

LIVE OAK POINT LIVING SHORELINES

2022 (Fall) Reference Site Monitoring Report



USACE Permit No.: SAJ-2011-00287

FDEP Permit No.: 0387876-001-EI-66

Permittee: Northwest Florida Water Management District
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Entity Conducting Monitoring: Choctawhatchee Basin Alliance of Northwest Florida
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Project Location: Live Oak Point Salt Marsh Reference Site
30.42° North, -86.27° West
Approximately 2 ½ Miles NW of Santa Rosa Beach
Walton County, Florida

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Synopsis

Live Oak Point contains the largest salt marsh system (approximately 1,000 acres) in Choctawhatchee Bay. However, its ecological integrity and long-term survival is threatened by ongoing erosion and shoreline retreat. Analysis of historic aerials indicates that, since 1941, the salt marsh has retreated up to 300 FT along the northern edge. In situ measurements and analysis of recent digital orthophoto quads (DOQs) show that shoreline retreat now averages >4 FT per year.

The objectives of the Live Oak Point Living Shorelines project are 1) halting loss of salt marsh habitat at Live Oak Point, 2) restoring salt marsh habitat in a strip parallel to the current shoreline that will be protected by limerock breakwaters, and 3) enhancing existing salt marsh habitat via improved buffers. To achieve these objectives, a living shoreline is being implemented along the northern edge of the Live Oak Point salt marsh.¹

New construction of approximately 4,695 FT of limerock breakwaters is planned, although expansion of seagrass beds (*Halodule wrightii*) during the summer of 2022 in the project area may require modification of the linear footage to be implemented.² Breakwater construction began 8/13/2021. As of 10/31/2022, approximately 3,440 FT or 73% of the planned breakwater had been completed. Due to seagrass concerns, breakwater construction has been halted and may or may not resume in 2023 depending on whether impacts to expanded seagrass beds can be avoided. Alternatives, such as use of coir logs, is under investigation. Limited plantings of salt marsh vegetation (*Spartina patens*, *Juncus roemarianus*, *Spartina alterniflora*) were implemented in the summer and fall of 2022, though the bulk of plantings are anticipated for Spring 2023. Barring unforeseen events (e.g., a major hurricane), full completion of this project is anticipated in 2023.

The Live Oak Point Living Shorelines project is a component of the Northwest Florida Water Management District (NFWFMD) In-Lieu Fee (ILF) mitigation program (USACE Permit SAJ-2011-00287) and will generate, upon full completion, 2.61 estuarine mitigation credits for use by the Florida Department of Transportation (FDOT).³

This 2022 (Fall) Reference Site Monitoring Report has been developed to comply with federal and state monitoring requirements. It is the third monitoring report for the reference site, the other

¹ The NFWFMD has contracted with the Choctawhatchee Basin Alliance of Northwest Florida State College (CBA) to implement the Live Oak Point Living Shorelines project.

² New breakwater construction will tie in with an existing 550 FT of oyster shell breakwater / living shoreline constructed in 2011. When complete, total living shoreline length at Live Oak Point is planned to be approximately 5,245 FT (4,695 FT + 550 FT), subject to modification to avoid seagrass impacts.

³ Mitigation credit is associated only with the living shoreline currently under construction; no credit is associated with the 550 FT of living shoreline implemented in 2011.

two monitoring events having been conducted in Fall 2021 and Spring 2022. Parameters for the Fall 2022 reference site monitoring are vegetation cover, sediment accretion, panoramic and general photo documentation. The reference site has similar geomorphology, tidal range, elevations, and vegetation community structure when compared with the project site (the reference site is located approximately 3,000 FT southwest of the project site). Trends established from previous monitoring indicate that vegetation at the reference site is generally stable, with the low marsh dominated by *Spartina alterniflora*, the mid marsh dominated by *Spartina patens*, and the high marsh dominated by *Juncus roemerianus*. Monitoring of the project site is scheduled to begin in 2023 when construction of the breakwater and plantings of marsh vegetation is completed or substantially completed. All monitoring reports for the Live Oak Point Living Shorelines reference site and project site will be posted at <https://www.nfwater.com/Water-Resources/Regional-Wetland-Mitigation-Program/Regional-Mitigation-Plan/NFWMD-Mitigation-Sites/Choctawhatchee-Watershed-Mitigation-Sites/Live-Oak-Peninsula-ILF/Living-Shorelines> or any successor website.

