



April 5, 2016
photos



**Local Comprehensive
Beach Management Plan –
5-Year Review
City of Isle of Palms
April 25, 2023**

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TABLE OF CONTENTS

SECTION I. Introduction	1
1.1 Purpose	1
1.2 History of Plan Approval and Revisions	1
1.3 Overview of Municipality/History of Beach Management Approaches	2
1.4 Current Beach Management Issues	3
SECTION 2. Inventory of Existing Conditions	3
2.1 General Characteristics of the Beach	3
2.2 General Land Use Patterns	7
2.2.1 Beach Use	9
2.2.2 Benefits and Value of the Beach	10
2.3 Beachfront Development and Zoning	11
2.3.1 Beachfront Structural Inventory	14
2.4 Natural Resources and Ecological Habitats	15
2.4.1 Threatened and Endangered Species	16
2.4.2 Turtle Nesting	16
2.5 Existing Public Access and Map	23
2.5.1 Parking for Public Beach Access	24
2.5.2 Full and Complete Public Beach Access	28
2.6 Community Rating System	30
SECTION 3. Beachfront Drainage Plan	30
SECTION 4. Beach Management and Authorities	32
4.1 State Authorities	32
4.1.1 Overview of State Policies (Beachfront Management Act)	32
4.1.2 Beachfront Setback Area	34
4.2 Local Government and Authorities	41

4.2.1	Municipality’s Comprehensive Plan	41
4.2.2	Municipality’s Hazard Mitigation Plan	43
4.2.3	Municipality’s Disaster Preparedness and Evacuation Plan	44
4.2.4	Beachfront Development Regulations	44
4.2.5	Regulations on Beach and Shoreline Protection	45
4.2.6	Other Regulations on Beach Management	46
SECTION 5. Erosion Control Management		48
5.1	Shoreline Change Analysis	48
5.1.1	Beach Profiles	49
5.1.2	Long Term Erosion Rates and Shoreline Change	51
5.2	Beach Alteration Inventory	54
5.2.1	Beach Renourishment	57
5.2.2	Emergency Orders and Sandbags	64
5.2.3	Previous Hurricane or Storm Events	68
5.3	Discussion of Erosion Control Alternatives	68
5.3.1	Beach Renourishment	69
5.3.2	Other Measures	69
SECTION 6. Needs, Goals and Implementation Strategies		69
6.1	Policy of Beach Preservation	70
6.2	Strategy for Preserving and Enhancing Public Beach Access	70
SECTION 7. References		71
APPENDIX 1. Inventories <u>(separate attachment)</u>		
APPENDIX 2. Maps <u>(unchanged from 2017)</u>		

1. Introduction

1.1 Purpose

This document is an update of the 2017 Local Comprehensive Beach Management Plan (LCBMP) of the City of Isle of Palms (“City” or IOP). The update is being carried out to comply with OCRM 2020 guidance for the required LCBMP 5-year “review” update.

The City’s LCBMP 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 LCBMP is intended for incorporation into the State Beachfront Management Plan in accordance with the provisions of the State Beachfront Management Act.

The following significant events occurred between the 2017 LCBMP and the 2022 5-year update:

- revision of the OCRM Baseline and 40-year Setback Line in 2018, which moved the jurisdictional lines seaward from their 2008 locations in some places
- passage of the 2017-2018 Beach Management Reform Act (Act 173), that removed the State’s 40-year Retreat Policy and instituted a Beach Preservation Policy
- addition to previous beach access parking areas
- emergency beach scraping and berm construction along the west and east ends of IOP (Breach Inlet to 10th Ave; portions of Wild Dunes shoreline) following Hurricane Irma (September 2017)
- completion of the 2018 beach restoration project (53rd Ave to 18th hole of Links Course)
- adoption of revised FEMA Flood Insurance Rate Maps for Isle of Palms (effective January 29, 2021) and adoption of freeboard above throughout the City
- In 2019, the City banned use of the following on the beach: single-use plastic bags, plastic straws, polystyrene coolers and polystyrene food containers, cups and balloons
- In 2020, the City banned smoking and vaping on beaches and beach access paths

1.2 History of Plan Approvals and Revisions

The City 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 LCBMP, concentrating on other matters.

In July 2006, the City reactivated its efforts to create and adopt a LCBMP. The City Council adopted the LCBMP in March 2007 and the Plan was submitted to DHEC OCRM in April 2007. DHEC OCRM provided comments to the City in November 2007, revisions were made to the

Plan and the City adopted the revised Plan on February 22, 2008. DHEC OCRM approved the LCBMP on April 7, 2008.

Data collection for update of the 2008 LCBMP began in March 2015. Additional data collection took place later in 2015 and in 2016, and a draft revised Plan was reviewed by the City in 2016. Discussions were held with OCRM staff in late 2016 and early 2017 to review and respond to OCRM comments on the 2008 LCBMP. A revised LCBMP was submitted to OCRM on January 26, 2017. City Council adopted the January 26, 2017 version on February 28, 2017. OCRM approved the LCBMP on May 9, 2017, following review and a 30-day public comment period.

The City began LCBMP 5-year update discussions with OCRM staff in fall 2021. Clarification was received regarding 5-year versus 10-year update requirements, and the 5-year update began in March 2022.

1.3 Overview of Municipality/History of Beach Management Approaches

The City of Isle of Palms was formed on January 12, 1953 (Isle of Palms Planning Commission, 2015). The City has a Council form of government, with a Mayor and eight Council Members. A City Administrator is appointed by and reports to the Council; the Administrator carries out tasks assigned by Council and oversees daily operations of City departments.

The City Council is responsible for adopting ordinances that, when implemented, form the basis for beach management on IOP (See Section 4.2). The City Council is also responsible for the expenditure of City funds toward beach management efforts.

The City's vision for beach management was articulated by the City's Long-Term Beach Management Citizens Advisory Group (Jones, 2008):

- 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

The City has pursued this vision through a number of actions:

- instituting regulations and policies for planning, zoning, development, environmental protection, and public safety
- developing and maintaining an excellent public beach access system
- prohibiting hard erosion control structures on the beach

- monitoring beach and dune conditions
- acting as permit applicant and providing funds for beach nourishment, shoal management, and emergency berm construction projects

1.4 Current Beach Management Issues

There are three main beach management issues facing IOP at present:

1. Beach and dune erosion in the unstabilized inlet erosion zones near Dewees Inlet at the eastern end of the island and near Breach Inlet at the western end of the island.
2. Balancing public beach parking demand with available safe parking capacity on the island.
3. Drainage of low-lying areas, an issue highlighted by tidal and rainfall flooding during October 2015 (Joaquin) and September 2017 (Irma).

2. Inventory of Existing Conditions

2.1 General Characteristics of the Beach

Isle of Palms is a seven-mile-long barrier island located eight miles east of Charleston on the South Carolina coast (Figure 1). This long and relatively narrow island varies in width from 0.35 mile at the west end to 1.6 miles at the east end, and its slightly curving shoreline has an orientation of southwest to northeast. For descriptive purposes, the end of the island nearest Charleston is referred to as the “west” end, while the opposite end of the island is referred to as the “east” end. The total area of the island is four and one-half square miles.

The island is bounded on the north by Hamlin Creek and the 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.

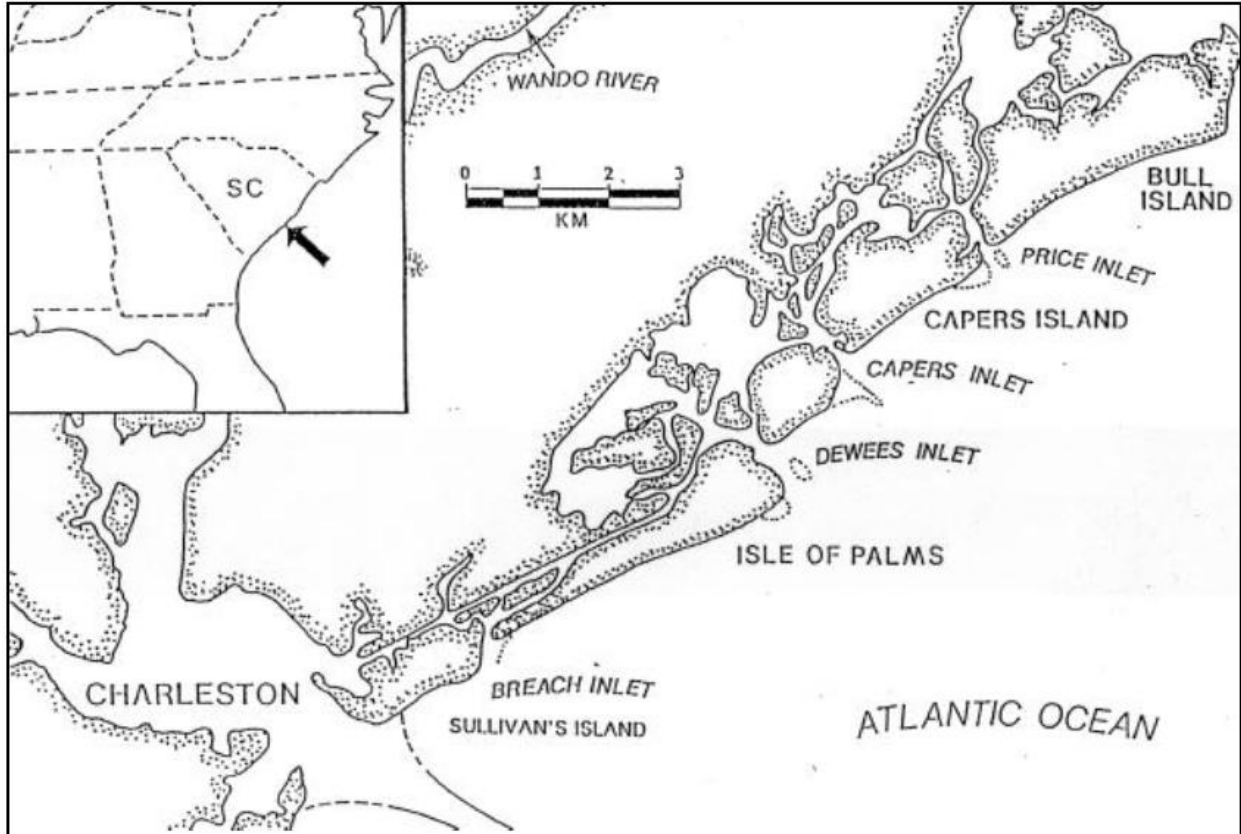


Figure 1. Isle of Palms Location Map.

Isle of Palms has a characteristic “drumstick” shape (Figure 2), with a wider upcoast (east) end due to the influence of Dewees Inlet and to the inlet shoal migration and attachment west of the inlet (Coastal Science & Engineering – CSE, 2015a). Because of this inlet shoal bypass process, however, the shoreline along the east end of Isle of Palms is highly dynamic, with localized advance or retreat by hundreds of feet in short periods of time (Figure 3). Eventually, much of the bypassed sediment travels along Isle of Palms, leading to a persistent, long-term trend of accretion at the west end of the island (Jones, 1986). The west end of the island is also dynamic (but not nearly as dynamic as the east end) as a result of sediment being bypassed from Isle of Palms across Breach Inlet to Sullivan’s Island.



Figure 2. Isle of Palms exhibits a “drumstick” shape due to inlet shoal bypassing at Dewees Inlet at the east end of the island, and westerly sediment transport toward Breach Inlet (bottom). Figure from CSE (2015a).

Between 1941 and 1997, inlet shoals bypassed Dewees Inlet and attached to the beach at the east end of Isle of Palms every four to ten years, with an average interval between attachments of ~ 6 years (Guadiano and Kana, 2001). That shoal attachment frequency has continued through 2016. CSE (2015a) estimates that inlet shoal attachments add approximately 100,000 cy/yr of sediment to the island.



Figure 3. February 2007 view northeast toward Dewees Inlet (CSE, 2015a). Migrating inlet shoal leads to a wide beach immediately landward of the migrating shoal, and focused erosion adjacent to the location of shoal attachment.

Beaches are composed of fine-to-medium sand with a small percentage of shell. As a result, beach slopes on Isle of Palms are relatively flat, and the typical beach width (distance between the dune toe and the water line) tends to be ~20-50 feet at high tide and ~200 feet or more at low tide. However, in areas immediately landward of and adjacent to attaching inlet shoals, beach widths vary considerably – high tide beach width can be hundreds of feet in areas immediately landward of attaching inlet shoals, but can disappear entirely in areas adjacent to attaching shoals. Once a shoal attaches the added sediment spreads along the beach and beach widths return to a more normal condition.

Dune fields along the island are well-developed along the western and central portions of the island, ranging from approximately 50 ft to 250 ft wide. Along the eastern end of the island, dune width depends on the recent history of shoal attachments, and ranges from 0 ft to ~ 200 ft. Crest elevations of well-developed dunes reach ~ 12-15 ft NAVD (North American Vertical Datum), while crests of newer dunes may be just a few feet above the beach elevation. The 6 ft NAVD contour tends to define the typical boundary between the dune toe and the back of the beach berm.

Ground elevations on the island range from as high as 17 ft above at some points along a ridge on the ocean side of the island, down to sea level at the margins of the island. However, the topography of most of the island is relatively flat with an average ground elevation of approximately 6-8 ft NAVD.

2.2 General Land Use Patterns

Land use on Isle of Palms is depicted on the City's Current and Future Land Use Map (Figure 4). Land Use on the island is a mix of residential (low, medium, high density), commercial, park/recreation and conservation. The following alongshore lengths of land use occur on Isle of Palms:

- Low-density residential exists along approximately 4.4 miles (63%) of the ocean shoreline: 1.4 miles between Breach Inlet and 10th Ave., 2.7 miles between 21st Ave and 57th Ave, and 0.3 mile along Beachwood East and Dunecrest Lane.
- Medium-density residential exists along approximately 0.1 mile east of IOP County Park.
- High-density residential exists along approximately 1.1 miles (16%) of the ocean shoreline, all in the Wild Dunes Planned Development District: 0.25 miles in the vicinity of Grand Pavilion and Seagrove, and approximately 0.8 mile between the Property Owners Beach House and Ocean Club.
- Commercial exists along approximately 0.3 miles (4%) of the ocean shoreline, between 10th Ave. and 14th Ave.
- Park and recreation exist along approximately 0.6 mile (9%) of the ocean shoreline: ~400 ft at Isle of Palms County Park, and approximately 0.5 mile at the Wild Dunes Links Course.
- Conservation exists along the Dewees Inlet shoreline north of the Links Course.

Approximately 330 oceanfront parcels have been platted for residential or commercial use along the ~ 7-mile ocean shoreline. Approximately 90% of these parcels are single family residential.

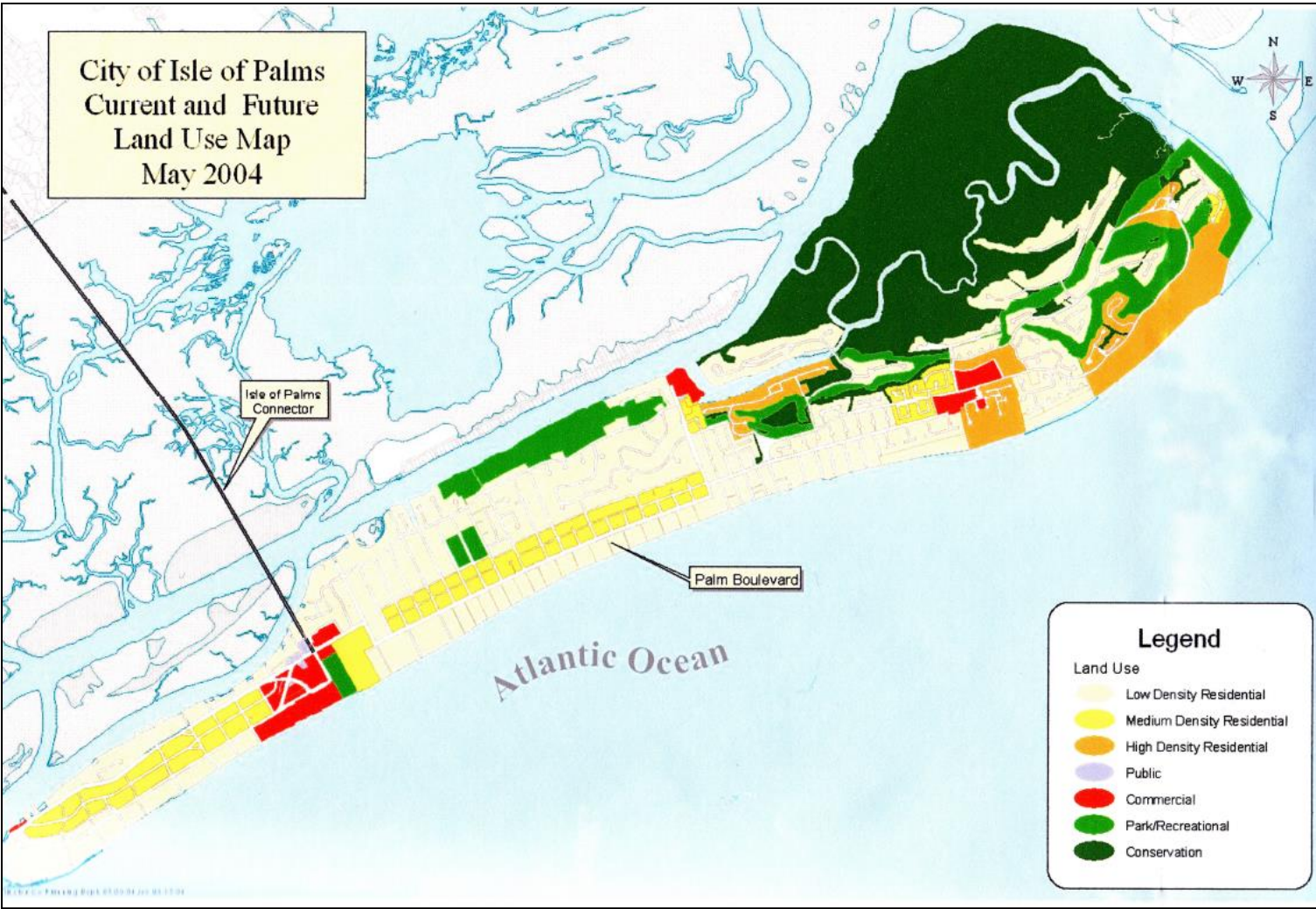


Figure 4. City of Isle of Palms Current and Future Land Use Map.

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 along the northeastern third of the island (generally, from 55th Avenue to Dewees Inlet) where inlet shoal attachments occur on a regular basis. Unfortunately, the northeastern end of the island is also the area where the oceanfront development density is greatest, and the buildings are the largest.

In recognition of erosion hazards influenced by land use patterns at the east end of the island, the City has a beach nourishment and focused erosion shoal management strategy, which addresses long-term erosion, storm impacts and episodic erosion due to shoal attachments. The City and the Wild Dunes community cooperate and coordinate on the issue, and Wild Dunes helps fund erosion strategies along the northeast portion of the shoreline.

According to the Comprehensive Plan (Isle of Palms Planning Commission, 2015):

- The 2010 resident population of Isle of Palms was 4,133. The resident population is fairly stable.
- 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.
- There were 4,274 housing units on the island in 2010. Approximately 35% were owner-occupied, approximately 8% were occupied by (long-term) renters, and approximately 57% were seasonal rentals or vacant. Approximately 48% of all housing units are in Wild Dunes.

The 2020 United States Census <https://censusreporter.org/profiles/16000US4536115-isle-of-palms-sc/> shows:

- A resident population of 4,371 with a median age of 53.6 years and a median income of \$128,523
- 4,376 housing units, with approximately 39% owner-occupied. The median value of owner-occupied units is approximately \$815K.

2.2.1 Beach Use

There are a variety of beach uses on Isle of Palms, including: walking, jogging, shelling, wading, skim boarding, sunbathing, volleyball, bicycling, swimming, fishing, paddle boarding, surfing, kite boarding, kayaking, boating and others.

There are generally no restrictions on which of these permissible uses can be carried out along the beach, except:

- Motorized vehicles, including most golf carts, are not permitted on the beach. Exceptions include emergency vehicles, trash pick-up, and in accordance with State Law, golf carts with a State permit and handicap placard.

- A “swimming zone” has been designated from the Isle of Palms Pier east for 450 ft (incorporating the County Park shoreline), where activities other than swimming, wading and related activities are prohibited.
- Swimming and wading are prohibited along the Breach Inlet shoreline.
- Operation of boats, motorboats and jet skis is prohibited within 100 yard of Police jurisdiction, except in emergencies.
- Parasailing is prohibited within Police jurisdiction.
- Tents, canopies, beach chairs, kites, coolers, beach umbrellas and similar property are allowed on the beach after sunset only so long as such property is being attended to by the user.
- No personal property shall be located within 25 feet of any emergency beach access or any turtle nest.
- Any personal property, except "Hobie Cat" style sailboats which are operable and kept in good working condition or poles supporting volleyball nets adjacent to commercially zoned property, left on the beach after sunset shall be deemed abandoned and subject to disposal by the City.
- Overnight sleeping on the beach is prohibited.
- Glass bottles, fireworks, bonfires and alcoholic beverages are prohibited on the beach.
- Single-use plastic bags, plastic straws, polystyrene coolers and polystyrene food containers, cups and balloons are prohibited on the beach.
- Smoking and vaping are prohibited on the beach and beach access paths.
- Dogs may be on the beach and off leash, from 5:00 AM until 9:00 AM April 1st through September 14th, and 4:00 PM until 10:00 AM September 15th through March 31st. Dog owners must have leash in hand and have their dog under voice command. At all other times, dogs must be on leash and under complete control, even in the water.

