The Town of Hilton Head Island
Planning Commission
Comprehensive Plan Committee
March 16, 2016 Meeting
2:00 p.m. Conference Room #3

AGENDA

As a Courtesy to Others Please Turn Off All Cell Phones and Pagers during the Meeting.

1. Call to Order

2. Freedom of Information Act Compliance
Public notification of this meeting has been published, posted, and mailed in compliance with the Freedom of Information Act and the Town of Hilton Head Island requirements.

3. Acceptance of Meeting Notes from October 21, 2015 Meeting

4. Beach Management Plan
The Comprehensive Plan Committee will review and consider a recommendation to Planning Commission on updates to the Town's Local Comprehensive Beach Management Plan, an appendix to the Town's Comprehensive Plan, for adoption.

5. Adjournment

Please note that a quorum of Town Council may result if four or more of their members attend this meeting. A quorum of Planning Commissioners may result if five or more of their members attend this meeting.

Comprehensive Plan Committee of the Planning Commission
Meeting Notes
October 21, 2015
2:00 PM
Conference Room Three, Town Hall

Comprehensive Plan Committee Members present: Judd Carstens (Chairman), Peter Kristian, Caroline McVitty, Lavon Stevens

Community Development Staff present: Jayme Lopko, Shawn Colin

- Chairman Carstens called the meeting to order at 2:02 PM.
- The meeting notes for the September 2, 2015 meeting were accepted.
- Chairman Carstens introduced the Economic Development Element and made opening comments about the changes that were made to this element.
- Chairman Carstens then introduced Don Kirkman, Executive Director of the Hilton Head Island Economic Development Corporation. Mr. Kirby went through the new Economic Development Element which contains no goals or implementation strategies at this point. After review and discussion the Committee decided to wait and see what comes from the Town Council visioning process before making any final determinations regarding the Economic Development and any goal and strategies it may contain.
- Chairman Carstens adjourned the meeting at 3:02 PM.

Submitted by: Jayme Lopko

Meeting date: October 21, 2015

TOWN OF HILTON HEAD ISLAND

Community Development Department

TO:	Planning Commission Comprehensive Plan Committee
VIA:	Shawn Colin, Deputy Directory of Community Development
FROM:	Shea Farrar, Senior Planner
DATE	March 9, 2016
SUBJECT:	Review of Beach Management Plan Updates

RECOMMENDATION

Staff recommends that the Comprehensive Plan Committee forward the updated Beach Management Plan to the full Planning Commission with a recommendation for approval and adoption as an appendix to the Town's Comprehensive Plan.

BACKGROUND

In 1977 the South Carolina Tidelands and Wetlands Act was enacted by the State of South Carolina to protect coastal resources from unwise development. This act did not provide adequate jurisdiction to the state's coastal management agency. Consequently, unwise development had jeopardized the stability of the beach and dune system, accelerating erosion and endangering adjacent property. So, the law was amended in 1988 to adopt the South Carolina Beachfront Management Act, which outlined eight beach policies described below. This Act required local governments of the State's beachfront localities to develop comprehensive beach management plans consistent with these policies and to update them every five years.

State Beachfront Management Act Policies:

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

enhance public access;
7. Involve local governments in long-range comprehensive planning and management of the beach/dune system in which they have a vested interest; and
8. Establish procedures and guidelines for the emergency management of the beach/dune system following a significant storm event.

These policies are implemented through a variety of mechanisms at the state and local levels, including through the local comprehensive beach management plans.

The Act specifies ten components that local beach plans must contain. Once these plans are submitted by a beachfront locality to DHEC OCRM, a Beach Management Committee, comprised of the State's technical review staff, evaluates the plan. When the plan is found to be satisfactory and has been adopted by the local government, the Beach Management Committee makes a final recommendation for approval to the DHEC OCRM Deputy Commissioner, who formally approves the local beach management plan and it is incorporated into the State's management plan.

The Town's first Beach Management Plan was adopted by Town Council on June 17, 1991. In 2008, this Plan underwent a comprehensive update that was approved by the State and adopted as an appendix to the Town's Comprehensive Plan, which was later amended by the Town and approved by the State on March 1, 2011 to address changes related to public beach parking for beach renourishment funding. The purpose of this draft is to address updates to the 2008 plan and to reorganize the plan based on guidelines that have been developed by the State for the organization of all local plans.

SUMMARY

The purpose of this plan is to:

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

At a minimum, State law specifies 10 elements that local beach management plans must contain, which are summarized below:

1. An inventory of beach profile data and historic erosion rate data for each standard erosion zone and inlet erosion zone;

This information can be found in Section 5.1, Shoreline Change Analysis, on pages 62-74 of this plan and is used by DHEC OCRM to establish the location of the State's beachfront jurisdiction and where construction, reconstruction, or alteration activities are restricted in order to implement the policy of shoreline retreat for development.

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2. An inventory of public beach access and attendant parking along with a plan for enhancing public access and parking;

Section 2.5, Existing Public Access and Map, which begins on page 35, contains an inventory of existing beach access and parking. In 1998, the Town's Beach Management Plan was amended to include a Beach Access Plan, which outlined a plan to construct a total of 1,400 public parking spaces by December 2008 associated with beach renourishment funding assistance. The Town currently has 1,454 beach parking spaces, of which 1,062 are open to the general public of the State, and has met this obligation.

3. An inventory of all structures located in the areas seaward of the setback line;

Section 2.3.1, Beachfront Structural Inventory, begins on page 26 and describes the guidelines required for the inventory of all structures landward of the setback line. Appendix A includes an inventory of each tax map parcel.

4. An inventory of turtle nesting and important habitats of the beach/dune system and a protection and restoration plan if necessary;

The importance of barrier islands 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 marine plants and animals.

In order to help protect one of these important species, sea turtle monitoring has been an ongoing program of the Coastal Discovery Museum since 1984 (funded by the Town since 1989). This program surveys and inventories sea turtle nests and provides information on nesting activity and hatchling success rates. This information as well as information on other important species is included in the plan in Section 2.4, Natural Resources and Ecological Habitats, which begins on page 27.

5. A conventional zoning and land use plan for the area seaward of the setback line;

The Town's Official Zoning Map has been included along with a description of beachfront development regulations. In addition to this conventional zoning plan the Town also has also created the Coastal Protection Area and Transition Area Overlay Zoning Districts to better protect the dunes system from encroaching development. Section 2.3, Beachfront Developments and Zoning, begins on page 19, and contains this information.

6. An analysis of beach erosion control alternatives, including renourishment;

Prior to the initiation of beach restoration through nourishment, different types of hard structures were implemented for shore stabilization by the private sector (*i.e.* homeowners, developers, hotels, P.O.A.'s, etc.). These structures have typically consisted of groins and seawalls or bulkheads. For the purpose of evaluation, two basic types of shoreline stabilization techniques are discussed in the plan: hard and soft shoreline treatments.

Rather than solely relying on these hard structures, the principal means of shore stabilization embraced by the Town is beach nourishment, a restorative "*soft*" structure which provides for improved shorefront

conditions suitable for recreation, protection of upland development or infrastructure, as well as environmental enhancement, which is outlined in Section 5 – Erosion Control and Management also.

7. A drainage plan for the area seaward of the setback;

Drainage outfalls along the beachfront do not exist in the Town and the Town Code prohibits any future development from directly discharging storm water onto the beach. The beachfront areas of the Island can be divided into 6 major natural drainage basins, none of which drain to outfall structures on the beach. In general, stormwater is carried from the beachfront areas to the adjacent inland bodies of water.

In 1995, the Town completed The Island Wide Drainage Study. Since then, all projects were completed through the Town's Capital Improvements Program. Currently, stormwater studies are being conducted for individual watersheds to develop drainage inventories, flood models, water quality models and lists of potential capital improvement projects. This is included in Section 3, Beachfront Drainage Plan, which begins on page 43.

8. A post disaster plan including provisions for cleanup, maintaining essential services, protecting public health, emergency building ordinances, and the establishment of priorities;

In Section 4.2, Local Government and Authorities, beginning on page 54, the Town's plans for hazard mitigation and disaster recovery are outlined. The Town most recently approved its Comprehensive Emergency Management Plan (CEMP) in 2014, which contains the Town's Recovery Plan and establishes the Town's recovery policies and schedule that detail the Town's pre-event responsibilities and recovery actions. The Town also developed a Hazard Mitigation Plan, which is included as Appendix B to this Plan. The Town works with all appropriate agencies, in advance of a disaster (if predictable) and after, to minimize potential injury and damage, and to expedite recovery and redevelopment.

9. A detailed strategy for achieving the goals of the State's Beachfront Management Act by the end of the forty-year retreat period, which shall consider relocating buildings, removal of erosion control structures, and relocation of utilities;

The South Carolina Beachfront Management Act requires that local plans include a 40 year retreat policy that considers relocation of buildings, removal of erosion control structures and relocation of utilities. When the Town's Beach Management Plan was first adopted in 1991, the State was in the process of drafting their own policy, and provided little direction to the Town at that time. In 1992, the Town amended its original Beach Management Plan to include a 40 Year Retreat Policy which stated to:

- Locate development landward of the DHEC OCRM Setback line to the extent possible;
- Adopt various growth management techniques and procedures to reduce development levels;
- Retain open space seaward of the DHEC OCRM Setback line to the extent possible;
- Utilize land acquisition; and
- Address retreat during redevelopment scenarios after a disaster.

With the adoption of this updated Beach Management Plan, this Policy continues to be in effect. To accompany the above Retreat Policy, this Beach Management Plan details an additional Policy on beach renourishment as part of the 40 Year Retreat Policy. Beginning in 1990, the Town embarked on an ambitious renourishment program with an ongoing maintenance program. As a result of these projects, portions of the beach and dunes system have been enhanced, thereby resulting in expanded areas subject to development pressures by construction that is not in the public interest and not in accordance with

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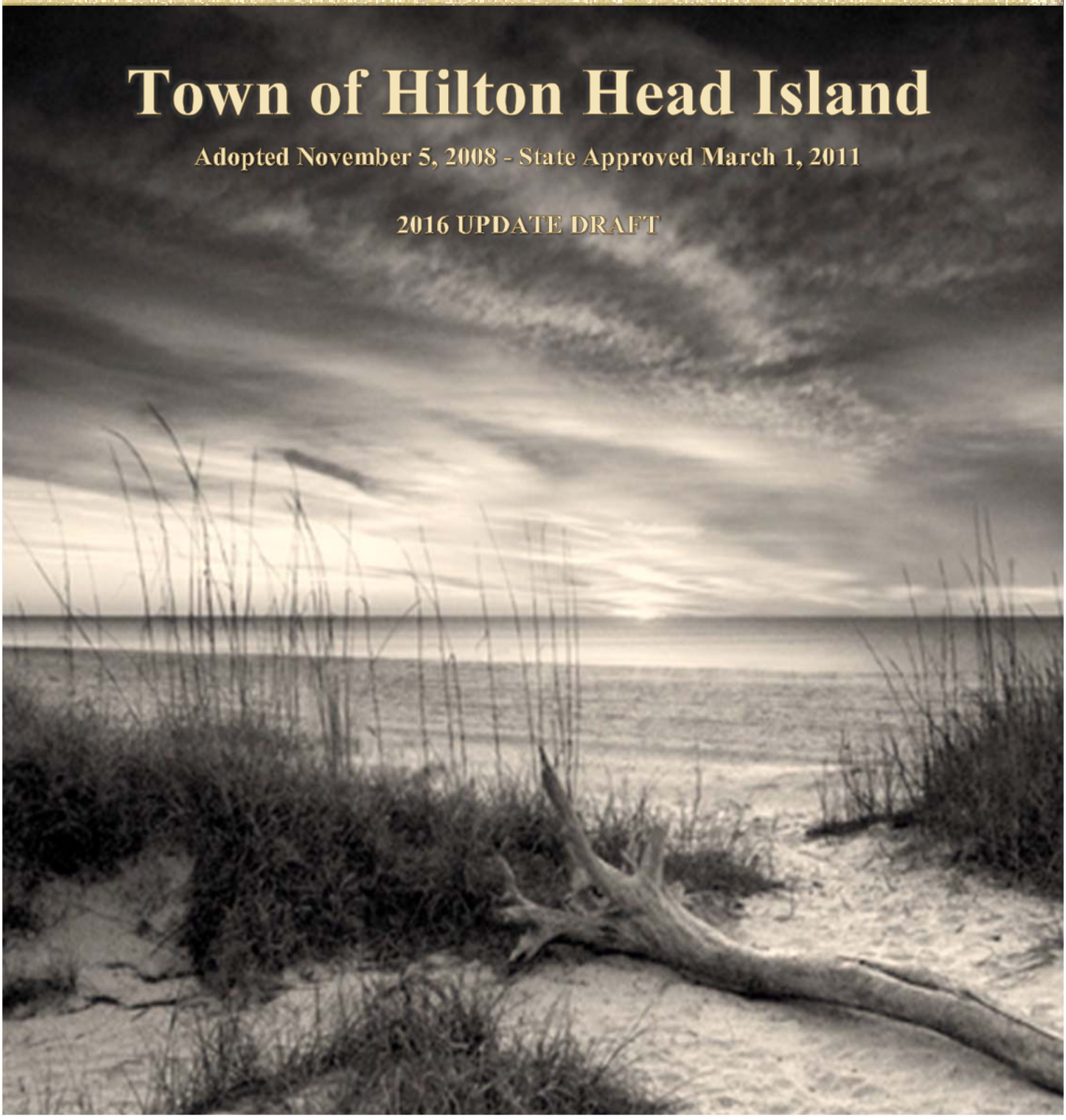
retreat policies and goals of the State and the Town. In a few instances, DHEC OCRM has designated a newly formed embryonic dune as the new primary dune, allowing development on the landward, and sometimes larger, dune. Because of this, there have been petitions to the DHEC OCRM to move the Baseline further seaward, increasing the potential for loss of the larger dunes system. In addition, DHEC OCRM re-examines the possibility of relocating the Baseline every 8-10 years, possibly seaward. This would further encourage development on top of the larger dunes system.

It is not and has not been the intent of the Town to encourage or permit development to move seaward as a result of the Town's beach renourishment projects and efforts, or to support any effort to move the DHEC OCRM established baseline seaward, where such effort to relocate the baseline is based in whole or in part on the existence of new dunes and/or new beach areas formed as a result of the Town's beach renourishment projects and efforts, or by other private efforts. The Town's Coastal Protection Area and Transition Area Overlay Zoning Districts also help to better protect the dunes system from encroaching development.

10. A detailed strategy for achieving the goals of preserving existing public access and the enhancement of public access to assure full enjoyment of the beach by all residents of the State of South Carolina.

The Town owns 8 beach parks with a total of over 1400 parking spaces. Additionally, there are over 150 other privately-owned beach access points (neighborhoods, hotels, condominiums and beach clubs). Most of these private access points are located in gated communities and are accessible to their residents and visitors. With over 70% of the land on Hilton Head Island in gated communities, and near build-out conditions of the Island, there are very few parcels remaining next to or adjacent to the ocean that could be purchased by the Town and developed into a beach park. It is therefore critical for the Town to coordinate with private property owners during redevelopment of commercial areas to allow beach access for the public on their oceanfront areas and to protect existing access locations as outlined in the beach access goals that begin on page 88 of the plan.

Beach Management Plan



Town of Hilton Head Island

Adopted November 5, 2008 - State Approved March 1, 2011

2016 UPDATE DRAFT

CONTENTS

EXECUTIVE SUMMARY

The United States Congress recognized the importance of meeting the challenge of continued growth in coastal areas by passing the Coastal Zone Management Act (CZMA) in 1972. This law established the guidelines of a state-federal partnership program to comprehensively manage coastal resources and was authorized in South Carolina in 1977 under South Carolina's Coastal Tidelands and Wetlands Act (CTWA) with the goal of achieving a balance between the appropriate use, development, and conservation of coastal resources in the best interest of all citizens of the state. The South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC OCRM) is the designated coastal management agency for the State of South Carolina and is responsible for the implementation of the Coastal Management Program in conjunction with the National Oceanic Atmospheric Administration (NOAA) and coastal communities.

In 1988, the State of South Carolina adopted the South Carolina Beachfront Management Act, which gives the State authority over the direct regulation of impacts to coastal resources within the critical areas of South Carolina's coastal waters, tidelands, beaches and beach dune systems; and indirect certification authority over federal actions and state permit decisions within the eight coastal counties. This law is complex and requires the use of scientific studies of coastal processes to establish precise building setback lines along the coast based on historic erosion rates. In addition, the Act adopts a policy of retreat for development away from the erosional beach and requires oceanfront counties and municipalities to prepare local comprehensive beach management plans in coordination with DHEC OCRM that become part of the State's management plan upon approval. These plans must be updated every 5 years.

This Beach Management Plan was prepared in compliance with the ~~1990~~ South Carolina Beachfront Management Act and was adopted as part of the Town's Comprehensive Plan~~. Section 48-39-350 of the South Carolina Code of Laws required local governments to prepare a local beach management plan by July 1, 1991. This plan is to be updated at least every five years following its approval by the state of South Carolina. At a minimum, the Plan must contain~~ It contains all ~~of~~ the following:

- ✓ an inventory of beach profile data and historic erosion rate data for each standard erosion zone and inlet erosion zone;
- ✓ an inventory of public beach access and attendant parking along with a plan for enhancing public access and parking;
- ✓ an inventory of all structures located in the areas seaward of the setback line;
- ✓ an inventory of turtle nesting and important habitats of the beach/dune system and a protection and restoration plan if necessary;
- ✓ a conventional zoning and land use plan for the area seaward of the setback line;
- ✓ an analysis of beach erosion control alternatives, including renourishment;
- ✓ a drainage plan for the area seaward of the setback;

- ✓ a post disaster plan including provisions for cleanup, maintaining essential services, protecting public health, emergency building ordinances, and the establishment of priorities;
- ✓ a detailed strategy for achieving the goals of this chapter by the end of the forty-year retreat period, which shall consider relocating buildings, removal of erosion control structures, and relocation of utilities;
- ✓ a detailed strategy for achieving the goals of preserving existing public access and the enhancement of public access to assure full enjoyment of the beach by all residents of the State of South Carolina.

Through this plan the following shoreline retreat policies and beach management needs, goals and implementation strategies are adopted:

Beach Management Needs, Goals and Implementation Strategies

1. Shoreline Retreat

Need 1: *The Town should investigate methods to continue to protect existing beach/dune features and those features resulting from renourishment projects from development and redevelopment pressures.*

Goal 1.1: Have a well maintained beach and dunes system that helps to preserve and protect the Island's manmade and natural resources and provides for a sound economic base; the Town does not support movement of the baseline or any other action that would result in encroachment of development into the dunes system or seaward of the ~~existing~~ baseline that was established in 1999.

Goal 1.2: ~~Extend the Town's Critical Storm Protection and Dune Accretion Area to other areas of the Island.~~ Continue to Protect and Enhance the Beach/Dune System though the regulation of beachfront development.

Implementation Strategies:

A. The Town should continue to implement its Capital Improvement Program and Land Acquisition Program to develop, renovate, or expand its beach parks.

B. Continue to hold densities along the beachfront to their current levels or below.

C. Continue to amend and enforce the LMO and Municipal Code to protect the established dunes systems on our beach–front, to provide for re-establishment of the dunes systems during redevelopment, and to provide for redevelopment scenarios after a natural disaster.

D. Work with DHEC OCRM during the update of the Town's Local Comprehensive Beach Management Plan when designated by the State and to review, as requested, public petitions to move the Baseline on individual properties to ensure compatibility with this Plan. It is the policy of the Town of Hilton Head Island that the baseline not be moved seaward.

E. Continue to promote environmental education programs and standards that stress protection of fragile areas and wildlife.

F. Coordinate with the Chamber of Commerce in tourism efforts to promote our beach.

G. Work to revise state legislation for enhanced protection of the beach and dunes system which should include an effective retreat policy in addition to considering renourishment efforts when determining baseline locations to prevent movement of the baseline further seaward as a result of renourishment.

H. Provide input to DHEC OCRM during the update of the State's Beach Management Plan to help ensure that the DHEC OCRM Baseline does not move further seaward along the Town of Hilton Head Island shoreline.

I. Work with the State to receive beach renourishment funds in the event the Town does not have local funding to renourish.

2. Beach Access

Need 2: *With the large majority of oceanfront land under private ownership, the Town should seek ways to work with developers to allow for public beach access in redeveloped sites, and to work with Property Owners Associations to protect accesses that currently exist.*

Goal 2.1: Have adequate public beach access at Town-owned sites and seek innovative solutions to provide additional beach access for the public in privately owned neighborhoods and commercial areas.

Implementation Strategies:

A. The Town should continue to implement its 10 year Capital Improvement Program to develop, renovate, or expand its beach parks.

B. Continue to work with oceanfront developments to provide public access to the beach during redevelopment. Also work with neighborhood associations to protect neighborhood access points.

C. Develop methods of increasing public awareness concerning beach access points through better access signage, informational kiosks, directional signage and brochures.

Town of Hilton Head Island's Shoreline Retreat Policy

The State's Beach Management Act requires local plans to include a 40 year retreat policy that should consider relocation of buildings, removal of erosion control structures and relocation of utilities. When the Town's Beach Management Plan was first adopted in 1991, the State was in the process of drafting their own policy, so very little direction was received at that time. In 1992, the Town amended its original Beach Management Plan to include a 40 Year Retreat Policy which stated:

1. Locate development landward of the Setback line to the extent possible;
2. Adopt various growth management techniques and procedures to reduce development levels;
3. Retain open space seaward of the Setback line to the extent possible;
4. Utilize land acquisition; and
5. Address retreat during redevelopment scenarios after a disaster.

With the adoption of this Beach Management Plan, this Policy continues to be in effect. The Town's zoning, density and design standards help fulfill this policy along with other techniques mentioned in the next Section.

To accompany the above Retreat Policy, this Plan details an additional Policy on beach renourishment as part of the 40 Year Retreat Policy. Beginning in 1990, the Town embarked on an ambitious renourishment program with an ongoing maintenance program of sand fencing and native plantings. As a result of these beach renourishment and maintenance projects, portions of the beach and dunes system have been enhanced, thereby resulting in expanded areas that are subject to development pressures by construction that is not in the public interest and would not be in accordance with retreat policies and goals of the State of South Carolina and the Town of Hilton Head Island. In a few instances, the DHEC OCRM has designated a newly formed embryonic dune as the new primary dune, allowing development on the landward, and sometimes larger, dune. There have been petitions to the state administrative law judges to move the DHEC OCRM Baseline further seaward, in accordance with SC. Code Section 48-39-280 (A) (4) increasing the number of areas for loss of the larger dunes system. In addition, the DHEC OCRM is also required under Section 48-39-280 (C) to revise the Baseline every eight to ten years, which could possibly result in moving the line seaward. This would further encourage development on top of the larger dunes system.

It is not and has not been the intent of the Town to encourage or permit development to move seaward as a result of the Town's beach renourishment projects and efforts, or to support any effort to move the DHEC OCRM baseline established by the DHEC OCRM seaward, where such effort to relocate the baseline is based in whole or in part on the existence of new dunes and/or new beach areas formed as a result of the Town's beach renourishment projects and efforts, or by other private efforts. The Town's intent in pursuing the renourishment program is:

- ✓ To protect, preserve, restore, stabilize and enhance the beach/dune system through beach renourishment and other appropriate means, to provide for the protection of life and property, and to act as a buffer from high tides, storm surge, hurricanes, and erosion;
- ✓ To prohibit development from moving seaward onto new dunes or beach areas formed as a result of the Town's beach renourishment projects and efforts;
- ✓ To provide an important basis for a tourism industry that generates annual revenue for the State of South Carolina and the Town;
- ✓ To provide habitat for numerous species of plants and animals which are threatened or endangered, or which may become threatened or endangered as a result of the loss of the beach/dune system;
- ✓ To provide habitat for beach/dune system vegetation that is unique and extremely important to the vitality and preservation of the system; and
- ✓ To create a recreational beach at high tide.

1 – INTRODUCTION

1.1 PURPOSE

Local comprehensive beach management plans are an important and effective management tool for local governments to develop strategies for managing and protecting coastal resources. In South Carolina, if a local government wishes to participate in the state funding programs available for beach renourishment or other grant programs, the governing body must adopt and enforce a Local Comprehensive Beachfront Management Plan that is consistent with the South Carolina Beachfront Management Act. Section 48-39-350 of the South Carolina Code of Laws required local governments to prepare a local comprehensive beach management plan by July 1, 1991. This plan is to be updated at least every five years following its approval by the State of South Carolina.

The purpose of the Town of Hilton Head Island's Beach Management Plan is to:

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

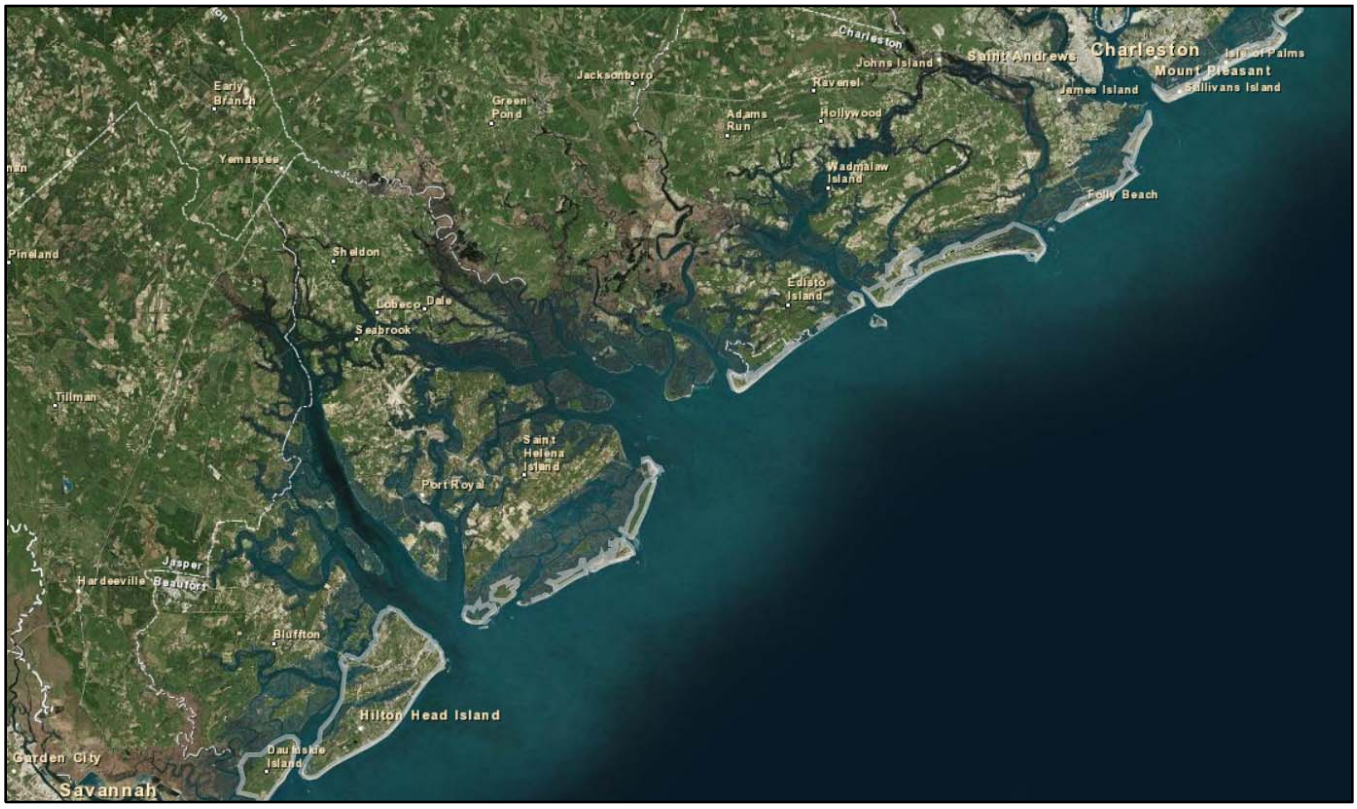
1.2 HISTORY OF PLAN APPROVALS AND REVISIONS

The Town's first Beach Management Plan was approved by the South Carolina Coastal Council (SCCC; now known as South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management - DHEC OCRM) and was adopted by Town Council on June 17, 1991. In 1992, the Plan was amended by Town Council and approved by the State to include a 40 Year Retreat Policy. Additional Plan modifications were adopted by Town Council including amendments to the public access improvement section, changing the number of beach access parking spaces and the implementation schedule of the Plan. The Beach Management Plan was also adopted as part of the Town's Comprehensive Plan in 2004 and 2010. Since initial adoption, the Plan has been reviewed by the State in 1992, 1995, 1998, and 2001. In 2009 a complete update of the plan was approved and minor modifications to beach parking were approved in 2011, which were also adopted as an appendix to the Town's Comprehensive Plan. ~~This document constitutes a complete revision and update of the previous 1991 Plan as amended, and is to be incorporated as an appendix to the Town's Comprehensive Plan.~~

1.3 OVERVIEW OF HILTON HEAD ISLAND

Hilton Head Island is located along the Atlantic Coast in Beaufort County, South Carolina. The Island is located about 22 miles northeast of Savannah, Georgia, and 15 miles south of Beaufort, South Carolina. It occupies a land area of approximately 23,000 acres or 54 square miles, with approximately 34.4 square miles of high ground, and is approximately 12 miles long and 5 miles wide, making it the largest oceanfront island on the Atlantic seaboard between New York and Florida. It is bounded on the northeast by Port Royal Sound, Calibogue Sound to the southwest, and Skull Creek, part of the Atlantic Intracoastal Waterway, to the north. ~~The average tidal range along the island can be between six and thirteen feet. A seven mile tidal inlet, Broad Creek, runs diagonally across the Island and opens into Calibogue Sound. The island is relatively flat with a maximum elevation of twenty-four feet in limited places.~~

FIGURE 1: HILTON HEAD ISLAND LOCATION



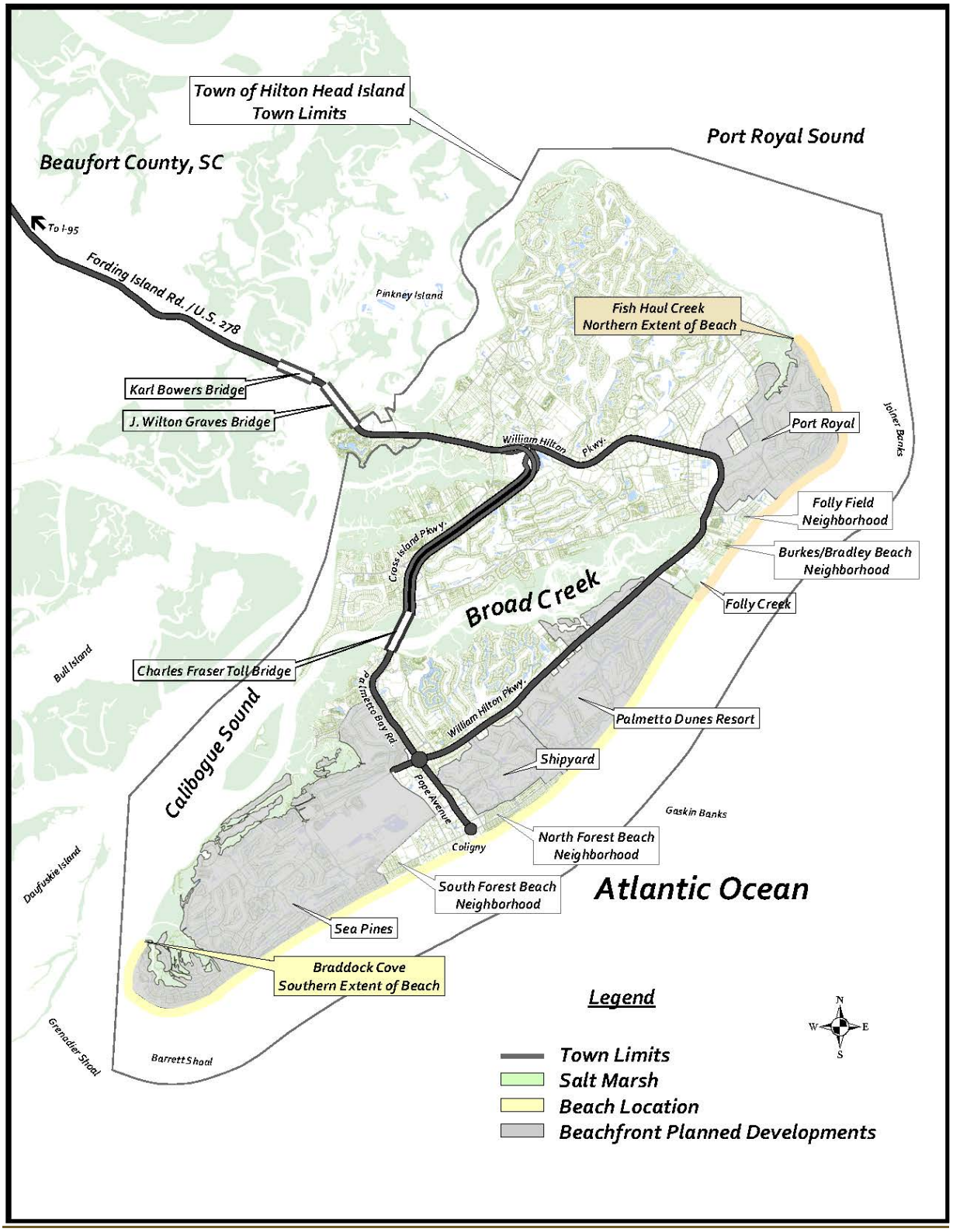
Source: DHEC OCRM (http://gis.dhec.sc.gov/shoreline/)

The Island's southeast shoreline faces the Atlantic Ocean and has a beach that stretches ~~19~~13 miles from Braddock Cove in the south to Fish Haul Creek in the north. The beach runs uninterrupted except for a small tidal inlet located mid-island, called the Folly. Historically, the Island has had a wide, sandy beach to the north and south and a narrow, recreational beach mid-island at low tide. ~~-~~A seven mile tidal inlet,

Broad Creek, runs diagonally across the Island and opens into Calibogue Sound. The island is relatively flat with a maximum elevation of twenty-four feet in limited places. The average tidal range along the island can be between six and thirteen feet.

Access to the Island is provided by U.S. 278 over two toll-free bridges, Graves Bridge and Karl Bowers Bridge. William Hilton Parkway (US 278 Business) and the Cross Island Parkway (US 278) serve as the Island's primary roadways. The Fraser Bridge spans across Broad Creek to connect the Cross Island Parkway with William Hilton Parkway on the south end of the Island. All other roads connect these roads, making them the life line connecting area residents and visitors to local residential, business and recreational areas. From its beginnings as a rich and abundant agrarian community to its current status as a distinguished resort and retirement community, Hilton Head Island has become known for its unique island character which integrates high quality design in the built environment with the superior natural beauty of the Island's beaches, extensive wetlands, diverse wildlife and natural landscape. Currently, approximately 70% of the Island has been developed as a part of master planned communities, also referred to as Planned Unit Developments (PUDs), which contribute significantly to the unique character and demographic composition of the Island. These PUDs reflect a tradition of planned street patterns, dwelling sites, and locations for public and institutional activities adapted to a modern resort concept that has become unique to Hilton Head Island.

FIGURE 2: ISLAND DESCRIPTION



1.4 CURRENT BEACH MANAGEMENT ISSUES

Development Issues

One of the most significant threats to the shoreline of Hilton Head Island is from continuous development pressure to construct as closely to the dunes system as possible, and in some cases, to build on older, more well-established dunes that are located outside of any required setbacks. With the Island approaching build-out, older developments are renovating or redeveloping with larger building footprints that push ever closer to the dunes system and beach. Some recent development and redevelopment projects have even petitioned the State to move the DHEC OCRM line further seaward in order to create more land on which to build.

There are also several vacant parcels of land seaward of existing developments that usually encompass the dunes system, known as strand blocks. These parcels have historically been owned by property owners' associations. Some of these have been sold to developers who wish to develop the parcels. This endangers the existing dunes system and causes the landward parcels, which were marketed as oceanfront, to no longer have a view of or direct access to the beach. Furthermore, the economic, societal and safety risks that result from such development are of great concern to the Town.

Environmental Issues

The Town also faces various environmental concerns in relationship to the management of its shoreline. Erosion of the beach is ongoing at some locations and has prompted a very ambitious and expensive renourishment program by the Town. The Town of Hilton Head Island has spent over $~~37,000,000~~ $50 million in beach renourishment projects from 1990-~~2007~~ 2012 resulting in a wider, higher and more robust beach configuration suitable for both active and passive use opportunities at all stages of the tide. Currently, a large scale renourishment project is planned for this year that is estimated to cost approximately $50 million dollars. Constant monitoring is undertaken and a continuous local funding source has been established for renourishment. The potential for negative impacts from global warming and rising sea levels will require the Town to continue to evaluate the feasibility of renourishment as its primary shoreline management technique and plan accordingly.

In addition to beach renourishment, shoreline stabilization has also been performed in ~~six~~ seven locations through the use of hard structures, such as groins, revetments and bulkheads. Some of these efforts were undertaken by homeowners, developers, hotels or property owners associations; however, the Town must evaluate issues such as liability, ownership, maintenance, cost and permit matters to determine the future role of the Town and the public's interest in these structures in relationship to overall shoreline management.

The protection and enhancement of the dunes system and its vegetation, as a part of an overall approach to beach management, is an extremely important issue for the Town. This area helps to protect life and property by serving as a storm barrier and habitat for numerous species of plants and animals, some of

which are threatened or endangered. As the number of beachgoers and activities on the beach increases, more demand will be placed on these important resources. Additionally, the protection of critical habitats, such as tidal inlets and creeks, like the Folly, as well as Fish Haul Creek, are also concerns.

Beach Access

There are very few undeveloped beachfront parcels remaining on the Island. This makes preservation and enhancement of any current beach parking and access location critical. Redevelopment projects also offer the opportunity to secure additional easements open to the general public. Prior to the incorporation of the Town in 1983, public access to the beach was provided by more informal access areas. People often parked along the sides of roadways or on undeveloped properties to access the beach. As the Island has continued to develop, additional parking and access areas have been developed by the Town and the other beachfront developments for visitors and residents of the Island. The Town has constructed eight public beach parks. Other private developments contain a total of seven beach parks that serve thousands of visitors and residents of the Island.

Water Quality

It is important to maintain a high level of beach water quality to protect the natural functions (i.e. chemical, biological and physical) and recreational opportunities (i.e. swimming, fishing, wading, boating). To support this, the Town of Hilton Head Island directs all drainage away from the beach area. Moreover, ~~beach water~~ storm water quality is monitored at 16 locations twice a month on Hilton Head Island. DHEC OCRM monitors ~~at~~ locations throughout the recreational swimming season, designated as April 15 through October 15. The Town of Hilton Head Island has documented less than 5 advisories in the past two years; overall, beach water quality is very good. In order to ensure that this does not change, the Town must continue to monitor water quality and make any necessary changes as a result of test indications.

Hurricane and Storm Damage

As a coastal community, the potential for hurricanes and the associated impacts must be considered. In addition to the Town's efforts to maintain adequate storm protection through the continuation of beach renourishment, dune refurbishment and maintenance of selected shoreline protection structures, disaster recovery and response are being addressed. ~~In~~ Since 2003, the Town has an adopted ~~a~~ post-disaster recovery plan that will be implemented after experiencing the effects of a major storm event. This plan was recently updated. In relationship to beach management recovery efforts, issues for the Town include the recovery and disposition of overwash sand, damage assessment of structures and the permitting process for oceanfront properties. A later chapter will discuss planning efforts currently underway in regard to these issues.

Social Issues

The increasing popularity of the beach has resulted in more intense use of the beach for recreational and commercial purposes. In addition to the increasing numbers of beach goers, commercial companies are marketing the beach as a location for special events, such as weddings, parties, fitness programs, animal training, racing events, religious services, and even movies. The Town must ensure that these events do not interfere with any other franchise agreements that currently exist for beach areas and that other codes are not violated. This requires increased efforts ~~of~~ by Town staff and other enforcement agencies.

FIGURE 3: HILTON HEAD ISLAND RECREATIONAL BEACH

2 - INVENTORY OF EXISTING CONDITIONS

2.1 GENERAL CHARACTERISTICS OF THE BEACH

Hilton Head Island is a compound barrier island formed by the advancing and falling sea during which sediment was deposited and leveled a number of times. The northern portion is a core of marine sediments deposited during periods of higher sea level caused by melting of continental ice sheets in the early Pleistocene epoch (1 million- 10,000 years ago). This area generally extends from Skull Creek, east to Port Royal Sound and Fish Haul Creek, and west to Brams Point following the western bank of Broad Creek. Much of the land area east and southeast of Broad Creek is a "fringe" of marine sediments. Fine sand was pushed inland by the rising sea level, caused by another time of warming and thawing of ice during the Holocene Period of the Pleistocene Epoch. The approximate foot shape of Hilton Head Island is typical of barrier islands on the "mesotidal" shoreline, in the interior of the Georgia Bight. Islands in this area are wider than other barriers, strongly influenced by tides (2-4 meters in range), shaped by waves and currents, and develop ebb-tidal deltas such as Joiner Bank (Port Royal Sound) and Barrett Shoals (Calibogue Sound).

The existing conditions along the shoreline of Hilton Head Island are the result of natural erosion patterns and various shoreline stabilization efforts. Historically, wide, sandy beach areas generally occur along portions of the Island's shoreline, indicating areas of accretion. Accretion is the gradual buildup of sediment that results in an increase in the size of the beach. Other areas of the Island's shoreline have been more vulnerable to erosion and have a narrower beach area. Typically a wide, sandy beach occurs on the northern and southern ends of the Island with a narrower beach occurring mid-island. Ongoing erosion has been continually mitigated by beach renourishment projects.

According to Section 8-1-112 of the Town's Municipal Code, the beach extends from Fish Haul Creek to Braddock Cove, from the first property line into the water 75 yards from the low water mark. The surface material of the beach contains a mix of silica sand, or quartz sand and shell fragments, which is typical of other shorelines along this area of the coast and has a light brown appearance. The native sand is approximately 0.16mm in size.

Along the shoreline, the existing dunes system varies in depth and height. This system is defined by the Town of Hilton Head Island's Municipal Code as "one or a series of hills or ridges of wind-blown sand or one or a series of hills or ridges of sand resulting directly or indirectly from restoration or beach renourishment, all of which may or may not be anchored by vegetation and is in the vicinity of the beach." The average dune height is approximately six feet, with heights ranging from three to twelve feet.

Calibogue Sound lies between Hilton Head Island to the west and Bull Island and Daufuskie Island to the east. It is the southernmost embayment in South Carolina. This Sound floods and drains extensive salt marshes landward of Hilton Head and Daufuskie Islands. A large intertidal shoal, Grenadier Shoal, has remained stable on the west side of Calibogue Sound for all of the 20th century. It lies seaward of Daufuskie Island and to the southwest of the main channel (See Figure ~~3~~ 4- Shoreline Changes, Calibogue Sound 1898-1977). Eastward of this channel the shoals are more short-lived. They result from the littoral transport of sediment eroded from the central portion of Hilton Head Island. The accumulation of these shoals at the southwest corner of Hilton Head Island is the first step in forming the ebb tidal delta of Calibogue Sound.

FIGURE 4 – SHORLINE CHANGES CALIBOGUE SOUND 1898-1977

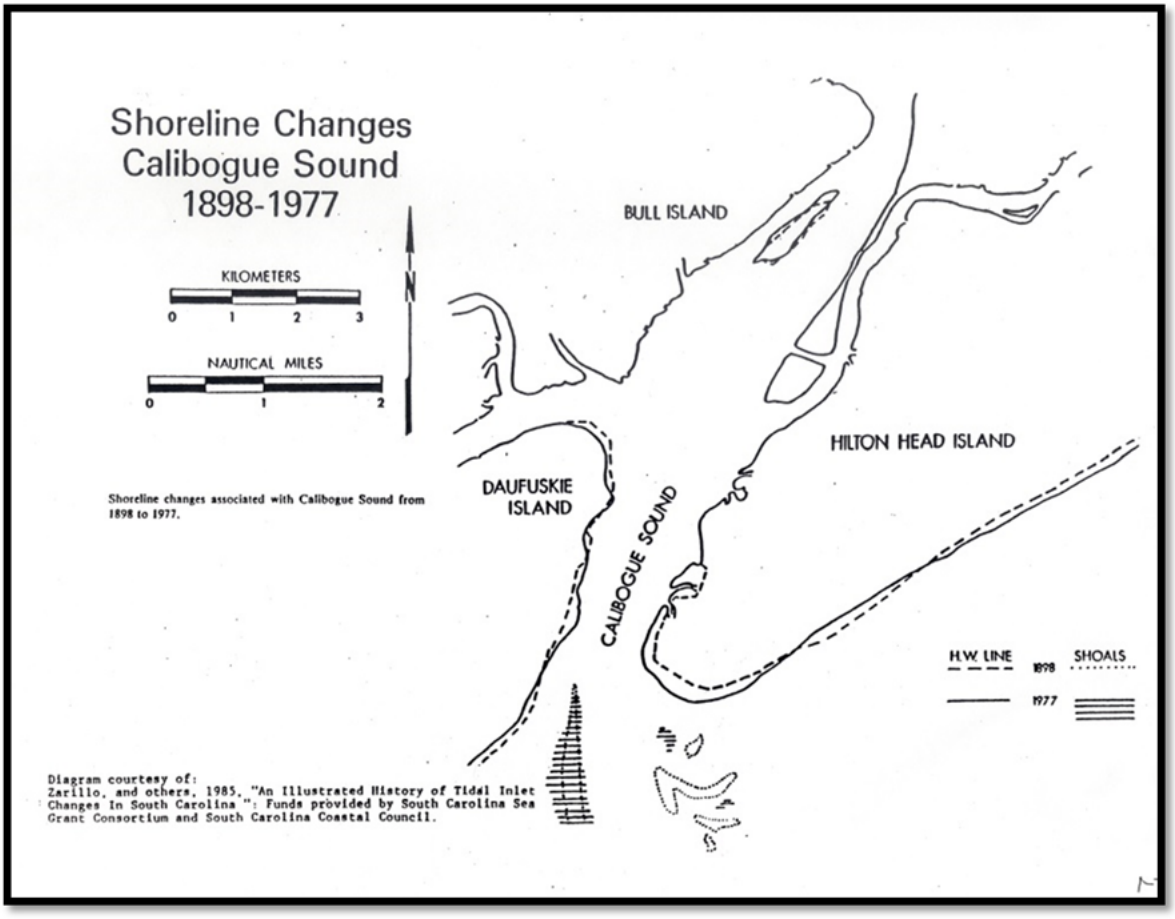
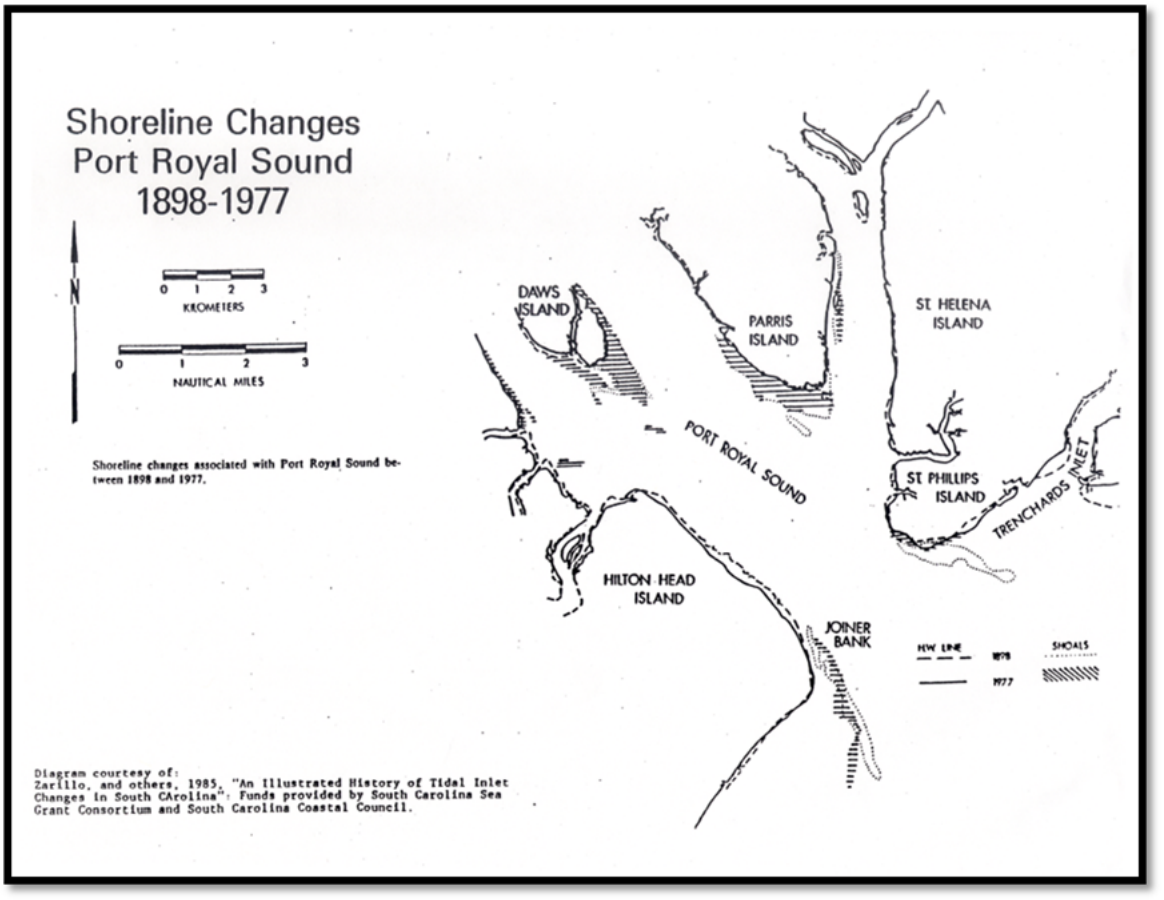


FIGURE 5: SHORELINE CHANGES CALIBOGUE SOUND 1898-1977



2.2 GENERAL LAND USE PATTERNS

Hilton Head Island is known for its incredible natural beauty and a sense of harmony between the natural and built environment. Over 70% of Hilton Head Island has been developed with master planned communities, which occupy the majority of the Island's shoreline. These beachfront planned developments include Sea Pines, Palmetto Dunes, Port Royal, and a small portion of Shipyard. In general, these developments are largely single family developments with some multi-family and resort areas along the beach. Other beachfront areas include South and North Forest Beach, Folly Field, Singleton, and Bradley Neighborhoods. (See Figure 2: Hilton Head Island Description.)

~~The Island is currently home to~~ According to the 2010 Census, there are approximately ~~39~~37,~~000~~ 099 permanent residents on the Island. ~~, with an anticipated population of over 53,000 by the year 2020. (Southern Beaufort County Regional Plan, 2006) U.S.~~

~~Census results from the year.~~ ~~2000~~ Census data also indicates that the Island's population consists of a higher percentage of older adults and retirees with a median age of ~~46~~ 50.9 and average income of $~~60,438~~70,041. The racial composition of Island residents is predominately white, ~~85.3~~75.2% with an average household size of ~~2.53~~ 2.3 people. The beach and associated amenities drive the Island's economy and contribute significantly to the economic vitality of the region supported by the Island's tourism industry support the Island's tourism industry, which drives the Island's economy and contributes significantly to the economic vitality of the region. ~~-~~(See Figure ~~1~~ 2 - Hilton Head Island ~~Location Map~~Description.)

2.2.1 Beach Uses

In the past ~~20~~ 25 years, the beach at Hilton Head Island has gone from an area where only a few beach walkers, sunbathers, and swimmers frequented, to an area with more varied activities. The primary uses of the beach include the traditional uses of walking, wading, swimming and sunbathing. The Town contracts with a private company, Shore Beach Services, to provide life guard services during certain times of the year. This service also includes litter patrol, including recycling, and beach rental items. Other activities that have become popular are fishing, surfing, kiting, volleyball, sailing, bocce ball and other beach games. The beach is also used for special events such as weddings, parties, fitness program locations, animal training locations, racing events, religious services, and even movies. ~~See a later section on Regulated Uses of and Activities on the Beach.~~

2.2.2 Benefits and Values of the Beach

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

Hilton Head Island's shoreline is a diverse and productive ecosystem that serves as a critical link between the water and the land. The sandy beach and dunes system serves as the Island's first line of protection from the high winds and waves associated with storm activities and turbulent seas. This area also supports a rich web of life including animals like worms, clams, shrimp and crabs that in turn attract predators such as seabirds, which depend on sandy beaches for their foraging activities. The beach provides critical nesting habitat for several species of birds and animals, particularly the threatened loggerhead sea turtle. Recreational opportunities such as fishing, swimming, beachcombing, bird-

watching, and sunbathing are also provided by the beach and contribute significantly to the success of the multi-million dollar tourism industry on the island.

According to the Hilton Head Island-Bluffton Chamber of Commerce, the Island hosts approximately 2.~~2~~ 4 million annual visitors ~~and over 85% of these tourists take advantage of~~ with the beach and its associated amenities being the most important reason for choosing Hilton Head Island. (Hilton Head Island Visitor Profile and Conversion Study, ~~2006~~2010). According to this same study, travel parties reported spending an ~~average of $2,400~~estimated $2,726 per trip during week-long trips to the Island. In order to help maintain the recreational quality of the beach associated with this industry, the Town of Hilton Head Island exercises beach renourishment as its primary means of shoreline management, which is anticipated to be needed every seven years.

The primary source of funding for these renourishments is a 2% local Accommodations Tax levied on short term rentals, hotels and motel accommodations, which ~~providing~~ provided $~~4.4~~5.3 million ~~each~~ last year in funding dedicated to beach renourishment and related monitoring, dune refurbishment, maintenance and operations, and new beach parks and beach access facilities. It is anticipated that this source of funding will remain a viable option in future years. This document contemplates this and other issues surrounding the continuation of the Town's Beach Management Program and other alternatives for shoreline management, including shoreline retreat. The Town adopted special zoning districts along the beachfront to prevent development from moving further seaward, which is discussed in more detail in the Land Use Development and Zoning section.

The economic impact of the coastal areas has also been recognized by DHEC OCRM in a report that was issued in October of 2002. According to this report, 22% of the state's economy is a result of the output of revenues from coastal areas. This report also indicated that a quarter of the state's population growth in the last 10 years has occurred in the eight coastal counties. One in every three new private jobs during the past decade has been created along the coast and when compared to other areas of the State the average income in coastal areas is higher. (Henry, M.S. & Barkley, D.L. 2002. The Contribution of the Coast to the South Carolina Economy. Clemson University Regional Economic Development Research Laboratory.)

2.3 BEACHFRONT DEVELOPMENTS AND ZONING

The Town's Land ~~M~~Management Ordinance, in Chapter ~~4~~ 3 (Zoning Districts ~~Regulations),~~ provides for the establishment of certain base and overlay districts for the purpose of guiding development in accordance with existing and future needs and in order to protect, promote and improve the public health, safety, morals, convenience, order, appearance, prosperity and general welfare. Of these zones, a~~A~~ large portion of the beachfront area is zoned PD-1 (Planned Development ~~Master Plans~~Mixed-Use District). Sea Pines and Port Royal Master Plans specifically identify much of their beachfront area as

'open space.' To change this land use, it typically would require a vote of the majority of property owners as this property is typically owned by the POA. Such a change would then require a rezoning by Town Council.

Other areas along the beach are classified into different zones. The designation of 'open space' along the beach is not specifically identified in these other zones as it is in the PD-1 zone. In some instances, this has led to certain parcels "(strand blocks)" being sold to developers who are looking into the possibility of developing these parcels. These strand blocks typically contain remnants of the dunes system that lie landward of the primary dune. Development of these areas would therefore destroy the remaining dunes system. The Town is taking steps to prevent this, as described later in the Shoreline Retreat Policy Section.

Density in the zoning districts is limited, in part to protect and preserve the beach and dunes system. The PD-1 zoning districts are typically 2 or fewer units/acre. The beachfront zones which allow the most density are the Coligny Resort District, for which the allowable density is undefined. It is but limited by applicable design and performance standards such as height and parking, ~~limited to RM-8 and RD which both will allow 8 dwelling units per acre (d.u./acre).~~ The Resort Development District allows 16 dwelling units per acre.

The following is a listing and brief description of the character and purpose of each of the beachfront zoning districts (See Figure 23 - Official Zoning District Map.)

- PD-1 (Planned Development Mixed-Use District):
  The purpose of the Planned Development Mixed-Use (PD-1) District is to recognize the existence within the Town of certain unique Planned Unit Developments (PUDs) that are greater than 250 acres in size. Generally, these PUDs have served to establish the special character of Hilton Head Island as a high quality resort and residential community. It is the intent in establishing this district to allow the continuation of well planned development within these areas. In limited situations, some commercially planned portions of PUDs are placed within other base districts to more specifically define the types of commercial uses allowed.~~The purpose is to recognize the existence of certain unique mixed use Planned Unit Developments (PUD's) which are greater than 250 acres in size. Generally, these PUD's have served to establish the special character of the Island as a quality resort and residential community and the intent in establishing this District is to allow the continuation of well-planned development within these areas.~~

- ~~RS-4 (Single Family Residential):~~
  ~~The intent is to allow, preserve and protect the character of low density, single family areas and neighborhoods at densities at 4 units per acre.~~

- ~~RS-6 (Single Family Residential):~~RSF-6 Residential Single-Family-6 District:
  The purpose of the Residential Single-Family-6 (RSF-6) District is to primarily accommodate single-family dwellings at densities ranging up to six units per acre. It is intended to discourage any use that would substantially interfere with the development of single-family dwellings or would be detrimental to the quiet residential nature of single-family neighborhoods. The district also accommodates agricultural uses and parks as permitted uses.~~The intent is to allow, preserve and protect the character of low density, single family areas and neighborhoods at densities at 6 units per acre.~~

- ~~RM-8 (Moderate Density Residential):~~RM-8 Moderate Density Residential District:
  The purpose of the Moderate Density Residential (RM-8) District is to allow the development of residential uses at densities up to eight dwelling units per net acre. The district allows a variety of residential uses, along with uses that support neighborhoods. The district is intended to discourage development that would substantially interfere with, or be detrimental to, moderate residential character.~~The purpose is to allow development of residential uses up to 8 dwelling units per net acre. This district is used to encourage a moderate density neighborhood providing a variety of residential opportunities for residents of the Town~~.

- ~~CFB (Central Forest Beach Resort Development):~~Coligny Resort District:
  The purpose of the Coligny Resort (CR) District is to recognize and promote further investment in the area near Coligny Circle as an activity center and a core high-energy and visitor oriented resort destination that encourages people to live, work, and recreate within the district. The district is intended to accommodate relatively high-intensity commercial, office, residential, and mixed-use development that is pedestrian oriented and human-scale. It is also intended to promote development that integrates civic and public gathering spaces and connects to such places in nearby developments and public places.~~The purpose in establishing this District is to provide for continued development of this moderate intensity resort-oriented neighborhood and infill with other compatible visitor-oriented development.~~

- RD (Resort Development District):
  It is the purpose of the Resort Development (RD) District to provide for resort development in the form of multifamily development, bed and breakfasts, and resort hotels. It is also the purpose of this district to provide for commercial development aimed at serving the island visitor.~~The intent is to provide for tourist resort development in the form of multi-family, timeshare or interval occupancy units intended for use as resort transient lodging, and, under controlled circumstances, the development of motels and resort hotels. It is also the intent to provide for commercial development aimed at serving the transient island visitor. The commercial development is meant to service primarily the market created by the needs and desires of the transient population staying in the resort development district.~~

- PR (Parks~~, Recreation and Public Facilities~~and Recreation District):
  The purpose of the Parks and Recreation (PR) District is to accommodate and manage the land uses allowed on publicly held land used for active or passive recreation purposes, or publicly owned land preserved in its natural state for public enjoyment. Development in this district shall be allowed and designed to minimize, as much as possible, its impact on both the natural environment and the community.~~The intent is to manage the types of land uses permitted on publicly held land by permitting the establishment of areas within the Town for active or passive recreation, or providing for the preservation of land in its natural character for public enjoyment.~~

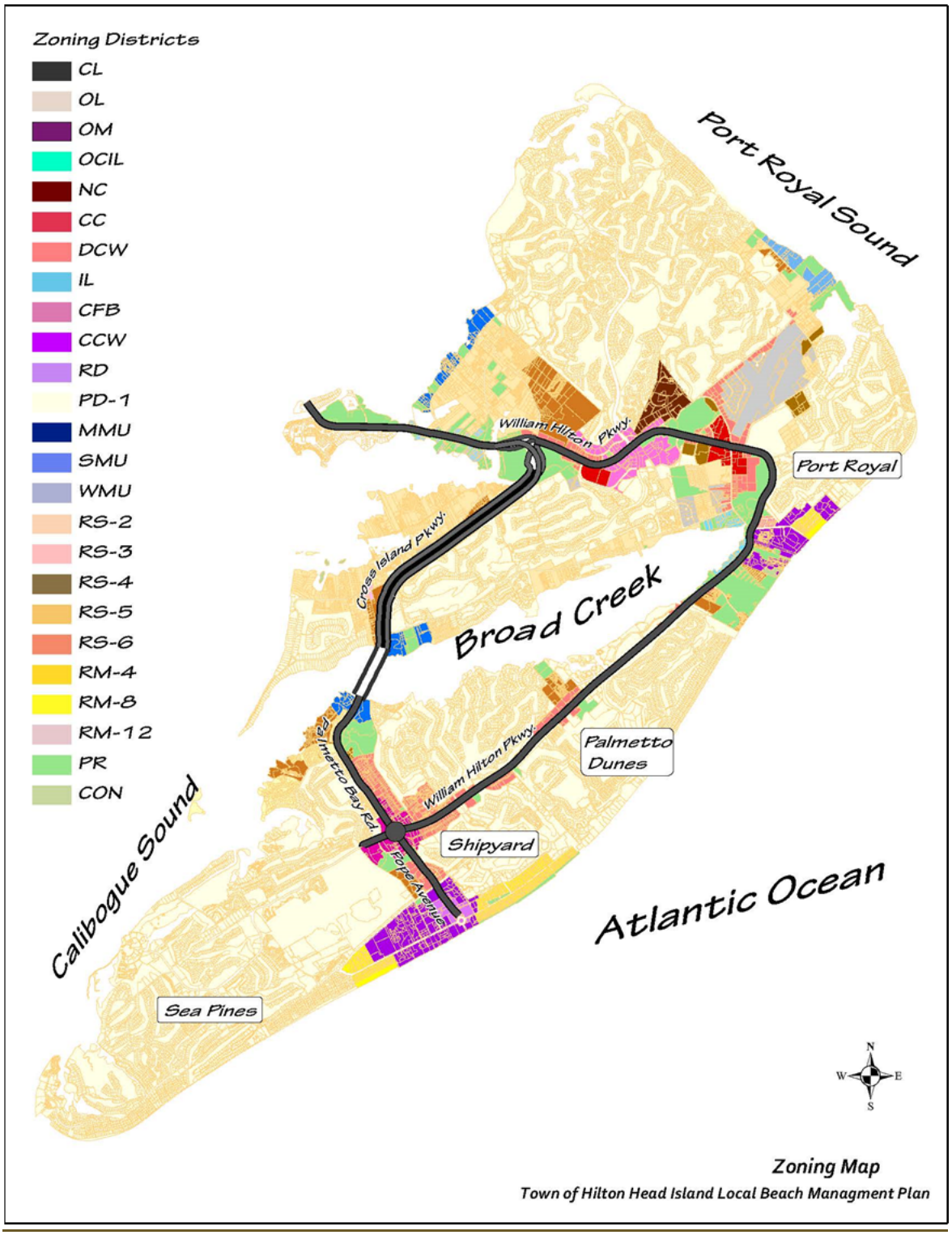
- CON (Conservation District):
  The purpose of the Conservation (CON) District is to preserve and protect environmentally sensitive tidal wetland and beachfront lands subject to natural hazards by ensuring these areas only accommodate very low intensity development that minimally disrupts natural features or systems (either temporarily or permanently). The upland boundary of this district corresponds to the OCRM Critical Line and therefore is approximately coterminous with all tidal wetlands and the upland boundary of the beach, as defined in Section 8-1-112 of the Municipal Code, and extends outward to the Town jurisdictional boundary, as identified in Section 2-1-20 of the Municipal Code.~~The purpose is to regulate very low intensity development in environmentally sensitive tidal wetland areas and the beach. Only development which will minimally disrupt natural features or systems, whether temporarily or permanently, will be allowed~~.

- ~~Folly Field Neighborhood Character Overlay District:~~FF-NC-O Folly Field Neighborhood Character Overlay District
  The purpose of the Folly Field Neighborhood Character Overlay (FF-NC-O) District is to protect the single-family residential character of the district and in particular the development and redevelopment of lots within the district. All new development and changes to existing development in the district are subject to the overlay district regulations in addition to those listed in Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.~~The purpose of this overlay district is to protect the single-family residential character of the district and in particular the development and re-development of lots within the district. This district identifies the 'strand block' as being the area between the existing most current seaward lots and the beach and is designated as open space. In addition, vertical construction in this designated area is prohibited. It also has an Open Space section which states that: "open space adjacent to the beach shall be designated as the area between the existing most current seaward lots and the beach and shall not be counted towards the density calculation for any development activities."~~

- ~~Forest Beach Neighborhood Character Overlay District:~~FB-NC-O Forest Beach Neighborhood Character Overlay District: The purpose of the Forest Beach Neighborhood Character Overlay (FB-NC-O) District is to protect the single-family residential character of the district and in particular the development and redevelopment of lots within the district. All new development and changes to existing development in the district are subject to the overlay district regulations in addition to those listed in Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.~~The purpose of this overlay district is to protect the single-family residential character of the District and in particular the development and redevelopment of lots within the district.~~

- HH-NC-O Holiday Homes Neighborhood Character Overlay District:
  The purpose of the Holiday Homes Neighborhood Character Overlay (HH-NC-O) District is to protect the single-family residential character of the district and in particular the development and redevelopment of lots within the district. All new development and changes to existing development are subject to the overlay district regulations, in addition to those listed in Sec. 16-3-104.D, Residential Single-Family-6 (RSF-6) District. Existing nonconforming structures and site features may be expanded as long as the site complies with certain standards for the the required floor area ratio (FAR) and maximum impervious cover.

FIGURE 6 – ZONING MAP



Zoning regulations for beachfront areas adjacent to these PUD's are based on their individual master plans as part of the Planned Development Mixed Use Zoning District (PD-1) within the Town. In addition to these regulations, the Town's Land Management Ordinance requires ~~an average buffer of 40 feet adjacent to the DHEC-OCRM Baseline, with a minimum setback at any point of 20 feet. Single family structures are only required to have a 20 foot setback from the DHEC-OCRM Baseline~~ that developments along the beach comply with special zoning districts.

Table 1: Major Beachfront Planned Developments

Sea Pines Plantation: 4,694 acres 5,890 residential units maximum permitted (includes both single family and multi-family)
Shipyard: 726.3 acres 279 single family lots 1,588 multi-family/hotel units 1,867 units total
Palmetto Dunes: 1839 acres 1,231 single family 3,653 multi-family 4,884 total units
Port Royal: 1,254 acres 1,021 single family lots/homes 1,032 multi-family 2,053 total units

Town of Hilton Head Island, 2007

The following is a summary of the private covenants and restrictions that apply to each of the beach-front planned developments moving south to north along the Island's shore.

Sea Pines

Setbacks and other restrictions for properties in this PUD are outlined in the "Guidelines and Procedures for Design and Construction of Single Family Residences" (November 1991).

Owners of oceanfront lots are strongly encouraged to locate new homes as far from the beach as possible. Thus, the Sea Pines Architectural Review Board (ARB) has established a setback from the oceanfront property line for all vertical construction of 50 feet or 25 percent of the lot depth, whichever is greater. The ARB reserves the right, depending on special circumstances on a case-by-case basis, to approve variances from this setback guideline. The ARB also applies several aesthetic and natural setting considerations as it reviews proposed beachfront projects.

Setback requirements for pools and spas are also outlined in the guidelines for beachfront lots the decks of "in-ground" and "above-ground" pool and spa units, including decking, are considered "vertical" structures and are thus subject to the minimum 50 foot setback from the beachfront property line.

Persons who believe these regulations are unfair, inconsistent with past practices, or fail to consider all relevant facts and information may formally request the matter be reviewed and reconsidered again by the ARB via an appeal or variance. The Guidelines and Procedures outline the process for such appeals or variances.

Shipyard

This development has very limited beachfront area, which is currently developed with a hotel and beach club for visitors and residents of the development. Beachfront setbacks for the development are not mentioned within the Shipyard ARB guidelines or restrictive covenants, so the Town's ~~minimum~~ setbacks apply that are further described in Section 4.2.4, Beachfront Development Regulations.

Palmetto Dunes

Setback requirements for this development are outlined in its "Architectural Review Board Policies, Procedures and New Construction Guidelines" (March 2005). This outlines the beachfront setback requirements as generally being 50 feet from the beachfront. Pools and their surrounding decks have a setback of 20 feet. Variances from these setbacks may also be sought from the Architectural Review Board.

Port Royal

Setbacks in this PUD are outlined in the "Port Royal Plantation Plans Approval Board Guidelines and Procedures" (November, 2005). Property line setback regulations require that no vertical construction shall be closer than 50 feet from a property line adjoining a golf course, lagoon, ocean, dune area or marsh. Variances and appeal procedures area also included.

2.3.1 Beachfront Structural Inventory

Section 48-39-350(A)(3) of the Beachfront Management Act requires all communities to include an inventory of all structures located seaward of the DHEC OCRM setback line as part of their local beach

management plan. ~~Specific guidelines, supplied by the South Carolina Coastal Council staff in 1991, indicate that all structures located within tax parcels that are 50 feet landward of the DHEC-OCRM setback line should be inventoried; therefore, the structure inventory undertaken for this plan consists of the zones illustrated in Tables 5 through 8. There were no habitable structures that existed seaward of the DHEC-OCRM Baseline.~~ This inventory was conducted using the Town's GIS system and can be found in Appendix A.

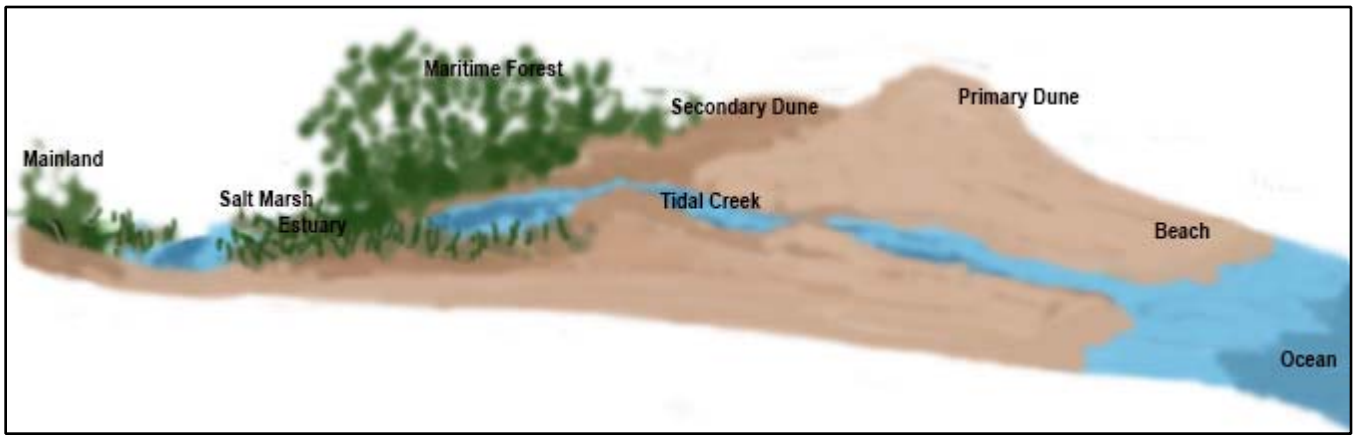
- ~~Zone 1 is located seaward of the baseline;~~
- ~~Zone 2 is located between the baseline and setback line;~~
- ~~Zone 3 is located within 50 feet of the landward side of the setback line; and~~
- ~~Zone 4 is located within tax parcels of which a portion of is located within Zones 1, 2 or 3, and is more than 50 feet landward of the setback line.~~

Structural inventory guidelines required by the state are as follows:

- If any portion of a structure ~~touches a line (baseline, setback line or 50 foot line), include the structure in the seaward-most category;~~ is seaward of the setback line document the distance seaward the structure is located.
- ~~In estimating the size of structures, include the area of attached decks, porches and garages;~~
- Commercial structures are considered habitable structures;
- Count all detached structures as separate buildings (decks, boardwalks, pools, etc.); and
- An erosion control structure which covers more than one tax parcel should be counted as a separate structure for each parcel.

2.4 NATURAL RESOURCES AND ECOLOGICAL HABITATS

FIGURE 7: BARRIER ISLAND ENVIRONMENTS



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

Three terrestrial habitats are found around the Hilton Head Island beachfront, namely the beach community, maritime shrub thickets, and maritime forest. Maritime forests are upland communities typified by live oak, cabbage palmetto, and loblolly pine. Small remnant patches of this habitat are scattered throughout the island. 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. Finally, the beach community generally includes the open beach and dune habitats, as well as the foreshore zone that is frequently inundated by the tides. 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 zone of dunes extends from the seaward edge of the beach berm to the seaward edge of the maritime forest tree line. Dunes on Hilton Head Island are relatively small due to the lack of strong, direct winds. Dunes form when ~~wind~~ wind-blown sand lodges against an obstacle. Native plants, including sea rocket, seaside pennywort, morning-glory species, beach pea, dune sandbur, sea oats, seaside panicum, camphorweed, yucca species, wax myrtle and yaupon, ~~—~~ are resistant to blowing salt and stabilize the dunes with their roots. The typical "dune field" has five zones:

- Sea wrack: Debris, primarily dead spartina grass, deposited by high tides.
- Embryo dune: Sand that collects in the sea wrack.
- Foredune: The seaward dune that is stabilized by plants.
- Interdune troughs: Low areas between dune ridges.
- Back dunes: One or more dunes landward of the foredune, populated by common seaside grasses, shrubs and stunted trees.

The importance of barrier islands 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, such as at Hilton Head Island, 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~~ marine plants and animals.

Natural habitats and resources are also recognized for the social and economic benefits that they provide. Protection of natural resources is identified in the Town's Comprehensive Plan as essential to

maintaining the high quality of life on Hilton Head Island. Residents indicate that the attributes of coastal ecosystems, including marshes, mature trees, marine waters, and sandy beaches influenced their decision to purchase property on Hilton Head Island. In addition, the accessible ocean beach is a predominant factor in the local tourism and vacation rental economy. Eco-tourism has also increased as an economic market around Beaufort and on Hilton Head Island.

FIGURE 8: THE FOLLY TIDAL CREEK ESTUARY

Several natural resource protection efforts have been achieved and continue for the Town of Hilton Head Island.

- **Beach nourishment:** Conducted in 1990, 1997, 1999 (emergency work at South Beach) and, ~~2006~~2007 and 2012. ~~–~~This created a suitable nesting habitat for sea turtles along miles of previously eroded and/or reveted beach. It protects the sand dune habitat, promotes native plant and animal species that depend upon it and protects the shoreline from destruction by erosion. Approximately ~~6 –~~8 miles of beach have been renourished.
- **Dune rebuilding/revegetation:** Sand fencing and native beach plants are routinely installed to help enhance the restoration of dune habitat previously destroyed by erosion.
- **Sea Turtle Protection Ordinance:** Established in 1990, this ordinance helps protect nesting sea turtles and emerging hatchlings by reducing disorientation caused by artificial lights shining onto the nesting beach. Prior to each season, the Town and the Coastal Discovery Museum use the media and informational brochures to advertise the ordinance.

Town Code Enforcement Officers patrol the beaches regularly at night throughout the season to ensure compliance.

- **Sea turtle monitoring**: This has been an ongoing program of the Coastal Discovery Museum since 1984 (funded by the Town since 1989) that surveys and inventories sea turtle nests which provides information on nesting activity and hatchling success rate. The Town has been accurately mapping the nests since 1999 using GPS technology. Educational benefits are afforded to the general public through opportunities for participation in the program, staff lectures and the distribution of a brochure written by the Town that gives information on sea turtle life history, states the regulations protecting them and gives contact numbers to report violations. (See Figure ~~5~~10: Sea Turtle Nesting Densities.)
- **Tree protection ordinance:** Established in 1986, this ordinance protects native vegetation. Through the tree approval process, parcels are examined prior to development to ensure trees are marked for removal according to the approved site plan. ~~for specimen trees.~~ Applicants are also encouraged to protect non-tree understory plants and are required to replant native trees similar to those removed if the post-development site no longer meets ordinance standards.
- **Wetland protection ordinance:** Established in 1986, this protects both salt and freshwater wetlands through the use of setbacks and buffers. Mitigation in-kind and on-site or ~~in the same watershed~~ at another location on the Island is required for any ~~fill~~ wetland alteration~~allowed~~. Monitoring the success of the mitigation is required for three years, with written reports required every six months and corrective action taken as necessary.
- **Design Review Board:** Established in 1987, this board reviews development projects along major roads, conservation districts, and waterfront areas (including beaches). It requires vegetated buffers (natural preferred) along waterfronts; reviews landscape plans to insure that a post-development site is adequately vegetated and encourages the use of native plant materials.
- **Land Acquisition Program:** Established in 1990, this program allows the Town to purchase properties for a variety of reasons, including beachfront and environmentally sensitive lands. The Town now owns over 1,312~~1,100~~ acres. Most undeveloped beachfront property outside of the gated communities is now owned by the Town.
- **Town Staff:** An Environmental Planner and Sustainable Practices Coordinator ~~Natural Resource Associate and an extra Codes Enforcement Officer~~ have been hired since the initial adoption of the Town's Beach Management Plan. The ~~Natural Resources Associate~~Environmental Planner reviews site plans (including beachfront). The Sustainable Practices Coordinator prepares educational material such as brochures, performs biological monitoring, works to insure the Town is green in all its operations, implements the Town's Sustainability Plan (Green Blueprint)~~, manages the Town's~~

~~stormwater monitoring program, analyzes the resulting data and writes yearly reports~~ and performs other natural resources functions for the Town. The Codes Enforcement Officer is responsible for tree and wetland protection, including beachfront codes enforcement.

- **Water Quality Monitoring:** ~~The Town is entering its second season of~~DHEC ~~managing~~ manages the water quality monitoring program for the Island's monitoring and testing of the beachfront for ~~enteroccocus~~enterococcus.

2.4.1 Threatened and Endangered Species

The following is a listing of Endangered and Threatened Species, and species of Special Concern that use the beachfront, followed by a map (Figure 4 9—Piping Plover Critical Habitat) of the only known beachfront critical habitat on the Island for the piping plover.

Table 2: Endangered and Threatened Species, and Species of Special Concern Using Hilton Head Island Beach

Name	***Status***	***Habitat/Activity***
Loggerhead Sea Turtle	Threatened, FS	Beaches (nesting)
Green Sea Turtle	Threatened, FS	Beaches (nesting)
Kemps-Ridley Sea Turtle	Endangered, FS	~~Beaches (nesting)~~ Nearshore waters (Foraging)
Leatherback Sea Turtle	Endangered, FS	Beaches (nesting)
Eastern Brown Pelican	Species of Special Concern, S	Beaches
Least Tern	Threatened, S	Beaches, Dunes (nesting)
Wilson's Plover	Threatened, S	Beaches, Dunes (nesting)
Piping Plover Red Knot	Threatened, F Threatened, S Threatened, F	Beaches, ~~Dunes~~ -Intertidal Flats(Wintering) Beaches, Intertidal Flats (Wintering)
Island Glass Lizard	Species of Special Concern, S	Dunes
Seabeach Amaranth	Species of Special Threatened, F Threatened, S	Dunes (Plant)

F—Federally Protected Species S— State Protected Species

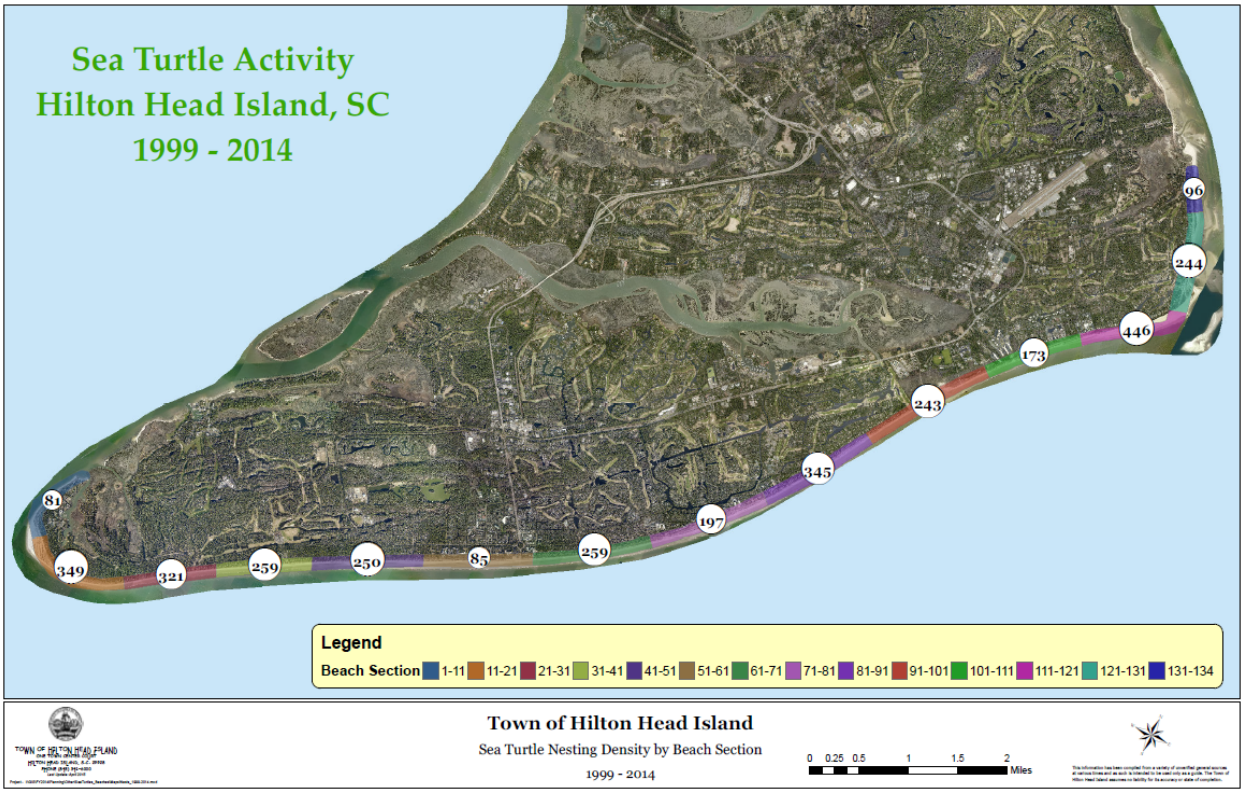
Source: ~~SCDHEC, 2001~~*USFWS and Town of Hilton Head Island, 2014*

FIGURE 9: PIPING PLOVER CRITICAL HABITAT

Source: U.S. Fish and Wildlife Service

2.4.2 Sea Turtle Nesting

FIGURE 10 – SEA TURTLE ACTIVITY 1999-~~2013~~2014



2.5 EXISTING PUBLIC ACCESS AND MAP

In 1989, the Town of Hilton Head Island received a $6,200,000 grant from the State of South Carolina (of which $2,500,000 was received from SCCC) for a beach renourishment project. As part of this agreement, the Town committed to providing between 2,000-3,000 beach parking spaces on the Island, with all of the facilities being within 1,000 feet of public beach access points.

The Town's original 1991 Beach Management Plan detailed public access parks, undesignated private parking areas, privately-owned beach access points (hotels, condominiums and beach clubs), neighborhood access points, future public beach parks and facilities, and emergency vehicular access points. This was approved by the State and included a commitment of 2,000-2,500 parking spaces.