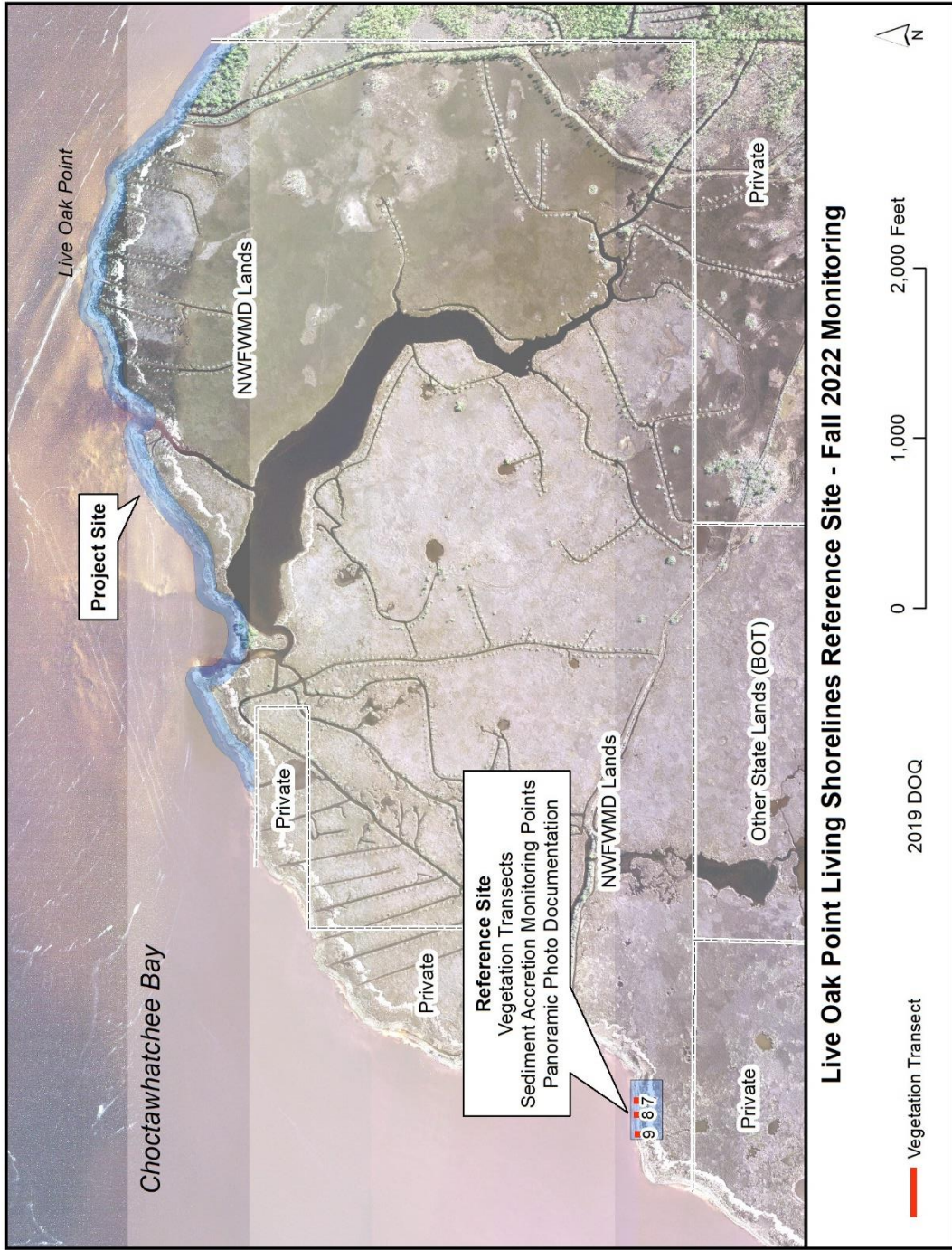


Figure 1. Fall 2022 Reference Site Monitoring Overview

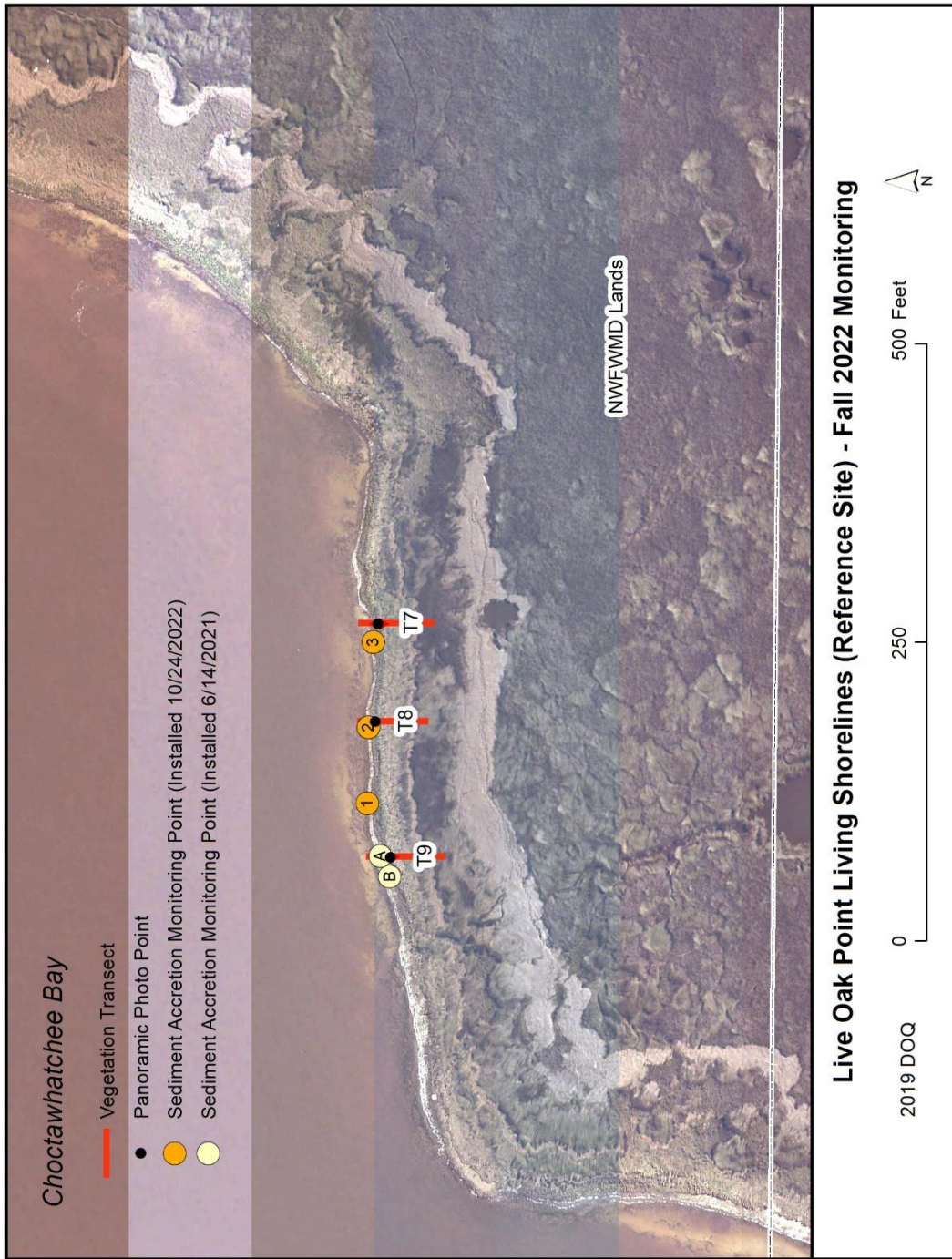


Figure 2. Fall 2022 Reference Site Monitoring Closeup

Vegetation Monitoring

Vegetation cover at the reference site was quantitatively measured on 10/20/2022 using a modified Daubenmire method.⁴ Three (3) transects of variable length were established in the reference area. Each transect began in the low marsh and extended into the high marsh. Twelve (12) 0.5-meter square (0.25m²) quadrats were sampled along each transect. Four (4) quadrats were located in the low marsh, four (4) in the mid marsh, and four (4) in the high marsh. All plant species were identified in each quadrat. Percent cover of vegetation by species and bare ground was visually estimated. No exotic or invasive plants were present in any transect. Data collected on 10/20/2022 indicate that the low marsh continues to be dominated by *Spartina alterniflora*, the mid marsh by *Spartina patens*, and the high marsh by *Juncus roemerianus*.

