dune restoration efforts will not allow upland lighting to be visible from the beach to prevent disorientation of nesting females or hatchlings. The specifications in the Plan were developed to avoid and minimize potential impacts to sea turtles through best practices and proper planning.

The ability of dunes to form and evolve can be restricted by backshore raking for litter removal or vehicle traffic (Houser *et al.* 2012), both of which eliminate vegetation and beach wrack that trap blowing sand (Nordstrom *et al.* 2011).

City monitoring efforts have recognized that bitter panicgrass significantly outperforms sea oats along erosional northeast Folly Beach. This species appears to be tolerant and resilient to the harsh conditions which include frequent overtopping and inundation of the dune system. Bitter panicgrass appears to be able to recover from these incidents much more so than sea oats. Thus, bitter panicgrass should be the only vegetation recommended in areas that are regularly impacted by waves.

Finally, non-native species compete with and overwhelm more stable native dune plants, thereby threatening the stability and biodiversity of the dune system. Reducing the presence of

aggressive, non-native vegetation preserves and promotes the structural integrity and biodiversity of the dune. The removal of non-native, invasive plants exposes dune areas which can be colonized by non-native invasive vegetation if they are not replanted quickly with native vegetation.

Objectives

3.1 Restore a natural beach and dune system to enhance habitat for sea turtles and nesting shorebirds

3.2 Encourage incipient (new, young) dune formation

3.3 Replace invasive, non-native plants like beach vitex in the dune system with native vegetation

3.4 Educate beachfront property owners about new requirements to plant native dune vegetation in the dune management area.

Recommendations

a) To restore a natural dune system to the extent possible, plant native vegetation as follows:
    - Utilize a ratio of native dune vegetation that has adapted to the harsh conditions, has historically populated dunes in this region, and will effectively trap sand (e.g., 70% sea oats (*Uniola paniculata*) and 30% bitter panicum (*Panicum amarum*)).
    - 100% Bitter panicgrass should be planted in the dune management area northeast of the Washout and in any area with a high probability of frequent erosion or dune overwash.
    - Once dunes are established with native vegetation (equivalent of at least two years of growth), railroad vine (see Appendix D) may be added for color and variety.

b) To address objective 3.2, eliminate backshore beach raking/removal of wrack line.

c) To address objective 3.3, enforce City Ordinance 151.12, which requires beach vitex to be eliminated.

d) To address objective 3.4, implement the following:
    - Develop an information sheet for beachfront homeowners to enhance dune habitat in the dune management area. Utilize information in Appendices C and D, which includes turtle-friendly sand fencing configurations and reduction of lighting visible from the beach berm.
    - Amend existing requirements for private property filling (Ordinance 151.60) to be planted with appropriate vegetation. See Recommendation b) under Goal 2.

Goal 4 Implement strategic dune walkover/access path management

In many cases, the same public walkover has been rebuilt in-place numerous times. Rather than repair these damaged structures repetitively after major storms, the plan makes recommendations on permanent fixes that should require little to no post-storm repair in the future.

An annual dune access inventory should be collected each year prior to hurricane season and concurrent with the annual beach monitoring and USACE Superintendent inspection. The inventory shall consider the status and condition of the access. Recommendations should be made for strategic repairs and prioritized improvements over various timeframes. This process has already been initiated following Hurricane Irma.

An initial Public Access Inventory (Appendix A) was conducted in November 2017 following Hurricane Irma to consider the status and condition of the access and make recommendations for both immediate repairs and long-term improvements. The immediate post-Irma repairs have been completed to the paths and walkover structures, as well as the first phase of "retreating" some of the walkovers along northeastern Folly Beach.

Objectives

4.1 Develop consistent requirements for new and repaired public and private dune walkover structures

4.2 Implement public walkover improvements strategically to limit repetitive maintenance to public infrastructure

4.3 Provide adequate ADA access

4.4 Provide sufficient emergency vehicular access

Recommendations

a) To address objective 4.1, establish a seaward extent for all new and substantially improved private dune walkover structures at the toe of the seaward dune.

b) To address objective 4.2, continue implementing public walkover and access path improvements according to a prioritized, proactive plan updated annually and based on a dune access inventory

- Continue to retreat public walkover structures along the northeast beach where severe dune erosion has left an impractical walkover with no dune beneath, e.g., 15E, 1510, 1522 (Figure 13).
- Do not retreat walkovers within the groin rehabilitation project area (8th St. E to 14th St. E). The intent is to restore a dune system in this area now that the groins will slow loss of nourished sand.
- Extend public walkovers along central Folly Beach to the toe of dune vegetation and over the high developed dunes. Fill in pedestrian sand paths or otherwise block/close off. An example of a public access that needs this management recommendation is shown in Figure 14.

c) To address objective 4.3, implement the following:
    - Utilize and properly maintain Mobimats for handicapped access.
    - Include an additional ADA access in the vicinity of 9E.
d) To address objective 4.4, implement the following:
    - Maintain emergency vehicle access paths at 10W, 3W, 2E, and path at Coast Guard station gate.
    - Construct additional 15-ft wide vehicle access path(s) between 2E and the Coast Guard station gate. Consider 9E and 1587E.

Figure 13. Photo of a dune walkover constructed during a time of wider dunes at the Washout. This walkover has since been retreated. Photo taken on September 30, 2017 looking onshore.

Figure 14. Photo of a public dune walkover that stops short of the seaward toe of vegetation and does not provide sufficient protection of the primary dune. Photo taken at 4th St. E. looking offshore on September 29, 2017.

Goal 5 Restore dunes to maximize recreational benefits

The beach and dune system provides economic benefits to the City of Folly Beach because the beach is a top tourism destination. Maintaining recreational excellence is very important to the City's economy. Sufficient recreational space must exist between the toe of the dune and the high-water line even during eroded time periods between renourishment projects.

While it is tempting to provide additional storm protection by installing another row of dune fencing and native vegetation after each renourishment event, managers must be aware of the need to provide both storm protection benefits and recreational benefits. Once sufficient dunes are established, management efforts should be focused on increasing the elevation of existing dunes while maintaining a wide recreational beach. High tides often force beachgoers into the dunes when the recreational beach is inundated (Figure 15).

