Local Comprehensive Beach Management Plan

City of Isle of Palms, South Carolina

Local Adoption - February 22, 2008
State Approval – April 7, 2008

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C. Earl Hunter, Commissioner

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April 7, 2008

Mayor F. Michael Sottile
City of Isle of Palms
PO Box # 508
Isle of Palms, SC 29451

RE: State Approval of the Local Comprehensive Beach Management Plan for the City of Isle of Palms

Dear Mayor Sottile,

In accordance with the Beachfront Management Act, S.C. Code Ann. § 48-39-250 *et seq.*, South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC-OCRM) has reviewed and hereby approves the locally adopted Comprehensive Beach Management Plan for the City of Isle of Palms.

Implementation of the State-approved local plan begins immediately and the approval and implementation date will be specified in a public notice published by DHEC-OCRM.

The City's Local Comprehensive Beach Management Plan must be updated at least every five years in coordination with DHEC-OCRM following its approval.

Congratulations on the approval of the Local Comprehensive Beach Management Plan for the City of Isle of Palms. We look forward to working with you in the implementation of this plan.

Sincerely,

Carolyn R. Boltin

Carolyn R. Boltin
Deputy Commissioner

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Ocean and Coastal Resource Management
Charleston Office • 1362 McMillan Avenue • Suite 100 • Charleston, SC 29405 • Phone: (843) 953-0200 • Fax: (843) 953-0201 • www.scdhec.gov

STATE OF SOUTH CAROLINA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
1362 McMillan Ave, Suite 400
Charleston, South Carolina 29405

In the Matter of the Request by the

CITY OF ISLE OF PALMS

APPROVAL AND FINDINGS

for Approval of the Comprehensive Beach Management Plan for the City of Isle of Palms pursuant to §48-39-350 of the Beachfront Management Act.

I. SUMMARY

The Deputy Commissioner of the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC-OCRM) approves the Local Comprehensive Beach Management Plan (LCBMP) for the City of Isle of Palms pursuant to the State Beachfront Management Act (§ 48-39-250 *et seq.*) and Chapter 30-14(A) of the South Carolina Code of Regulations.

II. FINDINGS OF FACT

A. The City of Isle of Palms LCBMP

1. The City Council of Isle of Palms adopted its LCBMP by resolution on February 26, 2008.

2. The City's locally adopted LCBMP contains the ten required elements set forth in § 48-39-350 (A) of the State Beachfront Management Act.

3. DHEC-OCRM afforded the public a thirty-day comment period and the opportunity for a public hearing on the LCBMP, and considered all comments in accordance with Chapter 30-14(A) of the South Carolina Code of Regulations.

4. The City's LCBMP is a comprehensive management plan for the City's oceanfront beaches and was prepared and adopted under the provisions of the State Beachfront Management Act and its implementing regulations, Chapter 30-14(A) of the South Carolina Code of Regulations.

B. Required elements of the LCBMP as set forth in § 48-39-350 (A) of the State Beachfront Management Act

1. An inventory of beach profile data and historic erosion rate data provided by the department for each standard erosion zone and inlet erosion zone under the local jurisdiction;
   An inventory and discussion of beach profile and erosion rate data is provided in Section 2 beginning on page 18 of the City's local plan.

2. An inventory of public beach access and attendant parking along with a plan for enhancing public access and parking;
   An inventory of public and community beach access and parking is provided in Table 4 beginning on page 42 and is mapped in the Appendices beginning on page 74. The City's policy for enhancing public access is to clarify public parking (page 37) and to protect existing access points as stated in Section 7.2 on page 69.

3. An inventory of all structures located in the area seaward of the setback line;
   An inventory of structures located seaward of the DHEC-OCRM setback line is mapped and is also provided in tabular form (Structural Inventory) in the Appendices beginning on page 74.

4. An inventory of turtle nesting and important habitats of the beach/dune system and a protection and restoration plan if necessary;
   A discussion of Ecological habitats is provided in Section 2.5 beginning on page 34, and an inventory of turtle nesting is provided in Table 2 on page 36. Local habitat and turtle protection measures are discussed in Section 4.3.2 beginning on page 56.

5. A conventional zoning and land use plan consistent with the purposes of this chapter for the area seaward of the setback line;
   A zoning and land use plan consistent with the purposes of the Act is discussed in Section 2.4 beginning on page 32, in Section 4.3.2 beginning on page 56, and is mapped in Figure 12 on page 33.

6. An analysis of beach erosion control alternatives, including renourishment for the beach under the local government's jurisdiction;
   Beach erosion control alternatives are discussed in Section 3.1 beginning on page 50.

7. A drainage plan for the area seaward of the setback zone;
   The City's stormwater and drainage management plan prohibits beach discharge and is discussed in Section 2.8 beginning on page 48.

8. A post disaster plan including plans for cleanup, maintaining essential services, protecting public health, emergency building ordinances, and the establishment of priorities, all of which must be consistent with this chapter;
The City's post disaster plan, including all above-mentioned elements, is discussed in Section 6 beginning on page 64.

9. A detailed strategy for achieving the goals of this chapter by the end of the forty-year retreat period. Consideration must be given to relocating buildings, removal of erosion control structures, and relocation of utilities;
The City's plan summarizes its strategy in Section 7.1 on page 68 drawing reference to pertinent policies and regulations discussed more fully in other sections of the plan, most notably in Section 4.3.2 beginning on page 56. Each of the above considerations are discussed in Section 3.1 beginning on page 50 and Section 5 beginning on page 62.

10. A detailed strategy for achieving the goals of preservation of existing public access and the enhancement of public access to assure full enjoyment of the beach by all residents of this State.
The City's plan summarizes its strategy for achieving the goals of preservation of existing public access and enhancing public access in Section 2.6 beginning on page 37 and in Section 7.2 on page 69.

C. State Review and Approval Process

1. The City Council adopted its LCBMP by resolution on February 26, 2008 and forwarded the locally approved plan to DHEC-OCRM for State review and approval.

2. DHEC-OCRM announced a 30-day public comment period on March 3, 2008 and posted the locally adopted plan on the DHEC-OCRM website. The announcement was also included in the weekly public notice on March 7, 2008.

3. DHEC-OCRM advertised in the Post and Courier a legal advertisement notifying the public of a public hearing scheduled for March 19, 2008.

4. DHEC-OCRM hosted a public hearing at the Isle of Palms City Hall on March 19, 2008 and heard public comment.

5. The 30-day public comment period closed on April 1, 2008 and a response to comments document was prepared.

III. CONCLUSIONS

1. The Local Comprehensive Beach Management Plan for the City of Isle of Palms meets the requirements for a LCBMP set forth in the State Beachfront Management Act (§ 48-39-250 *et seq.*).

2. The Local Comprehensive Beach Management Plan for the City of Isle of Palms includes all of the required elements as set forth in § 48-39-350 (A) of the State Beachfront Management Act.

3. The Local Comprehensive Beach Management Plan for the City of Isle of Palms was publicly noticed, an opportunity for a public hearing was afforded, and all comments received were considered as set forth in Chapter 30-14(A) of the South Carolina Code of Regulations.

IV. Approval

Pursuant to the findings of fact and conclusions of law set forth above, the **LOCAL COMPREHENSIVE BEACH MANAGEMENT PLAN FOR THE CITY OF ISLE OF PALMS** is hereby **APPROVED** as meeting the requirements of the State Beachfront Management Act and its implementing regulations. Such Local Comprehensive Beach Management Plan is therefore entitled to recognition as a State-Approved Local Comprehensive Beach Management Plan.

Carolyn R Boltin

Carolyn R. Boltin
Deputy Commissioner

April 3, 2008
Date

Cover Photo Credits: Lower left photo by Barbara Bergwerf; other photos by Chris Jones.

TABLE OF CONTENTS

1. Introduction

1.1. Local Comprehensive Beach Management Plan

In accordance with the State Beachfront Management Act, the City of Isle of Palms has prepared this local comprehensive beach management plan in coordination with the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC OCRM). The City's local comprehensive beach management plan represents considerable effort, inventory, and deliberation on the part of the City, and establishes a strategy for the management of the Isle of Palms beach for the sustainable enjoyment by residents and visitors. This local beach management plan is intended for incorporation into the State Beachfront Management Plan in accordance with the provisions of the State Beachfront Management Act.

The State Beachfront Management Act became law in 1988 with revisions in 1990 and 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 DHEC OCRM to implement the forty-year retreat policy by designating a baseline and setback line on all oceanfront properties, and to develop a long-range comprehensive State plan for management of the beach and dune resources.

One of the most important provisions of the Act requires local beachfront counties and municipalities to develop and adopt local comprehensive beach management plans which refine the State's beach management strategy to address local conditions and issues. The Act requires that these local plans be long-range, comprehensive, and consistent with the State Beachfront Management Act. Once adopted locally, DHEC OCRM reviews the plan for approval, and approved local plans become part of the State Beachfront Management Plan. Once approved, the local plan is required to be updated every five years in coordination with DHEC OCRM.

Local beach management plans are required to include a minimum of ten elements:

1. an inventory of beach profile data and historic erosion rate data;
2. an inventory of public beach accesses along with a plan for enhancing public access and parking;
3. an inventory of all structures located in the area seaward of the setback line;
4. an inventory of turtle nesting and important habitats of the beach/dune system and a protection and restoration plan if necessary;
5. a conventional zoning and land use plan consistent with the purposes of the Act for the area seaward of the setback line;
6. an analysis of beach erosion control alternatives, including renourishment of the beach under the local government's jurisdiction;
7. a drainage plan for the area seaward of the setback zone;

8. a post disaster plan including plans for cleanup, maintaining essential services, protecting public health, emergency building ordinances, and the establishment of priorities, all of which must be consistent with the Act;
9. a detailed strategy for achieving the goals of this chapter by the end of the forty-year retreat period. Consideration must be given to relocating buildings, removal of erosion control structures, and relocation of utilities; and
10. a detailed strategy for achieving the goals of preservation of existing public access and the enhancement of public access to assure full enjoyment of the beach by all residents of this State.

The City of Isle of Palms has coordinated with DHEC OCRM to fully inventory, analyze, and document each of the ten required elements for an approvable local comprehensive beach management plan. The plan also identifies and discusses the economic and social benefits, issues and opportunities, and local, state, and federal policies and authorities related to the management and protection of the Isle of Palms beach. This local beach management plan represents the foundation for a comprehensive, long-range, and enforceable local management strategy for the beachfront area of the City of Isle of Palms.

1.1.1. Purpose

The City of Isle of Palms has written and adopted this Plan for two principal reasons:

- To identify and collect information relevant to the management of the City's ocean and inlet shorelines
- To become eligible for State beach management funding

1.1.2. History

The City first initiated drafting its Local Comprehensive Beach Management Plan in 1992. A Plan was submitted to the South Carolina Coastal Council (SCCC) and the City received SCCC comments in March 1994. Subsequent efforts by the City to address the comments were not entirely successful, and the City set aside its work on the plan, concentrating on other matters. In July 2006, the City reactivated its efforts to create and adopt a Plan. The City Council adopted the Plan in March 2007 and the Plan was submitted to DHEC OCRM in April 2007. DHEC OCRM provided informal comments to the City in November 2007, revisions were made to the Plan and the City adopted the revised Plan in 2008.

1.1.3. Goals

The City hopes to realize the beach management vision articulated by its Long Term Beach Management Advisory Group in October 2007:

- a dry sand beach at all stages of the tide, capable of providing recreational opportunities for residents and visitors, protecting upland development and sustaining our natural resources
- elimination of the chronic and periodic erosion problems that threaten buildings and loggerhead nesting habitat along the shoreline

- minimizing the need for emergency protection of upland structures and development
- avoiding future shoreline development practices which perpetuate or exacerbate problems of the past, where some buildings were sited close to a dynamic inlet shoreline
- cooperation between all City residents to ensure that this vision is implemented and that generations to come can enjoy the beach on Isle of Palms

1.2. Description of Isle of Palms

The Isle of Palms is a seven-mile long barrier island located eight miles east of Charleston on the South Carolina coast (see Figure 1). This long and relatively narrow island varies in width from .35 miles to 1.6 miles and its slightly curving shoreline has an orientation of southwest to northeast. The total area of the island is approximately four and one-half square miles, or 2,880 acres (Isle of Palms Planning Commission, 2004).

The island is bounded on the north by Hamlin Creek and the Atlantic Intracoastal Waterway, on the east by Dewees Inlet and Dewees Island, on the south by the Atlantic Ocean, and on the west by Breach Inlet and Sullivan's Island. Ground elevations on the island range from 17 feet above mean sea level (MSL) at points along a ridge on the ocean side of the island to sea level. However, the topography of the island is relatively flat with an average ground elevation above mean sea level of only eight (8) to ten (10) feet.

The mean tide range, low tide to high tide, is 5.2 feet with the spring tide range increasing to 6.1 feet. Tides can be considerably higher during hurricanes and other severe storms.

Wave energy along the shoreline tends to be mild, with a mean significant wave height of 2.4 ft and a mean wave period of 5.7 seconds (Jensen, 1983). Winds and waves tend to approach from the south and southeast during the summer months and from the northeast during the winter. The south/southeast direction of approach is more frequent, but the northeast winds and waves are usually stronger.

The Isle of Palms beach has been designated as a Blue Wave Beach by the Clean Beaches Council, a national not-for-profit organization devoted to increasing public awareness and volunteer participation in beach sustainability. The Blue Wave designation is America's first environmental certification for ocean beaches, and the conferees voluntarily pledge to uphold responsible beach management practices related to water quality, beach and intertidal conditions, hazards, services, habitat conservation, public information and outreach, and erosion management. The Isle of Palms beach is the only Blue Wave certified beach in South Carolina[a]

[a] see http://www.cleanbeaches.org/ and http://www.resourcesaver.com/ewebeditpro/items/O31F13023.pdf

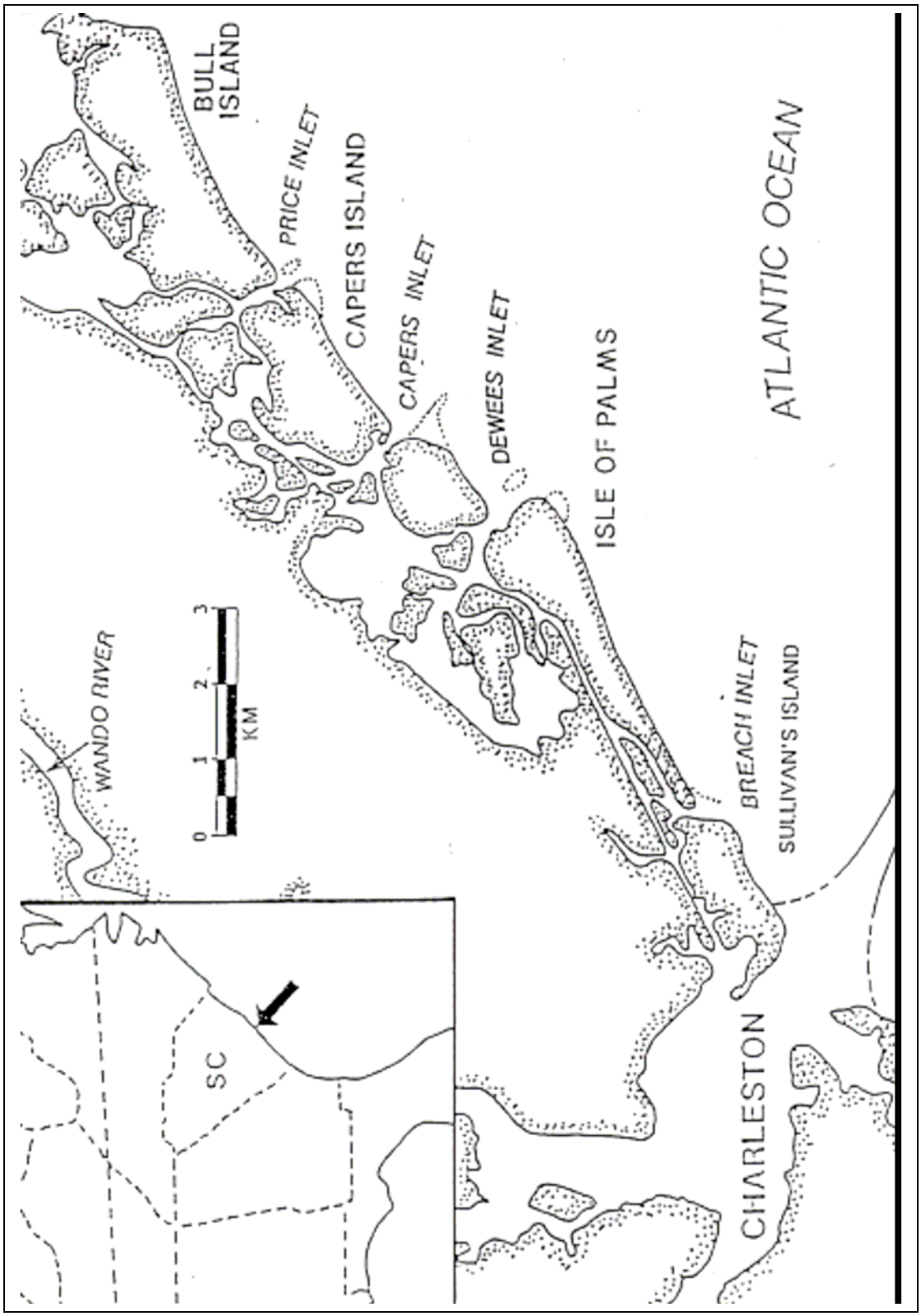

Figure 1. Isle of Palms Location Map

1.2.1. Local History and Background

Originally known as Hunting Island and then, between the mid 18th century and 1898, as Long Island, the Isle of Palms served for many years as a place of refuge and recreation. By the early 1900s, the name of the island was changed to Isle of Palms and the first overland access began by means of a trolley rail line running from Mount Pleasant across Sullivan's Island to Isle of Palms. Local entrepreneurs attempted to create a holiday resort on the island including the opening of a restaurant and Ferris wheel and the construction of the Seashore Hotel in 1902.

As the island's popularity continued to increase, a long, covered pavilion, which stood until the late 1930s, was constructed along the beach. However, in 1924, Isle of Palms was effectively closed when the ferry service from Charleston to Mount Pleasant was discontinued due to financial difficulties. In 1926, a wooden bridge replaced the trolley trestle enabling visitors to come by car. With the opening of the Grace Memorial Bridge in 1929, linking Charleston and Mount Pleasant, and the advent of other road and bridge improvements, it soon became even easier to reach the Isle of Palms by automobile. Development was modest during the 1930s and increased in the 1940s and through the post-war era. In 1953, the island was incorporated as the City of Isle of Palms by an Act of the South Carolina Legislature.

1.2.2. Storm History

The Isle of Palms has experienced many storms and hurricanes but none as devastating as Hurricane Hugo – a Category 4 hurricane which hit the South Carolina coast at midnight on September 21, 1989. The storm surge covered most of the island with peak water levels ranging between 15.5 feet above MSL along the beach and 12.5 feet above MSL along the back of the island. Hurricane Hugo damaged nearly every structure on the island and destroyed more than 200 structures.

Several important reports describe historic storm impacts in the Isle of Palms area. Information about hurricanes and tropical storms that have affected the area is contained in several references (Ludlum, 1963; Purvis and Landers, 1973; Myers, 1975; Federal Emergency Management Agency, 2004)[b]. Descriptions of some of the more significant storms are taken from the 2004 Flood Insurance Study for Charleston County (FEMA, 2004) and are included below:

August 27, 1813:
This storm passed near Charleston causing a large loss of lives and property. This hurricane rates a position close to the top of Charleston's meteorological list for its combination of severe winds, heights of flood tide and general destruction.

[b] Additional, up-to-date information on hurricanes affecting South Carolina can be found at the State Climatologist web site: http://www.dnr.state.sc.us/climate/sco/

September 27, 1822:
This small destructive hurricane passed inland between the City of Georgetown and Charleston on September 27. This hurricane caused unprecedented tides at Georgetown and several hundred deaths in Charleston, the Town of Sullivan's Island, Georgetown and North Island.

August 25, 1855:
This hurricane, which originated in the Bahamas, moved inland north of Savannah on a northeasterly course and passed to the west of Wilmington, North Carolina. This hurricane is said to have damaged 90 percent of the houses in Charleston and swept some away completely. This extreme hurricane severely damaged the entire South Carolina coast. Damage in Charleston alone was $1.7 million. As a result of this destructive storm, it was proposed that a weather reporting network be set up in the West Indies and Mexico. Twenty-one lives were lost in Charleston as a result of this storm.

August 27, 1893:
This severe hurricane penetrated the Georgia and lower South Carolina coasts on August 27. It is estimated that more than 1,000 people lost their lives on the coastal islands and in the lowlands between the City of Tybee Island, Georgia and Charleston. The highest tide in this storm was estimated to have ranged from 17.0 to 19.5 feet msl at Savannah Beach, Georgia. At Charleston, the tide was 8.9 feet msl. Extensive property damage was caused along the Georgia and South Carolina coasts.

August 23-30, 1911:
The center of this hurricane crossed the coast between the City of Savannah and Charleston on August 28. This storm is considered in the same category as the storm of 1940. At Charleston, the barometer fell to 992 millibars (mb) (29.30 inches). The wind at the weather bureau office reached 81 mph from the southeast. Seventeen lives were lost, and damage totaled about $1 million. The storm passed into the piedmont section of South Carolina and then again curved to the northeast. At Charleston, the tide reached 7.5 feet msl.

