



**Beach Preservation Ad Hoc Committee
9:00 a.m., Tuesday, December 10, 2024
City Hall Council Chambers
1207 Palm Boulevard, Isle of Palms, SC 29451**

Agenda

1. Call to order and acknowledgement that the press and the public have been duly notified of this meeting in accordance with the Freedom of Information Act
2. Discussion of proposed recommendations regarding beach preservation policies
3. Adjournment

City of Isle of Palms, SC
Beach Preservation Ad Hoc Committee

DRAFT Report to City Council

Introduction

The Beach Preservation Ad Hoc Committee was established by the City Council on January 23, 2024. Its members include Mayor Phillip Pounds, Councilmember Scott Pierce, Councilmember Katie Miars, and island residents Andrew Vega, Dan Slotchiver, Cindi Solomon, and Tim Ahmuty. Councilmember Elizabeth Campsen was also part of the committee before her resignation from the Isle of Palms City Council in August.

The committee's operations were supported by City Administrator Desirée Fragoso, Deputy City Administrator Douglas Kerr, and Steven Traynum from Coastal Science and Engineering.

Throughout the year, the committee convened 24 times, engaging with a range of stakeholders, including representatives from state and federal permitting agencies, as well as staff and elected officials from other beach communities facing similar challenges.

The goals and task of this committee were to

- 1) Review overall beach restoration policies,
- 2) Develop recommendations for a more proactive response to beach erosion, and
- 3) Develop new and consistent funding mechanisms for future needs and projects.

Recommendations

The following recommendations are being presented to City Council for consideration:

1) Beach Restoration Policies

Recommendation	Consensus (75% +)	General Agreement (50%-75%)	Divided (Less than 50%)
Establish a minimum healthy beach volume profile per Figure 5 (approx. 600 cy per foot within the unstabilized inlet zones and 380 cy per foot elsewhere on the beach)	X		
Establish triggers for when Council should consider authorizing construction of mid-scale and large-scale projects (See exhibit X)	X		
Consider becoming a US Army Corps of Engineers (USACE) managed beach	X		
Repeal ordinance prohibiting hard erosion control structures 250' of mean high water		X	
Modify ordinance prohibiting hard erosion control structures 250' of mean high water			X
City performs emergency work (sand scraping, trucking in sand and/or placement of sandbags)		X	

Establish property owner's responsibilities for maintaining dune system within private property (Folly Beach model)	X		
Prohibit construction of new pools seaward of the maximum building line	X		
Consider seeking second opinion on emergency protective actions, future beach nourishment program and other beach protection options (groins, sandbag installation and review of emergency protective actions taken during the last 2 years)	X		

2) Proactive Response to Beach Erosion

Recommendation	Consensus	General Agreement	Divided
Accelerate and increase frequency of large-scale dredging beach nourishment projects from every 10 years to every 8 years	X		
Initiate permitting for large-scale nourishment projects two years after completion of a large-scale nourishment project	X		
Coordinate construction of large-scale nourishment projects on both unstabilized inlet zones to occur at the same time	X		
Hire full time employee tasked with overseeing resilience efforts, including beach management	X		
Establish an ongoing Beach Preservation Committee made up of 5 Residents and 2 Council members	X		
Increase the frequency of beach monitoring surveying from annual to semi annual	X		

3) New and Consistent Funding Mechanisms for Future Needs and Projects

Recommendation	Consensus	General Agreement	Divided
Establish separate accounts for 1) emergency beach restoration work, and 2) large-scale beach nourishment projects and 3) other beach related projects	X		
Consider raising revenue to cover the proposed proactive beach nourishment schedule (See funding sheet)	X		
Engage state and federal lobbyists/legislators to secure funding for beach nourishment	X		
Engage state lobbyists/legislators to amend state law to allow beach nourishment to be added to Municipal Improvements Act (MID) to allow City to establish special purpose tax district	X		
Engage state lobbyists/legislators to amend state law to provide coastal communities ability/flexibility to raise revenue for beach nourishment (i.e. real estate transfer fees or additional atax)	X		
Establish a cost-sharing plan with Wild Dunes for projects along areas that do not meet public access requirements based on WD contributions to the Beach Preservation Fund	X		

City of Isle of Palms

Analysis of Beach Preservation Fee Fund Contributions Outside Wild Dunes and Inside Wild Dunes

As of November 15, 2024

	Outside of Wild Dunes		Wild Dunes		Total	
	Number of Licenses	Gross Revenue	Number of Licenses	Gross Revenue		
Grand Total	983	91,885,773	800	80,425,862	1,783	172,311,635
Total Percentage	55%		45%		100%	
Approx 1% of Gross Revenue		918,858		804,259		1,723,116

Note:

Total gross revenue obtained from Short Term Rental licenses as indicated in the STR license application, and from hotels as specified in the business license application.

City of Isle of Palms
Analysis of Property Taxes Outside Wild Dunes and in Wild Dunes
County Data Billed for 2024

Type	Outside Wild Dunes		Wild Dunes		Total Amount Billed	Total Parcels
	Amount Billed	Parcels	Amount Billed	Parcels		
101 - RESID-SFR	2,865,053	2,216	1,095,972	917	3,961,026	3,133
120 - RESID-TWH			207,336	235	207,336	235
130 - RESID-DUP/TRI	46,528	50	1,946	1	48,474	51
160 - RESID-CNU	121,406	257	562,654	740	684,060	997
165 - CONDO COMMON		12		11		23
167 - CONDO COMMON COMM		4		2		6
250 - SPCLTY-COMMCONDO	24,671	131	6,356	12	31,027	143
451 - ROAD-ROW	-	1			-	1
460 - AUTO-PARKING		2	762	26	762	28
471 - TELEPH-COMM		1				1
500 - General Commercial	17,321	20	13,813	6	31,135	26
530 - SPCLTY-RTL	17,349	2			17,349	2
580 - SPCLTY-RST	11,210	7			11,210	7
671 - GOVT-BLDG	2,065	6			2,065	6
691 - RELIGIOUS		3				3
700 - SPCLTY-HTL			69,420	2	69,420	2
742 - HOA-PROP	70	16	42	60	112	76
750 - SPCLTY-REC	35,663	200	12,842	18	48,504	218
800 - AGRICULTURAL			23	1	23	1
900 - RES-DEV-ACRS			173	1	173	1
905 - VAC-RES-LOT	158,668	102	17,951	21	176,618	123
910 - COM-DEV-ACRS		1				1
952 - VAC-COMM-LOT	1,550	20			1,550	20
990 - UNDEVELOPABLE	3,487	110	130	83	3,617	193
Grand Total	3,305,041	3,161	1,989,420	2,136	5,294,461	5,297
	62%	60%	38%	40%		

FY25 Property Tax Budget
Variance

5,277,233

17,228

Beach Preservation Ad Hoc Committee - 11/15/2024

Emergency Erosion Protection Policy/Protocol Questions to Consider

1. Should the City be performing emergency work to protect private property?
 - a. When the City is confident that the Beach Preservation Fund will maintain an adequate balance for future large-scale renourishment projects
2. If so, is there a limit to resources available for emergency erosion mitigation?
 - a. Yes, see answer 1
 - b. The Committee supports raising revenue to be able to fund both emergency work and large-scale renourishment projects
- ~~3. If not, what are the appropriate levels of City vs. property owner participation?~~
 - ~~a. scraping after large storms?~~
 - ~~b. scraping when erosion gets within 20' of house/structure?~~
 - ~~i. Any limit to how much the city should do this? Limit determined by funds, duration or number of properties.~~
 - ~~ii. An annual budgeted amount?~~
 - ~~iii. A percentage of the Beach Preservation Fund?~~
 - ~~iv. Only when the fund forecasts available monies to fund major renourishment as well?~~
 - ~~c. Install sandbags when houses are within 20' of erosion and it appears that scraping is not sustainable or effective?~~
 - ~~i. Any limit to how much the City should do this? Limit determined by funds, duration or number of properties.~~
 - ~~ii. An annual budgeted amount?~~
 - ~~iii. A percentage of the Beach Preservation Fund?~~
 - ~~iv. Only when the fund forecasts available monies to fund major renourishment as well?~~
 - ~~d. Truck in sand when there is not enough beach to scrape and it appears that there is a chance the sand will survive?~~
 - ~~i. Considering cost is 10 times more than scraping, any limit to how much the City should do this? Limit determined by funds, duration or number of properties.~~
4. Should the City permanently modify the prohibition on hard erosion control outside of BCM's jurisdiction, but within 250' of mean high tide?

- a. If so, what is the appropriate seaward limit to how far these should be allowed?
 - i. Anywhere outside of BCM's jurisdiction?
 - ii. Just seaward of the house foundation?
 - iii. Somewhere in between?
 - b. If so, what devices should be allowed?
 - i. Anything designed by an engineer- wall, revetment, geotube, larger bags, etc.
 - ii. Others?
5. The City's code allows pools to be constructed seaward of the Ocean Blvd. maximum building line.
- a. Should this code be amended?
 - b. If so, where- all of Ocean Blvd. or just the unstabilized inlet zone?

Sec. 5-4-15. Beach regulations.

- (A) No land or building situated in whole or in part in a critical area as defined in S.C. Code 1976, § 48-39-10, as amended, shall be used, occupied, constructed, altered or moved without compliance with the State of South Carolina Beachfront Management Act (S.C. Code 1976, § 48-39-10 et seq., as amended).
- (B) No land, building or other manmade structure situated in whole or in part landward of the critical area as defined in S.C. Code 1976, § 48-39-10, as amended, but within a two hundred fifty-foot (250') radius of the mean high-water mark of the Atlantic Ocean, Breach Inlet, or Dewees Inlet, shall be used, occupied, constructed, erected, altered or moved except in compliance with the requirements set forth in this section and all other requirements set forth in this chapter or any other City ordinance.
- (1) Only beach-compatible sand may be used for any erosion control or beach renourishment activities. Sea walls, revetments, bulkheads, groins, rip-rap or any other hard erosion control structures or devices are strictly prohibited. Hard erosion control structures or devices shall include bags with a capacity greater than five (5) gallons per bag. Hard erosion control structures or devices shall not include bags containing beach-compatible sand with a capacity of five (5) gallons or less per bag, subject to the following restrictions:
- (i) No straps, soldier piles, tape, wire, rope, or any other material or device shall be used to hold together or fasten any sand bags in place;
- (ii) No filter cloth, geotextile fabrics, mats or other underlayments shall be placed in conjunction with the use of any sand bags; and
- (iii) All sandbags shall be commercially manufactured for the purpose of holding sand, be tan, off-white or white in color, and manufactured with single layer fabric, with a grab tensile strength not exceeding three hundred (300) pounds or a trapezoidal tear strength not exceeding one hundred (100) pounds.
- (2) Walkways over sand dunes which meet all of the requirements of S.C. Code 1976, § 48-39-130(D), as amended, and all regulations promulgated thereunder, shall be allowed.
- (3) Placement of sand fence and installation of vegetation in accordance with OCRM Critical Area Regulations R.30-13 shall be allowed.
- (4) Other than walkways over dunes, sand fencing and vegetation, no alteration of primary oceanfront sand dunes shall be allowed.
- (C) No person shall obstruct any beach or beach access within the City. Violation of this section shall be a misdemeanor, and punished in accordance with the provisions of section 1-3-66.
- (1) For purposes of this section, the term "beach access" means any public route of ingress to and egress from the beach.
- (2) For purposes of this section, the term "obstruct" or "obstruction" means any act or occurrence that inhibits pedestrian use of the beach access, including but not limited to the placement of vegetation or fencing within the beach access, the erection of any barrier within the beach access, any change in topography in the beach access, or the placement of any material in, on, over, under or touching the beach access that impedes or adversely affects pedestrian use.
- (3) The City shall have the right to remove all obstructions to the beach or beach accesses. In removing such obstructions, the City, its employees, contractors and agents, may enter onto private property in order to remove the obstruction.

