



Catherine B. Templeton, Director

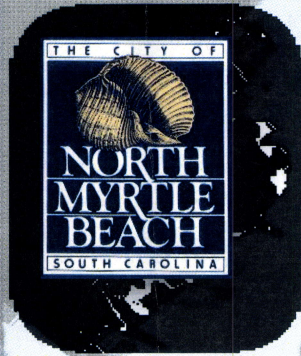
Promoting and protecting the health of the public and the environment

NOTICE OF APPROVAL *WBS*

***Local Comprehensive Beach Management Plan
City of North Myrtle Beach***

The South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC-OCRM) announces its approval of the **Local Comprehensive Beach Management Plan for the City of North Myrtle Beach**. DHEC-OCRM has determined that the plan satisfactorily addresses the requirements for approval established in the State Beachfront Management Act, S.C. Code Ann. § 48-39-250 *et seq.* and implementing regulations.

Implementation of the State-Approved Local Comprehensive Beach Management Plan for the City of North Myrtle Beach commences on August 29, 2014.



LOCAL COMPREHENSIVE BEACHFRONT MANAGEMENT PLAN

Prepared by the North Myrtle Beach
Planning & Development Department

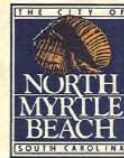
3/25/2014



In accordance with the State Beachfront Management Act, the City of North Myrtle Beach has prepared this updated Local Comprehensive Beachfront Management Plan in coordination with the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (SCDHEC-OCRM). The Plan represents considerable effort, inventory, and deliberation on the part of the City of North Myrtle Beach, and establishes a strategy for the sustainable management of the beach and dune system for residents and visitors to enjoy.

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Resolution



STATE OF SOUTH CAROLINA
COUNTY OF HORRY
CITY OF NORTH MYRTLE BEACH

A RESOLUTION BY THE CITY OF NORTH MYRTLE BEACH CITY COUNCIL TO ACCEPT THE 2014 LOCAL COMPREHENSIVE BEACHFRONT MANAGEMENT PLAN.

WHEREAS, the City of North Myrtle Beach, in accordance with the South Carolina Beachfront Management Act (SC Code ann. Section 48-39-250 et. seq.), and the State Beachfront Management plan (R.30-14, Coastal Division Regulations), did draft its initial Local Comprehensive Beach Management Plan in 1991, which was approved by the South Carolina Coastal Council; and

WHEREAS, the purpose of the plan is to highlight the unique setting and management issues facing North Myrtle Beach, the goals of the community, and strategies for improved beachfront management to help inform local, state, and federal decisions and funding priorities; and

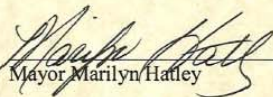
WHEREAS, the Local Comprehensive Beachfront Management Plan more specifically enables the city to identify and collect information relevant to the city's ocean and inlet shorelines and to continue to be eligible for the State of South Carolina beach nourishment funding; and

WHEREAS, the City of North Myrtle Beach has, working in coordination with the South Carolina's Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management, revised the plan in 2014 and recommended its acceptance by resolution to City Council.

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and City Council, in Council duly assembled, that the attached 2014 Local Comprehensive Beachfront Management Plan be accepted.

RESOLVED THIS 16 day of June, 2014

ATTEST:


Mayor Marilyn Hatley


City Clerk

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Acknowledgements

The City of North Myrtle Beach prepared this plan in close coordination with the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management and with technical assistance from Coastal Carolina University's Burroughs and Chapin Center for Marine and Wetland Studies. We thank the Coastal Planner in the Coastal Services Division of SCDHEC-OCRM, William Salters, S.C. Sea Grant Coastal Processes Extension Specialist Coastal Carolina University's Burroughs and Chapin Center for Marine and Wetland Studies, Michael Slattery, Ph.D., as well as Planning Commission and City Council members for overall guidance.

Preparation of the plan was supervised by Jim Wood, Director of Planning & Development and Principal Planner, Aaron Rucker, with assistance by Dawn Snider, Planner, and key personnel from the Public Works, Parks & Recreation, and Public Safety Departments.

1.0 Introduction

1.1 Purpose

In accordance with the State Beachfront Management Act, the City of North Myrtle Beach has prepared the 2014 Local Comprehensive Beachfront Management Plan in coordination with the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (SCDHEC-OCRM). The Plan represents considerable effort, inventory, and deliberation on the part of the City of North Myrtle Beach, and establishes a strategy for the sustainable management of the beach and dune system for residents and visitors to enjoy (*see Appendix A*).

This Plan is intended to replace the previously approved 1991 Beach Management Plan and be incorporated into the State Beachfront Management Plan in accordance with the provisions of the State Beachfront Management Act.

Specifically, the purpose of the 2014 Local Comprehensive Beachfront Management Plan is to:

- Fulfill the State-mandated requirements for a local beach management plan;
- Provide guidance for ordinances and actions that protect and preserve the beach and dunes;
- Provide guidance for local ordinances and actions that regulate development near the beach and dunes;
- Provide guidance and goals for future beach access;
- Provide guidance for beach management and maintenance;
- Provide goals for future protection, preservation, and regulation of the beach and dunes system; and
- Retain eligibility for State beach renourishment funding.

1.2 History of 1991 Beach Management Plan

In 1976, the South Carolina Coastal Council (SCCC), now SCDHEC-OCRM, was established by passage of the Coastal Zone Management Act for the State of South Carolina as a coastal zone management and permitting agency. From this Council, the State Beachfront Management Act was created in July 1988, with revisions in 1990. The new law, among other elements:

- Enacted a 40-year policy of "retreat" from eroding beaches.
- Established a new jurisdictional area for permitting between a "baseline" (generally the primary dune crest or historical inlet shoreline position) and a "setback" line (based on a multiplier of 40 times the local, annual rate of erosion).

- Limited construction would be allowed within a 20 foot restricted zone landward of the baseline, and construction would be prohibited seaward of the baseline;
- Within the setback area:
 - No new erosion control devices are allowed, and existing seawalls were to be replaced with sloping structures over time;
 - New structures are limited to 5,000 square feet of heated space;
 - Homes damaged beyond repair must be rebuilt farther landward wherever practicable;
- Created standards for state and local comprehensive beach management plans;
- Established real estate disclosure requirements for beachfront property transactions.

During the 1990 legislative session, the Beachfront Management Act was amended to eliminate the 20-foot restrictive zone landward of the baseline (which had become known derisively as the “dead zone”); and to remove the prohibition on construction seaward of the baseline by authorizing “special permits” (SCDHEC-OCRM, 2003). The amendment increased regulatory authority over seawalls and prohibited the replacement of structures that are damaged beyond repair (now set at 50% of structural integrity). Subsequent amendments to the Act in 2002 specifically authorized the use of groins in association with beach renourishment projects, under certain guidelines.

Section 48-39-350 of the South Carolina Code of Laws required local beachfront governments to develop and adopt local comprehensive beach management plans to address local conditions and issues by 1991. The Act required that these local plans be long-range, comprehensive, and consistent with the State Beachfront Management Act. Once adopted locally, SCDHEC-OCRM would review Beach Management Plans for approval, and approved plans become part of the State Beachfront Management Plan. Regulations state that the 1992 Beach Management Plan was required to be updated every five years following approval by the State of South Carolina. At a minimum, local comprehensive beach management plans would contain all of the following:

1. Inventory of beach profile data and historic erosion rate data for each standard erosion and inlet erosion zone;
2. Inventory of public beach accesses and attendant parking along with the plan for enhancing public access and parking;
3. Inventory of all structures located in the area seaward of the setback line;
4. Inventory of turtle nesting and important habitats of the beach/dune system and a protection and restoration plan if necessary;
5. Conventional zoning and land use plan consistent with the purpose of the Act for the area seaward of the setback line;
6. Analysis of beach erosion control alternatives, including renourishment of the beach;
7. Drainage plan for the area seaward of the setback zone;

8. Post disaster plan including plans for cleanup, maintaining essential services, protecting public health, emergency building ordinances, and the establishment of priorities;
9. Detailed strategy for achieving the goals of this chapter by the end of the 40-year retreat period, which shall consider relocating buildings, removal of erosion control structures, and relocation of utilities; and
10. Detailed strategy for achieving the goals of preserving existing public access and the enhancement of those public accesses to ensure full enjoyment of the beach by all residents of the State of South Carolina.

The City of North Myrtle Beach coordinated with SCDHEC-OCRM in the early 1990s to fully inventory, analyze and document each of the ten elements to complete the 1991 Beach Management Plan in conjunction with a local beach renourishment program. City Council adopted the Beachfront Management Plan by resolution on May 20, 1991.

The Plan provided a detailed inventory of existing conditions along the approximate nine-mile oceanfront between Hog Inlet and White point Swash, encompassing the limits of the City of North Myrtle Beach. The inventories included lists of buildings, shore-protection structures, and miscellaneous amenities such as pools, lists of beach accesses and parking areas, outlines of drainage basins and stormwater-control improvements, summaries of land use and zoning, and an endangered species list. Also included was a review of beach erosion rates and a general plan for beach erosion control, a post-disaster plan, and the city's 40-year retreat strategy. Accompanying the text were exhibits relating to the above elements of the plan. A separate set of map overlays supported the plan providing delineations of structures, accesses, etc., at a 1:100 foot scale, corresponding with the 1988 SCCC orthophoto maps of the shoreline. The Plan also recognized local, state, and federal policies and authorities.

Adopting the 1991 Beachfront Management Plan also allowed the city to continue to receive state beach renourishment funds. Public beach access was a major component, and preservation of public beach accesses helped ensure funding of beach renourishment.¹ Since 1991 beach renourishment has played an important role in beach expansion, along with local zoning and building codes.

It was reported in the 1991 Beachfront Management Plan that the Beach Management Act (BMA) of 1990 prescribed a methodology for establishing baselines and setback lines for the purposes of enforcing state law. Interim lines were set in July 1988 based on the 1986 *North Myrtle Beach Shorefront Management Plan* (SMP). These lines were adopted by the city for purposes of implementing local oceanfront development regulations. The SCCC (now SCDHEC-OCRM) baseline for North Myrtle Beach was adopted in June 1991 and varied somewhat from the city's building control line, which was based upon 1986 data. In general, the differences between the lines was small, indicating relatively little change in beach

¹ Beachfront Management Plan §49-39-350(B) of the Code of Laws of South Carolina.

condition between 1986 and October 1990. While the city ordinance was tied to the original 1986 lines, it was expected the lines would be revised from time to time as conditions along the beach changed. Sometime around 1994, the ordinance and its building control lines were reevaluated, and the city chose to remove local enforcement of the building control line and instead adopt the state's baseline and setback lines. The baseline was established at the crest of the primary oceanfront sand dune in standard zones (beaches not influenced by tidal inlets or associated tidal shoals), and at the most landward point of erosion at any time during the past forty years in unstabilized inlet zones (SC Code §48-39-280(A)). The setback line was established landward of the baseline a distance of forty times the average annual erosion rate or not less than twenty feet from the baseline. The baseline and setback line are updated every 8-10 years using the best available scientific and historical data including aerial imagery, LiDAR data, historical shorelines, beach profile data, and long-term erosion rates.

The 1991 Beach Management Plan has represented the foundation for a comprehensive, long-range and enforceable local management strategy for the beach and beachfront area in the City of North Myrtle Beach since 1991.

1.3 Storm History

Below is a list of named storms known to have hit the North Myrtle Beach area in the past, most notably Hurricanes Hazel and Hugo.

Hurricane Hazel 1954 (category 4)

Hurricane Hazel made landfall in the vicinity of the North Carolina/South Carolina state line, near Little River, with wind speeds reported at 106 mph destroying many beach homes. The estimated damage was \$27 million.

Hurricane Diane 1955 (Category 1)

Fortunately there was no storm surge associated with Hurricane Diane, but it did cause tides to come in higher than normal. Damages in South Carolina were reported by the National Weather Service to be approximately \$100,000.

Hurricane Helen 1958 (Category 3)

Hurricane Helen approached North Myrtle Beach but curved northeast and only caused minor damages.

Hurricane David 1979 (Category 5)

Hurricane David washed away up to 20 feet of the dune. Afterwards, property owners accelerated the building of hard erosion-control devices such as seawalls and revetments.

Hurricane Diana 1984 (Category 2)

Hurricane Diana caused heavy flooding from up to 19 inches of rain, tree damage, and downed power lines. Most of the damage was experienced between Wilmington, North Carolina and Myrtle Beach, South Carolina.

Nor'easters 1986 and 1987

These two northeasters produced about 40 feet of dune retreat throughout the Grand Strand and caused over \$2.5 million in property damage in North Myrtle Beach. Much of the damage involved seawalls and pools which collapsed from undermining and scour as storm waves penetrated further inland. In April 1987, a report was issued explaining that sections of the city with armored shorelines continue to have a lower sand volume than natural sections as seawalls exacerbate the erosion problem.

Hurricane Hugo, September 21, 1989 (Category 4)

Hurricane Hugo caused unprecedented damage and extensive beach erosion with upwards of 75 feet of erosion in North Myrtle Beach. Volumetric losses exceeded 1.1 million cubic yards of beach.

By 1991 the condition of the beach in North Myrtle Beach was similar to pre-Hugo conditions. Because of natural recovery combined with emergency nourishment and dune re-establishment, about 90 percent of the volumetric losses sustained during the hurricane had been restored by this time.

Hurricane Fran 1996 (Category 1)

The most severe damage in South Carolina took place in Horry County where winds reached 77 mph. Numerous trees were felled by the winds, leaving roughly 60,000 residents without power.

Hurricane Dennis 1999 (Category 1)

Damage in South Carolina was limited to downed trees and scattered power outages.

Hurricane Floyd 1999 (Category 1)

The states of Georgia and South Carolina, although threatened by the storm, were largely spared when it turned northward. Some areas of eastern South Carolina reported up to 16 in (410 mm) of rain.

1.4 Description of North Myrtle Beach

North Myrtle Beach is located along the Atlantic Coast in Horry County, South Carolina. The city was incorporated in May 1968 to include the four municipalities of Windy Hill, Crescent Beach, Ocean Drive, and Cherry Grove. The community is located in the northeastern corner of the State; roughly 6 miles from the North Carolina State line, 18 miles from Conway, South Carolina, and adjacent to Little River, South Carolina. With approximately nine miles of ocean frontage as its eastern boundary, North Myrtle Beach spans both sides of the Atlantic Intracoastal Waterway to the west, from the mouth of Hog Inlet west to the Waterway to the north, and 48th Avenue South along U.S. Highway 17 and across the Waterway to just after Waterway Hills golf course to the south. The city occupies a land area of approximately 13,362 acres or 21 square miles (*see Figure 1*).

The shoreline of North Myrtle Beach is included in South Carolina’s “Grand Strand,” a 30-mile stretch of shoreline between Little River Inlet to the north and Murrells Inlet to the south. The Grand Strand is a primary income generator for South Carolina’s tourism industry. The beach and associated amenities, plus the addition of the new NMB Park and Sports Park with active fields to support local and regional sports tourism events, drives the city’s economy and contributes significantly to the economic vitality of the region.

Extrapolating from increases in local accommodations tax revenues, staff estimates visitation numbers have increased to approximately 5.5 million annual visitors to North Myrtle Beach and the city’s average peak daily population is estimated at 75,000 to 105,000 persons during the summer months with a total of 16,988 bedrooms available.² Overnight average travel party size is 4.8 persons staying an average of 5.10 nights and spending an average of \$1,888.43 per trip.³

North Myrtle Beach has maintained a reputation as a family beach—as a good place for gatherings without the noise, congestion, and expense of other beach resort areas. Access to over 100 golf courses in the area also brings in plenty of golfers and the mild winters “Snowbirds.” With property values along the oceanfront totaling approximately \$1.8 billion⁴, over 1,300 acres of property west of the AICW under the city’s jurisdiction awaiting development; and access to U.S. Highway 31 and the new Robert Edge Parkway forming a new connection to Main Street over the AICW, the city’s future looks bright.⁵

1.5 Local Beach Management Issues

The City of North Myrtle Beach manages its beach as one contiguous stretch of sand, and its beach regulations apply uniformly along the entire oceanfront. It should be noted that the city code does not attempt to exert duplicate jurisdiction over some activities seaward of the 40-year setback line that are already regulated by SCDHEC-OCRM (e.g., erosion control devices, emergency sand bagging, etc.) but does exert jurisdiction over these activities landward of the 40-year setback line. Buildings constructed seaward of the 40-year setback line must comply with City of North Myrtle Beach requirements (i.e., zoning, building code, National Flood Insurance Protection, etc.) and with SCDHEC-OCRM requirements.

Development Issues

One of the most significant threats to the shoreline of North Myrtle Beach is from development pressure to construct as closely to the dune system as possible. With much of the land approaching build-out along the nine miles of city coastline, older single family beach houses and rental developments are renovating or redeveloping into larger buildings with site designs that push closer to the dune system and the beach. Since the beach is

² Sources: NMB Planning & Development Department/Finance Department and *Seasonal and Part-Time Population Study 2001-2002*.

³ Source: North Myrtle Beach Chamber of Commerce – Convention & Visitors Bureau 2012 Visitor Conversion Research.

⁴ Source: ESRI GIS Parcel V3 data, Total market value of improvements as mapped field.

⁵ Source: Chapter 3, Land Use Element, *2010 Comprehensive Plan Update*.

routinely renourished, last occurring in fall 2008, and accreting in areas, property owners are seeking to legally extend property lines seaward. Although SCDHEC-OCRM building setback lines continue to be enforced, the opportunity for an even wider public beach is removed if private property extends seaward. There has been no policy or strategy to address this. Extending private lot lines seaward, as a result of an expanding beach, also influences potential public redevelopment projects, such as possible oceanfront boardwalks city officials may consider in the future, because public access easements or public purchase of the private property must be sought.

Environmental Issues

The city also faces various environmental concerns in relationship to the management of the coastline. Beach erosion is ongoing in some locations and has led to periodic beach renourishment projects (*see Section 5.2.2 Beach Renourishment*). If sea levels rise enough resulting from climate change, the South Carolina coastal communities may be required to reevaluate the feasibility of beach renourishment as a primary shoreline management technique and plan accordingly.

Shoreline stabilization has also been used extensively in Cherry Grove through the use of seawalls, revetments, and large boulders to prevent beach erosion.

The protection and enhancement of the dunes system and its vegetation, as a part of an overall approach to beach management, is an extremely important issue. Vegetated dunes help to protect life and property by serving as a storm barrier and create habitat for numerous species of plants and animals, some of which are threatened or endangered. In some places, unregulated beach access has led to multiple paths over the dune and trampled vegetation as a result. City staff is pursuing ways to reduce unnecessary dune crossings and rehabilitate those areas already trampled.

Additionally, the protection of critical habitats, such as tidal inlets and creeks like White Point Swash and Cherry Grove Marsh, is paramount. Providing recreational areas is also beneficial. Heritage Shores Nature Preserve was created in 2007 with seven (7) acres of marsh and maritime forest, $\frac{3}{4}$ miles of walking paths, elevated boardwalks, and observation platforms with interpretive signage. Russell R. Burgess, Jr. Coastal Preserve was created in 2004 to access the water and protect and maintain important Cherry Grove Marsh habitat. A boardwalk was added in 2009.

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CITY OF NORTH MYRTLE BEACH LOCATION MAP

City Limit as of 6-17-2014



Figure 1. North Myrtle Beach location map. Source: NMB Planning & Development Department.