2.2.2 Benefits and Value of the Beach

Like most beach communities, Isle of Palms owes its existence mainly to the beach. Golf and boating are also important contributors to the Island’s prosperity, but the beach is the main draw. Property values, real estate activity, tourist visitation, commercial activity and City revenues depend directly or indirectly on the presence of a healthy beach.

The 2017 LCBMP stated tourists spent an estimated \$130 million annually on Isle of Palms (based on City information and Oh, 2006). This figure has likely increased significantly. City data from FY 2013 to FY 2015 show the following revenues which are tied to the fact that Isle of Palms is a beachfront community:

- Municipal/County/State Accommodations Tax revenues to the City have averaged approximately \$2.8 million annually

- City Hospitality Tax has brought in approximately \$0.6 million annually.
- City Residential License fees have brought in approximately \$0.5 million annually.
- The City's recently instituted Beach Preservation Fee raised approximately \$1 million in its first year.

City data show that approximately half of the revenues described above are associated with rental/vacation properties and tourist activity at Wild Dunes.

2.3 Beachfront Developments and Zoning

City regulations pertaining to Land Use, Zoning and Building are contained in Title 5 (Planning and Development) of the Code of Ordinances, https://www.municode.com/library/sc/isle_of_palms/codes/code_of_ordinances?nodeId=14483. The newest, adopted ordinances, some not yet incorporated into the Code, are posted on the City web site <http://www.iop.net/ordinances>.

Zoning was established on October 25, 1956, approximately 3 years after incorporation by the City. The entire zoning code has been repealed and readopted, or amended substantially, in 1975, 1981, 1989 and 1992-1993 (Isle of Palms Planning Commission, 2015). Other amendments to zoning regulations have been ongoing since that time. The latest Zoning Map was adopted in September 2022 (Figure 5). The Planning and Zoning Commission was created on December 10, 1986. The City also adopted an ordinance in 1981 creating a Board of Adjustment, which has since been renamed the Board of Zoning Appeals.

In 1975 City Council approved a Planned Residential Development (PRD) zoning district for the eastern, then undeveloped, end of the island. Today this area includes the gated resort community of Wild Dunes and several adjacent residential areas. The PRD was the first zoning agreement of its type in the State of South Carolina. Under the PRD zoning, the eastern end of the island was developed to include a wide variety of housing types: low to high density single-family detached units, townhouses, and low-rise and high-rise condominium multi-family units. Within the gated section of Wild Dunes many of the approximately 2,067 residential units are used as seasonal rental properties. Wild Dunes also includes offices and conference facilities and other resort amenities. The PRD also includes a few properties on 43rd through 45th Avenues outside the Wild Dunes gates.

In the PRD zoning district, the use, subdivision, and development of property is governed through deed restrictions enforced by the Wild Dunes Community Association. The City has implemented zoning control in Wild Dunes only on a few matters not specifically described in the PRD documents (e.g., tree cutting, conservation overlay, marsh setback). Development within Wild Dunes is also subject to OCRM requirements.

In 2000 the name of the zoning district for planned developments changed from Planned Residential District (PRD) to Planned Development District (PDD). The new designation more accurately describes the land use activities.

Figure 5 shows that the approximate 7-mile length of ocean and inlet shoreline can be broken down as follows:

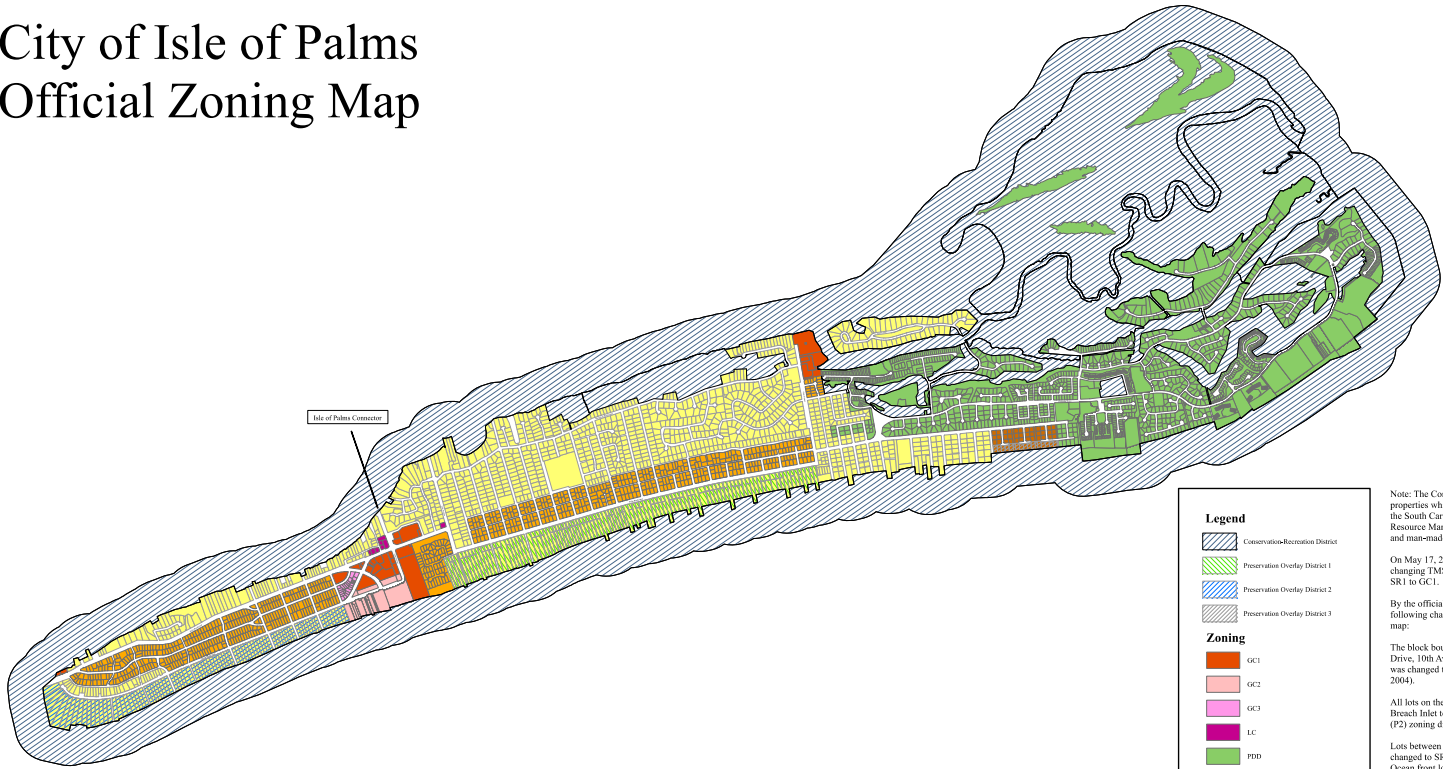
- Single family residential: 4.2 miles in SR-1, SR-2, SR-3 districts (between Breach Inlet and 10th Ave., and between Isle of Palms County Park and 57th Ave.)
- General Commercial: 0.4 mile in GC-2 and GC-2 district (between 10th Ave. and 14th Ave., and Isle of Palms County Park)
- Wild Dunes PDD: 3.4 miles, with a mixture of low- and high-density residential and the Links Course

Since 1989, a Conservation District Overlay Zone has been established along the entire ocean, inlet and marsh shorelines. Permitted activities are limited to recreation, public utility lines, beach nourishment and special activities and franchises approved by the City.

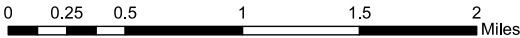
Preservation Overlay Zones have been established landward of the Conservation District along 3.3 miles of ocean shoreline. The zones were established to preserve natural barriers against forces from the ocean, to preserve adequate light, air and open space, and to preserve scenic, historic and ecologically sensitive areas.

- In 1990 the City established a Preservation Overlay Zone (P-1) between 21st Ave. and 41st Ave.
 - The seaward limit of construction (structures and their stairs) is 130 ft seaward of the Palm Blvd. right of way (on-site waste disposal systems may extend beyond 130 ft).
 - Other activities permitted seaward of the construction limit include 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.
- In 2006, a second Preservation Overlay Zone (P-2) was established between Breach Inlet and 10th Ave.
 - The seaward limit of construction is given by the “Maximum Building Line” shown on the January 8, 1988 final plat by E.M. Seabrook, and generally lies 150 ft to 250 ft seaward of Ocean Blvd., putting the limit landward of the DHEC OCRM Setback line in all but a few instances.
 - Other activities permitted seaward of the construction limit include 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.

City of Isle of Palms Official Zoning Map



Isle of Palms Community



Legend

- Conservation-Recreation District
- Preservation Overlay District 1
- Preservation Overlay District 2
- Preservation Overlay District 3

Zoning

- GC1
- GC2
- GC3
- LC
- PFD
- SR2
- SR3
- SR1

Note: The Conservation (CO) District includes all properties which were designated as Critical Area by the South Carolina Office of Ocean and Coastal Resource Management and isolated pieces of natural and man-made highland.

On May 17, 2017 a clerical error was corrected by changing TMS#s 568-11-00-174, 177 and 451 from SR1 to GC1.

By the official action of the City Council, the following changes were made to the official zoning map:

The block bound by J.C. Long Boulevard, Pavilion Drive, 10th Avenue and Ocean Boulevard (block 30) was changed to GC3 zoning district (September 26, 2004).

All lots on the seaward side of Ocean Boulevard, from Breach Inlet to 10th Avenue were changed to the SR1 (P2) zoning district (November 26, 2006).

Lots between 53rd Avenue and 56th Avenue were changed to SR3 zoning district (February 23rd, 2016). Ocean front lots and pedestrian beach access paths between 53rd Avenue and 56th Avenue were changed to SR3 (P3) zoning district (February 23rd, 2016).

The Conservation (CO) District was changed to the Conservation-Recreation District; golf course and tennis court parcels were added to the Conservation-Recreation District (Date Adopted).



Data Source: City of Isle of Palms
 Coordinate System: NAD 1983 State Plane South Carolina FIPS 3900
 Ft Inf
 Projection: Lambert Conformal Conic
 Created August 2022

This is to certify that this is the Official Zoning Map referred to in section 5-4-3 of the Zoning Ordinance of the City of Isle of Palms, S.C. adopted pursuant to the 1994 Comprehensive Planning and Enabling Act on June 27, 2000.

Approved by: _____

Attested by: _____

Figure 5. September 2022 Isle of Palms Zoning Map.

- In 2016, a third Preservation Overlay Zone (P-3) was established between 53rd Ave. and 56th Ave when the area was rezoned from PDD to SR-3.
 - The seaward limit of construction is 110 ft from 54th, 55th and 56th Ave. rights of way (see City Ordinance 2015-15). The construction limit is landward of the DHEC OCRM Setback Line along 54th Ave., but seaward along 55th and 56th Ave.
 - Other activities permitted seaward of the construction limit include 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.

2.3.1 Beachfront Structural Inventory

Section 7 (Appendix) of this LCBMP provides maps and inventories of beach accesses and structures extending seaward of the DHEC OCRM 40-yr Setback Line. The information contained therein is summarized below.

A review of 2021/2022 data and aerial photography (e.g., <https://gis.dhec.sc.gov/shoreline/> and https://gisccweb.charlestoncounty.org/Public_Search/) showed the following structures¹ extend seaward of the 2018 DHEC OCRM 40-year setback line (the vast majority of these encroachments are at the east end of the island, between 55th Ave and Dewees Inlet):

- ~69 detached single family buildings
- ~16 multifamily buildings that include approximately 297 residential units
- ~12 swimming pools and/or pool decks
- 4 other structures (small ancillary building, pool equipment building)
- ~176 wooden dune walkovers and 3 Mobi-Mat paths
- 1 private pier
- 2 golf course holes
- rock revetments (exposed and buried)

Of these, the following² extend seaward of the 2018 DHEC OCRM baseline:

- ~55 detached single family buildings
- ~15 multifamily buildings that include approximately 285 residential units
- ~7 swimming pools and/or pool decks
- 2 other structures (small ancillary building, pool equipment building)
- 1 private pier

¹ Note: some counts are approximate. Accurate determinations at some locations will require field surveys.

² Note: some counts are approximate. Accurate determinations at some locations will require field surveys.

- 2 golf course holes
- rock revetments (exposed and buried)

Construction of additional buildings along the Isle of Palms shoreline is unlikely, given the fact that the ocean shoreline of Isle of Palms is essentially built-out. However, an increasingly common occurrence on Isle of Palms is the teardown of existing homes and construction of new homes on those properties. New homes tend to be larger than the pre-existing homes, but must comply with all City and State requirements and regulations. It is highly unlikely that additional buildings will be constructed seaward of the DHEC OCRM setback line.

2.4. Natural Resource 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. Prior to development, the island was covered by maritime forest.

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.

2.4.1 Threatened and Endangered Species

South Carolina Department of Natural Resources (SCDNR) does not maintain an island-specific listing of rare, Threatened or Endangered species for Isle of Palms. A list does exist for Charleston County

(<https://experience.arcgis.com/experience/af61ba156d054cc7b3e27d09a0c35c0f>), but not for the island. The Charleston County List from the 2017 LCBMP is shown in Table 1.

Limited island-specific information exists in the 2015 Isle of Palms Comprehensive Plan:

- Seven species of birds are listed on the federal Endangered or Threatened list which may be found in the area. The Endangered species are the bald eagle, Bachman’s warbler, wood stork and red-cockaded woodpecker. Threatened birds are the piping plover, peregrine falcon and red knot.
- No federally listed Endangered or Threatened plants are known to be located on the island. The primary tree species on the island are palmetto, live oak, loblolly pine, wax myrtle, and crepe myrtle. In 1989 the City adopted its first tree ordinance to prevent parcels from being completely cleared during development. In 2002, the ordinance was amended to include further protection for all live oak trees and other trees in excess of eight inches in diameter.
- The loggerhead sea turtle, a Threatened species, visits the island to lay eggs along the beach. South Carolina beaches have the largest number of nest sites in the “population” tracked between North Carolina and Northern Florida.

2.4.2 Turtle Nesting

Since 2000 the annual number of loggerhead sea turtle nests along Isle of Palms has fluctuated between approximately 10 and 60. It is thought that individual turtles may return to historical/regional nesting sites every two to five years, accounting for the wide fluctuation in the number of nests from year to year. Enforcement of the island’s lighting ordinance, which prohibits lighting directed at the beach, as well as other City ordinances (e.g., requiring the removal of overnight beach furniture, filling in holes in the sand, properly disposing of all trash and garbage, and the banning of single-use plastic bags at retail checkout) are thought to reduce interference and entanglement of sea turtles and to contribute to survival of this Threatened species.

Green, Leatherback and Kemp’s ridley turtles can nest on South Carolina beaches, but nesting on Isle of Palms is rare. Recent Activity includes: Once false non-nesting crawl and one nest by endangered Leatherback turtles in 2008 and 2018 respectively. In 1998 when green turtles were listed as Endangered one laid one nest, and in 2020 when they were listed as Threatened another green turtle nest was laid. The remaining activity of nesting and false crawls throughout the years was by the Threatened Loggerhead turtle.

Since 2020 coyotes have begun to impact several species on the Isle of Palms including marine turtle nests, with six loggerhead nests being dug up and destroyed on the night they were laid by coyotes at the east end of the island in 2022. Other species that are possibly being impacted by the appearance of coyotes on this island in recent years are nesting shorebirds, deer fawns

Table 1. SCDNR List of Rare, Threatened and Endangered Species and Communities Known to Occur in Charleston County (6/11/2014).

Scientific Name	Common Name	USES Designation	State Protection	Global Rank	State Rank
<u>Vertebrate Animals</u>					
<i>Accipiter cooperii</i>	Cooper's Hawk			G5	S3?
<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	LE: Endangered	SE: Endangered	G3	S3
<i>Acris crepitans</i>	Northern Cricket Frog			G5	S5
<i>Aimophila aestivalis</i>	Bachman's Sparrow			G3	S3
<i>Ambystoma cingulatum</i>	Flatwoods Salamander	LT: Threatened	SE: Endangered	G2	S1
<i>Ambystoma tigrinum tigrinum</i>	Eastern Tiger Salamander			G5	S2S3
<i>Caretta caretta</i>	Loggerhead	LT: Threatened	ST: Threatened	G3	S3
<i>Charadrius wilsonia</i>	Wilson's Plover		ST: Threatened	G5	S3?
<i>Clemmys guttata</i>	Spotted Turtle		ST: Threatened	G5	S5
<i>Condylura cristata</i>	Star-nosed Mole			G5	S3?
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat		SE: Endangered	G3G4	S2?
<i>Crotalus horridus</i>	Timber Rattlesnake			G4	SNR
<i>Dendroica virens</i>	Black-throated Green Warbler			G5	S4
<i>Elanoides forficatus</i>	American Swallow-tailed Kite	SC: Sp. of Concern	SE: Endangered	G5	S2
<i>Haliaeetus leucocephalus</i>	Bald Eagle		ST: Threatened	G5	S2
<i>Heterodon simus</i>	Southern Hognose Snake			G2	SNR
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4
<i>Lasiurus cinereus</i>	Hoary Bat			G5	SNR
<i>Limnothlypis swainsonii</i>	Swainson's Warbler			G4	S4
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	SNR
<i>Microtus pennsylvanicus</i>	Meadow Vole			G5	SNR
<i>Micrurus fulvius</i>	Eastern Coral Snake			G5	S2
<i>Mycteria americana</i>	Wood Stork	LE: Endangered	SE: Endangered	G4	S1S2
<i>Myotis austroriparius</i>	Southeastern Bat			G3G4	S1
<i>Neotoma floridana</i>	Eastern Woodrat			G5	S3S4
<i>Neotoma floridana floridana</i>	Eastern Woodrat			G5T5	S3S4
<i>Ophisaurus compressus</i>	Island Glass Lizard			G3G4	S1S2
<i>Pelecanus occidentalis</i>	Brown Pelican			G4	S1S2
<i>Phoca vitulina</i>	Harbor Seal			G5	SNA
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE: Endangered	SE: Endangered	G3	S2
<i>Plegadis falcinellus</i>	Glossy Ibis			G5	SHB,SNRN
<i>Pseudobranchius striatus</i>	Dwarf Siren		ST: Threatened	G5	S2

Table 1 (continued).

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
<i>Rana capito</i>	Gopher Frog		SE: Endangered	G3	S1
<i>Sciurus niger</i>	Eastern Fox Squirrel			G5	S4
<i>Seminatrix pygaea</i>	Black Swamp Snake			G5	SNR
<i>Sterna antillarum</i>	Least Tern		ST: Threatened	G4	S3
<i>Tyto alba</i>	Barn-owl			G5	S4
<i>Ursus americanus</i>	Black Bear			G5	S3?
<i>Vermivora bachmanii</i>	Bachman's Warbler	LE: Endangered	SE: Endangered	GH	SX
<u>Animal Assemblage</u>					
Waterbird Colony				GNR	SNR
<u>Vascular Plants</u>					
<i>Agalinis linifolia</i>	Flax Leaf False-foxglove			G4?	SNR
<i>Agrimonia incisa</i>	Incised Groovebur			G3	S2
<i>Amaranthus pumilus</i>	Seabeach Amaranth	LT: Threatened		G2	S1
<i>Amphicarpum muehlenbergianum</i>	Blue Maiden-cane			G4	S2S3
<i>Anthraenantia rufa</i>	Purple Silkyscale			G5	S2
<i>Asclepias pedicellata</i>	Savannah Milkweed			G4	S2
<i>Botrychium lunarioides</i>	Winter Grape-fern			G4?	S1
<i>Calopogon barbatus</i>	Bearded Grass-pink			G4?	S2
<i>Canna flaccida</i>	Bandana-of-the-everglades			G4?	S2
<i>Carex decomposita</i>	Cypress-knee Sedge			G3G4	S2
<i>Carex elliotii</i>	Elliott's Sedge			G4?	S1
<i>Chasmanthium nitidum</i>	Shiny Spikegrass			G3G4	S1
<i>Coreopsis gladiata</i>	Southeastern Tickseed			G4G5	SNR
<i>Coreopsis integrifolia</i>	Ciliate-leaf Tickseed			G1G2	S1
<i>Cornus racemosa</i>	Stiff Dogwood			G5?	S1?
<i>Cyperus tetragonus</i>	Piedmont Flatsedge			G4?	S2
<i>Dionaea muscipula</i>	Venus' Fly-trap			G3	S3
<i>Eleocharis tricornata</i>	Three-angle Spikerush			G4	S2?
<i>Eleocharis vivipara</i>	Viviparous Spike-rush			G5	S1
<i>Eryngium aquaticum</i> var. <i>ravenelii</i>	Ravenel's Eryngo			G4T2T3	S1
<i>Eupatorium anomalum</i>	Florida Thorough-wort			G2G3	S1?
<i>Eupatorium fistulosum</i>	Hollow Joe-pye Weed			G5?	SNR
<i>Forestiera godfreyi</i>	Godfrey's Privet			G2	S1
<i>Galactia elliotii</i>	Elliott's Milkpea			G5	S1
<i>Helenium pinnatifidum</i>	Southeastern Sneezeweed			G4	S2
<i>Hypericum nitidum</i>	Carolina St. John's-wort			G4	S1

Table 1 (continued).

