

Appendix

- A. HHI beach width summary – page 19 2022 Monitoring Report
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Appendix A

Table 2.1: Hilton Head Island beach width as of April 2022. Areas highlighted red indicate a narrow beach width (< 200 ft).

	Monument Range	Alongshore Distance from Lands End (ft)	April 2022 Beach Width
Whole Island	Calibogue Sound	HI00A	91.3
		HI00B	228.5
		HI01	409.6
		Average	243.1
	South Beach	HI01	409.6
		HI01A	351.4
		HI01B	344.5
		HI01C	329.4
		HI02	362.1
		HI02A	370.2
		HI03	414.3
		HI04	211.1
		Average	349.1
	South Island	HI04	211.1
		HI05	261.9
		HI06	296.8
		HI07	290.3
		HI08	297.9
		HI09	291.3
		HI10	316.9
		HI11	335.6
		Average	287.7
	Central Island	HI11	335.6
		HI12	362.2
		HI13	384.8
		HI14	219.4
		HI15	198.1
		HI16	285.3
		HI17	306.5
		HI18	336.2
		HI19	346.2
		HI19A	269.6
		HI20	293.0
		HI21	332.1
		HI22	274.7
		HI23	263.8
		HI24	285.3
		Average	299.5
	Continued		
Whole Island	North Island	HI24	285.3
		HI25	341.9
		HI26	299.9
		HI27	372.2
		HI27A	408.7
		HI27B	430.7
		HI28	569.5
		Average	386.9
	The Heel	HI28	569.5
		HI28A	564.0
		HI28B	512.2
		HI28C	455.1
		HI28D	436.9
		HI29	388.0
		HI29A1	527.6
		HI29A2	779.8
		HI29A3	734.3
		HI29B	640.5
		HI29C	719.1
		HI29D	786.8
		HI29E	673.3
		Average	599.0
	Port Royal Plantation	HI29E	673.3
		HI29F	627.2
		HI30	484.8
		HI30A	425.9
		HI31	464.9
		HI31A	460.6
		HI31B	485.0
		HI32	497.8
		Average	514.9
	Lands End Groin to Fish Haul	Average	400.8
		Minimum	91.3
		Maximum	786.8

Appendix B - IOP 2024 report

6.0 SUMMARY & RECOMMENDATIONS

This report describes beach condition changes occurring at Isle of Palms from 2023 to 2024. Overall, the island lost ~43,200 cy (1.2 cy/ft) of sand from August 2023 to September 2024. Within the 2018 project area, the island lost ~109,600 cy (10.1 cy/ft) over the past year and has lost ~1.53 million cy since project completion. This represents more than 95% of the 2018 project volume. Since project completion, the project area has seen higher erosion rates compared to the previous post-project monitoring period (2009–2017). From 2009 to 2017, annual losses in Reaches 5 and 6 measured ~100,000 cy/yr, while from 2018 through 2024, they measured ~250,000 cy/yr.

There are several dynamics that would drive a multi-year increase in erosion rates, as have been observed. First and foremost is the relatively high frequency of moderate-strength storm impacts over the same period. More than a dozen named tropical cyclones, un-named tropical cyclones, and non-tropical nor'easter-type storms have impacted the Isle of Palms since Hurricane *Matthew* in 2016. The short windows of relatively quiet conditions between these storms hamper post-storm recovery in the beach and dune system, which increases the vulnerability to erosional losses during subsequent storm events (Houser and Hamilton 2008).

Second, an ongoing shoal bypass event in Reaches 5 and 6 has resulted in rapid, localized erosion around Beachwood East and Ocean Club due to wave refraction around the approaching shoal. Changes in the shoals of Breach Inlet, along with storm impacts, have also triggered nearly 330,000 cy of erosion between 2021 and 2024.

Third, sea level rise has accelerated around the Charleston area since 2010 such that year-to-year water level increases from 2010 through 2024 are an order of magnitude higher than those observed from 2000 through 2010. While the increase in water levels does not necessarily trigger beach erosion on its own, increased water levels coincident with a series of storm impacts – noted above – allow storm waves to erode higher on the profile and do more damage than under a scenario with lower water levels.

With the ongoing shoal bypass event at Dewees Inlet, reduced dune volumes at Breach Inlet, and ever-increasing flood hazards due to sea level rise, the City certainly has a number of active concerns with regard to beach (and coastal) planning. CSE recommends the City continue its current efforts to pursue various restoration efforts, including short-, mid-, and long-term plans. This includes continued maintenance of emergency protective measures, pursuit of a shoal-management permit and project, and expedited implementation of a long-term nourishment project. The USACE beneficial use project at the south end (if completed to design) will restore all of the sand volume lost



Appendix C - Executive Summary HHI 2022 Monitoring Report

Town of Hilton Head Island, SC 2022 Annual Beach Monitoring Report

October 2022

EXECUTIVE SUMMARY

This report summarizes April 2022 beach conditions and changes from April 2021 to April 2022 along the sand shoreline of Hilton Head Island, South Carolina. The results discussed herein are principally related to island-wide beach changes experienced between the approximately 3.5 and 4.5-years following completion of the 2016 Island-wide Beach Renourishment Project and the 2017 South Island Emergency Beach Fill Project, respectively. This report serves as the fifth major discussion of the island's shoreline conditions and changes since the 2016 Annual Beach Monitoring Report (Olsen Associates, Inc., 2017), which analyzed the period *prior to* construction of the 2016 project.

