



Captiva

Erosion Prevention District

2021 Beach Nourishment

Project Description

- The project area was located between Florida DEP reference monuments **R-84** and **R-109** (Captiva Island).
- The project consists of the placement of 806,270 cubic yards of beach fill and 350,000 dune plantings along 4.85 miles of shoreline and rehabilitation of existing dunes along the entire Gulf of Mexico shoreline of Captiva Island between Redfish Pass and Blind Pass.
- The project, designed to last beyond 8-10 years, provides necessary maintenance to counteract long-term critical erosion of our beaches, properties, and shorelines.

Costs

Item	No	Units	Bid Volumes		Balances	
			Unit Price	Total Anticipated	Paid	Remaining
Mobilization/Demobilization	1	LS	\$ 5,480,000.00	\$ 5,480,000.00	\$ 5,480,000.00	\$ -
Beach Tilling and Scarp Leveling	25,700	LF	\$ 1.55	\$ 39,835.00	\$ 39,835.00	\$ -
Turbidity Monitoring	1	LS	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00	\$ -
Dredging and Placement of Beach and Dune Fill	806,270	CY	\$ 16.00	\$ 12,900,320.00	\$ 12,900,320.00	\$ -
Relocation Trawling Mobilization	-	LS	\$ 25,000.00	\$ -	\$ -	\$ -
Sea Turtle Relocation Trawling	-	Days	\$ 4,150.00	\$ -	\$ -	\$ -
Project Site Layout and Data Collection	1	LS	\$ 135,000.00	\$ 135,000.00	\$ 135,000.00	\$ -
Sea Oat Planting	350,000	Ea	\$ 0.95	\$ 332,500.00	\$ 332,500.00	\$ -
Screening to Remove Unacceptable Material	-	CY	\$ 9.00	\$ -	\$ -	\$ -
Hauling and Removal of Unacceptable Material	-	CY	\$ 62.00	\$ -	\$ -	\$ -
Remediation of Non-Compliant Material	-	Ac	\$ 25,000.00	\$ -	\$ -	\$ -
Sea Turtle Nest Relocation & Monitoring	1	Ea	\$ 156,970.00	\$ 156,970.00	\$ 156,970.00	\$ -
Post Construction Sea Turtle Report	1	Ea	\$ 900.00	\$ 900.00	\$ -	\$ (900.00)
Post Construction Sea Turtle Monitoring	199	Days	\$ 140.00	\$ 27,860.00	\$ -	\$ (27,860.00)
Daily Breeding Shorebird Monitoring	35	Days	\$ 200.00	\$ 7,000.00	\$ 7,000.00	\$ -
PIPL/REKN Surveys (Piping Plover/RedKnot)	52	Ea	\$ 250.00	\$ 13,000.00	\$ 13,000.00	\$ -
Report Preparation and Materials	1	Ea	\$ 300.00	\$ 300.00	\$ 300.00	\$ -
Eagle Monitoring	1	Ea	\$ 625.00	\$ 625.00	\$ 625.00	\$ -
Dune Protection Fencing	1	Ea	\$ 94,500.00	\$ 94,500.00	\$ -	\$ (94,500.00)
Engineering	1	Ea	\$ 564,797.78	\$ 564,797.78	\$ 514,777.54	\$ (50,020.24)
Grand Total				\$ 19,878,607.78	\$ 19,705,327.54	\$ (173,280.24)

Funding

\$	% Share	Share Source
\$ 19,919,576.16	100.00%	Total Cost
\$ 1,016,860.51	5.10%	PW 361 (FDEP)
\$ 50,843.03	0.26%	PW 6059 (FDEM)
\$ 259,664.00	1.30%	FDEP 19LE4 (IRMA)
\$ 6,054,450.00	30.39%	FDEP 21LE1
\$ 12,537,758.62	62.94%	Remainder Before County Contribution
\$ 3,729,203.34	18.72%	County Rec
\$ 94,033.19	0.47%	County Storm
\$ 1,000,000.00	5.02%	County Additional Cont
\$ 4,823,236.53	24.21%	County Total Share
\$ 7,714,522.09	38.73%	Remainder Before CEPD Contribution
\$ 1,000,000.00	5.02%	CEPD Reserves Contribution
\$ 6,714,522.09	33.71%	Local Assessment



Tentative Benefits
Based Apportionment Model
As Approved

All Properties on Captiva Benefit from Beach Nourishment

- The beach nourishment project will generate a stream of benefits for property owners on Captiva Island which, ultimately, will show up as an enhancement of property values beyond the levels they would have attained in the absence of the project.
- Gulf-facing Captiva properties are better protected from erosion and storm damage as a result of the nourishment project. Properties are grouped into similar categories based upon engineering data. These are known as the **Storm Protection Benefits Zones**.
- The Project will provide access to an enhanced recreational beach. Captiva properties experience enhancements in values due to increased recreational benefits. Captiva properties are grouped into three distinct categories: **Residential, Residential with Homestead Exemption, and Commercial**.