August 11, 1940:
This hurricane entered the coast from the southeast, between Savannah, Georgia and Beaufort County, South Carolina, at about 4 p.m. on August 11. Near Beaufort County, the tide is estimated to have reached 14.2 feet msl. Near the southern tip of Edisto Island, a high-water mark indicated a tide of 13.6 feet msl on the open coast. About 175 cottages were destroyed on Edisto Island. On Folly Island, the maximum tide determined from a National Ocean Survey benchmark was 8.3 feet msl. The entire beachfront eroded an average of 75 feet. At Charleston, most of the damage was to buildings, wharfs and boats along the waterfront. Large areas of the waterfront perimeter in the city were inundated and many automobiles were damaged by the storm tide, which reached an elevation of 8.0 feet msl. Estimated damage to the city was $1 million. Sullivan's Island, the City of Isle of Palms, and Pawley's Island suffered minor damage. Overall, this hurricane was responsible for 34 deaths and caused damage estimated at $6.6 million.

September 29, 1959
(Hurricane Gracie): Hurricane Gracie moved inland on September 29. The center passed over the South Carolina coast at St. Helena about 10 miles east of the City of Beaufort. Damage of disaster proportions occurred in the coastal region from Beaufort to Charleston, and considerable additional damage occurred in the area of Walterboro. An enormous number of trees were felled, causing considerable random damage. There was a great deal of crop damage, especially to unpicked cotton. A barometric pressure of 950 mb (28.06 inches) was reported at Beaufort. The total damage inflicted by the storm was estimated at $14 million. High water marks, which were reported near the Town of Edisto Beach, South Carolina, ranged from 7.3 to 11.9 feet msl.

August 25-September 7, 1979
(Hurricane David): At its time, Hurricane David was the most intense storm of the century to affect the islands of the eastern Caribbean. However, the storm was not a major hurricane when it struck the United States. David struck just north of the Town of Palm Beach, Florida, on September 3rd and made a second landfall about 24 hours later near Savannah Beach, Georgia. In the U. S., hurricane David was responsible for five deaths and about $300 million in damages.

September 21, 1989
(Hurricane Hugo): Hurricane Hugo crossed the coast at Charleston at midnight on September 21. The hurricane was one of the most severe to strike the United States, and caused an estimated $7 billion in damages. Beach erosion and wash over were extensive from Folly Beach to the North Carolina line, as were flooding and damage to structures. The storm tide on Isle of Palms reached 16 ft above mean sea level during the storm (USGS. 1990), several feet higher than the level at Charleston, 10.5 ft. A barometric pressure of approximately 934 mb (27.60 inches) was reported at Charleston. Damage to dunes and structures along Isle of Palms' shoreline was extensive. Miller (1990) reported that a claim was assigned to each of the 576 windstorm insurance policies in force on Isle of Palms at the time of Hugo.

Figure 2 shows hurricanes and tropical storms affecting South Carolina between 1975 and 2005[c]. It is apparent from the figure that relatively few storms make landfall[d]; most travel offshore of South Carolina, parallel to the coast. Fortunately, storms that parallel the coast or exit from land to sea will not cause as much damage as those making landfall.

Ho, et al. (1987) describes in detail the tropical storm and hurricane climatology for the gulf and east coasts of the United States. Selected information concerning storms affecting the Isle of Palms area have been extracted from the report and are included in Table 1.

[c] An interactive storm track viewer is available at http://maps.csc.noaa.gov/hurricanes/viewer.html.
[d] Additional data on landfalling storms affecting the SE United States, South Carolina and Charleston County can be obtained from the *United States Landfalling Hurricane Probability Project*, see http://www.e-transit.org/hurricane/welcome.html

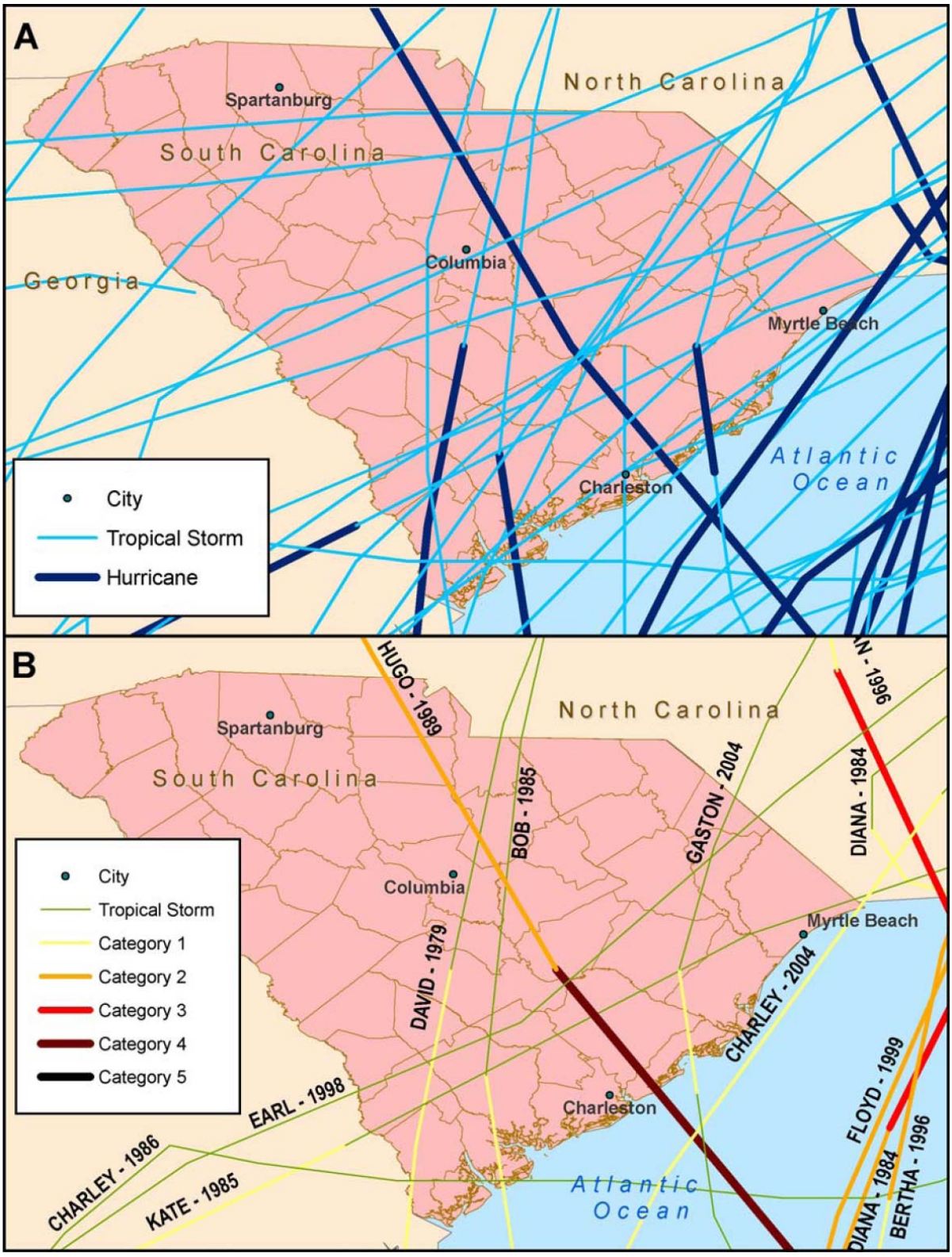

Figure 2. A -- Hurricanes and Tropical Storms Passing within 100 Miles of South Carolina, 1975-2005. B -- Hurricanes and Tropical Storms Affecting South Carolina, 1970-2005 (SCEMD, 2005).

A series of maps delineating anticipated flooding during various storm conditions (category 1, 2, 3, 4 and 5 hurricanes) is also available as part of the South Carolina hurricane evacuation study that was completed in 1986 (S. C. Water Resources Commission, 1986). The maps depict anticipated storm surge stillwater levels for hurricanes arriving or passing by the area at mid-tide.

Table 1. Climatological Characteristics of Hurricanes and Tropical Storms affecting the Charleston Area (Ho, et al., 1987).

Frequency of Occurrence, Landfalling, Exiting and Offshore Storms	
Number of landfalling tropical storms and hurricanes per 10 nmi per 100 years	1.3
Number of exiting tropical storms and hurricanes per 10 nmi per 100 years	0.5
Number of along shore tropical storms and hurricanes passing within 30 nmi offshore per 100 years	6
Probability that a landfalling storm will have a central pressure less than or equal to:	
980 mb (Category 2)	50%
965 mb (Category 3)	23%
945 mb (Category 4)	7%
920 mb (Category 5)	<1%

Many northeast storms have also affected the Isle of Palms' shoreline, although they have not been documented as well as hurricanes and tropical storms. One exception is the January 1987 northeaster that affected the entire coastline of South Carolina. The storm occurred near the time of monthly spring tides and caused extensive damage to seawalls, pools and decks in the Grand Strand, but limited damage elsewhere. Tides in Charleston during the storm were as much as 3.3 ft above normal levels, but had relatively little impact on Isle of Palms' beach.

1.2.3. Population and Demographics

The year-round population of Isle of Palms was recorded as 4,583 in the 2000 Census and 4,643 in the 2006 Census Bureau estimate. During the summer beach season, the island's population rises to 12,000 people and may increase to as many as 20,000 people during peak weekends such as Memorial Day, Fourth of July and Labor Day, based on City Police Department estimates.

The demographics of Isle of Palms were reported for the year-round population as part of the 2000 Census. The gender of residents of the Isle of Palms were evenly mixed between 2,312 male (50.4%) and 2,271 female (49.6%). Roughly 98% of the population identified in the 2000 Census was white with 1.2% Hispanic or Latino, less than 0.3% black or African American, less than 0.2% American Indian, and 0.5% Asian. The number of residents under the age of 18 was 873, or 19% of the total population. Residents 60 and older totaled 996- 22% of the population. According to the City's Comprehensive Plan, these trends were expected to continue.

1.2.4. Major Roads and Bridges

The Isle of Palms is accessible from the mainland via the SC 517 (Clyde M. Dangerfield Highway), also known as the Isle of Palms Connector. The Connector opened in 1993 and is a fixed span bridge providing direct connection between Isle of Palms, Mount Pleasant and US Highway 17. The Isle of Palms is also connected to Sullivan's Island to the southwest by way of the Breach Inlet Bridge on SC 703.

Major local roads on the island include Palm Boulevard (SC 703), Ocean Boulevard, Waterway Boulevard, Palmetto Drive, and Back Bay Drive.

- Palm Boulevard is the longest shore-parallel road on the island, extending from Breach Inlet to 57th Avenue, a distance of almost five miles.
- Ocean Boulevard is the shore-parallel road closest to the beach between Breach Inlet and 14th Avenue.
- Palm Boulevard is the shore-parallel road closest to the beach between 21st Avenue and 57th Avenue.
- Palmetto Drive is the major road closest to the beach within the gated community of Wild Dunes, although there are several neighborhood roads closer to the shoreline (e.g., Grand Pavilion Boulevard, Beachwood East and Dunecrest Lane). Palmetto Drive begins near the Wild Dunes entrance at 46th Avenue, and extends approximately 2.3 miles toward the east end of the island, where the road turns into Back Bay Drive and loops back for approximately 1.3 miles to the 57th Avenue vicinity along the marsh side of the island.
- Waterway Boulevard extends along the Intracoastal Waterway side of the island from the City Marina (41st Avenue) to 21st Avenue.

The total length of roads on the island is estimated to be approximately 34 miles, with approximately 22 miles of roads outside Wild Dunes and under the jurisdiction of the SCDOT. Maintenance for roads within the State system is provided through an agreement between Charleston County and the SCDOT. Roads within the Wild Dunes community total approximately 12 miles and are privately owned and maintained. The City has accepted maintenance responsibility for all or sections of some roads: Ocean Boulevard between 10th and 14th Avenues, part of Hartnett Boulevard, most of Forest Trail, the cul-de-sac on Pavilion Boulevard and 27th, 28th, and 29th Avenues between Hartnett and Waterway Boulevards.

SCDOT and the City are responsible for maintaining the rights-of-way along public roads; however, in the past, the City has undertaken maintenance along some State roads to expedite mowing and upkeep.

1.2.5. Land Use Patterns

Land use on the Isle of Palms is primarily residential in the form of single and multiple-family dwelling units, including those located within the gated community of Wild Dunes. Residential development on Isle of Palms began on the western end of the island where many of the remaining homes date back to the 1940s. Residential subdivision and construction continued through the 1950s and into the 1960s. In 1975, the City approved plans for the development of a

"recreational-oriented residential community" at the eastern end of the island. This private gated development by the Sea Pines Company soon became known as Wild Dunes. The Sea Cabin condominiums, used mainly for seasonal occupancy, opened in 1980 and 1981. More recently, 88 residential lots were platted in 1986 on accreted land along Ocean Boulevard between Breach Inlet and 10th Avenue.

The Census indicated that there were 3,881 total housing units in the City in 2000, and that 1,942 (50%) were occupied and 1,939 (50%) were vacant housing units, including those under construction, not occupied year-round, or occupied by persons with primary residences elsewhere. The Census also reported that 1,442 (37%) of the total housing units in the City were owner-occupied single-family homes and the median value of these houses was $423,100 in 2000. Renter-occupied units comprised 9.6% of the total housing units and roughly 3% were owner-occupied but were not single-family units (Isle of Palms Planning Commission, 2004).

Isle of Palms also hosts a relatively large commercial base when compared to most other barrier islands in the area. Of the approximately 2,880 acres on the island, approximately 40.6 acres or 1.4% of the island is zoned commercial, excluding resort amenities within the gated section of Wild Dunes. The commercial development on the island was originally centered on Ocean Boulevard between 10th and 14th Avenues, known as the "Front Beach" area. The commercial area now includes Palm Boulevard as well. Over the years, the type of buildings has changed from open-air pavilions for seasonal activities to more substantial enclosed buildings and shopping centers housing businesses which operate year-round. The Island Center on Palm Boulevard opened in 1959, followed by the Ocean Park shopping center in 1992. The Pavilion Shops on Ocean Boulevard opened in 1989. The island has had two hotels and several multifamily developments built since the late 1990s. Only a small portion of the commercially zoned land remains undeveloped. The gated community of Wild Dunes also includes resort, conference, education and outreach, golf and tennis facilities.

Two 18-hole championship golf courses are located on the island within the Wild Dunes gated community, the Wild Dune Links course and the Harbor course. The green for hole 18 on the Links course is located adjacent to the Atlantic Ocean, and the green for hole 17 is located adjacent to Dewees Inlet.

The Charleston County Parks and Recreation Commission (PRC) owns and operates a regional park on a nine-acre tract located off 14th Avenue along the Atlantic Ocean known as Isle of Palms County Park. The Park has over 350 parking spaces with restroom, shower, changing, picnic and volleyball facilities, lifeguard services, children's play area and beach access for the handicapped. Limited food and beverages are available for sale and chairs and umbrellas can be rented.

1.2.6. DHEC OCRM Shoreline Classification, Baseline and 40-Year Setback Line

DHEC OCRM, in accordance with the requirements of the State's Beachfront Management Act (BMA), establishes a baseline and 40-year setback line at approximate 10-year intervals. Preliminary lines were established on the Isle of Palms by DHEC OCRM in 1989/90, final lines were established in 1991, and the current lines were established on March 29, 1999 (OCRM, 1999). The Beachfront Management Act strictly regulates construction and reconstruction along the ocean shoreline seaward of the DHEC OCRM 40-year setback line.

The Beachfront Management Act differentiates between shorelines impacted by tidal inlets (inlet erosion zones) and those shorelines not directly affected by tidal inlets (standard erosion zones). The Act requires that different procedures be used to establish baselines in the two zones. In standard erosion zones, the baseline is set along the crest of the primary sand dune; in unstabilized inlet erosion zones, the baseline is set along the most landward point of erosion (taken by DHEC OCRM to be the most landward vegetation line) during the past forty years, unless detailed studies show the shoreline is unlikely to return to its former position. Figure 3 shows the locations and boundaries of the Isle of Palms erosion zones designated by DHEC OCRM, along with DHEC OCRM beach profile survey stations.

- The shoreline between Breach Inlet and 6th Avenue (DHEC OCRM Sta. 3115) is designated as an unstabilized inlet erosion zone (Iu), but the baseline was not set along the most landward shoreline -- near continuous accretion in this area allowed setting of the baseline along the 1998 primary dune crest.

- The shoreline between 6th Avenue and DHEC OCRM Sta. 3155 (near 47th Avenue) is designated a standard erosion zone (S) and the baseline was set along the crest of the 1998 primary dune (i.e., as shown on the DHEC OCRM orthophoto maps).

- The shoreline between DHEC OCRM Sta. 3155 and Dewees Inlet is designated an unstabilized inlet erosion zone (Iu); the baseline in this region was set along the most landward shoreline between 1959 and 1998, in recognition of the unstable nature of the shoreline.

The 40-year setback line was established 20 ft landward of the baseline along all of Isle of Palms, in recognition of the long-term accretional trends along the entire island.

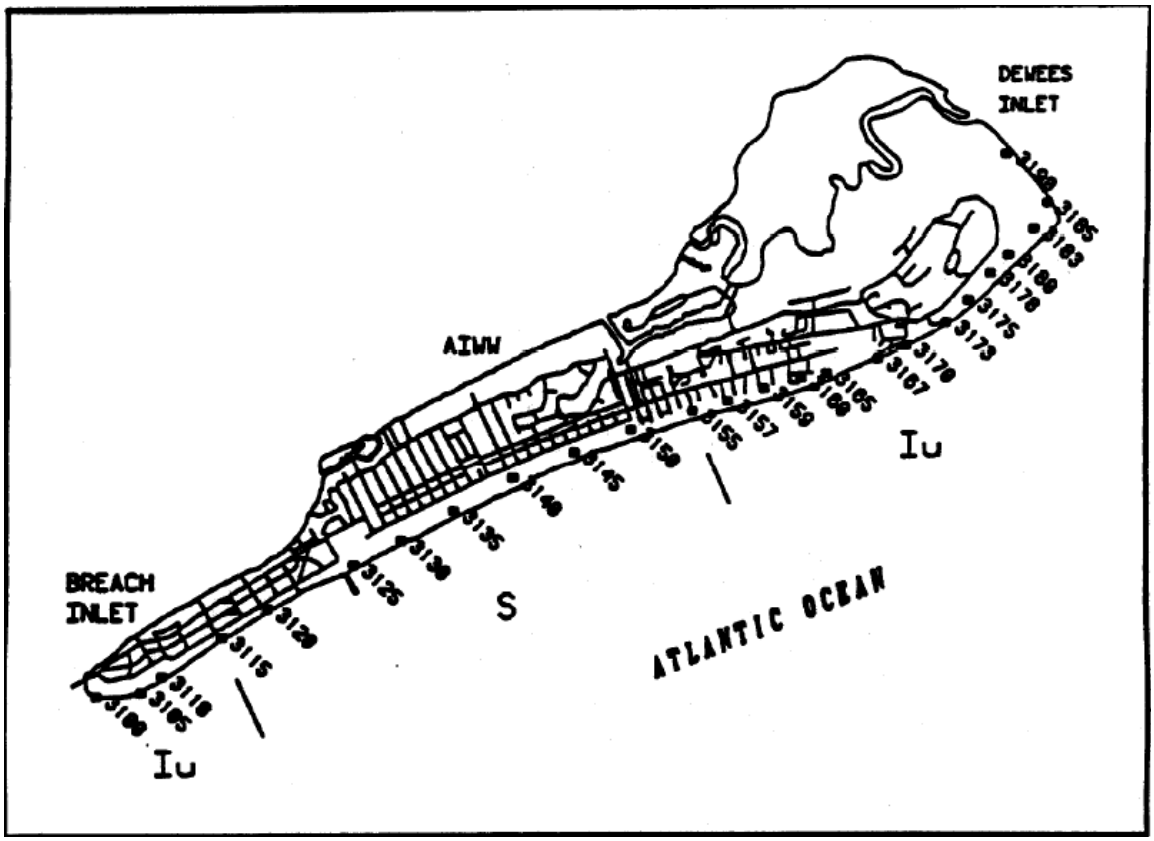

Figure 3. DHEC OCRM Erosion Zone Designations and Beach Survey Monuments (OCRM, 2006).

1.3. Local Beach Management Issues

The most significant local beach management issue facing Isle of Palms is the erosion threat to buildings and infrastructure, particularly along the eastern third of the island which is affected by Dewees Inlet shoal migration and attachment. The erosion problem is episodic in nature, and the area threatened by erosion varies, depending on the location and size of a particular shoal attachment, but the erosion threat in this general region occurs frequently.

Emergency protection of threatened buildings and infrastructure goes hand-in-hand with the episodic erosion threat, and has been a challenging issue on Isle of Palms. Until recently, both the State and the City limited emergency sand bags to 5 gallons in size (DHEC OCRM, seaward of their 40-year setback line; the City, landward of the 40-year setback line), but widespread scattering of these small sand bags during 2007 proved to do more harm than good, so both DHEC OCRM and the City allowed larger sand bags to be placed. It is expected the bags will be removed in conjunction with a $10 million beach nourishment project planned for 2008.

Sand scraping to alleviate erosion associated with inlet shoal attachment has also been a subject of controversy on the island. A previous DHEC OCRM permit for scraping was challenged and is currently (February 2008) under appeal.

Finally, *cost-sharing* for projects to address erosion problems along the Wild Dunes section of the City's shoreline has been controversial. Lack of full and complete public access (according to current DHEC OCRM guidelines) has made the expenditure of public funds a controversial issue which is still being finalized (on January 10, 2008, City Council voted to fund approximately 20% of a proposed $10 million beach nourishment project).

The City recently convened a Long Term Beach Management Advisory Group which provided recommendations on each of these issues to the City in October 2007. The City is reviewing the findings and recommendations of the Advisory Group at this time (January 2008).

The City has been able to successfully address other beach management issues, e.g., protection of marine turtle nesting (through its turtle team), providing public beach access and parking along most of the ocean shoreline (far in excess of DHEC OCRM guidelines), controlling new oceanfront development, and providing for public safety (including evacuation and disaster planning), etc.