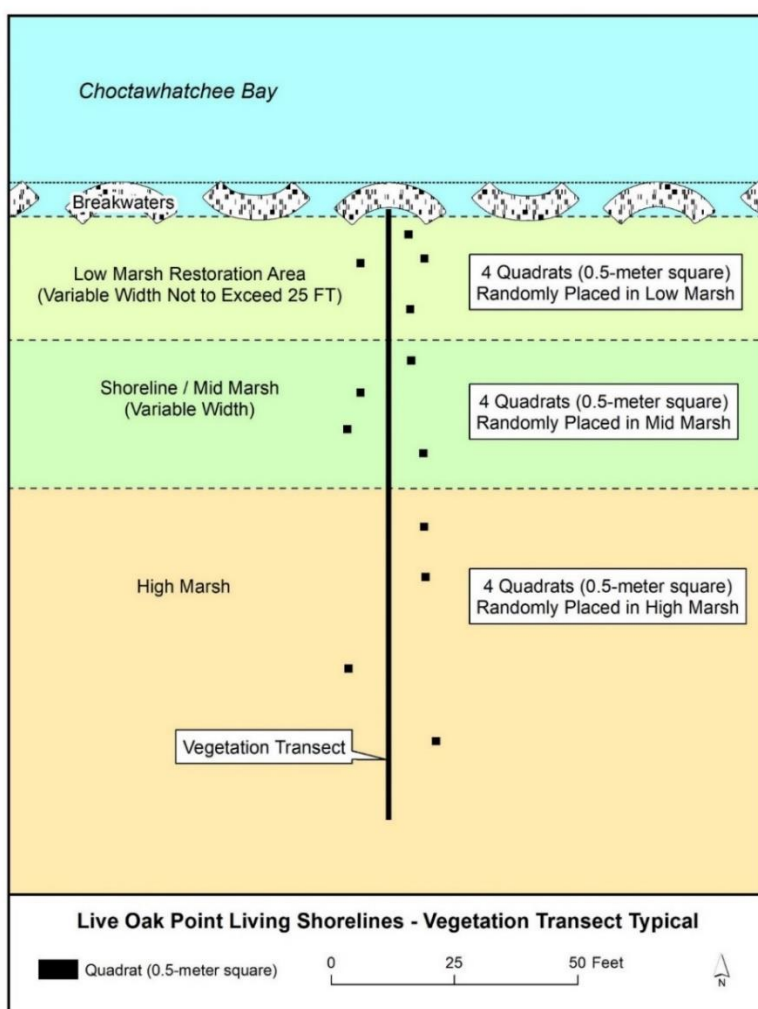


Figure 3. Vegetation Transect Sampling Design (Breakwaters Not Present at Reference Site)

⁴ Daubenmire, Rexford. 1959. A Canopy-coverage method of vegetational analysis. Northwest Science 33:43-64.