The 2016 project was a renourishment of previously restored and maintained beach segments along the island's sand beach. This project placed approximately 2,855,800 cubic yards (cy) of offshore-dredged, beach compatible sand along about 8.1 miles of the shoreline between June-December 2016. During this project's construction period, the island was impacted by Hurricane Matthew (October 2016), which necessitated post-storm reparations and additional sand placement (included in the 2,855,800 cy total). Subsequently, the 2017 South Island Emergency Beach Fill Project was constructed to address erosional impacts resulting from Hurricane Matthew along the southern end of the island. This project placed about 709,500 cy of offshore sand along 2.3 miles of shoreline between roughly Brown Pelican Road and Duckhawk Road, from August-November 2017. During construction of this project, Hurricane Irma impacted the island (September 2017), which resulted in additional sand being placed during the same project period (included in the 709,500 cy total).

Current beach conditions, as referenced in this report, are represented by the April 2022 survey, while the April 2021 survey represents conditions that existed approximately one year prior. The June 2018 survey generally represents the post-construction beach condition immediately following completion of both the 2016 Island-wide Beach Renourishment Project and the 2017 South Island Emergency Beach Fill Project (due to semi-annual beach survey timing). Accordingly, this report includes:

- (1) a summary of current beach conditions as of April 2022;
- (2) a summary of shoreline and volumetric changes that occurred along the sand beach of Hilton Head Island between April 2021 and April 2022;
- (3) a summary of shoreline and volumetric changes that occurred along the sand beach of Hilton Head Island between June 2018 (post-construction) and April 2022;
- (4) a summary of shoreline position as of April 2022 compared to a previously defined Recommended Minimum Beach Condition (RMBC); and
- (5) a summary of particular areas of interest, which include: Lands End, South Beach, The Heel, Fish Haul Creek, and Joiner Bank.

To monitor the condition of the island's sand beach, the Town of Hilton Head Island established the use of permanent survey transects at reference monuments ("stations") along the island's shoreline. Since 1986, the island's monitoring stations have been surveyed at least twice annually (late spring/early summer and fall) and have been expanded from an original 32 stations to a total of 74 stations. The monitored area of the island is the 16.6-mile sand beach between the Lands End Groin at Braddock Cove Creek on the Calibogue Sound shoreline and the southern end of the Hilton Head Plantation rock revetment along the Port Royal Sound shoreline, corresponding to approximately monitoring stations HHI-00A and HHI-39, respectively. This includes the entire Atlantic Ocean shoreline of the island and portions of the Calibogue Sound and Port Royal Sound shorelines. The sand beach consists of the shorefront area from the primary dune to the apparent depth of profile closure in the subaqueous nearshore area. **Figure EX.1** (page vi) presents an overview of the Town's monitored shoreline segments, as well as past project sand placement extents.

Current Beach Conditions (April 2022). From the Lands End Groin (~HHI-00A) to Fish Haul Creek (~HHI-32), the average beach width as of April 2022 was +400.8 ft. For this discussion, beach width is defined as the distance from the Town's Beachline¹ to the mean high water shoreline (MHW, +3.2 ft NGVD). The greatest width, relative to the June 2018 shoreline position, was found along The Heel at HHI-29D (+786.8 ft) and the smallest was at HHI-00A on Calibogue Sound (+91.3 ft). HHI-00A is located along the Calibogue Sound shoreline where sand has not been placed as part of the Town's beach management program. It is noted that an *informal* goal of the beach management program has been to maintain the beach width in excess of 200 feet along all areas of the island but especially along areas of the island's shorefront that are susceptible to erosion. As of April 2022, besides HHI-00A, only one other monitoring station on the island has a width less than 200 ft, HHI-15 with a width of 198.1 ft.

Monitoring Period – April 2021 to April 2022. From the Lands End Groin to Fish Haul Creek, the MHW receded by approximately -20.0 ft over the one-year period, on average, while Fish Haul Creek to HHI-39 (southern end of the Hilton Head Plantation revetment on the Port Royal Sound shoreline) retreated by -11.2 ft. The greatest individual survey transect advance was +190.0 ft at FH-01 (Fish Haul Creek) and the greatest retreat was -144.0 ft at FH-02. Over this period, average shoreline retreat occurred along eight of the nine monitored shoreline reaches. Only the Inner Port Royal Sound shoreline had an average shoreline advancement. **Table EX.1** (below) presents a summary of both the MHW shoreline and beach volume changes experienced along all the reaches of Hilton Head Island from April 2021 to April 2022.

From April 2021 to April 2022, the beach between Lands End Groin and Fish Haul Creek, gained a net +132,700 cy (+1.7 cy/ft) of sand from the beach. Over the same period, the beach between Fish Haul Creek and HHI-39 gained a net +55,100 cy (+6.0 cy/ft) of sand from the beach. Combined, this represents an island-wide net gain of +187,800 cy (+2.1 cy/ft) from April 2021 to

¹ The Town's Beachline is a local regulatory line adopted by the Town in December 2006 and is defined as having the same location as the 1999 OCRM Baseline. The Beachline is generally located along the seaward parcel boundary of upland public and private parcels.