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- (4) All costs of removal, including costs of personnel and equipment and any reimbursement for damage, shall be borne by the person placing or creating the obstruction.
 - (5) The following activities are deemed to be obstructions to beach access, and are punishable in accordance with section 1-3-66:
 - (a) It shall be unlawful to drive a vehicle on any public beach or beach access, except as follows:
 - (1) Vehicular use of the beach and beach access which is determined by the City Council to be for public health and safety purposes;
 - (2) Emergency use of the beach and beach accesses by emergency vehicles; or
 - (3) Other vehicular use of the beach or beach accesses approved by City Council.
 - (b) It shall be unlawful to park a vehicle in the public right-of-way in such a manner as to block or obstruct use of a beach or beach access.

(Code 1994, § 5-4-15; Ord. No. 1997-10, 8-26-1997; Ord. No. 2006-2, § 1, 2-28-2006; Ord. No. 2007-5, § 1, 3-27-2007)

Sec. 5-5-7. Development standards.

- (a) *Location.* Critical area, land subject to flooding by normal tides, freshwater wetlands and other areas subject to periodic inundation shall not be subdivided for residential use, unless provisions are made for satisfactory drainage in accordance with the requirements of OCRM, U.S. Army Corps of Engineers and other applicable State and Federal regulatory agencies. All drainage system shall be designed and constructed in accordance with the requirements of the OCRM and the latest edition of the County Road Code.
- (b) *Easements and dedications.*
 - (1) Easements for drainage, water or sewer, may be required along rear and side property lines where necessary. Redesign of the lot may be required to address drainage conditions.
 - (2) Drainage easements shall be provided and dedicated in accordance with the requirements of the OCRM and the latest edition of the County Road Code.
 - (3) Easements shall center along or be adjacent to a common property line where practical.
 - (4) No subdivision shall block or obstruct the natural drainage of the adjacent area.
 - (5) Existing natural drainage shall be retained or adequately relocated.
 - (6) Dedication of streets, schools sites, or recreational areas may be required.
- (c) *Lots.* Lot requirements are contained in sections 5-4-32 through 5-4-40, with special requirements and exceptions contained in additional sections of this title.
- (d) *Flood prevention.*
 - (1) All subdivision proposals shall be consistent with the need to minimize flood damage.
 - (2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
 - (3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.
 - (4) Base flood elevation data shall be provided for subdivision proposals and other proposed development which is greater than fifty (50) lots or five (5) acres.
- (e) *Other requirements.*
 - (1) All land subdivisions in the City shall be in accordance with (Class A) Urban Land Surveys as promulgated by S.C. Code 1976, title 40, ch. 22, as amended, and as described in the Minimum Standards Manual For the Practice of Land Surveying in South Carolina.
 - (2) Beachfront property. All plats for beachfront property shall contain the following note:

"The City of Isle of Palms, at the time of the approval of this plat, prohibits the issuance of any permits for any kind of hard beach erosion control structures or devices (i.e., sea walls, revetments, rip-rap, bulkheads, groins, large sandbags, etc.) within the area landward of the OCRM critical area and within a 250-foot radius of the mean high water mark of the Atlantic Ocean, Breach Inlet, or Dewees Inlet, and strongly opposes the issuance of any permits for hard beach erosion control structures elsewhere in the City.
 - (3) The Planning Commission shall approve and authorize the name of a street or road laid out within property over which it has jurisdiction. Also, it may, after fifteen (15) days' notice published in a newspaper having general circulation in the City, change the name of a street or road within the City pursuant to S.C. Code 1976, § 6-29-1200, as amended.

through zoning. Buildings here are approximately 100 ft landward of the DHEC OCRM Setback Line.

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

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

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

4.2.6 Other Regulations on Beach Management

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

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

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

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

- Prohibits development and activities that do not comply with the Beachfront Management Act.
- Prohibits construction of hard erosion control devices. Restricts sand bag installations⁶.

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

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

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

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

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

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

Title 6, Chapter 4 (Smoking)

- Prohibits smoking on public beaches and beach access points.

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

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

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

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

5.2.3 Previous Hurricane or Storm Events

A number of hurricanes and storms have affected the Isle of Palms. The last major event was Hurricane Hugo in September 1989. Hugo was a Category 4 hurricane and its storm surge covered most of the island (peak water levels ranging between 15.5 feet above MSL along the beach and 12.5 feet above MSL along the back of the island). Hurricane Hugo damaged most buildings on the island and destroyed more than 200. Beach and dune erosion during Hugo was severe.

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

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

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

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

5.3 Discussion of Erosion Control Alternatives

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

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

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

Beach Nourishment Planning Model

Assumptions

- The Beach Preservation Fee Fund nets about \$700K annually
- Frequency of large scale nourishment projects - every 8 years for 32 years
- Wild Dunes/City Cost Share – 75/25 or 50/50
- No state or federal grants
- Revenue growth assumption 2% and expenses growth assumption at 3%.
- Project cost assumes 3% increase
- Does not include cost or frequency of small-scale shoal management projects
- Maintain \$2M in Fund Balance

Beach Preservation Ad Hoc Committee
Recommendation Considerations
September 6, 2024

1. Minimum Healthy Beach Volume = 380 cy/ft from areas away from the inlets and up to 600 cy/ft within Breach Inlet- as specifically shown on Figure 5 of attached report.
2. Expected erosion rate for north end =150,000 cubic yards per year
3. Expected erosion rate for south end =70,000 cubic yards per year
4. The planned time between major offshore renourishment projects should be eight (8) years (Committee is currently analyzing 6 years as well)
5. Major offshore renourishment projects should be coordinated to be constructed on ~~and~~ both ends of the islands at the same time ~~should be renourished at the same time~~ to avoid additional mobilization costs.
- 4.6. Major offshore renourishment projects should be coordinated regionally and scheduled well in advance to avoid urgent need pricing increases .
- 5.7. Recommend increasing frequency of beach monitoring surveys from annual to semi-annual
- 6.8. Suggested trigger for when the City Council should consider implementing midscale projects (sand recycling, shoal management or other):
 - a. when beach monitoring forecasts show 1500 linear feet of beach is projected to reach the Minimum Healthy Beach Volume within the next 12 months (see page 12 of attached report)
 - b. when beach monitoring forecasts show 1500 linear feet of beach is projected to have a dune width of 75' within the next 12 months.
 - c. Always have permits in hand when this need arises
 - d. to be written
- 7.9. Suggested trigger for the City Council to consider implementing large scale offshore dredging renourishment projects:
 - a. when beach monitoring forecasts show one mile of beach is projected to reach the Minimum Healthy Beach Volume within the next 12 months
 - b. when beach monitoring forecasts show the beach is projected to have a dune width of 50' within the next 12 months.
 - b. Always have permits in hand when this need arises
 - c. to be written

10. Identify funding mechanism to cover gap between revenues and renourishment expenses .

11. Engage legislators and lobbyists to:

- a. amend the SC Code to allow beach renourishment to be added to the Municipal Improvements Act (MID Act).
- b. Provide a dedicated and permanent funding source
- c. Provide coastal communities the ability to raise revenues to cover some amount of beach renourishment. This could include an additional amount on accommodations or a real estate transfer fee or any other means deemed appropriate.

8.—

9.12. Provide information to the Wild Dunes Community Association regarding potential changes that would make the northern end eligible for public beach renourishment funding (see attached ~~ed~~ maps p. 21-22 of packet)

10.13. Analyze the pros and cons of the ~~south entire island end~~ becoming a USACE managed project

11.14. Develop strategies to guide emergency response strategies due to storm damage and to chronic erosion

Isle of Palms Beach Management Planning Scenarios

BACKGROUND

Isle of Palms (IOP) is a classic “drumstick” barrier island (Hayes 1979), with a bulbous updrift end at the northeast, and a narrow recurve spit on the southwest (Figure 1). Generally, sand comes to the island via shoal bypassing at Dewees Inlet and then migrates south, maintaining a historically stable shoreline along the central portion of the island. Sand eventually accumulates along the southern spit of the island and then into the shoals of Breach Inlet. The shorelines near the inlets are highly dynamic and are classified as “unstabilized inlet erosion zones” by SCDHEC–OCRM due to the episodic fluctuations in the shorelines. Figure 2 provides a map of the monitoring stations referenced herein.



FIGURE 1. "Drumstick" barrier island model developed from Hayes (1979).

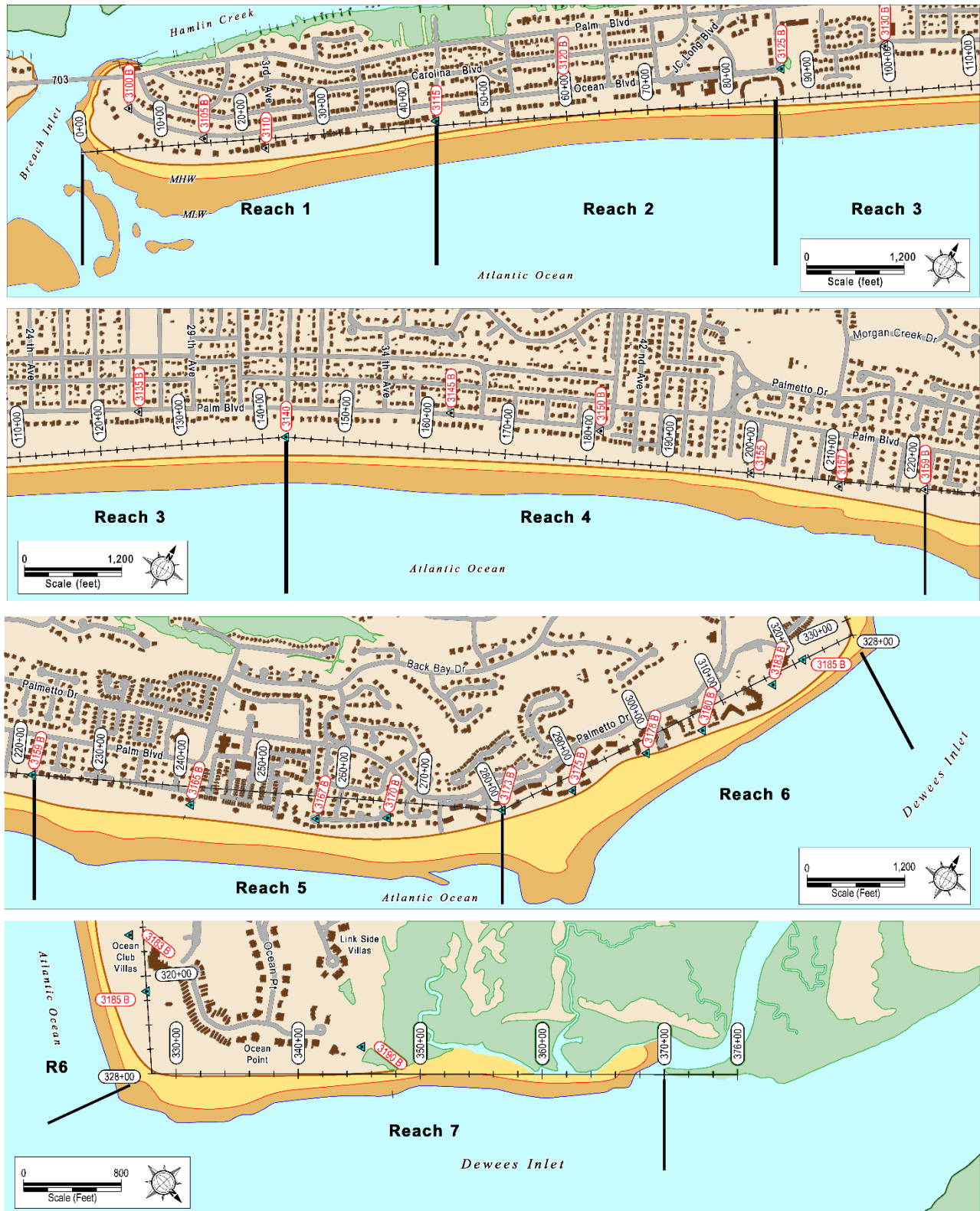


FIGURE 2. Station and reach map showing the monitoring profiles and reaches used in prior beach monitoring efforts.

