LIVE OAK POINT LIVING SHORELINES

2022 (Spring) Reference Site Monitoring Report

USACE Permit No.:	SAJ-2011-00287
FDEP Permit No.:	0387876-001-EI-66
Permittee:	Northwest Florida Water Management District 81 Water Management Drive Havana, FL 32333-4712 POC: Robert Lide (robertlide@nwfwater.com)
Entity Conducting Monitoring:	Choctawhatchee Basin Alliance of Northwest Florida State College 109 South Greenway Trail Santa Rosa Beach, FL 32459-5415 POC: Rachel Gwin (gwinr@nwfsc.edu)
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

Contents

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]

Approximately 4,695 FT of limerock breakwaters will be constructed.[2] Breakwater construction began 8/13/2021 (as of 3/24/2022, approximately 500 FT or 10% had been completed). Planting of appropriate salt marsh vegetation (e.g., *Spartina patens, Juncus roemarianus, Spartina alterniflora*) behind completed breakwater segments is anticipated to begin in Spring 2022. Barring unforeseen events (e.g., a major hurricane), full completion of this project is anticipated by 2023.

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

This 2022 (Spring) Reference Site Monitoring Report has been developed to comply with federal and state monitoring requirements. Parameters for the Spring 2022 reference site monitoring include vegetation cover, sediment accretion, panoramic and general photos. The refence site has similar geomorphology, tidal range, elevations, and vegetation community structure when compared with the project site (located approximately 3,000 FT northeast of the reference site). Monitoring of the project site is scheduled to begin in late 2022 when construction of the breakwater is completed or substantially completed. All monitoring reports for the Live Oak

[1] The NWFWMD 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 will be approximately 5,245 FT (4,695 FT + 550 FT).

[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.

Point Living Shorelines reference site and project site will be posted at: https://www.nwfwater.com/Water-Resources/Regional-Wetland-Mitigation-Program/Regional-Mitigation-Plan/NWFWMD-Mitigation-Sites/Choctawhatchee-Watershed-Mitigation-Sites/Live-Oak-Peninsula-ILF/Living-Shorelines.