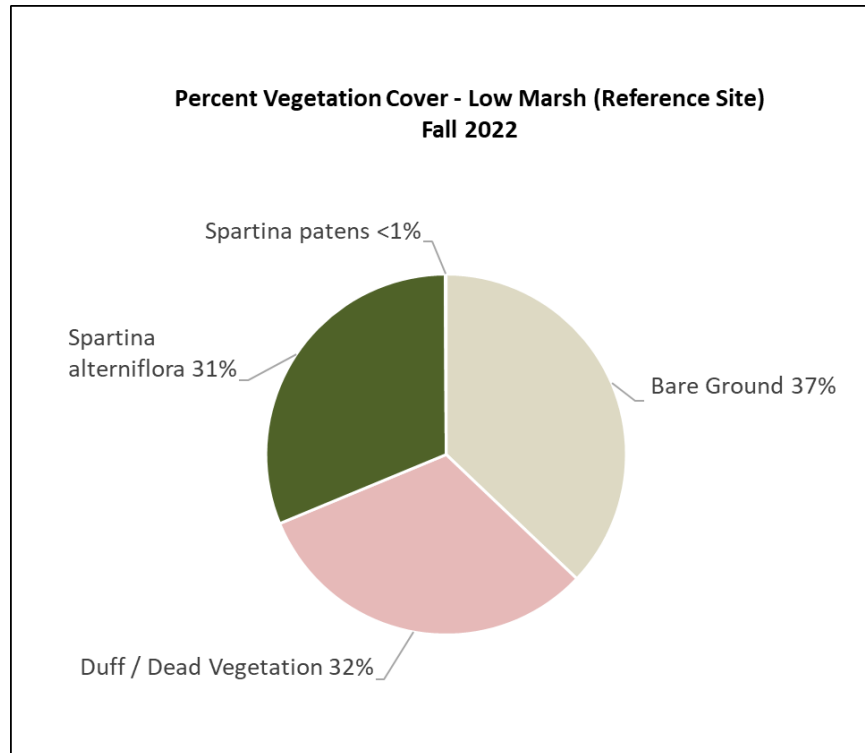


Figure 4. Reference Site Low Marsh Vegetation (Average of Transects T7 -T9)

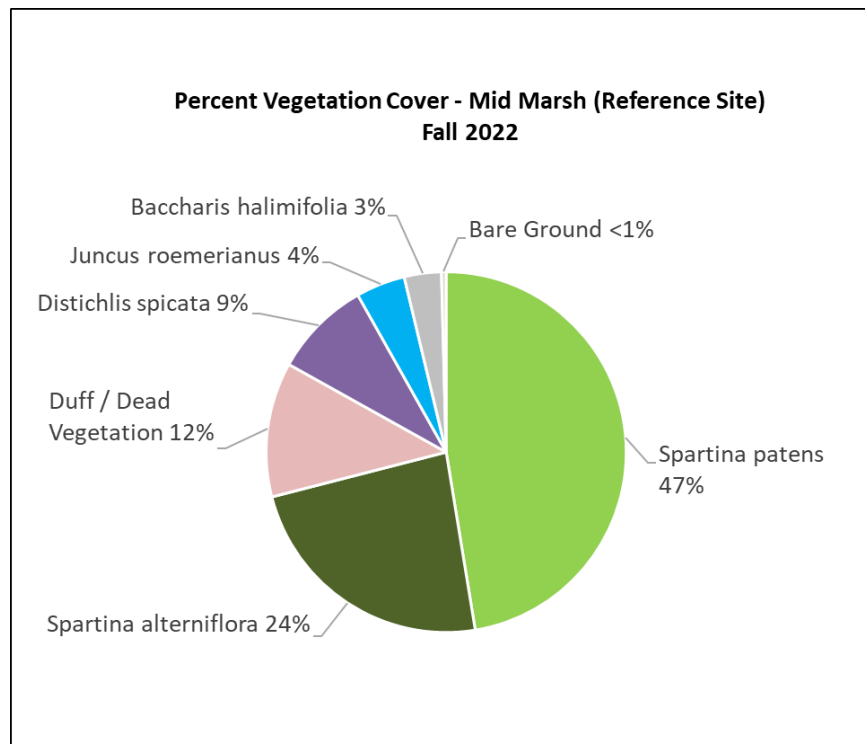


Figure 5. Reference Site Mid Marsh Vegetation (Average of Transects T7 – T9)