April 2022. The only shoreline segments exhibiting net volume losses were the South Beach and the Heel – losing -96,300 cy and -20,700 cy, respectively. These areas also experienced the greatest losses during the previous monitoring year (April 2020 to April 2021).

Table EX.1: Summary of MHW line and beach volume changes from April 2021 to April 2022.

	Reach	Monument Range	Length (ft)	April 2021 to April 2022 Change		
				Sectional (cy/ft)	Total Volume (cy)	MHW (ft)
Project Areas	Calibogue Sound	HHI-00A to HHI	3,685	+2.5	+9,200	-7.6
	South Beach	HHI-01 to HHI-04	7,260	-13.3	-96,300	-36.8
	South Island	HHI-04 to HHI-11	17,010	+7.4	+125,700	-0.3
	Central Island	HHI-11 to <i>The Folly</i>	28,915	+1.2	+33,300	-24.1
	North Island	<i>The Folly</i> to HHI-28	10,490	+5.1	+53,300	-33.2
	The Heel	HHI-28 to HHI-29E	5,075	-4.1	-20,700	-27.9
	Port Royal Plantation	HHI-29E to FHC	6,680	+4.2	+28,200	-14.9
	Fish Haul Creek	FHC to HHI-35	3,865	+4.2	+16,300	-28.0
	Inner Port Royal Sound	HHI-35 to HHI-39	5,300	+7.3	+38,800	+1.0
Calibogue Sound to FHC		HHI-00A to FHC	79,115	+1.7	+132,700	-20.0
FHC to Inner Port Royal		FHC to HHI-39	9,165	+6.0	+55,100	-11.2
Total		HHI-00A to HHI-39	88,280	+2.1	+187,800	-19.1
Project Areas		HHI-00A to HHI-35	82,980	+1.8	+82,980	-20.4

Beach Width

Post-Construction Period – June 2018 to April 2022. The period from June 2018 to April 2022 represents island-wide changes to the beach since completion of both the 2016 and 2017 beach fill projects. The June 2018 survey represents the approximate post-construction conditions due to timing of project completion (November 2017) and the June 2018 monitoring survey (Fall 2017 monitoring survey was completed in October 2017). This period represents approximately 3.5 years since completion of the 2017 project and about 4.5 years since completion of the 2016 project.

Between June 2018 and April 2022, the MHW shoreline experienced its greatest changes along South Beach, The Heel, and Fish Haul Creek. From the Lands End Groin to Fish Haul Creek, the MHW retreated approximately -40.3 ft, on average, while the average MHW shoreline location between Fish Haul Creek and HHI-39 retreated by -83.0 ft. The greatest advance was +95.3 ft at HHI-37 (Inner Port Royal Sound) and the greatest retreat was -330.1 ft at HHI-01A (Fish Haul Creek excluded due to sediment dynamics that differ from other parts of the shoreline, discussed in main text).

As of April 2022, the beach between the Lands End Groin and Fish Haul Creek had lost approximately -754,700 cy (-9.5 cy/ft) of sand since June 2018. Over the same period, the beach from Fish Haul Creek to HHI-39 gained about +500 cy (+0.1 cy/ft) of sand. The sum of these losses represents approximately 22.6% of the total sand volume placed during the 2016 and 2017 project. Over this period, the South Beach segment lost the most sand of all the island's shoreline

segments, about -510,500 cy, or -70.3 cy/ft of shoreline. The other important area of high sand losses was Central Island, which includes North Forest Beach and Palmetto Dunes. Along this area, the beach lost -287,800 cy of sand, or about -10.0 cy/ft of shoreline, on average. The highest sand loss rates along the Central Island Segment occurred along the North Forest Beach shoreline. The South Island gained the most sand volume during this period, about +224,800 cy, or +13.2 cy/ft of shoreline. The South Island shoreline reach has traditionally been the most stable shoreline reach along the island since detailed beach monitoring efforts began in the mid-1980's. **Table EX.2** presents a summary of both the MHW shoreline and beach volume changes experienced along all reaches of Hilton Head Island over the post-construction monitoring period.

Table EX.2: Summary of beach volume and shoreline changes from February 2016 to April 2022.

	Reach	Monument Range	Length (ft)	Volume Change (cy)			June 2018 to April 2022 MHW Change (ft)
				Feb. 2016 to June 2018*	June 2018 to April 2022	Feb. 2016 to April 2022 [#]	
Project Areas	Calibogue Sound	HHI-00A to HHI	3,685	+199,500	-22,100	+177,400	-79.4
	South Beach	HHI-01 to HHI-04	7,260	+506,000	-510,500	-4,500	-173.6
	South Island	HHI-04 to HHI-11	17,010	+599,300	+224,800	+824,100	+9.8
	Central Island	HHI-11 to <i>The Folly</i>	28,915	+1,400,300	-287,800	+1,112,500	-31.5
	North Island	<i>The Folly</i> to HHI-28	10,490	+11,000	+4,300	+15,300	-30.9
	The Heel	HHI-28 to HHI-29E	5,075	+163,200	-261,200	-98,000	-117.9
	Port Royal Plantation	HHI-29E to FHC	6,680	+346,300	+97,800	+444,100	+4.8
	Fish Haul Creek	FHC to HHI-35	3,865	+106,500	-20,600	+85,900	-204.4
	Inner Port Royal Sound	HHI-35 to HHI-39	5,300	-5,500	+21,100	+15,600	+5.5
	Calibogue Sound to FHC	HHI-00A to FHC	79,115	+3,225,600	-754,700	+2,470,900	-40.3
	FHC to Inner Port Royal	FHC to HHI-39	9,165	+101,000	+500	+101,500	-83.0
	Total	HHI-00A to HHI-39	88,280	+3,326,600	-754,200	+2,572,400	-44.7
	Project Areas	HHI-00A to HHI-35	82,980	+3,332,100	-775,300	+2,556,800	-47.9