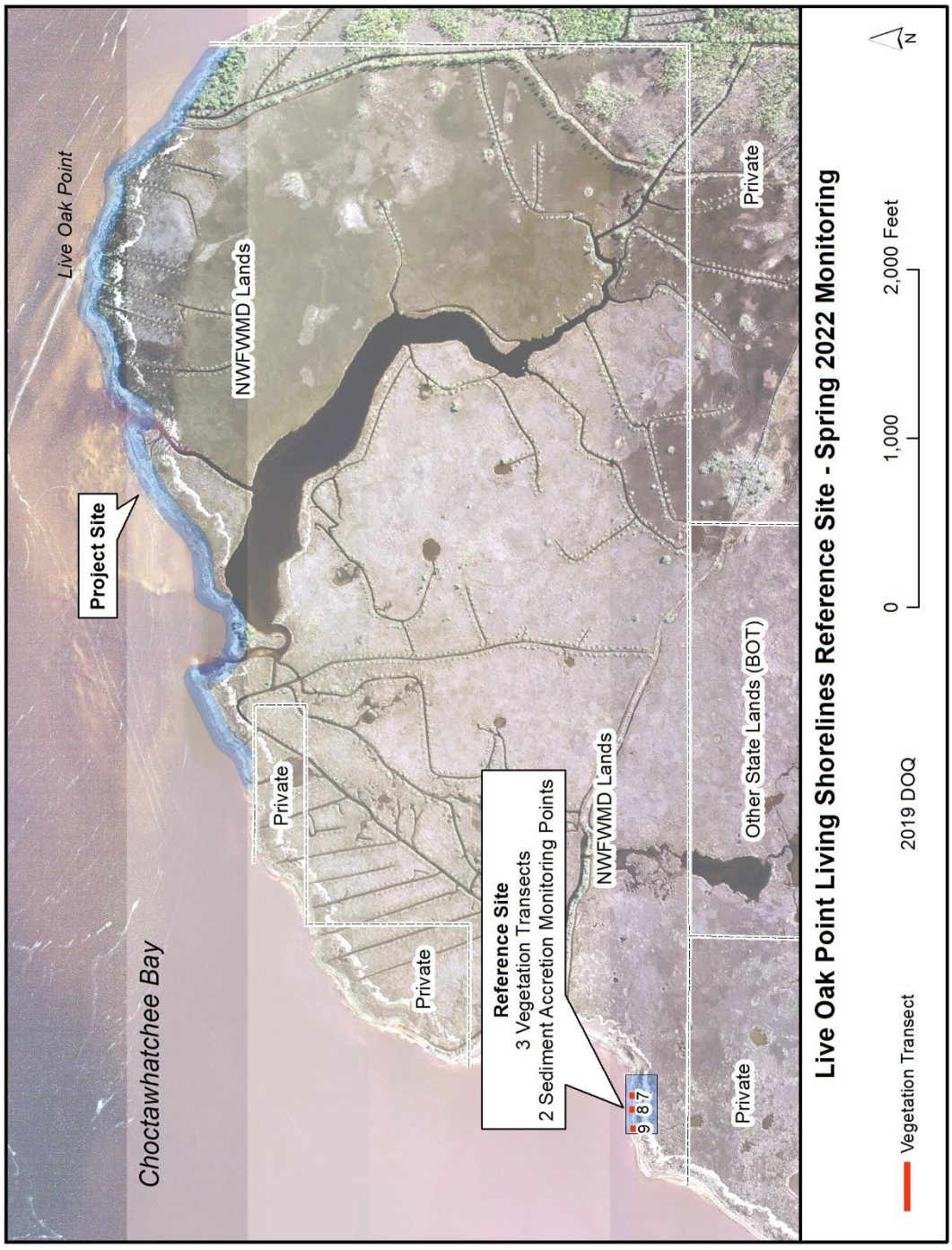

Figure 1. Spring 2022 Reference Site Monitoring Overview

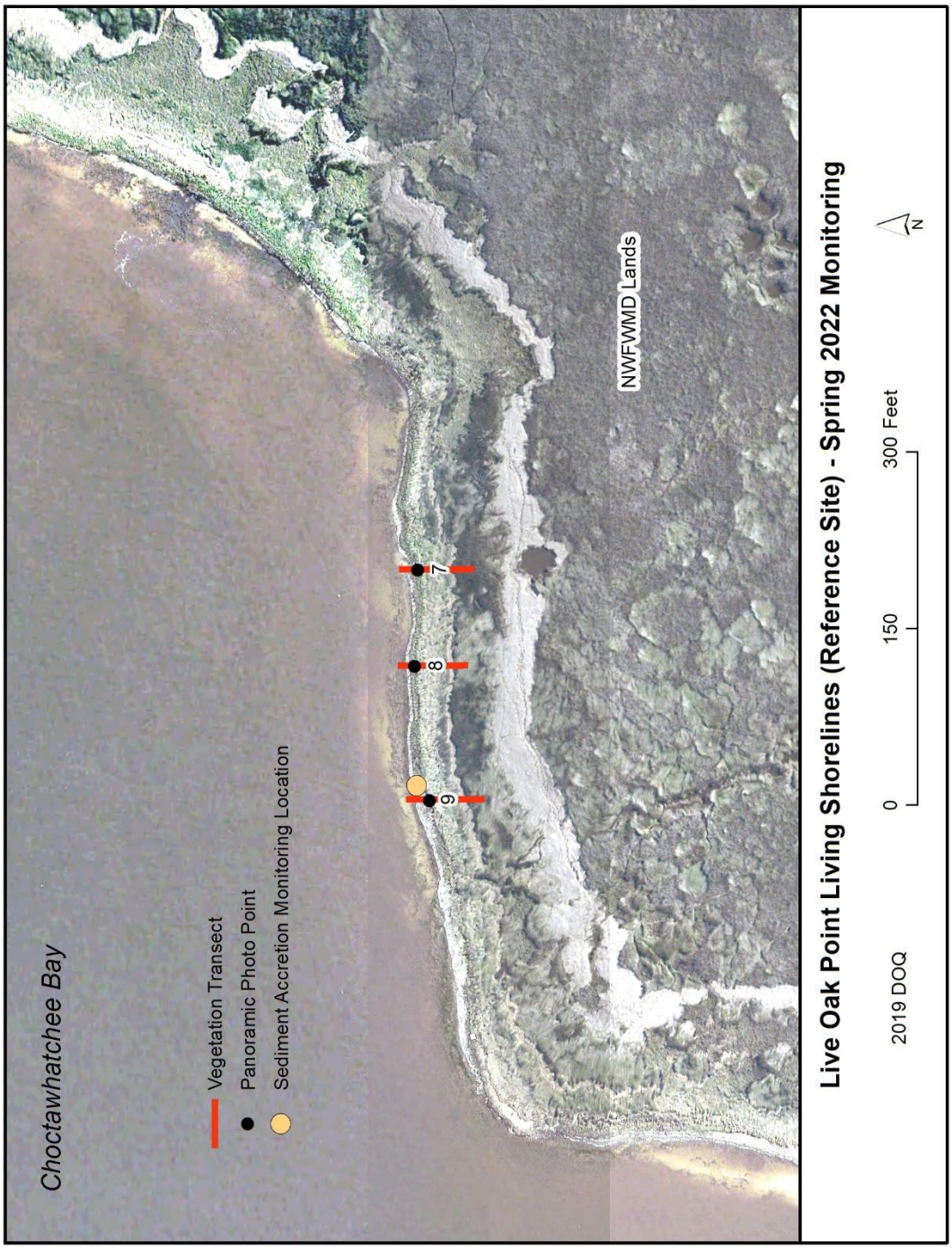

Figure 2. Spring 2022 Reference Site Monitoring Closeup

Vegetation Monitoring

Vegetation cover at the reference site was quantitatively measured on 3/21/2022 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 (0.25m^2) 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.