In 1998, the Beach Management Plan was amended by the Town and approved by South Carolina Department of Health and Environmental Control to include a Beach Access Plan, which outlined a plan to construct a total of 1,400 public parking spaces by December 2008, reducing the previous 2,000-2,500 parking spaces in the earlier plan. This plan included the construction of spaces that could be reserved for Island residents and property owners; however, such spaces are not counted when the State designates "full and complete public access" areas on the beach, which can impact grant eligibility. Currently, the Town has 1,454 beach parking spaces, of which 1,062 are open to the general public of the State, so they do not meet the requirements to be considered in the calculation of the areas that are considered "Full and Complete Public Access" by the State, in accordance with the State's Beachfront Management Act. However, these spaces are recognized by DHEC OCRM for the purpose of meeting the previous 1990 grant requirement. Currently, the Town has met this revised obligation.

Figure ~~6~~ 11 - Town-owned Beach Parks and Parking, shows the location of Town-owned beach access and parking areas. Table 3 details the existing number of public parks owned by the Town of Hilton Head Island with their facilities.

Figure ~~7~~12: Neighborhood Beach Access and Parking, shows the location of neighborhood beach access and parking. These facilities are provided by the PUD's and neighborhood associations and are used by thousands of Island residents and visitors. There are a total of 107 neighborhood beach access locations, eight of which have parking areas, which are used predominately by visitors and residents within the gated community in which they are located.

Figure ~~8~~13: Private Beach Access and Parking, shows the location of private and multifamily beach access points and parking locations. These facilities are provided by hotels and condominium complexes. There are a total of 59 private access locations with parking on the Island.

Table 3: Existing Town-Owned Beach Parks and Parking

	Handicapped access	Boardwalk	Restrooms	Trash receptacles	Showers	Bike Racks	Drinking Fountain	Life guards / rentals	Picnic pavilion	Natural trails	Sitting Deck	Viewing scope	Emergency Access	Historical Marker	Public Parking Spaces	Notes
Alder Lane Access	✓	✓	✓	✓	✓	✓	✓	✓							23*	
Coligny Area	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓		522*	Parking breakdown: Coligny Circle Lot: 12 Paved Lot: 430 Unpaved: 80
Chaplin Park & Burkes Beach Road			✓	✓	✓	✓	✓	✓		✓			✓		258*	Parking breakdown: Burkes Beach Road: 13 w/in 1000' Chaplin Park: 110 w/in 1000' Castnet: 135 via shuttle
Driessen Beach Park	✓	✓	✓	✓	✓	✓	✓	✓	✓						179* 28	28 Spaces for Island Beach Pass Holders (Residents and Property Owners)
Folly Field Park	✓	✓	✓	✓	✓	✓	✓	✓							55*	
Islanders Beach Park	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		25* 131	131 Spaces reserved for Island Beach Pass Holders (Residents and Property Owners)
Fish Haul Park	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	47	
Mitchelville Beach Park & Barker Field	✓	✓	✓	✓		✓	✓				✓	✓		✓	186	101 at Mitchelville Beach Park and 85 via boardwalk at Barker Field

*Parking contributing to full and complete public access.

FIGURE 11 – EXISTING BEACH PARKS WITH PARKING

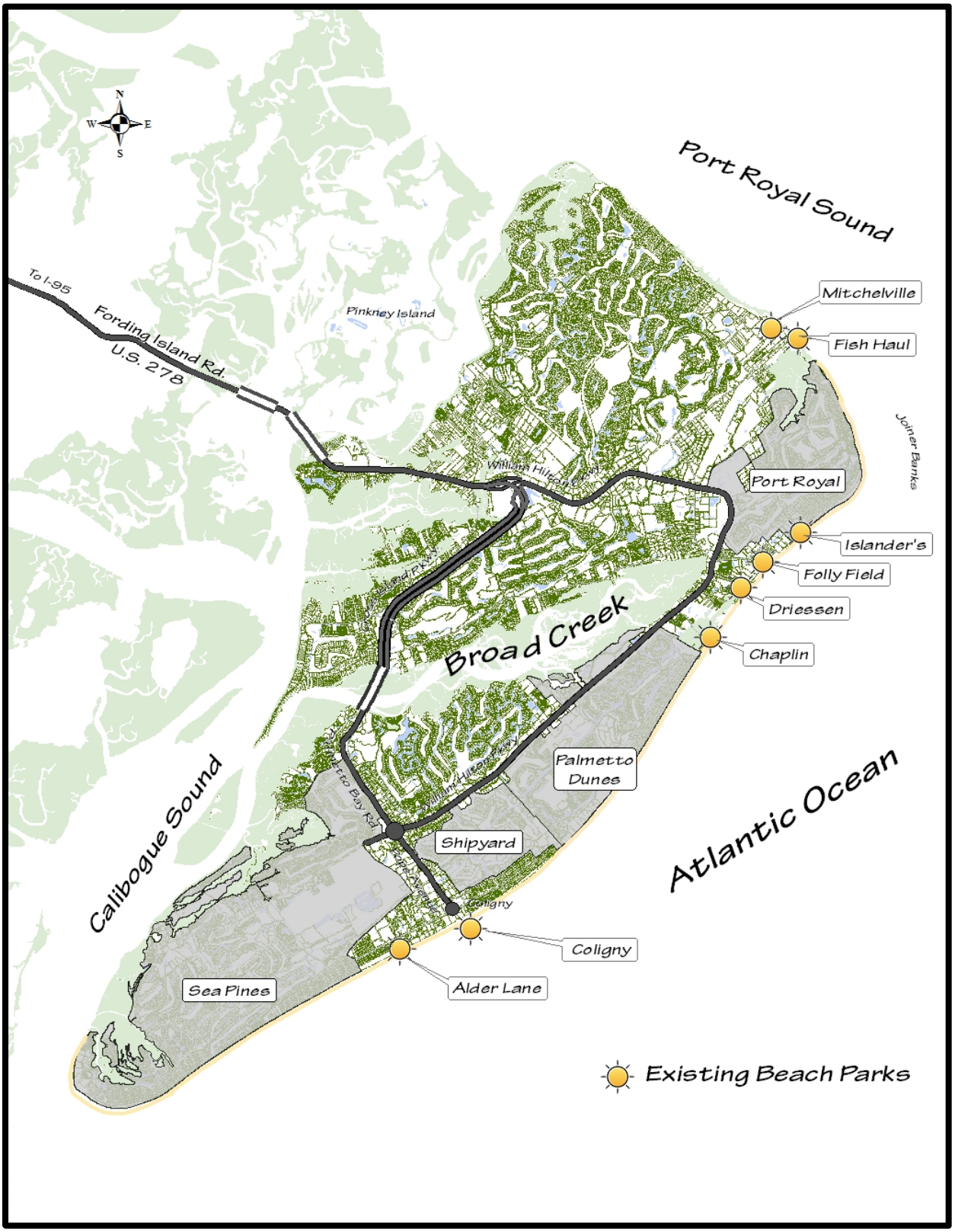


FIGURE 12 – NEIGHBORHOOD BEACH ACCESS AND PARKING LOCATIONS

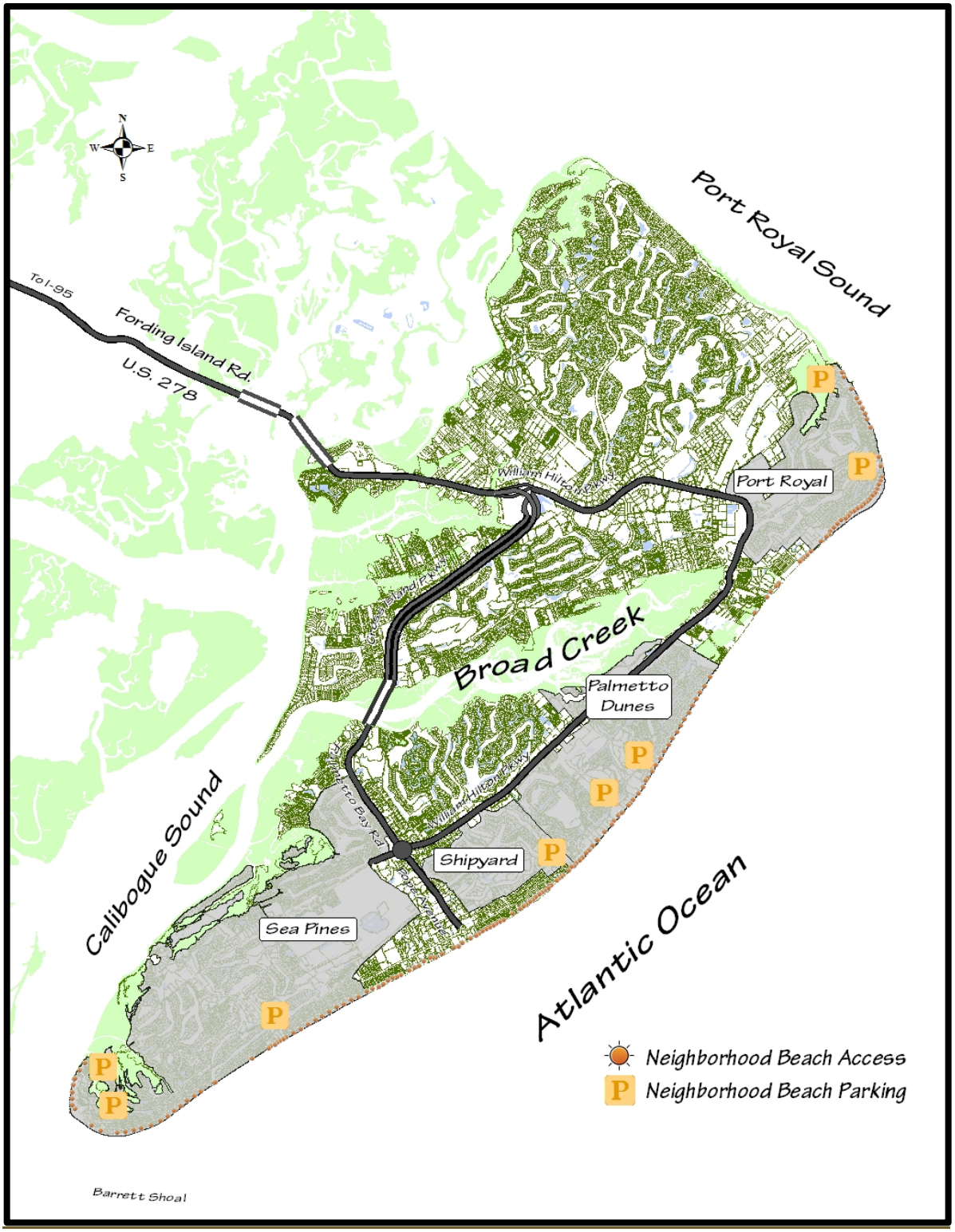


FIGURE13 – PRIVATE BEACH ACCESS

FULL AND COMPLETE PUBLIC ACCESS

DHEC OCRM classifies areas along the beach that are considered to offer full and complete public access, which is defined based on the criteria shown in Table 4 below. This classification is factored into the review of some State grants.

Table 4:
DHEC-OCRM Public Beach Access Facility Classification (SCCC, 1995).

Type of Facility	Distance on either side of Access Point which will be considered as having Full and Complete Access	Minimum Facilities
Public Access Point	**1/8 Mile**	**Trash Receptacle, Walkover/Improved Surface Access; Signage; On-Street Parking For 6 Vehicles**
Local Public Access Park	**1/4 Mile**	**As Above, Parking For 10 Vehicles**
Neighborhood Public Access Park	**1/2 Mile**	**As Above, Showers, Restrooms, Parking For 25 Vehicles**
Community Public Access Park	**3/4 Mile**	**As Above, Showers, Handicapped Access; Parking For 75 Vehicles**
Regional Public Access Park	**1 Mile**	**As Above, Parking For 150 Vehicles And Greater**

On Hilton Head Island, ~~T~~the number and distribution of public access points are excellent. Sufficient access points, signage, facilities and parking exist to classify approximately ~~27~~ 20% of the Hilton Head Island beach as having full and complete access per the State guidelines (SCCC, 1995; see Table 4). DHEC OCRM recognizes that full and complete public access is provided in ~~three~~ two main areas along approximately ~~5.25~~3.9 miles of the ~~19~~13-mile beach (see Figures ~~9~~14 and 15~~, 10, and 11~~):

~~1. from a point ½ mile (2,640 feet) northwest of the public beach access at Mitchelville Park, to a point ½ mile (2,640 feet) southeast of the public beach access at Fish Haul Park;~~

~~2.~~1. from a point ½ mile (2,640 feet) northeast of the public beach access at Islanders Park to a point ¾ mile (3,960 feet) southwest of the public beach access at Chaplin Park~~from a point 1 mile (5,280 feet) northeast of the public beach access at Islander's Beach Park to a point ¾ mile (3,960 feet) southwest of the public beach access at Chaplin Park~~; and

~~3.~~2. from a point 1 mile (5,280 feet) northeast of the public access point at Coligny Beach park to a point ¼ mile (1,320 feet) southwest of the public beach access at Alder Lane.

While Mitchelville and Fish Haul Parks provide significant public access and parking, both parks are located outside of the extent of the state ocean beachfront jurisdiction. These parks are noted as providing public access and parking but are not included in calculations related to "full and complete public access". DHEC OCRM does not recognize these parks as providing "full and complete public access" in accordance with the State Beachfront Management Plan.

The majority of public parking associated with the Town-owned public beach access points is located within 1,000 feet of the accesses. Only one beach parking location is in excess of 1,000 feet. Shuttle service is available for this location if the need arises. Establishing public parking closer to the beach would be infeasible due to infrastructure and development constraints. Based on these considerations, DHEC OCRM has agreed to allow public parking located greater than 500 feet away from the sand beach to be a factor in classifying these sections of Hilton Head Island's beach as achieving "full and complete" public access in accordance with the guidelines established in the State Beachfront Management Plan.

Signage indicating the public access points, as well as local beach regulations is located at each of the Town's public beach access points. In addition, dog waste collection and disposal containers are located at many of the public access points, as well as recycling collection bins.

FIGURE 14: ALDER LANE AND COLIGNY-FULL AND COMPLETE ACCESS AREA

FIGURE 15: CHAPLIN TO ISLANDER'S-FULL AND COMPLETE ACCESS AREA

Figure to be provided by DHEC OCRM.

~~FIGURE 11: MITCHELVILLE AND FISH HAUL FULL AND COMPLETE ACCESS AREA~~

3 - BEACHFRONT DRAINAGE PLAN

The Town of Hilton Head Island does not have any existing drainage outfalls along the beachfront (either natural or anthropogenic) and Section 16-5-602 of the Town Code prohibits any future development from directly discharging storm water onto the beach.

The beachfront areas of the Island can be divided into 6 major natural drainage basins~~. N~~, none of which drain to outfall structures on the beach (see Figure ~~12~~16: Hilton Head Island Watersheds). In all of the drainage basins, the most common methods of conveyance are lagoons, swales, and pipes. In general, storm water is carried from the beachfront areas to the adjacent inland bodies of water. There are no significant grade differences on the island, necessitating the use of four pump stations during heavy rains to protect against flooding. They are located at Lawton Creek in Sea Pines, Cordillo Parkway in Shipyard, Broad Creek in Wexford and Jarvis Park.

The southernmost portion of the Island drains into Baynard Cove and Braddock Cove which in turn drain into Calibogue Sound. To the north, the second basin in Sea Pines Resort and South Forest Beach drains into Lawton Canal which is pumped toward Calibogue Sound.

The North Forest Beach area drains through the lagoons of Shipyard Plantation. A pump station was constructed in 2004 to help push the water through the lagoon system. Then the stormwater runs under William Hilton Parkway via a pipe through a canal in Wexford Plantation and is pumped into Broad Creek.

The Palmetto Dunes drainage basin contains approximately 11 miles of canals, which carry the storm water under William Hilton Parkway and into Broad Creek.

Storm water from the Folly Field basin is transported to the Folly, the Island's only tidal inlet to the Atlantic Ocean. The Folly is made up of several meandering creeks which accept runoff and carry it to the Ocean.

The northernmost drainage basin is Port Royal Plantation. The storm water from this basin is carried via a large drainage ditch to Broad Creek.

Overall, the effectiveness of the beachfront drainage systems is good. An inherent problem with Hilton Head Island is the lack of elevation (See Figure ~~13~~17: Hilton Head Island Elevations). The vast majority of land being drained has an elevation of less than 10 feet. Therefore a common problem is capacity of the systems to convey runoff during an intense storm of short duration.

In 1995, the Town completed The Island Wide Drainage Study. Since then, all ~~but 2 of the recommended~~ projects have been implemented. ~~The remaining projects are scheduled for funding and will be completed in accordance with the Town's Capital Improvements Program~~.

1. Palmetto Hall Outfall Improvements (partnership) 1995
2. Lawton Canal Pump Station upgrades (partnership) - 1997
3. Jarvis Creek Pump Station - 1999
4. South Forest Beach Phase I - 2000
5. William Hilton Parkway, Culvert at Wendy's - 2000
6. Gum Tree Area – 2000
7. South Forest Beach Phase II – 2001
8. Pineland Mills Shops - 2001
9. North Forest Beach Phase 1 - 2003
10. North Forest Beach Wexford Pump Station - 2004
11. North Forest Beach Phase II - 2004
12. Ashmore Tract – 2003
13. Folly Field -2004
14. Northridge – 2006
15. Beach City Road / Airport – 2006
16. Lawton Canal Pump Replacement (partnership) – 2006
17. Club Course Drainage Project (partnership) – 2007/8

In terms of estimated life, the existing drainage systems are expected to remain in place well beyond a 20-year horizon. Build-out is substantially complete in these beachfront areas. The drainage systems in place should adequately handle future conditions since minimal new development can occur.

Cleaning, dredging and maintaining the existing drainage system is a foremost priority. The Beaufort County Stormwater Utility collect~~ed~~ $3.56 million dollars yearly from the Town. The Town provided 5% $91,992) last year to the Utility for administrative overhead. The Utility returns the entire $3.56 million of fees (minus the administrative overhead) for the Town to use for drainage infrastructure maintenance and debt service on a $17 million SWU Revenue Bond.

The Town also monitors water quality at ~~16~~ 18 sites Island-wide. This project was initiated in 1999 in an effort to monitor stormwater drainage improvements. The Town currently tests for dissolved oxygen, pH, salinity, temperature, turbidity, nitrate, total phosphates, fecal coliform, total kjedahl nitrogen, and ammonia.

Stormwater studies are being conducted for individual watersheds to develop drainage inventories, flood models, water quality models and lists of potential capital improvement projects.

FIGURE 16 - WATERSHEDS

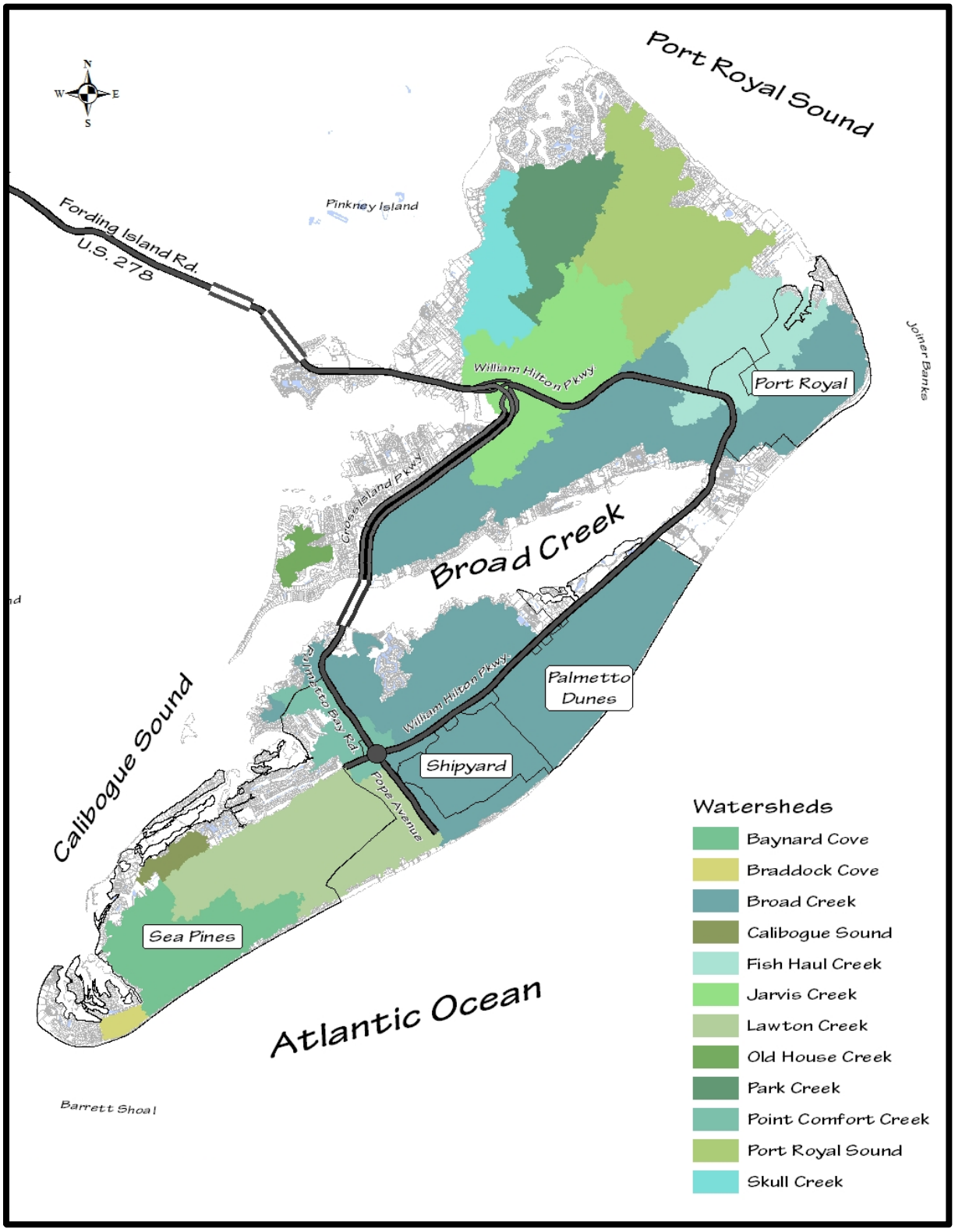
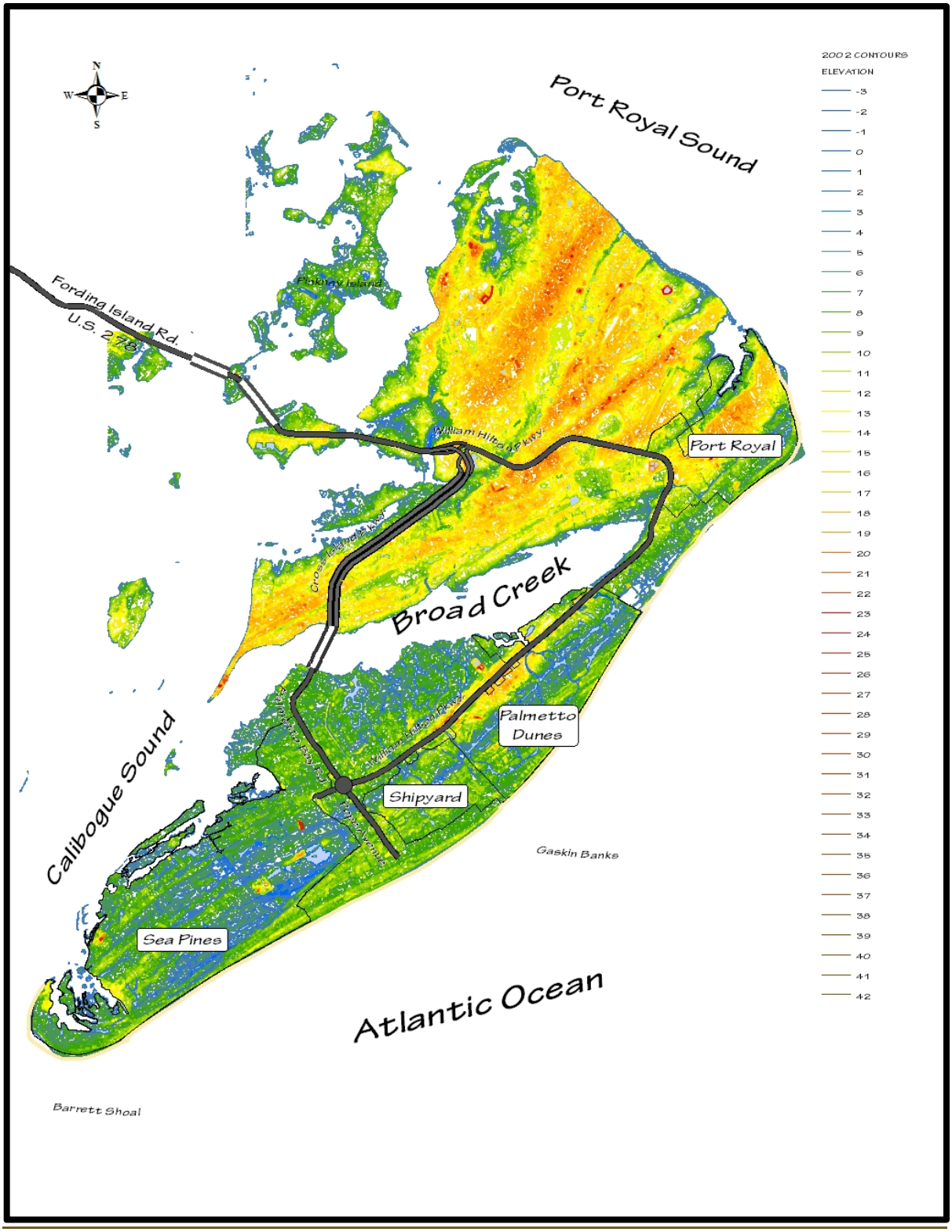


FIGURE 17 – ELEVATIONS



4 - BEACH MANAGEMENT & AUTHORITIES

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

In the coastal zone, the Public Trust Doctrine covers navigable waters and lands that are subject to the ebb and flow of the tide, including tidal marshes and oceanfront beaches. While each state is able to implement the Public Trust Doctrine according to its own views of justice and policy, the core principles are the same throughout the country. These principles, and the responsibility they establish for the state, are at the heart of many of the state's coastal laws, regulations, and policies. In many states, including South Carolina, the jurisdiction of the Public Trust Doctrine on the beach and navigable waters of the ocean extends landward to the mean high water line. Generally, the Public Trust Doctrine protects the right of the public to pass along the shoreline up to the mean high water line and utilize the space for fishing, navigation or recreation. The Public Trust Doctrine does not authorize the public to trespass on upland private property in order to access the beach. However, the doctrine does help preserve and protect the right of the public to access and utilize the beach

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

Numerous federal and state agencies have responsibility or authority for assisting beach management on Hilton Head Island. ~~This section provides a~~ A summary and description of the agencies with regulatory or management authority relevant to beach management in the Town of Hilton Head Island can be found as Appendix E to this plan.

4.1 STATE AUTHORITIES

4.1.1 Overview of State Policies (Beachfront Management Act)

Refer to Appendix E on regulatory agencies.

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

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

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

All baseline decisions are determined by DHEC-OCRM, founded on the best scientific and historical data available. In determining the baseline location for inlet erosion zones, DHEC-OCRM 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.

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

No new construction is permitted seaward of the baseline, with the exception of wooden walkways not more than six feet wide, wooden decks no larger than 144 square feet, public fishing piers, golf courses,

normal landscaping, pools that were located landward of existing functioning erosion control structures, groins built before 1988, or structures permitted by a DHEC OCRM special permit. A DHEC OCRM permit is required for all of the above actions except for the construction of wooden walkways not more than six feet wide.

Construction within the State setback line is restricted in order to implement the State forty-year retreat policy. Construction, reconstruction, or alterations between the State baseline and setback lines are governed as habitable structures, erosion control devices, and swimming pools. All other construction between the baseline and setback lines requires a permit from DHEC OCRM. New habitable structures built between the baseline and setback line may not exceed five thousand square feet of heated space, be located as far landward on the property as possible, and not incorporate any erosion control structure or device as part of the integral habitable structure. No part of the building may be constructed seaward of the baseline or on the primary sand dune. The applicant must certify to DHEC OCRM in writing that these conditions are accurate, and submit a drawing that shows the footprint of the structure on the property, a cross section of the structure, and the structure's relation to property lines and setback lines which may be in effect.

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

No new erosion control devices are allowed seaward of the setback line except to protect a public highway which existed prior to the enaction of the Beachfront Management Act. Erosion control structures that existed before 1988 may not be repaired or replaced if destroyed more than fifty percent above grade. DHEC OCRM is responsible for assessing the damage to erosion control devices and structures, as well as habitable structures, to determine the extent of damage following hurricanes or other events.

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

Town of Hilton Head Island's Retreat Policy

The South Carolina Beachfront Management Act requires that local plans include a 40 year retreat policy that considers relocation of buildings, removal of erosion control structures and relocation of utilities. When the Town's Beach Management Plan was first adopted in 1991, the State was in the process of drafting their own policy, and provided little direction to the Town at that time. In 1992, the Town amended its original Beach Management Plan to include a 40 Year Retreat Policy which stated:

1. Locate development landward of the DHEC OCRM Setback line to the extent possible;
2. Adopt various growth management techniques and procedures to reduce development levels;
3. Retain open space seaward of the DHEC OCRM Setback line to the extent possible;
4. Utilize land acquisition; and
5. Address retreat during redevelopment scenarios after a disaster.

With the adoption of this 2008 Beach Management Plan, this Policy ~~continues~~ continued to be in effect. The Town's zoning, density and design standards mentioned previously help fulfill this policy along with other techniques outlined in the next Section.

To accompany the above Retreat Policy, this Beach Management Plan details an additional Policy on beach renourishment as part of the 40 Year Retreat Policy. Beginning in 1990, the Town embarked on an ambitious renourishment program with an ongoing maintenance program. As a result of these projects, portions of the beach and dunes system have been enhanced, thereby resulting in expanded areas subject to development pressures by construction that is not in the public interest and not in accordance with retreat policies and goals of the State and the Town. In a few instances, DHEC OCRM has designated a newly formed embryonic dune as the new primary dune, allowing development on the landward, and sometimes larger, dune. Because of this, there have been petitions to the DHEC OCRM to move the Baseline further seaward, increasing the number of areas for loss of the larger dunes system. In addition, DHEC OCRM re-examines the possibility of relocating the Baseline every 8-10 years, possibly seaward. This would further encourage development on top of the larger dunes system.

It is not and has not been the intent of the Town to encourage or permit development to move seaward as a result of the Town's beach renourishment projects and efforts, or to support any effort to move the DHEC OCRM established baseline seaward, where such effort to relocate the baseline is based in whole or in part on the existence of new dunes and/or new beach areas formed as a result of the Town's beach renourishment projects and efforts, or by other private efforts. The Town's intent in pursuing the renourishment program is:

1. To protect, preserve, restore, stabilize and enhance the beach/dune system through beach renourishment and other appropriate means, to provide for the protection of life and property, and to act as a buffer from high tides, storm surges, hurricanes, and erosion;
2. To prohibit development from moving seaward onto new dunes or beach areas formed as a result of the Town's beach renourishment projects and efforts;
3. To provide an important basis for a tourism industry that generates annual revenue for the State of South Carolina and the Town;
4. To provide habitat for numerous species of plants and animals which are threatened or endangered, or which may become threatened or endangered as a result of the loss of the beach/dune system;
5. To provide habitat for beach/dune system vegetation that is unique and extremely important to the vitality and preservation of the system; and
6. To create a recreational beach at high tide.

In support of this, the Town adopted two overlay zoning districts along the beachfront for the purpose of limiting the seaward migration of development as a result of renourishemnt.

- CPA-O Coastal Protection Area Overlay District

  The purpose of the Coastal Protection Area Overlay (CPA-O) District, in conjunction with the Transition Area Overlay (TA-O) District, is to eliminate the potential for seaward migration of the built environment along the Island's beachfront to the greatest extent possible. This environmentally sensitive area:

  i. Protects life and property by serving as a storm barrier;

  ii. Provides an important basis for a tourism industry that generates annual tourism industry revenue;

  iii. Provides habitat for numerous species of plants and animals that are important to the natural functioning of the beach and dune system, or that are threatened or endangered; and

  iv. Provides beach and dune system vegetation that is unique and extremely important to the vitality and preservation of the barrier island environment.

- TA-O Transition Area Overlay District

  The purpose of the Transition Area Overlay (TA-O) District, in conjunction with the Coastal Protection Area Overlay (CPA-O) District, is to eliminate the potential for seaward migration of the built environment along the Island's beachfront as well as protect the area between existing construction and the mean high water mark, to the greatest extent possible. This environmentally sensitive area:

  i. Protects life and property by serving as a storm barrier;

  ii. Provides an important basis for a tourism industry that generates annual tourism industry revenue;

iii. Provides habitat for numerous species of plants and animals that are important to the natural functioning of the beach and dune system, or that are threatened or endangered; and

iv. Provides beach and dune system vegetation that is unique and extremely important to the vitality and preservation of the barrier island environment.

4.2 LOCAL GOVERNMENT AND AUTHORITIES

4.2.1 Municipality's Comprehensive Plan

The Town's first Comprehensive Plan was adopted in 1985. This was revised and adopted in 1990, 1996, 2000, and 200~~4, t~~The plan was then rewritten and adopted in 2010 and was been updated in 2012. The Comprehensive Plan is a continuing planning program for the physical, social and economic growth, development and redevelopment of the Island. The original 1991 Town Beach Management Plan was adopted as part of the Town's Comprehensive Plan. The ~~updated~~ plan approved in 2009 ~~Beach Management Plan constitutes~~ was a revision and ~~updating~~ update of the previous 1991 Beach Management Plan and was adopted ~~will be adopted~~ as an Appendix to the Town's Comprehensive Plan.

Other Elements of the Comprehensive Plan promote protection and preservation of the beach and dune systems. The Natural Resources Element describes the Island's beach systems and coastal dunes, as well as the endangered, threatened and rare plant communities and species. It also lists goals and strategies for continued research and monitoring of natural resources; improvement of water quality and reduction of pollutants; development and implementation of a wildlife protection plan; continued land acquisition to further protect sensitive and endangered environments; creation of view corridors; promotion of environmental education programs; and incorporation of environmental protection into development projects. The Land Use Element describes goals and strategies for reduction of allowable density to ensure that development does not create adverse impacts on natural resources and encourages incentives and voluntary compliance with the 40 year setback zones. The Recreation Element provides strategies for park development and guidelines for the continued creation or expansion of public beach parks and beach accesses.

Regional Planning Efforts

In 2006, the Town of Hilton Head Island adopted by resolution the Southern Beaufort County Regional Plan. In relationship to Beach Management, this plan recommended that the participating local governments adopt the same regulations, if possible. As part of the implementation of this plan, a regional Natural Assets Working Group was formed which compiled a list of baseline standards that should be adopted by the applicable participating local governments and also be made available to the region. These included such recommendations as uniform dune/dune system definition, protection of more than just the primary dune, protection of all dune plants, reasonable dune plant pruning, re-establishment of dunes systems by redevelopments, restriction of structures in dune systems and buffer areas, uniform lighting standards for protection of wildlife, and standards for violations. These recommended suggestions ~~are still being~~ have been reviewed by the Regional Plan's Implementation Committee.

4.2.2 Municipality's Hazard Mitigation Plan

In 2004, the Town adopted the Beaufort County Hazard Mitigation Plan which replaced earlier mitigation plans. It was updated in 2009 and identifies natural hazards to the Island, contains a vulnerability assessment, and gives goals to continue periodic beach renourishment. A Disaster Recovery Commission ~~is currently~~was formed that ~~working~~ worked on the implementation of the 2003 Recovery Plan. This Plan will be discussed in more detail ~~later in this document.~~below.

4.2.3 Municipality's Disaster Preparedness and Evacuation Plan

The Town developed a Post-Disaster Plan in 1991 to guide its citizens and post-disaster operations. The plan was incorporated into the Town's Comprehensive Plan in 1999. In 2003, the Town prepared a Comprehensive Emergency Management Plan (CEMP), ~~of which, Volume IV represents the Town's Recovery Plan and establishes the Town's recovery policies and schedule that detail the Town's pre-event responsibilities and recovery actions.~~ which was updated in 2014. According to this plan, Recovery is defined as actions taken in the long term after the immediate impact of the disaster has passed to stabilize a community and to restore some semblance of normalcy.

The Town's Disaster Recovery Plan is designed to supplement the Town's *Emergency Operations Plan – Basic Plan (EOP – Basic Plan)*, and identify agencies to provide assistance to disaster victims in conjunction with Federal, State and County governments and coordinate emergency recovery activities. This plan provides local emergency management personnel with operational guidance in order to effectively manage recovery activities in the aftermath of a major or catastrophic disaster or emergency. The Town works with all appropriate agencies, in advance of a disaster (if predictable) and after, to minimize potential injury and damage, and to expedite recovery and redevelopment.

~~The Town Recovery Plan establishes the following Town Recovery Goals:~~

- ~~Maintain leadership;~~
- ~~Promote economic recovery;~~
- ~~Utilize local initiative and resources;~~
- ~~Maximize state/federal programs and benefits;~~
- ~~Establish and maintain communication to and from citizens;~~
- ~~Provide a point of contact for disaster victims; and~~
- ~~Make maximum use of damage assessment for recovery planning~~

The organization of the Town's recovery activities is consistent with the concepts of the Incident Management System (IMS) and Integrated Emergency Management System (IEMS). Storm recovery is divided into short-term phases, which begins during the response phase of an emergency and can last up to six months, and long-term recovery which focuses on restoring the community to pre-disaster

condition or better. The Town's recovery activities and programs are grouped into 22 Recovery Functions (RF) including, Recovery and Redevelopment (RF1), Continuation of Government (RF3), Damage Assessment and Impact Analysis (RF 9), Emergency Permits and Inspections (RF 13), and Mitigation (RF 19).

In the event of a hurricane threat, the Town will activate all or part of the Town Emergency Operation Center (EOC).

Cleanup

The purpose of the Debris Management Plan is to effectively manage debris generated by natural and man-caused disasters and contains the following policies:

1. First focus debris removal efforts on clearing of major transportation routes and roadways into damaged areas to allow for the movement of emergency vehicles, personnel, equipment and supplies.

2. Remove debris in affected areas to prevent the development and spread of vector-based epidemiological agents and general sanitation problems.

3. Conduct disposal activities with health and environmental concerns being the foremost consideration.

Maintaining essential services

The repair and restoration of public infrastructure, services and buildings after a disaster will be completed for the purpose of returning public infrastructure and the Town's services to pre-event levels or better. Restoration of utility services is critical to the success of both short and long-term recovery programs. Complete utility restoration could take months. Initial roadway clearance will push debris to the right-of-ways, providing access to underground cables. Restoration of the commercial power supply will be the pacing activity for reestablishing water and sewer systems, and the restoration of power will be passed by the clearance of debris along the transmission line rights-of-way.

Damage to transportation systems will influence the accessibility of disaster relief services and supplies. Restoration of transportation systems is designed to make sure that the Town (service, equipment, facilities, etc.) can facilitate the movement of emergency personnel, vehicles, equipment and supplies.

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

Protecting public health

The Town will also work to identify the threats to public health during the recovery period and to provide remedies. It is the policy of the Town that the continuation of public health functions and control of environmental factors related to public health is essential following a disaster to prevent the outbreak of disease and to monitor the spread of vectors associated with the disaster itself.

Emergency Building Ordinances

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

Mitigation

In 1999, the Town developed a Flood Hazard Mitigation Plan. It was one of the first mitigation plans in the nation to be officially incorporated into a Town's Comprehensive Plan—a concept now embraced by the American Planning Association through their *Planning Advisory Series*, and FEMA, through the *Disaster Mitigation Act of 2000* (*DMA) regulations.* In 2004, the County joined with its municipalities to create the *Beaufort County Hazard Mitigation Plan*, which was adopted by the Town as part of its Comprehensive Plan. This Plan was updated in 2009 and outlines hazard identification, vulnerability assessment, community mitigation capability assessment, goals and objectives, and hazard mitigation projects and Action Plan.

As mentioned in this Plan, floodplain management and development policies and procedures are in good order and contribute to the Town's commendable Community Rating System (CRS) rating of ~~6~~5, which provides a ~~20~~25% reduction in the cost of flood insurance to the more than ~~29,000~~30,000 policyholders. This represents an approximate annual savings of $~~1.75~~5.5 million.

4.2.4 Beachfront Development Regulations

The Town's Land Management Ordinance (LMO) is a set of laws that regulate land use and development activity within the Town. It has several sections that regulate development activity on the beach and dune system.

Development review and site design standards for all development on Hilton Head Island are regulated in LMO Chapter 2, 3, 4, 5 and 6. This includes regulations on density, buffers, setbacks, aesthetics, landscaping, tree protection, wetland alteration, traffic circulation, open space standards, street and

pathway standards, parking and loading standards, stormwater management standards, lighting, flood zone standards, fire protection water supply and utility standards.

Other local setbacks exist regarding adjacent use and adjacent street setbacks in LMO:

Chapter 5: Adjacent Use Setbacks (for Single family, Multifamily/Recreational, Institutional/Commercial, and Industrial/Utility) and adjacent street setbacks (Single family detached and other uses) in areas outside the beachfront PUD's are governed by Chapter 5 of the LMO. Required setbacks for development shall be determined according to the relationship of the proposed use to the existing contiguous use on each property adjacent to the development. For purposes of determining the appropriate setback distance where the adjacent property is vacant, it shall be classified as the use which would require the greatest setback allowed by right in that district. As mentioned previously, the PUD's also contain their own adjacent use and street setback requirements.

One consequence of this setback restriction may be that the buildable area of a parcel of land is diminished. The State has attempted to overcome this limitation by adopting a policy encouraging buildings to be located as far landward as practical. However, once the local setbacks required by the Town and/or a local architectural review board are included, the buildable size of the parcel may be even further diminished. A local avenue of relief for landowners who find themselves in this dilemma exists in the form of a variance required from local setback requirements. The Town's Board of Zoning Appeals determines whether to grant the variance based on those findings dictated in the State enabling legislation which requires consideration of the Town's Comprehensive Plan and therefore the Beach Management Plan.

LMO Chapter 6: (Natural Resource Protection) contains regulations designed to promote the protection and stabilization of existing beaches.

Before development plan approval is granted, it must meet the following general standards:

- Will not result in the removal or diminution of the amount of sand, silt, shell, sediment or other geologic components of any beach, or interfere with natural patterns of wind and water movement of sand, silt, shell, sediment or other beach components, except for maintenance of any structures causing these effects which were existing prior to the enactment of this Title;
- Will not result in the direct discharge of stormwater onto any beach;
- Will not result in the discharge of treated or untreated sewage or other human waste from land or waterborne sources, with the exception of advanced treated effluent irrigation systems approved by the SCDHEC;
- Will not result in the direct or indirect removal, destruction, depletion or digging out of vegetation which contributes to beach stability;

- Will minimize any interference with the natural use of the beach for feeding, foraging, resting, nesting and breeding by indigenous and migratory birds, shellfish, marine fishes, sea turtles and other wildlife. Such interference shall include the destruction or diminution of organisms or material upon which wildlife feed;
- Will not interfere with the customary rights of the public for access to and use of the active beach; and
- Will not remove, alter or destroy any beach protection structure, such as walls or revetments, unless specifically authorized by an appropriate development plan approval or building permit.

4.2.5 Regulations on Beach and Shoreline Protection

The Town's Municipal Code defines a dunes system as one or a series of hills or ridges of wind-blown sand or one or a series of hills or ridges of sand resulting directly or indirectly from restoration or beach renourishment, all of which may or may not be anchored by vegetation (e.g., sea oats) and is in the vicinity of the beach. Damage to or development of this dune system is not in the public interest and would not be in accordance with retreat policies of the State of South Carolina and the Town of Hilton Head Island. Furthermore, the Town wishes to protect, preserve, restore, and enhance the beach/dune system for the protection of life and property so it acts as a buffer from high tides, storm surge, hurricanes, and erosion.

In 2006, Town Council adopted an amendment to the Municipal Code Title 8 which strictly regulated the South Forest Beach area ~~(see Appendix). Figure 24 –~~ by establishing a Critical Storm Protection and Dune Accretion Area ~~indicates those areas~~ along the beach ~~that are~~ between the State-mandated Setback Line and the actual line of habitable existing construction. The Town ~~has~~ determined that dunes systems exist in this area between the OCRM Setback Line and the line of existing construction that could be developed. Therefore, in 2006, Town Council adopted a Resolution and Ordinance to create and define the Landward Barrier Line, define and designate a Critical Storm Protection and Dune Accretion Area and Transition Area, and limit the type of construction activities within these areas. ~~Further research is being conducted to extend this concept, or a similar concept, further along the beach.~~These provisions were expanded and ultimately incorporated into the Town's Land Management Ordinance natural resource protection requirements referenced above when it was rewritten as the CPA-O and TA-O overlay zoning districts that help to protect the dunes and oceanfront properties by protecting the dunes and limiting the intensity of uses in these areas, which are included as an appendix to this plan.

The activities and uses permitted and prohibited in the CPA-O District are as follows:

All development is prohibited in the CPA-O District except the following permitted uses and activities:

- Boarded pathways as perpendicular to the beach as practical and not larger than six feet in width and their associated wooden deck not larger than 144 square feet (must comply with Sec. 16-6-103, Beach and Dune Protection);
- Beach renourishment;
- Emergency vehicular beach access; and
- Permitted beach maintenance activities such as sand fencing, re-vegetation with native plant material and erosion control.
- All activities and uses in the CPA-O District must also comply with all current local, State and federal laws.

The activities and uses permitted in the TA-O District are as follows:

- In addition to the activities and uses permitted in the CPA-O District (see Sec. 16-3-106.L.3), the TA-O District may include any uses that do not require enclosed space to operate. These activities and uses include, but are not limited to, swimming pools, boardwalks, fire pits, decks, required drainage improvements, and necessary utilities.
- The activities and uses in the TA-O District shall be located as far landward as possible. Activities or uses in the TA-O District shall be accessory activities or uses to the development to which they are directly seaward.
- Development in the TA-O District shall conform to the standards for impervious cover and open space for the underlying base zoning district.
- Activities or uses in the TA-O District shall not be on or in any part of a dune or dune system.

4.2.6 Other Regulations on Beach Management

Chapter 6 of the LMO also describes general standards, beach nourishment and erosion control standards, beach access standards, and dune protection standards.

- Standards for beach nourishment and erosion control detail requirements for fill materials; the use of natural features of the beach and dune system over artificial structures; limited approval of erosion control structures; interference with existing or planned public access to the beach; and timing of beach nourishment or construction of control structures.
- Beach access standards regulate elevated walkways; vehicular access to the beach; general public interest in development applications (such as the need for land acquisition for public use); and prohibitions on development adjacent to the beach that would cause net loss of any officially designated beach access. Beach access will be discussed later in more detail.
- Dune protection standards prohibit development on dunes with certain exceptions; prohibit primary dune destruction, disturbance or alteration with exceptions; restrict elevated walkways; allow vegetation planting and construction of wood, sand and wire fences; and prohibit removal,

alteration or destruction of any dune protection structure. It also outlines when restoration or stabilization of existing dunes and creation of new dunes may be required for new developments and redeveloping properties.

Title 8 of the Town of Hilton Head Island Municipal Code is the Town's Beach Ordinance. It covers activities which are prohibited or regulated on the beach, defines Designated Areas, and regulates enforcement. In order to ensure the public health, safety and welfare of individuals using the beach, the following activities are regulated or prohibited by the Town's Municipal Code:

- Prohibited: vehicles, para-sailing, glassware, horses on the beach, interfering with marine life and wildlife, indecent exposure, disorderly conduct, unauthorized wearing of lifeguard emblems, littering, possession or consumption of alcoholic beverages, and open containers.

- Regulated: operation of motorized watercraft, sand sailing, kites, sleeping on the beach, animals, shark fishing, fires, firework discharge, disturbing the public peace, and franchising commercial activities on the beach.

In addition, the Town contracts with two organizations for beach safety; the Beaufort County Sheriff's Office to provide law enforcement and security on the beach and Shore Beach Services to provide a patrol boat and rescue jet skis, life guards (9:00 a.m.-5:00 p.m. from Memorial Day weekend through Labor Day weekend), litter patrol, and beach rental items (chairs, umbrellas, paddleboats, sailboats, fun cycles, sailboards, etc.) Beach markers were also installed as part of the Sea Turtle Program every 0.1 miles along the beachfront. These markers are used to help identify beach access points.

The Town of Hilton Head Island is proactive on educating the public on the accessibility of its beaches. This includes information on access locations, parking rules, swimming areas, beach rules, pathways, and beach renourishment. In addition, the Town's Facilities Management Division operates and maintains the beach parks, including overseeing contracts for life guards, boat rentals, and litter patrol; collecting beach fees; park security; and public relations. Kiosks are being installed at several parks, and beach rule signs have been posted at every public access point. In addition, South Carolina Department of Transportation signs assist in directing beach-goers to the various parks.

Brochures and other information locations produced or funded by the Town include:

- Island Pathways Brochure
- Island Parks Brochure
- Beach Renourishment Brochure
- Resident and Visitor Guide to Hilton Head Island's Beaches
- EcoMap (funded with Southeastern Ecological Institute)
- Sea Turtle Information Brochure
- Website *www.hiltonheadislandsc.gov*

5 - EROSION CONTROL & MANAGEMENT

When the Town was incorporated in 1986, the need for a beach management strategy was also identified. A Shore Protection Task Group was created, along with a semi-annual beach monitoring program. The beach monitoring results revealed areas of highly erosional shoreline and sediment deficits that placed upland areas at risk along certain areas of the beach. The Town evaluated alternatives including no action and encouraging individual property owner's to protect their properties from potential beach erosion impacts. This led to the identification of an initial program philosophy of restoring and maintaining the entire beach system with a comprehensive approach and a program was developed by the Town that included comprehensive beach restoration, comprehensive beach monitoring, strategic use of shoreline stabilization structures to improve performance/increase longevity of beach nourishment, use of near-island sand sources, as available, and attempts to control seaward advancement of development and protect beach/dune resources. The benefits of this program include:

- Recreational – Provides/maintains recreational amenity for visitors and residents of the Island.
- Storm/Erosion Protection – Provides/maintains buffer between the ocean and upland.
- Environmental – Maintains beach habitat for turtles, birds, etc.
- FEMA Benefits – Can help decrease storm damage.

This program has been highly successful. The performance of nourishment projects has far exceeded program expectations and there have been island-wide improvements in beach and dune conditions.

FIGURE 18: HILTON HEAD ISLAND BEACH EROSION NEAR PORT ROYAL SOUND

5.1 SHORELINE CHANGE ANALYSIS

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

In accordance with the Beachfront Management Act, Hilton Head Island is divided into 3 inlet erosion zones and 2 standard erosion zones. These zones are defined and described from south to north according to the numbering system of the State's beach monitoring network. The location of each monitoring monument and zone designation is shown in Figure ~~14~~ 19 - Beach Control Monuments & Erosion Rate Zones. Each of the inlet zones are unstabilized by terminal groins, jetties or other types of shoreline armor.

5.1.1 Beach Profiles

There are 45 beach monitoring stations on Hilton Head Island that were surveyed in March 2014. Stations 1400-1406 show a low-lying dune field, hundreds of feet wide, at the southwest end of the island. Profiles at stations 1409-1436 in Sea Pines and South Forest Beach show a well-established dune field, with crests of 12-15 ft, and a wide high-tide sand berm. Stations 1437-1448 in North Forest Beach and Shipyard Plantation exhibit a similar beach profile with a wide beach and a dune crest peaking at 15 ft. At stations 1451 and 1454 in the southern end of Palmetto Dunes, the dune field becomes even wider, and stations 1456-1466 in the remaining section of Palmetto Dunes also have a mature dune field and wide dry-sand beach. In many places three distinct rows of sand dunes have formed seaward of the oceanfront houses. Stations 1468 and 1469 at Singleton Beach and also station 1472 on the other side of The Folly at Burkes Beach all have a wide dune field and dry-sand beach.

Stations 1474-1478 are located on Bradley Beach and Folly Field Beach. At stations 1474-1477 the dune field remains wide but becomes narrower and flatter at station 1478. The area to the northwest, where stations 1481 and 1484 are located in Port Royal Plantation, became highly erosional around 10 years ago. At that time an offshore sand shoal called Joiner Bank had dissipated, resulting in higher-energy waves reaching the shoreline and causing extreme erosion. The Town of Hilton Head Island responded to this situation by constructing a groin and a beach renourishment project here in 2011. The project has stabilized the beach, and the most recent profile data shows a 300-ft wide shelf of dry sand seaward of the vegetation line.

Stations 1487-1493 are located in Port Royal Plantation, along the Port Royal Sound shoreline up to Fish Haul Creek. Profiles here show a wide beach with a low-lying dune field, and the offshore portion of the profiles also show massive sand bars associated with the channels of Port Royal Sound. Station 1496, on the inland side of Fish Haul Creek, is far enough into Port Royal Sound to be out the state's beachfront jurisdiction. This is a typical estuarine shoreline, with a minimal sand beach.

Beach profile and volume over time graphs for representative monuments of each erosion zone are provided in Figures 20-27.

FIGURE 19 - BEACH CONTROL MONUMENTS & EROSION RATE ZONES

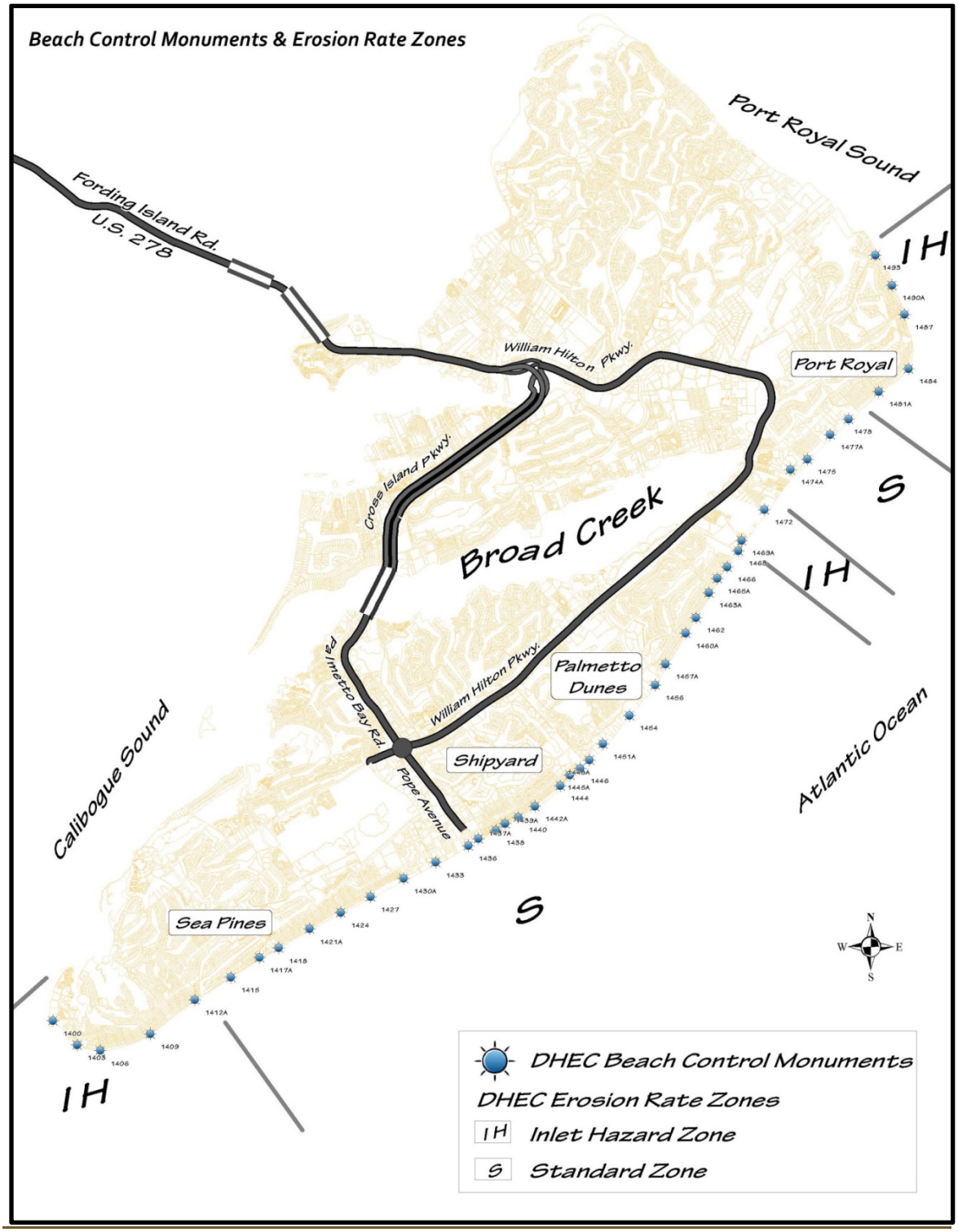
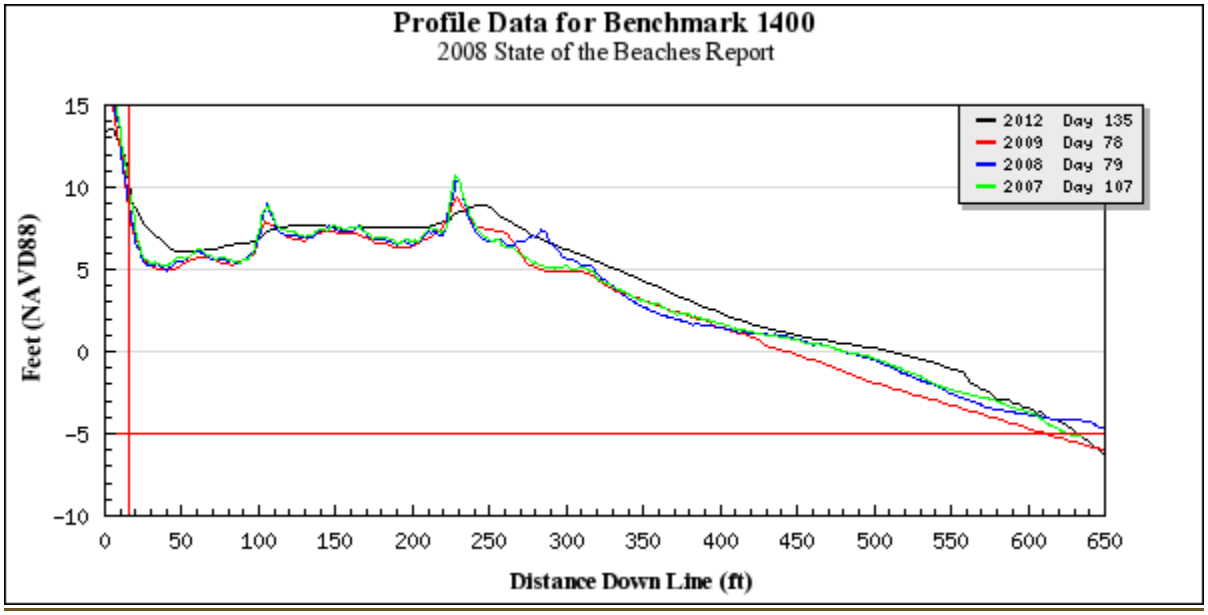


FIGURE 20: BEACH CONTROL MONUMENT 1400



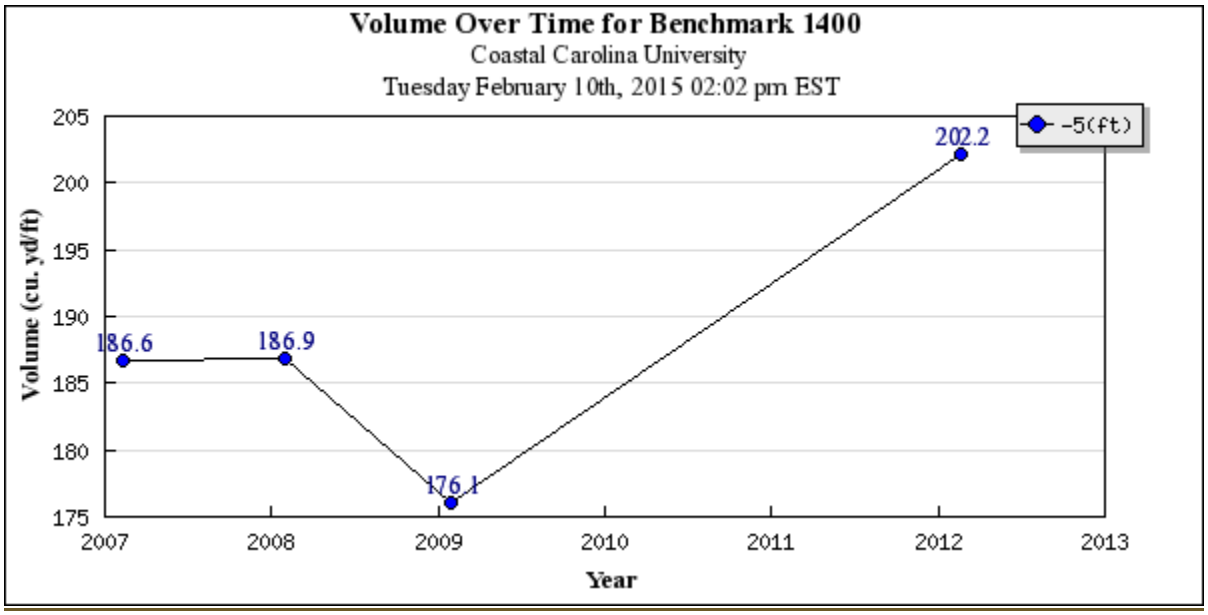
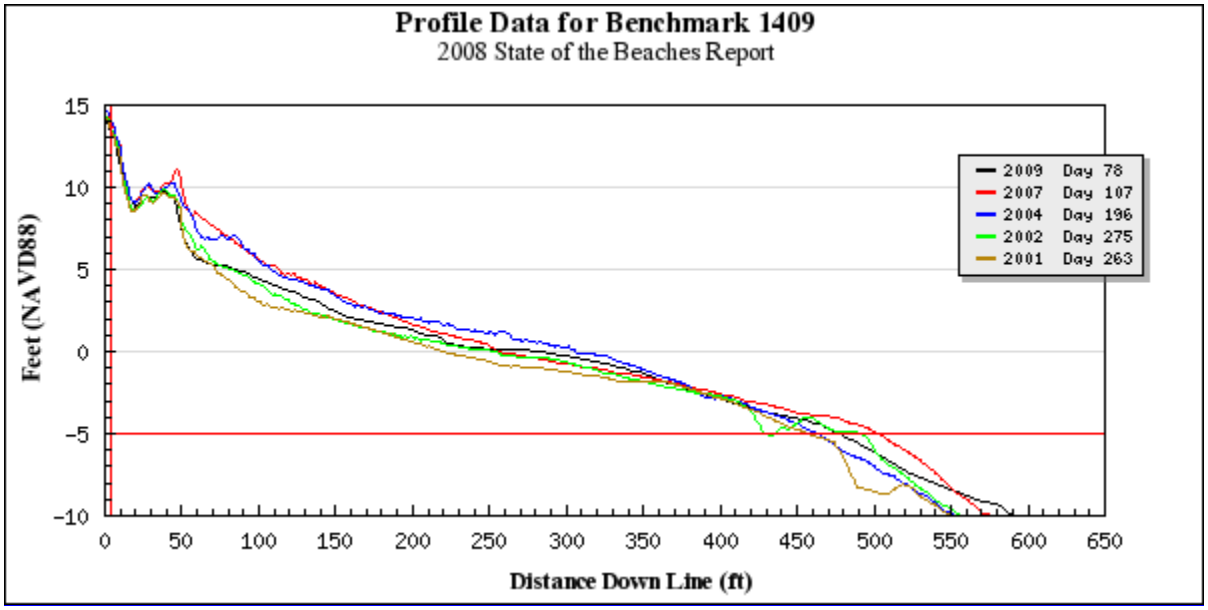


FIGURE 21: BEACH CONTROL MONUMENT 1409



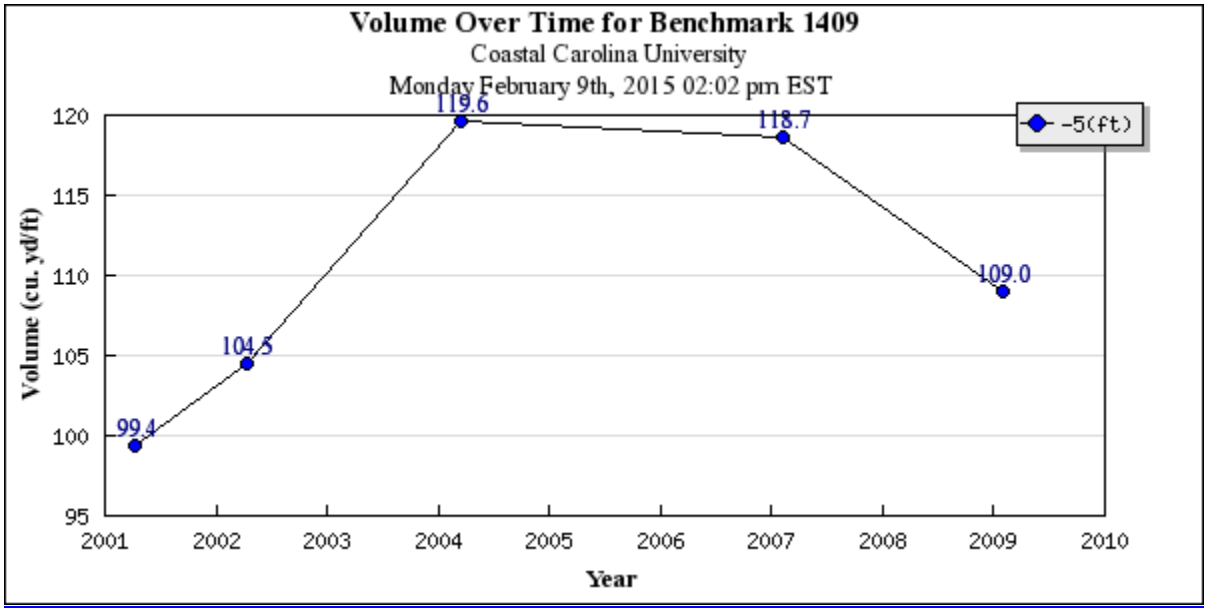
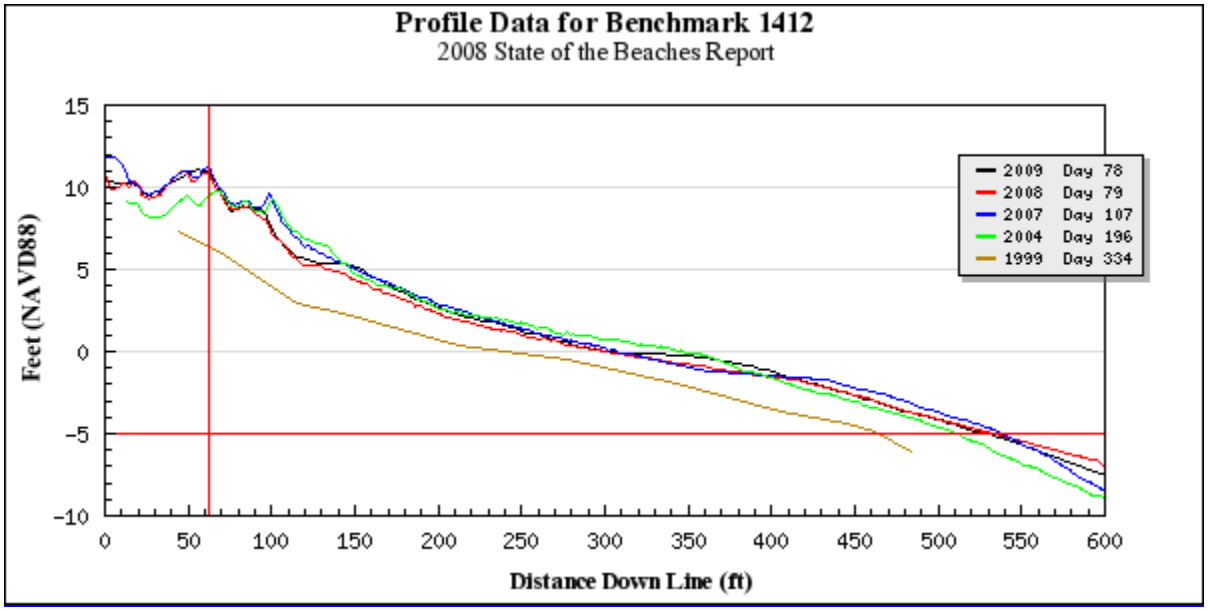


FIGURE 22: BEACH CONTROL MONUMENT 1412



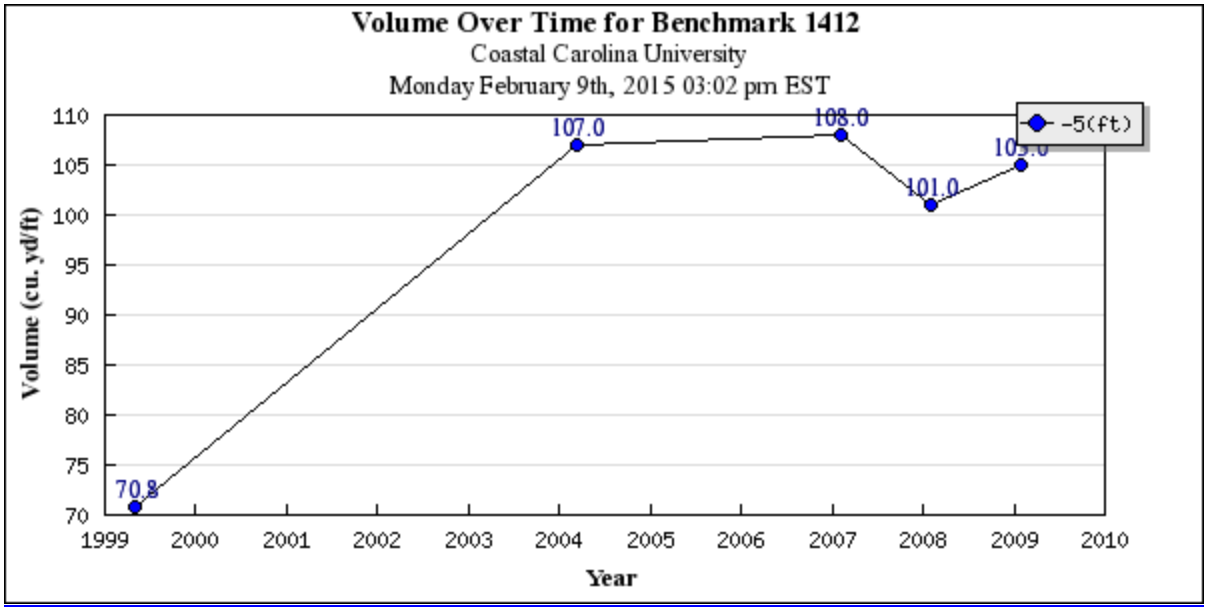
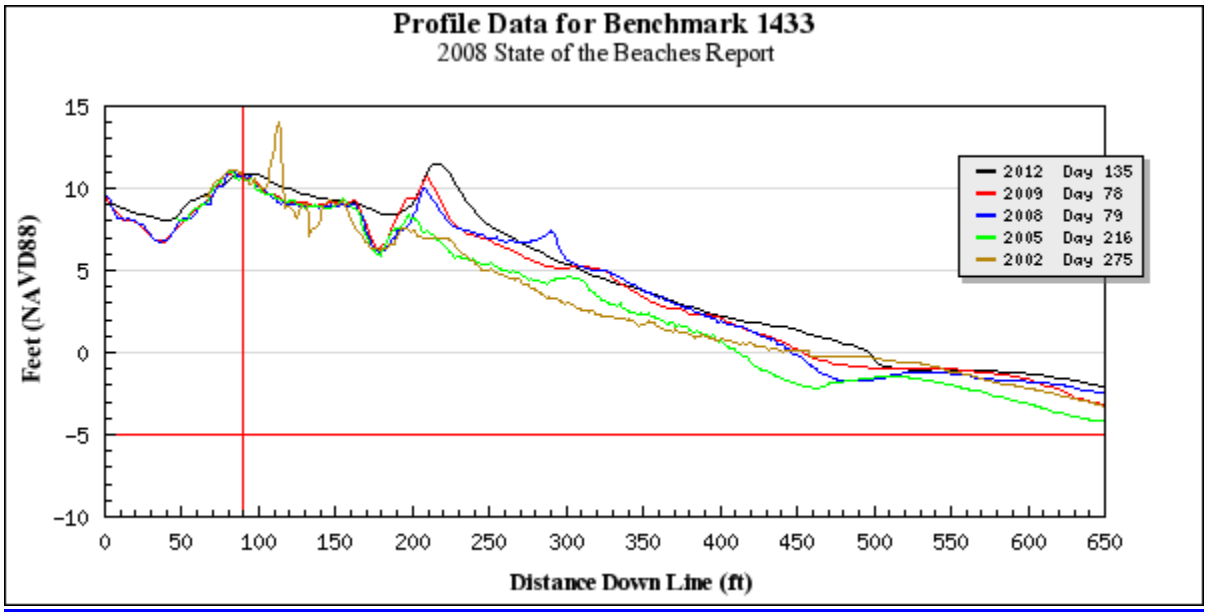


FIGURE 23: BEACH CONTROL MONUMENT 1433



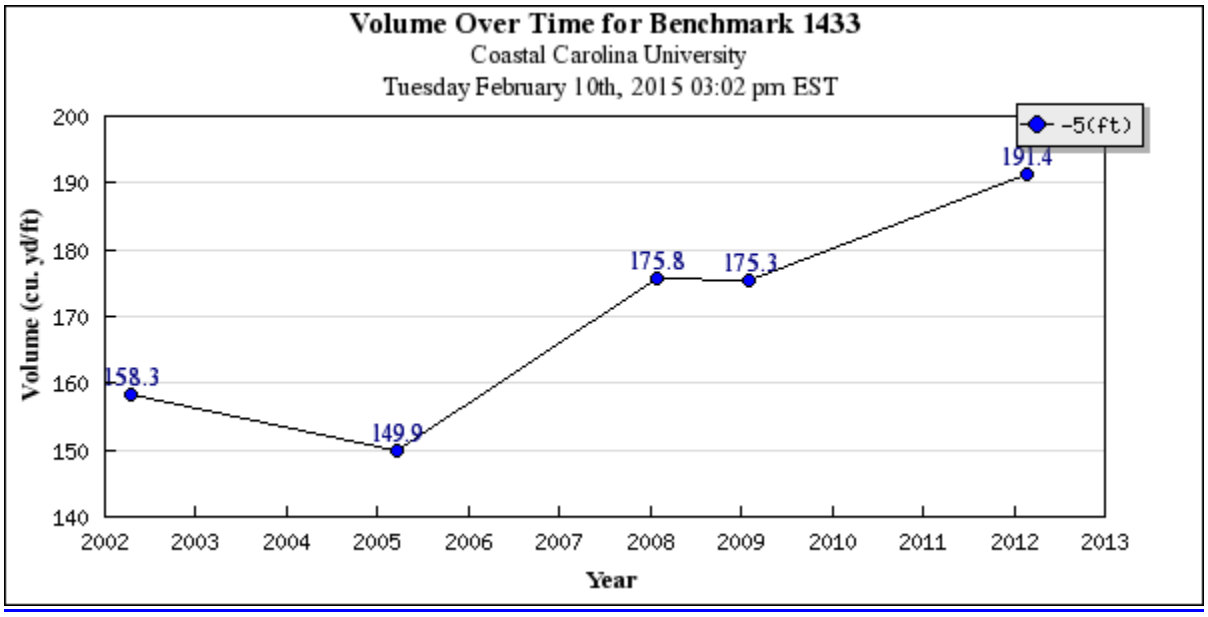
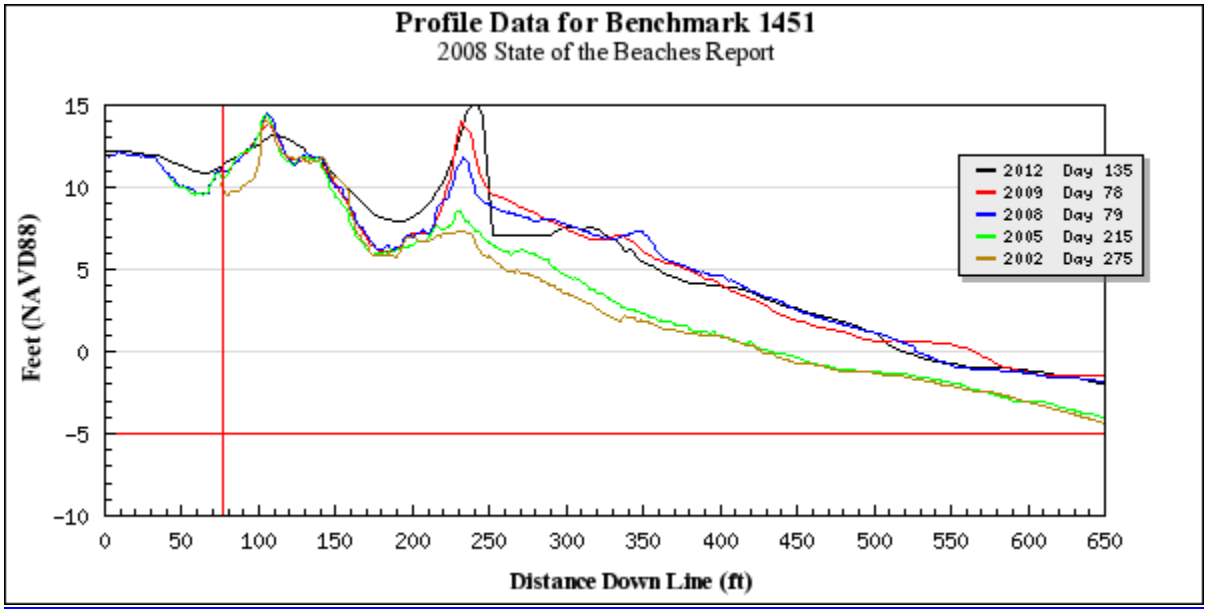


FIGURE 24: BEACH CONTROL MONUMENT 1451



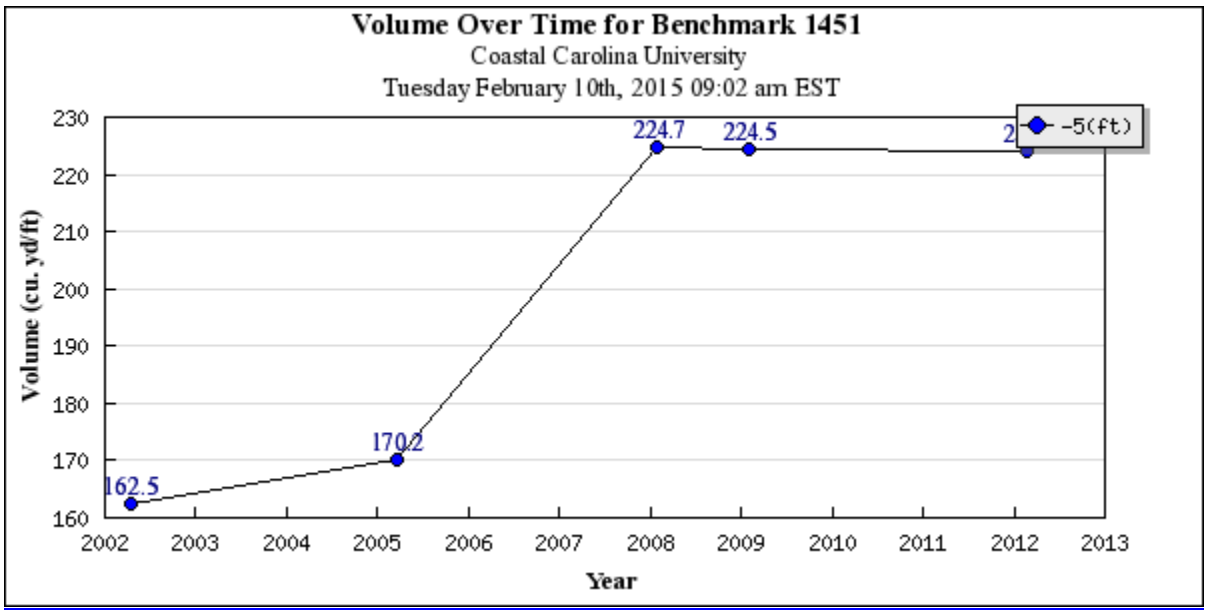
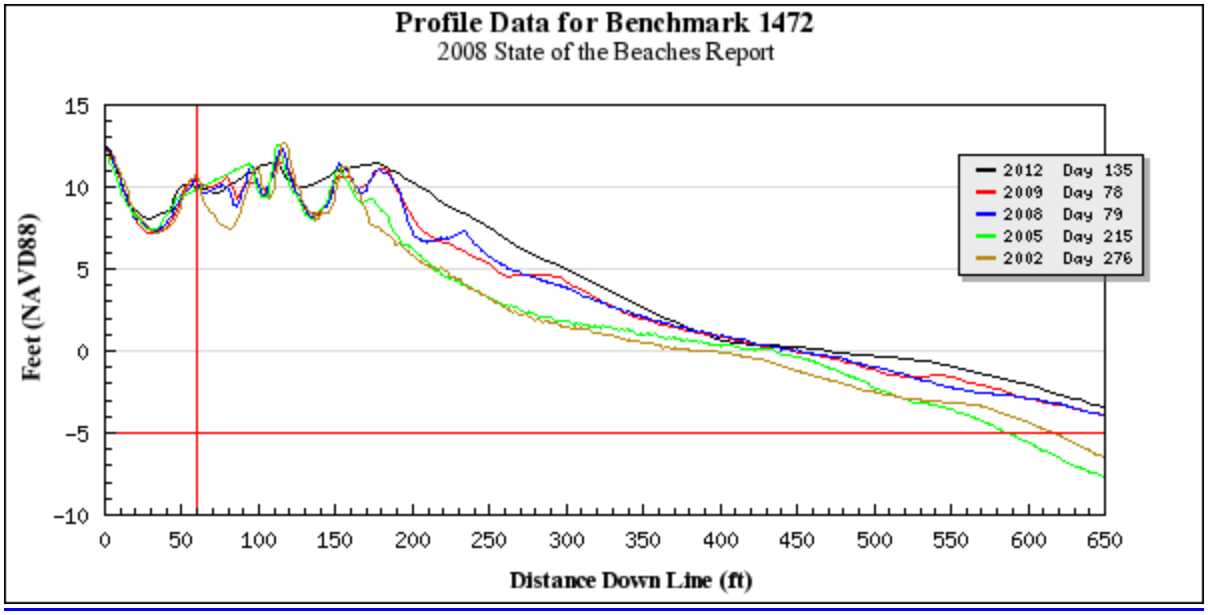


FIGURE 25: BEACH CONTROL MONUMENT 1472



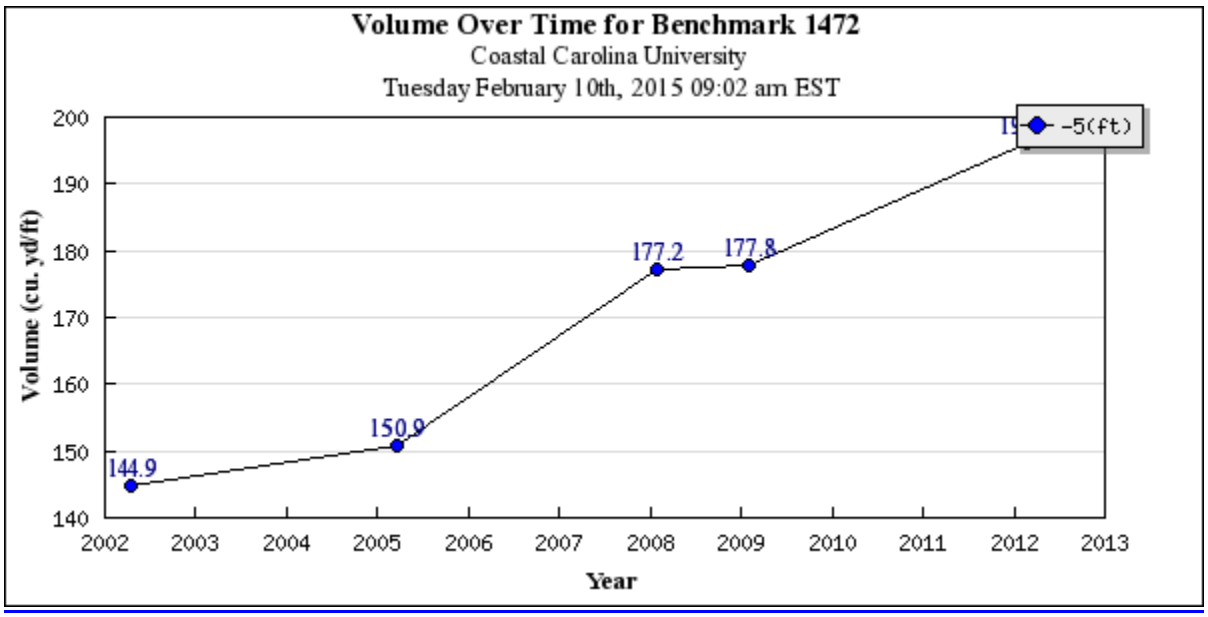
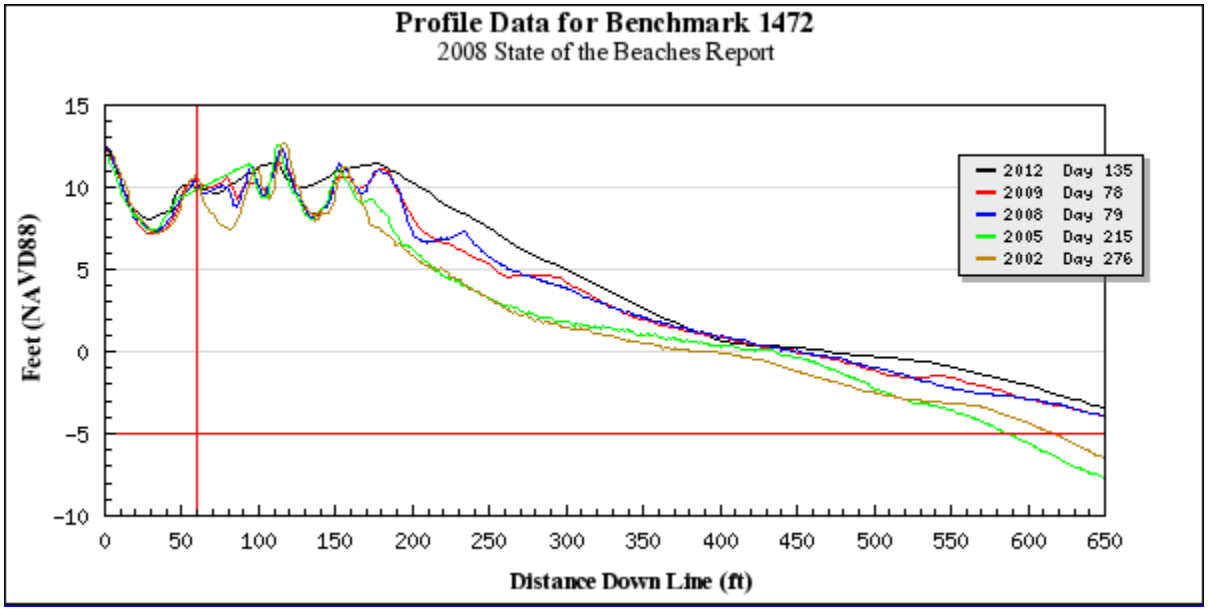


FIGURE 26: BEACH CONTROL MONUMENT 1478



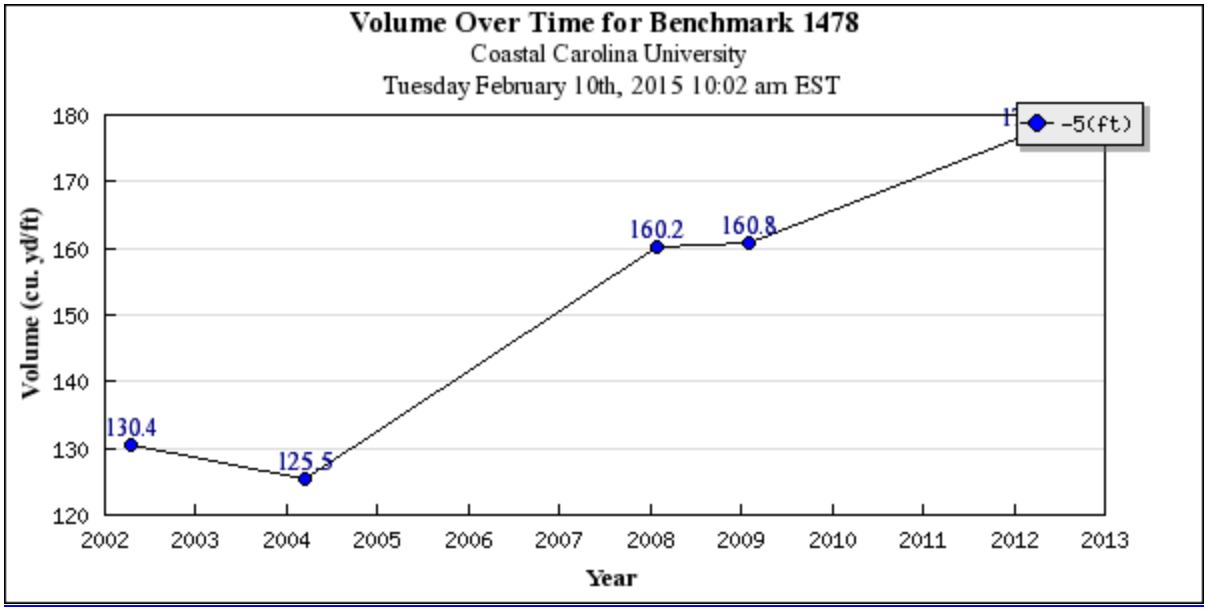
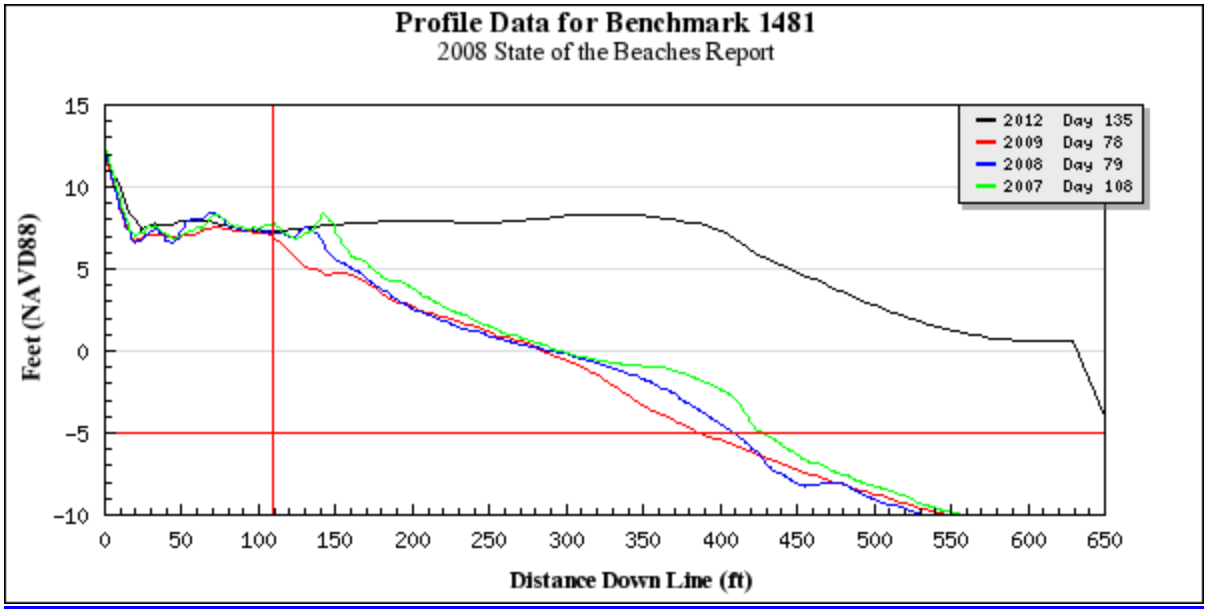
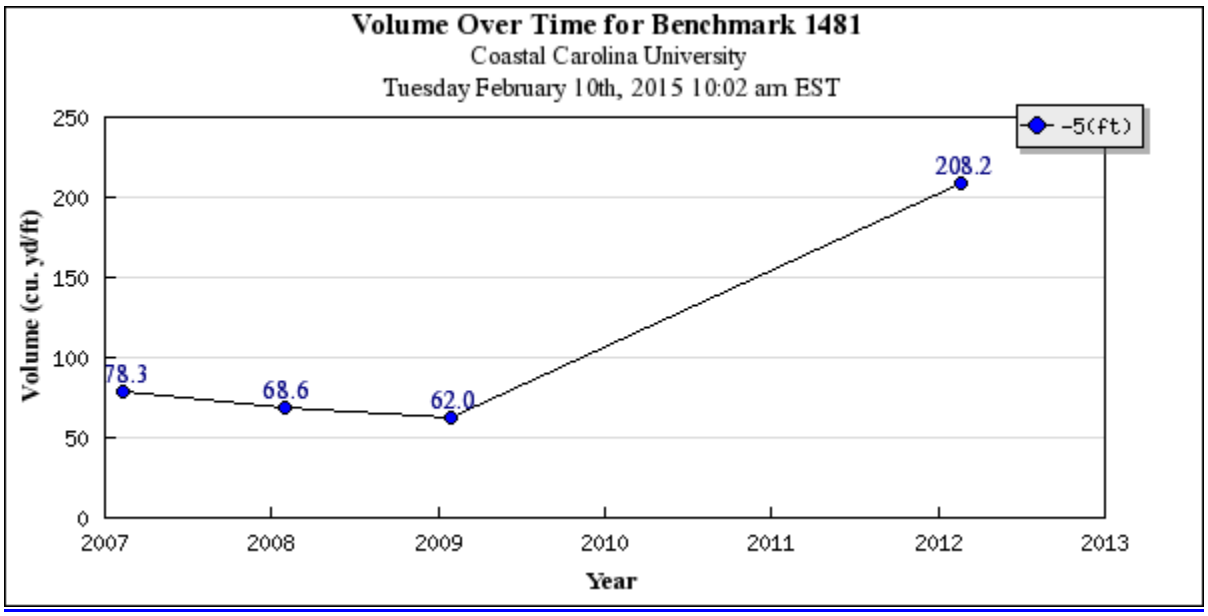


FIGURE 27: BEACH CONTROL MONUMENTS 1481





5.1.2 Long Term Erosion Rates and Shoreline Change

Hilton Head Island can be divided into five geomorphologic reaches, which are each discussed below:

The portion of Sea Pines Plantation bordering on Calibogue Sound is an unstabilized inlet zone, subject to the influence of the Sound and tidal processes. This section of shoreline is historically accretional.