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2.0 Inventory of Existing Conditions

2.1 General Characteristics of North Myrtle Beach

North Myrtle Beach is a continuous, sandy shoreline approximately 9 miles in length from White Point Swash in Windy Hill to Hog Inlet in Cherry Grove (*see Figure 2*). Development consists of a combination of single-family houses, condominiums, apartments, small motels and large high-rise hotels along with their supporting commercial establishments. Few vacant lots remain along the beachfront and redevelopment has increased the density of dwelling units and hotels along the beach. With limited land between Ocean Boulevard and the beach, plus increased demand for beachfront living, high-density development has historically moved closer to the shoreline, displacing much of the natural dune system; though there is evidence that the dunes are rejuvenating.

Population and Demographics

According to the 2010 census conducted by the U.S. Census Bureau, North Myrtle Beach is currently home to 13,752 permanent residents, 27,584 housing units and 7,033 households.⁶ Since its inception in 1968, North Myrtle Beach has consistently gained in population and housing, and it continues to grow today. For example, increases in population and housing units (27% and 36% respectively) were some of the highest in the country between years 2000 and 2006. Furthermore, there are approximately 11,959 additional housing units approved and awaiting construction. Assuming a conservative 2.7% annual growth rate, it is possible that the permanent residential population could reach 17,000 by 2020 (a 19% increase from 2010).

Relying on 2010 Census data, the median age of year-round residents in North Myrtle Beach is 54.7. The U.S. Census Bureau's 2007-2011 American Community Survey 5-Year Estimates indicates households had an average income of \$47,205 (+- \$5,500) in 2011 inflation-adjusted dollars. The racial composition of city residents remains predominately White (Caucasian), 90.4%, with an average household size of 1.94 people.

Major Roads and Bridges

Access to and from North Myrtle Beach is provided by U.S. Highway 17 and U.S. Highway 31 (Carolina Bays Parkway) via U.S. Highway 22, Robert Edge Parkway (Main Street Connector), U.S. Highway 9, or Sea Mountain Highway. U.S. Highway 17 is the principal arterial roadway, the service provider for visitors, and the economic locus for retail, amusements, and restaurants. U.S. Highway 65 (Ocean Boulevard) is another important roadway and has several roles; it serves as a principal transportation route along the beach, as a place of recreation, and as the core of the tourism economy. Ocean Boulevard is more than a street; it is a destination for the millions of tourists who visit annually, and has a certain iconic cultural status as the birthplace of the "Shag" dance.

⁶ The U.S. Census Bureau's 2012 population estimate is 14,472.

2.1.1 General Land Use Patterns

With tourism as the mainstay of the economy, the city's growth between 1995 and 2005 included a diversity of housing stock and price ranges. Essentially, the previous land use policies promoted high-density growth on the oceanfront and lower densities elsewhere, although the AICW has increasingly become an important second waterfront attracting high-density resort development. General commercial activity was concentrated along U.S. Highway 17, with beach-oriented business along the main routes feeding Ocean Boulevard such as Sea Mountain Highway, Main Street, 6th Avenue South, 17th Avenue South, and 39th Avenue South. Zoning generally respected the Comprehensive Plan, and subsequent requests for zoning changes have been consistent with the plan in most cases. To facilitate additional economic activity within existing commercially-oriented neighborhoods, in 2011 City Council approved the Priority Investment - Activity Center Overlay district. The overlay relaxes parking standards around the traditional commercial centers of the four historic beach communities (Cherry Grove, Ocean Drive, Crescent Beach, and Windy Hill), which permits development and redevelopment of small parcels that were created prior to current parking standards. It has been shown that a primary limiting factor in the economic use and revitalization of these areas has been excessive parking requirements for new uses. Reducing these standards will also promote walkability and the use of other modes of transportation.

Since 2005, most large tracts have been designated as Planned Development Districts. Approximately 50% of North Myrtle Beach has been developed, or is approved for development, as a master planned community, also referred to as Planned Development Districts (PDDs), which help shape the urban form and demographic composition of the area. An exception to annexed areas becoming PDD's is the 2011 "Sandridge" annexation discussed below.

Annexation

New standards for development are continually created, and land use and transportation networks will continue to enhance, thus promoting greater livability within the community. For example, in 2007, the 173-acre former Robber's Roost golf course, zoned R-1 Single-Family Residential Low-Density, was subdivided into a 68-acre single-family detached subdivision. In 2009, the remaining 100 acres was rezoned and got approved for a mixed-use residential and village commercial community not possible under the R-1 zoning district. Likewise, in 2008, the Parkway Group PDD annexation and zoning of 1,363 acres occurred, approving another mixed-use, high-density residential community with access to and from Highway 31-Carolina Bays Parkway. In 2011, the second largest annexation occurred with the 1,877-acre multiple parcel area known as "Sandridge." Unlike many previous annexations zoned PDD, the "Sandridge" annexation contains low and high residential zoning (R-1, R-2A and R-4), and commercial (BC, HC and GC). Additionally, the North Myrtle Beach Park and Sports Complex was built on 142 acres that has brought additional people to the beach as expected. The facility opened Spring of 2014.

Golf

Six 18-hole golf courses are located in North Myrtle Beach. Surf Golf and Beach Club is located approximately two blocks from the Atlantic Ocean, and the greens for holes 3, 8, and 13 on Tidewater Golf Club and Plantation are located adjacent to the Cherry Grove Marsh.

2.2 Beach Characteristics⁷

The beach is generally wide and flat with a well-developed berm and a system of small dunes (1-2' in height) vegetated with native species (sea oats and native grasses/forbs). Shoreline stabilization structures are present over approximately 3 miles of shoreline (approximately 16,000 ft. of seawall, 2200 ft. of bulkhead, and 100 ft. of riprap) (*see Figures 3 - 4*) and are currently protected from exposure to waves and nearshore processes by a berm and dune system in most places.

Recent sediment studies indicate grain size is primarily medium to fine sand with low organic matter content (Xu, 2010). Grain size distribution is coarse-skewed, likely a result of high shell fragment content. Sediment samples collected 20 cm below land surface are coarser than surficial samples indicating sediments placed on the beach from the recent nourishment project (from offshore borrow site) have likely been buried by finer wind-blown sediments from dunes or other sources.

⁷ References:

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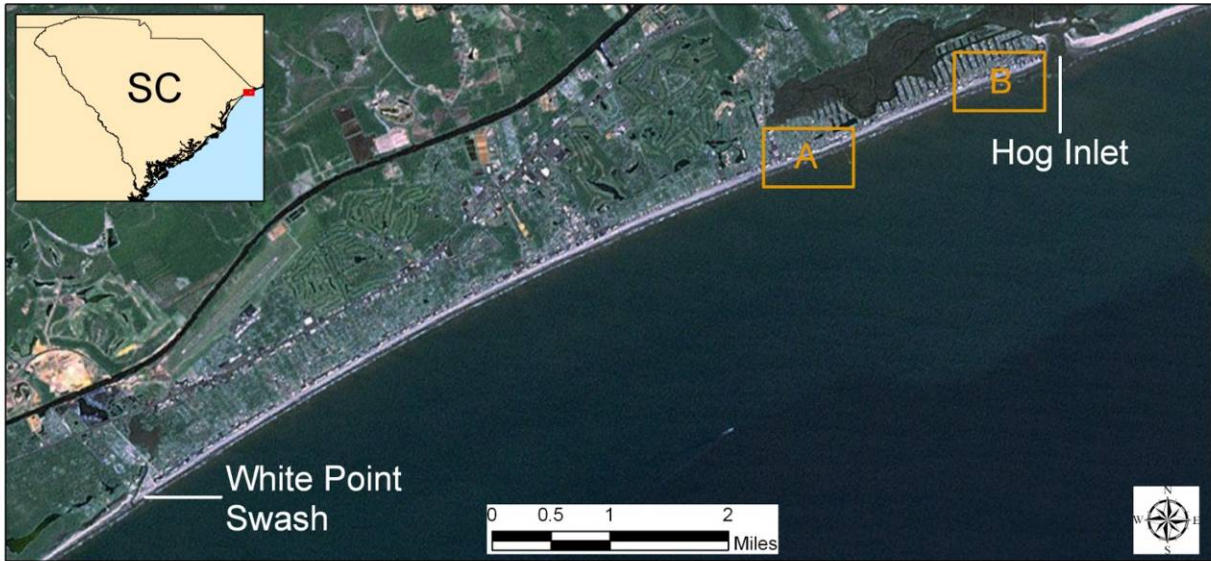


Figure 2. Map of the North Myrtle Beach shoreline from White Point Swash (SW) to Hog Inlet (NE). Boxed regions are highlighted in Figures 3 and 4.



Figures 3 and 4. Region A between Sea Mount Hwy and Cherry Grove Pier (left) and Region B (right) at the northeast extent of North Myrtle Beach adjacent to Hog Inlet. Orange shore perpendicular transects indicate location of SCDHEC-OCRM benchmark profiles. Note: Presence of extensive shoreline armoring in these regions (see Appendix B, OCRM Beach Monuments Map).

2.2.1 Beach Use and Safety

Beach Use

Like many South Carolina beaches, the beach in North Myrtle Beach is used for a wide variety of recreational activities, including sunbathing, beachcombing, walking/jogging, cycling, fishing, surfing, swimming, sand sculpting, and relaxing. Bonfires and overnight sleeping are not permitted on the beach, nor are motorized vehicles with the exception of vehicles used by Beach Services, lifeguards, and emergency personnel. Generally, no commercial activities are allowed on the beach; however, limited food and beverages are available for sale and chairs and umbrellas can be rented. Also, the City does operate an inflatable waterslide, the Trippo. The slide is set up on the beach between 1st Avenue and 2nd Avenue South May through August.

Fishing, Boating and Surfing

Fishing is a popular pastime. Some of the largest and most prized fish can be caught off the coast of South Carolina. This enjoyment extends inshore, offshore and into the surf in North Myrtle Beach.

Boating is also big: particularly parasailing and banana boat rides from two beach locations (Sea Mountain Highway and 17th Avenue South). An additional third banana boat only operation is set to open on the beach in the vicinity of North Beach Plantation Summer of 2013. Surfers and kayakers also launch from the beach. Motorboats and jet skis cannot be beached, except in an emergency.

Boardwalk and Fishing Piers

Future uses on the beach may include a new boardwalk and additional fishing piers. City officials may consider a boardwalk similar to the completed boardwalk in Myrtle Beach (*see photos 1-4*). A conceptual design for a future boardwalk has been designed by Planning Division staff, illustrating a serpentine raised wooden structure that extends approximately .92 miles from 6th Avenue South to 6th Avenue North. The boardwalk would primarily occur seaward of most existing property lines, but would also occur shoreward of the primary dune centerline in places⁸. Critical area permits will be required by SCDHEC-OCRM.

The conceptual boardwalk design includes a proposed 1,000 linear foot pier centrally located. The boardwalk would abut the existing property lines at that point and is intended to encompass a heavily trafficked gathering space. The serpentine design allows for varying widths, which at times occurs in response to property lines and existing dune elevations creating unique spaces and visual interest. By channeling pedestrian flow to and from the beach, there is a potential to increase the vegetation seaward of the primary dune as well, and along the secondary dune by minimizing the pedestrian disruption of the vegetation in those regions. Increased vegetation would

⁸ No funding source has been identified for such a facility, property owners have not been contacted, and City Council has not approved its construction.

benefit wildlife, increase dune mass to protect against wave action during storm events, and enhance the visual character of the boardwalk. The proposed boardwalk surrounds one of the identified Priority Investment - Activity Center Overlay Zones as defined by the recent comprehensive plan update and zoning ordinance amendment. The boardwalk has the potential to enhance the economic conditions for adjoining businesses; not to mention also becoming a unique local and regional iconic element.



Photos 1-4. Example of boardwalk prototype in Myrtle Beach, South Carolina.

To better accommodate new fishing piers, the Zoning Ordinance was amended. Prior to the amendment, pier regulations effectively made it impossible to develop a pier on any parcel of land less than roughly 130-150 feet in width, due to the requirement for a minimum 50' side setback. This large setback requirement was established because of the restriction against swimming within fifty (50') feet of fishing piers. The policy had the effect of excluding many parcels of land that might otherwise be suitable for a pier, including parcels that adjoin public streetends, where the swimming restriction may not directly impact a single property owner. The ordinance also established a parking requirement of 1 space per 275 square feet of pier area.

The new ordinance has adjusted the side setback requirement, and made it possible to develop more piers on more properties, by accomplishing three things:

- Acknowledging that a side setback is not as critical where the pier property abuts a public right-of-way or other public property,
- Establishing a setback requirement of fifty (50') feet from the farthest 40% of adjoining private properties, to preserve the rights of adjoining property owners to swim behind a portion of their property. The setback is measured at the high tide line, extending out into the ocean 50 yards. There would be no setback required from public rights-of-way or streetends, and
- Less parking; spaces for accessory uses plus one (1) space per 300 square feet of pier area for the farthest one-third length of the pier.

It remains the case that no new building or addition exceeding 25 feet above grade shall be allowed on a lot containing another principal use building/structure seaward of the OCRM Setback line.

Public safety also plays a critical role in the management of beach activities and overall beach safety (*see Appendix C*).

Wind Energy

The City of North Myrtle Beach and North Myrtle Beach Chamber of Commerce formed the North Strand Coastal Wind Team (NSCWT) in 2009. In addition to these members, NSCWT is made up of partners from Clemson University, Coastal Carolina University, Grand Strand SCORE, Jim Caudle Reef Foundation, Myrtle Beach Regional Economic Development Corporation, North Myrtle Beach Sea Turtle Patrol, Orangeburg-Calhoun Technical College, Santee Cooper, Savannah



River National Laboratory, South Carolina Energy Office, and South Carolina Sea Grant Consortium. According to NSCWT's mission, North Myrtle Beach will serve as a demonstration city in building the local economy and developing energy independence, with the intention of establishing a community-based wind energy program and sustainable energy plan.

On November 30, 2010, the NSCWT helped spearhead South Carolina's first wind turbine added to the electric grid at Cherry Grove Oceanfront Park in North Myrtle Beach by launching the South Carolina Energy Offices' Wind Energy Education Project, designed to demonstrate wind turbine technology, promote education and awareness about the viability of wind as a source for electricity in South Carolina, and invite feedback.⁹



Photos 5-7. Skystream 3.7, 2.4-kilowatt generating wind turbines at Russell Burgess, Jr. Coastal Preserve (left), City Park (middle) and Cherry Grove Oceanfront Park (right).

Two more turbines have since gone up at Oceanfront Park at 1st Avenue South and the Russell Burgess Coastal Reserve in Cherry Grove in February 2012 (*see photos 5-7*). The three turbines are considered demonstration projects and will help further public

⁹ Source: <http://www.myrtlebeachonline.com/2011/01/13/1917302/blowin-in-the-wind.html>

awareness of, and knowledge about, wind power, and wind power now joins solar and landfill biogas generation in Santee Cooper's Green Power fleet. The city has approved three additional oceanfront turbine sites that may someday be built, including 39th Avenue South. Santee Cooper's newest proposal is to erect a fourth wind turbine at the 39th Avenue South public streetend.

An electric charging station at 6th Avenue South has also been installed allowing owners of electric cars free charging through a partnership with Plug-In Carolina.

2.2.2 Benefits and Value of the Beach

The City of North Myrtle Beach is known for the family atmosphere, fishing piers reaching into the Atlantic, wide sandy beaches, and championship golf courses, as well as being centrally located to a very wide range of neighboring attractions and entertainment. North Myrtle Beach is primarily a residential community with world-class resort and golf course amenities that cater to a large tourist based commercial market heavily influencing the local economy.

The 2010 Comprehensive Plan Update indicates the Atlantic Ocean, with nine miles of beach, tidal marshes, and marinas as being North Myrtle Beach's most important economic asset. It is the primary draw for the millions of people who visit the area annually. Ensuring that our most important amenity stays clean and healthy is critical to the success of our community. Maintaining and enhancing the quality of the beach experience requires a multi-faceted effort including protecting and enhancing sensitive coastal plant and animal ecosystems, preserving and enhancing public access, keeping the beach clean, and providing for its safe and convenient use.

The desirability of living near the beach has created relatively high property values which in turn, have raised the tax base. According to a report prepared for the NMB Chamber of Commerce, visitors spend about \$395 million each year in North Myrtle Beach, which accounts for about 62 percent of all spending in the city.¹⁰

According to the U.S. Census Bureau, 2010 Census, there are 28,082 housing units. Of those, 16,533 (or 58.9%), constitute seasonal, recreational, or occasional use.

It is reasonable to assume that the existence of rental, hotel, and seasonal residential dwellings is due in large part to the beach and related amenities that are present in North Myrtle Beach. These properties help contribute to over \$11.5 million annually in property tax revenue. These units also generate a large part of the approximately \$2.5 million in state accommodations taxes, \$2.6 million in local accommodations taxes, and

¹⁰ *The Economic Impact of Tourism in the City of North Myrtle Beach and the Potential Impacts of a 1% Sales Tax for Destination Marketing*, Dr. Donald L. Schunk, Coastal Carolina University, June 2010.

\$2 million in hospitality taxes received by the City of North Myrtle Beach in fiscal year 2012.¹¹

2.3 Beachfront Developments and Zoning

Approximately 444 oceanfront parcels have been platted for residential or commercial use along almost nine (9) miles of ocean shoreline. Like many coastal communities, the majority of high-density oceanfront development in North Myrtle Beach is close to the shoreline, seaward of Ocean Boulevard. The area at greatest risk to erosion is located in Cherry Grove (generally, northeast from 34th Avenue North to Hog Inlet). Extensive shoreline armoring is present with a series of seawalls and revetments in place; however, erosion is also influenced by channel and ebb tidal delta migration associated with Hog Inlet.

Present day development along the ocean shoreline of North Myrtle Beach can be divided and described as follows:

- Ocean Boulevard, between Hog Inlet to 54th Avenue North (approximately 0.7 miles) – primarily multifamily;
- Ocean Boulevard, between 54th Avenue North and 25th Avenue North (approximately 1.7 mile) – primarily single family homes and multifamily;
- Ocean Boulevard, between 25th Avenue North and 19th Avenue North (approximately 0.4 miles) – primarily commercial and multifamily;
- Ocean Boulevard, between 19th Avenue North and 18th Avenue North (approximately 0.3 miles) – primarily multifamily;
- Ocean Boulevard, between 18th Avenue North and 5th Avenue North (approximately 0.9 miles) – primarily single family homes;
- Ocean Boulevard, between 5th Avenue North and 3rd Avenue South (approximately 0.6 miles) – mixture of commercial , multifamily and hotel/motel;
- Ocean Boulevard, between 3rd Avenue S and 11th Avenue South (approximately 0.9 miles) – primarily multifamily;
- Ocean Boulevard, between 11th Avenue S and 16th Avenue South (approximately 0.6 miles) – mixture of single family homes and multifamily ;
- Ocean Boulevard, between 16th Avenue South and 28th Avenue South (approximately 1mile) – multifamily;
- Ocean Boulevard, between 33rd Avenue S and 48th Avenue South (approximately 1.3 miles) – multifamily.

¹¹ City of North Myrtle Beach Finance Department 2013.

Zoning requirements are found in Chapter 23, Zoning, of the *Code of Ordinances of North Myrtle Beach, South Carolina* and Zoning Districts are represented on the Zoning Map (see Figure 5). Land use policies are found within Chapter 20, Land Development Regulations, of the *Code of Ordinances of North Myrtle Beach*.

Along the oceanfront, building location is determined by either the SCDHEC-OCRM baseline or the property line, whichever insures greater sand dune protection. Currently there are fifteen (15) oceanfront structures touching or seaward of the 2008 SCDHEC-OCRM baseline and one hundred ten (110) oceanfront structures seaward of the 2008 SCDHEC-OCRM setback.

