City of Tampa
Jane Castor, Mayor

Contract Administration
Richard Mutterback, Director
306 East Jackson Street, 4N
Tampa, FL 33602

Office (813) 274-8116
Fax: (813) 274-7368

ADDENDUM
Via E-Mail
DATE: October 22, 2025

Contract: 25-D-00030 Picnic Island Park Nature Based Solutions

Submitters on the above referenced project are hereby notified that the following addendum is made to the RFQ. Any submissions shall conform to this notice.

Item 1: Attached is a copy of the Pre-Submission Sign-In Sheet. Attendance was not mandatory.

Item 2: Attached is a copy of a 2022 Technical Report.

All other provisions of this RFQ not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to ContractAdministration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

25-D-00030 Picnic Island Park Nature Based Solutions

3 PM Pre-Submission Conference 10-13-25

Sign-In Sheet Please Print — City of Tampa, Contract Administration Department

	Name	Organization	E-Mail
1	Jim Greiner, PE	Tampa Contract Administration Dept.	Jim.Greiner@tampagov.net
2	MIKE HERRMAN	MOFFATT & NICHOL	mherman@moffattnichol.com
3	JACQUES FORTINS		
4	Danielle Riffenburg	Parks & Recreation	danielle.riffenburg@tampa.gov
5	MANUEL CASTANO	MOFFATT & NICHOL	mycastano@moffattnichol.com
6	Joe Di Stefano	Tierra, Inc	jdistefano@tierraeng.com
7	Michael Bradley	Miller Legg	mbradley@millerlegg.com
8	Tracy Schneider	Pennoni	Tschneider@pennoni.com
9	Zaine Arth	MDR	zaine.arth@gmail.com
10	NABIL BAWANY	WSP	NABIL.BAWANY@WSP.com
11	BRAD SUDER	COT PKR	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			

Technical Memorandum

Picnic Island

The Nature Conservancy
Mangrove Engagement Restoration Management (MERM) Pilot Project

Tampa Bay, FL

July 22, 2022

Table of Contents

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1 Introduction

HDR Engineering inc. (HDR) has partnered with The Nature Conservancy (TNC) to provide engineering services for the Mangrove Engagement Restoration Management (MERM) Pilot Project at the Cohn Preserve (Texas), Grand Isle (Louisiana), and Picnic Island Park (Florida). These services include data reviews, project stakeholder coordination meetings, conceptual project design and associated cost development, and regulatory agency pre-application meetings associated with the restoration projects that incorporate mangroves. This Technical Memorandum summarizes the data collection, conceptual designs, and agency comments for the Picnic Island project site.

1.1 Project Location

Picnic Island is located between Old Tampa Bay and Tampa Bay, and is northwest of the MacDill Air Force Base as shown in Figure 1. Picnic Island's western shoreline is exposed to locally generated wind waves from several directions. In addition, it is exposed to larger waves during hurricanes that impact this region between June 1 and November 30 annually. The project site is also located adjacent to a ship channel making the shoreline susceptible to ship wakes. Exposure to these varied wave climates can cause significant shoreline change.

Figure 1. Project Vicinity

Picnic Island is immediately south of Port Tampa Bay and includes a public beach, upland areas, marshland, and mangroves that provide a recreational space for local communities and important habitat for local wildlife. Due to shoreline recession and habitat loss, some riprap protection has been placed along the western, southwestern, and southern shorelines as shown in Figure 2. In the early 2000s the southern breakwater was constructed to protect the southern shoreline while providing habitat suitable for mangrove reestablishment. While the breakwater has successfully allowed reestablishment of mangroves in the area, adjacent unprotected areas have continued to erode to the northwest.

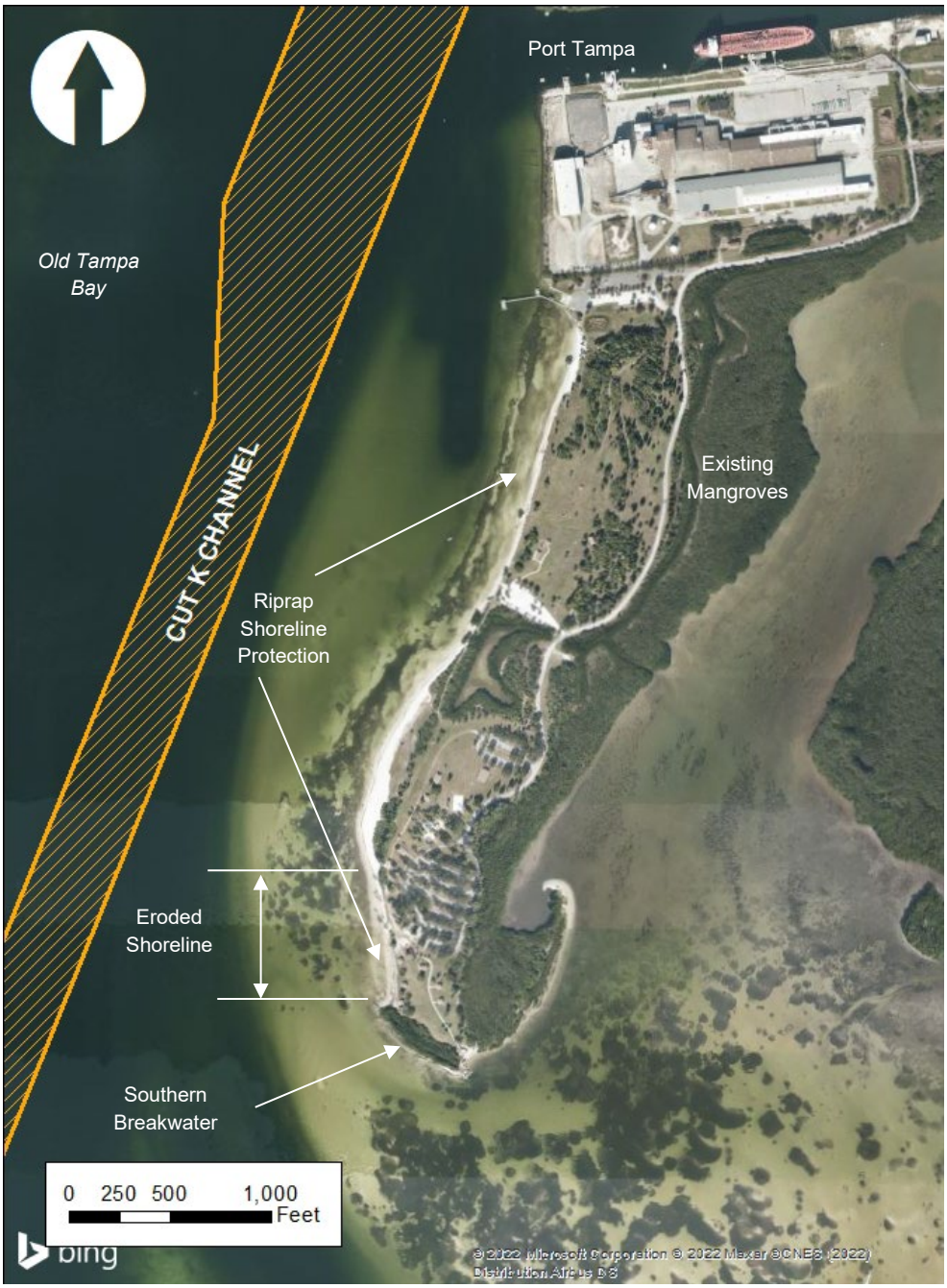


Figure 2. Study area

2 Data Collection

The data collection process consisted of aggregating readily available information on current and historical shoreline positions, bathymetry and topography, hydrodynamics at the site, meteorological information, oil and gas infrastructure in the area, and environmental conditions. This information will be used to identify major morphological events and trends, determine hydrodynamic forcing conditions, and assess the constructability of varying design alternatives at the site. The following sections describe the data gathered for the project.

2.1 Project Datums

Unless otherwise noted, all data references the North American Datum of 1983 (NAD83) State Plane Florida West FIPS 0902 horizontal datum in US feet and the North American Vertical Datum of 1988 (NAVD88) vertical datum in US feet.

2.2 Historical Imagery/Shoreline Change Analysis

Using the Florida Department of Transportation (FDOT) Aerial Photo Look Up System (APLUS), aerial photographs were compiled between 1976 and 2020 (FDOT, 2022). These aerial photographs were visually analyzed to identify an approximate shoreline position for each image using ArcMap. The shoreline locations were approximated as the wet/dry line or wrack line, if observed. This methodology is typically implemented when using rectified aerial photography for shoreline position analyses as the wet/dry or wrack line is the most consistent shoreline feature available between images. Following this analysis, the Digital Shoreline Analysis System (DSAS) GIS application developed by the U. S. Geological Survey (USGS) was used to determine shoreline change rates. Three time periods were analyzed including before the southern breakwater construction (1976-2000), after the southern breakwater construction (2000-2020), and the combined period (1976-2020). The shoreline was classified into 5 geographic analysis groups, shown in Figure 3, based on general trends and characteristics. Table 1 and Figure 3 show the shoreline change rates relative to each analysis area and time period. Note that because elevation-based data were not available, shoreline positions were approximated and may not be as precise as surveyed shoreline locations and change rates. Factors such as high or low tide may skew the visually-approximated shoreline location.

Table 1. Shoreline Change rates

Analysis Group	End Point Rate (ft/yr)		
	1976 - 2000	2000-2020	1976-2020
1	-2.2	-0.8	+1.6
2	+0.5	+0.5	+0.5
3	-2.5	-2.3	-2.4
4	-3.4	+0.8	+1.5
5	+4.6	+2.3	+3.6
Combined	-1.0	-0.1	-0.6

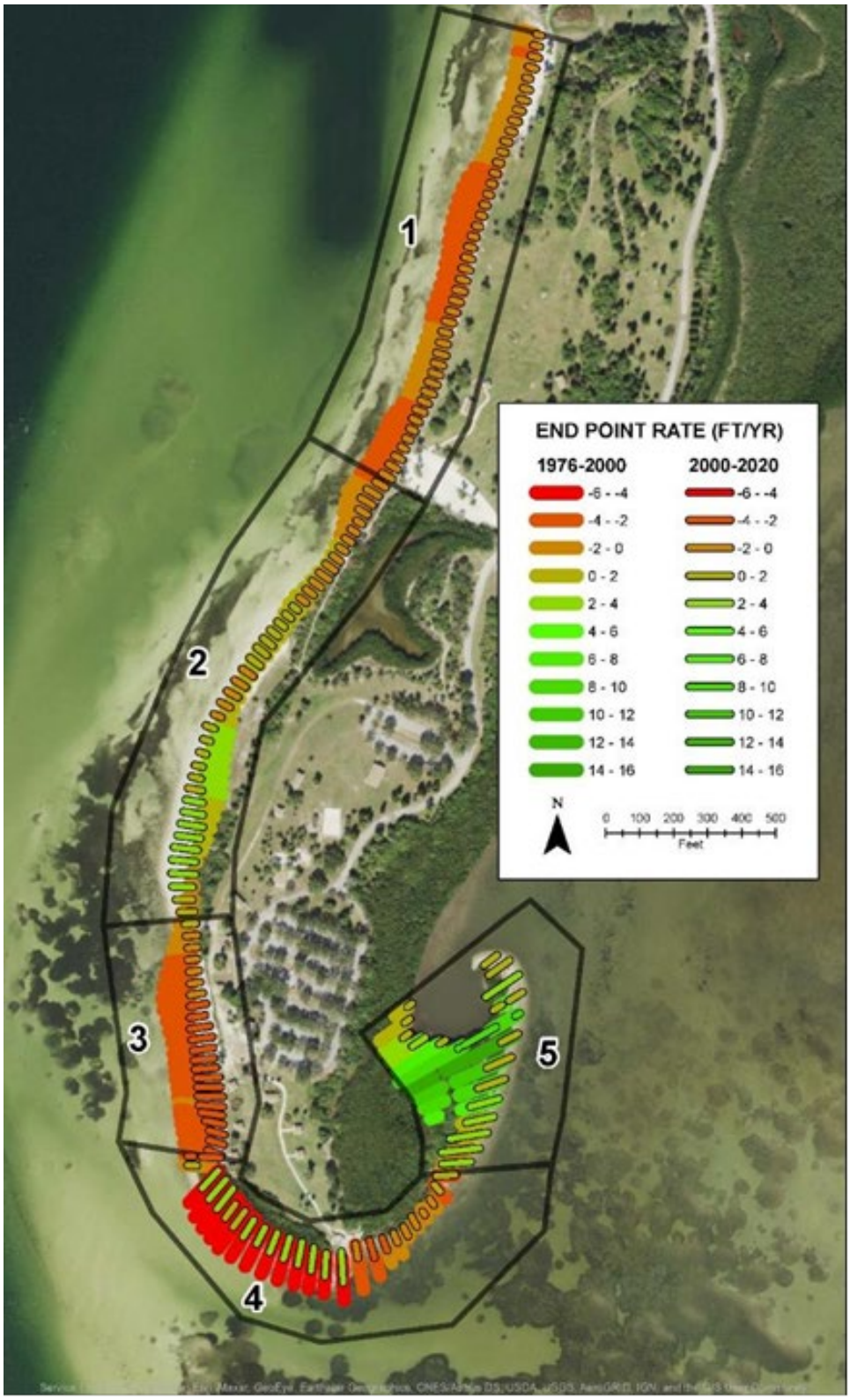


Figure 3. DSAS Shoreline Change rates (2020 aerial)

2.3 Bathymetry and Topographic Data

Topographic and bathymetric data will be used to assess accessibility to the site during construction, and hydrodynamic processes that influence erosion and sediment transport. This information will also be important to the development of numerical models, if needed, in later phases. The bathymetric and topographic data come from a Continuously Updated Digital Elevation Model (CUDEM) of the U.S. coast found in the NOAA Bathymetry Viewer (CIRES, 2021). Figure 4 shows the contour lines of the bathymetric data near the study area relative to NAVD. Generally, bathymetry is relatively shallow near the project site; however, sharp changes in bathymetry occur near the navigational channel boundaries. In addition, dredging near the northern shoreline is not properly represented in the bathymetry. This omission is likely caused by limited data in the region and would need to be considered during later phases of the project.

Figure 4. NOAA CUDEM Bathymetric and Topographic Contours

2.4 Environmental Data

Environmental data will be used to guide the conceptual design and regulatory phases of the project. Readily-available information on seagrass, oyster reefs, and wetland habitat was collected for this study.

2.4.1 Seagrass

Seagrass geographical information was obtained from the Florida Fish and Wildlife Conservation Commission (FWC) ArcGIS Seagrass online tool. The FWC data collection process included visual identification using photographs and field measurements from several organizations between 1987 and 2020. FWC classified the polygons as either “Continuous Seagrass” cover or “Patchy (Discontinuous) Seagrass” cover (FWC, 2022). Figure 5 shows the seagrass extent near the project site. The Tampa Bay Seagrass Transect Dashboard website developed by the Tampa Bay Estuary Program was reviewed; however, there were no transects directly at the project site (TBEP, 2022).

Figure 5. Seagrass Extent

2.4.2 Oyster

Oyster geographic data were obtained from the FWC ArcGIS viewer. The data are a compilation of information from several organizations in Florida. This data is only meant for mapping of oyster beds around the state and does not provide any additional information. Figure 6 shows the location of oyster beds in the region. Though there are no beds near the site, their location in the bay indicates that this region supports oyster habitat (FWC, 2022).

Figure 6. Oyster Map

2.4.3 Wetlands

Wetland geographic data were obtained from the U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory GIS layer. The data is a compilation of information from several organizations and represents general mapping of wetland habitat. The data are not meant to serve as a jurisdictional map. Figure 7 shows the location of wetland types in the project area (USFWS, 2022). The project area is generally surrounded by estuarine and marine wetland and deep water.

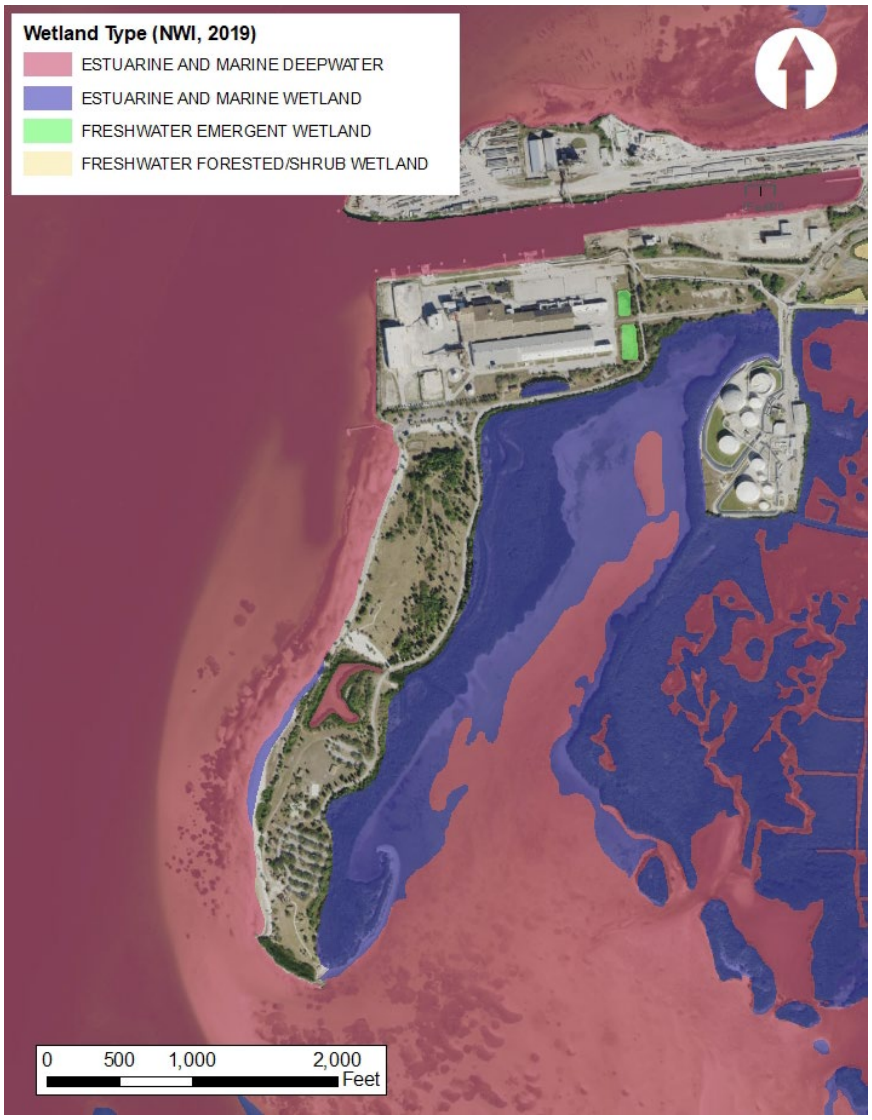


Figure 7. USFWS National Wetland Index

2.5 Water Level Data

Water level data are key to understanding the hydrodynamic conditions near the project site. Several factors impact the water levels. To understand the entirety of the water level trends in the area, information on historical water levels, tidal datums, storm surge, and relative sea level rise was extracted.

2.5.1 Water Level Time Series

Water level time series data were obtained from the National Oceanic and Atmospheric Administration (NOAA) Tides and Currents site (NOAA N. O., 2022). Figure 8 shows the nearby NOAA tide stations relative to the Picnic Island project site. NOAA Station 8726607 (Old Port Tampa) was selected for further analysis due to its proximity to the project site. Figure 9 shows the water level time series at the station during 2017 and 2020. These time series show seasonal trends in the region and highlight surge events during two recent hurricanes.

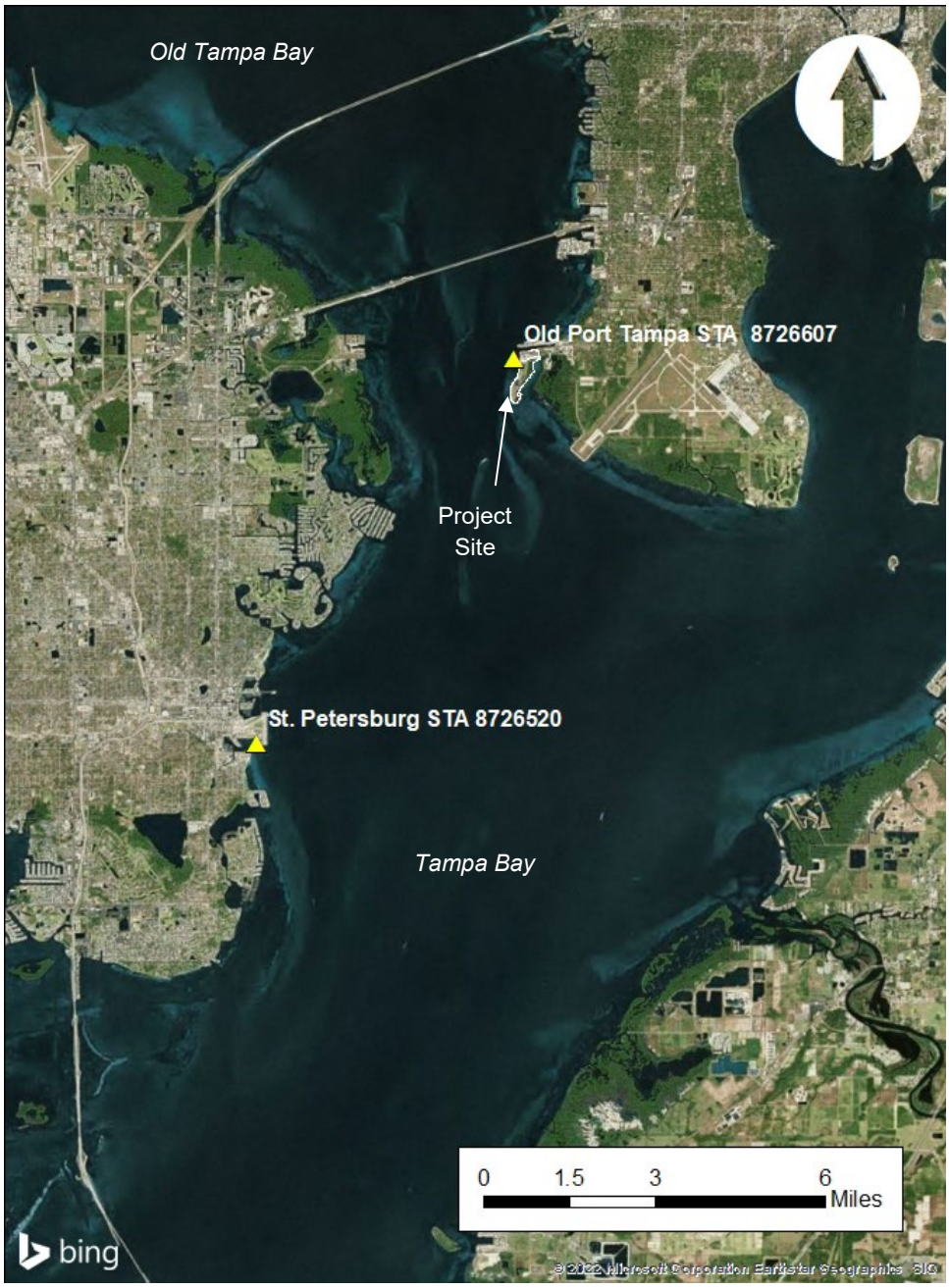


Figure 8. NOAA Station Locations

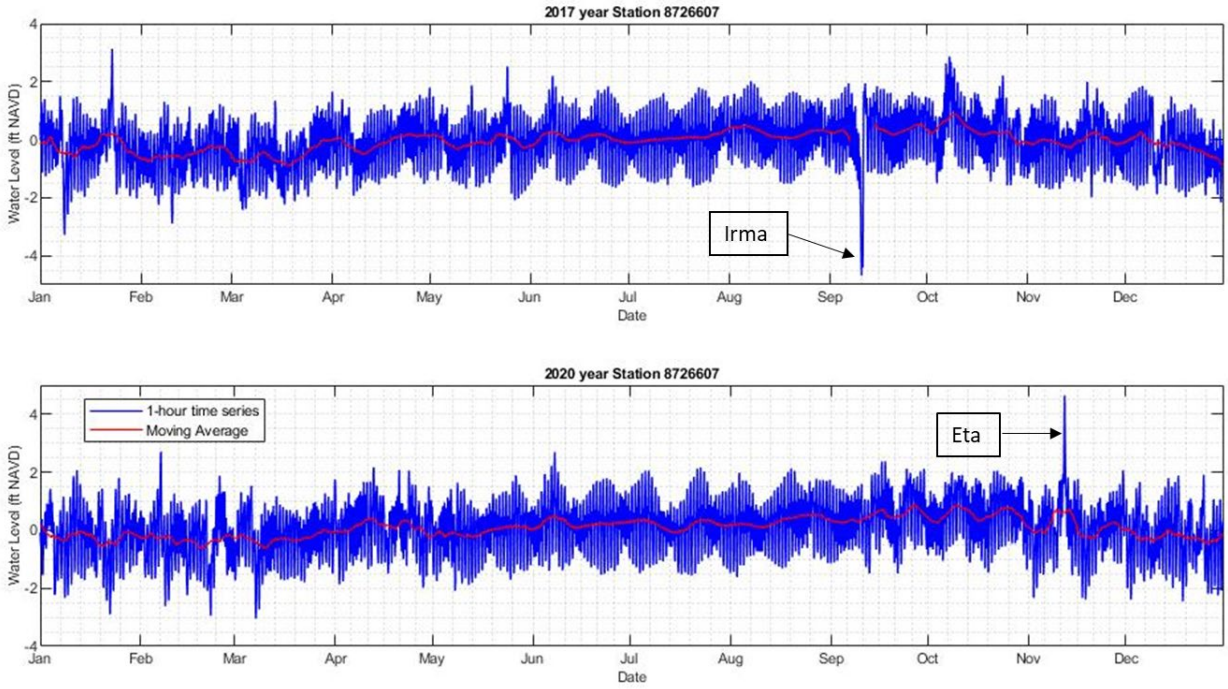


Figure 9. NOAA Station water level time series

2.5.2 Tidal Datums

Tidal datums were also extracted NOAA Station 8726607 (Old Port Tampa) and are shown in Table 2 below. These values represent statistical water levels and show a mean tidal range (MLW to MHW) of 1.73 ft and a diurnal tide range (MLLW to MHHW) of 2.48 ft. Water levels may further vary based on seasonal and storm events.

Table 2. Old Port Tampa Station 8726607 Tidal Datums

Tidal Datums	Water Level (ft NAVD)
Mean Higher High Water (MHHW)	+0.79 ft
Mean High Water (MHW)	+0.47 ft
Mean Sea Level (MSL)	-0.39 ft
Mean Low Water (MLW)	-1.25 ft
Mean Lower Low Water (MLLW)	-1.69 ft

2.5.3 Storm Surge Data

Storm surge is caused by severe meteorological characteristics (i.e., atmospheric pressure and wind speed) generated by extreme events such as hurricanes. These factors raise water levels and push larger volumes of water onshore resulting in significantly higher water levels along the coastline. The Federal Emergency Management Agency (FEMA) and NOAA have each

calculated water levels to represent statistically extreme severe events using numerical modeling, historical water level data, and statistical analysis. The FEMA statistical water levels were extracted along Transect 31 from the 2021 Hillsborough County, Florida Flood Insurance Study report (FEMA, 2021). The NOAA extreme water levels were not available at Old Port Tampa Station 8726607 (NOAA N. O., 2022). Instead, the extreme water levels were extracted from NOAA Station 8726520 (St. Petersburg). The statistical water level values are listed in Table 3 and the FEMA transect location is shown in Figure 10.

Table 3. FEMA and NOAA extreme water level analysis

Return Periods	Water Level (ft NAVD)	
	FEMA Transect 31	NOAA Station 8726520 (St. Petersburg)
10-year	+5.80	+3.35
50-year	+8.40	+4.79
100-year	+9.40	+5.71

Figure 10. FEMA transect location

2.5.4 Hurricane Tracks

Hurricane track data were obtained from the NOAA Hurricane Tracker tool (NOAA, 2022b). Using this tool, hurricanes and tropical storms from 2000 to 2021 within 60 nautical miles of the project site were identified and are shown in Table 4 and Figure 11. The storms of interest were identified based on hurricane track, category of storm, orientation to the project site, and potential to create extreme water level and wave conditions at the site. These storms are boldened to further refine the set of information to be analyzed and used for later phases.

Table 4. Hurricane track information

Name	Start Date	End Date	Highest Category	Fastest Windspeed	Landfall Category	Landfall Windspeed
Eta	**10/31/2020**	**11/14/2020**	**H4**	**150 mph**	**TS**	**63 mph**
Irma	**8/30/2017**	**9/13/2017**	**H5**	**178 mph**	**H3**	**115 mph**
Emily	7/30/2017	8/2/2017	TS	58 mph	TS	58 mph
Barry	5/31/2007	6/5/2007	TS	58 mph	TD	35 mph
Jeanne	9/13/2004	9/29/2004	H3	144 mph	H2	86 mph
Frances	8/25/2004	9/10/2004	H4	144 mph	TS	69 mph
Charley	**8/9/2004**	**8/15/2004**	**H4**	**150 mph**	**H4**	**144 mph**
Henri	9/3/2003	9/8/2003	TS	58 mph	TD	35 mph
Gabrielle	9/11/2001	9/21/2001	H1	70 mph	TS	69 mph

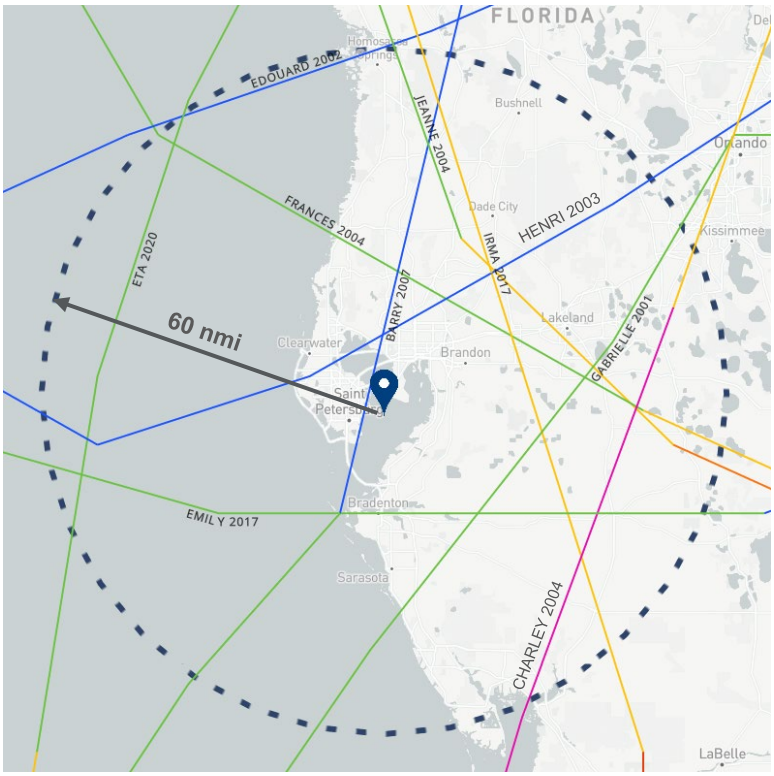


Figure 11. NOAA hurricane tracks at project site (2000-2021)

2.5.5 Relative Sea Level Rise Projections

Relative sea level rise (RSLR) considers sea level rise and local settlement or other geological changes to determine anticipated changes in water levels over time. The USACE Sea Level Change Curve Calculator (USACE U. A., 2022) was used to calculate several RSLR scenarios at NOAA Station 8726520 (St Petersburg) as shown in Figure 12. The RSLR information will be used to inform design alternatives.

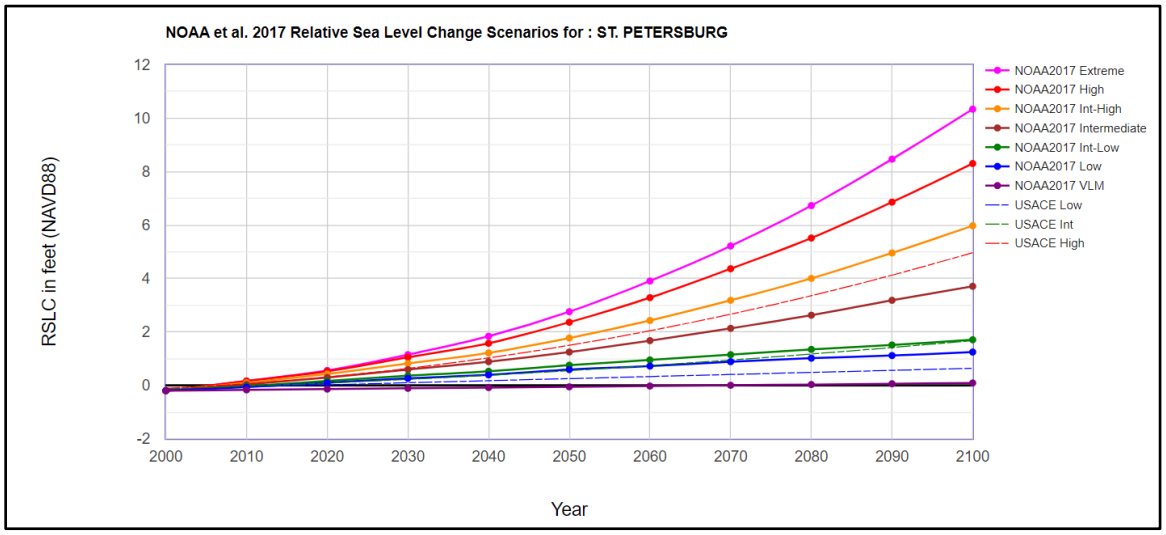


Figure 12. USACE RSLR Chart (USACE U. A., 2022)

2.6 Wind

Wind is a primary forcing mechanism on the intensity and direction of the wind-generated waves. Wind data were obtained from NOAA Station 8726607 (Old Port Tampa) (NOAA N. O., 2022) and are shown as a wind rose in Figure 13. The wind rose classifies the wind data in terms of windspeed, direction and frequency of occurrence, and helps identify the predominant wind directions for typical and extreme windspeeds. From this wind rose, the dominant relevant wind approaches the project area from the northwest. Winds from the south-southeast also travel along the controlling fetch and may significantly impact the southern shorelines.

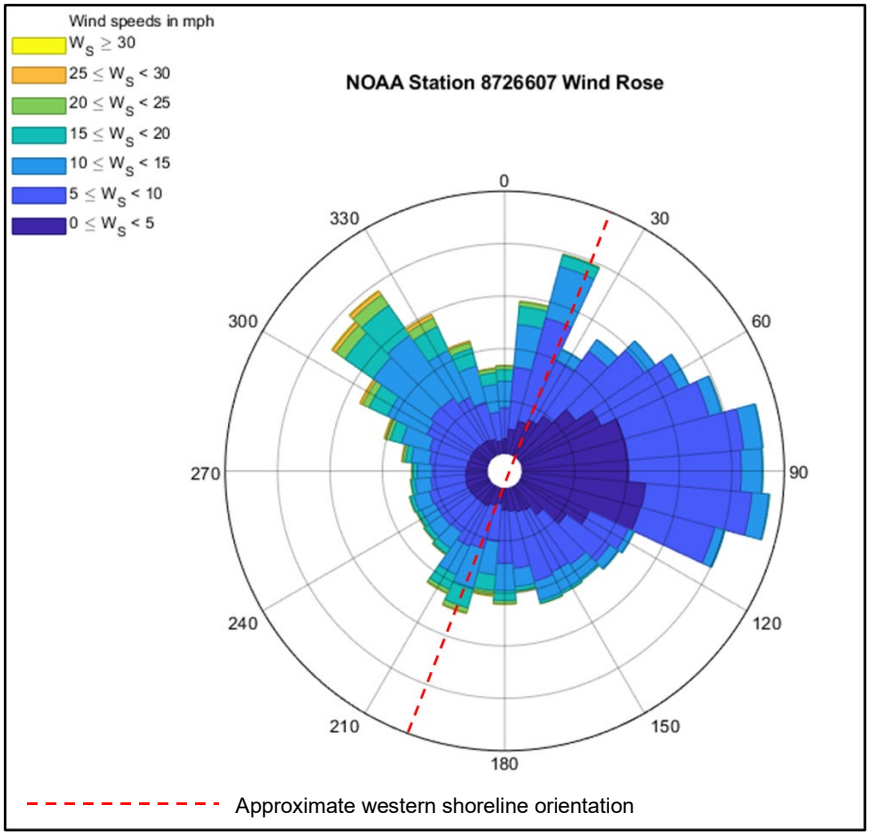


Figure 13. NOAA Station 87726607 wind rose

2.7 Wave Analysis

Waves are a primary driving force behind morphological change along coastlines and are an important consideration in the design process. Using the compiled data described above, a preliminary wave analysis was conducted using the one-dimensional Automated Coastal Engineering System (ACES) software. This program computes wave heights and periods using inputs of windspeed, wind duration, fetch length, and water depth. A 24-mph sustained windspeed was used as a representative windspeed during northern cold fronts. The longest fetch lengths were measured in ArcMap and are shown in Figure 14. The results of the preliminary ACES wave analysis are shown in Table 5. Because refraction, directional spreading, shoaling, breaking, and other factors influence local wave climates, it is recommended that a two-dimensional wave

numerical model be conducted to calculate a more accurate prediction of the wave climate for detailed design.

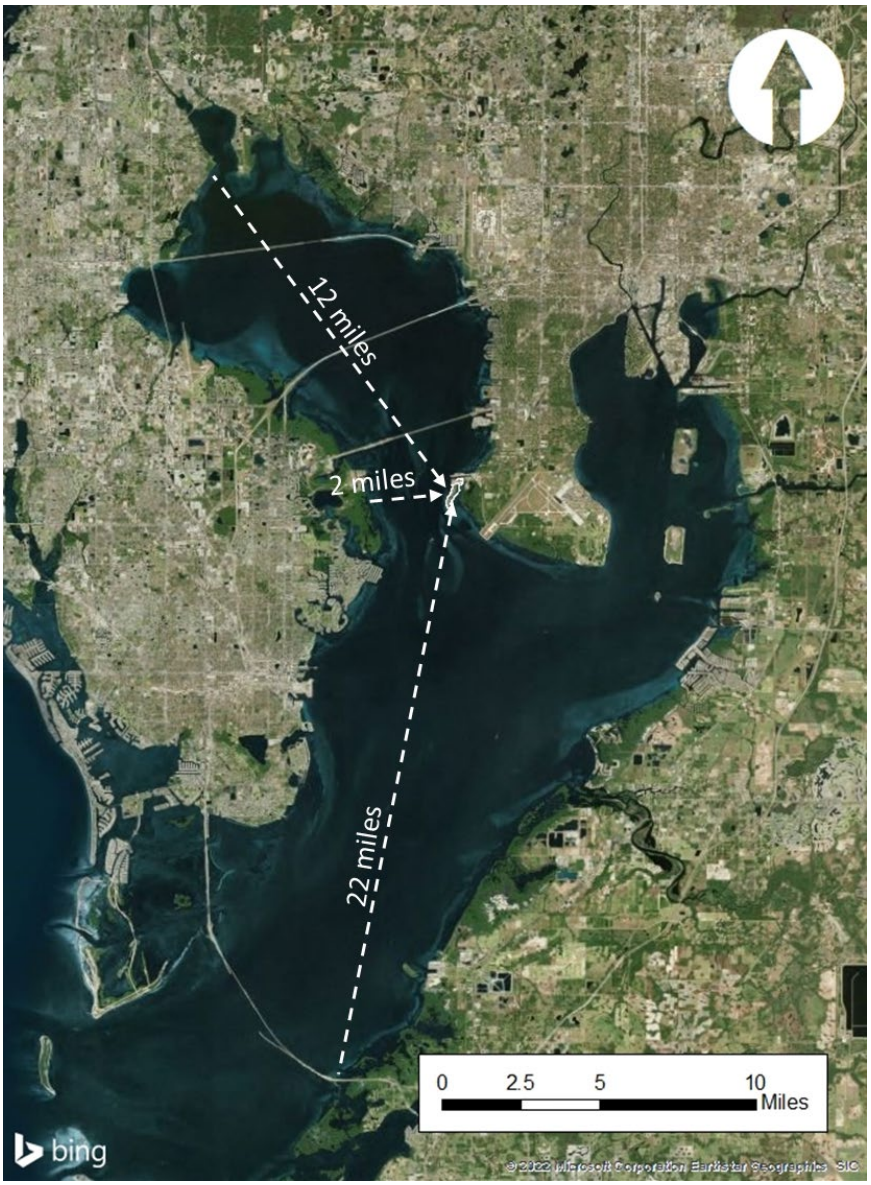


Figure 14. Picnic Island Fetch Lengths

Table 5. Calculated wave heights and periods used ACES		
Fetch Length	**Significant Wave Heights (H_{mo})**	**Peak Periods (T_p)**
22 miles	2.4 ft	3.5 sec
12 miles	2.2 ft	3.1 sec
2 miles	1.1 ft	2.0 sec

3 Mangrove Conditions Along Central Gulf Coast of Florida

3.1 Range of Mangroves

Historically, the northern limit of mangrove forest in Florida has been near the City of Tarpon Springs at the northern extent of Pinellas County. However, smaller areas of mangroves are known further north at Cedar Key and other smaller communities south to Tampa Bay. Primarily, freezing temperatures limit the establishment and northern expansion of mangrove forests along peninsular Florida.

Mangrove forests are protected critical habitat in Tampa Bay, and they are present in extensive forests and along many tidally influenced shorelines. Coverage today is about 50% of their historical coverage (FWC 2022). These intertidal communities tolerate a range of saline waters from nearly fresh to coastal Gulf of Mexico waters. The forests primarily consist of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and in adjacent uplands, buttonwood (*Conocarpus erectus*).

3.2 Regulatory Considerations

Mangroves comprise subtidal wetland forests and as such are protected by federal, state, and local regulatory programs. These programs have overlapping authority and require regulatory permit approvals for alteration and dredge and fill activities. Mangrove forests are key production habitats and food chain initiators in subtropical and tropical tidal environments. They provide critical habitat for adult fish and are important nursery grounds for juvenile fish.

The U.S. Army Corps of Engineers Section 404 program of the Clean Water Act requires regulatory approval of all impacts to Waters of the U.S., including mangrove wetlands. In Florida, the Florida Department of Environmental Protection (FDEP) assumed the Section 404 program in 2020 for a majority of non-tidal waters and the USACE retained regulatory authority in tidal waters. The USACE issues Individual or Nationwide Permits (NWP), depending on the total area of work in waters and wetlands. A NWP 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities is used for qualifying projects that propose to restore, create, or enhance wetland habitats such as mangroves.

The Southwest Florida Water Management District (SWFWMD) regulates the State of Florida regulatory program under Chapter 62-330, FAC, for impacts to waters and wetlands, including mangrove wetlands. The regulation and protection of wetlands is shared with the FDEP, dependent on Memorandum's of Agreement between District offices. Depending on the type of work proposed, permitting can be authorized by Individual and General Permits, and Exemption verifications.

The Environmental Protection Commission of Hillsborough County (EPC) has regulatory authority over activities in wetlands and waters in Hillsborough County. In addition, the EPC Wetlands Division is charged with implementing the Port Tampa Bay (PTB) Minor Work Permit (MWP) program for any construction activities in tidally influenced waterbodies. The EPC Wetlands Rule Chapter 1-11 offers regulatory guidance and the Port Tampa Bay permitting program includes management and leases over sovereign submerged lands.

4 Conceptual Design

To address ongoing erosion, several natural and nature-based features (NNBF) alternatives have been developed. These alternatives include offshore and onshore features that consider direct or indirect inclusion of mangroves. Typical NNBF alternatives have several goals (Bridges, et al., 2021), which include:

- Attenuate the energy, and height, of incoming waves
- Attenuate storm surge water levels along the shoreline
- Reduce erosion of sediments and soils
- Attract and stabilize sediments
- Attract and sustain flora and fauna, which can assist in stabilizing the shoreline

The proposed alternatives can also work as individual projects or be combined to provide multiple layers of defense against erosion. A systems approach, or tiered levels of protection, increase overall resiliency of an area. When looking at coastal flood risk reduction, the U.S. Army Corps of Engineers (USACE, 2015) considers incorporating multiple layers of defense as shown in Figure 15. While the scale of protection systems shown below may not be fully applicable to this project, the concept of including several components or alternatives, along with upland improvements, will help provide long-term resilience to the Picnic Island shoreline and critical habitat that lies just behind.

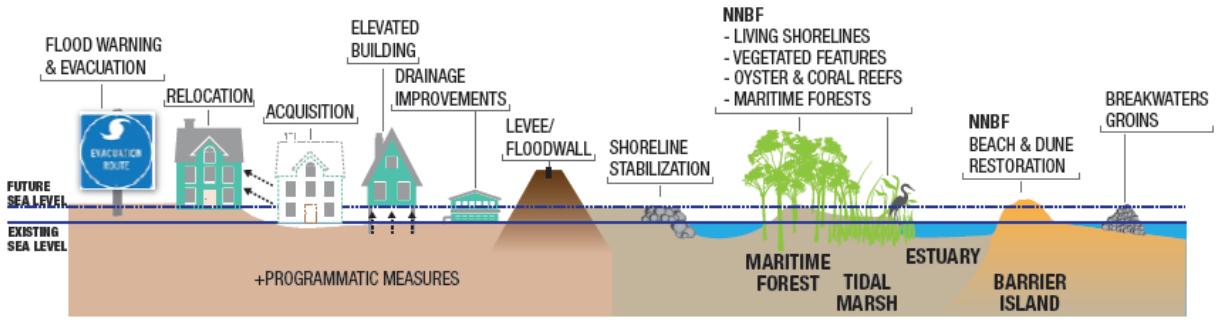


Figure 15. USACE coastal flood risk reduction measures (USACE, 2015)

NNBF, or living shoreline projects, can also vary in their makeup between green and gray infrastructure. A graphical depiction of various levels of gray-green infrastructure is shown in Figure 16 and are typically for bay or estuarine systems (NOAA, 2015). Beach and dune systems are other forms of living shorelines or NNBF that could be incorporated when considering the beach shoreline along most of the project site.

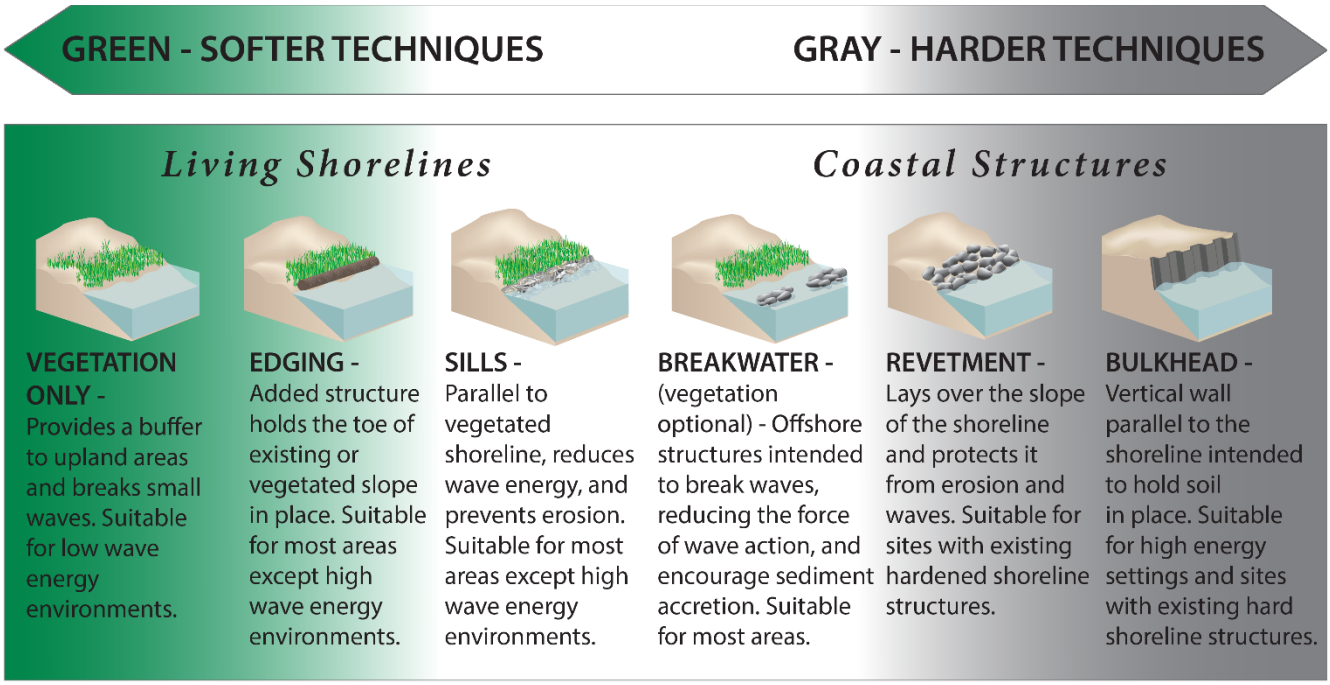


Figure 16. Shoreline stabilization options - gray to green infrastructure

4.1 Design Criteria and Considerations

Based on a review of existing conditions and discussions with TNC and stakeholders, several baseline design considerations were developed, as follows:

- Shoreline stabilization strategies should consider the benefits of marsh vegetation, including mangroves, along the project shoreline.
- While recent hurricanes have caused damage to the project shoreline, the dominant erosional waves come from the northwest and are associated with cold front passage in winter season.
- The project shoreline is a sandy bay beach. Project should consider whether this should be converted to another shoreline type or be preserved/protected.
- Considering the sandy shoreline at the project site, the project will need to consider how features impact sediment transport along the shoreline and potential downdrift impacts.
- Living shoreline components should include low and mid-marsh elevations. It is anticipated that mangroves will move into the marsh area and establish, particularly with a shoreline protection system.
- Shoreline protection features will be placed to avoid existing natural resources (seagrass).
- Construction of nearshore features will utilize typical construction equipment. Sand fill and matting may be required.

Using the existing condition data and the above considerations, a stakeholder meeting to review existing conditions and discuss project alternatives was help on March 29, 2022 at HDR offices. The group reviewed various project concepts, discussed sediment transport processes along the

project shoreline, and evaluated the migration of mangroves as critical project features along with their ability to move into the site. A summary of the discussion and marked drawings is included in Appendix A. On July 18, 2022 a follow-up update meeting with stakeholders was held to provide a summary of the interventions the team developed that are discussed below (Appendix C). The following sections provide a brief description and several cross-sections, including renderings, or the proposed project alternatives.

4.2 Project Site Layout

The stakeholder conceptual plan meeting provided input for differing size and scale of projects along Picnic Island. These included beneficial use of dredged material to backfill areas that were previously deepened through dredging, living shorelines, and offshore living breakwaters. It was also noted that there are key park features that should not be changed, such as sandy beach along the northern reaches of the site as well as the dog park at the north end of the island. There were additional discussions about changes to park uses, inclusion of trails, and other park projects in the upland area. These later projects are included in Appendix A for documentation and future efforts but were not included in the MERM project because they were not within the framework of this study.

Subsequent to the planning meeting, the project team decided to show areas of opportunity for shoreline and restoration projects and to provide conceptual sections of these features. Conceptual unit costs for features will also be provided for use in development of future projects and to seek funding for detailed design and construction. The intent of the site plan is to provide a map of potential projects that could be pursued individually, or as groups, and be sequenced. In addition, feature designs may be revised based on location and performance of implemented features. For this reason, proposed layouts for the features are not included herein, rather only the areas of opportunities discussed above. Figure 17 shows these proposed areas of opportunity and the following sections provide more detail about each of the key features shown below.

4.3 Intervention 1 – Dredged Hole Filling

Aerial photography of the project site shows a deep area offshore of the northern portion of the project site that was likely dredged as part of channel work associated with Port Tampa, which is immediately north of the project site. Bathymetric data shown in Figure 4 do not reflect the deep area due to limited survey information and broad data coverage creating contours over the area, but the deep water is clearly visible in the aerial photograph background. The deep section extends close to the project shoreline, and it cuts through the typically wide, shallow nearshore environment along the rest of the project area. During the conceptual plan meeting, the opportunity to beneficially use dredged material was discussed. There have been several past initiatives to fill dredged holes within local bay systems, and this location would be an ideal location. Considering ongoing maintenance and planned widening/deepening projects for federal channels, there will be ample sediment available for beneficial use. Filling the dredged hole would reconnect the shallow habitats on either side and provide resiliency against larger waves traveling to the project shoreline.

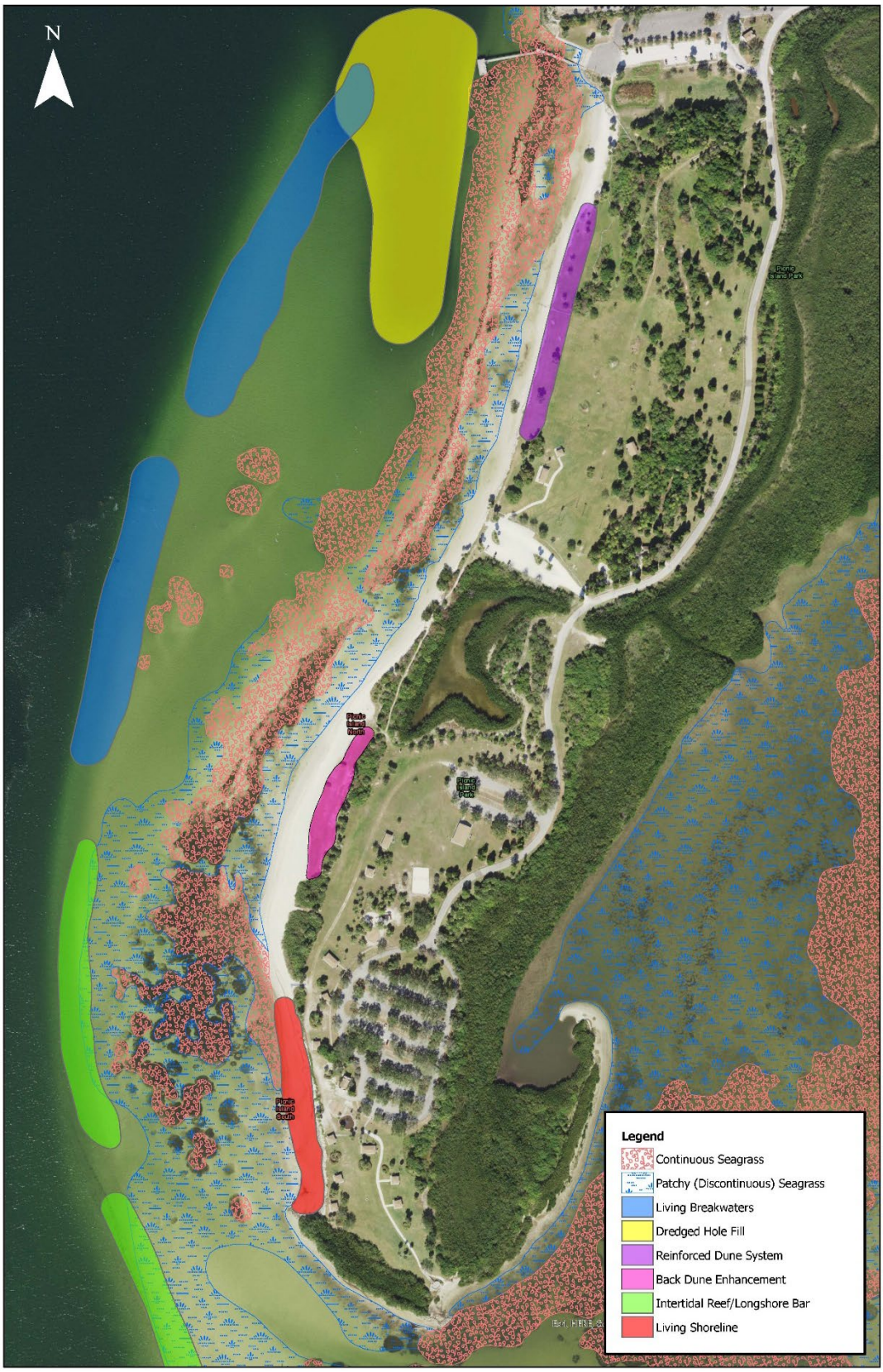


Figure 17. Proposed project layout concept

4.4 Intervention 2 – Living Shoreline

As noted in Section 2.2, the southern portion of the project shoreline has been experiencing significant erosion, which has impacted existing upland infrastructure. However, the shoreline change analyses indicate that the southern section of shoreline transitions from an erosional area to an accretional area just to the north. As a result, this southern part of the project shoreline would be a candidate for a living shoreline sill breakwater style project, similar to the existing system along the southern tip of the park. It is not anticipated that placing a breakwater system in this reach of shoreline would result in adverse impacts to the shoreline to the north. However, additional numerical wave and sediment transport modeling are recommended to further assess project limits and impacts.

The proposed living shoreline system includes a graded riprap sill, or small breakwater, located 30 to 50 feet from to shore. Sand would be imported and graded as needed to bring the area between the breakwater and the shoreline to appropriate marsh elevations. It is anticipated that the target elevations would be for all low marsh, but mid to high marsh elevations could also be added. The marsh area would then be planted with marsh grass such as *Spartina alterniflora*. Existing mangroves in the project site as well as seed pods in the water would likely make their way into the marsh area. Mangroves could also be directly planted in the marsh are behind the sill breakwater.

Figure 18 and Figure 19 provide a typical cross-section and rendering of the proposed living shoreline system. Additional work could be performed on the upland area behind the marsh area to provide a ridge for additional shoreline resilience. The living shoreline system would be approximately 650 feet long. Some gaps or fish passages in the breakwater may be required by regulatory agencies during permitting.

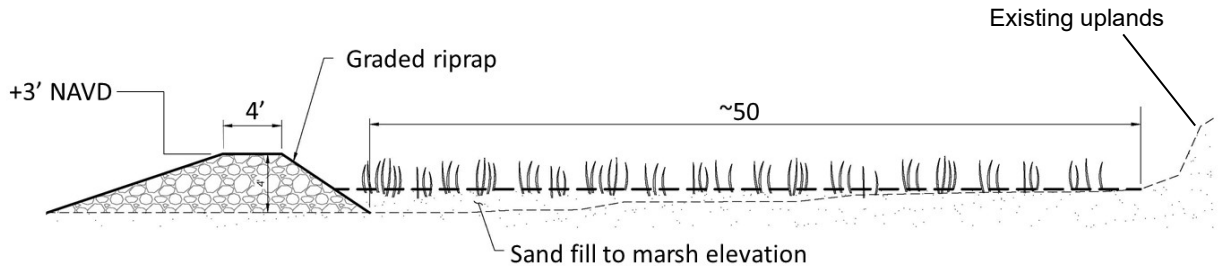


Figure 18. Intervention 2 living shoreline conceptual cross-section

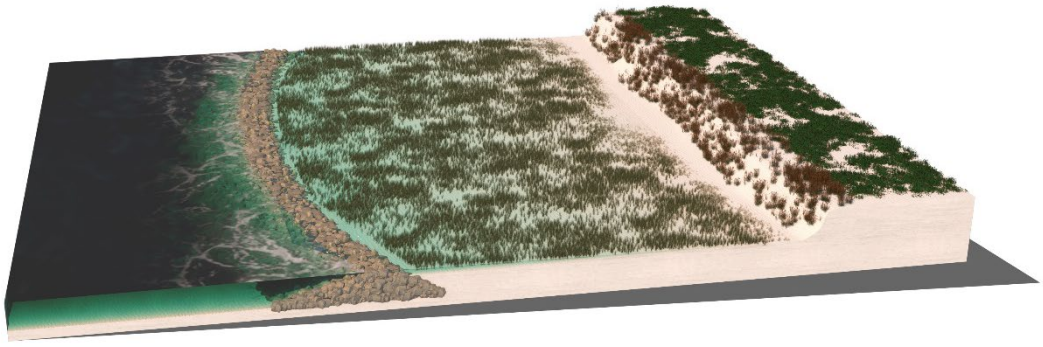


Figure 19. Intervention 2 living shoreline conceptual cross-section rendering

4.5 Intervention 3 – Living Breakwater

As describe above, the central and northern portions of the Picnic Island shoreline will remain sandy beach. Therefore, a living breakwater option was developed to provide shoreline protection to the beach area as well as restoring marsh habitat to offset habitat losses in the region. This system would be located further offshore of the project site and bayward of seagrass areas. The water levels are also a bit deeper, which would allow construction barge access, but are still relatively shallow, which should help limit quantities of material required to construct the project. The living breakwater system would include a graded riprap breakwater set to an elevation to attenuate typical winter storm waves. A smaller sill breakwater would be located closer to shore, approximately 50 to 100 feet from the larger breakwater, and provide containment for the living breakwater system. Sediment would then be placed immediately landward of the breakwater and set to from high to low marsh elevations to provide habitat area. Mangroves could be planted in the marsh area to provide further shoreline protection, resiliency, and habitat function. Figure 20 provides a typical cross-section overview of the living breakwater feature, while Figure 21 provides a more detailed cross-section. Figure 22 shows a rendering of what this feature could look like in place. The living breakwater features would be between 500 and 750 feet in length.

Construction of this feature would be from the bay side using shallow draft equipment due to the shallow water in the project area. Fill for the new marsh platform could be imported fill or beneficial use material. Additional features such has bird habitat could also be incorporated.

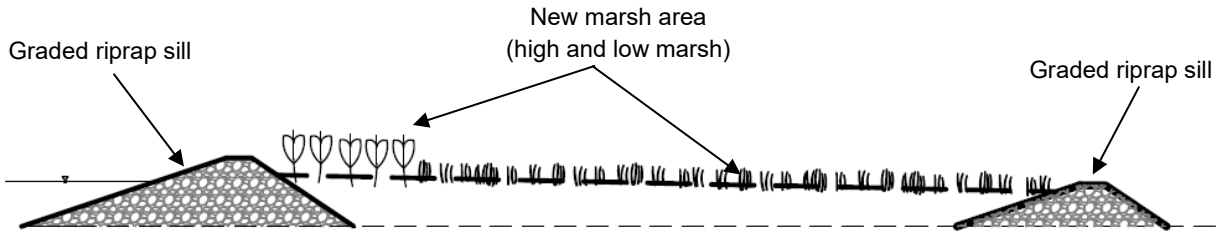


Figure 20. Intervention 3 typical cross-section overview

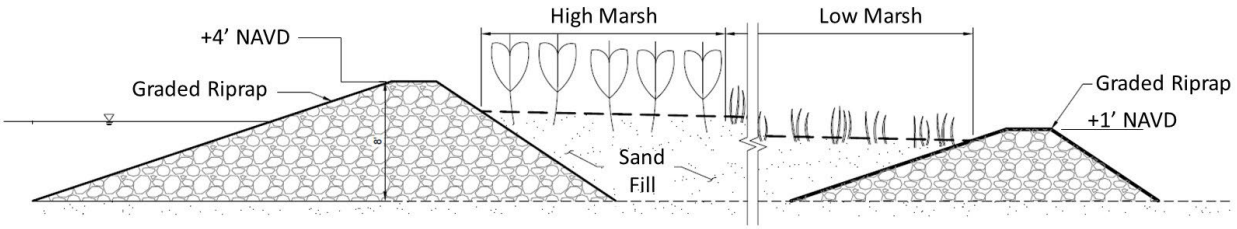


Figure 21. Intervention 3 typical cross-section detail

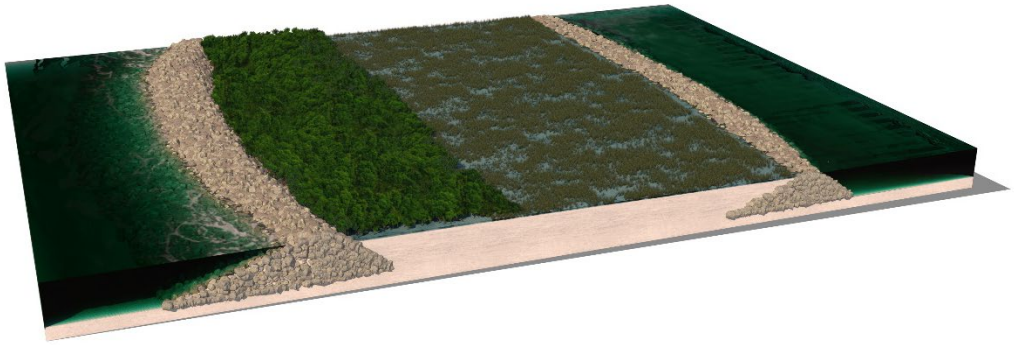


Figure 22. Intervention 3 living breakwater with landward containment cross-section rendering

4.6 Intervention 4 – Intertidal Reef/Longshore Bar

A longshore bar, or an intertidal reef, is proposed as a first line of defense against wave impacts along the project shoreline. The purpose of the bar/reef is to provide wave attenuation as well as reef habitat. The features would also be located along the southern portion of the project area, offshore of the proposed living shoreline section. The nearshore seagrass coverage is denser in this area, which will result in placement of the reefs bayward of the existing seagrass beds and at depths of 4 to 6 feet below NAVD. These water depths are sufficient for construction by barge; however, the barges will need to be light loaded, which incurs additional cost due to multiple material handling and slower production. The final elevation of the structure, width, and materials will be further refined to best attenuate incoming wave energy along with providing submerged and intertidal habitat. The location of the features would also be influenced by up to date seagrass mapping in the project area. Due to the structure being submerged or intertidal, there will still be wave energy that gets past the structure. However, the reef in combination with the living shoreline sill and marsh grass/mangroves will provide a multi-layer system against wave impacts and erosion. The proposed reef is shown as a graded riprap feature, but other materials or artificial reef units could be considered. These include Reefballs, Wave Attenuating Devices (WADS), a

Reefmaker system, or other. The length of the bar/reef may be limited by regulatory requirement and will likely include gaps.

Figure 23 and Figure 24 provide a typical cross-section and rendering of the intertidal reef system using graded riprap. As a result, this feature may work best in combination with other shoreline protection strategies.

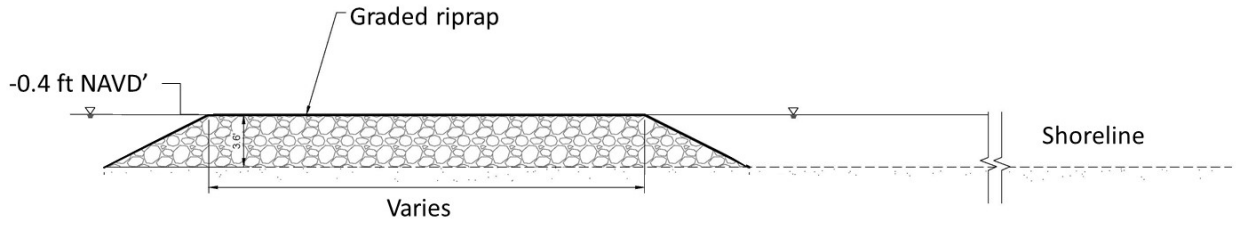


Figure 23. Intervention 4 intertidal reef/longshore bar conceptual cross-section

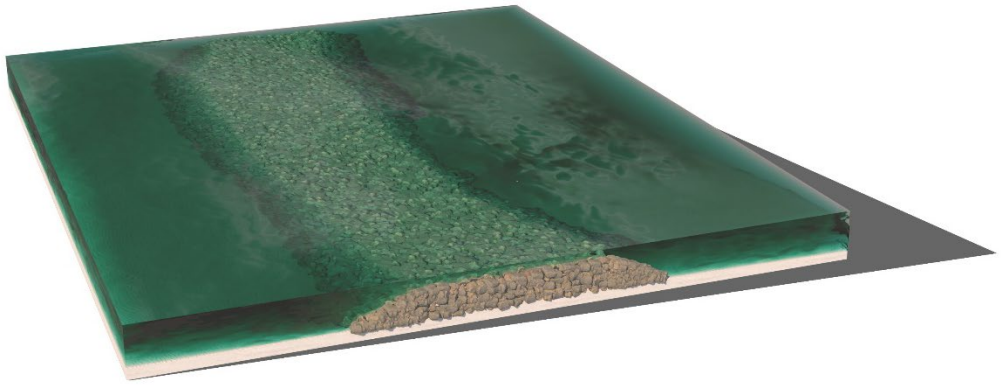


Figure 24. Intervention 4 intertidal reef/longshore bar conceptual cross-section rendering (high tide condition)

4.7 Intervention 5 – Reinforced Dune

The northern portion of Picnic Island consists of a narrow sandy beach with a revetment located at the beach/park interface. An improvement to this site was discussed along with providing increased resiliency to the shoreline. The presence of nearshore seagrass will limit the area available for enhancement or nourishment of the park beach. Therefore, another option would be to remove the existing revetment, lower the grade of part of the park uplands to beach elevations, then create a new revetment further inland. The revetment would then be covered with a sandy dune and planted with sea oats and other dune species. This process would provide additional beach habitat while reducing impacts to nearshore resources. The revetment within the dune system provides a tiered approach to shoreline stabilization. Smaller storm events that impact the site would impact the dune, which would be expected to recover naturally, or event with assistance

from park services. During a larger, less frequent storm event, if the dune were to be fully eroded, the revetment would provide a last line of defense against wave impacts to park uplands. Figure 25 provide a typical cross-section and Figure 26 shows a rendering of the reinforced dune system.

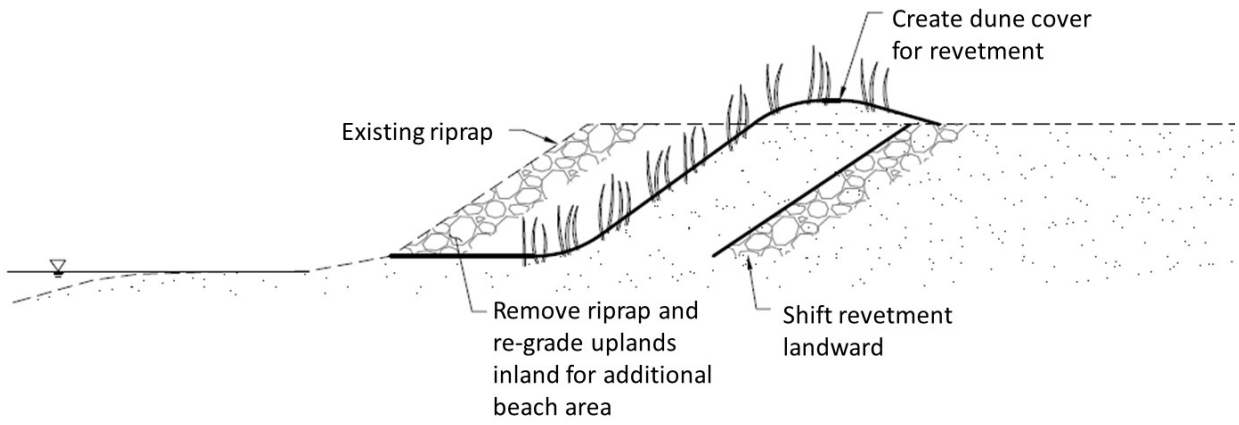


Figure 25. Intervention 5 reinforced dune conceptual cross-section

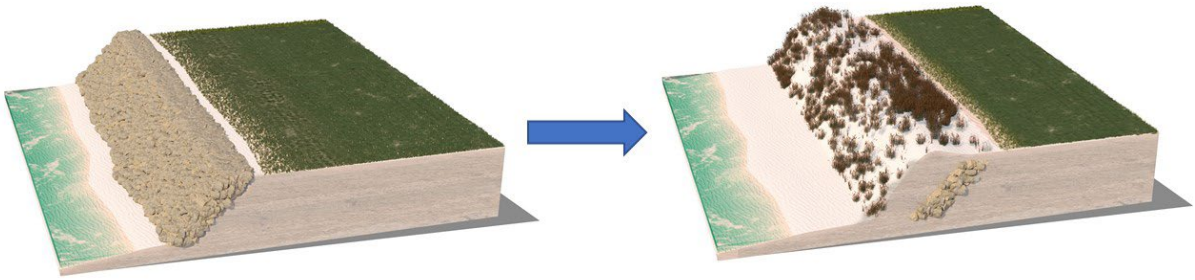


Figure 26. Intervention 5 reinforced dune conceptual cross-section rendering

4.8 Regulatory Agency Meeting Summary

A pre-application meeting was help was held on May 3, 2022 with staff from Southwest Florida Water Management District (SWFWMD) and the Environmental Protection Commission (EPC) of Hillsborough County. A copy of attendees, meeting minutes, and associated presentation are provided in Appendix B. The pre-application meeting process is typically held for projects that are ready to go to permitting and further along in the design process as compared to the current project. However, the agency staff were interested in the project ideas and proposed interventions.

As described above, meeting minutes are provided in Appendix B, and these minutes also include notes from SWFWMD that relate to information on permitting requirements and overall project guidance. Additional comments are summarized below.

- SWFWMD recommend reviewing previous projects and assessing existing habitat and species that use the current dredge hole site prior to application submittal. Also recommended reviewing the 2005 “Tampa Bay Dredged Hole Habitat Assessment Project” report produced by the Tampa Bay Estuary Program (TBEP)

- When performing seagrass survey, consider updating the seagrass limits during growing season (June 1st – September 30th) but also reviewing locations of seagrass in previous years.

- Application should document how projects would directly and indirectly affect seagrass in the project area. Would sedimentation be expected?

- An Individual ERP permit is expected.

- EPC stated that submerged lands are likely Port Tampa Bay property and would need EPC authorization. Jackie Julian and Chris Cooley would be contacts at the Port.

- EPC has recently revised their rules for restoration projects to include natural and nature-based feature (NNBF) options and will provide a link to updated information.

- EPC recommended presenting the project aspects to the Agency on Bay Management.

- EPC mentioned that a funding opportunity would be the Pollution Recovery Fund and Chris Pratt is the contact. This information has been added to Section 6 of this report.

5 Conceptual Construction Costs

A conceptual-level opinion of probable constriction cost (OPCC) was developed for each of the proposed interventions described in the previous section. These costs are conceptual level estimates based on limited information about existing conditions at the site. The proposed intervention costs listed below are per-unit costs and include ancillary items such as mobilization/demobilization, surveying, and other costs such as sedimentation control (silt curtain) costs associated with construction in coastal Florida waters. The unit costs were developed to provide guidance on typical project costs and can be extrapolated over varying distances for project features. Detailed layouts and extents have not yet been developed.

Costs are based on recent and historical trends, understanding of site access, current economic conditions, and a contingency of 30%. All costs are subject to changes in market conditions. The project costs also do not include engineering, permitting, or construction administration costs.

Intervention 1 – Dredge Hole Filling

Filling of the dredged hole through beneficial use of dredged material placement considers that the project would be done as an incremental cost to a channel dredging project being performed by others. As a result, basic mobilization/demobilization and other ancillary costs would be part of the dredging project. The per unit costs for the beneficial use cost would cover additional pipeline, placement of the material in the dredged hole, additional surveys, and siltation protection. To determine the required volume for the material placement, detailed surveys of the deep area are needed; however, an estimated quantity of 380,000 cy within a 7.5 acre area was used for the cost assessment. The range of unit costs were estimated as shown in Table 6.

Table 6. Intervention 1 – Dredge hole filling estimated unit costs

Low Range ($/cy)	High Range ($/cy)
$10	$26

Intervention 2 – Living Shoreline

Intervention 2 costs assume that all work will be conducted from uplands and using typical upland based equipment. Materials and equipment would be brought to the project site via trucking. Planting costs included assume placing marsh plants at 3 ft on center. The range of unit costs were estimated as shown in Table 7 and consider a project approximately 650 feet in length with a footprint of approximately 1 acre.

Table 7. Intervention 2 – Living shoreline estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$1,100	$1,350

Intervention 3 – Living Breakwater

Costs for Intervention 3 assume placement of the outer breakwater at approximately -6 ft NAVD and the inner sill at approximately -4 ft NAVD. Fill will be placed to marsh elevations from +2 ft to 0.0 ft NAVD. Costs for the fill range from beneficial use of dredged material (low) to importing upland fill and placing at the site by barge (high) (see Table 8). Two living breakwater segments averaging 750 feet in length with a project footprint of approximately 5 acres were considered for the cost assessment.

Table 8. Intervention 3 – Living breakwater estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$2,700	$4,000

Intervention 4 – Longshore Bar/Intertidal Reef

The intertidal reef, or longshore bar, costs consider placement of graded riprap along the -5 ft NAVD contour. The low range costs consider a narrower reef with a 10 ft crest, and the high range costs assume a wider 30 ft crest. A detailed assessment of wave conditions and water levels, along with updated locations of seagrass, would better define the required structure geometry and alignment for appropriate wave attenuation conditions. In addition, the seagrass delineations would help locate the structures in as shallow of water as possible. Additional design analyses could be included to review whether other materials for the reef/bar could be used such as Reefballs. Use of those systems may help reduce overall cost. The range of unit costs were estimated as shown in Table 9 and consider 3 segments up to 500 feet each in length. Project footprint would range between 1 acre and 1.65 acres.

Table 9. Intervention 4 – Longshore bar estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$1,300	$2,150

Intervention 5 – Reinforced Dune

The reinforced dune intervention assumes that the upland material to be excavated will be sand and suitable for use in the dune feature. The revetment will likely need to be supplemented with stone to develop an engineered revetment section. The excavated material would be placed to form a dune over the revetment and would be planted with sea oats and other dune plant species. The range of unit costs were estimated as shown in Table 10 and consider a 750-foot project length south of the dog park area. Inside the dog park the section could be up to 500 feet.

Table 10. Intervention 5 – Reinforced dune estimated unit costs

Low Range ($/lf)	High Range ($/lf)
$610	$850

Engineering and Permitting Costs

Data collection (surveys, geotechnical investigations, habitat mapping), engineering design, and permitting for the interventions listed above will vary due to complexity of the features, location, and size. It is estimated that the engineering and permitting costs would vary between $200,000 and $400,000 per feature. However, the would be cost savings if multiple features were designed and permitted together.

6 Funding Sources

A listing of potential funding sources for the Picnic Island Park project is provided in Table 11 below.

Table 11. Available Funding Sources

Program	Source	Notes
Florida Coastal Management Program (FCMP) – Coastal Partnership Initiative	FDEP/NOAA	Coastal program for typically smaller projects but good for planning, engineering, permitting. Will not pay for construction of breakwaters.
Florida Resilient Coastlines Program	FDEP	Grant applications for planning and implementation of projects to address rising sea levels, coastal flooding, erosion, and ecosystem changes.
RESTORE Act	FDEP and coastal counties	Several “buckets” of funding available and projects compiled into Gulf Restoration Plan every few years.
Natural Resource Damage Assessment (NRDA)	Florida NRDA Trustees	Used to offset damages to natural resources. NRDA funding from Deepwater Horizon may still be available. Other actions may need projects.
National Coastal Resilience Fund	NFWF	Annual grants for coastal restoration (includes marshes and living shoreline)
Coastal Program	USFWS	Have grant programs including the National Coastal Wetlands Conservation Grants Program.
Pollution Recovery Fund	Environmental Protection Commission – Hillsborough County	Grant money for projects to restore polluted areas, mitigate the effects of pollution, and to otherwise enhance pollution control activities within Hillsborough County.

7 Conclusion

Several conceptual design opportunities were developed with input from TNC and relevant stakeholder groups to address erosion and habitat loss at the Picnic Island shoreline. The design interventions are natural and nature-based features (NNBF) that incorporate habitat restoration and the ability for mangroves to assist with shoreline protection. Conceptual level OPCCs were developed for each intervention and potential funding sources have been identified.

Next steps for the project will include:

- Coordination with City of Tampa Parks and other stakeholders to select opportunities for initial design and permitting.

- Coordination with U.S. Army Corps of Engineers about upcoming dredging projects and opportunities to beneficially use dredged material at the project site. Significant coordination and regulatory work will be required and should start as soon as possible so that the area is available for use when projects come online.

- Conduct updated nearshore habitat surveys to document current seagrass limits and conditions. This work could be performed in coordination with Tampa Bay Estuary Program and their ongoing seagrass monitoring work within the bay system.

- Update funding opportunities and plan projects/requests to tie into short and long-term options.

- Perform detailed engineering evaluations and design. Engineering evaluations should include bathymetric and topographic surveys, geotechnical investigations, and wave numerical modeling.

8 References

Blueways, C. (2022, March 24). *Coastal Resilience*. Retrieved from Conservation Blue Ways (Map Server): www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fservices2.coastalresilience.org%2Farcgis%2Frest%2Fservices%2FGulf_of_Mexico%2FConservation_Blueways%2FMapServer&source=sd

Bridges, T. S., King, J. D., Simm, J. D., Beck, M. W., Collins, G., Loder, Q., & Mohan, R. K. (2021). *International Guidelines on Natural and Nature-Based Features for Flood Risk Management.* Vicksburg, MS: U.S. Army Engineer Research and Development Center.

CIRES, C. I. (2021, October 27). *Continously Updated Digital Elevation Model - 1/9 Arc Second Resolution Bathymetric Topographic Tiles*. Retrieved from NOAA National Centers for Environmental Information: https://doi.org/10.25921/ds9v-ky35

FDOT, F. D. (2022, April 04). *FDOT*. Retrieved from APLUS: https://fdotewp1.dot.state.fl.us/AerialPhotoLookUpSystem/

FEMA, F. e. (2021). *Flood Insurance Study, Hillsborough County, Florida and Incorporated Areas.* Washington D.C.: FEMA.

FWC, F. F. (2022, March 05). *Florida Fish and Wildlife Conservation Commision*. Retrieved from Seagrass Habitat in Florida : https://geodata.myfwc.com/datasets/seagrass-habitat-in-florida/explore

NOAA. (2015). *Guidance for Considering the Use of Living Shorelines.* NOAA.

NOAA. (2022b). *NOAA Hurricane Track*. Retrieved from https://coast.noaa.gov/hurricanes/

NOAA, N. O. (2022, January 26). *NOAA Tide & Current*. Retrieved from https://tidesandcurrents.noaa.gov

TBEP. (2022). *Tampa Bay Seagrass Transect Dashboard*. Retrieved from https://shiny.tbep.org/seagrasstransect-dash/#section-individual-transects

USACE. (2015). *North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk.* U.S. Army Corps of Engineers.

USACE, U. A. (2022, March 24). *Sea-Level Rise Calculator*. Retrieved from US Army Corps of Engineers: https://cwbi-app.sec.usace.army.mil/rccslc/slcc_calc.html

USFWS. (2022). *National Wetlands Inventory Wetlands Data Layer*. Retrieved from https://www.fws.gov/program/national-wetlands-inventory/wetlands-data

A

Appendix A

Picnic Island Stakeholder Conceptual Plan Meeting Minutes

Meeting Minutes

Project:	Picnic Island Park MERM
Subject:	Concept Meeting
Date:	Tuesday, March 29, 2022
Location:	HDR Tampa Office – Westshore Conference Room
Attendees:	See attached sign-in sheet (Attachment A)

This memorandum documents key information exchanged during the Stakeholder Conceptual Plan Meeting (agenda in Attachment B) held on March 9, 2022 at 2:00 pm at HDR Tampa Office.

Introductions

Presentation

HDR provided a presentation that discussed project location, background, existing data for the site, and living shoreline examples (Attachment C).

Plan Ideas

Plan and concept design discussion along with marking drawings was held. Below is a summary of the items noted by participants:

- City of Tampa 3 Objectives:
  1. Do not touch current public areas (dog park, beach, disc golf)
  2. Have “recruitment” areas
  3. Projects should have “growth capabilities” i.e.. the features should be capable to lengthen or adapt as time passes)
- Natural barriers are preferred alternatives. These should be able to grow/adapt as sea levels rise.
- Discussion on shoreline type and use. Areas of existing beach that should remain as beach habitat. Dune area in vicinity of accretional shoreline could use enhancement.
- Northern shoreline has park uplands that could be built into to create additional beach width and a reinforced dune. Would limit work into existing waters and habitat.

- Resilience grants and funding opportunities may include sea level design rates and/or design requirements/considerations.

- Local stakeholders and residents would like to see area cleaned and would also welcome anything that reduced flood impacts to nearby residents.

- Southern shoreline that includes nearshore breakwater and mangroves was constructed by Florida Dept. of Transportation (FDOT) as mitigation for impacts at another site. This feature could be expanded but not appropriate for all of project shoreline.

- The “spit” on the southeast tip of the island developed after the implementation of breakwaters/mangroves at south tip.

- Longshore Bar terminology is a preferred feature and has been a part of local systems. These bars are not usually exposed at lowtide. The Estuary program Team has performed studies to review material types and influence on seagrass areas.

- Estuary program has instruments installed near Philippe Park near Safety Harbor that measure wave height and can differentiate between wind waves and boat waves.

- Nabil Bewany (Pinellas County) has data regarding Hurricane Eta.

- Wading bird habitats would be a good item to include in design.

- Keep/maintain upland and park features on the north of end of the island (more stable, longer lasting), minimize new park features to the south.

- Channel projects (maintenance and widening/deepening) typically use upland placement or offshore disposal. There are opportunities to work with USACE and Port to beneficially use material in deep areas at site or for other features. Contact Port of Tampa Environmental Team.

- Estuaries Program has studied oyster bed capabilities/evaluation of recruitment (elevation/salinity). There are areas in project vicinity that are well suited for oyster habitat.

Project design Ideas

Several project ideas were sketched on maps provided at meeting (Attachment D) and additional sketches were provided to the project team by City of Tampa Parks staff (Attachment E) and by

- Oyster longshore bar with seagrass behind.
- Living breakwater options with breakwaters and habitat between to provide shoreline protection and habitat. Mangroves could be included to provide increased resilience.
- Develop system of various types of features: living breakwaters, oyster reef, beach, longshore bar, fill (exposed), dune system.

HDR will work on furthering project conceptual designs and will develop conceptual “per-linear-foot” or “per-acre” costs.

Attachment A Meeting Sign-in Sheet
Attachment B Meeting Agenda
Attachment C Conceptual sketches from meeting
Attachment D Sketch from City of Tampa Parks Department staff
Attachment E Sketches from City of Tampa Grants Department staff

ATTACHMENT A

MEETING SIGN-IN SHEET

HDR Engineering, Inc.

3/29/2022

THE NATURE CONSERVANCY

MERM PILOT PROJECT – PICNIC ISLAND PARK, FL

STAKEHOLDER CONCEPTIAL PLAN MEETING SIGN-IN SHEET

Name	Organization	E-Mail Address	Telephone Number
Cameron Peery	HDR	Cameron.Peery@HDRINC.com	361-696-3352
Zaine Arth	HDR	zaine.arth@hdrinc.com	813.465.3683
Debi Luke	Florida Aquarium	dluke@flaquarium.org	301-676-5914
Joe Schmidt	TNC	Joseph.Schmidt@tnc.org	561-553-2662
Chris Thompson	COT	chris.thompson@tampagov.net	813-274-5155
Destini Tidwell	COT	"	"
ROD BRAUN	TNC	rod.braun@tnc.org	561-351-1210
MARIA CERON	USF	cerionm@usf.edu	786-205-9850
Rebecca Young	COT	Rebecca.Young@tampa.gov	813.274-8745
CAPHEIGHN BLESING	COT	Carleigh.Blesing@tampagov.net	813.274.3300
BRAD SUDER	COT	BRAD.SUDER@TAMPAGOV.NET	813 274 5741
MAYA BURKE	TBEP	mburke@tbep.org	7278932765
Kali Denault	Port Tampa Civic Assoc.	Kd@Kalidenault.com	217-280-0407

ATTACHMENT B

MEETING AGENDA

Agenda

Project: TNC MERM Pilot Project – Picnic Island Park

Subject: Stakeholder Conceptual Plan Meeting

Date: March 29, 2022 at 2:00 pm

Location: HDR Office – 4830 W Kennedy Blvd, Tampa, FL 33609 (4th Floor)

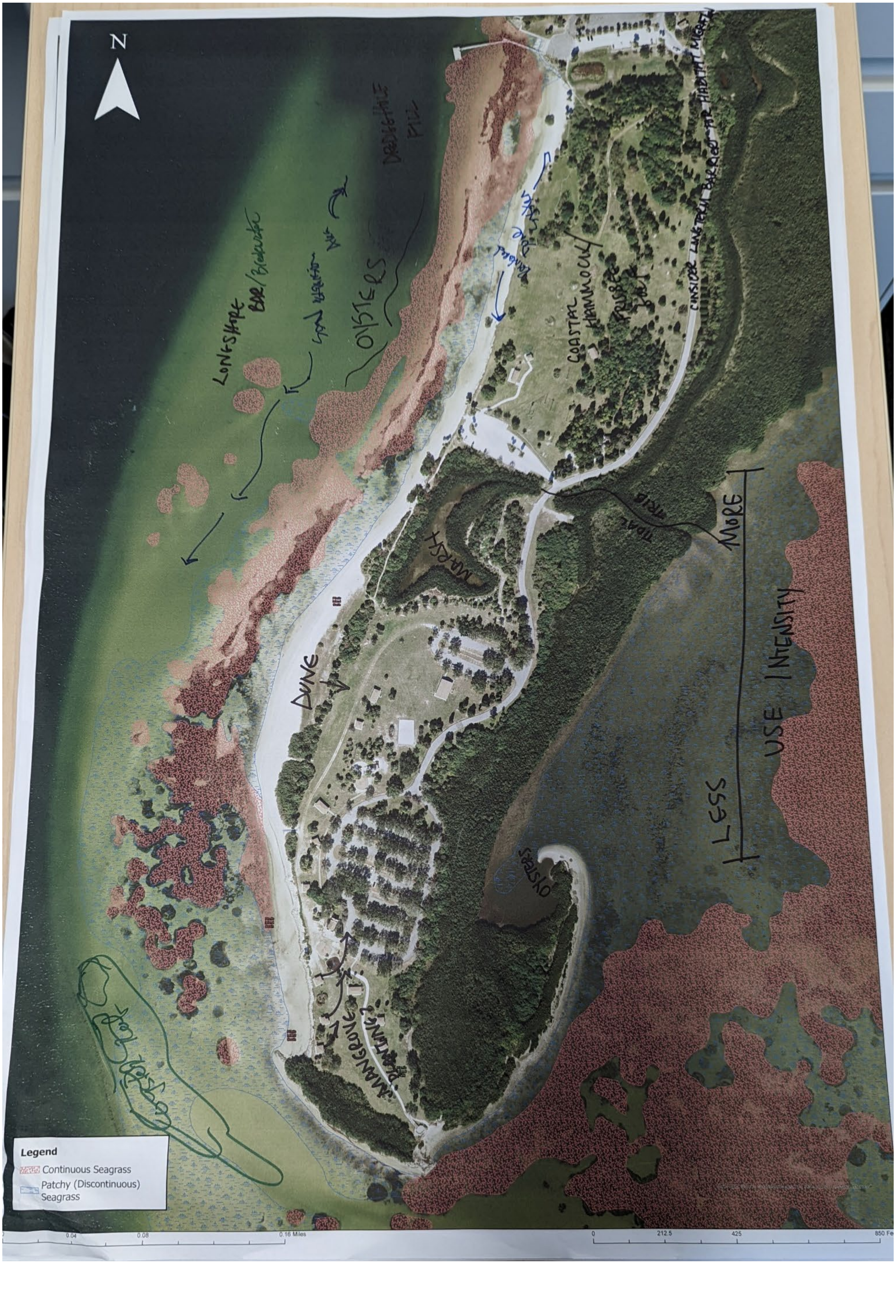
2:00	Introductions

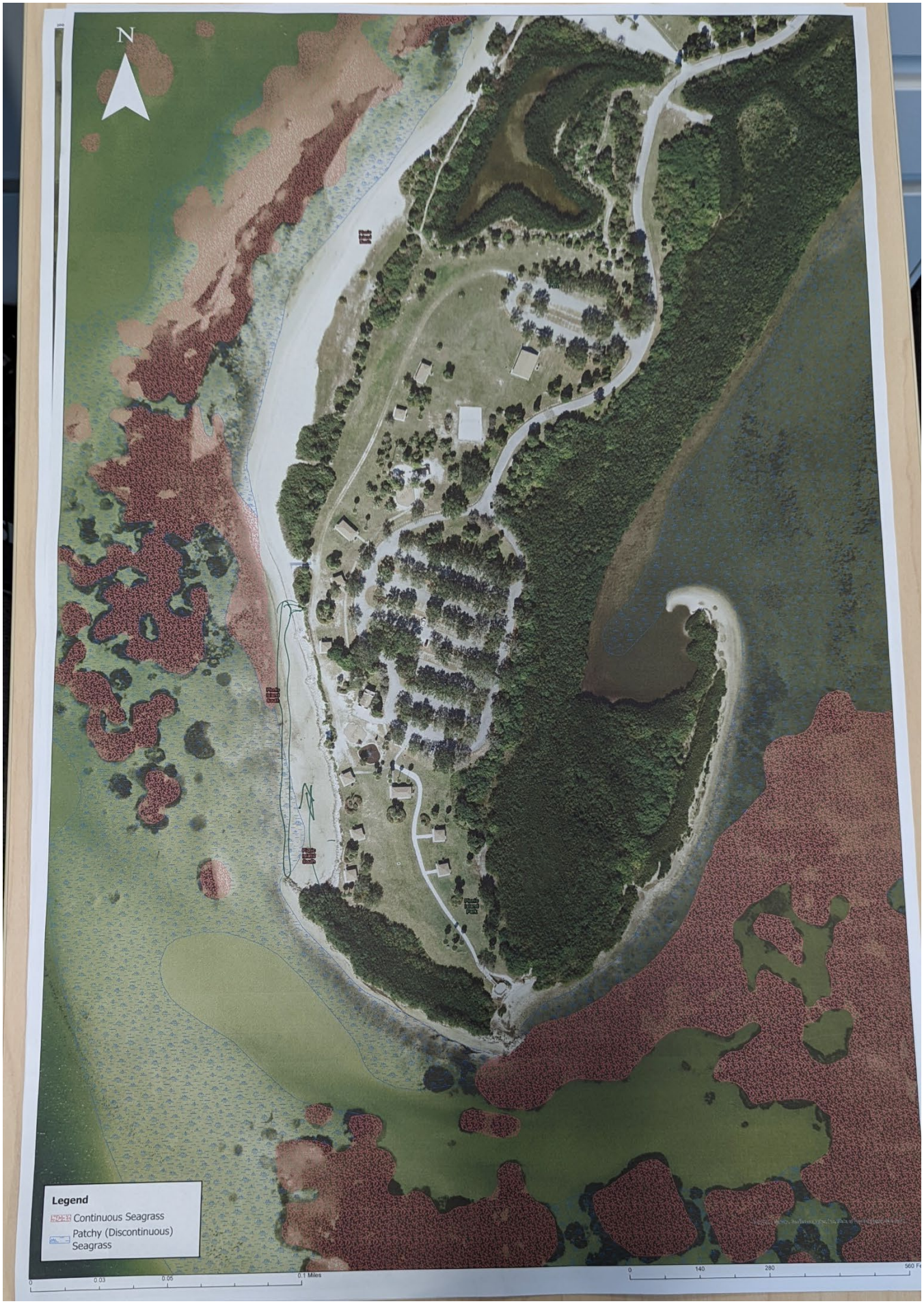
2:05	Presentation
	• Introductions (5-minutes)
	• Background / Project Location
	• HDR Scope
	• Data Gathering
	  ○ Bathymetry/Topography
	  ○ Natural Resources
	  ○ Water Levels
	  ○ Sea Level Rise
	  ○ Winds
	  ○ Hurricanes
	  ○ Waves
	  ○ Shoreline Change
	• Site Photos
	• Living Shoreline Protection Examples

2:35	Discussion/Planning • Shoreline type and regions • Design criteria • Living shoreline concept ideas
3:50	Next Steps
4:00	Adjourn

ATTACHMENT C

CONCEPTUAL SKETCHES FROM MEETING


N
Legend
Continuous Seagrass
Patchy (Discontinuous) Seagrass
0.04
0.08
0.16 Miles
0
212.5
425
LONGSHORE
OYSTERS
DUNE
MARSH
COASTAL HAMMOCK
TIDAL TRIB
MANGROVE?
LESS
USE INTENSITY
MORE


N
Legend
Continuous Seagrass
Patchy (Discontinuous) Seagrass
0
0.03
0.05
0.1 Miles
0
140
280
560 Fe


N
Deeper Here
Fill
Off.

ATTACHMENT D

SKETCH FROM CITY OF TAMPA PARKS DEPARTMENT STAFF


Legend
Continuous Seagrass
Patchy (Discontinuous) Seagrass
NO ACCESS
LIVING BREAKWATER
NO ACCESS
LIVING BREAKWATER
NO ACCESS
LIVING BREAKWATER
N
POTENTIAL FISHING & PEDESTRIAN ACCESS
LIVING BREAKWATER
BACK DUNE
FILL DREDGE HOLE
NEW PIER TRAIL
DUNE SYSTEM
FUTURE BRIDGE
OPEN FLOW TO BAY

ATTACHMENT E

SKETCHES FROM CITY OF TAMPA GRANTS DEPARTMENT STAFF


N
Shell
Storm water
Dog Beach
Kayaking & offshore fishers
Bike path
Shell
Add bike rack
Add bike rack?
Legend
Continuous Seagrass


Asphalt
Shell
Bike rack?
water bottle refill?
Stormwater
Wet
Can we do something with this?
Can we have bike lanes?
Dog Beach
Picnic Island Park
Disc Golf Path


Shell
Stormwater
wet
Dog Beach
Disc Golf path
Kayaking + offshore fishers
Kayak launch
Shell
Disc Golf path

B

Appendix B

SWFWMD Pre-application Meeting Minutes

Meeting Minutes

Project:	TNC MERM – Picnic Island Park, FL
Subject:	SWFWMD Pre-Application Meeting
Date:	Thursday, June 09, 2022
Location:	WebEx
Attendees:	Joe Schmidt (TNC) Cameron Perry (HDR) Zaine Arth (HDR) Chip Messenkopf (HDR) Monte Ritter (SWFWMD) Jeff Glas (SWFWMD) Kim Tapley (EPC)

This memorandum documents key information exchanged during the Southwest Florida Water Management District (SWFWMD) pre-application meeting held on June 9, 2022 at 3:00 pm (Eastern) via WebEx teleconference. Staff from the Environmental Protection Commission (EPC) of Hillsborough County also participated in the meeting.

Introductions

- Introductions by the project teams from HDR and TNC were made.
- Agency staff provided introductions.

Site Location/Background/Project Description

- HDR and TNC presented the project description, background, and options in the attached slide show.

Comments from agency staff include:

- SWFWMD staff provided information on permitting requirements and guidance as summarized in the SWFWMD meeting notes (attached).

- SWFWMD mentioned that previous dredge hole filling projects had received some pushback. Much of this stemmed from hardbottom or similar features in the dredge hole. Recommend reviewing previous projects and assessing existing habitat and species that use the current dredge hole site prior to application submittal. Also recommended to review the 2005 “Tampa Bay Dredged Hole Habitat Assessment Project” report produced by the Tampa Bay Estuary Program (TBEP)

- Proposed project options appear to be limited to environmental concerns. Engineering concerns to District infrastructure not anticipated.

- When performing seagrass survey, consider updating the seagrass limits during growing season (June 1st – September 30th) but also reviewing locations of seagrass in previous years.

- Application should document how projects would directly and indirectly affect seagrass in the project area. Would sedimentation be expected?

- HDR asked about permitting and ability to use general permits. TNC would likely be a project partner but expect permittee would be the City of Tampa due to their ownership of site. In this case, TNC would be a co-applicant on the SWFWMD permit application. SWFWMD stated that general permits may be an option, and the tasks/scopes may be permitted differently based on type of work. However, an Individual ERP permit is expected.

- EPC stated that submerged lands are likely Port Tampa Bay property and would need EPC authorization. Jackie Julian and Chris Cooley would be contacts at the Port.

- EPC has recently revised their rules for restoration projects to include natural and nature based feature (NNBF) options and will provide a link to updated information.

- EPC stated that the project appears to be similar to the Apollo Beach project and recommends reviewing work there.

- EPC recommended presenting the project aspects to the Agency on Bay Management.

- EPC mentioned that a funding opportunity would be the Pollution Recovery Fund and Chris Pratt is the contact.

Attachments: PowerPoint slides from meeting
SWFWMD Pre-Application Meeting Notes

Picnic Island Park

SWFWMD Pre-Application Meeting

06/09/2022

1 Introductions

2 Background/Location

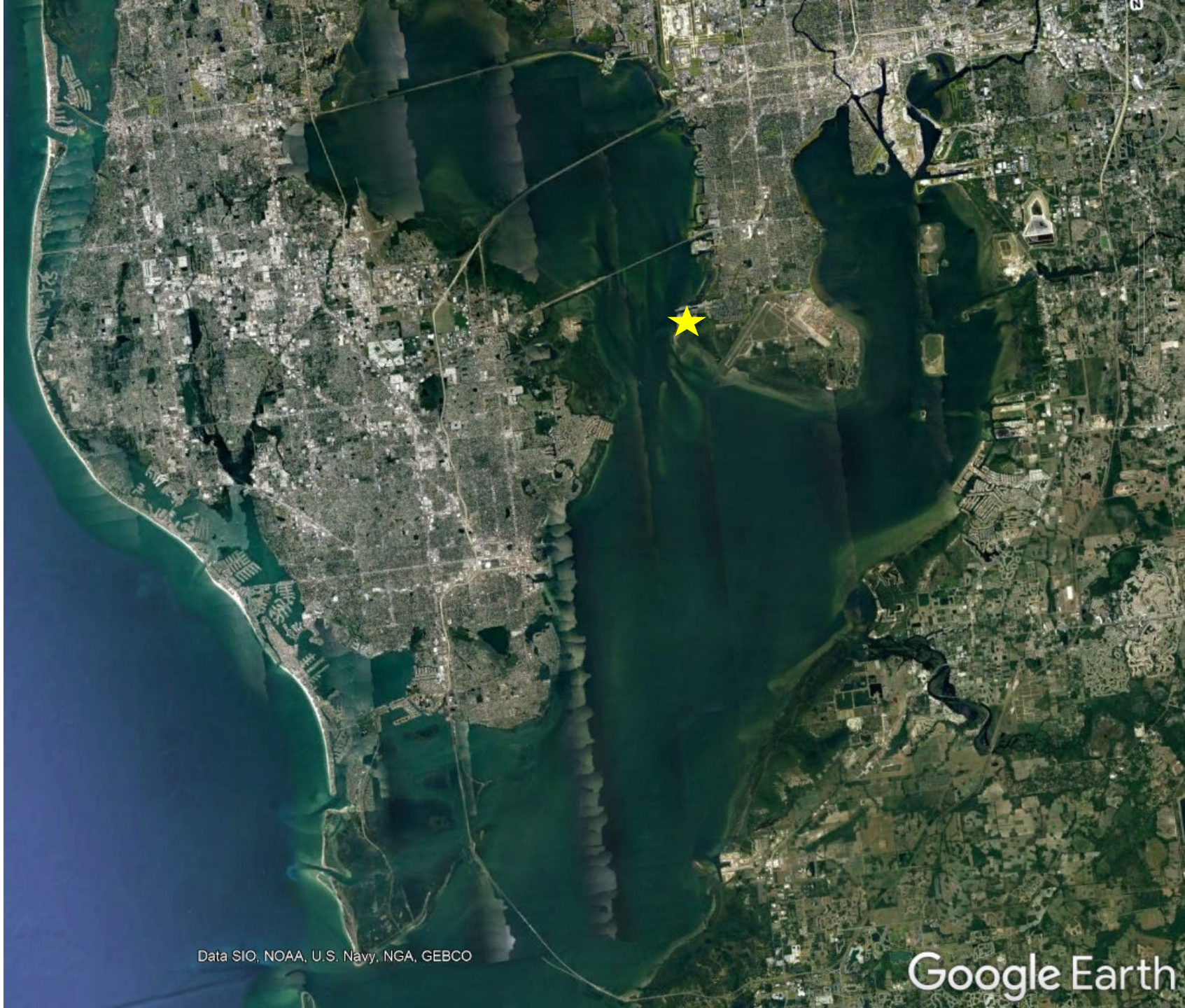
3 Existing Conditions

4 Project Alternatives

5 Discussion

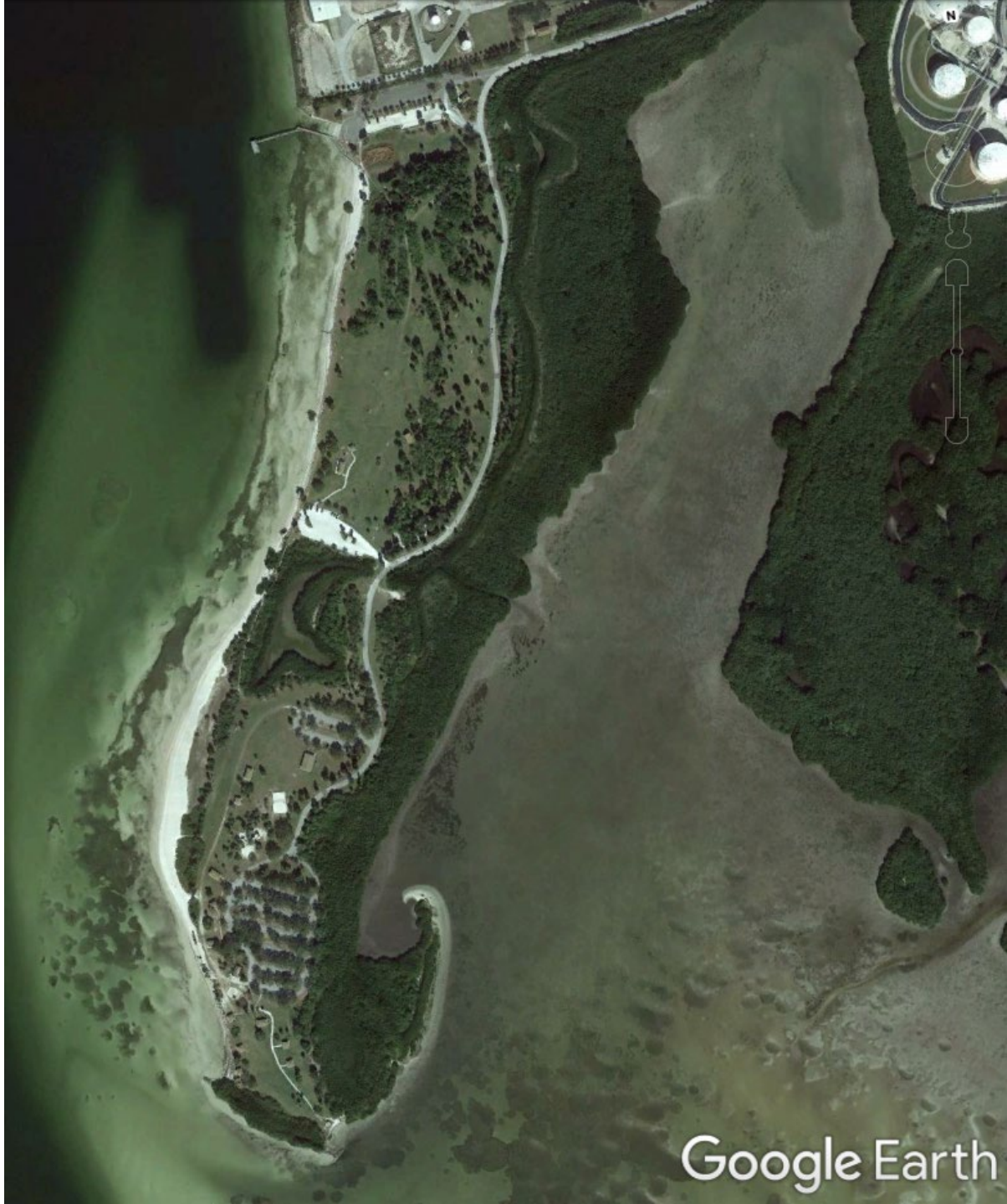
Project Location

- Located in Old Tampa Bay
- Adjacent to Port Tampa
- Constructed from dredged material



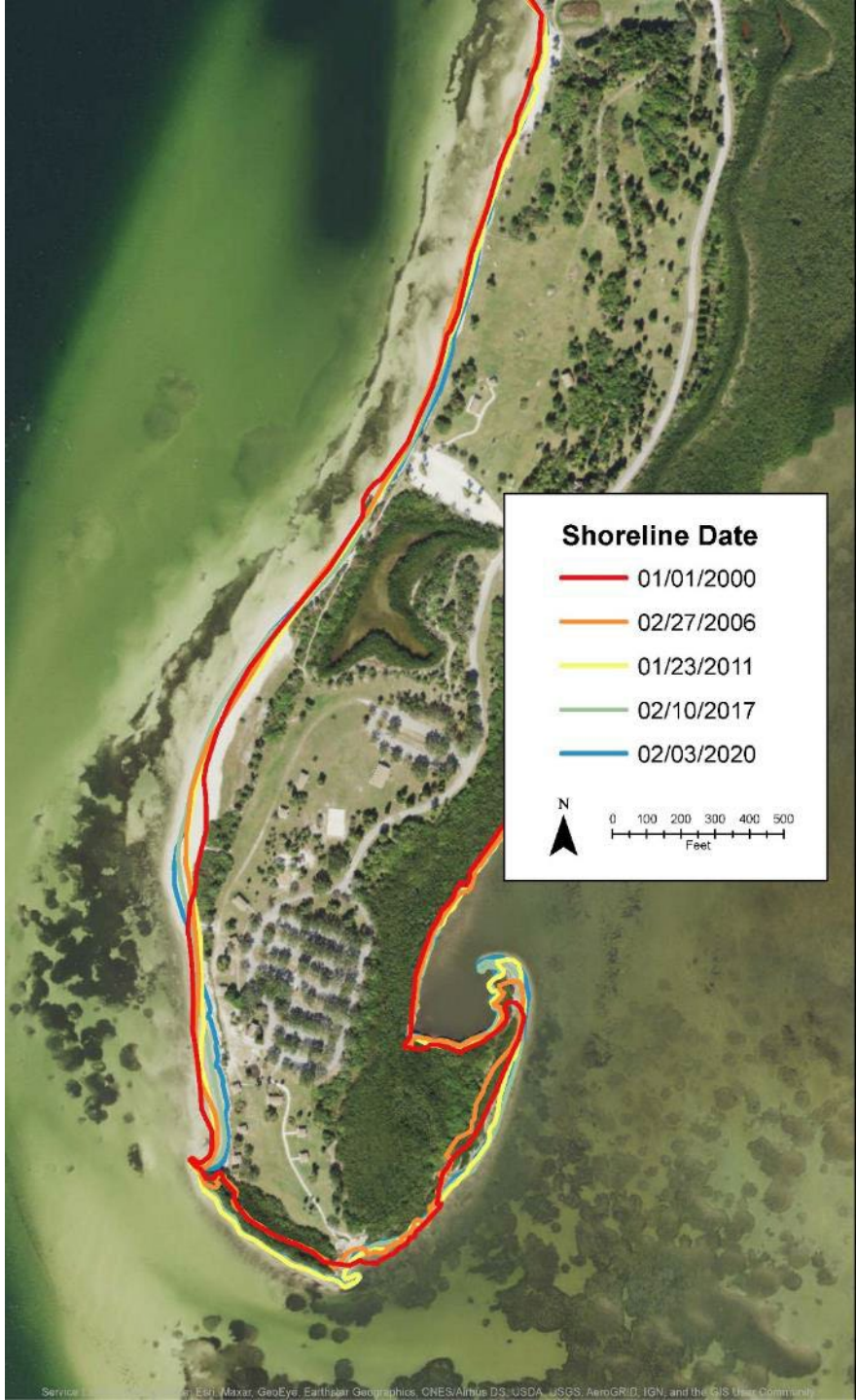
Project Location

- Sandy shoreline along western section
- Breakwater and mangrove planting project constructed
- Shoreline impacted by waves from winter fronts
- Southern shoreline exposed to large fetch and impacted by storm events



Shoreline Change

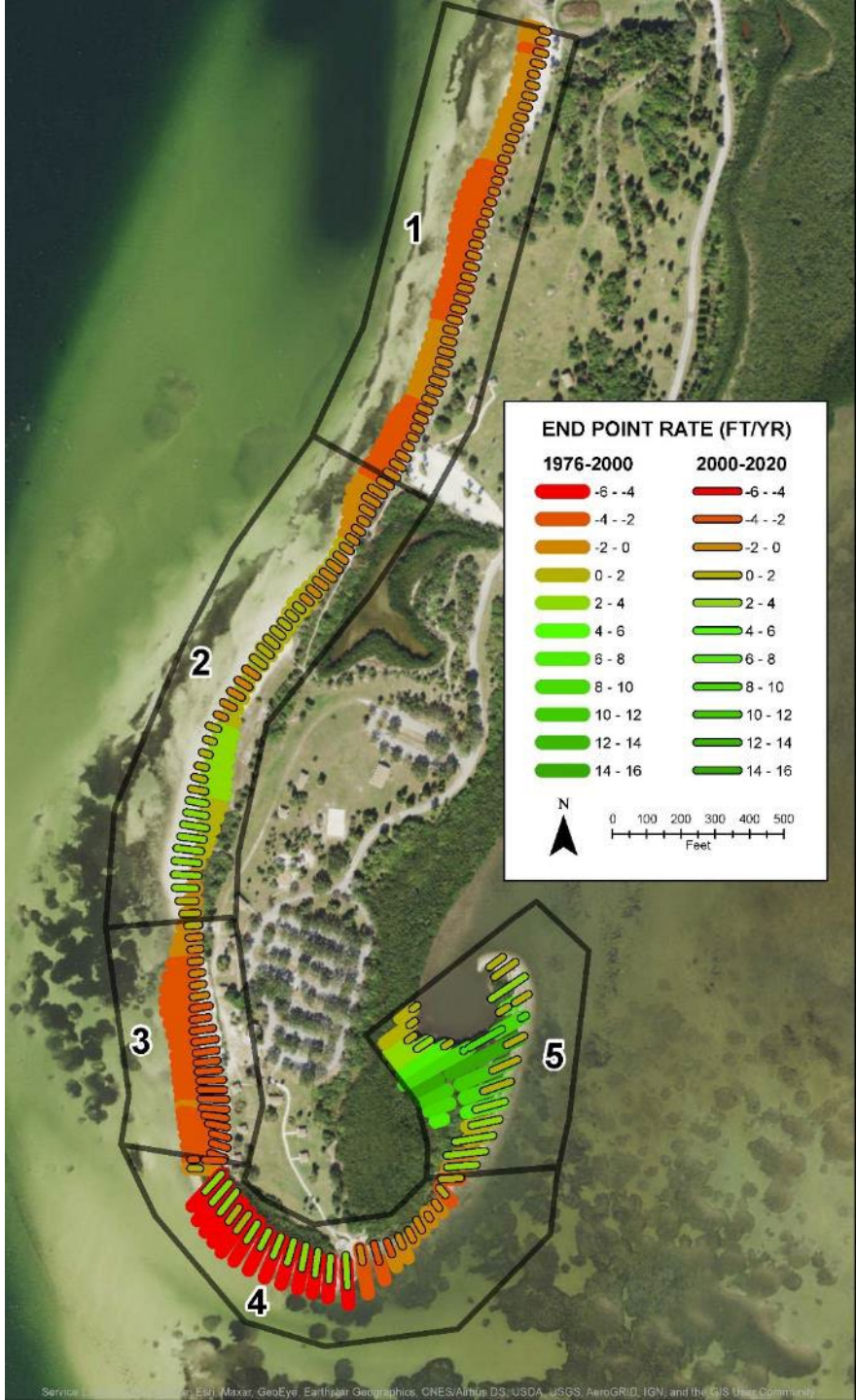
- Used historical aerials from 1976 to 2020
- Traced shoreline (wet/dry line or wrack line)
- Performed change analyses for different areas



Shoreline Change

- Area near picnic table pavilions has experienced chronic erosion. Average of -2.4 ft/year
- Reviewing storms and shorelines, definite impact from storms
- Accretional area – transport of sand from both directions

Analysis Group	End Point Rate (ft/yr)		
	1976 - 2000	2000-2020	1976-2020
1	-2.2	-0.8	1.6
2	0.5	0.5	0.5
3	-2.5	-2.3	-2.4
4	-3.4	0.8	1.5
5	4.6	2.3	3.6
Combined	-1.0	-0.1	-0.6



Existing Conditions

- Site experiencing significant erosion on southwestern shoreline
- Accretional area in middle of shoreline
- Narrow shoreline and backing revetment on northern shoreline

Bathymetry

- Bathymetric data from NOAA
- Shallow nearshore conditions
- Dredged hole not accounted for in available data

Natural Resources

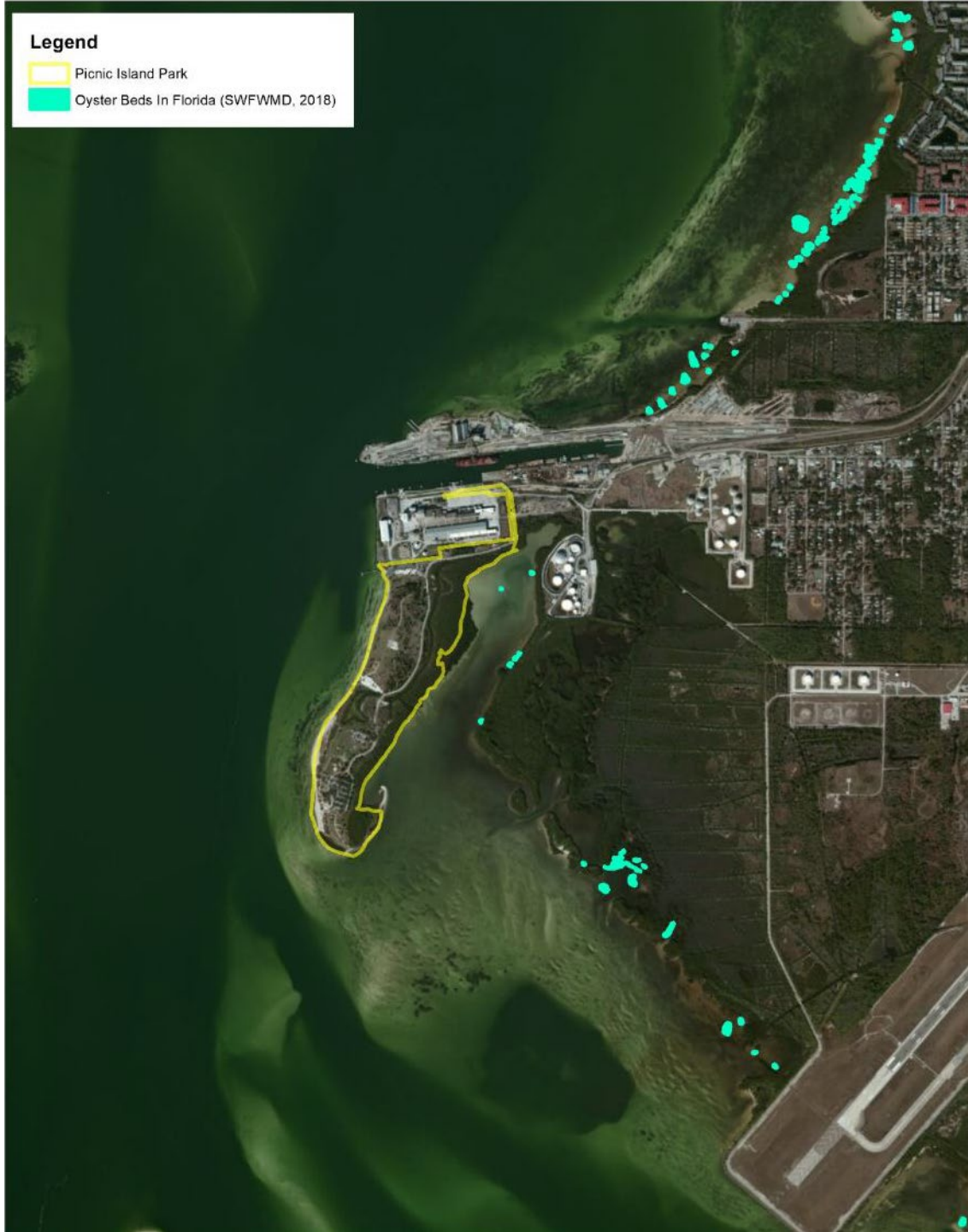
- Seagrass mapping from Florida Fish and Wildlife Conservation Commission (FWC) GIS database
- Mapping will need to be updated

Natural Resources

- Wetland types from the USFWS National Wetlands Inventory GIS data

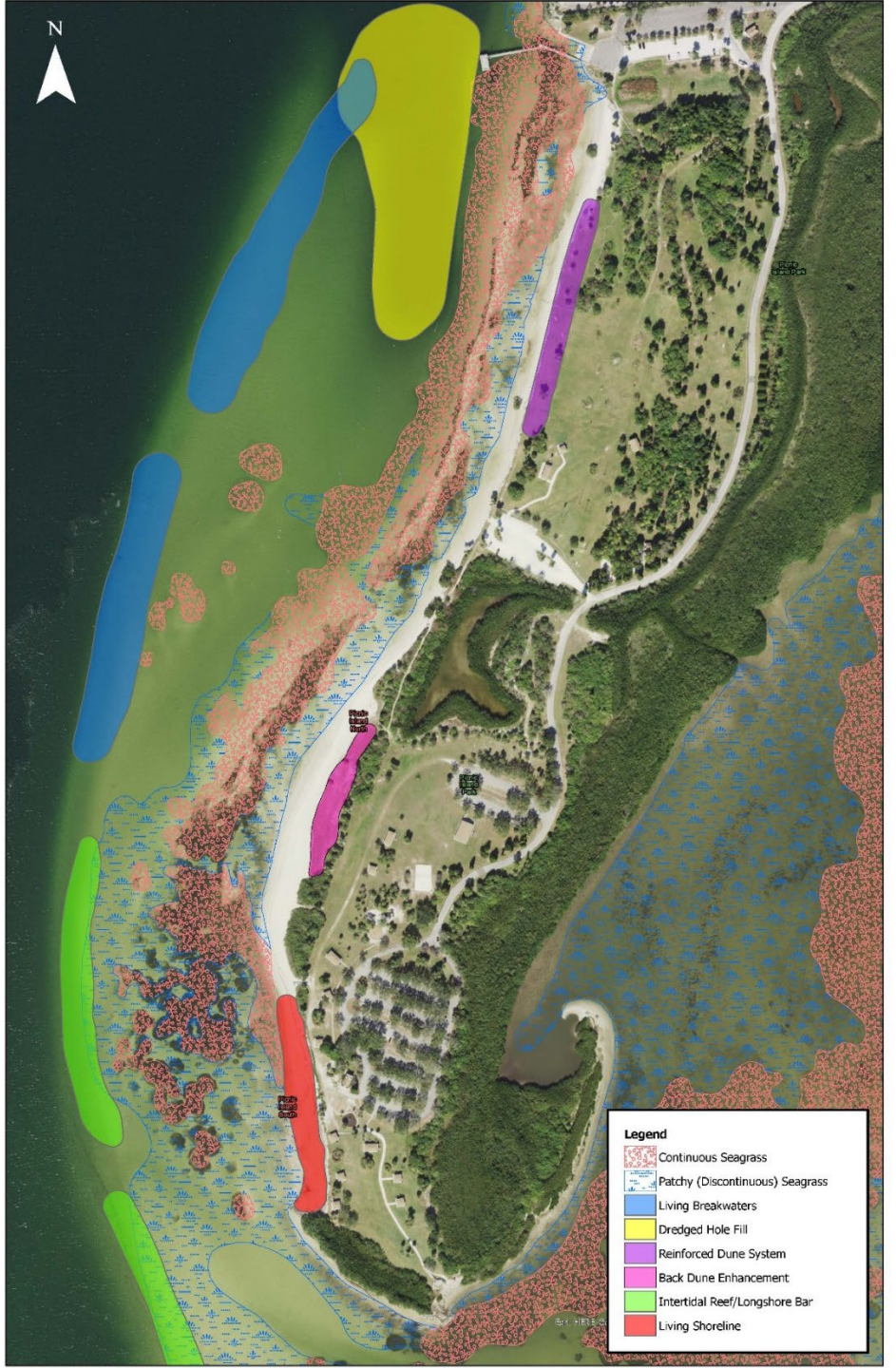
Natural Resources

- Oyster bed data from Southwest Florida Water Management District (SWFWMD) GIS database
- No oysters in project area



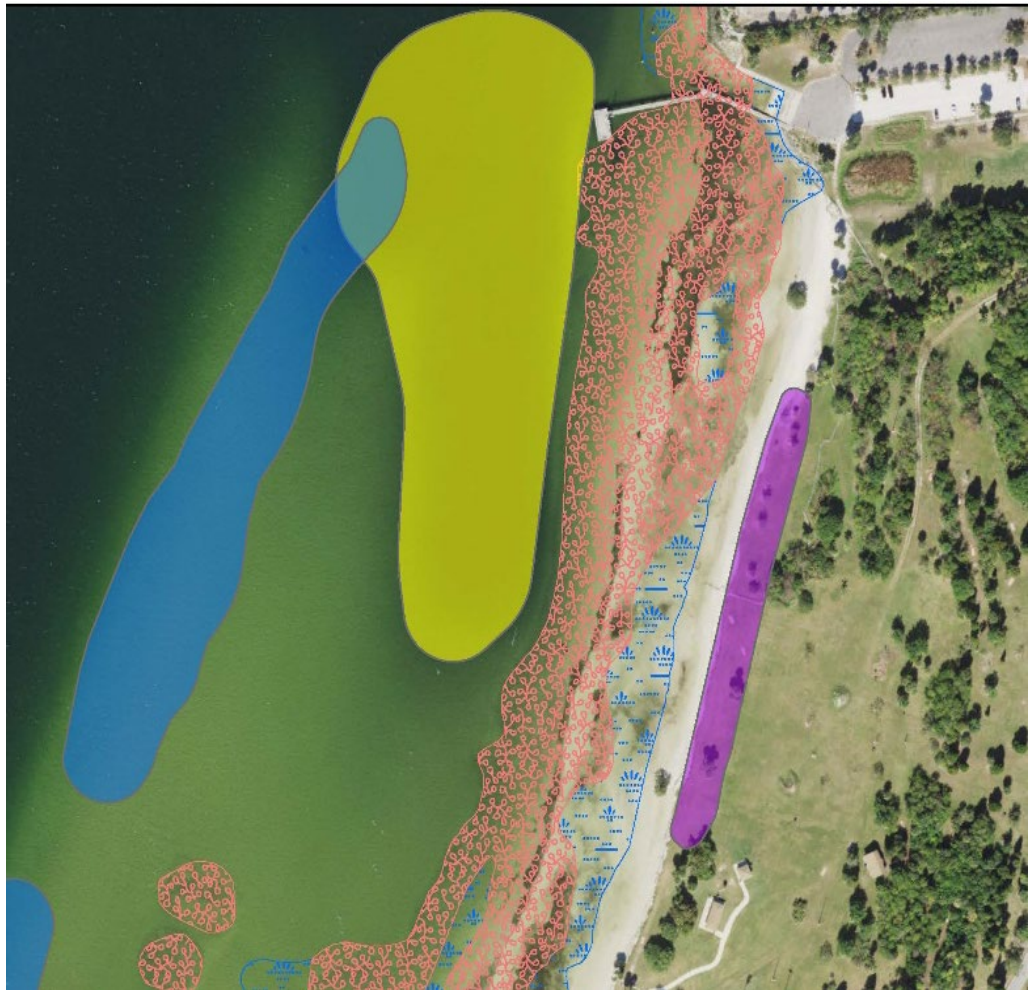
Project Design

- Working with TNC, City of Tampa, and stakeholders
- Natural and nature-based features for shoreline protection concepts
- Consider current and future shoreline conditions/uses
- Developed protection opportunity areas
- Guidance for future design and funding phases



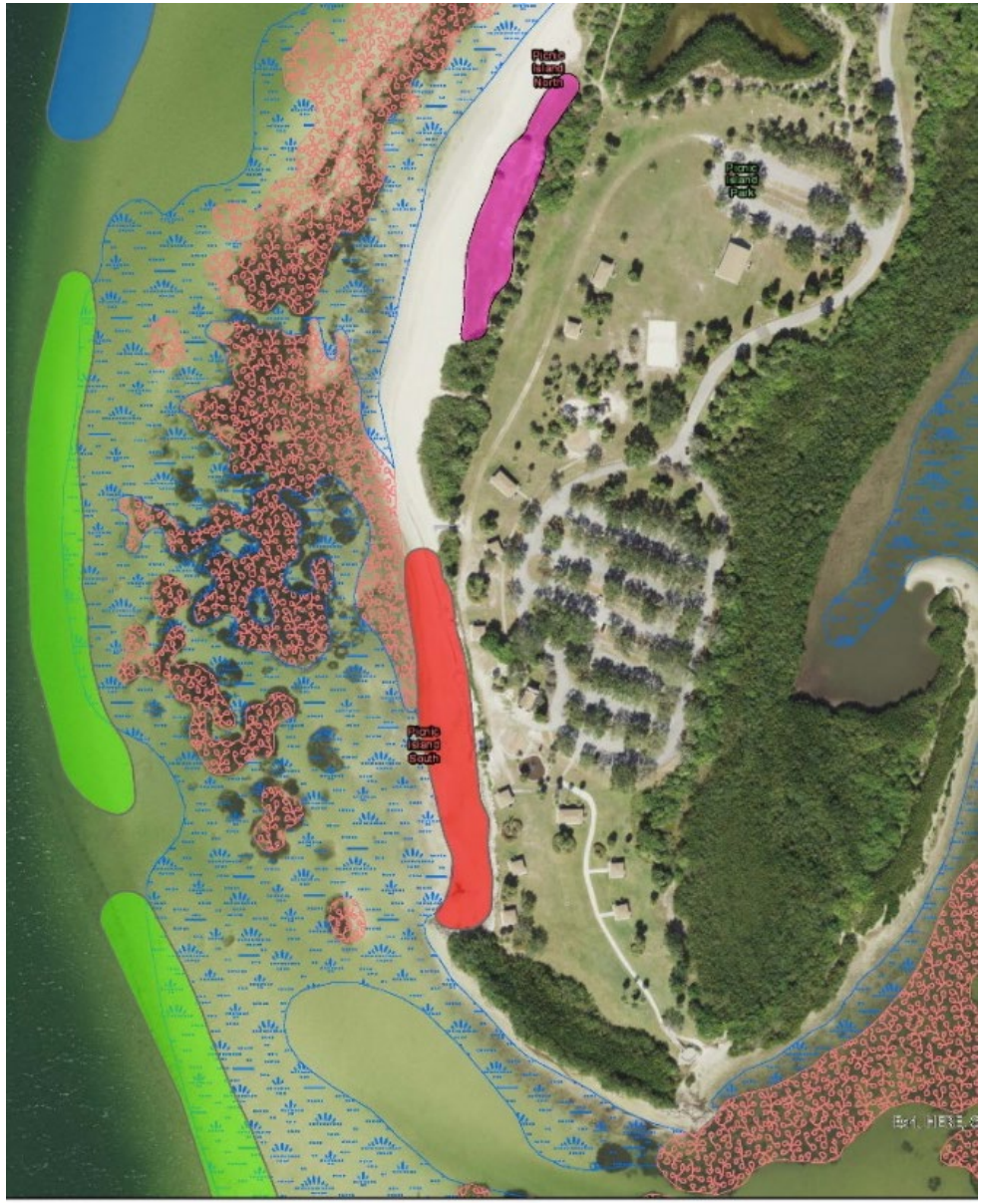
Alternative 1 – Dredge Hole Filling

- Fill existing deep hole at north end of project
- Beneficial use opportunity
- Fill to match adjacent bottom conditions



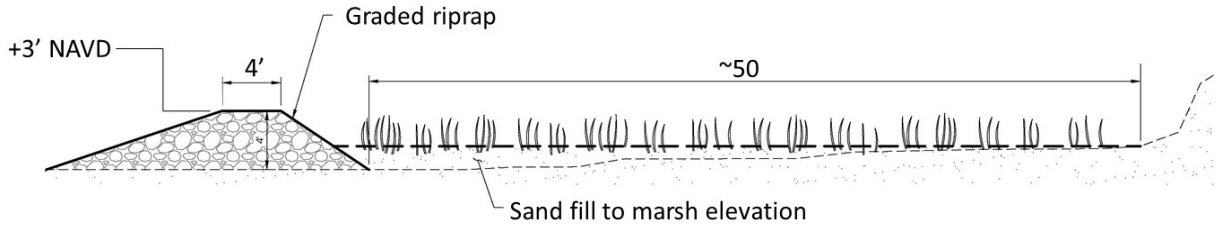
Alternative 2 – Living Shoreline

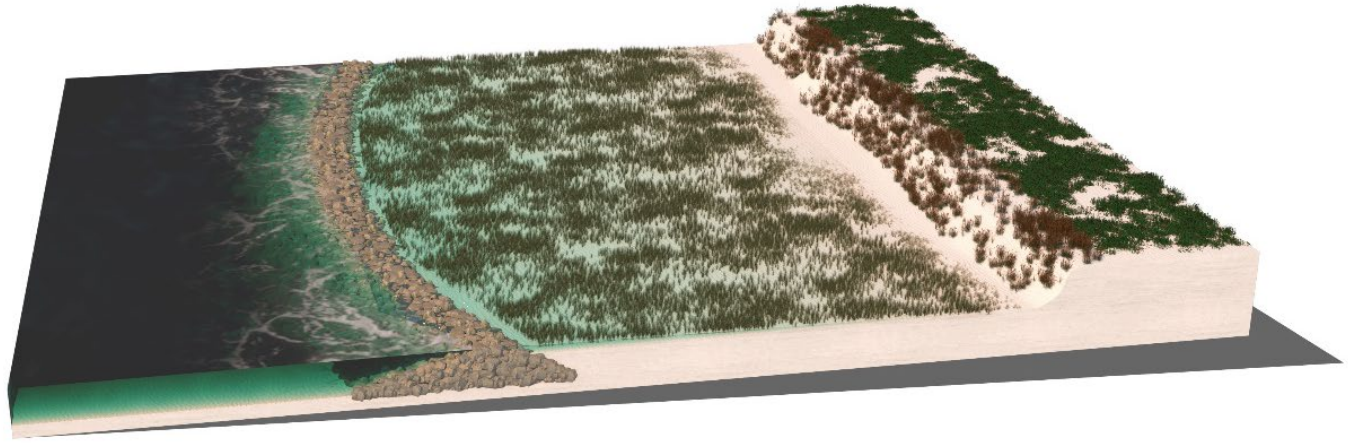
- Southern shoreline significantly eroded
- Located south of accretional area
- Create living shoreline system
- Provide habitat restoration component
- Hard substrate provides oyster habitat



Alternative 2 – Living Shoreline

- Nearshore sill breakwater
- Marsh/mangrove planting
- Similar to 1999 project
- Provide protection to upland infrastructure



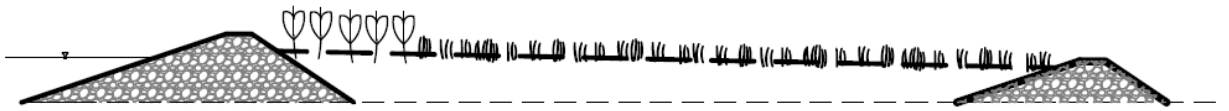


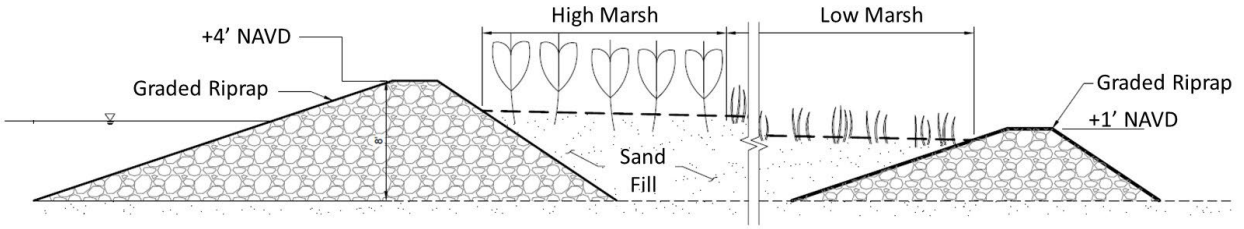
Alternative 3 – Living Breakwaters

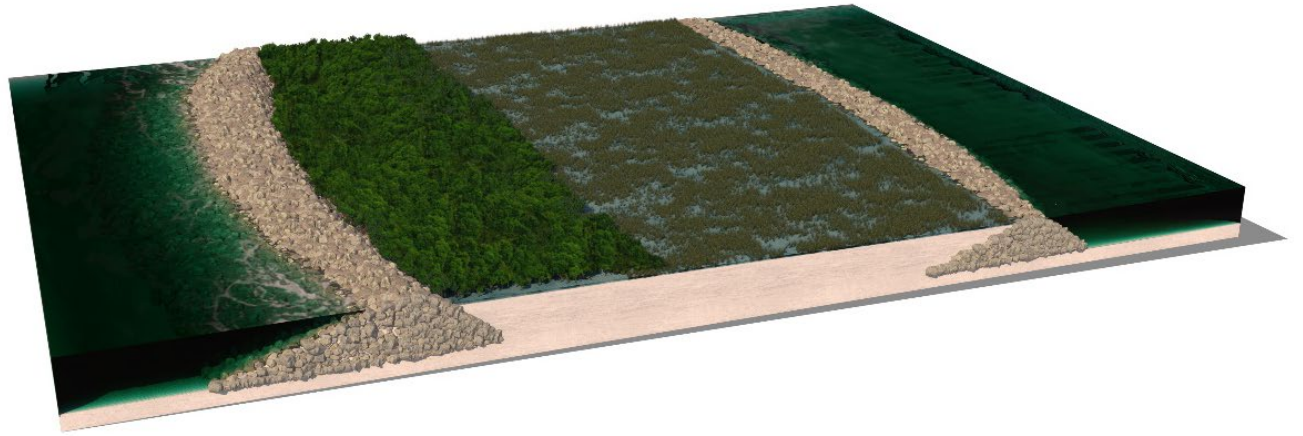
- Northern shoreline is sandy beach
- Provide offshore wave protection
- Create living breakwaters
- Provide habitat restoration component
- Hard substrate provides oyster habitat

Alternative 3 – Living Breakwaters

- Placed offshore – offset from existing seagrass
- Larger offshore breakwater – smaller sill breakwater on island side
- Fill placement to marsh elevations
- Bird nesting opportunities





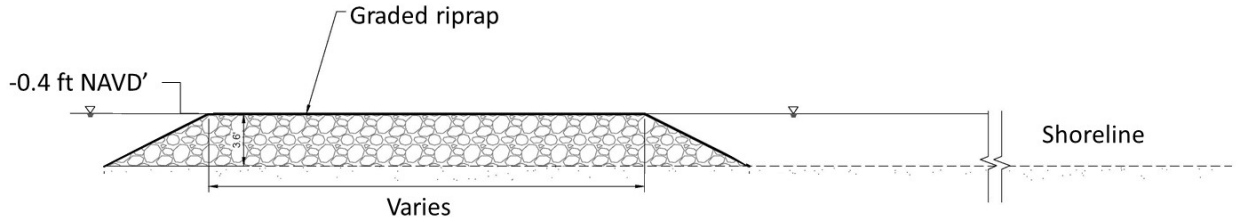


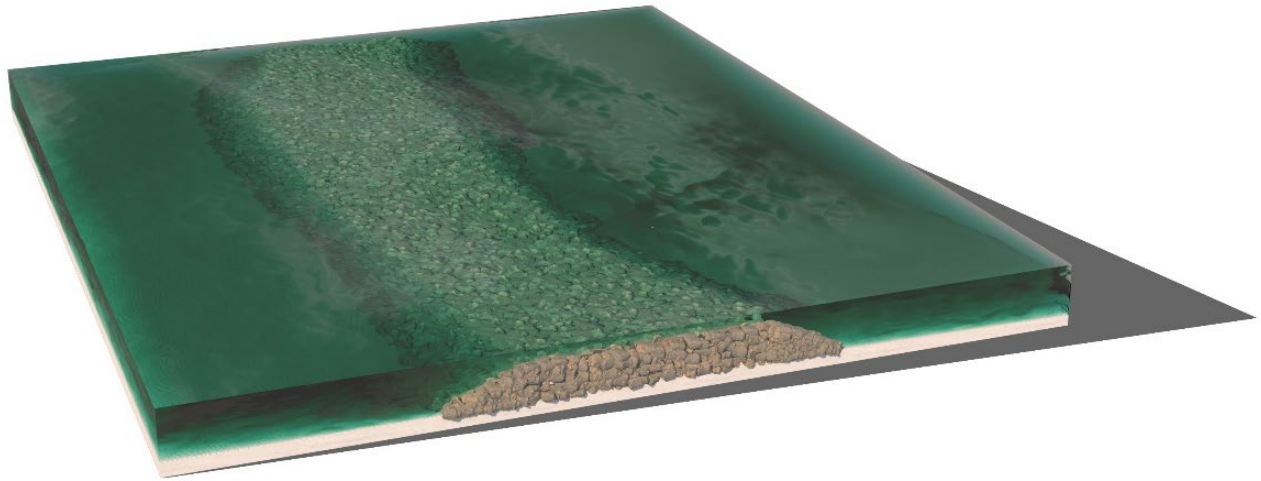
Alternative 4 – Intertidal Reef/Longshore Bar

- Provide additional wave protection for shoreline
- Supplement onshore efforts
- Located offshore of seagrass

Alternative 4 – Intertidal Reef/Longshore Bar

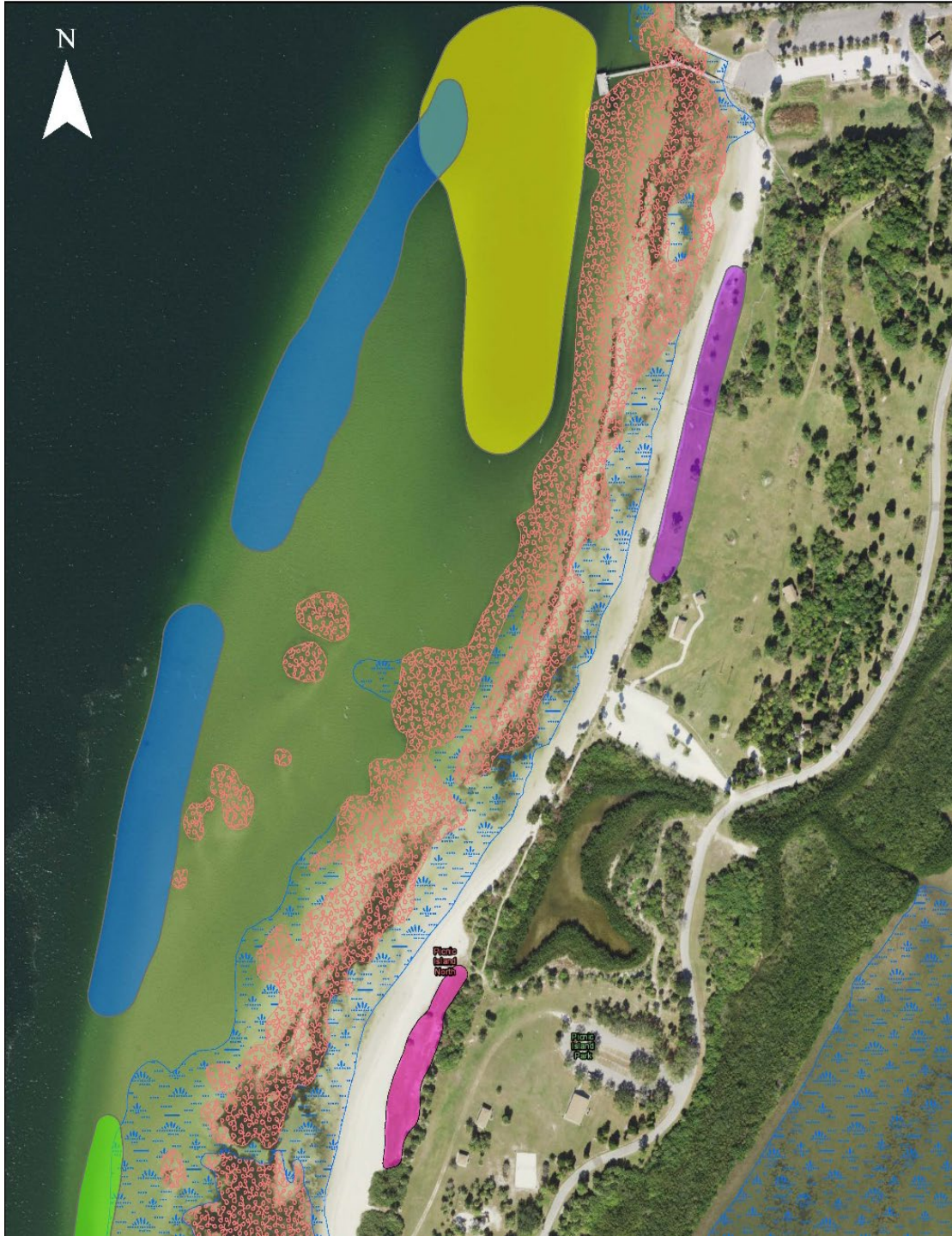
- Graded riprap intertidal reef
- Could use other artificial reef systems
- Provides wave attenuation and oyster habitat





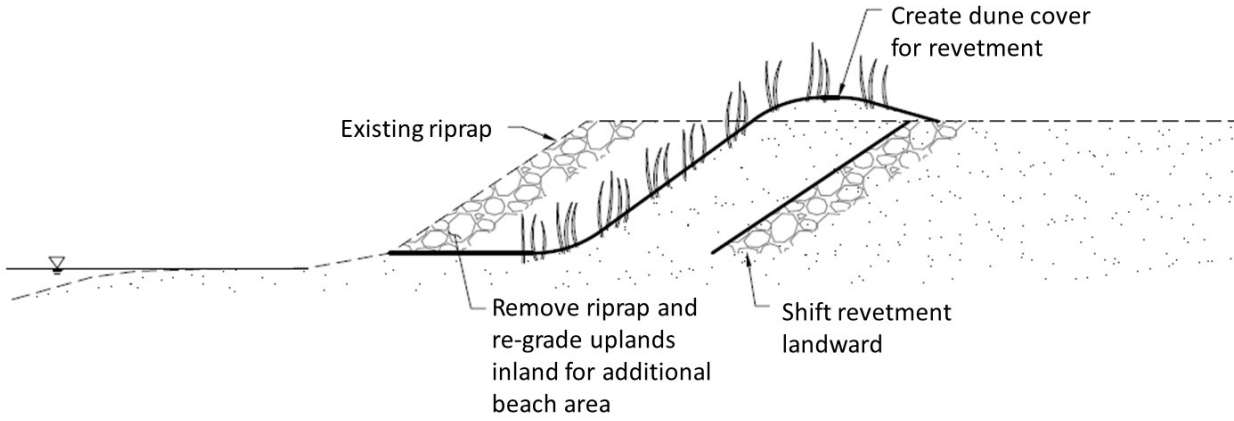
Alternative 5 – Reinforced Dune

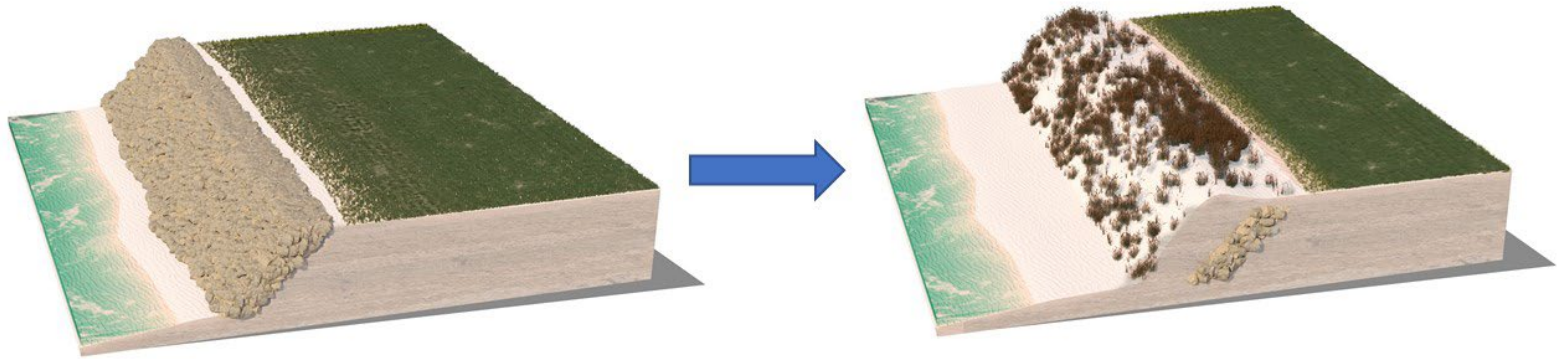
- Narrow shoreline with backing revetment
- Use upland areas for beach expansion
- Avoid nearshore seagrass



Alternative 5 – Reinforced Dune

- Graded uplands to create beach area
- Re-use and supplement existing riprap to create new revetment
- Cover revetment with sand – create dune feature
- Plant with sea oats – dune species





Discussion

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER:

PA 409551

Date:	6/9/2022		
Time:	3:00		
Project Name:	The Nature Conservancy / MERM Pilot Project - Picnic Island Park		
District Engineer:	Monte Ritter		
District ES:	Jeff Glas		
Attendees:	Cameron Perry, Zaine Arth, Joe Schmidt, KimberlyTapley, Chip Messenkopf		
County:	Hillsborough	**Sec/Twp/Rge:**	24,25/30/17
Total Land Acreage:		**Project Acreage:**	acres

Prior On-Site/Off-Site Permit Activity:

-

Project Overview:

- Proposed work at Picnic Island Park to improve coastal resilience/shoreline erosion associated with sea level rise.
- Work alternatives include dredge hole filling with sandy material, living shorelines, living breakwaters, intertidal reefs/longshore bars, reinforced dune systems.
- Majority of activities appear to qualify for an Individual SWERP
- Some activities may qualify for certain General Permits per Rules 62-330.600, .631 or .632

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Wetlands present - impacts proposed.
- Provide the limits of jurisdictional wetlands and surface waters. Roadside ditches or other water conveyances, including permitted and constructed water conveyance features, can be claimed as surface waters per Chapter 62-340 F.A.C. if they do not meet the definition of a swale as stated under Rule 403.803 (14) F.S.
- Demonstrate elimination and reduction of wetland impacts. The elimination and reduction criteria can be found in subsection 10.2.1 of Applicant's Handbook Volume 1.
- Provide information regarding how longshore bars and breakwaters may effect seagrass due to changes in flushing, sedimentation, etc.
- SAV studies should include presence/absence analysis over time as well as current field surveys.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- The site is located in the Tampa Bay and Coastal Areas ERP Basin. Mitigation Banks that serve this area include the Northshore Seagrass, Tampa Bay, Mangrove Point, Big Bullfrog Creek, and Nature Coast. For an interactive map of permitted mitigation banks and their service areas, use this LINK. Be advised that use of a bank with a modified service area (i.e. a service area that is larger than the basin the bank is located in), may require the submittal of a cumulative impact analysis pursuant to subsection 10.2.8 of Applicant's Handbook volume 1.
- If the wetland mitigation is appropriate and the applicant is proposing to utilize mitigation bank credit as wetland mitigation, provide a letter of reservation of credits from the wetland mitigation bank. The wetland mitigation bank current credit ledgers can be found out the following link: https://www.swfwmd.state.fl.us/business/epermitting/environmental-resource-permit, Go to "ERP Mitigation Bank Wetland Credit Ledgers"
- Please note, the Florida Department of Environmental Protection (FDEP) has assumed the Federal dredge and fill permitting program under section 404 of the Federal Clean Water Act within certain waters. State 404 Program streamlining intentions direct Agency staff to coordinate joint site visits for overall consistency between the two State programs. As such, District staff and the FDEP will need to conduct a joint site visit for evaluation of the wetland/surface water systems proposed for impact. District staff will coordinate with FDEP staff on determining dates/times of joint Agency availability. Upon determination of joint availability,

staff will provide the applicant's representative with site visit scheduling options. A site visit will not be scheduled until the appropriate signatures on the application and the fee is submitted. ****Site appears to be within Retained Waters and therefore will require a separate submittal to USACE (see below)****

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- All work proposed within and adjacent to tidal waters.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- No adverse water quantity impacts are expected.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- No adverse water quality impacts are expected.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- The project may be located within state owned sovereign submerged lands (SSSL). Be advised that a title determination will be required from FDEP to verify the presence and/or location of SSSL.
- If use of SSSL is proposed, authorization will be required. Refer to Chapter 18-21, F.A.C. and Chapter 18-20, F.A.C. for guidance on projects that impact SSSL and Aquatic Preserves.
- Include discussion on the potential type of SSSL authorization that may be required. Refer to Chapter 18-21.005, F.A.C.
- Coordination with the Port Authority for projects located in Hillsborough County is recommended.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to entity that owns or controls the property. City of Tampa will likely be the permittee.

Application Type and Fee Required:

- SWERP Individual – Sections A, C and D of the ERP Application. Fee will be based on project size and wetland/sw impacts.
- Notice of Intent to Use Environmental Resource General Permit. $250 for an online submittal.
- Consult the fee schedule for different thresholds.

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- The plans and drainage report submitted electronically must include the appropriate information required under Rules 61G15-23.005 and 61G15-23.004 (Digital), F.A.C. The following text is required by the Florida Board of Professional Engineers (FBPE) to meet this requirement when a digitally created seal is not used and must appear where the signature would normally appear:

  ELECTRONIC (Manifest): *[NAME] State of Florida, Professional Engineer, License No. [NUMBER] This item has been electronically signed and sealed by [NAME] on the date indicated here using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies*

  DIGITAL: *[NAME] State of Florida, Professional Engineer, License No. [NUMBER]; This item has been digitally signed and sealed by [NAME] on the date indicated here; Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant's Handbook Vol. 1 Part IV Erosion and Sediment Control.

- On December 17, 2020, the Environmental Protection Agency (EPA) formally transferred permitting authority under CWA Section 404 from the U.S. Army Corps of Engineers (Corps) to the State of Florida for a broad range of water resources within the State. The primary State 404 Program rules are adopted by the Florida Department of Environmental Protection (FDEP) as Chapter 62-331 of the Florida Administrative Code (F.A.C.). While the State 404 Program is a separate permitting program from the Environmental Resource Permitting program (ERP) under Chapter 62-330, F.A.C., and agency action for State 404

Program verifications, notices, or permits shall be taken independently from ERP agency action, the FDEP and the Southwest Florida Water Management District (SWFWMD) will be participating in a Joint application Process. Upon submittal of an ERP application that proposes dredge/fill activities in wetlands or surface waters within state assumed waters, the SWFWMD will forward a copy of your application to the FDEP for activities under State 404 jurisdiction. The applicant may choose to have the State 404 Program and ERP agency actions issued concurrently to help ensure consistency and reduce the need for project modifications that may occur when the agency actions are issued at different times. Additional information on the FDEP's 404 delegation can be found at: https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/state-404-program

- Additionally, for those projects located in areas where the Corps retains jurisdiction, the applicant is advised that the District will not send a copy of an application that does not qualify for a State Programmatic General Permit (SPGP) to the U.S. Army Corps of Engineers. If a project does not qualify for a SPGP, you will need to apply separately to the Corps using the appropriate federal application form for activities under federal jurisdiction. Please see the Corps' Jacksonville District Regulatory Division Sourcebook for more information about federal permitting. Please call your local Corps office if you have questions about federal permitting. Link: http://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/

C

Appendix C

Picnic Island Stakeholder Update Meeting Minutes

Meeting Minutes

Project:	TNC MERM – Picnic Island Park
Subject:	Stakeholder Update Meeting
Date:	Monday, July 18, 2022 at 11:00 am
Location:	WebEx

Attendees:	
Joe Schmidt (TNC)	Andy Lykens (MacDill AFB)
Brad Suder (City of Tampa)	Megan Kramer (USF)
Chris Thompson (City of Tampa)	Maria Ceron (USF)
Carleigh Blessing (City of Tampa)	Kali Denault (Port Tampa Civic Assn)
Hank Hodde (Pinellas County)	Cameron Perry (HDR)
Tom Vento (Port Tampa Assn)	Zaine Arth (HDR)
Maya Burke (Tampa Bay Est. Program)	Richard LeBlanc (HDR)
Debi Luke (Florida Aquarium)	Katie Duty (HDR)

This memorandum documents key information exchanged during the Stakeholder Update Meeting held on July 18, 2022 at 11:00 am (EDT) via WebEx teleconference.

- Introductions by the project teams from HDR and TNC were made.

- HDR provided a PowerPoint presentation showing the updated plan for Picnic Island, the five interventions to address shoreline protection and habitat loss, and overall cost estimates for each intervention on a per unit (LF, acre) basis.

- TNC provided information on the next steps and the recent funding requests that have been submitted.

- Maria Ceron from USF asked about the use of graded riprap for reef and other features. Cameron from HDR replied that the graded riprap was one of the materials that could be used for the reef and that other items such as reefballs, etc. could be considered in the next phases of work. Graded riprap has been shown to be conducive to oyster recruitment and that it can be sized to be stable in larger wave conditions, which this site can experience.

- There was discussion about timeline for the projects that are seeking funding and how that relates to USACE channel work. Maya Burke mentioned that feasibility studies are ongoing now for the channel projects.

- Based on the Corps timeline, this would be a good time to engage with the City, Port, and Corps on beneficial use opportunities.

Attachments

- Picnic Island Stakeholder Update Meeting PowerPoint slides.

Picnic Island Park

Stakeholder Update Meeting

7/18/2022

1 Introductions

2 Background/Location

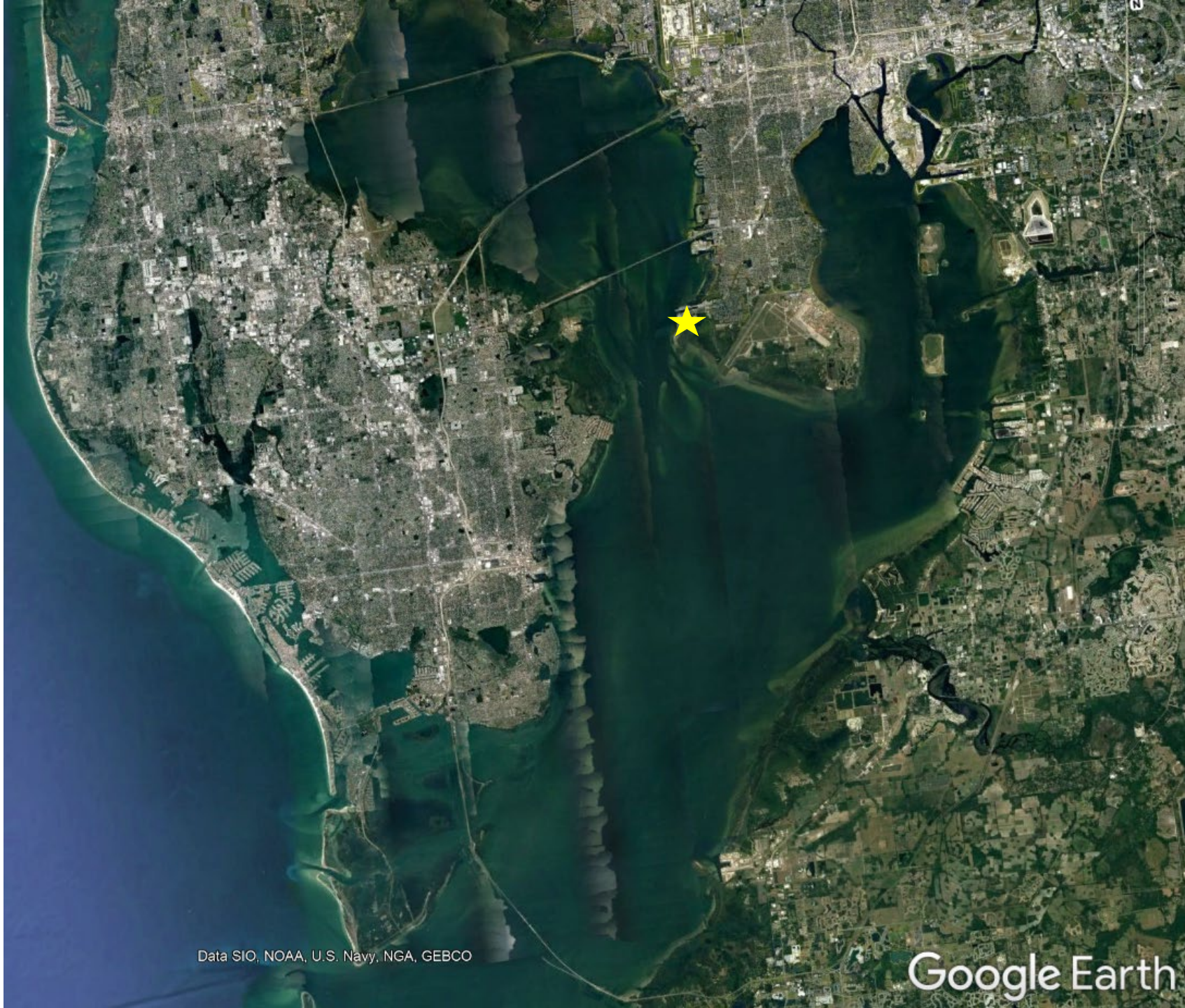
3 Existing Conditions

4 Project Interventions

5 Discussion

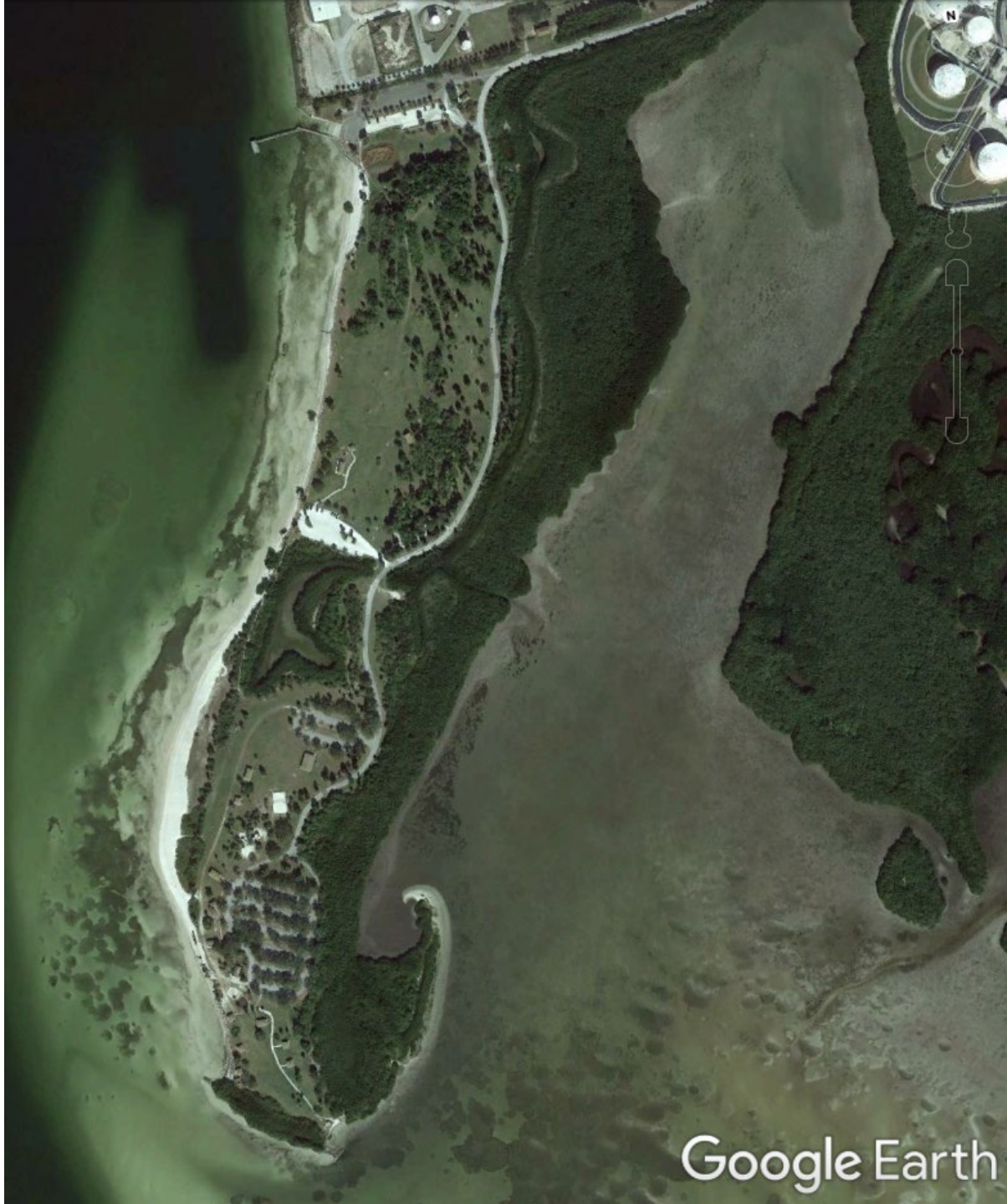
Project Location

- Located in Old Tampa Bay
- Adjacent to Port Tampa
- Constructed from dredged material



Project Location

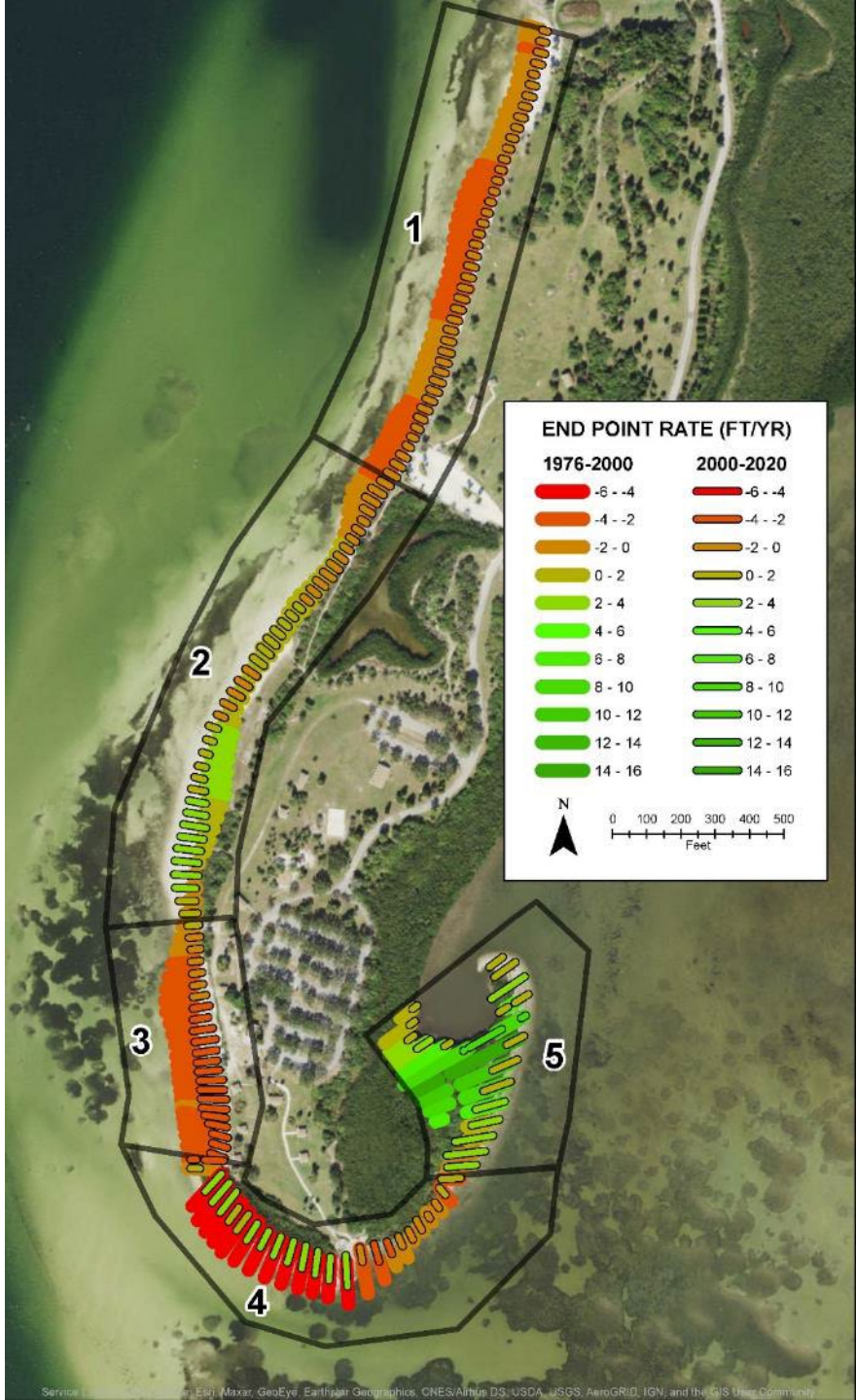
- Sandy shoreline along western section
- Breakwater and mangrove planting project constructed
- Shoreline impacted by waves from winter fronts
- Southern shoreline exposed to large fetch and impacted by storm events



Shoreline Change

- Area near picnic table pavilions has experienced chronic erosion. Average of -2.4 ft/year
- Reviewing storms and shorelines, definite impact from storms
- Accretional area – transport of sand from both directions

Analysis Group	End Point Rate (ft/yr)		
	1976 - 2000	2000-2020	1976-2020
1	-2.2	-0.8	1.6
2	0.5	0.5	0.5
3	-2.5	-2.3	-2.4
4	-3.4	0.8	1.5
5	4.6	2.3	3.6
Combined	-1.0	-0.1	-0.6



Existing Conditions

- Site experiencing significant erosion on southwestern shoreline
- Accretional area in middle of shoreline
- Narrow shoreline and backing revetment on northern shoreline

Bathymetry

- Bathymetric data from NOAA
- Shallow nearshore conditions
- Dredged hole not accounted for in available data

Natural Resources

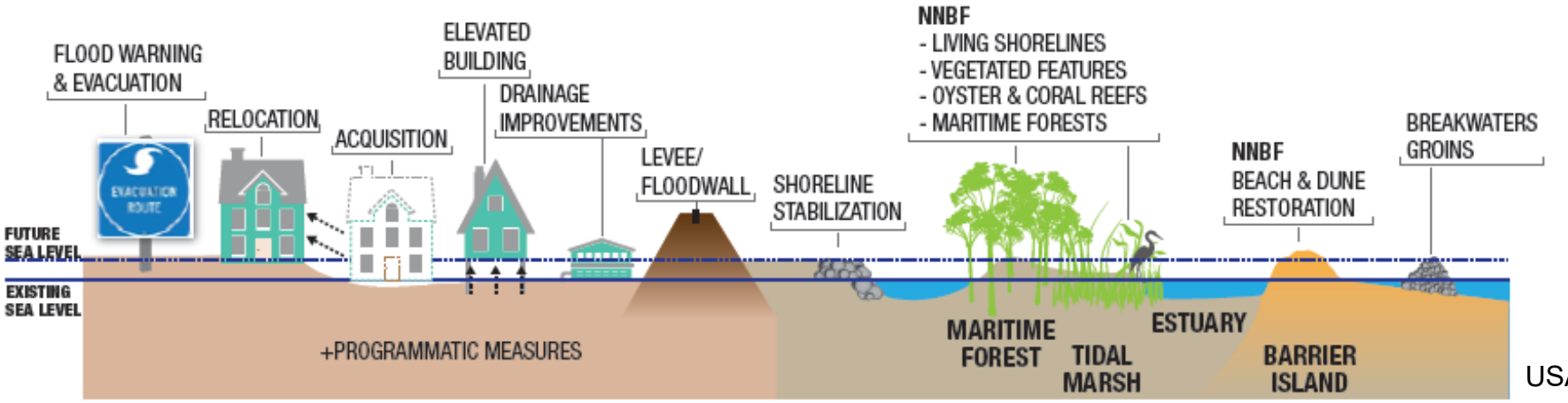
- Seagrass mapping from Florida Fish and Wildlife Conservation Commission (FWC) GIS database
- Mapping will need to be updated

Design Considerations

- Erosional forces
  - Seasonal winds/waves
  - Hurricane conditions
  - Ship/boat passage
- Natural resources
- Changing conditions

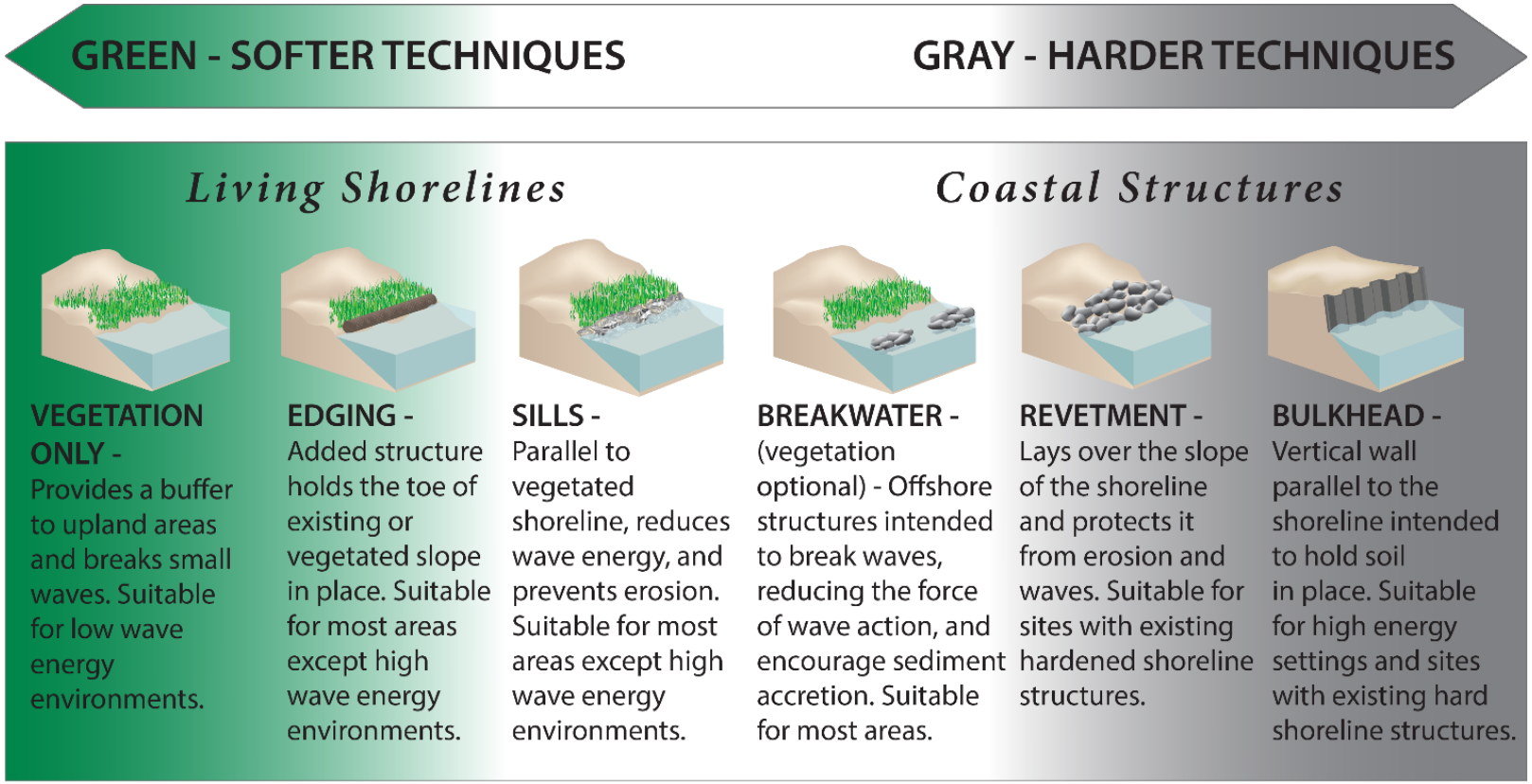
Natural & Nature-Based Features

- NNBF Goals:
  - Attenuate the energy, and height, of incoming waves
  - Attenuate storm surge water levels along the shoreline
  - Reduce erosion of sediments and soils
  - Attract and stabilize sediments
  - Attract and sustain flora and fauna, which can assist in stabilizing the shoreline
- Redundancy in project design



USACE, 2015

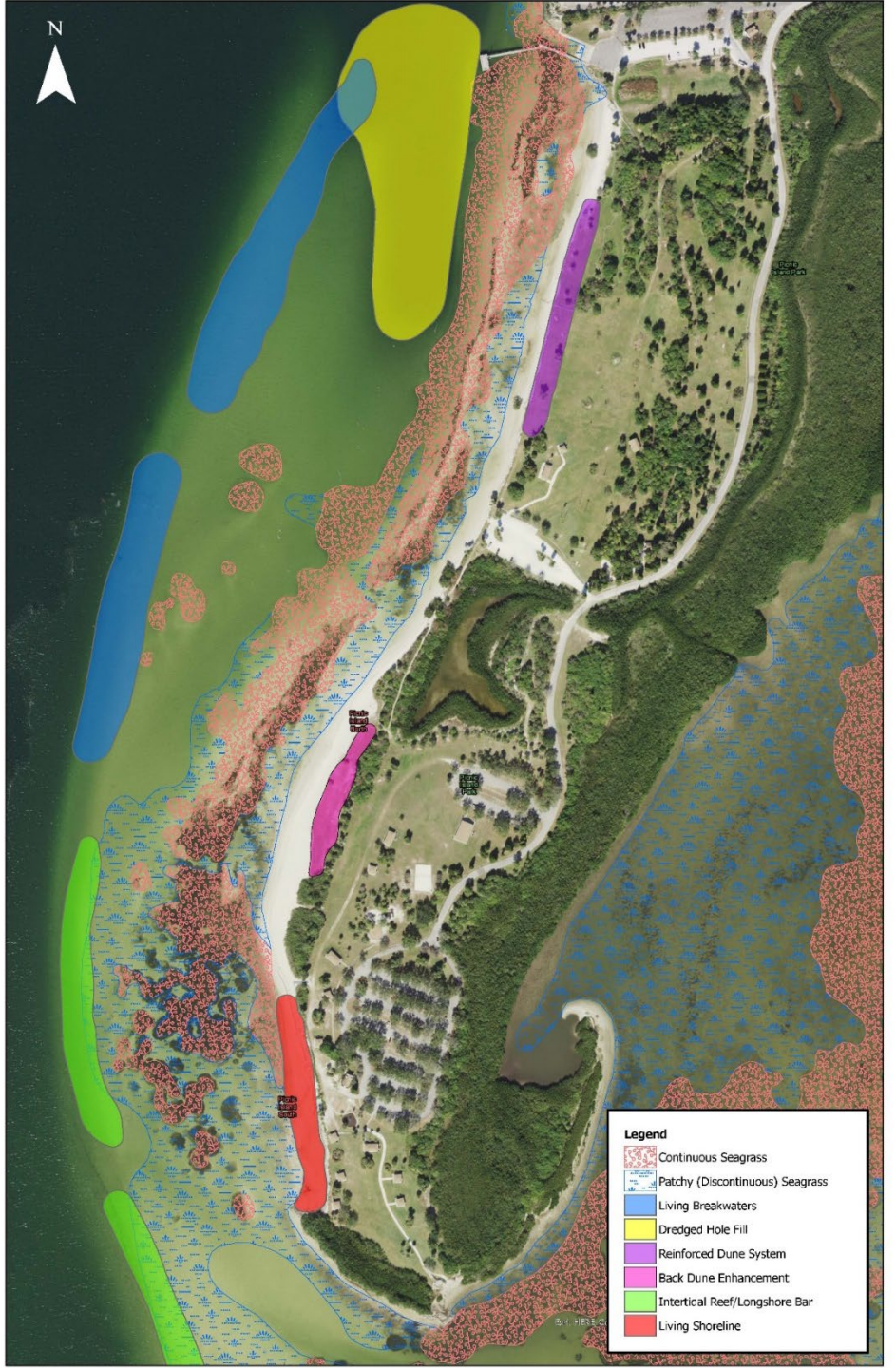
Shore Stabilization Options



NOAA, 2015

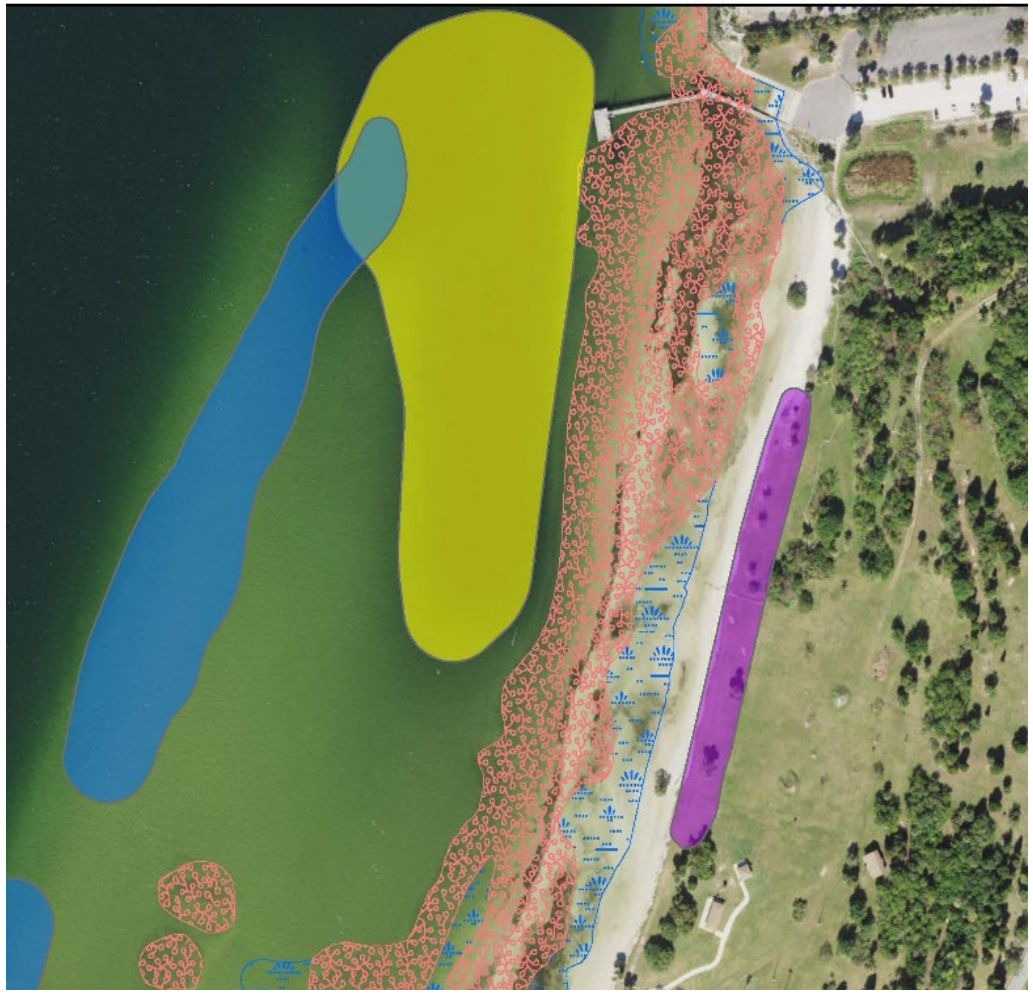
Project Interventions

- TNC, City of Tampa, and stakeholders
- Natural and nature-based features for shoreline protection concepts
- Consider current and future shoreline conditions/uses
- Developed protection opportunity areas
- Guidance for future design and funding phases



Intervention 1 – Dredge Hole Filling

- Fill existing deep hole at north end of project
- Beneficial use opportunity
- Fill to match adjacent bottom conditions

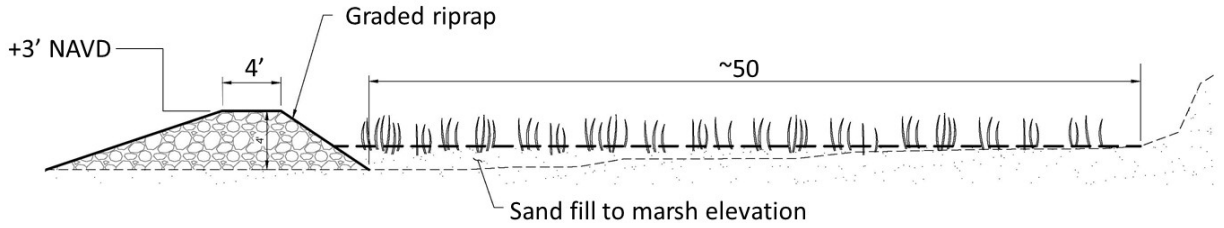


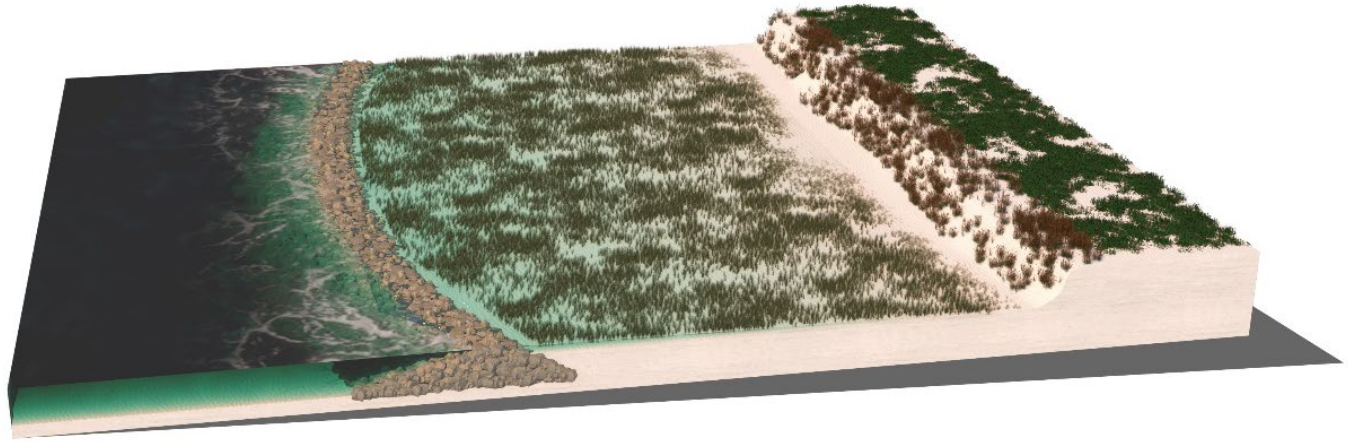
Intervention 2 – Living Shoreline

- Southern shoreline significantly eroded
- Located south of accretional area
- Create living shoreline system
- Provide habitat restoration component
- Hard substrate provides oyster habitat

Intervention 2 – Living Shoreline

- Nearshore sill breakwater
- Marsh/mangrove planting
- Similar to 1999 project
- Provide protection to upland infrastructure



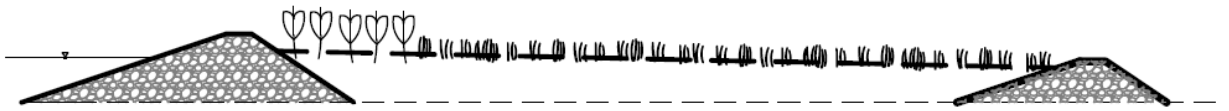


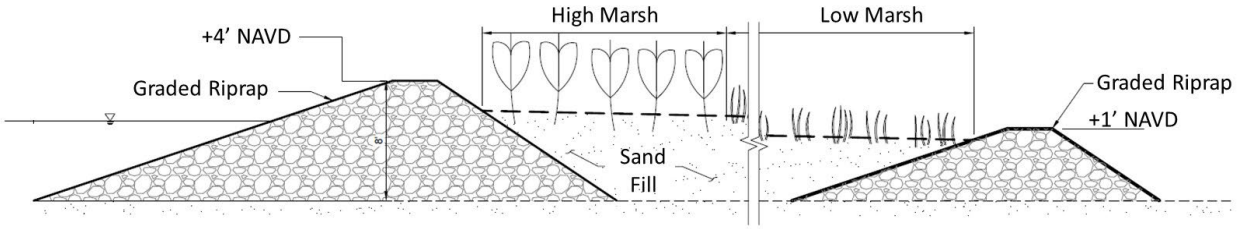
Intervention 3 – Living Breakwaters

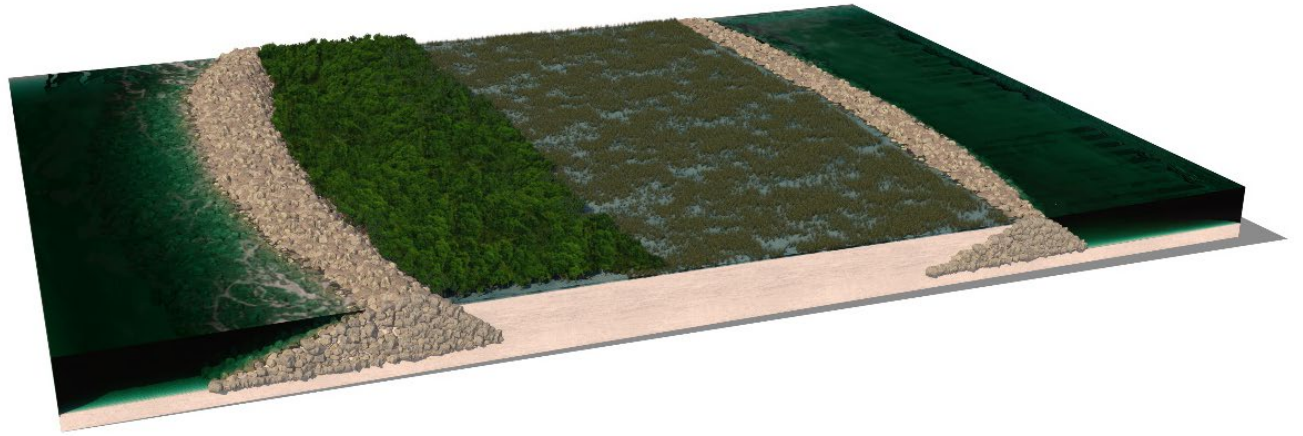
- Northern shoreline is sandy beach
- Provide offshore wave protection
- Create living breakwaters
- Provide habitat restoration component
- Hard substrate provides oyster habitat

Intervention 3 – Living Breakwaters

- Placed offshore – offset from existing seagrass
- Larger offshore breakwater – smaller sill breakwater on island side
- Fill placement to marsh elevations
- Bird nesting opportunities





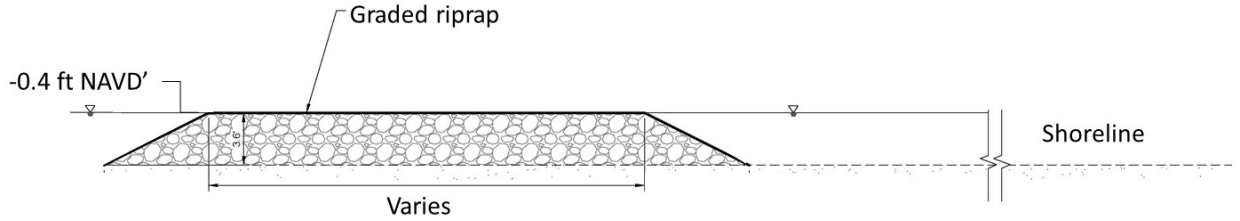


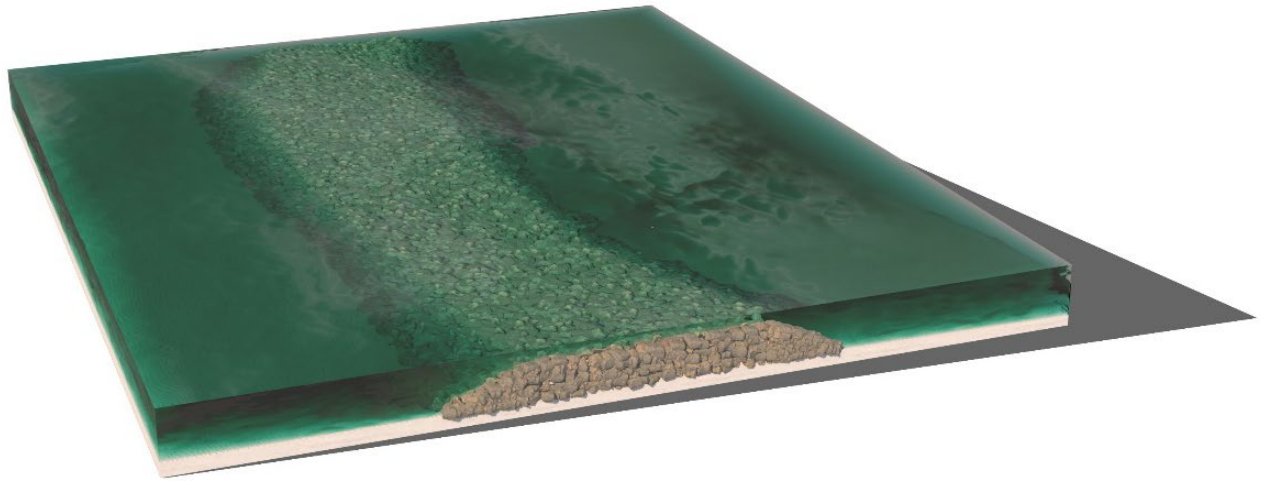
Intervention 4 – Intertidal Reef/Longshore Bar

- Provide additional wave protection for shoreline
- Supplement onshore efforts
- Located offshore of seagrass

Intervention 4 – Intertidal Reef/Longshore Bar

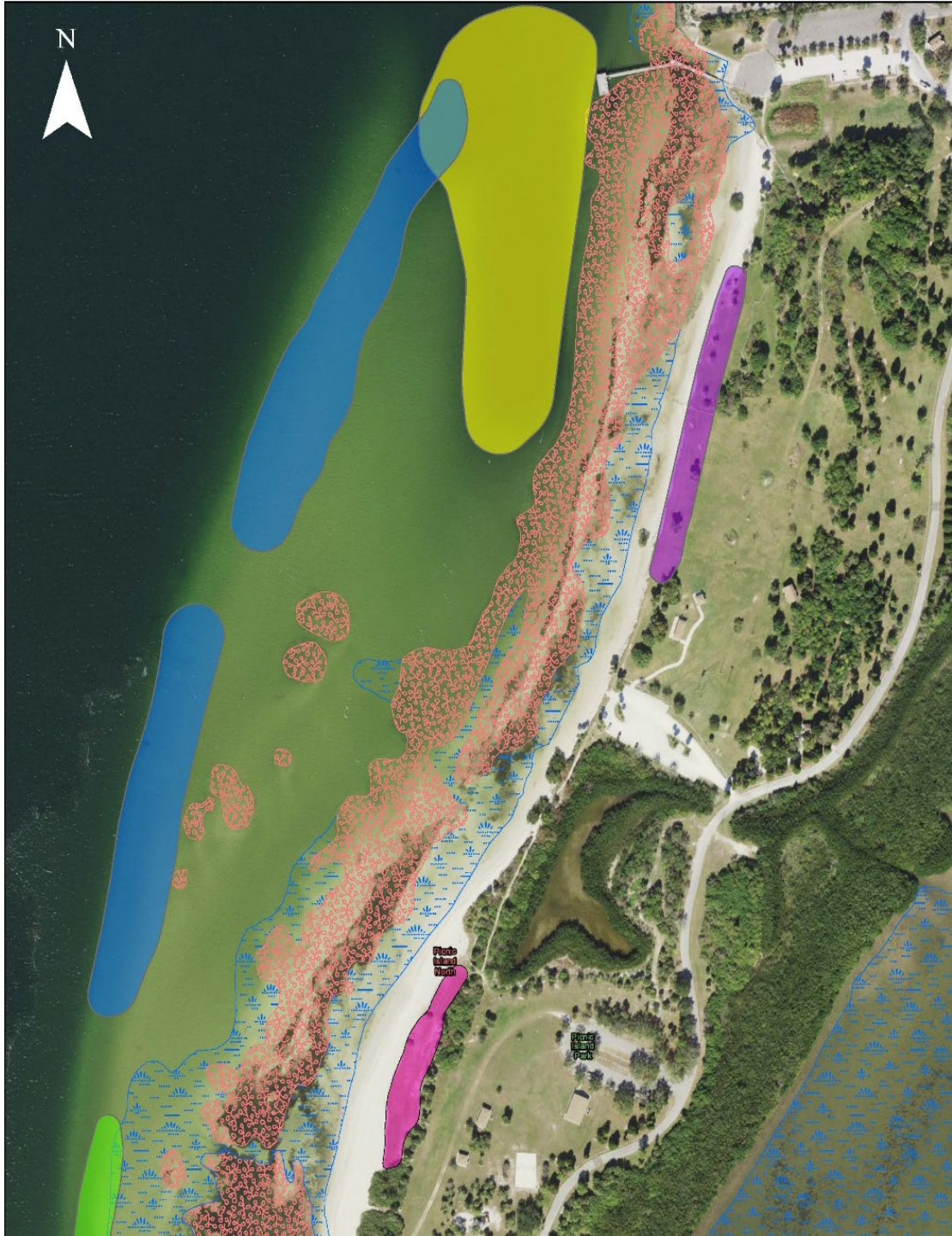
- Graded riprap intertidal reef
- Could use other artificial reef systems
- Provides wave attenuation and oyster habitat





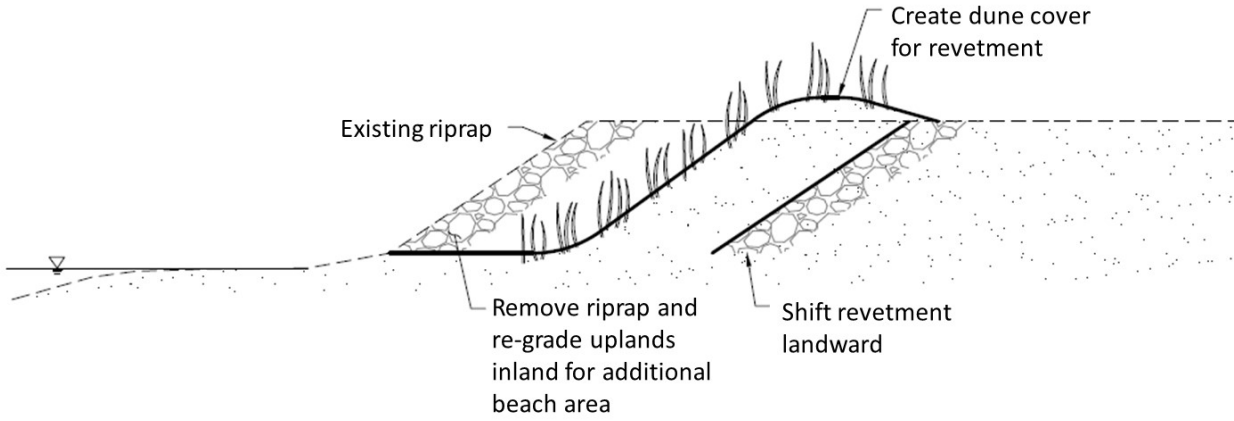
Intervention 5 – Reinforced Dune

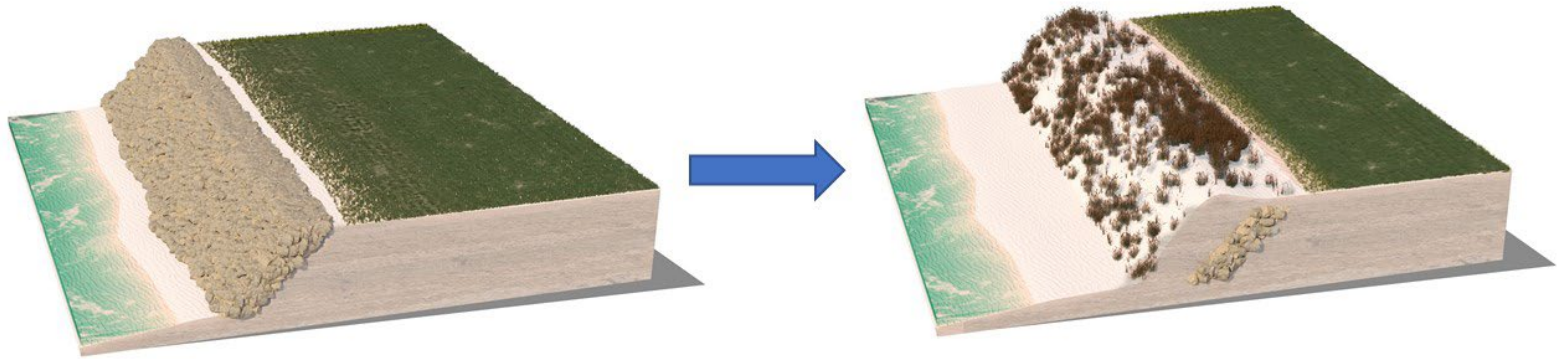
- Narrow shoreline with backing revetment
- