

***Strategic Beach Management Plan:
Florida Keys Region***

Office of Resilience and Coastal Protection

Florida Department of Environmental Protection

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Smathers Beach at Key West, Florida in 2019, photo courtesy of Johnnie Yongue, P.E.

Introduction – Florida Keys

There are 36.3 miles of beaches in the **Florida Keys Region**, which extends from Soldier Key, just south of Key Biscayne in Dade County, to the Dry Tortugas in Monroe County as shown on Figure 1. There is a total of 13.8 miles of critically eroded beaches in this region, of which 1.5 miles have been restored and maintained.

The Florida Keys Region does not have any [inlet management plans](#). For additional beach management or project information, see the current [Critically Eroded Beaches Report](#), the [joint coastal permits](#) by county or the [local government funding requests](#) by county. Each subregion listed below will have the introductory paragraph listing miles of coastline and erosional events/ storms that have affected the subregion.

Each title within the subregion will list the coastal location, the island/ key name and the county for the critical erosion area. In addition, there will be a subregion map highlighting the critical erosion areas and the managed project areas. Finally, references to coastal reports will also be listed at the end of each subregion.

For more specific information concerning projects or strategies along Florida’s coastline, see the following links for the other six coastal regions of Florida and for background information, see the Strategic Beach Management Plan’s Introduction.

[Strategic Beach Management Plan’s Introduction](#)

[Northeast Atlantic Coast Region](#)

[Central Atlantic Coast Region](#)

[Southeast Atlantic Coast Region](#)

[Southwest Gulf Coast Region](#)

[Big Bend Gulf Coast Region](#)

[Panhandle Gulf Coast Region](#)

For additional information pertaining to beach and ocean conditions, coastal associations, educational institutions or government agencies, see the following [related coastal sites](#).

The State of Florida was significantly impacted by Hurricane Irma in 2017. For information on the 2017 hurricane season, see the “[Hurricane Irma Post-Storm Beach Conditions and Coastal Impact in Florida](#)” report. The post-storm survey data has been fully analyzed and an updated list of critically eroded

beaches is in the Critically Eroded Beaches Report.

Florida Keys Region

The **Upper Keys** subregion extends from Soldier Key to Tavernier Creek. No natural beaches exist in the Upper Keys subregion.

The **Middle Keys** subregion extends from Tavernier Creek to Pigeon Key. There are 6.0 miles of critically eroded beaches in this subregion.

The **Lower Keys** subregion extends from Pigeon Key to Key West. There are 7.8 miles of critically eroded beaches in this subregion.

The **Distal Sand Keys** subregion extends west of Key West and includes Woman Key, Boca Grande Key, the Marquesas Keys, and the Tortuga Keys. This subregion has beach erosion conditions that have not been adequately studied for inclusion in this plan.

Erosion in the **Florida Keys Region** is attributed to tropical storms and hurricanes, and to natural geomorphic changes caused by the pattern of littoral transport of sediments in this area. However, natural shoreline fluctuations are exaggerated by interaction with coastal protection structures, such as seawalls and revetments, which are located at the ends of many small pocket beaches in this region. The most erosive storms in recent years were Hurricane Andrew (1992; Upper Keys), Hurricane Georges (1998), which caused extensive property damage throughout the Keys and significant beach erosion at many locations, Hurricane Irene (1999; Middle and Lower Keys), Hurricanes Rita (2005), Wilma (2005), Tropical Storm Fay (2008) Hurricane Isaac (2012) and Hurricane Irma (2017).

Monitoring of the beaches along the Florida Keys is accomplished through vertically controlled aerial photography. There are no Department range or reference (R monuments) along the beaches of Monroe County. The Department's [interactive maps](#) have virtual (V) monuments for reference points along the Florida Keys' shoreline.

Strategies for Inlets and Critically Eroded Beaches

Middle Keys Subregion

Sea Oats Beach, Lower Matecumbe Key, Monroe County

This is a 1.3-mile segment of critically eroded beach along Lower Matecumbe Key in the City of Islamorada. Erosion threatens recreational interests and U.S. Highway 1 along Sea Oats Beach. Hurricanes Rita and Wilma (2005) caused moderate beach and dune erosion and flooding in this segment. The Florida Department of Transportation constructed a road shoulder stabilization project in 2008 that included a sloping mattress, sand fill and sea oats. Hurricane Irma (2017) severely impacted this area.