* February 2016 to June 2018 represents the project construction period

[#] February 2016 to April 2022 represents the volume within the monitored beach limits relative to pre-construction of the two projects.

April 2022 Shoreline Position Relative to RMBC². This section summarizes the April 2022 beach condition compared to the Recommended Minimum Beach Condition (RMBC). The RMBC has been *informally* adopted and used by the Town over the past 20+ years as one metric regarding the health and condition of the island's beach. It is used as a baseline to measure beach conditions and compare those conditions to a minimal acceptable condition. For example, should areas of the island's sand beach become eroded and retreat near the RMBC, or based upon erosion rates would be expected to retreat to that location in the near future, the Town would consider taking action to address the erosion and protect shorefront infrastructure and beach and dune conditions. It is considered a worst-case condition that should be avoided. Since the late 1990's the Town, through the beach management program, has been proactive in preventing these conditions from occurring along the island's beach.

² The minimum condition used herein is generally based upon the April 1997 island-wide beach position and condition. The beach survey conducted in April 1997 represents beach conditions that existed immediately prior to the construction of the 1997 Beach Renourishment Project (Olsen Associates, Inc., 2004).

Beach width

As of April 2022, the average MHW position along the monitored beach from the Lands End Groin to HHI-32 was +208.6 ft seaward of the RMBC, and HHI-33 to HHI-39 was +206.6 ft seaward of the RMBC. The April 2022 MHW was seaward of the RMBC (where there is a defined RMBC) for all but two monitoring transects over the entire island: HHI-00A and HHI-00B. The Calibogue Sound shoreline, which has eroded beyond the RMBC at HHI-00A and HHI-00B, has never been nourished as part of the Town's beach nourishment program and does not currently or is expected to present in the near future a threat to upland development or other beach related interests. Along those areas where sand placement has occurred in the past, the average distance between the April 2022 MHW shoreline and the MHW shoreline position for the RMBC was +238.5 feet. The distances ranges from +71.2 feet at HHI-04 – at the border of the South Beach and South Island reaches -- and +621.9 feet at HHI-29C, The Heel. The position of the April 2022 shoreline relative to the RMBC is typically the greatest at the terminal ends of the island, South Beach and The Heel, due to natural shoreline and inlet dynamics.

In summary, the overall condition of the island's beach as of April 2022 was good. There are shoreline recession trends, however, that suggest conditions will gradually deteriorate over the next year or two should existing trends continue. Areas of particular interest are South Beach, North Forest Beach, Port Royal Sound, and Fish Haul Creek. A planned renourishment project in the 2024-25 timeframe remains to be a reasonable goal for both addressing areas that may become problematic by that time and adding sand to the island's beach in anticipation of continued baseline erosion.