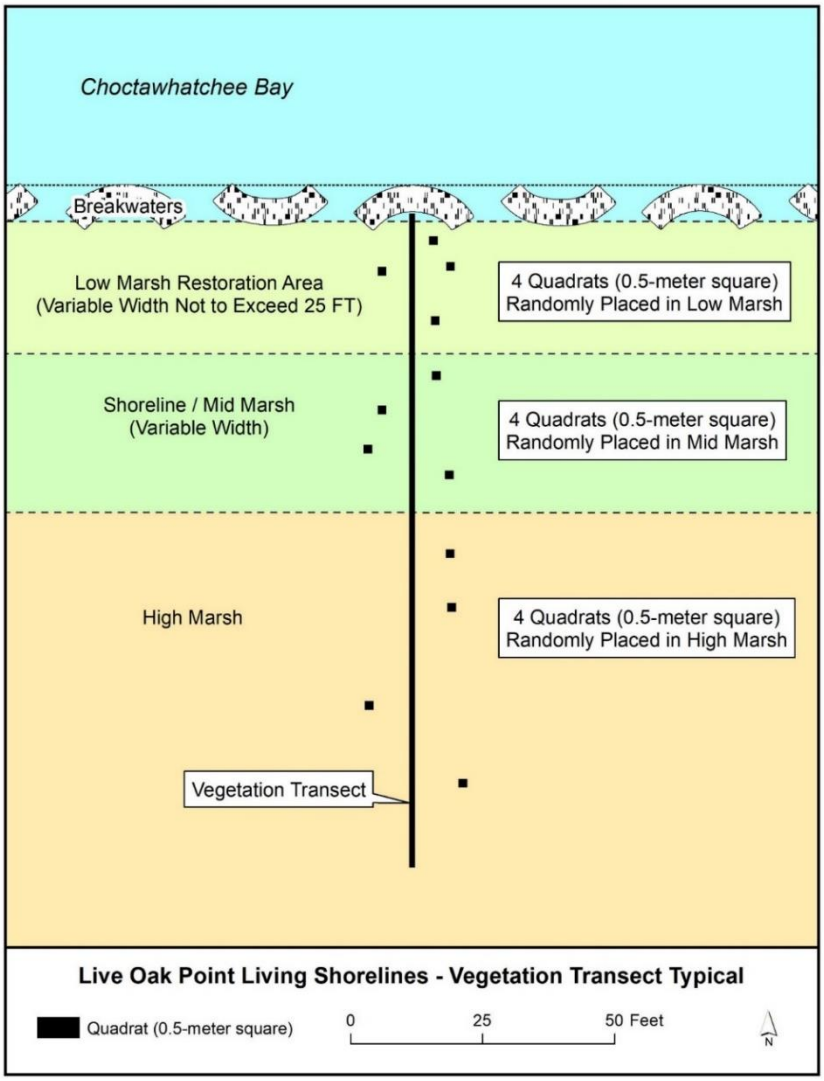

Figure 3. Vegetation Transect Sampling Design

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

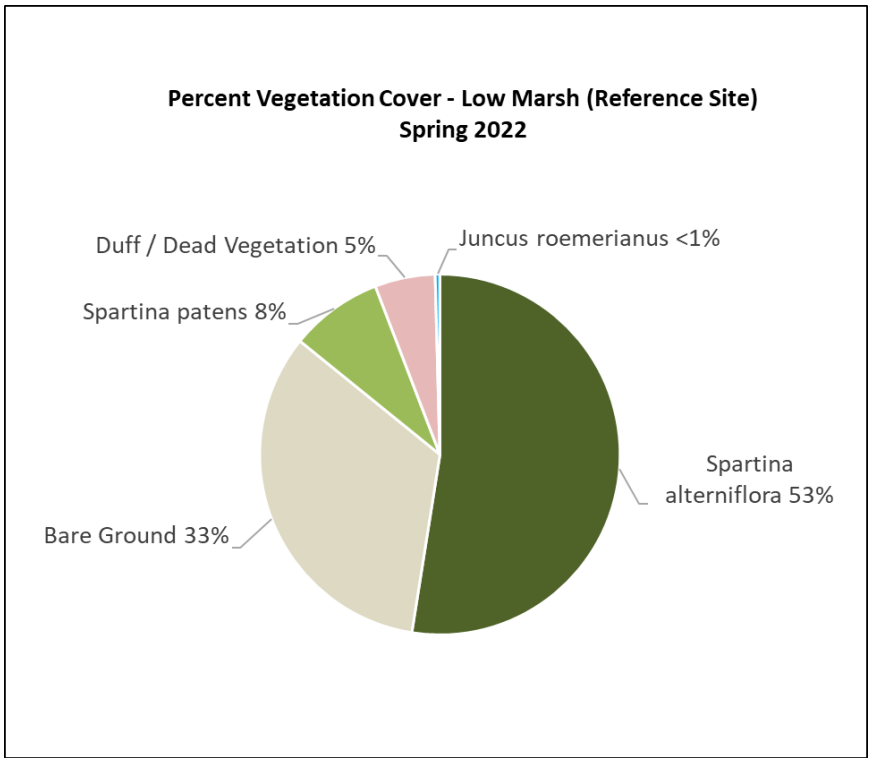

Figure 4. Reference Site Low Marsh Vegetation (Average of Three Transects)

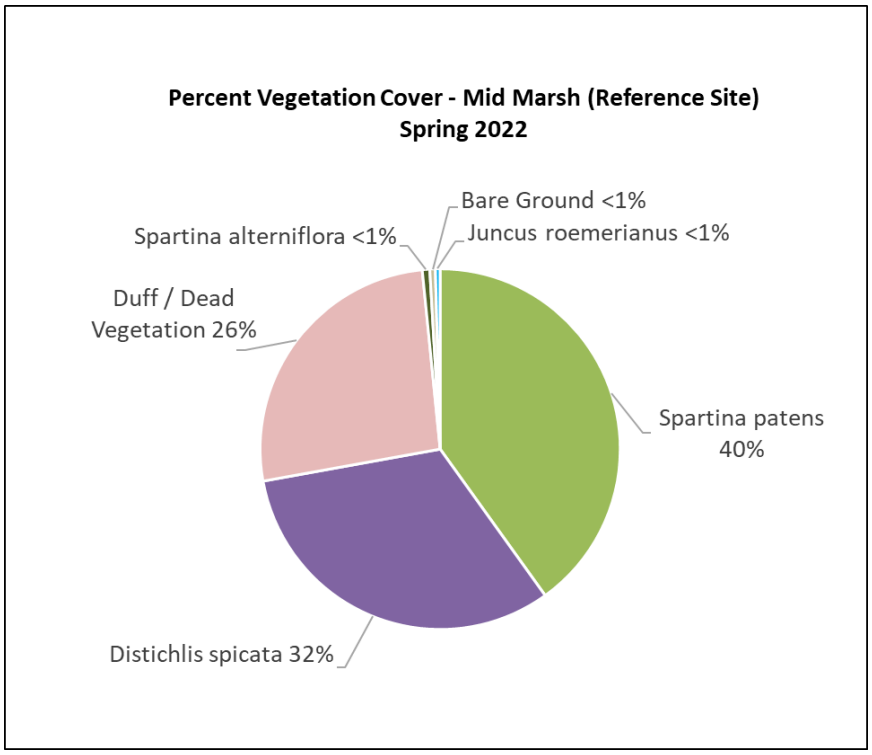

Figure 5. Reference Site Mid Marsh Vegetation (Average of Three Transects)