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
<i>Ipomoea macrorhiza</i>	Large-stem Morning-glory			G3G5	S1
<i>Ipomoea stolonifera</i>	Beach Morning-glory			G5?	SNR
<i>Iris hexagona</i>	Walter's Iris			G4G5	S1
<i>Lepuropetalon spathulatum</i>	Southern Lepuropetalon			G4G5	S2
<i>Lilaeopsis carolinensis</i>	Carolina Lilaeopsis			G3G5	S2
<i>Listera australis</i>	Southern Twayblade			G4	S2
<i>Litsea aestivalis</i>	Pondspice			G3?	S3
<i>Lobelia boykinii</i>	Boykin's Lobelia			G2G3	S3
<i>Ludwigia lanceolata</i>	Lance-leaf Seedbox			G3	S1
<i>Lysimachia hybrida</i>	Lance-leaf Loosestrife			G5	S1
<i>Monotropis odorata</i>	Sweet Pinesap			G3	S2
<i>Muhlenbergia filipes</i>	Bentgrass			G5?Q	S3S4
<i>Orobanche uniflora</i>	One-flowered Broomrape			G5	S2
<i>Oxypolis canbyi</i>	Canby's Dropwort	LE: Endangered		G2	S2
<i>Paspalum bifidum</i>	Bead-grass			G5	S2
<i>Peltandra sagittifolia</i>	Spoon-flower			G3G4	S2
<i>Physostegia leptophylla</i>	Slender-leaved Dragon-head			G4?	SNR
<i>Pieris phillyreifolia</i>	Climbing Fetter-bush			G3	S1
<i>Plantago sparsiflora</i>	Pineland Plantain			G3	S2
<i>Platanthera integra</i>	Yellow Fringeless Orchid			G3G4	S1
<i>Psilotum nudum</i>	Whisk Fern			G5	S1
<i>Pteroglossaspis ecristata</i>	Crestless Plume Orchid			G2G3	S2
<i>Quercus austrina</i>	Bluff Oak			G4?	S1
<i>Rhexia aristosa</i>	Awed Meadowbeauty			G3G4	S3
<i>Rhynchospora breviseta</i>	Short-bristle Baldrush			G3G4	S1
<i>Rhynchospora careyana</i>	Horned Beakrush			G4?Q	S3
<i>Rhynchospora globularis</i> var. <i>pinetorum</i>	Beakrush			G5?T3?	S1
<i>Rhynchospora harperi</i>	Harper Beakrush			G4?	S1
<i>Rhynchospora inundata</i>	Drowned Hornedrush			G4?	S2?
<i>Rhynchospora tracyi</i>	Tracy Beakrush			G4	S3
<i>Sageretia minutiflora</i>	Tiny-leaved Buckthorn			G4	S3
<i>Sarracenia rubra</i>	Sweet Pitcher-plant			G4	S3S4
<i>Schwalbea americana</i>	Chaffseed	LE: Endangered		G2G3	S2
<i>Scleria baldwinii</i>	Baldwin Nutrush			G4	S2
<i>Spiranthes laciniata</i>	Lace-lip Ladies'-tresses			G4G5	S1S2

Table 1 (continued).

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
<i>Tridens carolinianus</i>	Carolina Fluff Grass			G3G4	S1
<i>Tridens chapmanii</i>	Chapman's Redtop			G3	S1
<i>Triphora trianthophora</i>	Nodding Pogonia			G3G4	S2
<i>Xyris brevifolia</i>	Short-leaved Yellow-eyed Grass			G4G5	S1
<i>Xyris difformis</i> var. <i>floridana</i>	Florida Yellow-eyed Grass			G5T4T5	S2
<i>Xyris elliotii</i>	Elliott Yellow-eyed Grass			G4	S2
<i>Xyris stricta</i>	Pineland Yellow-eyed Grass			G4	S1
Communities					
Atlantic coastal plain depression meadow	Depression Meadow			G5	SNR
Bald cypress - tupelo gum swamp				G5	S4
Bald cypress - water tupelo swamp	Bald Cypress - Tupelo Gum Swamp			G5	SNR
Bottomland hardwoods				G5	S4
Depression meadow				G3	S2
Estuarine intertidal mud flat	Intertidal Mud/sand Flat			G5	SNR
High pocosin	Pocosin			G3G4	SNR
Interior freshwater marsh				G3	SNR
<i>Juniperus virginiana</i> var. <i>silicicola</i> - <i>zanthoxylum clava-herculis</i> - <i>quercus virginiana</i> - (<i>sabal palmetto</i>) / <i>sageretia minutiflora</i> - (<i>sideroxylon tenax</i>) woodland	South Atlantic Coastal Shell Midden Woodland			G2?	SNR
Longleaf pine flatwoods				GNR	SNR
Maritime forest				G2	S2
Maritime shrub thicket				G4	S2S3
Mesic mixed hardwood forest				G5	S4
Middens				GNR	S3
Non-alluvial swamp forest				G5	S4S5
Pine - scrub oak sandhill				G4	S4
Pine flatwoods				G5	S3S4
Pocosin				G3G4	S3S4
Pond cypress pond				G4	S4
Pond cypress savanna				G3	S2

Table 1 (continued).

Scientific Name	Common Name	USES Designation	State Protection	Global Rank	State Rank
Salt marsh				G5	S5
Salt shrub thicket (allard)	Salt Shrub Thicket			G5	SNR
South atlantic inland maritime forest	Maritime Forest			G2	SNR
Spruce pine - mixed hardwood forest				G3	S2
Spruce pine / mixed hardwood				GNR	SNR
Swamp tupelo pond				G3	S3
Tidal freshwater marsh				G3	S3
<u>Geological</u>					
Carolina bay				GNR	SNR

and domestic animals including feral cats. In 2022 one loggerhead nest was destroyed by human poaching on the Isle of Palms.

The City of Isle of Palms participates in the Island 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 <http://www.iop.net/turtle-team>. Team members identify nest locations, mark and safeguard the nests, and relocate nests where required. The Island Turtle Team operates under permit from the SCDNR Marine Turtle Conservation Program. SCDNR also authorizes release of marine turtles by the SC Aquarium on the Isle of Palms.

Turtle nesting statistics for 2009 through 2022 are shown in Table 2.

Table 2: 2009 - 2022 Marine Sea Turtle Nesting Data for Isle of Palms. Source: Island Turtle Team, SCDNR Marine Turtle Conservation Program.

	2009	2010	2011	2012	2013	2014	2015	2016
Number of Nests	19	23	42	62	34	11	31	27
False Crawls	12	18	17	24	26	6	15	25
Nests Relocated	13	16	24	46	26	8	22	23
Nest Success*	19	19	31	58	32	11	31	26
Eggs	2,396	2,380	4,226	6,426	3,866	1,397	3,640	3,151
Hatched Eggs	2,094	1,923	2,628	5,088	3,130	1,199	3,225	2,524
Emerged Hatchlings	1,898	1,761	2,424	4,830	2,723	1,101	3,095	2,293
Emergence Success**	79%	76%	57%	74%	71%	80%	85%	73%

	2017	2018	2019	2020	2021	2022
Number of Nests	43	18	57	40	36	43
False Crawls	32	17	55	36	36	26
Nests Relocated	23	11	39	37	28	38
Nest Success*	38	17	57	39	36	39
Eggs	4,547	1,967	6,544	4,568	4,127	4,862
Hatched Eggs	3,534	1,520	5,788	3,537	3,699	3,651
Emerged Hatchlings	3,361	1,471	5,530	3,306	3,634	3,221
Emergence Success**	72%	80%	84%	75%	88%	65%

* number of nests with at least 10% hatch success

** $(\text{number of hatchlings that emerge from nests} / \text{number of eggs laid}) \times 100$

Each season a different group of marine turtles nests on the Isle of Palms which results in some seasons seeing the most nests at the east end and other seasons seeing the most nests west of 6th Avenue closer to Breach Inlet. This may be influenced by beach nourishment projects, erosion control structures, the presence of humans on the beach at night, or by the cyclical nature of nesting.

2.5 Existing Public Access and Map

Public beach access along Isle of Palms is excellent. There are 56 public access points along approximately 4.5 miles of shoreline between Breach Inlet and 57th Ave (average spacing between public access points is approximately 400 ft). The three easternmost of the 56 access points (between 54th Ave. and 57th Ave.) 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.

East of 57th Ave., beach access is available via 14 community access points for residents and guests of Wild Dunes (average spacing between community access points is approximately 875 ft, or 1/6 mi).

Public beach access and parking information is posted on the City's web site <http://www.iop.net/beach-access-parking>, and is tabulated in this LCBMP. Public beach access locations also are shown on the SC Beach Guide <http://gis.dhec.sc.gov/beachaccess/> and Figure 6, taken from the SC Beach Guide.

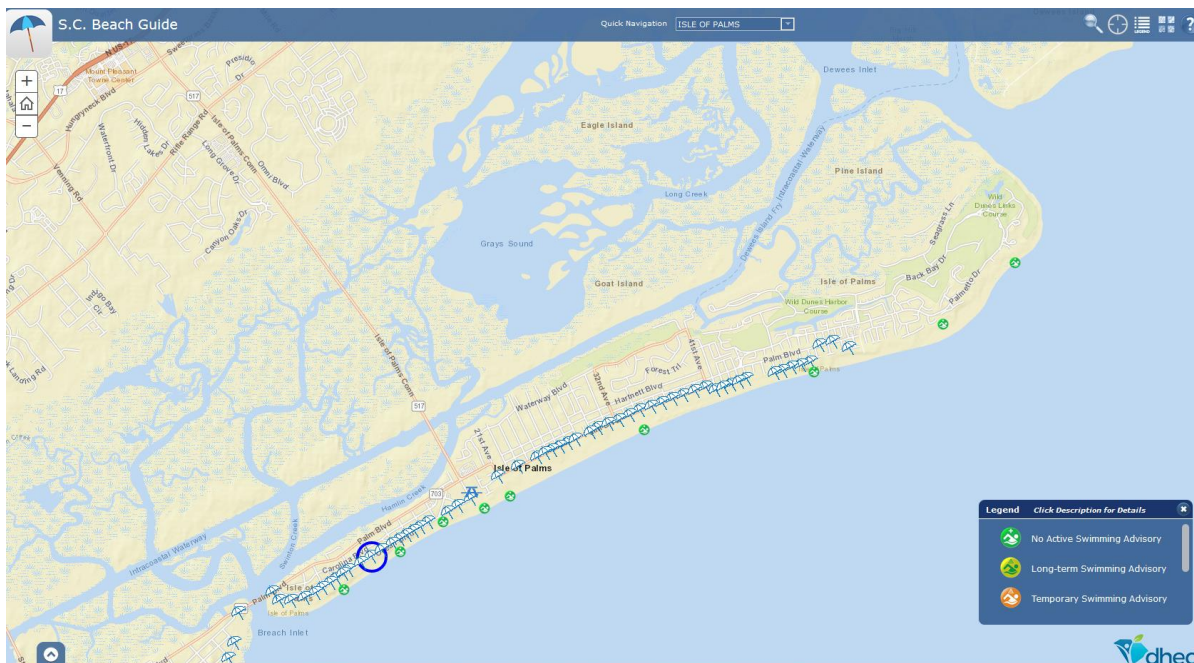


Figure 6. Public beach access points (umbrella and picnic table symbols) and water quality monitoring stations (green swimmer symbols). From SC Beach Guide <http://gis.dhec.sc.gov/beachaccess/>

Isle of Palms public access points are identified by numbered signs (landward and seaward ends) and marked with 'Beach Access' signs. The access points also have beach regulation signs, and trash and recycling receptacles, and many have dog waste collection and disposal containers. The City maintains the access paths and signs, and replaces lost or damaged signs.

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 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.

Public restrooms are available at the public beach access between 1116 and 1122 Ocean Boulevard, and at the Isle of Palms County Park.

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

Mobi-mat[®] beach access mats were installed at 9th Ave., 31st Ave. and 42nd Ave., and there are plans to install the mats at access 34A (between 34th Ave. and 35th Ave).

2.5.1 Parking for Public Beach Access

In 2015 the City completed deliberation and multi-year analysis of parking supply and demand on the island, incorporating input from residents, businesses, SCDOT and other stakeholders. The result was a Managed Beach Parking Plan (Parking Concept C) for the 2016 summer beach season. The City continued to study and modify the Parking Plan between 2016 and 2021. Public parking for beach access is available in paved parking areas and on certain public street rights-of-way.

Four public parking lots are available to beachgoers:

- 30-space paved lot (free) near Breach Inlet (including 2 handicap spaces)
- two City gravel parking lots (pay between March 1 and Oct. 31, free other months of the year) on Pavilion Blvd. with a total of 493 spaces (including 2 handicap spaces)
- paved/grass parking lot (pay year-round) with 424 spaces at Isle of Palms County Park (including 11 handicap spaces)

In addition, approximately 155 spaces (pay between March 1 and Oct. 31, free other months of the year) are situated in the commercial district along Ocean Blvd. between 10th Ave. and 14th Ave. Ten handicap spaces are included in the 155. The pay parking areas are shown in Figure 7.



Figure 7. Pay parking areas between 10th Ave. and Isle of Palms County Park

The City has established a Residential Parking District and a Beach Parking District (public parking) to improve public safety and to better manage on-street (rights-of-way) parking on the Isle of Palms. Parking along street rights-of-way is available as shown on maps at https://www.iop.net/sites/default/files/uploads/beach-parking/2020/20191119_iop_final_parking_plan.pdf.

The City installed over 400 signs along the roads of Isle of Palms during winter 2015-2016 to help residents and the public identify those areas where on-street (rights-of-way) parking is permitted.

The Beach Parking District (see Figure 8) requires no permit or parking fee to park along the public rights-of-way in the following areas:

- North side of Palm Blvd., between Carolina Blvd. and 3rd Ave.
- 3rd Ave. between Ocean Blvd. and Charleston Blvd.
- East side of 4th Ave. between Ocean Blvd. and Charleston Blvd.
- 5th Ave. between Ocean Blvd. and Carolina Blvd.
- 6th Ave. between Ocean Blvd. and Carolina Blvd.
- 7th Ave. between Ocean Blvd. and Carolina Blvd.
- East side of 8th Ave. between Ocean Blvd. and Carolina Blvd.
- East side of 9th Ave. between Ocean Blvd. and Carolina Blvd.
- Palm Blvd., between 21st Ave. and 40th Ave.
- Landward side of Palm Blvd. between 42nd Ave. and 57th Ave.

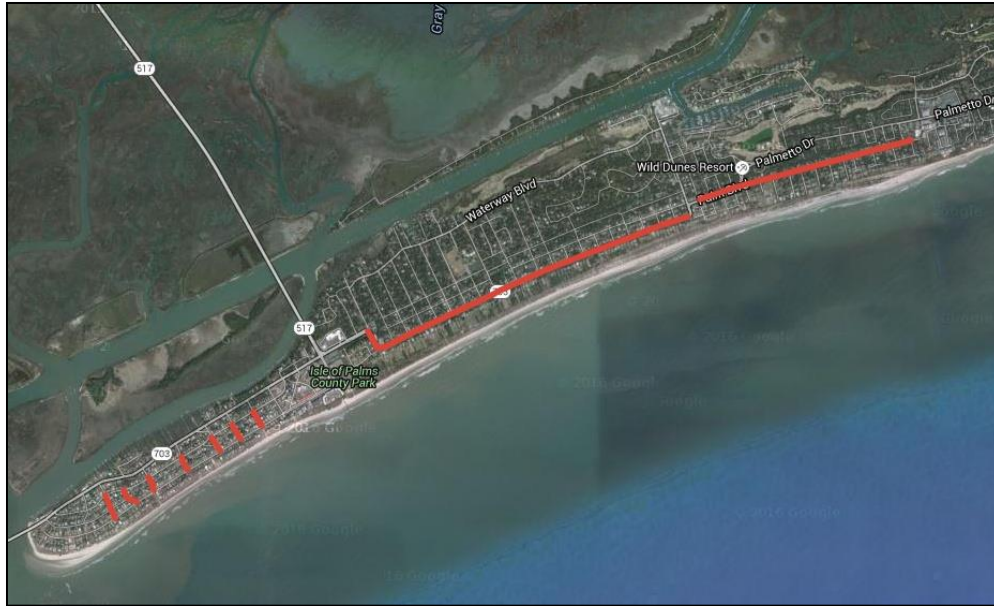


Figure 8. Beach Parking District (public parking along road rights-of-way) established by the City Parking Plan <http://www.iop.net/beach-access-parking>

On March 23, 2021, City Council approved the implementation of angled parking on the landward side of Palm Blvd. between 21st Ave. and 40th Ave. <https://www.iop.net/news/council-approves-angled-parking-along-palm-boulevard>. Figure 9 shows the angled parking layout.

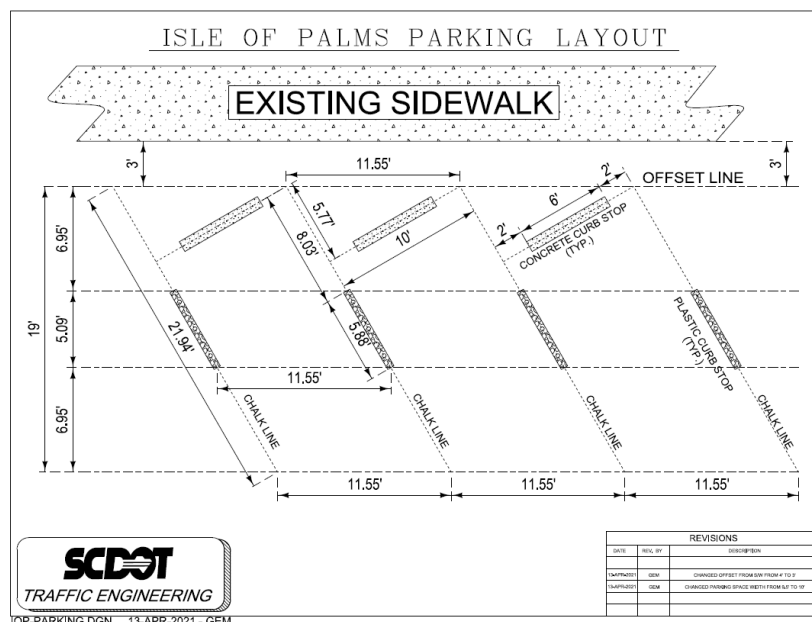


Figure 9. Angled parking layout along the landward side of Palm Blvd. between 21st Ave. and 40th Ave.

Site inspections during preparation of the 2017 LCBMP showed a total of approximately 1,566 public parking spaces available for beach access purposes. 2021/2022 updated figures show a total of approximately 1,737 public parking spaces available for beach access purposes³, broken down as follows⁴:

- 30 spaces (including 2 paved handicap space) at Breach Inlet lot
- +/- 10 spaces on Palm Blvd. north right-of way, between Carolina Blvd. and 3rd Ave.
- +/-61 spaces on road rights-of-way between 3rd Ave. and 9th Ave., including 2 paved handicap spaces off Ocean Blvd. at 9th Ave.
- 155 spaces along Ocean Blvd. between 10th Ave. and 14th Ave., including 10 paved handicap spaces
- 100 spaces, including 2 paved handicap spaces, in the City lot west of Pavilion Blvd.
- 393 spaces in the City lot east of Pavilion Blvd.
- 424 spaces, including 11 paved handicap spaces, in the Isle of Palms County park lots
- +/- 436 spaces on Palm Blvd. right-of-way between 21st Ave. and 41st Ave. (+/- 203 parallel parking spaces on the seaward side and 233 angled parking spaces on the landward side), including 2 paved handicap spaces off Palm Blvd. at 21st Ave. and 2 paved handicap spaces at access 34A (between 34th Ave. and 35th Ave).
- +/- 128 spaces on Palm Blvd. landward-side right-of-way between 41st Ave. and 57th Ave.
- 2 paved handicap spaces at 42nd Ave.

The above figures do not include designated golf cart parking spaces along the beach access paths at 9th Ave. (3 spaces), 25th Ave. (15 spaces), 28th Ave. (10 spaces) and 31st Ave. (10 spaces). Also not counted in the above figures -- the Property Owners Beach House in Wild Dunes provides +/- 50 paved vehicle parking spaces for Wild Dunes residents and guests, and provides space for approximately 30 golf carts along the community beach access path.

The City inspects road rights-of-way upon which public beach access parking is allowed, and prohibits any new encroachments. Some long-established encroachments persist due to

³ The difference between the 2017 LCBMP public parking space total and the 2022 LCBMP total is due to: an increase in the Breach Inlet lot (20 space increase); counting spaces utilized by the public but not previously counted along Palm Blvd. between Carolina Blvd. and 3rd Ave. (10 space increase); a recount of City lots on Pavilion Dr. (71 space increase); changes to front beach parking between 10th Ave. and 14th Ave. (14 space increase); a revised parking count from Charleston County PRC for IOP County Park (17 space decrease); a more efficient angled parking layout on the north side of Palm Blvd. between 21st Ave. and 41st Ave. (5 space increase); a higher space count by SCDOT on the south side of Palm Blvd. between 21st Ave. and 41st Ave. (74 space increase); the inclusion of two paved handicap spaces at 42nd Ave; and a 6-space reduction on Palm. Blvd. between 41st Ave. and 57th Ave. (LCBMP no longer counts these spaces on the seaward side of Palm Blvd. near 44th Ave.).

⁴ Some parking space counts are indicated with "+/-" where exact spaces are not marked and where the number of spaces available will depend upon how efficiently users park.

complex legal issues, but those encroachments have been accounted for in the parking counts in this Plan.

As stated previously, some public parking is available free year-round, some is paid year-round, and some is free for part of the year, paid the rest of the year. Table 3 below summarizes this information.