Figure 15. Photo of several rows of established sand dunes along central Folly Beach and total inundation of the recreational beach during a high tide in April 2018.

Along northeastern Folly Beach, establishing a dune system on the public beach has proven difficult despite repeated attempts. This is not surprising. As noted in the Dune Issues section above, dunes are beneficial coastal landforms but they do not stop long-term erosion. Dunes are stable only in areas that are not regularly reworked by waves. Natural dunes provide storm protection because they are only subject to wave energy (and sometimes inundation) during rare, severe storm events. In highly erosive areas like this, it is important to focus initial public efforts in managing the beach erosion rate with beach nourishment and perhaps erosion control structures before attempting to stabilize a dune system. The dune management area along northeastern Folly Beach has the greatest chance of success for dune restoration activities such as increased elevation and bitter panicgrass plantings.

Objectives

5.1 Provide sufficient beach space from the pre-nourishment storm high tide line to the toe of the dune for habitat and recreational space

5.2 Minimize pedestrian impacts to establishing and established dunes

5.3 Identify areas where dune restoration has a low probability of success

Recommendations

a) To address objective 5.1, provide at least 50 ft of beach space from the pre-nourishment storm high tide line to the toe of the dune for habitat and recreational space. When beach widths decrease to less than 50 ft, beach goers are often forced into the dune system (Figure 15).
b) To address objective 5.2, install signage to keep pedestrians out of dunes.
c) To address objective 5.3, implement dune restoration efforts strategically:
    - Focus public dune restoration efforts southwest of the Washout where dune restoration seaward of the PEL has a higher probability of success.
        - Aim to establish dunes between 8th St. E. and 14th St. E. landward of the 2018 groin rehabilitation project
        - Increase the elevation of existing dunes southwest of 8th St. E.
    - Northeast of the Washout, focus public restoration efforts on erosion management, and encourage beachfront property owners to enhance their private dune management areas through education.

Summary of Recommendations

Establish a dune management area:

a) Modify Section 151.02 of the Folly Beach Code of Ordinances to include the establishment of a 40-ft wide dune management area landward of the PEL. Limit improvements within the dune management area to seawalls, appropriate plantings and/or sand fencing, beach compatible sand, and walkovers. Do not allow above grade structures, septic tanks, or non-native landscaping.
b) When seawalls/revetments are constructed within the dune management area:
    a. Clarify that there is no setback for the revetment/rock rip rap.
    b. Require that both the new seawall and the revetment/rock rip rap area up to the PEL are reburied and the disturbed area filled to a 10' elevation and planted with appropriate vegetation.
c) Require that any other disturbance of the dune management area, such as destruction of dunes, must be mitigated by filling the dune management area to 10' NAVD88 with beach-quality sand and adding appropriate plantings.

Enhance storm protection

a) Require any new construction or substantial improvement on a beachfront lot to provide a 10' elevation berm within the dune management area that is planted with native vegetation.
b) Amend Section 151.23 to add a requirement that new or substantially improved seawalls be built to an elevation of at least 8' NAVD88.
c) Where possible, eliminate foot paths through dunes that create discontinuities by filling holes with sand and installing dune walkover structures.
d) Narrow beach access paths through the dunes to limit low-lying areas that will funnel storm surge by installing additional sand fencing and dune vegetation at seaward end of paths.
e) Work with SCDOT to maintain the revetment protecting East Ashley Avenue at the Washout
f) In the absence of new construction or dune damages, enforce and expand Ordinance 151.60: beachfront property owners must maintain a minimum level of protection to avoid compromising the integrity of the federal beach nourishment project by:
    - Building or repairing the existing seawall or revetment to a minimum elevation (at +8.0 ft NAVD88)
    - Hauling in beach-compatible sand to elevate the private land to at least +8.0 ft NAVD88.
    - Expand to also require the planting of approved native dune vegetation, and sand fencing where appropriate (per Appendices C and D), in addition to the filling of any area that would fall inside the dune management area boundaries.

Restore a natural dune ecosystem where possible

a) Plant native vegetation as follows:
    - Along the majority of the beachfront, utilize a ratio of 70% sea oats (*Uniola paniculata*) and 30% bitter panicum (*Panicum amarum*)).
    - 100% Bitter panicgrass should be planted in the dune management area northeast of the Washout and in any area with a high probability of frequent erosion or dune overwash.

- Once dunes are established with native vegetation (equivalent of at least two years of growth), railroad vine (see Appendix D) may be added for color and variety.

b) Eliminate backshore beach raking/removal of wrack line.
c) Enforce City Ordinance 151.12, which requires beach vitex to be eliminated.

Implement strategic dune walkover/access path management

a) Establish a seaward extent for all new and substantially improved private dune walkover structures at the toe of the seaward dune.
b) Continue implementing public walkover and access path improvements according to a prioritized, proactive plan updated annually and based on a dune access inventory
    - Continue to retreat public walkover structures along the northeast beach where severe dune erosion has left an impractical walkover with no dune beneath.
    - Do not retreat walkovers within the groin rehabilitation project area (8th St. E to 14th St. E).
    - Extend public walkovers along central Folly Beach to the toe of dune vegetation and over the high developed dunes. Fill in pedestrian sand paths or otherwise block/close off.
c) Utilize and properly maintain Mobimats for handicapped access.
    - Include an additional ADA access in the vicinity of 9E.
d) Maintain emergency vehicle access paths at 10W, 3W, 2E, and path at Coast Guard station gate.
    - Construct additional 15-ft wide vehicle access path(s) between 2E and the Coast Guard station gate. Consider 9E and 1587E.

