



Living Shorelines and Oyster Reef Balls in Jupiter, Florida

**FSBPA 36th Annual National Conference on
Beach Preservation Technology
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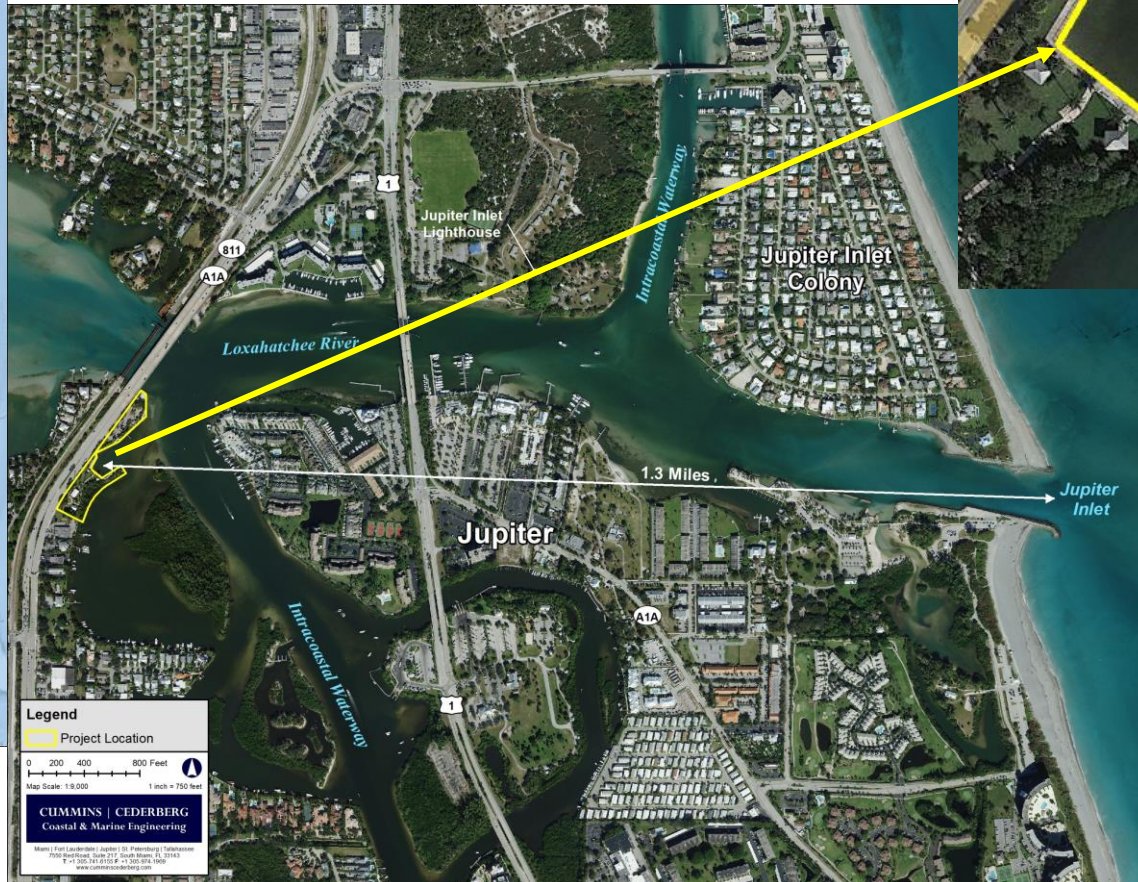
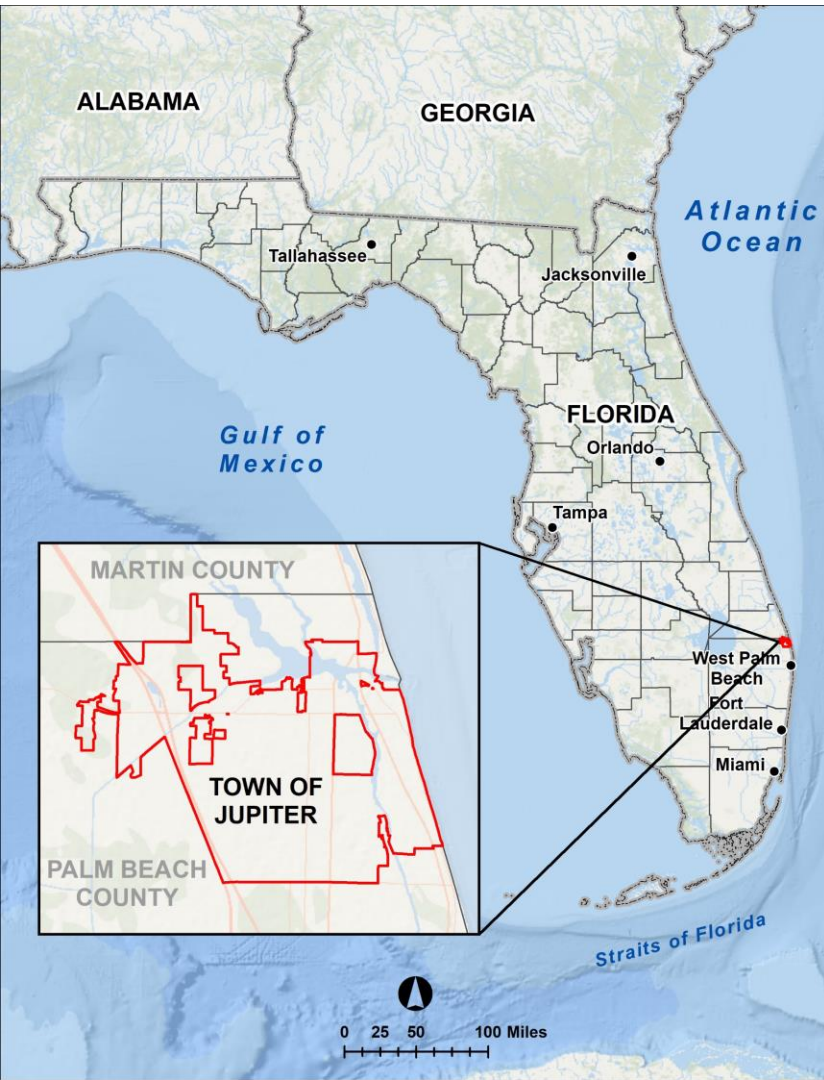
Will Lorentzen, P.G. – Cummins Cederberg