Table 3. Public Parking for Beach Access, Free vs. Paid by Time of Year

	Free Public Parking Spaces*	Paid Public Parking Spaces
Nov. 1 – Feb. 28	1,322	415
March 1 – Oct. 31	686	1,051

* no charge for handicap parking year-round

2.5.2 Full and Complete Public Beach Access

Public parking within 500 ft of the landward terminations of beach access paths between Breach Inlet and 57th Avenue can be counted toward full and complete public beach access (however, per R.30-21F(3)(b)(vi) some distances to beach parking may exceed 500 ft on a case-by-case basis. This occurs: 1) between the rear of the dune and Palm Blvd. between 41st Ave. and 57th Ave. (DHEC OCRM staff indicated in April 2015 and March 2023 that this was acceptable) and 2) between beach access points and parking spaces on Palm Blvd. north right-of way, between Carolina Blvd. and 3rd Ave. (DHEC OCRM staff indicated in March 2023 that this was acceptable).

In order to qualify for “full and complete public beach access” per State criteria, public parking and other facilities meeting the classification shown in Table 4 must be distributed along the shoreline (SC DHEC, 2020). According to LCBMP site inspections and Table 4:

- Isle of Palms County Park is classified as a *Regional Public Access Park*, and provides full and complete public access for 2 miles of shoreline, from 5th Ave to +/- 31st Ave.
- The Breach Inlet parking lot and parking along 3rd Ave. are each classified as a *Local Public Access Park*, and provide full and complete public access between Breach Inlet and 5th Ave (+/- 0.75 mile).
- Parking along Palm Blvd between 31st Ave. and 57th Ave, results in a continuous *Local Public Access Park* classification, and provides more than enough parking to yield full and complete public access for 2.0 miles, from +/- 31st Ave. to ¼ mile east of Access 57 (between 56th Ave. and 57th Ave.)

The number and distribution of public access points, facilities and parking exist to classify 4.8 miles of the Isle of Palms beach – from Breach Inlet to the Wild Dunes Grand Pavilion (¼ mile east of public beach access 57) -- as having full and complete access per the State guidelines (SC DHEC, 2020). See Figure 10.

Table 4. State Public Beach Access Facility Classification (SC DHEC, 2020).

Type of Facility	Distance on Either Side of Access Point for Full/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, 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



Figure 10. Full and Complete Public Beach Access (Breach Inlet to ¼ mile east of Access 57).

Calculations show that Isle of Palms could require as few as 7 access points (one *Regional Public Access Park* and six *Local Public Access Parks*) and approximately 210 public parking spaces to

yield full and complete public access along the same 4.8 mile shoreline. Using 2021/2022 data, Isle of Palms has approximately 8 times as many public access points and public parking spaces as required to provide full and complete public access.

2.6 Community Rating System

The City of Isle of Palms participates in the National Flood Insurance Program's Community Rating System (CRS), that rewards communities for engaging in activities that reduce flood risk with discounts on NFIP flood insurance premiums. During the 2021 Recertification process, the City of Isle of Palms was advised that a preliminary review of its application showed the City earned 2,664 credit points, and that the City would improve from Class 6 (20% discount on NFIP premiums) to Class 5 (25% discount). October 1, 2022 NFIP data show this to be the case https://www.fema.gov/sites/default/files/documents/fema_october-2022-crs-eligible-communities.pdf.

3. Beachfront Drainage Plan

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. Fortunately, Isle of Palms has no pipe outfalls or swashes discharging onto the beach. Stormwater issues on the island typically are related to shallow flooding of upland areas due to heavy rainfall. Stormwater issues seaward of the State's 40-year setback line are minor.

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 to review the study data prepared by the USDA-SCS and to 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, \$7 million in new drainage infrastructure was proposed. A bond referendum was conducted by City Council in November 1995, but the proposed bond issue was defeated by a wide margin. Since that time, stormwater improvements have been addressed on a project-by-project basis, with priority informed by the prior studies and recommendations.

Recent City and community actions related to stormwater are summarized below:

- During 2001 Wild Dunes undertook a major drainage project to accommodate the runoff of an upcoming project. The City was able to work in conjunction with Wild Dunes and agreed to pay to upgrade the size of the drainage pipe to accommodate additional drainage from an abutting neighborhood.
- 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) -- to facilitate 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) stormwater and sediment control regulations, and established a stormwater utility.

- In the fall of 2011, the City collaborated with Wild Dunes and completed a \$1.1M drainage project that alleviated many of the drainage problems between 53rd Ave. and 57th Ave. The second phase of the project will address drainage issues between 45th Ave. and 52nd. Ave., and has been designed (estimated cost \$1.3 to \$1.4 million). Partial funding (~\$800,000) is in hand and the remaining funds should be in place in the next 1-2 years, at which time the project will be constructed.
- In addition to the routine maintenance of existing drainage facilities, which is done with the assistance of the Charleston County Public Works Department and the SC Department of Transportation (SCDOT), the City has been employing an innovative rehabilitation technique that utilizes a water jet and sewer vacuum truck to re-grade and re-sculpt ditches while simultaneously removing spoil material and vegetation. This process has been successful in shaping ditches that were previously difficult to access with heavy equipment. The City plans to continue funding future maintenance.
- As required by the Priority Investment Act of 2007, an analysis was conducted of the likely federal, state and local funds available for public infrastructure and facilities on the Isle of Palms (Isle of Palms Planning Commission, 2015). Some of the possible projects are roadway and drainage improvements, and they might be eligible for funding by the Charleston County Transportation Development or by other funding sources. Installation of public sewers in areas served by septic systems and having marginal soils is considered a priority (specifically, septic tank systems in the areas near the beach between 42nd and 53rd Ave., adjacent to the Recreation Center from 26th to 29th Ave. and in low areas of the Forest Trail subdivision which are affected by flooding and seasonal high water and would benefit from public sewer service).
- The City cooperates with SCDHEC to monitor beach water quality at nine locations between May 1 and October 1 each year: 4th Avenue, 7th Avenue, 10th Ave, Isle of Palms County Park, 21st Avenue, 34th Avenue, 53rd Avenue, Dunecrest Lane and Port O'Call. If needed, 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). All posting of signs is coordinated between the City and DHEC. Beach water quality monitoring results are also available on <https://gis.dhec.sc.gov/beachaccess/> . Monitoring has shown only rare instances of bacteria levels exceeding State standards at one station (County Park-14th Ave., Sta TRI-054B

<https://www.theswimguide.org/beach/2254>), and no exceedance of State standards at this location since 2017.

4. Beach Management and Authorities

Beach management on Isle of Palms is exercised primarily through the entities listed below. More detail is provided for some of these entities in the sections that follow.

Federal:

USACE (permitting under Section 10 of the Rivers and Harbors Act; Section 404 of the Clean Water Act; post-disaster emergency assistance to the State)

USFWS and NMFS (principally via coordination with USACE on matters related to threatened and endangers species)

NOAA (principally via coordination with USACE and state agencies on coastal zone management and consistency issues; provides coastal zone management funding and training)

FEMA (oversees the National Flood Insurance Program; provides pre- and post-disaster hazard mitigation grant funds; provides disaster assistance to individuals and communities; provides training to fire, emergency management and other local government staff)

USEPA (principally on matters related to NPDES stormwater permitting, air quality, hazardous waste, etc.)

USCG (provides maritime safety and security; oil spill response),

State of South Carolina

SCDHEC (implementation of the Beachfront Management Act; water quality)

SCDNR (principally on matters related to rare/threatened/endangered species; flood mitigation)

SCDOT (transportation and parking)

SCEMD (emergency management coordination and assistance)

Charleston County (hazard mitigation and emergency management; planning and funding assistance with transportation and infrastructure)

City of Isle of Palms (land use and development regulations; public health and safety; environmental protection; public works)

4.1 State Authorities

4.1.1 Overview of State Policies (Beachfront Management Act)

The following overview was obtained from

<https://scdhec.gov/environment/your-water-coast/ocean-coastal-resource-management/beachfront-management>

In 1988, the South Carolina “Beachfront Management Act” (Coastal Tidelands and Wetlands Act, as amended, §48-39-250 et seq.) established a comprehensive statewide beachfront management program. The Act included several key legislative findings, including (summarized):

- the importance of the beach and dune system in protecting life and property from storms, providing significant economic revenue through tourism, providing habitat for important plants and animals, and providing a healthy environment for recreation and improved quality of life of all citizens;
- unwise development has been sited too close to and has jeopardized the stability of the beach/dune system;
- the use of armoring in the form of hard erosion control devices such as seawalls, bulkheads, and rip-rap to protect erosion-threatened structures has not proven effective, have given a false sense of security, and in many instances, have increased the vulnerability of beachfront property to damage from wind and waves while contributing to the deterioration and loss of the dry sand beach;
- inlet and harbor management practices, including the construction of jetties which have not been designed to accommodate the longshore transport of sand, may deprive downdrift beach/dune systems of their natural sand supply;
- it is in the state’s best interest to protect and promote increased public access to beaches for visitors and South Carolina residents alike.
- a coordinated state policy for post-storm management of the beach and dunes did not exist and that a comprehensive beach management plan was needed to prevent unwise development and minimize adverse impacts.

Section 48-39-260 of the Beachfront Management Act, as amended, established eight state policies to guide the management of ocean beaches:

1. Protect, preserve, restore, and enhance the beach/dune system;
2. Create a comprehensive, long-range beach management plan and require local comprehensive beach management plans for the protection, preservation, restoration, and enhancement of the beach/dune system. These plans must promote wise use of the state's beachfront⁵;
3. Severely restrict the use of hard erosion control devices and encourage the replacement of hard erosion control devices with soft technologies as approved by the department which will provide for the protection of the shoreline without long-term adverse effects;

⁵ Passage of the 2017-2018 Beach Management Reform Act (Act 173) removed the State’s 40-year Retreat Policy and instituted a Beach Preservation Policy.

4. Encourage the use of erosion-inhibiting techniques which do not adversely impact the long-term well-being of the beach/dune system;
5. Promote carefully planned nourishment as a means of beach preservation and restoration where economically feasible;
6. Preserve existing public access and promote the enhancement of public access for all citizens, including the handicapped, and encourage the purchase of lands adjacent to the Atlantic Ocean to enhance public access;
7. Involve local governments in long-range comprehensive planning and management of the beach/dune system in which they have a vested interest; and
8. Establish procedures and guidelines for the emergency management of the beach/dune system following a significant storm event.

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

4.1.2 Beachfront Setback Area

The State of South Carolina established a forty-year policy of retreat as part of the Beachfront Management Act in 1988. In 2018, Act 173 of the General Assembly eliminated the State policy of retreat and moved to a policy of beach preservation

https://www.scstatehouse.gov/sess122_2017-2018/bills/4683.htm

The policy is implemented by DHEC OCRM using jurisdictional lines along the ocean shoreline. DHEC OCRM has established two jurisdictional lines along the open coast beaches of South Carolina – a “Baseline” and a “40-year Setback Line” (see

<https://scdhec.gov/environment/your-water-coast/ocean-coastal-resource-management-ocrm/beach-management/state-beachfront>). The purpose of these jurisdictional lines is to

implement § 48-39-280(A) of the statute, which reads as follows:

“A policy of beach preservation is established. The department must implement this policy and utilize the best available scientific and historical data in the implementation. The department must establish a baseline that parallels the shoreline for each standard erosion zone and each inlet erosion zone.”

Descriptions of the jurisdictional lines are:

- The “Baseline”, which is established along the dune crest in “standard erosion zone” areas away from significant influence by unstabilized tidal inlets, and along the most landward shoreline (+/- vegetation line) in areas subject to significant influence by unstabilized tidal inlets. Although not applicable to the Isle of Palms, there is a third procedure used by OCRM to establish the baseline along shorelines near tidal inlets stabilized by jetties, terminal groins or other structures (the baseline is set in a manner similar to that in standard erosion zones). The Baseline is used as the reference feature from which the 40-year Setback Line is measured. Section 48-39-280 states that the baseline must not move seaward from its position on December 31, 2017.

Section 48-39-280 states, “(1) The baseline for each standard erosion zone is established at the location of the crest of the primary oceanfront sand dune in that zone. In standard erosion zones in which the shoreline has been altered naturally or artificially by the construction of erosion control devices, groins, or other manmade alterations, the baseline must be established by the department using the best scientific and historical data, as where the crest of the primary oceanfront sand dunes for that zone would be located if the shoreline had not been altered. (2) The baseline for inlet erosion zones that are not stabilized by jetties, terminal groins, or other structures must be determined by the department as the most landward point of erosion at any time during the past forty years, unless the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. In collecting and utilizing the best scientific and historical data available for the implementation of the retreat policy, the department, as part of the State Comprehensive Beach Management Plan provided for in this chapter, among other factors, must consider historical inlet migration, inlet stability, channel and ebb tidal delta changes, the effects of sediment bypassing on shorelines adjacent to the inlets, and the effects of nearby beach restoration projects on inlet sediment budgets. (3) The baseline within inlet erosion zones that are stabilized by jetties, terminal groins, or other structures must be determined in the same manner as provided for in item (1). However, the actual location of the crest of the primary oceanfront sand dunes of that erosion zone is the baseline of that zone, not the location if the inlet had remained unstabilized.”

- The 40-year Setback Line, which establishes the landward limit of DHEC OCRM jurisdiction under the Beachfront Management Act, generally is drawn landward of the Baseline a distance equal to 40 times the average annual erosion rate or not less than twenty feet from the baseline for each erosion zone based on the best historical and scientific data adopted for the department as part of the State Comprehensive Beach Management Plan.
- However, Act 173 modified this procedure in some locations by requiring that: 1) the baseline be established as the most seaward location of either the baseline established during the 2008-2012 establishment cycle, or the baseline proposed by DHEC on October 6, 2017. and 2) the setback line be established as the most seaward location of either the setback line established during the 2008-2012 establishment cycle, or the setback line proposed by DHEC on October 6, 2017.

The DHEC OCRM Baseline and 40-year Setback Line were last updated for Isle of Palms in 2018. The 2018 lines are posted on the DHEC OCRM website <https://gis.dhec.sc.gov/shoreline/>, and are shown in Figures 11a through 11d.

Calculations for the 2022 LCBMP (using Baseline and Setback Line .kml files provided by OCRM) show the following changes between the 2008 and 2018 jurisdictional lines:

- The 2018 Baseline is not landward of the 2008 Baseline anywhere on Isle of Palms.
- The 2018 40-year Setback Line is not landward of the 2008 40-year Setback Line anywhere on Isle of Palms

- The 2018 40-year Setback Line is +/- the same as the 2008 40-year Setback Line along approximately 4.3 miles of the 7-mile-long shoreline, and is seaward of the 2008 40-year Setback Line along approximately 2.7 miles. Of those 2.7 miles, the difference between the 2008 and 2018 40-year Setback Lines is less than 10 ft along approximately 2.2 miles. The 40-year Setback Line moved seaward as much as 200-300 ft along the 17th and 18th holes of the Wild Dunes Links Course.
- The movement of the Baseline is similar to that of the 40-year Setback line. The 2018 Baseline is +/- the same as the 2008 Baseline along approximately 4.7 miles of the 7-mile-long shoreline, and is seaward of the 2008 Baseline along approximately 2.3 miles. Of those 2.3 miles, the difference between the 2008 and 2018 Baselines is less than 10 ft along approximately 2 miles. The Baseline moved seaward as much as 150-300 ft along the 17th and 18th holes of the Wild Dunes Links Course.
- Act 173 did affect the location of the adopted 2018 Baseline and 40-year Setback Line (i.e., where the Baseline was established seaward of the most landward point of erosion in the past 40 years, or seaward of the dune crest, and where the 40-year setback was established seaward of where it otherwise would have been). A complete inventory of Act 173 effects on Isle of Palms was not undertaken, but the Act is thought to have affected the Baseline and/or Setback Line in the following locations:
 - along the shoreline between Breach Inlet and approximately 7th Ave.
 - along the shoreline between 41st Ave. and 46th Ave.
 - along the shoreline near Beach Club Villas and Mariners Walk.
 - along the shoreline between Summer Dunes Lane and Ocean Club.
 - along the shoreline near Ocean Point/17th hole of the Links Course.

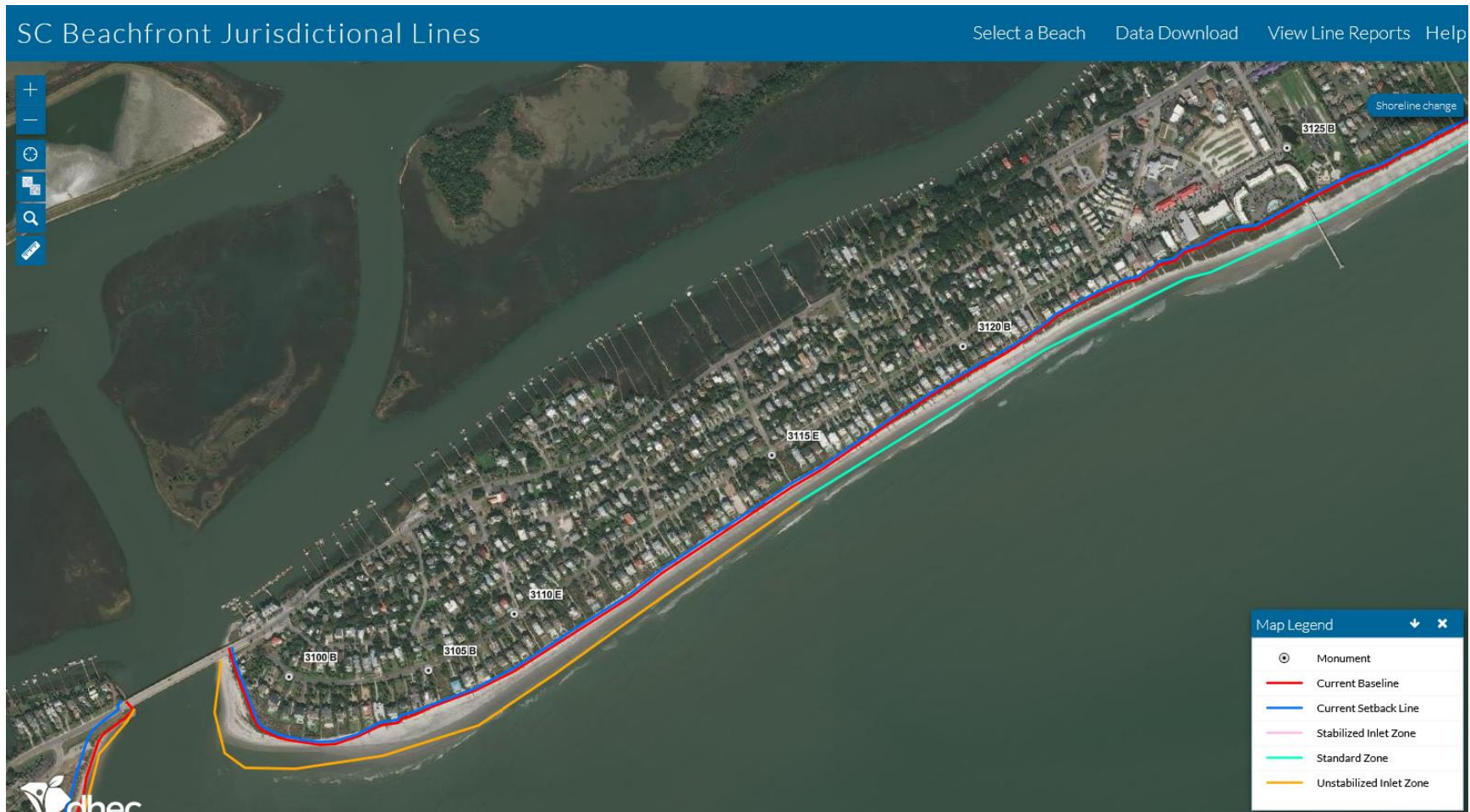


Figure 11a. 2018 Beachfront Jurisdictional Lines for Isle of Palms, Breach Inlet to 14th Ave. See <https://gis.dhec.sc.gov/shoreline/>.

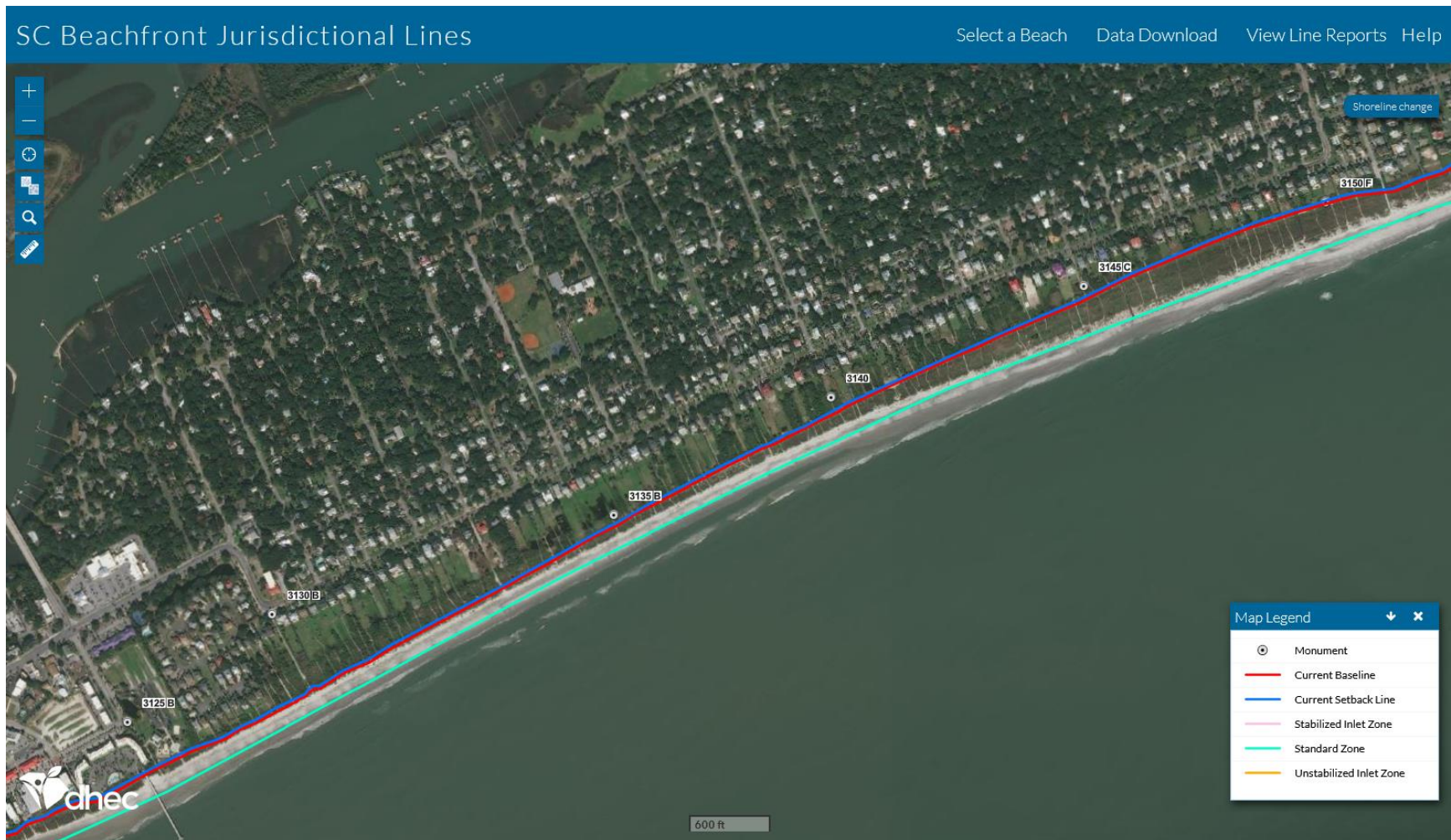


Figure 11b. 2018 Beachfront Jurisdictional Lines for Isle of Palms, 14th Ave. to 41st Ave. See <https://gis.dhec.sc.gov/shoreline/>.