Restore dunes to maximize recreational space

a) Provide at least 50 ft of beach space from the pre-nourishment storm high tide line to the toe of the dune for habitat and recreational space.
b) Implement dune restoration efforts strategically:
    - Focus public dune restoration efforts southwest of the Washout where dune restoration seaward of the PEL has a higher probability of success.
        - Aim to establish dunes between 8th St. E. and 14th St. E. landward of the 2018 groin rehabilitation project
        - Increase the elevation of existing dunes southwest of 8th St. E.
    - Northeast of the Washout, focus public restoration efforts on erosion management, and encourage beachfront property owners to enhance their private dune management areas through education

Educate the public and beachfront property owners

a) Provide informational materials to beachfront property owners following adoption of ordinance/policy updates.
    a. Include maps like Figure 10 to illustrate the dune management area to beachfront property owners.
    b. An example of educational materials that was mailed to beachfront property owners upon adoption of Ordinance 151.60 is provided in Appendix B. It included

information regarding the property owner's role in dune maintenance.

c. Appendices C and D contain information on sand fencing and vegetation that should also be incorporated into public information materials.

b) Educate property owners about the Folly Beach Nature Conservancy and potential benefits of donations. Consider incentives to pay up to a certain amount of legal fees, if needed, related to the donation.
c) Provide options for beachfront homeowners to i) grant a permanent easement to the City for the portion of the lot that requires filling or ii) deed the entire lot to the Folly Beach Nature Conservancy. Clarify that future maintenance, as described in b) above, would be handled by the City; however, the portion deeded would become public beach and the owner will no longer have exclusive use or ownership of the parcel. It is possible that granting the property to the City by deed or easement would result in the property being included in future renourishments by the Corps.
d) Develop an information sheet for beachfront homeowners to enhance dune habitat in the dune management area. Utilize information in Appendices C and D, which includes turtle-friendly sand fencing configurations and reduction of lighting visible from the beach berm.
e) Install signage to keep pedestrians out of dunes.

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Appendix A: Dune Access Path Inventory (conducted November 2017 and updated June 21-22, 2021)

Table A-1. Public Access Inventory updated June 21-22, 2021, including the status, condition, recommended actions, and the timeframe for implementing those actions.

Location	Status	Condition	Recommended Action	Timeframe
10 W	Open	Recently repaired	Dig sand from ramp, place on west side. Install 2 sand fence Vs, 1 on each side of ramp within dune vegetation and lined up with existing posts	Immediate
910 W	Open	Sand path	none	n/a
9 W	Open	Mediocre	Repair dilapidated boards	Immediate
810 W	Open	Has been recently repaired	Extend walkover to toe of vegetation	Long-term
8 W	Open	Has been recently repaired	Add trash can corral; Extend walkover to toe of vegetation	Immediate Medium-term
7 W	Open	Good, Walkover too short	Repair street-side stairs, minor railing board repair needed; Extend walkover to toe of vegetation	Immediate Long-term
610 W	Open	Mediocre-Poor; Walkover too short	Street side stairs need to be repaired eventually; Extend walkover to toe of vegetation	Short- to Long-term
6 W	Open	extended	Add trash can corral; Done as pilot. Success	Immediate
510 W	Open	Mediocre-Poor; Walkover too short	Add trash can corral; Extend walkover to toe of vegetation; Discuss with new property owner on east side	Immediate Long-term
5 W	Open	Mediocre-Poor; Walkover too short	Add trash can corral Consider improvement project here (like 6W); Extend walkover to toe of vegetation	Immediate Medium-term
4 W	Open	Mediocre-Poor; Walkover too short	Add trash can corral Next improvement project here (like 6W); Extend walkover to toe of vegetation	Immediate Short-term
310 W	Open	Mediocre-Poor; Walkover too short	Eliminate split path by installing minor rope and post	Immediate
3 W	Open	Good	n/a	n/a
3 W Bathhouse	Open	Improved, only one path now	n/a	n/a
210 W	Open	New; Walkover too short	Add no smoking sign; Add 2 Vs at angle, use existing rope to connect	Immediate

			to tip of V closest to seawall	
110 W	Open	Pavers	None	n/a
110 E	Closed	Mobi-Mat good,	Pier construction underway	n/a
2 E	Open	Sand vehicle access path	Good condition, despite high use. Add ~3 loads of sand to vehicle path	Short-term
210 E	Open	Removed old walkover	Add trash can corral on fence; Very low path relative to adjacent properties; Good candidate to place sand prior to storm	Immediate; short-term:
3 E	Open	Improved, excellent	Add hard barrier to close ped path	Immediate
4 E	Open	New; Walkover too short; Split beach entrance path	Install one keep off dunes sign on empty post; Hold off on 4-7E extensions until dune line adjusts	Immediate
410 E	Open	Mediocre; Walkover too short;	Hold off on 4-7E extensions until dune line adjusts	Long-term
5 E	Open	Poor, non-functional ramp covered w sand	Hold off on 4-7E extensions until dune line adjusts	Long-term
510 E	Open	Mediocre to poor (loose boards); Walkover too short;	Hold off on 4-7E extensions until dune line adjusts Include private access stairs;	Long-term;
6 E	Open	Deck poor, railings good; Walkover too short;	Hold off on 4-7E extensions until dune line adjusts	Long-term
610 E	Open	Sand path adjacent to private walkover that is too short	Hold off on 4-7E extensions until dune line adjusts, Pilot public/ private gate?	Long-term
7 E	Open	Deck mediocre, railings poor; Walkover too short;	Hold off on 4-7E extensions until dune line adjusts	Long-term
710 E	Open	Deck repaired; Walkover too short;	Hold off on 4-7E extensions until dune line adjusts	Long-term
8 E	Open	Mediocre to poor; Walkover too short;	Add trash can corral; Reframe street side stairs, replace railings	Immediate
810 E	Open	Sand path thru dunes; No walkover.	n/a	n/a
9 E	Open	Mediocre to poor; High, unused walkover with sand path beneath	Use as staging area for pre-storm beach compatible sand	Short-term

910 E	Open	Sand path	n/a	n/a
10 E	Open	Good, repaired, parking lot improved	Add trash can corral, repair railings	Immediate
1010 E	Open	Sand path allowed surge to reach the road	Add trash can corral	immediate
11 E	Open	Unnecessarily long walkover has trapped sand, seawall built	Railing repair; Consider future expansion of parking lot	Immediate; long-term
1110 E	Open	Sand path allowed surge to reach the road	Installed seawall with property owner to NE	n/a
12 E	Open	Good	Best east side candidate for parking lot expansion, demo walkover to the seawall	Short-term
1210 E	Open	Good	Good	n/a
13 E	Open	Good	Poll locals to see if add a few golf cart parking spots?	Immediate
14 E	Open	Sand path and walkover;	n/a	n/a
15 E	Open	Good, retreated	n/a	n/a
1510 E	Closed	Good, retreated	n/a	n/a
1522 E	Open	Good, retreated	n/a	n/a
1550 E	Open	Repaired, good	n/a	n/a
1560 E	Open	Good	n/a	n/a
1561/1563 E	Open	Good, ramp railings removed at MHW	n/a	n/a
1587 E	Open	Good, retreated	n/a	n/a
1640 E	Open	Retreated, good	n/a	n/a
1670 E	Open	Good	n/a	n/a
1690 E	Open	Retreated	n/a	n/a
Summer Place	Open	Good	None	n/a