Strategy: Initiate a feasibility study to determine environmentally acceptable erosion control alternatives and monitor.

Long Key State Park, Monroe County

This is a 1.6-mile segment of critically eroded beach at Long Key State Park. Park officials have estimated shoreline recession to be as much as three feet per year since the park was opened in 1970. A rock revetment was constructed along a limited segment of shoreline in 1976; however, erosion end effects are most apparent adjacent to the structure. The park was severely impacted by Hurricanes Georges and Irene in 1998 and 1999. Beach and dune restoration was considered necessary after these storms, and a feasibility study was initiated by the Florida Department of Environmental Protection (Department or DEP). In 2005, Hurricanes Rita and Wilma combined severely impacted the park and damaged all the waterfront campsites and infrastructure. A beach restoration project has been designed to restore the beach width and to protect campsites. To be consistent with the carbonate sand composition of the native beach, the project is proposing to use calcium carbonate sand imported from the Bahamas and permitting efforts are ongoing. Hurricane Irma (2017) severely impacted this area.

Strategy: Construct a beach restoration project that provides acceptable mitigation for sea grass beds and monitor.

Curry Hammock State Park, Little Crawl Key, Monroe County

This is a 0.3-mile segment of critically eroded beach at Curry Hammock State Park, where recreational interests are threatened. In 2005, Hurricanes Rita and Wilma combined to severely impact the park. In

2005, a feasibility study was completed to investigate sand sources for state parks in the Keys, including Curry Hammock State Park. The **Curry Hammock State Park Beach Nourishment Project** was constructed via truck haul with removal of inappropriate fill and the placement of 14,450 cubic yards (cy) of sand in April 2008. An additional 600 cy of sand were added to the dune in 2011 to repair the dune system from subsequent storm damages. Approximately 150 cy was placed at Curry Hammock State Park by truck haul in early 2016. Hurricane Irma (2017) caused major beach and dune erosion and severely damaged the park facilities.

Strategy: Maintain the project through nourishment and monitor.

Coco Plum Beach, Marathon, Monroe County

This is a 1.4-mile segment of beach created by dredge and fill development in the 1950’s. Most of the eastern end of Coco Plum Beach is a City of Marathon public park. The beach sustained moderate erosion during Hurricane Georges in 1998. Following Hurricane Irene in 1999, this segment of beach was designated critically eroded where upland private development is threatened. This segment has two rock groins on the western end. Net sediment transport along this segment is to the southwest. During Hurricane Rita (2005), minor beach and dune erosion prevailed with significant overwash observed landward of the beach, and rock revetments were damaged. Hurricane Wilma (2005) inflicted moderate beach and dune erosion and additional overwash, and damaged major structures. In 2006, a dune restoration project was completed using approximately 4,100 cy of sand (Table 1). A beach management plan was developed in 2008 using hurricane recovery funds to assist in documenting future storm damage. To repair damages sustained during Hurricane Isaac, a FEMA dune nourishment using 1,117 cy of sand was completed in April 2013 (Table 1). Dunes were re-vegetated at that time. Hurricane Irma (2017) severely impacted this area.

Table 1. Coco Plum Beach Project history.

Date	Volume (cy)	Sand Source	Project Location (by V monument) *	Length (mi.)
2006	4,100	Upland	V364.4-V365.4	0.3
2013	1,117	Upland	V364.4-V365.4	0.3

*DEP’s [interactive maps](#) have virtual (V) monuments for reference points along the Florida Keys’ shoreline.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Key Colony Beach, Monroe County

This is a 0.9-mile segment of critically eroded beach fronting on the Straits of Florida in the City of Key Colony Beach, west of Coco Plum Beach. Key Colony Beach is the western of two dredge and fill developments east of Marathon and is stabilized by 15 limerock groins, which were constructed in 1958. The 4,550-foot long private beach sustained minor to moderate beach erosion during Hurricane Georges (1998) and additional erosion during Hurricane Irene (1999). The upland development sustained substantial flooding and structural damage; however, little post-storm recovery was undertaken except some minor groin repair and the return of overwash sediments. Hurricanes Rita and Wilma combined to cause minor to moderate beach and dune erosion in 2005. Hurricane Irma (2017) severely impacted this area. The total Florida Keys coastal armoring damages logged by DEP staff in October 2017 fronting the Straits of Florida was 8,725 feet.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Sunset Beach, Monroe County

This is a 0.2-mile segment of critically eroded beach along the western shoreline of the City of Key Colony Beach, northwest of Sandy Point and includes the city's public beach, Sunset Beach. Hurricane Rita (2005) inflicted minor beach and dune erosion and destroyed the rock revetment at Sunset Beach. Hurricane Wilma (2005) caused major beach and dune erosion of this segment and greater structural damages. This segment was designated as critically eroded in April 2006, where public recreational interests at Sunset Beach are threatened. Hurricane Irma (2017) severely impacted this area.