1.3.1. Prior Reports and Studies

There have been a number of studies and reports documenting shoreline conditions along the Isle of Palms -- the more significant reports are summarized below:

Isle of Palms, Sullivan's Island and Charleston, South Carolina, April 1966, by U.S. Army Corps of Engineers. This report summarized historic hurricane damage to the area and proposed a 50-ft wide berm and artificial dune for storm protection.

Beach Erosion Inventory of Charleston County, South Carolina - A Preliminary Report, March 1975, by M.F. Stephen, P.J. Brown, D. M. FitzGerald, D.K. Hubbard and M.O. Hayes. This report provided the first assessment of historic shoreline changes along the Isle of Palms using aerial photographs during the period 1939 to 1973. Based on the analysis of these photos, the report generally classified the northern half of the island's ocean shoreline as unstable (i.e., shoreline fluctuations exceeding 50 ft during the study period), and classified the southern half of the island as accretional, with small segments of the shoreline classified as long-term erosional or stable (see Figure 4).

Beaches and Barriers of the Central South Carolina Coast, 1977, D. Nummedal, ed. This report contains several papers concerning Isle of Palms or surrounding islands, including: Longshore Sediment Transport Rates in South Carolina, by T.W. Kana and J.S. Knoth; Ebb-Tidal Delta of Breach Inlet, South Carolina: Morphology, Bed-Forms and Recent Changes, by A. Wojtal; Vegetation Patterns and Succession on the Isle of Palms, South Carolina, by P.E. Hosier; Potential for Hurricane Damage to the Isle of Palms, by D. Nummedal; Shoreline History of Sullivan's island and the Isle of Palms, by T.T. Morgan.

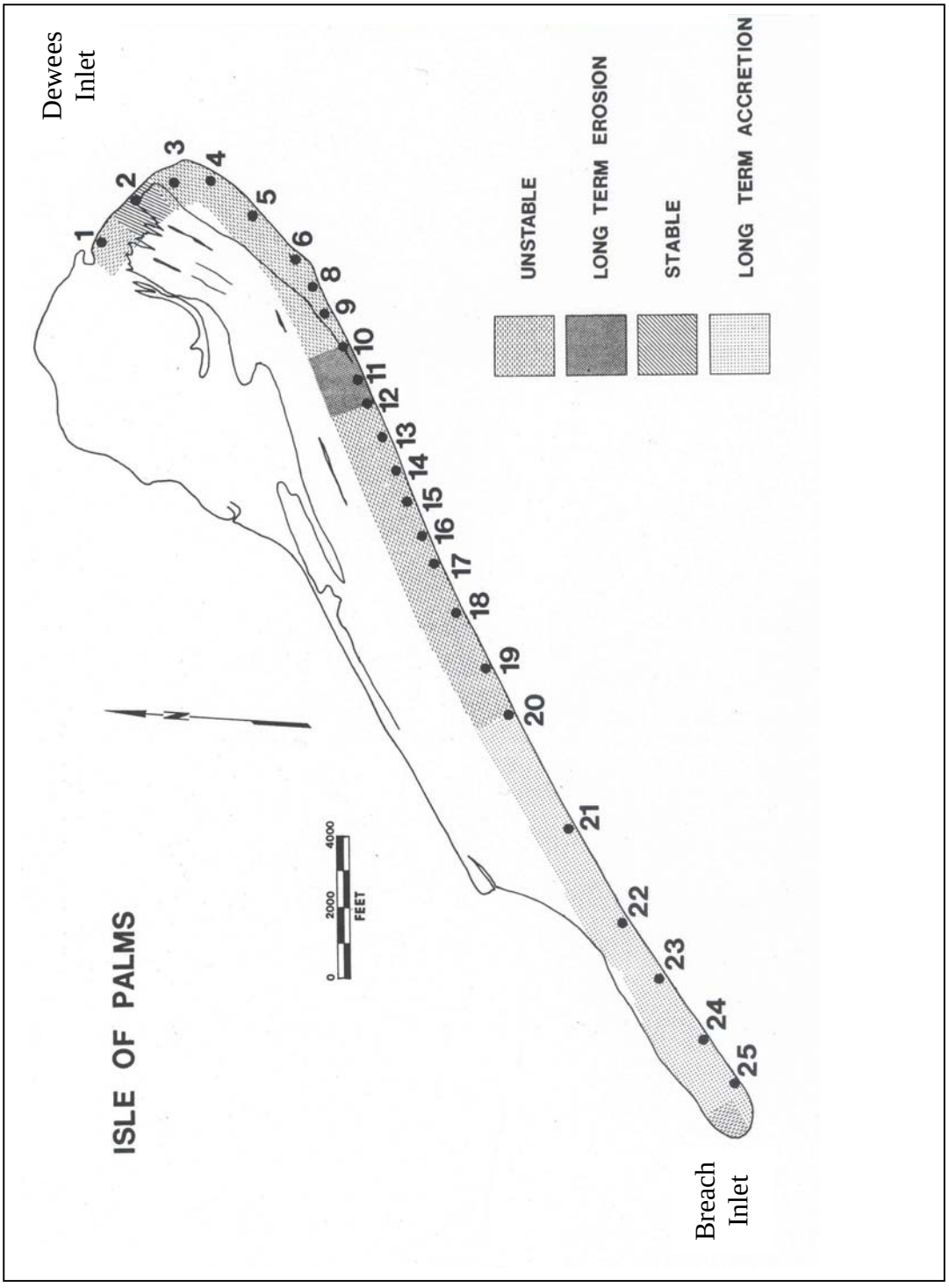

Figure 4. Shoreline Stability Classification by Stephen et al (1975)

Shoreline Changes Along Wild Dunes, Isle of Palms, 1982-1987, by Coastal Science and Engineering. A series of reports were produced for Wild Dunes Beach and Racquet Club Company and Wild Dunes Associates, summarizing the results of shoreline monitoring during the following periods: May 1982 through May 1983; May 1983 through May 1984; June 1984 through June 1985; June 1985 through May 1986; May 1986 through May 1987.

Managing Shoreline Changes in the Presence of Nearshore Shoal Migration and Attachment, 1985, by T.W. Kana and M.L. Williams. This paper, contained in the proceedings from the ASCE Coastal Zone 185 Conference, summarizes the history and shoreline changes associated with a shoal attachment at Wild Dunes during the 1982-1984 period.

Shoreline Assessment of Southern Isle of Palms, South Carolina, December 1986, By C.P. Jones. This report, prepared for an upland property owner, documented historic shoreline changes and storm vulnerability for the shoreline between Breach Inlet and 10th Avenue. The report utilized aerial photographs, historic MHW surveys and recent beach profiles to document persistent accretion in the study area.

Inlet Shoal Attachment and Erosion at Isle of Palms, South Carolina: A Replay, 1987, by M. L. Williams and T.W. Kana. This paper, contained in the proceedings from the ASCE Coastal Sediments 1987 Conference, summarizes the history and shoreline changes associated with a shoal attachment at Wild Dunes during the 1986-1987 period.

Calculation of Interim Baselines and 40-Year Setback Lines, 1988, by. C.P. Jones, D. M. Scaturo, T.W. Kana and W.C. Eiser. This report, prepared for the South Carolina Coastal Council, established the June 1988 locations of the interim baselines and setback lines for 11 islands along South Carolina, including the Isle of Palms. Locations of the interim lines were later revised by DHEC OCRM when final lines were adopted.

Determination of Baseline and 40-Year Setback Line for Southern Isle of Palms, South Carolina, November 1988, by Applied Technology and Management, Inc. This report summarized the results of a study to determine the appropriate location for the final DHEC OCRM baseline and setback line along western Isle of Palms. The study recommended that the interim baseline along the southern shoreline be shifted from its interim location (along the 1963 dune line) to a more seaward location. This revision was accepted by DHEC OCRM when final lines were later adopted.

Calculation of South Carolina Coastal Council Jurisdictional Baselines and Setback Lines -- Isle of Palms, May 1990. DHEC OCRM produced a series of reports documenting the rationale and data used to establish baselines and 40-year setback lines along the SC coastline, including this report for the Isle of Palms. The report found the entire ocean shoreline to be accretional over the long term, although a significant portion of the shoreline (between 47th Avenue and Dewees Inlet) was found to be unstable.

Determination of Baseline and Setback Line for Wild Dunes, 1990, by Applied Technology and Management, Inc. This report presented the results of a detailed analysis of long and short-term shoreline changes along the Wild Dunes section of the Isle of Palms' shoreline. Revisions to the

DHEC OCRM baseline and setback line were recommended for portions of the Wild Dunes' shoreline, but were not adopted by DHEC OCRM.

Shoreline Movements - Report 2 - Tybee Island, Georgia to Cape Fear, North Carolina, 1851-1983, May 1990, by F.J. Anders, D.W. Reed and E P. Meisburger. This report, produced by the U S. Army Corps of Engineers (Technical Report CERC-83-1), tabulates historic shoreline changes for the Isle of Palms, based on NOS/CERC shoreline change maps published in 1984. The report found the Isle of Palms' shoreline to be accretional over the period 1875-1983, at an average rate of approximately 4 ft/yr.

Isle of Palms Beach Line Revisions, December 21, 1998, by SCDHEC, OCRM. This report summarizes changes made to the baseline and 40-year setback line adopted in March 1999.

Short and Long-Term Variability of Ebb-Tidal Deltas: Management Implications, 1999 by M. Hansen and P. Work[e]. The paper concludes, "The use of ebb-tidal delta sediment as a source for beach nourishment material has and will be controversial. However, this study indicates that there is a natural variability to these inlets systems, and if artificially bypassing practices mimic the natural processes by removing a small percent of the delta on an annual basis, there is likely to be minimal adverse impact to adjacent shorelines. Mining the seaward edge of the delta over a large area would maintain the inlets overall geomorphology and would reduce the possibility of severely altering nearshore refraction and sediment transport patterns."

Shoal Bypassing in Mixed Energy Inlets: Geomorphic Variables and Empirical Predictions for Nine South Carolina Inlets, 2001, by D.J. Gaudiano and T.W. Kana. This paper summarizes shoal bypassing trends at nine inlets, including Dewees Inlet. The paper estimated that shoals averaging 412,000 cy in size detach from Dewees Inlet and attach at the east end of Isle of Palms every 6.6 years, on average, and contribute approximately 63,000 cubic yards (cy) annually to the Isle of Palms.

South Carolina's Annual State of the Beaches Report, March 2006, by SCDHEC, Ocean and Coastal Resource Management[f]. The report summarizes recent shoreline changes along the Isle of Palms and other South Carolina shorelines. The report also shows the locations of beach monitoring stations and the unstabilized inlet erosion zones (Iu) and standard erosion zone (S) on Isle of Palms (see Figure 3).

Erosion Assessment and Beach Nourishment Plan, Isle of Palms, South Carolina, April 2006, by Applied Technology & Management, Inc. This report summarizes shoreline changes, shoal attachment effects and protection measures undertaken along the Wild Dunes section of the Isle of Palms' shoreline. The report recommends short- and long-term remedial measures to address the erosion problems along the Wild Dunes' shoreline.

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[e] This paper is published by the USGS Center for Coastal Geology, and is available at http://coastal.er.usgs.gov/scerosion/tidal_deltas/index.html.

[f] This report is the latest in a series of reports published by DHEC OCRM, and is available at: http://www.scdhec.gov/environment/ocrm/pubs/reports.htm.

Isle of Palms Long-Term Beach Management Advisory Group, Findings and Recommendations, October 7, 2007. This report summarizes seven months of work by an advisory group. The report includes a beach management vision and findings and recommendations related to the following issues: erosion control, emergency protection, retreat, funding and implementation. The advisory group report is published as an appendix in the report by Jones (2008).

Feasibility Report: Shoreline Assessment and Long-Range Plan for Beach Restoration along the Northeast Erosion Zone, Isle of Palms, South Carolina, by Coastal Science & Engineering (2007). This report reviews erosion data, includes an updated beach/offshore survey, and proposes an 885,000 cy beach nourishment project between 53rd Avenue and Dewees Inlet.

Report on Isle of Palms Long-Term Beach Management, February 2008, by Christopher Jones. Jones chaired the City's long-term beach management advisory group, and prepared a report for the City, building upon the work of the advisory group. The report provides recommendations to the City on erosion control, emergency protection, retreat, funding and implementation.

1.4. City Beach Management Policies

The City of Isle of Palms manages its oceanfront beach as one contiguous stretch of sand, and its beach regulations apply uniformly along the entire oceanfront. These regulations are summarized in section 4.3 of this Plan.

It should be mentioned that the City does not attempt to exert duplicate jurisdiction over some activities seaward of the 40-year setback line that are regulated by DHEC 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 requirements (e.g., zoning, building code, NFIP, etc.) and with DHEC OCRM requirements.

2. Inventory of Existing Conditions

2.1. The Isle of Palms Beach

The Isle of Palms beach is a continuous strip of sand, extending approximately seven miles from Breach Inlet to Dewees Inlet. Details are provided in the following sections.

2.1.1. Beach Characteristics

The beach tends to be wide and flat (intertidal slopes are approximately 1:40 [V:H]), and backed by one or more low dunes which are vegetated with sea oats and other native grasses and ground covers. The beach width can be narrower and the beach slope can be steeper in the vicinity of the inlets, depending upon the proximity of inlet channels.

Beaches along Isle of Palms are composed of fine-to-medium sized sand. Beach sand samples collected in 2007 (CSE, 2007) show the median grain size is 0.25 mm, with approximately 5% of

the sediment coarser than 2 mm in size (shell fragments). Sediments on Isle of Palms beaches are generally similar to sediments on other Charleston County beaches.

Repetitive beach profiles measured from fixed starting points provide the best means of quantifying beach profile 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.

At least three separate sets of beach profile monuments have been installed along the Isle of Palms:

- temporary monuments set by DHEC OCRM in 1986 (surveyed in 1986 and 1987)
- a permanent set of monuments set by DHEC OCRM in 1987 and surveyed by DHEC OCRM, College of Charleston, and Coastal Carolina University. These monuments begin with station 3100 at Breach Inlet and end at station 3190 at Dewees Inlet. (Note that many of these monuments were lost during hurricane Hugo and were replaced. The numbering for the replacement monuments includes a 'B' following the original monument numbers).
- a set of monuments established by Wild Dunes to provide profile data specific to the Wild Dunes' section of the Isle of Palms' shoreline (surveyed beginning in 1982)

The permanent DHEC OCRM monuments have been surveyed approximately annually between 1987 and the present and provide the best island-wide basis for monitoring beach changes (see Figure 12 for monument locations)[g].

Figures 5 through 7 show beach profile changes between 1997 and 2005 at stations 3110 (3rd Avenue), 3140 (31st Avenue) and 3170 (Beachwood East)[h].

Examination of these plots shows several things:

1. Beaches in the eastern unstabilized inlet erosion zone show the most variability over time, due largely to the emergence, migration and attachment of Dewees Inlet shoals along the Wild Dunes section of the Isle of Palms' shoreline. Dunes there are low, with crest elevations less than 10 ft above the North Atlantic Vertical Datum (NAVD), a survey datum lying near mean sea level.

2. The dunes in the center and western portions of the island are stable-to-accretional over the period shown, with crest elevations of 12 ft NAVD. Beaches at the center of the island are stable, while beaches in the western unstabilized inlet erosion zone have experienced minor erosion during the period 1997 to 2004 (although they tend to be accretional over the long term).

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[g] Description sheets for the monuments are contained in OCRM (1999) and are available at the following electronic link: http://www.scdhec.net/environment/ocrm/permit/docs/beachsurveys/isle_of_palms.pdf.

[h] These plots were created using the on-line tool available at. http://camelot-2.coastal.edu/profiles/plotbybm.php.

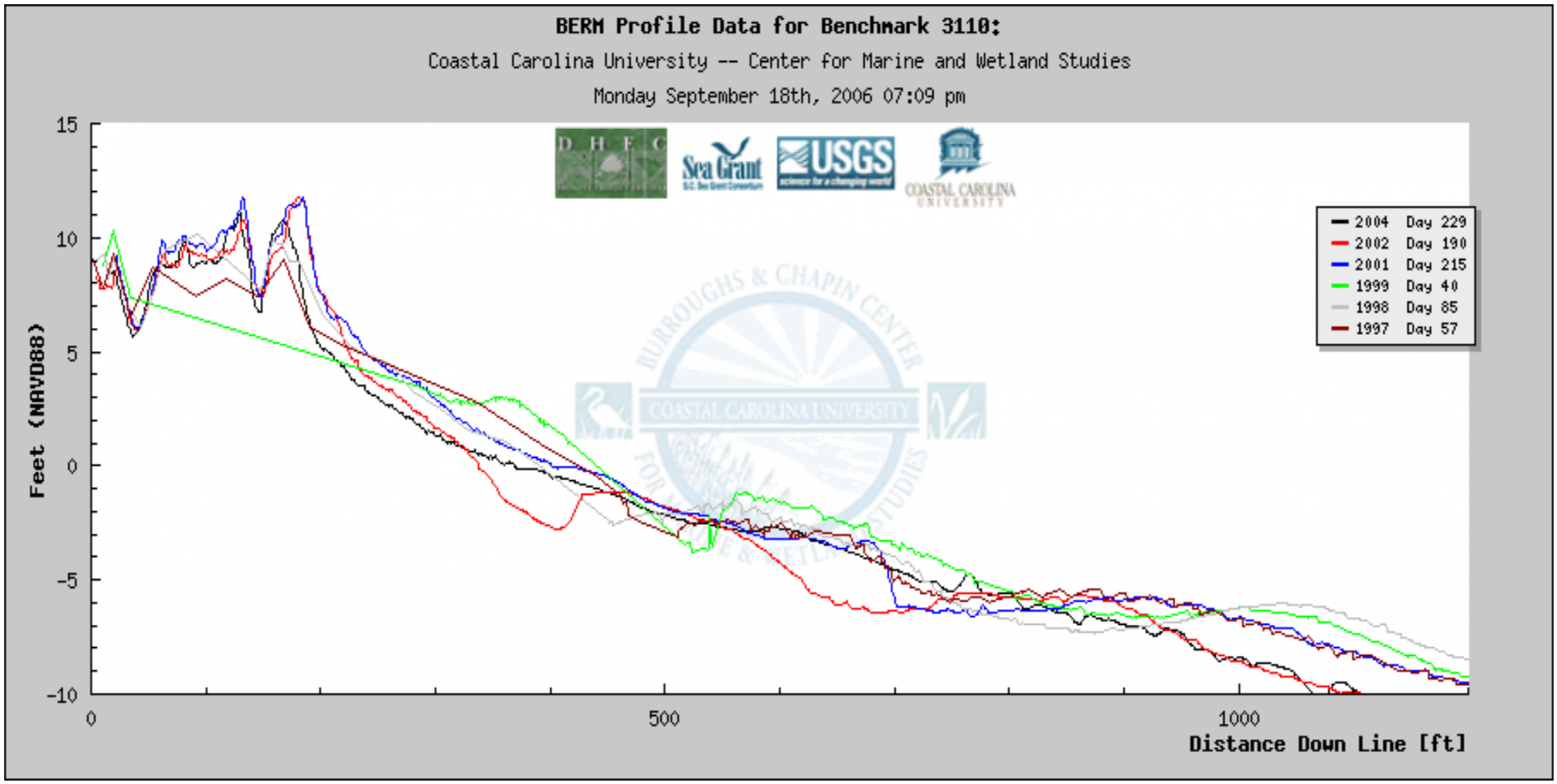

Figure 5. Beach Profiles in the Breach Inlet Unstabilized Inlet Erosion Zone at DHEC OCRM Station 3110 (3rd Avenue), created at http://camelot-2.coastal.edu/profiles/plotbybm.php

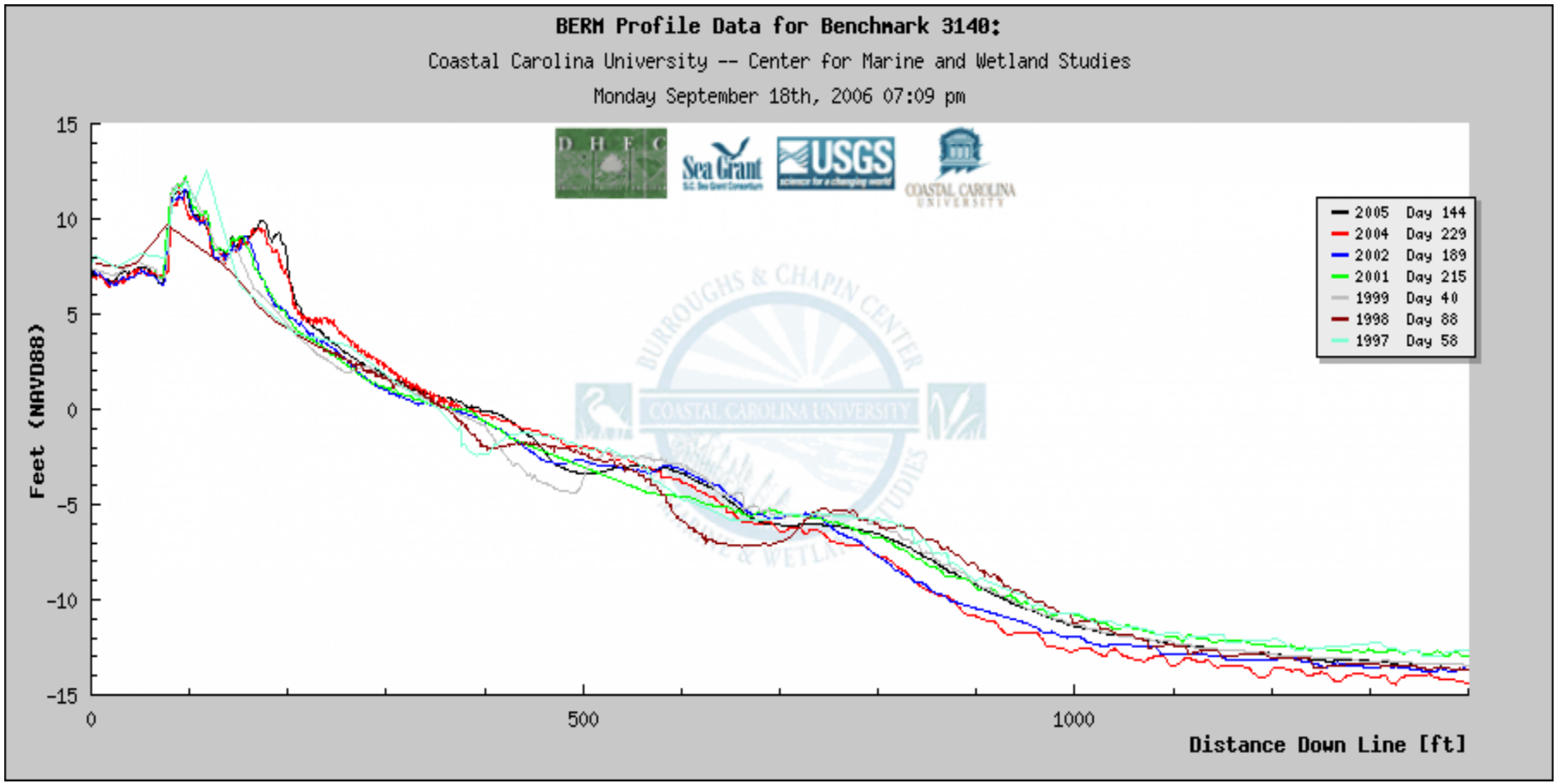

Figure 6. Beach Profiles Near the Midpoint of Isle of Palms in the Standard Erosion Zone at DHEC OCRM Station 3140 (31st Avenue), created at http://camelot-2.coastal.edu/profiles/plotbybm.php