Overview

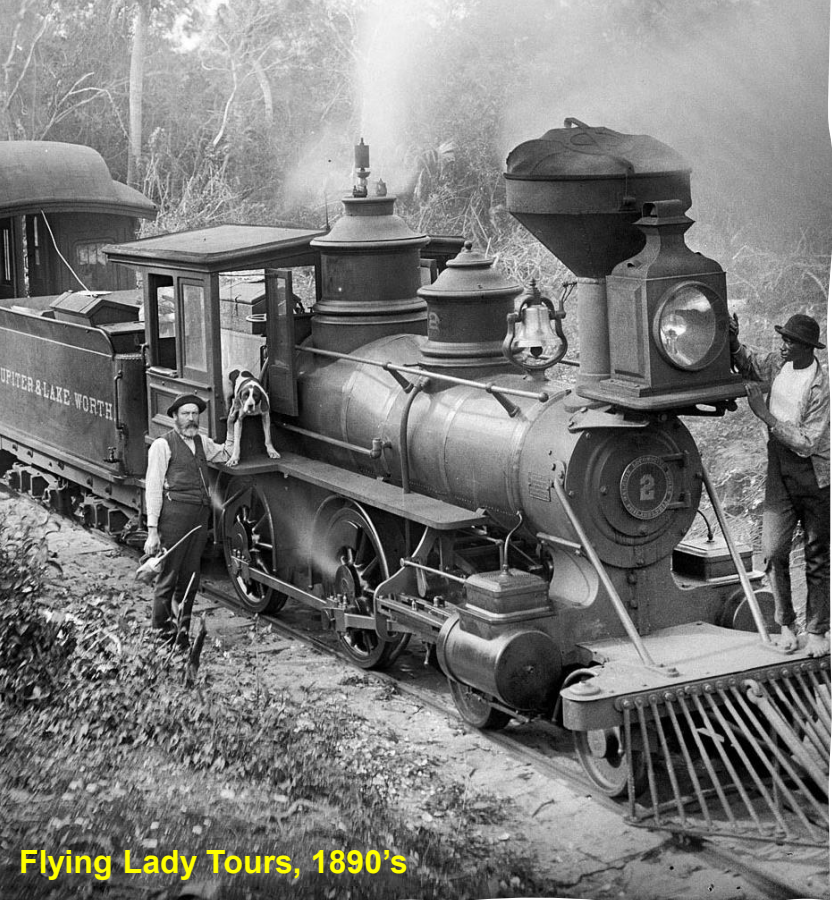
- Introduction
- Project Location
- Project Site History
- Project Goals
- Field Work
- Engineering Analysis & Design
- Environmental Permitting
- Student Engagement
- Limitations/Conclusions
- Next Steps