Studies show that major shoal bypass events affect the eastern end of the island every ~7 years (Guadiano 1998); however, they can occur more frequently. Generally, smaller events occur on a more rapid timescale, while large events may impact the shoreline for ten years or more (ie, 1940–1950’s attachment). These attachment events create localized areas of erosion and accretion that can see the shoreline change by up to 200 feet (ft) in one year. After attachment, the trend can reverse. The episodic nature of these events makes it difficult to predict shoreline trends and requires flexible solutions to deal with short-term erosion as well as long-term solutions for large-scale sand losses. While each shoal event adds sand to the system, monitoring efforts sponsored by the City of IOP show that there is a net loss of sand from the north end. This loss necessitates periodic additions of sand via offshore nourishment projects. Most of the sand added to the north end via shoals and nourishment projects shifts downcoast to maintain the remainder of the island, while the balance is eventually recycled back into Dewees Inlet to feed future shoals.

At the south end, the beach had accreted significantly in recent history despite minor fluctuations in volume from year to year and impacts from storms; however, erosion has accelerated over the past two years leaving portions of the beach critically eroded. While the condition appears to have largely stabilized in 2024, additional erosion is still a threat, and the existing beach condition is insufficient for storm protection. In CSE’s opinion, the rapid erosion occurring in 2022–2023 is not likely to persist in the future. That being said, there has been a significant increase in storm activity since 2015, and sea level rise appears to be accelerating. These factors may increase the long-term erosion rate along the south end, turning the area from accretional to erosional. Until nature proves otherwise, the City should anticipate a need for projects to supplement the sand supply to the south end.

This summary of alternatives is prepared at the request of the City of Isle of Palms to outline information necessary to plan for long-term beach management along the beach. While the analysis focuses on the erosional areas at the ends of the island, the entire beach will be assessed. The summary outlines:

- Alternatives for a minimum healthy beach profile
- Determination of existing volume deficits
- Summary of recent erosion rates
- Discussion of triggers
- Cost opinion for restoration alternatives

The summary herein includes impacts of the beach restoration efforts at the east end including two large-scale nourishments, two shoal management projects, various emergency measures and a planned USACE project at the south end that is currently in the initial phase of construction.

BEACH VOLUME

The condition of the beach is determined by the volume of sand in the beach profile. This includes all sand between the reference line along the landward boundary and a point offshore where little or no measurable elevation change occurs. The landward boundary can be at the crest of the primary dune or from a point of significance, such as a structure. For developed beaches, the beach volume seaward of structures is typically the main interest. The seaward boundary is referred to as the “closure depth,” and is a unique depth for every beach determined by sediment grain size, tide, and wave climate. Larger waves increase the depth of closure as the higher energy allows sand to be moved at greater depths. At Isle of Palms, the typical depth of closure is ~-13 ft NAVD (note 0 ft NAVD is approximately equal to mean sea level) (Figure 3).

Within the active beach profile, sand can shift in the cross-shore direction from varying weather conditions, with larger wave periods moving sand from the dune to underwater sandbars, and calmer weather moving sand higher in the profile. Generally, summertime weather conditions promote growth of the dry sand beach, while stormier winter conditions show narrower beaches with more gentle slopes and sandbars. Beach volumes are typically reported as cubic yards of sand per linear foot of beach (cy/ft), which is the total quantity of sand between the dunes and closure depth in every linear foot of alongshore beach. Repetitive surveys measure changes in profile volume from year to year, providing total beach volume change using the average-end-area method for quantifying sand volume between monitoring stations.

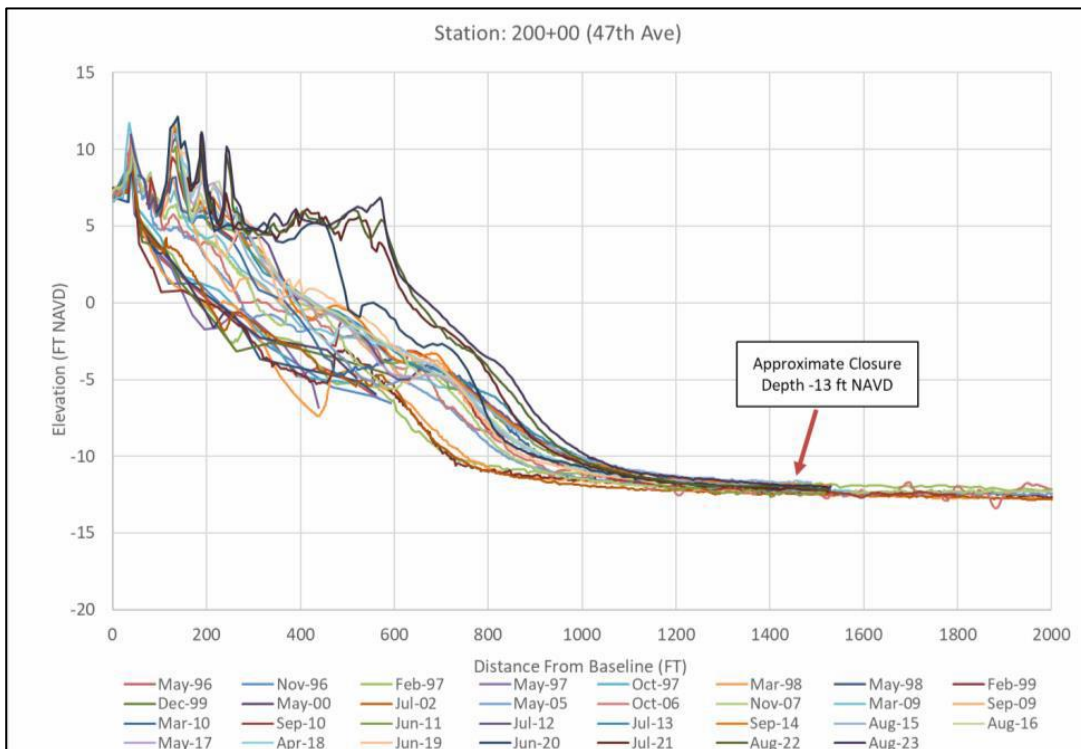


FIGURE 3. Example of "Closure Depth" at Isle of Palms. Repetitive surveys eventually overlap near -13 ft NAVD, which is considered the limit of measurable profile change.

Cross-shore movement of sand within a profile can occur without any net change in beach volume. Sand also moves alongshore due to currents and waves approaching the beach at an angle. This can result in net gains or losses of sand to a given area, resulting in accretion or erosion. Sediments arriving from adjacent sections of a shoreline often control whether a beach is gaining or losing sand, and changes to the sediment supply can create temporary or long-term changes in erosion rates. There are other mechanisms for changing beach volumes, including shoal bypassing, inlet dynamics, nourishment, and storms. When considering short and long-term changes to the beach volume, each of these factors need to be considered to determine the principal cause of erosion and identify appropriate alternatives for restoration.

Figure 4 shows a schematic of beach volumes for various beach conditions along the Isle of Palms in 2023. The profiles show the shape of the beach seaward of the structure line (0 ft on the x-axis). The beach conditions at the various locations represent areas that are eroded (Beachwood East), have a minimum healthy beach profile (9th Ave), and have an excess quantity of sand (Citadel House). The profile at Beachwood presently holds about 340 cy of sand per linear foot and is in a highly eroded condition. Note the volume would be even lower except for additional sand in the lower profile from an approaching shoal. The profile at 9th Ave holds ~380 cy/ft of sand, which is sufficient to hold a modest dune field and dry sand beach at this location. This volume can be considered the minimal healthy beach volume at this location. The profile at Citadel House holds over 700 cy/ft of sand, which is a surplus resulting from sand spreading from the nourishment projects and shoal attachments in Wild Dunes.

Comparison of beach profile volumes aids in beach management planning by providing quantitative erosion rates, determining the required volume to maintain a healthy beach profile, and providing forecasts of beach conditions. The minimum healthy beach volume is a measure of the required sand volume to maintain a healthy beach profile that includes a dune capable of withstanding a significant storm event and a dry sand beach that can accommodate seasonal weather changes without impacting the dune. This volume is site-specific based on beach slope, dune size, and closure depth. Regional closure depths are typically similar, but can be impacted by inlets and shoals, as these features alter the beach slope and wave climate reaching the beach.

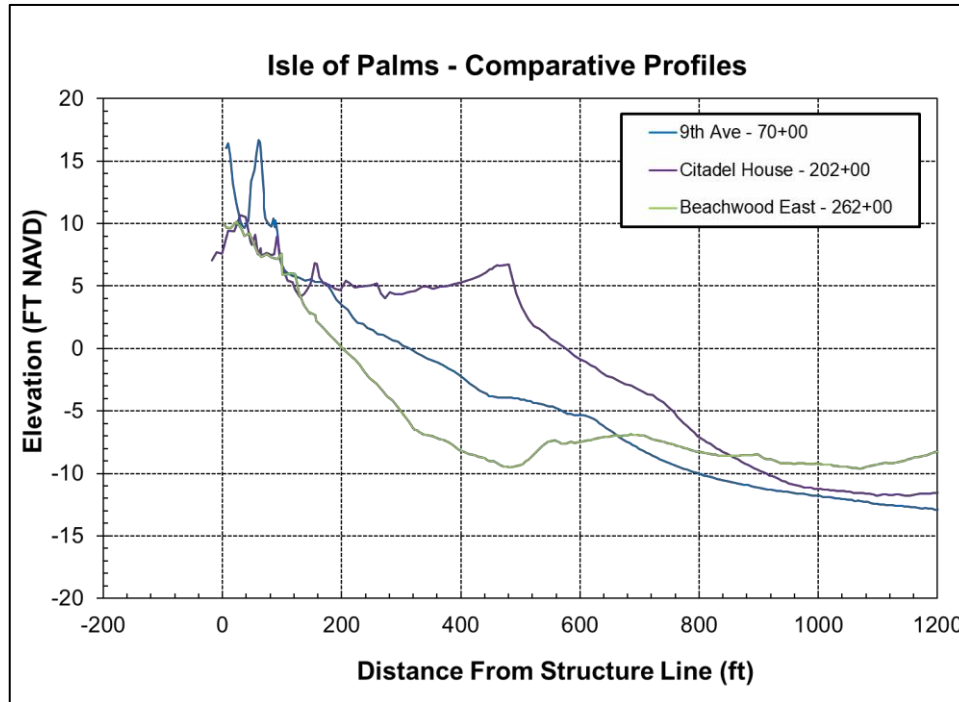


FIGURE 4. Comparative profiles along Isle of Palms showing eroded, healthy, and surplus sand volume conditions.

At Isle of Palms, the minimal healthy beach volume for the areas away from inlets is ~380–400 cy/ft when measured from the structure line to a depth of -13 ft NAVD. This value is based on the equilibrium shape of the beach, dune volume, and historical conditions.

Figure 5 shows the historical beach volume envelope for the Isle of Palms (not including the Dewees Inlet shoreline). The plot shows the maximum and minimum beach volumes measured since 2008, as well as the current volume and average volume between 2008 and 2023/2024. The plot shows the beach volume seaward of the structure line, which results in areas with greater setbacks having higher volumes, and structures that protrude beyond adjacent properties having lower volumes. This means that the volumes may not necessarily reflect erosion trends, but do show relative levels of dune protection across the island. In addition, it’s important to note that the localized erosion patterns are highly dynamic near the inlets, and areas that are relatively healthy now may quickly change due to shoal-induced erosion.

The figure includes a line showing the minimum healthy beach volume across the island. At Breach Inlet, the value is higher due to the constant presence of sand in the shallow underwater profile from the northern shoal of Breach Inlet. This increases the total sand volume in the profile measured to -13 ft NAVD. The minimum profile volume decreases at the northern tip of the island, as the sheltering effects of the Dewees Inlet delta create a steeper beach slope, reducing the volume necessary to maintain a healthy profile. Away from the inlets, the minimum healthy profile is ~380 cy/ft.