Section 23-30, W-1 Waterfront Pleasure District, was removed from the Zoning Ordinance and Official Zoning Map by City Council in March 2013. The district was no longer necessary because SCDHEC-OCRM beach management regulations already limits size and what may be rebuilt seaward of the setback line. Further, the district mostly regulated *activities* on the beach rather than land uses, as should be the function of a true zoning district. Additionally, such activities (fishing, franchises, etc.) are regulated in other sections of the city code, making the W-1 antiquated and redundant, and a potential barrier to the development of desirable amenities such as recreational fishing piers.

In the absence of the W-1 Zoning District, the existing zoning districts currently behind the W-1 (R-4, RC, and R-1) have extended seaward to cover the full extent of the affected properties with the exception of Planned Development Districts. In the areas zoned as Planned Development Districts, the R-4 zoning district would be extended to match the surrounding properties.

Regulations governing construction of fishing piers continue to be enforced via the city's R-4 and RC zoning districts and SCDHEC-OCRM. Both the R-4 and RC zoning districts allow fishing piers, with uses limited to restaurants, bait and tackle shops, and marine accessories, as approved by special exception by the Board of Zoning Appeals. Additionally, Section 23-124 of the Zoning Ordinance requires two thousand five hundred (2,500') feet of separation between existing and proposed fishing piers.

In addition to the standard zoning districts throughout the city, the coastal protection overlay (CPO) district was added to the zoning regulations in 1989 to control erosion, preserve and maintain the beach and its environs, safeguard property and promote safety and welfare of the community (see *Section 4.2.4 Beachfront Development Regulations*). The CPO district overlays existing zones with additional limits on land use and all development seaward of the centerline of U.S. Highway 65, Ocean Boulevard (see Figure 6).

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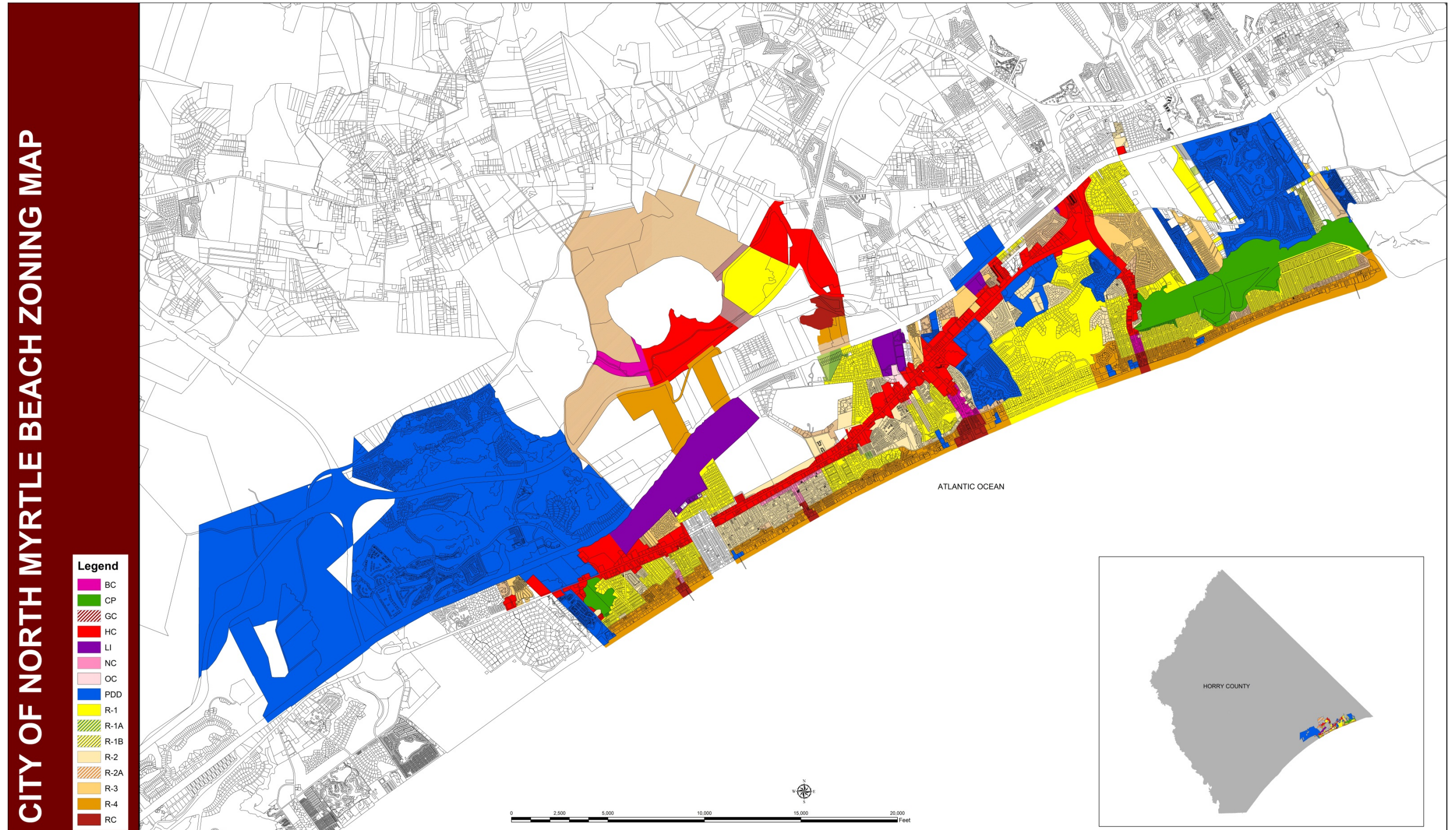


Figure 5. City of North Myrtle Beach Zoning Map 2013. Source: NMB Planning & Development Department.

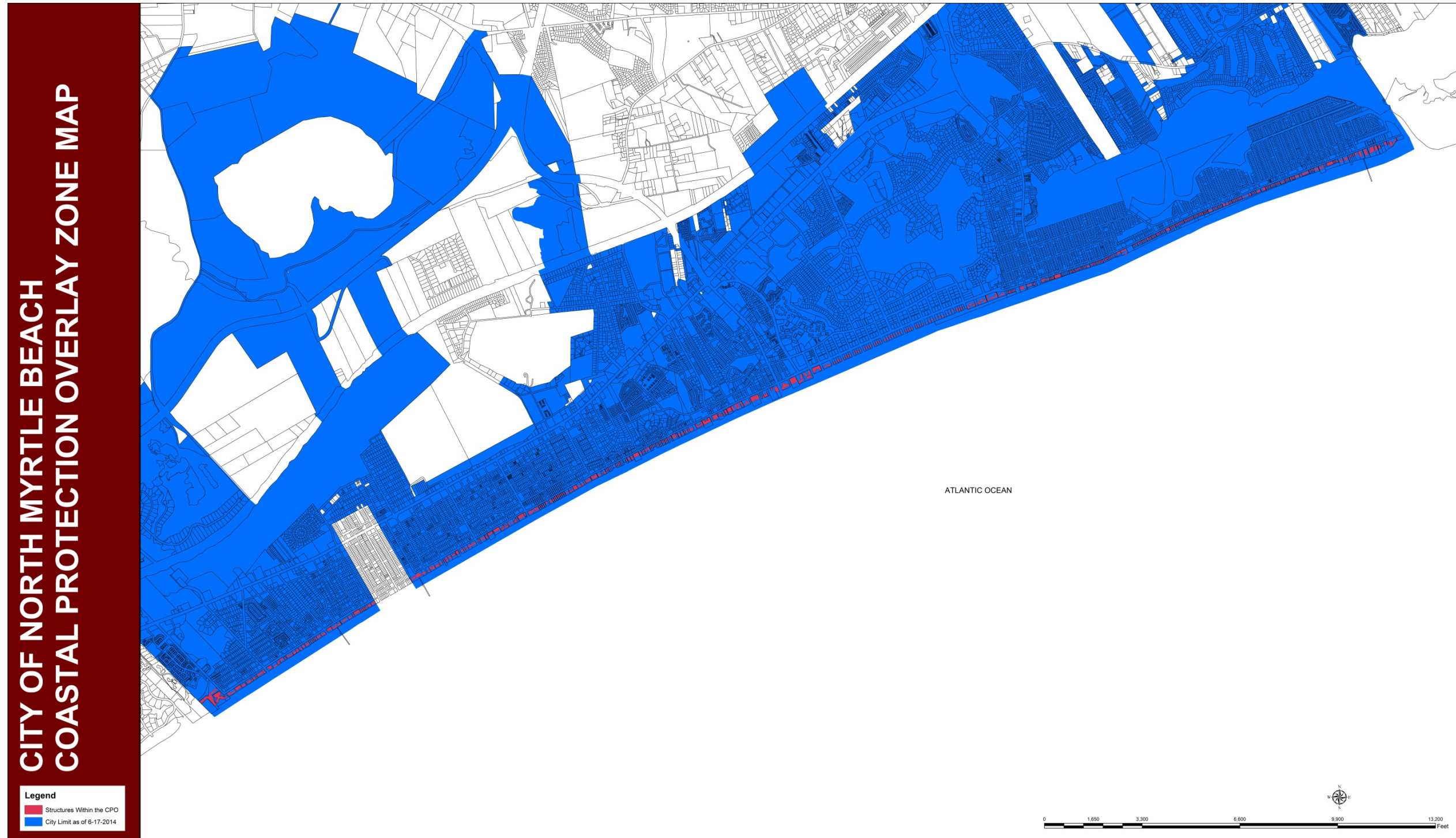


Figure 6. Structures within the CPO zone. Source: NMB Planning & Development Department.

2.3.1 Beachfront Structural Inventory

A review of 2009 aerial photography and SCDHEC-OCRM field inspections revealed approximately 125 single family, multifamily and commercial buildings 87 pools, 231 erosion control structures and 2 piers lie seaward of the 2008 SCDHEC-OCRM setback line. Fifteen (15) of the 125 buildings lie seaward of the 2008 SCDHEC-OCRM baseline.¹² The street addresses of all habitable structures that are seaward of the setback line have been provided in tabular form, as well as indicating any swimming pools and/or erosion control structures seaward of the setback line (see *Section 5.2 Beach Alteration Inventory and Appendix D*).

2.4 Natural Resources and Ecological Habitats

The coastal areas of South Carolina are often referred to as the “Low Country” due to large areas of marsh and wetlands that are found here, and Horry County is no exception. According to Horry County’s 2007 Comprehensive Plan, Envision 2025, approximately 328,444 acres, or 44.85%, of all land within Horry County is considered wetlands. A conservative estimate puts the total wetland acreage in the City of North Myrtle Beach at 1,636 acres, or 19%.

Two terrestrial habitats are found around North Myrtle Beach’s beachfront, namely the beach community and maritime evergreen forest. The beach community generally includes the open beach and dune habitats, as well as the area of beach that is frequently inundated by the tides.

Many small invertebrates, including crabs and clams, live on and in the beach. Small and large mammals live in the dunes and maritime evergreen forests and venture onto the beach at night to feed on the food items brought up by the waves and left by the receding tide.

Several types of shorebirds live along the beach and fish in the surf zone. Gulls and terns dart and soar along the beach while the smaller Sanderling Sandpipers scamper back and forth with the waves. Pelicans nest in nearby estuaries and fly just offshore looking for fish. Small hawks have also been witnessed perched atop dune walkovers with prey in their beaks caught in and around the dunes.

¹² According to the 2010 Shoreline Change Advisory Committee's "Adapting to Shoreline Change, A Foundation for Improved Management and Planning in South Carolina", based on ongoing analysis of aerial imagery, there are approximately 3,850 beachfront habitable structures in South Carolina at present; of these, 1,383 (~36%) are at least partially seaward of the SCDHEC-OCRM “setback line.” The majority of the state’s habitable structures seaward of the setback line are located in Hilton Head Island (22%), Garden City Beach (16%), and North Myrtle Beach (12%). An estimate suggests there are at least 65 structures statewide located partially or entirely seaward of the SCDHEC-OCRM “baseline.”

2.4.1 Threatened and Endangered Species

North Myrtle Beach’s development has left few critical habitats for rare and endangered species as defined by the South Carolina Department of Natural Resources Rare, Threatened, and Endangers Species Inventory.

Discussions with South Carolina Department of Natural Resources (SCDNR) staff indicated there are state and federally threatened and endangered wildlife in and around North Myrtle Beach. There are five species of birds found in the area; Wood Stork (state endangered), Least Tern (state threatened), Wilson's Plover (state threatened), Piping Plover (federal threatened), and Red Knot (federal candidate species) (see photos 6-10).



Photos 6-10: From left to right; Wood Stork, Least Tern, Piping Plover, Wilson’s Plover, and Red Knot. Photo credit: World Wide Web.

Additionally;

- One species of mammal is found within our waters, the West Indian Manatee (federal endangered);
- One species of fish can be found, the Shortnose Sturgeon (federal endangered);
- One species of plant can be found, the Seabeach Amaranth (federal threatened);
- (see photo 11) and,
- Four species of turtles: Loggerhead, (state threatened), Green Sea Turtle, (state threatened), Leatherback, (state endangered), and Kemp's Ridley, (state endangered).



Photo 11: Seabeach Amaranth. Photo credit: World Wide Web.

2.4.2 Turtle Nesting

The North Myrtle Beach Sea Turtle Patrol (NMBSTP) is a group of 80+ volunteers walking the areas beaches in 2-mile segments May through August to identify and protect sea turtles, and posts current nesting and sea turtle information on their web blog.¹³ Patrol members identify nest locations, barricade and safeguard nests, and relocate nests where required. Two Patrol members are also permitted by SCDNR to handle nestings and strandings (see photos 12 and 13).



Photos 12 and 13: From left to right; NMB Sea Turtle Patrol 2012 and an active turtle nest. Photo Credit: <http://nmbturtle.blogspot.com>.

The City of North Myrtle Beach elected officials and certain city departments are also involved in sea turtle protection. Council members have conducted public workshops on sea turtle safety and actively participated in sea turtle hatchings. The Public Safety

¹³ Source: <http://nmbturtle.blogspot.com>.

Department (Animal/Environmental Control, Beach Patrol and Beach Services Divisions) and Public Works Department (Sanitation Division) are actively involved with marine wildlife monitoring and NMBSTP specifically. Personnel are trained by NMBSTP to identify sea turtle nests and strandings. Two Animal/Environmental Control Division employees are permitted by SCDNR to handle strandings.

When a possible nesting site is identified, nesting preservation requires immediate action by NMBSTP. Sea turtle nesting along the coastline requires a nest to be identified by looking for a sea turtle crawl on the beach, quarantining the immediate nesting area, and gridding and digging into the nest by certified personnel. NMBSTP volunteers sit by the nest at night starting at day 45 to help assure that the hatchlings make it to the ocean. Three days after hatching, NMBSTP inventories the nest to see if there are any live hatchlings that have not been able to get out, counts the empty shells to see how many hatched, counts those eggs that did not hatch, and opens eggs to see if they were fertile, or died early or late in development. This process is documented and reported back to SCDNR Headquarters in Charleston, South Carolina.

Beginning in 2010 for the first time, North and South Carolina began working with the University of Georgia to conduct DNA studies on sea turtles. One egg is removed from the nest cavity, the yoke is emptied, and the shell is placed in a vial and sent to the University of Georgia. From the DNA, scientists will be able to track how many times a female will nest in a season and where she locates those nests. Also, when her hatchlings mature in 20 or 25 years, they will be able to track those females.

NMBSTP is also part of S.C.U.T.E., or South Carolina United Turtle Enthusiasts, dedicated to sea turtle conservation in Georgetown and Horry counties.

In the 2010 season a total of 11 Loggerhead nests¹⁴ with 1,178 eggs were found. Additionally, two nests were found in Briarcliffe Acres and two on Waites Island. There were nine strandings; six Loggerhead and three Kemp's Ridley. In the 2011 season, a total of 22 nests with 2,369 eggs were found. In 2012, a total of 10 nests with 1,155 eggs were found (*see Appendix E*).

¹⁴ Turtle nests were primarily found on beaches in North Myrtle Beach; however, a small percentage were also found in the Town of Briarcliffe or relocated from unincorporated Horry County.

Important Plant and Animal Habitats

A main concern in managing ocean beaches in North Myrtle Beach is the protection and conservation of natural coastal systems and ecological habitats. Preserving and protecting natural systems and habitats is identified in the City’s 2010 Comprehensive Plan Update and is essential to the city’s long-term success (see photo 14).



Photo 14: Tip of Heritage Shores Nature Preserve showing Cherry Grove Marsh in background with Hog Inlet to the far right.

There are large tracts of wetlands and forests in and adjacent to the city that provide natural habitat, such as Cherry Grove Marsh, White Point Swash, and Waites Island. To the north lies Cherry Grove Marsh and to the south is White Point Swash. Both of these properties are now zoned CP (Conservation Preservation), which is designed to discourage encroachment by residential, commercial, industrial, or other uses capable of adversely affecting the relatively undeveloped character of these areas. Approved land uses are regulated to only low impact recreational activities. Most of the small marine life, and in turn large marine life, is dependent on the salt marsh for their survival. A 2003 Pew Oceans Commission report cites the loss of such estuary nurseries as a major impact on the loss of ocean fisheries.¹⁵

Cherry Grove Marsh

Cherry Grove Marsh acts as a nursery and breeding ground for a multitude of plants and animals. Birds, including herons and egrets, live in the salt-water marsh, feeding on the fish, shrimp, and amphibians. Also present is Smooth Cordgrass or Saltmarsh Cordgrass (*Spartina alternatiflora*), a valuable resource for the costal biota, creating habitat and trapping sediment to enable oyster beds to settle.

Two barrier islands were consolidated by eliminating the Cherry Grove inlet in the 1950s to create Cherry Grove. At present, the tidal action, without the inlet, has brought in sand and silt that has reduced tidal flux that oxygenated the water and carried excess sediment out to sea. Today, while flounder, red and black drum, crabs, spotted sea trout, and many other species thrive, oysters, clams, and shrimp are noticeably absent. Poor water quality from failing septic systems and increased land development have also contributed to a serious decline in crustaceans and mollusks and has rendered

¹⁵ *America’s Living Oceans, Charting a Course for Sea Change*, Pew Oceans Commission, Recommendations for a New Ocean Policy, May 2003.

them unfit for human consumption.

The City of North Myrtle Beach has taken action in the recent past to increase water quality in the estuary in two important ways; by providing city sewer and water to properties with well and septic and dredging the canals in Cherry Grove Marsh (*see Figure 7*). In 2006, city water and sewer was provided to some of the unincorporated areas to prevent failed septic systems from affecting the water quality of the estuary.¹⁶

A state permit from the State of South Carolina Department of Health and Environmental Control and a federal permit from the U.S. Army Corps of Engineers was obtained authorizing the dredging of the Cherry Grove channels. Dredging would allow waterway access during low tides and also increase tidal flux to improve aquatic habitat. Dredging would affect channels from 42nd Avenue North out to the Cherry Grove point.

¹⁶ Referenced from a December 31, 2008 article by Jim Hulen, North Myrtle Beach Online.



Cherry Grove Dredging Project

Figure 7. Proposed Cherry Grove Dredging Project showing channels to be dredged in red.