Strategy: Maintain dune project with truck haul beach nourishment and dune vegetation; monitor.

Sombrero Beach, Vaca Key, Monroe County

This is a 0.3-mile segment of critically eroded beach at the southwestern tip of Vaca Key. Sombrero Beach is a City of Marathon public park. The beach is sheltered from east and southeast wave activity. This results in the net sediment transport along the beach to be easterly into an adjacent canal on Tingler Island. The park facilities sustained major damage from storm tide flooding and landward sediment transport during Hurricane Georges (1998). Hurricanes Rita and Wilma combined to cause minor to moderate beach and dune erosion in 2005. Hurricane Wilma also damaged much of the park's infrastructure. Significant sand losses have occurred as a result of overwash and sediment transport into

canals on Tingler Island. Private interests on Tingler Island have constructed impermeable docks and groins, which should partially mitigate the loss of material into adjacent canals from Sombrero Beach. A beach management plan was developed in 2008 using hurricane recovery funds. A feasibility study was also initiated but was never completed. To repair damages sustained during Tropical Storm Isaac, a FEMA dune nourishment using 1,064 cy of sand was completed in March 2014. Dunes were also re-vegetated at that time. Hurricane Irma (2017) severely impacted this area.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Lower Keys Subregion

Little Duck Key, Monroe County

This is a 0.2-mile segment of critically eroded beach and is the site of Veteran’s Memorial Park, a Monroe County park. Hurricane Wilma (2005) caused moderate beach and dune erosion and destroyed all the park facilities. In April 2006, this segment was designated as critically eroded, threatening recreational interests at the county park. Hurricane Irma (2017) severely impacted this area.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Bahia Honda State Park, Monroe County

Bahia Honda Key has three erosional areas. Within Bahia Honda State Park, Calusa Beach (between the bridges), Loggerhead Beach (a western segment) fronting on the Straits of Florida, and a stretch of Sandspur Beach at the east end have 2.0 miles of critically eroded beaches. The most significant carbonate beaches and dunes of the Lower Keys are on Bahia Honda Key, which is part of Bahia Honda State Park. The island has 11,900 feet of beach, south of U.S. Highway 1, fronting on the Straits of Florida, and another 800 feet of beach north of the highway fronting on the Gulf of Mexico. Coastal Tech (1987) estimated a southwesterly longshore sediment transport rate of 2,050 cy/yr; however, observations over time suggest that the actual rate along the beach and nearshore is minimal. Sediment transport has been observed to occur primarily during storm events, with most of the material either being transported onshore or offshore.

Several attempts have been made to armor, build groins, and fill the eroding areas since the early 1970's. In 1989, a 100-foot-long groin and restoration was constructed at Calusa Beach, the 600-ft-long recreation beach between the Flagler Bridge and the U.S. Highway 1 Bridge. The western 3,500 feet of Loggerhead Beach fronting the Straits of Florida, also designated critically eroded, receded about five feet between 1971 and 1986. Erosion control efforts have included the placement of concrete bridge piles near the west end, riprap along the 400 to 500 feet of threatened roadway in the early 1970's, the 1988/89 construction of a 1,200-foot-long limerock revetment, and substantial sea oats planting during the 1980s and 1990s.

Hurricane Georges (1998) caused major beach and dune erosion and severely damaged the park facilities, roadway and bridge. Hurricane Rita (2005) inflicted minor beach and dune erosion at Calusa Beach and Sandspur Beach, and minor to moderate beach and dune erosion at Loggerhead Beach. Hurricane Wilma (2005) caused moderate to major beach and dune erosion at Calusa Beach and Loggerhead Beach, and minor dune erosion with beach accretion within the critically eroded portion of Sandspur Beach. Wilma also caused severe damage to the park's recreation facilities at the public beaches. A project was designed in April 2005 for Calusa Beach, but was never constructed. During post-storm recovery operations, overwash sediments were returned to the beaches. In 2005, a feasibility study was completed to investigate sand sources for State Parks in the Florida Keys, including Bahia Honda State Park. Hurricane Irma (2017) caused major beach and dune erosion and severely damaged the park facilities, parking areas and roadway.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Long Beach, Big Pine Key, Monroe County