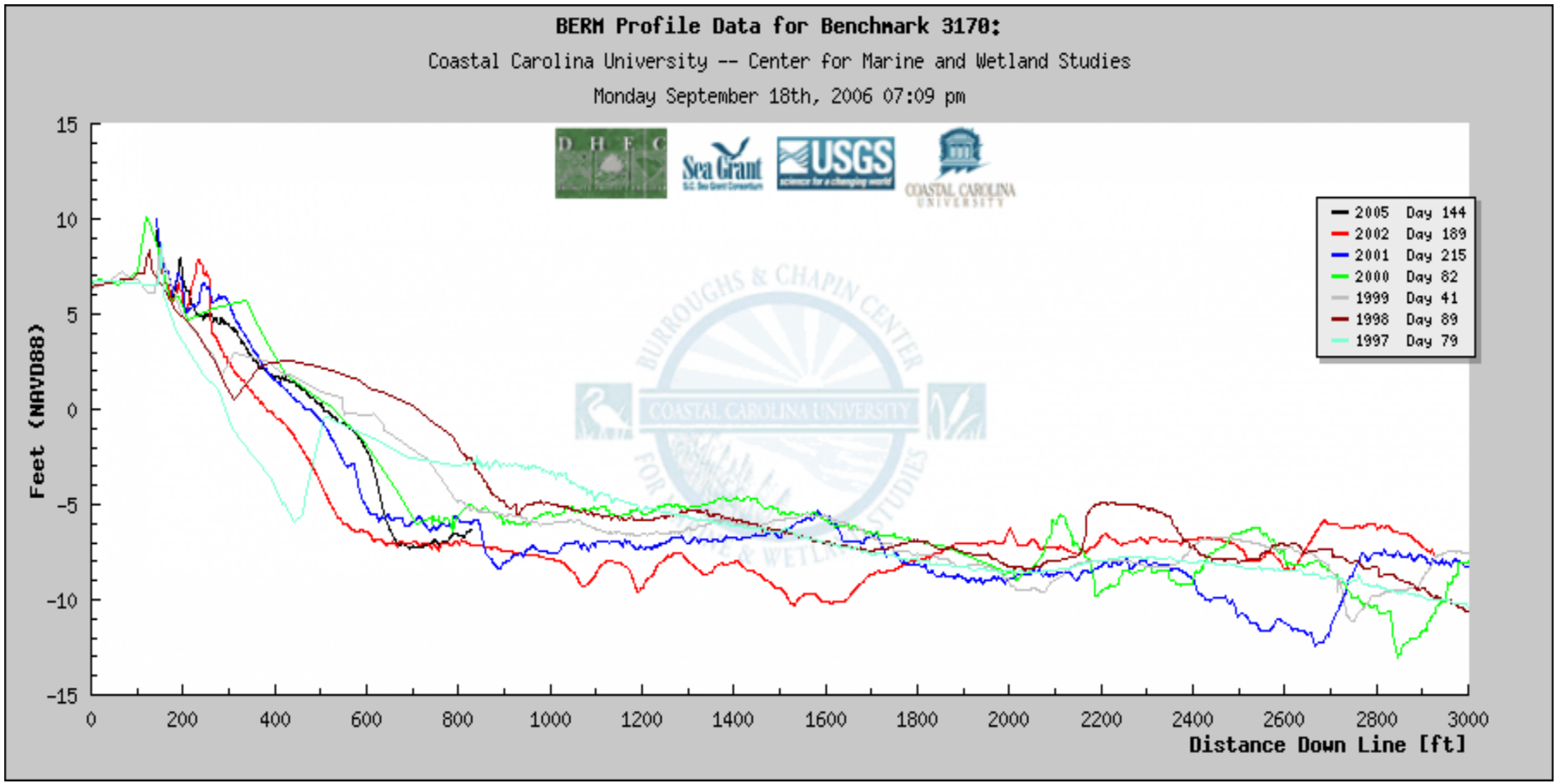

Figure 7. Beach Profiles in the Dewees Inlet Unstabilized Inlet Erosion Zone at DHEC OCRM Station 3170 (Beachwood East), created at http://camelot-2.coastal.edu/profiles/plotbybm.php

2.1.2. Shoreline Change

There are two principal sources of historic shoreline change information: 1) historic maps and charts, and 2) historic aerial photographs. Both are available for Isle of Palms, and both have been used to determine shoreline changes.

High water shoreline change maps covering the South Carolina coast were produced by the U. S. Department of Commerce, National Ocean Service (NOS, 1984). The maps show shorelines for the years 1875, 1921, 1933/34, 1962/64, and 1983. DHEC OCRM reviewed aerial photographs for the establishment of its baseline and 40-year setback line along Isle of Palms. DHEC OCRM used 1954, 1958, 1963, 1973, 1988 and 1993 aerial photographs in its analysis, and will be using later aerial photographs when it updates its baseline and setback line sometime between 2008 and 2010.

Figure 8 is taken from the NOAA (1984) historic Mean High Water (MHW) chart for western Isle of Palms. It shows the high water shorelines for the region between Breach Inlet and the commercial district, and shows the region is almost uniformly accretional over time.

Shoreline change patterns along the eastern section of the island are quite different, owing in large part to the influence of attaching sand shoals from Dewees Inlet. Shorelines near the east end of the island have advanced and receded hundreds of feet in just a few years time. Figure 9 shows an example of this shoreline change pattern.

2.1.3. Erosion Rates

Long-term erosion rates (measured over several decades or longer) have been calculated by three sources. Stephen, et al. (1975) calculated high water mark changes and change rates using aerial photographs for the period 1939 to 1973. Anders, et al. (1990) calculated shoreline change rates for the period 1921 to 1983 using the NOS (1984) shoreline change maps. DHEC OCRM calculated change rates for the period 1949 to 1988 using aerial photographs.

Anders, et al. (1990) found shoreline changes between -2 ft/yr. and +12 ft/yr. (averaging +4 ft/yr. accretion) for the island's mean high waterline during the period 1875 to 1983. Stephen, et al. (1975) documented long-term mean high water mark changes between -18 ft/yr. and +12 ft/yr. However, upland changes are usually less dramatic than high waterline changes due to rapid and large-scale mean high waterline changes associated with inlet effects.

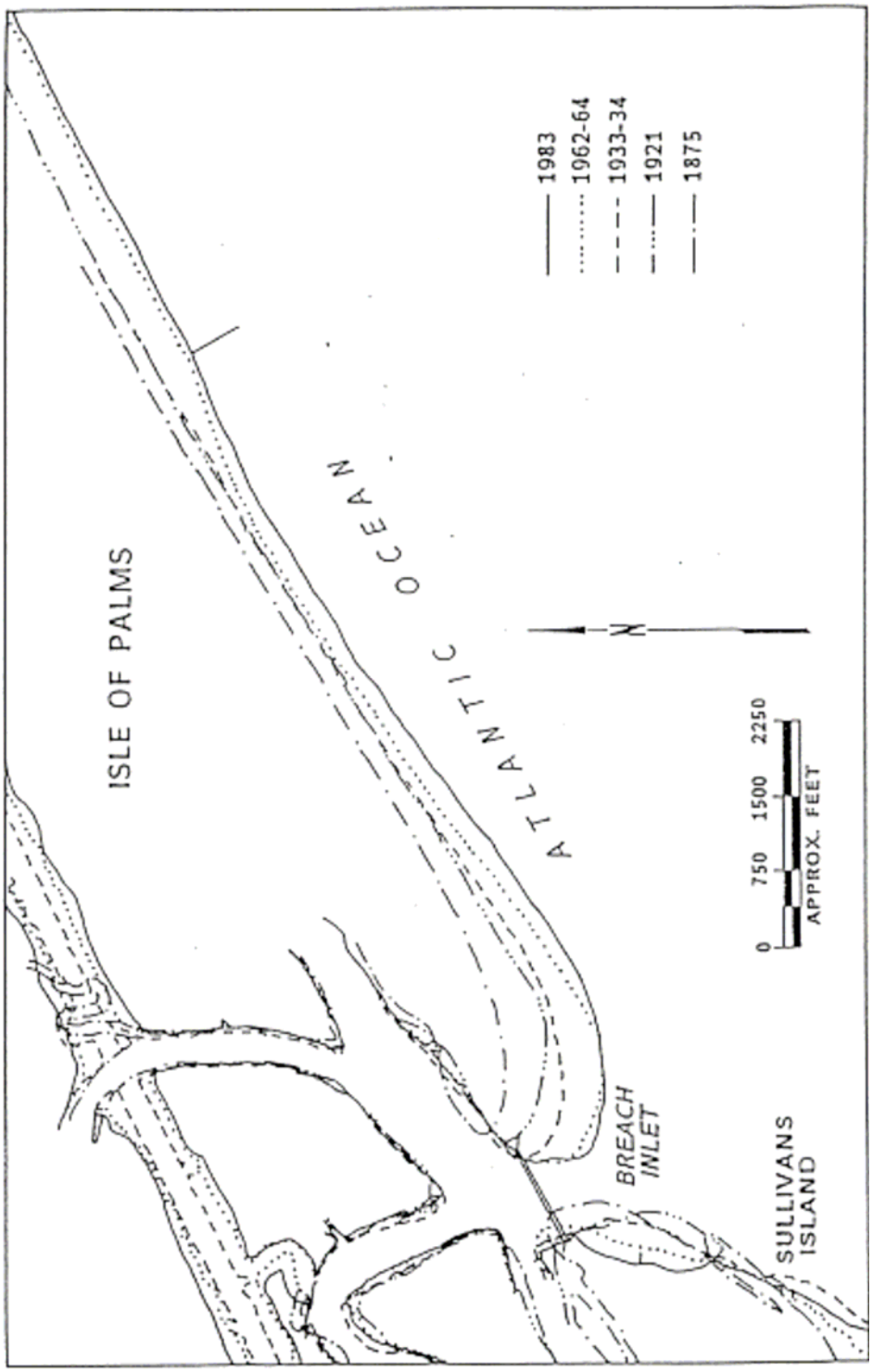

Figure 8. Historic shoreline Changes along Western Isle of Palms (Jones, 1986)

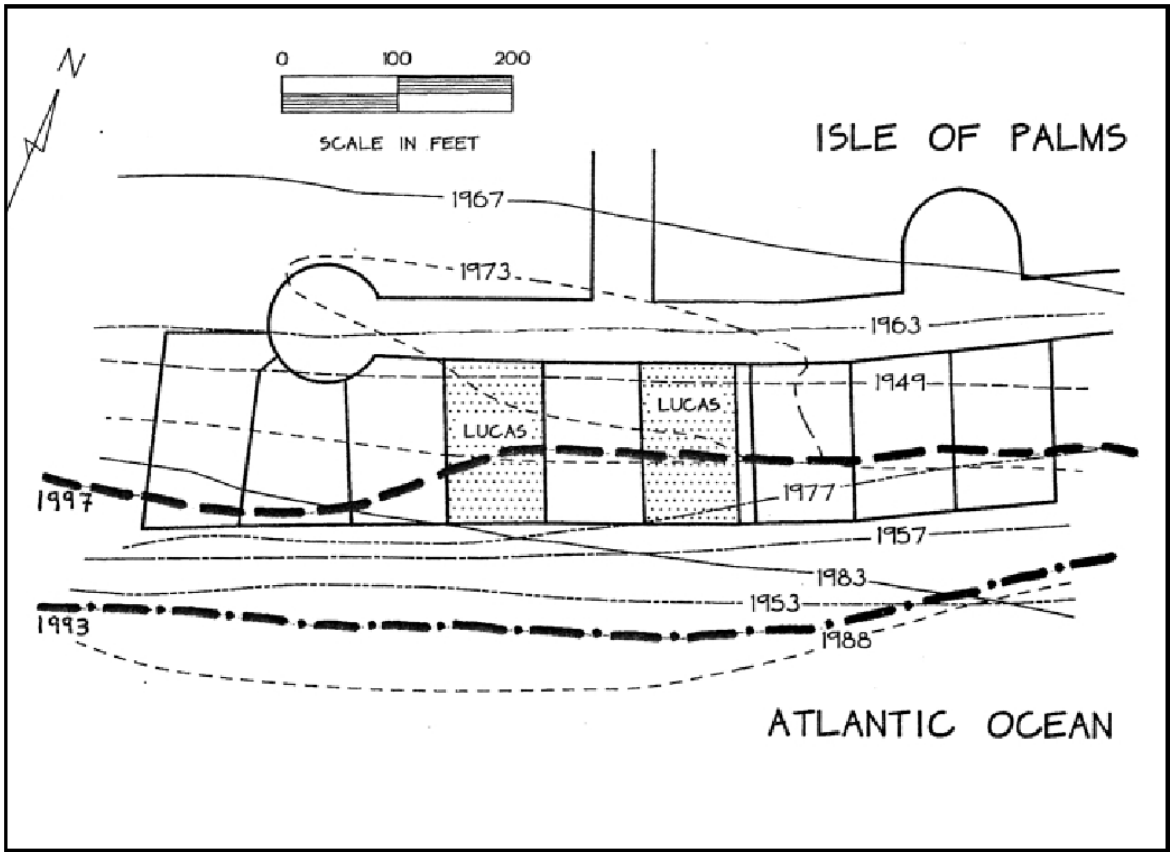

Figure 9. Example of Shoreline Changes Resulting from Nearby Shoal Attachments: Historical Vegetation Lines Superimposed on Oceanfront Lots along Beachwood East

DHEC OCRM found long-term accretion along the entire ocean shoreline, as follows: +2.0 ft/yr. inside the northern unstabilized inlet erosion zone; + (unspecified accretion rate) along the standard erosion zone; up to +8.9 ft/yr. inside the southern unstabilized inlet erosion zone. These accretion rates were adopted by DHEC OCRM and used to set the 40-year setback line.

It should be pointed out that despite long-term accretion trends, short-term erosion and accretion trends (measured over a few years time) can deviate substantially from the long-term, especially near the east end of Isle of Palms. Short-term erosion rates as high as 45 ft/yr have been documented in some areas along the Wild Dunes section of the Isle of Palms' shoreline (Applied Technology & Management [ATM], 2006).

2.1.4. Tidal Inlet Effects

The overall condition of the Isle of Palms' shoreline depends primarily on two factors: the incidence of storms and the supply of sediment bypassing Dewees Inlet onto the east end of Isle of Palms. As such, channel and shoal changes at Dewees Inlet can have a significant impact on

the Isle of Palms' shoreline, particularly along the eastern portion of the island where shoal attachments can lead to significant short-term erosion.

Breach Inlet plays a lesser role, since it acts to impound longshore sediment transport and leads to accretion along the western Isle of Palms' shoreline. Inlet channel and shoal changes at Breach Inlet may cause short-term erosion locally, but this effect is generally masked by the long-term accretional trend.

Dewees Inlet can affect the Isle of Palms in four ways:

1. Migration of the inlet channel between Dewees Island and the Isle of Palms may lead to accretion or erosion along the inlet shoreline. Historical records indicate that the Isle of Palms' shoreline along Dewees Inlet has changed relatively little since the mid-1850s; the inlet channel between Isle of Palms and Dewees Island has widened, principally through erosion along the Dewees Island inlet margin. Based on the historical record, it appears that the potential for Isle of Palms erosion due to down-shore channel migration is low.

2. Wave Penetration through gaps in the shoals adjacent to the main ebb channel of Dewees Inlet can allow northeast waves to penetrate through the inlet and attack the inlet shoreline (i.e., the 17th and 18th fairways of the Wild Dunes Links Course). These impacts are localized and do not tend to affect the ocean shoreline of Isle of Palms.

3. **Inlet shoal detachment from the ebb tidal delta complex and attachment onto the ocean shoreline of Isle of Palms has and will continue to cause the greatest erosion threat to upland development. Figure 10 shows a conceptual model for a typical shoal attachment at the east end Isle of Palms: stage 1 of the process begins when the shoal is driven toward and begins to distort the shoreline (accretion begins to occur in the lee of the shoal); stage 2 occurs as the shoal emerges and moves closer to the shoreline -- hundreds of feet of accretion can take place immediately landward of the shoal while substantial erosion will occur on either side of the accretional zone; stage 3 occurs as the shoal sediments spread laterally from the point of attachment.**

   Shoal attachments have been documented through the analysis of aerial photographs. Figure 11 shows some of the locations of shoal attachments between the period 1941 and 1995, with an anticipated 2008 shoal attachment shown. Most of the attachments have taken place along the Wild Dunes' ocean shoreline between the Beach Club Villas and Summer House developments; however, shoal attachments have been observed west of Seagrove Villas and along the 18th fairway of the Links Course.

4. Sediment trapping by Dewees Inlet can prevent the "release" of sediment to Isle of Palms beaches. If an unusually long period of time elapses with no shoal attachments, the eastern and central portions of the ocean shoreline can retreat in the absence of new sediment input. While over the long term the shoreline tends to be accretional, short term erosional periods can result due to the absence of shoal attachments and subsequent sand spreading. The area between 41st Avenue and 57th Avenue seems to be most susceptible to this effect.