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White Point Swash

In 2002, the city hired Davey Resource Group to conduct a natural resource inventory of White Point Swash (see photo 15). White Point Swash is a tidally influenced estuary that also receives water from Camp Branch Run, a small headwater stream flowing directly into the Atlantic Ocean. White Point Swash plays an important environmental role as a breeding ground and nursery for a number of Atlantic Ocean species like drum, menhaden, mullet, flounder,

spot, croaker, and kingfish, but also absorbs large amounts of pollutants from nearby development. The estuary is nearly surrounded by residential or commercial development and this may somewhat limit the ecological value of the site.¹⁷

Waites Island

Waites Island is three (3) miles long and .31 miles wide (see photo 16). Adjacent to North Myrtle Beach’s jurisdiction, the island is an outstanding example of an undeveloped complex of oceanfront beach, fresh and saltwater marshes, tidal creeks, and upland forest.

Surrounded by a rapidly urbanizing environment, it is becoming increasingly significant for Coastal Carolina University research, monitoring and education about natural coastal habitats. This makes Waites Island an excellent outdoor laboratory to study natural coastal processes in one of the last undeveloped barrier islands along South Carolina’s Atlantic coast.

Part of the charm of this island is the number of threatened and endangered plant and wildlife. A few examples of the wildlife include the Piping Plover, Bald Eagle, Loggerhead Sea Turtle, and the Wood Stork. In addition to the endangered wildlife, this island is the home of Seabeach Amaranth, which is a federally threatened plant found only on sandy beaches.



Photo 15. White Point Swash looking east towards the ocean.



Photo 16. Waites Island. Photo credit: susannem73, July 2010.

¹⁷ Source: *Natural Resources Inventory*, Davey Resource Group, May 2002.

2.5 Public Beach Access Inventory

A major goal of the state's beachfront management regulations was to ensure full public access to the beach. This public access may include facilities for parking, transportation, and safe and comfortable access to the beach. Numerous public walkways and parking lots at streetends meet the state's access criteria. This Plan contains mapped and tabular inventory of all public access along the oceanfront, second, and third row found in the following sections.

2.5.1 History of Public Beach Access

In 1984, a public beach access study was conducting resulting in recommendations for maintaining and relocating oceanfront beach accesses. It was recognized then that the location of the public beach accesses on the oceanfront helped maintain a low density of building massing and spacing; fewer smaller buildings with a proportionate amount of space between buildings. In 1985, City Council adopted the beach access plan and a policy for maintaining the walkways. At the same time, the city began formally adopting accesses on first row to ensure that they would remain open to the public in the future. By 1991, all 225 public accesses had been mapped and adopted.

In April 2000, another public beach access assessment was conducted, with 250 public accesses reported made up of 117 walkovers, 100 walkways, and 33 streetend public parking lots.

The original beach access policy of 1985 was re-adopted in 2002, but four (4) modifications were added. After requests to abandon and relocate 14 walkways and to use easements instead of fee simple property were granted, the policy was amended as follows:

- Require a compelling public purpose in relocating or closing a walkway;
- Disapprove the use of easements for public walkways;
- Disallow the use of air rights over public walkways. In particular, this arose due to several requests to build skywalks over a walkway to connect two adjacent towers; and,
- Reinforce the restriction against abandoning or closing walkways that are aligned with streetends.

2.5.2 Present-Day Public Beach Access

At present, there are 247 public beach accesses. Of these, 185¹⁸ directly access the beach (via dune walkovers or walkways) providing 589 automobile parking spaces and 109 golf cart/ low-speed vehicle parking spaces. Additionally, 62 public walkways extend through second and third rows, with an additional 629 automobile parking spaces provided within 17 public parking lots.

Oceanfront accesses are comprised of 54 dune walkovers, 92 walkways, 36 streetends with public parking, 1 public parking lot, and 2 public parks; Cherry Grove Oceanfront Park and Ocean Park (see Appendix F).

The 36 streetends, 1 public parking lot, and 2 public parks used for public beach parking along Ocean Boulevard, in combination with public parking lots on second row, provide approximately 1,208 free parking spaces throughout the nine miles of city coastline. Most are located in Ocean Drive and Cherry Grove (see Table 1 and Appendix G).

Table 1. Beach Access and Parking Information

| Location | Oceanfront Beach Accesses | 2nd Row Walkways | 3rd Row Walkways | Parking Lot(s) | Automobile Parking | Golf Cart/ LSV Parking |
|----------------|---------------------------|------------------|------------------|----------------|--------------------|------------------------|
| Windy Hill | 17 | 0 | 0 | 1 | 88 | 32 |
| Crescent Beach | 27 | 22 | 20 | 3 | 166 | 25 |
| Ocean Drive | 56 | 19 | 0 | 6 | 731 | 42 |
| Cherry Grove | 85 | 1 | 0 | 5 | 223 | 10 |
| Total | 185 | 42 | 20 | 14 | 1,208 | 109 |

Windy Hill

Windy Hill has 17 oceanfront beach accesses. Four of those oceanfront accesses are streetends. Of the four streetends, two contain 32 automobile parking spaces. The other two streetends contain 32 spaces exclusively for golf carts/ low-speed vehicles.

¹⁸ Clarification to oceanfront beach accesses as per SCDHEC-OCRM on 7/14/2014.

A second row parking lot was created resulting from a land swap for a public walkway in Crescent Beach (37th Avenue South and Seaview Street). That parking lot contains 56 parking spaces.

Crescent Beach

Crescent Beach has 27 oceanfront beach accesses. Seven of those oceanfront beach accesses are streetends. Of the seven, six contain 92 automobile parking spaces and 19 spaces for golf carts/ low speed vehicles. The remaining streetend contains 6 spaces exclusively for golf carts/ low-speed vehicles (20th Avenue South).

Twenty-two (22) second row and 20 third row public walkways, and 4 second row public parking lots with 74 automobile parking spaces, are also present.

Ocean Drive

Ocean Drive has 56 oceanfront beach accesses. Twenty-three of those oceanfront accesses are streetends and contain 442 automobile parking spaces and 20 spaces for golf carts/ low-speed vehicles. The remaining streetend contains 22 parking spaces for golf carts/ low-speed vehicles (14th Avenue South).

Nineteen (19) second row public walkways and 6 public parking lots with 289 automobile parking spaces are also present.

Cherry Grove

Cherry Grove has 85 oceanfront beach accesses. Two of those oceanfront accesses are streetends containing 20 automobile parking spaces, and adjacent to the Sea Mountain Highway streetend is 1 public parking lot containing 27 automobile parking spaces. Additionally, Cherry Grove Oceanfront Park contains 3 ADA accessible automobile spaces. There are 10 parking spaces for golf cart/ low speed vehicle parking spaces located at 27th Avenue North.

One (1) second row public walkway and 4 public parking lots with 173 automobile parking spaces are also present.¹⁹

Improvements to Access

Over the past eight years, numerous improvements have been made to public beach accesses. For example, public accesses are marked with posts, and many have had wooden dune walkovers installed. New walkway and streetend signage was added at all 184 oceanfront

¹⁹ Included is 53rd Avenue North, featuring the newest design, with 20 automobile or 36 non-exclusive golf cart/ low-speed vehicle spaces (see photo 19).

Case #MJPDD-13-06 amended the Prince Resort development to allow temporary, seasonal, paid parking on the private oceanfront parking lot and public parking on the second row parking lot through September 2018 by providing a minimum 40 surface public parking spaces on the second row vacant lot and a maximum 99 public parking spaces within the upper levels of the existing second row parking garage. Upon build-out, 131 parking spaces are to be shifted to the lower levels of the new parking garage and 8 second row surface spaces within a 25-foot public easement.

accesses (see photo 17). Over \$450,000 has been spent installing eight modular restrooms with outdoor showers and ten stand-alone outdoor showers at streetends throughout the city. Complete renovation at 46th Avenue South, 39th Avenue South, 21st Avenue South and 6th Avenue South streetends has also occurred, including improvements at the Shorehaven Drive oceanfront walkway (see photo 18).

All streetend public parking lots are paved except for the leased lot at 7th Avenue South, the leased Sea Mountain Highway streetend, those in the Tilghman Beach section of Ocean Drive, and 45th Avenue South (emergency vehicle use and golf cart parking). Additionally, the city has applied to the SCDHEC-OCRM for a permit to construct an observation deck for the physically impaired at 17th Avenue North.

Analysis of Parking

With the staff estimated visitation numbers of approximately 5.5 million annual visitors to North Myrtle Beach and the city's average peak daily population estimated at 75,000 to 105,000 persons during the summer months, data is available to support the notion that the beach is highly accessible and used by the public:

- Data collected by Kimley-Horn and Associates, Inc. on September 29, 2007 indicated nineteen (19) out of fifty (50) public parking areas exceeded perceived capacity, considered anything greater than 85%, at least one time during the morning, noontime, or afternoon. Two hundred eighty-five (285) spaces, or 3.62%, were at or near capacity;
- There were 1,032 total public parking spaces available for beach parking; and,
- Unpublished data suggested that the 19 public parking areas were close to capacity during certain times of the day for the entire month of September 2007.



Photo 17. New beach signage found at all beach accesses.



Photo 18. Example of public streetend improvement showing 6th Avenue South (Ocean Drive, OD-30).

While records are not kept regarding numbers of visitors per vehicle, or number of parked visitors visiting the beach, it is safe to say that thousands of visitors accessed the beach in September 2007 alone.

In October 2007, Kimley-Horn and Associates, Inc. also produced supplemental public beach access and parking information by completing a condition assessment of the public parking lots near the ocean.²⁰ The primary purpose



Photo 19. Example of public streetend improvement showing 39th Avenue South (Windy Hill, WH-9).

of this assessment was to observe the general condition of the lots, identify deficiencies in pavement, curb, striping, and signing, and develop repair/ replacement priorities with budgetary cost estimates in an effort to preserve the city’s capital assets while benefiting the public parking infrastructure. Overall, the parking lot network appeared to be performing well, but did have some deficiencies that need to be addressed to maximize the given space. This resulted in an overall performance rating of “*Good*” for the existing parking network.

The city continues to look towards expanding public parking facilities at every opportunity. As part of an on-street beach parking study in 2009, additional on-street shoulder parking was designated throughout the city. Approximately 220 spaces were created as a result of the study. Since 2009, an additional 39 parking spaces have been created at the newly designed 39th Avenue South and 46th Avenue South streetends (*see photo 19*) and 21st Avenue South, Spring Street, and 53rd North parking lots. Furthermore, another 139 public parking spaces will be announced with signage and clearly visible across from Prince Resort at the Cherry Grove Pier (*refer to footnote 18*). To date, there are approximately 1,190 automobile parking spaces and 109 dedicated golf cart/ low-speed vehicle parking spaces available for public use.

The number and distribution of public access points provide sufficient access facilities and parking to classify 100% of North Myrtle Beach as having full and complete public access per the State guidelines (SCCC, 1995).

Golf Carts/ Low-Speed Vehicles

A very popular mode of travel continues to be golf carts and low-speed electric vehicles, and creating safe travel routes and beach parking for these vehicles is an important concern. Golf carts are permitted on secondary roads if used within 2 miles of the registered address. Public beach accesses with golf cart only parking spaces already exist, as well as parking that incorporates both automobiles and golf carts.



²⁰ Source: *Parking Study for North Myrtle Beach*, Kimley-Horn and Associates, Inc., October 2007.

A variation on providing separate parking spaces can be found at the 53rd Avenue North streetend. There, city staff implemented a parking design incorporating both golf cart and automobiles in the same parking stall with ten (10') foot-wide stalls and a half-tick at five (5') feet (*see photo 20*).

3.0 Beachfront Drainage

Controlling stormwater and other discharges along the beachfront areas of North Myrtle Beach is a priority. In order to improve the drainage system and improve water quality, City Council approved the creation of a stormwater utility in July of 2000. A fee is collected on all developed property in the city limits; and is used to provide funding for stormwater collection and water quality improvements. The fee generates about \$1.4 million yearly.

The fee is paid on all developed property inside city limits. The fee is used to provide funding for stormwater and water quality improvements along the beachfront, such as inland drainage projects and the extension of beach outfalls 1,300 feet out to sea instead of terminating on the beach. Projected as a 15-year program, the fee is expected to generate \$1.4 million each year. Outfalls at 6th Avenue South, 39th Avenue South and 45th Avenue South were completed between 2004 and 2005. An additional outfall was installed at 21st Avenue South in 2006. Additionally, outfalls are being planned in for Main Street and 18th Avenue North.

A stormwater management plan was completed in September 2007 as part of the Environmental Protection Agency's (EPA) Phase II National Pollution Discharge Elimination System (NPDES) stormwater regulations promulgated by SC Department of Health and Environmental Control (SCDHEC). The city received general permit coverage for its stormwater system that same year. DDC Engineers, a private consulting firm, completed the stormwater master plan update and mapping, which is part of EPA's requirements. The city's Stormwater Coordinator is responsible for planning to ensure that stormwater runoff does not increase the likelihood of flooding; and that water quality is not compromised by contaminated runoff. Land disturbance activities are regulated by city code (Chapter 13, Stormwater Management and Erosion Control) and land development, redevelopment, and related activities are prohibited from illicit or improper discharge of stormwater into any receiving water (including the Atlantic Ocean). The City of North Myrtle Beach is expected to meet the requirements of the NPDES General Permit for Stormwater Discharges from Regulated Small Municipal Separate Storm Sewer Systems (MS4).

Managing stormwater runoff and improving water quality is a costly endeavor. For example, constructing the outfalls at 6th and 21st Avenue South cost approximately \$10.4 million dollars total. Constructing the outfalls at 39th and 45th Avenue South cost approximately \$3 million. The anticipated construction of Main Street and 18th Avenue North outfalls are each estimated to cost between \$8.5 and \$9.5 million dollars (*see Appendix H*).

Aimed at reducing localized flooding and improving ocean water quality, two major inland stormwater projects are planned for the area behind Hillside Drive near 7th Avenue South. A detention pond will be created along Hillside Drive to alleviate localized flooding. Additionally, the Public Works Department is planning a publicly-accessible naturalized stormwater facility upstream, on both the east and west sides of Highway 17, with construction beginning in 2013. The projected cost is approximately \$2.5 million dollars.

The City of North Myrtle Beach has contracted with an SCDHEC-OCRM approved lab, Coastal Carolina University-Environmental Quality Lab, for the collection and testing of ocean water samples. At some of the sites a stormwater runoff discharge pipe is located on the beach. Water quality monitoring samples are collected in knee deep to waist deep water in the surf during May 15th through September 15th (see Table 1).

Table 2. SCDHEC-OCRM water quality monitoring locations

| Water Quality Monitoring Station Number | Location | EPA Beach ID Number | Lab Sample Number | |
|---|-------------------------------|---------------------|-------------------|------------------------------|
| WAC-009 | 47 th Avenue South | SC934185 | E13-0913 | Streetend |
| WAC-008 | 33 rd Avenue South | SC934185 | E13-0914 | Streetend and pipe discharge |
| WAC-007 | 17 th Avenue South | SC934185 | E13-0915 | Streetend and pipe discharge |
| WAC-006 | 9 th Avenue South | SC934185 | E13-0916 | Streetend and pipe discharge |
| WAC-005A | 7 th Avenue South | SC934185 | E13-0917 | Streetend and pipe discharge |
| WAC-005 | 3 rd Avenue North | SC934185 | E13-0918 | Streetend and pipe discharge |
| WAC-004 | 16 th Avenue North | SC934185 | E13-0919 | Streetend and pipe discharge |
| WAC-003 | 30 th Avenue North | SC934185 | E13-0920 | Streetend |
| WAC-002 | 45 th Avenue North | SC934185 | E13-0921 | Streetend |
| WAC-001 | 59 th Avenue North | SC934185 | E13-0922 | Streetend |

Source: City of North Myrtle Beach.

Strict protocols are followed for posting beach advisories as developed by SCDHEC-OCRM. In addition, the city will post precautionary advisories as issued by local SCDHEC-OCRM/EQC staff. Advisory postings are placed on the beach at the sample location if a water quality concern is indicated, as follows:

- When a single sample exceeds 500 (Enterococci)
- When consecutive daily samples exceed 104 (Enterococci)

If an advisory is posted, swimming is not recommended within 100 feet of the site. Other activities, such as shell hunting, walking, or wading in the surf are not affected.

Between 2007, 2008, and 2009, one swimming advisory was issued for North Myrtle Beach in May 2009. The affected area included 200 feet above and below the beach access at 3rd Avenue North. High bacteria levels were detected in this section of the beach.²¹

²¹ *Source:* SCDHEC-OCRM's Region 6 Environmental Quality Control office found at http://www.scdhec.gov/administration/news/2009_releases.htm

4.0 Beach Management and Authorities

4.1 State Authorities

SCDHEC-OCRM is responsible for the management of the state's beachfront and coastal zone. In 1988, the General Assembly of the state of South Carolina amended the South Carolina Code of Laws to include the State Beachfront Management Act (Act) in the state's Coastal Tidelands and Wetlands Act (SC Code ann. §48-39-110 *et. seq.*). This amendment increased the state's authority to manage the use and preservation of ocean beaches and dunes. The Act is intended to protect both life and property, protect unique ecological habitats, and preserve the beach for future use by all citizens of South Carolina. The Act addresses preservation of a dry-sand beach, public access opportunities, measures for renourishment on eroding beaches, and the protection of natural vegetation within the beach and dune system. The Act rejects the construction of new erosion control devices and adopts retreat and renourishment as the basic state policy for preserving and restoring oceanfront beaches in South Carolina. The Act also directs SCDHEC-OCRM to implement the retreat policy by designating a baseline and setback line on all oceanfront properties, and develop a long-range comprehensive State plan for management of the beach and dune resources.

4.1.1 Beachfront Setback Area

The State of South Carolina established a 40-year retreat policy from eroding beaches as part of the Beachfront Management Act. SCDHEC-OCRM, as steward of the State's coastal resources, is responsible for implementing this policy. The implementation is derived from a baseline established by SCDHEC-OCRM which runs parallel to the shoreline on oceanfront beaches. The baseline is evaluated and redrawn by SCDHEC-OCRM every eight to ten years and, as directed by the Beachfront Management Act, stretches of beach are divided into standard erosion zones and inlet erosion zones based on their physical characteristics and proximity to inlets.

The baseline for a standard erosion zone is established at the location of the crest of the primary oceanfront sand dune in that zone. If the shoreline in a standard erosion zone had previously been altered naturally or artificially by the construction of erosion control or other anthropogenic structures, the baseline is established where the crest of the dunes would be had the disturbance not occurred.

The baseline for inlet erosion zones is determined differently for inlets that are stabilized by jetties, groins, or other structures, and inlets that are not stabilized. For unstabilized inlets, SCDHEC-OCRM establishes the baseline at the most landward point of erosion at any time during the past forty years. For inlet zones that are stabilized by jetties, groins, or other structures, SCDHEC-OCRM establishes the baseline at the location of the crest of the dune, and not at the location where the dunes would be had the inlet remained unstabilized.

The second part of implementing the retreat policy at the State level is the setback line. The setback line is a boundary established by SCDHEC-OCRM that is landward of the established baseline at a distance equal to forty times the average erosion rate, and not less than twenty feet landward of the baseline.

No new construction is permitted seaward of the baseline, with the exception of wooden walkways not more than six feet wide, wooden decks no larger than 144 square feet, public fishing piers, golf courses, normal landscaping, pools that were located landward of existing functioning erosion control structures, groins, or structures permitted by a SCDHEC-OCRM special permit. A SCDHEC-OCRM permit is required for all of the above actions except for the construction of wooden walkways not more than six feet wide.