The second zone on Hilton Head is a 10 mile-long standard zone that extends from station 1412 in Sea Pines Plantation to station 1469 just south of the Folly. This area includes South Forest Beach, North Forest Beach, and Palmetto Dunes. Long-term shoreline change rates vary in this zone. They are generally accretional for the area south of Coligny Circle and also north of Coligny Circle up to Lark St. Beyond Lark Street the beach becomes erosional up to Singleton Swash, with the rate of erosion increasing with distance from the Circle and reaching a maximum of -7 ft per year in Palmetto Dunes.

The third zone on Hilton Head is a 2,200-ft long unstabilized inlet zone, located on either side of the Folly. Stations 1468, 1469 and 1472 are the monitoring stations in this reach, which historically was very dynamic because of the inlet channel. However, a small jetty constructed on the south side of the Folly in 1997 has helped stabilize this region. Long-term erosion rates here are around -6 ft per year.

The fourth zone is a 1.3 mile-long standard zone that extends from just north of Burke's Beach Road to the Westin Hotel and includes stations 1474 through 1478. Long-term shoreline change rates here are stable to -3 ft per year of erosion.

The fifth zone is an unstabilized inlet zone that includes all of the Port Royal Plantation shoreline. Survey stations 1481 through 1496 are located here. Stations 1481 and 1484 on the Atlantic Ocean shoreline are accretional on decadal time scales, but experienced extreme erosion in recent years. A new groin was built here in 2011 to stabilize the beach. Stations 1487-1496, on the Calibogue Sound shoreline, have long-term erosion rates of -1 to -5 feet per year.

The long-term erosion rates adopted by the State are shown in Table 5.

Table 5:
2015 Annual Erosion Rates for Current Beachfront Baseline
DHEC-OCRM,

Station	Erosion Rate (ft/yr)	Station	Erosion Rate (ft/yr)	Station	Erosion Rate (ft/yr)	Station	Erosion Rate (ft/yr)
1400	20.80	1433	3.90	1454	-4.76	1475	-1.71
1403	11.29	1436	3.71	1456	-5.45	1477A	-0.59
1406	10.43	1437A	3.58	1457A	-5.94	1478	0.69
1409	S/A	1438	2.99	1460A	-6.17	1481A	0.69
1412A	S/A	1439A	2.89	1462	-6.69	1484	1.94
1415	S/A	1440	2.30	1463A	-6.59	1487	-0.36
1417A	S/A	1442A	0.89	1465A	-6.33	1490A	-0.33
1418	S/A	1444	-0.95	1466	-6.23	1493	-2.00
1421A	S/A	1445A	-1.80	1468	-5.84		
1424	2.20	1446	-2.30	1469A	-5.64		
1427	3.97	1448A	-2.76	1472	-4.69		
1430A	4.17	1451A	-3.02	1474A	-2.72		

5.2 BEACH ALTERATION INVENTORY

Although the Town's preferred approach to shoreline stabilization is beach renourishment, historic efforts to stabilize the Island's shoreline have resulted in structures being installed by various entities at six locations along the Island's shoreline.

Existing Shoreline Stabilization Structures

South Beach Groins:
Seven shore-stabilizing structures presently exist along the southern extremity of the Island within Sea Pines. Six of these structures constitute the groin field found along South Beach's ocean-facing shoreline, while the seventh structure is a terminal groin commonly called the Land's End Groin, located immediately adjacent to the Braddock Cove tidal creek. These structures were installed during the late 1960's and 1970's by Sea Pines Company.

North Forest Beach Armoring:
In conjunction with the development of this residential area in the 1960's and prior to the adoption of the S. C. Beachfront Management Plan and DHEC OCRM setback line in the 1980's, over a mile of various forms of armoring was constructed along the North Forest Beach shoreline by property owners. Typical

types of armoring ranged from walls, to granite rip rap and concrete rubble, most of which was placed in an undesigned fashion on an as-needed basis. As a result of the Town's renourishment efforts, this zone of shoreline hardening has been effectively isolated from normal day to day wave and tide impacts by beach fill projects conducted in 1990 and 1997. Since the section of central Hilton Head Island shoreline extending from North Forest Beach to the present day Marriott Hotel naturally experiences the most erosional stress, it is deemed to be an important trigger for beach restoration activities.

Marriott Hotel Sloping Concrete Revetment with Seawall:
The existing Marriott Hotel complex (formerly the Hyatt Hotel) is an example of the placement of a major habitable shorefront structure at the natural dividing point along Hilton Head Island's littoral system. A massive sloping concrete revetment with seawall was constructed in conjunction with and upland of the original project, clearly acknowledging that the hotel complex would be subjected to wave and tide impacts. However, what may not have been realized was the magnitude for potential chronic shoreline recession at that location. A Littoral Transport Study of the island's oceanfront shoreline (Olsen, June, 1996) confirmed that the natural dividing point for littoral transport lies in the vicinity of the hotel and that phenomenon has been partially responsible for increased background erosion rates measured at that location. Although two previous beach renourishment projects have overtly sought to both reduce erosion vulnerability at the Marriott hotel site and to maximize post-construction beach widths sufficient to address high intensity recreational demand, it is recognized that a comprehensive solution is neither practical nor cost-effective seaward of the hotel complex. It is acknowledged that erosion of this area will occur faster than other areas along the shoreline; however due to the specific nature of this area, such an occurrence will not be used as the trigger for a large scale renourishment, like erosion in the North Forest Beach area.

Folly Terminal Groin:
A relatively short rock terminal groin was built along the west side of the small tidal inlet known as the Folly, as part of the 1997 renourishment project. The primary purpose of the structure was to allow beach restoration operations to occur in close proximity to the Folly (westward of the inlet only) without increasing the probability of closure due to project induced shoaling. DHEC OCRM permits for beach nourishment on Hilton Head Island, require that the Folly "must be kept in an open and flowing condition" since the tidal inlet is connected to a small isolated estuarine area deemed to be an important environmental resource. Accordingly, maintenance of the groin structure at its current location and approximate existing configuration is an important mechanism for minimizing fill impacts at this location of the island. Conversely, the eastern limit of the Folly has remained unstabilized and beach fill operations at that location are not allowed to encroach toward the inlet.

Port Royal Plantation Groin Field:
Along the Port Royal Shoreline, 17 shore perpendicular groins and two shore parallel rock revetments were constructed between 1969 and 1974. The 17 groins were constructed of varying mixes of small,

medium and large granite stone. Some groins included concrete rubble. The two remaining groins, located at the southeastern most section of the Port Royal Sound shoreline, were constructed of palm tree trunks combined with granite stone. It is estimated that these two structures were constructed around 1960. The groins' lengths vary from about 100 to 600 feet and the spacing between groins varies from approximately 165 to 850 feet.

Town/SPA Breakwaters:
As part of the 2006 Beach Renourishment Project, a new section of Port Royal Sound facing shorefront received limited beach fill to the northwest of Fish Haul Creek. As a complement to the small sand fill, six small rock detached breakwaters were constructed seaward of the limits of sand placement. The purpose of the rock breakwaters is to extend the life (and performance) of the very small isolated fill project. The structures are likewise intended to reduce sand migration from the fill towards Fish Haul Creek. Subsequent to rock placement, marsh vegetation was planted in the lee of each structure to further encourage long term natural stabilization along this shoreline which is at the transition point from sandy beach to an estuarine environment. It should be noted that this shore stabilization project is not located within the DHEC OCRM Beach/Dune Critical Area, but serves to more evenly distribute beach access points throughout the Island.

Town/Port Royal Groin:
A new section of Port Royal Sound facing the Atlantic shorefront received limited beach fill and a 700 foot long rubble mound terminal groin at the northeastern end of the project. The groin is low crested and mostly buried. The purpose of the rock breakwaters is to extend the life (and performance) of the small isolated fill project.

Beach Renourishment

In 1980, United States Army Corps of Engineers (USACE) issued a permit for the deposition of 300,000 cubic yards of sand along approximately 14,000 linear feet of the beach to Sea Pines Company. The renourishment sand was transported from the permitted dredging project of Shelter Cove Marina, located mid-island on Broad Creek, as a result of its compatibility with existing beach front sand. A Palmetto Dunes Resort project was the only renourishment project on Hilton Head Island permitted by the USACE and certified by the South Carolina Coastal Council prior to 1990, and predates the incorporation of the Town.

In 1990, the Town of Hilton Head Island undertook a nourishment project that was jointly funded by the State and the Town. This project involved the placement and contouring of as much as 2.5 million cubic yards of compatible sand along 35,000 linear feet of the beach. This renourishment project covered an area of the beach from just north of the Westin Hotel to south of Coligny Circle, with a small area excluded around the Folly. The sand was excavated and placed by hydraulic dredge from two offshore borrow sites located at Joiner and Gaskin Banks.

In 1997, the Town performed another renourishment project located very similarly to the 1990 project; however, this project addressed an additional 1.5 mile segment along Port Royal Sound, the reconfiguration of a tidal channel and the installation of sand fencing and native vegetation to encourage dune formation and stabilization.

In 1999, another renourishment project was permitted for emergency work to renourish along the South Beach shoreline as the preferred solution to the localized erosion problem which was occurring at that time. This fill was placed over the South Beach groin field rather than maintaining the structures themselves.

In 2007, the Town finished a $16.6 million project that was similar to the projects constructed in 1990 and 1997, with the exception of certain design refinements near the Marriott and along North Forest Beach. In addition, the Town elected an area near Fish Haul Creek along the shoreline of Port Royal Sound due to chronic erosion. This project placed about 2 million cubic yards of sand along 6.6 miles of Atlantic shorefront, from just south of Coligny Circle to just north of the Westin Hotel at Port Royal Plantation, 85,000 cubic yards of sand along 2,000 feet of the Port Royal Sound shoreline north of Fish Haul Creek at the Spa, and 42,000 cubic yards of sand along 1,500 feet of Atlantic Shorefront at South Beach. As with previous projects, the nourishment sand was excavated by hydraulic dredge from two offshore shoal features.

The 2011-12, beach renourishment project was a smaller scale project that built up the beach from just north of The Westin Resort to the Beach House in Port Royal Plantation. The 9.8 million dollar project included two principal parts: The placement of about 1.0 million cubic yards of sand along 1.0 miles of Atlantic shorefront and the construction of a 700 foot long rubble mound terminal groin at the northeastern end of the project. The groin is low crested and mostly buried.

The 2016 beach renourishment of the Atlantic oceanfront shoreline is expected to be similar to the projects constructed in 1990, 1997 and 2006 and is estimated to cost over $20 million dollars, will also include sand placement along localized portions of previously restored shoreline in Port Royal Plantation and the area just north of Fish Haul Creek on Port Royal Sound.

The planned 2016 renourishment project will include four principal parts:

1. Placement of about 1.3 million cubic yards of sand along 5.5 miles of Atlantic Ocean shorefront from just South of Coligny Circle to The Folly tidal inlet at Singleton Beach,
2. Placement of about 0.5 million cubic yards of sand along 7,000 feet of the Atlantic Ocean and Port Royal Sound shorelines in northern Port Royal Plantation,
3. Placement of about 0.3 million cubic yards of sand along 5,000 feet of Atlantic Shorefront in southern Sea Pines near South Beach, and

4. Placement of up to 60,000 cubic yards of sand along 2,400 feet of the Port Royal Sound shoreline north of Fish Haul Creek in the vicinity of the Fish Haul Park, Mitchelville Beach Park and The Spa of Port Royal.

FIGURE 28: 2016 BEACH RENOURISHMENT MAP

FIGURE 29: PRE-1990 SHORELINE AND 2006 PROJECT COMPLETION

5.3 EROSION CONTROL ALTERNATIVES

Since about 1986 a fundamental tenet of the Town's beach management strategy is that reliance upon "*hard*" structures should be minimized. Prior to the initiation of beach restoration through nourishment, different types of hard structures implemented for shore stabilization by the private sector (*i.e.* homeowners, developers, hotels, P.O.A.'s, etc.) have typically consisted of structures such as groins and seawalls or bulkheads. For the purpose of evaluation, two basic types of shoreline stabilization techniques have been considered: hard and soft shoreline treatments. In 2005, Olson and Associates prepared a white paper on shoreline stabilization structures that included the following evaluation of alternatives for both "hard" and "soft" erosion control techniques.

"Armoring consists of shoreline *hardening* through the application of bulkheads, seawalls or revetments.

- Bulkheads are vertical retaining walls designed to hold or prevent soil from sliding waterward.
- Seawalls are usually massive, vertical designed structures used to protect backshore areas from heavy wave action. In highly erosive conditions or exposed locations they may separate land from water.
- Revetments provide a sloping protective cover of erosion resistant material to protect a shorefront from waves and/or strong currents. They can be solid (*i.e.* sloping concrete for

example), but most typically are comprised of a designed cross section of natural rock (like granite), or on less frequent occasions manmade type armor units.

Although armoring may be successful in limiting or reducing the extent of horizontal shoreline recession along a chronically eroding shorefront, it does *not* serve to alleviate deflation (*i.e*. vertical erosion) of the beach profile seaward. Hence, armoring is considered to be net impactive with respect to littoral processes. Most vertical armoring is highly reflective of incident wave energy, thereby further accentuating offshore sediment losses, in particular during storm events. For this reason, a sloping rock revetment (with a lower coefficient of reflectivity) is typically preferable over a vertical seawall or bulkhead in open coast environments.

Groins are one of the oldest and most common shore connected beach stabilization structures. Groins are structures typically constructed perpendicular to a shoreline in the zone of most active littoral transport across the beach profile. As such, groins are often designed to interrupt longshore transport in order to trap, or retain sand mobilized by waves or currents. Groins are often deployed as a field of structures in order to spatially affect a section of shorefront. At the terminus of a littoral cell, a single "terminal structure" may be used to anchor the beach, and/or limit the removal of sand from the shore into a navigational channel or the shoals of a tidal inlet."

Rather than these hard structures, the principal means of shore stabilization embraced by the Town of Hilton Head Island Shoreline Management Plan should be beach nourishment, a restorative "*soft*" structure which provides for improved shorefront conditions suitable for recreation, protection of upland development or infrastructure, as well as global environmental enhancement. In the mid 1980's the Town commissioned an "Erosion Assessment Study for Hilton Head Island" which was followed by an "Engineering Evaluation of a Beach Restoration Strategy for Hilton Head Island." In addition to providing the technical rationale for beach nourishment, these two documents formed the basis for the Town's initial and only request to use State funds for the purpose of beach nourishment in 1989.

Since that time, the Town has enacted a local "Beach Preservation Fee" which amounts to a 2% assessment on short-term rental accommodations. Rental to the same person or party of ninety (90) continuous days or more is not considered short term. The collection of this fee has allowed the Town to unilaterally fund subsequent beach renourishment projects, conduct semi-annual beach surveys and annual shoreline aerial photography, provide annual monitoring reports, acquire land, develop beach parks to enhance access, and install and maintain sand fencing and dune vegetation. The program generates approximately $4 million per year. The Town of Hilton Head Island has spent $~~35~~ 50 million for beach renourishment projects between 1990 and ~~2007~~2012, and the Town's Capital Improvements Program includes funding to continue providing beach re-nourishment and maintenance in future years.

The Town has undertaken large scale fill projects on its oceanfront beach in 1990, 1997 and 2006. Besides the creation of a wider, higher and more robust beach configuration suitable for both active and passive opportunities at all stages of the tide, the Town has also been able to initiate a wide array of additional beach and shoreline management functions. These efforts benefit the local population as well as the island's natural environment. Noteworthy accomplishments directly associated with the Town's existing management program include, but are not necessarily limited to the following areas:

1. A coincident program of dune and vegetation restoration,
2. Improved beach protection laws for existing shorefront development and future redevelopment,
3. Enhanced property values and concurrent ad valorem tax base,
4. Eligibility for unique post-disaster financial assistance from FEMA,
5. Acquisition of undeveloped oceanfront lands for purposes of improved public access and park creation,
6. Improved promotional opportunities and amenities for resorts, hotels, property management firms, etc.
7. Protection of the Folly and its unique estuarine environment,
8. Improved Federal Flood Insurance program compliance,
9. More effective regulation of inappropriate oceanfront development,
10. Enhanced habitat for birds and endangered sea turtles.
11. Semi-annual beach surveys and annual shoreline aerial photography are used for modeling erosion and accretion rates when studying the Island's renourishment needs.

FIGURE 30: SAND FENCING

FIGURE 31: BEACH RENOURISHMENT RESULTS

6 - NEEDS, GOALS AND IMPLEMENTATION STRATEGIES

With the adoption of the Land Management Ordinance and the Comprehensive Plan and appendices, including the Beach Management Plan, many of the Town's policies and goals on shoreline retreat are being met. However, continuous pressure from developers to move development toward the newly renourished beach is of grave and immediate concern to the Town.

Need 1: *The Town should investigate methods to continue to protect the existing beach/dune features and those features resulting from renourishment projects from development and redevelopment pressures.*

Goal 1.1: Have a well maintained beach and dunes system that helps to preserve and protect the Island's manmade and natural resources and provides for a sound economic base; the Town does not support movement of the baseline or any other action that would result in encroachment of development into the dunes system or seaward of the ~~existing~~ baseline that was established in 1999.

Goal 1.2: ~~Extend the Town's Critical Storm Protection and Dune Accretion Area to other areas of the Island.~~ Continue to Protect and Enhance the Beach/Dune System though the regulation of beachfront development.

Implementation Strategies:

A. The Town should continue to implement its Capital Improvement Program and Land Acquisition Program to develop, renovate, or expand its beach parks.

Achievements:

- ✓ Town Council authorized the first phase of a comprehensive Shoreline Management Plan. The first element, an inventory and analysis of shoreline stabilization structures, has been completed.
- ✓ The Town has completed ~~three~~ four major and one emergency beach renourishments since 1990, with another large scale project currently underway.
- ✓ Detached breakwaters were installed along parts of Port Royal Sound Shoreline.
- ✓ The Town has begun post 2007 project monitoring, studies on groins at Port Royal Plantation, South Beach, and the Spa area on Port Royal Sound.
- ✓ The Town contracted with Olsen Associates for studies on groins at Port Royal Plantation, South Beach, and the Spa area on Port Royal Sound.

- ✓ Semi-annual beach surveys are conducted and an annual monitoring report is prepared.
- ~~✓ The Town is entering its second season for water quality monitoring on the beach.~~
- ✓ Sea turtle monitoring continues on island beaches. Staff is mapping all nesting sites.
- ✓ A dedicated funding source has been established for beach renourishment in the form of a beach fee, derived from an additional two percent Local Accommodations Tax levied by Town Council. This source provides $4 million each year, dedicated to beach renourishment and related monitoring, dune refurbishment, maintenance and operations, and new beach parks and beach access facilities.
- ✓ Completed a Port Royal beach erosion study.
- ✓ In accordance with continuing beach maintenance activities, shorebird monitoring is entering its seventh season. The Town's monitoring of threatened or endangered shorebirds is assisting federal and state agencies in the protection and recovery of those species.

B. Continue to hold densities along the beachfront to their current levels or below.

Achievements:

- ✓ The Town adopted *Resolution 2003-08*, that states: "to ensure that the intent of the ten Planned Unit Developments within the Town's PD-1 District is not compromised, *the master plan caps for those Planned Unit Developments should be held at current levels or below* until the Comprehensive Plan review/revision process is completed and this resolution is incorporated into the same, unless it can be clearly demonstrated that such a change will result in a reduced impact on infrastructure and the natural resources of the Island."
- ✓ A goal of the Land Use Element states: "*the reduction in allowable densities is preferred*." The Town should "reduce allowable development densities to ensure that development and redevelopment do not create adverse impacts on the natural resources of the Island, and so, not place an unreasonable burden on the community's infrastructure. Further, since 70% of the Town is within areas that were master planned, the "*master plan caps should be held at or below current levels* to ensure that the intent of those PUDs is not compromised" *(Comprehensive Plan 2004).*

C. Continue to amend and enforce the LMO and Municipal Code to protect the established dunes systems on our beach–front, to provide for re-establishment of the dunes systems during redevelopment, and to provide for redevelopment scenarios after a natural disaster.

Achievements:

- ✓ LMO Chapters 3 ~~4~~ & 5 regulate growth management requirements regarding site design and density; LMO Chapter 6 regulates natural resources, including beach protection and preservation. These chapters address building location on the site ~~in relation to the Setback and Base lines,~~ and requirements for protection of beach/dunes systems and vegetation.
- ~~✓~~ Municipal Code Title 8 Chapter 1 regulates beach/dune use and activities~~,~~. ~~and creates Special Designation Areas, including the Critical Storm Protection and Dune Accretion Zone. Research currently underway to expand the Critical Storm Protection and Dunes Accretion Zone.~~
- ✓ Municipal Code Title 8 Chapter 3 provides for Sea Turtle Protection.
- ✓ Town Council adopted the Recovery Plan in 2003, which was updated in 2014. The Disaster Recovery Commission was formed to work with staff to further research certain unresolved issues in the Recovery Plan.
- ✓ Town Council adopted the ~~Critical Storm Protection and Dune Accretion Zone which increases protection of the dunes system along the South Forest Beach Area. The Town is evaluating the benefits of extending this type of protection to other areas of the Island.~~Coastal Protection Area and Transition Area Overlay Zoning Districts.
- ✓ The Town installed fences and plantings to support buildup and retention of dunes.

D. Work with DHEC OCRM during the update of the Town's Local Comprehensive Beach Management Plan when designated by the State and to review, as requested, public petitions to move the Baseline on individual properties to ensure compatibility with this Plan. It is the policy of the Town of Hilton Head Island that the baseline not be moved seaward.

Achievements:

- ✓ Beach Management Plan was first adopted in 1991 and amended in 1992 (inclusion of 40 Year Retreat Policy) and in 1998 (update of Beach Access section).
- ✓ This ~~document~~ constitutes the ~~most recent~~ update of the 2008 Beach Management Plan that was last amended in 2011. Town Staff coordinated heavily with OCRM Staff on its outline and content.

E. Continue to promote environmental education programs and standards that stress protection of fragile areas and wildlife.

Achievements:

- ✓ In 2001, USFWS identified critical wintering habitat for the Piping Plover along parts of the Island's shoreline.
- ✓ The Town supports the Loggerhead Sea Turtle Protection Program through funding.
- ✓ The Town provides brochures that addresses habitat on the beach.
- ✓ The Town conducted a habitat inventory near Fish Haul Creek in 2003.
- ✓ Ordinance enforcement is carried out by Town Codes Enforcement Officers, Facilities Management staff, Shore Beach franchise employees and BCSO deputies.
- ✓ Town Staff works with OCRM, DNR, the Coastal Discovery Museum, Clemson Extension, ~~and~~ Lowcountry Estuarium and other partners to present public education programs on such topics as water quality, low impact development, wildlife and native beach plantings to both the general public and the development community.

F. Coordinate with the Chamber of Commerce in tourism efforts to promote our beach.

Achievements:

- ✓ ATAX grants are given to the Chamber for promotions.

G. Work to revise state legislation for enhanced protection of the beach and dunes system which should include an effective retreat policy in addition to considering renourishment efforts when determining baseline locations to prevent movement of the baseline further seaward as a result of renourishment.

H. Provide input to DHEC OCRM during the update of the State's Beach Management Plan to help ensure that the DHEC OCRM Baseline does not move further seaward along the Town of Hilton Head Island shoreline.

I. Work with the State to receive beach nourishment funds in the event the Town does not have local funding to renourish.

2. Beach Access

Need 2: *With the large majority of oceanfront land under private ownership, the Town should seek ways to work with developers to allow for public beach access in redeveloped sites, and to work with Property Owners Associations to protect accesses that currently exist.*

Goal 2.1: Have adequate public beach access at Town-owned sites and seek innovative solutions to provide additional beach access for the public in privately owned neighborhoods and commercial areas.

Implementation Strategies:

A. The Town should continue to implement its 10 year Capital Improvement Program to develop, renovate, or expand its beach parks.

Achievements:

- ✓ The Town owns 8 dedicated beach parks with over 1400 parking spaces.
- ✓ The Town has a dedicated funding source for land acquisition on the beach.
- ✓ The Town has spent $~~138~~ 171 million for land acquisition to acquire over 1150 1,300 acres, some for beach parks.
- ✓ The Town ~~is currently renovating~~ has renovated the Coligny Beach Park to open views to the ocean and to provide a better designed park.

B. Continue to work with oceanfront developments to provide public access to the beach during redevelopment. Also work with neighborhood associations to protect neighborhood access points.

Achievements:

- ✓ LMO 16-6-304 provides the ability for the Town to "consider the need for beach access to meet the general public interest" while reviewing all development applications involving property adjacent to the beach. ~~It~~ This allows Town Staff to recommend to Town Council purchasing the property for beach access.
- ✓ The Town has negotiated with beachfront developers to include emergency vehicle access in some of the new development along the beach (Marriott Oceanfront, Disney).

C. Develop methods of increasing public awareness concerning beach access points through better access signage, informational kiosks, directional signage and brochures.

Achievements:

- ✓ The Town installed beach matting at Coligny, Driessen, Folly Field, Alder Lane, Mitchellville and Islander's beach parks for access to the lower beach area by wheelchairs and other mobility devices used by disabled people to traverse the dry, soft sand.
- ✓ The Town installed GEOWEB to stabilize emergency accesses to the beach. Accesses are in the Coligny Beach Park, Islanders Park, Bradley and Burkes Beach Roads, Mitchellville and future Collier Beach Park.
- ✓ Staff worked with oceanfront beach developers to allow beach access emergency markers for location identification and installed them for efficient emergency vehicle access.
- ✓ The Fire & Rescue Master Plan recommends special emergency response vehicles be purchased in order to facilitate medical emergency response on the beach.
- ✓ The Town produced a Beach brochure and a Park Brochure detailing beach access locations and pathways to the beach.
- ✓ The Town coordinated with SCDOT for highway identification signs directing the public to beach parks.

Town of Hilton Head Island Beach Managment Plan
Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
BEACH ACCES 68												Revetment	
BEACH ACCESS												Revetment	
BEACH ACCESS 61											Concrete Seawall		
BEACH ACCESS 61B												Revetment	
BEACH ACCESS 62												Revetment	
BEACH ACCESS 62A												Revetment	
BEACH ACCESS 65A												3 Revetments	
BEACH ACCESS 66A												Revetment	
BEACH ACCESS 66B												Revetment	
BEACH ACCESS 67											Wooden Bulkhead	2 Revetments	
BEACH ACCESS 67A												Revetment	
BEACH ACCESS 68A												Revetment	
BEACH ACCESS 69											Concrete Seawall		
R510 005 000 0030 0000	1	15	1	40	1	60	1	35					
R510 005 000 0031 0000	1	5	1	15	1	15							
R510 005 000 0032 0000													
R510 005 000 0033 0000													
R510 005 000 0034 0000	1	5	1	25	1	25	1	20					
R510 005 000 0035 0000	1	15	1	20	1	20	1	20	1	65			
R510 005 000 0076 0000									1	40			
R510 005 000 0077 0000			1	25	1	25	1	5					
R510 005 000 0078 0000			1	25	1	25	1	10	1	50			
R510 005 000 0083 0000													
R510 005 000 0084 0000													
R510 005 000 0085 0000			1	20			1	15					
R510 005 000 0094 0000			1	25	1	25	15		1	50			
R510 005 000 0095 0000									1	35			
R510 005 000 0096 0000													
R510 005 000 0102 0000													
R510 005 000 0103 0000													
R510 005 000 0104 0000			1	15	1	60	1	15	1	80			
R510 005 000 0142 0000													
R510 005 000 0143 0000													
R510 005 000 0144 0000													
R510 005 000 0145 0000			1	70					1	150			

Town of Hilton Head Island Beach Managment Plan
Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R510 005 000 0146 0000	1	45	1	50	1	200	1	50	1	180			
R510 005 000 0147 0000													
R510 005 000 0183 0000													
R510 005 000 0184 0000									1	20			
R510 005 000 0185 0000			1	15					1	25			
R510 005 000 0186 0000													
R510 005 000 0187 0000													
R510 005 000 0188 0000									1	20			
R510 005 000 0190 0000									1	20			
R510 005 000 0191 0000													
R510 005 000 0205 0000	1	50	1	60	1	60			2	220, 30			
R510 005 000 0206 0000	1	90	1	100	1	100	1	90	1	230			Arbors - 80
R510 005 000 0207 0000													
R510 008 000 022V 0000					1	150			1	150			
R510 008 000 0358 0000	1	55	1	80	1	80							
R510 008 000 0499 0000	1	140	1	140	1	160	1	130	2	180			
R510 008 000 0501 0000	1	130	1	170	1	140			1	180			
R510 008 000 0502 0000													
R510 008 000 0622 0000													
R510 008 000 0623 0000													
R510 008 000 0624 0000													
R510 008 000 0625 0000									1	50			
R510 009 000 0011 0000													
R510 009 000 0044 0000									1	50			
R510 009 000 0047 0000					1	140			1	140	Concrete Seawall		
R510 009 000 011A 0000	1	70	1	110	1	110	1	100	1	200	Concrete Seawall		
R510 009 000 011B 000C	1	80	1	110	1	110	1	80					
R510 009 000 011D 000C									1	150			120
R510 009 000 0169 0000									1	60			
R510 009 000 0171 0000													
R510 009 000 0196 0000													
R510 009 000 0197 0000													
R510 009 000 0198 0000													
R510 009 000 0199 0000													
R510 009 000 0221 0000													

Town of Hilton Head Island Beach Managment Plan
Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R510 009 000 0222 0000													
R510 009 000 0223 0000					1	10							
R510 009 000 0224 0000									1	10			
R510 009 000 0363 0000													
R510 009 000 0364 0000													
R510 009 000 0421 0000													
R510 009 000 0424 0000					1	10							
R510 009 000 0425 0000			1	5	1	5							
R510 009 000 0428 0000					1	10							
R510 009 000 0429 0000	1	90							2	125, 150			
R510 009 000 0538 0000									1	30			
R510 009 000 0775 0000			1	40					3	60, 70, 60			
R510 009 000 0776 0000									4	60, 70, 60, 50			
R510 009 000 0886 0000													
R510 009 000 0886 0000	1	25	1	55	1	55	1	35	1	100			Pool House - 20, Gazebo - 50
R510 009 000 0887 0000			1	20					2	60, 80			
R510 009 000 0892 0000									1	110			
R510 009 000 0897 0000	1	25	1	50	1	50			1	50			Gazebo - 20
R510 009 000 0921 0000	1	10			1	30			2	90			
R510 009 000 0922 0000									5	90, 4 X 110'			
R510 009 000 1012 0000									12	min. 50, max. 180			
R510 009 000 1014 0000									1	20			
R510 009 000 1014 0000													
R510 009 000 1014 0000													
R510 009 000 1014 0000													
R510 009 000 1014 0000													
R510 009 000 1014 0000													
R510 009 000 1014 0000									1	50			
R510 009 000 1029 0000									1	20			
R510 009 000 1049 0000													
R510 009 000 1050 0000			1	25	1	25	1	10					
R510 009 000 1057 0000			1	10	1	10							
R510 009 000 1058 0000	1	15	1	45	1	45	1	35					

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R510 009 000 1059 0000													
R510 009 000 1060 0000			2	10, 30					3	20, 140, 25,			
R510 009 000 1066 0000	1	30							1	190			
R510 009 000 1072 0000	1	120	1	130	1	130	1	100					
R510 009 000 1073 0000	1	130	1	120	1	150			1	180			
R510 009 000 1075 0000									1	60			
R510 009 000 1082 0000									1	60			
R510 009 000 1084 0000	1	120	1	120	1	120	1		1	190	Concrete Seawalll		
R510 009 000 1086 0000			1	60	1	60	1	55					
R510 009 000 1087 0000			1	25	1	20							
R510 009 000 1097 0000	1	70	1	70	1	70			1	180			
R510 009 000 1103 0000									1	15			
R510 009 000 171A 0000									1	30			
R510 009 000 171B 000C									1	40			
R510 009 000 171C 007C									1	280			
R510 012 000 0002 000C									1	120			
R510 012 000 0002 000C													
R510 012 000 0010 000C													
R510 012 000 010A 000C													
R510 012 000 010B 000C													
R510 012 000 010C 000C													
R510 012 000 010D 000C	1	200	1	210	1	210							
R510 012 000 010N 000C	1	120	1	130	1	130			1	290			
R510 012 000 010Q 000C			1	5	1	5	1	5					
R510 012 000 010R 0000											Concrete Seawalll		
R510 012 000 011B 0000											Concrete Seawalll		
R510 012 000 011D 000C													
R510 012 000 013B 000C													
R510 012 000 0350 000C													
R510 012 000 0363 000C	1	150	1	170	1	180	1	160	1	250			
R510 012 000 0378 000C	1	150	1	160	1	160	1	160	1	250	?		
R510 012 000 0379 000C	1	140	1	160	1	160	1	150	1	250			
R510 012 000 0380 000C	1	130	1	150	1	150	1	140	1	250			

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R510 012 000 0381 0000	1	130	1	180	1	180	1	160	1	250			
R510 012 000 0382 0000													
R510 012 000 0383 0000	1	150	1	170	1	170	1	160	1	250			
R510 012 000 0384 0000	1	160	1	170	1	170	1	170	1	250			
R510 012 000 0385 0000													
R510 012 000 0389 0000	1												
R510 012 000 0390 0000	1	160	1	170	1	170	1	170	1	250			
R510 012 000 0391 0000	1	160	1	170	1	170	1	170	1	250			
R510 012 000 0392 0000	1	170	1	200	1	200	1	180	1	240			
R510 012 000 0393 0000	1	170	1	180	1	180	1	150	1	250			
R510 012 000 0394 0000	1	200	1	220	1	220	1	220	1	270			
R510 012 000 0395 0000	1	200	1	210	1	210	1	210	1	260			
R510 012 000 0396 0000	1	170	1	190	1	190	1	185	1	250			
R510 012 000 0397 0000	1	10	1	15	1	15	1	10					
R510 012 000 0403 0000	1	40	1	50	1	50	1	40					
R510 012 000 0406 0000													
R510 012 000 0546 0000	1	220											
R510 012 000 0547 0000													
R510 012 000 0548 0000	1	110											
R510 012 000 0549 0000			1	180	1	180	2	110, 130	1	250			Pool House - 100, Gazebos - 150, Arbors - 130
R511 008 000 0372 0000	1	150	1	190	1	150			1	150			Arbors - 120, Gazebos - 150
R511 008 000 0504 0000									1	220			Golf Course Green, Sandtraps, Tees - 180
R520 012 000 0144 0000	1	10	1	20	1	20							
R520 012 000 0195 0000													
R520 012 000 0196 0000	1	160	1	215	1	215	1	205	1	230	Sheet Pile Seawall	Revetment	
R520 012 000 0197 0000	1	180	1	190	1	190	1	190	1	240			
R520 012 000 0198 0000	1	170	1	200	1	200	1	190	1	250			

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R520 012 000 0199 0000													
R520 012 000 0200 0000	1	15											
R520 012 000 0201 0000													
R520 012 000 0202 0000	1	190	1	220	1	240	1	220	1	290			
R520 012 000 0203 0000	1	200	1	230	1	230	1	220	1	270			
R520 012 000 0204 0000	1	200	1	230	1	230	1	220	1	250			
R520 012 000 0205 0000	1	200	1	220	1	220	1	220	1	290			
R520 012 000 0206 0000	1	200	1	220	1	240	1	220	1	350			
R520 012 000 0207 0000	1	200	1	240	1	250	1	240	1	300+			
R520 012 000 0208 0000	1	210	1	220	1	220	1	150	1	270			
R520 012 000 0209 0000													
R520 012 000 0210 0000	1	15											
R520 012 000 0211 0000			1	25	1	40	1	25					
R520 012 000 0212 0000	1	10	1	35	1	35	1	35					
R520 012 000 0213 0000			1	40	1	40	1	25					
R520 012 000 0214 0000	1	20	1	50	1	50	1	45					
R520 012 000 0215 0000	1	190	1	200	1	200	1	190					
R520 012 000 0216 0000	1	220	1	250	1	250	1	240					
R520 012 000 0217 0000	1	215	1	250	1	250	1	230	1	280			
R520 012 000 0218 0000	1	230											
R520 012 000 0219 0000	1	220	1	260	1	260	1	170	1	300			
R520 012 000 0220 0000	1	75											
R520 012 000 0221 0000	1	40											
R520 012 000 0222 0000													
R520 012 000 0226 0000													
R520 012 000 0227 0000	1	160	1	180	1	180	1	180					
R520 012 000 0228 0000	1	175	1	220	1	220	1	200					
R520 012 000 0229 0000	1	175	1	180	1	180	1	170					
R520 012 000 0230 0000	1	180	1	220	1	220	1	200					
R520 012 000 0231 0000	1	170	1	200	1	200	1	175	1	250			
R520 012 000 0232 0000	1	170	1	200	1	200	1	175					
R520 012 000 0233 0000	1	170	2	210, 250	1	250	1	210	1	300			
R520 012 000 0234 0000	1	180	2	225 , 250	1	250	1	220					
R520 012 000 0235 0000	1	190	2	230, 240	1	240	1	225					
R520 012 000 0236 0000													

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R520 012 000 0237 0000													
R520 012 000 0238 0000													
R520 012 000 0239 0000													
R520 012 000 0240 0000													
R520 012 000 0241 0000													
R520 012 000 0242 0000													
R520 012 000 0243 0000	1	25											
R520 012 000 0244 0000	1	220	1	250	1	250			1	300	Wooden Bulkhead		
R520 012 000 0334 0000	1	190	1	205	1	205	1	205					
R520 012 00A 0001 0000	1	190	1	220	1	220	1	210	1	230			
R520 012 00A 0002 0000	1	160	1	210	1	210	1	190	1	250			
R520 012 00A 0003 0000	1	200	1	240	1	240	1	220	1	250			
R520 012 00A 0004 0000	1	200	1	230	1	230	1	225	1	280			
R520 012 00A 0005 0000	1	35											
R520 012 00A 0006 0000			1	25	1	50	1	20					
R520 012 00A 0007 0000													
R520 012 00A 0008 0000	1	10	1	50	1	50	1	40					
R520 012 00A 0009 0000	1	170	1	200	1	200	1	190					
R520 012 00A 0014 0000	1	200	1	230	1	230	1	230	1	280			
R520 012 00A 0015 0000	1	170	1	205	1	220	1	200					
R520 012 00A 0016 0000	1	210	1	240	1	240	1	240	1	310			
R520 012 00A 0017 0000	1	230	1	250	1	250	1	250	1	280			
R520 012 00A 0018 0000													
R520 012 00A 0019 0000	1	30											
R520 012 00A 0020 0000	1	50											
R520 012 00A 0021 0000	1	40											
R520 012 00A 0022 0000	1	220	1	240	1	240	1	240					
R520 012 00A 0027 0000													
R520 012 00A 0028 0000	1	210	1	250	1	250	1	240					
R520 012 00A 0029 0000	1	240	1	260	1	260	1	250					
R520 012 00A 0030 0000	1	230	1	270	1	270	1	260	1	300			
R520 012 00A 0031 0000	1	60											
R520 012 00A 0032 0000													
R520 012 00A 0033 0000	1	55	1	75	1	75	1	70					
R520 012 00A 0034 0000	1	80											

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R520 012 00A 0035 0000	1	230	1	270	1	270	1	250					
R520 012 00A 0040 0000	1	240	1	250	1	250	1	250	1	270			
R520 012 00A 0041 0000	1	240	1	260	1	260	1	240	1	270			
R520 012 00A 0042 0000	1	220	1	240	1	240	1	230	1	250			
R520 012 00A 0043 0000	1	220	1	230	1	230	1	230	1	280			
R520 012 00A 0044 0000													Tennis Courts - 90
R520 012 00A 0045 0000	1	65	1	60	1	70	1	40					
R520 012 00A 0046 0000	1	65	1	20	1	20							Hot Tub - 10
R520 012 00A 0047 0000	1	65	1	80	1	80	1	75					
R520 012 00A 0048 0000	1	210	1	240	1	240	1	220					
R520 012 00A 0053 0000	1	220	1	220	1	220	1	220					
R520 012 00A 0054 0000	1	220	1	260	1	270	1	240			Sheet Pile Seawall	Revetment	
R520 012 00A 0055 0000	1	230	1	250	1	250	1	240					
R520 012 00A 0056 0000	1	180	1	220	1	220	1	210					
R520 012 00A 0057 0000	1	30	1	50	1	50							
R520 012 00A 0058 0000	1	60	1	55	1	55							
R520 012 00A 0059 0000	1	40	1	70	1	70	1	60					
R520 012 00A 0060 0000	1	40	1	65	1	70	1	65					
R520 012 00A 0061 0000	1	220	1	240	1	250	1	240					
R520 012 00A 0066 0000	1	200	1	220	1	220	1	215	1	300			
R520 012 00A 0067 0000	1	210	1	230	1	230	1	220	1	300			
R520 012 00A 0068 0000	1	220	1	240	1	260	1	240	1	280	Sheet Pile Seawall	Revetment	
R520 012 00A 0069 0000	1	190	1	230	1	230	1	220				Revetment	
R520 012 00A 0070 0000	1	40	1	70	1	70	1	55					
R520 012 00A 0071 0000	1	40	1	60	1	60	1	55	1	80			
R520 012 00A 0072 0000	1	40											
R520 012 00A 0073 0000													
R520 012 00A 0074 0000	1	205	1	250	1	250	1	240					
R520 012 00A 0079 0000	1	230	1	250	1	260	1	250	1	310			
R520 012 00A 0080 0000	1	230	1	260	1	260	1	250	1	280		Revetment	
R520 012 00A 0081 0000	1	210	1	240	1	260	1	220	1	280		Revetment	
R520 012 00A 0082 0000	1	230	1	240	1	240	1	240	1	300			
R520 012 00A 0083 0000	1	45	1	60	1	60	1	60					

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R520 012 00A 0084 0000	1	25	1	45	1	50	1	45					
R520 012 00A 0085 0000	1	40											
R520 012 00A 0086 0000	1	40											
R520 012 00A 0087 0000	1	230	1	240	1	250	1	240				Revetment	
R520 012 00A 0092 0000	1	180	1	240	1	240	1	200	1	290			
R520 012 00A 0093 0000												Revetment	
R520 012 00A 0094 0000	1	200	1	260	1	250	1	220	1	270	Wooden Bulkhead	Revetment	
R520 012 00A 0095 0000	1	210	1	240	1	240	1	230			2 Wooden Bulkheads		
R520 012 00A 0096 0000	1	50	1	65	1	65							
R520 012 00A 0097 0000	1	35											
R520 012 00A 0098 0000	1	40	1	45	1	60	1	45					
R520 012 00A 0099 0000	1	50											
R520 012 00A 0100 0000	1	190	1	225	1	250	1	200					
R520 012 00A 0205 0000	1	180	1	200	1	200	1	200					
R520 012 00A 0206 0000	1	190	1	200	1	250	1	190	1	250			
R520 012 00A 0207 0000	1	190	1	200	1	240	1	200					
R520 012 00A 0208 0000	1	190	1	200	1	225	1	200	1	250			
R520 012 00A 0209 0000	1	10	1	30	1	30	1	25					
R520 012 00A 0210 0000	1	20											
R520 012 00A 0211 0000	1	10											
R520 012 00A 0212 0000													
R520 012 00A 0213 0000	1	185	2	220, 250	1	250	1	220	1	250			
R520 012 00A 0218 0000	1	175	1	200	1	200	1	175					
R520 012 00A 0219 0000	1	190	1	230, 250	1	230	1	225	1	260			
R520 012 00A 0220 0000	1	150	1	120	1	120	1	75	1	250			
R520 012 00A 0221 0000	1	200	1	220	1	220	1	210	1	250			
R520 012 00A 0222 0000	1	190	1	200	1	200	1	200					
R520 012 00A 0223 0000	1	200	1	250	1	250	1	200	1	300			
R520 012 00A 0224 0000	1	200	1	230	1	230	1	230	1	250			
R520 012 00A 0225 0000													
R520 012 00A 0226 0000	1	190	1	200	1	200	1	200	1	250			
R520 012 00A 0227 0000			1	5	1	5	1	5					
R520 012 00A 0228 0000													
R520 012 00A 0229 0000													

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Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R520 012 00A 0230 0000													
R520 012 00A 0231 0000													
R520 012 00A 0232 0000			1	20	1	20	1	15					
R520 012 00A 0233 0000			1	10	1	20	1	10					
R520 012 00A 0234 0000													
R520 012 00A 0235 0000													
R520 012 00A 0236 0000	1	225	1	80	1	80	2	40, 60			Wooden Bulkhead		
R520 016 000 0095 0000	1	200	1	250	1	250	6	100 - 200	2	250			Gazebos, Atrium - 120, Pool House/Bathrooms - 250
R520 016 000 0096 0000	1	160							1	160			
R520 016 000 0332 0000	1	90	1	200					1	225			
R520 016 000 0334 0000	1	140							1	150			
R520 016 000 0335 0000	1	140	1	190	1	190	2	60	1	190			Pool House - 140
R520 016 000 0337 0000	1	130, 80, 100	4	100	1	100	6	20 - 180	2	100			3 other buildings/structures - 100
R520 016 000 0338 0000	1	180	2	180, 200	1	200	3	100, 160, 160	1	270	Wooden Bulkhead		Pool House/Bathrooms -90, Arbors - 100
R520 016 000 0340 0000	1	15	1	25	1	25	1	5	2	160			Pool House - 25 / BLDG - 15
R520 016 000 0343 0000	1	125							1	300			
R520 016 000 0345 0000	1	40											
R520 016 000 0347 0000	1	80											
R520 016 000 0350 0000			1	70	1	70	2	30, 45	1	200			Pool House (2) - 25, Arbors (2) - 55
R520 016 000 0351 0000	1	140	1	150	1	150	1	125	1	250			
R520 016 000 0353 0000	1	50											

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R520 016 000 0354 0000	1	100							1	120			Arbors (2) - 60
R520 016 000 0355 0000			3	100, 150, 160	1	150	3	30, 80, 90	3	220			Pool House - 30, Arbors (3) - 130
R520 016 000 0356 0000			1	20	1	20	1	10	3	180			Arbors (4) - 20
R520 016 000 0357 0000			6	30	6	30	6	30	1	40			
R520 016 000 0358 0000			5	40	5	40	5	30	3	180			
R520 016 000 0360 0000	1	15	7	40	7	40	7	35	1	55			
R520 016 000 0368 0000			1	140					1	180			
R520 016 000 0369 0000	1	100											
R520 016 000 097A 0000													
R520 016 000 347A 0000			2	30, 90	1	90			1	180			
R520 016 000 347B 0000	1	10	1	30	1	30			1	90			BLDG - 10
R550 015 000 0267 0000			1	15	1	15	1	10	1	50			
R550 015 00A 0081 0000					1	30						Revetment	
R550 015 00A 0082 0000	1	20	1	40	1	50	1	30			Concrete Seawall		
R550 015 00A 0084 0000											Concrete Seawall		
R550 015 00A 0085 0000	1	25	1	50	1	65	1	35			Concrete Seawall		
R550 015 00A 0086 0000	1	30	1	45	1	60	1	45	1	60		Revetment	
R550 015 00A 0088 0000	1	25	1	45	1	50	1	45	1	75			
R550 015 00A 0089 0000	1	20	1	60	1	60	1	45	1	125		Revetment	
R550 015 00A 0090 0000	1	15	1	45	1	45	1	35	1	95		Revetment	
R550 015 00A 0091 0000	1	20	1	55	1	55	1	45				Revetment	
R550 015 00A 0092 0000	1	10											
R550 015 00A 0093 0000	1	60	1	85	1	85	1	75	1	125		2 Revetments	
R550 015 00A 0097 0000													
R550 015 00A 0111 0000													
R550 015 00A 0112 0000													
R550 015 00A 0113 0000													
R550 015 00A 0115 0000			1	10	1	25			1	50			
R550 015 00A 0116 0000												Revetment	
R550 015 00A 0125 0000												Revetment	
R550 015 00A 0126 0000			1	20					1	40		Revetment	
R550 015 00A 0127 0000			1	25	1	25			1	45			

Town of Hilton Head Island Beach Managment Plan
Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

Property Tax Map and Parcel Number	Number of Habitable Structures Seaward of Setback	Distance of Structure Seaward Setback	Number of Decks Seaward of Setback	Deck Distance Seaward of Setback	Number of Fences Seaward of Setback	Fence Distance Seaward of Setback	Number of Pools Seaward of Setback	Pool Distance Seaward of Setback	Number of Boardwalks Seaward of Setback	Distance of Boardwalk Seaward of Setback	Vertical Erosion Control-Refer to Appendix A-3	Revetment-Refer to Appendix A-2	Additional Structures Seaward of Setback and Distance
R550 015 00A 0136 0000			1	5					1	30		Revetment	
R550 015 00A 0137 0000												Revetment	
R550 015 00A 0138 0000			1	20					1	35		Revetment	
R550 015 00A 0147 0000												Revetment	
R550 015 00A 0148 0000												Revetment	
R550 015 00A 0149 0000					1	25						Revetment	
R550 015 00A 0158 0000												Revetment	
R550 015 00A 0159 0000									1	40		Revetment	
R550 015 00A 0160 0000									1	35		Revetment	
R550 015 00A 0169 0000			1	10	1	15			1	45		Revetment	Pool House/Shed/ Gazebo - 10
R550 015 00A 0170 0000			1	10			1	5			Wooden Bulkhead	Revetment	
R550 015 00A 0171 0000									1	10		Revetment	
R550 015 00A 0180 0000			1	25	1	25	1	10	1	50		Revetment	Pool House/Shed/ Gazebo - 20
R550 015 00A 0181 0000					1	20						Revetment	
R550 015 00A 0182 0000			1	20	1	20			1	60		Revetment	
R550 015 00A 0191 0000	1	15	1	15	1	15	1	10	1	60		Revetment	BLDG - 15
R550 015 00A 0192 0000			1	30	1	30	1	25	1	65		Revetment	
R550 015 00A 0193 0000									1	15		Revetment	
R550 015 00A 0202 0000			1	20	1	20	1	15				Revetment	
R550 015 00A 0203 0000	1	20	1	25	1	25	1	10	2	45		Revetment	
R550 015 00A 0204 0000			1	20	1	20	1	10				Revetment	
R550 015 00A 0213 0000	1	10	1	10					1	20		Revetment	
R550 015 00A 0214 0000	1	10	1	20	1	20	1	20				Revetment	
R550 015 00A 0215 0000			1	10									
R550 015 00A 0226 0000					1	10							
R550 015 00A 0260 0000												Revetment	
R550 015 00A 0269 0000			1	30									
R550 015 00A 0280 0000												Revetment	
R550 015 00A 0281 0000			1	20									
R550 015 00A 0282 0000			1	25					1	40			
R550 015 00A 0292 0000												Revetment	
R550 015 00A 0313 0000			1	20					1	35		Revetment	

Town of Hilton Head Island Beach Managment Plan
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R550 015 00A 0315 0000			1	25	1	30			1	30			
R550 015 00A 0319 0000												Revetment	
R550 015 00A 0320 0000			1	20					1	40			
R550 015 00A 0323 0000													
R550 015 00A 0324 0000	1	40	1	60	1	60			1	200			Covered Deck/Gazebo - 15, 60
R550 015 00A 0511 0000			1	80	1	70	2	50	1	110		Revetment	Pool House - 80
R550 015 00A 0513 0000			1	70	1	70	1	50				Revetment	
R550 015 00A 0514 0000	1	20	1	30	1	30						Revetment	
R550 015 00A 0515 0000			1	90					14	60-140			
R550 015 00A 0526 0000									1	50			
R550 015 00A 0528 0000									19	30-60			
R550 015 00A 0528 0000													
R550 015 00A 0530 0000	1	25	1	50	1	70	1	45	1	120		Revetment	
R550 015 00A 0533 0000													
R550 015 00A 0540 0000													
R550 015 00A 0542 0000													
R550 015 00A 0544 0000													
R550 015 00A 0546 0000									1	30			
R550 015 00A 0548 0000									1	20			
R550 015 00A 0550 0000													
R550 015 00A 0552 0000													
R550 015 00A 0553 0000					1	35							
R550 015 00A 0554 0000													
R550 015 00A 0555 0000													
R550 015 00A 0556 0000					1	30							
R550 015 00A 0557 0000			1	50	1	50							
R550 015 00A 0558 0000			2	50, 55	1	55							
R550 015 00A 0559 0000			1	60	1	60							
R550 015 00A 0561 0000													
R550 015 00A 0562 0000									1	80			
R550 015 00A 0563 0000									1	80			
R550 015 00A 0565 0000									1	80			
R550 015 00A 0566 0000													

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R550 015 00A 0567 0000													
R550 015 00A 0568 0000													
R550 015 00A 0569 0000													
R550 015 00A 0570 0000													
R550 015 00A 0571 0000									1	100			
R550 015 00A 0572 0000													
R550 015 00A 0573 0000													
R550 015 00A 0574 0000									2	120, 140			
R550 015 00A 0575 0000													
R550 015 00A 0576 0000	1	20	1	60	1	60	1	35				Revetment	
R550 015 00A 0577 0000	1	30	1	50	1	50	1	45				Revetment	
R550 015 00A 0578 0000									1	25			
R550 015 00A 0578 0000			1	20					1	40			
R550 015 00A 0579 0000													
R550 015 00A 0583 0000													
R550 015 00A 0584 0000													Gazebo - 25
R550 015 00A 0585 0000			1	15									
R550 015 00A 0586 0000									1	30			
R550 015 00A 0587 0000													
R550 015 00A 0588 0000			1	15					1	30			
R550 015 00A 0589 0000													
R550 015 00A 0590 0000			1	20					1	20			
R550 015 00A 0592 0000			1	15									
R550 015 00A 0593 0000													
R550 015 00A 0594 0000													
R550 015 00A 0596 0000			1	15					1	25			
R550 015 00A 0597 0000			1	25					1	40			
R550 015 00A 0599 0000			1	15	1	15			1	30			
R550 015 00A 0600 0000			1	15									
R550 015 00A 0601 0000			1	15									
R550 015 00A 0602 0000			1	15					1	20			
R550 015 00A 0604 0000									1	35			
R550 015 00A 0605 0000													
R550 015 00A 0606 0000													
R550 015 00A 0607 0000													

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R550 015 00A 0608 0000													
R550 015 00A 0609 0000					1	30			11	30-80			
R550 015 00A 0612 0000			1	10								Revetment	
R550 015 00A 0613 0000												Revetment	
R550 015 00A 0614 0000													
R550 015 00A 0694 0000			1	20					1	30			Covered Deck/Pool House/Gazebo - 15
R550 015 00A 0703 0000			1	20					1	50			
R550 015 00A 0704 0000													
R550 015 00A 0711 0000													
R550 015 00A 0712 0000			2	25, 30	1	30			1	50			
R550 015 00A 0714 0000									1	40			
R550 015 00A 0714 0000									3	30, 40, 40			
R550 015 00A 0714 0000			2	30	2	30			2	50, 60			
R550 015 00A 0714 0000			1	5	1	20			1	30			
R550 015 00A 0714 0000													
R550 015 00A 0714 0000													
R550 015 00A 0714 0000													
R550 015 00A 0714 0000					1	30			1	45			
R550 015 00A 0714 0000			2	20, 25					2	40, 60			Covered Deck/Gazebo /Shed - 35
R550 015 00A 0714 0000									1	55			
R550 015 00A 0714 0000													
R550 015 00A 0714 0000													
R550 015 00A 0714 0000													
R550 015 00A 0714 0000			10	40					21	60-100			
R550 015 00A 0717 0000					1	30					Concrete Seawall		
R550 015 00A 083A 0000	1	20	1	60	1	60	1	50	1	65			
R550 015 00A 087A 0000	1	30	1	50	1	55	1	45					
R550 015 00A 089B 0000	1	30	1	70	1	70	1	65			Concrete Seawall		
R550 015 00A 095A 0000	1	30	1	80	1	95	1	70	1	100	Concrete Seawall		
R550 015 00A 095B 0000	1	40									Concrete Seawall		
R550 015 00A 096C 0000	1	40	1	75	1	80	1	75	1	110		Revetment	

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R550 015 00A 096D 0000	1	80	1	90	1	100	1	85	1	140			
R550 015 00A 097C 0000													
R550 017 000 0078 0000													
R550 017 000 0079 0000													
R550 017 000 077A 0000	1	40	1	40	1	40			1	100			
R550 017 000 1081 0000			1	40	1	40			1	140			
R550 017 000 1188 0000									1	70			
R550 017 00A 0001 0000			1	25					1	35			
R550 017 00A 0002 0000			1	25					1	30			
R550 017 00A 0003 0000									1	60			
R550 017 00A 0004 0000					1	10			1	70			10
R550 017 00A 0006 0000			1	45					2	50			
R550 017 00A 0007 0000					1	10			1	60			
R550 017 00A 0008 0000													
R550 017 00A 0009 0000									1	55			
R550 017 00A 0010 0000			1	30					1	50			
R550 017 00A 0011 0000			1	30					1	65			
R550 017 00A 0012 0000									1	20			
R550 017 00A 0013 0000			1	15					2	55			
R550 017 00A 0014 0000			1	15					1	65			
R550 017 00A 0016 0000									1	65			
R550 017 00A 0017 0000									1	90			
R550 017 00A 0018 0000									1	60			
R550 017 00A 0019 0000													
R550 017 00A 001A 0000			1	10					1	45			
R550 017 00A 0020 0000			1	15					1	70			
R550 017 00A 0021 0000			1	10					1	40			
R550 017 00A 0022 0000			1	10									
R550 017 00A 0024 0000									1	80			
R550 017 00A 0025 0000									2	50			
R550 017 00A 0026 0000			1	25									
R550 017 00A 0027 0000													
R550 017 00A 0029 0000			1	25					1	70			
R550 017 00A 0030 0000			1	30					1	80			
R550 017 00A 0031 0000			2	10, 20					2	75			
R550 017 00A 0032 0000													
R550 017 00A 0033 0000									1	100			
R550 017 00A 0034 0000			1	15					1	45			

Town of Hilton Head Island Beach Managment Plan
Appendix A: 2015 Inventory of Structures Seaward of Setback Line (North to South)

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R550 017 00A 0035 0000			1	15					1	40			
R550 017 00A 0036 0000			1	10									
R550 017 00A 0037 0000			1	20					1	55			
R550 017 00A 0038 0000			1	20					1	40			
R550 017 00A 0039 0000			1	20									
R550 017 00A 0040 0000			1	15									
R550 017 00A 0041 0000			1	20									
R550 017 00A 0042 0000													
R550 017 00A 0043 0000													
R550 017 00A 0044 0000													
R550 017 00A 0045 0000			1	20					1	20			
R550 017 00A 0046 0000													
R550 017 00A 022A 0000									1	40			
R550 017 00A 1281 0000			1	20	1	20			6	50			
R550 017 00A 1282 0000													
R550 017 00A 1283 0000													
R550 017 00A 1284 0000			1	10					1	20			
R550 017 00A 1288 0000			1	10					2	40			
R550 017 00A 1290 0000									1	60			
R550 017 00A 1303 0000			1	20					1	100			
R550 017 00B 0123 0000	1	10	1	40									
R550 017 00B 0124 0000	1	10	1	30					1	120			
R550 017 00B 0125 0000			1	10									
R550 017 00B 0126 0000													
R550 017 00B 0127 0000													
R550 017 00B 0159 0000													
R550 017 00B 0160 0000													
R550 017 00B 0161 0000													
R550 017 00B 0162 0000													
R550 017 00B 0163 0000									1	20			
R550 017 00B 0164 0000									1	10			
R550 017 00B 0176 0000									5	60-100			
R550 017 00B 0178 0000									1	20			
R550 017 00B 0186 0000													
R550 017 00B 0187 0000													
R550 017 00B 0199 0000													
R550 017 00B 0200 0000									1	110			
R550 017 00B 0208 0000													

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R550 018 000 003F 0000													
R550 018 000 006E 0000													
R550 018 000 016E 0000									1	30			
R550 018 000 016F 0000									1	40			
R550 018 000 0223 0000													
R550 018 000 0228 0000									2	80, 65			
R550 018 000 0285 0000									1	60			
R550 018 000 0302 0000									1	80			
R550 018 000 0315 0000													
R550 018 000 068T 0000									2	80			
R550 018 000 068U 0000													
R550 018 00A 0116 0000													
R550 018 00A 0117 0000			1	20					1	35			
R550 018 00A 0490 0000													
R550 018 00A 0491 0000			8	30					44	60-100			
R550 018 00A 0505 0000									2	50			
R550 018 00A 0505 0000			5	30	1	30			56	60-100			
R550 018 00A 0505 0000			4	40					44	60-100			
R550 018 00A 0505 0000													
R550 018 00A 0505 0000													
R550 019 000 0048 0000													
R550 019 000 0049 0000													
R550 019 000 0050 0000													
R550 019 000 0052 0000													
R550 019 000 0141 0000													
R550 019 000 0161 0000	1	10	1	45	1	50	1	40	1	70			
R550 019 000 0162 0000			1	35	1	50	1	25	1	120			
R550 019 000 0163 0000													
R550 019 000 0164 0000													Golf Green - 20
R550 019 000 0165 0000													
R550 019 000 0166 0000													
R550 019 000 0171 0000			1	25					1	40			
R550 019 000 0256 0000													
R550 019 000 0308 0000													
R550 019 000 0309 0000			1	35					1	70			
R550 019 000 307A 0000													
R552 018 000 001C 0000			1	40	1	40			1	60	2 Concrete Seawalls		

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R552 018 000 001C 0000									1	30			
R552 018 000 012B 0000													
R553 018 000 0001 0000			1	50					1	50			
R553 018 000 0003 0000			1	40	1	40	1	20	1	40			Volleyball Net/Court (2) - 50
R553 018 000 003A 0000									1	30			
R553 018 000 003B 0000									1	20			
Totals	205		340		247		224		524				

BEAUFORT
HAZARD MITIGATION PLAN
2009 UPDATE

for

Unincorporated Beaufort County
The City of Beaufort
The Town of Bluffton
The Town of Hilton Head Island
The Town of Port Royal

Prepared by:
Lowcountry Council of Governments
Planning Department

December 2009

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1. Introduction

Beaufort County, South Carolina and its incorporated communities prepared this update to their Hazard Mitigation Plan to assess the communities' vulnerabilities to natural hazards and prepare a long term strategy to address these hazards and prevent future damage and loss of life. This plan was created through participation from county and municipality officials, residents, and business owners and represents the community's consensus.

Background

Beaufort County is situated along the southern portion of South Carolina's Atlantic coastline (as shown in Figure 1-1) and has an area of 587 square miles. It lies in the coastal plain and is comprised largely of tidal marshes and swamp areas; the county has little relief with a high elevation of approximately 50 ft National Geodetic Vertical Datum 1929 (NGVD 29). Beaufort County's climate is generally subtropical with hot summers and mild winters. The average annual rainfall is approximately 49 inches with most precipitation occurring from April to October.

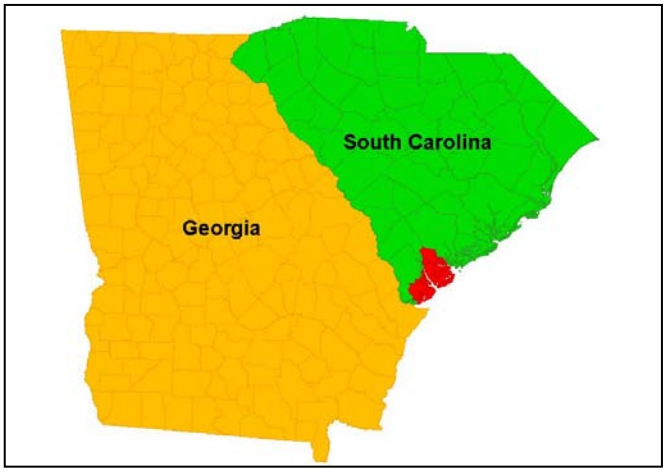


Figure 1-1. Beaufort County Locator Map

Beaufort County is one of the state's fastest growing counties (by population percentage increase) with a 2000 population of 120,937 (U.S. Census) which represented a 40% increase from the 1990 population. The 2008 population estimate was just over 150,000, representing 24.36 percent increase in eight years. Where there is population growth, there is usually also significant development. According to the U.S. Census in 2000 over 2,600 building permits were issued for housing units in the county. While the recent economic climate has slowed the building industry since 2004 there have been an average of about 2609 total building permits issued with 4,053 being the largest number of permits. Obviously, growth continues to occur.

There are five incorporated municipalities within the county: the Town of Bluffton, the City of Beaufort, the Town of Hilton Head, the Town of Port Royal, and a portion of the Town of Yemassee. The majority of Yemassee lies within Hampton County to the northwest of Beaufort County, and therefore they chose to participate in Hampton County's Hazard

Mitigation Plan Process, which is also currently underway. The City of Beaufort is the County Seat. A map of the county showing the locations of the incorporated communities is provided as Figure 1-2.

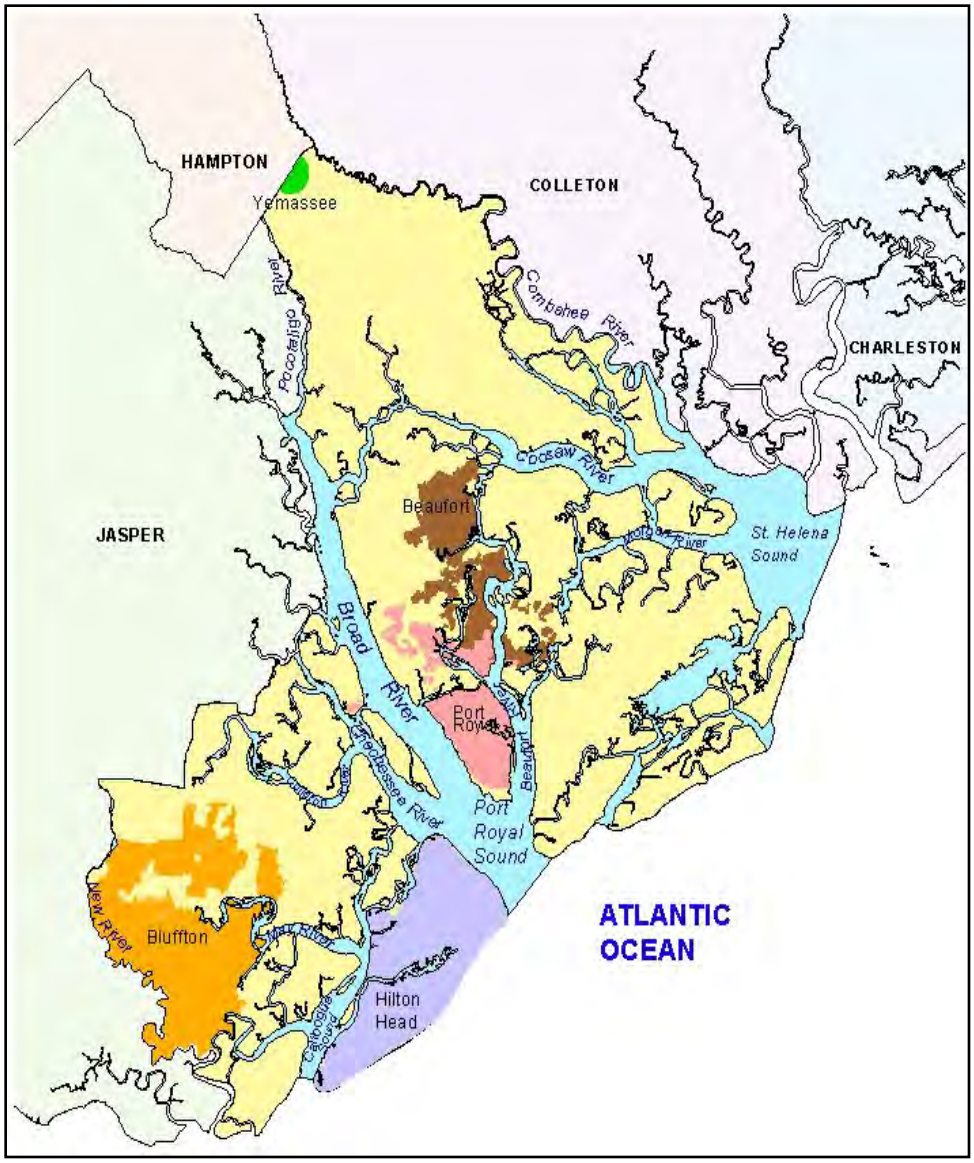


Figure 1-2 Beaufort County and Incorporated Areas

Beaufort County's coastal location makes it susceptible to flooding, erosion, and wind hazards associated with hurricanes, tropical storms and nor'easters. Furthermore, its proximity to the Charleston area, one of the most seismically active areas along the East Coast, makes it vulnerable to seismic hazards. The county's susceptibility to these and several other natural hazards were considered as part of this plan.

Planning Process

In order to conduct hazard mitigation planning, a committee was formed consisting of officials from the county and each of the participating communities. The formation of this committee was based on the members who participated in the original hazard mitigation plan. Participation by communities in the planning process was defined as attendance (at least once) of at least one representative from each jurisdiction and/or agency and one-on-one meetings with LCOG staff to both gather information and also to review suggested changes to such key components of the Plan as Mitigation capability Assessments and Action Plan items, thereby incorporating the review process. Through these meetings, this Hazard Mitigation Planning Committee developed a countywide Hazard Mitigation Plan.

It is important to note that the Town of Yemassee, an original participant in the plan, did not participate in this update. While they are partly in Beaufort County, they also have a large portion of their boundaries within Hampton County, SC. Representatives of the Town were contacted, but they have chosen to participate in the three-county mulit-hazard mitigation plan that will include Colleton, Hampton and Jasper Counties. LCOG is also the consultant for that project.

The committee reviewed the county's vulnerabilities to natural hazards and considered a wide variety of ways to reduce and prevent potential damage from these hazards. The committee then worked together to select the most appropriate and feasible mitigation measures.

To be effective, many of these measures, particularly floodproofing and emergency preparedness plans, require the cooperation of the floodplain residents. Because residents were involved in the hazard mitigation planning process through public meetings, and attempts to garner their input was made throughout the process. Following is a detailed description of the planning process and the committee's role.

Getting Organized

The first step of the hazard mitigation planning process was for the County to organize their resources by ensuring they had adequate technical assistance and expertise to conduct the planning process and to form a Hazard Mitigation Planning Committee to include representation from key county and municipal agencies such as planning departments, emergency management departments and building code inspection.

Support for the update of this plan was provided by the planning department at the Lowcountry Council of Governments under contract to Beaufort County. Each jurisdictions reviewed all of the technical information in the plan, and provided pertinent GIS, construction valuation and other data as necessary for updates. Accordingly, existing planning documents were evaluated to examine which documents support mitigation and where mitigation may be incorporated into existing plans.

Committee

A Hazard Mitigation Planning Committee (HMPC) was formed to work together to update the 2004 hazard mitigation plan and to conduct a hazard mitigation planning process compliant with Disaster Mitigation Act of 2000 (DMA), Flood Mitigation Assistance (FMA), and Community Rating System (CRS) planning requirements. A DMA Mitigation Plan Crosswalk is included as Appendix A. A steering committee was formed from a few highly involved individuals, who were contacted frequently throughout this process. For this plan, the steering committee was Trudie Johnson, Linda Bridges, Arthur Cummings, Libby Anderson, Ed Nelson, Matthew Brady and Ginnie Kozak. The HMPC consists of representatives from Beaufort County, the City of Beaufort, the Town of Hilton Head, and the Town of Port Royal. The HMPC is composed of the following members including county and municipality staff and representatives for the residents, military facilities and utilities:

Community Officials
Matthew Brady, Senior Planner, Lowcountry Council of Governments
Libby Anderson, Planning Director, City of Beaufort
Linda Bridges, Town of Port Royal Planning Administrator
Andy Corriveau, County Codes/Insurance
Arthur Cummings, Director, Beaufort County Building Codes
Ian Hill, Beaufort County Historic Preservationist
Frank Hodge, Town of Bluffton Building Official
Jay Hogan, Beaufort County Planner
Trudie Johnson, Town of Hilton Head Island, Floodplain Administrator.
Colin Kinton, Beaufort County
Ginnie Kozak, Low Country Council of Governments

Ed Nelson, Deputy Building Official, Beaufort County Building Codes
William Winn, Director, Beaufort County Emergency Management
John Webber, Disaster Recovery, Beaufort County.
Todd Ferguson, Beaufort County Emergency Management

Military Facility Representative
Marine Corps Recruit Depot - Parris Island, Operations Officer

Utility Representatives
Ken Jordan, BJWSA
Dick Deuel, BJWSA

Furthermore, each of the Counties in the Lowcountry Region (Hampton, Jasper, Colleton) were contacted and consulted at a June 30, 2009 meeting. They gave valuable input for inclusion into the Beaufort County Plan.