Storm Protection Benefits

- Only properties that are considered **front line** to the Gulf of Mexico are considered to receive storm protection benefits.
- The storm protection benefit to a property represents the difference between the value of expected property losses if the project is constructed compared to the value of losses if the project is not constructed.

	AVERAGE ANNUAL BENEFITS ± 1 STANDARD DEVIATION					
	Zone 1 Private Properties R-84 to R-89	Zone 2 Private Properties R-90 to R-93	Zone 3A Private Properties R-94 to R-96	Zone 3B Private Properties R-97 to R-101	Zone 4 Private Properties R-102 to R-105	Zone 5 Private Properties R-106 to R-109
Armor:	\$0,000 ± \$0,000	\$0,000 ± \$0,000	\$8,200 ± \$3,347	\$0,000 ± \$0,000	\$0,755 ± \$0,755	\$2,122 ± \$2,122
Development:	\$15,511 ± \$15,511	\$9,619 ± \$9,619	\$15,422 ± \$15,422	\$45,703 ± \$39,837	\$5,971 ± \$5,971	\$3,555 ± \$3,555
Backfill:	\$876,416 ± \$331,140	\$299,751 ± \$189,154	\$308,140 ± \$128,428	\$6,522 ± \$5,887	\$309,085 ± \$85,063	\$124,078 ± \$79,234
1/2 Landloss:	\$12,574 ± \$4,713	\$5,226 ± \$0,964	\$12,424 ± \$1,289	\$286,601 ± \$7,496	\$0,000 ± \$0,000	\$94,496 ± \$3,043
TOTAL:	\$904,501 ± \$351,364	\$314,596 ± \$199,737	\$344,186 ± \$148,486	\$338,826 ± \$53,219	\$315,811 ± \$91,789	\$224,251 ± \$87,953

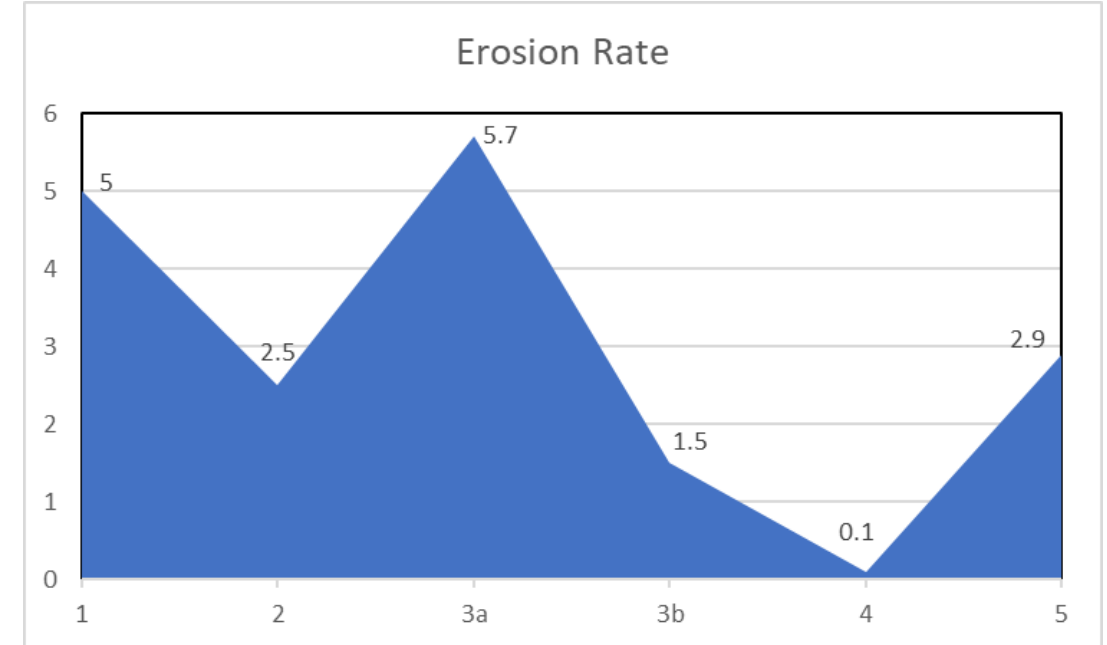
Storm Protection Benefits

- Based on the analysis performed, the erosion-related annual damages over the 22-year simulation period **without the project** in place total approximately **\$6,994,000**.
- **With the project in place**, the annual damages are reduced to **\$4,088,200**.
- This equates to a project related annual benefit of **\$2,905,755**.
- The adjusted benefits, removing public land loss, resulted in a total annual storm protection **benefit to private property owners of \$2,417,971**