Construction within the State setback area is regulated in order to implement the State retreat policy. Construction, reconstruction, or alterations of habitable structures, erosion control devices, and swimming pools are limited for the areas seaward of the State setback line. New habitable structures built partially or wholly within the setback area may not exceed 5,000 square feet of heated space, must be located as far landward on the property as possible, and may not incorporate any erosion control structure or device as an integral part of the structure. No part of the building may be constructed seaward of the baseline or on the primary sand dune. The applicant must certify to SCDHEC-OCRM in writing that these conditions are accurate, and submit a drawing that shows the footprint of the structure on the property, a cross section of the structure, and the structure's relation to property lines and setback lines which may be in effect.²²

Owners may replace habitable structures permitted within the setback that have been destroyed beyond repair by natural causes after notifying SCDHEC-OCRM. The owner must certify that the total square footage of the replaced structure seaward of the setback line is not greater than the original square footage beyond the setback line, the replaced structure is no further seaward than the original structure, and is constructed as far landward as possible, considering local zoning and parking requirements.

No new erosion control devices are allowed seaward of the setback line except to protect a public highway that existed prior to the enactment of the Beachfront Management Act. Erosion control structures may not be repaired or replaced if destroyed more than 50% above grade on a parcel-by-parcel basis. SCDHEC-OCRM is responsible for assessing the damage to erosion control devices and structures, as well as habitable structures, to determine the extent of damage following hurricanes or other events.

²² Requested change to third paragraph as per SCDHEC-OCRM on 7/14/2014.

No new pools are permitted to be constructed seaward of the setback line, unless they are located as landward as possible of an existing, functional erosion control device. Pools that existed prior to 1988 may be repaired or replaced, if destroyed beyond repair, if the owner certifies in writing to SCDHEC-OCRM that it is moved as far landward as practical, is rebuilt no larger than the destroyed pool, and is constructed in such a manner that cannot become or act as an erosion control device. SCDHEC-OCRM may issue a special permit for all other construction or alteration between the setback line and baseline or seaward of the baseline.²³

4.2 Local Government Authorities

Numerous Federal and State agencies have responsibility or authority for assisting in the management of the beaches of North Myrtle (*see Appendix I*). The following section provides a summary of the city's role in beach management.

City Hall has jurisdiction over lands within its boundaries,²⁴ and is responsible for planning, zoning, building regulation, code enforcement, floodplain management, and emergency services. In some fashion, the following city departments have authority over the beach and nearby areas:

- Public Safety (Police and Fire, emergency operations, evacuations, Lifeguards, etc.);
- Planning & Development (regulations of new and existing construction, land use and development, and code enforcement);
- Public Works (collection of garbage and debris; beach maintenance; street signs; stormwater maintenance; overall right-of-way grooming of public property);
- Parks & Recreation (management of streetends and beach events), and
- Judicial (adjudication of beach-related violations of the city code).

²³ The baseline and setback line for North Myrtle Beach can be found online:
http://www.dhec.sc.gov/environment/ocrm/beachfront_jurisdiction.htm

²⁴ According to Section 5-7-140 of Title 5 of State Law, the city's corporate boundaries, and therefore jurisdiction, extend one mile seaward of the high tide line.

4.2.1 North Myrtle Beach Comprehensive Plan

The Comprehensive Plan is intended to document the history of development in North Myrtle Beach, to identify the community’s infrastructure, and to articulate a vision for its future. The Plan is intended to help guide future decision-making in matters affecting the physical, social and economic growth, and development/redevelopment, of the community. The plan is not a final product; it is part of a continuing planning process

and is updated and revised every five years according to State statute. The Comprehensive Plan was last updated on April 26, 2010.



4.2.2 City of North Myrtle Beach 2010 Hazard Mitigation Plan

The 2010 Hazard Mitigation Plan was developed under the guidance of the eight-person Mitigation Planning Committee, appointed by City Council. A resolution was passed by City Council in July 2009 that formally recognized the planning process and created the Committee. The resolution specified that at least half of the members represent the general public, including floodplain residents.

The Committee was charged with the collection of data on natural hazards and the vulnerability of buildings and critical facilities, assessing the impact natural hazards could have on the citizens, property, and economy, recommending hazard mitigation goals, reviewing potential activities that will accomplish the proposed mitigation goals, preparing a mitigation plan recommending actions the city should take to achieve the recommended mitigation goals, soliciting public comment on natural hazard problems and solutions, and recommending procedures to evaluate the impact of the proposed actions.

The Mitigation Planning Committee set the directions and policies for this planning effort. The Building Division provided overall coordination and logistical support for the Committee. Other city staff, particularly the Planning & Development Department, Public Works Department, and Public Safety Department provided assistance and information for the plan. The team of Berry A. Williams & Associates was responsible for data collection, research, and analysis. This team also drafted public information

materials, handouts, and the Hazard Mitigation Plan. The Hazard Mitigation Plan was adopted by City Council May 2010.

North Myrtle Beach's ordinance meets the minimum National Flood Insurance Program requirements. The city exceeds the minimum standards for elevation. New, substantially improved, and/or substantially damaged buildings are to be protected to a level one foot above the base flood elevation shown on Flood Insurance Rate (FIRM) Maps.

Floodplain regulations are enforced as part of the inspection program by the Building Division. The Division reviews permit applications and site plans, conducts field inspections, and reviews elevation certificates, engineering certifications, and other documentation to determine compliance with federal, state, and local regulations.

The city has participated in the National Flood Insurance Program's Community Rating Service Program (CRS) for over ten years as a Class 7 community. In late 2012, however, the city received a Class 6 rating. As a result, property owners with a flood insurance policy receive a 20% reduction in the cost of annual flood insurance; meaning a savings of approximately \$1.2 million.²⁵ The CRS program encourages and rewards community and state mitigation activities that are beyond those required by the NFIP. Its goals are to reduce flood losses, promote the awareness of flood insurance, and facilitate accurate insurance ratings.

According to the Hazard Mitigation Plan, six proposed prevention measures have been recommend for adoption and would further increase the accumulated points under the CRS program; coastal AE-zone regulation, enclosure regulations, freeboard regulations, cumulative substantial improvement and substantial damage regulations, critical facility regulations, and regulations for additions to buildings.

The city is pursuing the following activities as part of its ongoing CRS Program:

Short Range Activities (Responsible party; Building Division or FEMA):

1. Maintain a database of flood elevation certificates on all structures;
2. Provide a list of all buildings built or improved in the Special Flood Hazard Area (SFHA);
3. Provide flyers, notices, or brochures to residents in flood zones;

²⁵ The reduction of premiums for those property owners who purchase flood insurance is based on the City of North Myrtle Beach's CRS ranking. Areas are rated on a scale of 1 to 10, with 1 being the best and 10 representing areas meeting the minimum standards. The city will continue participation in this program, since it results in better and safer construction, encourages citizens to better protect themselves against future disasters, and lowers the cost of insurance premiums for participating policyholders.

4. Prepare a physical inventory of buildings in flood hazard areas;
5. Update Flood Insurance Rate Maps (FEMA);
6. Advise and assist property owners with retrofitting of buildings; and.
7. Assist residents in determining whether a property is in a flood-prone area.

Long Range Activities (Responsible party; Public Works Department and Planning Division):

1. Continued monitoring and re-nourishment of the public beach as needed (most recently re-nourished in 2009);
2. Reduction of flooding in the Hillside Drive and 7th Avenue South area (see *Section 3.0 Beachfront Drainage*); and,
3. Reduction of flooding in the North Ocean Boulevard, 2nd Avenue North and 3rd Avenue North areas (see *Section 3.0 Beachfront Drainage*).

4.2.3 Disaster Preparedness and Evacuation Plan

A Comprehensive Community Based Emergency Plan was developed in 2004 representing the city's recovery plan and policies that detail pre and post-disaster recovery actions to minimize potential injury and damage and to expedite recovery and development. The Plan is consistent with the Horry County Hurricane Plan and the South Carolina Hurricane Plan. During emergency situations, the city's Community Based Emergency Plan establishes the line of succession to the City Manager. If the City Manager is unavailable, the line of succession goes to the Assistant City Manager, then to an appointment(s) made by the City Manager.

The Community Based Emergency Plan objectives are as follows:

1. Identify, assess, and prioritize local vulnerabilities to emergencies or disasters and the resources available to prevent or mitigate, plan for, respond to, and recover from them.
2. Indicate that the city will take necessary actions to prevent or mitigate the effects of emergencies or disasters and be prepared to respond to and recover from them when an emergency or disaster occurs.
3. Provide for the utilization of all available public and private emergency resources to protect against and address an emergency or threatening situation.
4. Provide for temporary essential services until the return of normal services.
5. Request access to state and federal programs, through Horry County, to assist victims of disasters and prioritize responding to the needs of the elderly, disabled, low income and other groups which may be especially affected.
6. Provide for recovery from an emergency or disaster by contacting the emergency manager to request access to state and federal programs.

The nationally recognized Incident Command System (ICS) and the National Incident Management System (NIMS) will be utilized to manage emergency response in the

community. Incidents will be classified into one of the following categories; non-emergency/administrative, monitoring/standby, alert, and emergency. The city's recovery activities and programs are listed under Section 3, Recovery, and manage damage assessment, planning for recovery and re-population, reconstruction, and public information and recovery assistance. There are also separate chapters handling re-entry, pandemics, hazardous weather, tsunami, and wildfire.

In the event of a hurricane threat, the Emergency Operation Center (EOC) will be activated within City Hall.

Cleanup

The City of North Myrtle Beach has contracted with Horry County Solid Waste Authority and Philips and Jordan, Incorporated for the purpose of providing organizational structure, guidance, and standardized procedures for the clearance, removal, and disposal of debris caused by a major debris-generating event. The Horry County Hurricane/Disaster Debris Removal, Reduction, and Disposal Plan describes the actions for pre-event and post-event should a storm occur.

With the assistance of a locally approved contractor for small debris-generating storms and Philips and Jordan, Incorporated for large debris-generating storms during the initial 72-hour period, the city is responsible for:

1. Debris removal efforts on clearing major transportation routes such as U.S. Highway 17 and major roads intersecting Ocean Boulevard in damaged areas;
2. Debris removal in affected areas to prevent the development and spread of epidemiological agents and general sanitation problems; and,
3. Debris disposal with health and environmental concerns being the foremost consideration.

Maintaining Essential Services

The repair and restoration of public infrastructure, services, and buildings after a disaster is paramount. For example, clearing roads to access sanitary sewer lift stations in close proximity to the beach become priority because of the risk of untreated sewage reaching the ocean. Restoration of utility services is critical to the success of both short and long-term recovery programs. Initial roadway clearance will push debris to the edge of right-of-ways, providing access for Santee-Cooper to restore power.

Restoration of electrical services and communication systems will begin as soon as major transportation routes are cleared of debris to allow emergency vehicles and crews to enter the disaster area.

Protecting Public Health

The City will also work to identify the threats to public health during the recovery period and to provide remedies.

Emergency Building Ordinances

After a disaster, the City will provide an emergency permitting plan to streamline the permitting process, which will include coordination with SCDHEC-OCRM for the permitting of any reconstructed oceanfront structures. This process will include determining whether repair or reconstruction of damaged structures will be allowed and under what conditions, coordinating and streamlining the City's permitting processes, and implementing a system to verify that repairs/redevelopment comply with all applicable codes and laws.

The City is also working with surrounding jurisdictions to develop an emergency zoning ordinance capable of allowing temporary uses to locate in areas otherwise prohibited under normal circumstances.

4.2.4 Beachfront Development Regulations

North Myrtle Beach regulations pertaining to beach use can be found in Chapters 5 (*discussed in Section 4.2.5, Other Regulations*), 6, and 23 of city code.

Coastal Protection Overlay (CPO) district

Coastal Protection Overlay (CPO) district was added to the zoning regulations in 1989 to control erosion, preserve and maintain the beach and its environs, safeguard property, and promote safety and welfare of the community. The CPO district overlays existing zoning districts along the entire oceanfront, including all areas east of Ocean Boulevard. It was developed to ensure compliance with all pertinent laws of the State's Beachfront Management Act.

The CPO limits the number of shore-protection options. New seawalls are prohibited and existing structures cannot be upgraded to protect from higher wave/water-level events, rising sea level, or increased wave energy caused by continued erosion within the framework of the 1991 Beach Management Plan policies, primarily through beach renourishment. Existing oceanfront structures can maintain armoring devices as permitted by SCDHEC-OCRM.

The CPO addresses non-conforming structures; reconstruction of damaged, non-conforming buildings, and other structures along the oceanfront (and elsewhere in the city):

1. Sec 23-133, Replacement of nonconforming use, building or structure requires a nonconforming building, structure or use shall not be re-established, reoccupied, or replaced with the same or similar building, structure or use after a physical

- removal or relocation from its specific site location at the time of passage of this chapter.
2. A nonconforming building or structure shall not be repaired, rebuilt, or altered after deterioration and/or damage exceeding seventy-five (75) percent of its replacement cost except in conformity with the provisions of this chapter.
 3. A nonconforming use shall not be re-established after deterioration and/or damage to the building or structure exceeding seventy-five (75) of its replacement cost.
 4. The provisions of subsection 23-133 (2) and (3) shall not apply to the reconstruction, repair or re-establishment of the following:
 - a. Single-family structures used as single-family dwelling, including single-family structures and patio homes;
 - b. A multi-family structure within a group development of two (2) or more multifamily structures where seventy-five (75) percent of the total group development has not been damaged;
 - c. A structure containing townhouse dwellings within a group development of two (2) or more such structures where seventy-five (75) percent of the total group development has not been damaged; and,
 - d. A structure containing a commercial use within a commercial center or when there are multiple commercial buildings on the property where seventy-five (75) percent of the total area of all principal buildings has not been damaged. Such structures may be repaired, rebuilt, altered, or re-established provided there is not an increase in the amount of land occupied by the structure, the height of the structure is not increased, the density is not increased, and other nonconformities are not created.
 5. According to city code *Section 23-31, Overlay zones, Coastal Protection Overlay Zone*, no new building or addition exceeding 25 feet above grade shall be allowed on a lot containing another principal use building, seaward of the OCRM setback line.
 6. In the event that a hurricane, explosion, fire, or other disaster shall damage any parking lot so that the repair cost of the parking lot exceeds 60% of its replacement cost, reconstruction shall be allowed only if all applicable regulations of the primary zoning district are met.

The CPO district also regulates sand fencing, public utilities and other public works provided that the structures serve an overriding public interest, walkways and dune crossovers in accordance with SCDHEC-OCRM guidelines, elevated sundecks, patios, walkways, gazebos, stairs, lighting, picnic tables, seating, and portable structures, accessory swimming pools in accordance with primary district regulations and SCDHEC-OCRM guidelines, and fences.

The CPO district also regulates fishing piers approved as special exceptions by the Board

of Zoning Appeals provided piers are first approved by SCDHEC-OCRM.

Public Beach Access

A high value has been placed upon free and unencumbered public access to the public beach by approving a resolution to adopt public beach access relocation policy. The purpose of the policy is to provide City Council and property owners guidelines to be utilized when considering closure, abandonment, or relocation of public beach accesses. The intent of City Council is to relocate or close public beach accesses only when there is a compelling public purpose to do so and when the proposal is consistent with the relocation conditions within the resolution (see *Section 2.5.1 History of Public Beach Access*).

Flood Damage Prevention

Sections 6-20 through 6-38 [Flood Damage Control] of the city code govern development activities within the Special Flood Hazard Area. The areas of special flood hazard identified by the Federal Emergency Management Agency in its flood insurance study, September 17, 2003 are adopted by reference and declared to be a part of floodplain management.

Buildings "substantially damaged or substantially improved" must be brought into compliance with the city's Flood Damage Control ordinance, including elevating the building to or above one (1') foot above the required published 100-year flood elevation shown on FIRM maps. "Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damage condition would equal or exceed fifty (50%) percent of the market value of the structure before the damage occurred. "Substantial improvement" means any repair, reconstruction, structural alteration, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds fifty (50%) percent of the "market value" of the structure before the "start of construction" of the improvement.

As with many coastal communities, North Myrtle Beach administers land development in compliance with the directives of the National Flood Insurance Program (NFIP). NFIP is a federally sponsored program that offers assistance to communities and property owners with properties in flood prone areas. The program is operated by the Federal Emergency Management Agency (FEMA). Flood-hazard areas are determined by FEMA through use of various computer-modeling techniques. These flood areas fall mostly within the 20-foot or lower contour elevations. In addition, designations for areas directly along the coast include calculations for the height of storm surge as a result of wind and wave actions. These are shown as "V" zones, or velocity zones. In V zone areas, the habitable floor area of new development and/or renovations must be one (1') foot in elevation above the designation shown for the V-zone on the FIRM.

The map designation also establishes a minimum building height for new or substantially improved construction. The flood regulations establish minimum building

elevations for residential structures and define requirements for “flood-safe” construction in order to minimize the amount of damage likely to occur to building in flood prone areas.

4.2.5 Other Regulations

Beach and Marine Regulations

This section promotes the recreational use of the city's beaches, marine resources and environs, and restricts uses and activities that would interfere with or impede traditional recreational uses or endanger members of the public.



Photo 21. Example of sand dune signage.

Regulation of Activities Affecting Protected Species and Habitats

The 1992 Beach Management Plan made specific reference to suggested guidelines for protection of endangered species and a model beach lighting ordinance. Protection of endangered sea turtle nesting sites and a mandatory leash law at all times has been successfully implemented at the local level. The city awaits further recommendations from state and federal agencies concerning protection of additional critical habitat areas and endangered species. A model beach lighting ordinance has not been implemented.

The protection and enhancement of a viable beach/dune system will provide habitat for numerous species of plants and animals. The vegetation within this system is unique and extremely important to the vitality and preservation of the system (see photo 21). Over the years, dune walkover structures have been provided, as well as coordinating sand-fencing installation and vegetation plantings with local civic groups (see photo 22).



Photo 22. Re-established dune awaiting native vegetation planting at 1st Avenue South.

Vehicle Operation on the Beach or Beach Accesses

It is unlawful for any person to drive any motor vehicle, of any nature or description, upon the public beach within the city. This prohibition does not apply to governmental, emergency, or other authorized vehicles.

It is also unlawful for any person to drive any vehicle, whether motorized or self-propelled, upon any sand dunes located within city limits.

Destruction of Sea Oat Plants

Dune construction and revegetation seaward of the State's 40-year setback line must comply with SCDHEC-OCRM requirements and guidelines.

City code states it is unlawful for any person to destroy, mutilate, break, move, tear up, carry away or alter in any manner the sea oats, sea grass, sand fencing or other plants or fixtures with a value of one thousand (\$1,000) dollars or less, planted or erected by the city or its agents as part of any beach renourishment or preservation. Said conduct shall constitute destruction of public property.

5.0 Erosion Control and Management

Long-term data (1850s-1980s) indicates the NMB shoreline is stable to slightly erosional and areas adjacent to inlets and swashes are more dynamic (Barnhardt, 2009). Short-term data suggests periods of erosion (1996-2000) and accretion (2007-2010), beach profile data collected from 1989 to present indicates seaward movement of the shoreline throughout most of North Myrtle Beach (*see Figures 8-15*) over the last 20 years. Low historical erosion rates in combination with recent beach renourishment have limited shoreline retreat in North Myrtle Beach (*see Section 5.1.2 Long-Term Erosion Rates and Shoreline Change*).

Shoreline change information is available from historic maps and aerial photographs and more recently via LIDAR and GPS surveys. Data available for North Myrtle Beach includes high water shoreline data provided as GIS shapefiles by SCDHEC-OCRM, paper maps originally produced by Anders et al (1990) (digitized and rectified shoreline positions from 1851-1983), NOAA annual airborne topographic surveys between 1996 and 2000, GPS surveys, and reports conducted by Coastal Carolina University from 2007 to present²⁶.