Appendix B: Educational Materials provided to Beachfront Property Owners following adoption of Ordinance 151.60

Private Property Dune Maintenance Challenges

Upon adoption of Ordinance 151.60 (Appendix B), a flyer was mailed to all beachfront property owners with the following information regarding the property owner's role in dune maintenance. This plan recommends that similar informational materials are provided to beachfront property owners following adoption of the plan and recommended ordinance/policy updates.

- Property Owner's Role
  - Improve your beachfront property to create a seamless connection between the public beach and private property.
  - Provide additional storm protection benefits to your property by:
    - Building or repairing the existing seawall or revetment: Most beachfront properties on Folly Beach have a seawall or revetment in place, but some are in disrepair. Seawall construction requires a City permit and must meet the requirements of Code of Ordinance 151.60.
    - Haul in sand to elevate the private property to the level of the public restored beach, or to build a protective dune.
    - Restore the dune system by installing sand fencing (in a V-pattern with V's opening to the ocean) and/or native dune vegetation such as bitter panicum (panic grass) and sea oats. Sand fencing helps trap wind-blown sand. Dune vegetation does too; it offers the additional benefit of a complex root system that helps to naturally stabilize the dune.
  - An ideal level of protection could include all three: a seawall buried under a restored beach/dune system with native vegetation. This type of "redundant" protection has proven to be effective during recent hurricanes, for example during Hurricane Sandy in the northeast.

Public/Private Property Line

- The following photo illustrates the difference between the public beach and private land:

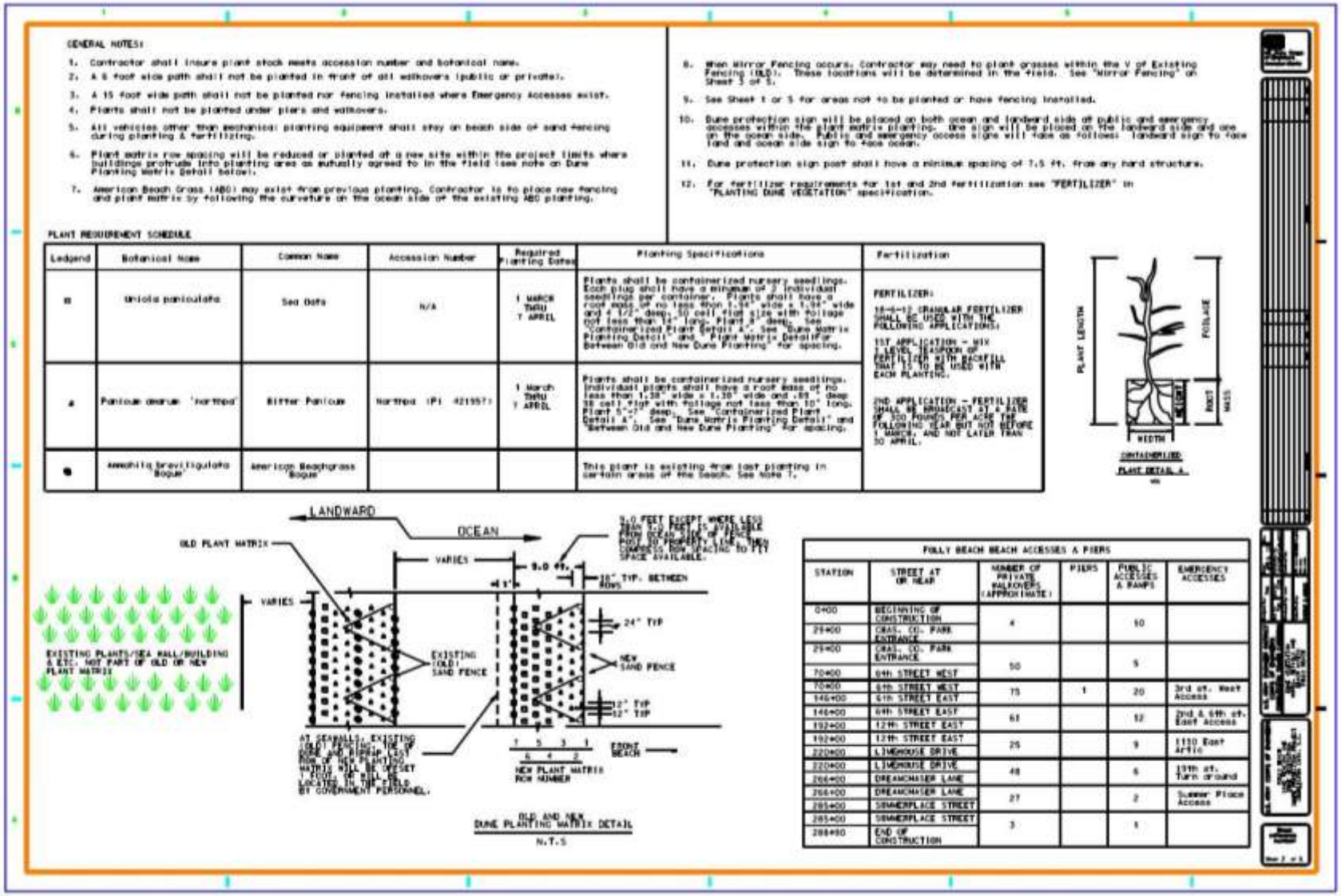
In this photo taken after the last renourishment, the public beach was renourished by the federal contractor but no sand was placed on private land. The static boundary between public

and private land is the red line. It is known as the Perpetual Easement Line (PEL). The above scenario compromises the integrity of the federal beach project; thus, the U.S. Army Corps of Engineers (USACE) requires that land behind the line is maintained. City Ordinance 151.60 (Property Owner Elevation Maintenance) was adopted in response to this USACE mandate. Private property owners are encouraged to follow the guidelines outlined herein to avoid this scenario.