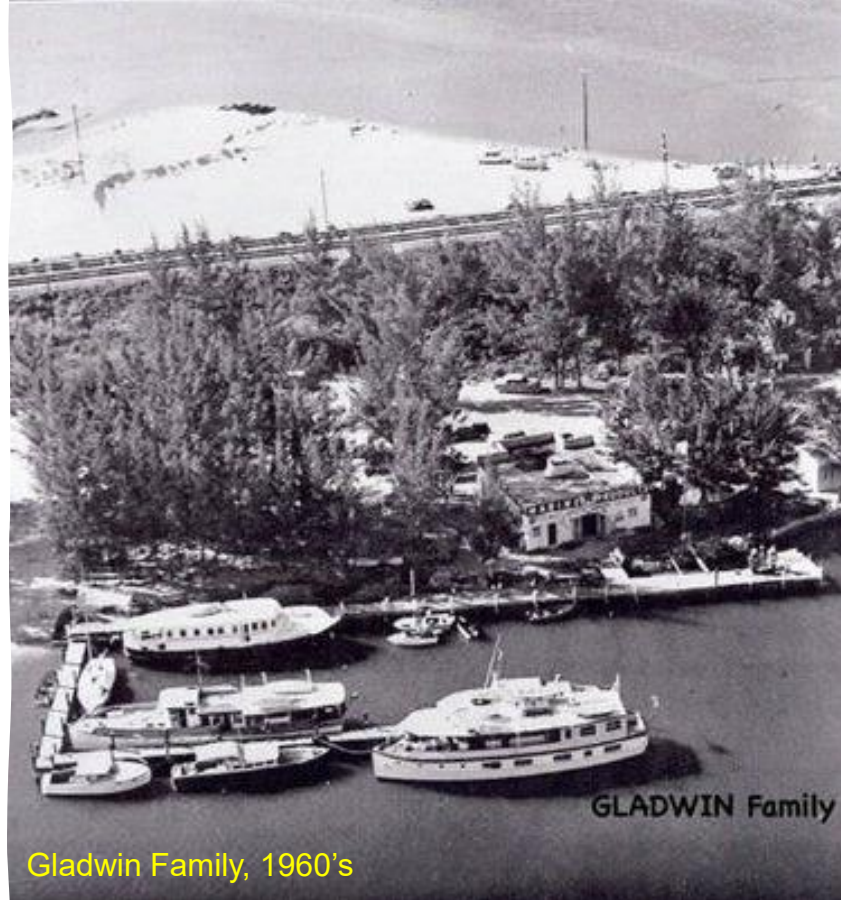
Project Location



Google Earth, 2022



Flying Lady Tours, 1890's



Gladwin Family, 1960's



Echo Fine Properties, present day

Project Site History

- First settlers, 5,000 years ago
- 1890's Henry Flagler Railroad
- 1920's Oyster Excavation
- 1940 - 1960's Old Jupiter Marina
- 1970's Navigation Improvements
- 1975 FDOT SR-811 Reconstruction



Project Goals

- Improve water quality
- Promote seagrass and oyster growth
- Improve fisheries
- Enhance coastal resiliency
- Restore natural hydrology