Historical shoreline data indicates the mainland-attached shoreline of North Myrtle Beach has been relatively stable over the past 150 years while inlet and swash zones have been more dynamic (*see Figures 16-17*). Migration of Hog Inlet and opening and closing of inlets approximately 1 mile south of Hog Inlet (1873, 1924-25, and 1933-34) have influenced historical shoreline locations in the northern-most areas of North Myrtle Beach (*see Figure 18*). Variability of shorelines adjacent to inlets along the South Carolina coast is common as shoals associated with ebb tidal deltas influence hydrodynamics by buffering and focusing wave energy and redirecting channelized flow through the inlet and nearshore environments.

5.1 Shoreline Change Analysis

The Beachfront Management Act defines three types of shoreline zones. A standard erosion zone is a segment of shoreline which is not directly influenced by an inlet or associated shoals. An unstabilized inlet erosion 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.

Most of North Myrtle Beach is classified as a standard erosion zone. There is a small stabilized inlet zone at the northern end of the island adjacent to Hog Inlet.

²⁶ Additional data may also be found in the 2007 – 2010 Grand Strand Beach Nourishment Study Final Report submitted to the United States Army Corps of Engineers, Charleston, SC District.

5.1.1 Beach Profiles

Representative beach profiles measured from fixed starting points provide the best means of quantifying short-term beach changes. These data allow changes in beach width (in feet) and beach volume (expressed in cubic yards per foot of shore length) to be assessed.

Forty-two permanent beach profile monuments, beginning with station 5895 at Hog Inlet and ending at station 5650 (White Point Swash), have been installed by SCDHEC-OCRM along North Myrtle Beach (*see Appendix B, OCRM Beach Monuments Map*). These monuments have been surveyed routinely between 1999 and the present and provide the best basis for monitoring beach changes.²⁷ *Figures 8 - 13* show the beach profile changes between 1999 through 2011 at stations 5895, 5800 and 5650.²⁸ Information on other monuments is available at <http://gis.coastal.edu>.

The "0" position on the x-axis of the profile figures marks the location of the beach profile monuments whereas the vertical red line marks the location of the SCDHEC-OCRM baseline. The figures and tables show the volumes of sand that were measured above the -5 ft. contour (NAVD88) and seaward of the SCDHEC-OCRM baseline for the years 1999, 2000, 2006, 2007, 2008, 2009 and 2011.

It is important to note that the beach profile volume changes presented in this section are based on data from 1999 to 2011 whereas the shoreline change rates in Section 5.1.2 are based on historical shoreline positions from 1873 to 2006. The beach profiles show recent, annual changes whereas the long-term shoreline change rates show the average annual erosion or accretion that has occurred since 1873.²⁹

²⁷ Description sheets for the monuments are contained in OCRM (2008) and are available at:

http://www.scdhec.gov/environment/ocrm/docs/BF_PACKET_ZIPS/NORTHMYRTLEBEACH.zip

²⁸ These plots were created using the on-line tool available at:

<http://gis.coastal.edu/opm/login/bmprofileselect.php>. Figures 3 and 4 on page 20 show monument locations.

²⁹ All profile volumes calculated seaward of the OCRM baseline, above the -5 ft. contour.

Monument 5895:

At monument 5895, located between 6204 and 6206 Ocean Boulevard, the average beach profile volume is 144.79 yd³/ft., but the volume at this station has varied from 104.9 yd³/ft. to 176 yd³/ft. The most recent measurements from November 2011 indicate that this location has only lost 14.5 yd³/ft. of sand since the completion of the last nourishment project in 2008. Overall, this beach section has a net gain of 47.4 yd³/ft. of sand since 1999. Despite this station being at its lowest volume since the nourishment project, it has been fairly stable since 2007. The loss of sand volume between 2009 and 2011 could have been due to tropical systems in 2011 (particularly Hurricane Irene).

Figures 8 and 9. Beach Profile at OCRM Monument 5895: North Myrtle Beach

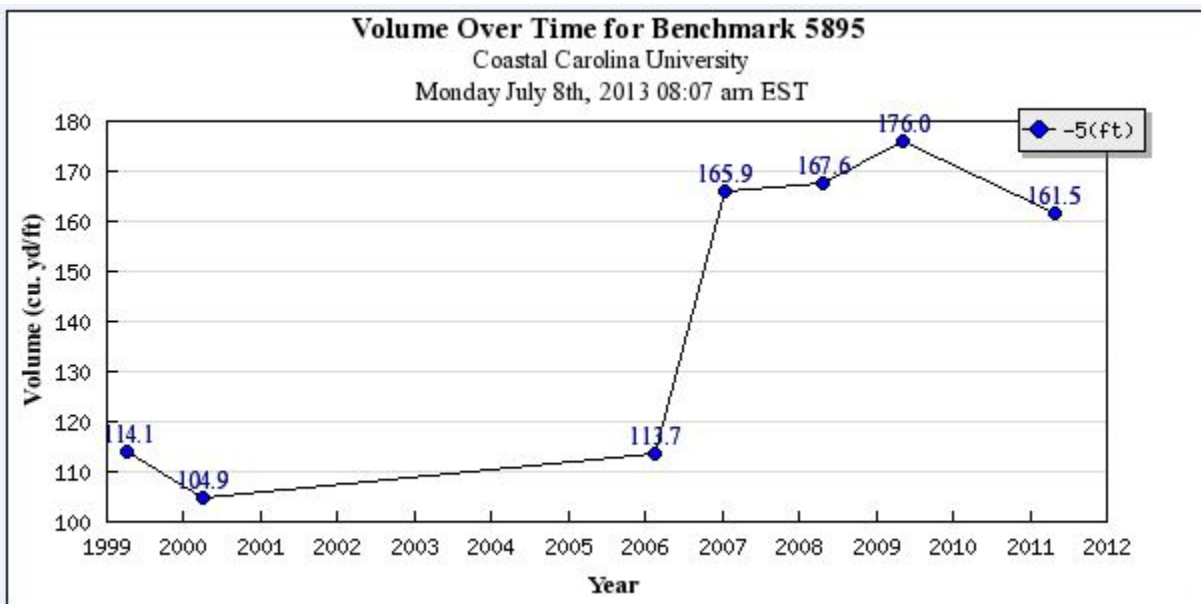
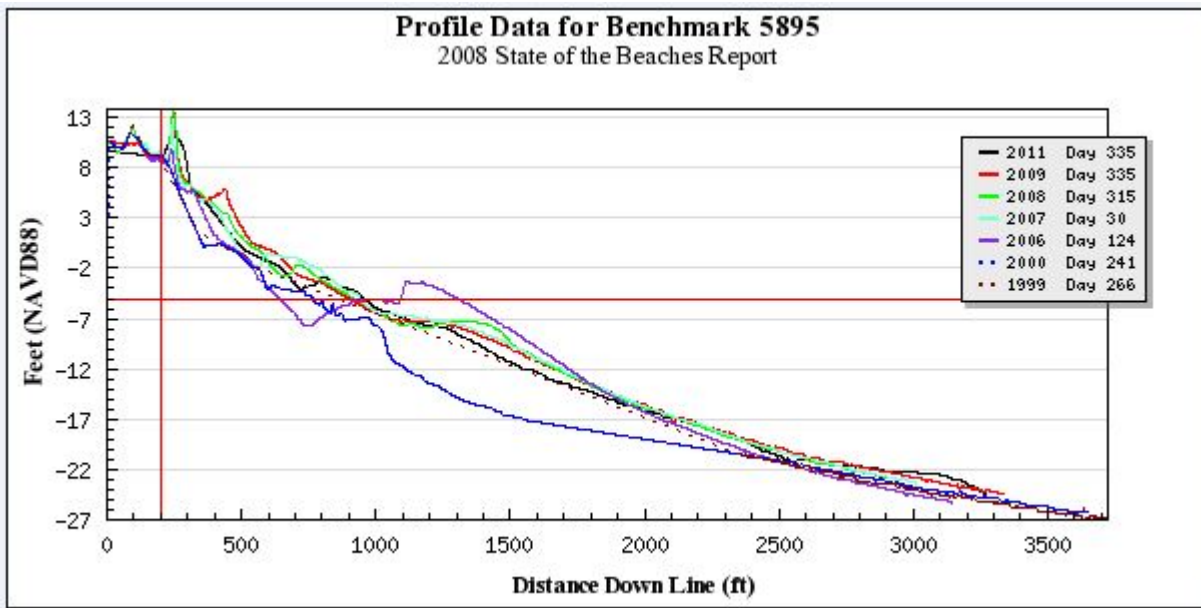


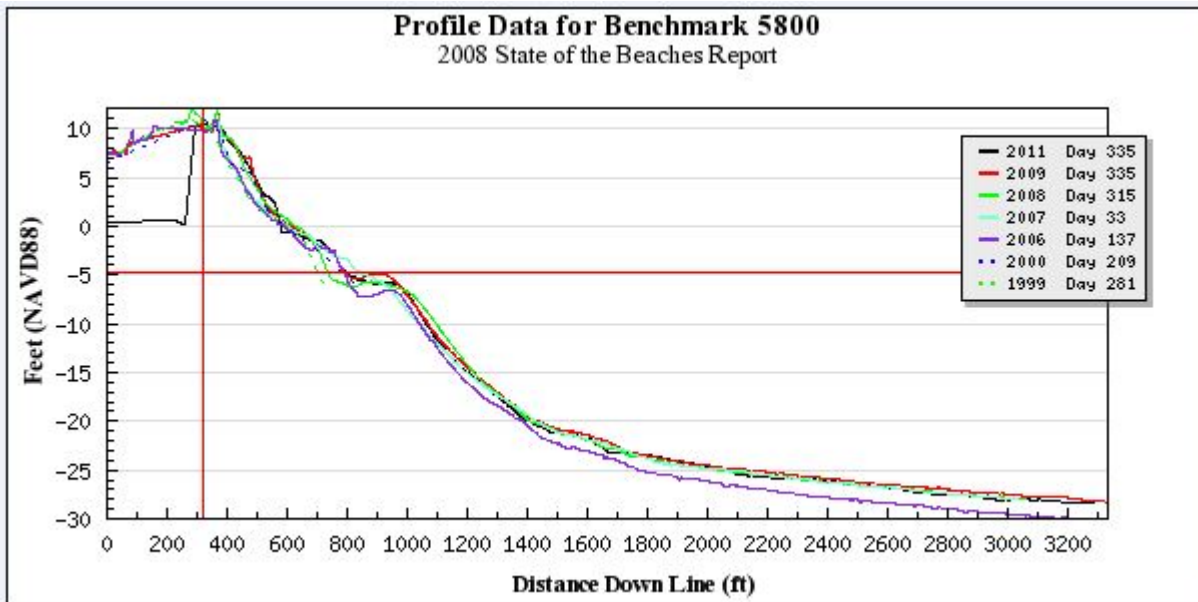
Table 3: Beach Profiles at Monument 5895: North Myrtle Beach

| Year | Volume | Volume Change | Beach Width | Width change |
|---------|---------|---------------|-------------|--------------|
| 2011 | 161.52 | -14.432 | 961.338 | 50.148 |
| 2009 | 175.952 | 8.397 | 911.19 | -19.047 |
| 2008 | 167.555 | 1.617 | 930.237 | -15.763 |
| 2007 | 165.938 | 42.428 | 946 | 298.667 |
| 2006 | 123.51 | 18.603 | 647.333 | -122.067 |
| 2000 | 104.907 | -9.217 | 769.4 | -97.101 |
| 1999 | 114.124 | | 866.501 | |
| Average | 144.79 | | 861.71 | |

Monument 5800:

At monument 5800, located in the median of Ocean Boulevard just southwest of 3rd Avenue North, the average beach profile volume is 122.25 yd³/ft., but the volume at this station has varied from 105 yd³/ft. to 133 yd³/ft. The most recent measurements from November 2011 indicate that this profile lost about 0.5 yd³/ft. of sand since the completion of the last nourishment project in 2008. Overall, the beach along this transect has a net gain of about 27 yd³/ft. of sand since 1999. This location appears to be stable despite a small loss of sand volume between 2009 and 2011.

Figures 10 and 11. Beach Profile at OCRM Monument 5800: North Myrtle Beach



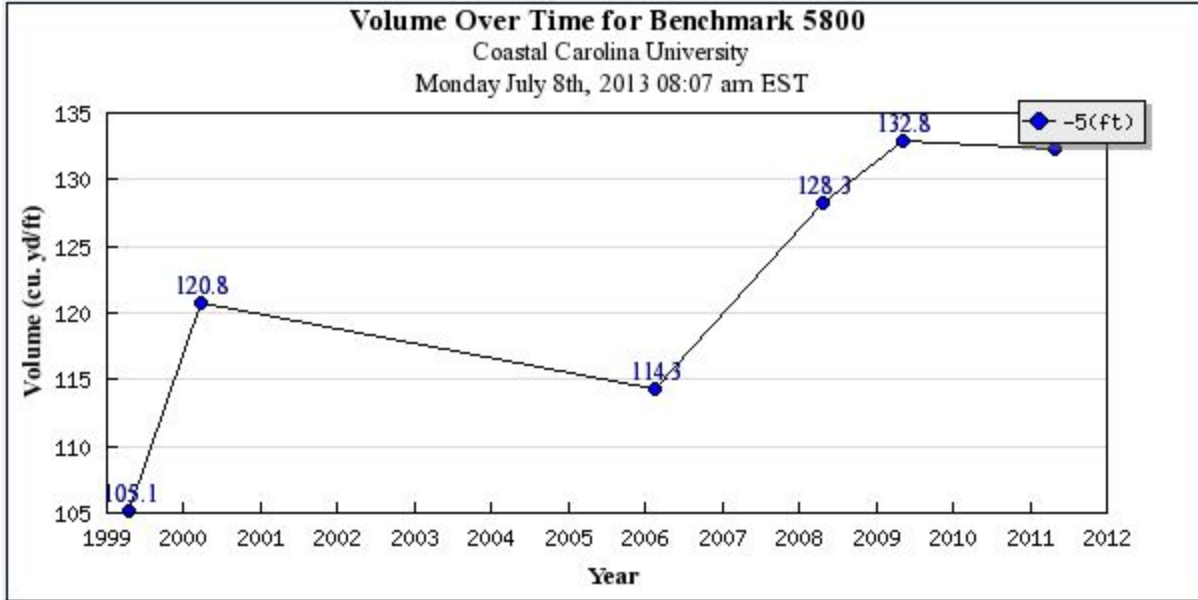


Table 4: Beach Profiles at Monument 5800: North Myrtle Beach

| Year | Volume | Volume Change | Beach Width | Width change |
|---------|---------|---------------|-------------|--------------|
| 2011 | 132.31 | -0.521 | 793.976 | 8.196 |
| 2009 | 132.831 | 4.577 | 785.78 | 49.583 |
| 2008 | 128.254 | 13.991 | 736.197 | -55.003 |
| 2006 | 114.263 | -6.497 | 791.2 | 9.946 |
| 2000 | 120.76 | 15.674 | 781.254 | 81.704 |
| 1999 | 105.086 | | 699.55 | |
| Average | 122.25 | | 764.66 | |

Monument 5650:

At monument 5650, located just southwest of 48th Avenue South and Ocean Boulevard in close proximity to North Beach Plantation, the average beach profile volume is 168.83 yd³/ft., but the volume at this station has varied from 158.2 yd³/ft. to 189 yd³/ft. The most recent measurements from November 2011 indicate that this profile gained about 13.5 yd³/ft. of sand since the completion of the last nourishment project in 2008. Overall, this station has a net gain of 23 yd³/ft. since 1999. This stretch of beach appears to be fairly dynamic, though largely accretional (gaining sand volume, not losing it).

Figures 12 and 13. Beach Profile at OCRM Monument 5650: North Myrtle Beach

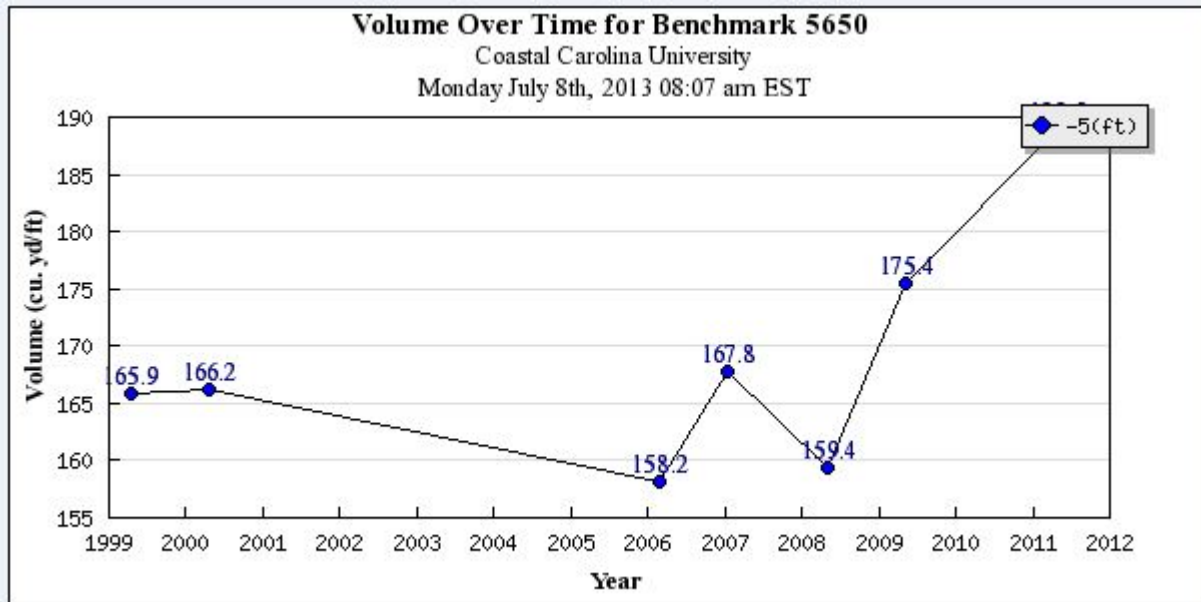
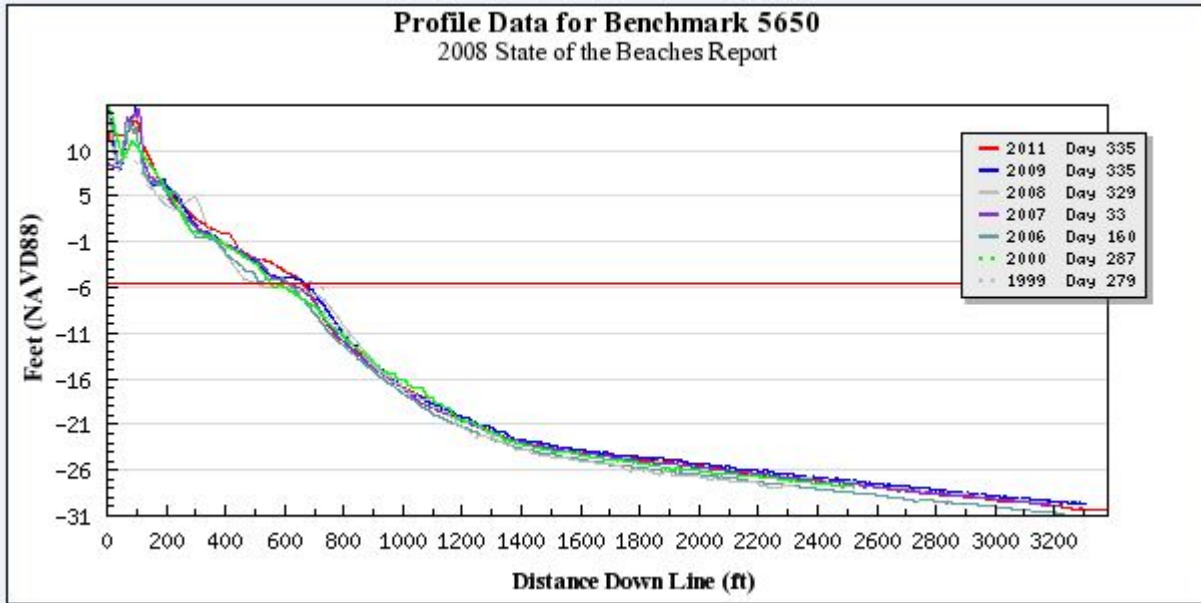


Table 5: Beach Profiles at Monument 5650: North Myrtle Beach

| Year | Volume | Volume Change | Beach Width | Width change |
|---------|---------|---------------|-------------|--------------|
| 2011 | 188.907 | 13.46 | 659.075 | -7.085 |
| 2009 | 175.447 | 16.047 | 666.16 | 167.987 |
| 2008 | 159.4 | -8.441 | 498.173 | -108.807 |
| 2007 | 167.841 | 1.669 | 606.98 | -4.52 |
| 2006 | 158.168 | -7.702 | 611.5 | 58.7 |
| 2000 | 166.172 | 0.302 | 552.8 | -136.997 |
| 1999 | 165.87 | | 689.797 | |
| Average | 168.83 | | 612.07 | |

5.1.2 Long-Term Erosion Rates and Shoreline Change

The erosion rates at all SCDHEC-OCRM beach monitoring stations statewide have been recalculated using the best available historical shoreline data. In most cases, the best available data included historical shoreline positions from as early as the 1850s. These older shoreline positions have also been used by the federal government to analyze shoreline change, and are considered to be accurate. The long-term erosion or accretion rate at each station was calculated by using a least-squares best fit regression through all data points. The resulting erosion rates are the official long-term rates used by SCDHEC-OCRM to update the beachfront setback line position. A variety of factors can cause short-term rates of change to be significantly different from the long-term erosion rates, but the setback line is based on a long-term trend.