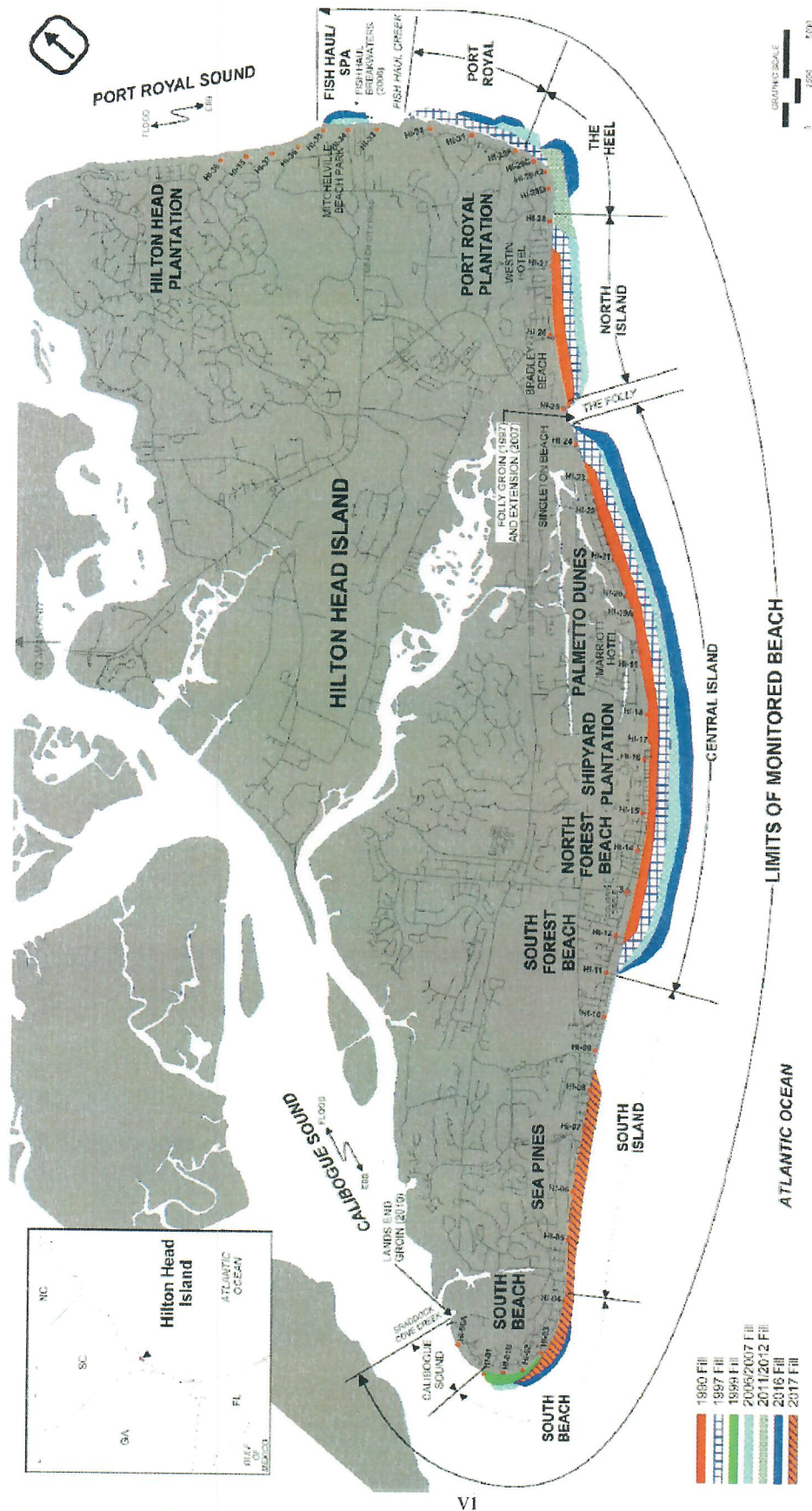


Figure EX.1: Overview of Hilton Head Island monitored shoreline segments and past project sand placement locations.

Appendix D - Draft executive summary IOP 2026 Monitoring Report

EXECUTIVE SUMMARY

This report is provided to the City of Isle of Palms as part of semi-annual beach monitoring efforts. It focuses on changes in beach condition between February 2026 and June 2026 and briefly discusses volume changes relative to the 2018 post-project condition. The June 2026 survey reoccupied the same beach profile locations as prior surveys and included data collection over the deltas of Dewees and Breach Inlets. This survey also serves as the pre-construction survey for the upcoming nourishment project, establishing the pre-project condition of the beach for documenting project performance and potential FEMA assistance claims.

Figure A shows the survey baseline and boundaries for reaches defined in earlier reports. Note that the monitoring reaches differ from the reaches identified in construction documents for the upcoming beach nourishment project. CSE recently subdivided Reaches 5 and 6 to provide more localized information on beach conditions along the dynamic northeastern end of the island.

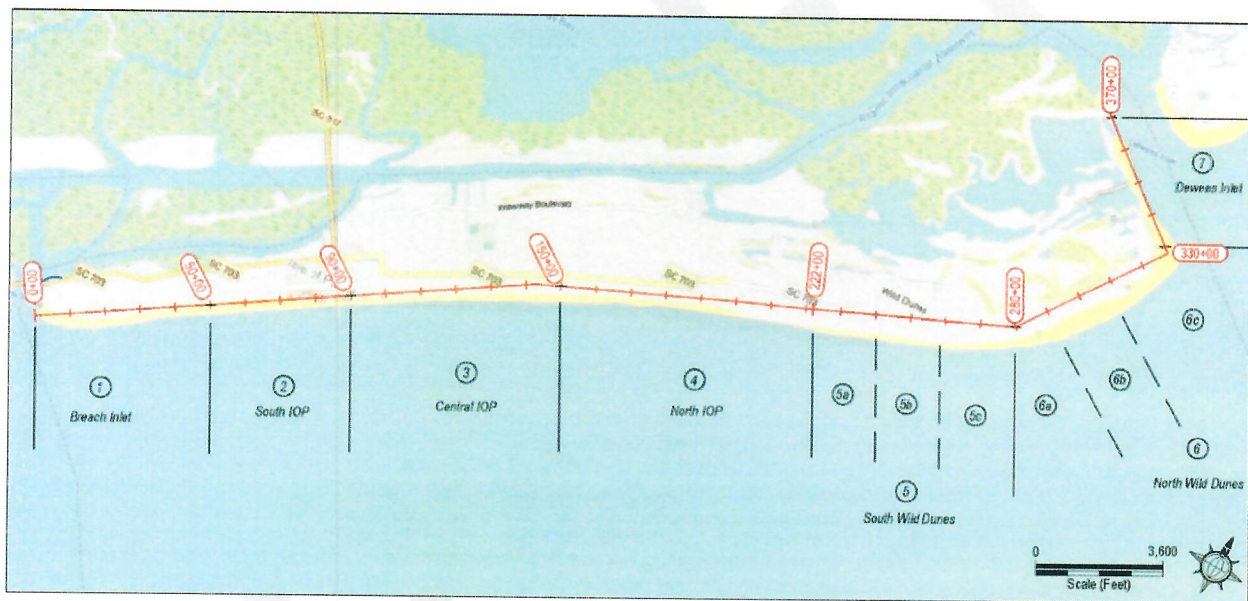


FIGURE A. Isle of Palm Survey Reference Line and Monitoring Reaches.