Creating Redundant Storm Protection on Private Beachfront Property

- Building or repairing a Seawall
  - City building permits are required
  - For more info: http://www.cityoffollybeach.com/city-departments-services/building-planning-and-business-licenses/building-permits-and-inspections/
- Purchasing beach-compatible sand
  - In conjunction with the 2018 beach renourishment project, property owners may purchase sand to address erosion on the seaward side of beachfront lots.
  - Property owners of beachfront lots that require sand to be placed will be notified 60 days prior to beach nourishment construction. A volume requirement and estimated cost will be provided.
  - For more information, please contact the City.
- Dune Restoration
  - Following the 2018 beach renourishment project, the City will be rehabilitating the dunes on the public beach between 8th and 14th St. E. There is not sufficient space on the public beach northeast of 14th St. E. to warrant public dune rehabilitation at this time.
  - If private beachfront property owners wish to participate in this effort, please contact the City.
  - If property owners wish to restore their dune system, sand, sand fencing, and native dune vegetation may be installed by the owners. Sea oats or bitter panicum may be purchased from local growers.
  - Plant native dune vegetation in spring and early summer.
  - Additional information on dune building from SCDHEC-OCRM is available here: http://www.scdhec.gov/HomeAndEnvironment/Docs/dunes_howto.pdf
    - Please note that American Beachgrass is not recommended for Folly Beach.

Appendix C: USACE Sand Fence and Vegetation Drawings & Specifications



GENERAL NOTES:

1. Contractor shall insure plant stock meets accession number and botanical name.
2. A 6 foot wide path shall not be planted in front of all walkovers (public or private).
3. A 15 foot wide path shall not be planted nor fencing installed where Emergency Accesses exist.
4. Plants shall not be planted under piers and walkovers.
5. All vehicles other than mechanical planting equipment shall stay on beach side of sand fencing during planting & fertilizing.
6. Plant matrix row spacing will be reduced or planted at a new site within the project limits where buildings protrude into planting area as mutually agreed to in the field (see note on Dune Planting Matrix Detail below).
7. American Beach Grass (ABG) may exist from previous planting. Contractor is to place new fencing and plant matrix by following the curvature on the ocean side of the existing ABG planting.
8. When Mirror Fencing occurs, Contractor may need to plant grasses within the V of Existing Fencing (OLD). These locations will be determined in the field. See "Mirror Fencing" on Sheet 3 of 5.
9. See Sheet 1 or 5 for areas not to be planted or have fencing installed.
10. Dune protection sign will be placed on both ocean and landward side of public and emergency accesses within the plant matrix planting. One sign will be placed on the landward side and one on the ocean side. Public and emergency access signs will face as follows: landward sign to face land and ocean side sign to face ocean.
11. Dune protection sign post shall have a minimum spacing of 7.5 ft. from any hard structure.
12. For fertilizer requirements for 1st and 2nd fertilization see "FERTILIZER" in "PLANTING DUNE VEGETATION" specification.