This is a 1.1-mile segment of critically eroded beach. Hurricanes Georges (1998) and Irene (1999) caused moderate to major beach and dune erosion. In 2005, Hurricane Rita caused minor beach and dune erosion and Hurricane Wilma caused moderate to major beach and dune erosion. Hurricane Irma (2017) severely impacted the beach and dune system in this area.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Boca Chica Key, Monroe County

This is a 1.3-mile segment of critically eroded beach and a Monroe County park. Hurricanes Georges (1998) and Irene (1999) caused moderate to major beach and dune erosion and road damage in this area. In 2005, Hurricane Rita caused minor beach and dune erosion and Hurricane Wilma caused moderate to major beach and dune erosion. Rita caused overwash deposits onto Boca Chica Beach Road and Wilma destroyed much of the road. The county has abandoned much of the road and beach destroyed by the 2005 hurricanes.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Smathers Beach, Rest Beach, Higgs Beach, and South Beach, Key West, Monroe County

This is a 2.8-mile segment of critically eroded beach fronting on the Straits of Florida. The U.S. Army Corps of Engineers (USACE) and others have studied this segment of shoreline since 1951. The net annual longshore sediment transport is to the west; however, the eastern end of the shoreline along South Roosevelt Boulevard is hardened with a seawall, providing little material for transport.

Hurricane Georges damaged the South Roosevelt seawall and private property to the west of Smathers Beach in 1998. Rest Beach and South Beach sustained substantial damage. Hurricane Irene damaged the seawall again and caused additional erosion in 1999. Hurricane Rita caused minor beach erosion to Smathers Beach, Higgs Beach, South Beach, and the private beaches, and minor beach and dune erosion to Rest Beach in 2005. Hurricane Wilma caused minor beach and dune erosion to Smathers Beach, moderate to major beach and dune erosion to Berg and Kitsos Beaches, major beach and dune erosion to Rest Beach, and minor beach erosion to Higgs Beach, South Beach, and Truman Annex beaches. Wilma substantially destroyed the entire park infrastructure at Rest Beach, as well as many major structures along the southeastern shoreline of Key West. The County is planning to nourish Higgs beach to restore to pre-Hurricane Wilma (prior to 2005) mean high water line if permits and funding can be secured.

Smathers Beach, an approximately 3,300-foot long beach, has been nourished since the 1960's with sand screened from crushed limerock and also with oolitic aragonite imported from the Bahamas (Table 2). A total of 0.6 mile of shoreline at Smathers Beach was nourished in 2000 using 23,600 cy of quartz sand from an upland sand source. In 2001, an additional 4,600 cy of quartz sand were added and four groins were constructed to retain sand within the beach limits. Two-thirds of Smathers was nourished

via truck haul again in 2011, with 12,800 cy of material from an upland sand source. The nourishment of the remaining one-third of Smathers was constructed in 2013, using 4,740 cy of material from the same upland sand source. Smathers Beach was nourished again in 2019 due to long term erosion and impacts from Hurricane Irma (2017), with placement of 23,740 cy of upland sand on the beach. Also, in Key West, South Beach received 582 cy of upland sand in 2019 and Dog Beach received 95 cy of upland sand in 2019.

Table 2. Smathers Beach Nourishment Project history.

Date	Volume (cy)	Sand Source	Project Location (by V monument) *	Length (mi.)
1960	30,000	Upland	V412-V412.5	0.6
1989	16,000	Bahamas	V412-V412.5	0.6
2000	23,600	Upland	V412-V412.5	0.6
2001	4,600	Upland	V412-V412.5	0.6
2011	12,800	Upland	V412-V412.5	0.6
2013	4,740	Upland	V412-V412.5	0.6
2019	23,740	Upland	V412-V412.5	0.6

*DEP's [interactive maps](#) have virtual (V) monuments for reference points along the Florida Keys' shoreline.