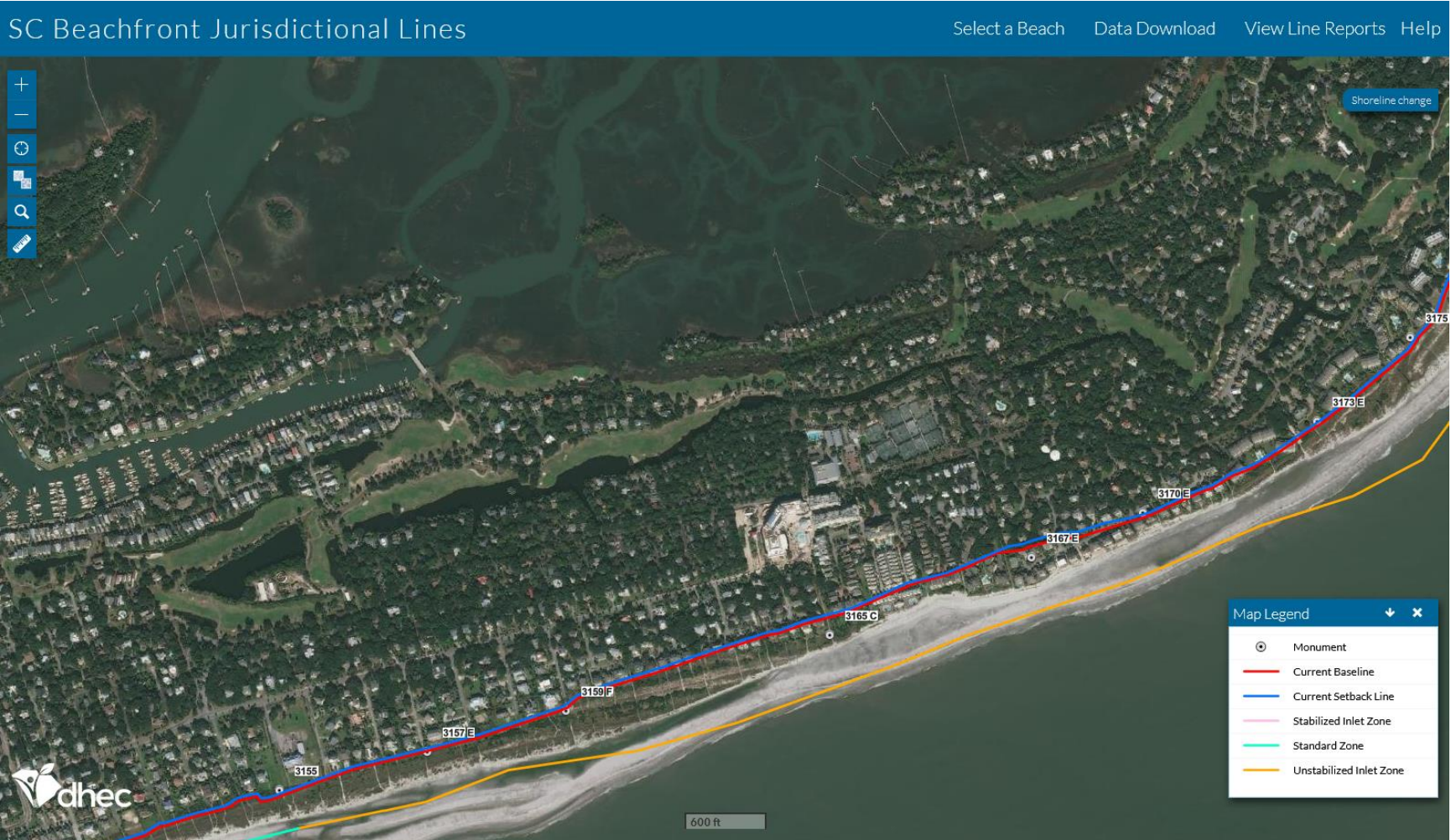


Figure 11c. 2018 Beachfront Jurisdictional Lines for Isle of Palms, 41st Ave. to Mariner’s Walk. See <https://gis.dhec.sc.gov/shoreline/>.

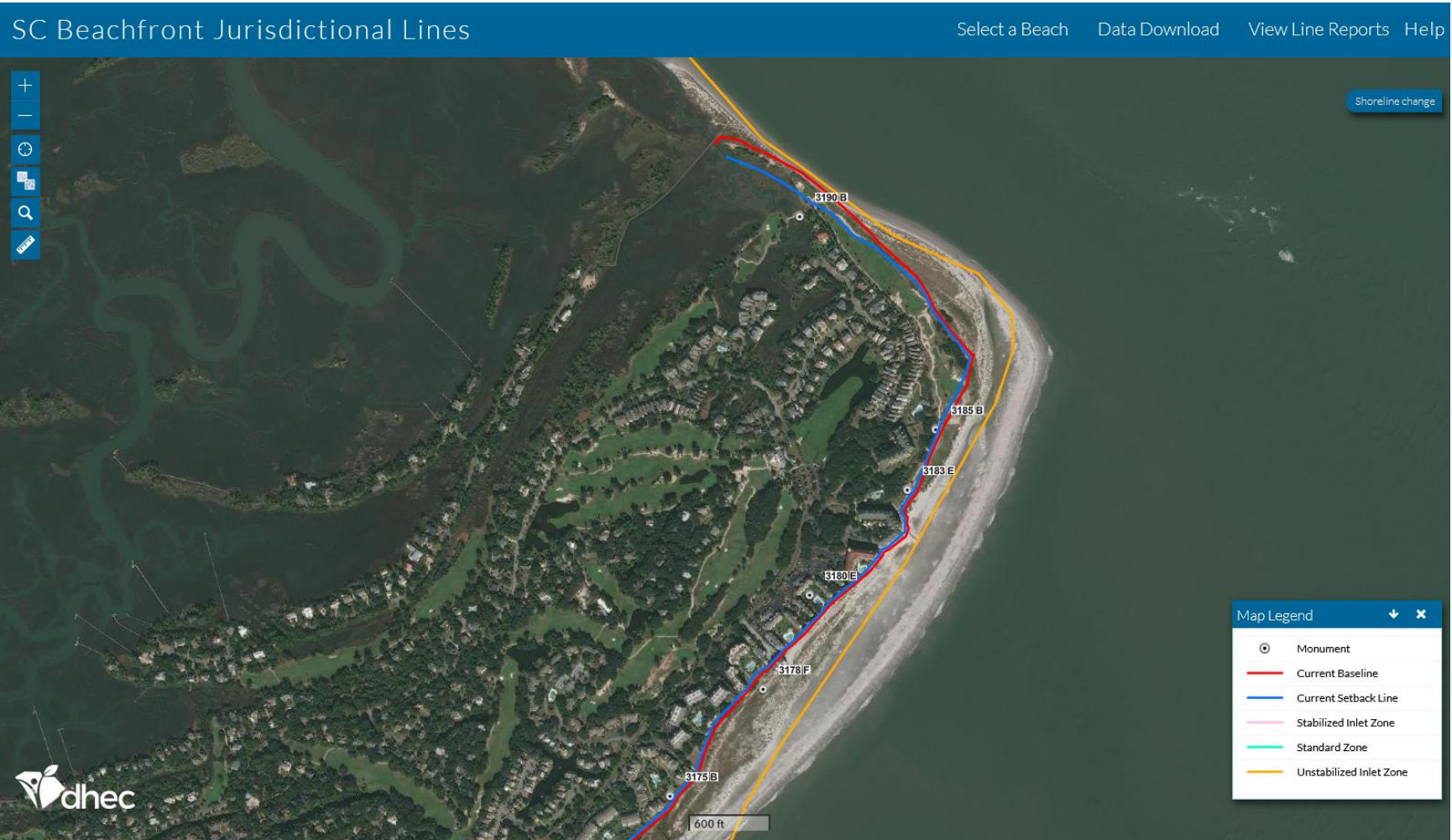


Figure 11d. 2018 Beachfront Jurisdictional Lines for Isle of Palms, Mariner’s Walk to Dewees Inlet. See <https://gis.dhec.sc.gov/shoreline/>.

4.2 Local Government and Authorities

The City of Isle of Palms uses various plans to guide development and other activities on the island. It carries out those plans and exercises beachfront management authority through powers provided in various sections of its Code of Ordinances https://www2.municode.com/library/sc/isle_of_palms/codes/code_of_ordinances. Plans and pertinent sections of the City Code are discussed in sections 4.2.1 through 4.2.6 of this LCBMP.

4.2.1 Municipality's 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/or needs arise. The latest adopted Comprehensive Plan is dated May 26, 2015 <http://www.iop.net/comprehensive-plan>.

The Comprehensive Plan is guided by the following Vision Statement:

"Isle of Palms has developed into a premier barrier island residential community with a variety of housing styles, commercial uses and recreational facilities. Despite the natural cycle of beach erosion that is inherent on barrier islands and the extensive development of the island, the natural resources that make Isle of Palms such a wonderful place to live and visit remain intact and in good condition. Measures that will enhance the existing character of the island as a quality place to live, and protect the environment both on and around the island, must be taken to guide development and preserve the quality of life for generations to come."

Issues most closely related to the beach and beach management are contained in the following elements of the Comprehensive Plan: Economic, Natural Resources, Community Facilities, Land Use, Transportation and Priority Investment.

Section 1.4 of this LCBMP identified three current beach management issues. These are listed below, accompanied by related extracts from the Comprehensive Plan and the status of City implementation for each.

- **Beach and dune erosion, particularly in the unstabilized inlet erosion zone at the eastern end of the island.** (see Section 5.2.1 of this LCBMP)

Economic Element

Goal 2.1 Balance the needs of residents and tourists with those of the environment.

Strategy 2.1.1: Establish policies and procedures to ensure that beaches, marshlands and marinas are protected and preserved. (Ongoing; Building Department and City Council)

Strategy 2.1.3: Maintain and enhance an effective monitoring system to ensure beaches, marshlands and marinas are properly maintained. *(Ongoing; General Government and City Council)*

Natural Resources Element

Goal 3.3: Protect marshes, dunes and beaches.

Strategy 3.3.1: Create a public awareness/education program aimed at protecting the sensitive ecosystem of a barrier island, to include protection of dunes and marshes and their vegetation, as well as the importance of removing animal waste and trash from the beaches. *(2008; General Government and Building Department)*

Strategy 3.3.2: Support efforts to minimize the impact of erosion on the ends of the island including beach nourishment projects. *(Ongoing; General Government)*

Goal 3.5: Protect the island's wildlife and vegetation.

Strategy 3.5.1: Pursue enforcement of ordinance(s) aimed at protecting loggerhead turtle nesting activities and sites. *(Ongoing; Building Department and Police Department)*

Strategy 3.5.2: Support other regulations that protect wildlife and vegetation. *(Ongoing; General Government and Police Department)*

- **Balancing public beach parking demand with available safe parking capacity on the island.** *(see Section 2.5 of this LCBMP)*

Transportation Element

Goal 8.1: Improve traffic flow and reduce congestion on the roadways of the island.

Strategy 8.1.4: Develop a management plan to lessen the effects beach traffic has on the island's roadways. *(2009; Building Department)*

Goal 8.2: Discourage non-resident parking and traffic in residential neighborhoods.

Strategy 8.2.1: Encourage appropriate measures including signs, traffic restrictions and parking restrictions. *(Ongoing; Managed Parking Plan being implemented; Police Department and City Council)*

- **Drainage of low-lying areas, an issue highlighted by tidal and rainfall flooding during October 2015 (Joaquin) and September 2017 (Irma).** *(see Section 3 of this LCBMP)*

Community Facilities Element

Goal 5.6: The City should take initiatives to address drainage and storm water runoff on the island.

Strategy 5.6.1: Continue to work closely with County and State agencies to properly maintain existing storm water and drainage systems. Clearly delineate the City's areas of responsibility and take appropriate action where feasible. *(Ongoing; General Government and City Council)*

Strategy 5.6.2: Consider funding for a comprehensive drainage study that would isolate the highest priority areas and provide engineering options and costs. *(Ongoing; General Government, Public Works and City Council)*

Strategy 5.6.3: Consider funding options, including special assessments, to address drainage problems. *(Ongoing; General Government and City Council)*

Strategy 5.6.4: The City should continue to work to remain in compliance with the National Pollution Discharge Elimination System Phase II as a small MS4 community. *(Ongoing; Building Department, General Government and City Council)*

Land Use Element

Goal 7.4: Ensure the adequacy of the infrastructure to support continued development and expanded uses.

Strategy 7.4.1: Continue to improve and expand the drainage system to alleviate the problems in those areas that drain poorly. *(Ongoing; Building Department and Public Works Department)*

Natural Resources Element

Goal 3.2: Improve the water quality of the ocean, waterway and creeks surrounding the island.

Strategy 3.2.4: Monitor DHEC/OCRM testing of ocean waters impacting the island. *(Ongoing; General Government and Building Department)*

Strategy 3.2.5: Create a public awareness/education program to address the impact of individual actions on the water ecology of the island. *(Ongoing; General Government, Building Department and Charleston County NPDES public education program)*

Priority Investments Element

Goal 9.1: Improve drainage in those areas that drain poorly.

Strategy 9.1.1: Identify problem areas and appropriate funding sources.

4.2.2 Municipality's Hazard Mitigation Plan

The City does not have a stand-alone Hazard Mitigation Plan, instead, elements of what would be a stand-alone plan are contained in the Charleston Regional Hazard Mitigation Plan, see <https://www.charlestoncounty.org/departments/building-inspection-services/hazard-mitigation-plan.php>. The City has been and continues to be an active participant in the Regional Plan development and update process, and chose this approach to facilitate coordination and consistency with Charleston County and other jurisdictions. All IOP-specific hazard mitigation information is contained in the County plan. The City will actively pursue funding (in advance or reimbursement) for hazard mitigation activities described in the Plan, in its efforts to reduce future damage and loss along the City shoreline.

4.2.3 Municipality's Disaster Preparedness and Evacuation Plan

The City's Disaster Preparedness Plan is posted on the City's Emergency Preparedness web page <http://www.iop.net/emergency-preparedness>. The plan and the website provide important information to residents, day-workers and tourists.

The City hosts a Disaster Expo every year, usually in May. Local, state, federal, private and other organizations provide information to attendees.

The Governor and the Mayor have the authority to order evacuations of the island. Evacuation routes from the island have been designated by Charleston County and the State, and are posted on the City web site.

The City has instituted a hurricane re-entry sticker program to facilitate re-entry of residents after an evacuation.

Wild Dunes Community Association (2012) also has a Hurricane Emergency Preparedness Plan which is consistent with the City's.

4.2.4 Beachfront Development Regulations

Section 5-4-15(A) of the Code of Ordinances ensures that development and redevelopment seaward of the 40-year Setback Line will satisfy DHEC OCRM requirements. The section states, "No land or building situated in whole or in part in a critical area as defined in S.C. Code 1976, § 48-39-10, as amended, shall be used, occupied, constructed, altered or moved without compliance with the State of South Carolina Beachfront Management Act (S.C. Code 1976, § 48-39-10 et seq., as amended)."

Sections 5-4-151 through 5-4-171 (Flood Damage Prevention) govern additions, improvements and reconstruction of damaged buildings within the Special Flood Hazard Area (100-yr floodplain shown on Flood Insurance Rate Maps). On Isle of Palms, this area includes almost all of the island. These sections of the Code require new buildings to comply with flood-resistant design, construction and use standards, and require *substantially damaged* and *substantially improved* buildings to meet the requirements for new construction.

- In June 2021, the City established a minimum lowest floor elevation for new buildings in the Special Flood Hazard Area at one foot above the Base Flood Elevation, or 13 ft NAVD88, whichever is higher. This was done after the January 2021 FIRMs were adopted; those FIRMs establish BFEs on IOP between 9 ft and 14 ft NAVD88. Thus, the City requires from one to four ft of freeboard.
- The City Code defines *substantial damage* to mean damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition equals or exceeds fifty percent (50%) of the fair market value of the structure before the damage occurred. Note that this trigger for complying with current code requirements is more restrictive than DHEC OCRM classification of habitable structures that are destroyed beyond repair in R.30-1.D(17) and R.30-14.D(5)(a) (trigger is 66-2/3 % of replacement value).
- The City Code defines *substantial improvement* to mean any combination of repairs, reconstruction, alteration, additions or improvements to a structure in which the total cost

equals or exceeds fifty percent (50%) of the fair market value of the structure before the start of construction. Note that in some ways this trigger for complying with current code requirements is more restrictive than DHEC OCRM treatment of: 1) additions to habitable structures in R.30-13.C and R.30-13.B (DHEC OCRM places a size limit and location restriction on additions but places no limit on the value of additions that trigger new construction requirements) and 2) repair and renovation of habitable structures that are not destroyed beyond repair in R.30-13.D (some habitable structures not captured by DHEC OCRM will be captured by the City Code).

Sections 5-4-45 through 5-4-48 of the Code of Ordinances generally permit nonconforming structures in the City to be used and rebuilt as long as the extent of the nonconformity is not increased, subject to certain limitations. The DHEC OCRM allowance in R.30-15.F (Activities Allowed Seaward of the Baseline, Special Permits) provides additional requirements related to non-conforming structures.

Several other portions of the City Code of Ordinances listed Section 4.2 of this LCBMP pertain directly to beachfront development and redevelopment regulations. These sections will be addressed in sections that follow.

4.2.5 Regulations on Beach and Shoreline Protection

Notwithstanding Section 5-4-15(A), it should be noted that while City zoning and land use regulations might permit construction or reconstruction of buildings larger than 5,000 sq ft in size (enclosed space), potential conflicts between DHEC OCRM and City regulations should not be a concern for most of the island. Outside the Wild Dunes PDD, City regulations specify a maximum single-family residential building size (livable space) of 7,000 sq ft, or 40% of the lot area, whichever is less. While the maximum size permitted by the City can sometimes exceed the DHEC OCRM limit of 5,000 sq ft of heated space, other factors often limit single family residential building size below 7,000 sq ft (e.g., lot size, deed restrictions and covenants, City construction limits and setbacks).

A comparison of the City seaward construction limit for buildings and the 2018 DHEC OCRM Setback Line shows:

1. The seaward construction limit for buildings on lots in City Preservation Overlay Zone P-2 along 1.4 miles of shoreline between Breach Inlet and 10th Ave. (see Figure 5 and Section 2.3 of this LCBMP) generally lies approximately 20 ft to 150 ft landward of the DHEC OCRM Setback Line, except near the Breach Inlet bridge.
2. The seaward building construction limit in the commercial district (10th Ave. to 14th Ave) is 200 ft seaward of the Ocean Blvd. right of way -- see Section 5-4-36(3)(a). This setback is approximately 20 ft to 70 ft landward of the DHEC OCRM Setback Line.
3. The seaward building construction limit in the Sand Dune Lane area (east of County Park, west of 21st Ave.) is established by the neighborhood Architectural Review Committee, and has resulted in a more restrictive setback than the City would require through zoning. Buildings here are approximately 100 ft landward of the DHEC OCRM Setback Line.

4. The seaward building construction limit in City Preservation Overlay Zone P-1 along 1.6 miles of shoreline between 21st Ave, and 41st Ave. is approximately 100 ft to 450 ft landward of the DHEC OCRM Setback Line.
5. The seaward building construction limit along 0.7 miles of shoreline between 41st Ave. and 53rd Ave. is dictated by deed restrictions. The effective seaward limit of building construction is approximately 30 ft to 140 ft landward of the DHEC OCRM Setback Line.
6. The seaward building construction limit in City Preservation Overlay Zone P-3 along 0.3 miles of shoreline between 53rd Ave. and 56th Ave. is 110 ft from the rights-of-way for 54th, 55th and 56th Ave. The building construction limit is from approximately 50 ft landward of the DHEC OCRM Setback Line at 53rd Ave. to approximately *60 ft seaward* of the DHEC OCRM Setback Line near 57th Ave.
7. Within the Wild Dunes PDD, building construction limits are dictated by the development agreement. The seaward sides of buildings presently lie from landward of the DHEC OCRM Setback Line to approximately *275 ft seaward* of the DHEC OCRM Setback Line (Beachwood East).