PLANT REQUIREMENT SCHEDULE

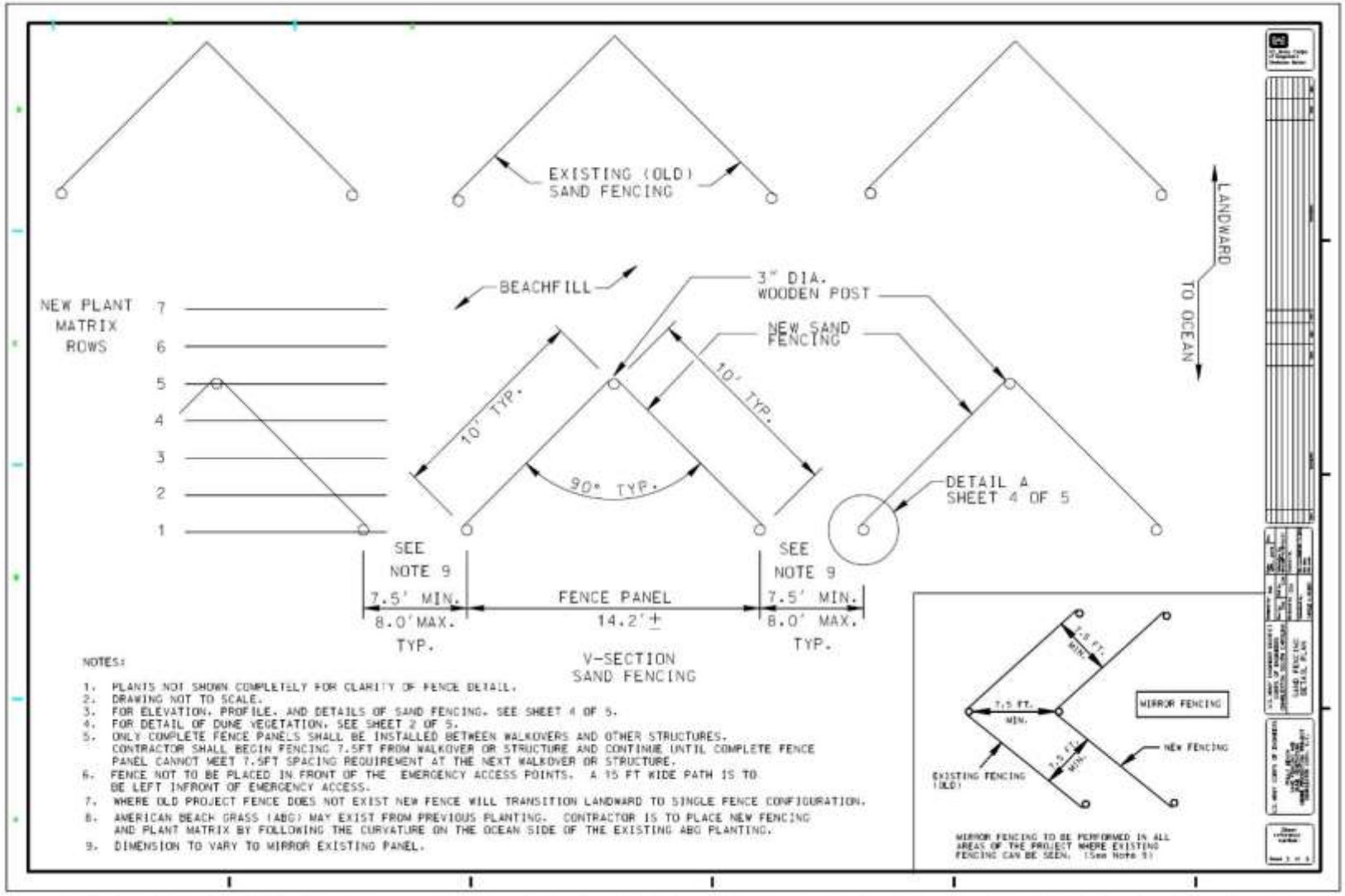
Legend	Botanical Name	Common Name	Accession Number	Required Planting Dates	Planting Specifications	Fertilization
■	Uniola paniculata	Sea Oats	N/A	1 MARCH THRU 1 APRIL	Plants shall be containerized nursery seedlings. Each plug shall have a minimum of 2 individual seedlings per container. Plants shall have a root mass of no less than 1.94" wide x 1.94" wide and 4 1/2" deep. 50 cell flat size with foliage not less than 12" long. Plant 6" deep. See "Containerized Plant Detail A". See "Dune Matrix Planting Detail" and "Plant Matrix Detail for Between Old and New Dune Planting" for spacing.	FERTILIZER: 10-6-12 GRANULAR FERTILIZER SHALL BE USED WITH THE FOLLOWING APPLICATIONS: 1ST APPLICATION - MIX 1 LEVEL TEASPOON OF FERTILIZER WITH BACKFILL SOIL THAT IS TO BE USED WITH EACH PLANTING. 2ND APPLICATION - FERTILIZER SHALL BE BROADCAST AT A RATE OF 300 POUNDS PER ACRE THE FOLLOWING YEAR BUT NOT BEFORE 1 MARCH, AND NOT LATER THAN 30 APRIL.
▲	Panicum amarum 'Northpa'	Bitter Panicum	Northpa (PI 421557)	1 March THRU 1 APRIL	Plants shall be containerized nursery seedlings. Individual plants shall have a root mass of no less than 1.38" wide x 1.38" wide and .69" deep. 38 cell flat with foliage not less than 10" long. Plant 5"-7" deep. See "Containerized Plant Detail A". See "Dune Matrix Planting Detail" and "Between Old and New Dune Planting" for spacing.	
●	Ammophila breviligulata Bosque	American Beachgrass Bosque			This plant is existing from last planting in certain areas of the beach. See note 7.	

CONTAINERIZED PLANT DETAIL A
N.T.S

OLD AND NEW DUNE PLANTING MATRIX DETAIL
N.T.S

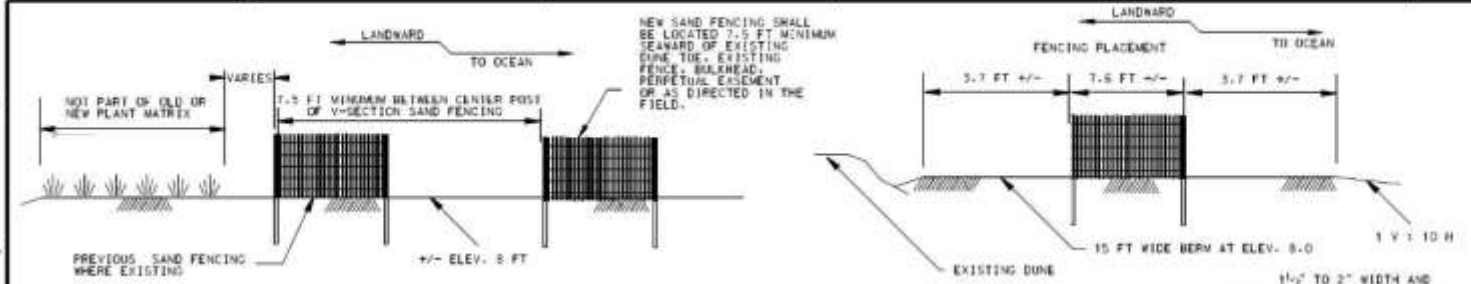
FOLLY BEACH BEACH ACCESSES & PIERS

STATION	STREET AT OR NEAR	NUMBER OF PRIVATE WALKOVERS (APPROXIMATE)	PIERS	PUBLIC ACCESSES & RAMPS	EMERGENCY ACCESSES
0+00	BEGINNING OF CONSTRUCTION	4		10	
29+00	CHAS. CO. PARK ENTRANCE	50		5	
29+00	CHAS. CO. PARK ENTRANCE				
70+00	6th STREET WEST	75	1	20	3rd st. West Access
70+00	6th STREET WEST				
146+00	6th STREET EAST	61		12	2nd & 6th st. East Access
146+00	6th STREET EAST				
192+00	12th STREET EAST	25		9	1110 East Ardie
192+00	12th STREET EAST				
220+00	LIMEHOUSE DRIVE	48		6	19th st. Turn around
220+00	LIMEHOUSE DRIVE				
266+00	DREAMCHASER LANE	27		2	Summer Place Access
266+00	DREAMCHASER LANE				
285+00	SUMMERPLACE STREET	3		1	
285+00	SUMMERPLACE STREET				
288+90	END OF CONSTRUCTION				