Rest Beach was restored in 1995 with 2,600cy of sand from an upland mine, removal of invasive exotic plants, construction of a protective berm planted with desired dune vegetation, and public access improvements. Due to storm activity in 1995, Hurricane Georges (1998), Hurricane Irene (1999), and the 2005 hurricane season, Rest Beach was nourished with upland sand (Table 3). To repair storm damage, the City of Key West conducted emergency nourishment of the berm at Rest Beach in 2009, using 505 cy of upland sand (Table 3). Storm damage again prompted the City to conduct emergency nourishment of the dune system using 200 cy of upland sand in early 2012 (Table 3). A full nourishment for Rest Beach, using 3,800 cy of material from the same upland source, is planned for 2019/2020. The permit for the Rest Beach nourishment was issued by the Department in March 2015.

Table 3. Rest Beach Nourishment Project history.

Date	Volume (cy)	Sand Source	Project Location (by V monument) *	Length (mi.)
1995	2,600	Upland	V413	0.12
1995 (post H Opal)	699	Upland	V413	0.12
1998	1,188	Upland	V413	0.12
1999	646	Upland	V413	0.12
2006	484	Upland	V413	0.12
2009	505	Upland	V413	0.12
2012	200	Upland	V413	0.12

*DEP's [interactive maps](#) have virtual (V) monuments for reference points along the Florida Keys' shoreline.

Strategy: Maintain the projects at Smathers and Rest Beaches through nourishment using sand from approved sources; assisted recovery of storm erosion impacts to city and county public beaches above mean high water consisting of sand trucked from approved upland borrow sites; monitor.

Simonton Beach, Monroe County

This is a 0.1-mile segment of critically eroded beach located on the south shoreline of Key West fronting the Gulf of Mexico. The City of Key West's sole public beach on the Gulf of Mexico was eroded by Hurricane Wilma (2005), threatening recreational interests. The Department designated this segment as critically eroded in April 2006. Simonton Beach was nourished in 2019 with placement of approximately 226 cy of upland sand on the beach.

Strategy: Maintain beach project consisting of sand trucked from approved upland borrow sites, placed in an alongshore berm configuration above mean high water, and stabilized with plantings of native vegetation; monitor.

Fort Zachary Taylor Historic State Park, Key West, Monroe County

This is a 0.3-mile segment of critically eroded beach on the southwest tip of Key West. The site includes the 150-year old fort. Erosion undermined a revetment built by the U.S. Navy in 1964. A terminal groin and breakwater project was constructed including approximately 10,000 cy of sand in 1989. In 1998, Hurricane Georges caused major beach and dune erosion along this area leaving an eight- to nine-foot vertical escarpment along the dune line between the west breakwater and the terminal groin. Hurricane Irene caused additional erosion and damaged the west shore revetment in 1999. Hurricane Rita caused minor to moderate beach and dune erosion along the park's beach, and Hurricane Wilma caused additional minor beach and dune erosion along the beach, and moderate upland bank erosion behind the west shore revetment in 2005. Also during Wilma, one of the four detached breakwaters sustained major damage, and the west shore revetment sustained minor damage.

A sand source investigation was concluded in October 2005, recommending the use of silicate sands from an upland sand source rather than the carbonate sands originally proposed. The restoration, via truck haul, was completed in December 2008, using 3,600 cy of sand from an upland mine.

Rehabilitation of the offshore breakwaters and terminal groin were permitted in 2011. Rehabilitation is planned to be coupled with a moderate truck haul to restore the beach to the 2008 design template. The

truck haul placed approximately 200 cy at the Fort Zachary Taylor Historic State Park beach in early 2016.

Strategy: Maintain project above mean high water line; repair the west shore revetment to prevent breaching of the terminal groin and rehabilitate the breakwaters; monitor.

Regional Strategies for Beach and Inlet Management

Sponsors and Funding

The Middle Keys subregion includes the communities of Plantation, Islamorada, the [City of Key Colony Beach](#), Marathon Shores, and the [City of Marathon](#). The Lower Keys subregion includes the [City of Key West](#). These communities, as well as Monroe County and the [USACE](#), are eligible governmental entities under the beach erosion control assistance program. Monroe County and the City of Key West have participated with the Department as the local sponsors of beach management projects. In addition, the [Division of Recreation and Parks](#) manages state parks on Long Key, Little Crawl Key, Indian Key, Lignumvitae Key, Bahia Honda, and Key West. This area is located within the Florida Keys National Marine Sanctuary program. Project cost estimates and schedules may be found in [Beach Management Funding Assistance Program - Long Range Budget Plan](#).