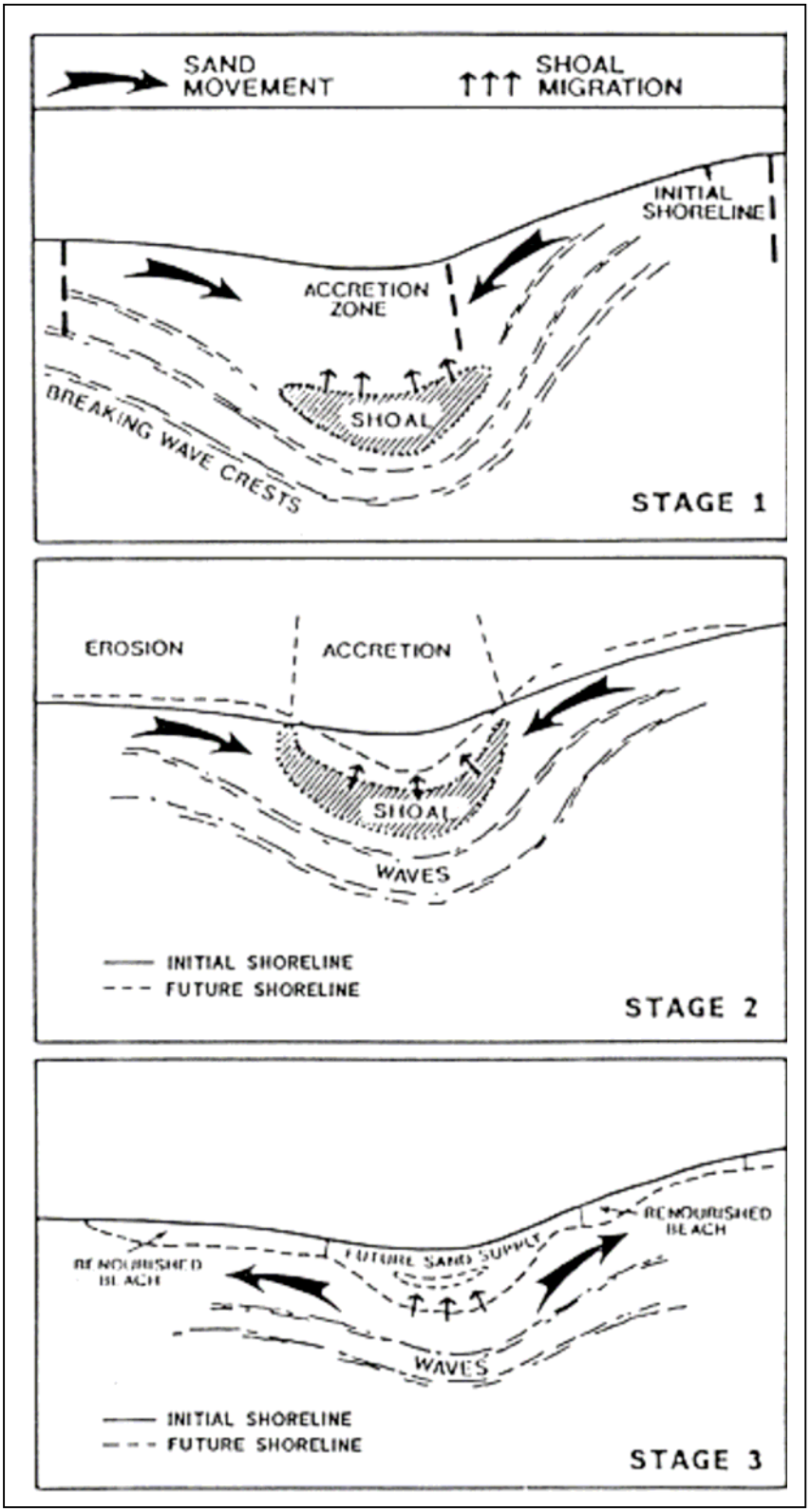

Figure 10. Typical Shoal Attachment Process (from Kana and Williams, 1985)

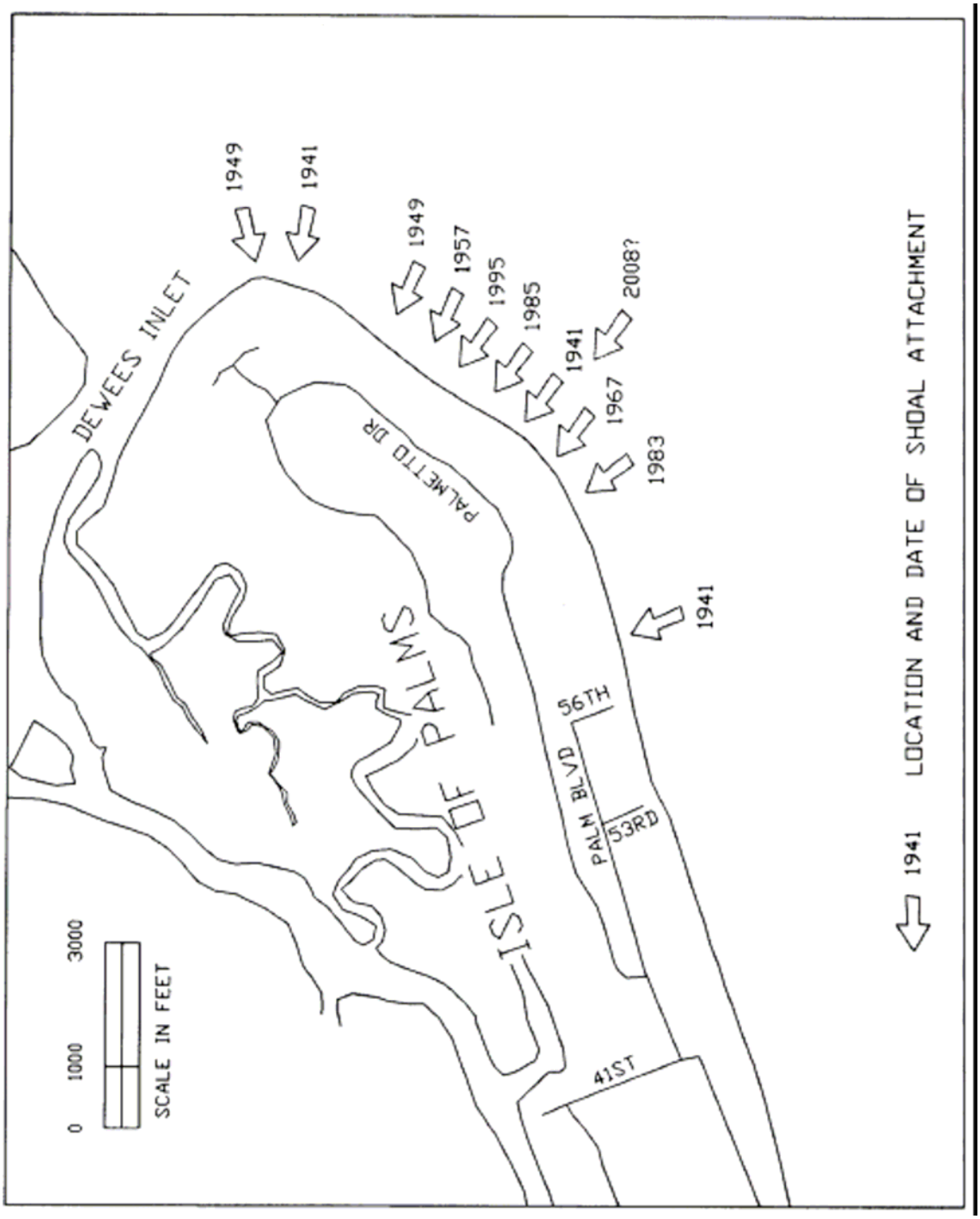

Figure 11. Approximate Locations of Selected Shoal Attachments, 1941-2008

2.1.5. Sediment Budgets

A sediment budget is an accounting of all the sediment that moves into and out of a defined system. A positive sediment budget means the system receives more sediment than it loses; a negative sediment budget means the system is losing more sediment than it gains. A positive sediment budget usually results in shoreline accretion; a negative sediment budget usually results in shoreline erosion.

Isle of Palms has a positive sediment budget, with sediments bypassing Dewees Inlet and moving onto the east end of the Isle of Palms' shoreline (i.e., the Wild Dunes area) in the form of large sand shoals. Once the shoals attach to the beach, the sediment shifts laterally along the shoreline, with the majority moving along the island's beaches in the direction of Breach Inlet; some of the sediment moves in the opposite direction, onto the Dewees Inlet shoreline. The Isle of Palms' shoreline closer to Dewees Inlet tends to exhibit unstable characteristics, due to the episodic nature of shoal attachment and sediment redistribution. Sediment that moves down the shore accumulates along the southern 1.5 miles of the Isle of Palms' shoreline, where long-term accretion rates average approximately 5 feet per year (ft/yr). Some of the moving sediment bypasses Breach Inlet in the form of sand bars that ultimately attach to Sullivan's Island.

2.1.6. Beach Use and Safety

Like most South Carolina beaches, the Isle of Palms beach is used for a wide variety of recreational activities, including sunbathing, beachcombing, walking/jogging, cycling, fishing, surfing, sand sculpting, etc. Bonfires and overnight sleeping are not permitted on the beach, nor are motorized vehicles. Generally, no commercial activities are allowed on the beach.

Boats (including sail and motor) and jet skis are permitted to be used in the waters off Isle of Palms, except within designated swimming areas (e.g., between 10th and 14th Avenues). Motorboats and jet skis cannot be beached, except in case of emergency.

Records are not kept regarding the number of visitors to the Isle of Palms beach. However, some data are available and support the notion that the beach is highly accessible and used by the public:

- Unpublished data collected by the City indicate that 38,000 vehicles parked in the two City parking lots (combined capacity of 435 +/- spaces) off Pavilion Drive between mid-March and mid-September 2007. The lots were estimated to be at 90% occupancy, or greater, for 40 days during 2007.
- Unpublished City data also show the 141 metered parking spaces along the front beach area were 100% occupied during an estimated 180 days in 2007.
- While records are not kept regarding numbers of visitors per vehicle, or number of parked visitors accessing the beach, it is safe to say that hundreds of thousands of visitors accessed the beach and/or "Front Beach" related businesses in 2007.

- Data from the Isle of Palms County Park indicate that 54,000 vehicles parked there between March and October 2007, and that an estimated 150,000 people visited the park during that period.
- The figures above do not count visitors parked at an estimated 1,000 additional beach access parking spaces along road rights-of-way (between Breach Inlet and 10th Avenue and between 21st Avenue and 57th Avenue), or visitors accessing the beach while staying at accommodations such as vacation rental homes, hotels and rental condominiums on the island.

The City routinely monitors weather and surf conditions, and receives notification of impending dangerous coastal conditions (high surf, rip currents, etc.) from the National Weather Service. Warnings are posted on the Connector Board at the Hwy. 517 entrance to the island and on the Breach Inlet information board, and warning flags are posted at guarded beaches (e.g., the County Park). Warnings are also passed along by the City to Wild Dunes.

The City has posted signs at Breach Inlet warning people of swift currents and prohibiting wading or swimming in the inlet, in accordance with Sec. 9-3-3 of the City Code.

Beach access for emergency vehicles is available at 5th Avenue, 14th Avenue, 25th Avenue, 42nd Avenue, 53rd Avenue and at the Property Owners Beach House (Wild Dunes). The City has two wave runners and larger watercraft which can be used in emergencies.

City police and Fire Department personnel have, on occasion, had to warn or rescue waders and swimmers who visited attaching Dewees Inlet sand shoals at low tide, some of whom became trapped on a rising tide.

2.2. Benefits and Value of Beach

Isle of Palms is primarily a residential community with world-class resort amenities and a modest commercial base that influence the local economy. The City's Comprehensive Plan (2004) clearly states that the island's ocean beach, tidal marshland, and marinas constitute its most important economic assets. The desirability of living near these natural resources has created relatively high property values which, in turn, have raised the tax base. Tourists spend an estimated $130 million annually on Isle of Palms (Council Member Cronin's calculations, based on Accommodations Tax data and on information contained in a recent Clemson University report [Oh, et al., 2006]).

The City estimates that there are approximately 2,500 rental units on the island (rental properties and second homes), and it is reasonable to expect that the existence of these units is due in large part to the beach and related amenities that exist on Isle of Palms. These rental units bring the City over $2 million annually in property taxes. These units also generate a large part of the +/- $1.3 million in Accommodations Taxes received by the City annually.

Tourism is the City's main industry, and the prosperity of the City is tied closely to the health of the beach. If the beach is in jeopardy, the City suffers. The sense of community and social well-

being on Isle of Palms is also tied to the beach. Without the beach, the City would exist, but it would be much different than it is at present.

2.3. Beachfront Development

Present day development along the ocean shoreline of Isle of Palms can be divided and described as follows:

- Ocean Boulevard, between Breach Inlet and 10th Avenue (approximately 1.5 miles) – single family homes
- Ocean Boulevard, between 10th Avenue and 14th Avenue (approximately 0.3 mile) – condominiums, hotels and commercial (this area is referred to locally as the "Front Beach" or commercial district)
- Isle of Palms County Park – east of 14th Avenue, with approximately 400 ft of ocean frontage[i].
- Palm Boulevard, between the County Park and 57th Avenue (approximately 2.8 miles) – single family homes
- Wild Dunes, between 57th Avenue and the Links (Golf) Course (approximately 1.4 miles) – a mixture of single family homes and condominiums (named from west to east as follows: Grand Pavilion, Seagrove, Beachwood East, Dunecrest Lane, Beach Club, Property Owner's Beach House, Mariner's Walk, Shipwatch, Summer House, Summer Dunes Lane, Port O' Call, Seascape and Ocean Club)
- Wild Dunes Links Course – at the eastern end of the island and along the Dewees Inlet shoreline (approximately 0.6 miles)

A review of the existing development along the Isle of Palms reveals the following:

1. Approximately 300 oceanfront parcels have been platted for residential or commercial use along almost seven miles of the ocean shoreline.
2. Unlike many coastal communities, the majority of the oceanfront development on Isle of Palms is set back a reasonable distance from the shoreline, and the area at greatest risk to erosion is confined to the northeastern third of the island (generally, from 55th Avenue to Dewees Inlet). Unfortunately, the northeastern end of the island is also the area where the oceanfront development density is greatest, the buildings are the largest and public beach access is limited.
3. A review of 2004 aerial photography and limited 2006 field inspections showed a total of 73 single family or condominium buildings, several swimming pools, two recreational cabanas/pavilions, one private pier, several buried rock revetments and two golf course holes lie at or seaward of the 1999 DHEC OCRM setback line. Sixty-seven of the 73 buildings lie seaward of the 1999 DHEC OCRM baseline. Structures seaward of the setback line are shown on the overlay maps and in the structure inventory tables in Section 10 of this Plan.

[i] see http://www.ccprc.com/index.asp?NID=60

4. Construction of additional buildings seaward of the setback line is unlikely, given the fact that the ocean shoreline of Isle of Palms is essentially built-out.

2.4. Land Use

The City of Isle of Palms has regulated coastal development since August, 1974. In 1997, the ordinances regulating coastal development were incorporated into the city's zoning regulations following a review of shoreline development and regulatory issues initiated as part of the creation of a new Comprehensive Plan. Zoning amendments were adopted to eliminate previously occurring overlaps and inconsistencies between state and local regulatory jurisdiction. The City's zoning map is shown in Figure 12. Specific development standards, permitted uses and other uses (accessory, conditional, temporary, etc.) are listed in Title 5, Chapter 4 (Zoning) of the City Code.

Since 1989, a Conservation District Overlay Zone has been established along the ocean, inlet and marsh shorelines, within which permitted activities include open air recreational uses, public utility lines and beach renourishment (see Figure 12).

In 1990 the City established a Preservation Overlay Zone (P-1) along the ocean shoreline between 21st Avenue and 41st Avenue. The overlay zone was established to preserve natural barriers against natural forces from the ocean; to preserve adequate light, air and open space; and to preserve scenic, historic and ecologically sensitive areas. In 2006, a second Preservation Overlay Zone (P-2) was established along the ocean shoreline between Breach Inlet and 10th Avenue.

These overlay zones establish the following seaward limits for construction:

- Overlay Zone P-1, Palm Blvd. between 21st Avenue and 41st Avenue: 130 ft from the Palm Blvd. right-of-way[j].

- Overlay Zone P-2, Ocean Blvd. between Breach Inlet and 10th Avenue: along the "Maximum Building Line" shown on the January 8, 1988 final plat by E.M. Seabrook

Activities permitted by the City seaward of the construction limit are as follows:

- Overlay Zone P-1: one dune walkover per lot, as permitted by the City Code and DHEC OCRM regulations; one open air gazebo per lot, as permitted by the City Code and DHEC OCRM regulations, not to exceed 100 square feet in floor area or 16 feet in height.

- Overlay Zone P-2: one dune walkover per lot, as permitted by the City Code and DHEC OCRM regulations; one swimming pool per lot, as permitted by the City Code and DHEC OCRM regulations.

[j] Structures and their stairs must comply with the 130 ft restriction; however, permitted underground onsite waste disposal systems may be located more than 130 ft from the Palm Blvd. right-of-way.

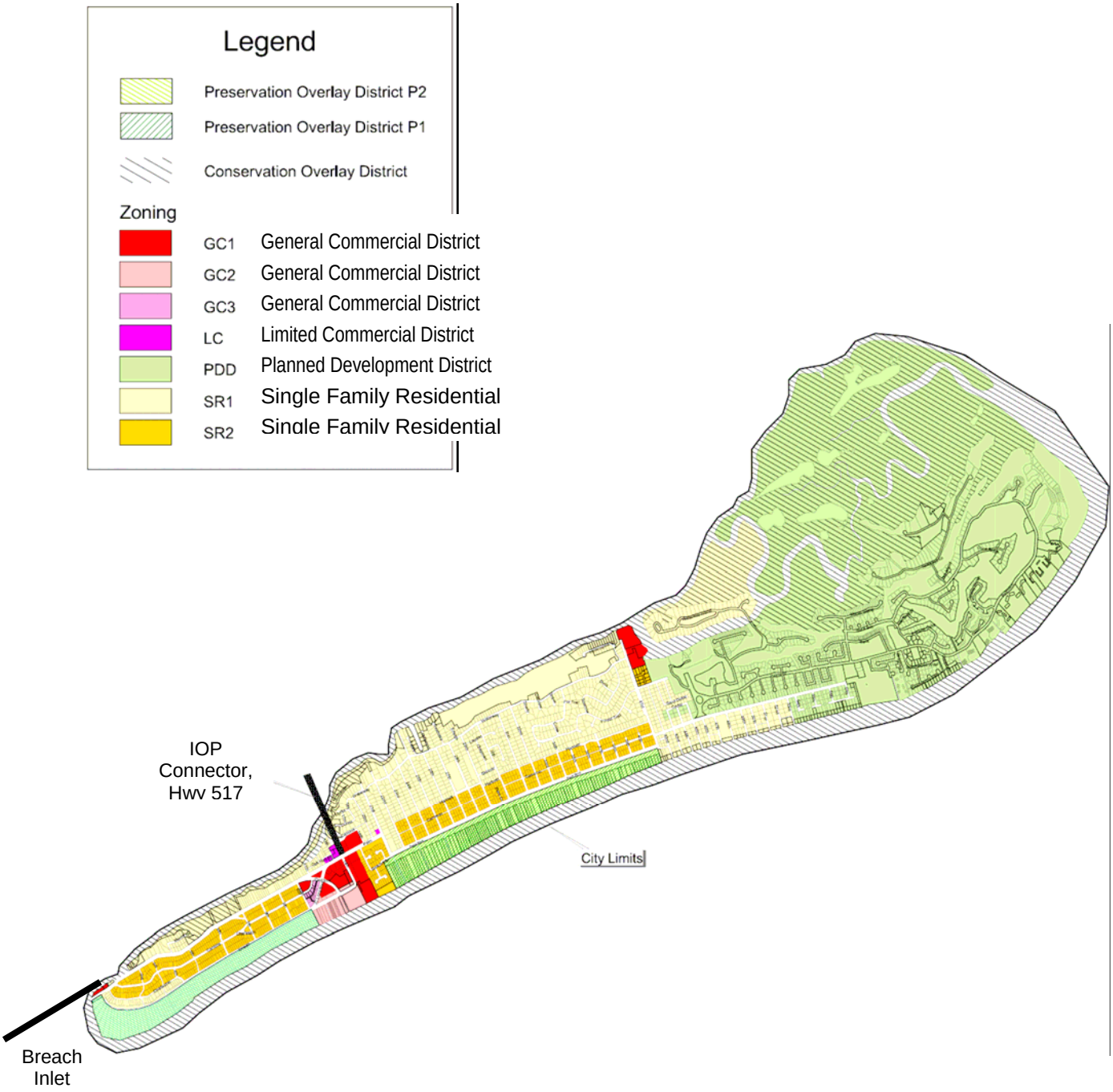

Figure 12. City of Isle of Palms Zoning Map, showing the two entrances onto the island (Breach Inlet bridge and Hwy 517 Connector)

2.5. Natural Resources and Ecological Habitats

Isle of Palms, like most South Carolina barrier islands, is characterized by a beach and dune ridge system, with an extensive tidal marsh along the northern side of the island. The island is surrounded by navigable waters and provides some opportunities for access by boat and numerous beach access points. Prior to development, the island was covered by maritime forest.

A main concern in managing South Carolina's ocean beaches is the protection and conservation of coastal natural resources and ecological habitats. As part of a coastal barrier island, the Isle of Palms beachfront exhibits a variety of natural resources due to the diversity of ecotypes and habitats that occur. The interaction between shifting terrestrial sand dune and beach habitats, shallow coastal waters, and the open ocean result in a dynamic landscape that is utilized by various organisms.

Three terrestrial habitats are found around the Isle of Palms' beachfront, namely the beach community, maritime shrub thickets, and maritime forest.

- The beach community generally includes the open beach and dune habitats, as well as the foreshore zone that is frequently inundated by the tides.
- Maritime shrub thicket communities commonly grow in older dunes, behind the primary dunes, and include salt tolerant shrubs such as wax myrtle, yaupon holly, and red cedar.
- Maritime forests are upland communities typified by live oak, cabbage palmetto, and loblolly pine, and remnant patches of this habitat are scattered throughout the island. Each ecological community provides benefits to plants and animals that use the habitat to forage, as shelter, for nesting, or for a combination of these uses.

The importance of barrier islands like Isle of Palms as habitat for plants and animals is significant. Many animals are dependent on smaller prey available on open beach habitats as part of complex food webs. Some animals also require the sands of primary dunes on barrier islands for nesting sites and are unable to successfully reproduce without access to this habitat. In the water, nearshore subtidal bars and sand flats can support large numbers and species of marine invertebrates and fish that cannot thrive in the open ocean. Long-term or permanent alteration to these habitats can affect the type, health, and vitality of the flora and fauna.

Natural habitats and resources are also recognized for the social and economic benefits that they provide. Protection of natural resources is identified in the City's Comprehensive Plan as essential to maintaining the high quality of life on the Isle of Palms. Residents indicate that the attributes of coastal ecosystems, including marshes, mature trees, marine waters, and sandy beaches influenced their decision to purchase property on Isle of Palms. In addition, the accessible ocean beach is a predominant factor in the local tourism and vacation rental economy. Eco-tourism has also increased in recent years as an economic market around Charleston and on Isle of Palms.

2.5.1. Threatened and Endangered Species

Discussions with South Carolina Department of Natural Resources (SCDNR) staff revealed there is no island-specific listing of threatened, endangered or rare species for Isle of Palms. A list does exist for Charleston County[k], but not for the island. However, limited island-specific information exists in the Comprehensive Plan:

- There are at least three species of birds that are listed on federal or state endangered or threatened lists which may be found in the area. The wood stork is listed as a state and federally endangered species. The piping plover is listed as both state and federally threatened and the peregrine falcon is listed as state-endangered.
- The loggerhead sea turtle, a threatened species, visits the island to lay her eggs along the beach. While visits have declined over the years as the island has become more developed, South Carolina beaches have the largest number of nest sites in the "population" tracked between North Carolina and Central Florida. In recent years the nests have numbered between 10 and 50 on the beaches of the Isle of Palms. It is thought that individual turtles return to the historical nesting site every two years, accounting for the wide fluctuation in the number of nests from year to year.

Green, Leatherback and Kemp's ridley turtles can nest on South Carolina beaches, but nesting on Isle of Palms is rare. The last Green turtle nest on Isle of Palms was in 1998; there has been one Kemp's ridley nest since 1980. The Hawksbill turtle does not nest in South Carolina (personal communication, DuBose Griffin, SCDNR Marine Turtle Conservation Program).

The City of Isle of Palms participates in the Turtle Team, a group of volunteers that monitors the critical habitat and nesting of loggerhead turtles on Isle of Palms and Sullivan's Island, and posts current nesting information on their web site[l]. Team members identify nest locations, mark and safeguard the nests, and relocate nests where required. Turtle nesting statistics for 2000 through 2007 are shown in Table 2.