The two main factors controlling beach volume change from February 2026 to June 2026 were: (1) the migration of sand from Reaches 3 and 4 to Reaches 1 and 2, and (2) onshore migration and spreading of shoal sand along the Wild Dunes area. Both events have led to net volume gains along the beach, despite the presence of erosional areas. Overall, the island gained 229,675 cubic yards (cy) in the past year, with 187,400 cy accreted from August 2025 to February 2026 and 42,075 cy of sand between February 2026 and June 2026.

Volume gains were highest along the south end, in Reaches 1 and 2. The area south of the pier gained 317,725 cy in the past year, with 152,875 cy of that total being gained over the past four months (Table A, Figures B-D). Much of the accretion in the first part of the survey period can be attributed to the gains from the USACE beneficial use project. Some of the gains, especially in the north end of Reach 2, can be attributed to a down-drift movement of sand from the center of the island. Sand moving into the area from the north originated from the 2018 nourishment project, and has now reached the southern end of the island.

A majority of stations south of Station 65+00 (Access 9) experienced substantial growth of the dry sand beach. The average movement of the dry sand beach (4.5' contour) at the south end was around 26.8 feet, with the largest gain close to 105.3 feet (Figure E). This is largely due to sand from Reaches 3 and 4 continuing to move farther south down the island. It is also partly due to the seasonal transition from a winter to a summer beach profile: as the beach shifts from winter to summer conditions, the offshore bar moves closer to shore and can widen the dry sand beach. Some of the gains in the dry sand beach are also attributable to continued movement of sand higher in the beach profile from sand that was placed below the low-tide line in the USACE project.

While some of this growth reflects natural seasonal variation, the significant volume increase points to genuine recovery of the beach. Reaches 1 and 2 experienced uncharacteristic erosion from 2021 to 2024, and CSE anticipated that the USACE disposal project, combined with sediment movement through the littoral system from upcoast, would eventually lead to some level of recovery. The beach currently holds as much sand volume as it did in June 2019, and the position of the high tide line is at or near its most seaward position documented since 2009.

The central portion of the island continues to experience migrating waves of accretion and erosion that are moving through the area. The waves can span a few thousand feet, and result in individual station volume changes that vary alongshore. The waves are associated with sand availability from upcoast, as sand is either trapped by approaching shoals or released by nourishment or shoals after attachment. CSE has been able to track “packages” of sand that move alongshore (generally south) from the northeast end of the island. In fact, the sand wave currently moving through the pier appears to have originated from the 2018 nourishment project at the northeast end of the island.

Overall, Reach 3 gained 1,750 cy in the past year, but erosion has started to increase in the past four months with the disruption in the upcoast sand supply. Reach 4 lost a total of ~62,100 cy from August 2025 to June 2026. Erosion has increased recently due to the lack of sand supply from farther north, as sand supply from Reach 5 was reduced in recent years. CSE expects that directly following the completion of the 2026 nourishment project, sand supply to Reach 4 will increase, resulting in a new accretional wave that propagates south.

Reaches 5 and 6 are the most dynamic, highly developed shoreline in South Carolina. The current shoal attachment event is toward the end of its cycle but is still bringing sand to the center portions of Wild Dunes. Sand has started to spread along other areas of the reaches, slowing down some of the erosion rates that were present in recent years. Individual stations immediately adjacent to the attachment site are gaining substantial amounts of sand, with unit volume change ranging from -60.9 cy/ft (cubic yards per foot) to 73.7 cy/ft in the past year. Accretion is occurring along Beachwood East and Dunecrest Ln, and Mariner's Walk to Summer Dunes Ln as the shoal attachment is welded to the shore and starting to spread alongshore.

The area fronting the Grand Pavilion continues to lose sand, as the erosional trend that affected Beachwood East has shifted to the southwest. CSE expects this trend to reverse as the accretional wave moves south; however, this will be masked by nourishment. Near Seascape and Ocean Club, erosion has slowed in the second half of the year; however, the erosion in the past years has left this area particularly vulnerable. The dry sand beach is directly fronting Ocean Club, allowing water to run under the structure.

Overall, Reaches 5 and 6 show a net loss of approximately -64,325 cy over the year, with the majority of those losses occurring in the past four months (~-48,150 cy) and occurring near the north and south ends of Wild Dunes. The shoal is almost completely attached to the beach as of July 2026. While erosion has slowed in Reach 5 and 6 as sand spreads alongshore, areas away from the attachment site are likely to continue to erode until the upcoming nourishment project is completed.

At the time of this report, Marinex Construction has initiated placement of 2.5 million cy of sand along the northern and southern ends of the island. Approximately 1.7 million cy will be placed along the Wild Dunes area, and 800,000 cy along the area south of the pier. By the end of the project, the island will contain around 1.55 million cubic yards (mcy) more sand than has been present in any survey conducted by CSE.