Project Coordination

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. Opportunities in this subregion include:

1. Regional opportunities for beach management activities have not been studied at the critically eroded beaches, but would include combining management activities at several sites to reduce costs through economies of scale. A coordination of efforts between local, county, state and Division of Recreation and Parks could prove beneficial.
2. Placing beach quality sand from navigational dredging on beaches in critical need.

Environmental Protection

The protection of marine turtles, shorebirds, mangrove wetlands, seagrass beds and hardbottom and coral reef communities and their habitats are primary environmental concerns within this subregion.

The timing of construction activities has not been restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse environmental impacts to natural resources, listed species and their habitat. The Keys are located within the limits of the [Florida Keys National Marine Sanctuary](#), and include the [Lignumvitae Key Aquatic Preserve](#) and [Coupon Bight Aquatic Preserve](#). Offshore of Monroe County is prime habitat for the endangered small-tooth sawfish. Projects located within and near the aquatic preserve boundaries require additional protection, including more stringent water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions.

Sand Sources

Adequate sand sources have not been identified for this region. Sufficient upland sand supplies for Curry Hammock State Park and Fort Zachary Taylor State Historic Park have been identified. Sand has been trucked in from upland sites in Dade County for small nourishments. Maintenance dredging of navigation channels in this region is conducted infrequently. Oolitic aragonite sand from the western Bahamas Islands has been used to nourish Smathers Beach in Key West. Although foreign sand sources have not been permitted since the 1990s, the Department's Division of Recreation and Parks continues its permitting efforts to use oolitic aragonite sand from the Bahamas for restoration of Long Key State Park, which still maintains its native carbonate composition. The Northwest Channel at Key West has been identified by USACE as a sand source for beach nourishment. A comprehensive investigation of upland sand sources has been performed to locate and characterize all beach compatible sand within economic distance of the critically eroded beaches. For additional information on sand sources, the Department manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

Additional Information

The executive introduction of the state’s Strategic Beach Management Plan provides additional background information on the Department’s Beach Management Programs, and includes overviews of:

- The principles and statutes followed to help guide the state’s management strategies
- Comprehensive list of Florida’s inlets
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plan