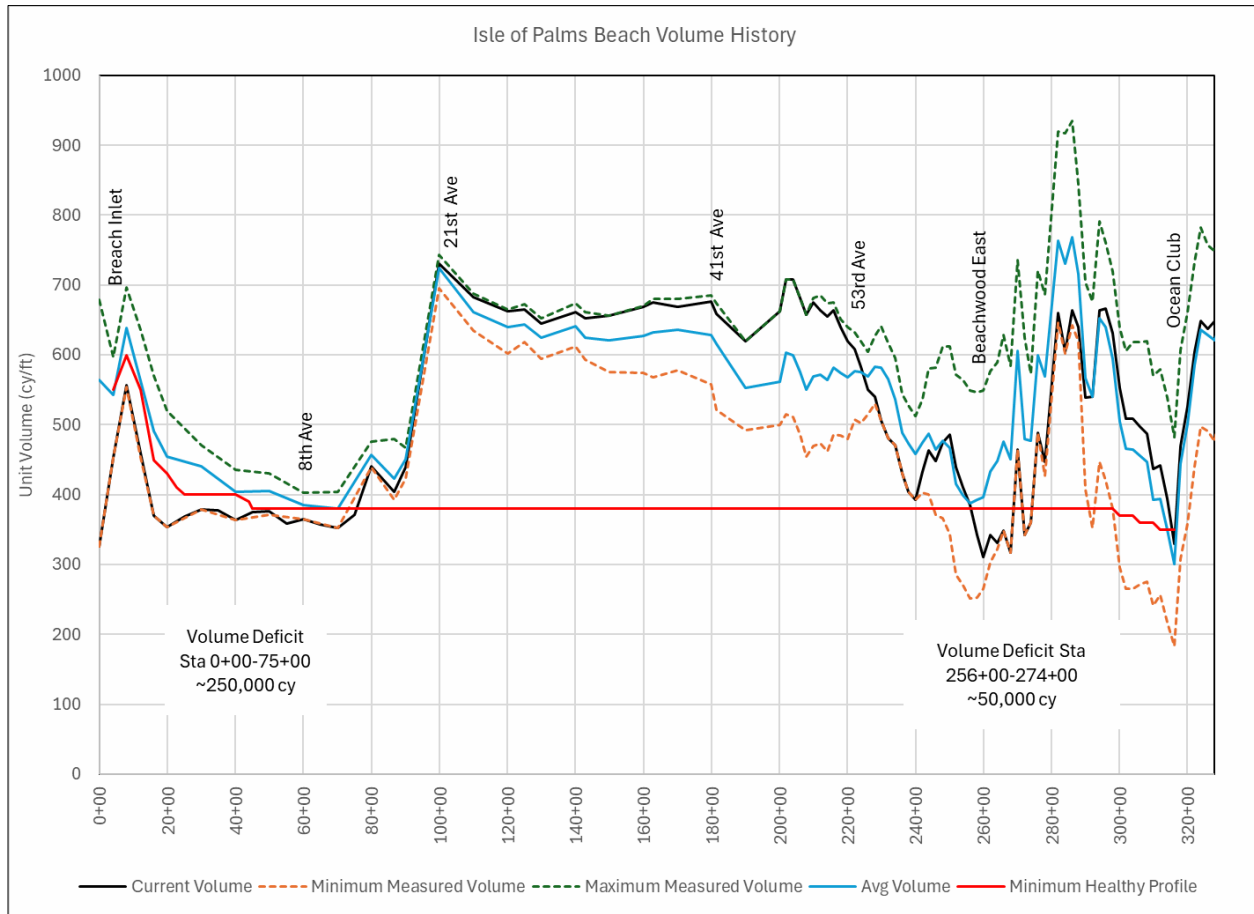


FIGURE 5. Volume summary for Isle of Palms 2009–2024. Note where the current condition (black line) is near the most eroded (orange line) or the healthiest (green line). The red line shows a site-specific minimum healthy beach volume.

The graph shows that the current beach condition is near the minimum measured volume south of the county park. The volume is near the maximum measured volume from the county park to 53rd Ave, and varies north of 53rd Ave as a result of shoal processes. Presently, ~7,500 linear feet (lf) of beach between Breach Inlet and 9th Ave is at or below the minimum ideal volume, as well as ~1,600 lf around Seagrove and Beachwood East in Wild Dunes. The station fronting the Ocean Club building is also just below the threshold volume.

Within the southern erosional area, there is a total sand deficit of ~250,000 cy to reach the minimum healthy condition at all stations. Along the northern erosional area, the current deficit is ~51,000 cy. These volumes would be required to bring the affected beach areas to the minimum healthy volume (this is commonly referred to as the “deficit volume” or “base volume”). Additional volume is required to account for future erosion over the design life of a project to protect this minimally healthy beach. This additional volume is generally referred to as “advance fill.” A beach nourishment project volume is the sum of the deficit volume and advance fill volume.

Figure 6 shows unit volumes for monitoring stations along the southern end of IOP since 2015. The bars show the beach volume for each year at each station, and the variability in erosion and accretion trends is apparent through 2021. Beginning in 2022, an erosional event was beginning, decreasing beach volumes at stations south of 50+00. The erosion accelerated from 2022–2023, leaving stations 8+00–50+00 (Breach Inlet to 6th Ave) below the healthy beach condition. Additional erosion was present in many stations as of March 2024.

The data in Figure 6 are useful in trying to predict future volume change where erosional patterns are generally consistent. It is more difficult to predict when a beach may reach the minimum healthy volume when erosion patterns vary, as in the case of the south end of IOP. Volumes fluctuate up and down from year to year before falling off dramatically in 2023. Figure 7 shows a similar graphic from beach monitoring at Edisto Beach, SC. Here, the areas represented by Reaches 1–4 are the main project area and show relatively consistent erosion trends since the last nourishment was constructed in 2017. This makes forecasting future beach conditions easier, as annual losses can be projected with more confidence.

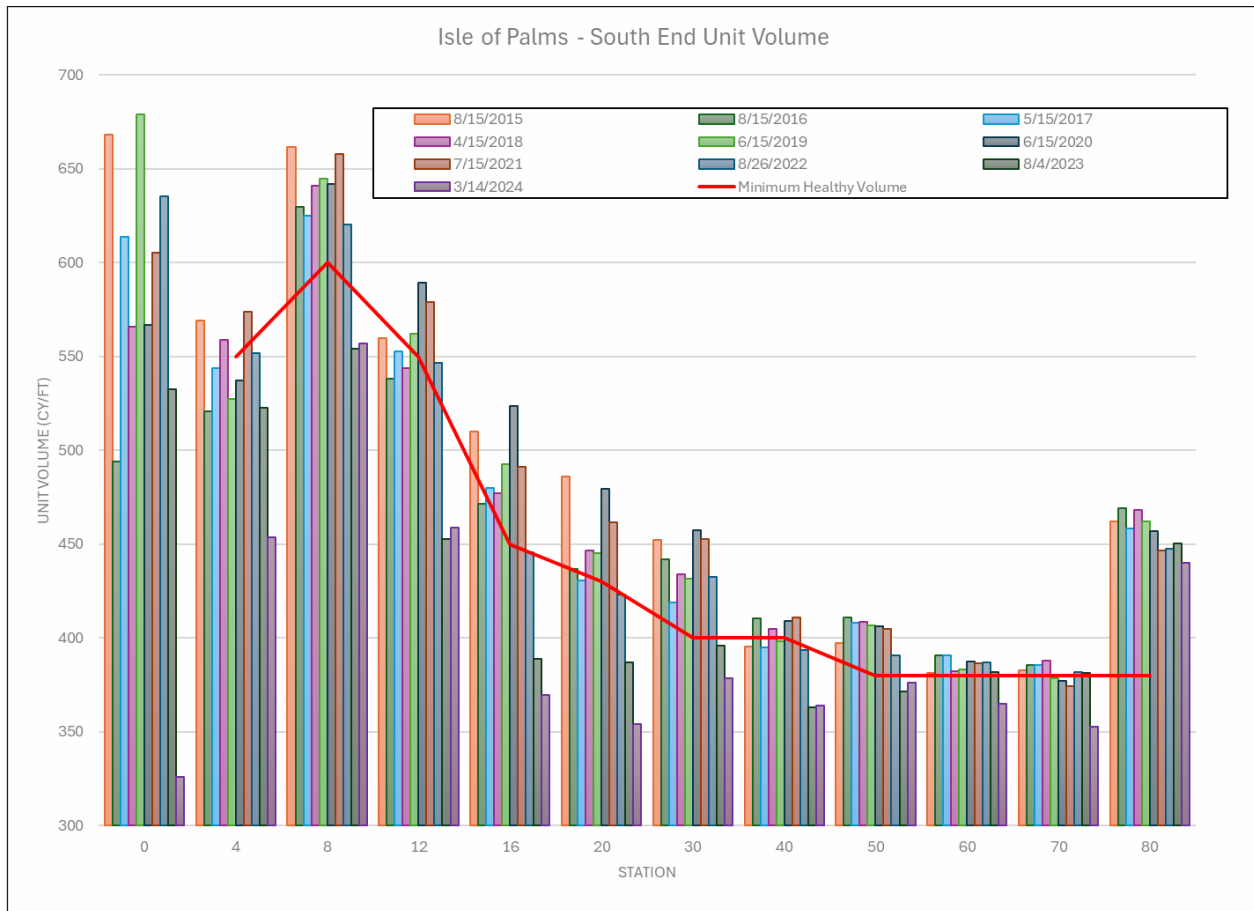


FIGURE 6. Beach Unit Volumes for the southern area of Isle of Palms. The local minimum healthy beach condition is shown in red. Note the dynamic trend south (left) of station 50 due to effects of Breach Inlet. Volume trends become more consistent away from the inlet (Stations 50–80).