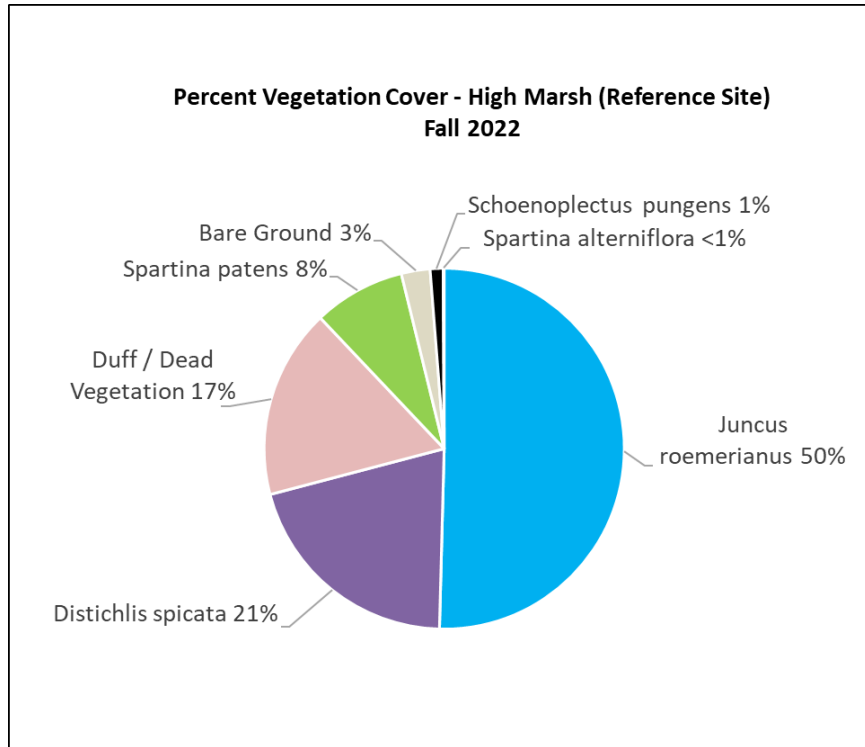


Figure 6. Reference Site High Marsh Vegetation (Average of Transects T7 – T9)

Table 1. Reference Site Vegetation (Fall 2022) by Marsh Zone (Average of Transects T7 – T9)

Species	Low Marsh	Mid Marsh	High Marsh
<i>Baccharis halimifolia</i> (Saltbush)	0%	3%	0%
Bare Ground	37%	<1%	3%
<i>Distichlis spicata</i> (Saltgrass)	0%	9%	21%
Duff / Dead Vegetation	32%	12%	17%
<i>Juncus roemerianus</i> (Needle Rush)	0%	4%	50%
<i>Schoenoplectus pungens</i> (Threesquare Bullrush)	0%	0%	1%
<i>Spartina alterniflora</i> (Smooth Cordgrass)	31%	24%	<1%
<i>Spartina patens</i> (Saltmeadow Cordgrass)	<1%	47%	8%
Total:	100%	100%	100%

Sediment Accretion Monitoring

To increase accuracy of sediment accretion monitoring, three additional points were installed in the mid marsh zone of the reference site on 10/24/2022. Each new point, assigned a unique ID of SB1 through SB3, consists of a 4" x 7" concrete paving stone placed approximately 20 cm below the vegetated ground surface. By placing these markers at greater depths and beneath vegetated surfaces, they will be at much less risk of washout than the initial monitoring points (Point A and Point B) installed on 6/14/2021. As of 10/24/2022, Point A was partially exposed at the surface and Point B is missing (apparently washed away). Sea level rise for the Panama City area is estimated by National Oceanic and Atmospheric Administration for the Panama City area at 2.91 mm per year.⁵ Moving forward, data will be periodically collected at SB1 through SB3 to establish sediment accretion trends for comparison with estimated sea level rise.

Table 2. Sediment Accretion Monitoring at Reference Site⁶

Date	Average Depth Below Surface (cm)				
	Point SB1	Point SB2	Point SB3	Point A	Point B
6/14/2021	-	-	-	2.5	5.1
10/21/2021	-	-	-	2.9	7.0
3/21/2022	-	-	-	0.0	0.0
10/20/2022	-	-	-	0.0	Missing
10/24/2022	21.9	16.9	21.3	1.1	Missing

⁵ Station 8729108 Panama City, Florida; Relative Sea Level Trend; ± 0.58 mm per year; 1973 to 2021.

⁶ Point "A" is a circular (4" DIA) stainless steel drain plate installed 6/14/2021 at 2.5 cm below the surface. Point "B" was (missing and presumed washed away) a circular (4" DIA) PVC drain plate installed 6/14/2021 at 5.1 cm below the surface. Points SB1 – SB3 are 4" x 7" concrete paving stones installed 10/24/2022 at depths of 21.9 cm, 16.9 cm, and 21.3 cm, respectively, beneath the surface (identified on Figure 2 map as Points 1 – 3).

Panoramic Photo Monitoring

Transect T7 (East)



Figure 7. Photo Point T7 Looking East – 11/8/2021



Figure 8. Photo Point T7 Looking East – 3/21/2022

Transect T7 (East)



Figure 9. Photo Point T7 Looking East – 9/21/2022

Transect T7 (West)



Figure 10. Photo Point T7 Looking West – 11/8/2021



Figure 11. Photo Point T7 Looking West – 3/21/2022

Transect T7 (West)



Figure 12. Photo Point T7 Looking West – 9/21/2022

Transect T8 (East)