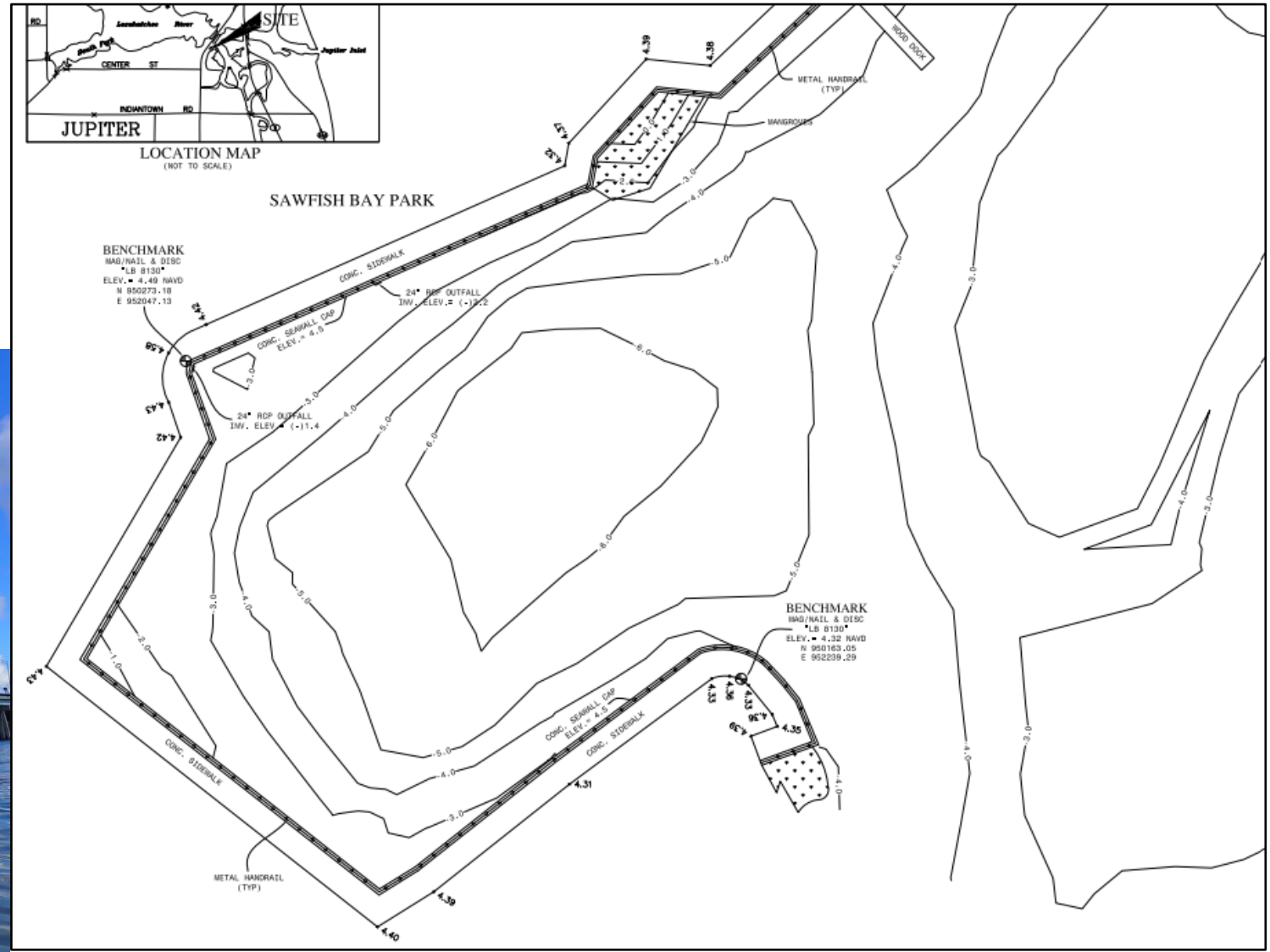


Bathymetric Survey

- 1 – 6 ft. NAVD

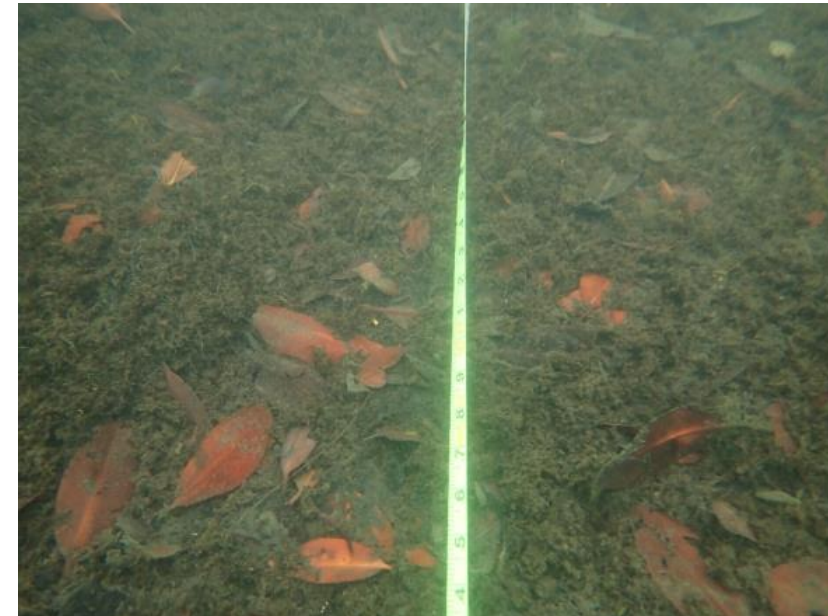
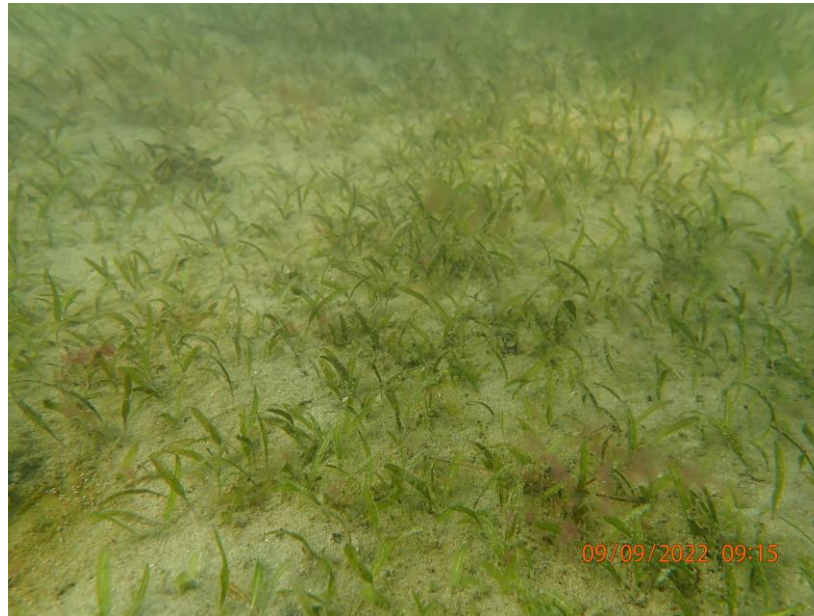
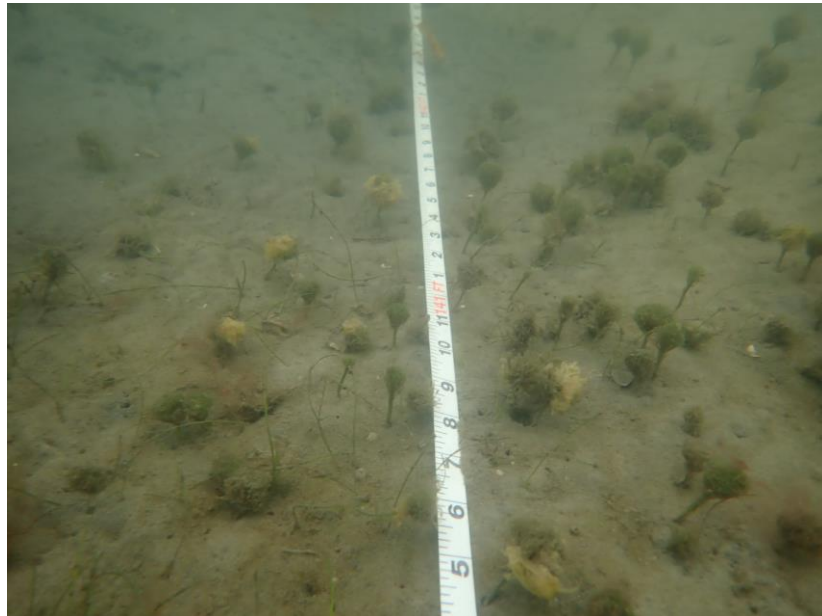
Engineering Conditions Assessment

- 983 LF of Vinyl Sheet Pile Seawall



Marine Resources Survey

- September 2021 & September 2022
- Paddle grass (*H. decipiens*), Johnson's seagrass (*H. johnsonii*), shoal grass (*H. wrightii*)
- BB Score 0 (absent) – 3 (>5 shoots, 25-50% cover)