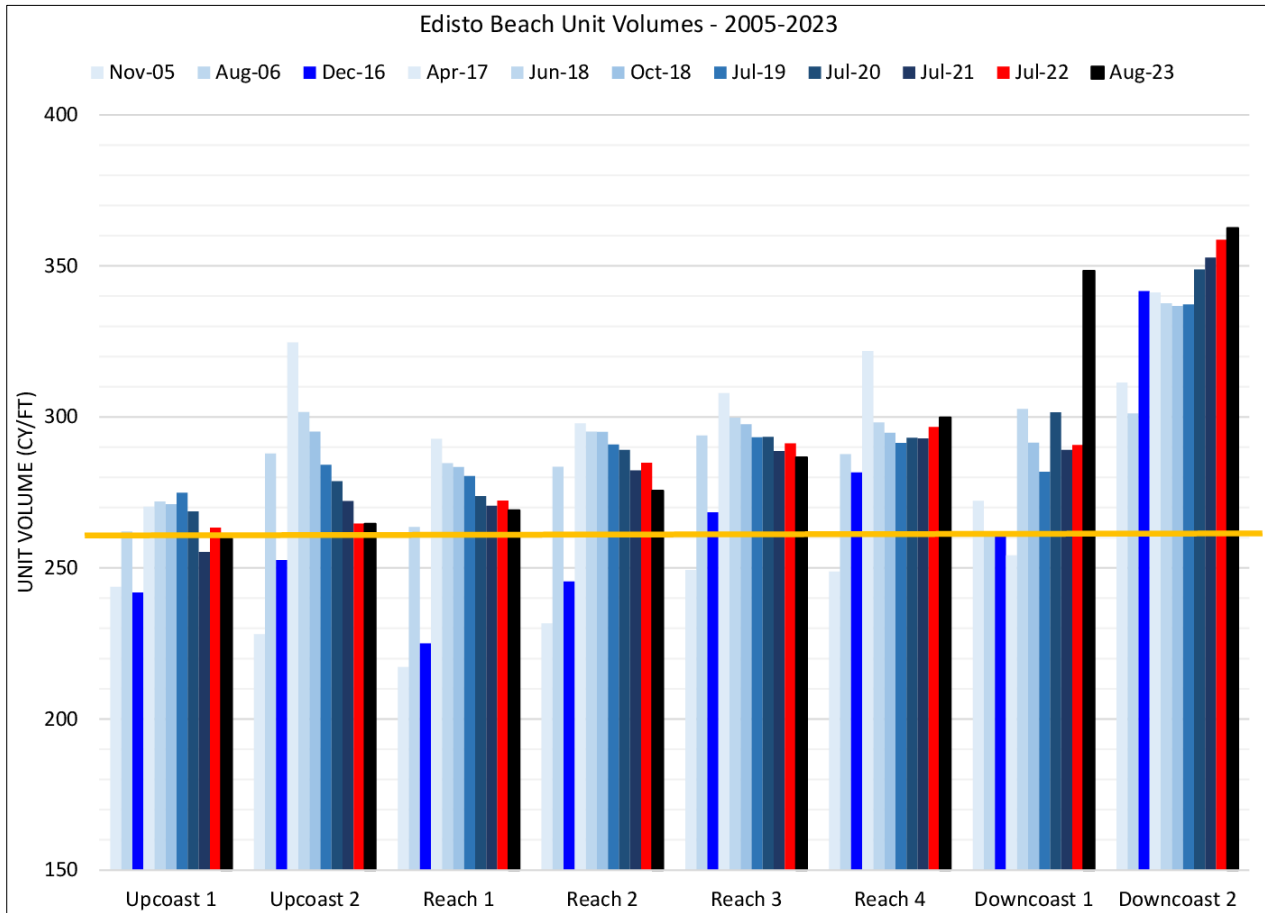


FIGURE 7. Beach Unit Volumes along Edisto Beach. Here, Reaches Upcoast 2 - Reach 3 represent the shoreline away from inlets and erosional trends are fairly consistent and predictable.

Figure 8 shows beach volumes combined into monitoring reaches used in prior reports to the City. The plot includes the minimum healthy beach volume for each reach. Assessing beach volumes by reach simplifies volume trends by eliminating highly localized spatial and temporal changes, but can mask erosional hotspots if the reaches include areas of varying beach condition. For example, Reach 5 includes healthy sections of beach north of 53rd Ave, as well as eroded sections near Beachwood East. The total volume may indicate a healthy beach, but areas within the reach may have less volume. The plot shows that Reach 1 is well under the minimum healthy volume, and Reach 2 is trending towards the minimum volume from 2018 to 2023, with a substantial decrease observed from August 2023 to March 2024, bringing the volume to below the minimum healthy condition. Along the center portions of the island (Reaches 3 and 4), the volumes have trended up since 2007, with only a few instances of annual decreases observed. At reaches 5 and 6 (north of 53rd Ave), the beach volumes decrease rapidly, then increase with nourishment (2008 and 2018). Note the volume increase from 2014 to 2016 in Reach 6 resulting from a large shoal attachment. For these reaches, a review of individual station volumes provides a better assessment of volume deficits.

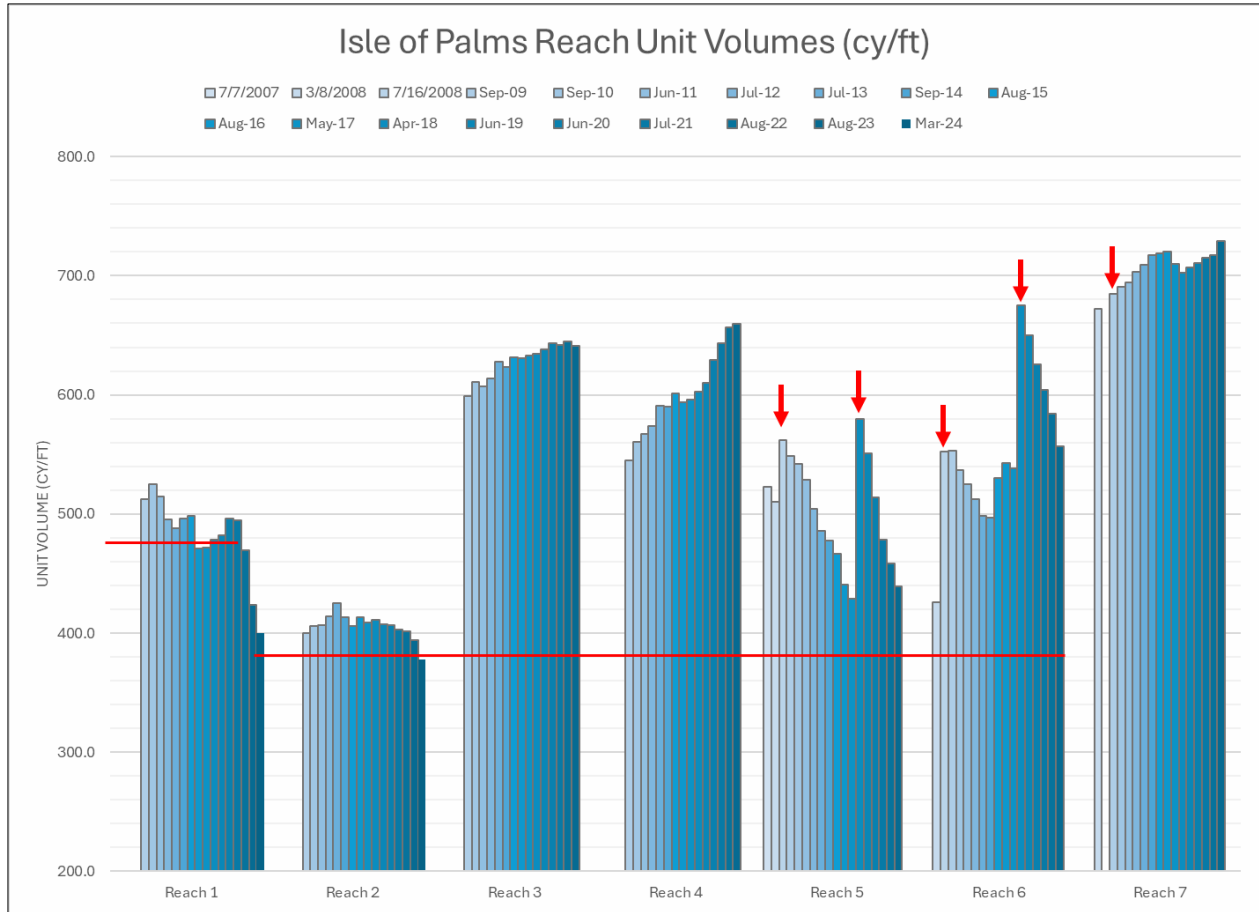


FIGURE 8. Reach Unit Volumes at Isle of Palms. Minimum healthy beach volumes are shown in the red line.

Table 1 shows erosion measures for the south end of Isle of Palms, covering the time period from 2018–2024. As mentioned previously, erosion has accelerated over the past two years, which has significantly increased erosion rates compared to historical averages. Collectively, the area south of station 80+00 has lost an average of 68,000 cy each year since 2018. This compares to a loss of 13,500 cy per year between 2009 and 2018. Should this level of erosion persist, artificial nourishment of 680,000 cy every ten years would be required to maintain the shoreline position. CSE believes the recent rates will return closer to the historical average, but with additional sea-level rise, there is a probability that future rates will be greater than the 2009–2018 rate.

At the north end, erosion has averaged ~250,000 cy per year since nourishment in 2018. This has been a very high rate of loss; however, much of the volume loss is attributable to the loss of shoal sand as well as nourishment, and much of the 2018 project area remains in good condition. A new shoal is nearing attachment, which will reduce erosion rates over the next two years. A better indication of long-term changes that include periodic shoal attachments can be estimated by comparing losses occurring from 2008–2017. This period represents the post-2008 nourishment to the pre-2018 condition and includes erosion of project sand and attachment of multiple shoal events. Over that time, reaches 5–6 lost a total of 865,000 cy of sand, or ~98,000 cy per year. This is a more realistic long-

term erosion rate for the north end; however, the variability and dependence on shoals cannot be understated.

Presently, the area between the northern end of the Grand Pavilion and Dunecrest Lane has lower volumes than the minimum healthy beach volume. The City is pursuing a shoal-management permit to mitigate erosion in this area.

TABLE 1. Volume change measures for the south end of Isle of Palms.

Station	Deficit Vol (cy/ft)	Erosion Rate 2018-2023/24 (cy/ft per year)	Annual Losses (cy/yr)	Total Deficit Vol (cy)	10-yr erosion volume (cy)
3100					
3105					
0					
4	-96.3	-17.78	-6,398	-27,860	63,976
8	-43	-14.21	-5,708	-26,820	57,082
12	-91.1	-14.33	-6,492	-34,280	64,923
16	-80.3	-18.13	-6,749	-31,260	67,491
20	-76	-15.61	-6,153	-26,875	61,535
25	-31.5	-9.00	-4,582	-13,225	45,819
30	-21.4	-9.33	-4,332	-10,825	43,319
35	-21.9	-8.00	-3,732	-14,500	37,321
40	-36.1	-6.93	-3,607	-10,375	36,071
45	-5.4	-7.50	-3,248	-2,325	32,480
50	-3.9	-5.49	-2,373	-6,225	23,730
55	-21	-4.00	-1,735	-9,050	17,351
60	-15.2	-2.94	-1,735	-9,600	17,351
65	-23.2	-4.00	-2,483	-12,650	24,828
70	-27.4	-5.93	-2,733	-9,200	27,328
75	-9.4	-5.00	-2,450	-2,350	24,498
80		-4.80	-1,608	0	16,077
Total			-67,993	-247,420	679,927

NOURISHMENT REQUIREMENTS

Beach monitoring efforts show that the total sand quantity along the Isle of Palms increased by 854,000 cy between 2008 (pre-nourishment) and 2023. This includes the placement of ~900,000 cy in 2008 and 1.6 million cy in 2018. Without these two projects, the volume change along IOP would be a net loss of ~1.7 million cy. Reaches 3, 4, (Sea Cabins Pier to 53rd Ave), and 6 and 7 (north of WD Property Owners Beach House) currently have more sand than the pre-2008 condition, while reaches 1–2 (south of Sea Cabins Pier) show a net loss of ~736,000 cy and Reach 5 (53rd Ave to Property Owners Beach House) has lost 424,000 cy.

The values above show that localized erosion trends within certain areas of the Isle of Palms can be distinct from total island changes. While the north end is more dynamic, with periods of erosion and accretion and high spatial variability within the reaches, the south end has had high erosion rates over the past two years. Despite the gains in the upcoast areas, insufficient sand has moved south from the central part of the island to compensate for losses to Breach Inlet.

To keep pace with erosion rates observed since 2018, the City will need to supplement an average of ~68,000 cy of sand per year along the south end, and ~100,000 cy of sand per year at the north end. Over a 10-year period, these loss rates translate into 680,000 and 1,000,000 cy projects, assuming there is a minimal healthy beach volume at the start of the project. Any deficit volume would be added to these values to bring all sections of the beach up to the same condition at project completion.

CSE recommends the City plan for nourishment projects at 8–10 year intervals based on current erosional trends, the performance of prior projects, and a general desire to limit the number of mobilizations and construction impacts. The City can establish triggers to aid in decision-making on when to move forward with a project; however, CSE recommends that any trigger allow for flexibility to accommodate the unique beach condition at the time, stage of shoal attachments, dredger availability, and storm impacts. Example triggers could be when a certain length of beach is projected to reach the minimum healthy beach condition within the next 12–24 months, a project would be considered. This could include separate triggers to aid in determining whether to move forward with a shoal management project, or a large-scale project at the north end.