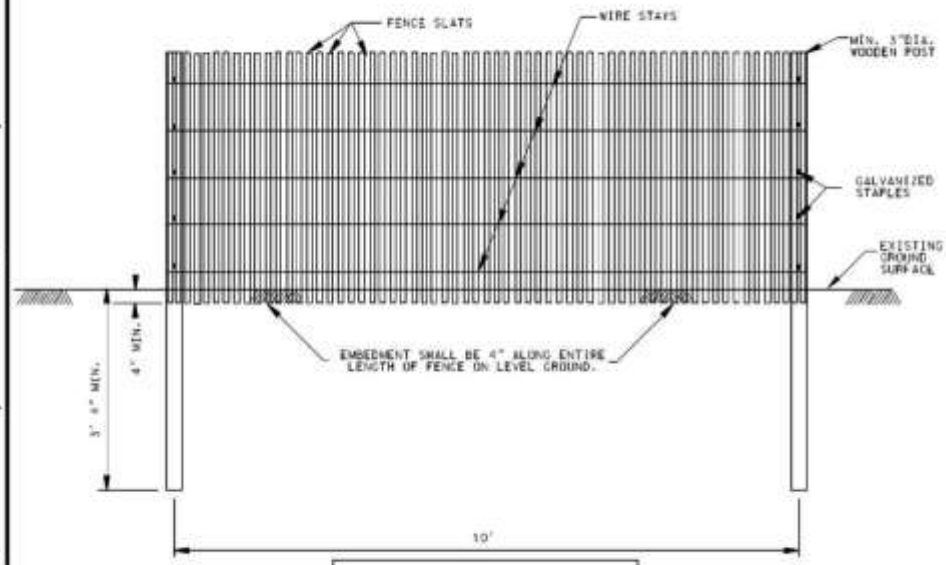


NOTES:

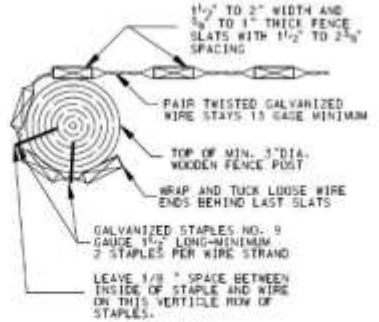
1. PLANTS NOT SHOWN COMPLETELY FOR CLARITY OF FENCE DETAIL.
2. DRAWING NOT TO SCALE.
3. FOR ELEVATION, PROFILE, AND DETAILS OF SAND FENCING, SEE SHEET 4 OF 5.
4. FOR DETAIL OF DUNE VEGETATION, SEE SHEET 2 OF 5.
5. ONLY COMPLETE FENCE PANELS SHALL BE INSTALLED BETWEEN WALKOVERS AND OTHER STRUCTURES. CONTRACTOR SHALL BEGIN FENCING 7.5FT FROM WALKOVER OR STRUCTURE AND CONTINUE UNTIL COMPLETE FENCE PANEL CANNOT MEET 7.5FT SPACING REQUIREMENT AT THE NEXT WALKOVER OR STRUCTURE.
6. FENCE NOT TO BE PLACED IN FRONT OF THE EMERGENCY ACCESS POINTS. A 15 FT WIDE PATH IS TO BE LEFT INFRONT OF EMERGENCY ACCESS.
7. WHERE OLD PROJECT FENCE DOES NOT EXIST NEW FENCE WILL TRANSITION LANDWARD TO SINGLE FENCE CONFIGURATION.
8. AMERICAN BEACH GRASS (ABG) MAY EXIST FROM PREVIOUS PLANTING. CONTRACTOR IS TO PLACE NEW FENCING AND PLANT MATRIX BY FOLLOWING THE CURVATURE ON THE OCEAN SIDE OF THE EXISTING ABG PLANTING.
9. DIMENSION TO VARY TO MIRROR EXISTING PANEL.



FENCING AND BEACH GRASS
NO SCALE



ELEVATION -- FENCE PANEL
NO SCALE



DETAIL A
FENCE POST (TYP.)
NO SCALE

NOTE:

1. NEW PLANT MATRICES NOT SHOWN FOR CLARITY.
2. A MINIMUM OF 5 PAIRS OF GALVANIZED WIRE STAYS SHALL BE PROVIDED.
3. SAND FENCE SHALL BE PLACED IN 4" DEEP TRENCH. SAND SHALL BE PLACED BACK IN TRENCH AND COMPACTED TO EXISTING GROUND SURFACE.
4. USE 1 STAPLE PER WIRE STRAND ON MIDDLE POST.
5. ANY FENCE MATERIAL IN THE ESTIMATED QUANITY THAT IS NOT INSTALLED WILL BE TURNED OVER TO THE SPONSOR. FENCE MATERIAL WILL BE DELIVERED TO STORAGE AREA LOCATED BY THE SPONSOR.
6. DO NOT HAMMER STAPLES WARD AGAINST WIRE.
7. PERPETUAL EASEMENT, CONSTRUCTION LIMITS, EXISTING FENCE POST, GROINS, RIPRAP, EROSION, EMERGENCY LANE OR EXISTING DUNE WILL DETERMINE NEW FENCE LOCATION WHICH WILL BE DETERMINED IN THE FIELD.
8. IN AREAS WHERE FENCE IS TO BE PLACED ON A SLOPE, FENCE SHALL HAVE A MINIMUM OF 4 INCH EMBEDMENT WITH THE UPPER END AS DEEP AS NEEDED TO HAVE A LEVEL FENCE.
9. DIMENSIONS ON "FENCE PLACEMENT" MAY VERY BASED ON SITE CONDITIONS, AS DIRECTED BY THE CONTRACTING OFFICERS REPRESENTATIVE.