Purpose

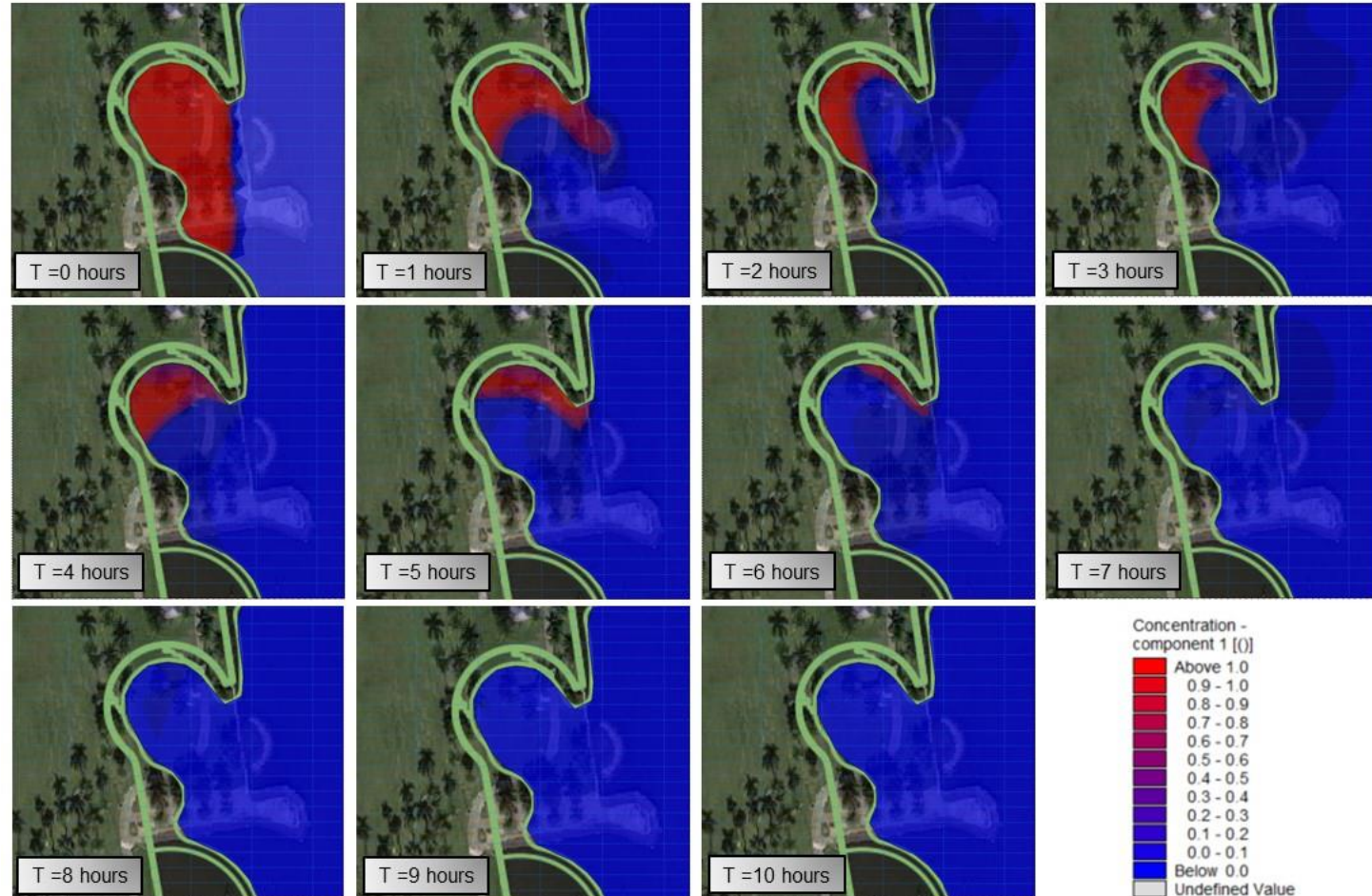
- Existing and proposed flushing times vs. existing and proposed conditions.
- Verify project will not have an adverse effect on flushing time.

Methods

- Inputs: basin depth at low and high tide, surface area, tidal cycle and non-tidal freshwater inflow.
- ERP Applicant's Handbook Volume I Section 10.2.4.3

Results

- Proposed project will have a slight improvement on flushing time.
- Analysis did not include numerical modeling.



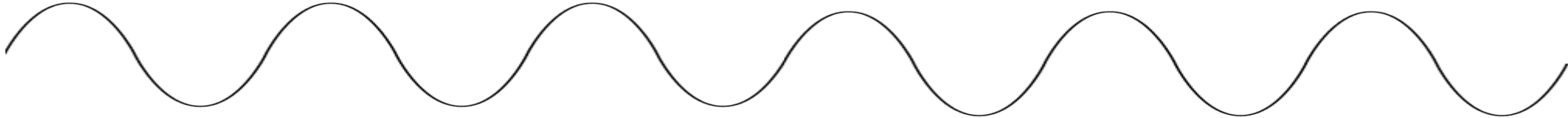
Currie Park, West Palm Beach

Flushing Analysis

Other recommendations to improve water quality and habitat.

- Curve living shoreline elements.
- Maintain existing stormwater outfalls.
- Install bubblers.
- Add baffle boxes to stormwater system.
- Remove detritus from the seabed.
- Dredge between Intracoastal Waterway and deeper areas within the basin.
- Add a culvert in the southeastern corner of the basin.