FIGURE B. Image showing the volume change by station for the year. Accretion (blue) is mostly seen in the south end of the island, where the USACE project and downdrift movement of sand have built up the beach. There are also pockets near the shoal attachment areas. There is erosion (Red) shown in some of the erosion hotspots in reaches 5 and 6.

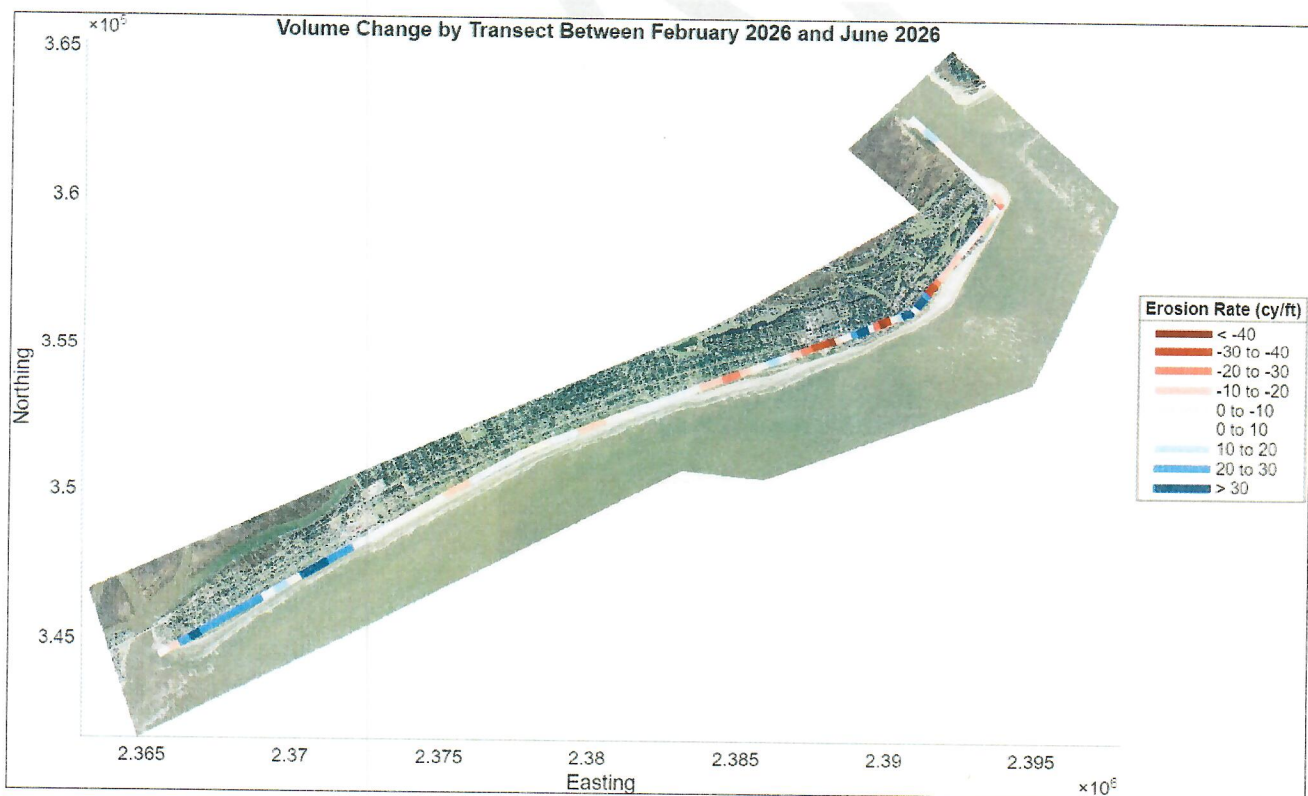


FIGURE C. Image showing the volume change by station from February 2026 to June 2026. Accretion (blue) is mostly seen in the south end of the island, where the downdrift movement of sand has built up the beach. There are also pockets near the shoal attachment areas. There is erosion (Red) shown in some of the erosion hotspots in reaches 5 and 6; note the decreased erosion on the northeast side of the island compared to Figure B.

TABLE A. Beach volume change between surveys from 2018 to 2026 for each monitoring reach. Note that moving from top to bottom in the table represents movement from south to north on the beach, and movement from left to right shows change over time.

	Length (ft)	Profile Volume Change Since Last Survey (cy)										
		Apr-18	Jun-19	Jun-20	Jul-21	Aug-22	Aug-23	Sep-24	Feb-25	Aug-25	Feb-26	Jun-26
Reach 1	5,000	34,720	-6,181	84,758	-4,285	-113,231	-209,793	-28,413	-4,397	125,816	82,217	84,110
Reach 2	4,000	7,250	-17,095	-362	-23,353	-7,217	-25,582	-49,861	-9,961	-2,210	82,631	68,765
Reach 3	6,000	3,428	25,593	34,573	-6,909	26,568	-15,674	97,482	10,684	34,670	21,716	-19,960
Reach 4	7,200	50,092	41,205	157,949	114,202	96,595	20,029	49,675	-78,825	-6,195	-9,396	-52,703
Reach 5a	2,000	65,240	72,718	-43,167	-67,369	-18,606	-34,784	-41,908	-29,207	-2,205	-12,382	-6,629
Reach 5b	1,400	340,444	-87,553	-58,643	-48,322	-4,770	12,044	4,791	-33,557	-14,166	-46,614	-33,751
Reach 5c	2,400	476,687	-142,926	-106,475	-92,924	-88,118	-95,096	-12,541	44,892	128,136	63,150	38,038
Reach 6a	1,200	170,019	-147,830	-41,927	-37,365	-8,043	24,388	152,239	54,526	-33,823	25,015	3,300
Reach 6b	1,800	269,976	-26,376	-56,329	-27,527	-22,376	-63,347	-97,961	-47,566	-38,180	8,409	-25,625
Reach 6c	2,000	229,945	59,673	-22,537	-38,852	-65,614	-96,793	-121,323	-52,258	3,702	-53,745	-23,483
Reach 7	4,000	-29,257	18,340	14,624	15,563	11,059	46,652	-108,341	3,150	17,560	26,391	10,012
Reaches 1-7	37,000	1,618,545	-210,432	-37,537	-217,140	-193,751	-437,955	-156,160	-142,520	213,104	187,392	42,073