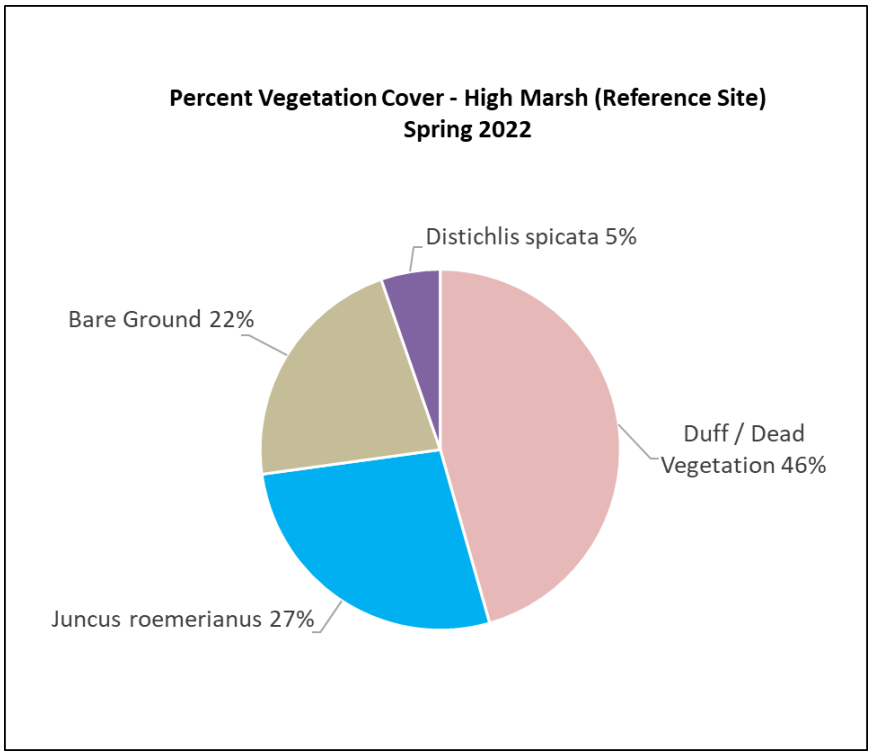

Figure 6. Reference Site High Marsh Vegetation (Average of Three Transects)

Table 1. Reference Site Vegetation (Spring 2022) by Marsh Zone (Average of Three Transects)

Species	**Low Marsh**	**Mid Marsh**	**High Marsh**
Bare Ground	33%	<1%	22%
Distichlis spicata	0%	32%	5%
Duff / Dead Vegetation	5%	26%	46%
Juncus roemerianus	<1%	<1%	27%
Spartina alterniflora	53%	<1%	0%
Spartina patens	8%	40%	0%

Sediment Accretion Monitoring

Two sediment accretion monitoring points were established in the mid marsh zone at the reference site on 6/14/2021. Each consisted of a 4-inch diameter circular plate set below the surface. Plate A was set 25.4 mm below the surface, whereas Plate B was set 50.8 mm below the surface. Initial measurements on 10/21/2021 indicated that sediment accretion was exceeding sea level rise (estimated by National Oceanic and Atmospheric Administration for the Panama City area at 2.29 mm per year). However, the 3/21/2022 inspection revealed that the sediment plates were completely exposed from erosion, apparently caused by winter storm activity. These plates will be reinstalled at a greater depth below surface and monitoring will resume.

Table 2. Sediment Accretion or Loss at Reference Site

Date	Depth Below Surface (mm)		Surface Elevation Relative to Initial Base Elevation[3] (mm)	
	Plate A[1]	Plate B[2]	Plate A	Plate B
6/14/2021	25.4	50.8	0 (Date Installed)	0 (Date Installed)
10/21/2021	28.7	70.3	+3.3	+19.5
3/21/2022	0 (Exposed)	0 (Exposed)	-25.4	-50.8

[1]Plate A is a circular (4" DIA) plate placed 25.4 mm below the surface on 6/14/2021.
[2]Plate B is a circular (4" DIA) plate places 50.8 mm below the surface on 6/14/2021.
[3]Base elevation is 0 mm, i.e., the ground surface above sediment plate on the date of installation (6/14/2021).

Panoramic Photo Monitoring

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

Figure 8. Photo Point 7 Looking East – 3/21/2022

Figure 9. Photo Point 7 Looking West – 11/8/2021

Figure 10. Photo Point 7 Looking West – 3/21/2022

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

Figure 12. Photo Point 8 Looking East -- 3/21/2022

Figure 13. Photo Point 8 Looking West – 11/8/2021

Figure 14. Photo Point 8 Looking West – 3/21/2022

Figure 15. Photo Point 9 Looking East – 11/8/2021

Figure 16. Photo Point 9 Looking East – 3/21/2022

Figure 17. Photo Point 9 Looking West – 11/8/2021

Figure 18. Photo Point 9 Looking West – 3/21/2022

Other Photo Documentation

Figure 19. Reference Site Monitoring (CBA Personnel) – 3/21/2022

Figure 20. Reference Site Monitoring (Sediment Plate Exposed from Erosion) – 3/21/2022