Storm Protection Benefits

Table B.2 Average Erosion Rates in Each Beach Zone				
Zone	Profile Lines	Erosion (+) & Accretion (-) (c.y./foot/year)	Shoreline Retreat (-) & Advance (+) (feet/year)	Average Residential Land Value per Square Foot
1. Upper South Seas	R-84 to R-89	-5.0	-8.3	\$60.88
2. Lower South Seas	R-90 to R-93	-2.5	-7.3	\$40.72
3A Village	R-94 to R-96	-5.7	-12.9	\$47.43
3B Tween Waters Road	R-97 to R-101	-1.5	-12.3	\$47.47
4 Upper Gold Coast	R-102 to R-105	-0.1	-4.5	\$41.47
5 Lower Gold Coast	R-106 to R-109	-2.9	-7.9	\$44.89

Note: Rates based on annualized changes between September 2009 and October 2017, excluding the construction period (September 2013 and January 2014) for the 2013-14 renourishment project.



REACH DESIGNATION		ADDRESS
ZONE 1	START	1200 SOUTH SEAS PLANTATION ROAD
	STOP	1135 LONGIFOLIA CT.
ZONE 2	START	1141 LONGIFOLIA CT.
	STOP	14790 CAPTIVA DRIVE
ZONE 3A	START	11558/560 LAIKA LANE
	STOP	15300 CAPTIVA DRIVE
ZONE 3B	START	15301 CAPTIVA DRIVE
	STOP	16213 CAPTIVA DRIVE
ZONE 4	START	16238 CAPTIVA DRIVE
	STOP	16770 CAPTIVA DRIVE
ZONE 5	START	16778 CAPTIVA DRIVE
	STOP	17200 CAPTIVA DRIVE



NOTES:

1. PARCEL DATA OBTAINED FROM LEE COUNTY PROPERTY APPRAISER OFFICE, LAST UPDATED 4/30/2018.
2. AERIAL DATED JANUARY 2018..

LEGEND:

- 1982 EROSION CONTROL LINE
- 1983 EROSION CONTROL LINE
- 1987 BERM (6' NGVD)
- 1988 MEAN HIGH WATER
- 2004 EROSION CONTROL LINE
- 2017 MEAN HIGH WATER

Table B.1
Beach Zones Used in the Economic Analysis

Zone	Profiles	Lee Co. Parcel Numbers	Street Addresses
1	R-84 to R-89	2245210000005002B to 27452101000000010	1057-1900 South Seas Plantation Road to 1135 Longifolia Ct.
2	R-90 to R-93	274521010000A00CE to 26452104000010010	1141 Longifolia Ct. to 14790 Captiva Drive
3A	R-94 to R-96	26452102000010060 to 35452101000000140	11558/560 Laika Lane to 15300 Captiva Drive
3B	R-97 to R-101	35452101000000150 to 034621010000B0030	15301-16213 Captiva Drive
4	R-102 to R-105	034621020000B0010 to 03462100000200010	16238-16770 Captiva Drive
5	R-106 to R-109	03462100000210010 to 11462100000010010	16778-17200 Captiva Drive



**BENEFIT ANALYSIS ZONES
CAPTIVA ISLAND, FLORIDA**

Aptim Environmental & Infrastructure Inc.
 2481 N.W. BOCA RATON BOULEVARD
 BOCA RATON, FLORIDA 33431
 PH. (561) 391-8102
 FAX (561) 391-9116
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Total Annual Storm Protection Benefits

Table 2 Annual Storm Protection Benefits of Private Properties on Captiva 2020-2021 Beach Nourishment by Benefit Category		
Benefit Category	Amount	Percent of Total Private Storm
Upper South Seas Beach Zone Properties	\$ 904,501	37.4
Lower South Seas Beach Zone Properties	\$ 290,396	12.0
Village Beach Zone Properties	\$ 344,186	14.2
Tween Waters Beach Zone Properties	\$ 338,826	14.0
Upper Gold Coast Beach Zone Properties	\$ 315,811	13.1
Lower Gold Coast Beach Zone Properties	\$ 224,251	9.3
Total Private Storm Protection Benefits	\$ 2,417,970	100.0

Note: items may not add to totals because of rounding.