Beaufort County contracted the Lowcountry Council of Governments (LCOG) to help the community perform hazard mitigation planning and develop the plan. The following is documentation of what happened at the meetings of the Hazard Mitigation Planning Committee. See Appendix A.

Development of the mitigation plan began with data collection. A kick-off meeting was held in March 2009 to begin the process of updating the plan. Community, county, state, and federal resources were identified and contacted to collect pertinent information about natural hazards including past occurrences, projected frequencies of future occurrence/the anticipated risk where available, and asset (structure, utility, and transportation systems) inventory information. Here the planning team also began to take a more definite form in terms of the makeup of the HMPC.

On May 13, 2009 another meeting was held. Here policy and regulatory information from each of the communities and the county was reviewed. This included comprehensive plans, zoning ordinances, development ordinances, and building code requirements. The LCOG compiled a report on these documents in regards to their compatibility with the Hazard Mitigation Plan and the HMPC was presented with this information. This list was also sent out electronically, and all participants were allowed to comment at the meeting and via e-mail. Also, the group present confirmed the members of the HMPC.

Information was collected from the Beaufort County Building Code Department, Planning Department, GIS Department, and Emergency Management Department. Several state agencies were contacted including the South Carolina Emergency Management Division, the Department of Natural Resources, and The University of South Carolina Hazards Research Lab. Information was collected from agencies such as The Department of Health and Environmental Control – Office of Ocean and Coastal Resource Management, the Forestry Commission, and the Geologic Survey.

At the May 13 meeting goals, objectives and mitigation actions were distributed to the HMPC for their review (see APPENDIX A, Handouts). The HMPC was directly involved in deciding what goals and actions were needed in order to further hazard mitigation within the County. They reviewed each of the previous goals for completion and established new goals. These goals, objectives and actions were collected at the HMPC meetings, through personal visits and through electronic mail. Through review of the identified hazards was discussed in order to make sure no possible mitigation action was "left out" of the plan. Finally, the staff was informed about the requirements of the updates and a review of all sections of the plan was performed.

Assess Hazards and Vulnerabilities

The next job of the HMPC was to perform a hazard identification, vulnerability assessment and risk assessment for the entire county. This process allowed the committee to analyze the county's greatest hazard threats and to determine its most significant vulnerabilities. GIS data from the County, Hilton Head Island, and state sources was used. The State of South Carolina at the time of this update, had contracted with the University of South Carolina geography department in order to collect the latest information on hazard assessment. That information has been used in this plan. At the first HMPC Meeting held on May 2009, an overview of the planning process was presented to the committee and the committee reviewed the first draft of the Hazard Identification and Vulnerability Assessment. The final assessment was later updated by LCOG staff using the date from the SC Hazard Research Lab. This assessment was reviewed, in turn, by a subcommittee of HMPC members with relevant technical expertise.

Develop a Mitigation Plan

Next, a Capability Assessment Update was performed whereby the existing programs and policies addressing natural hazards were reviewed. A thorough analysis of the adequacy of existing measures was performed and potential changes and improvements were identified. The HMPC reviewed the Capability Assessment at the June 2009 meeting. Additionally each jurisdiction reviewed their capability portion individually and provided the results by electronic confirmation or at individual meetings.

As part of the May, 2009 meeting the HMPC worked to identify goals and objectives for countywide mitigation efforts. These goals represent the county and communities' vision for disaster resistance. The HMPC also reviewed the previous action items, with each community representative being assigned to update his/her portion of previous action list. They were also charged with defining new actions and goals.

Communication was made frequently through electronic means throughout this process. LCOG staff received many of their action list updates through e-mails, but the primary source of updates to the actions and goals was through individual staff meetings and meetings of the entire Planning Committee. They also received updates to other items, and the staff was frequently in contact with community representatives to ensure accuracy.

At the June 19, 2009 meeting the HMPC reported on the status of mitigation actions for implementation. The results were recorded to be reflected in this plan. Furthermore, new mitigation actions were suggested. Everything that could affect hazard event-related damage in the county was considered by the HMPC with special consideration of the National Floodplain Insurance Program (NFIP). The role of LCOG advisors was to ensure not only that relevant activities were considered, but also that the process was not limited to just a few alternatives. LCOG staff informed the HMPC members that they would visit each of them to go over individual considerations in the Hazard Mitigation Plan update. The HMPC also considered the previous goals and objectives of the original plan, and amended them as appropriate at this meeting to create a final list of goals. Status of some sections of the plan such as the Vulnerability and Capability assessments was discussed.

At the August 27, 2009 meeting, the HMPC finalized the goals and actions of the plan, as well as participated in the discussion of prioritization of the actions and goals. Here, standards were set (included in this plan) for the ranking of hazards, goals, and actions based on NFIP standards and a feasibility review of the actions. The HMPC drafted an "action plan" that specifies recommended projects, who is responsible for implementing them, and when they are to be completed. The hazards and their particular ranking were discussed, with the original plan serving as their guide for ranking. Draft elements of the plan were presented to the HMPC for review and comment with particular emphasis on project development and prioritization. LCOG staff also ensured that the HMPC was aware of the need for public meetings and they were assigned the task of scheduling public meetings.

In order to get as much information as possible from the participants, LCOG staff met with the designated representative from each of the jurisdictions:

- Ed Nelson, Assistant Building Codes Director, Beaufort County, 08/06/2009,
- Libby Anderson, Planning Director, City of Beaufort, 08/06/2009;
- Trudie Johnson, Floodplain Administrator, Town of Hilton Head Island, 06/30/2009;
- Linda Bridges, Planning Administrator, Town of Port Royal, 06/26/2009,
- Dick Deuel, Program Manager, Beaufort Jasper Water and Sewer Authority, 09/08/2009.
- John Webber, Disaster Recovery Manager, Beaufort County Disaster Recovery, 09/28/2009

In these meetings, updates to the "action plan" were further discussed. Also an assessment of any updates to the jurisdictions' capability assessment that had not been covered in the HMPC meetings was confirmed. These meetings gave the committee members the opportunity to discuss other concerns that they had with the plan as well as an opportunity to finalize their prioritization scores.

HMPC meeting Number 4 was held on November 19, 2009. Comments were compiled and a Final Draft plan was given to committee members.

It should be noted that this plan recommends mitigation measures that should be pursued. Implementation of these recommendations depends on adoption of this plan by the County Council and each of the municipalities and the cooperation and support of the offices and contacts designated as being responsible for each action item.

Drafts were sent in November to all members of the HMPC. The final meeting was held by the steering committee on December 13, 2009. Here, the members made final comments before the plan was to be sent to SCEMD for review. After the review the LCOG staff made final revisions and sent it in to FEMA.

Documentation for the HPMC meetings can be found in the form of agendas, sign in sheets and meeting notes in the Appendices.

Other Agencies

During the planning process, contacts were made with the following agencies to determine how their programs affect or could support Beaufort County's hazard mitigation efforts:

- Federal Emergency Management Agency (FEMA), Region IV
- South Carolina Department of Natural Resources (SCDNR)
- South Carolina Emergency Management Division (SCEMD)
- University of South Carolina. Hazard Research Lab (SCHRL)
- US Army Corps of Engineers

Each of the agencies will receive a draft of the plan for their review and comment.

Evaluate Your Work

The County will continue to implement the plan and perform periodic reviews and revisions of the plan through on-going HMPC reviews. The HMPC will meet annually to review the plan and will also hold public meetings to garner citizen comment. Specific language on the HMPC's future endeavors to continue to evaluate the plan is included in the Action Plan.

Public Involvement

The public involvement elements of the planning process were addressed through several sets of public meetings.

The first set of public meetings was held on July 23, 2009 at Hilton Head Town Hall (one in the morning and one in the evening). At this meeting the public was given a general overview of Hazard Mitigation and the Hazard Mitigation Plan. Staff explained that there was a need to update the plan and fielded questions and recorded comments from the public. The public was given the option to contribute to the plan by completing a survey that was distributed. The comments at the meetings and the input from the survey were accepted by Hilton Head planning staff, and the input from the public was used in writing this Plan. The survey was also available online at http://www.surveymonkey.com/s/CWR879H. Response was not overwhelming but the reactions to the survey were positive.

The second set of meetings began on October 29, 2009. At this meeting the public was given a brief presentation on the status of the plan. Comments from the public were taken into consideration in order to make any last minute adjustments to the plan. Documentation in the form of public notice can be found in the appendices to this plan.

In order to have a continued commitment to public involvement a meeting is scheduled for January 2010 at the Beaufort County Planning Commission meeting. Staff will explain the updates and take any suggestions for changes to the plan. This will also begin the process of formal adoption by Beaufort County. Also, a version of the plan was placed on the LCOG website on December 10, 2009. Notice of the draft was placed in the Regional Planning agency announcement board and comments were taken until December 18, 2009.

Federal Funding Sources for Mitigation

In preparing the hazard mitigation plan and identifying potential mitigation measures the committee also had to consider potential funding sources for the specified projects. An overview of several federal and state funding sources that can be used for hazard mitigation projects is provided below. Preparations are being made to apply for grants once FEMA approves this update.

FEMA's Hazard Mitigation Grant Program (HMGP) assists states and local communities in implementing long-term hazard mitigation measures following a major disaster declaration. As of November 1, 2004, all communities must have an approved hazard mitigation plan in place to remain eligible for HMGP funding. HMGP grants can be used to fund projects that provide protection to either public or private property. HMGP eligible projects include structural hazard control such as debris basins, floodwalls, or stream restoration, and retrofitting measures such as flood proofing, acquisition, or relocation of structures.

FEMA can fund up to 75 percent of the eligible costs of each project. The State or local match does not have to be cash; in-kind services or materials may be used. Federal funding under the HMGP is based on 7.5 percent of the Federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster. Eligible applicants must apply for the HMGP through the South Carolina Emergency Management Division – Recovery and Mitigation Group.

FEMA's Pre Disaster Mitigation (PDM) **Funds** provide both planning and project funding to eligible communities. PDM project funding is nationally competitive; there is no 'base' amount guaranteed to each state. A national priority is placed on projects that address NFIP repetitive loss properties and a benefit cost analysis is required for each proposed project. Projects are awarded priority based on the state's analysis and resulting ranking, and on factors such as cost effectiveness, addressing critical facilities, and the percent of the population that benefits from the project.

FEMA funds up to 75 percent of the cost of the project, or up to 90 percent for small, impoverished communities. There is a $3 million cap on the federal share of the cost per project. Eligible applicants must apply for the PDM through the South Carolina Emergency Management Division – Recovery and Mitigation Group.

FEMA's Flood Mitigation Assistance Program (FMA) provides grants to states and communities for planning assistance and mitigation projects that reduce the risk of flood damage to structures covered by flood insurance. The types of grants available include planning and project assistance. FMA monies are available to eligible applicants when a Flood Mitigation Plan has been developed and FEMA has approved it.

FEMA may contribute up to 75 percent of the total eligible costs. At least 25 percent of the total eligible costs must be provided by a nonfederal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. There are limits on the frequency of grants and the amount of funding that can be allocated to a State or community

in any 5-year period. The South Carolina Department of Natural Resources (SCDNR) serves as the administrator of the planning and projects portions of the grant. The State's FMA Coordinator is within the Land, Water and Conservation Division of SCDNR. The agency's web page is www.dnr.state.sc.us.

Continuing Authorities Program (CAP) initiates a short reconnaissance effort to determine Federal interest in proceeding. If there is interest, a feasibility study is performed, and then the project might move on to a plans and specifications phase. Finally, the project goes to its construction phase. A local sponsor must identify the flood-related problem and request USACE Assistance. Small flood control projects are also eligible.

The cost share for the CAP is 65% USACE and 35 % local. The federal project limit is $7,000,000. The USACE's Charleston District office would review the local sponsor's request for assistance and would request funds from the USACE's annual appropriations.

USACE's Floodplain Management Services Program aims to support comprehensive floodplain management planning to encourage and guide sponsors to prudent use of the Nations' floodplains for the benefit of the national economy and welfare. Some examples of the types of projects that would be funded include:

- flood warning and flood emergency preparedness
- floodproofing measures
- studies to improve methods and procedures for flood mitigating damages
- preparation of guides and brochures on flood-related topics

A local sponsor must identify a problem and request USACE assistance under the Floodplain Management Services Program. The USACE may provide up to 100% of funding at the request of the sponsor. The USACE's Charleston District's office would review the local sponsor's request for assistance and determine if it fits within the program.

Department of Housing and Urban Development's (HUD) Community Development Block Grant - Disaster Recovery Initiative (DRI) program provides flexible grants to help cities, counties, and States recover from Presidentially-declared disasters, especially in low-income areas. Since it can fund a broader range of recovery activities than most other programs, the DRI helps communities and neighborhoods that otherwise might not recover due to limited resources.

When disasters occur, Congress may appropriate additional funding for the Community Development Block Grant and as DRI grants to rebuild the affected areas and bring crucial seed money to start the recovery process. Grantees may use DRI funds for recovery efforts involving housing, economic development, infrastructure and prevention of further damage, if such use does not duplicate funding available from the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Examples of these activities include:

- buying damaged properties in a flood plain and relocating them to safer areas;
- relocation payments for people and businesses displaced by the disaster;

- debris removal;
- rehabilitation of homes and buildings damaged by the disaster;
- buying, constructing, or rehabilitating public facilities such as water and sewer systems, streets, neighborhood centers, and government buildings;
- code enforcement;
- planning and administration costs (limited to no more than 20 percent of the grant).

HUD notifies eligible governments, which must then develop and submit an Action Plan for Disaster Recovery before receiving DRI grants. The Action Plan must describe the needs, strategies, and projected uses of the Disaster Recovery funds.

Certified Local Government (CLG) **Grants** are available for historic preservation through the **State Historic Preservation Office** (SHPO) which is part of the **South Carolina Department of Archives and History** (SCDAH). Although the funding for this program is administered by state, the funding is allocated by the U.S. Department of the Interior. Ten percent of the total federal appropriation to the State Historic Preservation Office's is awarded annually to Certified Local Governments (CLGs). The City of Beaufort and the Town of Bluffton are both Certified Local Governments and are thus eligible for this funding source. The grants can be used for projects related to historic structures and preservation, and requires matching funds (50/50 share) with awards generally ranging from $1,500 to $25,000. Historic Preservation projects often overlap with hazard mitigation efforts and include Identifying, Recording and Recognizing Historic Properties; Planning for Historic Districts and Multiple Historic Properties; Building Stabilization Projects; Planning for Individual Historic Properties; Preservation Education; and Strengthening Local Government Historic Preservation Programs.

The **SHPO** also administers the **State Development ("Bricks and Mortar") Grants** which can be used for stabilizing historic buildings and structures, or protecting historic buildings and structures from the adverse effects of the weather. Eligible applicants include local governments, nonprofit organizations applying for the grants for buildings or structures that are listed in the National Register of Historic Places or eligible for the National Register and have a planned or current public use. The grants are reimbursable, have a 50/50 cost match requirement and generally range from t$5,000 to $20,000. The SHPO's website is located at www.state.sc.us/scdah/histrcpl.htm.

2. Hazard Identification and Profiles

Introduction

Beaufort County performed a Hazard Identification to determine the hazards the County faces. The hazard identification section describes each hazard, describes the extent of severity of each hazard, provides the previous occurrences of hazards and describes the probability of future occurrences of each hazard based on historical data. While each hazard is described in narrative form, with its corresponding probability also included, Table 2-13 serves a quick reference guide that shows the annual probability, the hazard and the jurisdictions affected. The results were presented to the Committee members for review and data and additional events were added.

To perform this process existing sources of hazard frequency data were consulted including Flood Insurance Rate Maps (FIRMs), FEMA publications, Department of Agriculture Forest Service wildfire risk maps, USGS earthquake and landslide risk maps, storm surge mapping developed by the USACE, State of South Carolina erosion information, and wind and climatic data. Additionally historical hazard events were researched through publications as well as state and federal agency information provided on the internet to determine their effects on the County and their probability of recurrence. Since it is the most recent and deemed to be most reliable the information from the SC Hazard Research Labs was the primary information source for profiling hazards in Beaufort County. Unless otherwise noted these are the authoritative information sources for this planning document.

Finally flood insurance policy information was obtained from the state. The Hazard Identification process was used to identify those hazards that pose the greatest risk to the County and warrant further analysis through the vulnerability assessment. The hazard identification section describes each hazard, describes the extent of severity of each hazard, provides the previous occurrences of hazards and describes the probability of future occurrences of each hazard. Because of the County's geographical situation it can be expected that the County is almost equally vulnerable to hazards throughout. However, areas nearer the coast or closer to water and described by the FIRM as being in a flood zone are more susceptible to flooding and hurricane hazards.

For purposes of this plan, when "Beaufort" or "Beaufort County" is used, that is generally used to refer to the County and all municipalities in the County. Over all, all municipalities are affected the same in terms of probability and vulnerability by each hazard. If there is a notable or meaningful difference between jurisdictions, it is noted specifically such as Hilton Head Island and beach erosion.

Hurricanes, Tropical Storms

Hurricanes and tropical storms, as well as tropical depressions, are all tropical cyclones which are defined by the National Weather Service's National Hurricane Center (NHC) as *warm-core non-frontal synoptic-scale cyclones originating over tropical or subtropical water with organized deep convection and a closed surface wind circulation about a well-*

defined center. According to the NHC, once they have formed, tropical cyclones maintain themselves by extracting heat energy from the ocean at high temperatures and releasing heat at the low temperatures of the upper troposphere. Hurricanes and tropical storms bring heavy rainfall, storm surge, and high winds, all of which can cause significant damage. These storms can last for several days and therefore have the potential to cause sustained flooding, high wind, and erosion conditions.

These types of storms are classified using the Saffir-Sampson Hurricane Scale which was developed by Herbert Saffir and then director of the National Hurricane Center, Robert Simpson. The scale rates the intensity of hurricanes based on wind speed and barometric pressure measurements and is used by the National Weather Service to predict potential property damage and flooding levels from imminent storms. Although the scale assigns a wind speed and surge level to each category of storm, in recent years, there has been more and more recognition of the fact that wind speed, storm surge and inland rainfall are not necessarily of the same intensity for a given storm. Therefore, there is some interest in classifying hurricanes by separate scales according to each of these risks. However, the Saffir-Sampson Scale is still the most widely used classification tool for hurricanes. The scale is presented in Table 2-1.

Northeasters are extratropical storms occurring during the period from late fall to early spring that affect the east coast of the U.S. Low pressure systems develop off the east coast that lead to storms that bring strong northeast winds, heavy rains/precipitation and storm surge to coastal areas. Although northeasters' winds and storm surge might be less intense than that of hurricanes, northeasters can hover for several days over a given area. This kind of long duration storm allows larger accumulations of precipitation as well as more damage to structures as they are exposed to wind and flooding for long periods of time. Additionally, the long duration of northeasters typically leads to wide spread coastal change through erosion and accretion along the shoreline.

Past Occurrences of Hurricanes

Hurricane track data gathered from the South Carolina State Hazard Assessment (performed by the South Carolina Emergency Management Division in conjunction with the University of South Carolina Hazards Research Lab) indicates that from 1850 to 2008, 20 storms passed directly through Beaufort County[1]. These included tropical storms, tropical depressions, subtropical storms, subtropical depressions and extratropical storms[2]. Figure 2-1 illustrates the storm paths within the County. Hurricane tracks are shown in pink and all other storm tracks are shown in blue.

[1] The data is from the SCHRL; older data was taken from NOAA Coast Services Center and reflected 24 storms.
[2] At some point, all of these storms were tropical cyclone storms of at least tropical depression grade.

Table 2-1. Saffir-Sampson Scale and Typical Damages

CATEGORY	SUSTAINED WIND SPEEDS (MPH)	SURGE (FT)	PRESSURE (MB)	TYPICAL DAMAGE
Tropical Depression	<39	--	--	
Tropical Storm	39-73	--	--	
Hurricane 1	74-95	4-5	> 980	*Minimal* – Damage is done primarily to shrubbery and trees, unanchored manufactured homes are damaged, some signs are damaged, no real damage is done to structures on permanent foundations.
Hurricane 2	96-110	6-8	965-980	*Moderate* – Some trees are toppled, some roof coverings are damaged, major damage is done to manufactured homes.
Hurricane 3	111-130	9-12	945-965	*Extensive Damage* – Large trees are toppled, some structural damage is done to roofs, manufactured homes are destroyed, structural damage is done to small homes and utility buildings.
Hurricane 4	131-155	13-18	920-945	*Extreme Damage* – Extensive damage is done to roofs, windows, and doors; roof systems on small buildings completely fail' some curtain walls fail.
Hurricane 5	> 155	> 18	< 920	*Catastrophic Damage* – Roof damage is considerable and widespread, window and door damage is severe, there are extensive glass failures, some buildings fail completely.

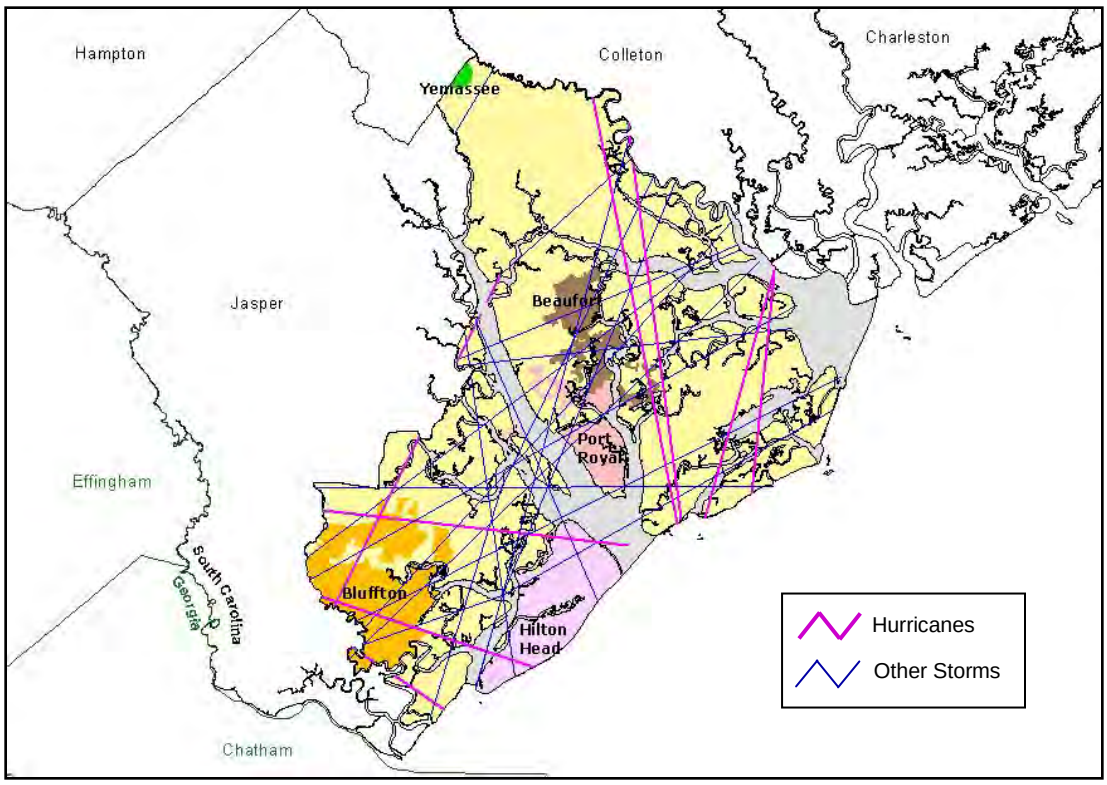


Figure 2-1. Storm Tracks Passing through Beaufort County, 1850-2008

A summary of the types and numbers of hurricanes and other storms is provided in Table 2-2. The data included in that table represents that data from the coastal services center of the original plan. Because of the disparity in this data, it is evident that there are some limitations on its meaning. However, it is evident that hurricanes and tropical storms represent a major threat to Beaufort County.

Table 2-2. Storm Tracks Passing through Beaufort County 1850-2008

TYPE OF STORM	QUANTITY	NAMED[1]
Hurricane – Category 3	1	
Hurricane – Category 2	2	
Hurricane – Category 1	5	
Tropical Storm	10	
Tropical Depression	2	1 - occurred prior to naming convention 1 – Yes
Subtropical Storm	1	No
Subtropical Depression	1	Yes
Extratropical Storms	2	Both Named

[1] If storm with a grade of Tropical Depression or lower was named, at some point it was classified as a Tropical Storm and/or Hurricane.

Hurricanes that pass in relatively close proximity to Beaufort County can also have an impact upon Beaufort County. Therefore, an analysis of storms passing through or within 50 miles of the County was also performed. Results of this analysis are presented in Table 2-3.

Table 2-3. Storm Tracks Passing within 50 miles of Beaufort County 1850-2006

TYPE OF STORM	QUANTITY
Hurricane – Category 4	2
Hurricane – Category 3	3
Hurricane – Category 2	5
Hurricane – Category 1	15
Tropical Storm	39
Tropical Depression	7
Subtropical Storm	3
Subtropical Depression	2
Extratropical Storms	5

Figure 2-2 shows the locations of the storm tracks within 50 miles of the County. Hurricanes tracks are shown in red. Tropical, subtropical, and extratropical storm paths are shown in blue.

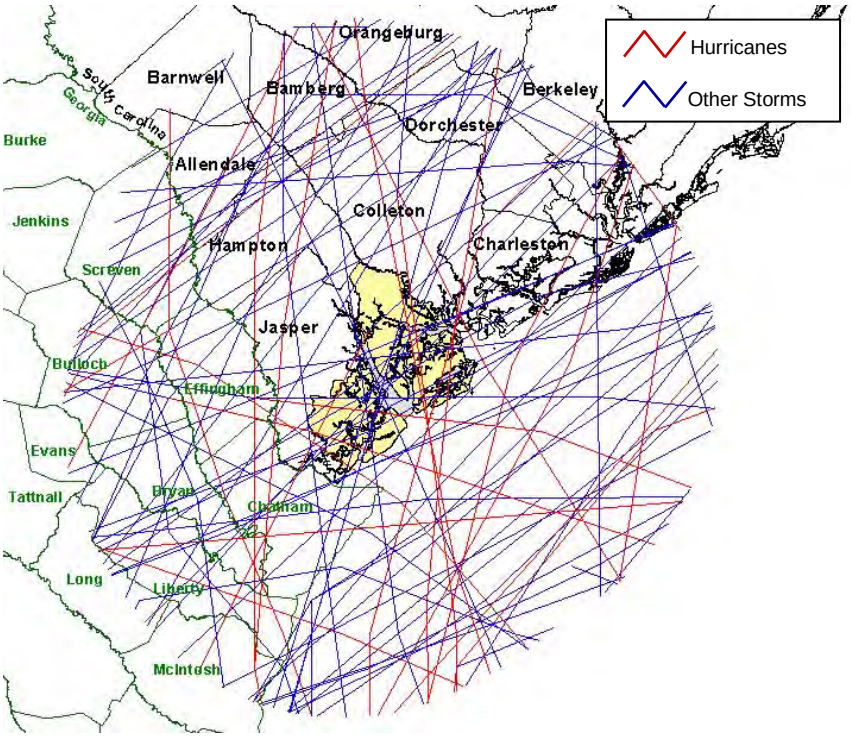


Figure 2-2. Storm Tracks through and within 50 miles of Beaufort County, 1850-2006

According to the County's Flood Insurance Study, the major storms that have effected or caused significant damage in Beaufort County include hurricanes that hit on September 7, 1804, August 7, 1854, and August 27, 1893. Additionally, on October 11, 1902 an extratropical storm hit Beaufort County. The storm had been a hurricane but was downgraded to an extratropical storm when it reached South Carolina. On August 11, 1940, a hurricane made landfall between Savannah and the City of Beaufort. On October 19-20, 1944 a Tropical Storm passed through Beaufort County bringing heavy rains. Hurricanes Cindy and Gracie hit South Carolina in 1959. Gracie made landfall in Beaufort County on September 29. Hurricane Donna moved off the South Carolina coast 50 to 70 miles from the Beaufort shore in September 1960. In 1979, Hurricane David hit the south coast of South Carolina, and in 1985, Hurricane Bob's center made landfall on Fripp Island. In addition to these storms, another noteworthy storm that affected the state of South Carolina in September 1989 was Hurricane Hugo. While northeaster storms also present a significant threat to the Beaufort County and particularly to its coastline there is not as much documented information about these storms suggesting that historically hurricanes have caused more damage in the county.

The following past storms have been documented to help predict the occurrences of future storms:

September 1804

A hurricane moved inland between Savannah, Georgia and Charleston, South Carolina on September 7 and caused severe damage along the coastline of both states. The center of the storm stayed along the inland side of the coastline and passed over the City of Beaufort. Records indicated that this storm caused over 500 persons to drown in South Carolina and severely impacted the state's economy.

August 1854

The center of this hurricane passed about 20-25 miles southeast of Beaufort County changing from a Category 3 storm to a Category 1 storm as it made its way over land. It approached the coastline from a south-southeasterly direction bringing winds that caused significant storm surge as they drove waters inland from the ocean into the tidal estuaries and over the tidal lowlands of Beaufort County.

August 1893

This hurricane went from a Category 3 to a Category 2 hurricane as its center approached the north Georgia coastline. The center of the hurricane passed 10-15 miles west of southern Beaufort County. The hurricane approached the coastline from the southeast and thus caused extensive storm surge along the coast. Surge levels on the North Georgia and lower South Carolina coasts reached up to 19.5 ft NGVD at Savannah Beach in Georgia, and 8.9 ft NGVD in Charleston. It is estimated that over 1,000 people along the coastal islands and lowlands from northern Georgia to Charleston, South Carolina died as a result of this storm.

October 1902

A hurricane moving from the Gulf of Mexico became an extratropical storm as it passed over Beaufort County bringing 3.4 inches of rain to the County during a 12 hour period on October 10 and 11, 1902.

August 1940

This Category 1 hurricane came from the southeast and made landfall in Beaufort County on August 11, 1940. Winds from the hurricane created surge in Beaufort's tidal estuaries and caused the Beaufort River to leave its banks and reach a height of 14.2 ft NGVD. In the Broad River on Lemon Island, a surge level of 16 ft NGVD was recorded. On outlying islands including St. Helena, Hilton Head, Daufuskie and Pinckney, flood levels reached 10 ft NGVD.

In Beaufort City, every wharf along the Beaufort River was damaged or destroyed and the business district was flooded to depths of 2 to 3 feet. On Ladies Island, flooding caused the deaths of 8 people. Severe damage was also reported on the outlying islands of St. Helena, Hilton Head, Daufuskie, and Pinckney where numerous homes were damaged or destroyed, several hundred people were left homeless, and 25 people lost their lives. At Hunting Island, severe beach erosion was reported causing the beach line to recede up to 100 feet. This hurricane caused the deaths of 34 people in all and damage estimated at $6.6 million (1940 costs).

October 1944

This storm passed through Beaufort County as a tropical storm on October 19-20, 1944 and brought heavy rains to the area. The storm center's track shows the storm entered southern Beaufort County at Daufuskie Island and traveled northwest tracing a long path through the County and entering into Colleton County north of the Williman Islands (St. Helena Sound Heritage Preserve). Damage estimates from the storm were fairly low with a property damage of approximately $200,000 and crop damage estimated at approximately $150,000 (1944 costs).

Hurricane Cindy – July 1959

Hurricane Cindy came ashore from the southeast into Charleston County as a Category 1 storm with winds of 75 mph. The eye of the storm was located near McClellanville, about 50 miles northeast of Beaufort County, when it made landfall. Cindy caused one death, high tides and considerable flash flooding.

Hurricane Gracie - September 1959

Hurricane Gracie came from the southeast and caused storm surge to reach between 7.3 and 11.9 ft NGVD at Edisto Beach (just north of Beaufort County at the border of coastal Colleton and Charleston Counties). The hurricane's center track went through St. Helena Sound and made landfall just northeast of Beaufort County in Colleton County. The hurricane was downgraded from a Category 4 to a Category 3 storm as it made landfall. Severe damage was reported from the City of Beaufort northward to Charleston including damage caused by fallen trees and crop damage. Considerable precipitation as well as several

tornadoes resulted from the storm. The total storm damage was estimated at $14 million (1959 costs).

Hurricane Donna – September 1960

Hurricane Donna was a Category 2 storm that passed offshore of Beaufort County moving parallel to the coastline. The hurricane was reportedly 50-70 miles from the coastline, but resulted in squalls and gale force winds along the coast. No significant damage or casualties were reported for this storm.

Hurricane David – September 1979

David made landfall as a Category 1 storm well south of Beaufort in McIntosh County, Georgia after causing severe destruction in the Caribbean. The storm had winds of up to 85 mph and its center passed within 6-7 miles of southern Beaufort County on September 4 causing minor to moderate damage and significant beach erosion.

Hurricane Bob – July 1985

The center of Hurricane Bob made landfall on Fripp Island in Beaufort County as a Category 1 Storm on July 25 and moved northwestward through the county. There was minimal damage associated with the storm and no deaths as a direct result.

Hurricane Hugo – September 1989

While Hurricane Hugo, which made landfall on the South Carolina coast on September 22, 1989, was the first major hurricane to hit the South Carolina coast since Hurricane Gracie, and the strongest hurricane to ever make landfall in the state (It was a Category 4 storm when it made landfall in Charleston County with sustained winds of 135 mph.), it did not cause significant damage in Beaufort County. However, a hurricane evacuation warning was issued in the county leading to a loss of revenue for many businesses particularly in resort areas including Hilton Head Island. Twenty-four (24) counties in South Carolina, including both Colleton and Charleston Counties located just north and northeast of Beaufort County, were Presidentially-declared disaster areas, and damage estimates for the state as a result of the storm were estimated at approximately $5.9 billion (1989 costs) (source: USACE – Charleston District).

Hurricane Bertha – July 1996

Hurricane Bertha came close to the south coastal counties of South Carolina, but did not cause any significant damage. The maximum sustained winds (36kts) and peak gust (50kts) both occurred at the Charleston City Office on 7/12/96. Bertha's most significant impact was on tourism where the estimated loss revenue approached $20,000,000. Near eleven (11) million dollars of that was in Beaufort/Hilton Head area. A few places along the Charleston coast experienced moderate beach erosion.

Hurricane Floyd – September 1999

Hurricane Floyd weakened to a category three hurricane as it approached the southeast Georgia and southern South Carolina coasts on the morning of September 15th.The storm brushed the area

during the late afternoon and evening as it took a more north and northeast course toward North Carolina. Sustained winds of tropical storm force were reported from Savannah on the southeast Georgia coast to Charleston on the South Carolina coast with wind gusts to hurricane force in the Charleston area. The highest sustained wind speed was 58 mph at the downtown Charleston office, which also had the highest gust (85 mph). In general, 3 to 5 inches of rainfall was reported across the area. Tides were 3.5 feet above normal with a maximum tide height 10.66 ft. ASL (7.71MLLW) at downtown Charleston. Minor to moderate beach erosion occurred along the South Carolina coast. Many businesses and homes suffered major damage with thousands of homes suffering at least minor damage in Charleston county, where 10.5 million dollars in damage was reported. Beaufort county reported 750,000 dollars damage with Berkeley and Dorchester counties reporting 500,000 dollars each. Well over a thousand trees were down, which contributed to over 200,000 people across south coastal South Carolina being without power at times on the night of September 15. There were sporadic reports of roofs being torn from homes or businesses across the area.

Past Occurrences of Tropical Storms

Recorded data show only 55 tropical storms passing in or near Beaufort County between 1850 and 2006, but that number is likely to be unrepresentative of the true number of events, as a result of limited record-keeping in the earlier years. During the period from 2000 to 2008, only 11 tropical storms were recorded that impacted Beaufort County. However they caused only minor property damage, the largest amount being the erosion at Hunting Island in August 2008.

Future Probabilities of Hurricanes

Based on the frequency of past events, the occurrence of future events can be predicted. From Table 2-2, the center of eight hurricanes, one of which was a Class 3 hurricane, has passed directly through Beaufort County since 1850. Table 2-3 shows that the centers of an additional 17 hurricanes have passed within 50 miles of Beaufort County. This includes two Category 3 and two Category 4 storms. That data reflects the NOAA Coastal Services Center data from the original plan.

In order to estimate the frequency of occurrence, the number of hurricanes is compared to the length of the period of record which is from 1850-2008 and is 158 years. The recurrence interval is defined from this information and is a rough estimate of the amount of time, on average, during which one occurrence of a given storm will take place. It is important to note that in reality a storm can occur multiple times during one recurrence interval and that the recurrence interval is only an estimated average time period. Recurrence intervals for hurricanes and tropical storms within and in the vicinity of Beaufort County are presented in Table 2-4 included as a reference.

The SC Hazard Research Lab reports 20 such events in the same period of time. Using this data as the authoritative source for this planning document, an annual percent chance of a hurricane of 12.66 percent is calculated for hurricanes for Beaufort. Taking into account both the updated data and that data from the original plan hurricanes are still considered a significant hazard—especially considering Beaufort's proximity to the Atlantic Ocean.

Table 2-4. Estimated Recurrence Intervals of Hurricanes and Tropical Storms within 50 miles of Beaufort County

Storm Type	Number of Occurrences With Center of Storm Track Within 50 miles of Beaufort County	Recurrence Interval (years)	Number of Occurrences With Center of Storm Track In Beaufort County	Recurrence Interval (years)
Tropical Storm	39	4	10	15
Category 1	15	10	5	30
Category 2	5	30	2	76
Category 3	3	50	1	151
Category 4	2	76	no record	----------
Category 5	no record	----------	no record	----------
Tropical Storms and All Hurricanes	64	2	18	8

Another source of hurricane frequency prediction is the Forecast of Atlantic Seasonal Hurricane Activity which is performed annually by the members of the Colorado State University Hurricane Forecast Team, including Dr. William Gray. The forecasts include individual monthly predictions activity and seasonal and monthly U.S. hurricane landfall probabilities. The prediction varies annually based on several atmospheric and oceanic factors and is available through the team's website at typhoon.atmos.colostate.edu/forecasts.

Past Occurrences of Nor'Easters

Major nor'easters that affected much of the East Coast occurred during March 1962 (the Ash Wednesday Storm), October 1991 (Halloween Storm), December 1992, March 1993, and January 1998. Records indicate that these storms generally had more of an effect on storm surge and flooding further north in the mid-Atlantic and northeast United States. The Ash Wednesday storm affected the coast from North Carolina to New England, just missing South Carolina. The effects of the Halloween Storm were felt along the mid-Atlantic and northeast coast as well as the north Atlantic Ocean.

The January 1998 Nor'Easter did have a direct effect on the County. It brought heavy rainfall in Beaufort County causing significant roadway flooding. There were also reports of standing water more than a foot in height in yards throughout the County.

The March 1993 storm caused high winds along the southeastern coast of the United States resulting in damage along beachfront and coastal properties. In Beaufort County, wind and storm surge destroyed the downtown Beaufort Marina and damaged or destroyed approximately 2 dozen boats in the marina. Throughout the county, drainage ditches filled with debris carried by wind and floodwater which led to more severe flooding. On Fripp and Harbour Island, residents lost electricity for a week when salt water flooding led to the damage of transformers.

Additionally, two storms occurred in October 1994 causing serious flooding as the slow-moving storms dropped several inches of rain on the county. A storm that occurred on October 3, 1994 dumped approximately 11.5 inches of rain on the county in a 24-hour period resulting in flash and coastal flooding. Many structures were damaged by floodwaters including an estimated 147 homes. Approximately 37 roads were washed out. Hilton Head Island was reportedly the hardest hit. A storm on October 13, 1994 led to flash and coastal flooding along the South Carolina coast with the southern counties being particularly hard hit. Runoff volumes were high and flooding was especially bad due to antecedent conditions; previous rainfall in the area had left the ground saturated. Beach erosion was reported at several locations along the coast as a result of this storm including a loss of an estimated 200,000 cubic feet of sand along Hilton Head Island. Conservative estimates for Beaufort County indicate that 218 residences and 15 businesses were damaged as well as wastewater treatment plants. Roadway flooding was also reported and the State Highway 21 Bridge over Whale Branch was closed. There is no data specifically for Nor'easters, but these storms are considered a serious threat to the entire County, along with hurricanes and other storms.

Flooding

Beaufort County is located along the Atlantic coast in southern South Carolina and is bordered by Jasper County to the west; Colleton County to the north, and Chatham County to the south. Beaufort, along with the three surrounding counties Colleton, Hampton and Jasper, is part of the *Low Country* of South Carolina; the highest elevation in Beaufort County is approximately 50 feet NGVD 29 (National Geoditic Vertical Datum of 1929) above sea level in its northern inland area. The County is located on the low coastal plain and is comprised partially of tidal marshes and swamps. Several waterways flow through the County and ultimately into the Atlantic Ocean along Beaufort's coast. Figure 2-3 shows Beaufort County and its waterways. Beaufort County is highly susceptible to storm surge and coastal erosion along the Atlantic Ocean shoreline due to the relentless wave action along the coastline and the coastal currents. Storm surge is a large dome of water formed by winds moving across large open bodies of water. Storm Surge is also affected by low pressure systems which add to the storm surge effect by pulling on the surface of the water. Storm surge threatens coastal areas as winds drive it towards the shoreline and can reach heights of 20 feet and be 50–100 miles wide. The county's flood vulnerability is also heightened by the fact that the county consists of low-lying land areas, including marsh areas adjacent to many of its waterways and wide relatively flat outlets where its streams and rivers meet the ocean.

A series of sea islands including both barrier islands and erosion remnant islands are within Beaufort County. Barrier islands are located in the ocean and are the first areas of the county to be affected by seaborne storms. The origin of their existence is debated but is generally believed to be due to accretion along sand bars or possibly due to the retreat of the ocean during the Ice Age combined with the effects of glacier meltdown. Barrier islands generally are prone to erosion along their northern ends and accretion along their southern portions. Fripp and Hunting Islands are barrier islands.

Erosion remnant islands are believed to be remnants of land that was once above sea level before Ice Age glaciers melted and raised the sea level. St. Helena and Port Royal Islands are erosion remnant islands. Hilton Head Island is actually a combination of the two types of

islands. Broad Creek divides the northern erosion remnant island from the southern barrier island that have been fused together.

While a few of the County's numerous waterways are rivers with sizeable watershed drainage areas, most of them are tidal estuaries. The Combahee and Pocotaligo Rivers both have significant drainage areas. The Combahee River forms the northern border of Beaufort County. The Pocotaligo forms part of the border between Beaufort and Jasper Counties and empties into the tidally influenced Broad River. Some of the major tidally influenced water bodies within the County include: the Broad River which divides the northern portion of the County from the southern portion; Beaufort River which flows along the eastern edge of the City of Beaufort and the Town of Port Royal; the Coosaw River which flows in an easterly direction and empties into St. Helena Sound; the Chechessee and Colleton Rivers in the southern portion of the County; Calibogue Sound and Skull Creek which separate Hilton Head Island from the mainland of the County; and May, Cooper, and New River in the southwestern Beaufort County.

The County's Flood Insurance Rate Maps (FIRMs) show that an estimated two-thirds (approximately 400 square miles) of the County's land mass lies within the 100-year floodplain or Special Flood Hazard Area (SFHA). Within Beaufort County the SFHA consists of A zones and V zones. The National Flood Insurance Program (NFIP) uses these general labels to mark areas subject to riverine and inland flooding (A zones) and coastal flooding (V zones) where flood hazards include velocity flows, wave action and erosion.

Most of the SFHA is designated as an AE zone. The NFIP uses this label for riverine/inland areas of the SFHA where base flood elevations (BFEs) or the elevations of the 100-year floodplain are determined. In Beaufort County within much of this AE zone floodwater levels are controlled by tidal influences and storm surge levels. Beaufort County also has areas designated as VE zones, or Coastal High Hazard Areas. VE zones are parts of the SFHA that are prone to velocity/wave action at least 3 feet in height during a 100-year flood. The wave action that occurs during flooding in these zones generally causes more severe damage to structures and erosion than what is experienced in nearby A zones or in areas of riverine flooding. Several VE zone areas are found along the coast within the County. Figure 2-4 shows the Floodplain Zones within Beaufort County. Elevations of flood depth within the County range from 22 ft NGVD within VE zones on Hilton Head Island to 8 ft NGVD in inland areas of the northern county.

Some coastal areas of the County are designated Coastal Barrier Resources Protection Act (CoBRA) zones. CoBRA was passed by Congress in 1982 to protect undeveloped environmentally-sensitive coastal lands. This designation protects natural resources and minimizes the loss of life and property damage caused by development in high risk areas. Designated CoBRA zones are undeveloped coastal barrier systems. Within CoBRA zones, no federal financing is available. Federally backed flood insurance is not available if the structures are new or substantially improved after October 1, 1983.

Although there is not a specific NFIP designation for them, areas called Coastal A zones exist in coastal communities like Beaufort County. They appear as A or AE zones on the

community's FIRMs, and are located adjacent to V zones. These areas are subject to some of the same flood hazards as V zones, including the effects of waves and velocity flow, but the magnitude of these effects is less. This is noteworthy because structures located in A zones adjacent to V zones often experience more extensive damage as a result of these effects than those in non-coastal A zones (FEMA, *Coastal Construction Manual*, 2000, Ch. 3). Generally, coastal A zones are defined as areas that are prone to velocity/wave action of 1 ½ - 3 feet in height during a 100-year flood.

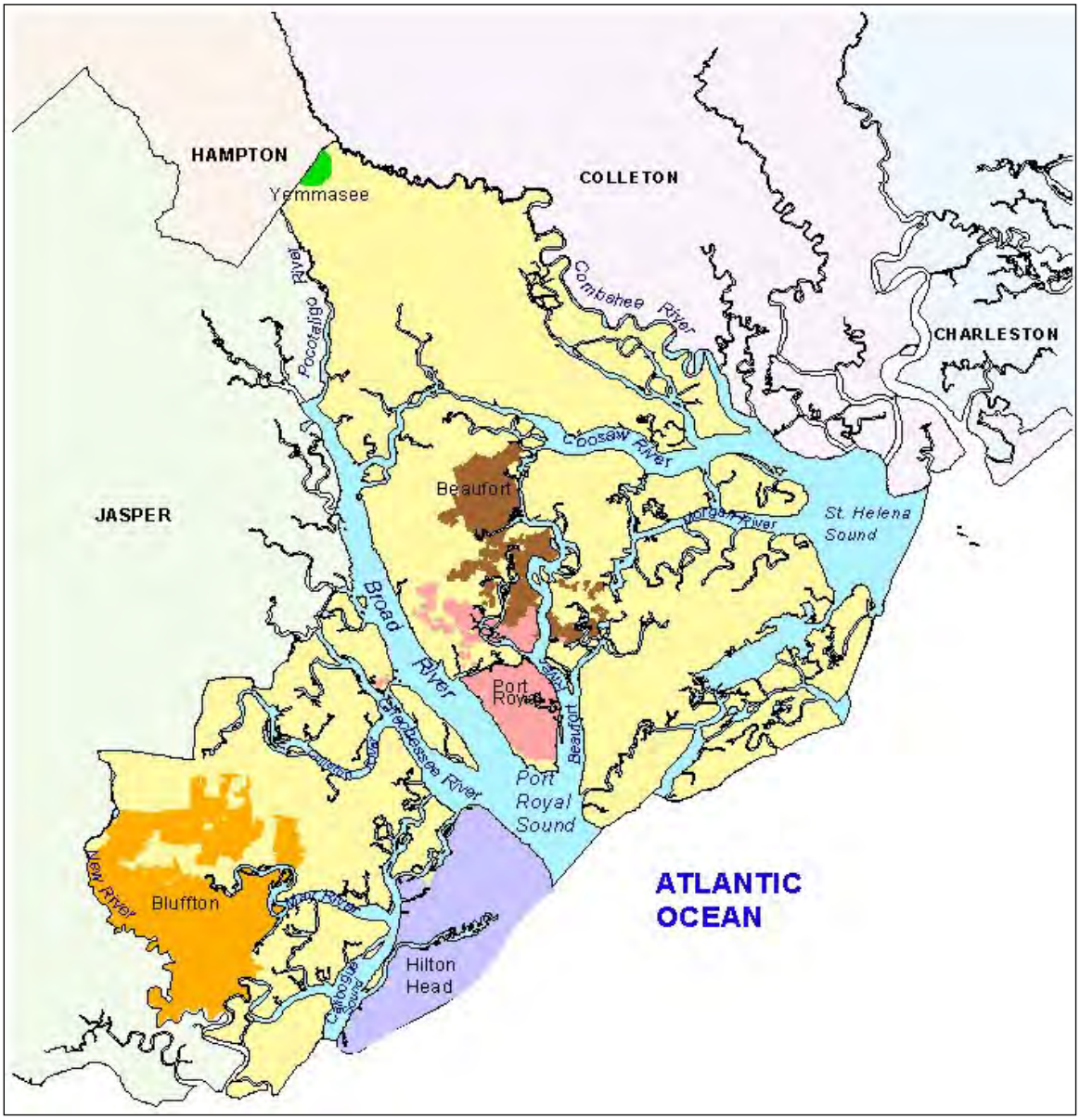


Figure 2-3. Beaufort County Waterways

Past Occurrences of Flooding

Data used to perform the State's risk assessment, which was processed by the University of South Carolina's Hazards Research Lab (HRL) and gathered from the National Climatic Data Center (NCDC) indicates that between 1950 and 2008, 25 floods occurred in Beaufort County. Combined the 25 floods caused a total of $26 million in property damage and $50,000 in crop damage. No fatalities or injuries were reported as a result of the floods.

Beaufort County is susceptible to flooding caused by hurricanes, tropical storms and coastal storms such as nor'easters. According to the community's Flood Insurance Study, major storms and hurricanes caused severe flooding in 1787, 1804, 1893, 1940, and 1959. The highest storm surge recorded was for the August 11, 1940 hurricane event for which flood heights reached 14 ft NGVD 29.

Future Probabilities of Flooding

Storm surge can be modeled by various techniques; one such technique is the use of the National Weather Service's (NWS) Sea, lake and overland surges from hurricanes (SLOSH) model. The model is used to predict storm surge heights based on hurricane category 4.

The SLOSH maps indicate that for a Category 1 Hurricane a significant portion of the County including the majority of Hilton Head Island, much of Port Royal, and portions of the City of Beaufort and Bluffton, would be inundated. Unincorporated areas including Fripp Island and the eastern portion of the Sheldon area would also be inundated by a Category 1 storm. As the Category of the hurricane increases more land area becomes inundated until in the case of a Category 5 storm there are only pockets of land that are not inundated including some land within and adjacent to Bluffton and an area located partially within the City of Beaufort and partially to its northwest (Gray's Hill). Storm surge is a major component of northeaster storms along the East Coast of the U.S. Because winds are moving from a north and/or eastward position winds move across the ocean towards shore and form large waves.

According the data from the SC Hazard Research Laboratory the percent chance per year or Hazard Frequency of a flood is 42.37 percent.

Figure 2-6 shows results from the SLOSH model for the northern and southern parts of Beaufort County respectively. Surge inundation areas are classified based on the category of hurricane that would cause flooding.

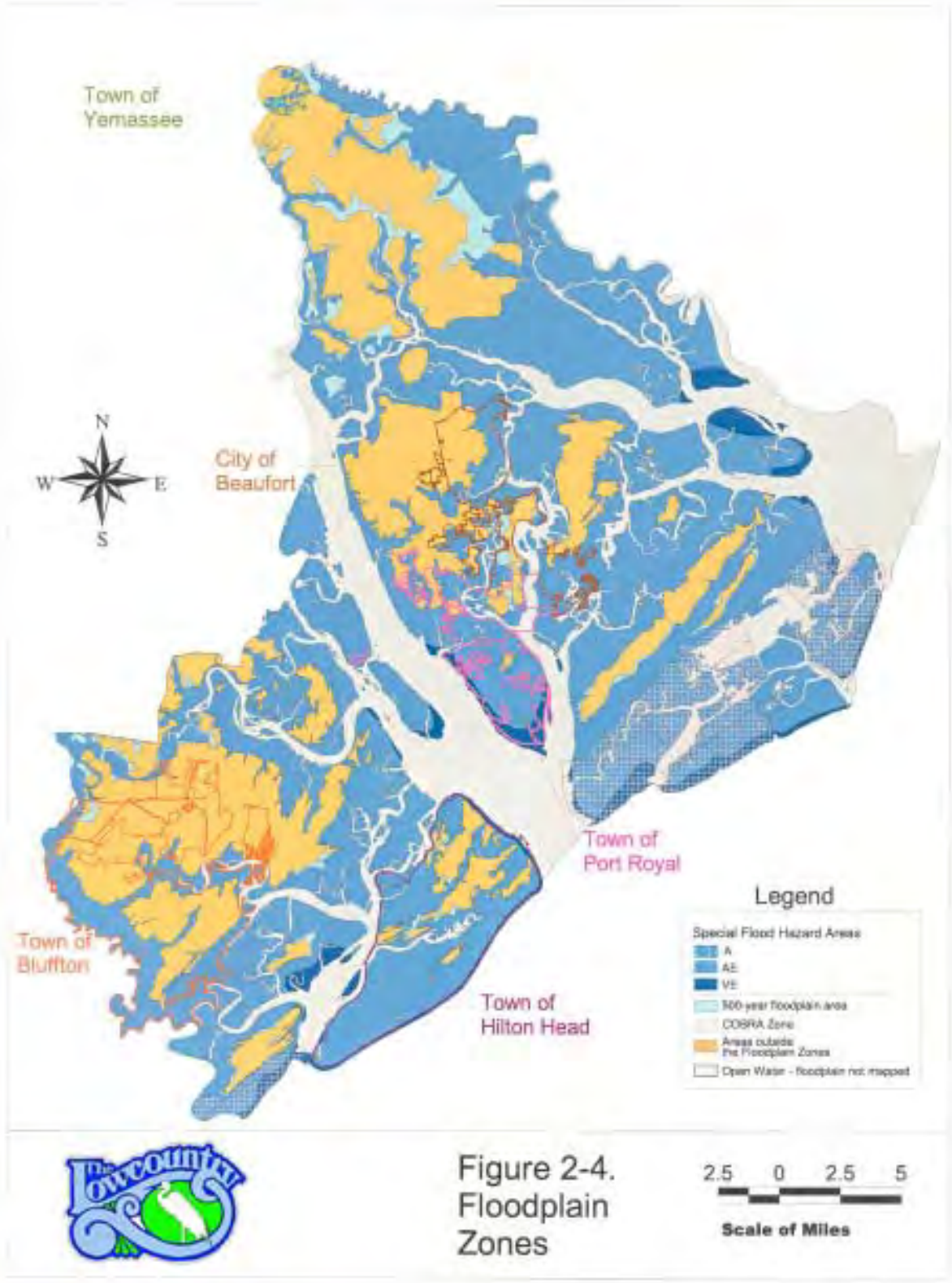


Figure 2-4. Floodplain Zones

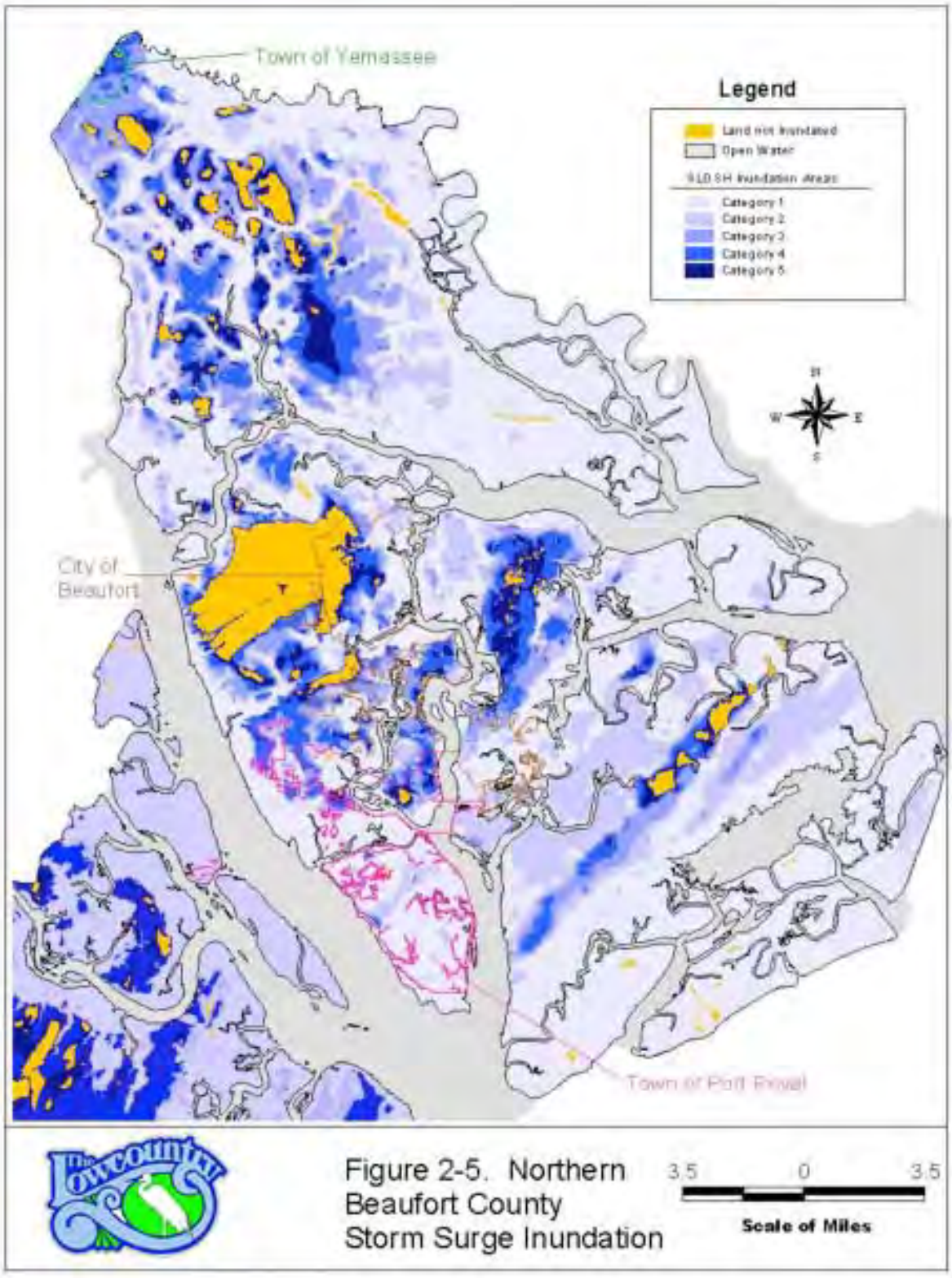


Figure 2-5. Northern Beaufort County Storm Surge Inundation

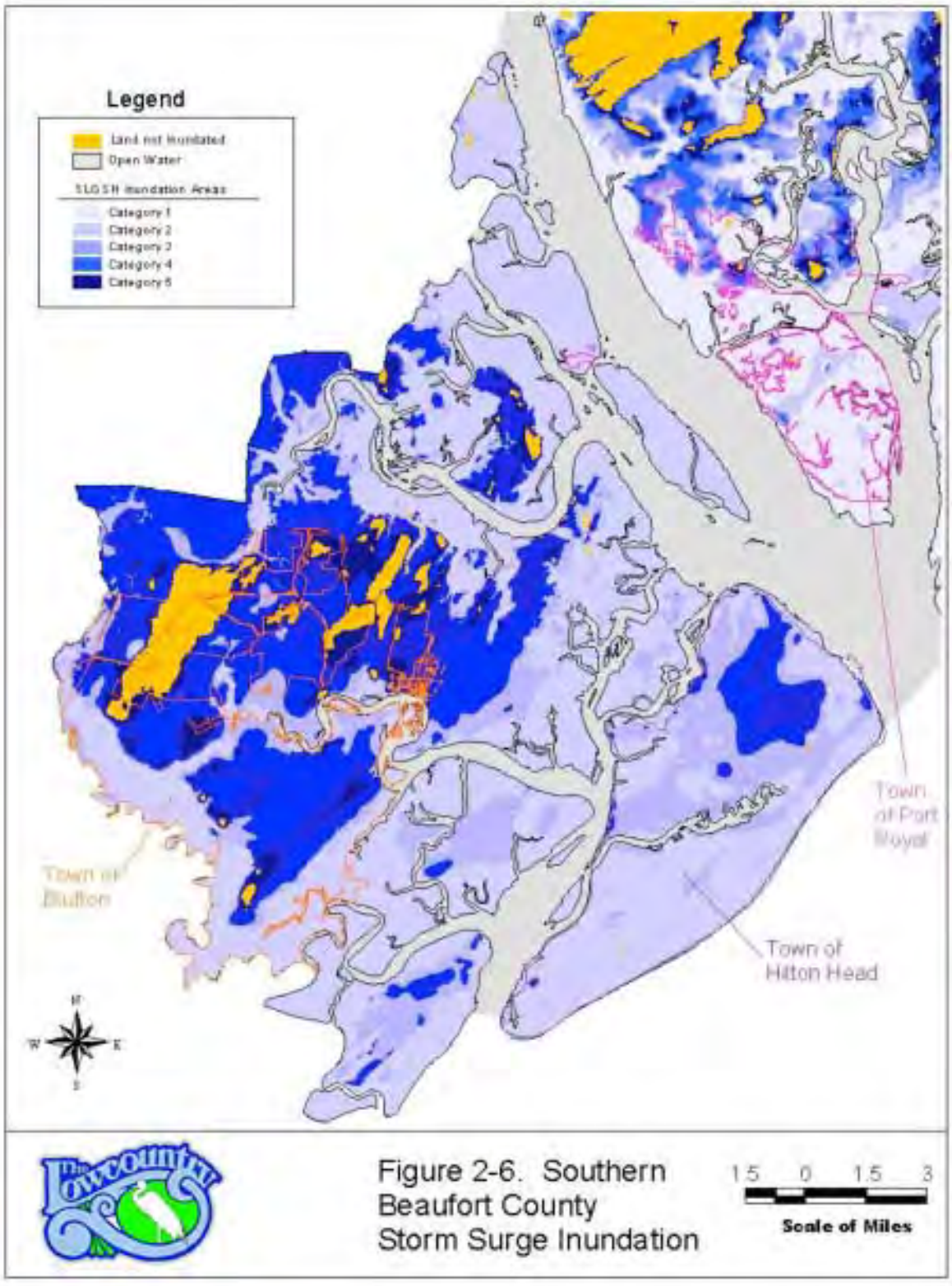


Figure 2-6. Southern Beaufort County Storm Surge Inundation

Erosion

Erosion and accretion are long term dynamic processes that occur along shorelines. Major erosion/accretion events are usually associated with coastal storms because floodwater forces have the ability to cause significant acts of erosion/accretion in a short time period.

Erosion is considered a serious hazard in coastal areas because it can threaten coastal development by eroding valuable beach areas including both the sandy beach and the protective dunes behind it. This has a direct effect on residents and business owners as well as the economies of beach communities that depend on tourists and vacationers.

Past Occurrences and Future Probabilities of Erosion

The South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management (DHEC-OCRM) publishes the *Annual State of the Beaches Report* which summarizes changes that have occurred along the state's shoreline. Results of the 2009 report for Beaufort County areas are presented in Table 2-5. The table notes what if any type of shoreline change is occurring for the given area, what the average long term change rate is, whether or not the area is an unstablized inlet zone, what is the type of shoreline zone where the greatest amount of change is likely to occur and the date of the last nourishment project in the area.

Hunting Island State Park had previously been listed as the state's highest priority for beach renourishment and restoration in the State of the Beaches report. Hunting Island provides public access to the beach but experiences chronic erosion. Renourishment is conducted on the island as it is needed and as funding can be provided.

While it is difficult to obtain a precise hazard frequency of beach erosion it is definite that the hazard occurs frequently in Beaufort County and that mitigation actions should be undertaken to slow its progress.

	EROSION ACCRETION, OR STABLE	AVERAGE LONG-TERM CHANGE RATE (FEET)	UNSTABILIZED INLET ZONE?	DATE OF LAST NOURISHMENT PROJECT
DAUFUSKIE ISLAND	Erosion	4 to 5	Yes	December 1998
FRIPP ISLAND				
Central to Northern island along Atlantic Coast	Strongly accretional	----------	No	
Southern island and NE island along Atlantic	Erosion	----------	No	
Fripp Inlet coastline	Erosion	----------	No	
HARBOR ISLAND			No	
Southern Island	Accretion		Yes	
Northern portions	Erosion		Yes	
HILTON HEAD ISLAND				
Sea Pines Plantation along Calibogue Sound	Light Accretion		Yes	Winter 1999
South Forest Beach	Stable	----------	No	2006-2007
North Forest Beaches and Palmetto Dunes	Erosion	----------	No	2006
Folly Beach-2200 ft stretch	Erosion	6	Yes	1997 (jetty built)
1.3 mile stretch beginning just north of Burke's Beach Road	Stable	----------	No	
Port Royal Plantation shoreline – Atlantic Coast	Accretion	----------	Yes	
Port Royal Plantation shoreline – Port Royal Sound	Erosion	2 to 5	Yes	
HUNTING ISLAND				
Southern End	Strongly erosional	7 to 15	Yes	2006
Northern End	Strongly erosional	7 to 15	No –inlet zone stabilized by terminal groin	2006
PRITCHARD ISLAND[1]	Highly erosional with accretion in some areas including north end	----------	----------	----------

Table 2-5. Shoreline Characteristics

Winter Storms

Winter storms can be very disruptive, particularly in areas where they are not frequent occurrences. While winter storms have had an affect on South Carolina and Beaufort County they occur relatively infrequently compared to areas of the northern U.S.

Winter storms can combine different types of precipitation including snowfall and ice storms as well as high winds and cold temperatures. According to SC Hazard Research Lab assessment there is a 1.69 percent chance in any given winter of a cumulative snow depth total of up to approximately 10 inches in Beaufort County. The area is thus expected to experience this type of winter once on average every 59 years over a long time period.

Past Occurrences of Winter Storms

Significant winter storms occur occasionally in the State of South Carolina. Beaufort County had a near miss with an event that occurred in early December 2002. A winter snow storm resulted in a Presidentially declared disaster in 6 counties in Northwest South Carolina including Cherokee, Greenville, Laurens, Spartanburg, Union and York. As a result of this storm tens of thousands in the Greenville area lost power.

On January 4, 2002 an ice storm occurred that hit northern Beaufort County particularly hard. Weather stations reported some freezing drizzle and light snowfall. In Yemassee residents were without power for several days.

On January 24, 2000, 1-2 inches of snow was measured in Beaufort County and was the first measurable event since 1989. Areas along the coast experienced mixtures of small amounts of sleet and freezing rain with the snow. The northwest portion of the state was particularly hard hit and received up to 6 inches of snow. This had a significant impact on major highways in including Interstate 85 where numerous accidents were reported. Tens of thousands of people in the state lost power due to power lines downed by the ice and snow.

The March 1993 northeaster was a winter storm event that caused damage and the loss of life in South Carolina. While there was no snow accumulation reported in Beaufort County, there were reports of high winds along the coastlines of the southeastern states leading to some property damage.

A winter storm event in 1989 caused snow accumulation in Beaufort County. While the highest snow depths in the state of 14-15 inches were recorded near Myrtle Beach, Beaufort County received approximately 5 inches of snow.

A snow storm that occurred from February 10-11, 1973 in South Carolina resulted in Beaufort receiving 11 inches of snow depth. The storm caused about 30,000 tourists to be stranded on the State's highways many of them had to be rescued by helicopter. The storm also brought severe winds and cold weather. Damage estimates reports indicated that at least 200 buildings collapsed. The damage estimate for property and road damage as well as the cost of snow removal and rescue operations was approximately $30 million (1973 dollars).

Future Probabilities of Winter Storms

Based on the limited period of record for winter events 5 major winter storm events have occurred within South Carolina in the last 20 years. However, only one of these resulted in winter precipitation and had a moderate to major impact on Beaufort County. The recording period is 59 years. Therefore the estimate for the county's winter storm probability is 1.69 percent.

Drought

Drought is caused by lack of precipitation but can be heightened or worsened by other circumstances such as high temperatures, high winds, and low relative humidity. Droughts can result in a shortage of water for consumption and can affect hydroelectric power, recreation, and navigation. Additionally severe droughts can lead to losses of crops, wildlife and livestock, as well as wildfires.

Future Probability of Drought

Beaufort County is located within the state's Drought Management Area No. 6 which includes all of the counties in southeastern South Carolina. According the SC Hazard Research Labs hazard profile for Beaufort County 21 droughts have occurred in Beaufort County in the last 59 years**.** This represents an annual probability of 35.59 percent. Also, the South Carolina Department of Natural Resources Drought Response Program has records showing how much time the drought management area has been subject to various drought conditions as defined by the Palmer Drought Severity Index for a period of record of about 75 years (895 months) beginning in 1925. This information is presented in Table 2-6 and it represents data through 2000. According to the records the area was not subject to drought conditions for over half of the period of record. For about 29 percent of the period of record the area was subject to mild drought conditions. The area was subject to moderate to extreme conditions for a total of 20 percent of the period of record with less than 4 percent of this time falling under extreme drought conditions.

Table 2-6. Time Spent in Drought Conditions, 1925-2000

DROUGHT CONDITION	PERCENTAGE OF TIME (895 MONTHS)
Mild	28.7
Moderate	10.5
Severe	5.9
Extreme	3.7

During 2000, 2001 and 2002, NOAA declared drought conditions in Beaufort County at total of 18 times, but with no property or crop damage. There were no drought incidents reported after 2002.

The State of South Carolina has had a drought management plan in effect since 1985 that continues to be updated by the office of the State Drought Program Coordinator. The Executive Director of LCOG serves of the statewide Drought Committee.

Wind: Thunderstorms and Tornadoes

Beaufort County's coastal location lends itself to being vulnerable to hurricanes and brings not only the threat of flooding but also damage from wind. Figure 6-1 of The American Society of Civil Engineers (ASCE) publication, *Minimum Design Loads for Buildings and Structures,* 1998 (also referred to as ASCE 7-98) shows that for Beaufort County the design wind speed (3-second gust) for structures ranges from 130 mph along the coast to 110 mph at the County's furthest inland point. While most of the continental U.S. is mapped as having a design wind speed of 90 mph the Atlantic and Gulf Coast areas have design wind speeds ranging from 100 mph to 150 mph (along the tip of the Florida peninsula and a portion of the Gulf Coast).

FEMA's publication, *Taking Shelter from the Storm,* 2008, presents a map of four wind zones in the U.S. and provides design wind speeds for shelters and other critical facilities. Zone IV shows the areas of highest wind activity which are situated in the Midwest and Tornado Alley, while Zone I shows the areas of lowest activity which are in the western U.S. All of South Carolina is mapped in Zone III. For shelters in this zone a design wind speed of 200 mph is recommended.

Past Occurrences of Thunderstorms

Wind events can also be the result of thunderstorms which occur more often than hurricanes. Historical records from the SCHRL shows that there have been 167 wind events in Beaufort County since 1950 related to thunderstorms. Sixty-three of the events have wind speeds recorded in the NCDC. For 127 of these storms, wind speeds greater than 50 kts were recorded.

Future Probability of Thunderstorms

Based on the information from the South Carolina Hazard Research Laboratory, thunderstorms are predicted to occur in Beaufort County at high rate**.** For the 59 years of record the 167 storms represent an annual probability of 285.05 percent. Obviously this means Beaufort experiences multiple thunderstorms annually and this hazard is one that merits serious attention.

Tornadoes

The National Weather Service defines a tornado as a violently rotating column of air pendant from a thunderstorm cloud that touches the ground. Tornadoes are generally considered the most destructive of all atmospheric-generated phenomena with an average of 800 touching down annually in the United States. In the U.S. more tornadoes occur during the months of May and June than in other months. Additionally over 30 percent of recorded tornado activity has occurred between the hours of 3:00 pm and 6:00 pm and an additional estimated 25 percent have occurred between 6:00 pm and 9:00 pm.

Tornadoes are considered a major natural hazard threat for areas in the Midwest known as Tornado Alley. Tornado Alley includes portions of Texas, Oklahoma, Arkansas, Missouri and Kansas. Some portions of Texas and Oklahoma have recorded over 15 tornado touch downs in a 1,000 square mile area (FEMA 361, Figure 2-3). Tornadoes follow the path of least resistance and therefore valleys and flatter land areas are most susceptible to them.

The entire State of South Carolina has 1.5 tornadoes recorded for every 1,000 square miles. This is considered a relatively low concentration of tornado touchdowns (FEMA 320, Figure 1.1).

Tornadoes are classified using the tornado scale developed by Dr. Theodore Fujita. The Enhanced Fujita Scale went into effect in 2007 and replaces the original. The Fujita Tornado Scale assigns a category to tornadoes based on their wind speed and relates this to the general type of damage that is expected. Ratings range from EF0 (light damage), to F5 (total destruction of a building). The scale is presented in Table 2-7. Approximately ninety percent of tornadoes nationwide recorded between 1956 and 2001 have been F2, F1, and F0 tornadoes. Most of these (nearly 88 percent) have been F1 and F0 tornadoes.

Table 2-7. Enhanced Fujita Tornado Scale

SCALE VALUE	WIND SPEED RANGE (MPH)	TYPE OF DAMAGE
EF0	65-85	*Light* – May be some damage to poorly maintained roofs. Unsecured lightweight objects, such as trash cans, are displaced.
EF1	86-109	*Moderate* – Minor damage to roofs occurs, and windows are broken. Larger heavier objects become displaced. Minor damage to trees and landscaping can be observed.
EF2	110-137	*Considerable* – Roofs are damaged. Manufactured homes, on nonpermanent foundations, can be shifted off their foundations. Trees and landscaping either snap or are blown over. Medium-sized debris becomes airborne, damaging other structures.
EF3	138-167	*Severe* – Roofs and some walls, especially unreinforced masonry, are torn from structures. Small ancillary buildings are often destroyed. Manufactured homes on nonpermanent foundations can be overturned. Some trees are uprooted.
EF4	168-199	*Devastating* - Well constructed homes, as well as manufactured homes, are destroyed. Some structures are lifted off their foundations. Automobile-sized debris is displaced and often tumbles. Trees are often uprooted and blow over.
EF5	200-234	*Incredible* – Strong frame houses and engineered buildings are lifted from their foundations or are significantly damaged or destroyed. Automobile-sized debris is moved significant distances. Trees are uprooted and splintered.

Past Occurrences of Tornadoes

Scale specific intervals are reported below. However, some of the touchdown locations are recorded for the same date and are therefore either the same tornado or the same system. There were also three recorded funnel clouds from 1956-2006 years without a touchdown. The annual percentage of occurrence is 18.75 percent.

Most of the recorded incidents of tornadoes in Beaufort County have been low strength tornadoes. Only one tornado with a rating of F2 has been recorded. The other incidents were all F0 or F1 tornadoes. Following the general trend of tornado touchdowns most of the 19 recorded tornadoes occurred in May and June. Table 2-8 presents a list of the recorded tornado activity in Beaufort County and includes incidents of sighted funnel clouds and waterspouts. Damage estimates are given as costs from the time when they occurred if available.

County Emergency Management and local community staff recalled that there was significant damage associated with the June 5, 1995 tornado because the tornado hit a fairly densely developed area and caused damage to a grocery store and a nearby construction project site. The June 12, 1995 tornado also hit a fairly densely developed area causing damage to several residential structures. Finally there was one death of a resident in Frogmore living in a manufactured home associated with the September 1998 tornado (no. 14). Figure 2-7 shows the known locations of the tornado touchdowns within Beaufort County for which exact location data is available[3].

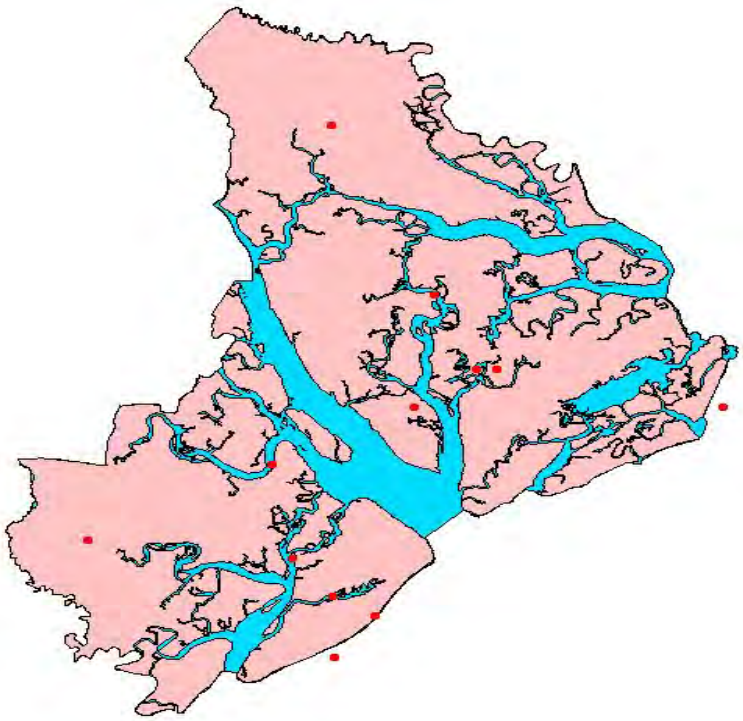


Figure 2-7. Tornado Events in Beaufort County, 1950-2006.

[3] Exact location data is available for only some of the tornadoes reported, as reflected in the map.

	Date	Time	Location	Type	Magnitude	Property Damage
1	9/25/1956	9:00AM	Beaufort (County)	Tornado	EF0	0K
2	4/12/1961	9:00AM	Beaufort (County)	Tornado	EF	25K
3	10/7/1965	1:55AM	Beaufort (County)	Tornado	EF1	250K
4	10/7/1965	2:10AM	Beaufort (County)	Tornado	EF1	25K
5	5/29/1973	12:00PM	Beaufort (County)	Tornado	EF1	25K
6	5/3/1984	3:00PM	Beaufort (County)	Tornado	EF1	25K
7	6/16/1985	1:00	Beaufort (County)	Tornado	EF0	0K
8	6/30/1994	1:50 AM	Beaufort (County)	Tornado	EF0	0
9	6/5/1995	11:05 AM	Hilton Head Island	Tornado	EF1	500K
10	6/12/1995	7:10 PM	St. Helena Island	Tornado	EF1	60K
11	9/3/1998	7:28 AM	Frogmore	Tornado	EF2	360K
12	6/12/2001	7:10 PM	Gardens Corner	Tornado	EF0	0
13	6/12/2001	7:25 PM	Bluffton	Tornado	EF0	0
14	6/12/2001	7:55 PM	Parris Is	Tornado	EF0	0
15	6/12/2001	8:15 PM	Beaufort	Tornado	EF0	0
16	6/15/2004	7:21 AM	Parris Is	Tornado	EF0	0
17	9/6/2004	1:40 PM	Hilton Head Is	Tornado	EF1	0
18	7/13/2005	1:17 PM	Parris Is	Tornado	EF0	0
19	7/13/2005	1:39 PM	19 Beaufort	Tornado	EF0	0
20	7/13/2005	4:19 PM	Bluffton	Tornado	EF0	0
21	6/13/2006	1:30 PM	Laurel Bay	Tornado	EF0	0
						1.270M TOTAL

Table 2-8. History of Known Tornados in Beaufort County, 1950-2006

Future Probabilities of Tornadoes

In order to estimate the frequency of occurrence or the number of tornado days as compared to the length of the period of record which is from 1950 to June 2006 it is necessary to consider the individual tornado incidents. Tornadoes that occur close in time on the same day are likely the same tornado that has re-formed or are a tornado that is part of the same system. The recurrence interval then is defined from this information and is a rough estimate

of the amount of time, *on average*, during which one occurrence of a given category of tornado will take place. It is important to note that in reality a tornado can occur multiple times during one recurrence interval and that the recurrence interval is only an estimated average time period. Recurrence intervals for tornadoes within Beaufort County are presented in Table 2-9. This data is based on information reported directly from the NCDC. Data obtained from the SC Hazard Research lab indicates 21 tornadoes have touched down in the last 59 years in Beaufort County meaning the overall probability for tornadoes is 35.59 percent.

Table 2-8. Estimated Recurrence Intervals of Tornadoes (based on data from 1950 to 2006)

TORNADO CLASS	NUMBER OF OCCURRENCES WITHIN BEAUFORT COUNTY (TORNADO DAYS)	RECURRENCE INTERVAL (years)
F0	12	4.91
F1	7	8.43
F2	1	59
F3	no record	----------
F4	no record	----------
F5	no record	----------
All Tornado Events	17[1]	3 ½

[1] For some of the records, the intensity and thus the Fujita Scale classification was unknown.

There is a moderate rate of occurrence of tornadoes in Beaufort County. This number has slightly increased since the original hazard mitigation plan in 2004 but this is generally not considered significant when compared with flooding and wind associated with tropical storms and hurricanes. Wind hazard mitigation will be addressed in the goals and actions section of this plan as high wind speed is the most harmful effect of a tornado.

Earthquakes

Earthquakes are classified according to their magnitude. The magnitude is a measurement of the maximum motion caused by an earthquake and is recorded by a seismograph. While several scales have been defined the most commonly used is the magnitude local (ML) which is used by the Richter Scale. Table 2-10 presents a classification of earthquakes according to their Richter Scale magnitude.

The USGS rates areas of the United States for their susceptibility to earthquakes based on a 10 percent probability of a given peak force (% g for a 1.0 SA)[4], being exceeded in a 50 year period. Beaufort County's peak acceleration is 5-6% g which is considered significant.

[4] Ground motion hazard values are expressed as a percent of the acceleration of gravity or %g. The acceleration of gravity is 980 cm/sec/sec. Spectral acceleration, SA, relates ground motion activity to the motion experienced by a structure or building.

Table 2-9. Richter Scale Magnitude Classes

MAGNITUDE CLASS	MAGNITUDE RANGE ML = MAGNITUDE
Great	ML ≥ 8
Major	7 ≤ ML < 7.9
Strong	6 ≤ ML < 6.9
Moderate	5 ≤ ML < 5.9
Light	4 ≤ ML < 4.9
Minor	3 ≤ ML < 3.9
Micro	ML<3

Past Occurrences of Earthquakes

Earthquake epicenter location data gathered by the HRL from the University of South Carolina Seismic Network was collected for the period from 1698 to 2001 and indicates that there has only been one earthquake with it's epicenter in Beaufort County. The Beaufort County earthquake had an epicenter located on Hilton Head Island and occurred on January 4, 1989. Its magnitude measured 2.8 on the Richter scale. Earthquakes with magnitudes less than 3.0 are considered micro earthquakes, and those with magnitudes less than 2.5 are generally not felt by humans. Earthquakes that measure magnitudes of at least 5.0 on the Richter scale are considered moderate. Those above 5.9 are classified as strong, major or great.

Earthquakes near Beaufort County: potentially a major impact.

Information from Charleston Southern University's Earthquake Education Center indicated that 12 measurable seismic events occurred in 2002. Of these 12 events 3 had magnitudes higher than 3, and no events had epicenters in Beaufort County.

Although only one epicenter is located within the County for the period of record there are areas of more intense earthquake activity located near Beaufort County. One major area of more intense seismic activity is located along the borders of Charleston, Dorchester, and Berkeley Counties northwest and west of the City of Charleston about 30-35 miles from Beaufort County. In this area approximately 700 earthquakes occurred over the period of record (1698- 2001). The average magnitude of the earthquakes was a low 2.4 on the Richter scale. However the highest magnitude recorded was 6.90 in 1886. Of the 700 earthquakes four earthquakes measured magnitudes above 5.0 and 12 measured magnitudes greater than or equal to 4.0. The Charleston Southern University data indicates that an earthquake with a magnitude of 3.02 occurred in this vicinity in 2002.

A second area with a sizeable number of past incidents is located off the coast of southern Charleston County. It is situated to the southwest of the City of Charleston and is approximately 20-25 miles from Beaufort County. An estimated 44 earthquakes have

occurred here during the period of record. However at least one additional earthquake event occurred in this general area since 2001. An earthquake with an epicenter located approximately 30 miles southeast of Charleston and a magnitude of 3.8 occurred in November 2002. Prior to this incident the highest recorded magnitude during the period of record was 2.75 and the average for all of the 44 earthquakes was a low 1.5. In addition the Charleston Southern University data indicates that an earthquake with a magnitude of 3.83 and one with a magnitude of 4.32 occurred in this vicinity in 2002.