The eastern section of the island -- which is most subject to erosion -- typically accounts for approximately 1/4th of marine turtle nesting on the island (personal communication, DuBose Griffin, SCDNR Marine Turtle Conservation Program).

[k] see https://www.dnr.sc.gov/pls/heritage/county_species.list?pcounty=charleston
[l] see http://web.ccgnet.com/turtleteam/

Table 2: 2000 - 2007 Marine Turtle Nesting Data for Isle of Palms and Sullivan's Island; Stranding Data for Isle of Palms. Source: Isle of Palms Turtle Team and SCDNR Marine Turtle Conservation Program.

	2000	2001	2002	2003	2004	2005	2006	2007
Number of Nests	42*	23*	41*	35*	10*	56*	15	26
False Crawls	30	36	28	11	4	34	11	28
Nests Relocated	23	12	21	23	5	36	8	13
Nest Success**	38	22	39	30	9	54	14	25
Hatch Success***	3,354	2,137	3,142	2,554	647	4,144	1,337	2,348
Hatch Success^	72%	83%	78%	67%	63%	69%	75%	85%
Strandings (IOP)	22	8	8	10	14	10	6	3

* approximately 90% of the nesting is estimated to occur on Isle of Palms; all nests in 2006 were on Isle of Palms; 23 of 26 nests in 2007 were on Isle of Palms

** number of nests with at least 10% hatch success

*** number of hatchlings that emerged

^ (number of hatchlings that emerge from nests/number of eggs laid) x 100

According to SCDNR statistics, there have been an average of approximately 11.6 strandings annually on Isle of Palms since 1980 (9.8/yr Loggerhead; 0.6/yr Leatherback; 0.6/yr Kemp's ridley; 0.3/yr Green; 0.3/yr unknown species). However, these figures must be interpreted carefully: studies have shown approximately 20% of the actual number of mortalities strand on the beach; strandings on Isle of Palms could have died elsewhere; mortalities occurring off the Isle of Palms beach could strand on another beach (personal communication, DuBose Griffin, SCDNR Marine Turtle Conservation Program). 2000 to 2007 stranding data (approximately 10.2/yr) are included in Table 2.

In August 2006 the City Council adopted a resolution approving and supporting the findings of the Isle of Palms Beach Advisory Committee regarding beach vitex (*Vitex rotundifolia*), an invasive woody shrub native to the Pacific Rim that colonizes dune habitats and displaces native plant species and may adversely impact turtle nesting. The Council has prohibited the planting of beach vitex and efforts to eradicate beach vitex on Isle of Palms are ongoing.

The City of Isle of Palms is also home to the Shore Bird Rescue Center, a facility where injured birds can be taken for rehabilitation and nurturing until they are released back to the wild.

2.6. Existing Public Access and Map

This Local Comprehensive Beach Management Plan serves as the repository of public beach access and parking information, details of which are provided below. Beach access and parking information will also be posted on the City's web site

A total of fifty-six (56) public beach access points lie along the shoreline between Breach Inlet and 57th Avenue, with an average distance between access points of approximately 400 ft. Three of the public access points along Palm Blvd. (between 54th Avenue and 57th Avenue) are actually owned and maintained by the Wild Dunes Community Association, but have no use restrictions and are available to the general public as well.

The Wild Dunes section of the Isle of Palms' shoreline between 57th Avenue and Seagrass Lane (Dewees Inlet) does not have public beach access points, per se, but has a total of 13 community access points owned and maintained by the Wild Dunes Community Association or homeowners associations (at an average spacing of approximately 950 ft).

Isle of Palms public access points are marked with 'Beach Access' signs, and annual maintenance occurs to replace lost or damaged signs. The access points also have beach regulation signs and trash receptacles, and many have dog waste collection and disposal containers.

Beach access for emergency vehicles is available at 5th Avenue, 14th Avenue, 25th Avenue, 42nd Avenue, 53rd Avenue and at the Property Owners Beach House (Wild Dunes).

Public and community beach access points are shown on the overlay maps and in the access inventory tables in the Section 10 of this Plan.

Public parking is available in close proximity (i.e., 500 ft) to the landward termination of beach access points between Breach Inlet and 57th Avenue. Parking spaces are in the form of either paved parking spaces, unpaved spaces (gravel or grass surface), and parking along public road rights-of-way ("on-street" parking) on the Isle of Palms.

Public parking along the rights-of way of one of the City's main roads, Palm Boulevard is permitted by the City as long as parked vehicles are not within 4 feet of the pavement, per City Code, section 8-1-32(r). The City has posted street signs indicating where parking is *not* allowed, and takes the position that public parking is allowed wherever it is not prohibited. Beach visitors are accustomed to this convention and the need to post signs stating where parking *is* allowed has not been necessary. In practice, public beach goers park along the north and south sides of Palm Boulevard between 21st Avenue and 41st Avenues, and along the north side of Palm Boulevard between 41st and 57th Avenues.

Note that public parking along Palm Boulevard between 54th and 57th Avenues is located more than 500 feet away from the sand beach. In this area, public access is provided

from Palm Boulevard by means of wood walkways across property owned and maintained by the Wild Dunes Community Association. The City maintains a public access indication sign, as it does with all other access points, and a trash receptacle at the Palm Boulevard entrances. Public access to this section of the beach is limited, and promoting opportunities to increase access is consistent with the objectives of the State Beachfront Management Act. In addition, establishing public parking closer to the beach would be infeasible due to infrastructure and development constraints. Based on these considerations, DHEC OCRM has agreed to allow public parking greater than 500 feet away from the sand beach at these specific locations to be a factor in classifying this section as achieving "full and complete" public access in accordance with the guidance established in the State Beachfront Management Plan.

Work conducted for this Beach Management Plan in September 2006 (and verified by the City Police Department) and December 2007 has documented 1,582 public vehicle parking spaces on the Isle of Palms within +/- 500 ft of beach access points, including 630 "on-street" spaces and 952 spaces in parking lots, metered spaces or other paved and marked spaces (some marked specifically for handicap parking). The numbers and distribution of public parking spaces are listed below and are shown in Table 4:

- 10 paved spaces at Breach Inlet (1 of which is designated as a handicap space) – <u>not counted for beach access credit purposes</u>
- +/- 71 "on-street" spaces along 2nd Avenue through 9th Avenue
- 2 paved spaces for handicap parking on Ocean Blvd. at 9th Avenue
- 141 paved and metered spaces along Ocean Blvd. between 10th Avenue and 14th Avenue (6 of which are designated as handicap spaces)
- 115 spaces (gravel surface) in the City-owned parking lot between Pavilion Dr. and J.C. Long Blvd.
- 320 spaces (gravel surface) in the City-owned parking lot between Pavilion Dr. and 14th Avenue.
- 362 spaces at Isle of Palms County Park (119 paved [includes 5 handicap spaces] and 243 overflow parking spaces on grass)
- 2 paved spaces for handicap parking on Palm Blvd. at 21st Avenue
- +/- 384 "on-street" parking spaces in the right-of-way along Palm Blvd. between 21st Avenue and 41st Avenue.
- +/- 25 "on-street" parking spaces at the seaward street end and in the right-of-way of 42nd Avenue
- +/- 11 "on-street" parking spaces at the seaward street end and in the right-of-way of 43rd Avenue

- +/- 9 “on-street” parking spaces at the seaward street end and in the right-of-way of 44th Avenue
- +/- 11 “on-street” parking spaces at the seaward street end and in the right-of-way of 45th Avenue
- +/- 4 “on-street” parking spaces at the seaward street end and in the right-of-way of 46th Avenue
- +/- 13 “on-street” parking spaces at the seaward street end and in the right-of-way of 49th Avenue
- +/- 9 “on-street” parking spaces at the seaward street end and in the right-of-way of 50th Avenue
- +/- 8 “on-street” parking spaces in the right-of-way of 51st Avenue
- +/- 10 “on-street” parking spaces in the right-of-way of 52nd Avenue
- +/- 16 “on-street” parking spaces at the seaward street end and in the right-of-way of 53rd Avenue
- +/- 18 “on-street” parking spaces in the north right-of-way of Palm Blvd. within +/- 500 ft of the entrance to the beach access path between 54th Avenue and 55th Avenue
- +/- 23 “on-street” parking spaces in the north right-of-way of Palm Blvd. within +/- 500 ft of the entrance to the beach access path between 55th Avenue and 56th Avenue
- +/- 18 “on-street” parking spaces in the north right-of-way of Palm Blvd. within +/- 500 ft of the entrance to the beach access path between 56th Avenue and 57th Avenue

The “on-street” parking count procedure used involved measurement of distances along the rights-of-way where parking would be possible (not prohibited by City; not blocking driveways or sidewalks, not precluded by vegetation/landscaping, not precluded by property owner obstructions); where parking is parallel to the road, each parking space was assumed to require 30 ft of right-of-way; where parking is perpendicular to the road or at a street-end, parking space widths were assumed to be approximately 12-15 ft.

In addition to the above, the City has provided space for three golf carts to park along the 25th Avenue beach access path.

The Property Owners Beach House in Wild Dunes provides the following parking for Wild Dunes residents and guests: +/- 50 paved vehicle parking spaces, and space for approximately 30 golf carts along the access path.

<u>The number and distribution of public access points are excellent, and sufficient access facilities and parking exist to classify 69% of the Isle of Palms beach as having full and</u>

complete access per the State guidelines (SCCC, 1995; see Table 3). DHEC OCRM recognizes that full and complete public access is provided along approximately 4.6 miles of the 6.7 mile beach, from a point 1/8 mile (660 feet) west of the public beach access at 2nd Avenue[m] to a point ¼ mile (1,320 feet) east of the public beach access between 56th and 57th Avenue – (see Figure 13).

Table 3. DHEC OCRM Public Beach Access Facility Classification (SCCC, 1995).

Type of Facility	**Distance on Either Side of Access Point Which Will be Considered as Having Full and Complete Access**	**Minimum Facilities**
Public Access Point	1/8 mile	Trash receptacle, walkover/improved surface access; signage; on-street parking for 6 vehicles
Local Public Access Park	1/4 mile	As above, parking for 10 vehicles
Neighborhood Public Access Park	1/2 mile	As above, showers, restrooms, parking for 25 vehicles
Community Public Access Park	3/4 mile	As above, showers, lifeguards, concession, handicapped access and parking; parking for 75 vehicles
Regional Public Access Park	1 mile	As above, parking for 150 vehicles and greater

Table 4 shows how the public access points along Isle of Palms are classified based on available parking and facilities (see white squares to the right of the listed public access locations – squares indicate the type of access facility at each access point, according to Table 3). The shaded areas above and below the white squares indicate the lateral extent of full and complete access based on the available parking and facilities. The Beach Access Tables and Overlays in the Section 10 of this Plan provide additional information for each beach access point.

Public access paths are shown on plats of the island, and the City will not permit any development or encroachments on the paths, since this would reduce or eliminate public

[m] There are 10 parking spaces at the Breach Inlet public access point, but these are not counted for access credit purposes -- there is no swimming permitted there.

beach access. The City routinely inspects public access paths and notifies adjacent property owners if their vegetation or property uses encroach into the public access paths, and the City requires those owners to correct the situation. The City also inspects rights-of-way upon which public beach access parking is allowed (i.e., where it is not prohibited), and prohibits any new encroachments. Some long-established encroachments persist due to complex legal issues, but those encroachments have been accounted for in the parking counts in this Plan.

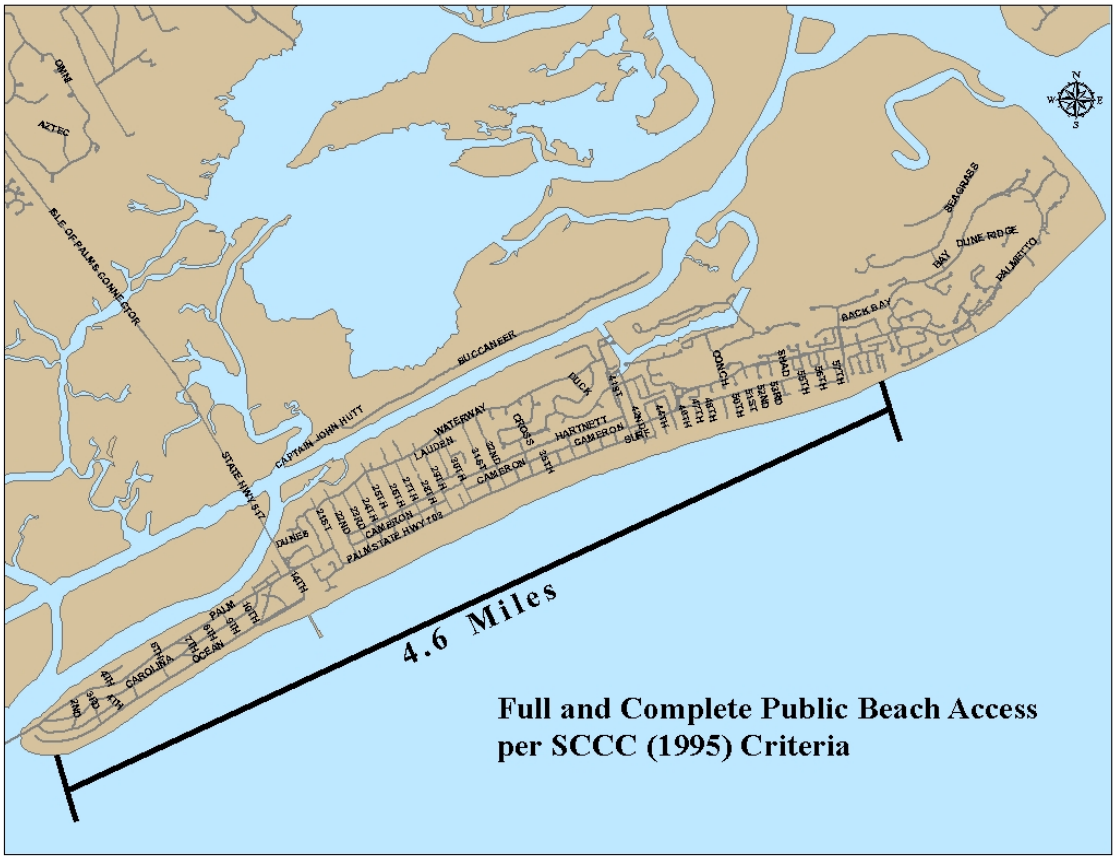

Figure 13. Region of Full and Complete Beach Access per SCCC (1995) on Isle of Palms (from 660 feet west of the 2nd Avenue beach access to 1,320 feet east of the beach access between 56th and 57th Avenues [approximately the east boundary of Grand Pavilion], a total length of 4.6 miles). The remaining 2.1 miles of ocean beach is accessible to the public but does not meet SCCC (1995) parking/facility guidelines.

Table 4. Isle of Palms Shoreline with Full and Complete Public Beach Access (shaded cells). The "Parking Spaces" column provides details on where the available public parking may be found near the corresponding beach access; see the parking description in the text on the preceding pages. Parking was determined during September 2006 and December 2007 field inspections, verified by City Police Dept.

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
1	Breach Inlet		10 paved					
2	Between Breach Inlet and 2nd Ave	--						
3	Between Breach Inlet and 2nd Ave	1						
4	2nd Ave	2	8 (on 2nd Ave row)					
5	Between 2nd Ave and 3rd Ave	2A						
6	3rd Ave	3	13 (on 3rd Ave row)					
7	Between 3rd Ave and 4th Ave	3A						
8	4th Ave	4	7 (on 4th Ave row)					
9	Between 4th Ave and 5th Ave	4A						
10	5th Ave	5	10 (on 5th Ave row)					
11	Between 5th Ave and 6th Ave	5A						
12	6th Ave	6	9 (on 6th Ave row)					

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
13	Between 6th Ave and 7th Ave	6A						
14	7th Ave	7	9 (on 7th Ave row)					
15	Between 7th Ave and 8th Ave	7A						
16	8th Ave	8	9 (on 8th Ave row)					
17	Between 8th Ave and 9th Ave	8A						
18	9th Ave	9	2 paved, 6 on 9th Ave row					
19	Between 9th Ave and 10th Ave	9A						
20	1118 Ocean Blvd	beach access	141 (metered spaces)					
21	Pavilion Dr	beach access	435 (two city lots)					
22	14th Ave	beach access						
23	IOP County Park	County Park	362 (paved lot and grass overflow lot)					
24	21st Ave	21	386 on N and S row of Palm Blvd, between 21st and 41st Ave					
25	23rd Ave	23						
26	25th Ave	25						
27	26th Ave	26						
28	Between 26th Ave and 27th Ave	26A						

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
29	27th Ave	27	(cont'd from previous page) 386 (on N and S row of Palm Blvd, between 21st Ave. and 41st Ave)		■			■
30	28th Ave	28			■			■
31	29th Ave	29			■			■
32	30th Ave	30			■			■
33	Between 30th Ave and 31st Ave	30A			■			■
34	Between 31st Ave and 32nd Ave	31A			■			
35	Between 32nd Ave and 33rd Ave	32A			■			
36	Between 33rd Ave and 34th Ave	33A			■			
37	Between 34th Ave and 35th Ave	34A			■			
38	Between 35th Ave and 36th Ave	35A			■			
39	Between 36th Ave and 37th Ave	36A			■			
40	Between 37th Ave and 38th Ave	37A			■			
41	Between 38th Ave and 39th Ave	38A			■			

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
42	40th Ave	40	(see previous)					
43	41st Ave	41						
44	42nd Ave	42	25 (at street end and on 42nd Ave row)					
45	43rd Ave	43	11 (at street end and on 43rd Ave row)					
46	44th Ave	44	9 (at street end and on 44th Ave row)					
47	45th Ave	45	11 (at street end and on 45th Ave row)					
48	46th Ave	46	4 (at street end and on 46th Ave row)					
	47th Ave	--		--	--	--	--	--
	48th Ave	--		--				
49	49th Ave	49	13 (at street end and on 49th Ave row)					
50	50th Ave	50	9 (at street end and on 50th Ave row)					

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
51	51st Ave	51	8 (on 51st Ave row)	■				
52	52nd Ave	52	10 on 52nd Ave row)		■			
53	53rd Ave	53	16 (at street end and on 53rd Ave row)		■			
54	Between 54th Ave and 55th Ave	beach access	18 (on N row of Palm Blvd)		■			
55	Between 55th Ave and 56th Ave	beach access	23 (on N row of Palm Blvd)		■			
56	Between 56th Ave and 57th Ave	beach access	18 (on N row of Palm Blvd)		■			
	Grand Pavilion				■			
	Seagrove Lane	Access for Regime and/or WD residents and guests only						
	Beachwood East	Access for Regime and/or WD residents and guests only						
	Dunecrest Lane	Access for Regime and/or WD residents and guests only						
	Beach Club Villas I	Access for Regime and/or WD residents and guests only						
	Property Owners Beach House	50 automobile spaces and 30 golf cart spaces for WD property owners and guests only						
	Beach Club Villas II	Access for Regime and/or WD residents and guests only						

Access Number, see Section 10 Tables & Overlays	Access Location	Access Signage	Parking Spaces	Full and Complete Access (per Table 3)				
				Public Access Point (+/- 1/8 mi)	Local Public Access Park (+/- 1/4 mi)	Neighborhood Public Access Park (+/- 1/2 mi)	Community Public Access Park (+/- 3/4 mi)	Regional Public Access Park (+/- 1 mi)
	Mariners Walk	Access for Regime and/or WD residents and guests only						
	Shipwatch	Access for Regime and/or WD residents and guests only						
	Summer House	Access for Regime and/or WD residents and guests only						
	Summer Dunes Lane	Access for Regime and/or WD residents and guests only						
	Port O'Call	Access for Regime and/or WD residents and guests only						
	Seascape	Access for Regime and/or WD residents and guests only						
	Ocean Club	Access for Regime and/or WD residents and guests only						
	Ocean Point	Access for Regime and/or WD residents and guests only						
	Sea Grass Lane	Access for Regime and/or WD residents and guests only						

2.7. Beachfront Structural Inventory and Map

According to the Inventory Tables and Overlays contained in the Section 10 of this Plan, 114 structures within the City of Isle of Palms are located seaward of the DHEC OCRM setback line. These include 57 habitable structures with living areas less than 5,000 square feet, 22 habitable structures with living areas greater than 5,000 square feet, 21 rock revetments, 6 decks, 4 pools, 2 ancillary buildings, 1 bulkhead, and 1 private pier. There are no revetments reported west of 46th Avenue, and the predominant area of encroachment into the setback is located east of 54th Avenue in the community of Wild Dunes.

2.8. Beachfront Drainage

Controlling stormwater and other discharges along the beachfront areas of the Isle of Palms is a priority. Uncontrolled, direct discharge to the beach cannot only lead to erosion of dune and beach areas, but can also affect water quality. In 1990, the USDA-Soil Conservation Service completed a stormwater management study for the City of Isle of Palms, covering all drainage structures, systems and watersheds between Breach Inlet and 56th Avenue.

Following an episode of serious island-wide flooding in October, 1994, the Isle of Palms City Council hired consulting engineers E. M. Seabrook, Jr. to review the study data prepared by the USDA-SCS and recommend engineered drainage improvements that would alleviate flooding conditions while still meeting stormwater management objectives of the Beach Management Act. As a result of the engineering study, E. M. Seabrook proposed $7 million in new drainage infrastructure. A bond referendum was conducted by City Council in November 1995, but the proposed bond issue was defeated by an 8 to 1 margin. Stormwater improvements are now being addressed on a project-by-project basis.