In general, most of North Myrtle Beach is reasonably stable over the long-term. The entire length of North Myrtle Beach has been renourished twice in the past: once in 1996-1997, increasing the dry-sand beach width by over 100 ft. and unit-width sand volumes by over 70 cubic yards per ft., and again in 2008.

The beach in the Windy Hill Beach section, the southernmost portion of North Myrtle Beach from 48th Avenue South to 33rd Avenue South, is slightly accreting; averaging 0.77 ft./yr. The Crescent Beach section, from 28th Avenue South to 2nd Avenue North, experienced similar changes in profile with an average accretion rate of 0.34 ft./yr. In the Ocean Drive section, from 2nd Avenue North to Sea Mountain Highway, most stations showed similar renourishment of sand with an average accretion rate of 0.52 ft./yr. In the Cherry Grove section, between Sea Mountain Highway 32nd Avenue North, the character of the beach changes. Much of this area is armored and, historically, experienced chronic sand deficits prior to renourishment. This same 7-block area south of the Cherry Grove pier has also experienced higher erosion rates following the 2008 renourishment project, and the beach here is currently not as wide as the beach north of the pier or south of 28th Avenue North. The average erosion rate in the Cherry Grove section is -0.11 ft./yr. North of the pier, from 37th Avenue North to Monument 5895 at Hog's Inlet, stations exhibited considerable more erosion in the lower part of the profile. This section's average erosion rate is -0.54 ft./yr.

The official SCDHEC-OCRM long-term erosion rates for North Myrtle Beach are listed below:

Table 6: Long Term Erosion Rates: North Myrtle Beach

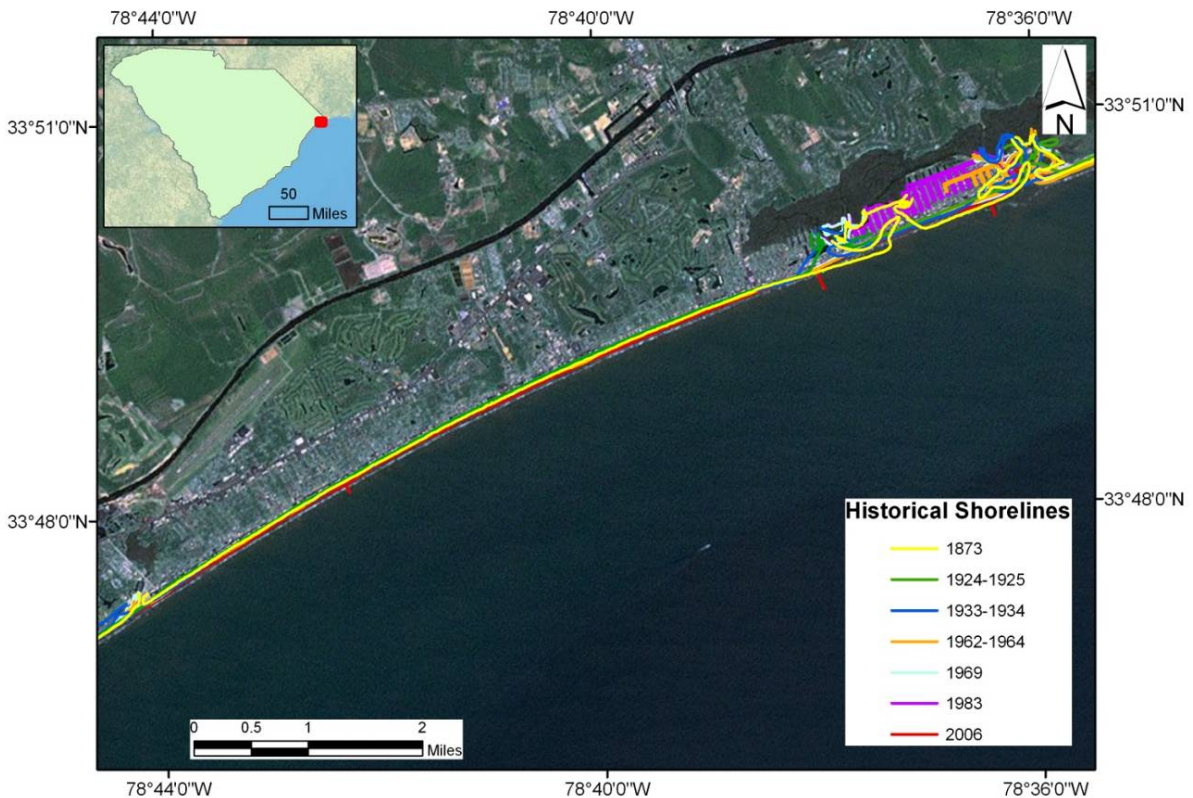
| | Monument | Beach Classification Zone | Long-Term Erosion Rate (ft./yr.) |
|----------------------------------|-----------------|----------------------------------|---|
| Windy Hill | 5650 | Standard | 1.25 |
| | 5700 | Standard | 0.66 |
| | 5705 | Standard | 0.49 |
| | 5715 | Standard | 0.69 |
| | 5720 | Standard | 0.39 |
| Crescent Beach | 5730 | Standard | 0.75 |
| | 5735 | Standard | 0.46 |
| | 5740 | Standard | 0.33 |
| | 5745 | Standard | 0.07 |
| | 5750 | Standard | 0.07 |
| | 5755 | Standard | 0.03 |
| | 5760 | Standard | -0.07 |
| | 5770 | Standard | 0.16 |
| | 5775 | Standard | 0.16 |
| | 5780 | Standard | 0.2 |
| | 5785 | Standard | 0.39 |
| | 5790 | Standard | 0.46 |
| | 5795 | Standard | 0.56 |
| | 5798 | Standard | 1.05 |
| Ocean Drive | 5800 | Standard | 0.92 |
| | 5803 | Standard | 0.59 |
| | 5805 | Standard | 0.56 |
| | 5810 | Standard | 0.62 |
| | 5815 | Standard | 0.62 |
| | 5818 | Standard | 0.46 |
| | 5820 | Standard | 0.36 |
| | 5825 | Standard | 0.3 |
| | 5830C | Standard | 0.23 |
| Cherry Grove | 5835A | Standard | 0.43 |
| | 5840 | Standard | 0.13 |
| | 5845 | Standard | -0.46 |
| | 5850 | Standard | -0.52 |
| Hog Inlet (north of pier) | 5855B | Standard | 1.67 |
| | 5860B | Standard | -2.99 |

| | Monument | Beach Classification Zone | Long-Term Erosion Rate (ft./yr.) |
|----------------------------------|----------|---------------------------|----------------------------------|
| | 5865 | Standard | -3.51 |
| | 5870 | Standard | 3.25 |
| Hog Inlet (north of pier) | 5875 | Standard | -1.87 |
| | 5880 | Standard | -2.03 |
| | 5885 | Standard | -1.15 |
| | 5890 | Standard | 0.1 |
| | 5895 | Inlet Stabilized/Standard | -0.39 |

There are two principal sources of historical shoreline change information: 1) historical maps and charts, and 2) historical and recent aerial photographs. Both are available for North Myrtle Beach, and both have been used to assess shoreline change.

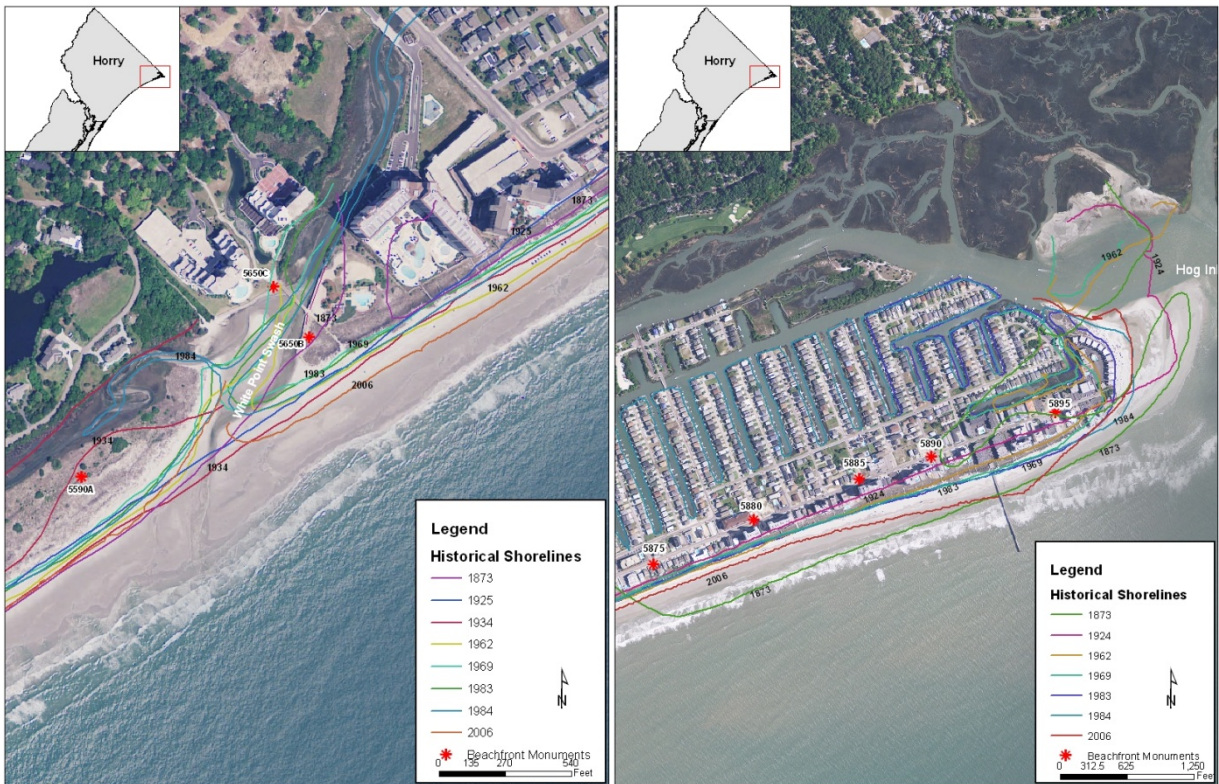
Historical shoreline data indicates the mainland-attached shoreline of North Myrtle Beach has been relatively stable over the past 150 years while Hog Inlet and swash zones have been more dynamic.

Figure 14. Historical shoreline locations along North Myrtle Beach (1873-2006).



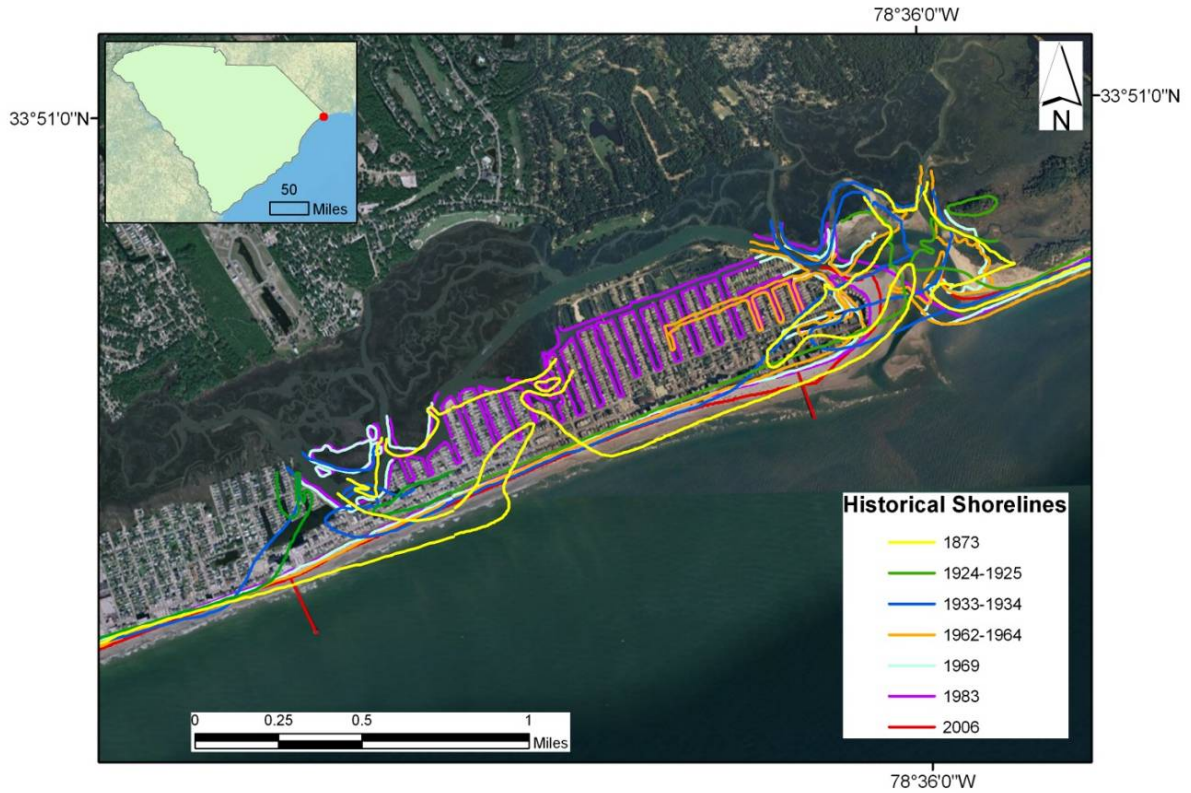
At the southern end, at White Point Swash, the shoreline has not always been near its present location. Based on a historical topographic chart from 1873, the Swash formerly cut through the island near the present day Ocean Creek Plantation. It is unlikely that the swash will return to the 1873 location, because a bulkhead has been installed along the southern edge of Ocean Creek Plantation. It is not unrealistic to consider the mouth of the swash fluctuating between its current position and a more southerly configuration. Although dynamic, this shoreline has recently begun to steadily move seaward mainly due to the success of nourishment projects.

Figure 15. Historical Shorelines for White Point Swash and Hogs Inlet (North Myrtle Beach).



At the northern end, the migration of Hog Inlet and opening and closing of inlets approximately one mile south of Hog Inlet (1873, 1924-25, and 1933-34) has influenced historical shoreline locations in the northern-most areas of North Myrtle Beach.

Figure 16. Historical shoreline locations near Hog Inlet, North Myrtle Beach (1873-2006). Since 1873, the inlet itself has migrated south approximately 800 feet to its current position. Variability of shorelines adjacent to inlets along the South Carolina coast is common as shoals associated with ebb tidal deltas influence hydrodynamics by buffering and focusing wave energy and redirecting channelized flow through the inlet and nearshore environments.



5.2 Beach Alteration Inventory

There are 231 erosion control structures found along the beachfront consisting of 45 bulkheads, 99 seawalls and 87 revetments (*see Appendix J*).

5.2.1 Sediment Budgets

A sediment budget is a method of accounting for all sediment that moves into and out of a defined area. Positive budgets generally result in accretion while negative budgets generally result in erosion. Barnhardt (2009) developed a conceptual sediment budget for the entire Grand Strand region which suggests a balanced budget. Modest erosion rates and periodic beach nourishment imply the North Myrtle Beach sediment budget is slightly negative.

Sediment sources for North Myrtle Beach include erosion of upland areas delivered by rivers, longshore transport from other coastal areas, erosion of older beach/shoreface deposits, and erosion of older deposits on the inner shelf (Barnhardt, 2009). Little River

and Hog Inlets are minor sediment sources for North Myrtle Beach and erosion of beach/shoreface and inner shelf deposits account for most new sediment in the system. Sediment sinks for North Myrtle Beach include losses at Hog Inlet and Singleton Swash as well as longshore and cross-shelf transport.

5.2.2 Beach Renourishment

The beach is affected by both natural and manmade forces. It is important to consider enacting policies to ensure that sufficient space is provided for the natural migration of the beach/dune system and that the related risks to private and public resources are minimized.

In years past “hard” erosion control structures were employed (223 bulkheads, revetments and seawalls) to protect beach sand from eroding away. Nowadays, beach renourishment is used. Given the long-term erosion rates and shoreline change data provided in this document (*Section 5.1.2, Long-Term Erosion Rates and Shoreline Change*), beach renourishment is successfully establishing more beach. Beach renourishment remains the city’s greatest tool against beach erosion; beach renourishment and other “soft” solutions are the preferred alternatives to hard stabilization in South Carolina. For example, beach profile data collected from 1989 to present indicates seaward movement of the shoreline throughout most of North Myrtle Beach over the last 20 years. Low historical erosion rates in combination with beach renourishment projects in 1997 and 2009 have limited shoreline retreat in North Myrtle Beach; however, significant erosion is occurring near Hog Inlet.

The SC Beachfront Management Act defines beach nourishment as “the artificial establishment and periodic renourishment of a beach with sand that is compatible with the existing beach in a way so as to create a dry sand beach at all stages of the tide” (SC Code § 48-39-270(4)). A typical renourishment project consists of dredging beach compatible sand from an offshore site, pumping the sand onto the beach, and distributing it on the beach face. Renourishment can also include trucking sand to the beach from an upland source. The current planning process for major beach renourishment projects involves an evaluation of the environmental impact of the project, the public recreational benefit, the expected useful life, the protection benefit, and the extent of support for the project (R. 30-18(B)). The project review can be time-consuming because it requires extensive coordination with local governments and appropriate agencies and consultants to ensure that all factors are considered (Adapting to Shoreline Change, 2010).

In 1995, 262 easements and rights-of-way were acquired in order to renourish, protect, and maintain the City’s public beaches. This project included distribution of sand, development of dunes and berms, and the planting of vegetation on the dunes and public walkways. Creating these easements and rights-of-way lead to the 1997 Reach 1 beach renourishment project and 2009 beach renourishment project.