A shoal project could be triggered by a smaller length of affected beach (on the order of 1,500–2,000 ft), with a caveat that the beach and shoal conditions meet permit conditions for buffers. A large-scale project could be triggered by a larger length of beach reaching a set volume above the minimum healthy profile. One example would be if 5,000 ft of beach at the east end averaged less than 430 cy/ft (50 cy/ft above minimum), then a large-scale project could be pursued (again, with a caveat that the specific conditions at the time would need to be considered).

The pending USACE project will add ~500,000 cy of sand to the southern end of IOP, restoring the deficit volume and providing an additional ~4 years' worth of erosion at recent rates. CSE is optimistic that this project will restore a dry sand beach to all areas south of the pier and allow for future dune growth following the City's supplemental efforts in connection with the USACE project. For cost projections, CSE assumes that the USACE project will accomplish restoring the existing deficit volume at the south end.

Nourishment costs are driven by several factors, summarized below:

- 1) Mobilization – Mobilization of an ocean-certified dredge can range from \$3–5 million or more depending on the amount of pipe required (distance to borrow area and length of shore pipe), dredge proximity, fleet availability, season, and local factors such as equipment access
- 2) Efficiency of borrow area – closer borrow areas with deeper available cuts, high-quality sand, and efficient layout can reduce costs. Reduced uncertainties about sediment quality and weather allow for better confidence and lower costs
- 3) Fill density – Larger fill volumes are typically more efficient to construct on the beach
- 4) Season – Typically, the summer season provides better weather conditions and more fleet availability; however, sea turtle concerns may impact permitting
- 5) Contract requirements – Insurance, wage, tolerances, or other requirements placed on contractors may increase costs

At Isle of Palms, prior nourishment projects have generally been bid at lower unit volumes compared to other projects in the state. For example, the unit cost for the 2018 project was \$6.15 per cy, along with mobilization of ~\$3.5 million. Comparable projects at nearby areas have cost \$11–12 per cy (Pawleys Island 2020, Edisto Beach 2017, DeBordieu Beach 2022). For planning purposes, and with considerations for inflation and higher construction prices over the past few years, CSE anticipates unit pumping costs for the next five years at IOP to be \$10–12 per cy with mobilization of \$4–5 million.

CSE recommends the City pursue a plan that allows for concurrent nourishment of the north and south ends (if necessary) to greatly reduce mobilization costs compared to separate projects. A joint project would require the dredge equipment to shift from one end of the island to the other, and would likely require a separate borrow area for the south end; however, these types of shifts are common to offshore dredging projects and would not result in a significant increase in mobilization costs. Constructing the projects separately would require full mobilization costs for each project.

Table 2 provides a 30-year example of a nourishment scenario, assuming the erosion losses discussed above. It includes a 3% inflation factor for mobilization and sand placement. CSE would recommend a contingency volume to account for storm events or higher-than-normal erosional periods to modify any particular project. In addition, should a major storm impact the beach, FEMA may reimburse the City to replace losses caused by the storm. For a combined project, CSE estimates that an initial project for both ends of the island would cost ~22 million dollars. Future project costs are shown assuming the 3% inflation.

TABLE 2. Example cost scenario for joint offshore projects at the north and south end over a 30-year period. A 3% inflation factor is assumed.

	Unit Cost	Volume (cy)	Total Cost - Year	Year 10	Year 20	Year 30
Mobilization	\$ 5,000,000.00		\$ 5,000,000.00	\$ 6,719,581.90	\$ 9,030,556.17	\$ 12,136,312.36
North End Placement	\$ 10.00	1,000,000	\$ 10,000,000.00	\$ 13,439,163.79	\$ 18,061,112.35	\$ 24,272,624.71
South End Placement	\$ 10.00	680,000	\$ 6,800,000.00	\$ 9,138,631.38	\$ 12,281,556.40	\$ 16,505,384.80
Total Project		1,680,000	\$ 21,800,000.00	\$ 29,297,377.07	\$ 39,373,224.92	\$ 52,914,321.87

Funding plans should consider potential partnerships with the state, as all the south end, and a portion of the north end would qualify for state beach nourishment assistance, if available. Note that presently, there are little remaining funds in the state’s beach nourishment fund. Additionally, private funding from the Wild Dunes community may be available for cost-sharing of work completed within Wild Dunes.

Nourishment via offshore dredge with placement at both ends of the island provides the most cost-effective, large-scale alternative for long-term beach management. These projects allow for predictable planning schedules, costs, and outcomes (with the caveat that periodic maintenance shoal projects may be required at the east end). The only other alternative for large-scale nourishment (>400,000 cy) at the south end is a project that would dredge sand from the shoals of Breach Inlet. This project could have lower pumping costs due to a shorter pump distance; however, it would still require high mobilization costs for an “ocean-certified” dredge. While altering the inlet could alleviate some of the present morphologic conditions that are drawing sand off the south end, there may be unintended consequences of large-scale alterations of the inlet to both Isle of Palms and Sullivan’s Island. Also, after permitting and funding are secured, natural changes in the inlet system may create conditions where relocating a channel is not as effective as if it were constructed today.

There may be several opportunities for modest-scale projects via beneficial use projects from the Intracoastal Waterway and/or adjacent creeks, especially at the south end. The USACE intends to place sand directly from the waterway in future years if the upcoming project proves successful and the

material is beach-compatible. This may add several hundred thousand yards of sand whenever the waterway is dredged. If federal funds are not available, the City can partner with the USACE to sponsor a project for the benefit of IOP. A modest-scale waterway project may cost \$3–6 million, with the high range due to variable volume scenarios. The upcoming USACE project will be constructed for just under \$10 million, but involves a larger volume than typical waterway dredging and involves clearing deposition basins and the double handling of material. More typical waterway dredging projects would cost less.

Should the erosion rate along the south end return to historical trends, it's likely that the beach can be maintained with infrequent smaller-scale projects. Future monitoring will be critical for determining the necessary mitigation plan. Ultimately, analysis of the unit cost for the different alternatives should be considered. Due to economies of scale, and mobilization being required for offshore projects at the east end, nourishment via offshore dredging likely has similar or lower unit cost as smaller-scale beneficial use projects (if not paid for by the USACE).

CSE recommends that the City seek permits well in advance of potential construction windows to allow for as much flexibility as possible. Permits can take 12–18 months to receive after submission of all necessary documentation. Engineering and sand searches may take 6–12 months prior to submission of an application. Initial planning for an offshore dredging permit should start 3–4 years after the last project is completed so that a permit is issued in year 5 or 6. With a 5-year life, the permit would allow for construction to occur anytime between years ~6 and 11, which allows for flexibility to account for unexpected changes in erosion trends, storm impacts, shoal attachments, and contractor availability.

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- Hayes, MO. 1979. Barrier island morphology as a function of tidal and wave regime. In S Leatherman (ed), Barrier Islands, Academic Press, New York, NY, pp 1-26.

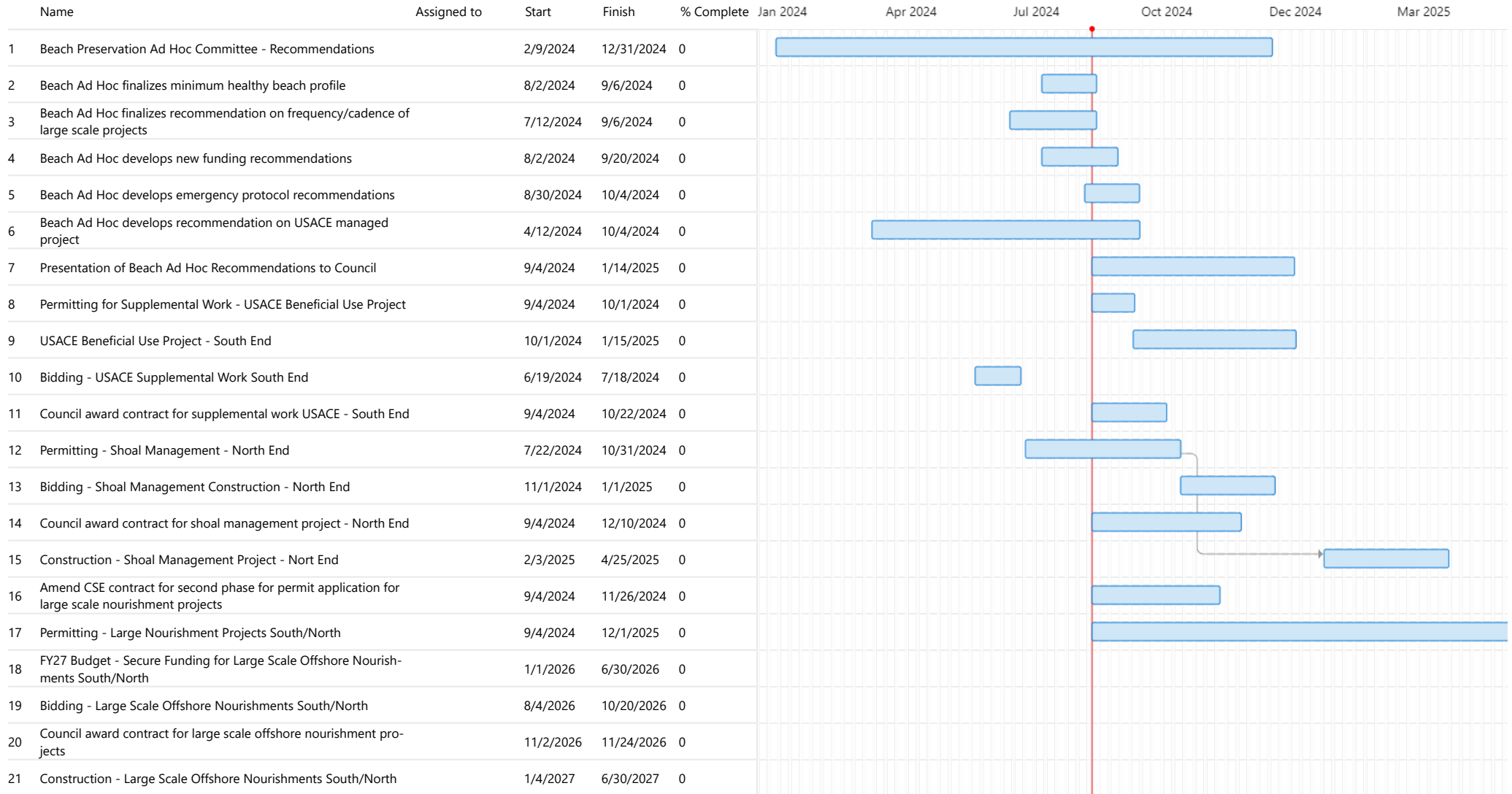
North End Annual Erosion Rate	150,000	cy/yr								
South End Annual Erosion Rate	70,000	cy/yr								
Inflation Rate	1.03									
		Interval (yr)	Volume (cy)	Cost Year 0	Year 8	Year 16	Year 24	Year 32	Total Cost (\$)	Total Sand Volume Placed
Mobilization	5,000,000	8		5,000,000	6,333,850	8,023,532	10,163,971	12,875,414	42,396,767	
North End Placement	10	8	1,200,000	12,000,000	15,201,241	19,256,477	24,393,529	30,900,993	101,752,241	6,000,000
South End Placement	10	8	560,000	5,600,000	7,093,912	8,986,356	11,383,647	14,420,463	47,484,379	2,800,000
Total Project		Total	1,760,000	22,600,000	28,629,004	36,266,366	45,941,147	58,196,870	191,633,386	8,800,000
North End Annual Erosion Rate	150,000	cy/yr								
South End Annual Erosion Rate	70,000	cy/yr								
Inflation Rate	1.03									
		Interval (yr)	Volume (cy)	Cost Year 0	Year 10	Year 20	Year 30		Total Cost (\$)	Total Sand Volume Placed
Mobilization	5,000,000	10		5,000,000	6,719,582	9,030,556	12,136,312		32,886,450	
North End Placement	10	10	1,500,000	15,000,000	20,158,746	27,091,669	36,408,937		100,159,351	6,000,000
South End Placement	10	10	700,000	7,000,000	9,407,415	12,642,779	16,990,837		46,741,031	2,800,000
Total Project		Total	2,200,000	27,000,000	36,285,742	48,765,003	65,536,087		179,786,832	8,800,000

Note volume requirements are based on the annual loss rate multiplied by the time interval between nourishments.