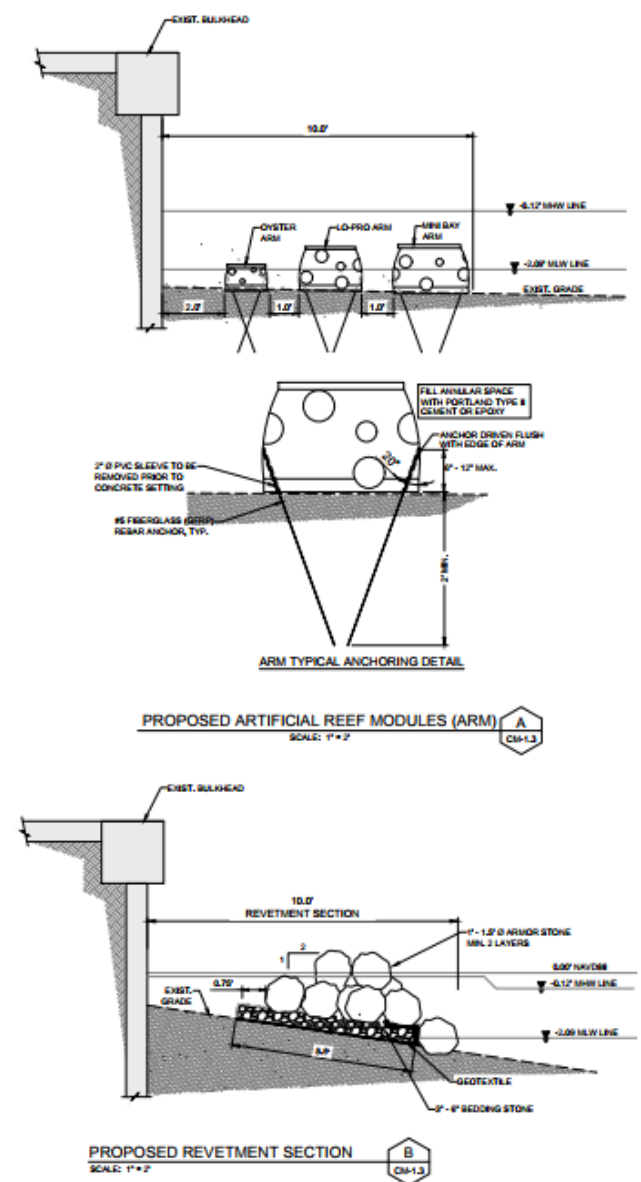
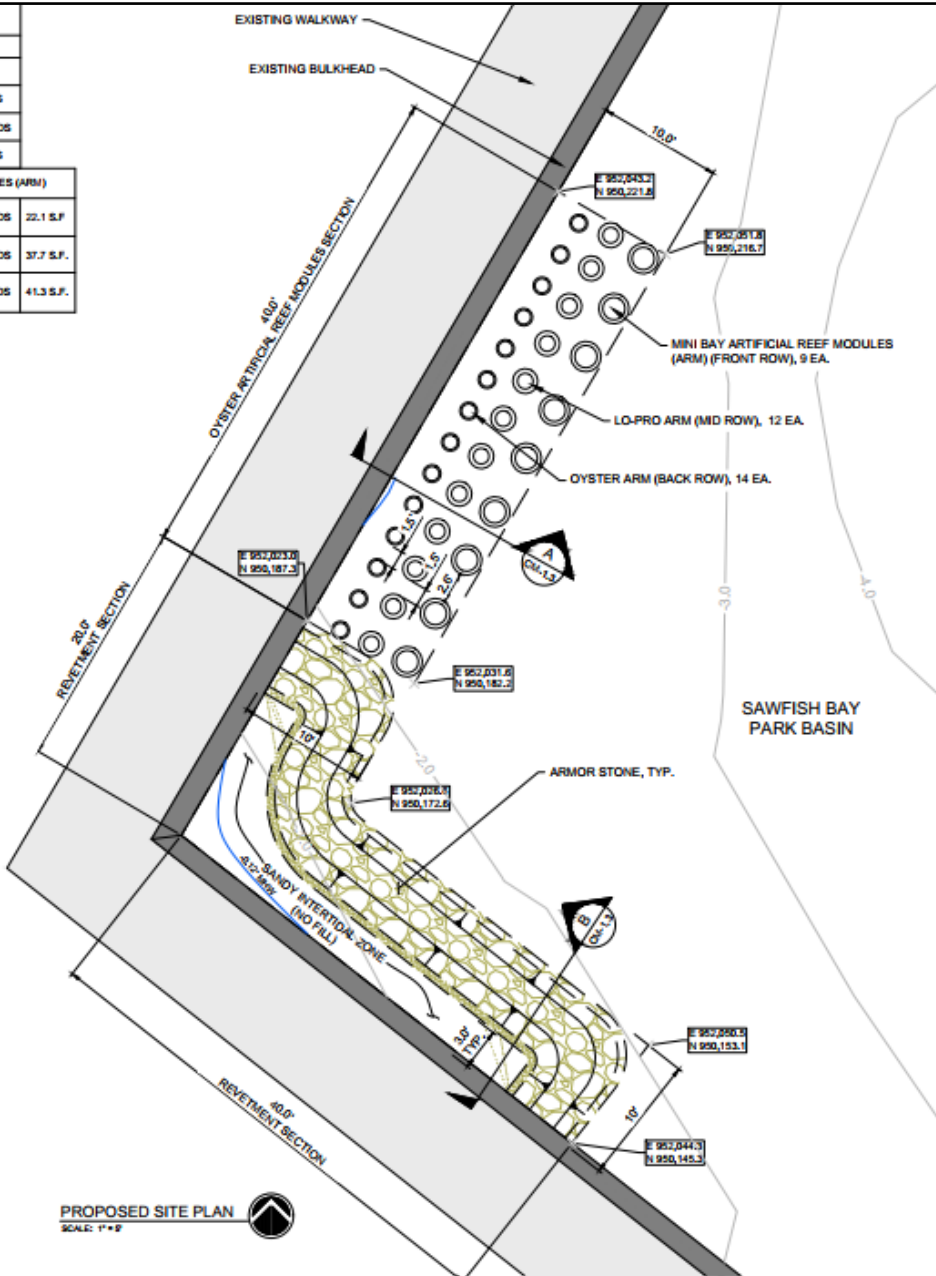
Sliding



Rolling

Engineering Design – Phase 1 “Pilot Project”

QUANTITIES TABLE		
LIVING SHORE LINE		
ITEM	QTY.	
BEDDING STONE	42 CU. YARDS	
ARMOR STONE	20.5 CU. YARDS	
GEOTEXTILE	41 CU. YARDS	
OYSTER ARTIFICIAL REEF MODULES (ARM)		
OYSTER ARM	0.39 CU. YARDS	22.1 S.F.
LO-PRO ARM	0.93 CU. YARDS	37.7 S.F.
MINI BAY ARM	1.23 CU. YARDS	41.3 S.F.