The most likely location where buildings greater than 5,000 sq ft are, or could be, affected by the DHEC OCRM building size limitation is in the unstabilized inlet erosion zone east of 47th Ave., particularly where homes and condominium buildings already encroach significantly seaward of the Setback Line (between 56th Ave. and Port O'Call).

A review of the development agreement for Wild Dunes was not performed, nor was a review of individual documents for property regimes, and it is possible that these could contain minimum building size or other requirements that would conflict with DHEC OCRM building limitations -- but the City has no authority to initiate modifications to the development agreement or regime documents; therefore, these are not considered in this LCBMP.

4.2.6 Other Regulations on Beach Management

The following other City regulations pertain to beachfront management. Some of these were mentioned in Sections 2.2.1 and 4.2 of this LCBMP.

Title 3, Chapter 4 (Environmentally acceptable packages and products)

- Bans single-use plastic bags, plastic straws, polystyrene coolers and polystyrene food containers, cups, and balloons from the beach.

Title 5, Chapter 4, Section 5-4-15 (Beach regulations)

- Prohibits development and activities that do not comply with the Beachfront Management Act.
- Prohibits construction of hard erosion control devices. Restricts sand bag installations⁶.
- Requires only beach compatible sand be used for beach nourishment.

⁶ 5-4-16(B)(1) still prohibits sand bags greater than 5 gallons in size, but the City defers to OCRM on sand bagging emergency orders.

- Prohibits dune alteration except for dune walkovers that meet DHEC OCRM requirements.
- Requires installation of sand fencing and dune vegetation to meet DHEC OCRM requirements.
- Prohibits obstruction of public beach access.

Title 5, Chapter 4, Section 5-4-17 (Sea turtle outdoor lighting regulations)

- Prohibits illumination of the beach by lights from new and existing development between May 1 and October 31 each year.
- Establishes lighting fixture specifications and requirements.

Title 6, Chapter 2, Sections 6-2-14 (Dogs running at large), 6-2-16 (Dogs not to disturb protected species and habitats) and 7-3-15 (Restrictions on dogs on the beach)

- Prohibits off-leash dogs on the beach, except for between the hours of 4:00 p.m. to 10:00 a.m. from September 15 through March 31, and between the hours of 5:00 a.m. to 9:00 a.m. from April 1 through September 14. Requires owners of dogs off-leash to be in close proximity to the dog, have a leash in hand, and have the dog under control.
- Makes it unlawful for any person to allow their dog to disturb nesting sea turtles, turtle nests or turtle hatchings.
- Makes it unlawful for any person to allow their dog to enter into critical habitat areas which have been posted to prohibit such entry by the City or the State Wildlife and Marine Resources Department.

Title 6, Chapter 4 (Smoking)

- Prohibits smoking on public beaches and beach access points.

Title 7, Chapter 2 (Drinking on streets, beaches, etc., prohibited)

- Prohibits drinking and possession of open containers of alcoholic beverages on the beach.

Title 7, Chapter 3 (Beach and Marine Recreation Regulations)

- Prohibits operation of motor vehicles on the beach, except for those determined by the City to be for emergency or public health and safety or other approved purposes.
- Prohibits use of surfboards or similar within 200 ft of the fishing pier or within 100 ft of any bather; requires surfers to use a surfboard leash within 200 ft of any bather or other surfers.
- Prohibits operation of motorboats and jet skis within 100 yards of the City police jurisdiction of the ocean, except for authorized emergency boats.

- Prohibits beaching or launching of any motorboat or jet ski on the public beach, except in case of emergency.
- Prohibits parasailing within police jurisdiction.
- Prohibits littering or dumping of garbage or refuse or waste on the beach.
- Prohibits bringing glass bottles or receptacles onto the beach.
- Requires users to attend to any tents, canopies, beach chairs, kites, coolers, beach umbrellas and similar property on the beach after sunset.
- Prohibits locating any personal property within 25 ft of any emergency beach access or any turtle nest.
- Prohibits leaving personal property on the beach after sunset, except "Hobie Cat" style sailboats which are operable and kept in good working condition or poles supporting volleyball nets adjacent to commercially zoned property
- Prohibits overnight sleeping on the beach.
- Prohibits fires and fireworks on the beach, except for City-sponsored events.
- Prohibits physically harming, harassing, or otherwise disturbing any sea turtle (including eggs and hatchlings) or any sea bird (including eggs and young). Requires beached or stranded sea turtles, whales, or dolphins to be reported immediately to the City Police Department.
- Prohibits alteration, destruction or removal of any portion of a sand dune, except by obtaining valid permits for construction or development from all required governmental authorities.
- Prohibits any person from cutting, collecting, breaking, or otherwise destroying sea oat plants or other native dune grasses, or any part thereof, on public property or on private property without the owner's consent. *Same prohibition in Section 9-1-12.*
- Establishes a swimming zone east of the fishing pier and seaward of Isle of Palms County Park. Only swimming and wading and related activities are permitted in this zone when County lifeguards are on duty

Title 9, Chapter 3, Sec. 9-3-3 (Swimming and wading at Breach Inlet)

- Prohibits swimming and wading in the waters at Breach Inlet.

5. Erosion Control Management

5.1 Shoreline Change Analysis

There are two types of shoreline zones on the Isle of Palms: unstabilized inlet zones at each end, and a standard zone in the center. The zone extents are shown in Figure 12, and they are described below.

Breach Inlet unstabilized inlet zone: extends approximately 0.9 miles, from the Breach Inlet bridge to DHEC OCRM survey monument 3115B (6th Ave).

Standard zone: extends approximately 3.0 miles, between DHEC OCRM survey monuments 3115B (6th Ave.) and 3155 (47st Ave).

Deweese Inlet unstabilized inlet zone: extends approximately 3.1 miles, between DHEC OCRM survey monument 3155 and the end of Morgan Creek Spit (Deweese Inlet shoreline).

5.1.1 Beach Profiles

Beach profiles are used to monitor beach width, beach volume and beach/dune conditions over time. Beach profiles have been surveyed along portions of the Isle of Palms since the early 1980s. Comprehensive beach profile measurements by DHEC OCRM contractors began about 1987 and occurred on an annual (or more frequent) basis until about 2008; State monitoring on Isle of Palms resumed in 2013, and has continued annually since that time.

State beach profile measurements are taken from 24 survey monuments established by the State (Figure 12), starting with station 3100 near the Breach Inlet bridge, and extending to station 3190 on Dewees Inlet shoreline.

State beach profile data since 2014 are contained in the DHEC OCRM *Berm Explorer* web site <https://gis.dhec.sc.gov/bermexplorer/> (see Figure 13).

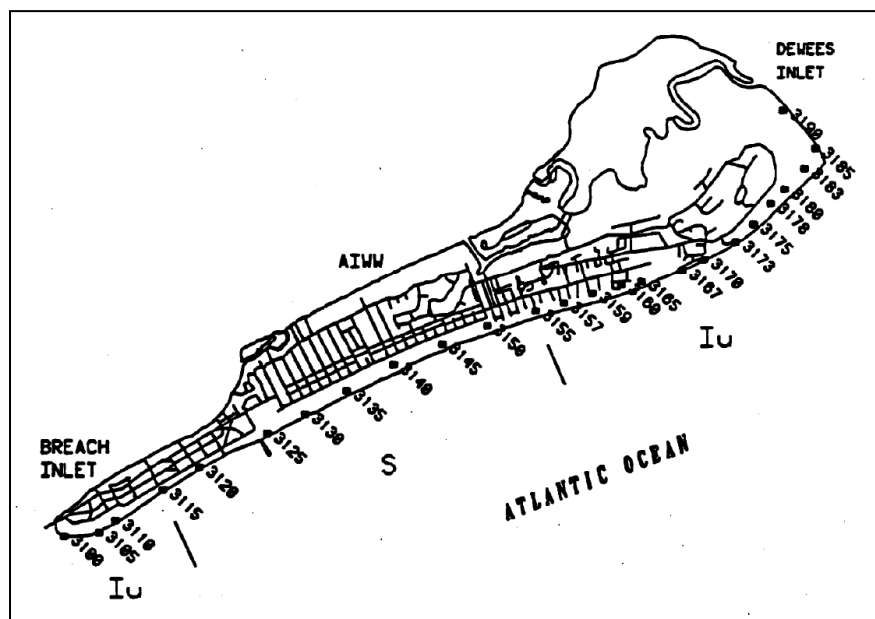


Figure 12. DHEC OCRM shoreline erosion zones (Iu = unstabilized inlet zone; S = standard zone) and beach profile survey monument designations (3100 to 3190) and locations (SCCC, 1992).

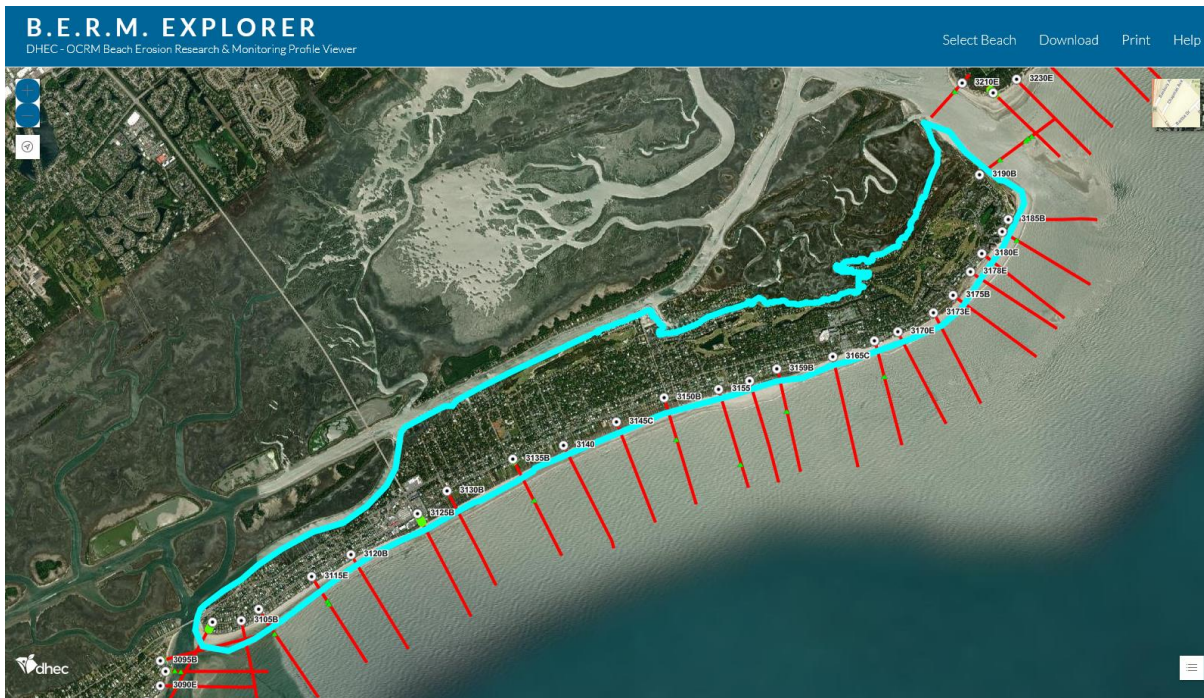


Figure 13. DHEC OCRM Berm Explorer beach profile site <https://gis.dhec.sc.gov/bermexplorer/> showing profile locations for Isle of Palms.

Since 2008, the City has supplemented the State beach profile program with its own beach monitoring program, using more frequent and more closely spaced beach profiles (118 profile locations, including 24 DHEC OCRM stations). Collectively, the State and City-sponsored profile data provide a good picture of temporal and spatial changes along the shoreline. Reports written as part of the City-sponsored beach monitoring program (e.g., CSE, 2015a, 2016a, 2019, 2020, 2021, 2022) provide the most detailed beach profile change and volumetric calculations. See <http://www.iop.net/beach-restoration> for City beach monitoring reports.

The City beach monitoring program divides the shoreline into 7 reaches (see Figure 14). Reach 1 is the same as the DHEC OCRM unstabilized inlet zone at Breach Inlet. The DHEC OCRM standard zone includes monitoring reaches 2 and 3, and most of reach 4. The DHEC OCRM unstabilized inlet zone at Dewees Inlet includes part of monitoring reach 4, and all of reaches 5, 6 and 7.

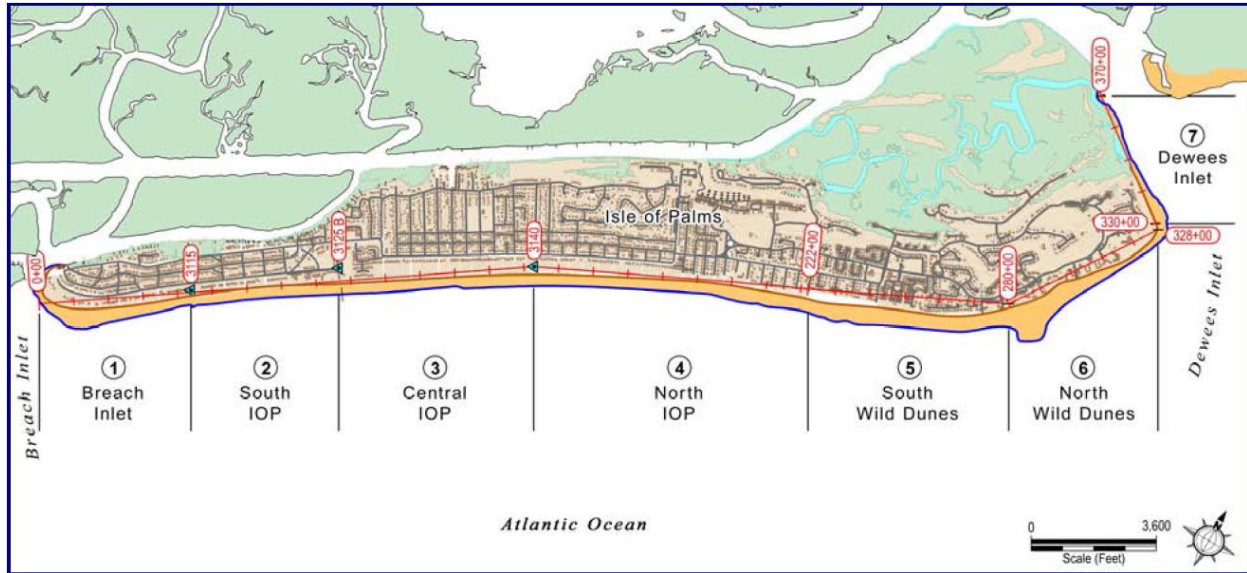


Figure 14. City beach monitoring reaches (CSE, 2015a).

OCRM and City beach monitoring data show high variability in beach width and volume in the eastern unstabilized inlet erosion zone (reaches 5, 6, 7, some of 4), due to shoal attachments and beach nourishment there. The beach profiles in the standard erosion zone (reaches 2, 3, most of 4) show less variability, as would be expected. Beach profiles in the western unstabilized inlet zone (reach 1) show some variability, but nowhere near what is seen in the eastern unstabilized inlet zone.

5.1.2 Long-Term Erosion Rates and Shoreline Change

Prior studies have shown how shorelines have changed over a period of decades on Isle of Palms. For example, Figure 15 shows shoreline changes at the west end of the island between 1875 and 1983 (Jones, 1986). The long-term trend there has been accretion, with short episodes of erosion. Figure 16 shows shoreline (vegetation line) movements along Beachwood East between 1949 and 1997 (data were developed as part of SCCC baseline establishment). As with many locations in the Dewees Inlet unstabilized inlet zone, the shoreline fluctuations here have been dramatic, often accreting or eroding hundreds of feet in just a few years.

DHEC OCRM has calculated long-term, average-annual rates of shoreline change at each of their survey monuments and at intermediate locations using historical shorelines and beach profile data. The rates are used to determine the location of the 40-year Setback Line landward of the DHEC OCRM Baseline (setback distance = 40 times the long-term rate, but not less than 20 ft for areas that are stable or accretional over long periods of time). New erosion rates are adopted by DHEC OCRM when the Baseline and 40-year Setback Line are redrawn (approximately once every 8-10 years). Table 5 shows the shoreline change rates associated with the 2018 Setback

Line. Areas subject to long-term accretion or erosion less than -0.5 ft/yr are given the minimum 20 ft setback.

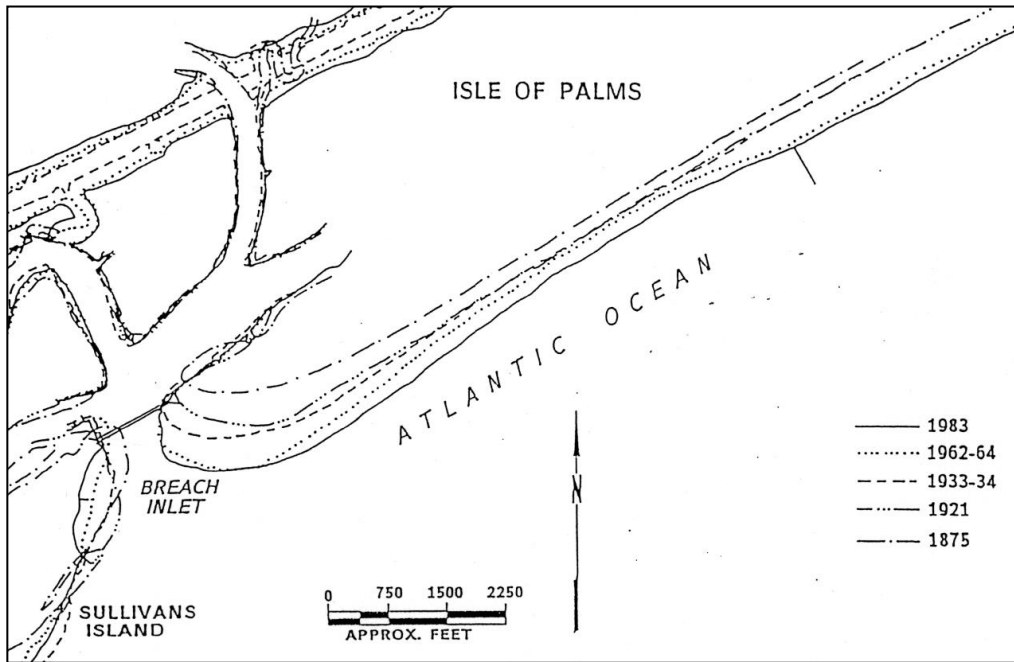


Figure 15. 1875 -1983 shoreline changes at the west end of Isle of Palms (Jones, 1986)

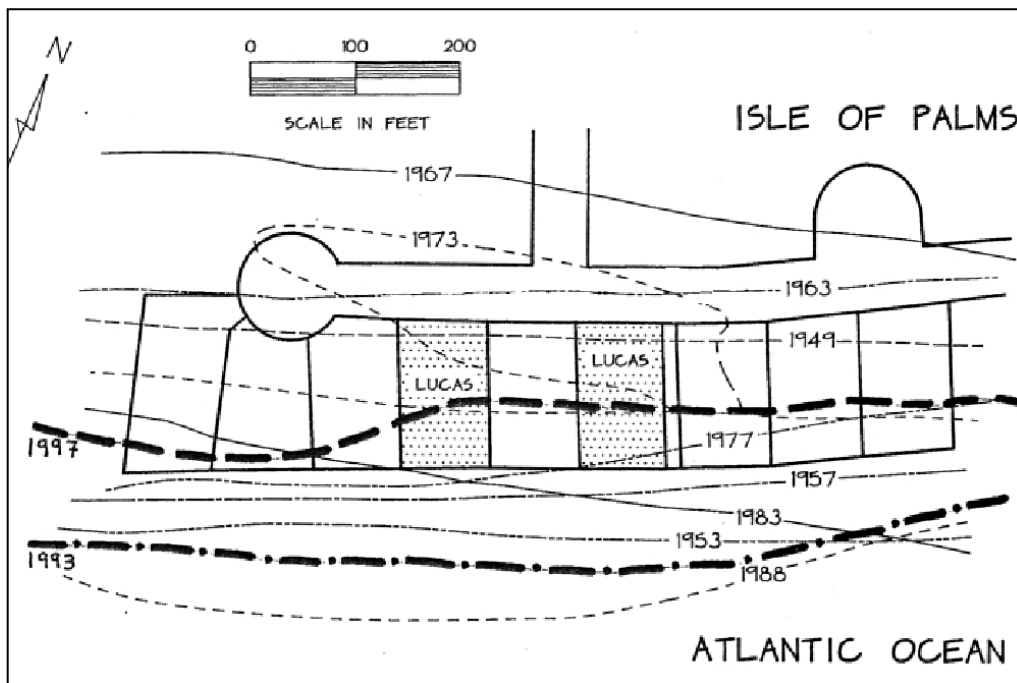


Figure 16. 1949-1997 movement of vegetation line in vicinity of Beachwood East.

Table 5. DHEC OCRM shoreline change rates (ft/yr) taken from Line Report (OCRM, 2019) and Jurisdictional Line Viewer <https://gis.dhec.sc.gov/shoreline/> . Positive numbers indicate accretion, negative numbers indicate erosion.