Figure 13. Photo Point T8 Looking East – 11/8/2021



Figure 14. Photo Point T8 Looking East – 3/21/2022



Figure 15. Photo Point T8 Looking East – 9/21/2022

Transect T8 (West)



Figure 16. Photo Point T8 Looking West – 11/8/2021



Figure 17. Photo Point T8 Looking West – 3/21/2022

Transect T8 (West)



Figure 18. Photo Point T8 Looking West – 9/21/2022

Transect T9 (East)



Figure 19. Photo Point T9 Looking East – 11/8/2021



Figure 20. Photo Point T9 Looking East – 3/21/2022



Figure 21. Photo Point T9 Looking East – 9/21/2022

Transect T9 (West)



Figure 22. Photo Point T9 Looking West – 11/8/2021



Figure 23. Photo Point T9 Looking West – 3/21/2022

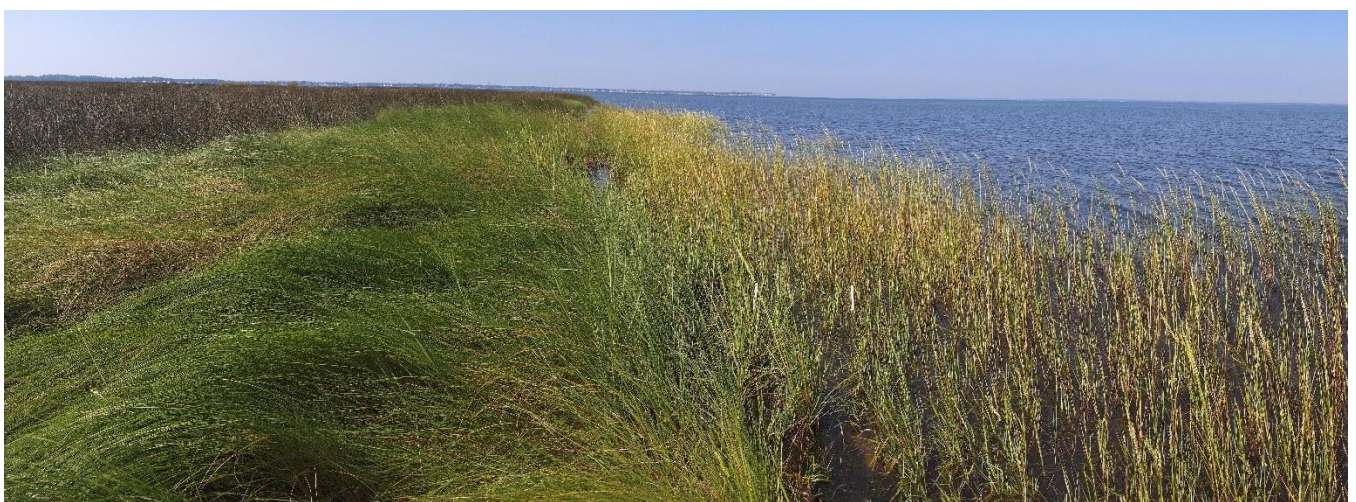


Figure 24. Photo Point T9 Looking West – 9/21/2022

Other Photo Documentation



Figure 25. Reference Site Monitoring (CBA Personnel) – 10/20/2022



Figure 26. Initial Sediment Monitoring Plate (Plate A) Exposed by Erosion – 10/20/2022

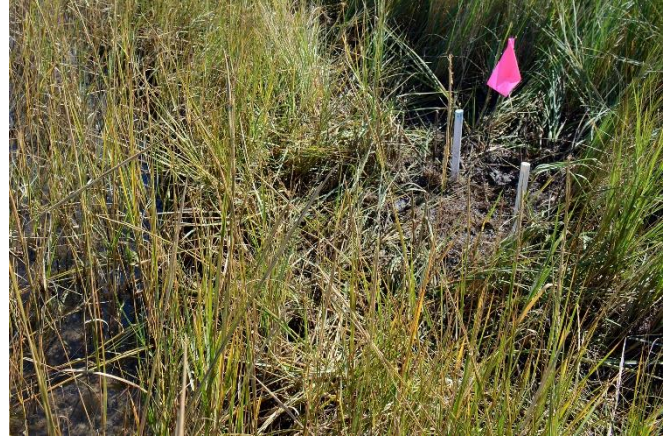


Figure 27. Installation of Additional Sediment Monitoring Points – 10/24/2022