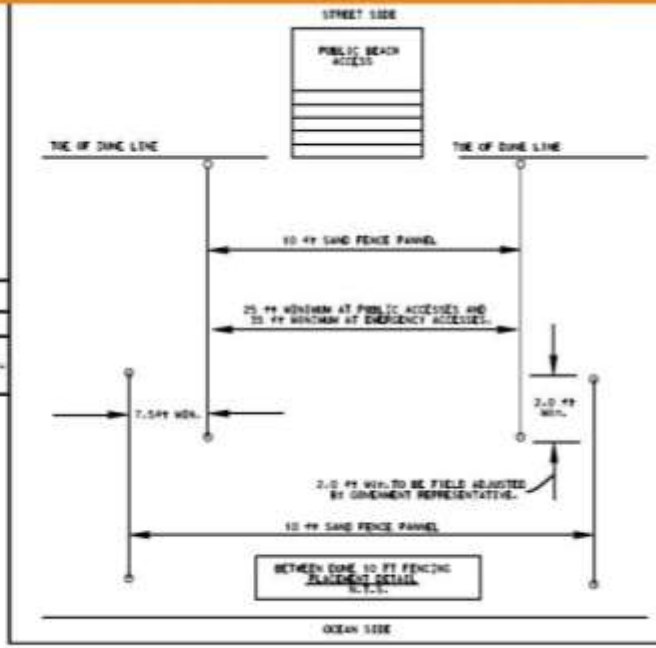
FBFENDT.dgn

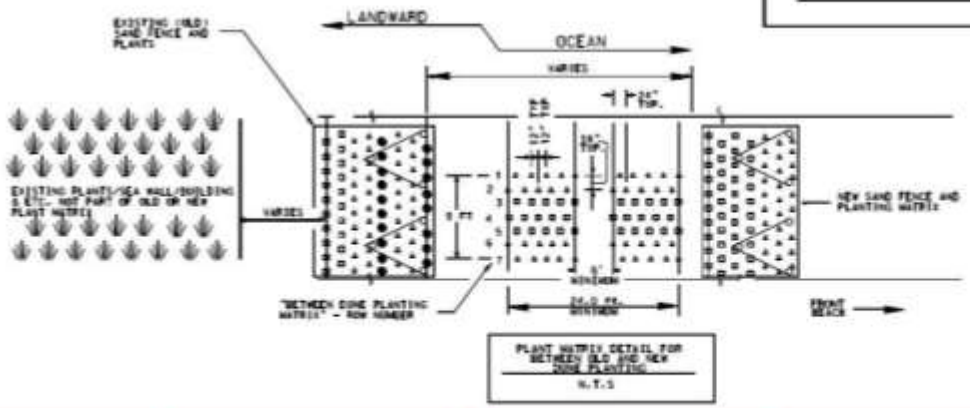
GENERAL NOTES:

1. Plant stock shall meet specifications on Sheet 2 of 5.
2. Plants shall not be planted under piers, walkovers or in front of any public or private accesses.
3. "Between Dunes Planting Matrix" should be planted approximately 300 feet apart or where Contracting Officer Representative specifies. See detail below titled "Plant Matrix Detail For Between Old and New Dune Planting". 14 obstruction fields at 300 foot interval. "Between Dune Planting Matrix" can be shifted to accomodate planting parallel to beach profile.
4. "Between Dune Planting Matrix" should be aligned between houses or vacant lots.
5. See Sheet 4 of 5 for details on fencing.
6. 10 FT fence panels should have fencing attached to post like end post in V-Section Fencing as shown in "Detail A Fence Post (TYP.)" on Sheet 4 of 5.
7. No fencing or post shall be placed within 7.5 Ft. of any hard structure.

PLANT REQUIREMENT SCHEDULE

Ledgend	Botanical Name	Common Name	Planting and Fertilization Specifications
O	Uniola paniculata	Sea Oats	See Sheet 2 of 5 for planting and fertilization instructions.
●	Panicum amarum "northpa"	Bitter Panicum	





PLANT MATRIX DETAIL FOR BETWEEN OLD AND NEW DUNE PLANTING
N.T.S

Specifications for wooden posts to hold and stabilize fence:

1) 7 ft long – pointed at end for ease of installation
2) Minimum 3 inch diameter or untreated 2 x 4
3) Buried 3 feet deep
4) Attach fence to posts with stainless or galvanized 1.5” x 9 gauge fence staples secured over/around the wires (not through the lath)

Appendix D: Vegetation Specifications and Planting Guidelines

Vegetation Specifications

Table D-1. Recommended vegetation specifications. General specifications for all plants noted below.

Common (Scientific) Name	Specification	
Sea oats (*Uniola paniculata*)	Each plant should have a minimum of 2 stems per container. Foliage at least 12″ long.	
Bitter panicgrass (*Panicum amarum*)	Each plant may have 1 stem. Foliage at least 8″ long.	
Railroad vine (*Ipomoea pes-caprae*)	Each plant may have 1 stem. Foliage at least 8″ long.	

General specifications for all plants listed in Table C-1 include:

- Plants shall be delivered in their original containers on flats in a consistent dimension. Each flat shall contain the same number of plants.
- Plants shall be at least 90 days old, as measured from the approximate time of germination, with a desired root ball size of 1 3/16" x 1 3/16" x 2" deep. Documentation shall be provided of the location of the seed source, name of the nursery where the plants were grown and approximate time of germination, prior to installing the plant material. Plant specification shall be submitted with the proposal and will be considered as part of proposal selection.
- Plants shall be vigorous and well rooted with roots completely filling the container.
- Plants shall meet high standards for health and vitality, have good foliage condition and be free from pest or mechanical damage.
- All plants shall be planted with at least 6 - 8" of sand above the rootball.

Species distribution. A mix of 70 percent of sea oats (Uniola paniculata) and 30 percent mix of other approved species.

Species spacing. Sea oats shall be installed to cover all barren areas and all areas cleared of exotics greater than 100 square feet, at an average spacing of 2 feet on center, to within 2 feet of the perimeter of undisturbed native vegetation.

The supplier should provide a material warranty as follows. All plants provided and installed under the terms of this agreement are guaranteed to be of good quality and free of disease or defects at the time of installation. A warranty is provided for a **80%** survivorship of all plants for **90** days following installation. **COMPANY** will perform replanting to meet the **80%** survival rate, at no cost to the client, if survivorship falls below **80%** of the initial plants installed. The plant survivorship warranty does not include the loss or damage of installed plants due to acts of God such as frost, flood, fire, drought, shoreline erosion, or other catastrophic events, nor does it include loss or damage due to theft, vandalism, fish, animal, chemical treatment, or negligence by others including inappropriate engineering or design.

Fertilizer and Irrigation Instructions

Plants may be installed with 2 ounces of pre-hydrated polymer gel (Terrasorb or equivalent) in the planting hole and must be fertilized with 1 teaspoon of Osmocote (or equivalent) in the backfill. Plants must be watered immediately to set the roots before backfilling the hole to grade. The supplier can propose an alternate watering method, but must meet the survival criteria at final inspection. The watering methods must be described in the proposal.