Monument	Long-term shoreline change rate (ft/yr)	Location
3100 B	6.97	Breach Inlet
3105 B	6.97	2 nd Ave.
3110 E	6.97	3 rd Ave.
3115 E	4.16	6 th Ave.
3120 B	4.16	8 th Ave.
3125 B	4.16	14 th Ave.
3130 B	4.16	21 st Ave.
3135 B	4.16	27 th Ave.
3140	4.16	31 st Ave.
3145 C	4.16	36 th Ave.
3150 F	4.16	41 st Ave.
3155	4.16	47 th Ave.
3157 E	4.16	50 th Ave.
3159 F	2.2	53 rd Ave.
3165 C	0.55	57 th Ave.
3167 E	-1.02	Beachwood East (west end)
3170 E	0.73	Beachwood East (east end)
3173 E	3.48	Wild Dunes Property Owners Beach House
3175 B	3.48	Mariner's Walk
3178 F	3.48	Summer House
3180 E	3.48	Port O' Call
3183 E	0.94	Ocean Club
3185 B	0.94*	18 th fairway, Links Course
3190 B	-2.78	17 th tee, Links Course

Notes:

1. "B" through "F" monuments are replacement monuments.
 2. Shoreline change rates vary between monuments. See Surveyor's Package and Line Report (DHEC OCRM, 2019), and <https://gis.dhec.sc.gov/shoreline/> .
- * "N/A" rate listed on OCRM Jurisdictional Line viewer in areas transitioning from long-term accretion to long-term erosion. Per OCRM guidance, the closest shoreline change rate was assigned to the monument.

All but approximately 3,000 ft of the 7-mile shoreline has the 20-ft minimum setback. The Setback Line is more than 20 ft landward of the Baseline along approximately 900 ft of Beachwood East, and along approximately 2,100 ft of the Dewees Inlet shoreline.

It should be noted that even though DHEC OCRM has classified the east end of Isle of Palms as an unstabilized inlet zone, and even though portions of this zone have been subject to significant erosion over short periods of time (shoal attachments), DHEC OCRM has determined much of this zone to be *long-term* accretional. In areas like this the setback distance between the Baseline and Setback Line is the minimum established by the Beachfront Management Act (20 ft), but the Baseline is drawn on the most landward shoreline in the 40 years preceding Baseline and Setback Line establishment. Figure 17 (a close-up of Figure 11c) shows such a location where the State has determined the long-term trend to be accretional, but has established the Baseline landward of present development.

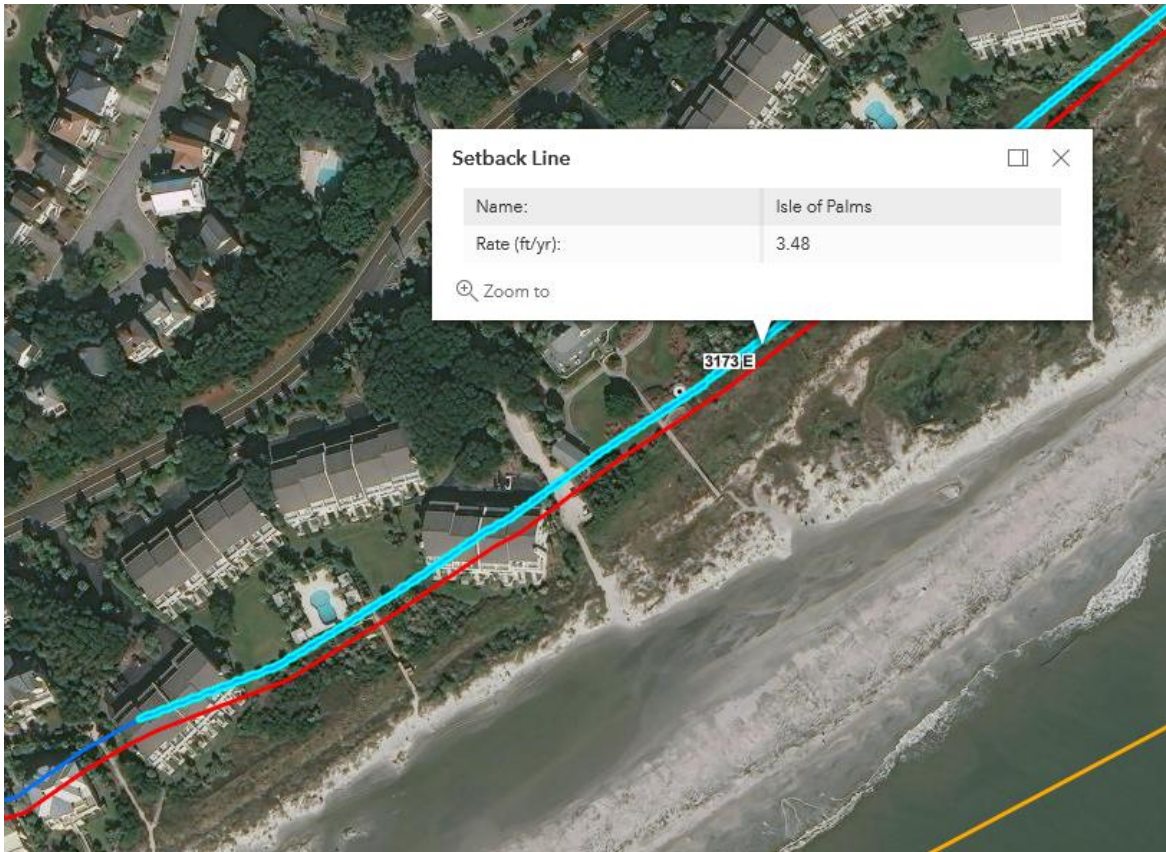


Figure 17. Example of long-term accretion and 20 ft minimum setback distance, with DHEC OCRM Baseline and Setback Line landward of existing development.

5.2 Beach Alteration Inventory

There is one groin on Isle of Palms, on the Dewees Inlet shoreline near the Links Course 17th tee (Figure 18). The groin was constructed in the 1980s using large bags filled with grout. The groin

is partially effective in maintaining the beach updrift (Links Course, 17th fairway) but has not significantly reduced the movement of sediment northward along the inlet shoreline. The Morgan Creek Spit continues to grow downdrift of the groin.



Figure 18. April 14, 2011 photos of groin at Wild Dunes Links Course, 17th tee.

There are thought to be five stone revetments east of 47th Ave – all but one buried by sand in April 2016. The approximate revetment locations and details (if known or estimated) are shown in the map overlays in the Appendix, and are described below:

- Rock revetment (see Figure 19). Length, approximately 700 ft, from approximately 600 ft west of DHEC OCRM station 3167 (Seagrove Villas) to approximately 100 ft east of DHEC OCRM station 3167 (west end of Beachwood East). Location, approximately 250 ft seaward of DHEC OCRM Setback Line. Condition, April 2016, exposed granite stone, ranging in size from approximately 6-in to 3-ft; woven filter fabric visible; other construction details unknown.
- Possible rock revetment. Length, approximately 600 ft, from approximately 170 ft west of 47th Ave. to approximately 100 ft east of 48th Ave. Location, approximately 40 ft seaward of DHEC OCRM Setback Line. Condition, April 2016, buried and not visible.

- Possible rock revetment. Length, approximately 1,300 ft, from 49th Ave. to 53rd Ave. Location, approximately 30 ft seaward of DHEC OCRM Setback Line. Condition, April 2016, buried and not visible.
- Possible rock revetment. Length, approximately 100 ft, near DHEC OCRM station 3165 east of 57th Ave. Location, approximately 100 ft seaward of DHEC OCRM Setback Line. Condition, April 2016, buried and not visible.
- Rock revetment. Length, approximately 1,100 ft (Beach Club II and Mariner’s Walk). Location, approximately 60 ft seaward to 10 ft landward of DHEC OCRM Setback Line. Condition, April 2016, buried and not visible.



Figure 19. April 5, 2016 photo of exposed rock revetment near Seagrove/Beachwood East.

Kana, et al (1985) reported that approximately 3,300 ft of rock revetment was constructed in 1983, somewhere in the vicinity of Seagrove, Beach Club and Mariner’s Walk. This length has not been confirmed as part of this LCBMP.

There are no known seawalls or bulkheads along the oceanfront, but there is one known timber retaining/landscaping wall near the east end of Beachwood East (approximately 80 ft long, plus return walls; other construction details are unknown) – see Figure 20.

As of January 19, 2017, there were three Wave Dissipation Systems (WDS) along the Isle of Palms oceanfront, all installed under pilot study authorization granted by the SC Legislature:

- Ocean Club. Length, approximately 350 ft.

- Seascape Villas. Length, approximately 200 ft (this is a replacement for a prior installation removed prior to a 2014 shoal management project).
- Beachwood East. Length, approximately 850 ft – see Figure 20.

DHEC OCRM ordered removal of the WDS by July 28, 2016, but the installations remained in place pending results of a legal challenge. In August 2017, a Federal Court ordered removal. The WDS installations were removed in January 2018, prior to the renourishment project. Documents and details may be found at <http://www.scdhec.gov/homeandenvironment/water/wds/> and <http://www.courthousenews.com/wp-content/uploads/2017/08/sea-turtle-order.pdf>.



Figure 20. April 5, 2016 photo of Wave Dissipation System installation at Beachwood East (same area as shown in Figure 16). WDS ties into rock revetment at west end, see Figure 19. A timber retaining/landscaping wall is also shown. The Wave Dissipation System was removed in 2018.

5.2.1 Beach Renourishment

There have been three large renourishment projects and numerous small projects, along the Wild Dunes shoreline. The small projects were truck-haul projects by property owners for emergency protection (1982 – 2008, details unknown).

There have also been two shoal management projects (2012, 2014-15) to redistribute sediment along the Wild Dunes shoreline in response to erosion from inlet shoal attachment.

The three large renourishment projects were conducted using dredges:

- Nov. 1983 – Mar. 1984. 350,000 cy, pumped from new marina construction at the north side of the island onto the beach.
- May – June 2008. 934,000 cy (pay volume = 847,400 cy), pumped from 2.5 miles offshore onto three sections of beach totaling 10,200 ft in length (Figure 21) at a cost of \$8.4 million (note: some references have reported a cost of \$10 million, but this includes some of the subsequent shoal management work).



Figure 21. Locations of 2008 beach renourishment sites and offshore sediment borrow area (CSE, 2015a).

- December 2017–April 2018. 1,676,500 cy, pumped from approximately 2 miles offshore onto two sections of beach totaling 8,800 ft in length (Figure 22) at a cost of \$13.5 million. These figures include 276,500 cy paid for by FEMA using post-Irma recovery funding.



Figure 22. Location of 2018 beach renourishment (CSE, 2019).

The 2008 and 2018 projects have been well-documented by a series of annual monitoring reports of the entire beachfront on the City web site <https://www.iop.net/administration/beach-restoration> . The reports produced since the 2018 renourishment project (CSE, 2019; CSE, 2020; CSE 2021; CSE, 2022) document 2018 project performance, and recent changes in beach condition along the entire ocean shoreline of Isle of Palms.

Figures 23 and 24 are taken from the most recent monitoring report (CSE, 2022), and show the historical changes in beach volumes between 2007 and 2021 for reaches 7 (Dewees Inlet) through 1 (Breach Inlet). CSE (2022) states:

- Reach 5-7 Summary -- *“The overall erosional trend is evident along reaches 5 and 6 between nourishment projects, each of which restores sand volumes to maintain a dry beach and protective dune. Sand lost from reaches 5 and 6 either moves south to provide sediment to the rest of Isle of Palms, or recycles to Dewees Inlet, where it will eventually form a shoal and recycle back to the beach. The increases in volume along Reach 7 observed in recent years, as well as the buildup of sand within the delta at the northeast corner of the island, document the transfers of sand from reaches 5 and 6 into the inlet system.”*
- Reach 7 (shoreline fronting Dewees Inlet channel) – *“The inlet shoals shelter large waves from impacting this portion of beach, resulting in the profile generally showing a narrow dry sand berm and a steep beach face. . . The seaward end of the reach was included in the 2008 nourishment project and remained relatively stable in the following years. . . Overall, Reach 7 has gained ~207,500 cy of sand since 2007, which is an average annual increase of 3.7 cy/ft per year.”*

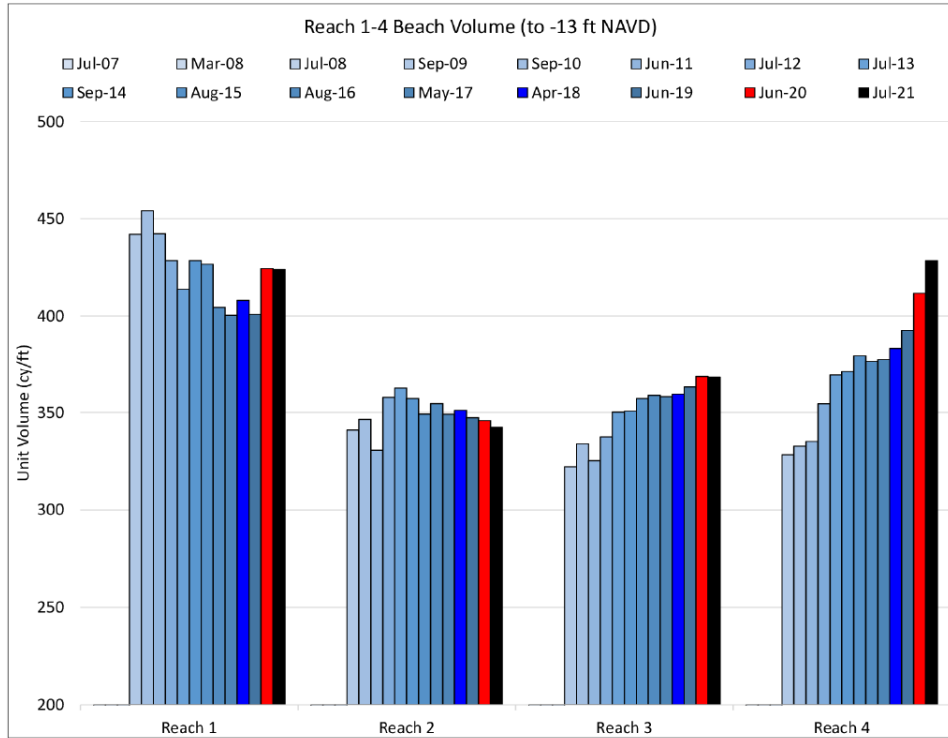


Figure 23. Unit volumes in monitoring reaches 1, 2, 3 and 4 between July 2007 and July 2021 (CSE, 2022). See Figure 14 for beach monitoring reaches.

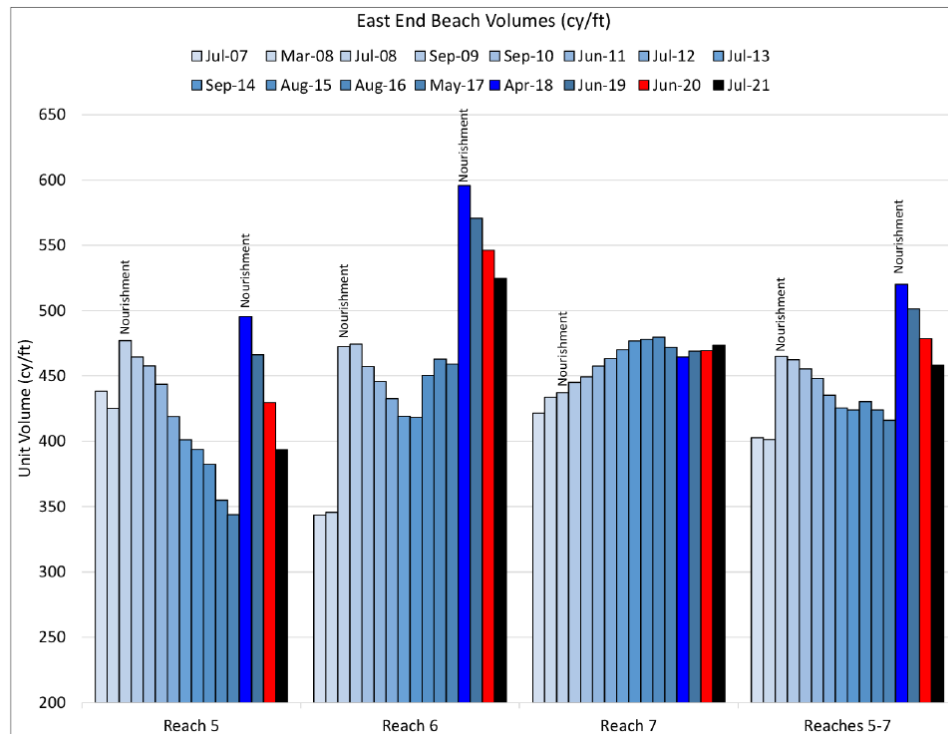


Figure 24. Unit volumes in monitoring reaches 5, 6 and 7 between July 2007 and July 2021 (CSE, 2022). See Figure 14 for beach monitoring reaches.

- Reach 6 (Wild Dunes Property Owners Beach House to the 18th Hole of the Links Course) – *“Along with Reach 5, shoal bypass events directly impact this length of beach. Depending on the location of bypass events, the shoreline can move hundreds of feet over a few months. As a result, the waterline periodically encroaches on properties along this reach. . . Following nourishment in 2008, this reach experienced variable erosion and accretion, with one part of the reach gaining sand while the other lost sand. The area along the western end of the reach near Beach Club Villas was highly erosional following the 2008 project, requiring additions of sand via shoal-management projects in 2012 and late 2014. The eastern end of the reach fluctuated in volume based on attaching shoals; however, it always maintained a sufficient width to protect property. By 2018, the eastern end of the reach was accreting from a prior shoal attachment while the western end was eroding. . . Reach 6 has exhibited similar erosion rates in each survey period following project completion in 2018. The western end of the reach (Beach Club Villas, Mariners Walk) has generally lost sand since the 2018 project, while the eastern end (closer to Dewees Inlet) has generally gained sand over the same period. . . Overall, the reach holds ~887,200 cy more sand than the 2007 condition. Nourishment projects in 2008 and 2018 have resulted in an average annual volume increase of 12.9 cy/ft per year along Reach 6. While the volume totals are very positive, the reach is subject to dynamic localized volume changes.”*
- Reach 5 (53rd Ave. to Wild Dunes Property Owners Beach House) – *“Similar to Reach 6, this area of the beach is highly influenced by shoal-bypass events, especially along the central and eastern portion of the reach. The 2008 nourishment project added ~318,000 cy of sand to the reach; however, by 2015, the area fronting Beachwood East and Dunecrest Lane was highly erosional. Reach 5 has lost the most volume of any reach on Isle of Palms from 2008 to 2021. . . Since 2018 project completion, Reach 5 has steadily lost ~30 to 40 cy/ft between each survey. The reach lost 176,000 cy (29.4 cy/ft) of sand between April 2018 and June 2019 and an additional 219,000 cy (36.5 cy/ft) from 2019–2020. From June 2020 to July 2021, Reach 5 lost ~216,200 cy (36.0 cy/ft). The magnitude of losses in recent years has been higher along the eastern part of the reach.”*
- Reach 4 (31st Ave. to 53rd Ave.) -- *“The reach receives sand eroded from the east end of the island, particularly reaches 5 and 6, with that sand originating from shoal bypass events or nourishment. . . It is also outside of the direct influence of Dewees Inlet and maintains a more typical and consistent beach profile shape. By being positioned downdrift of the nourishment area, it receives nourishment sand spreading from the placement area as well as spreading shoal sand. The reach has gained sand every year since 2009 except for 2016, the year after Hurricane Matthew impacted Isle of Palms. The beach volume in Reach 4 has increased by ~792,700 cy since September 2009, which is an average annual accretion rate of 9.2 cy/ft per year. The dune width has increased by at least 50 ft along the reach, not including the wider dry sand berm seaward of the dune. . . The dune has grown ~3 ft in elevation and offers substantially more storm protection than the 2009 condition.”*

- Reach 3 (Sea Cabins Pier to 31st Ave.) – *“Like Reach 4, the long-term trend in this area is stable to accretional. . . The reach has shown periods of erosion and accretion since CSE began island-wide monitoring in 2009. This is typical for stable to moderately accretional beaches as variations in wave conditions from year to year and temporary changes in sediment supply lead to minor fluctuations in yearly volume change. Over the long term, the trend is accretion. . . Overall, the reach holds ~258,900 cy more sand than the 2009 condition, equivalent to an average annual accretion of 4.3 cy/ft per year.”*
- Reach 2 (6th Ave. to Sea Cabins Pier) – *“Reach 2 shows an erosion/accretion pattern similar to Reach 3 with intermittent periods of accretion and erosion and a long-term accretion trend. Since monitoring began in 2009, Reach 2 has been the most stable reach, typically showing lower magnitudes of volume change compared to the other reaches. . . . Reach 2 is sensitive to yearly changes in weather patterns impacting short term sediment supply, rather than large-scale inlet dynamics that tend to overwhelm volume changes closer to Breach and Dewees Inlets. . . Compared to the 2009 condition, the eastern half of the reach has accreted up to ~10 cy/ft while the western half has eroded up to ~15 cy/ft. Much of the erosion occurring along the west end of the reach was due to a combination of storm impacts after 2015 and an erosional arc formation that impacted the area from 2012–2015. This erosional arc may have developed from changes occurring in Breach Inlet or from a temporary interruption in sediment supply from upcoast.”*
- Reach 1 (Breach Inlet to 6th Ave.) – *“The long-term trend in the reach is accretion, evidenced by a new row of houses being built seaward of the original “beachfront” row in the 1980s. Sand supply originates from shoal-bypass events at Dewees Inlet and longshore sand transport from north to south over the length of the Isle of Palms. Excess sand is deposited along the southern spit of the island and in the Breach Inlet ebb-tidal delta. Shoals of Breach Inlet form a protuberance in the shoreline, which backs sand up along the oceanfront much like a terminal groin traps sand. Changes in this area are related to bars from the inlet delta migrating onto the beach or marginal flood channels moving landward or seaward. Such natural processes lead to rapid changes in the beach volume compared to the central Isle of Palms reaches. . . The dune placed after Hurricane Irma in 2017 has performed well north of 2nd Ave. West of there, the dune eroded through 2020 but has since rebuilt naturally.”*

Two inlet shoal management projects were carried out between the 2008 and 2018 renourishment projects. The shoal management projects used land-based equipment to address hot-spot erosion associated with post-nourishment inlet shoal attachment:

- Mar. - Apr. 2012. ~87,700 cy moved from a shoal attachment accretion area to an adjacent erosion area (Figure 25).
- Nov. 2014 – Feb. 2015. ~240,000 cy moved from accretion areas (53rd Ave. to 56th Ave., and Mariner’s Walk/Shipwatch) to erosion areas (Beachwood East/Dunecrest lane, and Seascape/Ocean Club/18th hole). See Figure 26.

Shoal management work has proceeded under permits granted to the City by DHEC OCRM and USACE in 2011 and 2012. Those permits prescribe time windows (November 1 through April 30) during which work can take place; specifies a project size limit (two projects at up to 250,000 cy each, total volume = 500,000 cy); specifies a trigger for project initiation (+5 ft NAVD contour within 100 ft from building line); specifies excavation area buffer (excavation must take place at least 400 ft away from the building line).



Figure 25. Mar. – Apr. 2012 shoal management project (CSE, 2012).

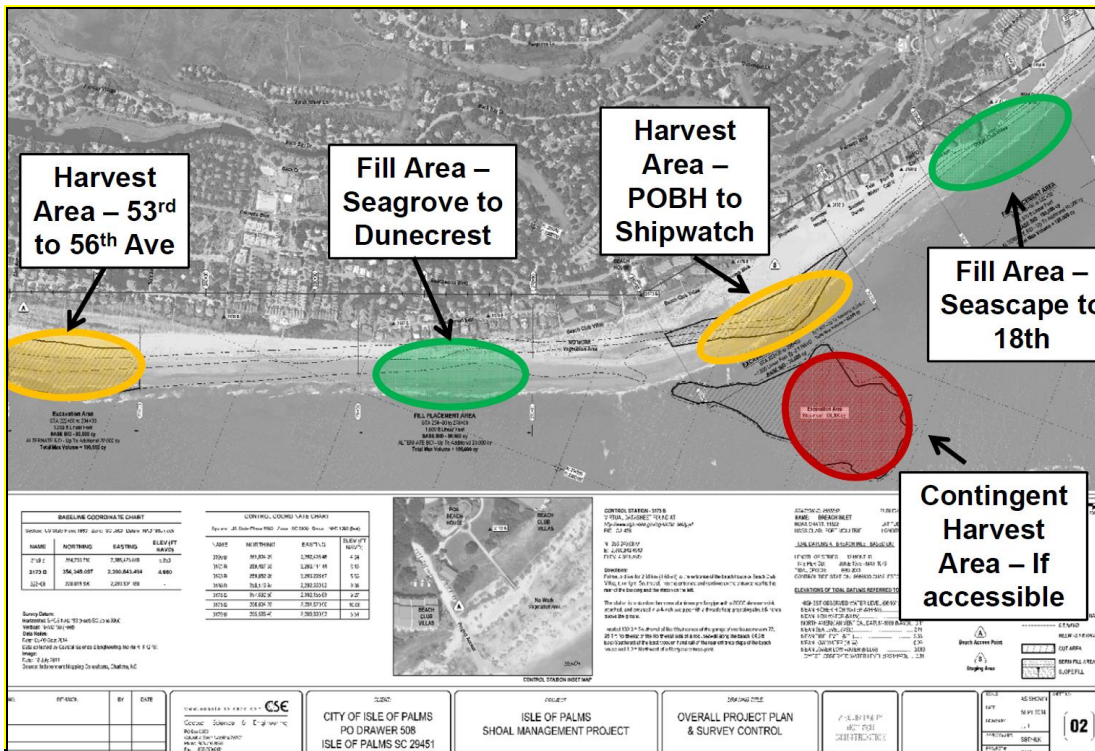


Figure 26. Plan for Nov. 2014 – Feb. 2015 shoal management project (CSE, 2014).

The shoal management permits were amended in April 2016 to increase the number of shoal management projects from two to four, and to increase the total project volume from 500,000 cy to 814,000 cy. The additional two shoal management projects must each be less than 250,000 cy, and no sediment can be excavated during the additional two projects from the area between 53rd Ave. and Grand Pavilion.

5.2.2 Emergency Orders and Sandbags

Over the years, property owners have requested and received permission from DHEC OCRM for emergency sand placement (using upland, beach-compatible fill) and sand bag installation. The City has not issued any emergency orders for the work since 1996 but has concurred with DHEC OCRM issuance since that time. OCRM records show a total of 92 emergency orders were issued between 1996 and 2021 – all for properties in Wild Dunes (see Table 6).

Prior to 2008, sand bag size was limited to 1 cubic ft, and the results were problematic – the small sand bags were dislodged and scattered by waves and currents. Starting in 2008, DHEC OCRM authorized the placement of 1 cy bags. No filter fabric beneath the bags was used, and the bags settled, requiring restacking and/or placement of additional bags.

Sand bags were removed prior to the 2008 beach nourishment project, but additional bags have been authorized and placed in eroding areas since then (in selected areas from Beachwood East to 18th hole of Links Course).

Following Hurricane Matthew, DHEC OCRM issued Emergency Orders EO-16-HM1, EO-16-HM2 and EO-16-HM3 on October 8, 2016 for all SC coastal counties, allowing sand bags, sand

scraping and minor renourishment. The City entered into a contract to carry out sand scraping and emergency berm repairs shortly thereafter.

Following King Tides and a Nor'easter in December 2017, OCRM issued Emergency Order EO-01 for minor renourishment via sand scraping at six properties on Beachwod East.

Table 6. Emergency Orders Issued on Isle of Palms, 1996 2021 (all Emergency Orders are expired). Source: SC DHEC - OCRM, April 28, August 2, 2016, January 20, 2017, and April 21, 2022.

Location (status)	By	Issue Date	Specified Mitigation Techniques
12 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
13 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
14 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
15 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
16 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
17 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
18 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
19 Beachwood East (expired)	City	19-Feb-96	Sand Scraping
Wild Dunes Beachfront (expired)	OCRM	1-Apr-96	Sandbags, Sand Scraping, Renourishment
Ocean Club Villas (expired)	OCRM	19-Aug-05	Sand Scraping, Renourishment
Wild Dunes Beachfront (expired)	OCRM	9-Sep-05	Sand Scraping, Renourishment
Wild Dunes Beachfront (expired)	OCRM	18-May-06	Sandbags
6 Summer Dunes Ln (expired)	OCRM	1-Dec-06	Sandbags
7 Summer Dunes Ln (expired)	OCRM	1-Dec-06	Sandbags
8 Summer Dunes Ln (expired)	OCRM	1-Dec-06	Sandbags
9 Summer Dunes Ln (expired)	OCRM	1-Dec-06	Sandbags
Tidewater Villas (expired)	OCRM	1-Dec-06	Sandbags
Port O' Call Villas (expired)	OCRM	1-Dec-06	Sandbags
Ocean Club Villas (expired)	OCRM	14-May-07	Sandbags
Seascape Villas (expired)	OCRM	16-May-07	Sandbags
Summer House Villas (expired)	OCRM	21-Jun-07	Sandbags
Ocean Club Villas (expired)	OCRM	9-May-13	Sandbags
Wild Dunes Links Course (expired)	OCRM	8-Jul-13	Sandbags
Seascape Villas (expired)	OCRM	10-Mar-14	Sandbags
11 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
12 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
13 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags

Location (status)	By	Issue Date	Specified Mitigation Techniques
14 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
15 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
16 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
17 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
18 Beachwood East (expired)	OCRM	18-Mar-14	Sandbags
4 Dunecrest Lane (expired)	OCRM	18-Mar-14	Sandbags
5 Dunecrest Lane (expired)	OCRM	18-Mar-14	Sandbags
19 Beachwood East (expired)	OCRM	21-Mar-14	Sandbags
20 Beachwood East (expired)	OCRM	30-Apr-14	Sandbags
Seascape Villas (expired)	OCRM	25-Sep-14	Renourishment
Seascape Villas (expired)	OCRM	1-Oct-14	Sandbags, Renourishment
Ocean Club Villas (expired)	OCRM	24-Oct-14	Renourishment
Ocean Club Villas (expired)	OCRM	20-Mar-15	Sandbags
11 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
12 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
13 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
14 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
15 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
16 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
17 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
18 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
19 Beachwood East (expired)	OCRM	24-Mar-15	Sandbags
11 Beachwood East (expired)	OCRM	27-May-15	Sandbags
12 Beachwood East (expired)	OCRM	27-May-15	Sandbags
13 Beachwood East (expired)	OCRM	27-May-15	Sandbags
14 Beachwood East (expired)	OCRM	27-May-15	Sandbags
15 Beachwood East (expired)	OCRM	27-May-15	Sandbags
16 Beachwood East (expired)	OCRM	27-May-15	Sandbags
18 Beachwood East (expired)	OCRM	27-May-15	Sandbags
19 Beachwood East (expired)	OCRM	27-May-15	Sandbags
11 Beachwood East (expired)	OCRM	28-Sep-15	Sandbags
13 Beachwood East (expired)	OCRM	28-Sep-15	Sandbags
14 Beachwood East (expired)	OCRM	28-Sep-15	Sandbags
Seascape Villas (expired)	OCRM	28-Sep-15	Sandbags
Ocean Club Villas (expired)	OCRM	28-Sep-15	Sandbags
15 Beachwood East (expired)	OCRM	29-Sep-15	Sandbags
16 Beachwood East (expired)	OCRM	29-Sep-15	Sandbags
17 Beachwood East (expired)	OCRM	7-Oct-15	Sandbags
Ocean Club Villas (expired)	OCRM	10-Nov-15	Renourishment

Location (status)	By	Issue Date	Specified Mitigation Techniques
19 Beachwood East (expired)	OCRM	24-Nov-15	Sandbags
20 Beachwood East (expired)	OCRM	24-Nov-15	Sandbags
11 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
12 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
14 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
15 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
16 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
17 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
19 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
20 Beachwood East (expired)	OCRM	17-Dec-15	Sandbags
Ocean Club Villas (expired)	OCRM	17-Dec-15	Sandbags, Renourishment
Seascape Villas (expired)	OCRM	22-Dec-15	Sandbags
11 Beachwood East (expired)	OCRM	28-July-16	Sandbags
12 Beachwood East (expired)	OCRM	28-July-16	Sandbags
14 Beachwood East (expired)	OCRM	28-July-16	Sandbags
15 Beachwood East (expired)	OCRM	28-July-16	Sandbags
16 Beachwood East (expired)	OCRM	28-July-16	Sandbags
17 Beachwood East (expired)	OCRM	28-July-16	Sandbags
19 Beachwood East (expired)	OCRM	28-July-16	Sandbags
20 Beachwood East (expired)	OCRM	28-July-16	Sandbags
Ocean shoreline, as needed (expired)	OCRM	8-Oct-16	Sandbags, sand scraping and minor renourishment (Hurricane Matthew)
8 Beachwood East (expired)	OCRM	8-Dec-16	Minor renourishment
9 Beachwood East (expired)	OCRM	8-Dec-16	Minor renourishment
11 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment
13 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment
14 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment
15 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment
16 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment
17 Beachwood East (expired)	OCRM	11-Dec-17	sand scraping and minor renourishment

5.2.3 Previous Hurricane or Storm Events

A number of hurricanes and storms have affected the Isle of Palms. The last major event was Hurricane Hugo in September 1989. Hugo was a Category 4 hurricane and its storm surge covered most of the island (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 most buildings on the island and destroyed more than 200. Beach and dune erosion during Hugo was severe.

The more recent storms to affect Isle of Palms have been relatively minor, but still caused some flooding and erosion. The offshore passage of Hurricane Sandy in October 2012 caused erosion along the oceanfront. Hurricane Joaquin passed offshore (October 2015) but was accompanied by tides approximately 2 ft above predicted, strong waves and extremely heavy rainfall. The result was flooding of low-lying areas of the island and some erosion along the oceanfront. The effects on the island were documented by CSE (2015b).

Hurricane Matthew eroded dunes along the Isle of Palms shoreline in early October 2016. An erosion assessment was performed and recommendations were provided to the City in November 2016 (CSE, 2016b).

Hurricane Irma further eroded dunes along the Isle of Palms shoreline in September 2017. Emergency sand scraping and berm construction were undertaken in September and October 2017. An erosion assessment was performed and recommendations were provided to the City in December 2017 (CSE, 2017).

Hurricane Ian made landfall on September 30, 2022 as a Category 1 hurricane near Georgetown, SC. Effects on Isle of Palms were reported by the City as minor.

5.3 Discussion of Erosion Control Alternatives

Erosion control actions that have been employed on Isle of Palms have included a variety of measures: construction of rock revetments and a groin (Section 5.2), beach nourishment and shoal management (see Section 5.2.1), and emergency fill placement and sand bags (Section 5.2.2). Kana, et al. (1985) reports that property owners also used sand scraping and artificial seaweed in the early 1980s.

The City has maintained its prohibition on hard erosion control devices (within 250 ft of mean high water) for at least 35 years. The DHEC OCRM prohibition would apply landward of this point, if the State's 40-year setback line lies landward of the City's 250 ft zone. The City defers to the State on experimental erosion control devices.

Going forward, the erosion control alternatives likely to be used on Isle of Palms are those that have proven most effective -- beach nourishment (offshore sediment), shoal management (excavation from accreting shoal areas and fill in eroding areas), and emergency sand bagging and fill placement by property owners. Other alternatives authorized by the State (e.g., experimental erosion control devices) may also be used.

5.3.1 Beach Renourishment

The City has demonstrated its commitment to beach renourishment, and plans to continue working with affected property owners and other stakeholders to implement this alternative in the future.

The City advocated for and was successful in changing State law in 2014, allowing qualified communities to ask voters to institute a Beach Preservation Fee. In November 2014, City voters overwhelmingly passed a referendum establishing a City Beach Preservation Fee (1% of gross receipts for accommodations and certain rentals). As of January 19, 2023, the balance in the associated Beach Preservation Fund is approximately \$7.3 million. Approximately \$9.4 million have been collected since Fee inception in 2015. Receipts from the Fee are used for beach monitoring, beach nourishment, erosion mitigation, dune restoration and maintenance, and maintenance of public beach accesses.

State cost-sharing for renourishment areas designated as having full and complete public access is pursued by the City. This includes the western ¼ mile of the Wild Dunes shoreline (most of Wild Dunes is not eligible under current rules). The City also works closely with Wild Dunes on planning, permitting, funding and monitoring beach projects there.

5.3.2 Other Measures

Other erosion control alternatives to be used in the community were outlined above: beach nourishment (offshore sediment); shoal management (excavation from accreting shoal areas and fill in eroding areas); emergency sand bagging and fill placement by property owners; and other options authorized by the State (e.g., experimental wave dissipation system installations).

6. Needs, Goals and Implementation Strategies

As was stated previously in Sections 1.4 and 4.2.1 of this LCBMP, there are three principal beach management issues facing Isle of Palms. The City has implemented, and will continue to implement, those measures necessary to address these issues:

1. Beach and dune erosion, particularly in the unstabilized inlet erosion zone at the eastern end of the island. *Strategy: manage and minimize erosion effects through beach monitoring, beach nourishment, shoal management, and limited emergency protection as approved by DHEC OCRM. The Comprehensive Plan, City Code of Ordinances and Council/Department actions support these types of measures.*
2. Balancing public beach parking demand with available safe parking capacity on the island. *Strategy: document parking demand and capacity on the island (completed, 2015) and implement a managed beach parking program to balance public beach parking and resident needs (implemented via designation of a [public] Beach Parking District and a Residential Parking District).*
3. Drainage of low-lying areas. *Strategy: adopt a stormwater plan and stormwater utility (accomplished) and identify and implement drainage projects and funding sources. This*

work is ongoing, and is supported by the Comprehensive Plan, the Code of Ordinances, and by Council/City department actions and operations. Fortunately, few drainage problems exist seaward of the DHEC OCRM Setback Line, and those that do are being addressed by the City.

In addition, the City's recently adopted Strategic Plan <https://www.iop.net/strategic-plan-2022-2027> mirrors and further speaks to these items.

6.1 Policy of Beach Preservation

Between the mid-1980s and 2007, the City was a mostly a passive participant in beach preservation efforts, leaving those to property owners. However, the City convened a Long-Term Beach Management Citizens Advisory Group in 2007, and subsequently accepted the findings and recommendations of that Group (Jones, 2008). The City also prepared, adopted, and received OCRM approval for its first LCBMP in 2008.

The 2007 Citizens Advisory Group articulated a ***Beach Management Vision for Isle of Palms*** that remains valid today:

- 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

Since 2007, the City has implemented this vision through its actions, including serving as facilitator for and using City funds for permitting, design and construction of major beach nourishment using offshore sediment, for inlet shoal management, and for emergency beach scraping and berm construction. The City also funds beach monitoring surveys and studies in an effort to stay abreast of beach conditions and trends, and to plan for future beach preservation projects.

6.2 Strategy for Preserving and Enhancing Public Beach Access

Maintaining public beach access on the island is very important and has been addressed by the City. There are 56 public beach access points along approximately 4.6 miles of beach. The beach accesses are recorded on plats and are protected against loss, encroachment or damage by City monitoring and enforcement. The City has approximately 8 times the necessary numbers of public beach access points and public parking spaces to qualify 4.8 miles of beach as having full

and complete public access according to SC DHEC criteria (see Table 4). However, all seven miles of Isle of Palms beaches are public beaches, and are accessible to the public. For the 2.2 miles of Wild Dunes beach beyond the SC DHEC full-and-complete-public-access designation, the public can visit the beach from the adjacent beach with full-and-complete-public-access, or from one of the many vacation/rental accommodations available in Wild Dunes.

7. References

- Coastal Science & Engineering. 2012. Final Report, Shoal Management Project.
- Coastal Science & Engineering. 2014. Presentation, *IOP East End Erosion Update*, Oct. 6, 2014.
- Coastal Science & Engineering. 2015a. 2008 Isle of Palms Beach Nourishment Project, Year 6 (2014) Monitoring Report.
- Coastal Science & Engineering. 2015b. Hurricane Joaquin, Isle of Palms Post-Storm Survey Results, October 30, 2015.
- Coastal Science & Engineering. 2016a. 2008 Isle of Palms Beach Nourishment Project, Year 7 (2015) Monitoring Report.
- Coastal Science & Engineering. 2016b. Hurricane Matthew Beach Damage Assessment and Recommendations.
- Coastal Science & Engineering. 2017. Hurricane Irma Beach Damage Assessment.
- Coastal Science & Engineering. 2019. City of Isle Palms 2018 Beach Restoration Project. Final report for the City of Isle of Palms, SC.
- Coastal Science & Engineering. 2020. City of Isle Palms 2018 Beach Restoration Project. Year 1 (2019) Beach Monitoring Report, City of Isle of Palms, SC.
- Coastal Science & Engineering. 2021. City of Isle Palms 2018 Beach Restoration Project. Year 2 (2020) Beach Monitoring Report, City of Isle of Palms, SC.
- Coastal Science & Engineering. 2022. City of Isle Palms 2018 Beach Restoration Project. Year 3 (2021) Beach Monitoring Report, City of Isle of Palms, SC.
- Gaudio, D.J., and Kana, T.W. 2001. Shoal Bypassing in Mixed Energy Inlets: Geomorphic Variables and Empirical Predictions for Nine South Carolina Inlets. *Journal of Coastal Research*, 17(2), 280-291.
- Isle of Palms. 2008. Local Comprehensive Beach Management Plan. Approved by DHEC OCRM on April 7, 2008.

- Isle of Palms Planning Commission. 2015. Amended Comprehensive Plan for the City of Isle of Palms. Revised, May 16, 2015.
- Jones, C.P. 1986. Shoreline Assessment of Southern Isle of Palms, South Carolina.
- Jones, C.P. 2008. Report on Long-Term Beach Management Citizen’s Advisory Group.
- Kana, TW, ML Williams, and FD Stevens. 1985. Managing shoreline changes in the presence of nearshore shoal migration and attachment. In Proc Coastal Zone '85, Vol 1, ASCE, New York, NY, pp 1277-1294
- Municode. 2015. Isle of Palms, South Carolina – Code of Ordinances.
https://www.municode.com/library/sc/isle_of_palms/codes/code_of_ordinances
- Oh, C., A. Dixon and J. Draper. 2006. *Visitor Needs Assessment and Economic Analysis at South Carolina Beaches*. Clemson International Institute for Tourism Research and Development, Department of Parks, Recreation and Tourism Management. Clemson, SC.
- South Carolina Coastal Council. 1992. South Carolina’s Beachfront Management Plan.
- South Carolina Code of Laws. 2021.
- South Carolina DHEC OCRM. 2009. Annual State of the Beaches Report – 2009.
- South Carolina DHEC OCRM. December 18, 2019 (revised version of October 6, 2017, May 3, 2018). Line Report: Proposed Baseline and Setback Line - Isle of Palms.
- South Carolina DHEC OCRM. 2020. Guidance for the Development of Local Comprehensive Beach Management Plans.
- South Carolina DHEC OCRM. 2021. Surveyor’s Package, Isle of Palms.
- South Carolina Marine Turtle Conservation Program. <https://www.dnr.sc.gov/seaturtle/>
- Wild Dunes Community Association. 2012. Hurricane Emergency Preparedness Plan.