Beach Nourishment



Beach Nourishment

Name	Jun 2025	Sep 2025	Nov 2025	Feb 2026	May 2026	Aug 2026	Nov 2026	Jan 2027	Apr 2027
1 Beach Preservation Ad Hoc Committee - Recommendations									
2 Beach Ad Hoc finalizes minimum healthy beach profile									
3 Beach Ad Hoc finalizes recommendation on frequency/cadence of large scale projects									
4 Beach Ad Hoc develops new funding recommendations									
5 Beach Ad Hoc develops emergency protocol recommendations									
6 Beach Ad Hoc develops recommendation on USACE managed project									
7 Presentation of Beach Ad Hoc Recommendations to Council									
8 Permitting for Supplemental Work - USACE Beneficial Use Project									
9 USACE Beneficial Use Project - South End									
10 Bidding - USACE Supplemental Work South End									
11 Council award contract for supplemental work USACE - South End									
12 Permitting - Shoal Management - North End									
13 Bidding - Shoal Management Construction - North End									
14 Council award contract for shoal management project - North End									
15 Construction - Shoal Management Project - Nort End									
16 Amend CSE contract for second phase for permit application for large scale nourishment projects									
17 Permitting - Large Nourishment Projects South/North	[Bar]								
18 FY27 Budget - Secure Funding for Large Scale Offshore Nourishments South/North				[Bar]					
19 Bidding - Large Scale Offshore Nourishments South/North						[Bar]			
20 Council award contract for large scale offshore nourishment projects							[Bar]		
21 Construction - Large Scale Offshore Nourishments South/North								[Bar]	

**Isle of Palms Beach Nourishment
Potential Revenue Opportunity Summary
Draft for Discussion Only
As of September 26, 2024**

Summary of Beach Nourishment Revenue Sources by Category

Net Revenue from Beach Nourishment Fund @ 1% of ATAX (excludes Grant)	\$	732,595		\$	732,595	Based on FY2024 Revenue Forecast					
= Input		FY24 Forecast Baseline	Assumption	Input	Potential Revenue	Notes/Comments					
Sub-Total Existing IOP Funding	\$	732,595			732,595						
Increase Parking Lot Fees	\$	1,485	493	\$	732,003	15% Increase	15%	\$	109,800	Based on FY2024 Forecast, Units from LBMP	
Increase Parking Meter Fees	\$	4,049	155	\$	627,594	15% Increase	15%	\$	94,139	Based on FY2024 Forecast, Units from LBMP	
Charge for Parking in Beach District	\$	-			-	Add New Spots	300	\$	222,719	Uses 50% of ARPU In Parking Lots (not meter)	
Property Tax Increase	\$	4,336,509		\$	782,000	Rollback Assumption (3yr)	\$	782,000	\$	782,000	\$91 increase for 4%, \$166 increase for 6% per \$1M Assessment - IOP
Increase Building Permit Fees	\$	569,519		\$	569,519	15% Increase	15%	\$	85,428	Based on FY2024 Revenue Forecast	
Increase Business License Fees (2048 Licenses)	\$	2,581,385		\$	2,581,385	15% Increase	15%	\$	387,208	Based on FY2024 Revenue Forecast	
Increase Short Term Rental License Fees (1,800 Licenses)	\$	1,869,052		\$	1,869,052	15% Increase	15%	\$	280,358	Based on FY2024 Revenue Forecast	
On-Beach Business Franchise Fees	\$	-		\$	-			\$	50,000		
Establish Beach Service or User Fee per Sec 6-1-330		4610		\$	4610	\$150 fee per dwelling	150	\$	691,500	4,610 dwellings per Charleston County records 2023	
Sub-Total IOP City Council Controllable - New Revenue	\$	10,716,062						\$	2,011,652	Assumes all new revenue increases are allocated to future beach projects	
Re-allocation of existing tourism revenue for beach projects											
Allocation % of State ATAX (Non-30% \$) to Beach Preservation Fund	\$	2,371,945		\$	2,371,945	5% Allocation	5%	\$	118,597	Based on FY2024 Revenue Forecast	
Allocation % of Muni ATAX to Beach Preservation Fund	\$	2,455,590		\$	2,455,590	5% Allocation	5%	\$	122,780	Based on FY2024 Revenue Forecast	
Allocation % of Hospitality Tax to Beach Preservation Fund	\$	1,551,058		\$	1,551,058	5% Allocation	5%	\$	77,553	Based on FY2024 Revenue Forecast	
Sub-Total of Re-allocation of existing tourism revenue for beach projects	\$	6,378,593						\$	318,930		
Wild Dunes Beach Nourishment Funding	\$	-			-	TBD	0	\$	-	No formal cost share agreement in place. City covered 18% in 2008 and 14% in 2018.	
Sub-Total Wild Dunes Controllable	\$	-			-			\$	-		
REQUIRES CHANGES TO STATE LAW. SOURCES NOT CURRENTLY AVAILABLE											
Establish Statewide Beach Nourishment Fund	\$	850,000		\$	850,000	Replenish Fund/Spend	\$	850,000	\$	850,000	Requires change to state law. Based on SCPRRT grant received in FY24.
Cap % state atax used for tourism promo (currently 30%)	\$	1,094,744		\$	1,094,744	Capped at 30% Share	70%	\$	766,321	Requires change to state law	
Request Specific State Funds for IOP (PRT/Campsen \$)	\$	-		\$	1,000,000	Same Every Year	\$	1,000,000	\$	1,000,000	Based on FY2025 approved state budget allocation. Requires state action during budget process.
Additional 1% local ATAX	\$	1,758,152	(FY25 Budget 1% Muni Atax)	\$	1,758,152	1%	\$	1,758,152	\$	1,758,152	Based on FY25 Muni ATAX. Increase requires change to state law
Establish Municipal Improvement District (MID)	\$	-		\$	-	TBD	TBD	\$	-	Requires change to state law	
Real Estate Transfer Fee (Total RE sales 2023 \$457,563,099)	\$	-		\$	457,563,099	0.25%	\$	457,563,099	\$	1,143,908	Requires change to state law. Currently, Hilton Head only community w real estate transfer fee
Sub-Total State Controllable	\$	1,944,744						\$	5,518,381		
REQUIRES FEDERAL GOVMT. APPROVAL. SOURCES NOT CURRENTLY AVAILABLE											
Pursue USACE Federal Assistance	\$	-		\$	-	TBD	TBD	\$	-	Depend on either becoming federal funded beach or receiving FEMA funds after named storm (Cat. G eligibility)	
Federal Beach Nourishment Assistance - Federal Lobbyists/Legislature	\$	-		\$	-	TBD	TBD	\$	-	Need House/Senate Rep Assistance	
Sub-Total Federal Controllable	\$	-			-			\$	-		
Total of Potential Revenue Opportunity Categories - Short/Long Term	\$	19,771,994						\$	7,848,962		

Financial Model Assumptions – Pages 2-4

1. Project timing & frequency – 2026 through 2050, 8-year cadence
2. Project funding type – Cash
3. Project cost growth rate – 3% annual
4. Beach Preservation Fund expenditures growth rate – 3% annual
5. Beach Preservation Fund revenue growth rate – 2% annual
6. Wild Dunes/City cost share (mobilization/demobilization and north end project)– 55% (WD), 45% (City)
7. Beach Preservation Fund Balance – \$2M target
8. No state or federal funding/grants
9. No additional city revenue

*Pages 5-6 show fund balance projections with assumption of additional city revenue of \$1M starting in 2026 with a 2% growth rate starting in 2028 +

City of Isle of Palms, SC
 Beach Renourishment Planning Model
 Dashboard

Projects Under Consideration														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
On/Off	Description	Current Amount	Timing (FY)	Inflation Rate	Inflated Amount	City %	Wild Dunes %	Grant %	Net City Funding Amount	Funding Type	Structure	Term	Principal Deferral	Rate
On	Project 1								-					
On	Large Offshore Beach Inlet	5,600,000	2026	0.00%	5,600,000	100.00%	0.00%	0.00%	5,600,000	Cash	Level D/S	8	0	4.00%
On	Large Offshore MOB / DEMOB	5,000,000	2026	0.00%	5,000,000	45.00%	55.00%	0.00%	2,250,000	Cash	Level D/S	8	0	4.00%
On	Wild Dunes Offshore	12,000,000	2026	0.00%	12,000,000	45.00%	55.00%	0.00%	5,400,000	Cash	Level D/S	8	0	4.00%
Off									-					
On	Project 2								-					
On	Large Offshore Beach Inlet	5,600,000	2034	3.00%	7,093,912	100.00%	0.00%	0.00%	7,093,912	Cash	Level D/S	8	0	4.00%
On	Large Offshore MOB / DEMOB	5,000,000	2034	3.00%	6,333,850	45.00%	55.00%	0.00%	2,850,233	Cash	Level D/S	8	0	4.00%
On	Wild Dunes Offshore	12,000,000	2034	3.00%	15,201,241	45.00%	55.00%	0.00%	6,840,558	Cash	Level D/S	8	0	4.00%
Off									-					
On	Project 3								-					
On	Large Offshore Beach Inlet	5,600,000	2042	3.00%	8,986,356	100.00%	0.00%	0.00%	8,986,356	Cash	Level D/S	8	0	4.00%
On	Large Offshore MOB / DEMOB	5,000,000	2042	3.00%	8,023,532	45.00%	55.00%	0.00%	3,610,589	Cash	Level D/S	8	0	4.00%
On	Wild Dunes Offshore	12,000,000	2042	3.00%	19,256,477	45.00%	55.00%	0.00%	8,665,415	Cash	Level D/S	8	0	4.00%
Off									-					
On	Project 4								-					
On	Large Offshore Beach Inlet	5,600,000	2050	3.00%	11,383,647	100.00%	0.00%	0.00%	11,383,647	Cash	Level D/S	8	0	4.00%
On	Large Offshore MOB / DEMOB	5,000,000	2050	3.00%	10,163,971	45.00%	55.00%	0.00%	4,573,787	Cash	Level D/S	8	0	4.00%
On	Wild Dunes Offshore	12,000,000	2050	3.00%	24,393,529	45.00%	55.00%	0.00%	10,977,088	Cash	Level D/S	8	0	4.00%
Off									-					
Off									-					
Off									-					
Off									-					
Off									-					
Off									-					