Storm Protection Benefits

Benefits Based Model (70.6% Recreation Benefits)								
# Properties	Zone	Annual Benefit	Project Benefit %	Cost share	Total Just Value	Millage		
35	1	\$ 904,501.00	11.66%	\$ 783,077.95	\$ 132,728,755.00	5.8998		
222	2	\$ 290,396.00	3.74%	\$ 251,412.33	\$ 189,646,021.00	1.3257		
23	3A	\$ 344,186.00	4.44%	\$ 297,981.39	\$ 68,752,505.00	4.3341		
55	3B	\$ 338,826.00	4.37%	\$ 293,340.93	\$ 191,002,221.00	1.5358		
41	4	\$ 315,811.00	4.07%	\$ 273,415.54	\$ 194,899,443.00	1.4029		
25	5	\$ 224,251.00	2.89%	\$ 194,146.84	\$ 94,111,269.00	2.0629		
401	Sub Total	\$ 2,417,971.00	31.18%	\$ 2,093,374.99	\$ 871,140,214.00	-		

*2020 Property Appraiser Data

Zone	Example Calculations	
	Example Just Value	Storm Protection Assessment
1	\$ 2,000,000.00	\$ 11,799.67
2	\$ 2,000,000.00	\$ 2,651.39
3A	\$ 2,000,000.00	\$ 8,668.23
3B	\$ 2,000,000.00	\$ 3,071.60
4	\$ 2,000,000.00	\$ 2,805.71
5	\$ 2,000,000.00	\$ 4,125.90



Total Annual Recreation Benefits

- All properties on Captiva.
- Consist of the recreational value of the beach that is created.
- Recreational value was obtained from a willingness to pay survey of beach users.

Benefit Category	Amount	Percent of Total Private Recreation
Residential Properties	\$ 4,115,287	77.1
Commercial Properties	\$ 1,222,409	22.9
Total Private Recreational Benefits	\$ 5,337,696	100.0

Recreation Benefit

# Properties	Zone	Annual Benefit	Project Benefit %	Cost share	Total Just Value	Millage
906	Residential and Institutional	\$ 4,115,287.01	53.06%	\$ 3,127,979.45	\$ 1,196,831,242.00	2.6136
126	Residential Homesteaded (42.1% discount)	-	-	\$ 434,858.52	\$ 319,683,282.00	1.3603
45	Commercial	\$ 1,222,409.17	15.76%	\$ 1,058,309.13	\$ 139,992,742.00	7.5597
1077	Sub Total	\$ 5,337,696.19	68.82%	\$ 4,621,147.10	\$ 1,656,507,266.00	

	Example Just Value	Recreation Assessment
Residential	\$ 2,000,000.00	\$ 5,227.10
Residential Homesteaded (42.1% discount)	\$ 2,000,000.00	\$ 2,720.56
Commercial	\$ 2,000,000.00	\$ 15,119.49

Side by Side Comparison

CURRENT MODEL

# Properties	Zone	Annual Benefit	Project Benefit %	Cost share
35	1	\$ 904,501.00	11.66%	\$ 783,077.95
222	2	\$ 290,396.00	3.74%	\$ 251,412.33
23	3A	\$ 344,186.00	4.44%	\$ 297,981.39
55	3B	\$ 338,826.00	4.37%	\$ 293,340.93
41	4	\$ 315,811.00	4.07%	\$ 273,415.54
25	5	\$ 224,251.00	2.89%	\$ 194,146.84
401	Sub Total	\$ 2,417,971.00	31.18%	\$ 2,093,374.99
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126	Residential Homesteaded (42.1% discount)	-	-	\$ 434,858.52
45	Commercial	\$ 1,222,409.17	15.76%	\$ 1,058,309.13
1077	Sub Total	\$ 5,337,696.19	68.82%	\$ 4,621,147.10
-	Total	\$ 7,755,667.19	100.00%	\$ 6,714,522.09

The only major change is assessing all residential properties at the same factor.



MAY 2014 FINAL MODEL

Benefit	Cost Shares	Just Values	Millage Rates 2014	Millage Rates 2010
<u>Storm Protection</u>				
Other Upper South Seas	\$285,000	\$44,546,424	6.3978	20.5421
Lower South Seas	\$535,800	\$212,528,287	2.5211	6.36377
Village Properties	\$381,900	\$35,810,267	10.6645	22.2713
Tween Waters	\$319,200	\$174,502,185	1.8292	5.1995
Upper Gold Coast	\$193,800	\$157,773,652	1.2283	3.1744
High Erosion Gold Coast	\$324,900	\$72,953,682	4.4535	11.4032
Sub-Total	\$2,040,600	\$698,114,497	NA	NA
<u>Recreation</u>				
Single-Family	\$980,400	\$688,550,519	1.4239	2.8615
Multi-Family	\$1,584,600	\$471,016,364	3.3642	13.9812
Interval Units	\$302,100	\$64,800,260	4.6620	15.3569
Commercial	\$792,300	\$65,757,100	12.0489	31.4134
Sub-Total	\$3,659,400	\$1,290,124,243	NA	NA
Total	\$5,700,000	NA	NA	NA

NA = not applicable

Apportionment Map

<https://captivaerosionpr.maps.arcgis.com/home/item.html?id=d1132294e3a6481caf21519430d797c0>