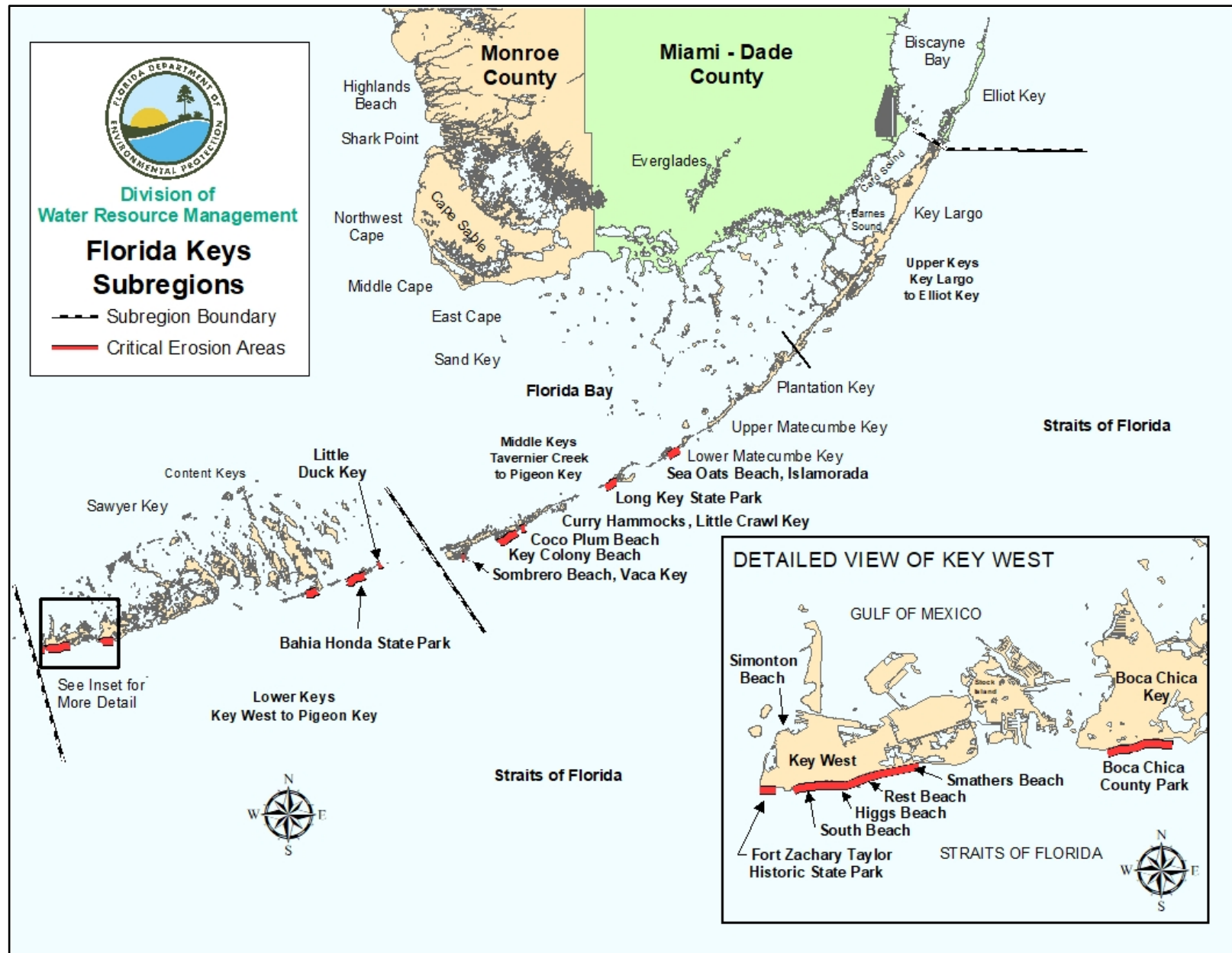


Figure 1. Map of the Florida Keys subregions. View an [interactive map](#) or [COASTS imagery](#).

References

- Clark, R.R. (1990) *The Carbonate Beaches of Florida: An Inventory of Monroe County Beaches*, Beaches and Shores Technical and Design Memorandum 90-1, Florida Department of Natural Resources, 63 p.
- Clark, R.R. (1998) *The Impact of Hurricane Georges on the Carbonate Beaches of the Florida Keys*, Florida Department of Environmental Protection Poststorm Report, 19 p.
- Clark, R.R. (2000) *The Impact of Hurricane Floyd and Hurricane Irene on the Florida East Coast*, Department of Environmental Protection Report No. BCS-00-01, 42 p.
- Clark, R.R., LaGrone, J.W., and Koch, J.L., 2005. *2005 Hurricane Season Impacts: Dade & Monroe Counties, Florida – Post-Storm Beach Conditions and Coastal Impact Report*, Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems, 85 p.
- Clark, R.R., LaGrone, J.W., and Koch, J.L., 2006. *Hurricane Wilma: Post-Storm Beach Conditions and Coastal Impact Report*, Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems, 98 p.
- Coastal Systems International, Inc., 2002. *Shoreline Condition Overview for Curry Hammock, Long Key, Bahia Honda, & Zachary Taylor State Park*, 68 p.
- Coastal Systems International, Inc., 2005. *Sand Source Review for the Proposed Truck Haul Beach Nourishment Project at Bahia Honda State Park and Fort Zachary Taylor State Historic Park, Monroe County, Florida*, 76p.
- Coastal Technology Corporation, 1987. *Shoreline and Marina Channel Renovation Alternatives at Bahia Honda State Recreation Area, Monroe County, Florida*.
- Coastal Technology Corporation, 1987. *Shoreline Renovation Alternatives at Fort Zachary Taylor State Historic Site, Key West, Florida*.
- Florida Department of Environmental Protection. *2004 Hurricane Recovery Plan for Florida's Beach and Dune System*, 65 p.

Florida Department of Environmental Protection, 2019. *Critically Eroded Beaches in Florida*, Division of Water Resource Management, 89 p.

PPB Environmental Laboratories, Inc. and Water & Air Research, Inc. 2004. *Key West Harbor Area Background Turbidity Monitoring, October 2003, Final Report*, 15 p.

Schmidt, D.V., Taplin, K.A., and Clark, R.R., 1993. *Hurricane Andrew Storm Summary and Impacts on the Beaches of Florida, Special Report*, U.S. Army Corps of Engineers, Jacksonville District, and Florida Department of Natural Resources, Division of Beaches and Shores, 103 p.

U.S. Army Corps of Engineers, 1957. *Beach Erosion Control Report on Cooperative Study of Key West, Florida*, Jacksonville District.