The City drafted a Storm Water Management Plan (October 28, 2005) to bring it into compliance with the National Pollution Discharge Elimination System (NPDES) permit requirements and into compliance with the State of South Carolina Stormwater Management and Sediment Reduction Act (SC Code Sec. 48-14-10) by facilitating the long range planning associated with the protection, maintenance, and enhancement of the environment of the City of Isle of Palms. The City's Stormwater Plan was subsequently approved, and in August 2007, the City adopted (see Ordinances 2007-14, 2007-15, 2007-16 and 2007-17)[n] stormwater and sediment control regulations. The City has established a stormwater utility. Land disturbance activities are regulated by the City Code (Title 3, Chapter 3, Stormwater Regulations)[o] and land development,

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[n] see pages 10-12 of City Council minutes at http://www.isle-of-palms.sc.us/client_resources/council%20minutes/city%20council%20minutes%208.28.2007%20-%20approved.pdf

[o] see http://www.isle-of-palms.sc.us/Government/CodesOrdinances.aspx

redevelopment and related activities are prohibited from illicit or improper discharge of stormwater into any receiving water (including the Atlantic Ocean). The City will meet the requirements of the NPDES General Permit for Stormwater Discharges from Regulated Small Municipal Separate Storm Sewer Systems (MS4).

The City cooperates with SCDHEC to monitor beach water quality at eight locations: 4th Avenue, 7th Avenue, 12th Avenue, 21st Avenue, 34th Avenue, 53rd Avenue, Dunecrest Lane and Port O'Call. Periodic water quality monitoring is conducted throughout the year, with increased monitoring during peak swimming months. The City has a standard protocol for warning swimmers if bacteria levels in swimming waters are elevated. DHEC will notify the City if water quality sampling results indicate unsafe conditions, at which time the City and/or DHEC will post signs in any affected areas (media reports do not always reach visitors and residents, and are not relied upon). The signs warn against wading, swimming, shell collecting and fishing until bacteria levels return to normal. All posting of signs is coordinated between the City and DHEC. No swimming advisories were required in 2005, 2006 or 2007.

3. Erosion Control and Management

As is the case for most every coastal community, erosion can and does threaten upland structures and infrastructure. Managing the erosion threat – by adding sand to the beach, relocating threatened development landward, or a combination of the two – is essential if Isle of Palms is to preserve its recreational beaches (which attract visitors and are an economic engine for the City, County and State), to preserve its tax base and to ensure the well-being of its citizens.

For the past 20+ years, erosion management on Isle of Palms has meant dealing with the periodic erosion threat to structures and infrastructure at the east end of the island. Erosion management has been undertaken largely through truck haul of sand from off-island sources, and paid for by property owners. Over the past two years, erosion problems have been addressed through a combination of truck haul beachfill, beach scraping, and placement of sand bags under emergency orders. Analysis of these Dewees Inlet shoal attachments shows that shoals attach to Isle of Palms, on average, every 6-7 years, and can adversely affect the shoreline for several years (i.e., from the point in time when a shoal begins to emerge and cause erosion, to the point when the shoal is fully attached and the sand disperses onto adjacent beaches). The City's Long-Term Beach Advisory Group believes inlet shoal attachment processes were causing erosion or posed an impending erosion threat during 11 of the past 12 years (1995-2007). A typical shoal attachment will cause erosion along approximately 1,500 to 2,000 ft of shoreline, but ultimately adds an average of approximately 400,000 cubic yards of sediment to the Isle of Palms beach (Kana, et al., 1999). Surveys show the currently approaching and attaching shoal contains over 1 million cubic yards of sediment (verbal communication, Dave Kynoski to the Advisory Group on September 17, 2007), much more than the average shoal.

3.1. Discussion of Erosion Control Alternatives

3.1.1. Emergency Protective Measures

Emergency protection along South Carolina beaches has traditionally involved small quantities of truck-haul of upland beach-compatible fill, use of sand bags and sand scraping from the low tide beach, as permitted by DHEC OCRM and other agencies. These activities have also been practiced on the Isle of Palms, with sand bags and truck-haul of off-island fill being the most common emergency protective measures.

Sand scraping for emergency berm construction was used along much of the Isle of Palms beach following Hurricane Hugo. Limited sand scraping has been use since that time (an DHEC OCRM permit for sand scraping at the east end of the island was issued in 2001, and renewed for three years in 2006). However, no corresponding federal permit was obtained. Scraping has not been employed under this permit.

In 2006, a permit application was submitted for scraping sand from the Cedar Creek Spit. The permit was issued in 2007 but did not authorize the sand scraping as requested. Instead, it authorized the placement of sand on the beach from an upland sand source. This permit has not been employed.

DHEC OCRM issued several emergency permits authorizing the use of 5-gallon sand bags to protect buildings threatened by erosion at the east end of Isle of Palms. However, the small bags offered little protection against shoal attachment erosion, and the bags scattered up and down the beach. In late 2006, DHEC OCRM authorized use of larger bags. The removal of the larger bags was required as of November 30, 2007, but the bags were not removed on that date (the City is anticipating a large beach nourishment project to be constructed in 2008, and the bag removal will be a condition of project permits).

The Isle of Palms Long Term Beach Management Advisory Committee (2007) considered emergency protective measures and made several recommendations to the City and DHEC OCRM (e.g., do not require use 5-gallon sand bags, permit larger bags; require placement of outside sand as mitigation for emergency protection; allow controlled sand scraping [shoal management]).

3.1.2. Beach Renourishment

Another common erosion management option is large-scale beach nourishment, using sediment sources normally considered to be outside the local sediment budget (e.g., offshore sand deposits, distant inlet shoals, or inland sand sources. In the case of Isle of Palms, one beach nourishment project has been completed to date – a 1983-84 project which excavated 350,000 cy of sediment from the Isle of Palms' marina and placed the sediment on the beach. A larger beach nourishment project -- 850,000 cy dredged from three miles offshore -- is planned for construction in 2008, in response to severe erosion at the east end of the island.

The Isle of Palms Long Term Beach Management Advisory Committee (2007) recommended use of both offshore dredging and management of attaching shoals as the preferred renourishment options.

3.1.3. Other Measures

Other erosion control measures can include:

- use of groins (in conjunction with beach nourishment and as a way to increase the longevity of a nourishment project),
- construction of seawalls and revetments (presently outlawed by both the State of South Carolina and the City of Isle of Palms)
- relocation of buildings and infrastructure away from an eroding shoreline (retreat)

The Isle of Palms Long Term Beach Management Advisory Committee (2007) considered each of these options, and recommended: 1) no relaxation on the City's prohibition of new groins; 2) no relaxation of the City's prohibition on the construction of seawalls and revetments landward of the DHEC OCRM 40-year setback line and within 250 ft from mean high water; and 3) opportunistic landward relocation of threatened or damaged structures.

4. Beach Management and Authorities

4.1. Public Trust Doctrine

The Public Trust Doctrine provides much of the basis for the management of public lands and waters in the United States. The Public Trust Doctrine is an example of common law, meaning rules that were derived from the traditional laws of England in the Middle Ages that are based on custom and precedent rather than legislative action. Common law often addresses issues of access, fairness, commerce, and land uses. The Public Trust Doctrine establishes that public trust lands, waters, and living resources are held in trust by the State for the benefit of all citizens. It also creates the right of the people to fully enjoy public trust lands, waters and living resources for a multitude of public uses. Finally, the Doctrine establishes responsibilities for the State when managing these public trust resources, and sets limitations on the ways government, public and private owners can use public trust resources.

In the coastal zone, the Public Trust Doctrine covers navigable waters and lands that are subject to the ebb and flow of the tide including tidal marshes and oceanfront beaches. While each state is able to implement the Public Trust Doctrine according to its own views of justice and policy, the core principles are the same throughout the country. These principles, and the responsibility they establish for the state, are at the heart of many of the state's coastal laws, regulations, and policies. In many states, including South Carolina, the jurisdiction of the Public Trust Doctrine on the beach and navigable waters of the ocean extends landward to the mean high water line. Generally, the Public Trust Doctrine protects the right of the public to pass along the shoreline up to the mean

high water line and utilize the space for fishing, navigation or recreation. The Public Trust Doctrine does not authorize the public to trespass on upland private property in order to access the beach. However, the doctrine does help preserve and protect the right of the public to access and utilize the beach.

In South Carolina, as with much of the United States, the Public Trust Doctrine has been at the center of numerous court cases and deliberations and will likely continue to be. This doctrine is at the core of the philosophy of coastal zone management and should be recognized and considered by the government, private landowners and the public at large in the course of decision-making along the beach.

4.2. Agencies and Jurisdiction

Numerous agencies have responsibility or authority for assisting in the management of the beach at Isle of Palms. This section provides a summary of the agencies with regulatory or management authority and discusses their authority as relevant to beach management in Isle of Palms.

4.2.1. Federal

The US Army Corps of Engineers (USACE)

The US Army Corps of Engineers (USACE) is responsible for providing engineering services to the United States, including a major role in civil works projects in which there is a federal interest. The regulatory mission of the USACE is to protect federal trust resources in their authority. USACE also plays a major regulatory function through section 404 of the Federal Water Pollution Control Act of 1972 (better known as the Clean Water Act), which authorizes the Secretary of the Army to issue permits for the discharge of dredged and fill material in and around wetlands.

USACE has three main permitting mechanisms, the general permit (GP), individual permit, and Nationwide permit. The Army Corps is responsible for reviewing applications and regulating beach nourishment activities under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The decision to issue a permit is based on evaluation of the probable impact of the project including cumulative impacts of the activity on the public interest.

USACE also maintains an emergency management responsibility through its Emergency Management Division located in Charleston. During emergencies, USACE is authorized to provide engineering and public works assistance to State government agencies.

The US Fish and Wildlife Service (USFWS)

The US Fish and Wildlife Service (USFWS) is the federal agency responsible for the protection of federal fish and wildlife habitats and species, specifically those that are imperiled, threatened, or endangered. Much like the National Oceanic and Atmospheric

Administration (NOAA), USFWS does not directly permit or authorize activities but is typically part of a consultation team and can elevate issues that are deemed important. USFWS is responsible for administering the federal Endangered Species Act (ESA), which protects threatened and endangered species and habitats primarily on land and on the beaches in coastal areas. The USFWS has direct responsibility for protecting endangered insects, plants, and shorebirds, and shares joint responsibility with National Marine Fisheries Service (NMFS) for the protection and recovery of sea turtles.

The Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) is part of the Department of Homeland Security and is responsible for reducing the loss of life and property and protecting the United States from hazards, including natural disasters. FEMA supports a risk-based program for a comprehensive emergency management system of preparedness, protection, response, recovery and mitigation. The Agency provides coordination, resources, and communication to state agencies during federal emergencies and is involved in promoting community resiliency and post-disaster relief.

FEMA also administers the National Flood Insurance Program, a federal program enabling property owners in participating communities to purchase insurance as protection against flood losses in exchange for State and community floodplain management.

The National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) is a federal agency housed within the Department of Commerce. The mission of NOAA is to protect federal trust resources, provide mapping of navigation channels, monitor and forecast weather, monitor coastal dynamics and conditions, and manage the nation's coast. Within NOAA are the National Ocean Service and the National Marine Fisheries Service.

The National Marine Fisheries Service (NMFS) implements the Magnuson-Stevens Fishery Management Act policies, monitors and establishes federal catch limits, restores coastal wetlands and shellfish habitat, and assesses natural resource damages to federal trust species. NMFS has coordination authority over federal activities and permits that may adversely affect Essential Fish Habitat (EFH), and requires notification and consultation prior to federal permitting of certain activities, including beach nourishment. NMFS administers the requirements of the Marine Mammal Protection Act, and has joint responsibility with the US Fish and Wildlife Service for the protection and recovery of sea turtles.

The National Ocean Service monitors coastal processes and conditions and administers the federal Coastal Zone Management program. Section 307 of the Coastal Zone Management Act requires that an applicant for a federal permit, grant, license, or approval must certify that the proposed action is consistent to the maximum extent practicable with the policies and purposes of a federally approved State coastal

management program. The state must concur with this certification prior to a federal agency undertaking the approval, authorization, licensing or funding of the proposed project.

The United States Coast Guard (USCG)

The United States Coast Guard (USCG) is the federal agency responsible for protecting the nation's waterways and coastline as part of the Department of Homeland Security. The Coast Guard's missions include promoting maritime safety, security and mobility, providing for national defense, and protecting natural resources. USCG performs search and rescue operations in coastal areas for missing boaters, lost swimmers, and sinking vessels. Coast Guard is also involved in law enforcement on the water, particularly reckless boating, boating while intoxicated and drug interdiction. In addition, the Coast Guard has authority over the permitting of bridges. A major responsibility of the Guard is to respond to, investigate, and address oil spills in a water body. USCG has developed an Area Contingency Plan for each section of the State for spills and response. USCG serves as the federal On Scene Coordinator for spills.

4.2.2. State

State General Assembly

The South Carolina General Assembly is the legal legislative body in the State and as such holds significant authority over decisions of the State. The General Assembly has the authority to control public lands, including bottomland and beaches below the mean high water mark, manage public trust resources, such as finfish and shellfish, and regulate the use of water bodies for various purposes including navigation. The Assembly has delegated responsibility for the management of many Public Trust resources to State agencies. All authority and jurisdiction assumed or acted upon by any State agency is through direct delegation of such authority from the South Carolina General Assembly.

Department of Health and Environmental Control

DHEC is the state's health and environmental management agency comprised of five deputy bureaus including Administration, Health Regulation, Health Services, EQC, and DHEC OCRM. The mission of DHEC is to promote and protect the health of the public in South Carolina. As the state's health agency, a considerable amount of resources are directed to the protection of human health. The DHEC Commissioner and a Board of Health and Environmental Control comprised of seven appointed members are appointed by the General Assembly.

Office of Environmental Quality and Control

DHEC EQC is the state's environmental management and regulatory agency and operates eight regional offices in the state. EQC manages water and community wastewater permitting, stormwater permitting, septic system, public and private wells and other

inspections, manages air emissions, brownfields, solid waste and hazardous waste, mining, beach monitoring, public swimming pools, and permitting activity for numerous environmental program areas.

Office of Ocean and Coastal Resource Management

DHEC OCRM is the State's coastal management agency and administers the federal coastal program, as amended and refined by the state, and protects and manages coastal public trust resources. Formerly known as the South Carolina Coastal Council, DHEC OCRM consists of a regulatory division, a coastal planning division, a science and policy division, communications and technical resources division, and an administrative division. The regulatory program reviews and permits dock activities, beach and dune permits, beach renourishment, wetland impacts, marina applications, and coastal stormwater permitting within the eight coastal counties. The Planning Division provides assistance to local communities in identifying and addressing coastal change, prepares guidance and policy documents to assist government agencies in understanding coastal issues, and manages the preparation of local comprehensive beach management plans.

Department of Natural Resources

The South Carolina Department of Natural Resources (DNR) is the principal advocate for and steward of the State's natural resources. This is accomplished through regulating hunting, fishing and boating activities and through conservation and land and water management programs. DNR administers the State's threatened and endangered species programs, including protection of shorebirds, sea turtles and marine mammals. DNR also administers most of the State's authority for the management of surface vessels and enforcing boating regulations through the DNR Law Enforcement Division.

Department of Transportation

The South Carolina Department of Transportation (DOT) is responsible for planning, constructing, and maintaining state roads and bridges, and providing mass transit services in the State. DOT is an Executive branch agency that is overseen by a seven-member commission. The Governor appoints the Commission chairperson and the six commission members represent the congressional districts of the State. The Commission is responsible for hiring the Executive Director who then is responsible for hiring division directors. The Department helps plan for hurricane evacuation routes and maintains and publishes the current evacuation routes. DOT also provides emergency response during hurricanes to facilitate evacuation.

Emergency Management Division

The South Carolina Emergency Management Division (EMD) is responsible for preparing for, responding to, and assisting in recovery after major disasters, storms, and other emergencies. EMD is comprised of six divisions under the supervision of a Division Director. The divisions include the division director's office, public

information, preparedness and recovery, response and operations, critical incident management group (CIMG) and administrative services. EMD provides planning assistance for communities prone to emergencies such as storms or hazards, and also provides training to responders. A Regional Emergency Management Program is housed in EMD that provides on-the-ground assistance to communities in the six EMD districts. EMD also works directly with county and local governments following storms to help facilitate rebuilding.

4.2.3. *City*

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

- police and fire (public safety, emergency operations, evacuations, etc.)
- building and planning (regulation of new and existing construction, land use and development, code enforcement)
- public works (collection of garbage and debris; beach maintenance; street signs; ditch maintenance and overall right-of-way grooming of public property)
- recreation (management of beach events)
- judicial (adjudication of beach-related violations of the City Code).

4.3. City Regulation and Management

4.3.1. City Comprehensive Plan

The Comprehensive Plan is intended to document the history of development on the Isle of Palms, to identify the community's problems and needs, and to articulate a vision for its future. The Plan is also intended to help guide future decision making in matters affecting the physical, social, and economic growth, development and redevelopment of the community. The plan is not a final product; it is part of a continuing planning process and is updated and revised as new information becomes available or as new problems and needs arise. The latest revision to the Comprehensive Plan was made on April 14, 2004.

4.3.2. Land Use, Development and Zoning

Title 5 of the City Code contains regulations pertaining to the Building Code, zoning and land use regulations.

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[p] According to Section 5-7-140 of Title 5 of State Law, the City's corporate limits, and therefore jurisdiction, extend one-mile seaward of the high tide line.

4.3.2.1. Building Regulations and Code Enforcement (Title 5, Chapter 1)

Chapter 1 establishes the authority of the Building Official and the Code Board of Adjustments and Appeals, and lists the currently adopted codes (generally the 2000 series of the International Codes: the 2000 International Building Code, the 2000 International Residential Code, etc.). These codes govern new construction and reconstruction on the island.

4.3.2.2. Zoning (Title 5, Chapter 4)

Chapter 4 lays out general zoning provisions, including those pertaining to various districts (see Figure 12), Chapter 4 also contains provisions pertaining specifically to beach regulations, sea turtle protection and flood damage protection.

4.3.2.2.1. Beach Regulations

Isle of Palms regulations pertaining to beach protection (Sec. 5-4-15 of City Code) require conformance with the State's Beachfront Management Act. The City's beach regulations also regulate development and other activities within 250 feet from mean high water, which can extend landward of the DHEC OCRM 40-year setback line. Within this 250 ft zone, the City prohibits new seawalls, revetments, bulkheads, rip-rap, and/or any other hard erosion control structures (existing erosion control structures may be maintained or repaired, but not enlarged, subject to local, state and federal permitting requirements). City Beach regulations also protect public beach access by prohibiting encroachments into public beach access routes and by prohibiting vehicle parking that blocks or obstructs public beach access.

4.3.2.2.2. Sea Turtle Outdoor Lighting Regulations

Sec. 5-4-17 of the Code specifies lighting requirements for the protection of sea turtle hatchlings.

4.3.2.2.3. Non-Conforming Structures

Reconstruction of damaged non-conforming buildings and other structures along the oceanfront (and elsewhere on the island) are governed by the City Code, specifically:

- Title 5, Chapter 4, Article 8 (Flood Damage Prevention) requires any work on substantially damaged or improved non-conforming structures to be in accordance with the requirements for new construction.
- Sec. 5-4-47(e) provides that any non-conforming structure damaged 50 percent or more of its appraised value at the time of the damage may be repaired or rebuilt as long as the extent of its pre-damage non-conformity is not increased (i.e., the repaired or rebuilt structure may occupy the original structure footprint). However, if the owner or the owner's agent willfully destroys or removes a non-conforming structure, a rebuilt or replacement structure must conform with the

City's zoning requirements for new construction and may *not* be able to occupy the original footprint.

Work on non-conforming structures must comply with both of the above, which means the more restrictive of the two will govern. Work seaward of the 40-year setback line must also comply with DHEC OCRM requirements.

4.3.2.2.4. District Regulations

The City has established two single family residential districts (SR-1 and SR-2), three commercial districts (LC, GC-1 and GC-2), one multifamily residential district (MF), one planned development district (PDD), one conservation overlay district (CO), and two preservation overlay districts (P-1 and P-2). District regulations are contained in Chapter 4, Article 2, sections 5-4-31 through 5-4-51. Section 2.4 of this *Local Comprehensive Beach Management Plan* discusses provisions of the conservation district and preservation overlay district requirements that pertain to beach management.

4.3.2.2.5. Landscaping and Tree Removal Regulations

Chapter 4, Article 3 includes regulations for tree removal and landscaping. These regulations apply everywhere on the island, including portions of parcels seaward of the DHEC OCRM 40-year setback line.

4.3.2.2.6. Flood Damage Prevention

Sec. 5-4-151 through 5-4-169 [Flood Damage Prevention] of the City Code govern development activities within the Special Flood Hazard Area. With the exception of a small area (approximately 300 ft wide by 5,000 ft long, 35 acres in size) in Wild Dunes, the entire City lies within the Special Flood Hazard Area (SFHA) and is subject to these requirements. The Code requires that all repairs to substantially damaged structures and substantial improvements be carried out in accordance with the requirements for new construction, where substantial improvements include repairs, reconstruction and improvements whose cost exceeds 50% of the value of the structure prior to improvement (substantial improvements are defined in Sec. 5-4-155).

The City Code has adopted the most recent Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) for the Isle of Palms, which were issued in 2004 (Federal Emergency Management Agency, 2004). The FIRMs are reportedly similar to those issued in 1991 following Hurricane Hugo. Flood hazard zones, Base Flood Elevations (BFEs) and stillwater flood elevations from the 2004 FIS are shown in Table 5.

The City has established the minimum elevation of the lowest floor for new construction at the BFE, consistent with NFIP minimum requirements. The November 2004 FIRMs and FIS should be consulted for specific flood zone and elevation requirements for any specific location on Isle of Palms.