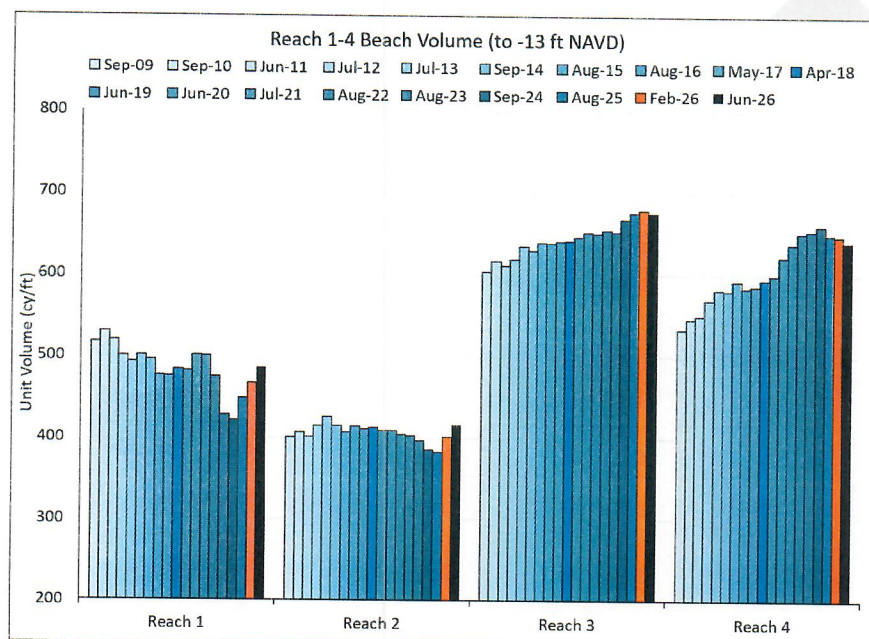


FIGURE D. Total beach volumes (unit length basis – cubic yards per foot) for the monitoring reaches between 2007 and 2026 (note surveys were not available for Reaches 1-4 until 2009). July 2008 and April 2018 represent post-nourishment conditions.

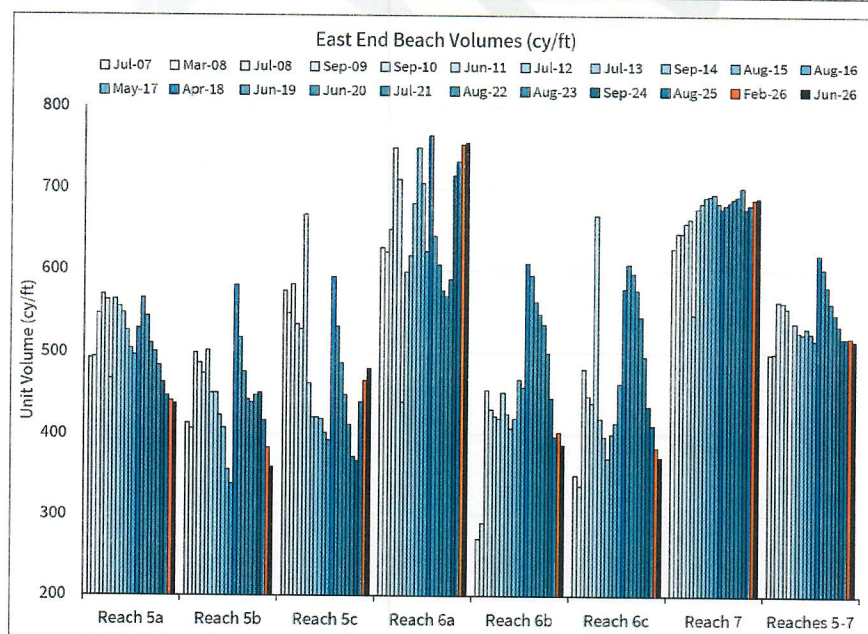


FIGURE E. Example maps showing the position of the typical high-tide line measured by the +4.5 ft NAVD contour for the most recent surveys. Previous shoreline positions are shown for reference, as well as the location of the state jurisdictional lines. The green and red shaded areas show growth or erosion of the high tide line between 2025 and 2026. Appendix C provides maps for the full island at a larger scale.