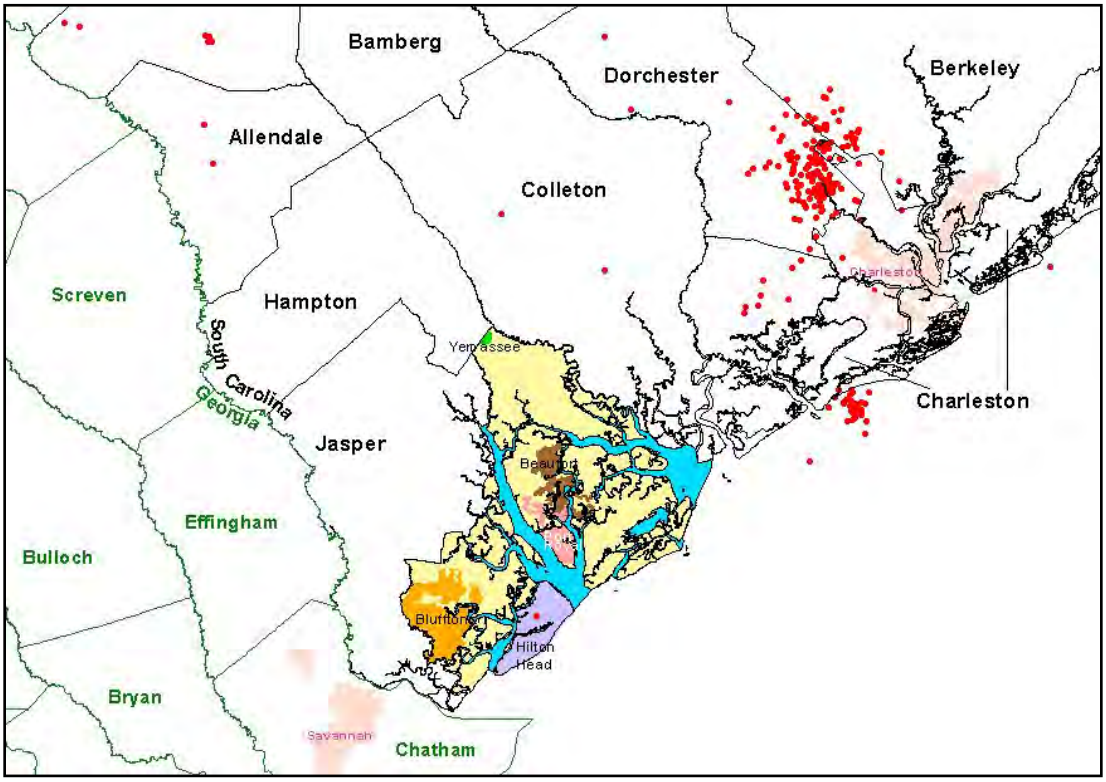


Figure 2-8. Historical Epicenter Locations 1698 to 2008.

1886 Earthquake

The Charleston Earthquake of 1886 was the largest earthquake of record for the southeastern United States and one of the largest earthquakes in eastern North America. Its major shock which lasted less than one minute had a magnitude of 6.9 and occurred on August 31, 1886. It resulted in serious damage to the City of Charleston and a death toll of approximately 60 people. The areas of most significant damage were Charleston and areas directly northwest of the city including Summerville and Jedburg.

More than 300 reported earthquakes that occurred in South Carolina after the 1886 earthquake occurred in the 35 years following the 1886 event and were actually aftershocks of the 1886 earthquake.

In addition to the recorded events for the period of record research has shown that there have likely been several events of strong to major magnitude along the South Carolina Coastal

Plain (Talwani and Schaeffer) over the last 6,000 years. Some of these events along with the 1886 earthquake have caused seismically induced liquefaction which has been observed at several sites in Coastal South Carolina, including the Bluffton area. According to Talwani and Schaeffer, one possible scenario puts one of the seismic events epicenters' near Bluffton with a magnitude of about 6.0. However, the study suggests that earthquakes with epicenters near Charleston are much more likely and that major earthquakes at Charleston have a recurrence interval of about 500-600 years. Because of the proximity to fault lines near Charleston and Bluffton Beaufort County has a strong commitment to seismic safety.

Future Probabilities of Earthquakes

Looking at the occurrences of earthquakes over the period of record from 1698-2001, the following recurrence intervals for earthquake events were determined (Table 2-11). These figures are based only on seismic activity with magnitudes of 3 or more and therefore include 145 events with epicenters in the previously described locations north and west of Charleston and 2 events in the area south of Charleston. While the SCHRL reports only a .32 percent annual probability of occurrence, the effects of an earthquake on Beaufort County could be devastating considering its proximity to major fault lines. Therefore earthquakes are considered a major hazard and should be taken seriously.

Table 2-10. Estimated Recurrence Intervals of Earthquakes in Beaufort County

(based on occurrence data from 1698-2002)

MAGNITUDE CLASS	NUMBER OF OCCURRENCES	RECURRENCE INTERVAL (YEARS)
Great	0	------
Major	0	------
Strong	0	-----
Moderate	0	------
Light	0	------
Minor	1	300

Fire

According to the U.S. Forest Service's Wildland Fire Assessment System (http://www.wfas.net/), Beaufort County is located in a low risk fire danger area. Generally, there are three major factors to consider in assessing the threat of wildfires to a community: topography, vegetation and weather.

An area's terrain and land slopes affect its susceptibility to wildfire spread. Wildfire travels much faster upslope than it does down slope. Wildfire can spread rapidly on steep slopes. When the ground slope doubles the rate of wildfire spread upslope will likely double. Beaufort County is situated on the coastal plain and is very flat. The County's highest ground elevation is approximately 50 ft NGVD 29.

Vegetation and land use is another characteristic that affects the spread of wildfire. In particular forests, dense wooded areas and grasslands provide readily accessible fuel for wildfires. Besides just the existence of this type of vegetation its moisture content is also a

significant factor. This is dependent on weather. Droughts or dry weather cause vegetation to become dryer and serve as better fuel. While there are sizeable marsh areas in Beaufort County there are also numerous undeveloped forested areas and grasslands that during dry conditions can be susceptible to wildfires.

Weather is the third factor for consideration. High temperatures combined with low humidity offer the most conducive environment for wildfires. Beaufort County's climate is considered subtropical humid. While the County may experience high temperatures during the summer months this is usually combined with high levels of humidity which are not conducive to the ignition and spread of wildfires. However during periods of drought the threat of wildfire increases. According to the Beaufort County Forest Ranger drought conditions have persisted for the last three summers (2000-2002) and have left Beaufort County more susceptible to wildfires.

Past Occurrences of Fire

The National Climatic Data Center has no records of wild or forest fires for Beaufort County during the period 1950 to June 2008. Records for wildfire events were obtained from the South Carolina Forestry Commission (SCFC). The SCFC responds to fires occurring in forested areas or brush areas and terms these types of fires landfires. The number of annual landfire events for Beaufort County for the period of record from 1988 to 2000 was provided by the SCFC. Also included in the data is information on the total number of acres affected annually by the fires. Table 2-12 presents this information.

According to the Beaufort County Forest Ranger, typical wildfires occur in forested areas of the County and in areas known as broomstraw fields where there is ample fuel for fires in the form of tall grass. Typically these fires do not cause damage to structures but affect only uninhabited areas. The SCFC has records of the damage caused by each individual fire event but it has not been compiled electronically or on an annual basis.

According to Beaufort County Emergency Management officials these fires are generally started by people through careless actions such as improper disposal of lit cigarettes, charcoal fuel for outdoor cooking and starting outdoor camp fires that are not properly controlled.

Given the relatively small land areas affected by the fires and the terrain of Beaufort County wildfires are considered a minor to moderate threat for the unincorporated and incorporated areas of Beaufort County. The potential for loss from wildfires is less than one percent. This is considered a relatively low risk hazard but will be addressed by a mitigation action.

Table 2-11. Occurrences of Landfires in Beaufort County, 1988-2008

YEAR	NUMBER OF LANDFIRES	ACREAGE AFFECTED
1988	121	763
1989	59	291
1990	69	211
1991	114	890
1992	64	192
1993	76	450
1994	89	313
1995	67	439
1996	113	710
1997	99	580
1998	51	197
1999	101	1,102
2000	90	450
2001	92	514
2002	12	33
2003	73	333
2004	36	255
2005	45	178
2006	41	178
2007	29	118
2008	43	120

Future Probabilities of Fire

Based on fire event data from the past 21 years, The SC Hazards Lab reports an average of 72 wildfires occur annually in Beaufort County. The SC Forestry Commision reports an average of 396 acres of land burned per year. The annual probability for fire in Beaufort County is well over 100 percent per year. However looking at past occurrences as an indicator it is likely that less than one square mile of land on average will be affected annually by wildfires.

Hazards not Historically Prevalent

Dam Failure

According to GIS data and previous HAZUS data collection there are 15 dams within Beaufort County. Most of these dams are less than 10 feet in height and all are under 25 feet in height. Dams less than 25 feet in height are generally exempt from the Dams and Reservoirs Safety Act because in most cases their failure would not pose a serious threat to

life, safety, or property. The Relative Hazard Rating for all of the dams in Beaufort County is low based on a previous HAZUS assessment.

Data for neighboring counties of Colleton, Jasper and Hampton shows that there are 39 dams within those counties, 38 of which also have a low relative hazard rating. There is one dam within Hampton County classified as having a significant hazard rating. This dam has an emergency action plan and is located along Black Creek, a tributary of the Coosawhatchie River which flows to the tidally-influenced Broad River. Although the dam is located in the drainage basin of the Broad River it is located approximately 35 stream miles above Beaufort County. The dam reservoir has a drainage area of approximately 60 square miles, but given the dam's distance from Beaufort County and the fact that the Coosawhatchie and Broad Rivers' drainage areas are relatively high a dam failure at the Hampton County dam is not likely to have a significant impact on Beaufort County. The SC Hazard Research Lab has no record of dam failure for Beaufort County. Therefore dam failure is not considered a significant hazard within Beaufort County.

Landslides

Landslides are often prompted by the occurrence of other disasters. Floods or long duration precipitation events create saturated unstable soils that are more susceptible to failure. The forces of earthquakes can also cause landslides. The USGS has a National Landslide Hazards Program and has mapped the landslide risk for the entire U.S. All of eastern South Carolina is mapped in the lowest risk zone. This is an area where the landslide incidence involves less than 1.5 percent of the land area. Given the relatively flat relief of Beaufort County and its low landslide incidence as mapped by the USGS landslides are not considered a significant threat within the County. According the SCHRL there are no recorded occurrences of landslides in the County.

Tsunamis

Tsunamis are sea waves created by underwater earthquakes. When a tsunami is generated and makes its way to the shoreline it can cause extensive damage to nearby structures and infrastructure as well as significant inland flooding. Tsunamis generally occur in the Pacific Ocean but there have been some recorded events of tsunamis in the Caribbean area of the Atlantic Ocean.

Tsunamis are not generally considered a threat along the eastern seaboard of the continental U.S. The National Oceanic and Atmospheric Administration (NOAA) prepared a Tsunami Mitigation Plan for the Senate Appropriations Committee in the Fall of 1995 that included an area of mapped tsunami risk. This area did not include the eastern U.S. and only showed the tsunami risk area to include coastline along Alaska, California, Hawaii, Oregon and Washington.

Recent findings have indicated that tsunamis can occur along coastal Virginia and North Carolina. In coming years tsunami scenarios for these portions of the Atlantic Coast will be further studied. However the South Carolina coast is not currently included as part of this

potential risk area and at present the South Carolina Geological Survey does not consider tsunamis to be a significant hazard to the State. There are no recorded occurrences of tsunamis in Beaufort County, but this plan considers the hazard a serious one, and plans to mitigate against it because of the devastating nature of only one occurrence.

Volcanic Hazards

Volcanic eruptions threaten human life as well as buildings and infrastructure. Among the hazards of volcanic eruptions are lava flows, lava domes, ashfalls, gasses and lateral blasts. There are more than 65 active or potentially active volcanoes in the United States. 55 of these volcanoes have been active in the last 200 years. While volcanic eruptions can pose a serious threat to life and property most of the volcanoes United States are located in Alaska. On the mainland of the U.S. only western states have been identified as being vulnerable to volcanic hazards. This vulnerability is based on the possibility of the areas being subject to lava flows and ashfall (FEMA's Multi-Hazard Identification and Risk Assessment Report, 1997). Therefore volcanic hazards are not considered a threat to Beaufort County

Table 2-13, Overall Probability Table

Hazard	Probability (percent chance)
Hurricane/Tropical Storm	12.66
Earthquake	0.32
Avalanche	n/a
Tsunami	n/a
Landslide	n/a
Dam Failure	n/a
Drought	35.59
Flood	42.37
Thunderstorm and Wind	283.05
Tornado	35.59
Fire	7180.95
Winter Weather	35.59

Table 2-13 represents the overall annual probability for each of the hazards discussed. If the value that is given is "n/a," that simply means that the hazard has not occurred in the recorded history according to the data from the SCHRL.

3. Vulnerability Assessment

The results of the Hazard Identification indicate that some of the hazards warrant a Vulnerability Assessment. A Vulnerability Assessment is performed to determine the impact that hazards have on the built environment and how they can affect people's safety. For those natural hazards with a relatively short frequency of occurrence or those which have caused major damage in the County a vulnerability assessment was deemed appropriate. Therefore the effects of flooding, wind events and earthquakes on Beaufort County will be analyzed. Some hazard events that were identified such as thunderstorms and tornadoes are considered to be events that create much larger hazards such as flooding and wind hazards. This analysis recognizes such and addresses vulnerability considering that. Overall unless this analysis indicates so all hazards appear to affect each of Beaufort County's multiple jurisdictions equally. Both during and after the Vulnerability Assessment LCOG staff consulted with Committee members individually and organizationally to ensure that both the data and the analysis truly reflected current conditions in the jurisdictions. Changes were made as needed.

Vulnerability Summary

The hazards to which Beaufort County has a notable vulnerability to are discussed in this section and available data has been used. The tables below reflect an over all summary of description of the each jurisdictions vulnerability to each hazard.

The valuation data in Table 3.1 below shows the total number of buildings based on the Beaufort County Tax assessor's estimates for residential, commercial and industrial facilities. It also estimates the value of the critical facilities based on value data. The loss numbers in the tables below represent the impact of hazards.

Table 3.1 Assessor Valuation Data

Jurisdiction	Residential	Commercial
Beaufort (City)	$ 1,203,122,492	$ 473,292,571
Port Royal	$ 356,003,588	$ 174,297,716
Hilton Head	$19,055,715,633	$1,691,949,007
Bluffton	$ 7,504,802,467	$1,071,752,821
County	$ 5,466,749,210	$ 460,983,277
TOTAL	*$33,586,393,390*	*$3,872,275,392*

Table 3.2 Loss information per hazard in Beaufort County based on historical data (NCDC)

Hazard	Property Damage
Drought	$14,201,478
Flooding	$10,849,940
Hurricane/Tropical	$13,114,269
Thunderstorm	$1,467,873
Tornado	$2,168,661
`Wildfire	$334,042
Wind	$3,111,284
Winter Weather	$14,226,954

To assess the vulnerability of the Beaufort County and all of its jurisdictions to each identified hazard, the frequency and severity were used. Each hazard was assessed based on compiled data. The "vulnerability and rankings" chart reflects how the vulnerability of the entire planning area to each of the hazards. Below, the terms and methodology is defined:

Frequency is valued at very high, high, medium, low and very low. These values are based on annual probability supplied from the NCDC based on historical data. The values are as follows:

- Very High-over 100% (event will happen more than once per year)
- High-60-100%
- Medium-30-59%
- Low-11-29 %
- Very Low 0-10%

Severity is based on the estimated loss of structures if the event occurred based on previous data and magnitude. As an example based on the historical data for a hurricane the severity of damage would be very high if a Category 3 or Category 4 storm struck Beaufort County. Severity is defined as follows:

- Very High-over 75% loss
- High-50-75% loss
- Medium-26-49% loss
- Low-11-25% loss
- Very Low-0-10% loss

Historical data from the SCHRL was used to estimate the magnitude of the event. Where an actual weather-based valuation such as the Enhanced Fujita scale was available that number is shown.

Methodology: To calculate the vulnerability frequency was multiplied by the severity. Each severity and frequency value was given an assigned numerical value. Frequency was valued at one-through-given. Because loss concerns the county much more the loss structure was

valued at 10,20,30,40,50, respectively. A vulnerability of 250 would be the highest, and a vulnerability of ten would be the lowest.

Loss information in Table 3.2 was based on data on information from the SCHRLbut was also examined using several sources. Data from the NCDC about severity and loss information was utilized to see how severe losses have been in past occurrences of hazards. Using this data an estimate of total loss percentage was determined. GIS information from Beaufort County and Hilton Head Island were used to determine structure count and location. Data from the SLOSH models shown in this plan was also reviewed. The Planning Mitigation Teams expertise was also drawn upon to understand the amount of loss that would be suffered in the event of a hazard. A compilation of all of the data above led to severity/loss scores. Valuation data was also compiled from the Beaufort County Assessor's office seen previously in Table 3.1.

Table 3.3 Overall Vulnerability Summary

Hazard	Frequency (annual probability)	Severity (loss)	Vulnerability	Relative Numerical Value
Hurricanes	low (12.6)	Very high (Cat. 4 or higher)	100	2 (tied)
Thunderstorms	Very high(283)	medium	150	1
Flood	Medium(42.37)	Medium	90	3 (tied)
Winter Event	Very low(1.69)	Very low	10	12
Dam Failure	Very low(n/a)	Very low	10	12
Drought	Medium(35.59)	Very Low	30	11
Tornadoes	Medium(35.59)	Medium	90	3
Earthquakes	Very Low(.32)	High	40	10
Fire	Very High(over 100)	Very Low	10	12
Landslides	Very Low(n/a)	Very Low	10	12
Tsunamis	Very Low(n/a)	High	40	10

Table 3.4 demonstrates the varied and unique risks, based on data from the Hazard Planning Team and historical data that each jurisdiction faces from each hazard. The chart reflects that the hazards are distributed evenly with few differences.

Table 3.4 Multi-jurisdictional Risk Assessment, varied and unique risks

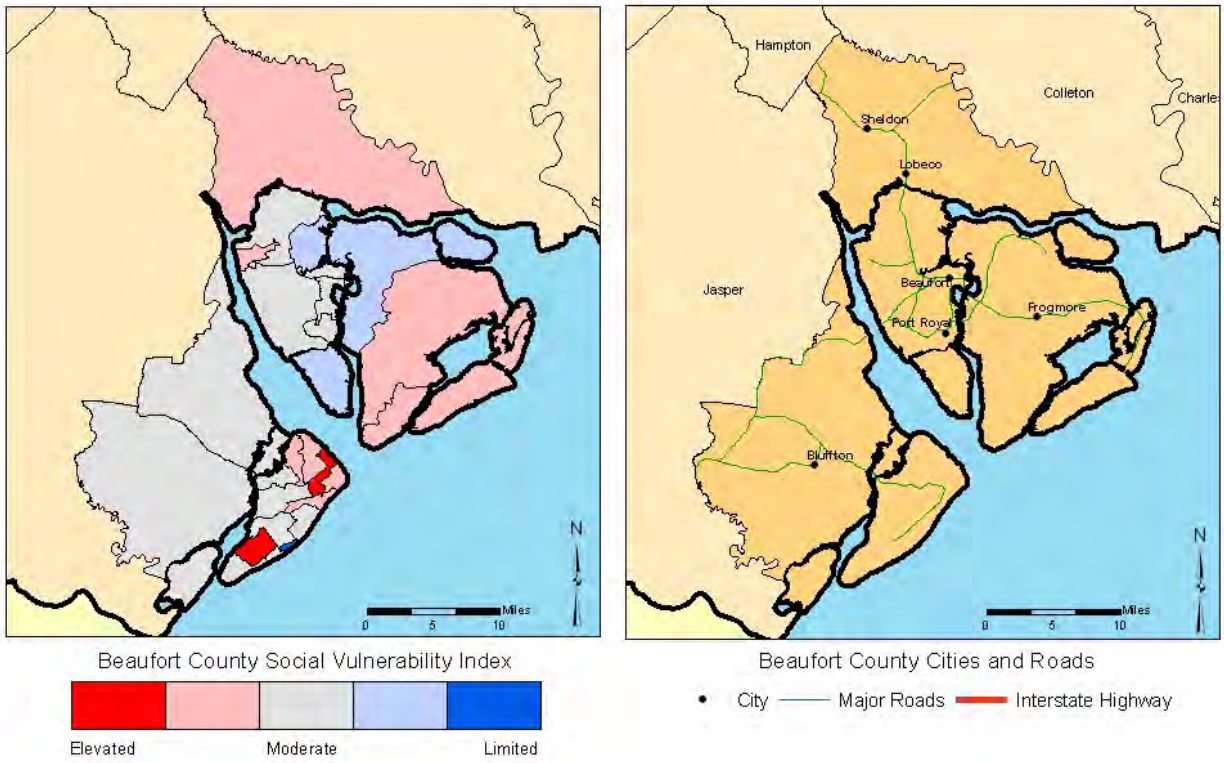
	Beaufort County	City of Beaufort	Town of Hilton Head	Town of Port Royal	Town of Bluffton
Hazard					
Hurricanes	x	x	x	x	x
Thunderstorms	X	X	X	X	X
Flood	X	X	X	X	X
Erosion	X	X	X	X	
Winter Event	X	X	X	X	X
Dam Failure	x				
Drought	x				
Tornadoes	X	X	X	X	X
Earthquakes	X	X	X	X	X
Fire	X				
Landslides					
Tsunamis	X	X	X	X	X

Social Vulnerability

Social vulnerability examines the socioeconomic and demographic character of places and helps to explain the variation in the population's ability to prepare for and respond to hazards. The Social Vulnerability Index (SoVI) is a statistical measure that compares social vulnerability to environmental hazards among places and then visually displays these comparisons on a map. SoVI illustrates where there is an uneven capacity for preparedness and response and where additional planning and response resources might be used most effectively to help residents. The variables used in determining the Social Vulnerability score along with how SoVI is calculated are available on the Hazards and Vulnerability Research Institute SoVI website (http://www.sovius.org).

According to SCEMD Beaufort County has a wide range of social vulnerability with most tracts exhibiting moderate levels. Hilton Head Island shows the extremes with two tracts in the elevated category, many in the moderate category and one tract in the limited category. Figure 3.1 provides maps of the Beaufort County depicting social vulnerability by census tract and Towns and major roads.

Figure 3.1 Social Vulnerability



Inventory Information

In order to assess the vulnerability of the community to natural hazards an inventory of the county's structures and critical facilities was performed. ArcGIS shape files with existing structure locations were provided by Beaufort County for all unincorporated areas, the City of Beaufort, Bluffton, Port Royal. This information includes structures digitized from aerial photography as well as updates based on recent Certificates of Occupancy as they are issued. The Town of Hilton Head Island also provided shape file inventory information and aerial photography used to identify some of the structures on Hilton Head Island and in the surrounding area located outside of the town boundary. Figure 3-2 provides a graphic representation of structure locations within the County

Critical facilities are those facilities that warrant special attention in preparing for a disaster and facilities that are of vital importance to maintaining citizen life, health, safety and community order during and directly after a disaster event. Beaufort County along with Hilton Head Island has prepared an inventory of critical facilities that includes emergency response facilities such as police stations, fire departments, emergency medical services stations (EMS) and medical centers, hospitals, public facilities including schools and local government buildings and important transportation facilities including airports. Hazard Mitigation Planning Committee Members reviewed and updated the county's list during the planning process. A count of the types of facilities in each community is provided in the tables below.

Figure 3-2. Structures in Beaufort County

LOCATION	NUMBER OF FACILITIES							
FACILITY TYPE	Emergency Facilities	Military Facilities	Schools	Public Buildings	Utilities	Airports	Commercial Facilities	TOTAL
INCORPORATED COMMUNITIES								
Beaufort	9	1	8	10	4	1	---	30
Bluffton	3	---	3	---	3-	---	---	6
Hilton Head	15	---	5	3	8	1	10	42
Port Royal	5	1	2	2	1	---	---	10
UNINCORPORATED AREAS								
Burton	3	---	4	1	---	---	1	9
Daufuskie	2	---	---	---	---	---	---	2
Chechessee	1	---	---	1	1	---	---	3
Frogmore	1	---	---	---	---	---	---	1
Lady's Island	---	---	3	1	---	---	---	4
Lobeco	1	---	1	---	---	---	1	3
Pritchardville	2	---	---	---	---	---	---	2
Seabrook	---	---	---	1	---	---	---	1
Sheldon	2	---	1	1	---	---	---	4
St. Helena	4	---	2	1	1	---	---	7
Total in Unincorporated Areas								36

Table 3-5. Critical Facilities

Flooding

This section discusses the vulnerability of Beaufort County to damage by the flooding described in the Hazard Identification. Flooding of vacant land or land that does not have a direct effect on people or the economy is generally not considered a problem. Flood problems arise when floodwaters cover developed areas locations of economic importance and infrastructure. Damage to buildings particularly residential buildings is usually the largest single flood problem a community faces.

Floodplain

The majority of land in Beaufort County lies within the 100-year floodplain as shown on the communities' Flood Insurance Rate Maps. A significant portion of existing development in the County is located in 100-yr flood zones and is vulnerable to flooding and flood damage. damages.

Flood Depths

Base flood elevations within the County range from 22 ft NGVD within VE zones on Hilton Head Island to 8 ft NGVD in inland areas of the northern county. Flood depths within the county also vary.

City of Beaufort

In the City of Beaufort properties along the Beaufort River in the downtown portion of the city are subject to flood depths of 3 to 6 feet during the 100 yr flood according to FEMA FIRM's base flood elevations and reference mark elevations. The base flood elevation along the river is 13 ft NGVD while ground elevations range from approximately 7 feet at the end of Hancock Street by the Beaufort River to approximately 11 feet on the northwest side of the intersection of Carteret and Port Republic Streets.

Town of Bluffton

Within incorporated Bluffton the majority of development lies outside of the 100-year floodplain. There are some developed areas along May River that lie within the Town of Bluffton where the base flood elevation is 13 ft NGVD. Ground elevations along the May River in developed areas within the Town are about 8 to 12 ft NGVD. Therefore a very limited amount of structures within the town are subject to base flood depths 1 to 5 ft.

Town of Hilton Head

Within the Town of Hilton Head Island, most areas are subject to base flood elevations of about 14 ft NGVD although the flood elevations along the shoreline range from 22 ft to 15 ft NGVD. According to reference marks on the Hilton Head Island FIRMs much of the inland areas are subject to flooding of about 1 to 3 ft. Most of the built environment near the coastline in Hilton Head Island that lies in areas subject to base flood elevations of 14 to 15 ft NGVD have ground elevations that range from 8 to 12 feet resulting in flood depths of 3 to 7 feet. However in some areas where properties are located further towards the shoreline and within VE zones base flood depths are higher. In the Forest Beach Drive Area, several structures located seaward of the road are within VE zones with water surface elevations of 18 to 20 ft NGVD while ground elevations are approximately 12 ft NGVD resulting in flood depths of 6 to 8 ft.

Town of Port Royal

Within the Town of Port Royal, most of the mapped base floodplain that affects the developed area is located along the Beaufort River in the southern portion of the Town. This includes properties along Sixth through Tenth Streets, eastern portions of Eleventh and Twelfth Streets and southern portions of Richmond, London, Paris, and Madrid Avenues. The base flood elevation here is 13 ft NGVD. Ground elevations are 4 to 8 ft south of Seventh Street and 9 to 13 ft between seventh and tenth. South of Seventh Street flood depths are 5 to 9 ft for the 100 year flood. Between Seventh and Tenth depths are less than 1 foot up to 4 feet.

Unincorporated County – Bluffton Township

In the Moss Creek Plantation area portions of the community lie in the floodplain. Flood depths are predicted to range from 1 to 9 feet. The base flood elevation in the same area is 14 ft NGVD and ground elevations range from 5 to 13 ft NGVD.

Unincorporated County – Dafuskie

In northwestern Dafuskie Island where the base flood elevation is 14 to 15 ft NGVD ground elevations are 4 to 9 ft NGVD resulting in base flood depths of about 5 to 11 ft. In central Dafuskie along the Calibogue sound BFE's range from 14 to 16 ft NGVD while ground elevations are at 4 ft near the shoreline. Slightly further inland where the base flood elevation is 14 ft NGVD ground elevations are from about 6 to 9 ft NGVD putting flood depths in this area from 5 to 11 ft.

Unincorporated County – Fripp Island

Fripp Island's development consists mostly of the Fripp Island resort which spans 3-1/2 miles of coastline along the Atlantic Ocean. The base flood elevation within the majority of this development is 13ft NGVD, while ground elevations range from 4 ft NGVD to 10 ft NGVD. Therefore, flood depths are an estimated 3 to 9 feet. Closer to the coast, the BFE ranges from 15 to 20 ft NGVD, but landward of the frontal dune where there is development, the elevation is 15 to 16 ft NGVD and ground elevations are 4 to 11 ft NGVD. Therefore, right along the coastline, but landward of the dunes the flood depth ranges from 4 to 12 feet. Therefore, flood depths vary dramatically from as much as about 11 feet in low-lying areas near the coastline to 3 feet in areas on some of the higher ground of the development located inland where the base flood elevation is 13 ft NGVD. The Fripp Island development is relatively new with development occurring after the county joined the NFIP. Therefore, the structures are post-FIRM and should all be elevated above the level of the base flood.

Unincorporated County – St. Helena

In the Fort Fremont area of St. Helena located at the mouth of the Beaufort River there is development located along the river within the floodplain. The base flood elevation here is 13 to 14 ft NGVD. Ground elevations of properties located adjacent to the river are generally 5 to 8 ft NGVD where the BFE is 14 ft NGVD. East of Bay Point Road and Fort Fremont Road ground elevations in developed areas are about 5 to 9 ft NGVD while the base flood elevation is 13 ft NGVD. Therefore flood depths are approximately 4 to 9 feet in the Fort Freemont area for the 100 year floodplain.

Along Sea Island Parkway in eastern St. Helena a significant portion of the developed area is within the 100 year floodplain. The base flood elevation ranges from 14 to 15 ft NGVD in and ground elevations are generally 6 to 10 ft NGVD in much of the developed areas. This puts flood depths as high as 9 feet in some areas with a range of 4 to 9 ft.

Unincorporated County – Sheldon-Dale

Along the Coosaw River in the Sheldon-Dale area the base flood elevation is 13 ft NGVD according to the county's FIRMs. Flood depths in this area are then an estimated 1 to 5 ft as ground elevations in the developed area generally range from 8 ft NGVD upwards.

Flood Prone Structure Counts

Table 3-6 provides the results of the analysis indicating the number of structures in Beaufort County and its incorporated areas that are vulnerable to flooding according to the data and the building shape files supplied by the jurisdictions.

The data supplied in Table 3-6 shows that a significant portion of the structures in Beaufort County are within the 100-year floodplain. In Hilton Head Island the incorporated area with the most structures (over 18,000) an estimated 76 percent of structures are located in the 100 year floodplain where there is a 1 percent chance of being flooded in any given year. In the City of Beaufort where there are over 4,000 structures approximately 29 percent lie within the 100 year floodplain. In Port Royal 38 percent of structures lie within the 100 year floodplain. The Town of Bluffton has a relatively low percentage of structures within the 100-year floodplain. Only 12 structures or about 2 percent of the Town's total structures lie within the 100 year floodplain.

Table 3-6. Number of Structures in Flood Zones

COMMUNITY	V ZONE(S)	A ZONE(S)	Subtotal		B ZONE	C ZONE	*TOTAL*
	100-YEAR FLOOD ZONE						
BEAUFORT COUNTY (UNINCORPORATED)	132	7,924	8,056		511	10,920	19,487
BEAUFORT (CITY)	------	1,254	1,254		988	2,059	4,301
BLUFFTON	------	12	12		0	508	520
HILTON HEAD	163	15,788	15,951		481	4,135	20,567
PORT ROYAL	18	691	709		213	939	1,861

Forty percent of structures in the unincorporated portion of the County are located in the 100 year floodplain. Beaufort County is divided into 7 planning districts that include the entire County. The Hilton Head Island planning district includes most of the Town of Hilton Head Island as well as the northern portion of the Island and the adjacent mainland, The remaining five planning districts encompass larger portions of the unincorporated County. Building counts for structures vulnerable to flooding are presented for each of the 7 planning districts as shown in Figure 3.3. Building count results are presented in Table 3.7.

Figure 3-3. Planning Districts and Incorporated Areas

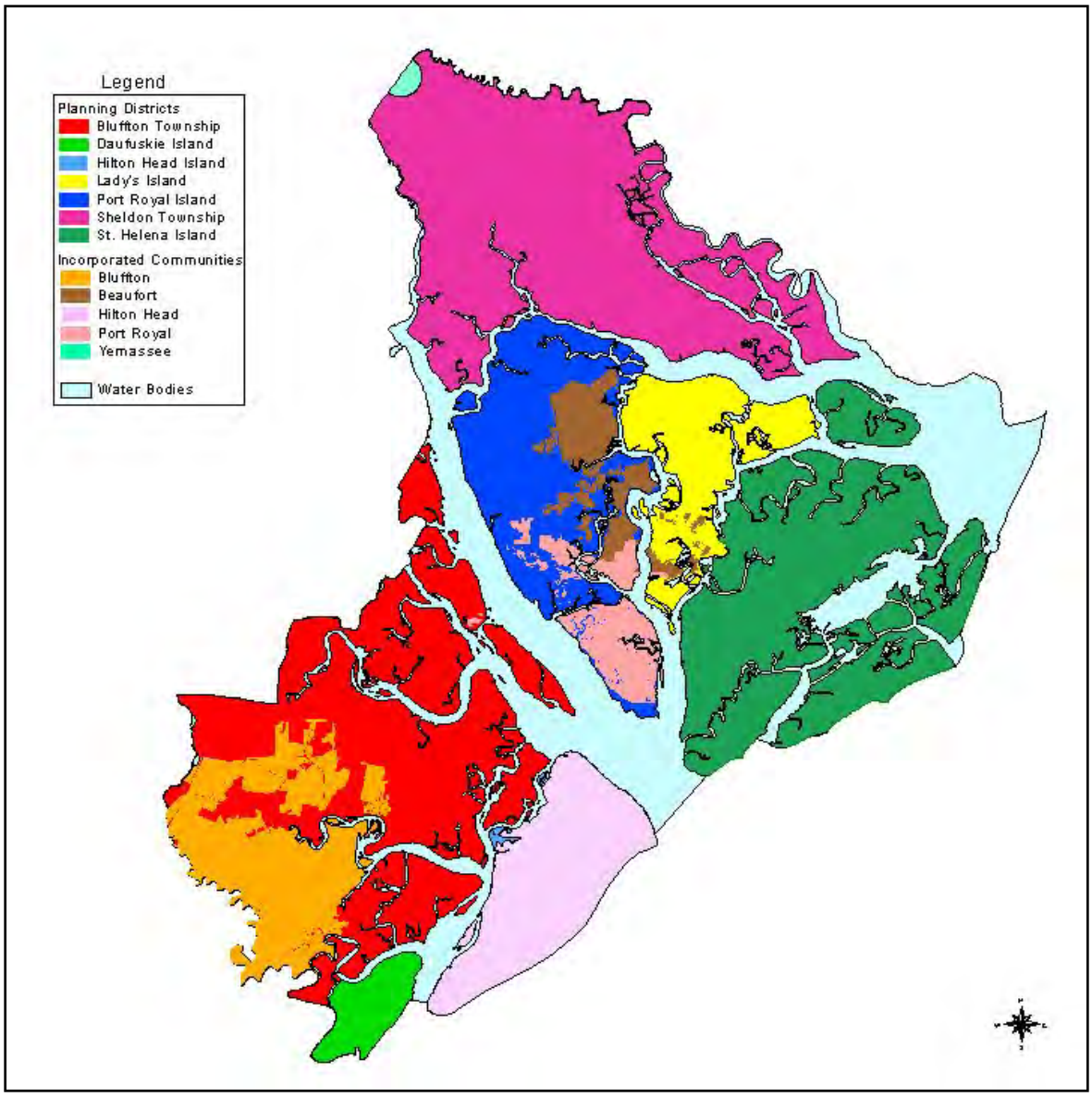


Table 3-7. Structures in Flood Zones in Unincorporated Beaufort County by Planning District

COMMUNITY	V ZONE(S)	A ZONE(S)		*SUBTOTAL*	B ZONE	C ZONE	*TOTAL*
	100-YEAR FLOOD ZONE						
BLUFFTON TOWNSHIP	------	1,248	------	1,248	53	1,685	2,986
DAUFUSKIE ISLAND	4	109	------	113	26	57	196
HILTON HEAD ISLAND	------	373	------	373	------	26	399
LADY'S ISLAND	------	972	------	972	26	1,289	2,287
PORT ROYAL ISLAND	18	1,593	------	1,611	43	5,963	7,617
SHELDON	------	436	------	436	252	1,217	1,905
ST. HELENA	110	3,193	------	3,303	111	683	4,097

Most of the structures in the unincorporated County are located in the northern portion of the County outside and to the east of Beaufort and Port Royal. The planning district with the highest overall number of flood prone structures is St. Helena Island which includes the Frogmore area and Fripp Island. There are over 3,000 structures in this area located in the 100 year floodplain. While relatively few in overall numbers it is noteworthy that all structures in the Hilton Head Island District that are not in the Town of Hilton Head are in the 100 year floodplain. The Port Royal Island area has about 1,600 flood prone structures and the unincorporated Bluffton area has over 1,300 structures located in the 100 year floodplain.

Flood insurance policy information was provided by SC Department of Natural Resources for the jurisdictions and is presented in the Table 3-8. Note that flood insurance is available to anyone in the County except for those structures in CoBRA zones even those structures outside of the mapped floodplain area. Therefore the number of policies includes policies for structures that are not in the mapped floodplain.

Table 3-8. Flood Insurance Policies as of May 2009

COMMUNITY	NO. STRUCTURES IN THE 100-YEAR FLOODPLAIN	NO. OF FLOOD INSURANCE POLICIES
UNINCORPORATED COUNTY	7,667	22,188
BEAUFORT (CITY)	1,254	1482
BLUFFTON	42	227
HILTON HEAD	9,149	29,515
PORT ROYAL	709	391

In addition to performing a count of structures in the 100-year floodplain zones a count of structures in storm surge zones was completed. This was done for each of the Category 1 through 5 surge zones and is divided by planning area. Results of the analysis are presented in Table 3-9.

Table 3-9. Structures in Storm Surge Zones in Beaufort County by Planning District

PLANNING DISTRICT	CATEGORY 1		CATEGORY 2		CATEGORY 3		CATEGORY 4		CATEGORY 5		TOTAL
	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT	COUNT	PERCENT	
BLUFFTON TOWNSHIP	673	19	1,368	39	2,127	60	2,842	80	3,145	89	3,536
DAUFUSKIE	89	45	185	94	190	97	196	100			196
HILTON HEAD ISLAND	11,799	57	17,615	86	19,392	94	20,556	99.93	20,557	99.9	20,557
LADY'S ISLAND	317	14	871	38	1,464	63	1,929	83	2,253	97	2,319
PORT ROYAL ISLAND	1,400	10	3,302	24	6,232	45	9,679	70	1,1097	81	13,747
SHELDON	263	13	660	34	1,242	63	1,704	87	1,861	95	1,961
ST. HELENA	1,752	43	3,381	83	3,664	89	3,872	95	3,998	98	4,097

Results from the storm surge analysis show that for a Category 2 storm building counts for storm surge inundation generally seem to correspond to building counts for inundation from the 100 year flood. Table 3-10 provides a numerical comparison of the building inundation counts.

Table 3-10. Structure Inundation 100 year Floodplain versus the Category 2 Storm Surge

PLANNING DISTRICT AND INCORPORATED COMMUNITIES	NUMBER OF STRUCTURES IN THE 100-YEAR FLOODPLAIN	PERCENT OF TOTAL	NUMBER OF STRUCTURES IN THE CATEGORY 2 STORM SURGE ZONE	PERCENT OF TOTAL
Bluffton Township Town of Bluffton	1,260	36	1,368	39
Daufuskie Island	113	58	185	94
Hilton Head Island Town of Hilton Head	15, 788	77	17,615	85
Lady's Island	972	43	871	38
Port Royal Island City of Beaufort Town of Port Royal	3,574	26	3,302	24
Sheldon (Beaufort Co.)	453	23	660	34
St. Helena	3,303	81	3,381	83

One notable exception to this pattern is seen for Daufuskie Island where only 113 structures (57 percent) are shown as being in the 100-year floodplain but 94 percent of structures are within the Category 2 surge zone. It is worth noting that Daufuskie has the smallest overall number of structures. Differences in building counts will thus have a greater affect on the overall percentage. Significant differences in the building counts also exist for Hilton Head Island and Sheldon, where a Category 2 storm would inundate more area than the 100-year flood. This analysis suggests that a storm with a magnitude equal to or in excess of that of a Category 2 storm would damage many structures outside of the 100-year floodplain on Daufuskie, Hilton Head Island and in Sheldon. The vast majority of these structures are likely not built to resist flooding or built to prevent flood damage since they lie outside of the regulatory floodplain. This is also true for Category 3 and higher magnitude storms for the

entire county. Therefore many of the structures vulnerable to Category 2 and higher magnitude storm surge flooding were not designed or constructed to withstand the effects of flooding.

Critical Facilities

Beaufort County's critical facilities GIS coverage (pubplcs.shp) was used as the basis for determining the county's critical facilities. The Lowcountry Council of Governments' GIS department participated in verifying both the critical facility numbers and floodplain data. Committee members reviewed the list of facilities included in this coverage and made modifications as appropriate. A total of 96 facilities within the County were identified as critical. Upon analysis of their location it was determined that 26 of these facilities are located within the 100 year floodplain. All of these are in the AE zone. Seventeen of these facilities lie within incorporated areas of the County. Nine of them are in the City of Beaufort, 7 are in Hilton Head Island and 1 is in Port Royal. Most of the remaining facilities are located in unincorporated portions of Northern Beaufort County with one exception. One facility is located in the southern part of the county near the Jasper County border. Table 3-11 and Table 3-12 provide the name of the facilities and address information where it is available.

Table 3-11. Critical Facilities located in the 100-year floodplain of Incorporated Communities

ADDRESS	FACILITY
BEAUFORT	
237 SEA ISLAND PKWY	LADIES ISLAND FIRE DISTRICT 1
237 SEA ISLAND PKWY	LADIES ISLAND AIRPORT
30 COUGAR DR	LADIES ISLAND MIDDLE SCHOOL
501 CHARLES ST	BEAUFORT POST OFFICE
302 CARTERET ST	BEAUFORT CITY HALL
2510 MOSSY OAKS RD	MOSSY OAKS ELEMENTARY SCHOOL
2501 MOSSY OAKS RD	BEAUFORT HIGH SCHOOL
2517 MOSSY OAKS RD	BEAUFORT FIRE DEPT STATION #2
311 SCOTT ST	COUNTY LIBRARY
Hilton Head	
120 Beach City Road	Beaufort County Airport Terminal Building
27 Dillon Road	Fire Station #9
40 Summit Drive	Hilton Head Island Fire and Rescue Headquarters
70 Cordillo Parkway	HHI Fire and Rescue Station #1
65 Lighthouse Road	HHI Fire and Rescue Station #2
534 William Hilton Parkway	HHI Fire and Rescue Station #3
400 Squire Pope Road	HHI Fire and Rescue Station #4
20 Whopping Crane Way	HHI Fire and Rescue Station #5
16 Queens Folly Road	HHI Fire and Rescue Station #6
1001 Marshland Road	HHI Fire and Rescue Station #7
21 Oak Park Drive	Hilton Head Island Fire and Rescue Dispatch
1 Town center Court	Municipal Government Offices
3 Town Center Court	Court
539 William Hilton Parkway	Beaufort County Government Offices

ADDRESS	FACILITY
10, 70, 80 Wilborn Road	Beaufort County Schools Hilton Head Campus
11 Beach City Road	Beaufort County Library Hilton Head Branch
7 Lagoon Road	Beaufort County Sheriff's Department
175 Greenwood Drive	Sea Pines Plantation Security Office
980 William Hilton parkway	Wexford Plantation Security Office
10 Shipyard Drive	Shipyard Plantation Security Office
399 Long Cove Drive	Long Cove Plantation Security Office
10 Queens Folly Road	Palmetto Dunes Plantation Security Office
100 Indigo Run Drive	Indigo Run Plantation Security Office
11 Surrey Lane	Hilton Head Plantation Security Office
40 Fort Howell Drive	Palmetto Hall Plantation Security Office
1 Brams Point Road	Spanish Wells Entrance Gate Security Office
10 Coggins Point Road	Port Royal Plantation Security Office
25 Hospital Center Blvd	Hilton Head Medical Center and Clinics
3 Marina Side Drive	Broad Creek PSD
25 Bow Circle	South Island PSD
21 Oak Park Drive	Hilton Head No 1 PSD
870 William Hilton Parkway	Hargray Telephone Company
111 Mathews Drive	Palmetto Electric Coop
4 Nature's Way	Jarvis Creek Pump Station
179 Greenwood Drive	Sea Pines Lawton Canal Pump Station
54 Yorkshire Drive	Wexford Canal Pump Station
PORT ROYAL	
700 PARIS AV	PORT ROYAL TOWN HALL

Table 3-12. Critical Facilities located in the 100-year floodplain of the Unincorporated County

ADDRESS	FACILITY
CHECHESSEE	
6 SNAKE ROAD	BJWSA
FROGMORE	
----------	EMS-5
LADY'S ISLAND	
73 DISTANT ISLAND RD	LADIES ISLAND ELEM SCHOOL
LOBECO	
----------	PROPOSED ELEMENTARY SCHOOL
41 SEABROOK POINT DR	SEABROOK POST OFFICE
ST. HELENA	
74 POLOWANA RD	LI/STHEL FIRE DEPT STA 24
291 TARPON BLVD	FRIPP ISLAND FIRE DEPT
1609 SEA ISLAND PKWY	LI/STHEL FIRE DEPT STA 23
774 SEA ISLAND PKWY	ST HELENA POST OFFICE

Repetitive Loss Areas

A repetitive loss structure is defined by FEMA as any structure for which two or more flood insurance claims have been paid for more than $1,000 in a 10 year period. While these properties make up only 1 percent of the flood insurance policies currently in force they account for 40 percent of the country's flood insurance claim payments. A report on repetitive loss structures recently completed by the National Flood Insurance Program found that 20 percent of these structures are listed as being outside of the 100 year floodplain. FEMA has reported that the NFIP's 75,000 repetitive loss properties have already cost billions of dollars in flood insurance payments and numerous other floodprone properties continue to remain at high risk in the Nation's floodplains. Therefore there are several programs that encourage communities to identify the causes of their repetitive losses and to work to mitigate these losses.

Identifying areas of repetitive losses within a community is a good indicator to use in determining areas of the highest flood damage vulnerability. Although flood damage is not necessarily limited to these areas repetitive loss data provides location indicators for areas where structures are experiencing recurring and costly flooding damage.

Unincorporated County

The County's participation in the Community Rating System has encouraged a thorough review of repetitive loss structures. As a result many of the previously listed repetitive loss properties have been investigated and in some cases mitigated so that many of the structures are no longer considered repetitive losses.

AW-501 forms (Repetitive Loss Update Worksheets) indicated that there is currently only one structure under County jurisdiction and is still considered a repetitive loss property. This structure is located in the unincorporated Bluffton area along the May River. Three claims were made on the structure, one each in 1994, 1995 and 1999.

Seven structures were removed from the list for various reasons including two structures for which flood protection mitigation in the form of stormwater management improvements were provided and funded by the property owner. Additionally one listing was an error and for one structure listed the cause of flooding was not identifiable. Three structures are in Hunting Island State Park area and are not under the jurisdiction of the County but fall under the jurisdiction of the South Carolina Office of Parks and Tourism.

Beaufort

There are no repetitive loss properties in the City of Beaufort. Since the original plan was written two properties were taken off the list.

Bluffton

There are no repetitive loss structures in Bluffton.

Port Royal

There are no repetitive loss properties in the Town of Port Royal.

Hilton Head

The Town of Hilton Head's participation in CRS has also encouraged a review of this community's repetitive loss structures which has resulted in the mitigation and removal of many structures from the list. Currently there are 27 properties on the repetitive loss list for the Town, eleven of which are insured. All of the properties except one are single-family dwellings. The remaining property is a multi-family dwelling.

A GIS coverage of the repetitive loss areas provided by the Town allowed for the following observations of the properties:

- 23 of the properties are located in the AE flood zone
- 4 of the properties are in the X zone which is outside of both the 100 year and the 500-year floodplain. Two of these are within 200 feet of the AE zone.
- 14 of the properties are located along the Atlantic Coast of the Island in the Forest Beach area adjacent to the VE zone.
- 2 are located in the Palmetto Bay area along Broad Creek at its confluence with the Intracoastal Waterway
- 3 are in the Palmetto Dunes area. One of these is adjacent to the VE zone and the other 2 are approximately ½ mile inland.
- 4 properties are in the AE flood zone on northeastern part of the island on the Atlantic Coast Side
- 4 of the properties are in the X zone on the northeastern part of Island

Although the construction of new buildings on Hilton Head Island has slowed considerably during the past few years it is expected that any new construction in the repetitive loss areas will be residential given the locations of the properties involved. Little or no new infrastructure will be required since the subject areas are already provided with services. A detailed review of recent building permits in the County provided an estimate of construction activity expected during the next 18 months. A reasonably optimistic trend projection of similar activity during the succeeding four years produced an estimated County total of $29,590,800 for new homes in the floodplain in 2010, almost all on Hilton Head. By the end of 2014 there would be approximately $148,000,000 of additional investment.

The only critical structures planned to be built in the floodplain are on Hilton Head Island. They are either new or substantial additions to fire and safety building with an estimated total value of $4,400,000 by 2014. This information was obtained from the departments responsible.

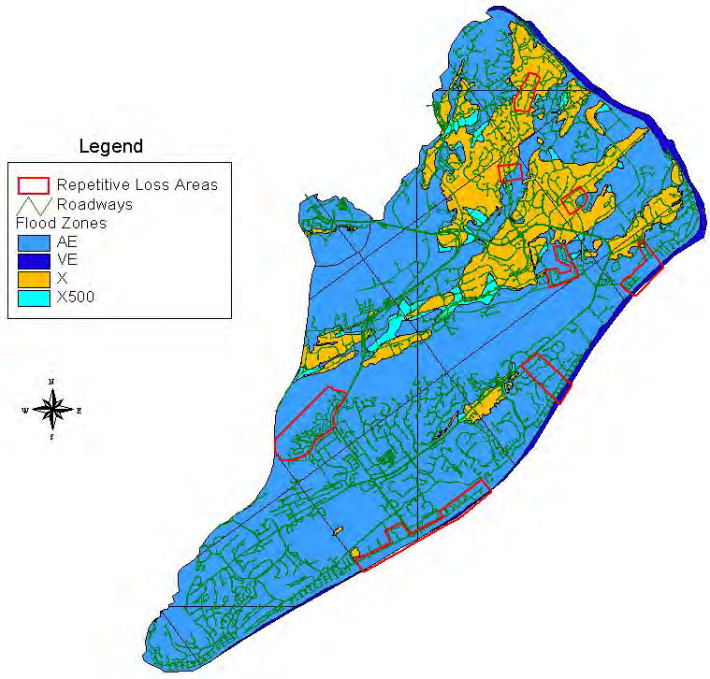


Figure 3-4. Repetitive Loss Areas in Hilton Head

Transportation

In addition to building and facility vulnerability communities must consider transportation and roadway accessibility during and after a flood. Drowning in vehicles is the number one cause of flood deaths. If residents wait too long to evacuate how will flooding will affect their chances of being able to get out of potentially dangerous areas. If residents and business owners chose not to evacuate during a storm there may not be a way for them to leave their property once the storm has ended if flood conditions remain. Evacuees hoping to return after a flood to assess damage and begin repairs may be blocked by flooded roadways and bridges preventing them from accessing their structures for several days. Therefore roadway vulnerability to flooding should be considered.

Because a majority of the land area within the county lies in the 100 year floodplain portions of all of the major highways within the county would be inundated by a 100 year event. As illustrated in Figure 3-5 this includes the major portions of South Carolina Routes 116, 170, and 802 in the Beaufort City and Port Royal areas. In the northern portion of the county it includes much of US Route 21 from Fripp Island up to the Sheldon area. Major portions of U.S. Route 17 would also be inundated by the 100 year flood. In Southern Beaufort County which includes Hilton Head Island and Bluffton approximately half of the length of US Route 278 lies within the 100 year floodplain. Additionally most of South Carolina Route 170 in Southern Beaufort would be inundated.

An important fact in considering Beaufort's evacuation routes is that there essentially are no alternatives to the ones existing now because of the topography of the area. Because of Beaufort County's physical composition, bridges should be considered as critical facilities because they are the essential connectors for both people and freight. Their future evaluation for planning activities is essential.

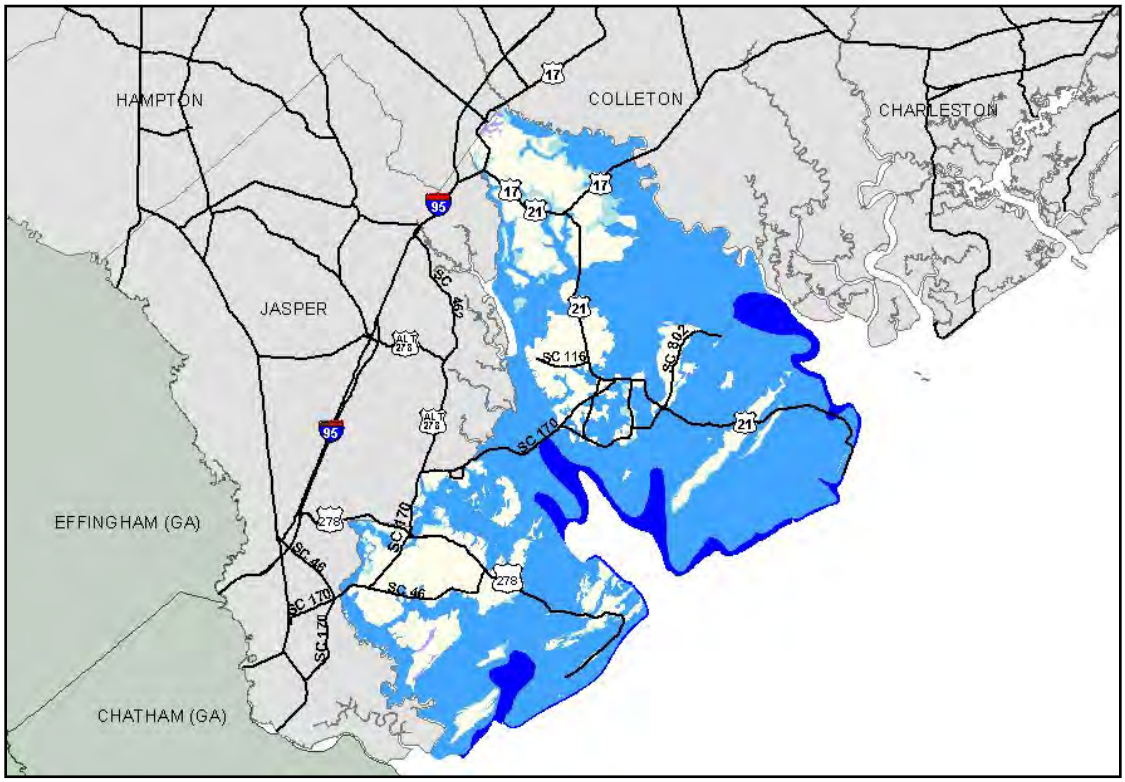


Figure 3-5. Major Routes in the Floodplain in Beaufort County

It is also important to note that highway milage has not increased while population has grown rapidly. This is a cause for concern for the area because of evacuation issues. Table 3-13 reflects this trend by reporting on the vehicle ownership relative to the highway miles.

Table 3-13, Vehicle Ownership Increases vs. Miles of New Roadway in Evacuation Area

Registered Motor Vehicles				
	2000	**2005**	**2009**	**%increase 2000-2009**
Beaufort	89,851	128,351	131,226	46.05%
Colleton	27,653	38,209	35,019	26.64%
Hampton	13,733	17,605	16,320	18.84%
Jasper	13,696	20,728	21,673	58.24%

TOTAL	144,933	204,893	204,238	40.92%
Roadway Miles				
	2000	**2005**	**2009**	**%increase 2000-2009**
Beaufort	771.2	884.2	884.2	14.65%
Colleton	1347	1347	1347	0.00%
Hampton	835.4	838.7	838.7	0.40%
Jasper	648	659.5	659.5	1.29%
TOTAL	3601.6	3729.4	3729.4	3.46%

Conclusions

The analysis suggests that while the entire county is vulnerable to flooding and flood damages there are some areas where this threat is greater due to the amount of land area susceptible to flooding and the amount of development within these areas. While the Town of Bluffton and the unincorporated area of the County known as Sheldon have relatively smaller vulnerabilities to flooding the Town of Hilton Head Island, the City of Beaufort, the Town of Port Royal, and unincorporated areas of the County including Daufuskie, St. Helena and areas directly surrounding Hilton Head Island, have larger numbers of structures and more infrastructure exposed to flooding.

Erosion

The South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management (DHEC-OCRM) publishes the *Annual State of the Beaches Report* which summarizes changes that have occurred along the state's shoreline. Results of the 2009 report for Beaufort County areas are presented above in Table 2-5. The table notes what, if any, type of shoreline change is occurring for the given area, what the average long term change rate is, whether or not the area is an unstablized inlet zone, what is the shoreline zone where the greatest amount of change is likely to occur, and the date of the last nourishment project in the area. By using this chart for analysis Beaufort's susceptibility to damage and loss from erosion can be evaluated.

Beaufort County is vulnerable to erosion, but there are no critical facilities in a highly instable area. While erosion exists as a hazard, for the purpose of this plan, vulnerability and mitigation are addressed primarily through the flooding and other items.

Development Trends

To understand the vulnerability of the built environment within each community an assessment of the development trends was necessary. This allows us to focus on where and what type of future development will occur and then determine hazard mitigation strategies. As noted in Chapter 1 Beaufort County is one of South Carolina's fastest growing counties by percentage of population change with an overall population increase of 40 percent in the 1990s and 24 percent since 2000. This suggests significant development of residential

structures as well as commercial structures and infrastructure to keep up with the resulting demands.

Beaufort County

Unincorporated Beaufort County continues to grow with considerable residential and commercial development occurring in areas close to the City of Beaufort, the Town of Port Royal and the Town of Bluffton. The Town of Bluffton continues to annex significant land area in southern Beaufort County. Based on U.S. Census data it is estimated that the overall population growth in the unincorporated county was 39 percent from 1990-2000 with a 52 percent increase in the number of housing units. From 2000 to 2008 there was nearly a 43% increase in population.

City of Beaufort

According to U.S. Census data, the City of Beaufort's population increased by 35 percent between 1990 and 2000, and the number of housing units in the City increased by 22 percent in this time period. From 2000 to 2008 population actually decreased by just over 7 percent. The city's land area is relatively small, 23 square miles, and will thus serve as a limit to growth in the future. This is evidenced by the decrease in population as citizens moved heavily to the unincorporated areas. From 2004 to 2008 a total of 300 building permits were issued.

Town of Bluffton

The Town of Bluffton has grown considerably in overall land area over the last 10 to 15 years. In 1990 it had a land area of approximately 1 square mile but in 2000 land annexations brought the land area total to 34 square miles. As of June 2009 the Town's land area was approximately 52.24 square miles. Bluffton's population increased by 73 percent during the 1990's and the number of housing units in the town increased by 68 percent. This is a result of both land annexation and increased development in the Town of Bluffton. From 2000 to 2008 the development trend increased again. Though slowed by the current economic situation the population has increase by 93 percent in eight years. From 2004 to 2008 a total of 3,310 building permits were issued.

Town of Hilton Head Island

The Town of Hilton Head Island has remained steady in terms of growth over the last decade. The Town is generally a resort and retirement community with many planned unit residential developments with considerable commercial development to support residents and vacationers. From 1990 to 2000 the population of Hilton Head Island increased 43 percent to an estimated 33,900 people. However housing units in the Town increased only by 15 percent in that time. That trend continues. From 2000 to 2008 the population actually decreased by just under one percent. This continues to suggests a trend in the community of more people with second homes becoming permanent residents but with the influx of new residents leveling off. From 2004 to 2008 a total of 1,063 building permits were issued.

Town of Port Royal

Within the Town of Port Royal, population increased by 32 percent in the 1990's and the number of housing units increased by 40 percent. The Town continues to experience

significant growth and to annex portions of the county along its borders. The Town population increased by over 18 percent from 2000 to 2008. From 2004 to 2008 a total of 435 building permits were issued.

Table 3.14, Development Trends at a glance

Jurisdiction	1990-2000 population/housing unit percentage increase	2000-2008 population increase estimates	Development Trend
Beaufort County	39%/52%	43%	Steady Development
City of Beaufort	32%/22%	-7%	Housing increase, population leveling
Town of Port Royal	73%/68%	93%	Large Annexation, steady development
Town of Hilton Head Island	43%/15%		Development stable but leveling out
Town of Bluffton	32%/40%	18%	Large Annexation, steady development

Vulnerability Assessment Summary

Based on the findings of the vulnerability assessment the hazards considered were ranked in order of the perceived risk to each of the County's communities. These results are presented in *Table 3-15.* It is obvious from the vulnerability assessment and from the perception of the planning group that wind and flood related events are by far the most imminent danger to Beaufort County and its municipalities.

Table 3-15. Ranking of Perceived Risk due to Hazards by Community

Planning District and Incorporated Communities	Hurricane/ Flood	Thunderstorm/ Wind	Tornado	Erosion	Winter Event	Drought	Dam failure/Other Hazards
City of Beaufort	1	2	3	4	5	6	7
Town of Bluffton	1	2	3	4	5	6	7
Town of Hilton Head	1	2	4	3	5	6	7
Town of Port Royal	1	2	3	4	5	6	7
Unincorporated Beaufort County	1	2	3	4	5	6	7

HAZUS-MH Data for the 2009 Update

The original 2004 Plan used HAZUS 99 for evaluation of its vulnerability to hazards. Because of technical limitations the preceding Vulnerability Assessment was based on historical data provided from NCDC, SCEMD and the SCHRL. However because of the thoroughness of the previous HAZUS data the following information has been left in the plan. The Hazard Mitigation Planning Committee will seek out opportunities to update this data when it becomes feasible with HAZUS MH in order to obtain the most accurate data.

For this Plan the Steering committee has decided to modify the 2004 data in a very simplistic way. Essentially we are taking the number of buildings identified in the previous Plan and adding the number of permits that have been issued since then for each jurisdiction. The Plan will reflect the percent increase and that should be a close estimate of the increase in potential damage. The tables below reflect the approximate changes based on the HAZUS 99 data using the increase property value based on permit data. This information may differ slightly from the Assessor's office but still serves as a valuable tool. The Beaufort County GIS department has agreed to revisit this and using their technology, they will perform a full HAZUS-MH assessment in the annual review.

Table 3-16, Data with increases based on building permit data

Jurisdiction	Building Totals 2004	Increase in Buildings from Permit Data	2008 Estimate Total	% increase	TOTAL VALUE $ IN THOUSANDS	TOTAL DAMAGE 99 HAZUS CATEGORY 1 $ IN THOUSANDS	% OF TOTAL VALUE DAMAGED BASED ON 99 HAZUS CAT 1 / CAT 3	TOTAL DAMAGE HAZUS 99 CAT 3
Beaufort	3,689	225	3,914	6.09	471,841	31,595	7 / 43	203,215
Bluffton	497	2853	3,350	474	45,754	3,999	9 / 48	21,749
Hilton Head	12,271	736	13,007	5.99	1,929,118	125,227	6 / 43	838,927
Port Royal	1,414	387	1,801	27.4	399,721	20,683	5 / 35	140,503
County	16,576	8240	24,816	49.7	1,276,550	255	10 / 51	654,467
County Total	34,447	12441	46,888	36.11	4,125,282	122,292	7 / 45	1,860,115

Table 3-17 Wind Scenarios based on building increases (damage sustained)

Jurisdiction	2008 Total Value estimate based on building permit increase	2008 Damage Estimate Category 1/ Category 3 $ in thousands)
Beaufort	$500576	$35040/ $215247
Bluffton	- - -	- - -
Hilton Head	$2032935	$75503/ $360738
Port Royal	$507645	$25382/ $177675
Unincorporated County	$1910995	$191099/ $974607
County Total	$5610383	$392726/ $2524672

Table 3-18 Total Buildings Damaged from earthquake of 6.9 Magnitude

JURISDICTION	TOTAL 2004	99 HAZUS number plus % increase
Beaufort	313	335
Bluffton	64	Permit data records 474% increase—number large but unfeasible
Hilton Head	652	690
Port Royal	189	240
Unincorporated County	2,634	3924
County Total	3,860	5189

2004 HAZUS Information

Wind

Having investigated the different wind hazard issues of concern in Beaufort County an analysis designed to assess current vulnerability of structures in the County to high wind hazards was performed. Tropical storms and hurricanes were the types of events considered most probable to have a widespread effect on the County.

Damage Functions

The wind vulnerability of structures is dependent on several factors:

- structure location particularly coastal vs. inland areas
- level of design attention (a measure of the level of engineering design for the structure)
- quality of materials and construction
- structure exposure and height
- beneficial or adverse effects of nearby trees and structures
- age and condition
- degree of rainfall or water penetration

For this analysis, a simplified approach is being used for which the factors being considered are structure location and the level of design attention. This approach will provide simplified results with an appropriate level of detail for this study. Furthermore review of post hurricane damage reports such as Mehta, et al. (1981) show that structural damages typically correlate well with structure type and degree of engineering attention.

Default wind damage functions for structures are included as part of FEMA's Benefit Cost Program for Hurricane Wind Damage. The User's Guide for version 1.0 of this program dated January 20, 1995, provides information about how hurricane winds affect coastal and inland areas and show that for wind events with a recurrence interval of from 10 to 2000 years, the wind speed along coastal areas is only slightly higher (5 mph or less) than that found 125 miles inland from the coast. Beaufort County's inland area is approximately 35 to 40 miles from the Atlantic Coast. Therefore a constant wind speed for the County was considered in evaluating wind vulnerability.

The User's Guide for the Hurricane Wind Benefit Program provides wind damage functions for each category of hurricane based on the level of design attention for structures. Structures are classified into 5 categories that for the purposes of this study will be termed:

- non-engineered wood
- non-engineered masonry
- marginally engineered
- fully engineered
- pre-engineered

Loss estimates for each classification of building are provided as percentages of the total building replacement value. This information is provided in Table 3-19.

Table 3-19. Wind Damage Percentages for Structure Classifications based on the Level of Engineering Design

		LEVEL OF DESIGN ATTENTION				
HURRICANE CATEGORY	**WIND SPEED (1-MINUTE SUSTAINED MPH)**	**NON-ENGINEERED WOOD**	**NON-ENGINEERED MASONRY**	**MARGINALLY ENGINEERED**	**FULLY ENGINEERED**	**PRE-ENGINEERED**
Tropical Storm	39-73	0	0	0	0	10
1	74-95	7.5	5	5	2.5	25
2	96-110	20	15	15	5	50
3	111-130	50	40	40	20	80
4	131-155	90	80	80	40	100
5	> 155	100	100	100	60	100

Building Inventory Information

GIS building coverages provided by Beaufort County and the Town of Hilton Head did not contain data as to the structures age, building type, or level of design attention, but instead provided building footprints and locations. Therefore FEMA's HAZUS program was used in order to obtain information about the specific types of buildings within the County including information used to classify the building's level of engineering design.

While the HAZUS program available at the time of this analysis (HAZUS 99, SR 2) can be used to assess building vulnerability and damage potential from earthquake events it is not yet programmed to run analysis for wind events. However there is a significant amount of basic structure and infrastructure data available from the program. Structure information is available on a census tract basis that provides information about the building type and occupancy class. The data are based on a combination of decennial census data from 1990 and information provided by the Dun and Bradstreet Corporation in 1996. Also included in HAZUS are dollar replacement values for various classifications of buildings. Dollar replacement values are based on Means cost estimating values in 1994 dollars and regional cost modifiers were applied in HAZUS that are generally used on a statewide basis.

A comparison of the building information between community provided GIS building coverage and the HAZUS data showed that that the HAZUS data has 34,569 structures assigned to Beaufort County. GIS building footprint coverages provided by Beaufort County and the Town of Hilton Head Island indicate that there are a total of 36,555 in the County which is a difference of only 5 percent.

Building types provided by HAZUS were evaluated to determine under which of the 5 engineering design level categories they fell. The results of this evaluation are provided in Table 3-2.

Table 3-20. Building Types Grouped by Level of Engineering Design

NON-ENGINEERED WOOD	NON-ENGINEERED MASONRY	MARGINALLY ENGINEERED	FULLY ENGINEERED	PRE-ENGINEERED
• Wood • light frame	None	• Wood, greater than 5,000 square feet • Concrete frame buildings with unreinforced masonry infill walls • Precast concrete tilt-up walls • Unreinforced masonry bearing walls	• Steel moment frame • Steel braced frame • Steel frame with cast-in-place concrete shear walls • Steel frame with unreinforced masonry infill walls • Reinforced concrete moment resisting frames • Concrete Shear Walls • Precast concrete frames with concrete shear walls • Reinforced masonry bearing walls with precast concrete diaphragms	• Steel light frame • Manufactured (mobile) homes

A general building analysis was performed to determine how the structures were distributed among each of the incorporated communities. Building classification distribution information is available on a census tract basis within HAZUS. Therefore, an analysis was performed using the community GIS building coverages to determine the number of buildings within a particular census tract and to determine the relative percentage of buildings within the tract that were located within incorporated areas. This percentage was then applied to the building counts from the census tract information. As an example Census Tract Number 45013002100 encompasses the Town of Bluffton as well as unincorporated areas of Southern Beaufort County within the Bluffton Township planning district. Upon analyzing the County's GIS data it was determined that there are an estimated 2,573 structures in the census tract and 553 in incorporated Bluffton. Therefore 21 percent (553 ÷2,573 = 0.21) of the census tract's structures are within the Town of Bluffton. The remainder are in the unincorporated portion of the Bluffton Township planning district.

For Census Tract Number 45013002100 to determine the approximate percentage of building census data associated with the incorporated portion of Bluffton a ratio of 0.21 was used so that where the census tract data reported 1,360 wood, light frame structures, 291 of these were assumed to be in incorporated Bluffton. Using this method the building type distribution shown in Table 3-23 was developed.

Table 3-23. Building Type Distribution by Engineering Design Level

AREA	NON-ENGINEERED WOOD		MARGINALLY ENGINEERED		FULLY ENGINEERED		PRE-ENGINEERED		TOTAL
	NUMBER	PERCENT-AGE OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	
Beaufort	2,949	80	319	9	80	2	340	9	3,689
Bluffton	291	59	30	6	6	1	171	34	497
Hilton Head	10,329	84	1,152	9	306	2	458	4	12,271
Port Royal	874	62	133	9	98	7	309	22	1,414
Yemassee	18	52	2	5	0	0	15	43	34
Unincorporated County	10,217	61	968	6	94	1	5,405	33	16,576
County Total	24,678	71	2,604	8	585	2	6,698	19	34,565

HAZUS dollar exposure information provides estimated replacement costs based on structure classification. For the wind vulnerability analysis the replacement cost information for the entire County was summed and grouped by building types based on the level of engineering design.

Using the same methodology discussed to determine building counts for incorporated areas as provided in Table 3-23, building replacement values were developed for the incorporated and unincorporated portions of the County and are presented in Table 3-24. Thus, the overall replacement value of all structures in the Town of Bluffton is equal to 21 percent of the overall replacement value for all structures in Census Tract Number 45013002100.

Table 3-24. Replacement Values for Structures Based on the Degree of Engineering Design (dollars in thousands)

AREA	NON-ENGINEERED WOOD	MARGINALLY ENGINEERED	FULLY ENGINEERED	PRE-ENGINEERED	TOTAL VALUE
Beaufort	263,595	90,870	98,052	19,324	471,841
Bluffton	22,538	9,218	7,343	6,655	45,754
Hilton Head	1,185,902	375,916	330,384	36,916	1,929,118
Port Royal	105,518	108,485	173,709	12,009	399,721
Yemassee	1,444	211	108	533	2,296
Unincorporated County	825,248	154,562	95,623	201,117	1,276,550
County Total	2,404,245	739,263	705,220	276,554	4,125,282

Wind Assessment Scenarios

Using the damage ratios along with the replacement values for the structures two wind scenarios were considered. The first was a Category 1 storm where wind speeds range from 74 to 95 mph (1-minute sustained). Five such storms have passed directly through Beaufort County between 1850 and 2001 and 10 additional Category 1 storms have passed within 50 miles of the County during the same time period.

Assuming a Category 1 storm passed directly through or within close proximity of the County and that all parts of the County experienced similar wind speeds, an analysis of the damage was assessed. Results are presented in Table 3-25.

Table 3-25. Damage Assessments for a Category 1 Hurricane Wind Event (dollars in thousands)

AREA	NON-ENGINEERED WOOD	MARGINALLY ENGINEERED	FULLY ENGINEERED	PRE-ENGINEERED	TOTAL DAMAGE	PERCENTAGE OF TOTAL VALUE
Beaufort	19,770	4,543	2,451	4,831	31,595	7
Bluffton	1,690	461	184	1,664	3,999	9
Hilton Head	88,943	18,796	8,260	9,229	125,227	6
Port Royal	7,914	5,424	4,343	3,002	20,683	5
Yemassee	108	11	3	133	255	11
Unincorporated County	61,894	7,728	2,391	50,279	122,292	10
County Total	180,318	36,963	17,631	69,139	304,051	7

The total amount of damage is estimated at $304 million or approximately 7% of the entire building dollar exposure of the County. Damage as a percentage of the total value of

structures for incorporated communities ranges from 11 percent in Yemassee to 5 percent in Port Royal. Hilton Head Island, the incorporated area with the most structures has the highest value loss at $126 million. The unincorporated portions of the County have a combined loss estimate that is slightly less than Hilton Head at about $121 million.

Generally the results of the assessment for the Category 1 storm suggest that most areas of the County would experience similar values of damages relative to their number of structures with the damage equaling about 5 to 11 percent of the overall value of the structure or 7 percent on average for the entire County.

The second scenario considered was a Category 3 Hurricane event. Wind speeds for a Category 3 storm range from 111 to 130 mph (1-minute sustained). One Category 3 storm passed through Beaufort during the period of record, 1850-2001. In 1885 the storm made landfall at Lady's Island and headed northwest into Colleton County. Three additional Category 3 storms passed within 50 miles of the County during the same time period. One of these storms, Hurricane Gracie hit the area in September 1959. The center of the track was within 2 miles of Beaufort County's northeastern border.

The analysis assumed that the Category 3 storm would pass directly through or within close proximity of the County and that all parts of the County would experience similar wind speeds. Results are presented in Table 3-26.

Table 3-26. Damage Assessments for a Category 3 Hurricane Wind Event (dollars in thousands)

AREA	NON-ENGINEERED WOOD	MARGINALLY ENGINEERED	FULLY ENGINEERED	PRE-ENGINEERED	TOTAL DAMAGE	% OF TOTAL VALUE
Beaufort	131,798	36,348	19,610	15,459	203,215	43
Bluffton	11,269	3,687	1,469	5,324	21,749	48
Hilton Head	592,951	150,367	66,077	29,533	838,927	43
Port Royal	52,759	43,394	34,742	9,608	140,503	35
Yemassee	722	84	22	426	1254	55
Unincorporated County	412,624	61,825	19,125	160,894	654,467	51
County Total	1,202,123	295,705	141,044	221,243	1,860,115	45

The total amount of damage is estimated at $1.86 billion or approximately 45% of the entire building dollar exposure of the County for the Category 3 storm. Damage as a percentage of the total value for incorporated communities range from 35 to 55 which is a significantly higher amount and larger range than that for the Category 1 storm. Again Hilton Head sustains the highest value loss at $845 million with unincorporated portions of the County having a combined loss of $648 million.

The building stock of communities and areas with higher percentages of overall damage can be assessed using Table 3-23. Where the overall percentage of damage is higher it is related to the community's dominant building types since this is the characteristic used to determine the appropriate damage function as provided in Table 3-1. Damage ratios for pre-engineered buildings are significantly higher than those for the other building types. Additionally ratios for non-engineered wood structures are higher than for marginally or fully engineered buildings and ratios for marginally engineered buildings are slightly higher than those for fully engineered buildings.

In unincorporated portions of the County where the damage is equal to about 51 percent of the entire building dollar exposure only one percent of structures are considered fully engineered and 6 percent are marginally engineered. One-third of the structures are pre-engineered and 61 percent are non-engineered wood frame structures. In Port Royal where the damage is a significantly lower 35 percent of the overall dollar exposure 16 percent of structures are marginally or fully engineered and only 22 percent are pre-engineered. Similar to the unincorporated County area 62 percent of the structures are non-engineered wood frame structures.

The wind vulnerability analysis allowed for a simplified approach to assessing wind vulnerability. The analysis showed that more damage is expected in unincorporated areas of the County, Bluffton and Yemassee due to the differences in building inventory between these areas and other areas of the County as it relates to the engineering design levels for the communities' structures. Additionally the analysis showed that for a minor Category 1 hurricane the County can expect an average of approximately 5 to 10 percent of damage while for a Category 3 storm this percentage increases significantly to 45 percent.

Conclusions

The wind vulnerability of each of the communities within the county is similar as shown in the assessment. Areas directly along the coast such as the Town of Hilton Head Island, Daufuskie Island and the St. Helena area are expected to suffer more direct wind damage from coastal storms than the other areas of the county given their proximity to the shoreline. However the County's coastal location puts all of its communities at risk from high winds from coastal storms.

Earthquake

The HAZUS program was used to perform an analysis of potential damage to the County by an earthquake. HAZUS allows the user to model earthquakes that are based at historical epicenter locations, but to vary the magnitudes for the events to provide a range of possible earthquake scenarios. Two earthquake scenarios were developed to use in assessing the County's vulnerability to damage from earthquakes.

Building Inventory Information

HAZUS was used to determine the number of structures that would incur at least moderate structural damage as the result of the each of the earthquake scenarios. HAZUS categorizes structural damage into 5 categories: none, slight, moderate, extensive, and complete. There are descriptions of damage provided for each type of building (ex. wood light frame, steel moment frame, unreinforced masonry bearing walls) at all of the 4 damage states above none. A detailed description of these states can be found in Chapter 5 of the HAZUS99-SR2 Technical Manual. Some examples of moderate damage descriptions are presented in Table 3-27.

Table 3-27. HAZUS Moderate Structural Damage Descriptions

WOOD FRAME	STEEL FRAME	UNREINFORCED MASONRY	MANUFACTURED HOMES
• Large cracks at corners of door and windows • Small cracks along shear wall panels	• Steel members have yielded showing observable permanent rotations at connections • Steel braces have yielded showing stretching an buckling	• Most infill walls exhibit large diagonal or horizontal cracks • Some walls show crushing of brick around beam-column connections	• Major movement of the mobile home over its supports resulting in some damage to metal siding • Requires resetting o the home on its supports

For this analysis, building types are divided into 7 basic types:

- Wood frame
- Steel frame
- Reinforced Concrete
- Unreinforced concrete
- Reinforced Masonry
- Unreinforced Masonry
- Manufactured Homes

An initial inventory count of the number of each of these types of buildings within the County was performed and is presented in Table 3-28.

Table 3-28. Building Count by General Building Type

COMMUNITY	WOOD	STEEL	REIN. CONCRETE	UNREIN. CONCRETE	REIN. MASONRY	UNREIN. MASONRY	MANU. HOMES	TOTAL
Beaufort	2,970	60	12	5	16	295	332	3,689
Bluffton	293	5	1	0	1	27	171	497
Hilton Head	10,391	192	49	9	89	1,081	434	12,245
Port Royal	876	37	39	21	18	119	309	1,418
Yemassee	18	0	0	0	0	2	15	34
Unincorporated County	10,246	75	11	3	19	936	5,395	16,686
County Total	24,795	369	111	38	142	2,459	6,655	34,569

Earthquake Assessment Scenarios

As indicated in the Hazard Identification, the most powerful earthquake of historical record in the vicinity was the Charleston earthquake of 1886 which had a magnitude (M_L) of 6.9. This magnitude falls under the strong category as defined by the Richter scale. A scenario was performed based on that event using the same epicenter location and magnitude. A depth of 10 kilometers was used for the epicenter.

Additionally, a scenario was performed using a lesser magnitude to determine potential damages for a smaller, but still significant earthquake event. A magnitude of 5.9, which falls within the moderate earthquake classification, was also chosen for a scenario with the epicenter still located at the site of the 1886 earthquake.

Results

Results are presented for both scenarios as the number of structures that are damaged to the moderate level or higher as defined by the HAZUS program. The strong earthquake (M_L = 6.9) generates results as presented in Table 3-29.

Table 3-29. Number of Structures Incurring at Least Moderate Damage for a ML = 6.9 Event

COMMUNITY	WOOD	STEEL	REIN. CONCRETE	UNREIN. CONCRETE	REIN. MASONRY	UNREIN. MASONRY	MANU. HOMES	TOTAL
Beaufort	100	16	3	1	2	61	130	313
Bluffton	6	1	0	0	0	4	53	64
Hilton Head	263	32	8	0	8	189	152	652
Port Royal	26	7	10	6	2	23	116	189
Yemassee	1	0	0	0	0	0	6	8
Unincorporated County	353	12	0	0	0	192	2,076	2,634
County Total	750	68	21	7	12	469	2,533	3,860

Results from the analysis show that about 11 percent of the County's entire building inventory would be moderately to completely damaged. For each of the incorporated communities and the unincorporated County, this percentage is as follows:

- 8 percent for the City of Beaufort
- 13 percent for the Town of Bluffton
- 5 percent for Hilton Head
- 13 percent for the Town of Port Royal
- 24 percent for Yemasssee
- 16 percent for the unincorporated portions of the County.

The heaviest losses by percentage by building type are for manufactured housing, where 38 percent of the County's inventory is at least moderately damaged, and for unreinforced masonry, reinforced concrete, unreinforced concrete and steel where this percentage is 19, 19, 18 and 18 respectively. However, the heaviest overall losses include not only manufactured housing and unreinforced masonry buildings, but also wood frame buildings where 750 structures are at least moderately damaged.

Results for the analysis of the moderate earthquake run (M_L = 5.9) showed that only two types of buildings incurred moderate damage. These were unreinforced masonry buildings and manufactured homes. Neither of these types of buildings experienced any complete damage, but some extensive damage was experienced by the unreinforced masonry buildings. Most of the rest of the building types experienced some slight damage with wood frame structures having a count of 583 structures being slightly damaged. Seven steel frame buildings were slightly damaged, and only one each of reinforced and unreinforced (pre-cast) concrete experienced slight damage. Building damage count results for unreinforced masonry and manufactured homes that experienced at least moderate damage are in Table 3-30.

Table 3-30. Number of Structures Incurring at Least Moderate Damage for a ML = 5.9 Event

COMMUNITY	UNREINFORCED MASONRY	MANUFACTURED HOMES	TOTAL
Beaufort	6	14	30
Bluffton	1	3	4
Hilton Head	43	16	59
Port Royal	6	11	17
Yemassee	0	1	1
Unincorporated County	47	237	284
County Total	103	282	395

The vulnerability analysis shows that for the moderate earthquake with a M_L of 5.9, about 1 percent of the County's structures are vulnerable to at least moderate damage as compared to the 11 percent of the structures vulnerable from a strong earthquake (M_L = 6.9). Most of these are manufactured homes located within unincorporated portions of the County (236 out of 395 or 60 percent).