Table 5. Flood Elevation Data from the 2004 Flood Insurance Study (FEMA, 2004)

Recurrence Interval	Stillwater Elevation (ft NGVD)	Associated BFEs (ft NGVD)**
10-year	9.1	
50-year	11.5	
100-year	12.0*	Zone AE: 13.0 to 16.0 Zone VE: 16.0 to 23.0
500-year	14.2	

* not including 2.6 feet of wave setup, which is included in the BFEs

** BFEs listed above are higher than the 100-year stillwater elevation, due to the impacts of wind-driven waves along the shoreline

4.3.3. Beach Management

4.3.3.1. Public Access and Parking

Public beach access routes are shown on City plats and are not subject to development or elimination. Parking for public beach access is permitted in any City-owned or controlled parking area, and along road rights-of-way, where not expressly prohibited (Section 8-1-32 lists parking prohibitions, for example subsection 8-1-32(r) prohibits parking within 4 feet from Palm Boulevard).

Sec. 5-4-15 and 8-1-19 of the City Code prohibit driving on beach access paths (with an exception for emergency vehicles). Section 5-4-15 also prohibits any encroachments in or obstructions of public beach access paths. The City also restricts any new encroachments into road rights-of-way where the public is permitted to park for beach access.

4.3.3.2. Dogs

Sec. 6-2-23 of the Isle of Palms Code prohibits persons from allowing a dog to disturb nesting sea turtles, turtle nests or turtle hatchlings, or from allowing a dog to enter into critical habitat areas which have been posted by the City or the State.

Sec. 6-2-15 of the Isle of Palms Code requires dogs to be under the voice command and control of an owner or other person during those limited times when dogs are permitted to roam on the beach (between the hours of 5:00 o'clock a.m. and 10:00 o'clock a.m. from November 1st through March 31st and between the hours of 5:00 o'clock a.m. and 8:00 o'clock a.m. from April 1st through October 31st). The dog owner or other person charged with the custody and control of a dog shall at all times be in close proximity to the dog, have a leash in hand, and have the dog under control.

4.3.3.3.Beach and Marine Regulations (Title 7, Chapter 3)

This chapter 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.

4.3.3.4.Regulation of Activities Affecting Protected Species and Habitats

Sec. 5-4-17 of the Code specifies lighting requirements for the protection of sea turtle hatchlings.

Dogs on the beach are restricted per the requirements stated above in Section 4.3.3.2 of this Plan.

Sec. 7-5-2 of the Isle of Palms Code prohibits persons from disturbing or entering into a posted critical habitat area.

4.3.3.5.Vehicle Operation on the Beach or Beach Accesses (Title 8)

Vehicular traffic on the beaches of Isle of Palms is generally prohibited [see Sec. 7-3-3 and 5-4-15(C)(5)(a)]. The following vehicles are permitted to use the beach accesses and beaches: emergency vehicles; vehicles used for public health and safety purposes (e.g., trash pickup); and other vehicular uses approved by the City Council.

Vehicles operating on the beach must be operated in such a manner that pedestrians and other beachgoers are not endangered or harmed. Further, vehicles must be driven on the wet sand beach whenever possible, and must not travel on the dry sand or upper beach except as necessary; vehicles must not disturb nesting areas or other sensitive areas. Vehicles must use only designated vehicle access points to gain access to and from the beach.

4.3.3.6.Destruction of Sea Oat Plants

Sec. 7-3-21 states that it is unlawful for any person to cut, collect, break, or otherwise destroy sea oat plants or other native dune grasses, or any part thereof on public property, or on private property without the owner's consent.

Dune construction and revegetation seaward of the State’s 40-year setback line must comply with DHEC OCRM requirements and guidelines (e.g., see SC OCRM, 2002).

4.3.3.7.Swimmer Safety

Sec. 7-3-22 of the City Code states that duly appointed law enforcement officers of the City shall have the power and authority to recall from the waters adjoining the beach any person who, in their discretion, shall be in danger of drowning or becoming imperiled, or who may imperil the safety of others, or when the condition of the wind, water, weather

or any hazard, including the physical and mental condition of the person in the water, shall be such as to constitute a danger to the health, life, or safety of that person, rescue personnel or other persons within the waters.

Sec. 9-3-3 of the City Code states it shall be unlawful for any person to swim or wade in the waters at Breach Inlet.

Sec. 7-3-5 of the City Code prohibits the use of surfboards within 200 ft of any fishing pier or 100 ft from any bather, and Sec. 7-3-6 prohibits the operation of boats (including sail and motor) and jet skis within designated swimming areas (e.g., between 10th and 14th Avenues. Sec. 7-3-6 also prohibits the operation of boats, water skis, aquaplanes, surfboards or similar devices while under the influence of alcohol, narcotic, barbiturate, marijuana or hallucinogen.

4.3.4. Hazard Mitigation Plan

Hazard Mitigation planning for the City has been carried out in conjunction with the regional effort led by Charleston County. The City has recognized and participated in the Charleston Regional Hazard Mitigation Project Committee[q] since August 27, 2002. The City posts a link to the regional plan on the City web site.

The regional plan contains Isle of Palms-specific information related to hazard event history, critical infrastructure vulnerability, repetitive flood losses and the value of structures within the special flood hazard area.

4.3.5. Stormwater Management Plan

In August 2007, the City adopted stormwater and sediment control regulations (see Ordinances 2007-14, 2007-15, 2007-16 and 2007-17), and has established a stormwater utility. Land disturbance activities are regulated by the City Code (Title 3, Chapter 3, Stormwater Regulations) and land development, redevelopment and related activities are prohibited from illicit or improper discharge of stormwater into any receiving water (including the Atlantic Ocean).[r]

4.3.6. Floodplain Management

Sec. 5-4-151 through 5-4-169 [Flood Damage Prevention] of the City Code govern development activities within the Special Flood Hazard Area. The City participates in the National Flood Insurance Program, and administers its floodplain management in accordance with NFIP and SCDNR requirements.

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[q] see http://www.isle-of-palms.sc.us/departments/emergencypreparedness.aspx

[r] See Section 2.8 of this Plan for additional information.

4.4. Local Enforcement

Isle of Palms is currently served by a police force of 17 sworn officers, eight (8) auxiliary staff, 18 patrol cars, one (1) animal control truck, one (1) beach services truck and one (1) all terrain vehicle for beach patrol. The heavy volume of vehicular traffic, parking, and the safety of bicyclists and pedestrians are currently challenges facing the island. Also, as the numbers of boats and jet skis on waters around the island increase, regulatory measures may be necessary in the future to ensure that the City's waterways remain safe

The City is currently served by a building official (who also serves as building inspector and a code enforcement agent) and two other employees who serve code enforcement agents.

4.5. Public Outreach and Education

The City maintains extensive public outreach and education capabilities, through its web site, newsletters and other methods. Citizens are involved in seven boards, committees and commissions (Planning, Zoning Appeals, Code Appeals, Beach Advisory, Accommodations Tax, Elections, and Real Property), and in occasional ad-hoc advisory groups (e.g., Long-Term Beach Management Advisory Group, 2007).

5. Shoreline Retreat Policy

5.1. State Mandated Beachfront Setback

The State of South Carolina established a forty-year policy of retreat as part of the Beachfront Management Act. DHEC OCRM, as the steward of the State's coastal resources, is responsible for implementing this policy. The policy is implemented by DHEC OCRM using a baseline and a 40-year setback line which run generally parallel to the shoreline on oceanfront beaches, and seaward of which DHEC OCRM has jurisdiction. The baseline is a line approximating the dune crest or another physical feature, from which the 40-year setback line is measured. The 40-year setback line is a projection of future erosion (but not less than 20 feet landward of the baseline). The baseline is established in different ways, depending upon the nature of the shoreline. The baseline and setback line are evaluated and redrawn by DHEC OCRM every eight to ten years.

As directed by the Beachfront Management Act, DHEC OCRM has classified stretches of beach as standard erosion zones and inlet erosion zones based on their morphology and erosion characteristics. A standard erosion zone is a shoreline segment with a fairly constant range of beach profiles and sediment characteristics, and which is not influenced directly by a tidal inlet or associated inlet shoals. An inlet erosion zone is a segment of shoreline along or adjacent to a tidal inlet, and which is directly influenced by the inlet and/or its associated shoals. Inlet erosion zones are further divided into stabilized and unstabilized zones, with the former altered by jetties, terminal groins or other structures, and the latter not subject to those structures.

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 has been altered by the construction of erosion control devices, groins or other manmade alterations, the baseline is established where the crest of the dune would be if the shoreline had not been altered. The baseline for a stabilized inlet erosion zone is established in a similar way to that in standard erosion zones, using the dune crest along the stabilized shoreline. For unstabilized inlets, DHEC OCRM establishes the baseline at the most landward point of erosion at any time during the past 40 years.
All baseline and setback line determinations are made by DHEC OCRM using the best scientific and historical data available. DHEC OCRM considers shoreline and beach/dune profile changes over time, the presence of erosion control devices, previous beach nourishment, inlet migration, inlet stability, inlet channel and ebb tidal delta changes, and inlet sediment bypassing in making its determinations.

No new construction is permitted by DHEC OCRM 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 built before 1988, or structures permitted by a DHEC OCRM special permit. A DHEC OCRM permit is required for all of the above actions except for the construction of wooden walkways not more than six feet wide.

Construction between the 40-year setback line and the baseline is restricted by DHEC OCRM in order to implement the State's forty-year retreat policy. Construction, reconstruction, and alteration of habitable structures, erosion control devices, and swimming pools are regulated and require a permit from DHEC OCRM. New habitable structures built between the baseline and setback line may not exceed five thousand square feet of heated space, must be located as far landward on the property as possible, and must not incorporate any erosion control structure or device as part of the integral habitable structure. No part of the building may be constructed seaward of the baseline or on the primary sand dune. A permit applicant must certify to DHEC 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.

DHEC OCRM is responsible for assessing the damage to erosion control devices and habitable structures, to determine the extent of damage following hurricanes or other events.

Building owners may replace habitable structures permitted within the setback that have been destroyed beyond repair by natural causes after notifying DHEC OCRM. The owner must certify that the total square footage of the replacement structure seaward of the setback line is not greater than the original square footage beyond the setback line, that the replacement structure is no further seaward than the original structure, and that it

is constructed as far landward as possible, considering local zoning and parking requirements.

No new erosion control devices are allowed to be constructed seaward of the setback line, except to protect a public highway which existed prior to the enaction of the Beachfront Management Act. Erosion control structures that existed before 1988 may not be repaired or replaced if destroyed more than fifty percent above grade.

No new pools are permitted to be constructed seaward of the setback line, unless they are located as far landward as possible from an existing, functional erosion control device. Pools that existed prior to 1988 may be repaired or replaced, if destroyed beyond repair, and if the owner certifies to DHEC OCRM that the pool 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.

DHEC OCRM may issue a special permit for all other construction or alteration between the setback line and baseline.

5.2. City-Mandated Beachfront Setback and Protection Regulations

The City has instituted setbacks greater than the DHEC OCRM 40-year setback line in many locations. For example, the Conservation Overlay Zone and Preservation Overlay Zones (see Section 2.4 above) restrict construction in an area farther landward than the State's 40-year setback line along much of Ocean Blvd. and Palm Blvd. City Beach regulations prohibit construction of hard erosion control devices within 250 ft of the mean high water line, and this can preclude their construction in an area landward of the State's 40-year setback line.

6. Disaster Recovery and Mitigation

6.1. Preparedness and Evacuation

In the wake of Hurricane Hugo, the city developed a Disaster Preparedness Plan to guide its citizens and post-disaster operations[s]. Under this plan, the city government addresses evacuation of citizens and visitors on the island, damage assessment, utility restoration, and re-entry onto the island, among other things. The City will work with all appropriate agencies, in advance of a disaster (if predictable) and after, to minimize potential injury and damage, and to expedite recovery and redevelopment.

Section 1-2-5 of the City Code describes the emergency powers of the Mayor (and others designated by the Mayor) in the event that a disaster or other emergency occurs. These powers will facilitate disaster response and recovery.

[s] see http://www.isle-of-palms.sc.us/Departments/EmergencyPreparedness.aspx

The City of Isle of Palms is designated by the Charleston Regional Hurricane Evacuation Plan as a Category 1 Evacuation area, meaning that all tourists and residents should evacuate the island in the event that a Category 1 or greater hurricane threatens the area.

In the event of a hurricane threat, the City will implement its Disaster Preparedness Plan. In case of a pending storm, and upon activation of the Charleston County Emergency Operation Center, the Mayor or designee will notify the City's Hurricane Preparedness Committee and establish a Municipal Emergency Operations Center (MEOC) at Police Headquarters (City Hall, (1207 Palm Blvd.). The MEOC will alert all island businesses, which will be responsible for notifying their employees, and all island rental agencies, which will be responsible for notifying their guests. Storm notices will also be provided to the Wild Dunes security, who will notify the occupants of all vehicles passing through the gates. The City Fire Department will dispatch trucks broadcasting the recommended evacuation.

SCE&G, the electric and gas provider to the island, is authorized to turn off all power at the island substation following an order for voluntary evacuation and notification by the MEOC that evacuation is significantly complete.

If mandatory evacuation is ordered, City Police will restrict Island access at the Breach Inlet Bridge and IOP Connector to all except emergency and official vehicles. Providing it is safe to do so, and manpower is sufficient, fire and police department personnel may go door to door to advise citizens of the mandatory evacuation. The MEOC will remain at City Hall as long as it is deemed prudent. In the event of a mandatory evacuation, the MEOC will relocate to the Charleston County Satellite Complex on Iron Bridge Road in Mount Pleasant. The island Fire and Police Department personnel will remain on the island until they must evacuate for the safety of personnel and equipment. Upon evacuation of the City fire and police, no emergency services will be available on the island and there will be no access to or from the island until the emergency is lifted.

Evacuees from the Isle of Palms would use the Isle of Palms Connector (SC 517) to go to US 17. The right lane will turn north on US 17, then proceed to SC 41, to SC 402, then to US 52 to SC 375, then to US 521, to SC 261 to US 378 to Columbia. Evacuees using the left lanes of the Isle of Palms Connector would turn left to go to I-526 then on to I-26. Evacuees in the right lane on I-526 approaching I-26 from the East Cooper area will be directed to the normal lanes of I-26. Evacuees in the left lane on I-526 will be directed into the reversed lanes of I-26.

6.2. Response and Recovery

Following a severe storm, City Fire and Police Department personnel and City officials will return to the island to begin search and recovery operations, safety evaluations and preliminary damage assessments, and determination of clean-up needs. City representatives will coordinate closely with representatives of SC Division of Emergency Management, Charleston County, FEMA, the US Army Corps of Engineers, DHEC OCRM and other agencies to complete safety evaluations and preliminary damage

assessments quickly. If needed, mutual aid agreements will be activated to obtain sufficient outside personnel to assist in these efforts. All findings will be reported to the MEOC and City officials.

Isle of Palms Fire Department personnel will, as required, assemble teams to:

- evaluate life safety issues
- chlorine gas for water treatment is stored at four locations on the island – personnel will inspect the chlorine gas storage facilities
- look for signs of people in distress
- look for signs of people in structures that may be in danger
- perform search and rescue operations
- request assistance from SC Firefighter Mobilization through Charleston County EPD
- check conditions of roadways and make roadways passable
- look for and report all downed power lines and compromised power poles
- assist the Building Department by conducting a windshield survey to evaluate structural damage – minor – moderate – severe
- look for and report all water and sewer leaks
- secure propane tanks and mark with fluorescent paint
- look for and report all injured or distraught animals
- assist with preparation of situation report
- be on the lookout for and report any looters
- set up first aid stations
- place PVC poles near fire hydrants as debris begins to build
- assist with setting up a soup kitchen for all personnel

The Building Official and/or his designated representatives will utilize a building safety evaluation procedure such as that outlined in ATC-45, "Field Manual: Safety Evaluation of Buildings after Wind-storms and Floods" (Applied Technology Council, 2004). The procedure allows structures to be quickly categorized as unsafe (red tag), restricted entry (yellow tag), and inspected (green tag). Unsafe and some restricted entry buildings will be barricaded.

SCE&G will work to restore power and gas as needed. Power will first be restored to the City buildings and important support complexes, then to residences. The Isle of Palms Water Commission monitors supplied water on a continuous basis and are prepared to re-chlorinate as necessary. In cases where pipes are broken, water may be shut off or may not be drinkable.

The Building Official will order the owners of any collapsed structures to remove those structures within a reasonable time. If the owners fail to comply with the order, the City may have the buildings removed and may attempt to recoup the costs of removal from the owners.

Substantial damage determinations will also be made by the Building Official and/or his designated representatives. Buildings which have been determined to be substantially damaged can only be repaired or reconstructed in compliance with prevailing floodplain management and building code requirements.

It is expected that DHEC OCRM staff will be conducting "destroyed beyond repair" evaluations of buildings, pools and erosion control devices seaward of the DHEC OCRM 40-year setback line. City personnel will coordinate with DHEC OCRM staff, as appropriate.

Residents will be permitted access to the island immediately upon determining that no dangerous conditions exist from chlorine or other gases, or from other threats to public safety. The fire department, security forces, SCE&G, public works personnel and disaster survey personnel will have first priority for return to the island. The Mayor is empowered to initiate a curfew, if necessary, in order to maintain public safety and protection of property.

In case residents' return to the island is delayed for any reason, a video and photography recording team will be promptly dispatched around the island to photograph streets and areas as the roadways are cleared and access is available. Videotapes and photographs will be forwarded to the island information center in Mount Pleasant where they will be available for viewing by island residents. This information will also be posted on a web site or broadcast with the cooperation of local media.

Emergency orders may be issued by the Building Department, allowing property owners to undertake emergency repairs and procedures to protect against further damage. Depending on the severity and extent of damage to the island, the City may institute a temporary moratorium on building reconstruction (except for emergency repairs), and may later modify building permit fees.

Clearing debris from roads will be undertaken as quickly as possible following return to the island. Subsequent debris management (including removal, stockpiling, sorting and disposal) will be carried out in cooperation with state and federal agencies tasked with that responsibility. Residents will be informed of any disposal policies and procedures as they are implemented. Residents will be instructed to place debris on the front of their property in a manner that will not obstruct the roadways or fire hydrants. Burning debris on property will be prohibited.

6.3. Mitigation

In an effort to reduce future storm-related damages, the City has participated in the development of the Charleston Regional Hazard Mitigation Plan (see Section 4.3.4 above).

City regulations will also preclude the reconstruction of non-conforming structures[t], and will result in a more hazard resistant community following reconstruction.

As part of its duties, the City's Board of Zoning Appeals (BOZA) considers requests for variances to requirements of the City's zoning ordinance[u]. Inasmuch as many of the provisions of this Local Comprehensive Beach Management Plan have been incorporated into the City's zoning ordinance and can be considered to be in the public interest, a request for a variance to these provisions could be considered a detriment to the public good. The BOZA should consider the requirements of this Plan and the public interest before acting on any variance request affecting the beachfront or nearby areas governed by this Plan.

7. Beach Management Needs, Goals, and Implementation Strategy

7.1. Strategy for achieving goals of State 40-Year Retreat Policy

The City has developed and adopted development regulations which complement the State's 40-year retreat policy. For example:

- The City will not permit the construction of hard erosion control devices landward of the DHEC OCRM 40-year setback line, where those devices would lie within 250 feet of the MHW line.
- The City encourages property owners to site oceanfront buildings and structures as far landward as possible. Where appropriate, the City's Board of Zoning Appeals will consider variances to reduce front yard (street) setbacks and increase rear yard (oceanfront) setbacks.
- The City has established a Preservation Overlay Zone along Ocean Blvd. and portions of Palm Blvd. This zone restricts construction activities seaward of a platted building line (which generally lies 30-100 ft landward of the DHEC OCRM setback line along Ocean Blvd., and 100-400 ft landward of the DHEC OCRM setback line along Palm Blvd.)
- The City allows non-conforming structures that are destroyed or damaged more than specified allowable limits to be rebuilt only in accordance with applicable provisions of City regulations. This may result in reconstruction in a more landward location, either due to DHEC OCRM regulations or City regulations.
- The City will not approve construction or any other activities unless it can be shown that the activity or alteration is not likely to weaken or alter significantly the protective function of beaches and sand dunes, nor likely to prevent the formation of new dunes.

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[t] See Section 4.3.2.2.3 of this Plan.

[u] City Code section 5-4-4(b)(4) states that the BOZA must find "the authorization of a variance will not be of substantial detriment to an adjacent property or to the public good, and the character of the district will not be harmed by the granting of the variance."

7.2. Strategy for preserving and enhancing public beach access

A total of 56 public beach access points lie along the shoreline between Breach Inlet and 57th Avenue, with an average distance between access points of approximately 400 ft. Approximately 1,600 vehicle parking spaces (in parking lots, in marked on-street spaces, and along road rights-of-way) lie within approximately 500 feet of public beach access points. Isle of Palms has beach access, parking and facilities far in excess of DHEC OCRM "full and complete access" criteria; in fact, Isle of Palms has approximately four times the access and parking required to be classified as having full and complete access along the 4.8 mile stretch between Breach Inlet and 57th Ave. Thus, the City places emphasis on the protection and maintenance of existing public beach access rather than on the creation of new public beach access along this stretch. With the exception of the Wild Dunes Planned Development District, public beach access and parking on Isle of Palms is plentiful.

As discussed above in Sections 2.6 and 4.3.3.1, public beach access on Isle of Palms is recorded on plats and protected by City regulations. Encroachments into and obstruction of public beach access paths are prohibited by the City, as are new encroachments and obstruction of road rights-of-way which provide beach access parking.

8. City Beach Management Policies

City policies related to beach management are as described previously in this Plan. They are integrated into the City Code or in other plans adopted by the City, and are enforced and implemented by the City on an ongoing basis. These policies protect natural resources; ensure public beach access; promote retreat; control stormwater and drainage; and facilitate disaster response and recovery. These policies are more restrictive than the State's current requirements regarding erosion control devices and building setbacks, and have resulted in far more public beach access along 4.6 miles of beach than State guidelines require.

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