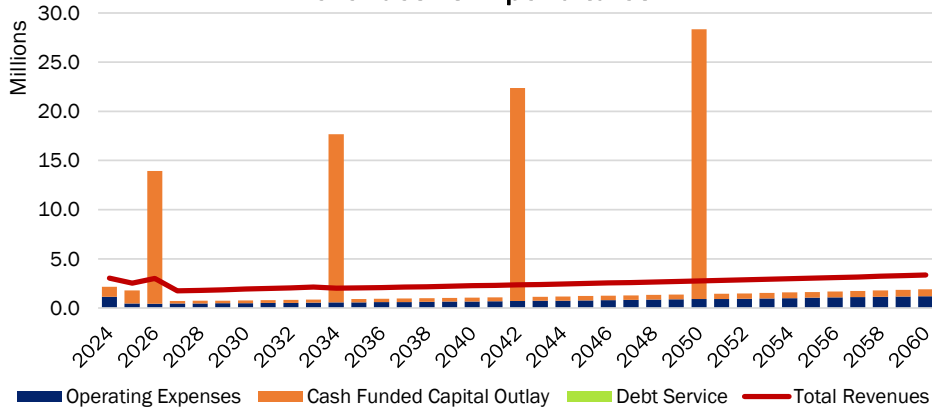
City of Isle of Palms, SC

Beach Renourishment Planning Model
Dashboard

	Fund Balances		Debt Service Coverage
Target		2,000,000	1.00x
16	17	18	19
FY	Annual Surplus (Deficit)	Fund Balance	Debt Service Coverage
Total			
2024	868,787	9,214,510	-
2025	732,596	9,947,106	-
2026	(10,947,055)	(999,948)	-
2027	1,033,338	33,389	-
2028	1,060,799	1,094,188	-
2029	1,101,086	2,195,275	-
2030	1,142,433	3,337,708	-
2031	1,184,861	4,522,569	-
2032	1,228,390	5,750,959	-
2033	1,273,042	7,024,000	-
2034	(15,655,580)	(8,631,580)	-
2035	1,142,942	(7,488,638)	-
2036	1,156,773	(6,331,865)	-
2037	1,170,610	(5,161,255)	-
2038	1,184,446	(3,976,809)	-
2039	1,198,270	(2,778,539)	-
2040	1,212,075	(1,566,464)	-
2041	1,225,851	(340,613)	-
2042	(20,022,771)	(20,363,383)	-
2043	1,253,279	(19,110,105)	-
2044	1,266,909	(17,843,196)	-
2045	1,280,468	(16,562,728)	-
2046	1,293,946	(15,268,782)	-
2047	1,307,329	(13,961,453)	-
2048	1,320,604	(12,640,849)	-
2049	1,333,760	(11,307,089)	-
2050	(25,587,742)	(36,894,831)	-
2051	1,359,652	(35,535,179)	-
2052	1,372,358	(34,162,821)	-
2053	1,384,885	(32,777,936)	-
2054	1,397,214	(31,380,722)	-
2055	1,409,329	(29,971,393)	-
2056	1,421,211	(28,550,182)	-
2057	1,432,842	(27,117,340)	-
2058	1,444,201	(25,673,139)	-
2059	1,455,269	(24,217,870)	-
2060	1,466,024	(22,751,846)	-

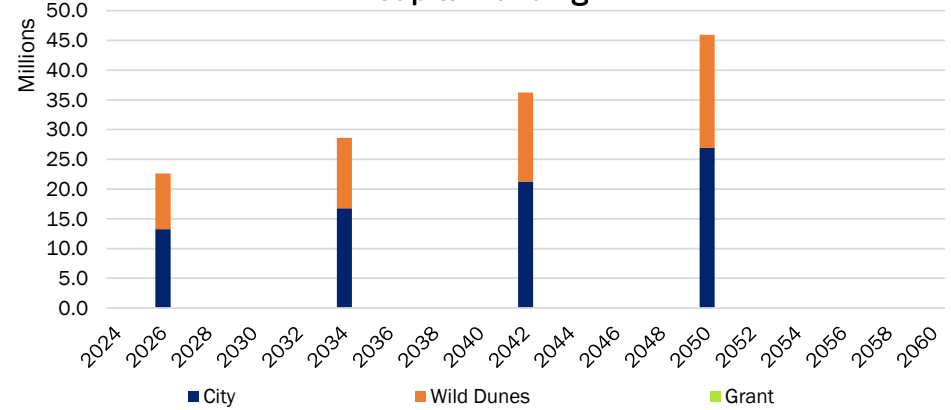
Start Year 2024
End Year 2060

Revenues vs Expenditures



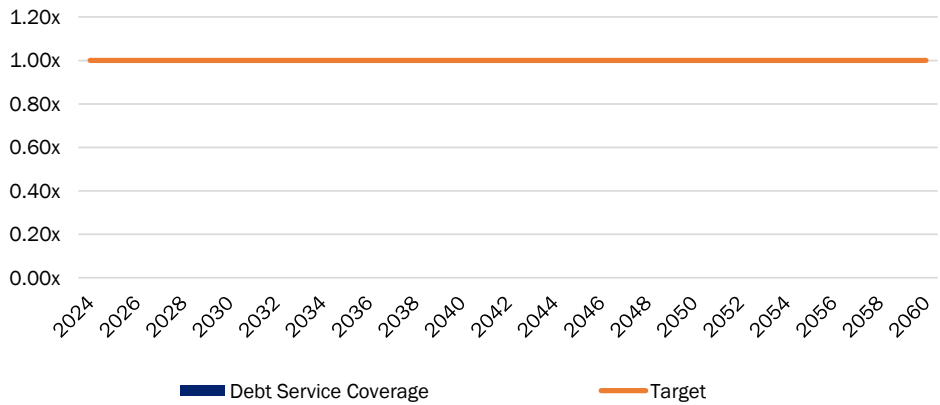
Start Year 2024
End Year 2060

Capital Funding



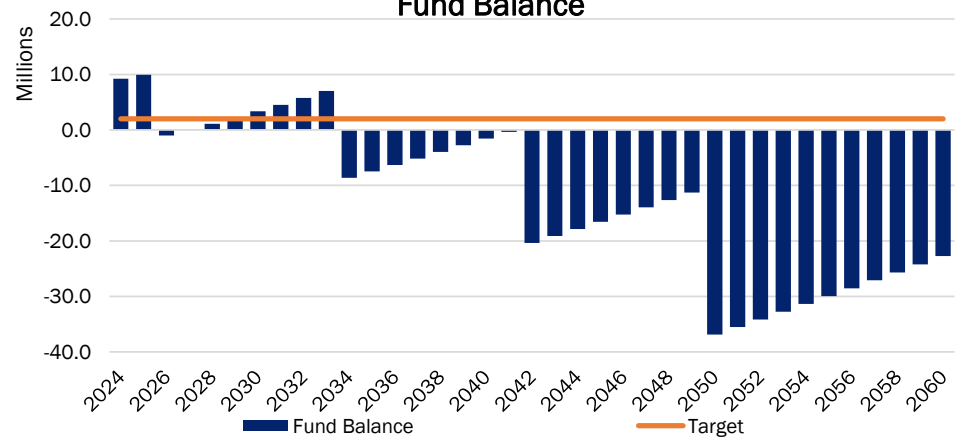
Start Year 2024
End Year 2060

Projected Debt Service Coverage



Start Year 2024
End Year 2060

Fund Balance



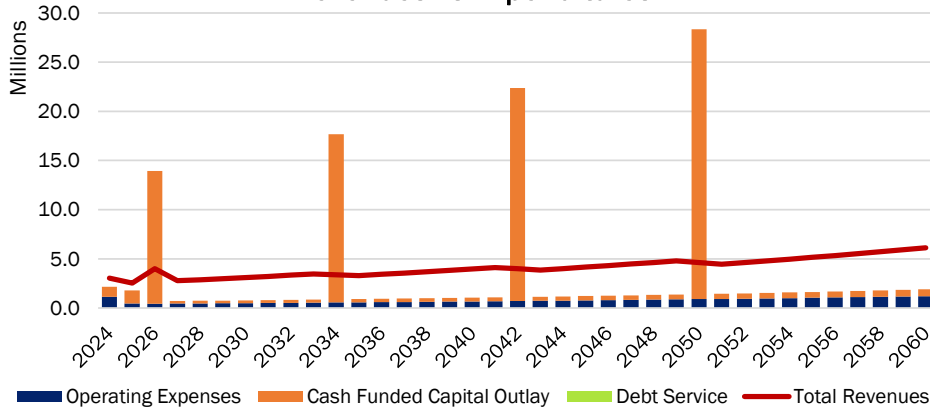
City of Isle of Palms, SC

Beach Renourishment Planning Model
Dashboard

	Fund Balances		Debt Service Coverage
Target		2,000,000	1.00x
16	17	18	19
FY	Annual Surplus (Deficit)	Fund Balance	Debt Service Coverage
Total			
2024	868,787	9,214,510	-
2025	732,596	9,947,106	-
2026	(9,947,055)	52	-
2027	2,058,756	2,058,807	-
2028	2,144,184	4,202,992	-
2029	2,232,211	6,435,203	-
2030	2,322,905	8,758,108	-
2031	2,416,333	11,174,441	-
2032	2,512,569	13,687,010	-
2033	2,611,682	16,298,692	-
2034	(14,280,763)	2,017,929	-
2035	2,393,982	4,411,911	-
2036	2,491,562	6,903,472	-
2037	2,592,062	9,495,534	-
2038	2,695,556	12,191,090	-
2039	2,802,120	14,993,210	-
2040	2,911,833	17,905,043	-
2041	3,024,773	20,929,816	-
2042	(18,387,118)	2,542,698	-
2043	2,722,458	5,265,156	-
2044	2,832,118	8,097,274	-
2045	2,945,005	11,042,279	-
2046	3,061,198	14,103,478	-
2047	3,180,779	17,284,257	-
2048	3,303,831	20,588,087	-
2049	3,430,438	24,018,526	-
2050	(23,710,515)	308,011	-
2051	3,012,890	3,320,901	-
2052	3,133,649	6,454,550	-
2053	3,257,895	9,712,445	-
2054	3,385,713	13,098,158	-
2055	3,517,186	16,615,344	-
2056	3,652,403	20,267,747	-
2057	3,791,450	24,059,197	-
2058	3,934,417	27,993,614	-
2059	4,081,398	32,075,012	-
2060	4,232,484	36,307,496	-

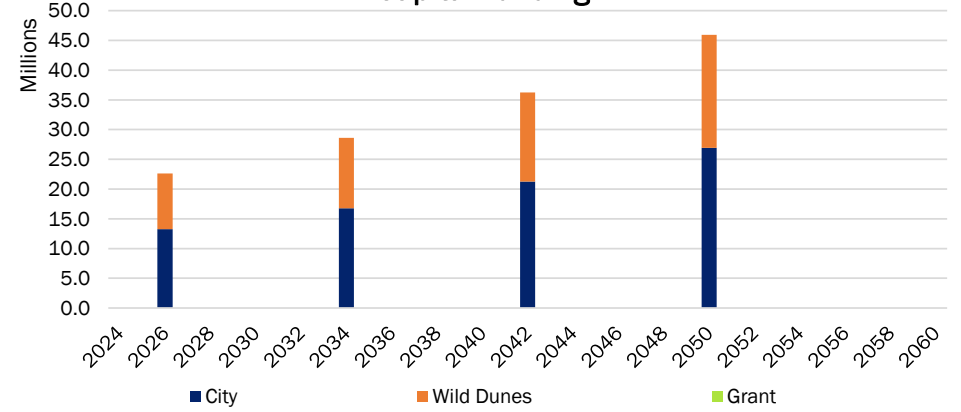
Start Year 2024
End Year 2060

Revenues vs Expenditures



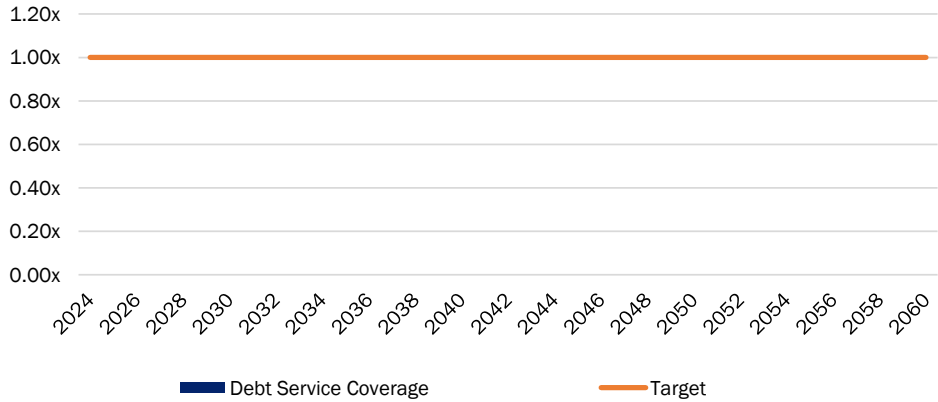
Start Year 2024
End Year 2060

Capital Funding



Start Year 2024
End Year 2060

Projected Debt Service Coverage



Start Year 2024
End Year 2060

Fund Balance