Conclusions

Vulnerability to earthquakes for the communities within Beaufort County is based largely on their proximity to known epicenter areas as well as the distribution of building types within each of the communities. Given these factors, portions of Unincorporated Beaufort County had one of the highest percentages of damaged structures from a major earthquake, most of which were manufactured homes. The Town of Port Royal and the Town of Bluffton had similar damage rates indicating similar vulnerabilities that were slightly less than the unincorporated county due mostly to a different distribution of building types than the county. The City of Beaufort had a lower damage rate also due to its distribution of structure types. Hilton Head Island had the lowest rate of damage for the M_L = 6.9 event due in large part to its distance from the area's major epicenter site which is the Charleston area.

4. Community Mitigation Capability Assessment

Thus far the planning process has identified and updated the natural hazards posing a threat to Beaufort County and described and quantified the vulnerability of the County and communities to these risks. This has been done by using updated information from FEMA and the local jurisdictions. Prior to finalizing updated Goals and Objectives for improving each jurisdiction's ability to reduce the impacts of these risks we must assess and update the mechanisms that exist already in these areas to reduce hazard damage. By doing so the plan can focus the goals, objectives and actions in this plan more accurately. This part of the planning process is referred to as "The Community Mitigation Capability Assessment."

The HMPC took two approaches in conducting this assessment. First, a review of the previous plans inventory of existing policies, regulations and plans was made. These policy and planning documents were collected and reviewed to determine if they contributed to reducing hazard related losses or if they inadvertently contributed to increasing such losses. Second, an inventory of other mitigation activities was made through the use of a matrix. The purpose for this effort was to identify activities and actions beyond policies, regulations and plans that were either in place, needed improvement, or could be undertaken if deemed appropriate. Throughout the process there was frequent consultation with the representatives of the jurisdictions to discuss and clarify the issues. When the assessment was completed, the Committee reviewed the results and made further recommendations that were incorporated. The HMPC collected and analyzed the documents presented in Table 4-1.

Table 4-1. Beaufort County Documents used for Capability Assessment

BEAUFORT COUNTY	CITY OF BEAUFORT	TOWN OF BLUFFTON	TOWN OF HILTON HEAD ISLAND	TOWN OF PORT ROYAL
Comprehensive Plan,	Comprehensive Land Use Plan,	Comprehensive Plan,	Comprehensive Plan,	Comprehensive Plan,
Zoning & Development Standards,	Subdivision Regulations,	Development Standards Ordinance,	Land Management Ordinance	Subdivision Regulations,
Southern Beaufort County Plan	Zoning Ordinance,	Zoning Ordinance,	Ward One Master Land Use Plan,	Zoning Regulations and Map,
			Flood Damage Prevention Ordinance	Flood Damage Prevention Ordinance,
Beaufort Co. Above Ground Historic Resources Survey,	Beaufort Preservation Manual, and Supplement			
Northern Beaufort County Plan			Flood Hazard Mitigation Plan,	Overlay District Standards,
Stormwater BMP Manual; Stormwater Utility developed	Stormwater Utility developed in past five years	Stormwater BMP Manual; Stormwater Utility developed	Stormwater Utility developed	Stormwater Utility developed
All ICC Building codes without amendments	All ICC Building codes without amendments	All ICC Building codes without amendments	All ICC Building codes without amendments and "History of Building Codes"	All ICC Building codes without amendments
Hurricane Response & Recovery Guide,			Comprehensive Emergency Management Plan	
Emergency Operations Plan,			Emergency Operations Basic Plan	

[1] As part of the SWM Utility, all communities will eventually be required to adopt the BMPs as outlined in the BMP manual developed by the SWM Utility that is currently in effect in Beaufort County and The Town of Bluffton.

Below is a bulleted summary of how each of these documents contributes to an overall Hazard Mitigation framework. Each point identifies where and how mitigation concepts, principles and measures are integrated into the normal day-to-day activities of the local governments. Text that is highlighted **in bold underline** identifies opportunities to strengthen or improve activities to reduce future hazard-related losses further.

Beaufort County:

Comprehensive Plan, 2007:

- Document presents policies and strategies for growth management, a fundamental principle of coastal mitigation planning. The plan recognizes natural hazards as a constraint to growth.

- Beaufort County's vulnerability to hazards is acknowledged throughout the plan, and hurricanes appear as the area's most devastating, regularly occurring natural hazards.

- The Existing Land Use Element identifies Resource Conservation Zoning Districts and Overlay Districts. These districts regulate development in flood hazard areas. The Resource Conservation Zoning District protects and conserves sensitive environmental areas, maintains Open Space, and discourages growth in areas which "pose undue hazards to man." The element calls for lower densities within rural and critical areas.

- The Future Land Use Element stresses preservation of certain area-wide resources. It calls for infill development in the main urban centers. **This could be expanded to include property preservation by calling on development to take place only in areas that are less prone to hazards.**

- The Cultural Resources Element identifies the need to protect the County's valuable resources. **The plan could be strengthened by recommending a disaster preparedness plan to preserve the resources.**

- The Natural Resources Element identifies mainland geology, sea-level change, erosion and accretion, and drainage issues. It identifies the need for preparation for sea-level rise in the coming decades. It also recognizes the hazard Beaufort County faces especially hurricanes and flooding. **This plan could be strengthened by recommending strict building regulations to avoid loss in hazard prone areas.**

- The Regulatory section references the relationship to OCRM regulations and development.

- The Community Facilities section identifies the Emergency Management Department. It suggests a regional evacuation plan with agreements for cooperation from the surrounding counties; protecting the major evacuation routes, and to continue coordination efforts to ensure maximum efficiency in evacuations. **This section could be expanded to include mitigation by, for example, suggesting that new and or expanded community facilities take hazard protection into their siting decisions such as schools, wastewater, and cultural facilities. Could be expanded to identify existing critical facilities important to protect from disasters in order to preserve a minimum response capability.**

Zoning & Development Standards

- ZDSO is the tool to achieve the objectives of the Comprehensive Plan. ZDSO addresses setbacks, buffers, wetland and natural resources protection and drainage.

- Identifies flood control design criteria for retention/detention ponds; collector, local streets and closed drainage systems; roadside swales; canals and major ditches; and bridges.

Stormwater BMP Manual, 3/98

- Identifies existing federal, state and county regulations.

- Most of document recommends policies and standards for new and existing development. County aggressively pursues protection of water quality.

- Water quality and bacteria data is gathered under this plan.

Hurricane Response & Recovery Guide

- The Damage Assessment Emergency Support Function (ESF) identifies pre-disaster Preparedness and Mitigation actions. Procedures regarding "substantially damaged" structures are in the post-disaster assessment procedures of the Building Code. These procedures are important because when buildings are "substantially damaged" (damaged greater than 50% of their pre-damage value) their repair, reconstruction, or replacement are treated as new construction, requiring compliance with any new codes and standards adopted since the building was constructed. **The county could benefit by hosting pre-disaster training on FEMA's Residential Substantial Damage Estimator (RSDE), a damage assessment software program specifically designed to support decision-making by local building officials when addressing "substantial damage" issues. Using FEMA's RSDE program will qualify NFIP policy-holders for additional payments if their building is substantially damaged, within the mapped 100-year floodplain, and insured under the NFIP.**

Emergency Operations Plan

- The County Hazard Mitigation Plan is appended to this plan. It establishes a Mitigation Committee with listed responsibilities, and describes Pre- and Post-disaster actions.

- Attachment A to Appendix H describes 6 continuing mitigation projects; the Storm Water Utility Comprehensive Development Plan, The NFIP/CRS, The Land Purchase Project, the Flood Alert Program, the Drainage Program, and Mitigation Education. The Storm Water Utility regulates density and land-use, and establishes goals for future transportation requirements and road development. The land Purchase Project is a mechanism to preserve open zones and reduce development. The Flood Alert Program keeps citizens aware of potential flooding situations through cable TV and radio warnings. The Drainage Program is designed to eliminate existing drainage problems and provide drainage where it is

nonexistent. The Mitigation Education Project is a combined effort between the County Building Codes and Emergency Management Departments to teach citizens about potential hazards in order to reduce potential damage.

Other

- The County pursues Open Space preservation through its ZDSO, and a Rural and Critical Land Preservation Program. The R&CLP Program is a voluntary Program which provides the means for private landowners to permanently preserve or maintain the rural character of their land. The main goal of the Program is to preserve open space, protect critical and natural resources and preserve rural uses. Funds available for the Program can be leveraged with federal, state, local, or private conservation efforts and development rights purchase funds to protect property and purchase development rights.

- County promotes sustainability and Growth Management principles and programs through their Comprehensive Plan. The Plan specifically identifies the resident's vision for their future as integrating new development into the County in a way that will protect County values that include: protecting water quality, environmental quality, the scenic landscape of the rural communities and towns, the stability of the communities by retention of land by the residents, and their diversity in terms of age, income and race. A central theme of the Comprehensive Plan is to engender quality development that respects the local values and protects the residents from becoming Anywhere, USA. It is a Public Policy Goal of Beaufort County to "define and perpetuate the ethic of quality growth."

City of Beaufort:

Comprehensive Plan, 2009 revision

- The basic purpose of the land use plan is to provide direction for managing anticipated growth and change. Growth in the City however, has been slow compared to other parts of the County. There has been very little growth within the City limits in the last thirty years as the population has increased a relatively low rate.

- The plan's Natural Resources Element identifies several critical geologic features. First, there are basically two types of soils: soils generally associated with the locations of wetland areas, and soils associate with areas of stable ground. The wetland areas are rarely suitable for any type of development. Second, the highest elevations in the city are approximately 20 feet above MSL.

- The climate section describes the potential for devastating hurricanes, citing 60 tropical cyclones that passed within 75 nautical miles of the County's barrier islands from 1886-1993. According to the plan, hurricane force storms are expected approximately every 11 years.

- Beaufort's main water supply comes by pipe from the Savannah River. The City's back-up supply comes from wells that tap the Florida Aquifer. The plan states that the aquifer will not be a reliable source in the future due to overuse.

- The document discusses river corridors and floodplains**. This document could be improved with a quality map and discussion of the NFIP development regulations in connection with the map. This would create a nexus between existing and proposed development and the hazards associated with floodplains, and the benefits of river corridors.**

- Historic resources are described in depth in a separate element. The proposed policies promote the renovation and preservation of the Historic District and buildings. In addition, there is a Historic Preservationist working in the County, and the Beaufort Preservation Manual, and Supplement, have been developed to assist owners of historic structures. Also, included as recommendations of this Hazard Mitigation Plan, is the development of specific guidance to assist owners with damage assessment and repair and reconstruction in a post-disaster situation.

- The Housing Element describes how single family housing represents the largest percentage of buildings in the County, and points out that this is somewhat skewed by the resort development of multi-family housing in other areas of the county. Additionally, the plan states that there continues to be a significant surge in housing development with most of it occurring along the waterfront and marshland. **The housing element could be improved by creating a nexus between the proposed housing goals and the maintenance and creation of safe, disaster resistant housing.**

- The Facilities Element speaks to transportation (roads, bridges, bicycle paths), water and wastewater treatment, police and fire, health and medical facilities, parks and recreation, and public education (schools and libraries). The Fire Department maintains an ISO (Insurance Services Organization) Class 2 for fire, and 3 for codes enforcement. These ISO classes are the same type of rating system that ISO applies to the CRS program of the NFIP. The ratings range from 1 to 10; the lower the rating, the better the measurement of community performance (and the lower the rate applied towards that component of insurance cost). Thus, the City does a commendable job in maintaining its capability for fire defense and code enforcement. **The Facilities Element could be improved by including a list of critical community facilities and describing the need for protection of these facilities.**

- The Land Use Element provides a 20-year concept for future land use, and it strives to inventory future development. It defines future densities, **but this could be improved by creating a connection between the future development densities and the developable soils (and thus the reduction of potential storm and flood damage).**

- The Land Use strategies propose establishing criteria for a redevelopment policy within the city, aimed at historic structures and the Board of Architectural Review. **This could be strengthened by establishing and adopting redevelopment policies and procedures for post-disaster redevelopment, regardless of where it is located.**

- Modifications to the existing Zoning Ordinance are made, with particular reference to adopting a Tree Preservation Ordinance. **By including a "maintenance" provision in the proposed ordinance, the City would help to reduce the exposure to the high degree of damage and power losses created by breaking, falling, and uprooted trees during severe storms. A maintenance provision would ensure that trimming tree limbs away from power lines would take place on a routine basis, thus eliminating a major factor in**

incurring power losses. Such a provision can also strengthen the concept keeping new plantings a set distance away from power lines, and only planting vegetation with root systems appropriate to the local environment.

- The Short-term Work Program in the Implementation Section recommends preparation of a Coastal Zone Management Plan as well as the preparation and implementation of a Stormwater Drainage Plan including the feasibility of developing a Stormwater Utility. **Storm damage reduction and property protection are additional benefits of these plans that should be mentioned. Drainage plans not only address existing drainage problems, but also establish standards for new development so as not to exacerbate the existing problem any further, thus reducing damage to infrastructure and property. Stormwater Utilities can provide a dedicated ongoing source of funding that can pay for maintenance, new construction, and public education.**

Unified Development Ordinance, 2006

- The document includes all of the City Ordinances. **The Floodplain Management Ordinance (Flood Damage Prevention Ordinance) required for participation in the NFIP should be included.**

- The Ordinance cites the Mobile Home District. However, the Building Code is where tie-downs, special foundation requirements, or on-site sheltering requirements are cited.

- Article six defines the Historic District that is bordered on 3 sides by water. **A reconstruction/redevelopment standard should be considered. This standard would reinforce that any post-disaster reconstruction, as well as normal redevelopment/rehabilitation must adhere to all other standards for historic preservation as well.**

- Article 7 Deals with nonresidential signs. **This section could be strengthened because it dictates the size and types of signs that can be erected and signs suffer and cause significant damage during windstorms. By restricting large, flat signs, and canopies, such as those frequently found at fueling service stations, certain frequent damages can be reduced. Additionally, collateral damage is often caused by flying debris in severe wind storms, so it is important to dictate how to securely attach signs that are permitted.** (Building Code contains requirements for fastening/ attachments.)

- The UDO references non-conforming buildings or uses. Zoning regulations require structures damaged greater than 50% of their pre-damage appraisal be removed and replaced with confirming buildings and uses.

- Article 3 requires drainage facilities as part of the review criteria for subdivision of land.

- The UDO requires underground utilities in new developments.

- Section 7.20 allows for emergency removal of storm-damaged trees (and allows trimming around utility lines, and sometimes requires trees to be replaced). **Consideration should be given to requiring native species within Article H, Landscaping and Tree Conservation.**

- The "Development Standard" section for the Beaufort Historical District should be expanded. **Reconstruction and redevelopment standards should be considered.**

- Appendix A: Preliminary reviews of subdivisions require that floodplains and any other conditions affecting the site be identified.

- Appendix A requires that the location of existing culverts and drainage pipes be identified.

- Appendix A allows the Planning Commission to require a topographic map at an interval deemed necessary by the Commission if conditions peculiar to the site warrant special consideration.

- Appendix A outlines requirements for final approval for subdivision of land. Appendix A outlines Required Street Improvements, drainage requirements and encourages the use of the most up-to-date and innovative drainage techniques. **This would be an opportunity for Emergency Management/Fire Department to conduct a preliminary review for access/egress and evacuation considerations. Many communities lament that Emergency Management is not involved in the Development process until after-the-fact.**

Town of Bluffton:

Comprehensive Plan, 2007:

- Since 1998, the town limits of Bluffton have increased from one square mile to approximately 54.24 square miles.

- In the Natural Resources Element floodplains and floodways are defined and addressed as areas where development and variances to floodplain development should be prohibited.

- The plan identifies and acknowledges the vast amount of wetlands within the Town and surrounding areas and the need to protect those systems.

- The Town requires all development to comply with the latest version of the their Stormwater Ordinance and Best Management Practices.

- The plan recommends review of ordinances and practices to ensure compliance with FEMA and National Flood Insurance programs.

- Water quality protection for the all watersheds is a priority with the Town of Bluffton with immediate attention being dedicated to the May River. The Town is currently developing the May River Action Plan to ensure a sustainable and protected watershed is maintained both now and in the future.

- Scenic River status for the New and May Rivers is recommended.

- The plan recommends reducing parking requirements, street widths, and driveway widths or imposing a maximum impervious surface percentage to help control increased surface runoff.

- Retaining or installing natural buffers along waterways and wetlands is recommended to reduce the potential for pollution from surface runoff.

- Open ditches and grass-lined swales are preferred to concrete lined or piped drainage ways and the plan states that the maintenance of such needs to be routine. Additionally, it notes that care must be taken to balance the designs to move stormwater quickly from potential flood locations while preserving water quality.

- **Plan states that the Old Town's drainage system needs to be upgraded.**

- Through development agreements, all new development in the Town's newly annexed areas will have proper supporting infrastructure i.e. BJSWA (water and sewer – no septic systems), stormwater BMPs, and roadways that meet County and SCDOT standards.

Zoning Ordinance

- The zoning ordinance includes a River Protection Overlay District with buffers and setbacks depending on use and distance from critical line.

- The Density Bonus Ordinance encourages sustainable development and protection of wetlands, trees, and floodplains.

- Revision to the tree ordinance is underway and recognizes the crucial role of trees in reducing stormwater impacts. **Consideration should be given to tree maintenance, tree trimming and "native" vegetation in order to reduce storm damage from falling trees and branches interrupting power.**

- Historic District Standards apply for Bluffton Conservation Neighborhood and the Bluffton Preservation Sub-District that are located within the Town's original one-square mile area.

- Non-conforming buildings or uses with damage greater than 50% of the pre-damaged appraisal must be removed and replaced with conforming buildings and uses. However a pre-FIRM building within the 100-year mapped floodplain that is *substantially damaged* becomes nonconforming when that level of damage is incurred. Such a residential structure can be elevated in lieu of being removed or relocated. Commercial structures could be elevated or flood-proofed.

- Non-conforming buildings or uses must implement conforming practices such as landscaping, storm water retention and open space requirements as a condition of approval for redevelopment. Redevelopment is the term applied towards substantially improving existing buildings for reasons other than the repair of significant damage.

Stormwater BMP Manual, 2007.

- The Town is currently represented on the Stormwater Utility Advisory Board.
- The manual compiles federal, state, and Town regulations into one document thereby simplifying the process of stormwater treatment and mitigation.
- The stormwater ordinace is currently under revision to add additional measures to ensure that post-development surface runoff volume is the same as predevelopment surface runoff volume.

Unified Development Ordinance

- Unified Development Ordinance undergoing comprehensive overhaul to address form-based land use management techniques within a watershed framework
- The subdivision standards were adopted in June 2001.
- The subdivision review application requires identification of floodplains, topography, wetland, waterways, trees, drainage ditches, etc.
- Subdivision plans must be approved by each of the following entities: the County Engineer, the Town Engineer, the Fire Marshall, SCDOT, BJWSA, EMS Addressing and other utilities.
- Conservation and Flood Hazard Districts are defined with special standards applied in conjunction with NFIP.
- Development and building permits are valid for one year.

Town of Hilton Head Island:

Comprehensive Plan, 2009

- The Comprehensive Plan includes the Beaufort County Multi-jurisdictional Hazard Mitigation Plan as an Appendix.. Additional Appendices include:
  - Post-Disaster Recovery & Mitigation Plan
  - Beach Management Plan
  - Islandwide Drainage Study, and the
  - Fire and Rescue Master Plan
- The process of conducting the state mandated Comprehensive Plan update fulfilled the Town's Community Rating System (CRS) planning requirements by updating this Hazard Mitigation Plan.

- The Natural Resources Element identifies and assesses coastal resources, wetlands, floodplains and soils among other concerns.

- The Community Facilities Element includes an analysis of stormwater management and Fire Protection and Emergency Medical Services.

- Hazard Mitigation is promoted to minimize the vulnerability of Town infrastructure and public facilities to storm damage by including the Beaufort Multi-jurisdictional Hazard Mitigation Plan as an integral part of the Town Comprehensive Plan.

- The Land-Use Element includes a future land-use map, and includes redevelopment strategies and policies that address pre- and post-disaster issues. The strategies are within the Town's Land Management ordinance (LMO).

- The Land-Use Element includes the consideration of land purchases in areas of the Island that are vulnerable to severe storms and flooding and would be prime areas for future development.

- Implementation of the Islandwide Drainage Study is identified as a critical activity and its continued implementation is vital to the Island.

- The Natural Resources Element identifies 56 percent of the Island surface as having soils that are poorly drained and though Hurricanes pose a catastrophic threat the limited drainage capacity of the soils, the lack of connected wetlands and poorly maintained rural ditches cause sustained periods of rain to be the foremost threat of flooding.

- The Town supports the use of Best Management Practices including innovative nonstructural and structural technology for the prevention and control of urban runoff.

- The Town promotes the protection of water quality and combines those techniques to lessen drainage and flooding problems where appropriate.

- Sustainability and Growth Management are planning principles woven throughout the Comprehensive Plan.

- Maintenance of the ocean beachfront is described as a balance between tourism and the island's sensitive environment.

Beaufort County Hazard Mitigation Plan

- The Beaufort Multi-jurisdictional Hazard Mitigation Plan is an Element of the Comprehensive Plan.

- The Town is in the top 4% of communities nationwide that manage their floodplains well and exceed minimum NFIP requirements through the CRS program.

- The Town has a Public Information Program and an annual Flood Awareness Week

- The Town has more than 30,000 NFIP policies

- The Town has taken a proactive approach to Flood Hazard Mitigation. They developed a Disaster Recovery and Mitigation Plan in 1991 following the devastation Hurricane Hugo created in South Carolina. This was one of the first Recovery Plans in the nation, and the first that defined "re-entry" following an evacuation as the beginning of Recovery. In 1995 the Town recognized that while they are extremely vulnerable to hurricanes their foremost problem with flooding was due to inadequate drainage and the more normal rainstorms typical to coastal South Carolina. This led to the development of the Town *Island-Wide Drainage Study,* which continues to be updated. Then in 1999 the Town of Hilton Head Island developed their *Flood Hazard Mitigation Plan.* This was one of the first mitigation plans in the nation to be officially incorporated it with the Town *Comprehensive Plan,* a concept now embraced by the American Planning Association (APA) through their *Planning Advisory Series* and FEMA through the DMA regulations. The Town continues to enforce and update their plan when necessary and takes a proactive approach to flood mitigation.

- The Town is susceptible to drainage system flooding, coastal erosion and Tropical Storms and Hurricanes. Wind hazards present additional concerns.

- The highest priority flood mitigation issue is the coordination of new development with drainage improvements and stormwater management. This is followed by the protection of critical facilities, with an emphasis on water supply and wastewater treatment facilities.

- The Town pursues a variety of flood mitigation activities, including:
    - Preventative Measures
        - Open Space Preservation
        - Storm Water Management
    - Property Protection Measures
        - Building Elevation
        - Floodproofing
        - Flood Insurance
    - Natural Resources Protection
    - Structural Protection
        - Beach Nourishment
        - Sand Fencing
        - Drainage Improvements
    - Emergency Services

Island Wide Drainage Study, August 30, 1995

- Comprehensive study inventoried existing drainage facilities, determined major drainage paths, identified bottlenecks, and recommended prioritized improvements.

- Primary drainage problems within the Town include the changing drainage design standards over time while the island was being developed, separate systems not planned with an island-wide perspective, lack of maintenance of stormwater management facilities and the low and flat topographic nature of the island.

- The study notes that the Island is incapable of handling storm surge from Atlantic Ocean.
- Cleaning, dredging and maintaining the existing drainage system is the foremost priority.
- The study recommends that lagoon and ditch levels be lowered prior to major storm events.
- The study recommends that future construction require finished floor elevations to be 1 foot higher than existing lot topography and adjacent roadways.
- The study makes recommendations for improvements totaling $17.5 million many of which have been completed.
- The drainage study is continually updated and the staff looks for improvements and recommendations on a regular basis.

Floodplain Management and Land Management Ordinance

Floodplain Management and Development policies and procedures are in good order and contribute to Hilton Head Island's commendable CRS Class 6 rating which provides a 20% reduction in the cost of flood insurance to the more than 30,000 policyholders. This represents an approximate annual savings of $3.5 million.

Other Considerations:

- There are over 30,000 NFIP policies in force on HHI
- The 1999 Flood Hazard Mitigation Plan calculated damages to structures from the 100 year flood would be approximately $680 million. If Hilton Head Island was not an active participant in the NFIP it estimates that the damage would have been $1.66 billion.
- Hilton Head Island has an established beach renourishment program, funded by a local accommodation tax, which excavates sand from offshore shoals and places it onto retreating beaches every 5-7 years.
- Hilton Head Island has an extensive Sand Fencing Project aimed at preserving existing and enhancing new dunes. They have placed over 40,000 linear feet of fencing and indigenous vegetation.
- Hilton Head Island has adopted all ICC codes in full and enforces these codes stringently.

Town of Port Royal:

Comprehensive Plan (update nearly complete in 2009)

- The vision of Port Royal is to become the choice place to live and do business when considering small, unique, and ***safe*** coastal communities and neighborhoods.

- The Town strives for continuous improvement, orderly and planned growth, and Historic Preservation.

- The Natural Resources Element strives to ensure harmony between the natural and manmade environment.
    - The barrier islands that surround the Town provide some natural protection from severe weather events.
    - The highest points in Town are 20 feet above sea level.
    - The Town has two types of predominant soils, eighty-five (85) percent of which can be used for development as it can accommodate septic systems. Fifteen (15) percent cannot support development.

- Within the Natural Resources Element, the following are identified as implementation strategies:
    - Implement a program to bury overhead utility lines and require new utility lines be placed underground
    - Strengthen and enforce tree preservation ordinances
    - Encourage the use of indigenous plants
    - Designate areas for uses compatible with their natural functions and their potential for recreational and economic activities
    - Recognize and protect wetlands for their capacity to filter pollutants and control flooding and erosion
    - Employ wetland buffers and storm water Best Management Practices to reduce contamination into marshes
    - Budget to acquire undeveloped land that are set aside to remain in their natural state (greenways)
    - Minimize impervious surface roadways to reduce storm water runoff
    - Design storm water drainage systems to mimic the path of runoff in natural systems
    - Discourage the trading or filling of wetlands by developers
    - Develop programs to promote natural resources education, appreciation, and appropriate recreational use
    - Create a River Overlay District

Comprehensive Plan could be improved simply by making mention that each of the above strategies relates to, and contributes to natural hazard mitigation or loss prevention.

- The Cultural Resources Element seeks to preserve and enhance the Town's historical integrity.

  - The Element details the 1893 hurricane that was responsible for "the loss of thousands of lives in Port Royal and the surrounding vicinity."
  - A survey is described that identified 1,506 historical sites within 1320 properties . A County survey identifies 1488 sites, 1121 of which are residences. These figures substantiate the enormous percentage of Port Royal that is culturally significant and worthy of special care and protection.)

- The Community Facilities Element cites the new Russell Bell Bridge as the replacement for an old drawbridge that was damaged extensively in Hurricane Hugo.

- The Land Use Element identifies the FH (Flood Hazard) Zoning District (which is delineated by the community's NFIP map)

Plan could be enhanced by adding and describing how the Floodplain Management Ordinance/Flood Hazard Zoning District prevents future flood damages.

Building Regulations

- The Town uses the current IBC and International Mechanical, Fire, Fuel Gas, and Residential Codes. The Town also uses the current National Electric Code.

Town Code

- Chapter 9 of Port Royal Code is the Flood Damage Prevention Ordinance (standard). Section 9-73 requires that the Town Manager review and approve subdivision proposals and new developments to assure that:
  - They are consistent with the need to minimize flood damage,
  - Public utilities and facilities are located and constructed to minimize or eliminate flood damage,
  - Adequate drainage is provided to reduce exposure to flood hazards, and
  - All proposals include flood elevation data.

- Chapter 17.5 contains the Subdivision Regulations
  - Section 17.5.62 defines the Design Standards
  - Section 17.5.67 defines the Drainage System requirements
  - Section 17.5.68 defines the Flood Hazard Area requirements

- Chapter 22 contains the Zoning Ordinance of the Town of Port Royal, South Carolina
  - Section 22-73 defines the MH (Mobile Home) District, where subsection *(h)* (1) requires MH Parks be located on a well drained site
  - Section 22-77 defines the FH (Flood Hazard) District

The Local Government Capability Matrix

In addition to the assessment of community policies, regulations and plans the Planning Team also reviewed a matrix as a way of taking inventory of additional mitigation capabilities in each community. The intent of this effort was to see if there were any similarities or gaps in community programs and tools that might indicate where some improvements could be made. There were some key improvements that have been made since the last plan.

- Jurisdictions have taken steps to protect their critical facilities as funds become available. While not all jurisdictions have a formalized critical facilities protection plan outside of the Hazard Mitigation Plan, all new construction has been built to mitigate loss and existing buildings have in some cases been retrofitted.
- Bluffton is now fully participates in the NFIP.

The matrix and the key to the matrix labels are located on the following pages. There are boxes that are shaded yellow, and others that are red. The yellow boxes highlight an opportunity to make an improvement.

- Moving forward with incorporating the Hazard Mitigation Plan into all comprehensive plans should be a priority. However, all jurisdictions have expressed the desire to put the Hazard Mitigation Plan into their plan, and all plans have elements of hazard mitigation in them. Hilton Head Island is currently updating their plan together with the hazard mitigation plan, and other jurisdictions (such as the County, City of Beaufort and Port Royal) which are updating their plans currently are doing so in conjunction with the update of this hazard mitigation plan and intend to include it as a part of the plans.

- Port Royal should consider joining the CRS program. The data indicates that Port Royal has 709 buildings within the 100-year floodplain, and only 181 flood insurance policies in force (25%). Interestingly, the Planning Team determined that many of the 709 are military facilities and wouldn't be insured under the NFIP. However, the fact remains that 75% of the floodprone structures are uninsured against flood damages. The public, and the military, should be informed of the community's flood vulnerability and the availability of flood insurance. Additionally, if insurance coverage and the number of policies in the community do increase, the Town should then consider joining the CRS program (because there would be a large enough policy base to make it cost effective). Community participation in the CRS program decreases the cost of flood insurance for all policyholders in the community.

- Monitoring the reduction of the number of Repetitive Losses on Hilton Head Island. There are 27 repetitive losses within the Town of Hilton Head Island. At first glance, this is a high concentration of repetitive losses. At second glance, it is only a little more than 1/10 of 1% of the total number of policyholders on the Island. The Planning Team knows that there is a drainage project underway that is intended to address the cause of these repetitive losses. Thus, this issue is worth noting as one to monitor, but it does not warrant being tagged a "red flag."

The red boxes highlight issues that should generate a higher level of concern, and thus warrant further investigation. For example, the red highlighted boxes indicate:

- That no incorporated municipality has undertaken any special efforts to create a water supply plan. This could easily be a mitigation priority.

Table 4.2 Capability Matrix

	Unincorporated Beaufort County	Beaufort City	Bluffton	Hilton Head	Port Royal
Comp Plan	Y	Y	Y	Y	Y
- with HM?		Y		Y	
Land Use Plan	Y	Y	Y	Y	Y
Subdivision Ord	Y	Y	Y	Y	Y
Zoning Ord	Y	Y	Y	Y	Y
BFM Plan	Y			Y	
HM Plan	Y			Y	
FPM Ord	Y	Y	Y	Y	Y
- Sub.Damage?	Y	Y	Y	Y	Y
- Administrator?	Y	Y	Y	Y	Y
- # of FP Bldgs?	7,667	1,254	42	9,149	709
- # of policies	12,347	1,106	264	29,515	181
- # of RL's?	0	2		27	0
CRS Rating	8	8		6	
Stormwater Program	Y	BMP	Y	Y	BMP
Building Code	Y	Y	C	Y	Y
Building Official.	Y	Y	C	Y	Y
- Inspections?	Y	Y	C	Y	Y
BCEGS Rating	4	6	4C	3	6
LEOP?	Y	C	C	C	C
Warning-sirens?	Y	Y	Y	Y	Y
- NOAA W.Radio?	Y	Y	Y	Y	Y
- Cable Override?	Y	Y	Y	Y	Y
- Reverse 911?					
- Lead Time	72 hours Parris Island and MCAS have own sirens				
Structural Projects	Bulkhead Permits at Cherry Pt			Y	Y
Property Protection	Stmwtr Util &	Detention/ Retention		Y	Y
Crit.Fac.Protection				Y	
Water supply plan	Y	BJWSA	BJWSA	PSD	BJWSA
Nat/Cult Res. Inv.	Y	Y	Y	Y	Y
Erosion Control	Y	C	C	Y	Y
Sediment Control	Y	C	C	Y	Y
Pub. Info Prgrm	Y	Y	Y	Y	Y
Env. Ed Prgrm	Y	N	Y	Y	N

EXPLANATION OF CAPABILITY ASSESSMENT MATRIX

Comp Plan: Does your community have a Comprehensive Long-Term Growth Plan?
Land Use Plan: Does your community have a plan that designates Land Use regulations?
Subdivision Ordinance: Does your community have an ordinance that dictates lot sizes, density, setbacks, construction type?
Zoning Ordinance: Does your community have an ordinance that dictates type of use or occupancy in certain areas?
BFM Plan: Does your community have a Beachfront Management Plan as required by SC-DHEC
HM Plan: Does your community have an existing stand alone Hazard Mitigation Plan?
FPM Ord: Does your community have a Floodplain Management Ordinance that directs development in identified Flood Hazard Areas?
Sub. Damage: Does your FPM Ordinance contain language on Substantial Damage or Substantial Improvements?
Administrator: Does your community have a Floodplain Administrator?
# of FP Bldgs: How many buildings are in the floodplain in your community?
# of policies? How many buildings in the floodplain are insured through the NFIP?
# of RL's: How many NFIP Repetitive Losses are in your community?
CRS Rating: Are you in the Community Rating System of the NFIP and if so, what's your rating?
Stormwater Prgram: Does your community have a Stormwater Management program?
Building Official: Does your community have a Building Official?
Inspections: Does your community conduct building inspections during and after completion of the development process?
BCEGS: What is your Building Code Effectiveness Grading System Rating?
LEOP: Does your community have a Local Emergency Operations Plan?
Warning: Do you have any systems such as sirens, NOAA Weather Radio reception, Cable TV Override, "Reverse 911"? How much "lead time" is provided?
Structural Protection Projects: Do you protect levees, critical drainage, detention/retention basins?
Property Protection Projects: Do you sponsor buy-outs, elevation of structures, floodproofing, small "residential" levees or floodwalls?
Critical Facility Protection: Do you protect power substations, sewage lift stations, water-supply sources, the EOC, police or fire stations, medical or essential services in the floodplain?
Natural And Cultural Inventory: Do you have an inventory of resources, maps or special regulations within the community?
Erosion Or Sediment Control: Do you have any projects or regulations in place?
Public Information Or Environmental Education Program: Do you have an ongoing program even if its primary focus is not hazards? Examples would be "regular" flyers included in city utility billings, a website or an environmental education program for kids in conjunction with Parks & Recreation?

There are some regional capabilities that should also be considered, and an additional layer of regulations at the State and Federal Level enhance these local capabilities. The Planning Team looked also reviewed the following:

State Plans and Regulations

The South Carolina Emergency Management Division (SCEMD) publishes an annual *South Carolina Hurricane Plan* which includes a listing of hurricane shelters for various regions in the state including the Southern Coastal Conglomerate of which Beaufort County is a part. While there are some shelters within Beaufort County they do not open for storms that are greater than a Category 1 Hurricane. However there are several shelters in adjacent counties that are meant for use by Beaufort County residents. These include schools and community centers in the adjacent counties of Colleton, Hampton, and Jasper as well as southern counties located further inland in Aiken, Allendale, Bamberg and Barnwell Counties. Some of these shelters are opened only for mandatory evacuations as ordered by the Governor while others are opened for both mandatory and voluntary evacuations. A third group of reserve shelters are opened as determined necessary by local officials. A list of these shelters in adjacent counties is provided as Table 4-3.

Table 4-2. Regional Hurricane Shelters in Adjacent Counties

Colleton County Shelters			**Hampton County Shelters**		
Shelter	**Address**	**Type**	**Shelter**	**Address**	**Type**
Northside Elementary	1929 Industrial Blvd Walterboro, SC 29488	V	Varnville Elementary	395 Pine Street, East Varnville, SC 29944	V
Colleton High School	1379 Mighty Cougar Drive Walterboro, SC 29488	M	Wade Hampton High School*	115 Airport Rd. Hampton, SC 29944	V
Contact: Suzanne Gant, Emergency Prep Director Phone: 843-549-5632			Hampton Elementary	705 South Hoover Street Hampton, SC 29924	M
Jasper County Shelters			Estill High School	1450 Columbia Hwy North Estill, SC 29918	M
Shelter	**Address**	**Type**	North District School	507 Tillman Avenue Varnville, SC 29944	R
Jasper County High School*	US Highway 278 West Ridgeland, SC 29936	V	Ben Hazel Primary School	628 West Railroad Ave. Hampton, SC 29924	R
Ridgeland Elem. School	Bees Creek Road Ridgeland, SC 29936	M	Estill Middle School	555 West Third Street Estill, SC 29918	R
Ridgeland Middle School	Bees Creek Road Ridgeland, SC 29936	M	Estill Elementary	318 Fourth Street, East Estill, SC 29918	R
Coosawhatchie Community Center	SC Highway 462 West Coosawhatchie, SC 29940	R			
Robertville Community Center	US Highway 321 Robertville, SC 29922	R	Contact: Suzanne Peeples, Disaster Prep Coordinator Phone: 803-943-7522		
Contact: Wilbur Daley, Disaster Prep Director Phone: 843-726-7797					

*These shelters are also special medical needs shelters. In Colleton County, the Colleton Medical Center in Walterboro serves as a special medical needs shelter.

Although these shelters are available for use by Beaufort County residents, many residents are not aware of their existence and their function during disaster situations. **Beaufort County citizens should be better informed about the existence and locations of the shelters and the fact that they are available for their use.**

The South Carolina Local Government Comprehensive Planning Enabling Act of 1994 gave local governments (counties and incorporated towns/cities) five years to bring their planning programs and regulatory ordinances into compliance. The Act repealed existing planning legislation as of May 4, 1999, requiring that a Comprehensive Plan be used as a tool for guiding future development. The Act consolidates existing planning legislation for local governments into one law and defines a set of requirements that must be met for the planning activities of a local government to be legal. In particular the Act describes required comprehensive plan elements, defines the roles of the town council, planning commission, and zoning board of adjustment and outlines the public review process and procedures for adopting comprehensive plans and land use ordinances.

South Carolina Department of Health and Environmental Control (SC-DHEC)
Ocean and Coastal Resource Management (OCRM)

- ***The Coastal Tidelands and Wetlands Act*** (1977) was amended in 1993, creating the South Carolina Coastal Zone Management Act.

- ***The South Carolina Coastal Zone Management Act***, which merged the South Carolina Coastal Council with DHEC, creating OCRM whose general purpose is to:
    - Protect the coastal environment, and
    - Promote economic and social improvement of the Coastal Zone
    - It identifies "Critical Areas" as coastal waters, tidelands, dune systems, and the beach, and gives DHEC permitting authority in those areas.
    - Identifies salt/brackish marshes as protecting highlands from erosion and storm damage

- ***The Beachfront Management Act*** (BFMA, 1988) establishes authority to address erosion hazards due to persistent sea level rise, a lack of comprehensive beach management planning, and poorly planed coastal development. The BFMA establishes "retreat" as the basic approach to beachfront management, rejecting "armoring" and including beach nourishment as a mechanism to assist in retreat.

  The basic policy is one of a 40-year retreat, and establishes a Baseline and Setback on all oceanfront properties. The Baseline is the crest of the primary dune or the line where it *would have been*. The Setback is 40 times the annual rate of erosion but always at least 20 feet.

  The BFMA also establishes rules for rebuilding structures, seawalls and bulkheads. Structures including swimming pools cannot be repaired or replaced if they are destroyed or damaged greater than 66.67% of their replacement cost. Seawalls and bulkheads cannot be repaired or replaced if they are destroyed or damaged greater than 66.67% of their replacement cost between July 1, 1995 and June 30, 2005. Beginning July 1, 2005 seawalls and bulkheads cannot be repaired or replaced if they are destroyed or damaged greater than 50%.

Federal Regulations

- ***The National Flood Insurance Program (NFIP)***: Established in 1968, the NFIP provides flood insurance in communities that agree to regulate new development in identified Special Flood Hazard Areas through the adoption and enforcement of a minimum Flood Damage Prevention Ordinance. It also requires, as a condition of every federally backed mortgage within an identified Special Flood Hazard Area to require the purchase and maintenance of a flood insurance policy for the life of the loan.

- ***The Coastal Barrier Resources Act (CoBRA)***: Established in 1972, the CoBRA is environmental legislation administered by the Fish & Wildlife Service. It provides for the identification and protection of Coastal Barrier Resources. It prohibits the availability of federally backed assistance within identified areas, including grants, loans, mortgages and flood insurance.

- ***Coastal Zone Management Act (CZMA):*** Established in 1972, and amended by the Coastal Zone Protection Act of 1996 the CZMA defines a national interest in the effective management, beneficial use, protection and development of the Coastal Zone and identified the urgent need to protect this natural system from these competing interests. The Act encourages states to exercise their full authority over the lands and waters of the Coastal Zone. Annual cost-share grants to states creates an incentive to establish land-use and environmental protection standards that have served to reduce damage from coastal storms, as well as achieve its other multi-objective goals.

5. Mitigation Goals and Objectives

Introduction

This section of the Beaufort County Hazard Mitigation Plan describes the goals and objectives established by the Hazard Mitigation Planning Committee and the completed and anticipated actions for implementation and maintenance of this plan in an ongoing effort to achieve these goals.

Goals and Objectives for the Mitigation Plan

The Beaufort County Hazard Mitigation Planning Committee has established a number of goals and objectives to guide its work in the development of this plan. The goals and objectives help to focus the efforts of the group in the mitigation planning effort to achieve an end result that matches the unique needs, capabilities and desires of Beaufort County. Recommendations were evaluated against these goals and objectives by the representatives of the jurisdictions and later by the entire Committee; changes were made as needed.

The goals and objectives selected by the Hazard Mitigation Planning Committee for the planning process are listed below. In the planning approach, the goals are established for the entire County. As this is an update to the original plan, the updated goals are listed here and have changed slightly from the original goals and objectives. The action items that were created in the original goal are addressed in terms of their completeness and the reasons why any item may have not been completed in Table 5.3. The goals were reviewed by the Hazard Mitigation Planning Committee and it was determined that their ranking remained the same as the original Plan. Some language was changed but the general principles behind each goal was agreed to have remained the same. The goals and objectives are listed below:

1. ***Improve the protection of critical facilities.***
    a) Identify at-risk facilities in the 100-year floodplain and within areas subject to Storm Surge inundation.
    b) Develop measures to address the risk to vulnerable critical facilities to prevent future damages.

2. ***Enhance the Hazards Education/Public Information Program***
    a) Identify and solicit low cost or no cost Partners such as TV, radio, newspapers
        - Promote Flood Insurance in B/C/X zones through Agents, Realtors and Banks
        - Promote Public Awareness of FEMA Regulations
        - Continuing Education of Elected Public Officials
        - Seismic Safety
        - Provide education for Building Inspection staff
        - Conduct Building Code Workshops for contractors and other stakeholders

3. Continue to update all Comprehensive Plan land use ordinances and other relevant policy documents in a way that supports mitigation activities.

a) Promote appropriate designations:
   - Land-use
   - Affordable Housing Issues

b) Integrate vulnerability data into the Zoning and Land Use policies
   - The Floodplain Ordinance is already integrated into the Comprehensive Plan

c) Incorporate Hazard Mitigation Plan into the community Comprehensive Plan and work to integrate mitigation into all community decisions
   - Get concept accepted by political body
   - Identify appropriate as a Comprehensive Plan element or include as an appendix

4. Protect Community Historic Preservation Resources

a) Identify all historic resources and utilize the list compiled for historic resources in the County

b) Identify repair and reconstruction rules and policies where they differ for policies for other types of structures

c) Continue with pre-disaster coordination with SHPO and local Historic Preservation groups.

5. Promote Seismic Safety

a) Implement and Enforce Seismic Safety Provisions

6. Continue to Identify Drainage Problems and Work towards their Resolution

a) Ensure the proper maintenance of existing drainage systems and the improvements and replacements as necessary

b) Expand the existing drainage system to meet increasing demands

7. Preserve and Protect Natural Resources

a) Much of the county's marshland should be preserved for water quality and flood water storage purposes through the use of wetland buffers, wetlands protection and river buffers.

b) Promote open space initiatives.

c) Continue the planning and implementation of projects from the Island Wide Drainage Study

8. Continue to Ensure Emergency Response Personnel are Adequately Equipped

b) Focus on pre- and post-disaster coordination and access to important information.

9. Ensure the Communities Continue to be Compliant with NFIP Requirements, that Flood Risk Maps are accurate and up to date and that the Flood Maps are used to achieve FEMA mandated compliance within in the special flood hazard area.

a) Work with FEMA to conduct restudies as necessary to ensure that maps are accurate.

b) Continue to include flood development permitting as an important part of building and development permitting.

10. Promote building code enforcement by encouraging all policymakers to adopt the most up-to-date versions of universally accepted codes.

a) Inform state and local lawmakers about the importance of following all newly adopted codes.

b) Promote building codes without amendments to homeowners and homebuilders, demonstrating the added safety measures and cost savings benefits that come with applying the universally accepted building codes to new construction and significant renovations.

c) Encourage property owners to retrofit and renovate homes to meet the current building codes standards as part of continuing maintenance

6. Mitigation Action Plan (and update of previous actions)

Based on the goals and objectives the Hazard Mitigation Planning Committee established several action items that they intend to implement over the next five years. These action items were carefully considered and they were developed to address the protection of both new and existing buildings and all critical facilities. As the funding and political timing deems implementation appropriate the actions will be undertaken by the appropriate jurisdiction and department. Particular mitigation actions were considered and all are focused on continued compliance with Federal Programs such as NFIP. Throughout the process there was frequent consultation with the representatives of the jurisdictions to discuss and improve the specific recommendations. When the assessment was completed the Committee reviewed the results and made further County wide and individual municipality recommendations that were incorporated into the final document.

Explanation of Tables

For clarity's sake a brief explanation of the mitigation action table should be addressed. There are three tables pertinent for clarification: Table 6.1 was created as a scoring table was created as cost benefit review tool to further prioritize the actions. Based on this table, each mitigation action was given a score and a priority designation of High (a score greater than 20), Medium (a score of 10-19) and Low (a score less than 10).

Table 6.2 is a status report of what happened with all of the proposed mitigation actions from the previous plan. This prioritization is intended to comply with the intent of the NFIP and reflect a cost-benefit review of each action. Any action that has not been completed or is ongoing is indicated and it is reflected in table 6.3.

Table 6.3 through Table 6.7 are the most up-to-date list of the goals, actions, prioritization, , approximate time of completion and approximate cost for each jurisdiction. It reflects the work of the HMPC throughout this process, and it gives an idea of where we would like to be in five years. Each action is given a designation of high, medium or low based on the score it received. This enables the Beaufort County Hazard Mitigation Planning Committee to identify which of the established goals and objectives are to be addressed by the proposed action item. By considering the goals when establishing new action items the Hazard Mitigation Planning Committee focused its efforts on implementing mitigation actions based on the established goals and objectives.

Each of the four jurisdictions has its own table. While some of the actions are similar or the same it is necessary for each jurisdiction to have its own list of actions to mitigate hazards.

National Floodplain Insurance Program—prioritization and participation

All of the actions that the Hazard Mitigation Planning Committee developed were established and prioritized using several criteria. Primarily the Hazard Mitigation Planning Committee established the actions based on the National Floodplain Insurance Program. The actions are intended to fulfill the requirements of the NFIP and the goals and mitigation actions reflect this. All participating jurisdictions are participants in the NFIP and are not under any sanctions. Beaufort County and its municipalities participating in this Plan have current Flood Insurance Rate Maps. All of the communities in Beaufort County are committed to NFIP's continued success. All of the identified hazards are addressed by an action item and a significant number of the mitigation actions were formulated in order to reduce loss and damage from flood.

The Prioritization Scoring Table (6.2) was developed as a means of ranking the action items based on the NFIP. The scoring criteria represent a cost-benefit review and the project's feasibility is reflected from these scores. A score was figured for each mitigation action which was evaluated on the criteria from Table 5.2, with the highest score being 27 and the lowest being zero 0. The actions were then prioritized based on the scores.

Table 6.2 was created as a scoring table and a cost benefit review tool to further prioritize the actions. Based on this table each mitigation action was given a score and a priority designation of High (a score greater than 20), Medium (a score of 10-19) and Low (a score less than 10).

Addressing Known Risks and Vulnerabilities

The process of selecting actions to mitigate known threats to hazards began with a review of the previous action items and goals as mentioned in the Planning Section of this Plan. Committee members also consulted personnel from within their respective agency or organization. The resulting list is part wish list and part a reflection of Beaufort County's hazards. This list is an indication of the problems that Beaufort County needs to address based on necessity, cost of repairs and future needs.

As the Beaufort County Hazard Mitigation Plan is reviewed and updated by the Hazard Mitigation Planning Committee the goals and objective statements are also reviewed to ensure they are still applicable to meeting the unique needs, interests and desires of the community.

Table 6.1, Prioritization Scoring Table

Priority Criterion	Numeric Score 0	1	2	3
Strategy effectiveness	No affect on risk or hazard	Affects several structures within the community	Affects many structures within the community	Affects most structures within the community
Percentage of population benefitted	Less that 10% benefitted	10% to 15% benefitted	50% to 75% benefitted	Greater than 75% benefitted
Time to implement	Cannot be implemented	Long term	Within one year	Immediate
Time to impact	Cannot be implemented	Long term	Within one year	Immediate
Cost to community	Completely unaffordable	Expensive	Inexpensive	Little to no Cost
Funding source	No known Funding source is available	Requires outside Funding	Requires budget consideration	Within existing county budget
Cost to others	Cost to others is unacceptable	Expensive, but manageable	Cost is easily managed by others	No cost to others
Community support	Opposed by the entire community	Some community opposition	Acceptable only to those affected by the project	Acceptable community wide
Project feasibility	Not possible	Accomplished with extensive design and planning	Accomplished with some design and planning	Easily accomplished

Benefit-to-Cost Review

A key analytical measure commonly used in vulnerability assessments is the benefit to cost ratio which expresses the estimated benefits in dollars in comparison to the estimated costs to implement and maintain the proposed mitigation initiative. For an action to be considered cost effective the dollar value of the benefits derived needs to exceed the costs to implement and maintain the initiative. The benefit to cost ratio should be greater than 1.0. The process for calculating a benefit to cost ratio begins with estimating the direct and indirect costs of the situation that the mitigation initiative is intended to address. If the initiative were to be implemented these are the future costs that would be avoided or the benefits derived from implementing the action.

Both direct costs of the situation are considered such as structural damages as well as indirect costs such as lost wages. The total of the direct and indirect costs are then divided by the predicted life of the initiative in years. This then gives the dollar benefits of the project on an annual basis. The cost side of the benefit to cost ratio is by determining the estimated cost to initially implement the proposal such as initial construction cost for a project or the development costs for a training program. To this amount is then added any annual costs that implementation of the project would incur such as annual operations and maintenance costs or annual implementation costs.

Next the approach then considers any cost impact of the proposal or the costs that would be incurred by others in the County due to implementation of the initiative such as the economic effect on new construction of adopting a more stringent building code. The cost impact figure is also annualized by the life of the project and then any annual cost impact values such as an annual user fee or tax is added to give a total annual cost impact. Finally by dividing the annual costs of the benefits of the proposal by the annual cost and cost impact necessary to implement the proposal a benefit to cost ratio is estimated. A more sophisticated methodology for calculating a benefit to cost ratio is likely to be necessary at the time of actual implementation, when applying to state or federal agencies for funding or for the design and construction stage of development.

Cost Benefit Review—Prioritization of Mitigation Actions

Currently no benefit-cost analysis has been conducted for each of the mitigation actions in this Plan. This is due to both the lack of information and this type of evaluation is beyond the scope of the Plan. However the Hazard Planning Committee considers the priority scoring table a valuable cost-benefit review tool and thus has prioritized the actions based on those scores. The higher scored mitigation actions reflect actions that meet a higher standard on more criteria and are thus considered much more cost efficient and beneficial to the community. Furthermore when each mitigation action is considered for particular funding the responsible agency will conduct an in depth cost-benefit analysis of the project.

It is possible to see from this table that the minimum priority rank for a proposed initiative would be zero while the maximum would be twenty seven. As noted above this priority ranking may differ from the true priority for implementation assigned to a specific mitigation initiative based on unanticipated conditions or situations occurring at a certain time. The priority ranking given through application of the ten criteria in the table will remain constant through time because of the inherent characteristics of the proposed initiative unless those characteristics are also modified.

All of the actions are listed with their priority designation assigned to each in Table 6.4 as a result of the common process to characterize and prioritize mitigation initiatives that was used in the planning process. This priority ranking is a long term characterization value directly associated with each specific initiative based on its own merits at the time it was first proposed by the individual participant. The priority ranking is intended to serve as a guideline for the Hazard Mitigation Planning Committee regarding the relative desirability of implementation of a specific mitigation initiative in relation to the other proposed initiatives incorporated into the plan.

Multi-jurisdictional action items

As reflected in Table 6.3 each mitigation action is assigned to a particular jurisdiction and when possible a particular department within that jurisdiction. Table 6.3 shows the action items that were taken from the previous plan. The status of these items was reported and the update is given. For this Plan's update while some action items may have been modified no mitigation action was deleted from the list. If the item has not been completed since the original plan the reason is listed in Table 6.3 and the item reappears as a new mitigation action. The original action items are shown with their status. If the project is listed as "ongoing," some form of that mitigation action still appears in the updated plan.

Table 6.2, Previous Mitigation Actions and Status Report

Project	Implementation	Community/Agency Responsible	Status Report
Goal 1			
Fortify County Archive Facility at 2727 Depot Road to protect it and its contents from flooding and high winds.	Inspect facility and find funding for retrofits	County building codes; archives personnel	Facility has been relocated. The new facility is in zone C and building is wind resistant.
Relocate the Archer Road Communications Facility	Identify new sites and ensure new building is resistant to damage.	HHI communications system administrator; EMD	Facility has been relocated to a C zone and building is wind resistant.
Retrofit both the Cleveland Point and Shell Point Communications Facilities to increase their ability to withstand flood and high wind events.	Relocate Cleveland site. Inspect Cedarbrook site to determine potential mitigation measures	Beaufort County EMD; building codes	Project has been completed
Conduct engineering inspections of county fire stations to determine mitigation retrofitting measures necessary	Application for federal funds	County EMD; building codes from all communities	Hilton Head Island has completed all inspections and three new facilities have been built. HHI has shutters able to withstand a category 5 hurricane. All HHI fire facilities have fire sprinklers.
Make improvements to the St. Helena Wastewater Treatment Plant to protect it from flood damage	BJWSA and County EMD Office to pursue mitigation funding for the proposed project.	Unincorporated Beaufort County; BJWSA Safety & Risk Manager	not done; no funding
Protect the Chelsea Water Treatment Plan from flood damage.	BJWSA and County EMD Office to pursue mitigation funding for the proposed project.	Unincorporated Beaufort County; BJWSA Safety & Risk Manager	not done; no funding
Protect the Bay and Lauren Streets stormwater collection systems from inflow problems.	BJWSA and County EMD Office to pursue mitigation funding for the proposed project.	Unincorporated Beaufort County; BJWSA Safety & Risk Manager	Bay Street upgrade completed in FY 2009
Maintenance and replacement of critical bridges	Engineers to develop inventory and prioritize improvements	Community engineering departments; Beaufort County EMD; Beaufort County Council and Community Councils.	Not done; No funding

Goal 2			
Train Building Officials on most up to date code requirements for hazard resistant construction	Annually evaluate their building inspectors' capabilities and recent training experience.	Beaufort County Building Codes Director; building codes officials from all municipalities	Annually review with staff all updates for current Codes and procedures ongoing
Sponsor and conduct workshops for local engineers, architects and contractors on IBC and hazard resistant construction	Will quarterly advertise these training sessions via the community web site and by using flyers to be posted in building permit offices.	All communities building codes officials	All jurisdictions conduct classes as an ongoing effort. HHI held a FEMA sponsored class based on Guide to Coastal Construction; HHI also has annual June Hurricane forum with chamber of commerce
The county will work with stations WTOC and WSAV to promote public awareness of disaster preparedness	Coordination with the local station reprters to promote public awareness of disaster preparedness and mitigation.	All communities Beaufort County public information; Beaufort County EMD; municipal EMD.	TV stations broadcast disaster awareness messages as an ongoing effort
Goal 3			
All Municipalities will include the Hazard Mitigation Plan as an element of the Comp Plan.	Each community responsible for incorporation of the hazard mitigation plan into their comprehensive plan and other planning tools.	All municipalities/ planning directors and floodplain officials	The Beaufort County Hazard Mitigation Plan was adopted as part of the Beaufort County and City of Beaufort's Comprehensive Plans in July 2004. Port Royal adopted the Hazard Mitigation Plan as Appendix J of the Town's Comp Plan on August 2004. Plan was adopted by Town of Hilton Head Island August 2004.
Goal 4			
Prepare pamphlet for mitigation and recovery issues for historic structures	Greenhorne & O'Mara, Inc. will provide text to the county for the county to use in developing the pamphlet by September 2003; distribution in 2004.	Beaufort County; City of Beaufort Historic preservation officers	The City of Beaufort prepared a Hurricane Preparedness Brochure for Historic Properties in 2005. This brochure has been included in mailings on an annual basis to all property owners in the flood hazard area.

Work to develop public education program for historic property	Target meeting date December 2003 to discuss coordination of the program and to schedule the first property owner workshop.	Beaufort County; City of Beaufort; Town of Bluffton historic preservation officers.	Preservation Planners work with property owners on a regular basis to educate them on the importance and value of their properties and to guide them in making improvements.
County to expedite re-building of historic structures post disaster	Gather better historic property value data and resources for estimating costs of repair and materials for historic structures.	Beaufort County; City of Beaufort; Town of Bluffton historic preservation officers.	All communities have damage assessment and emergency permitting processes after major disaster. These expedited permits for structures in Historic Districts are issued after applicant consultants with team comprised of the Preservation Planner and building inspector to discuss damage with applicant and agree on appropriate repairs.
Provide technical assistance to historic property owners and advise them of funding sources.	Historic preservation officers in all communities will provide technical assistance to property owners.	Beaufort County; City of Beaufort; Town of Bluffton historic preservation officers.	All communities Preservation Planners assist property owners completing forms for state and federal income tax credits for repair of properties.
Goal 5			
The County will enforce seismic provisions in their building code.	Building Code Department will continue to enforce the seismic provisions.	Beaufort County building department	ongoing
Goal 6			
Hilton Head will implement structural drainage projects identified in the 1995 Island Wide Drainage Study.	Continue funding structural drainage projects in the annual CIP budget development process	Hilton Head Island Engineering department	All 16 original projects have been completed ($15M). Second phase will continue inventory of Shipyard, replace 12 miles of culvert pipe, Jarvis Creek wetland restoration, Tide Point ditch improvement, stormwater easements, 278 at Arrow road study, continue maintenance

All communities to continue to support Beaufort Co.'s SWM Utility/plan for future SWM projects.	The advisory board has begun work on the county wide inventory and analysis of the SWM facilities which has a completion date of September 2004.	All communities; chairman of the stormwater utility advisory board.	This is a continuing project. HHI has completed stormwater management agreements
County use the Zoning Ordinance and best management practices to mitigate stormwater and erosion protection	Ongoing effort	Beaufort County engineering department	ongoing
Goal 7			
Hilton Head will use their land purchasing plan to obtain floodprone properties and designate them as open space.	Continue to collect the real estate transfer tax and use proceeds for the land purchasing plan.	Town of Hilton Head Island Town Manager and Town Council	ongoing
Hilton Head will continue to perform periodic renourishment of its beaches.	Use proceeds from the beach preservation fee to conduct renourishment projects.	Town of Hilton Head Engineering department	This is a continuing project. HHI spent $17M in 2005, dune accretion has occurred, critical stormwater protection zone laws passed
Goal 8			
Town of Hilton Head Island will create a centralized information technology system to access pertinent information during a disaster to be used county wide.	Town of Hilton Head Island to research information technology options	Town of Hilton head Island GIS and Floodplain Administrator	Town has computerized FEMA damage assessment forms and developed a spreadsheet linked to the County Assessors data to expedite the damage assessment reporting process. Information will be available to Town's emergency permitting center to expedite permitting. Information shared with all municipalities with MOU.
City of Beaufort to be equipped with radios for use during emergency to improve communications	Apply for funding for radio equipment to guarantee reliable emergency communications	City of Beaufort Emergency Service appointee	The City has purchased satellite phones for the key departments involved in disaster recovery.

Goal 9			
SCDNR to sponsor revised Flood Insurance Rate Maps based on newer and more accurate topographic data.	All municipalities to partner with SCDNR State floodplain coordinator to produce digitized versions of revised FIRM's	Floodplain Administrator all municipalities	Draft FIRM's to be released early 2012.
Hilton Head Island will provide data based on USACE and FEMA mapping guidelines for the FIRM's restudy to SCDNR	The Town will continue to work with the USACE and FEMA to restudy and create the FIRM's.	Town of Hilton Head Island Floodplain Administrator	Draft FIRM's to be released early 2012
Enforce floodplain regulations to ensure proper development in compliance with all building codes, FEMA regulations and any other pertinent ordinances.	This is a continuing effort	Beaufort County building codes and department of inspections; City of Beaufort Codes enforcement; Bluffton planning department ; Town of Hilton Head Island building and fire codes department; Port Royal planning administrator	All municipalities enforce the ICC building code regulations and the FEMA regulations for any development in the flood hazard area. The Beaufort City's local flood hazard mitigation ordinance is more stringent than FEMA requirements. City's regulations require residential additions in the flood hazard area be elevated and non residential additions to be dry flood-proofed.

Implementing the Actions

The Beaufort County Hazard Mitigation Plan contains the compilation of the proposed mitigation actions that have been formulated as the result of the planning efforts by the Hazard Mitigation Planning Committee. The matrix below demonstrates how the plan will be administered and implemented based on jurisdiction, department responsible, potential funding sources, implementation timeline and a cost estimate based on the Hazard Planning Committee's evaluation. These mitigation actions form the fundamental mechanism for the implementation of the local mitigation plan. When the resources and opportunity to do so become available the responsible organization implements an action to address the vulnerability of the facility, system or planning issue that was identified through the mitigation planning process. After each successful implementation of an initiative the benefited community will become that much more resistant to the impacts of future disasters.

Following is the Hazard Mitigation Action Item Matrix (Tables 6.3 through 6.7) which describes all of the newly formulated actions, their related goal, their priority based on the prioritization score, funding sources, impediments, estimated cost and approximate implementation date.

For the purposes of the edition of the Beaufort County Hazard Mitigation Plan shown here and to be included as an Appendix to the Town of Hilton Head Island's Comprehensive Plan only Table 6.4 showing Hilton Head Island's new mitigation actions will be printed. The mitigation actions of other Beaufort County municipalities are available upon request.

Table 6.4 Hilton Head Island New Mitigation Actions

Mitigation Action	Associated Hazards	Priority/Score	Goal	Estimated Cost	Department	Potential Funding	Schedule	obstacle
Continue engineering inspections of fire stations and Town owned buildings to determine retrofitting measures necessary especially for wind and flood.	All Hazards	Medium/17	1	$20,000.00	Facilities Maintenance Engineering	Town CIP	2010 (ongoing)	funding
Inspect vulnerable bridges and causeways to determine ones to be replaced or retrofitted. Prioritize maintenance.	Hurricane, wind, earthquakes	Medium/15	1	unknown	SCDOT, Engineering	SCDOT, PDM, HMGP, County, Federal Highways	2014 or as funds are available	funding
HHI will work with regional media to promote public awareness of disaster preparedness and mitigation strategies.	All Hazards	High/24	2	$2,000.00	Community Development	County, all municipalities	2009	funding
Distribute “Citizen’s Guide to Flood Awareness” and “Citizens Guide to Emergency Preparedness” publications regularly	All Hazards	High/25	2	$10,000	Community Development	HHI	2010 (ongoing)	funding
Use EMD’s centralized information technology system to access pertinent information during a disaster.	All Hazards	Medium/11	2	$10,000.00	Emergency Preparedness	County, HHI, PDM, HMGP	2010	funding

Hilton Head will continue to implement structural drainage projects	flood	High/27	6	CIP budget	Engineering	HHI CIP, HGMP, PDM	2010 (ongoing)	funding
Hilton Head Island will continue to support Beaufort County's SWM Utility plan	flood	High/21	6	n/a	Engineering	BJWSA, all jurisdictions	2010 (ongoing)	funding
Hilton Head island will study poorly drained areas and remedy them through best practices.	flood	Medium/17	6	CIP budget	Engineering	HHI CIP budget HGMP, PDM	2010	funding
Hilton Head will continue to use their land purchasing plan to obtain flood prone properties and designate them as open space.	flood	Medium/17	7	unknown	Administration	HHI, PDM, HGMP	2010 (ongoing)	funding
Hilton Head will continue to perform periodic renourishment of its beaches	flood, erosion	Medium/17	7	$17,000,000.00	Planning, Public Works	HHI, PDM, HGMP	2010 (ongoing)	funding
GPS systems available for emergency personnel	All Hazards	Medium/19	8	$5,000.00	Building, Emergency Management	HHI, PDM, HGMP	2012	funding
Conduct periodic surveys of the equipment used by emergency personnel and budget upgrades to facilitate safety and rapid recovery	All Hazards	Medium/18	8	n/a	Emergency	HHI, PDM, HGMP	2010 (ongoing)	funding
Complete work with SCDNR to update FIRM's based on more accurate topography.	flood	High/20	9	unknown	SCDNR, Community Development	SCDNR	2012	funding

Complete work with the USACE and FEMA to develop new maps and incorporate into county FIRM's	flood	High/20	9	unknown	SCDNR, Community Development	USACE, Town of Hilton Head Island	2012	funding
Update all flood maps with new municipal and county boundaries	flood	Medium/12	9	unknown	SCDNR, Community Development	SCDNR	2012	funding
Hilton Head Island will continue to enforce all floodplain regulations to ensure proper development in compliance with building codes, FEMA regulations and any other pertinent laws and ordinances without exception	Flood, wind	High/25	10	unknown	Community Development	Town budget	2010 (ongoing)	none
Continue to train Building Department personnel on most up to date code requirements for hazard resistant construction	All Hazards	High/22	10	$5,000.00	Building Division	Town budget	2010 (ongoing)	none
Sponsor and conduct workshops for local engineers, architects and contractors on International Codes and hazard resistant construction	All Hazards	High/21	10	$5,000.00	Building	Town Budget	2010 (ongoing)	funding
Actively advocate to public officials the adoption of the latest version of universally accepted building codes without amendments	All Hazards	High/20	10	unknown	Community Development, Administration	Town Budget	2010 (ongoing)	funding

Actions Incorporated into the Mitigation Plan and Implementation

The mitigation action matrix table reflects the prioritization that was conducted by the Hazard Mitigation Planning Committee during development of the Hazard Mitigation Plan. That table contains the most up-to-date information regarding mitigation actions. The proposed actions discussed in this section are specific mitigation actions and projects being considered to reduce the effects of each hazard pursuant to federal regulations.

Each proposed mitigation action was subjected to a review and analysis by the Hazard Mitigation Planning Committee. The purpose of this review and analysis is to ensure that an initiative proposed by a participating organization or community group is based on an adequate level of technical analysis, that all needed information about the proposal is presented, that any assumptions utilized are reasonable and logical, that the proposal is consistent with the goals and objectives of the Hazard Mitigation Planning Committee and that it is addressing identified vulnerabilities of the community or shortfalls in the communities' mitigation policy framework. More specifically the review and analysis process is focused on ensuring the technical validity of the proposal, making a judgment whether the initiative would be technically effective and cost-beneficial, if it is duplicative or in conflict with other proposed initiatives or if its implementation would have an adverse affect in another jurisdiction.

All actions were proposed by the committee assembled and sent to the members for review and comment. Over the course of several meetings the list of action items was refined, shortened and crafted for viability. The Hazard Mitigation Planning Committee then reviewed the proposal for any other concerns such as its consistency with other plans and political and community objectives. By doing this thorough review of the actions the plan reflects the values of the community and will be met with less resistance in the future.

All of the actions listed in this plan have been approved by the Hazard Planning Committee. An approved mitigation action is one that has been fully reviewed and deemed acceptable to be incorporated in the Hazard Mitigation Plan. However it is appropriate to report that many of the actions from the previous plan were completed and the following chart reports the progress of the actions and goals of the previous plan.

The Mitigation Action Matrix Table lists actions that are currently in the Beaufort County Hazard Mitigation Plan and their priority scores. The priority scores are based on 10 separate prioritization criteria used by all of the planning participants to allow the Beaufort County Hazard Mitigation Planning Committee to compare various mitigation actions. The specific priority scores are based on a numeric classification system shown in table 6.1.

Implementation through Existing Plans and Programs

One of the methods to most effectively implement the Beaufort County Hazard Mitigation Plan is to propose and implement actions that will modify other community plans, policies,

and programs. By including personnel from a variety of departments in the hazard mitigation planning process concepts derived from the planning process will be spread throughout County departments such as, public works, storm water management, GIS, building codes and planning. Mitigation activities initiated by this plan have been incorporated into the Community Rating System (CRS) plan. As discussed in the community capability portion of this plan other planning documents should reflect the objectives of the Hazard Mitigation Plan. Beaufort County and its municipalities are committed to hazard mitigation and it is shown that some comprehensive plans include the Hazard Mitigation Plan by reference. As the goals state there is a consensus that all Comprehensive Plans should have the Hazard Mitigation Plan appended in some fashion. Such commitment is reflected in the fact the participants intend to either include the Hazard Mitigation Plan as a separate element of their Comprehensive Plans or Development Codes or that this Plan would be at least appended to all other plans.

As all of the Comprehensive Plans for each jurisdiction go through their state mandated updates every five years Hazard Mitigation Plans as an element will also be reviewed. For instance the Town of Hilton Head is joining this year's update of their Comprehensive Plan with the update of the Hazard Mitigation Plan and public meetings are being held in conjunction. The Hazard Mitigation Plan capability section shows where hazard mitigation elements have been incorporated into existing documents and ways each jurisdiction should incorporate these elements in the future.

Continued Public Involvement

The Hazard Mitigation Planning Committee will continue efforts to develop and implement a year round program to engage the community in the mitigation planning process and to provide them with mitigation related information and education. These efforts will be to continually invite public comments and recommendations regarding the mitigation goals for the community, the priorities for the planning and the unique needs of each community for mitigation related public information.

Public information activities that have been completed or are planned by the organizations making up the Beaufort County Hazard Mitigation Planning Committee are listed in Section 6 of this Plan. Each of these activities continues to engage the community in the planning process through the presentation of a specific topic or program related to, or relevant for, hazard mitigation.

The Next Planning Cycles

The Beaufort County Hazard Mitigation Planning Committee has established a schedule and procedure for both plan implementation and plan maintenance that will improve and expand the mitigation planning process.

In addition to these activities for plan maintenance, the Hazard Mitigation Planning Committee will establish a recommended schedule for implementation of the proposed priority initiatives included in this edition of the Plan. It is expected that the agencies and organizations that sponsored these initiatives for the Plan will during the next planning cycles take advantage of timely opportunities and available resources to implement them on the desired schedule.

The Beaufort County Hazard Mitigation Plan is a dynamic document reflecting a continuing and expanding planning process. The efforts of the Disaster Mitigation Committee will continue into the future ensuring that all of the jurisdictions of Beaufort County become truly disaster resistant communities.

Idealized schedule of implementation

The Mitigation Action Matrix Table in this section also includes an ideal schedule of implementation of the action items. This time table is based on the Hazard Mitigation Planning Committee's knowledge of the feasibility of completion.

Monitoring, Evaluating, and Updating the Plan

Unincorporated Beaufort County, City of Beaufort, Town of Bluffton, Town of Hilton Head Island and the Town of Port Royal have developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. The HMPC Chairman is responsible for ensuring viability of the HMPC. If a member is inactive or wishes to no longer participation the chairman is responsible for finding a replacement.

Plan Maintenance

The HMPC will meet once a year at a date to be set by the current Committee Chairman to be coordinated with the participating communities and their local governing bodies. At this meeting, the Committee will review the plan to determine if the information is up to date and should be updated or modified. The parties responsible for implementing action items detailed in Chapter 6 of the plan will report on the status of their projects. The chairman will be responsible for updating the Hazard Mitigation Plan to reflect the progress made of the annual meeting.

The Committee may choose to meet more often as the need requires such as if there is a change in State or federal policy or after disasters affect the County. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies outlined in the Plan.

The chairman will be responsible for ensuring that updated copies of the Plan are made available at the Beaufort County Administrative Building. If deemed necessary and appropriate a public meeting will be held after each annual Hazard Mitigation Planning

Committee meeting. This meeting will provide the public an opportunity to ask questions about the progress of the items in the Action Plan as well as make suggestions for updates to the Plan.

Updating the Plan

No later than five years from now the committee will meet in order to conduct the required FEMA five year update of the Plan. The next planned update to this plan will be in 2014.

Potential Funding Sources

Each initiative incorporated in the Beaufort County Mitigation Plan has been ranked based on the ability to fund it either within County budget or from outside funding sources. The Hazard Mitigation Planning Committee developed a subset of the potential sources for the approved initiatives, shown below. Using this list funding sources are assigned to initiatives by their primary area of appropriateness.

As of the current date on this plan Beaufort County has not verified the true availability of all sources on this list. Some may no longer be available while others may have come into existence since this list was developed.

It is the expectation of the Hazard Mitigation Planning Committee of the Disaster Mitigation Committee that the agencies and organizations that sponsored a specific initiative would utilize the information given in this report to pursue funding opportunities to implement the initiative.

Potential Funding Sources

- Local Governments
- Lowcountry Council of Government Based Grants
- Federal Funding Sources for Mitigation
- State Resources

❖ **FEMA's Hazard Mitigation Grant Program** (HMGP) assists states and local communities in implementing long-term hazard mitigation measures following a major disaster declaration. As of November 1, 2004, all communities must have an approved hazard mitigation plan in place to remain eligible for HMGP funding. HMGP grants can be used to fund projects that provide protection to either public or private property. HMGP eligible projects include structural hazard control such as debris basins, floodwalls, or stream restoration, and retrofitting measures such as floodproofing, acquisition, or relocation of structures.

FEMA can fund up to 75 percent of the eligible costs of each project. The State or local match does not have to be cash; in-kind services or materials may be used. Federal funding under the HMGP is based on 7.5 percent of the Federal funds spent

on the Public and Individual Assistance programs (minus administrative expenses) for each disaster. Eligible applicants must apply for the HMGP through the South Carolina Emergency Management Division – Recovery and Mitigation Group.

- **FEMA's Pre Disaster Mitigation** (PDM) **Funds** provide both planning and project funding to eligible communities. PDM project funding is nationally competitive; there is no 'base' amount guaranteed to each state. A national priority is placed on projects that address NFIP repetitive loss properties and a benefit cost analysis is required for each proposed project. Projects are awarded priority based on the state's analysis and resulting ranking, and on factors such as cost effectiveness, addressing critical facilities, and the percent of the population that benefits from the project.

FEMA funds up to 75 percent of the cost of the project, or up to 90 percent for small, impoverished communities. There is a $3 million cap on the federal share of the cost per project. Eligible applicants must apply for the PDM through the South Carolina Emergency Management Division – Recovery and Mitigation Group.

- **FEMA's Flood Mitigation Assistance Program** (FMA) provides grants to states and communities for planning assistance and mitigation projects that reduce the risk of flood damage to structures covered by flood insurance. The types of grants available include planning and project assistance. FMA monies are available to eligible applicants when a Flood Mitigation Plan has been developed and FEMA has approved it.

  FEMA may contribute up to 75 percent of the total eligible costs. At least 25 percent of the total eligible costs must be provided by a nonfederal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. There are limits on the frequency of grants and the amount of funding that can be allocated to a State or community in any 5-year period. The South Carolina Department of Natural Resources (SCDNR) serves as the administrator of the planning and projects portions of the grant. The State's FMA Coordinator is within the Land, Water and Conservation Division of SCDNR. The agency's web page is www.dnr.state.sc.us.

- **Continuing Authorities Program** (CAP) initiates a short reconnaissance effort to determine Federal interest in proceeding. If there is interest, a feasibility study is performed, and then the project might move on to a plans and specifications phase. Finally, the project goes to its construction phase. A local sponsor must identify the flood-related problem and request USACE Assistance. Small flood control projects are also eligible.

  The cost share for the CAP is 65% USACE and 35 % local. The federal project limit is $7,000,000. The USACE's Charleston District office would review the local sponsor's request for assistance and would request funds from the USACE's annual appropriations.

- **USACE's Floodplain Management Services Program** aims to support comprehensive floodplain management planning to encourage and guide sponsors to prudent use of the Nations' floodplains for the benefit of the national economy and welfare. Some examples of the types of projects that would be funded include:
  - flood warning and flood emergency preparedness
  - floodproofing measures
  - studies to improve methods and procedures for flood mitigating damages
  - preparation of guides and brochures on flood-related topics

  A local sponsor must identify a problem and request USACE assistance under the Floodplain Management Services Program. The USACE may provide up to 100% of funding at the request of the sponsor. The USACE's Charleston District's office would review the local sponsor's request for assistance and determine if it fits within the program.

- **Department of Housing and Urban Development's** (HUD) **Community Development Block Grant - Disaster Recovery Initiative** (DRI) program provides flexible grants to help cities, counties, and States recover from Presidentially-declared disasters, especially in low-income areas. Since it can fund a broader range of recovery activities than most other programs, the DRI helps communities and neighborhoods that otherwise might not recover due to limited resources.

  When disasters occur, Congress may appropriate additional funding for the Community Development Block Grant and as DRI grants to rebuild the affected areas and bring crucial seed money to start the recovery process. Grantees may use DRI funds for recovery efforts involving housing, economic development, infrastructure and prevention of further damage, if such use does not duplicate funding available from the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Examples of these activities include:
  - buying damaged properties in a flood plain and relocating them to safer areas;
  - relocation payments for people and businesses displaced by the disaster;
  - debris removal;
  - rehabilitation of homes and buildings damaged by the disaster;
  - buying, constructing, or rehabilitating public facilities such as water and sewer systems, streets, neighborhood centers, and government buildings;
  - code enforcement;
  - planning and administration costs (limited to no more than 20 percent of the grant).

  HUD notifies eligible governments, which must then develop and submit an Action Plan for Disaster Recovery before receiving DRI grants. The Action Plan must describe the needs, strategies, and projected uses of the Disaster Recovery funds.

- **Certified Local Government** (CLG) **Grants** are available for historic preservation through the **State Historic Preservation Office** (SHPO) which is part of the **South Carolina Department of Archives and History** (SCDAH). Although the funding for this program is administered by state, the funding is allocated by the U.S. Department of the Interior. Ten percent of the total federal appropriation to the State Historic Preservation Office's is awarded annually to Certified Local Governments (CLGs). The City of Beaufort and the Town of Bluffton are both Certified Local Governments and are thus eligible for this funding source. The grants can be used for projects related to historic structures and preservation, and requires matching funds (50/50 share) with awards generally ranging from $1,500 to $25,000. Historic Preservation projects often overlap with hazard mitigation efforts and include Identifying, Recording and Recognizing Historic Properties; Planning for Historic Districts and Multiple Historic Properties; Building Stabilization Projects; Planning for Individual Historic Properties; Preservation Education; and Strengthening Local Government Historic Preservation Programs.

- The **SHPO** also administers the **State Development ("Bricks and Mortar") Grants** which can be used for stabilizing historic buildings and structures, or protecting historic buildings and structures from the adverse effects of the weather. Eligible applicants include local governments, nonprofit organizations applying for the grants for buildings or structures that are listed in the National Register of Historic Places or eligible for the National Register and have a planned or current public use. The grants are reimbursable, have a 50/50 cost match requirement and generally range from $5,000 to $20,000. SHPO's website is located at www.state.sc.us/scdah/histrcpl.htm.

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Appendix A

May 14, 2009
Hazard Mitigation Planning Committee
First Meeting/Kick-off

Participants present:
Ed Nelson
Trudie Johnson
John Webber
Ginnie Kozak
Libby Anderson
Juan Fui
Linda Bridges
Matthew Brady
Wayne Walters
Alice Howard
Jay Hogan
Ken Jordan
Tony Criscitiello
Arthur Cummings
Marjorie Arnold

The meeting began with discussion of the formation of the committee. The group was presented with a list of last plan's participants, and were informed that they were invited because they were on that list. The group generally agreed that the people present and the list represented the necessary staff for the update. The agreed that the previous plan's list should serve as the foundation for the Hazard Mitigation Planning Committee, and that LCOG staff should be responsible for contacting and setting up HMPC meetings. Mr. Brady stated the importance of the planning process, and noted that public meetings should be held and that the HMPC meetings should be documented.

Mr. Brady stated that any information about hazard mitigation should be given to them that they have, included updated planning documents, GIS, etc. He also stated that with the help of data they collect, the LCOG will play the primary role in updating hazard information such as profiles and vulnerability. He discussed what he learned at the SCEMD training session, and gave a brief overview of the materials to be updated. Mr. Brady gave a review of all FEMA requirements for all sections of the plan per the "Guidance."

Finally, Mr. Brady went over all of the sections/elements of the plan with the HMPC. He stated that some of the most important things that the planning committee will need to do will be update the goals/objectives/actions that are associated with the plan. They would also ultimately be responsible for scheduling public meetings. The next meeting time was discussed (June), and the HMPC was instructed to start revising their actions for their particular jurisdiction.

He also discussed the capability section, and stated that he would review the documents for accuracy and that the HMPC would need to check his work to make sure he had the right capability documents in the plan, etc.

Trudie Johnson discussed the important of adhering the NFIP and CRS standards, and stated that they wanted to do a more thorough job in order to produce a higher CRS rating.

After discussion ended, the group was dismissed

Beaufort County Hazard Mitigation Plan Stakeholders Meeting

June 18, 2009

- Overview of community mitigation capability initiatives and documents
- Review action item update list
- Review of goals from hazard mitigation plan
- Update on USC's hazard assessment efforts
- Next meeting and in-office meetings

Beaufort County Hazard Mitigation Meeting, June 19, 2009
Location: Beaufort County Administration Building.
Time: 10: 00a.m.

Attendance:
Edward Nelson, Beaufort County
Marcy Benson, Town of Hilton Head,
Trudie Johnson, Town of Hilton Head
Jay Hogan, Beaufort County
John Webber, Beaufort Country
F. Wayne Walters, Beaufort County Government
Ginnie Kozak, Lowcountry Council of Governments (LCOG)
Matthew Brady, Lowcountry Council of Governments
Jon Lattimore, Lowcountry Council of Governments

- The meeting started at 10:05am

- Matthew Brady began by discussing the previous plans goals/actions/objectives. These were brought up at the first meeting, and each of the members had time to look over them and updates were given to be finalized for the plan. Any other updates for these items were to be sent to Matthew either via email or by individual meetings.

    - Ed discussed the first Action item on the list, mentioning that the archive facility was moved from its former location

    - Emails will be sent on implementation status. Trudie mentioned the construction of new fire stations and also mentioned that the mayor of Hilton Head wanted the bridge in Beaufort County to be retrofitted to mitigate a potential hazard.

    - Edward Nelson said that he will contact someone from Beaufort County engineering in reference to HMP retrofitting. In terms of preparation of employees, Trudie Johnson said that training is being done with the building officials.

- Matthew Brady also discussed the review of mitigation initiatives, requesting each representative at the meeting table to evaluate the list of updated goals, objectives and actions and to check for mistakes or make suggestions for things to be added to the list. Also, the Hazard Mitigation chart with the document checklist for the County and the municipalities was presented with a request that it be evaluated by the representatives at the table. The list was intended to give HMPC a direction to go with new action items that Matthew may have left off the list.