Reach 1 Renourishment 1996

The project was constructed by Great Lakes Dredge and Dock Company at a total cost of approximately \$16 million. Construction was initiated on August 19, 1996 upon issuance of the Notice to Proceed and continued until May 14, 1997, when the dredge was demobilized. Approximately 750,000 cubic yards of sand was replaced, pulled from borrow pits 3 miles offshore. Its funding was largely due to the City’s willingness to continue to implement the policies of the 1991 Beachfront Management Plan.

Reach 1 Renourishment 2008

The most recent project was constructed by Great Lakes Dredge and Dock Company at a total cost of approximately \$15 million; \$11,250,000 Federal, \$1,876,000 State, and \$1,876,000 City (see photo 23). The project was initiated in August 2008 and completed on October 11, 2008; fencing and grassing completed March 2009. Approximately 750,000 cubic yards of sand was redistributed over 8.6 miles, pulled from a the Little River borrow pit 3 miles offshore.



Photo 23. Beach renourishment project occurring in North Myrtle Beach in 2008.

Congress authorized these projects under the Water Resources Development Act of 1990. The 50-year project life allows for renourishment until 2046.³⁰

³⁰ Sources: 2010 Hazard Mitigation Plan and U.S. Army Corps of Engineers website http://www.sac.usace.army.mil/?action=programs.myrtle_beach.

City staff continue to maintain dunes and berms as part of the public beach to maximize space between development and active beach. Each year the Public Works Department reviews erosion data and sand budgets from SCDHEC-OCRM and other sources and determines if any change in the above strategy is warranted (*see Appendix K*).

5.2.3 Emergency Orders and Sandbags

The term “emergency” is defined by the SC Coastal Tidelands and Wetlands Act as “any unusual incident resulting from natural or unnatural causes which endanger the health, safety, or resources of the State, including damages or erosion to any beach or shore resulting from a hurricane, storm or other such violent disturbances.”³¹ SCDHEC-OCRM does not consider long-term, chronic erosion as an “emergency.” Emergency situations before or after 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.³² Property owners being protected by sandbags are responsible for the maintenance of the bags to insure that they remain in place and in good repair, and they are responsible for the complete removal of the bags.³³ Four Emergency Orders have been issued historically in North Myrtle Beach; the first occurring in October of 1990 (sandbags) and the last occurring in September of 1996 (renourishment).

5.3 Discussion of Erosion Control Alternatives

Similar to other coastal communities in South Carolina, since the mid-1980s a fundamental tenet of the city’s beach management strategy is that reliance upon “hard” structures should be minimized. Prior to the initiation of beach restoration through nourishment, different types of hard structures implemented for shore stabilization by the private sector (i.e. homeowners, developers, hotels, P.O.A.’s, etc.) typically consisted of structures such as groins and seawalls or bulkheads.

Rather than using these hard structures, the principal means of shore stabilization embraced by the City of North Myrtle Beach should be beach renourishment, a restorative “soft” structure which provides for improved shorefront conditions suitable for recreation, protection of upland development or infrastructure, as well as global environmental enhancement. Bulkheads and seawalls are prohibited within the state’s beachfront jurisdiction.³⁴

5.3.1 Other Measures

Repetitive Loss Properties

There are five repetitive loss areas located in the city; Cherry Grove, 7th Avenue North, Main Street, Perrin Drive, and Windy Hill. Within these areas approximately two

³¹ SC Code §48-39-10(U).

³² R.30-15(H).

³³ R.30-15(H).

³⁴ Requested last sentence to be added as per SCDHEC-OCRM on 7/14/2014.

hundred (200) repetitive flood loss structures are present. General vicinity maps show the five areas highlighted, with some of these repetitive loss properties occurring on the oceanfront.³⁵

Recommendations towards mitigating repetitive flood loss properties are as follows:

- Implement an annual outreach project to the properties in the mapped repetitive loss areas. At a minimum, the outreach project will advise the recipient of three (3) things;
 - That the property is in or near an area subject to flooding,
 - Property protection measures appropriate for the flood situation, and
 - Basic facts about flood insurance.
- Hold public hearing and consider adoption of Coastal AE-Zone regulations.
- Hold public hearing and consider adoption of enclosure regulations.
- Hold public hearing and consider adoption of freeboard regulations.
- Develop a Hazard Mitigation Administrative Plan that outlines policies, priorities, and procedures for the use of mitigation grant funds.
- Update public information materials to include methods to protect buildings from flooding, high winds, shaking, and wildfire.
- Provide flood map and coastal erosion information to the public.
- Undertake a study to gauge how many property owners would potentially benefit from the addition of a repetitive loss provision in the ordinance.
- Continue the phasing of stormwater drainage improvements to the Hillside Drainage Basin near 6th Avenue South to reduce flooding during significant rainfall events including ocean outfalls, installation of regional detention ponds along U.S. Highway 17, purchasing 20 acres of wetlands for retention, and raising the elevation of Hillside Drive between 6th and 9th Avenue South (construction anticipated Fall 2013).
- Seek funding to complete the Main Street drainage area improvements (anticipated outfall structure .
- Conduct a study of drainage problems in the Cherry Grove area (drainage improvements are being studied along Lake Drive currently).

The city was awarded Flood Mitigation Assistance Program funding to conduct a housing elevation planning project. The funding covers all the legwork required to identify and qualify ten potential repetitive loss houses to be elevated. In another year or so, the city will likely submit a grant proposal requesting additional funds to physically elevate these ten houses.

Land Acquisition, Demolition/Relocation

Fee simple acquisition can be used to meet several community objectives. For example, purchasing oceanfront properties would ensure recreational access and reduce hazard risk. Acquisition can also be used where the Land Development Regulations and Zoning

³⁵ Source: NMB Hazard Mitigation Plan April 2010.

Ordinance are not sufficient or where environmental objectives are sought. Acquisition policies could also target oceanfront properties where redevelopment would be permitted under current regulations but would impact the beach and dune system.

The power of acquisition can be a useful tool for pursuing mitigation goals. The City may find the most effective method for completely hazard-proofing a particular property is to remove it from the private market, thereby eliminating the possibility of inappropriate development. Because of cost, this technique should be used only for property in the most hazardous areas, where property and life is subject to repeated damage or extreme risk; however, as noted above, potential grant opportunities exist to help offset costs..

Suggested recommendations towards mitigation are as follows:

- Develop a post-disaster recovery program that establishes policies and procedures that will be used to administer acquisition and demolition/relocation grants. Priority for the allocation of these funds should go first to acquire and demolish the most severe repetitive loss buildings in the highest hazard areas. The second priority should be buildings that suffer substantial damage and are in high hazard areas. The policy should identify the criteria to be used to determine the remaining priority categories for the use of these funds.
- For demolition, consider applying for funding to pay for 75% of the fair market value of substantially damaged buildings and associated lots. Funding may be available from the Flood Mitigation Assistance (FMA) and Hazard Mitigation Grant Programs (HMGP).

The city should consider how these acquisitions can assist in achieving other objective, such as increased storm protection, an expanding beach and dune system, building a boardwalk, and providing greater parking and ocean access.

6.0 Needs, Goals and Implementation Strategies

6.1 Beach Development Policy

6.1.1 State Government-Mandated Beachfront Setback and Protection Regulations

The South Carolina Beachfront Management Act requires that local plans include a 40-year retreat policy. In 1992, the Beachfront Management Plan for a 40-year retreat strategy contained five elements:

- **Development and redevelopment setbacks.** Where lots were seaward of Ocean Boulevard, new construction would be regulated by the CPO District regulations contained in the Zoning Ordinance.
- **Revised setback line.** The city would consider revising its building control line according to section 23-31(3)[presently 23-32(1) CPO District Overlay] of the zoning ordinance.
- **Artificial beach nourishment.** Areas experiencing a sand deficit as evidenced by lack of a dry-sand beach, exposed seawalls, absence of dunes, or shallow setbacks would be nourished artificially using sand from an external source. The outcome of such projects would be monitored to determine the cost-effectiveness and longevity of the fill. The primary goal of large-scale nourishment would be replacement of the sand deficit, restoration of a dry-sand beach, and restoration of dunes. Cherry Grove was considered a prime area for such restoration work.
- **Small-scale beach nourishment and scraping.** From time to time, localized erosion problems would develop due to shifts in the position of inlets or swashes and their effect on adjacent beaches, or from storms. Such problems would be addressed with smaller scale nourishment or emergency sand-scraping projects. The degree to which these activities were required depended on the performance of large-scale nourishment and success in relocating structures more landward.
- **Dune enhancement.** The prerequisite for dunes was a viable, dry-sand beach. As a final phase of the 40-year retreat strategy, property owners would be encouraged to improve and enhance the height and sand volume in the foredune. The city would assist by providing vegetation and specific recommendations. The long-range goal was to create dunes with sufficient volume and elevation to withstand a 50-100 year return-period storm. Dunes eroded by large storms would be repaired in coordination with efforts to rebuild the dry beach.



Photos 24-29. Illustrating dune restoration; the Maritime, Sea Castles, and Blockade Runner Resort following Hurricane Hugo in 1989 and the approximate areas in January 2011.

With the adoption of the 2013 Local Comprehensive Beach Management Plan these elements continue to be relevant. The Zoning and Land Development Regulations, beach renourishment, and localized dune enhancement projects have contributed towards a healthier and fuller sand dune post Hurricane Hugo in 1989. As a result of these efforts, portions of the beach and dunes system have been greatly enhanced (*see photos 24-29*).

The city's intent in pursuing the renourishment program is:

1. To protect, preserve, restore, stabilize, and enhance the beach/dune system through beach renourishment and other appropriate means, to provide for the protection of life and property, and to act as a buffer from high tides, storm surges, hurricanes, and erosion;
2. To prohibit development from moving seaward onto new dunes or beach areas formed as a result of beach renourishment projects and efforts;

3. To provide an important basis for a tourism industry that generates annual revenue for the State of South Carolina and the City of North Myrtle Beach;
4. To provide habitat for numerous species of plants and animals which are threatened or endangered, or which may become threatened or endangered as a result of the loss of the beach/dune system;
5. To provide habitat for beach/dune system vegetation that is unique and extremely important to the vitality and preservation of the system; and
6. To create a recreational beach at high tide.

6.1.2 Strategic/Voluntary Relocation of Vulnerable Properties and Utilities for achieving goals of State 40-Year Retreat Policy

The City of North Myrtle Beach continues to adhere to the State’s retreat policies in the following ways; :

1. Limit the size of structures within the setback area; within the setback area, structures are generally restricted to 5,000 square feet of heated space (SC Code §48-39-290), which may facilitate retreat since smaller structures may be more easily relocated or removed, and represent a smaller private investment.
2. Move buildings and utilities away from the active beach; the Beachfront Management Act limits the rebuilding of structures “destroyed beyond repair” to their original size and requires that they be moved as far landward as possible on existing lots, but not necessarily outside of the setback area [48-39-290(B)(iv)]. There are no mechanisms for actively relocating or removing structures prior to damage, unless they were authorized by a special permit and become situated on the “Active Beach” for a set period of time (R.30-14(I)). The active beach is defined as “the area seaward of the escarpment or the first line of stable natural vegetation, whichever first occurs, measured from the ocean landward,” and only applies to structures that have received special permits from SCDHEC-OCRM (R. 30-1(D)(2)).
3. Implement mitigation guidelines/regulations for construction activity that damages beach/dune vegetation; new structures are prohibited on the “primary dune” (R. 30-13(B)(5) and R. 30-15(F)(1)), but secondary dunes can still be impacted by development.

In late 2007, an external “Shoreline Change Advisory Committee” was formed to: 1) identify continuing information and research needs; and 2) evaluate existing policies and policy alternatives. The Committee was made up of 23 experts from academia, government, and the private sector, and was charged with examining science and policy issues related to both beachfront and estuarine shoreline management in South Carolina, to help the state address future social, economic, and natural resource impacts of shoreline changes that may result from continued (or accelerated) rise in sea level, development encroachment into the beach/dune system, shoreline alterations, and coastal storms.

This effort lead to a final report entitled “Adapting to Shoreline Change, A Foundation for Improved Management and Planning in South Carolina” dated April 2010. Based

upon this report, the city has identified the following goals to achieve the state's 40-year retreat policy.

Goal 1: Consider investigating ways of continuing to minimize risks to beachfront communities to ensure the long-term health of the coastal shoreline and vitality of the coastal economy. Instead of repeated damage and continual demands for federal disaster assistance, resilient communities proactively protect themselves against hazards, build self-sufficiency and become more sustainable.³⁶

Implementation Strategy: Consider implementing recommendations from the Final Report of the Shoreline Change Advisory Committee's "Adapting to Shoreline Change, A Foundation for Improved Management and Planning in South Carolina" released in April 2010 (*see Appendix L*);

- Prevent the Seaward Expansion of Beachfront Development:
 - Continue to support the existing 20-ft SCDHEC-OCRM setback from the baseline. However, if the setback is to be revised, it should be based on a detailed analysis to support the revision. This analysis would include a careful analysis of the implications of the new rule, historic analysis of the success and failure of the existing 20-ft setback, and challenges that the city would face to implement a revision.
 - Maximize the space between existing oceanfront structures and the mean high water line. Key sub-recommendations would restrict in most cases seaward movements of the SCDHEC-OCRM baseline.
- Re-establish (resurvey) the legal boundary between private and public property prior to renourishment along shorelines that have eroded gradually over time:
 - Resurvey the shoreline prior to any major renourishment project that has resulted from long-term, chronic erosion, to reset the legal boundary between public and private land. This may not apply to areas affected by episodic erosion (for example, from a storm event), because of the common law principle of "avulsion," which allows property owners to reclaim land lost due to a storm event.
- Strategically Acquire Beachfront Lands and/or Easements:
 - Work with SCDHEC-OCRM on a voluntary land acquisition program to incorporate both fee-simple purchase and conservation easements for properties deemed at risk from storms and erosion. Acquisition options

³⁶ Source: Godschalk et al, 2009

could include (1) purchase of lands that are not currently developed, (2) acquisition of high risk land prior to or after storms and erosion damage, limiting redevelopment, and (3) acquisition of lands further inland that would be locations for relocation.

- Explore and expand funding mechanisms for voluntary acquisitions, including a state “beach management” trust fund.
- Encourage the State of South Carolina to develop and implement a Regional Sediment Management (RSM) plan.
 - The plan would help address the sand material needs specific to the city’s coast, determine sediment budgets, and identify potential borrow sites within reach based on reasonable pumping distances. The plan would be periodically updated.
 - Work with SCDHEC-OCRM to manage finite number of identified inshore sand borrow sites.

Goal 2: Consider seeking a regional planning approach to beach management:

Implementation Strategy: As part of a regional planning effort, consider reaching out to local governments in neighboring communities.

- Partner with Horry County, Brunswick County and the City of Myrtle Beach for cross-communication to coordinate strategies, techniques and proposed projects affecting the beach.
- Participate with SCDHEC-OCRM during the next update of the State's Beach Management Plan.

Goal 3: Encourage property owners to site oceanfront buildings and structures as far landward as possible.

Implementation Strategy: The City should consider amending zoning codes where appropriate.

- Consider a zoning text amendment to reduce front yard (street) setbacks and increase rear yard setbacks (oceanfront) in the R-1 and R-4 zoning districts for properties along the oceanfront.
- The Board of Zoning Appeals is also able to consider any variance to reduce front yard (street) setbacks and increase rear yard (oceanfront) setbacks.

Goal 4: Consider measures to consolidate public/private dune accesses.

Implementation Strategy: Look to close unnecessary dune walkways and walkovers in favor of shared access where possible.

- Continue to fund extension of public dune walkovers to lessen impacts to the dune and vegetation.
- City staff should continue mitigating damage to the dune system on a periodic basis by recreating dunes and working with Horry County’s Academy for Arts, Science and Technology to vegetate with native landscaping.

6.1.3 Strategy for Environmental Awareness

Maintaining and enhancing the quality of the beach experience requires a multi-faceted effort, including environmental awareness and protection. The city faces special challenges regarding sensitive coastal plant and wildlife ecosystems considering the role that the natural environment plays in tourism, community livability, and quality of life, as well as economic sustainability.

Goal 1: Continue to promote environmental programs and standards that stress protection of important habitat and wildlife ecosystems.

Implementation Strategy: Protect and/or create refuge areas for state and federally threatened and endangered plants and animals.

- Work with SCDNR to determine set-aside areas for additional plant and animal species requiring special protection.

Goal 2: Consider additional protections for sea turtle hatchlings modeled after other South Carolina coastal communities.

Implementation Strategy: Consider creating a sea turtle beach lighting ordinance with City Council (recommended in the 1992 Beach Management Plan).

Goal 3: Protect and enhance sand dune and native vegetation.

Implementation Strategy: Continue to re-establish native vegetation and sand dunes on public oceanfront properties. Work with private oceanfront property owners to do the same.

- Encourage all pedestrians to use designated access points.
- Continue to re-establish, repair and maintain sand dune fencing and nearby associated vegetation to capture eluvial “windblown” distribution of sand.
- Fertilize the dune vegetation twice a year.

- Coordinate all dune protection signage with a consistent style and remove any damaged or faded signage.

6.2 Strategy for Preserving and Enhancing Beach Access and Parking

A total of 184 oceanfront public beach accesses exist along the shoreline between 48th Avenue South and 63rd Avenue North as of 2013. Within these beach accesses, there are 608 oceanfront vehicular parking spaces and 103 dedicated golf cart parking spaces.

In October 2007, the City contracted Kimley-Horn and Associates to review public beach access and available parking and complete a conditional assessment of the oceanfront public parking lots. Overall, they found the parking lot network to be performing well, but did find some parking and maintenance deficiencies that needed to be addressed. This resulted in an overall performance rating of “Good” for the entire network.

Goal 1: The City should continue to protect existing beach accesses, or consolidate public beach accesses during redevelopment, if appropriate.

Implementation Strategy: Update the 1988 surveys by resurveying and recording all beach accesses.

- Contract a licensed surveyor to verify the current status of public beach accesses when establishing new, or redeveloping existing, beach accesses.

Goal 2: Continue to maintain and improve beach accesses. Consider placing new demarcation posts, site-specific regrading and new surface improvements, and removing all private encroachments existing within public space.

Implementation Strategy: Determine which beach accesses require general maintenance and which require major improvements using the conditional assessment prepared by Kimley-Horn and Associates.

- Over the next few years, city departments should work together to identify deficiencies, determine a course of action and execute a solution.

Goal 3: Consider providing ADA compliant beach accesses every three to four blocks.

Implementation Strategy: Each year the Public Works Department assesses ADA compliant access locations and determines which ones to improve.

Goal 4: With the majority of oceanfront, second and third row land under private ownership, the City should continue seeking opportunities to provide additional public beach access and parking.

Implementation Strategy: Have adequate public beach access and public parking at city-owned sites and seek solutions to providing additional public beach access and parking.

- Continue improving additional public streetends consistent with improvements to 6th Avenue South, 21st Avenue South, 39th Avenue South and 46th Avenue South streetends.
- Continue acquiring first and second row property at every opportunity to provide additional parking or partner with private property owners to help alleviate the need.

Goal 5: Pursue implementation of the East Coast Greenway along Ocean Boulevard.³⁷

Implementation Strategy: Incorporate the East Coast Greenway along Ocean Boulevard where possible, especially when proposed improvements to Ocean Boulevard are scheduled.

³⁷ The East Coast Greenway is a project to create a nearly 3,000-mile (4,800 km) urban path linking the major cities of the Atlantic coast of the United States, from Calais, Maine, to Key West, Florida, for non-motorized human transportation.

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