U.S. Army Corps of Engineers, 1983. *Feasibility Report for Beach Erosion Control with accompanying environmental impact statement for Monroe County, Florida*, Jacksonville District, February 1982 (revised April 1983).

Appendix - Acronyms

Acronyms associated with the Florida Department of Environmental Protection’s Strategic Beach Management Plan:

Coastal Associations Acronyms:

- ASBPA – American Shore & Beach Preservation Association
- FSBPA – Florida Shore & Beach Preservation Association
- DCA – Dredging Contractors of America

Federal Agencies Acronyms:

- BOEM – Bureau of Ocean Energy Management
- CBRA – Coastal Barrier Resources Act
- CHL – Coastal and Hydraulics Laboratory
- CIRP – Coastal Inlets Research Program
- CMS – Coastal Modeling System
- CSRMM – Coastal Storm Risk Management
- CZMA – Coastal Zone Management Act
- EA – Environmental Assessment
- EIS – Environmental Impact Statement
- ERDC - Engineer Research and Development Center
- FCCE – Flood Control and Coastal Emergency
- FEMA – Federal Emergency Management Agency
- FRF – Field Research Facility
- GRR – General Reevaluation Report
- HSDR – Hurricane and Storm Damage Reduction
- LPP – Locally Preferred Plan
- LRR – Limited Reevaluation Report
- MMP – Marine Minerals Program
- NGVD 29 – National Geodetic Vertical Datum of 1929
- NAVD 88 – National American Vertical Datum of 1988
- NPS – National Park Service
- NWF – National Wildlife Refuge
- NEPA – National Environmental Policy Act

- NOAA – National Oceanic and Atmospheric Administration
- NHC – National Hurricane Center
- NWF – National Wildlife Refuge
- ODMDS - Ocean Dredge Material Disposal Site
- OCS – Outer Continental Shelf
- RSM – Regional Sediment Management
- SAJ – South Atlantic District, Jacksonville
- SPP – Shore Protection Project
- SLC – Sea Level Change
- SLR – Sea Level Rise
- TSP – Tentatively Selected Plan
- USACE – United States Army Corps of Engineers
- USFWS – United States Fish and Wildlife Service
- WRDA – Water Resources Development Act

State Agencies Acronyms:

- AIWW - Atlantic Intracoastal Waterway
- BCS – Beaches and Coastal Systems
- BIP – Beaches, Inlets and Ports Program
- BMA – Beach Management Agreement
- BMFA – Beaches and Mines Funding Assistance Program
- BMP – Best Management Practices
- BSM – Bureau of Survey and Mapping
- CCCL – Coastal Construction Control Line
- COASTS – Collection of Aerials and Shoreline Trends Systems
- DEP – Department of Environmental Protection
- DMMA – Dredge Material Management Area
- DSL – Division of State Lands
- DWRM – Division of Water Resource Management
- ECL – Erosion Control Line
- EOC – Emergency Operation Center
- FAC – Florida Administrative Code

- FAR – Florida Administrative Register
- FDEM – Florida Department of Emergency Management
- FDFS – Florida Department of Financial Services
- FDOT – Florida Department of Transportation
- FHCF - Florida Hurricane Catastrophe Fund
- FIND – Florida Inland Navigation District
- FPS – Florida Park Service
- FS – Florida Statutes
- FWC – Florida Wildlife Commission
- IMP – Inlet Management Plan
- IWW – Intracoastal Waterway
- JCP – Joint Coastal Permit
- LABINS – Land Boundary Information System
- LGFR – Local Government Funding Request
- LRBP – Long Range Budget Plans
- MHWL – Mean High Water Line
- MLLW – Mean Lower Low Water
- MLW – Mean Low Water
- MOA – Memorandum of Agreements
- MOU – Memorandum of Understandings
- OCULUS – DEP’s Electronic Document Management System
- OGC – Office of General Counsel
- R – Range or Reference Survey Monument/ Survey Marker
- RCP – Resilience and Coastal Protection
- ROSSI – Regional Offshore Sand Source Inventory
- SAND – Sediment Assessment and Needs Determination Study
- SBMP – Strategic Beach Management Plan
- SOP – Standard Operating Procedures
- SOW – Scope of Work
- TAC – Technical Advisory Committee
- TIITF – Trustees of the Internal Improvement Trust Fund
- WCIND – West Coast Inland Navigation District