- Capability documents were also discussed again, with Matthew stating that the LCOG staff had reviewed the Community's mitigation Capability, and that he would be going around to each individual community to make sure he had their particular situation reflected correctly.

- Matthew asked about the Town of Yemassee's participation in the Hazard Mitigation Plan. Ed Nelson said that there was no participation from Yemasee previously. Trudie Johnson and John Webber felt the Town of Yemassee should be invited to participate and to attend all meetings. LCOG will take care of this. Town of Yemassee is part of the HMP because 10 percent of it is in Beaufort County and must be included in the planning process. It is important to invite Yemassee because of the part the Town will play in Beaufort County's evacuation and recovery and because there is a large Beaufort County Housing Authority project there.

- Matthew discussed talking to the Department of Natural Resources about repetitive loss structures, and that it is necessary to have the information about those structures in each jurisdiction. Trudie said the Town of Hilton Head's Geographic Information System's manager could provide that information, both numbers and general locations of the properties and which have already been mitigated. to get data in reference to the repetitive loss structures. Ed said that he would provide the data for Beaufort County.

- Matthew mentioned that he talked to University of South Carolina (USC) about their hazard assessment project that is ongoing. USC will have completed hazard assessment data for the County once this project is complete. Also, he briefly went over the status of the Capability, Vulnerability and Hazard profiling portion of the plan, explaining that most of the updated information had been updated and asking for any input into the available updates.

- Matthew initiated a discussion of the Hazard Mitigation Plan (HMP) goals/objectives/actions from the 2004 document. He also went on to discuss vulnerability to each hazard for the County and its jurisdictions. The information would be based on data from the COG, and he took comments

    - Trudie asked what can be done in reference to the HMP goal number 9. Ginnie Kozak felt as though the Beaufort Country evacuation plan is more important and should have be updated.

    - Edward Nelson mentioned evaluating property owners that are remodeling to ensure that they are in compliance with hazard mitigation. Trudie Johnson mentioned the 2006 International Residential Code. Homebuilders have lobbied against it in Columbia, because they felt they would losing money. She feels the code should be adopted in full, because of its strong building codes and the particular susceptibility to hazards we face on the coast. It is

possible that the Community Rating System (CRS) could be lost. Further discussion, Ginnie Kozak and Edward Nelson, it was a general consensus of establishing stringent codes/standards on the coastal line. Ginnie Kozak mentioned the importance of education when it comes to CRS, floodplains, etc.

- John Webber feels as though mitigation improves the recovery process. Trudie Johnson mentioned that a strong link should be connected to HMP and DRP. John Webber said that the municipalities are working collaboratively for HMP (i.e., impact assessment). Ginnie Kozak requested to have combined meetings with representatives from the surrounding counties and other municipalities. Trudie Johnson felt as though that Goal 8 was a little weak and an evaluation of where the emergency personnel stand needs to be performed, and the Goal 8 needed its progress documented.

- Matthew Brady then discussed the flood maps-----how can they be enforced, with a strategy of how people cannot be penalized due to flood map updating. Goal 9 needs to be rewarded to ensure the process of updating the flood maps.

- John Webber felt as though Goal 3 of the Action Items General Goals need to be more detailed. Trudie Johnson mentioned that the comprehensive plan for the Town of Hilton Head was being updated. John Webber asked about the drainage in reference to water pollution, in reference to Goal 6. Trudie Johnson said that it is not about water pollution but about the maintenance of stormwater.

- Matthew Brady discussed the survey that can be disseminated to the public and how it can be submitted back by the public (i.e. newspaper websites). Ginnie Kozak felt as though this would be a good idea to get public input about Hazard Mitigation. John Webber mentioned the possibility of using the questionnaire as an opportunity to inform the public of lawmakers' influence with the adoption and enforcement of stringent building codes. There were also suggestions of using the questionnaire and related media coverage to provide information about some of the key issues of Hazard Mitigation Planning.

- Matthew Brady mentioned eligible grant activities in which the departments could get FEMA funding for hazard mitigation and hazard recovery projects. There has also very recently been a request to the COGs by SCEMD to encourage local governments to apply for funding for Flood Mitigation since available funding has not been utilized John mentioned that he would like to look into eligible building improvements for the County Administration Building Although no one from the Storm Water Management utility was there, they may have an eligible project available. Another potential project is the completion of Hilton Head's drainage plan.

- Matthew also discussed prioritization of the goals based on NFIP and the methodology to prioritize. He stated that the prioritization was not "set in stone" but required by FEMA.

- Matthew Brady said that he will be contacting everyone in the meeting to talk to each one individually, with the assistance of Jon Lattimore, in order to discuss individual parts of the plan and any other concerns. Matthew Brady mentioned that the next meeting will be on Thursday July 16th @ 10am in the Executive Conference Rm 170, Beaufort County Administrative Building.

Agenda
Flood Mitigation/Hazard Mitigation Planning Meeting
August 27, 2009
(items subject to change)

1. Prioritization of goals in accordance with NFIP
2. Cost Benefit Review/Discussion of Feasibility of action items
3. Timeline for completion of any new action items
4. Planning the Public Meeting schedule (please be thinking of dates)
5. Ranking of Hazards
6. Dismissal

Hazard Mitigation Meeting

Meeting Minute Notes August 27 2009

HMPC members present:

Ed Nelson

Linda Bridges

Matthew Brady

Jay Hogan

Marcy Benson

Trudie Johnson

Arthur Cummings

John Webber

Libby Anderson

Todd Furgeson

Melissa Easler

Colin Kinton

George Owens

Ginnie Kozak

Maggie Hickman

Russell Byrd

Roni Abdella

Robert Klink

Jain Fui

Matthew Brady (did not sign in)

7. Prioritization of goals in accordance with NFIP

- Mr. asked for the group to look over the revised goals and determine if they were written as the HMPC had directed him. Furthermore, he asked them to review the goals for NFIP compliance. It was generally agreed that the goals/objectives/actions were final, and that any changes would be sent directly to Matthew from the HMPC members.

- Mr. Brady emphasized that all of the goals need to be prioritized and written in a manner that is compliant with the NFIP.
- The group made several suggestions (both grammatical and substantive)
  - Expand on all goals to ensure NFIP complians
  - Ensure that FEMA guidelines are emphasized in the objectives and goals
- After the comments, the group decided to allow the LCOG staff to make the changes, and offer any changes within seven-to-ten days for the goals.
- Overall, the group did decide that the goals met the requirements and were established in accordance with NFIP.

8. Cost Benefit Review/Discussion of Feasibility/Prioritization of action items

- Mr. Brady discussed the necessity of a cost-benefit review for the actions that were listed.
- He also presented a chart that would allow all stakeholders to assign a numerical ranking to each of the proposed action items.
- The chart/worksheet gave a score to each item based on nine criteria: strategy effectiveness, percentage of population benefitted, time to implement, cost to community, funding source, cost to others, community support and project feasibility. The worksheet will produce a score.
- Mr. Brady also stated that he will electronically send everyone the worksheet.
- He asked every to make changes to the action items as they saw they were appropriate.

9. Timeline for completion of any new action items
   - Mr. Brady mentioned that all of the stakeholders should look at the action items, and the responsible jurisdiction should give an estimated time for completion of the action item, cost, etc.
   - Any changes to the first drafts of action plans were decided to be on track and finalized

- Matthew also generally discussed where the draft of each section of the plan stood.

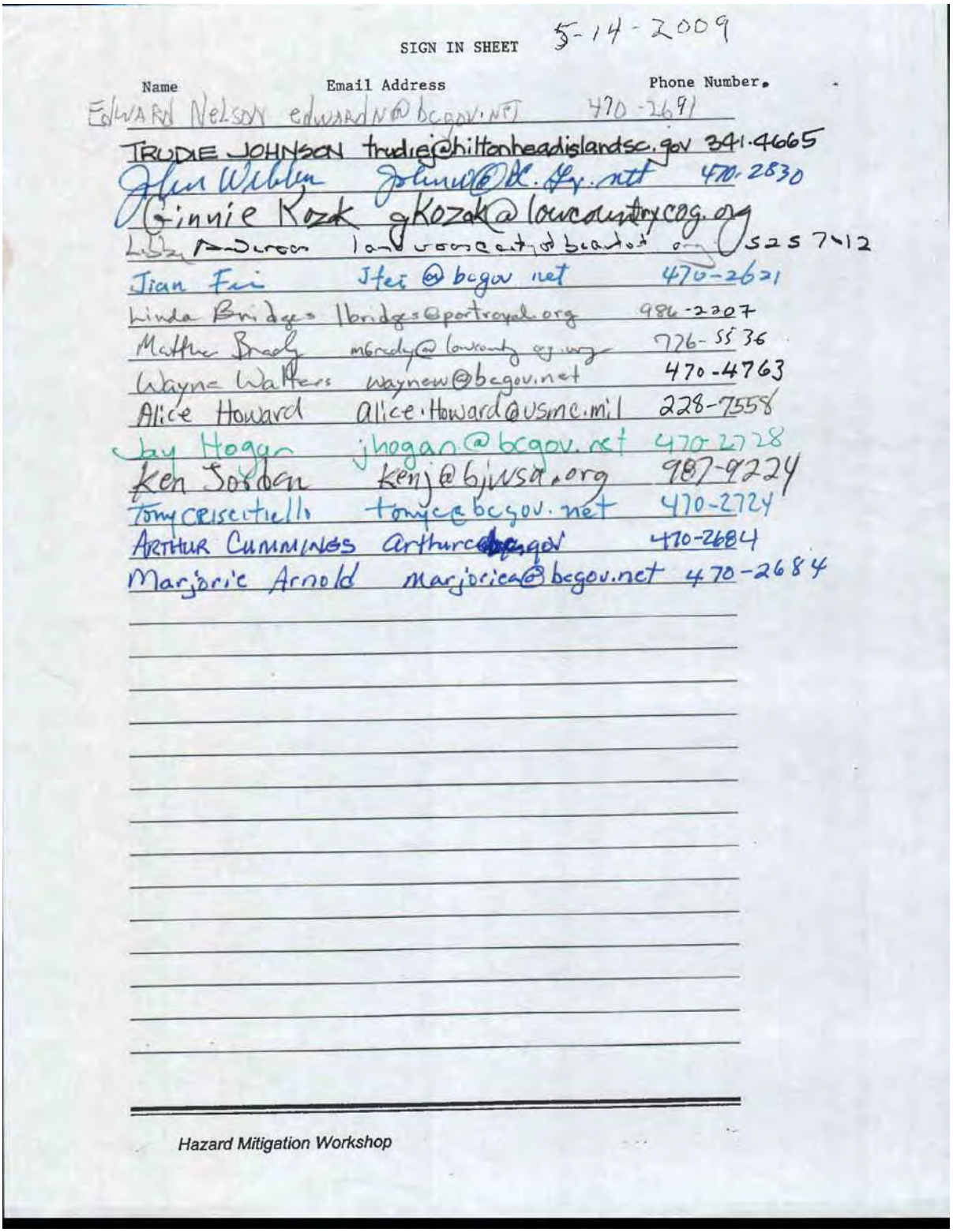
10. Planning the Public Meeting schedule (please be thinking of dates)
    - Mr. Brady mentioned that the HMPC should come up with dates for two more public meetings regarding this plan.
    - Mr. Cummings stated that they would look into a meeting time.
    - Ms. Johnson and others stated that having a meeting while the planning commission meets would involve more stake holders in the process.

11. Ranking of Hazards

    - Mr. Brady mentioned that only four main hazards were reported according to the data previously, and these generally fall in line with the data reported this time
    - He also mentioned, however, that during hazard assessment, there were other hazards that could pose a threat and that the HMPC should rank them
    - The HMPC decided to keep the ranking of the hazards as the original plan had them described, as nothing had changed dramatically since the original plan

12. Dismissal

APPENDIX B
SIGN IN



SIGN IN SHEET 5-14-2009

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Tony Criscitiello	tonyc@bcgov.net	470-2724
ARTHUR CUMMINGS	arthurc@bcgov	470-2684
Marjorie Arnold	marjoriea@bcgov.net	470-2684

Hazard Mitigation Workshop

8-27-09

SIGN IN SHEET

Name	Email Address	Phone Number
ED NELSON	edwardn@bcgov.net	470-2691
Linda Bridges	lbridges@portroyal.org	986-2207
Matthew Brady	mbrady@lowcountrycog.org	725-5536
Jay Hogan	jhogan@bcgov.net	470-2728
Marcy Benson	marcyb@hiltonheadislandsc.gov	341-4684
TRUDIE JOHNSON	trudiej@hiltonheadisland.gov	341-4605
ARTHUR CUMMINGS	Arthurc@bcgov.net	470-2684
John Weblen	jlmcweblen05@BCGov.net	470-2530
Libby Anderson	landerson@cityofbeaufort.org	525-7012
Todd Ferguson	Toddf@bcgov.net	470-3100
Missy Easler	melissae@bcgov.net	470-3055
Colin Kinton	CKINTON@bcgov.net	470-2631
GEORGE OWENS	COUNCIL@TOWNOFBLUFFTON.COM	706-4525
Ginnie Kozak	gkozak@lowcountrycog.org	726-5536
County Eng. Admin - Maggie Hickman	Maggieh@bcgov.Net	470-2625
Russell Byrd	RO Russell.Byrd@usmc.mil	228-7119
Roni JoAbdella	Ronij@ibcode.net	209-3275
County Eng Robert Klink	robertK@bcgov.net	470-2625
Asst County Eng Jaion Fei	jfei@bcgov.Net	470-2625

Hazard Mitigation Workshop

12-14-04

SIGN IN SHEET

Name	Email Address	Phone Number
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Arthur L. Cummings,	arthurc@bcgov.net	470-2684
Linda Bridges	lbridges@portroyal.org	986-2207
TRUDIE JOHNSON	trudiej@hiltonheadislandsc.gov	843 341 4685
Roni Abdella	ronij@ibcode.net	843-209-3275

Hazard Mitigation Workshop

APPENDIX C
PUBLIC MEETING NOTICES

2A Thursday, July 23, 2009 • beaufortgazette.com • islandpacket.com

GOOD MORNING

LOCAL GOVERNMENT

TODAY

Beaufort-Jasper Water & Sewer Authority board meeting: 9 a.m., administration room, 6 Snake Road, Okatie

Agenda: Presentation on draft integrated water resources plan, wastewater consolidation project, capital improvement project additions.

On the Web: www.bjwsa.org

S.C. Department of Health and Environmental Control public hearing: 6 p.m., Palmetto Electric, 1 Cooperative Way, Hardeeville

Agenda: Discussion of permit application by the Sembler Co. to fill in 2.55 acres of wetlands at Okatie Crossings, along U.S. 278 and S.C. 170.

On the Web: www.scdhec.gov

BEAUFORT COUNTY

Airports Board: 1:30 p.m., County Council Chambers, county administration building, 100 Ribaut Road, Beaufort

Agenda: Updates on Hilton Head Island Airport and Beaufort County Airport on Lady's Island; hangar rental rates, aircraft tax rates, operating agreement with Signature Flight Services, airport grant discussion.

On the Web: www.bcgov.net

TOWN OF HILTON HEAD ISLAND

Neighborhood meetings: 10 a.m., Hilton Head Island library, 11 Beach City Road; and 6 p.m., Benjamin M. Racusin Council Chambers, Town Hall, One Town Center Court, Hilton Head Island

Agenda: Public input on three chapters of proposed comprehensive plan: land use, economic development and natural resources. Discussion about an update to the all hazards mitigation plan, which lays out how the town will prevent or lessen damage from natural disasters.

On the Web: www.hiltonheadislandsc.gov

CITY OF BEAUFORT

Northwest Quadrant Study Group: 5 p.m., 1211 Boundary St., Beaufort

Agenda: Discussion of first neighborhood association meeting, interviews within the four-block core area, architects' reactions, results of interviews with property owners and other topics.

On the Web: www.cityofbeaufort.org

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TOWN SEEKS INPUT

By DANIEL BROWNSTEIN
dbrownstein@islandpacket.com
843-706-8125

The Town of Hilton Head Island is asking the community to comment on the first three chapters of its upcoming comprehensive plan during two meetings Thursday.

The chapters on land use, economic development and natural resources will be available at the meetings.

Senior planner Shawn Colin said the town plans to unveil the comprehensive plan three chapters at a time over three months before the entire package heads to the Planning Commission and on to the Town Council this fall.

The comprehensive plan is used as a blueprint for all planning decisions on the island.

Titled "Charting the Island's Future from Here to 2030," it will be the first full update since the plan was created in 1999, though some changes were made in 2004.

Before town employees and a board of residents began crafting the new plan, they met with more than 300 people and organizations and considered about 500 responses to a survey.

The meetings will also include a presentation about disaster plans.

IF YOU GO:

Both meetings soliciting input on the comprehensive plan are Thursday.

- **10 a.m.,** Hilton Head Island Public Library, 11 Beach City Road
- **6 p.m.,** Benjamin M. Racusin Council Chambers, Town Hall, One Town Center Court

More information about the comprehensive plan is available online at www.hiltonheadislandsc.gov. Click on the "Charting the Island's Future" link on the home page.

We would like to know what you think!

Neighborhood Meeting

"Charting the Island's Future - from Here to 2030"
(Town of Hilton Head Island Comprehensive Plan Update)

The Comprehensive Plan Committee of the Planning Commission would like to present a summary of broad strategies developed for three elements to the community and ask for input. The elements to be presented include:

- **Community Facilities**
- **Transportation**
- **Recreation**
- **Priority Investment**

Each meeting listed below will include a formal presentation and a facilitated discussion.

"Charting the Island's Future from Here to 2030" is a collaborative effort between the community and its leaders to form a vision for the future of the Town over the next 20 years.

So far, more than a hundred stakeholder interviews, over 500 responses from a community assessment survey, and input from over 200 citizens during a series of neighborhood meetings, have provided important information that has been considered during the update of the plan.

In addition, there will be a presentation on the updated draft of the Hazard Mitigation Plan.

Please plan to attend one of the meetings and join us in "Charting the Island's Future from Here to 2030!"

Neighborhood Meeting Choices

(A map for each location can be found on the page that follows.)

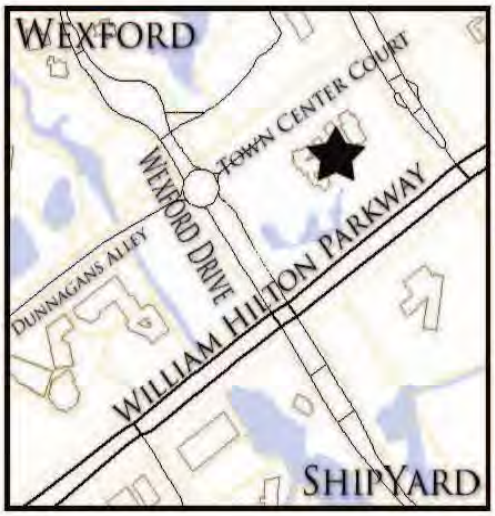
1. **Thursday, October 29th in Benjamin M. Racusin Council Chambers at Town Hall. Presentation at10am.**

2. **Thursday, October 29th at Hilton Head Island Public Library. Presentation at 6pm.**

Location of Neighborhood Meetings

Hilton Head Island Library
11 Beach City Road
Hilton Head Island, SC 29926

Thursday, October 29th at 6:00pm



Hilton Head Island Town Hall
1 Town Center Court
Hilton Head Island, SC 29928

Thursday, October 29th at 10:00am

NOTES:

Information on the plan can also be found on the Town's website at www.hiltonheadislandsc.gov
(Click on: "Charting the Island's Future - Comp Plan Update.")
or
Contact Shawn Colin at 843-341-4696 or shawnc@hiltonheadislandsc.gov

APPENDIX D
SURVEY

Beaufort County Multi-jurisdictional Hazard Mitigation Plan Survey

7. If damage occurred, please describe the date of the event and the cost of damage.

8. If flooding caused the damage, what was the source of the flooding? (Check all that apply)

- ☐ Storm Surge
- ☐ Insufficient storm Drainage
- ☐ overbank flooding of an adjacent stream or river

Other (please specify)

9. If the damage was caused by wind, what type of wind event was it?

- ☐ Tropical Storm
- ☐ Tornado
- ☐ Nor'easter

Other (please specify)

10. If the damage was caused by events other than flooding or wind, please describe the event and how the damage was caused.

11. Please describe any corrective measures taken to protect your property from damage due to natural hazards such as flooding, wind, erosion, etc. Please include the cost and effectiveness of these measures, if available.

* **12. Protective mitigation measures have several benefits, including decreasing damage from hazards (such as flooding) and lower insurance rates. In light of this, would you be willing to pay for any retrofits to your property in order to mitigate from hazard damage?**

- ◯ Yes
- ◯ No

Page 3

Beaufort County Multi-jurisdictional Hazard Mitigation Plan Survey

13. Would you support the enforcement of more stringent building codes on new construction and significant improvements to existing structures?

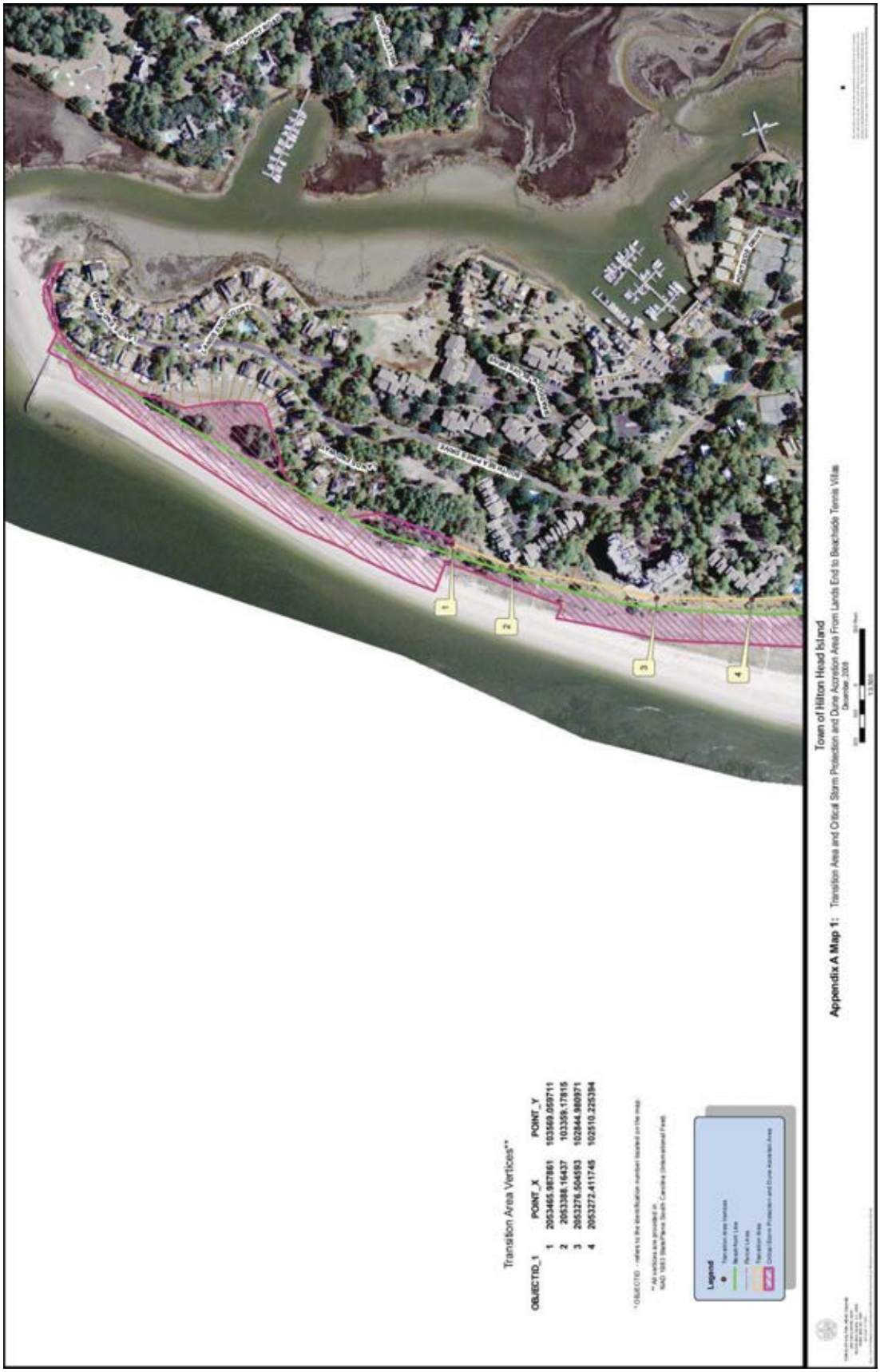
- ◯ Yes
- ◯ No

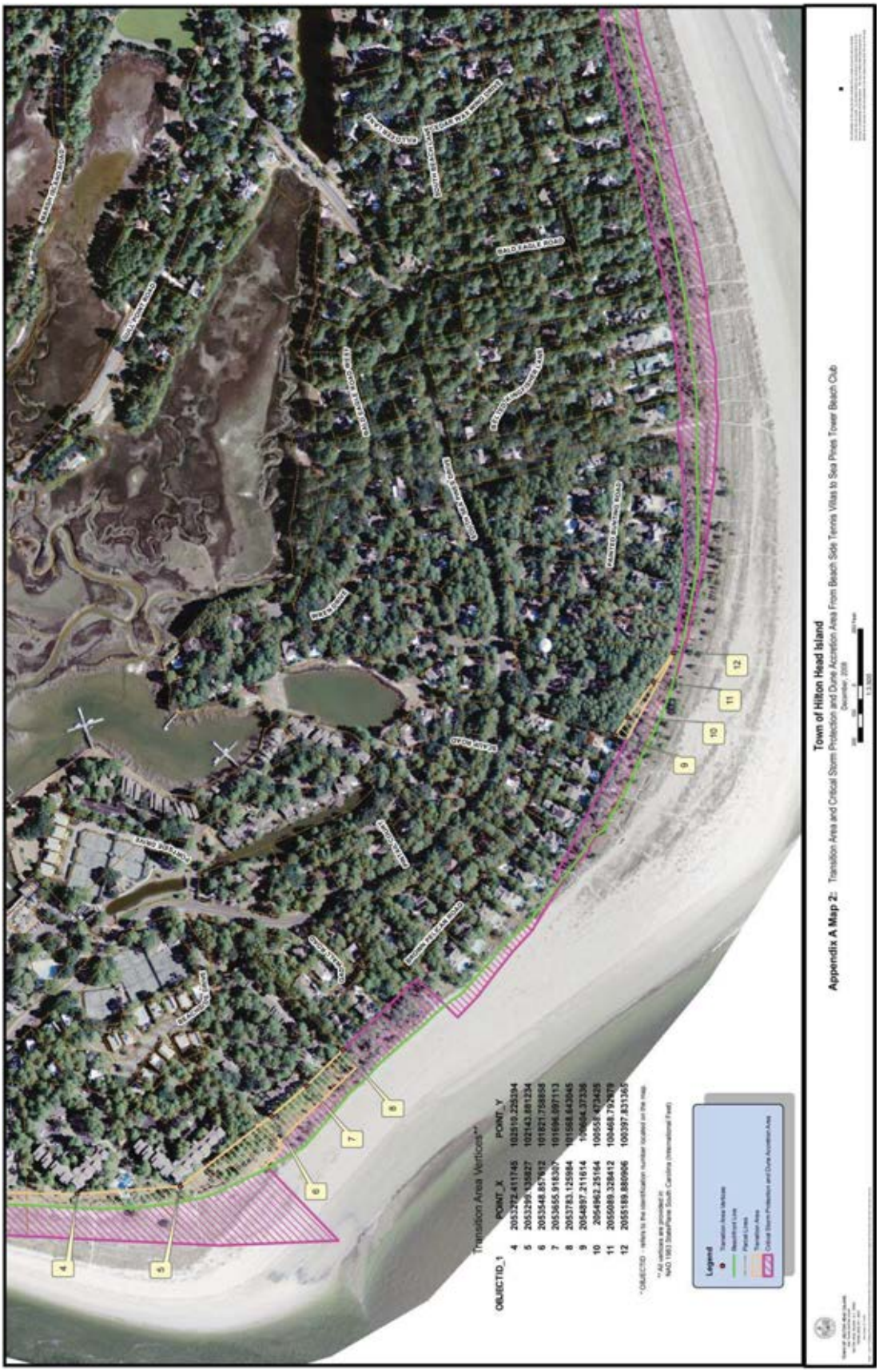
14. If you ever received any federal assistance or assistance from your county/town/city for damage to your property due to flooding, wind, erosion, etc. , please describe.

15. Please provide any suggestions your have on how to protect your property/neighborhood from flooding, wind, erosion or other types of natural hazards.

16. Please provide any additional comments.

Page 3


Town of Hilton Head Island
Appendix A Map 1: Transition Area and Critical Storm Protection and Dune Accretion Area From Lands End to Beachside Tennis Villas
December, 2008
Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
1 2053465.987861 103569.059711
2 2053388.16437 103359.17815
3 2053276.504593 102844.980971
4 2053272.411745 102510.225394
Legend


Town of Hilton Head Island
Appendix A Map 2: Transition Area and Critical Storm Protection and Dune Accretion Area From Beach Side Tennis Villas to Sea Pines Tower Beach Club
December, 2008
Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
4 2053272.4117745 102510.2202394
5 2053299.1338827 102143.3881234
6 2053548.8578832 101821.7588858
7 2053855.9181307 101694.0971113
8 2053783.1125984 101568.6430945
9 2054087.2111614 100804.37338
10 2054962.251164 100558.4723435
11 2055089.3284412 100468.7792479
12 2055189.8880906 100397.8313631
Legend
Transition Area Vertices
Baseline Limit
Portal Limits
Transition Area
Critical Storm Protection and Dune Accretion Area


Legend
Baseline
Parcel Lines
Transition Area
Critical Storm Protection and Dune Accretion Area
Town of Hilton Head Island
Appendix A Map 3: Critical Storm Protection and Dune Accretion Area From Cedar Wax Wing Drive to Black Skimmer Lane


Legend
Town of Hilton Head Island
Appendix A Map 4: Critical Storm Protection and Dune Accretion Area From Black Skimmer Lane to East Beach Lagoon Drive
MAGNOLIA ROAD
GREENWOOD DRIVE
MAGNOLIA ROAD


Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
13 2065111.73468 105551.396654
14 2065338.5196885 105673.7776247
15 2065600.6394436 105826.7032756
16 2066058.6444529 106088.5062234
17 2066247.1699861 106196.8555643
Legend
Town of Hilton Head Island
Appendix A Map 5: Transition Area and Critical Storm Protection and Dune Accretion Area From East Beach Lagoon Drive to Duck Hawk Road
13
14
15
16
17


Legend
Town of Hilton Head Island
Appendix A Map 6: Critical Storm Protection and Dune Accretion Area From Duck Hawk Road to Cassina Lane

Transition Area Vertices**

OBJECTID_1	POINT_X	POINT_Y
18	2073296	110244.069882
19	2074190.5	110692.649934
20	2076231.875	111695.399934
21	2077066.5	112107.899934
22	2077155.5	112153.319882

* OBJECTID - refers to the identification number located on the map.

** All vertices are provided in NAD 1983 StatePlane South Carolina (International Feet)

Town of Hilton Head Island

Appendix A Map 7: Transition Area and Critical Storm Protection and Dune Accretion Area From Cassina Lane to Coligny Circle

December, 2008

1:3,500

Transition Area Vertices**

OBJECTID_1	POINT_X	POINT_Y
18	2073296	110244.069882
19	2074190.5	110692.649934
20	2076231.875	111695.399934
21	2077066.5	112107.899934
22	2077155.5	112153.319882

* OBJECTID - refers to the identification number located on the map

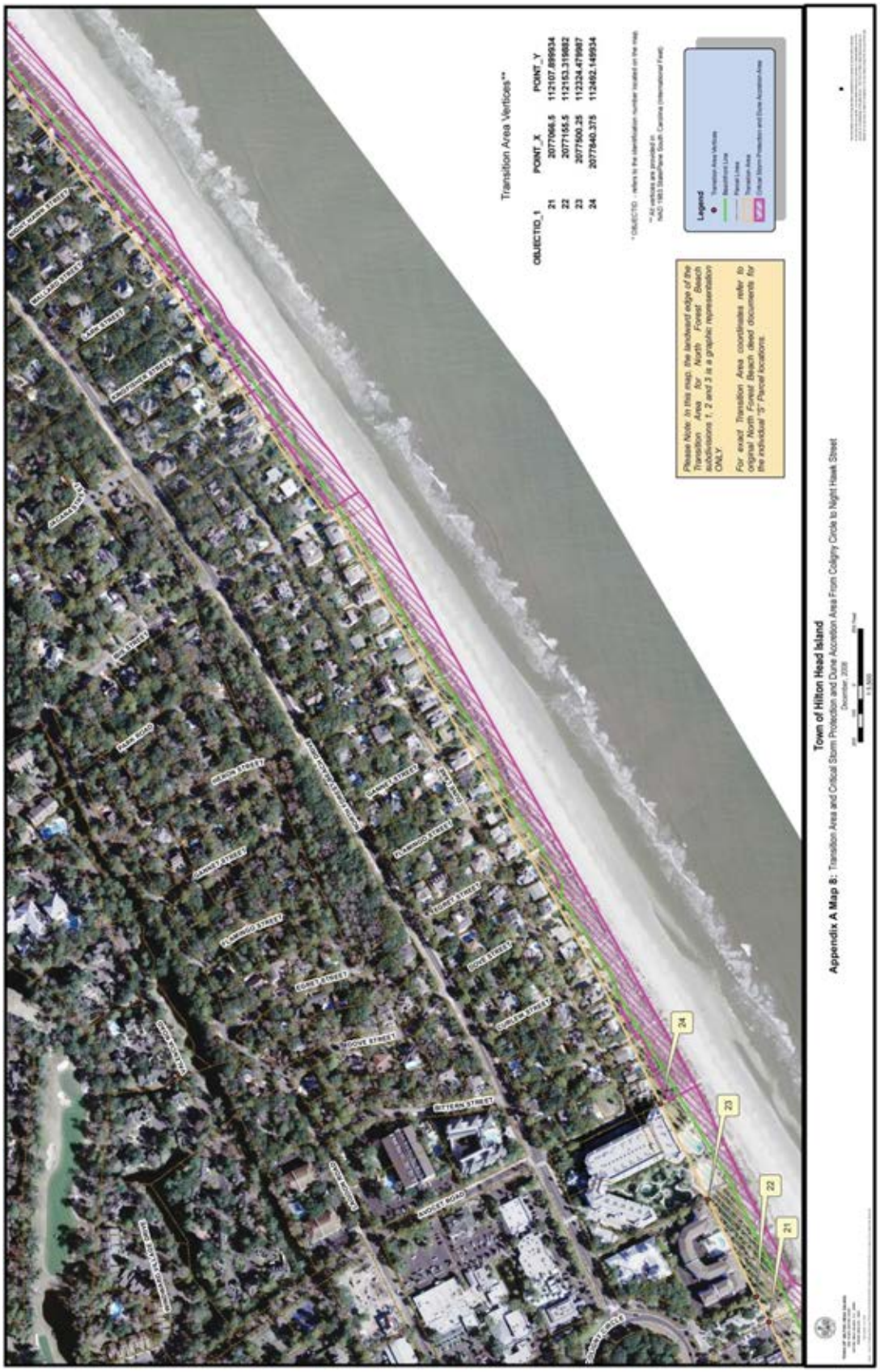
** All vertices are provided in
NAD 1983 StatePlane South Carolina (International Feet)

Town of Hilton Head Island

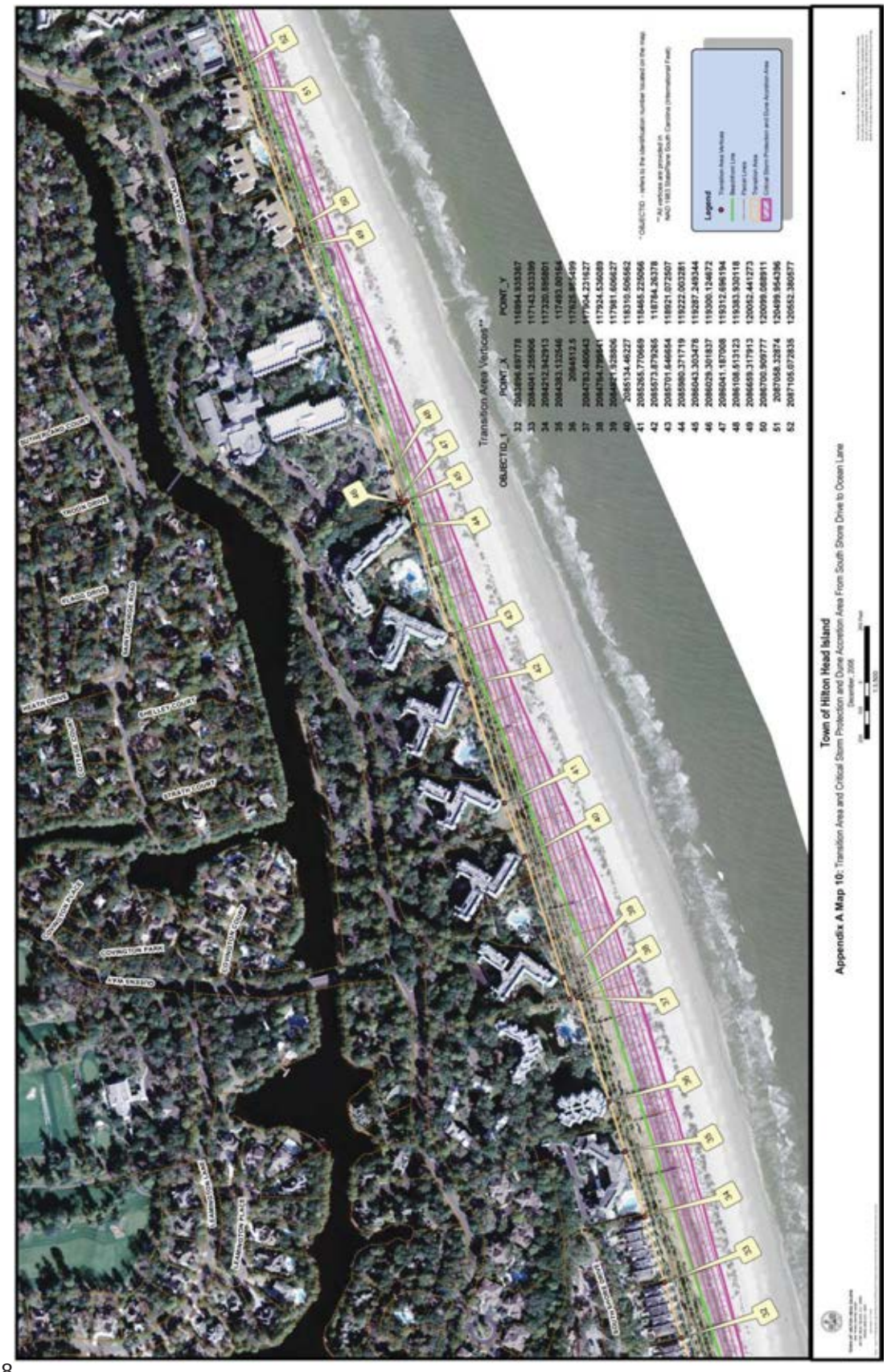
Appendix A Map 7: Transition Area and Critical Storm Protection and Dune Accretion Area From Cassina Lane to Coligny Circle

December, 2008

1:3,500


Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
21 2077068.5 1121078.899934
22 2077155.5 1121153.316882
23 2077500.25 1123224.479987
24 2077840.375 1124892.149934
* OBJECTID - refers to the identification number located on the map
** All vertices are provided in NAD 1983 StatePlane South Carolina (International Feet)
Please Note: In this map, the landward edge of the Transition Area for North Forest Beach subdivisions 1, 2 and 3 is a graphic representation ONLY
For exact Transition Area coordinates refer to original North Forest Beach deed documents for the individual "S" Parcel locations
Legend
Transition Area Vertices
Baseline
Parcel Lines
Transition Area
Critical Storm Protection and Dune Accretion Area
Town of Hilton Head Island
Appendix A Map 8: Transition Area and Critical Storm Protection and Dune Accretion Area From Calgary Circle to Night Hawk Street
December, 2008
MARSH HAWK STREET
MEADOW STREET
PARK STREET
PARK ROAD
HERON STREET
GANNET STREET
PELICAN STREET
EGRET STREET
DOVE STREET
DUNLIN STREET
GROOVE STREET
RITTERN STREET
MARSH ROAD
CIRCLE
21
22
23
24

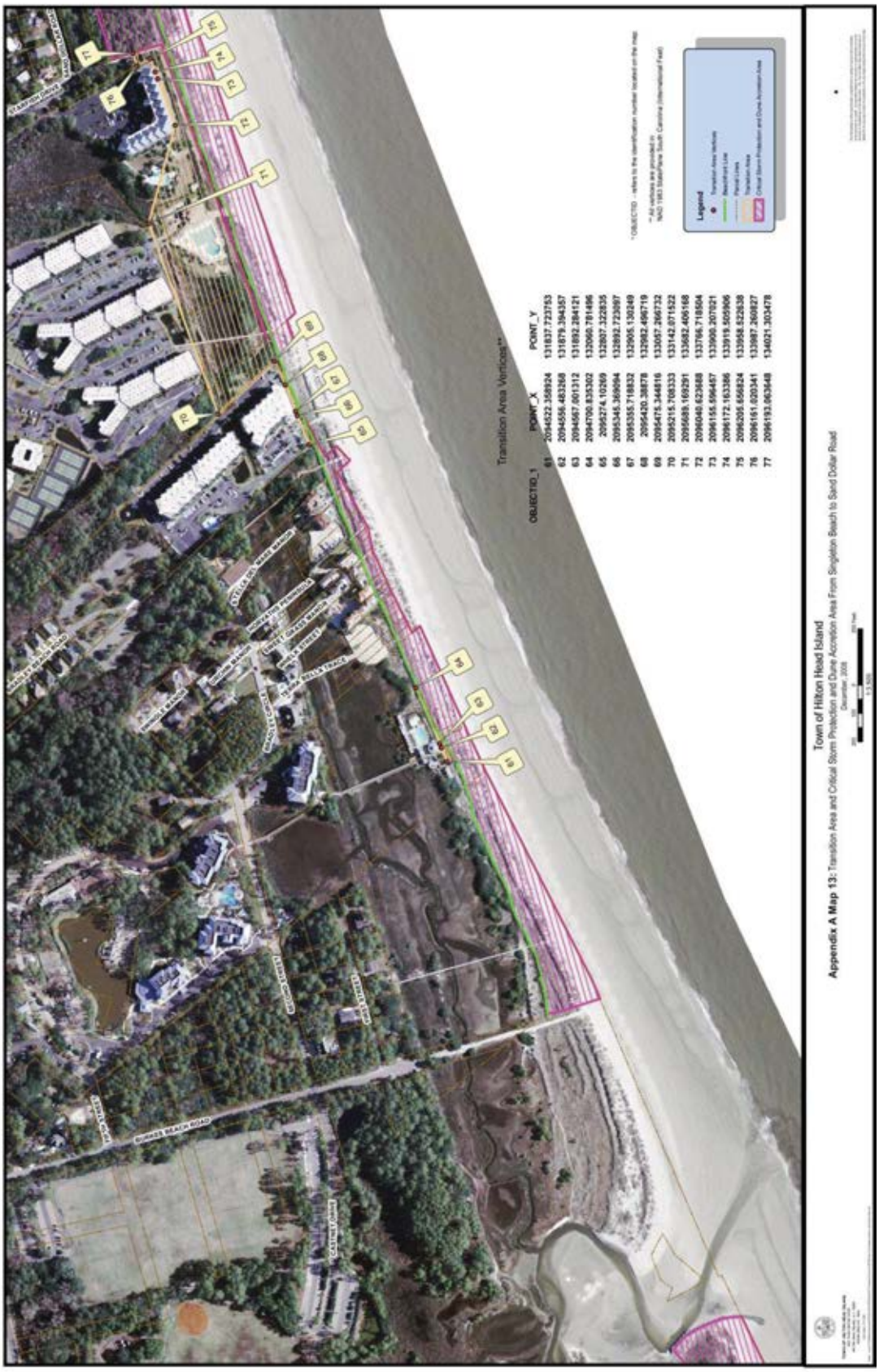

Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
25 2083332.889436 1164410.317913
26 2083064.465374 1164436.671622
27 2083466.233896 1165504.69252
28 2083565.776247 1166606.259186
29 2083628.748032 1166657.082021
30 2083643.571522 1166668.046604
31 2083732.316241 1167797.138123
32 2083896.697178 1169945.935367
33 2084041.255906 1171143.933399
34 2084212.942913 1172265.695801
*OBJECTID - refers to the identification number located on the map
**All vertices are provided in NAD 1983 StatePlane South Carolina (International Feet)
Please Note: In this map, the landward edge of the Transition Area for North Forest Beach subdivisions 1, 2 and 3 is a graphic representation ONLY.
For exact Transition Area coordinates refer to original North Forest Beach deed documents for the individual "S" Parcel locations.
Legend
Transition Area Vertices
Baseline
Parcel Lines
Transition Area
Critical Storm Protection and Dune Accretion Area
Town of Hilton Head Island
Appendix A Map 9: Transition Area and Critical Storm Protection and Dune Accretion Area From Night Hawk Street to South Shore Drive
December, 2006
34
33
32
31
30
29
28
27
26
25


Town of Hilton Head Island
Appendix A Map 10: Transition Area and Critical Storm Protection and Dune Accretion Area From South Shore Drive to Ocean Lane
Legend
Transition Area Vertices
Baseline Line
Parcel Lines
Transition Area
Critical Storm Protection and Dune Accretion Area
Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
32 2083896.697178 116894.935387
33 2084041.255906 117143.933399
34 2084212.942913 117320.856801
35 2084383.132546 117493.00164
36 2084512.5 117625.897499
37 2084783.460643 117904.231627
38 2084784.179941 117924.536089
39 2084827.329806 117981.606627
40 2085134.46227 118310.606562
41 2085265.770669 118465.229596
42 2085573.879265 118784.26378
43 2085701.646654 118921.072507
44 2085980.371719 119222.003281
45 2086043.393478 119287.249344
46 2086029.391837 119300.124672
47 2086041.187008 119312.696194
48 2086108.613123 119383.930118
49 2086659.317913 120052.441273
50 2086700.909777 120099.088911
51 2087058.32874 120499.954396
52 2087105.072835 120552.390577

8

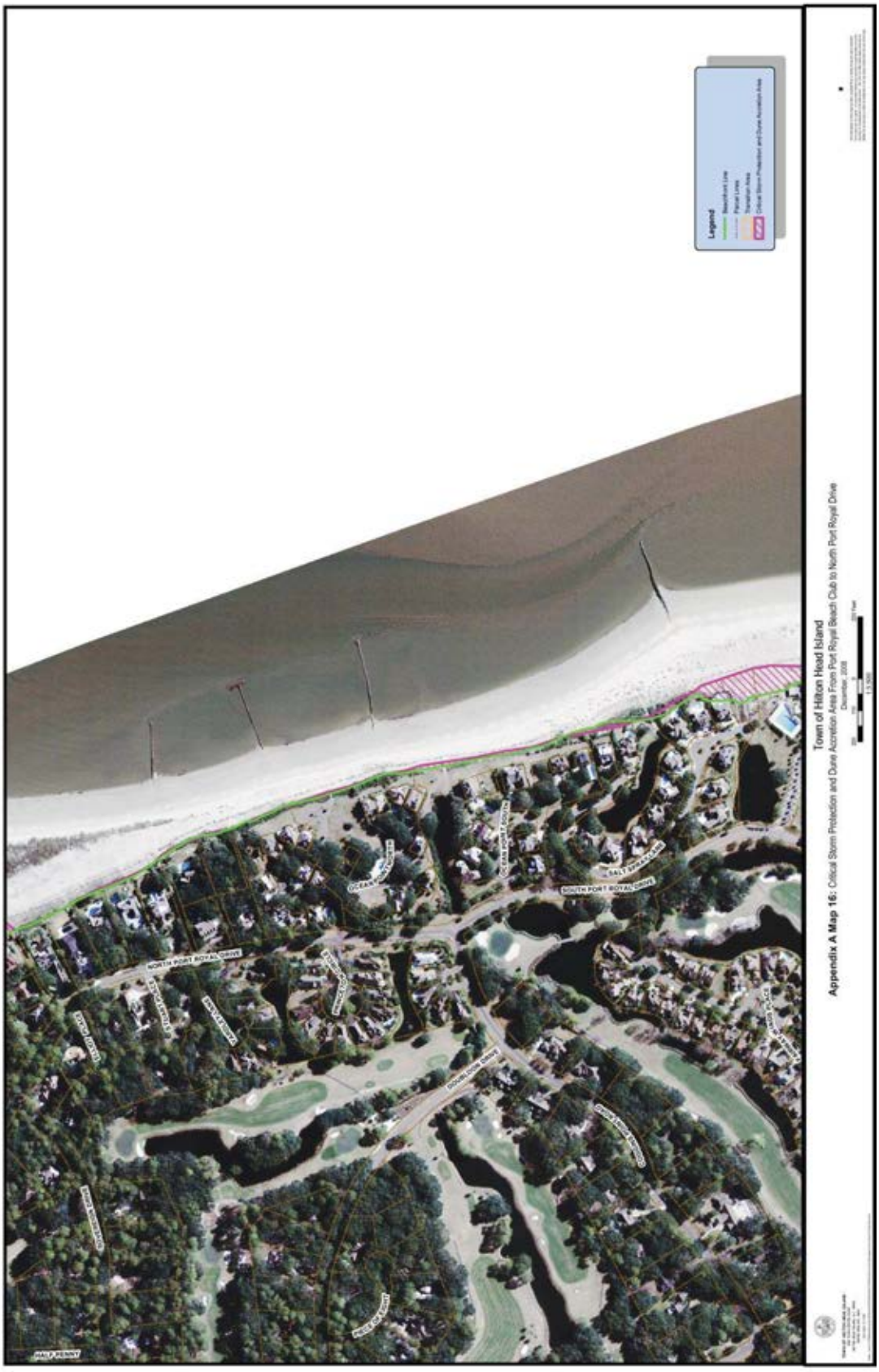

Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
53 2087336.362861 120804.472113
54 2087002.831365 121093.864801
55 2087097.945866 121096.988189
56 2087613.448819 121121.496391
57 2087658.616798 121194.746063
58 2088130.933071 121942.361549
Legend
Town of Hilton Head Island
Appendix A Map 11: Transition Area and Critical Storm Protection and Dune Accretion Area From Ocean Lane to Flotilla
OCEAN LANE
FLOTILLA
EAST PINE
CHURCH LANE
WYNDTAH
CAT HOLE
ANCHORAGE
SEA PINE
ARMADA
DUNE HOUSE LANE
QUEENS FOLLY ROAD
58
57
56
55
54
53


Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
59 2092239.4933766 128795.7744606
60 2092272.1745641 128844.2718871
Legend
Town of Hilton Head Island
Appendix A Map 12: Transition Area and Critical Storm Protection and Dune Accretion Area From Florida to Singleton Beach


Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
61 2094522.358924 131837.723753
62 2094556.483268 131879.394357
63 2094567.801312 131892.284121
64 2094706.835302 132060.781486
65 2095274.10269 132807.322835
66 2095345.369094 132892.723097
67 2095355.718832 132905.130249
68 2095420.38878 132982.496719
69 2095475.344816 133057.266732
70 2095215.708333 133142.071522
71 2095689.169291 133682.406168
72 2096040.623688 133766.718504
73 2096155.596457 133900.207021
74 2096172.163386 133919.505906
75 2096205.556824 133958.522838
76 2096161.020341 133987.260827
77 2096193.063648 134021.303478
Legend
Appendix A Map 13: Transition Area and Critical Storm Protection and Dune Accretion Area From Singleton Beach to Sand Dollar Road
Town of Hilton Head Island


Transition Area Vertices**
OBJECTID_1 POINT_X POINT_Y
79 2097152.422572 135013.44357
79 2097264.857612 135094.319584
80 2097515.962598 135340.879197
81 2097765.0479 135590.299514
82 2098373.939633 136149.544291
83 2098440.760827 136211.621982
84 2098543.268701 136305.742782
85 2098652.275919 136408.407152
86 2098694.284777 136364.995709
87 2098729.636483 136396.807743
88 2099041.064304 136677.404856
89 2099155.709646 136780.700459
Legend
Town of Hilton Head Island
Appendix A Map 14: Transition Area and Critical Storm Protection and Dune Accretion Area From Sand Dollar Road to Donax Road


Legend
Town of Hilton Head Island
Appendix A Map 15: Critical Storm Protection and Dune Accretion Area From Donax Road to Port Royal Beach Club


Legend
Town of Hilton Head Island
Appendix A Map 16: Critical Storm Protection and Dune Accretion Area From Port Royal Beach Club to North Port Royal Drive
NORTH PORT ROYAL DRIVE
SALT SPRAY LANE
OCEAN RIDGE COURT
QUEEN'S POINT SOUTH
DOUBLOON DRIVE
HALF PENNY


Legend
Beachfront Line
Parcel Lines
Transition Area
Critical Storm Protection and Dune Accretion Area
Town of Hilton Head Island
Appendix A Map 17: Critical Storm Protection and Dune Accretion Area From North Port Royal Drive to Fish Haul Creek
December, 2008

B-3. *Beachfront Line* Coordinates

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
1	2096189.95	133834.98	*Beachfront Line*
2	2096208.04	133853.59	*Beachfront Line*
3	2096222.72	133870.46	*Beachfront Line*
4	2096240.60	133890.54	*Beachfront Line*
5	2096262.18	133915.72	*Beachfront Line*
6	2096292.75	133942.77	*Beachfront Line*
7	2096310.38	133968.21	*Beachfront Line*
8	2096345.16	134002.11	*Beachfront Line*
9	2096355.94	134010.78	*Beachfront Line*
10	2096368.29	134023.32	*Beachfront Line*
11	2096399.35	134054.09	*Beachfront Line*
12	2096422.69	134081.03	*Beachfront Line*
13	2096449.32	134113.35	*Beachfront Line*
14	2096463.16	134128.00	*Beachfront Line*
15	2096477.74	134148.28	*Beachfront Line*
16	2096489.58	134160.63	*Beachfront Line*
17	2096502.57	134172.69	*Beachfront Line*
18	2096520.04	134196.82	*Beachfront Line*
19	2096537.50	134214.88	*Beachfront Line*
20	2096561.07	134232.08	*Beachfront Line*
21	2096574.47	134243.20	*Beachfront Line*
22	2096592.47	134264.19	*Beachfront Line*
23	2096601.23	134276.46	*Beachfront Line*
24	2096619.05	134294.10	*Beachfront Line*
25	2096638.23	134315.80	*Beachfront Line*
26	2096644.24	134322.29	*Beachfront Line*
27	2096651.93	134332.11	*Beachfront Line*
28	2096667.07	134346.85	*Beachfront Line*
29	2096686.42	134366.67	*Beachfront Line*
30	2096703.42	134386.60	*Beachfront Line*
31	2096723.33	134408.99	*Beachfront Line*
32	2096741.68	134428.74	*Beachfront Line*
33	2096746.89	134434.90	*Beachfront Line*
34	2096758.64	134442.84	*Beachfront Line*
35	2096781.64	134468.51	*Beachfront Line*
36	2096799.67	134483.83	*Beachfront Line*
37	2096812.38	134497.48	*Beachfront Line*
38	2096827.39	134513.22	*Beachfront Line*
39	2096840.91	134528.32	*Beachfront Line*
40	2096857.43	134545.88	*Beachfront Line*
41	2096869.77	134561.05	*Beachfront Line*
42	2096878.20	134568.14	*Beachfront Line*
43	2096896.89	134587.61	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
44	2096917.95	134608.29	*Beachfront Line*
45	2096941.07	134629.57	*Beachfront Line*
46	2096958.19	134647.45	*Beachfront Line*
47	2096975.78	134665.93	*Beachfront Line*
48	2096981.46	134672.25	*Beachfront Line*
49	2096995.12	134683.46	*Beachfront Line*
50	2097015.03	134706.31	*Beachfront Line*
51	2097029.96	134719.62	*Beachfront Line*
52	2097047.90	134733.70	*Beachfront Line*
53	2097059.28	134748.88	*Beachfront Line*
54	2097066.42	134762.31	*Beachfront Line*
55	2097084.19	134779.54	*Beachfront Line*
56	2097110.73	134804.24	*Beachfront Line*
57	2097128.07	134820.54	*Beachfront Line*
58	2097143.78	134835.94	*Beachfront Line*
59	2097157.88	134846.55	*Beachfront Line*
60	2097172.85	134857.99	*Beachfront Line*
61	2097189.54	134879.22	*Beachfront Line*
62	2097208.26	134899.40	*Beachfront Line*
63	2097225.18	134920.25	*Beachfront Line*
64	2097243.76	134941.55	*Beachfront Line*
65	2097264.92	134965.29	*Beachfront Line*
66	2097281.30	134977.31	*Beachfront Line*
67	2097292.36	134987.56	*Beachfront Line*
68	2097302.84	135005.01	*Beachfront Line*
69	2097318.72	135021.52	*Beachfront Line*
70	2097346.04	135049.02	*Beachfront Line*
71	2097357.55	135058.14	*Beachfront Line*
72	2097377.77	135076.71	*Beachfront Line*
73	2097389.10	135094.21	*Beachfront Line*
74	2097403.70	135108.58	*Beachfront Line*
75	2097426.34	135129.67	*Beachfront Line*
76	2097438.04	135139.25	*Beachfront Line*
77	2097457.35	135157.20	*Beachfront Line*
78	2097480.53	135177.97	*Beachfront Line*
79	2097499.85	135198.28	*Beachfront Line*
80	2097506.41	135204.51	*Beachfront Line*
81	2097531.42	135203.93	*Beachfront Line*
82	2097554.05	135226.73	*Beachfront Line*
83	2097574.76	135248.83	*Beachfront Line*
84	2097606.76	135278.16	*Beachfront Line*
85	2097635.41	135305.78	*Beachfront Line*
86	2097707.72	135372.11	*Beachfront Line*
87	2097735.27	135395.94	*Beachfront Line*
88	2097745.16	135409.04	*Beachfront Line*
89	2097754.73	135419.17	*Beachfront Line*
90	2097783.33	135447.58	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
91	2097814.79	135479.96	*Beachfront Line*
92	2097837.87	135503.90	*Beachfront Line*
93	2097875.89	135532.50	*Beachfront Line*
94	2097902.08	135556.27	*Beachfront Line*
95	2097928.40	135581.23	*Beachfront Line*
96	2097953.64	135609.39	*Beachfront Line*
97	2097961.96	135625.76	*Beachfront Line*
98	2097975.59	135644.67	*Beachfront Line*
99	2097995.90	135668.41	*Beachfront Line*
100	2098025.94	135692.38	*Beachfront Line*
101	2098084.47	135745.85	*Beachfront Line*
102	2098119.04	135777.97	*Beachfront Line*
103	2098144.71	135802.01	*Beachfront Line*
104	2098160.30	135816.80	*Beachfront Line*
105	2098186.02	135843.86	*Beachfront Line*
106	2098195.75	135856.77	*Beachfront Line*
107	2098216.43	135872.57	*Beachfront Line*
108	2098238.98	135890.65	*Beachfront Line*
109	2098249.92	135898.89	*Beachfront Line*
110	2098270.00	135917.41	*Beachfront Line*
111	2098280.16	135937.56	*Beachfront Line*
112	2098296.29	135947.03	*Beachfront Line*
113	2098310.08	135951.35	*Beachfront Line*
114	2098334.21	135973.04	*Beachfront Line*
115	2098368.82	136002.27	*Beachfront Line*
116	2098388.86	136020.07	*Beachfront Line*
117	2098403.57	136032.05	*Beachfront Line*
118	2098422.69	136044.30	*Beachfront Line*
119	2098444.00	136064.84	*Beachfront Line*
120	2098456.16	136075.18	*Beachfront Line*
121	2098472.89	136089.95	*Beachfront Line*
122	2098497.42	136107.79	*Beachfront Line*
123	2098518.28	136124.07	*Beachfront Line*
124	2098540.37	136145.71	*Beachfront Line*
125	2098562.41	136164.65	*Beachfront Line*
126	2098580.11	136182.46	*Beachfront Line*
127	2098604.46	136203.50	*Beachfront Line*
128	2098626.82	136221.07	*Beachfront Line*
129	2098630.83	136226.18	*Beachfront Line*
130	2098647.35	136237.94	*Beachfront Line*
131	2098674.38	136261.52	*Beachfront Line*
132	2098696.56	136293.36	*Beachfront Line*
133	2098712.99	136309.01	*Beachfront Line*
134	2098756.02	136347.35	*Beachfront Line*
135	2098814.71	136401.34	*Beachfront Line*
136	2098875.74	136459.24	*Beachfront Line*
137	2098936.77	136517.15	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
138	2098966.51	136544.53	*Beachfront Line*
139	2099005.63	136582.87	*Beachfront Line*
140	2099045.54	136621.21	*Beachfront Line*
141	2099132.39	136698.68	*Beachfront Line*
142	2099232.55	136783.18	*Beachfront Line*
143	2099284.19	136826.22	*Beachfront Line*
144	2099330.36	136862.21	*Beachfront Line*
145	2099439.12	136947.50	*Beachfront Line*
146	2099492.22	136987.00	*Beachfront Line*
147	2099544.30	137027.56	*Beachfront Line*
148	2099583.36	137058.61	*Beachfront Line*
149	2099628.43	137095.17	*Beachfront Line*
150	2099683.51	137140.74	*Beachfront Line*
151	2099755.63	137198.33	*Beachfront Line*
152	2099819.23	137250.41	*Beachfront Line*
153	2099864.80	137290.97	*Beachfront Line*
154	2099930.90	137350.07	*Beachfront Line*
155	2099982.48	137401.15	*Beachfront Line*
156	2100034.56	137452.73	*Beachfront Line*
157	2100067.11	137484.28	*Beachfront Line*
158	2100124.20	137546.87	*Beachfront Line*
159	2100187.30	137612.98	*Beachfront Line*
160	2100232.37	137662.05	*Beachfront Line*
161	2100272.43	137708.12	*Beachfront Line*
162	2100311.99	137755.70	*Beachfront Line*
163	2100352.05	137805.78	*Beachfront Line*
164	2100394.62	137857.86	*Beachfront Line*
165	2100408.14	137874.38	*Beachfront Line*
166	2100435.18	137900.42	*Beachfront Line*
167	2100483.26	137944.49	*Beachfront Line*
168	2100519.32	137977.04	*Beachfront Line*
169	2100548.36	138001.58	*Beachfront Line*
170	2100560.38	138012.10	*Beachfront Line*
171	2100645.01	138075.20	*Beachfront Line*
172	2100685.57	138102.74	*Beachfront Line*
173	2100728.14	138132.28	*Beachfront Line*
174	2100765.70	138159.33	*Beachfront Line*
175	2100819.28	138193.38	*Beachfront Line*
176	2100859.34	138218.42	*Beachfront Line*
177	2100907.92	138248.97	*Beachfront Line*
178	2100974.52	138293.54	*Beachfront Line*
179	2101033.62	138332.60	*Beachfront Line*
180	2101060.66	138350.12	*Beachfront Line*
181	2101098.72	138377.67	*Beachfront Line*
182	2101140.28	138407.21	*Beachfront Line*
183	2101161.82	138424.24	*Beachfront Line*
184	2101175.84	138431.75	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
185	2101204.38	138448.28	*Beachfront Line*
186	2101229.42	138465.80	*Beachfront Line*
187	2101266.98	138491.84	*Beachfront Line*
188	2101310.05	138521.89	*Beachfront Line*
189	2101344.60	138549.43	*Beachfront Line*
190	2101381.66	138579.98	*Beachfront Line*
191	2101427.23	138616.54	*Beachfront Line*
192	2101473.80	138652.59	*Beachfront Line*
193	2101489.32	138665.11	*Beachfront Line*
194	2101516.37	138690.15	*Beachfront Line*
195	2101552.42	138724.21	*Beachfront Line*
196	2101563.94	138735.22	*Beachfront Line*
197	2101581.97	138755.75	*Beachfront Line*
198	2101609.51	138787.80	*Beachfront Line*
199	2101636.55	138820.36	*Beachfront Line*
200	2101673.61	138866.43	*Beachfront Line*
201	2101699.15	138897.48	*Beachfront Line*
202	2101724.19	138932.53	*Beachfront Line*
203	2101742.72	138959.07	*Beachfront Line*
204	2101758.74	138981.11	*Beachfront Line*
205	2101779.78	139006.65	*Beachfront Line*
206	2101815.83	139052.72	*Beachfront Line*
207	2101835.86	139082.26	*Beachfront Line*
208	2101850.89	139104.30	*Beachfront Line*
209	2101871.92	139131.84	*Beachfront Line*
210	2101895.96	139163.39	*Beachfront Line*
211	2101920.50	139194.94	*Beachfront Line*
212	2101950.54	139246.02	*Beachfront Line*
213	2101971.07	139267.55	*Beachfront Line*
214	2102002.62	139325.14	*Beachfront Line*
215	2102013.64	139345.67	*Beachfront Line*
216	2102031.17	139368.71	*Beachfront Line*
217	2102059.21	139424.80	*Beachfront Line*
218	2102071.23	139448.33	*Beachfront Line*
219	2102087.76	139496.41	*Beachfront Line*
220	2102095.27	139517.44	*Beachfront Line*
221	2102120.81	139573.03	*Beachfront Line*
222	2102128.32	139593.56	*Beachfront Line*
223	2102142.34	139636.63	*Beachfront Line*
224	2102170.89	139719.76	*Beachfront Line*
225	2102188.41	139771.84	*Beachfront Line*
226	2102201.43	139817.41	*Beachfront Line*
227	2102212.45	139857.47	*Beachfront Line*
228	2102222.97	139896.53	*Beachfront Line*
229	2102230.98	139934.09	*Beachfront Line*
230	2102244.00	139978.16	*Beachfront Line*
231	2102256.02	140021.73	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
232	2102268.04	140075.31	*Beachfront Line*
233	2102276.55	140112.87	*Beachfront Line*
234	2102282.06	140137.41	*Beachfront Line*
235	2102283.57	140148.46	*Beachfront Line*
236	2102287.10	140174.31	*Beachfront Line*
237	2102292.27	140210.74	*Beachfront Line*
238	2102293.21	140215.44	*Beachfront Line*
239	2102293.92	140238.00	*Beachfront Line*
240	2102295.47	140253.69	*Beachfront Line*
241	2102298.41	140275.72	*Beachfront Line*
242	2102299.59	140294.52	*Beachfront Line*
243	2102301.05	140313.91	*Beachfront Line*
244	2102303.11	140347.41	*Beachfront Line*
245	2102305.75	140378.25	*Beachfront Line*
246	2102306.89	140399.85	*Beachfront Line*
247	2102306.89	140447.22	*Beachfront Line*
248	2102303.96	140462.27	*Beachfront Line*
249	2102300.28	140485.78	*Beachfront Line*
250	2102296.98	140514.79	*Beachfront Line*
251	2102295.51	140537.56	*Beachfront Line*
252	2102294.41	140559.22	*Beachfront Line*
253	2102291.10	140580.89	*Beachfront Line*
254	2102286.70	140611.37	*Beachfront Line*
255	2102275.68	140651.76	*Beachfront Line*
256	2102261.36	140684.82	*Beachfront Line*
257	2102254.01	140709.42	*Beachfront Line*
258	2102246.67	140733.29	*Beachfront Line*
259	2102241.16	140749.81	*Beachfront Line*
260	2102237.49	140775.15	*Beachfront Line*
261	2102223.53	140811.14	*Beachfront Line*
262	2102211.41	140849.70	*Beachfront Line*
263	2102208.11	140863.66	*Beachfront Line*
264	2102196.36	140865.12	*Beachfront Line*
265	2102190.11	140890.10	*Beachfront Line*
266	2102181.30	140928.29	*Beachfront Line*
267	2102172.49	140970.15	*Beachfront Line*
268	2102165.51	141004.67	*Beachfront Line*
269	2102154.86	141011.65	*Beachfront Line*
270	2102143.48	141034.78	*Beachfront Line*
271	2102158.17	141063.06	*Beachfront Line*
272	2102154.13	141100.15	*Beachfront Line*
273	2102153.02	141133.94	*Beachfront Line*
274	2102158.17	141159.27	*Beachfront Line*
275	2102174.32	141184.61	*Beachfront Line*
276	2102179.47	141191.59	*Beachfront Line*
277	2102170.28	141206.65	*Beachfront Line*
278	2102148.99	141238.96	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
279	2102135.03	141258.43	*Beachfront Line*
280	2102128.79	141269.81	*Beachfront Line*
281	2102113.36	141294.41	*Beachfront Line*
282	2102107.12	141304.33	*Beachfront Line*
283	2102090.60	141368.96	*Beachfront Line*
284	2102085.82	141410.46	*Beachfront Line*
285	2102085.45	141441.31	*Beachfront Line*
286	2102085.45	141473.62	*Beachfront Line*
287	2102079.95	141514.02	*Beachfront Line*
288	2102074.07	141530.17	*Beachfront Line*
289	2102068.56	141539.72	*Beachfront Line*
290	2102060.85	141552.58	*Beachfront Line*
291	2102056.44	141584.52	*Beachfront Line*
292	2102049.10	141608.03	*Beachfront Line*
293	2102042.49	141630.43	*Beachfront Line*
294	2102031.10	141656.87	*Beachfront Line*
295	2102021.92	141682.94	*Beachfront Line*
296	2102018.25	141687.35	*Beachfront Line*
297	2102014.21	141698.73	*Beachfront Line*
298	2102006.87	141710.48	*Beachfront Line*
299	2101996.59	141733.99	*Beachfront Line*
300	2101991.81	141763.36	*Beachfront Line*
301	2101987.77	141781.36	*Beachfront Line*
302	2101985.20	141790.54	*Beachfront Line*
303	2101973.82	141815.88	*Beachfront Line*
304	2101966.84	141861.78	*Beachfront Line*
305	2101963.90	141886.39	*Beachfront Line*
306	2101955.09	141942.57	*Beachfront Line*
307	2101946.28	141991.05	*Beachfront Line*
308	2101945.54	141995.09	*Beachfront Line*
309	2101934.52	142033.28	*Beachfront Line*
310	2101923.14	142097.18	*Beachfront Line*
311	2101914.69	142147.12	*Beachfront Line*
312	2101911.39	142175.40	*Beachfront Line*
313	2101906.25	142198.53	*Beachfront Line*
314	2101900.74	142237.82	*Beachfront Line*
315	2101900.00	142266.10	*Beachfront Line*
316	2101898.90	142280.06	*Beachfront Line*
317	2101895.23	142300.99	*Beachfront Line*
318	2101884.21	142333.67	*Beachfront Line*
319	2101875.77	142351.66	*Beachfront Line*
320	2101860.71	142384.35	*Beachfront Line*
321	2101853.37	142409.69	*Beachfront Line*
322	2101844.19	142432.09	*Beachfront Line*
323	2101836.47	142455.96	*Beachfront Line*
324	2101833.17	142466.61	*Beachfront Line*
325	2101826.56	142494.88	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
326	2101816.28	142520.96	*Beachfront Line*
327	2101813.34	142532.71	*Beachfront Line*
328	2101808.20	142554.01	*Beachfront Line*
329	2101796.81	142600.28	*Beachfront Line*
330	2101788.37	142631.13	*Beachfront Line*
331	2101783.59	142652.06	*Beachfront Line*
332	2101764.86	142687.31	*Beachfront Line*
333	2101755.68	142706.41	*Beachfront Line*
334	2101746.87	142732.48	*Beachfront Line*
335	2101733.28	142752.31	*Beachfront Line*
336	2101728.14	142786.83	*Beachfront Line*
337	2101716.02	142810.33	*Beachfront Line*
338	2101707.58	142829.43	*Beachfront Line*
339	2101704.27	142837.14	*Beachfront Line*
340	2101695.83	142865.42	*Beachfront Line*
341	2101685.91	142887.08	*Beachfront Line*
342	2101684.81	142904.71	*Beachfront Line*
343	2101682.24	142918.30	*Beachfront Line*
344	2101678.57	142940.70	*Beachfront Line*
345	2101673.42	142955.02	*Beachfront Line*
346	2101667.92	142974.48	*Beachfront Line*
347	2101662.04	142987.34	*Beachfront Line*
348	2101655.43	143001.29	*Beachfront Line*
349	2101645.88	143014.88	*Beachfront Line*
350	2101640.74	143024.43	*Beachfront Line*
351	2101629.36	143046.46	*Beachfront Line*
352	2101613.93	143067.03	*Beachfront Line*
353	2101591.95	143101.73	*Beachfront Line*
354	2101557.06	143144.88	*Beachfront Line*
355	2101531.35	143191.24	*Beachfront Line*
356	2101509.78	143244.03	*Beachfront Line*
357	2101497.38	143271.11	*Beachfront Line*
358	2101488.66	143293.61	*Beachfront Line*
359	2101479.94	143317.48	*Beachfront Line*
360	2101468.92	143344.10	*Beachfront Line*
361	2101446.89	143388.63	*Beachfront Line*
362	2101432.20	143412.95	*Beachfront Line*
363	2101421.18	143431.78	*Beachfront Line*
364	2101398.69	143478.60	*Beachfront Line*
365	2101381.25	143511.65	*Beachfront Line*
366	2101364.72	143544.24	*Beachfront Line*
367	2101361.51	143550.21	*Beachfront Line*
368	2101350.03	143587.39	*Beachfront Line*
369	2101333.05	143617.23	*Beachfront Line*
370	2101319.28	143656.70	*Beachfront Line*
371	2101312.85	143678.74	*Beachfront Line*
372	2101306.43	143701.23	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
373	2101300.92	143715.92	*Beachfront Line*
374	2101305.05	143740.25	*Beachfront Line*
375	2101311.47	143761.82	*Beachfront Line*
376	2101271.08	143839.86	*Beachfront Line*
377	2101232.98	143916.06	*Beachfront Line*
378	2101221.50	143940.39	*Beachfront Line*
379	2101199.93	143955.08	*Beachfront Line*
380	2101184.32	143993.18	*Beachfront Line*
381	2101170.55	144029.90	*Beachfront Line*
382	2101166.42	144053.31	*Beachfront Line*
383	2101149.89	144062.03	*Beachfront Line*
384	2101137.04	144073.05	*Beachfront Line*
385	2101120.98	144098.75	*Beachfront Line*
386	2101103.07	144118.49	*Beachfront Line*
387	2101087.47	144146.03	*Beachfront Line*
388	2101067.73	144159.81	*Beachfront Line*
389	2101047.07	144206.17	*Beachfront Line*
390	2101032.38	144232.79	*Beachfront Line*
391	2101028.71	144251.61	*Beachfront Line*
392	2101027.33	144279.15	*Beachfront Line*
393	2101017.23	144304.86	*Beachfront Line*
394	2101014.48	144324.60	*Beachfront Line*
395	2101009.43	144347.09	*Beachfront Line*
396	2101004.38	144380.60	*Beachfront Line*
397	2100964.44	144426.96	*Beachfront Line*
398	2100952.05	144451.75	*Beachfront Line*
399	2100932.31	144473.79	*Beachfront Line*
400	2100926.34	144494.44	*Beachfront Line*
401	2100920.84	144517.39	*Beachfront Line*
402	2100920.84	144545.40	*Beachfront Line*
403	2100913.43	144563.84	*Beachfront Line*
404	2100899.98	144596.32	*Beachfront Line*
405	2100891.16	144619.52	*Beachfront Line*
406	2100883.74	144648.75	*Beachfront Line*
407	2100872.14	144674.27	*Beachfront Line*
408	2100863.79	144691.91	*Beachfront Line*
409	2100840.59	144703.51	*Beachfront Line*
410	2100819.24	144715.57	*Beachfront Line*
411	2100786.30	144736.45	*Beachfront Line*
412	2100755.21	144752.69	*Beachfront Line*
413	2100727.37	144795.84	*Beachfront Line*
414	2100709.27	144825.07	*Beachfront Line*
415	2100687.47	144858.95	*Beachfront Line*
416	2100655.91	144904.88	*Beachfront Line*
417	2100628.07	144944.79	*Beachfront Line*
418	2100616.01	144966.59	*Beachfront Line*
419	2100630.39	144983.76	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
420	2100627.15	145011.14	*Beachfront Line*
421	2100615.08	145028.77	*Beachfront Line*
422	2100599.31	145048.72	*Beachfront Line*
423	2100587.71	145061.25	*Beachfront Line*
424	2100574.25	145074.24	*Beachfront Line*
425	2100552.44	145083.99	*Beachfront Line*
426	2100535.74	145112.76	*Beachfront Line*
427	2100514.86	145139.20	*Beachfront Line*
428	2100505.11	145165.19	*Beachfront Line*
429	2100489.80	145209.73	*Beachfront Line*
430	2100476.81	145245.92	*Beachfront Line*
431	2100465.67	145271.91	*Beachfront Line*
432	2100458.25	145298.36	*Beachfront Line*
433	2100447.58	145336.40	*Beachfront Line*
434	2100432.73	145373.52	*Beachfront Line*
435	2100420.67	145402.76	*Beachfront Line*
436	2100414.17	145436.63	*Beachfront Line*
437	2100405.35	145483.03	*Beachfront Line*
438	2100394.22	145537.78	*Beachfront Line*
439	2100390.97	145582.79	*Beachfront Line*
440	2100384.47	145620.84	*Beachfront Line*
441	2100375.19	145652.85	*Beachfront Line*
442	2100365.91	145686.26	*Beachfront Line*
443	2100358.03	145712.24	*Beachfront Line*
444	2100351.07	145727.09	*Beachfront Line*
445	2100336.22	145751.68	*Beachfront Line*
446	2100325.55	145768.85	*Beachfront Line*
447	2100310.23	145775.35	*Beachfront Line*
448	2100287.96	145785.56	*Beachfront Line*
449	2100275.90	145787.88	*Beachfront Line*
450	2100257.80	145792.52	*Beachfront Line*
451	2100239.24	145796.23	*Beachfront Line*
452	2100222.07	145802.72	*Beachfront Line*
453	2100190.52	145813.40	*Beachfront Line*
454	2100159.43	145825.92	*Beachfront Line*
455	2100137.16	145841.70	*Beachfront Line*
456	2100115.35	145891.35	*Beachfront Line*
457	2100099.11	145927.54	*Beachfront Line*
458	2100077.77	145968.37	*Beachfront Line*
459	2100060.14	146001.78	*Beachfront Line*
460	2100032.30	146048.18	*Beachfront Line*
461	2100027.66	146065.81	*Beachfront Line*
462	2100016.06	146109.43	*Beachfront Line*
463	2100007.76	146131.02	*Beachfront Line*
464	2099988.82	146156.84	*Beachfront Line*
465	2099973.90	146193.56	*Beachfront Line*
466	2099967.02	146223.97	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
467	2099953.25	146246.92	*Beachfront Line*
468	2099933.74	146286.52	*Beachfront Line*
469	2099915.95	146303.16	*Beachfront Line*
470	2099852.83	146367.42	*Beachfront Line*
471	2099806.93	146409.31	*Beachfront Line*
472	2099797.75	146418.49	*Beachfront Line*
473	2099778.81	146455.79	*Beachfront Line*
474	2099779.39	146464.39	*Beachfront Line*
475	2099777.67	146475.87	*Beachfront Line*
476	2099774.80	146491.94	*Beachfront Line*
477	2099762.17	146495.95	*Beachfront Line*
478	2099734.06	146503.41	*Beachfront Line*
479	2099709.38	146508.58	*Beachfront Line*
480	2099674.38	146515.46	*Beachfront Line*
481	2099646.27	146533.82	*Beachfront Line*
482	2099589.46	146569.40	*Beachfront Line*
483	2099545.28	146617.60	*Beachfront Line*
484	2099509.65	146657.30	*Beachfront Line*
485	2099456.40	146743.14	*Beachfront Line*
486	2099403.61	146802.36	*Beachfront Line*
487	2099301.70	146865.25	*Beachfront Line*
488	2099221.44	146874.92	*Beachfront Line*
489	2099204.21	146870.76	*Beachfront Line*
490	2099190.26	146865.12	*Beachfront Line*
491	2099176.60	146859.18	*Beachfront Line*
492	2099167.69	146859.47	*Beachfront Line*
493	2099150.17	146860.37	*Beachfront Line*
494	2099134.13	146870.76	*Beachfront Line*
495	2099118.99	146878.18	*Beachfront Line*
496	2099102.36	146885.01	*Beachfront Line*
497	2099084.54	146889.17	*Beachfront Line*
498	2099044.75	146888.87	*Beachfront Line*
499	2099015.94	146890.06	*Beachfront Line*
500	2098990.11	146884.42	*Beachfront Line*
501	2093899.57	131087.72	*Beachfront Line*
502	2093914.14	131100.18	*Beachfront Line*
503	2093941.99	131118.59	*Beachfront Line*
504	2093973.03	131142.57	*Beachfront Line*
505	2093996.73	131165.14	*Beachfront Line*
506	2094023.45	131182.92	*Beachfront Line*
507	2094048.68	131208.46	*Beachfront Line*
508	2094071.70	131229.86	*Beachfront Line*
509	2094090.24	131261.04	*Beachfront Line*
510	2094109.03	131285.64	*Beachfront Line*
511	2094123.61	131303.18	*Beachfront Line*
512	2094136.93	131326.75	*Beachfront Line*
513	2094156.22	131356.65	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
514	2094178.95	131383.44	*Beachfront Line*
515	2094213.97	131414.51	*Beachfront Line*
516	2094230.79	131435.91	*Beachfront Line*
517	2094250.48	131462.82	*Beachfront Line*
518	2094264.67	131485.82	*Beachfront Line*
519	2094281.21	131509.69	*Beachfront Line*
520	2094295.54	131531.33	*Beachfront Line*
521	2094320.67	131559.49	*Beachfront Line*
522	2094338.99	131584.25	*Beachfront Line*
523	2094369.08	131628.73	*Beachfront Line*
524	2094391.01	131656.56	*Beachfront Line*
525	2094418.41	131681.89	*Beachfront Line*
526	2094447.30	131702.83	*Beachfront Line*
527	2094461.45	131723.14	*Beachfront Line*
528	2094484.28	131742.10	*Beachfront Line*
529	2094499.10	131756.92	*Beachfront Line*
530	2094521.64	131789.09	*Beachfront Line*
531	2094542.97	131817.64	*Beachfront Line*
532	2094561.73	131843.34	*Beachfront Line*
533	2094579.20	131876.97	*Beachfront Line*
534	2094590.11	131891.25	*Beachfront Line*
535	2094596.71	131914.86	*Beachfront Line*
536	2094608.73	131941.43	*Beachfront Line*
537	2094625.29	131960.93	*Beachfront Line*
538	2094640.17	131979.95	*Beachfront Line*
539	2094661.61	132002.47	*Beachfront Line*
540	2094681.31	132032.52	*Beachfront Line*
541	2094700.41	132055.08	*Beachfront Line*
542	2094720.90	132076.84	*Beachfront Line*
543	2094734.98	132095.23	*Beachfront Line*
544	2094748.08	132115.79	*Beachfront Line*
545	2094769.13	132143.57	*Beachfront Line*
546	2094782.24	132157.42	*Beachfront Line*
547	2094802.34	132183.28	*Beachfront Line*
548	2094819.27	132203.17	*Beachfront Line*
549	2094835.54	132226.05	*Beachfront Line*
550	2094855.40	132248.26	*Beachfront Line*
551	2094871.44	132269.51	*Beachfront Line*
552	2094885.88	132289.88	*Beachfront Line*
553	2094904.51	132316.30	*Beachfront Line*
554	2094917.65	132334.89	*Beachfront Line*
555	2094933.59	132359.16	*Beachfront Line*
556	2094966.78	132398.05	*Beachfront Line*
557	2094980.55	132419.89	*Beachfront Line*
558	2095005.19	132445.12	*Beachfront Line*
559	2095018.73	132462.49	*Beachfront Line*
560	2095037.81	132485.96	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
561	2095053.84	132508.55	*Beachfront Line*
562	2095067.24	132522.01	*Beachfront Line*
563	2095085.48	132543.89	*Beachfront Line*
564	2095102.48	132566.90	*Beachfront Line*
565	2095119.25	132591.52	*Beachfront Line*
566	2095134.95	132609.04	*Beachfront Line*
567	2095153.32	132629.04	*Beachfront Line*
568	2095164.39	132644.47	*Beachfront Line*
569	2095179.07	132663.80	*Beachfront Line*
570	2095204.43	132692.62	*Beachfront Line*
571	2095226.59	132721.22	*Beachfront Line*
572	2095238.23	132736.60	*Beachfront Line*
573	2095250.92	132749.20	*Beachfront Line*
574	2095265.54	132767.02	*Beachfront Line*
575	2095279.16	132782.65	*Beachfront Line*
576	2095294.37	132797.96	*Beachfront Line*
577	2095307.53	132816.34	*Beachfront Line*
578	2095323.83	132842.38	*Beachfront Line*
579	2095338.38	132859.67	*Beachfront Line*
580	2095352.92	132876.14	*Beachfront Line*
581	2095373.58	132899.40	*Beachfront Line*
582	2095398.99	132932.66	*Beachfront Line*
583	2095419.15	132960.29	*Beachfront Line*
584	2095434.71	132983.57	*Beachfront Line*
585	2095446.35	132998.26	*Beachfront Line*
586	2095467.39	133014.84	*Beachfront Line*
587	2095481.80	133033.51	*Beachfront Line*
588	2095509.92	133068.52	*Beachfront Line*
589	2095534.98	133093.21	*Beachfront Line*
590	2095554.42	133115.57	*Beachfront Line*
591	2095577.22	133145.17	*Beachfront Line*
592	2095601.25	133173.95	*Beachfront Line*
593	2095629.81	133205.10	*Beachfront Line*
594	2095656.62	133231.33	*Beachfront Line*
595	2095674.83	133261.07	*Beachfront Line*
596	2095698.28	133282.78	*Beachfront Line*
597	2095716.76	133305.03	*Beachfront Line*
598	2095744.23	133336.38	*Beachfront Line*
599	2095767.69	133366.35	*Beachfront Line*
600	2095787.11	133385.68	*Beachfront Line*
601	2095814.31	133404.27	*Beachfront Line*
602	2095835.64	133429.91	*Beachfront Line*
603	2095848.52	133439.62	*Beachfront Line*
604	2095873.54	133467.91	*Beachfront Line*
605	2095881.41	133483.80	*Beachfront Line*
606	2095892.80	133503.52	*Beachfront Line*
607	2095908.95	133525.30	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
608	2095921.31	133542.55	*Beachfront Line*
609	2095937.21	133558.35	*Beachfront Line*
610	2095950.96	133573.39	*Beachfront Line*
611	2095964.84	133586.01	*Beachfront Line*
612	2095981.60	133600.81	*Beachfront Line*
613	2095991.99	133615.33	*Beachfront Line*
614	2096000.49	133626.35	*Beachfront Line*
615	2096010.14	133638.45	*Beachfront Line*
616	2096022.72	133659.32	*Beachfront Line*
617	2096036.48	133670.85	*Beachfront Line*
618	2096058.23	133688.76	*Beachfront Line*
619	2096075.37	133711.30	*Beachfront Line*
620	2096090.80	133726.57	*Beachfront Line*
621	2096099.92	133737.23	*Beachfront Line*
622	2096126.25	133764.35	*Beachfront Line*
623	2096147.50	133789.87	*Beachfront Line*
624	2096167.52	133811.11	*Beachfront Line*
625	2096189.95	133834.98	*Beachfront Line*
626	2070844.78	108670.91	*Beachfront Line*
627	2070873.18	108687.69	*Beachfront Line*
628	2070904.09	108701.88	*Beachfront Line*
629	2070928.20	108716.53	*Beachfront Line*
630	2070966.02	108739.50	*Beachfront Line*
631	2070987.34	108749.86	*Beachfront Line*
632	2071027.30	108766.06	*Beachfront Line*
633	2071051.00	108787.00	*Beachfront Line*
634	2071071.42	108798.78	*Beachfront Line*
635	2071120.19	108817.79	*Beachfront Line*
636	2071160.77	108836.32	*Beachfront Line*
637	2071184.86	108847.22	*Beachfront Line*
638	**2071217.11**	**108863.84**	*Beachfront Line*
639	2071242.85	108875.89	*Beachfront Line*
640	2071280.72	108895.92	*Beachfront Line*
641	2071315.07	108912.69	*Beachfront Line*
642	2071339.97	108923.12	*Beachfront Line*
643	2071373.68	108950.23	*Beachfront Line*
644	2071400.29	108965.70	*Beachfront Line*
645	2071427.67	108977.60	*Beachfront Line*
646	2071447.07	108987.11	*Beachfront Line*
647	2071477.68	109004.38	*Beachfront Line*
648	2071486.64	109010.65	*Beachfront Line*
649	2071532.40	109039.56	*Beachfront Line*
650	2071557.99	109049.78	*Beachfront Line*
651	2071599.10	109071.17	*Beachfront Line*
652	2071633.48	109091.03	*Beachfront Line*
653	2071655.11	109104.29	*Beachfront Line*
654	2071680.10	109121.45	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
655	2071695.15	109128.78	*Beachfront Line*
656	2071720.01	109138.91	*Beachfront Line*
657	2071753.32	109154.38	*Beachfront Line*
658	2071773.61	109167.45	*Beachfront Line*
659	2071806.09	109187.23	*Beachfront Line*
660	2071836.68	109201.46	*Beachfront Line*
661	2071859.62	109212.02	*Beachfront Line*
662	2071890.11	109228.74	*Beachfront Line*
663	2071911.66	109242.78	*Beachfront Line*
664	2071930.43	109254.10	*Beachfront Line*
665	2071960.23	109268.84	*Beachfront Line*
666	2071982.38	109283.78	*Beachfront Line*
667	2072023.99	109305.81	*Beachfront Line*
668	2072050.96	109321.17	*Beachfront Line*
669	2072075.37	109331.01	*Beachfront Line*
670	2072098.49	109342.63	*Beachfront Line*
671	2072125.52	109359.07	*Beachfront Line*
672	2072152.90	109372.14	*Beachfront Line*
673	2072176.48	109378.59	*Beachfront Line*
674	2072205.08	109400.07	*Beachfront Line*
675	2072232.58	109417.14	*Beachfront Line*
676	2072257.43	109431.98	*Beachfront Line*
677	2072283.72	109447.36	*Beachfront Line*
678	2072308.49	109461.84	*Beachfront Line*
679	2072343.27	109475.49	*Beachfront Line*
680	2072366.55	109486.03	*Beachfront Line*
681	2072413.96	109514.59	*Beachfront Line*
682	2072443.87	109527.37	*Beachfront Line*
683	2072481.06	109549.61	*Beachfront Line*
684	2072502.32	109561.05	*Beachfront Line*
685	2072547.49	109584.81	*Beachfront Line*
686	2072572.46	109599.33	*Beachfront Line*
687	2072604.33	109616.73	*Beachfront Line*
688	2072642.39	109634.37	*Beachfront Line*
689	2072664.50	109651.05	*Beachfront Line*
690	2072701.15	109670.39	*Beachfront Line*
691	2072744.02	109685.88	*Beachfront Line*
692	2072775.34	109707.55	*Beachfront Line*
693	2072811.71	109725.27	*Beachfront Line*
694	2072883.28	109774.89	*Beachfront Line*
695	2072899.91	109783.98	*Beachfront Line*
696	2072919.08	109794.74	*Beachfront Line*
697	2072941.77	109807.26	*Beachfront Line*
698	2072965.29	109820.52	*Beachfront Line*
699	2073007.93	109830.93	*Beachfront Line*
700	2073039.60	109843.23	*Beachfront Line*
701	2073061.52	109854.00	*Beachfront Line*

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
702	2073102.25	109870.40	*Beachfront Line*
703	2073133.21	109888.99	*Beachfront Line*
704	2073157.39	109904.80	*Beachfront Line*
705	2073209.23	109923.94	*Beachfront Line*
706	2073226.72	109933.19	*Beachfront Line*
707	2073256.47	109948.98	*Beachfront Line*
708	2073280.02	109952.70	*Beachfront Line*
709	2073298.70	109957.66	*Beachfront Line*
710	2073305.80	109961.66	*Beachfront Line*
711	2073343.62	109986.60	*Beachfront Line*
712	2073368.87	110001.45	*Beachfront Line*
713	2073398.74	110014.60	*Beachfront Line*
714	2073438.77	110034.71	*Beachfront Line*
715	2073468.50	110054.05	*Beachfront Line*
716	2073497.12	110065.38	*Beachfront Line*
717	2073523.91	110082.14	*Beachfront Line*
718	2073560.03	110099.37	*Beachfront Line*
719	2073610.12	110128.77	*Beachfront Line*
720	2073639.50	110138.31	*Beachfront Line*
721	2073676.45	110153.92	*Beachfront Line*
722	2073710.11	110173.20	*Beachfront Line*
723	2073741.61	110189.19	*Beachfront Line*
724	2073766.57	110201.01	*Beachfront Line*

B-4. Transition Area Boundary Coordinates

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
1	2053465.99	103569.06	Transition Area
2	2053388.16	103359.18	Transition Area
3	2053276.50	102844.98	Transition Area
4	2053272.41	102510.23	Transition Area
5	2053299.14	102143.88	Transition Area
6	2053548.86	101821.76	Transition Area
7	2053655.92	101696.10	Transition Area
8	2053783.13	101568.64	Transition Area
9	2054897.21	100604.37	Transition Area
10	2054962.25	100558.47	Transition Area
11	2055089.33	100468.79	Transition Area
12	2055189.88	100397.83	Transition Area
13	2065111.73	105551.40	Transition Area
14	2065338.52	105675.78	Transition Area
15	2065600.64	105826.70	Transition Area
16	2066058.64	106088.51	Transition Area
17	2066247.19	106196.86	Transition Area
18	2073296.00	110244.07	Transition Area
19	2074190.50	110692.65	Transition Area
20	2076231.88	111695.40	Transition Area
21	2077066.50	112107.90	Transition Area
22	2077155.50	112153.32	Transition Area
23	2077500.25	112324.48	Transition Area

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
24	2077840.38	112492.15	Transition Area
25	2083332.89	116410.32	Transition Area
26	2083364.45	116436.57	Transition Area
27	2083446.23	116504.59	Transition Area
28	2083565.78	116606.26	Transition Area
29	2083628.75	116657.08	Transition Area
30	2083643.57	116669.05	Transition Area
31	2083732.32	116797.14	Transition Area
32	2083896.70	116994.94	Transition Area
33	2084041.26	117143.93	Transition Area
34	2084212.94	117320.60	Transition Area
35	2084383.13	117493.00	Transition Area
36	2084512.50	117625.89	Transition Area
37	2084783.48	117904.23	Transition Area
38	2084764.80	117924.54	Transition Area
39	2084821.93	117981.61	Transition Area
40	2085134.46	118310.51	Transition Area
41	2085265.77	118465.23	Transition Area
42	2085573.88	118784.26	Transition Area
43	2085701.65	118921.07	Transition Area
44	2085980.37	119222.00	Transition Area
45	2086043.30	119287.25	Transition Area
46	2086029.30	119300.12	Transition Area
47	2086041.19	119312.70	Transition Area
48	2086108.51	119383.93	Transition Area
49	2086659.32	120052.44	Transition Area
50	2086700.91	120099.09	Transition Area
51	2087058.33	120499.95	Transition Area
52	2087105.07	120552.38	Transition Area
53	2087336.36	120804.47	Transition Area
54	2087602.83	121093.86	Transition Area
55	2087597.95	121096.99	Transition Area
56	2087613.45	121121.50	Transition Area
57	2087658.62	121194.75	Transition Area
58	2088130.93	121942.36	Transition Area
59	2092239.49	128795.77	Transition Area
60	2092272.17	128844.28	Transition Area
61	2094522.36	131837.72	Transition Area
62	2094556.48	131879.39	Transition Area
63	2094567.00	131892.28	Transition Area
64	2094700.84	132060.78	Transition Area
65	2095274.10	132807.32	Transition Area
66	2095345.37	132892.72	Transition Area
67	2095355.72	132905.13	Transition Area
68	2095420.39	132982.50	Transition Area
69	2095475.34	133057.27	Transition Area
70	2095215.71	133142.07	Transition Area
71	2095689.17	133682.41	Transition Area
72	2096040.62	133766.72	Transition Area
73	2096155.60	133900.21	Transition Area
74	2096172.16	133919.51	Transition Area
75	2096205.66	133958.52	Transition Area
76	2096161.02	133987.26	Transition Area
77	2096193.06	134021.30	Transition Area
78	2097182.42	135013.44	Transition Area
79	2097264.86	135094.32	Transition Area

OBJECTID	POINT_X	POINT_Y	DESCRIPTION
80	2097515.96	135340.68	Transition Area
81	2097785.05	135590.26	Transition Area
82	2098373.94	136149.54	Transition Area
83	2098440.76	136211.02	Transition Area
84	2098543.27	136305.74	Transition Area
85	2098652.28	136406.41	Transition Area
86	2098694.28	136364.96	Transition Area
87	2098729.64	136396.81	Transition Area
88	2099041.06	136677.40	Transition Area
89	2099155.71	136780.70	Transition Area

Sec.16-3-106. - Overlay Zoning Districts

A. Purpose

Overlay zoning districts are superimposed over portions of one or more underlying ***base zoning districts*** or planned ***development*** districts with the intent of supplementing generally applicable ***development*** regulations with additional ***development*** regulations that address special area-specific conditions, features, or plans while maintaining the character and purposes of the underlying zoning district.

B. Establishment of Overlay Zoning Districts

Table 16-3-106.B, Overlay Zoning Districts Established, sets out the ***overlay zoning districts*** established by this ***Ordinance***. Except where specifically provided in this ***Ordinance***, variances from the ***overlay zoning district*** standards shall not be granted.

TABLE 16-3-106.B: OVERLAY ZONING DISTRICTS ESTABLISHED

DISTRICT NAME	ABBREVIATION
Airport Overlay District	A-O
Corridor Overlay District	COR
Planned Development Overlay District	PD-2
Forest Beach Neighborhood Character Overlay District	FB-NC-O
Folly Field Neighborhood Character Overlay District	FF-NC-O
Holiday Homes Neighborhood Character Overlay District	HH-NC-O
Redevelopment Overlay District	R-O
Coastal Protection Area Overlay District	CPA -O
Transition Area Overlay District	TA-O

C. Classification of Overlay Zoning Districts

Land shall be classified or reclassified into an ***overlay zoning district*** only in accordance with the procedures and requirements set forth in Sec. 16-2-103.C, Zoning Map Amendment (Rezoning).

D. Relationship Between Overlay and Base Zoning Districts

Regulations governing ***development*** in an ***overlay zoning district*** shall apply in addition to the regulations governing ***development*** in the underlying ***base zoning district***. The standards governing the ***overlay zoning district*** shall control, whether they are more restrictive or less restrictive than a ***base zoning district***. If ***land*** is classified into multiple ***overlay zoning districts*** and the standards governing one overlay district are not consistent with the standards in another overlay district, the more restrictive standard shall apply unless the standards applicable in either of the overlay districts expressly provide that the district's standards shall prevail over those in other overlay districts.

E. Airport Overlay (A-O) District

1. Purpose

The Airport Overlay (A-O) District is hereby established to ensure against safety hazards, noise, and obstruction problems associated with aircraft utilizing the Hilton Head Island Airport. All ***development*** proposed within the A-O District shall be subject to the standards specified in this section in addition to the standards and regulations contained in the particular base district in which the ***development*** occurs.

2. Applicability

Development in the A-O District is subject to regulation primarily to mitigate safety and noise problems. However, ***uses*** within the district also shall be regulated to ensure they are compatible with airport operations. The regulations governing ***use*** and ***height*** within the A-O District shall conform to the standards recommended by the Federal Aviation Administration's (FAA) Advisory Circular, 150/5190-4A, "Model Zoning Ordinance to Limit Height of Objects Around Airports" (12-14-87).

3. Delineation of the District

a. Mapping

The A-O District boundaries correspond with the ***Ldn*** 60 noise curve in accordance with planning standards of the FAA. The following five subdistricts of regulation are delineated within the A-O District. The A-O District and subdistricts are mapped as part of the ***Official Zoning Map***.

i. Discretionary Noise Level

This level of regulation corresponds to the ***Ldn*** 60 noise curve. It is considered discretionary because it is the transitional impact level between significant and insignificant noise levels in the vicinity of the airport. The areas to be regulated are subsections of the Discretionary Noise Level.

ii. Significant Noise Level

The ***Ldn*** 65 noise curve is concentrically placed inside the ***Ldn*** 60 noise curve. Due to its proximity to the airport's primary surface, greater noise and safety concerns exist and more restrictive regulation is required.

iii. Approach Path Subdistrict

This Approach Path subdistrict is established to ensure that ***development*** near the airstrip will not pose safety problems due to vertical protrusions. It is the area that extends 525 feet on both sides of the airport's primary surface, and extends to the ***Ldn*** 60 noise curve at each end of the airport's primary surface. The ***airport runway primary surface area*** consists of a rectangle that is 5,000 feet long and 500 feet wide. The area encompassed by these special height limitations at the ends of the runway is in the shape of a trapezoid, in which the smaller and larger bases are established by the FAA. The height of the trapezoid would be the linear distance from the end of the runway.

iv. Inner Hazard Zone

This Inner Hazard Zone is defined to include the runway protection zone, object free area, and obstacle free zone as determined by the FAA. All of the ***land*** within the Inner Hazard Zone lies on the Hilton Head Island Airport property.

v. Outer Hazard Zone

Land within the Outer Hazard Zone is identified as the area that demonstrates a higher statistical probability of aircraft accidents occurring as determined by methods developed by the Institute of Transportation Studies at the University of California at Berkeley.

b. Plat Notice

i. A notice shall be placed on all plats for properties located within the A-O District that states as follows: "This property lies either partially or wholly within the Hilton Head Island Airport Overlay District and is subject to noise that may be objectionable."

ii. A notice shall be placed on all plats for properties located within the Outer Hazard Zone of the A-O District that states as follows: "This property lies either partially or wholly within the Outer Hazard Zone of the Hilton Head Island Airport Overlay District."

4. Airport Overlay District Regulations

Geographically, the subdistricts of the A-O District overlap; however, ***development*** shall comply with all applicable regulations. Occupant loads referenced shall be based upon Table 1003.2.2.2, Maximum Floor Area Allowances Per Occupant, of the latest adopted edition of the IBC. For ***uses*** with fixed seating, minimum occupant load shall be calculated by dividing the net square footage by the number of seats.

a. Discretionary Noise Level District—Ldn 60

Notwithstanding any other provisions of this ***Ordinance***, no ***use*** may be made of ***land*** or water within the ***Ldn*** 60 noise level district in such a manner as to create electrical interference with navigational signals or radio communication between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and other lights (i.e., colors and patterns), result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, create bird strike hazards or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the airport. Noise mitigation measures are encouraged for all proposed residential ***development***.

b. Significant Noise Level—Ldn 65

Residential ***development*** is prohibited inside the ***Ldn*** 65 noise curve due to the severe nature of public health, safety, and welfare concerns.

c. Approach Path

Within the Approach Path subdistrict, no ***building***, ***structure***, utility pole or protrusion of any kind shall be permitted to extend to a height measured from the mean elevation of the airport runway that exceeds the limits established by the methodology described in this section.

i. The maximum ***height*** limits permitted under this ***Ordinance*** of 75 feet shall be lowered as necessary to correspond with the limits established as follows:

01. Along both sides and ends of the airport primary surface area, at the extremity of the primary surface, the ***height*** restriction shall be zero feet. Moving outward from both sides of the runway, 250 feet from the runway center line, the ***height*** limit shall increase at the rate of 1 foot upward per 7 linear feet, or a ratio of 1:7.

02. Moving outward from both ends of the runway primary surface area, the ***height*** limit shall increase at the rate of one foot upward per 34 linear feet, or a ratio of 1:34. From both ends of the primary surface area, the area subject to these special ***height*** limitations shall fan outward beyond the area that would be covered if the ***height*** limitation from the sides of the primary surface area extended beyond the ends of the runway.

ii. The following process has been established for ***tree*** pruning, topping, and removal on and off airport property to address the ***height*** limits in provision i above. For purposes of this section, "on airport property" shall be defined as any property in the approach path owned by Beaufort County and used for the operations of the Hilton Head Island Airport; "off airport property" shall be defined as that property affected by the ***height*** limits in the approach path. The requirements listed below are the only requirements in this ***Ordinance*** that the Hilton Head Island Airport must follow for ***tree*** pruning, topping and removal in the approach path.

01. On Airport Property

(A) ***Applicants*** for a Natural Resources Permit (see Sec. 16-2-103.K, Natural Resources Permit) need only submit an ***application*** form, a brief narrative of proposed plans for ***tree*** protection and replacement, a ***site plan***, and copies of all required permits from other agencies. The ***applicant*** may phase the ***tree*** pruning, topping, and removal by ***parcel***. The ***site plan*** shall identify the ***parcels*** where ***trees*** will be pruned or removed and delineate any wetlands and ***wetland buffers*** within the subject ***parcels***. Additionally, the Town and Beaufort County will jointly fund and employ an arborist to document the size and species of each removed ***tree*** by ***parcel***. This data will be used to prepare a mitigation plan and to calculate any required fee for the ***tree*** replacement fund.

(B) Prior to any ***tree*** pruning or removal, the ***applicant*** shall flag all buffers and wetlands.

(C) In meeting the ***height*** requirements of provision i above, all adjacent use buffers and adjacent street buffers shall be a minimum of 75 feet in width. Additional buffers will also be required in the following areas:

(1) Between the 75-foot buffer and the ***wetland buffer*** related to the wetland on airport property in closest proximity to St. James Baptist Church and between this ***wetland buffer*** and the 75-foot buffer near Beach City Road; and

(2) Between the ***wetland buffer*** related to the wetland on airport property in closest proximity to St. James Baptist Church and the 1:34 approach slope line.

(D) All ***trees*** within the 1:34 slope, unless located within wetlands, ***wetland buffers*** or any buffers listed in provision (C) above may be removed.

(E) The Arborist will determine which ***trees*** within the 1:7 slope, wetlands or any buffers have exceeded or have the potential to exceed the ***height*** requirements in provision i above within five years [hardwoods] of the approval date or ten years [conifers] of the approval date based on the species and maturity of each ***tree***; the Arborist will then identify which of these ***trees*** can be pruned to be out of the approach path and to the five or ten year growth potential, respectively. For the purposes of this section, conifers are defined as cone-bearing ***trees*** with needle-like leaves, to include the cypresses as well as cone-bearing evergreens. Those ***trees*** that the Arborist determines require such severe pruning that they can no longer support themselves may be removed. Those ***specimen trees*** and ***trees*** in any ***wetland buffer*** that cannot be pruned may be removed without a Variance. Those ***trees*** in any wetland that cannot be pruned may be removed without a Wetland Alteration Permit. Reasonable care shall be taken to protect the understory vegetation. Mechanized vehicles shall not be used in wetlands or any buffers.

02. Off Airport Property

(A) ***Applicants*** for a Natural Resources Permit (see Sec. 16-2-103.K, Natural Resources Permit) need only submit an ***application*** form, a brief narrative of proposed plans for ***tree*** protection and replacement, a ***site plan***, copies of all signed avigation ***easements*** or a copy of paperwork indicating that condemnation notices have been filed, and copies of all required permits from other agencies. The ***applicant*** may phase the ***tree*** pruning and removal by ***parcel***. The ***site plan*** must identify the ***parcels*** where ***trees*** will be pruned or removed and delineate any wetlands and ***wetland buffers*** within the subject ***parcels***. Additionally, the Town and Beaufort County will jointly fund and employ an Arborist to document the size and species of each removed ***tree*** by ***parcel***. This data will be used to prepare a mitigation plan for each ***parcel***.

(B) Prior to any ***tree*** pruning or removal the ***applicant*** shall flag all wetlands and ***wetland buffers***.

(C) The Arborist shall determine which ***trees*** have exceeded or have the potential to exceed the ***height*** requirements in provision i above within five years [hardwoods] of the approval date or within ten years [conifers] of the approval date based on the species and maturity of each ***tree***; the Arborist will then identify which of these ***trees*** can be pruned to be out of the approach path and to the five or ten year growth potential, respectively. Those ***trees*** that the arborist determines require such severe pruning that they can no longer support themselves may be removed. Reasonable care shall be taken to protect understory vegetation.

(D) ***Specimen trees*** and ***trees*** within ***wetland buffers***, if required to be removed based on the above subparagraph, may be removed without a Variance. ***Trees*** within wetlands, if required to be removed based on the above subparagraph, may be removed without a Wetland Alteration Permit. Mechanized vehicles shall not be used in wetlands or any buffers.

03. Other Requirements

(A) Due to its significance to the Town, the 64-inch ***DBH*** Live Oak ***tree*** located ***adjacent*** to St. James Baptist Church in the Beach City Road right-of-way shall not be pruned or removed; instead, a light will be installed in the canopy of the ***tree*** to indicate the presence of this ***tree*** to the operators of aircraft in the vicinity of the airport. Should the FAA reject lighting this ***tree***, the provisions of Sec. 16-3-106.E.4.c.ii shall apply.

(B) Due to their significance to the Town, the specimen Live Oak ***trees*** in the 1:34 and 1:7 slopes for the Hilton Head Island Airport shall only be pruned one foot out of the slope.

(C) The County and Town shall work together to jointly develop a plan to protect water quality consistent with storm water utility objectives. This plan shall include the planting of low growing native plants on the non-wetland, non-buffer portions of on airport property in the 1:34 slope. These plants help to maintain this area's ability to filter stormwater and biodegrade pollutants by maintaining the forest soils and their beneficial decomposers, keeping pore space in the soil to allow oxygen flow and providing suitable root systems as additional habitat for decomposers and to uptake pollutants. Examples of plants that can be used for these purposes are seaside juniper, native grasses, dwarf wax myrtle, saw palms, needle palms and some species of native blueberries. This plan shall be implemented by the County.

(D) All previous Hilton Head Island Airport projects related to non-***development tree*** removal and mitigation on and off airport property must be completed prior to a permit being issued for additional ***tree*** removal.

(E) For both on airport and off airport property, the County and Town will work together to develop a landscape plan to meet mitigation requirements based on ***tree*** removal documented by the Arborist. The mitigation plan shall indicate dense plantings in all buffer areas; however, mitigation will be required throughout the affected ***parcels*** off airport property. The County shall present this landscape plan to the Town's ***Design Review Board*** for approval. Once the landscape plan is approved, the County shall implement the plan and pay into the ***tree*** replacement fund for ***tree*** mitigation not accomplished by replanting.

d. Inner Hazard Zone

All ***uses*** other than those that are airport runway related are prohibited from this area.

e. Outer Hazard Zone

i. **Special Construction Standards**

01. For ***uses*** with minimum occupant loads of 100 square feet or more per occupant or ***structures*** designated as historical by the ***Town Council***, no special ***construction*** standards shall apply.

02. For ***uses*** with minimum occupant loads of more than 20 square feet but less than 100 square feet per occupant, the following special ***construction*** standards shall apply:

(A) Noncombustible ***construction*** (IBC Type I, II, III or IV) is required.

(B) Fire protection sprinkler system is required.

(C) Minimum of two exits are required for each occupancy.

(D) Emergency lighting system is required.

ii. **Prohibited Uses**

01. ***Uses*** with a minimum occupant load of 20 square feet per occupant or less.

02. ***Uses*** designed to serve children or those with low effective mobility. Examples include, but are not limited to, day care centers, ***hospitals***, assisted living facilities, and ***nursing homes***.

03. ***Uses*** categorized as hazardous under the IBC.

5. Nonconforming Uses or Structures

a. Regulations Not Retroactive

The regulations prescribed in this section shall not be construed to require the removal, lowering, or other change or alteration of any existing ***structure*** not conforming to the regulations as of July 21, 1998, or otherwise interfere with the continuance of a ***nonconforming use***. Nothing contained herein shall require any change in the ***construction***, alteration, or intended ***use*** of any ***structure***, the lawful ***construction*** or alteration of which was begun prior to July 21, 1998, and is diligently pursued.

b. Marking and Lighting

The owner of any existing ***nonconforming structure*** is required to permit the installation, operation, and ***maintenance*** thereon of such markers and lights as shall be deemed necessary by the Airport Manager to indicate to the operators of aircraft in the vicinity of the Airport the presence of such airport obstruction. Such markers and lights shall be installed, operated, and maintained at the expense of Beaufort County.

F. Corridor Overlay (COR) District

1. Purpose

a. The purpose of establishing this overlay district is to protect the aesthetic and visual character of ***lands*** on Hilton Head Island ***adjacent*** to the major ***streets***, the waterfront, and the marshfront, as defined in this section. All ***development*** proposed within this Corridor Overlay (COR) District shall be subject to the procedures, standards and guidelines specified in the following paragraphs, in addition to those standards pertaining to the particular base district in which the ***development*** occurs. In particular, the purpose of the COR District is to:

i. Encourage and better articulate positive visual experiences along the Island's major ***streets***, the beachfront, and the marshfront;

ii. Provide for the continued safe and efficient utilization of these ***streets***; and

iii. Provide for the continued preservation and conservation of the beachfront and marshfront.

b. This is accomplished through evaluation of ***development*** within the COR District by the ***Design Review Board*** (DRB), which is authorized to review the location, character, and appearance of new ***development*** and redevelopment. It is the purpose of such review to determine whether the proposed plan for ***development*** complies with the guidelines and other standards of this district.

2. Delineation of District

a. The COR District shall include:
   i. The ***rights-of-way*** and all ***parcels*** lying in whole or in part within 450 feet of each side of the ***rights-of-way*** of any street designated as a major or minor arterial in Sec. 16-5-105.B, Street Hierarchy;
   ii. All ***parcels*** lying in whole or in part within 500 feet landward of the OCRM Base Line within the Town;
   iii. All ***parcels*** lying in whole or in part within 500 feet of the OCRM Critical Line; and
   iv. All ***parcels*** in the RD District, SPC District, and CR District.

b. The approximate boundary of this COR District shall be shown on the ***Official Zoning Map***.

c. There shall be no alteration of the existing condition of ***land***, ***uses***, ***structures***, landscaping, or lighting within the COR District, except in accordance with the requirements of this section and all other relevant provisions of this ***Ordinance***.

d. All proposed new ***development*** and changes to existing ***development*** located in the COR District shall be reviewed by the DRB in accordance with Sec. 16-2-103.I, Corridor Review (Minor and Major), and receive DRB approval before proceeding with ***development***, unless exempted in accordance with subparagraph e below.

e. All public projects, with the exception of pathways, ***streets***, and underground utilities, are subject to review by the ***Design Review Board***.

f. If a proposed ***development*** will not be visible from the ***right-of-way*** of the associated arterial once the project is completed, the ***Official*** will review it through the Minor Corridor Review Procedure (Sec. 16-2-103.I.3).

3. Design Review Guidelines

The intent of the design review is not to stifle innovative architecture but to assure respect for and reduce incompatible and adverse impacts on the visual experience. To accomplish this, the DRB shall utilize the Design Guide, in reviewing and making decisions on ***development***.

4. Streetscape Improvement Guidelines

Streetscape ***improvements*** include those architectural or functional facilities or ***structures*** that occur on site but are not part of the ***building***, and that encourage and facilitate human interaction with the environment. Examples include, but are not limited to, decorative light fixtures, fountains, sculpture, benches and tables, planters, retaining walls, pedestrian and bicycle paths, bicycle parking ***structures***, trash receptacles and enclosures, vendor areas, bollards and fences. These ***improvements*** shall be designed to be consistent with all guidelines of this section, and shall be reviewed for aesthetic functionality and compatibility with the Island character, as defined in the Hilton Head Island Design Guide.

a. Lighting

   i. Decorative, low-level intensity, non-concealed source lighting that defines vehicular or pedestrian ways may be acceptable if not used as general lighting for a ***development***.
   ii. All interior lighting shall be designed to prevent the light source or high levels of light from being visible from the corridor.
   iii. Exterior architectural, display and decorative lighting visible from the corridor shall be generated from a concealed light source or low level light fixtures. With the exception of LED lighting, color lamps shall not be used.
   iv. Site lighting shall conform to the provisions of Sec. 16-5-108, Site Lighting Standards.

b. Landscape Plans

Landscape plans for the proposed ***development*** shall provide visually harmonious and compatible settings for ***structures*** on the same ***lot*** and on adjoining or nearby ***lots*** and shall blend with the surrounding natural landscape. Natural appearing landscape forms are strongly encouraged; formal plans and the appearance of uninterrupted lines are discouraged. Landscaping may be required between ***buildings*** and sidewalks, parking lots and ***driveways***. The scale of the proposed landscaping shall be in proportion to the ***building***.

c. Signs

   i. New ***signs***, replacement ***signs***, or alterations to existing ***signs*** shall receive approval from the DRB (major ***signs***) or the ***Official*** (minor ***signs***), as provided in Sec. 16-5-114, Sign Standards, prior to installation.
   ii. Signs will be reviewed for compliance with the guidelines of this section and for compatibility with the Island character.
   iii. All ***signs*** shall meet all requirements of Sec. 16-5-114, Sign Standards.

5. Requirements Following Project Completion

a. All appearance features, lighting, and landscaping shown on the ***application*** approved by the DRB shall be maintained by the ***landowner*** and all subsequent ***landowners***.

b. Changes or damage to any appearance features, lighting, and landscaping shown on the ***application*** approved by the DRB that occur as a result of events or occurrences beyond the ***landowner's*** control shall be restored by the ***landowner*** to the condition that existed prior to the changes or damage.

c. Any changes to any appearance features, lighting, and landscaping shown on the ***application*** approved by the DRB that are proposed by the ***landowner*** shall require review and approval by the DRB in accordance with Sec. 16-2-103.I, Corridor Review (Minor and Major).

G. Planned Development Overlay (PD-2) District

1. Purpose

This Planned Development Overlay (PD-2) District is intended to encourage creativity in design and planning in the ***development*** of ***parcels*** between five and 249 acres by allowing greater design flexibility than the underlying ***base zoning district*** so that natural features may be protected and ***development*** concentrated in more suitable or less environmentally sensitive areas.

2. Designation of District

A PD-2 Overlay District may be established in any base district other than the CON District using the provisions set forth in Sec. 16-2-103.D, Planned Unit Development (PUD) District.

3. Permitted Uses

Any ***use*** permitted ***by right***, subject to ***use***-specific conditions, or as a Special Exception in the underlying base district is permitted. Where multiple ***base zoning districts*** are incorporated in the PD-2, the ***uses*** shall remain proportional to the area of the underlying ***base zoning district(s)***.

4. Density and Development Standards

a.

A section or phase of the planned development may be built at a ***density*** which is greater than the site-specific ***density*** allowed by the underlying ***base zoning district***, provided that any such concentration of ***density*** is offset by an area of lower ***density*** in another section or phase of the planned development or by an appropriate reservation of ***common open space*** elsewhere in the planned development. The average ***density*** for the PD-2 Overlay District shall not exceed the maximum ***density*** permitted in the **base zoning district**.

b. The standards for ***impervious cover*** and open space within a PD-2 Overlay District shall be fully satisfied for the district as a whole, but do not have to be satisfied on a ***site***-specific basis within individual phases of the planned development.

c. When a PD-2 Overlay District overlays more than one base **zoning district**, the area standards shall be pro-rated based on the district acreage and the average resulting standard shall rule.

d. Where a specific site in a PD-2 Overlay District has been developed for a ***use*** that can reasonably be considered to be long-term in nature (e.g., residential structures) and the resulting ***density*** of the ***use*** is less than the maximum ***density*** allowed for the specific ***site*** by the approved Master Plan, the Master Plan shall be deemed to be automatically amended for both the ***site*** and, when applicable, the Master Plan cap, to reflect the lesser ***density*** actually developed on the specific ***site***. This provision shall not apply if a plan, survey, or other similar relevant document approved by the ***Town*** indicates that additional ***development*** is still contemplated for the specific ***site*** after completion of ***development*** of the long-term ***use***. This provision shall not necessarily preclude the transfer of specified ***density*** from one undeveloped ***site*** to another undeveloped ***site*** through the approval of minor deviations from the approved Master Plan in accordance with Sec. 16-2-103.D.8, Minor Deviations from Approved Master Plan.

5. PD-2 Listed Master Plans

The following PUDs are included in PD-2 Overlay Districts and their Town-approved Master Plans including associated text and any subsequent amendments are hereby incorporated by reference as a part of the ***Official Zoning Map*** and LMO text.

TABLE 16-3-106.G.4: PD-2 LISTED MASTER PLAN

FILE NAME	NUMBER	PARCEL	TAX MAP #
Palmetto Headlands and H.H. Hospital	CUR-3-88	27/103/103A/337	4,8
Centre Court on Mathews Drive	CUR-1-89	88B	8
Presbyterian Conference Center	CUR-2-89	2	18
Marriott-South Forest Beach	CUR-1-90	67/69/71/73/252	15-A,18
Park Plaza Self Storage	CUR-2-90	336	15
Tidepointe Retirement	CUR-1-92	342/342A	14
Exec/Air Hilton Head	CUR-1-94	271A	5
Spanish Grove	CUR-1-95	34A/34B	10
First Baptist Church	CUR-1-96	138A/138C	18
Bermuda Point	CUR-1-97	1B	7
Waterside (Town Center)	N/A-JPC	202/202D	18
Palmetto Bay Marina	N/A-JPC	47/66A/273/273A/273C/314E	10
Marsh Tacky Village	ZMA080007	2B, 2D, 2E, 2F, 2H, 2I, 14, 14D, 14I, 16, 16A, 16B, 19C, 19D, 19E, 49, 58, 58A, and 223	3

6. Planned Development Master Plan Design

Planned development Master Plans shall include the following elements:

a. An arrangement of developed ***uses*** on the ***site*** that properly considers significant natural features and natural drainage patterns, views, roadway access, and surrounding ***land uses***.

b. Clustering of ***development sites,*** especially ***buildings***, so as to preserve natural or historic features and provide usable ***common open space***.

c. An integrated, coordinated circulation system with complete interconnection.

d. Maximum integration of other infrastructure—such as sewer, water, and drainage systems—in consideration of environmental factors.

e. Design and sizing of ***street***, drainage, and utility systems to accommodate the overall service demand of the planned development.

f. Provision for the ownership and ***maintenance*** of ***common open space*** through a ***property owners***' association or other mechanisms permitted under Section Sec. 16-5-104.E, Ownership, Management and Maintenance of Common Open Space.

g. Architectural guidelines and standards throughout the planned development.

h. Acreage sufficient to accomplish the basic purposes and features as outlined above.

7. **Noncontiguous Planned Developments**

a. General

As a means of enabling greater flexibility in the use of planned developments and promoting the ***Comprehensive Plan's land*** management goals, planned developments may be allowed on noncontiguous lands in several areas, as identified by the ***Comprehensive Plan***. A noncontiguous planned development consists of two or more separate ***tracts*** of land that are not ***contiguous*** but are or upon approval, will be owned by the same legal entity. For purposes of this paragraph, ***tracts*** are not deemed noncontiguous solely because they are separated by a ***street***, ***street right-of-way***, or utility ***easement.***

b. Additional Criteria for Noncontiguous Planned Development Master Plans

In addition to meeting the requirements of paragraph 6 above, the Master Plan for a noncontiguous planned development shall be designed expressly to provide creative utilization of separate ***lands*** to accomplish one or more of the following purposes:

i. To make better use of existing infrastructure;
ii. To establish and link ***amenities***—including, but not limited to, open space, pedestrian and bike paths, and parking;
iii. To provide solutions to drainage, parking, redevelopment, or shoreline erosion problems;
iv. To allow protection in the Airport Overlay (A-O) District; and
v. To enable protection of significant historic, cultural, or natural resources.

c. Calculation and Transfer of Density and Area Requirements

i. The overall ***density*** permitted within a noncontiguous PD-2 Overlay District shall be calculated by adding the densities allowed by right for the total acreage of all ***sites*** in the district and then averaging.
ii. Densities on the ***tract*** where ***development*** will occur cannot exceed 125 percent of the ***density*** allowed by the underlying ***base zoning district***.
iii. Any ***tracts*** from which ***density*** is transferred to another ***tract*** within the PD-2 Overlay District shall not contain less than ½ acre of ***contiguous*** area, and the ***base zoning district*** containing ***land*** from which ***density*** is transferred shall be rezoned simultaneously to the Conservation District and subject to the Conservation District's ***development*** limitations.
iv. ***Applications*** for a noncontiguous PD-2 Overlay District shall include documents in a form suitable for recording that identify ***tracts*** proposed to be rezoned to the Conservation District and the ***tracts*** to which ***density*** is proposed to be transferred. The documents shall also summarize the restrictions of future ***development*** under Town regulations. The document shall be recorded as a condition of ***development*** plan approval and be in effect until the property is subsequently rezoned.

H. Forest Beach Neighborhood Character Overlay (FB-NC-O) District

1. Applicability and Purpose

The purpose of the Forest Beach Neighborhood Character Overlay (FB-NC-O) District is to protect the ***single-family*** residential character of the district and in particular the ***development*** and redevelopment of ***lots*** within the district. All new ***development*** and changes to existing ***development*** in the district are subject to the overlay district regulations in addition to those listed in Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.

2. Approval

Compliance with the requirements of this section shall be determined by the ***Official*** at the time the ***building*** permit is reviewed and shall be based upon the standards of Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.

3. District Regulations

a. Setbacks

i. In addition to the ***single-family*** setback requirements of Sec. 16-5-102, Setback Standards, a side, and rear adjacent use setback shall be required.
ii. Setbacks shall comply with the standards of Sec. 16-5-102, Setback Standards, except that the 65 degree setback angle shall be measured from 20 feet above the required ***base flood elevation***.
iii. Side adjacent use setbacks shall be 10 feet for ***lots*** with a width of 70 feet and above. For ***lot*** widths less than 70 feet, the side adjacent use setback shall be equal to 12 percent of the ***lot*** width rounded to the closest whole number. However, to preserve significant ***trees*** or stands of ***trees*** any one side setback may be reduced to five feet, provided the sum of the required side setbacks is not reduced.
iv. Rear adjacent use setbacks shall equal 10 percent of the ***lot*** depth or 10 feet, whichever is greater. However, to preserve significant ***trees*** or stands of ***trees***, the rear setback may be reduced to five feet provided the sum of the required street and rear setbacks is not reduced.
v. To preserve significant ***trees*** or stands of ***trees*** in the rear of the lot, the street setback may be reduced to 15 feet provided the sum of the required street and rear setback is not reduced.

b. Buffers

i. A 20-foot street buffer and side and rear buffers equal to the setbacks above shall be required.
ii. Buffers shall comply with the standards of Sec. 16-5-103, Buffer Standards,except that ***driveways*** for ***street access*** as permitted in Sec. 16-5-103.J, Development Within Required Buffers, shall be limited to a total of 18 feet wide within the buffer.
iii. If the cumulative size of existing ***trees*** in a buffer is less than two inches ***DBH*** per 100 square feet, supplemental ***tree*** planting shall be required. Supplemental ***trees*** shall be sized to achieve the two inches ***DBH*** per 100 square foot minimum in each buffer. 50 percent of the caliper inches of any supplemental ***trees*** shall be broad-leaved evergreen overstory hardwoods and endangered species as identified in Sec. 16-6-104.H.
iv. In the case of a ***corner lot***, the required 20-foot adjacent street buffer may be reduced to 10 feet for the ***street*** with the lower ADT unless the ***street*** with the higher ADT is approved for the reduction in order to preserve significant ***trees*** or stands of ***trees***. In the case where both ***streets*** have the same ADT, the 20-foot buffer shall apply to the ***street*** that will better preserve significant ***trees*** or stands of ***trees***.
v. In order to preserve significant ***trees*** or stands of ***trees*** in the rear of the ***lot***, the street buffer may be reduced to 15 feet, provided the sum of the required street and rear buffer is not reduced.

c. Impervious Cover

All site paving shall be ***pervious*** with the exception of a swimming pool and deck not to exceed 500 square feet unless the site complies with the maximum ***impervious cover*** requirements for the RSF-5 District. Spaced wood decking over a ***pervious*** surface is considered ***pervious***.

d. Floor Area Ratio

The maximum ***gross floor area*** is limited to 0.55 times the area of the ***lot*** containing the ***single-family*** residence up to a maximum of 5,000 square feet. The ***gross floor area*** shall include covered porches and all enclosed space with a ceiling height of seven feet or greater except as follows:

i. Areas beneath the ***structure*** utilized solely for parking and storage. All such areas must be hydrostatically vented if required by the Building ***Official***.
ii. The first 600 square feet of covered porches.
iii. Attic space as defined by the latest adopted edition of the IBC.

e. Minimum Lot Size and Width

The ***subdivision*** or recombination of ***lots*** platted and recorded on or after April 3, 2001, shall not result in any ***lot*** less than 7,000 square feet in size or 70 feet in width.

f. Parking

Two parking spaces are required for up to 2,000 square feet of ***gross floor area***. Above 2,000 square feet, one additional space is required for each 1,000 square feet or less of ***gross floor area***. ***Driveway*** paving not located in the required buffer may be counted for parking.

I. Folly Field Neighborhood Character Overlay (FF-NC-O) District

1. Applicability and Purpose

The purpose of the Folly Field Neighborhood Character Overlay (FF-NC-O) District is to protect the ***single-family*** residential character of the district and in particular the ***development*** and redevelopment of ***lots*** within the district. All new ***development*** and changes to existing ***development*** in the district are subject to the overlay district regulations in addition to those listed in Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.

2. Approval

Compliance with these regulations shall be determined by the ***Official*** at the time the ***Building Permit*** is reviewed and shall be based upon the standards of Sec. 16-3-104.C, Residential Single-Family-5 (RSF-5) District.

3. Delineation of District

The Folly Field Neighborhood Character Overlay (FF-NC-O) District includes all ***parcels*** depicted as the Strand or as part of Sections A, B, C, or D in Figure 16-3-106.I.3 below.

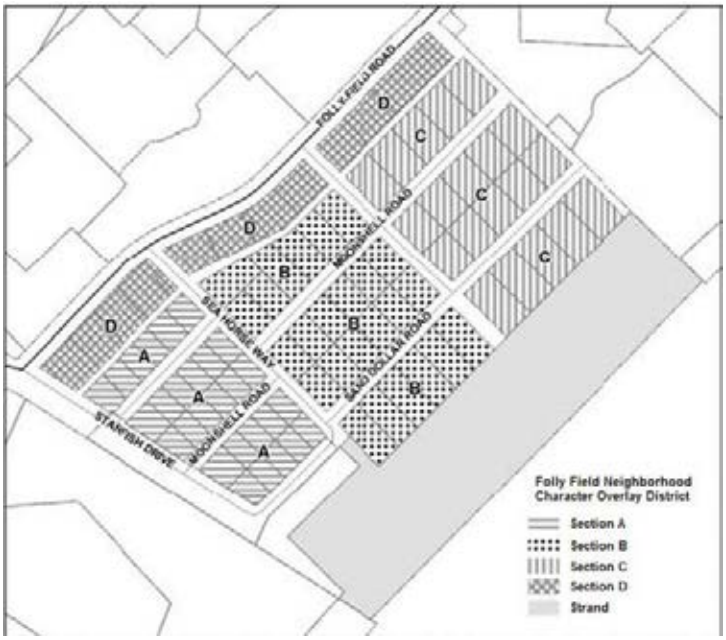


Figure 16-3-106.I.3: Folly Field Neighborhood Character Overlay (FF-NC-O) District and Sections.

4. District Regulations

a. Setbacks

In addition to the ***single-family*** setback requirements of Sec. 16-5-102, Setback Standards, with the exception that ***structures*** greater than 24 inches in ***height*** along minor arterials are required to have a minimum adjacent street setback of 20 feet, the following setbacks shall be required.

i. Rear yard setbacks shall be a minimum of ten percent of ***lot*** depth or ten feet, whichever is greater.
ii. Side yard setbacks shall each contain a minimum of ten percent of the total ***lot*** width.
iii. Maximum setback angle of 65 degrees shall be measured from 20 feet above the required ***base flood elevation***.

b. Buffers

In addition to the buffer requirements of Sec. 16-5-103, Buffer Standards, the following buffers shall be required.

i. A 20-foot adjacent street buffer shall be required.
ii. ***Driveways*** for ***street access*** as permitted in Sec. 16-5-103.J, Development Within Required Buffers, shall be limited to a total width of 24 feet within the buffer.
iii. In the case of a ***corner lot***, the required 20-foot adjacent street buffer may be reduced to ten feet for the ***street*** with the lower ADT unless the ***street*** with the higher ADT is approved for the reduction in order to preserve significant ***trees***. In the case where both ***streets*** have the same ADT, the 20-foot buffer shall apply to the ***street*** that will better preserve significant ***trees***.

c. Impervious Cover

Impervious cover of the ***lot*** shall not exceed 55 percent.

d. Open Space

The ***open space*** or strand area that lies between the existing most current seaward ***lots*** and the ***beach*** shall not be counted towards the ***density*** calculation for any ***development*** activities for any ***lot*** or other ***land***. In addition, vertical ***construction*** in this area is prohibited.

e. Floor Area Ratio

The maximum ***gross floor area*** is limited to 0.45 times the area of the ***lot*** containing a ***single-family dwelling*** up to a maximum of 4,500 square feet. The ***gross floor area*** shall include covered porches and all enclosed space with a ceiling height of seven feet or greater, with the following exclusions:

i. Areas beneath the ***structure*** utilized solely for parking or storage.
ii. The first 600 square feet of covered porches.
iii. Attic space as defined by the latest adopted edition of the IBC.

f. Minimum Lot Frontage and Depth

The ***subdivision*** or recombination of any ***lot*** shown on a plat recorded prior to November 5, 2003, shall not result in any ***lot*** with ***frontage*** and depth less than that shown on the following table for the applicable Section of the district (see Figure 16-3-106.I.3 above).

	MINIMUM LOT FRONTAGE (FEET)	MINIMUM LOT DEPTH (FEET)
Section A	50	100
Section B	75	100
Section C	90	100
Section D	95	100

g. Parking

Two parking spaces are required for up to 2,000 square feet of ***gross floor area***. Thereafter, one additional space is required for each 1,000 square feet or less of ***gross floor area***. ***Driveway*** paving not located in the required buffer may be counted for parking.

J. Holiday Homes Neighborhood Character Overlay (HH-NC-O) District

1. Applicability and Purpose

The purpose of the Holiday Homes Neighborhood Character Overlay (HH-NC-O) District is to protect the ***single-family*** residential character of the district and in particular the ***development*** and redevelopment of ***lots*** within the district. All new ***development*** and changes to existing ***development*** are subject to the overlay district regulations, in addition to those listed in Sec. 16-3-104.D, Residential Single-Family-6 (RSF-6) District. Existing ***nonconforming structures*** and site features may be expanded as long as the site complies with the required floor area ratio (FAR) and maximum ***impervious cover*** listed in paragraph 3 below.

2. Approval

Compliance with these regulations shall be determined by the ***Official*** at the time the ***Building Permit*** is reviewed and shall be based upon the standards of Sec. 16-3-104.D, Residential Single-Family-6 (RSF-6) District.

3. Delineation of District

The Holiday Homes Neighborhood Character Overlay (HH-NC-O) District includes all ***parcels*** shown as hatched in Figure 16-3-106.J.3 below.

Figure 16-3-106.J.3: Holiday Homes Neighborhood Character Overlay (HH-NC-O) District.

4. District Regulations

a. Setbacks

In addition to the ***single-family*** setback requirements of Sec. 16-5-102, Setback Standards, the following setbacks shall be required:

i. Rear yard setbacks shall be a minimum of ten feet.
ii. Side yard setbacks shall be a minimum of ten feet; however, to preserve existing ***trees***, any one side yard setback may be reduced to five feet provided the sum of the required side yard setbacks equals at least 20 feet.

01. A ***lot*** with less than 50 feet of ***street frontage*** or less than 0.15 acres in area shall be permitted to reduce side yard setbacks to a minimum of five feet.

02. Dwelling units that are nonconforming as to the side yard setbacks identified above are permitted to be expanded along the subject boundary line; however, ***expansions*** shall be constructed no closer than five feet from the side property line.

03. Side yard setback angles shall be a minimum of 65 degrees measured from 20 feet above the required ***base flood elevation*** (BFE), at the setback line. The illustration in Sec. 16-5-102.D, Adjacent Use Setback Requirements, can be referenced for an example of a setback angle.

iii. In the case of a ***corner lot***, the required 20-foot adjacent street setback may be reduced to ten feet for the ***street*** with the lower average daily trips (ADT).

iv. ***Lots*** directly ***adjacent*** to Folly Field Road shall have a minimum adjacent street setback of 20 feet.

b. Buffers

In addition to the buffer requirements of Sec. 16-5-103, Buffer Standards,the following buffers shall be required:

i. A 20-foot street buffer and side and rear buffers equal to the setbacks above.

ii. ***Driveways*** for ***street access***, as permitted in Sec. 16-5-103.J, Development Within Required Buffers,shall be limited to a total width of 24 feet per ***lot***.

iii. In the case of a ***corner lot***, the required 20-foot adjacent street buffer may be reduced to ten feet for the ***street*** with the lower average daily trips (ADT).

iv. ***Lots*** directly ***adjacent*** to Folly Field Road shall have a minimum adjacent street buffer of 20 feet.

c. Impervious Coverage

Impervious cover of the ***lot*** shall not exceed 50 percent.

d. Floor Area Ratio

The maximum ***gross floor area*** is limited to 0.45 times the area of the ***lot*** containing the ***single-family dwelling***, up to a maximum of 4,000 square feet. The ***gross floor area*** shall be calculated as all enclosed space with a ceiling height of seven feet or greater with the following exclusions:

i. Enclosed areas, where the floor level is located below the required ***base flood elevation*** (BFE), which are used solely for parking or storage.

ii. Attic space as defined by the latest adopted edition of the IBC.

e. Parking

Two parking spaces are required for up to 2,000 square feet of ***gross floor area***. Thereafter, one additional space shall be required for each 1,000 square feet or less of ***gross floor area***.

f. Minimum Lot Size

The ***subdivision*** or recombination of any ***lot*** shown on a plat recorded prior to July 21, 1998, shall not result in any ***lot*** having a gross area of less than 7,260 square feet.

K. Redevelopment Overlay (R-O) District

1. Purpose

The purpose of the Redevelopment Overlay (R-O) District is to create and establish a zoning overlay district to provide flexibility in the design standards of Chapter 16-5: Development and Design Standards, and to utilize zoning and planning techniques specifically designed to promote and encourage the redevelopment of existing ***nonconforming structures*** and existing ***nonconforming site features***.

2. Zoning District Type

The Redevelopment Overlay (R-O) District is a hybrid floating zone and overlay zone that is unmapped on the ***Official Zoning Map*** and that can be applied to discrete, noncontiguous ***parcels*** for the purpose of promoting the redevelopment of existing ***nonconforming structures*** and existing ***nonconforming site features***.

3. Specific Techniques Authorized

On ***parcels*** approved for the Redevelopment Overlay (R-O) District, the following techniques are authorized to accomplish the purpose of the R-O District:

a. A relaxation of specific design standards set out in Chapter 16-5: Development and Design Standards; or

b. Authorization of the ***Official*** to make minor amendments to any R-O District.

4. Applicability

a. A ***landowner*** of a ***parcel*** of ***land*** who proposes to redevelop may apply to have the ***parcel*** of ***land*** rezoned R-O District in accordance with Sec. 16-2-103.C, Zoning Map Amendment (Rezoning), and this section. For the purposes of this section, redevelopment is defined as the renovation of a previously developed site to the ***density*** allowed under this ***Ordinance***, or the existing ***density***, whichever is greater. Cosmetic changes to the exterior of the ***structure*** and interior renovations do not qualify as redevelopment.

b. The following ***parcels*** of ***land*** may apply to have the ***land*** rezoned R-O District:

i. A ***parcel*** of ***land*** that contains a ***nonconforming structure*** or site feature; or

ii. A conforming ***parcel*** that redevelops in conjunction with a ***parcel*** that contains a ***nonconforming structure*** or site feature.

c. A ***parcel*** of ***land*** that is located in a RSF district does not qualify and is not eligible to have the ***land*** rezoned R-O District.

5. Procedure

An R-O District classification shall only be approved in accordance with the procedures in Sec. 16-2-103.C.2, Zoning Map Amendment (Rezoning) Procedure, and the standards in Sec. 16-2-103.C.3, Zoning Map Amendment (Rezoning) Review Standards, and the requirements of this section.

6. Additional R-O District Review Standards

In addition to the review standards in Sec. 16-2-103.C.3, Zoning Map Amendment (Rezoning) Review Standards, redevelopment proposed to be classified to a R-O District may modify the dimensional, ***development*** and design, and natural resources protection standards of this ***Ordinance*** in accordance with Table 16-3-106.K.4, Additional R-O District Review Standards.

TABLE 16-3-106.K.4: ADDITIONAL R-O DISTRICT REVIEW STANDARDS	
STANDARD	**ALLOWABLE MODIFICATION**

Uses (see base district standards in this chapter)	Only ***uses*** allowed in the base district are allowed, except for legal ***nonconforming uses***. Legal ***nonconforming uses*** are allowed to continue in accordance with the requirements of this section.
Maximum ***density*** (see base district standards in this chapter)	May not exceed maximum ***density*** of base district, or if a legal ***nonconforming use*** or ***structure***, the existing ***density***. A ***nonconforming use*** that exceeds maximum ***density*** of the base district may be permitted to change the ***use*** if there are no additional impacts of the proposed ***use*** on infrastructure and surrounding properties will result, and if the adequacy of the site ***improvements*** (such as parking and stormwater infrastructure) are evaluated, and determined to be sufficient to support the proposed redeveloped ***use***.
	Nonconforming square footage may be converted to another ***use*** if the ***density*** of the proposed ***use*** is based on square footage and the proposed ***use*** is permitted within the base zoning district where the property is located.
Maximum ***building height*** (see base district standards in this chapter)	A ***structure*** that is nonconforming because of ***height*** may be rebuilt to legally nonconforming ***height***. Such decision shall be based on ability to recapture ***density*** of ***development*** and ***height*** of surrounding ***buildings***.
Maximum ***impervious cover*** (see base district standards in this chapter)	Shall not exceed maximum requirements of the base district, except for ***impervious cover*** that exists as a legal ***nonconforming site feature***, which may be maintained. In no case shall an **application** for rezoning to the R-O district be appropriate for a site where ***impervious cover*** exceeds 80% of the site.
Minimum adjacent street setback requirements (see Sec. 16-5-102.C) and adjacent street buffer requirements (see Sec. 16-5-103)	Up to 20% reduction in setback distance, buffer width, and planting rate for buffer screening.
Minimum adjacent use setback requirements (see Sec. 16-5-102.D) and adjacent use buffer requirements (see Sec. 16-5-103.E)	Up to 50% reduction in setback distance, buffer width, and planting rate for buffer screening.
Maximum adjacent street setback angles (see Sec. 16-5-102.C) and adjacent use setback angles (see Sec. 16-5-102.D)	May be increased based on the ***height*** of the ***structure*** and setback distance, but may not exceed a 75 degree angle.
Minimum ***open space*** requirement (see Sec. 16-5-104)	Shall not exceed minimum requirements of the base district, except for ***open space*** that exists as a legal ***nonconforming site feature***, which may be maintained. In no case shall an **application** for rezoning to the R-O district be approved for a site where ***open space*** is less than 20% of the site.
Minimum number of parking spaces (see Sec. 16-5-107.D.1)	Up to 50% reduction, if it is demonstrated off-street parking can be adequately addressed.
Parallel parking spaces (see Sec. 16-5-107.D.7)	The number of parallel parking spaces may be increased.
Compact parking spaces (see Sec. 16-5-107.D.8)	Compact parking spaces may be maintained up to the number that existed on the site as a ***nonconforming site feature*** prior to redevelopment.
Parking space dimensions (see Sec. 16-5-107.E.1)	Regular parking spaces that are no less than 8.5 feet by 18 feet, or compact spaces that are no less than 8.5 feet by 15 feet may be reconstructed to the same size that existed as a legal ***nonconforming site feature*** prior to the proposed redevelopment.

	Width of parking spaces adjoining a median at the end of a row of parking may be reduced to nine feet, or what existed on the site before redevelopment if the parking space dimensions at the time were a legal ***nonconforming site feature***.
Maximum number of parking spaces between landscaped medians along a row of parking (see Sec. 16-5-107.G.3.a.iv)	May be increased by up to three spaces if it is demonstrated that the parking lot contains sufficient landscaping to mitigate its environmental and visual impacts to an equivalent degree.
Minimum width of landscaped medians in parking lots (see Sec. 16-5-107.G.3.b)	May be reduced by up to 20% if it is demonstrated that the parking lot contains sufficient landscaping to mitigate its environmental and visual impacts to an equivalent degree.
Maximum ***off-site*** parking spaces (see Sec. 16-5-107.H.4.a)	Up to 20% of required parking spaces may be provided ***off-site***, if it is demonstrated that safe and convenient vehicular ***access*** is provided to the ***development*** served by the ***off-site*** parking.
Pedestrian ***access*** to ***shared parking*** (see Sec. 16-5-107.H.3.b) and ***off-site*** parking (see Sec. 16-5-107.H.4.c)	***Access*** to shared or ***off-site*** parking may cross an arterial ***street*** if it is determined there is adequate and safe pedestrian ingress and egress to the ***development*** served by the off-premise parking.
On-street parking (see Sec. 16-5-107.H.6)	May be used to satisfy up to 100% of the number of parking spaces required.
Minimum tree coverage (see Sec. 16-6-104.G)	A legal nonconforming site that does not comply with the minimum ***tree*** coverage requirement may be allowed to redevelop without the minimum amount of tree coverage if it is determined all feasible and practical alternative steps have been taken to meet the required amount of tree coverage on the site, and the ***landowner*** deposits a ***tree*** mitigation fee in a Town-administered ***tree*** replacement fund in-lieu of providing additional ***tree*** canopy. (see Sec. 16-6-104.L).

7. Minor Amendment

Because unanticipated circumstances may arise in the redevelopment of existing ***nonconforming structures*** and existing ***nonconforming site features*** that make it impractical or impossible to execute an approved redevelopment plan set out in an approved R-O District, the ***Official*** is authorized to approve minor amendments to an approved R-O District as follows:

a. A minor amendment shall be an amendment that does not make the site nonconforming to the adopted ***development*** and design standards approved as part of the R-O District. A minor amendment shall not further relax a ***development*** or design standard or other design criteria that has been modified by the approved R-O District.

b. Disapproval or denial of a request for a proposed minor amendment to an R-O District by the ***Official*** may be appealed within 14 calendar days of the decision to the ***Board of Zoning Appeals***.

8. Expiration

An R-O District Map Amendment (Rezoning) shall not expire, but the amended ***Official Zoning Map*** is subject to further amendment or repeal, in accordance with the map amendment procedures set forth in Sec. 16-2-103.C, Zoning Map Amendment (Rezoning).

L. Coastal Protection Area (CPA-O) District

1. Applicability and Purpose

a. The purpose of the Coastal Protection Area Overlay (CPA-O) District, in conjunction with the Transition Area Overlay (TA-O) District, is to eliminate the potential for seaward migration of the built environment along the Island's beachfront to the greatest extent possible. This environmentally sensitive area:
   i. Protects life and property by serving as a storm barrier;
   ii. Provides an important basis for a tourism industry that generates annual tourism industry revenue;
   iii. Provides habitat for numerous species of plants and animals that are important to the natural functioning of the beach and ***dune system***, or that are threatened or endangered; and
   iv. Provides ***beach*** and ***dune system*** vegetation that is unique and extremely important to the vitality and preservation of the barrier island environment.

b. All new ***development*** and changes to existing ***development*** in the district are subject to the regulations of this section.

c. The ***Town's*** standards and regulations pertaining to ***development*** activity within the CPA-O district are intended to complement those of the State of South Carolina.

d. Where ***State*** law and ***Town*** provisions regulate ***development*** under this subsection, the more restrictive standard shall govern, to the extent allowed by ***State*** law. In the event of a conflict between the provisions of this section and applicable ***State*** law, ***State*** law governs.

2. Delineation of the CPA-O District

a. General

Except as otherwise provided in subparagraph b below, the Coastal Protection Area Overlay (CPA-O) District includes the following areas within and ***adjacent*** to ***parcels*** fronting the Hilton Head Island ***beach***, as defined in Section 8-1-112 of the ***Municipal Code***:

i. **Parcels Containing Single-Family, Golf Course, and Open Space Uses**

For ***parcels*** containing ***single-family*** residential and golf course ***uses***, and ***open space uses*** without ***structures***, the CPA-O District includes the area between:

01. The ***Beachfront Line*** or the seaward property line of the ***parcel***, whichever is further landward, and

02. The ***mean high water line***, the ***Beachfront Line***, or the seaward property line of the ***parcel***, whichever is further seaward.

ii. **Parcels Containing Other Uses**

For ***parcels*** containing any ***land use*** other than ***single-family*** residential and golf course ***uses***, and ***open space uses*** without ***structures***, the CPA-O District includes the area between:

01. The seaward boundary of the Transition Area Overlay (TA-O) District (see Sec. 16-3-106.M.2, Delineation of the TA-O District) and

02. The ***mean high water line***, the ***Beachfront Line***, or the seaward property line of the ***parcel***, whichever is further seaward.

iii. **Basis for Parcel Lines**

The ***single-family parcels*** (with the exception of North Forest Beach ***Subdivisions*** 1, 2, and 3) and non-***single-family parcel*** lines used to establish the CPA-O District boundaries in accordance with this subparagraph are as platted and recorded in the Beaufort County Register of Deeds Office as of the date of Ordinance 2009-22.

b. Hilton Head Beach Subdivisions 1, 2, and 3 subdistricts

i. The three ***single-family subdivisions*** identified as Hilton Head Beach ***Subdivisions*** 1, 2, and 3, are subdistricts within the CPA-O District. The Hilton Head Beach ***Subdivisions*** 1, 2, and 3 subdistricts are ***contiguous*** with ***parcels*** of property described as "Beach Lot," "Strand Parcel" ***lots*** on recorded plats as follows:

01. For Hilton Head Beach Subdivision 1, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 81 at Page 153, and the property in question is described thereon as the "Beach Lot";

02. For Hilton Head Beach Subdivision 2, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 84 at Page 112, and the property in question is described thereon as the "Strand Parcel"; and

03. For Hilton Head Beach Subdivision 3, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 81 at Page 154, and the property in question is described thereon as the "Beach Lot."

ii. The ***uses*** allowed in the CPA-O District in Hilton Head Beach Subdivision 2 are those ***uses*** allowed on the "Strand Parcel" property in the declarations of covenants and restrictions that are recorded in the Beaufort County Register of Deeds Office in Official Record Book 1532 at Page 1312.

iii. For all other property in the CPA-O District, this ***Ordinance*** applies.

iv. With respect to the CPA-O District in Hilton Head Beach Subdivision 2, where the text of this ***Ordinance*** conflicts with the declarations of covenants described above, the text of the declarations of covenants and restrictions shall control.

3. Activities and Uses Permitted and Prohibited in the CPA-O District

a. All ***development*** is prohibited in the CPA-O District except the following permitted ***uses*** and activities:

i. Boarded pathways as perpendicular to the ***beach*** as practical and not larger than six feet in width and their associated wooden deck not larger than 144 square feet (must comply with Sec. 16-6-103, Beach and Dune Protection);

ii. Beach renourishment;

iii. Emergency vehicular ***beach access***; and

iv. Permitted ***beach maintenance*** activities such as sand fencing, re-vegetation with native plant material and erosion control.

b. All activities and ***uses*** in the CPA-O District must also comply with all current local, ***State*** and federal laws.

4. Nonconforming Structures within the CPA-O District

a. Any ***structure*** or site feature that is nonconforming to the activities and ***uses*** permitted within the CPA-O District may be rebuilt to its current size (or smaller) and location provided that:

i. The ***structure*** conforms to current local, ***State***, and federal laws;

ii. The same ***use*** that previously existed is reestablished within the ***structure***; and

iii. Neither the ***structure*** nor the ***use*** has been discontinued for a period of 12 consecutive months or greater.

b. Normal ***maintenance*** activities of nonconforming ***structures*** are allowed.

M. Transition Area Overlay (TA-O) District

1. Applicability and Purpose

a. The purpose of the Transition Area Overlay (TA-O) District, in conjunction with the Coastal Protection Area Overlay (CPA-O) District, is to eliminate the potential for seaward migration of the built environment along the Island's beachfront as well as protect the area between existing ***construction*** and the mean high water mark, to the greatest extent possible. This environmentally sensitive area:

i. Protects life and property by serving as a storm barrier;

ii. Provides an important basis for a tourism industry that generates annual tourism industry revenue;

iii. Provides habitat for numerous species of plants and animals that are important to the natural functioning of the ***beach*** and ***dune system***, or that are threatened or endangered; and

iv. Provides ***beach*** and ***dune system*** vegetation that is unique and extremely important to the vitality and preservation of the barrier island environment.

b. All new ***development*** and changes to existing ***development*** in the district are subject to the regulations of this section.

c. The ***Town's*** standards and regulations pertaining to ***development*** activity within the TA-O district are intended to complement those of the State of South Carolina.

d. Where ***State*** law and ***Town*** provisions regulate ***development*** under this subsection, the more restrictive standard shall govern, to the extent allowed by ***State*** law. In the event of a conflict between the provisions of this section and applicable ***State*** law, ***State*** law governs.

2. Delineation of the TA-O District

a. General

Except as otherwise provided in subparagraph b below, the Transition Area Overlay (TA-O) District applies only to non-***single-family*** areas, where it includes the area between:

i. The existing line of ***construction*** (as bound by the South Carolina State Plane Coordinate System), and

ii. The most immediate seaward property line of ***parcels*** fronting the ***beach*** (as defined in Section 8-1-112 of the ***Municipal Code***) or the ***Beachfront Line***,

whichever is further landward.

b. Hilton Head Beach Subdivisions 1, 2, and 3 subdistricts

i. The three ***single-family subdivisions*** identified as Hilton Head Beach Subdivisions 1, 2, and 3, are subdistricts within the TA-O District. The Hilton Head Beach Subdivisions 1, 2 and 3 subdistricts are ***contiguous*** with ***parcels*** of property described as 'A' ***lots***, 'E' and 'S' ***lots*** and 'X' ***lots*** on recorded plats as follows:

01. For Hilton Head Beach Subdivision 1, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 81 at Page 153, and the ***lots*** in question are described thereon as the "A" ***lots***;

02. For Hilton Head Beach Subdivision 2, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 84 at Page 112, and the ***lots*** in question are described thereon as the "E" and "S" ***lots***; and

03. For Hilton Head Beach Subdivision 3, the plat is recorded in the Beaufort County Register of Deeds Office, in Plat Book 81 at Page 154, and the ***lots*** in question are described thereon as the "X" ***lots***.

ii. The ***uses*** allowed in the TA-O District in Hilton Head Beach Subdivisions 1, 2, and 3 are those ***uses*** allowed on the "A," "E," "S," and "X" ***lots*** in the declarations of covenants and restrictions that are recorded in the Beaufort County Register of Deeds Office as follows:

01. For Hilton Head Beach Subdivision Number 1, in Official Record Book 1450 at Page 835;

02. For Hilton Head Beach Subdivision Number 2, in Official Record Book 1532 at Page 1317; and

03. For Hilton Head Beach Subdivision Number 3, in Official Record Book 1450 at Page 828

iii. Where the text of this ***Ordinance*** conflicts with the declarations of covenants described above, the text of the declarations of covenants and restrictions shall control.

3. Activities and Uses Permitted in the TA-O District

a. In addition to the activities and ***uses*** permitted in the CPA-O District (see Sec. 16-3-106.L.3), the TA-O District may include any ***uses*** that do not require enclosed space to operate. These activities and ***uses*** include, but are not limited to, ***swimming pools***, boardwalks, fire pits, decks, required drainage ***improvements***, and necessary utilities.

b. The activities and ***uses*** in the TA-O District shall be located as far landward as possible. Activities or ***uses*** in the TA-O District shall be accessory activities or ***uses*** to the ***development*** to which they are directly seaward.

c. ***Development*** in the TA-O District shall conform to the standards for ***impervious cover*** and ***open space*** for the underlying ***base zoning district***.

d. Activities or ***uses*** in the TA-O District shall not be on or in any part of a ***dune or dune system***.

4. Nonconforming Structures within the TA-O District

a. Any ***structure*** or site feature that is nonconforming as to the activities and ***uses*** permitted within the TA-O District may be rebuilt to its current size (or smaller) and location provided that:

i. The ***structure*** conforms to current local, ***State***, and federal laws;

ii. The same ***use*** that previously existed is reestablished within the ***structure***; and

iii. ***Use*** of the ***structure*** has not ceased for a period of 12 consecutive months or greater.

b. Normal ***maintenance*** activities of ***nonconforming structures*** are allowed.

Appendix D- Town of Hilton Head Island Beach and Dune Regulations

Sec.16-6-103. - Beach and Dune Protection

A. Purpose and Intent

The purpose of this section is to protect, preserve, restore, and enhance the *beach* and *dune systems* that are so important to protecting life and property from storms, providing significant economic benefits through tourism, providing habitat for important plants and animals, providing a healthy environment for recreation, and improving the quality of life for citizens of and visitors to Hilton Head Island.

B. Applicability

1. The standards in this section shall apply to all *development*.
2. If these standards conflict with standards in any Town-adopted shoreline management program, the standards in that program govern.
3. *Development* on *beaches* and dunes is also subject to *State* regulations administered by OCRM.

C. General Standards

Development Plan approval shall be granted for *development adjacent* to the *beach* only if the *applicant* can demonstrate that the proposed *development*:

1. Will not result in the removal or diminution of the amount of sand, silt, shell, sediment, or other geologic components of any *beach*, or interfere with natural patterns of wind and water movement of sand, silt, shell, sediment or other *beach* components, except for *maintenance* of any *structures* causing these effects that existed before July 21, 1998;
2. Will not result in the direct discharge of stormwater onto any *beach*;
3. Will not result in the discharge of treated or untreated sewage or other human waste from *land* or waterborne sources, with the exception of advanced treated effluent irrigation systems approved by the South Carolina Department of Health and Environmental Control;
4. Will not result in the direct or indirect removal, destruction, depletion, or digging out of vegetation that contributes to *beach* stability;
5. Will minimize any interference with the natural use of the *beach* for feeding, foraging, resting, nesting, and breeding by indigenous and migratory birds, shellfish, marine fishes, sea turtles, and other wildlife (Such interference shall include the destruction or diminution of organisms or material upon which wildlife feed.);
6. Will not interfere with the customary rights of the public for *access* to and use of the active *beach*; and
7. Will not remove, alter or destroy any *beach* protection *structure*, such as seawalls or revetments, unless specifically authorized by an appropriate Development Plan approval or *Building Permit*.

D. Beach Nourishment and Erosion Control

Private or public projects for *beach nourishment* or control of *beach* erosion shall adhere to the following standards:

1. Fill materials shall come from approved areas and use approved methods as regulated by the appropriate *State* and federal agencies. Fill materials shall be of similar sediment size and material as the existing material.
2. Use of natural features of the *beach* and *dune system* shall be favored over artificial *structures*. (Examples: trapping sand by use of sand fencing; planting *dune* vegetation on small dunes to encourage growth.)
3. Erosion control *structures* shall not interfere with existing or planned public *access* to the *beach* unless equivalent, alternate *access* can be provided.
4. Beach nourishment or *construction* of erosion control *structures* shall be done at times of the year when impact on wildlife, particularly endangered species, is minimized. Appropriate *State* and federal permits shall be secured before *Town* approval.

E. Beach Access Standards

1. Pedestrian or bicycle *access* to *beach* areas shall be provided by elevated walkways with a two foot minimum clearance where dunes of any size or age exist or are to be restored. In no case shall direct vehicular *access* to *beach* areas be permitted unless specifically authorized by the *Town*.
2. In reviewing all *development applications* involving property *adjacent* to the *beach*, the *Official* shall consider the need for *beach access* to meet the general public interest.
3. The *Official* shall not approve any *development* on property *adjacent* to the *beach* that would cause the net loss of any existing officially designated *beach access*.

F. Development on Dunes

1. General

No *dune* in an active *beach* system shall be leveled, breached, altered, or undermined in any way by *development* or other human-caused activity, and no *dune* vegetation may be disturbed or destroyed, except for:

a.

The ***construction*** and ***maintenance*** of very limited elevated boardwalks with a two foot minimum clearance or similar beach access for handicap accessibility necessary for pedestrian and bicycle ***access*** to the *beach*, in accordance with the standards in paragraph 2 below and their associated wooden deck not larger than 144 square feet;

b. The establishment and *maintenance* of a view corridor in accordance with paragraph 3 below;

c. The planting of native, salt-tolerant vegetation or the placement and *maintenance* of wood-and-wire sand fences, where used to speed accumulation of sand for *dune* stabilization, restoration, or reconstruction;

d. The removal of non-native invasive vegetation, provided any *trees* removed shall be cut flush with existing *grade* and their root systems left intact;

e. The placement of informational *signs*, trash receptacles, and other similar minor *structures* serving *persons* accessing the *beach*;

f. Tie-downs or anchors to existing minor *structures* or *trees*;

g. Limited shore stabilization measures approved under the S.C. Beachfront Management Act; and

h. Temporary measures (e.g., sandbags, sand scraping) approved by the *Town* or OCRM to address an emergency situation.

2. Dune Boardwalks

All boardwalks constructed on dunes for pedestrian and bicycle *access* to the *beach* shall comply with the following standards:

a. *Dune boardwalks* shall be designed and sited to protect *dune* features, minimize disturbance of native *dune* vegetation, avoid lateral *beach access*, and minimize the amount of *construction* material that may become debris during a storm event. If removal or disturbance of native *dune* vegetation cannot be avoided, replacement vegetation in an equivalent amount shall be planted.

b. *Dune boardwalks* shall generally be constructed perpendicular to the shoreline and extend at least to the seaward toe of the *primary dune*.

c. *Dune boardwalks* constructed across existing or proposed native *beach* and *dune* vegetation shall be post-supported and elevated a minimum of two feet above the vegetation to allow for sand build-up and clearance above the vegetation.

d. Where possible, stairways and ramps leading from the *dune* crest down to the *beach* shall be designed to minimize the quantity of material used in *construction*.

e. *Dune boardwalks* shall not exceed an overall width of six feet unless otherwise permitted by SCDHEC-OCRM. Support posts shall not be encased in concrete or installed in *dune* slopes greater than 30 degrees.

f. Windblown sand may be removed from *dune boardwalks*.

3. View Corridors

Dune vegetation may be removed or selectively pruned to establish view corridors to the *beach*, in accordance with the following standards:

a. To the *maximum extent practicable*, view corridors shall be located where the least amount of native *dune* vegetation is required to be removed or pruned (i.e., where little *dune* vegetation exists or where existing vegetation is non-native), and the pruning of *trees* and vegetation *adjacent* to the corridor can be done in a manner that maintains the health of such *trees* and other vegetation.

b. No healthy *specimen tree* may be removed to create a view corridor. Selective pruning of *trees* (including *specimen trees*) is allowed, in accordance with accepted International Society of Arboriculture practices.

c. Any *trees* removed shall be cut flush with existing *grade* and their root systems left intact. All removed vegetation shall be replaced with shrubs or other low-growing vegetation (not turf) that will enhance the stabilization of the *dune system*.

(Ord. No. 2015-23, § 1(Exh. B), 11-3-2015)

Agencies and Jurisdiction

Numerous agencies have responsibility or authority for assisting beach management on Hilton Head Island. This section provides a summary and description of the agencies with regulatory or management authority relevant to beach management in the Town of Hilton Head Island.

Federal

The US Army Corps of Engineers (USACE)

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

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

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

The National Oceanic and Atmospheric Administration (NOAA)

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

The National Marine Fisheries Service (NMFS) implements the Magnuson-Stevens Fishery Management Act policies, monitors and establishes federal catch limits, restores coastal wetlands and shellfish habitat, and assesses natural resource damages to federal trust species. NMFS has

coordination authority over federal activities and permits that may adversely affect Essential Fish Habitat (EFH), and requires notification and consultation prior to federal permitting of certain activities, including beach nourishment. NMFS administers the requirements of the Marine Mammal Protection Act, and has joint responsibility with the US Fish and Wildlife Service for the protection and recovery of sea turtles.

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

The US Fish and Wildlife Service (USFWS)

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

The Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) is part of the Department of Homeland Security and is responsible for reducing the loss of life and property and protecting the Nation from hazards, including natural disasters. FEMA supports a risk-based program for a comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation. The Agency provides coordination, resources, and communication to state agencies during federal emergencies and is involved in promoting community resiliency and post-disaster relief. FEMA also administers the National Flood Insurance Program, a federal program enabling property owners in participating communities to purchase insurance as protection against flood losses in exchange for State and community floodplain management.

The United States Coast Guard (USCG)

The United States Coast Guard (USCG) is the federal agency responsible for protecting the nation's waterways and coastline as part of the Department of Homeland Security. The Guards' missions include promoting maritime safety, security and mobility, providing for national

defense, and protecting natural resources. USCG performs search and rescue operations in coastal areas for missing boaters, lost swimmers, and sinking vessels. Coast Guard is also involved in law enforcement on the water, particularly reckless boating, boating while intoxicated and drug interdiction. In addition, the Coast Guard has authority over the permitting of bridges. A major responsibility of the Guard is to respond to, investigate, and address oil spills in a waterbody. USCG has developed an Area Contingency Plan for each section of the State for spills and response. USCG serves as the Federal On Scene Coordinator for spills.

State

State General Assembly

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

Department of Health and Environmental Control (DHEC)

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

DHEC Office of Environmental Quality and Control (EQC)

DHEC-EQC is the state's environmental management and regulatory agency and operates eight regional offices in the state. EQC manages water and community wastewater permitting, stormwater permitting, septic system, public and private wells and other inspections, manages air emissions, brownfields, solid waste and hazardous waste, mining, beach monitoring, public swimming pools, and permitting activity for numerous environmental program areas.

DHEC Office of Ocean and Coastal Resource Management (OCRM)

DHEC OCRM is the State's coastal management agency and administers the federal coastal program, as amended and refined by the state, and protects and manages coastal public trust resources. Formerly known as the South Carolina Coastal Council, DHEC OCRM consists of a regulatory division, a coastal planning division, a science and policy division, communications

and technical resources division, and an administrative division. The regulatory program reviews and permits dock activities beach and dune permits, beach renourishment, wetland impacts, marina applications, and coastal stormwater permitting within the eight coastal counties. The Planning Division provides assistance to local communities in identifying and addressing coastal change, prepares guidance and policy documents to assist government agencies in understanding coastal issues, and manages the preparation of local comprehensive beach management plans.

Department of Natural Resources (DNR)

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

Department of Transportation (DOT)

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

Emergency Management Division

The South Carolina Emergency Management Division (EMD) is responsible for preparing for, responding to, and assisting in recovery after major disasters, storms, and other emergencies. EMD is comprised of six divisions under the supervision of a Division Director. The divisions include the division director's office, public information, preparedness and recovery, response and operations, critical incident management group (CIMG) and administrative services. EMD provides planning assistance for communities prone to emergencies such as storms or hazards, and also provides training to responders. A Regional Emergency Management Program is housed in EMD that provides on-the-ground assistance to communities in the six EMD districts. EMD also works directly with county and local governments following storms to help facilitate rebuilding.

Town

The enforceable jurisdictional boundaries of the Town generally include all of Hilton Head Island including an area extending one mile offshore as per Section 5-7-1450 of State Statutes. The Town also includes a large area of Town owned property on Jenkins Island. The jurisdictional area of the Town is defined by Section 2-1-20 of the Municipal Code.

The areas of Jenkins Island that are not included within the Town's limits are regulated by Beaufort County and include the following developments: Windmill Harbour, Blue Heron Point, Mariners Cove and the RV Resort.