SAWFISH BAY PARK SHORELINE STABILIZATION PROJECT

ADDRESS: 1133 N. ALTERNATE A1A, SUITE 101, WEST PALM BEACH, FLORIDA 33418

CLIENT: CALVIN, GIORDANO & ASSOCIATES, INC.

ADDRESS: 990 VILLAGE BLVD, SUITE 325 WEST PALM BEACH, FL 33409

ENGINEER: CUMMINS CEDERBERG COASTAL & MARINE ENGINEERING
201 ALHAMBRA CIRCLE, SUITE 601 CORAL GABLES, FL 33134
TEL: +1 305 754-4155 FAX: +1 305-471-1989
WWW.CUMMINSCEDERBERG.COM
COA # 28962

Permit Number: 50-0327899-004-EG
Southeast District

SCALE: 1"=8'

DATE: 10/20/2023

PROJECT NO: 19000

DRAWN BY: [REDACTED]

CHECKED BY: CHAMP

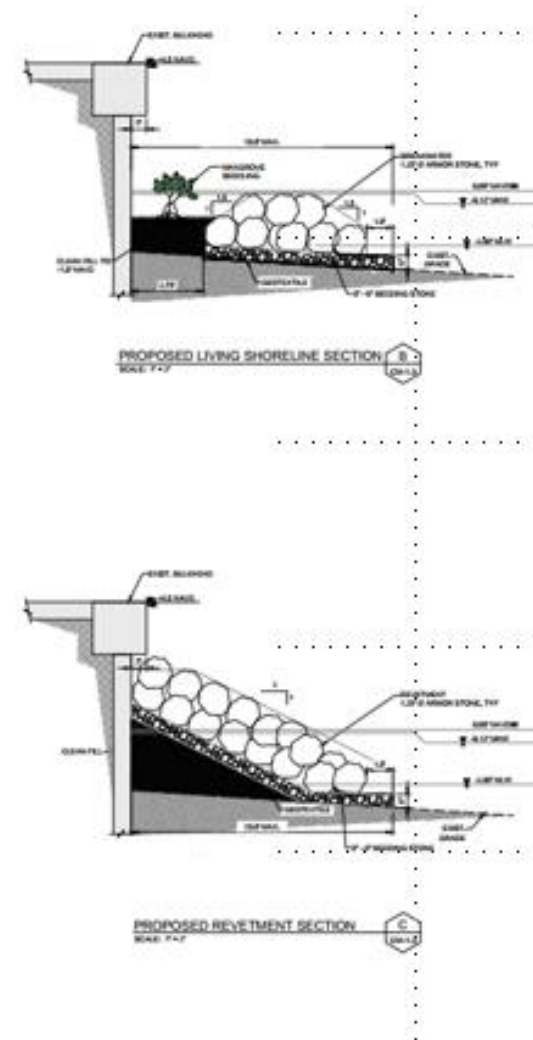
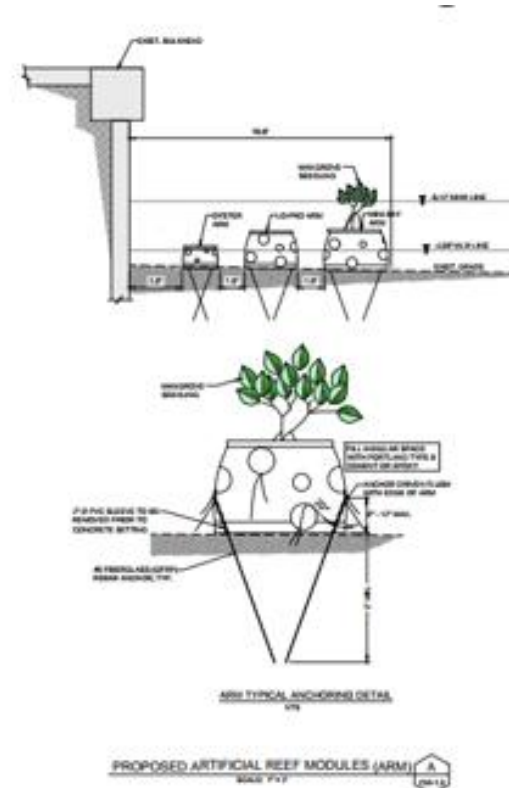
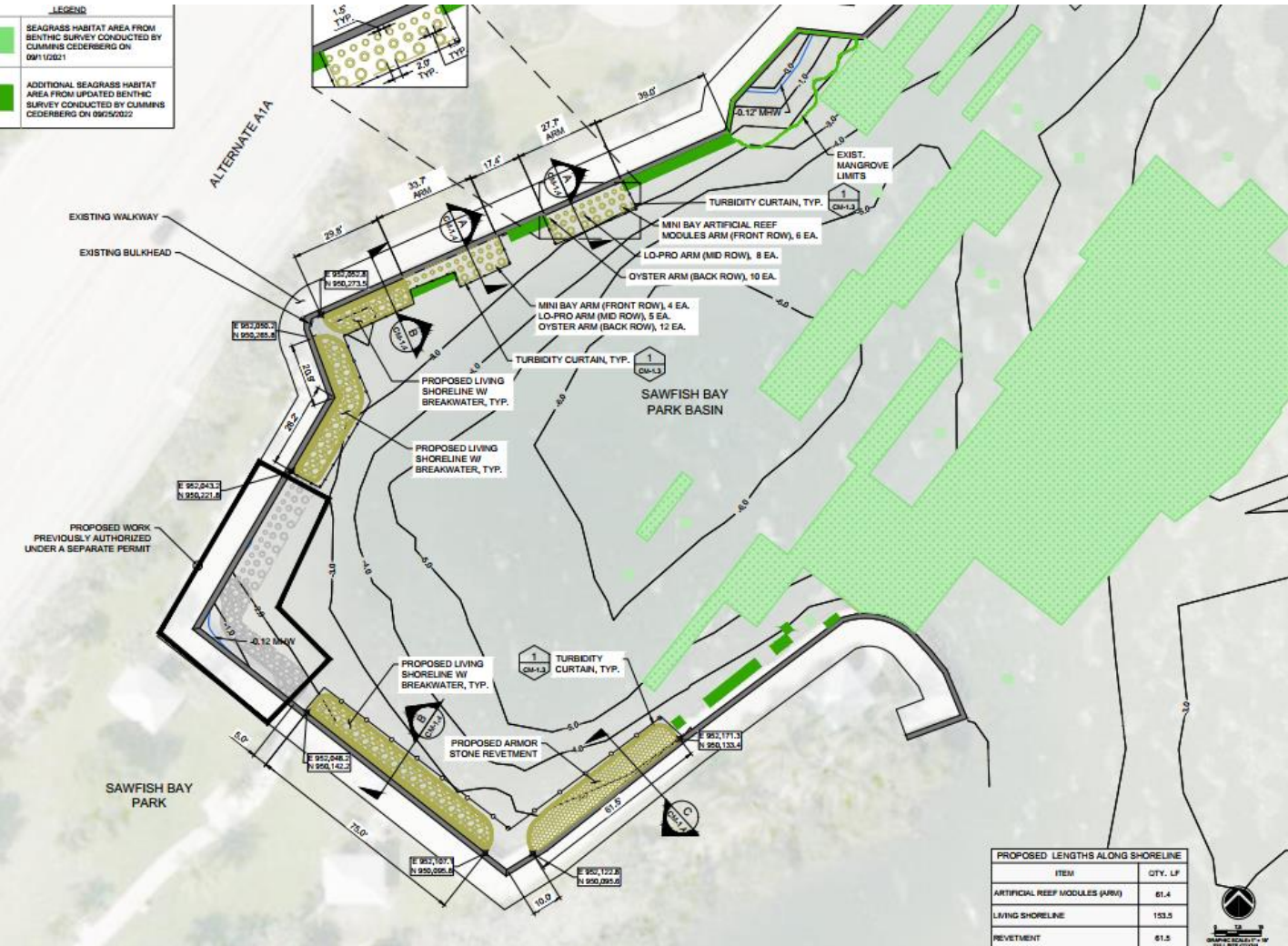
SCALE: AS SHOWN

SHEET TITLE: PROPOSED WORK

CM-1.3

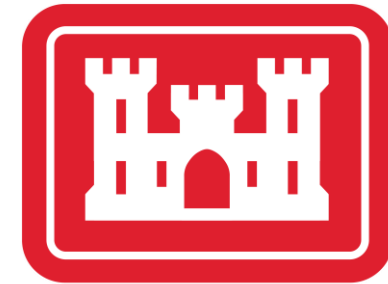
- Install 100 LF of shoreline stabilization
- 40 LF ARMs
- 60 LF rock revetment
- Mangrove plantings
- Short project schedule

Engineering Design – Phase 2



Phase 1 – “Pilot Project”

- Project schedule – October 2022
- General permit to install riprap (Chapter 62-330.431, FAC)
- Federal authorization granted via SPGP-VI
- Limitations
 - 100 LF
 - Maximum of 10 ft. waterward
 - No impacts to marine resources
 - 2(H):1(V) slope



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Phase 2 – Expansion of the “Pilot Project”

- Permitting is ongoing - applications submitted
- Anticipate an FDEP SWERP and a USACE IP via JaxBO

Student Engagement – October 2022

CUMMINS | CEDERBERG
Coastal & Marine Engineering



Student Engagement – November 2022



- Incorporate any necessary changes to ensure that the implemented nature-based solutions are self-sustaining.
- Evaluate success - serve as a baseline.
- Annual exotic removal.
- Marine resource monitoring (seagrass, oysters, etc.).
- Mangrove planting areas will be checked and supplemented.
- Oyster growth will be checked and supplemented.
- Regular volunteer trash pickups.



- Phase 3
 - Fully funded: Fill barren basin to restore natural hydrologic features, matching adjacent shoal where seagrass grows; installation of riprap, reef balls, and mangrove planters.
- Phase 4
 - Installation of a wetland on the park to provide stormwater treatment of an existing FDOT outfall, breakwater structure, mangrove planters, improved fishing structure, and marine habitat abutting existing mangroves.
- Phase 5
 - Construct two new fishing platforms in Sawfish Bay Park, extend restoration throughout Sawfish Bay area, where necessary.



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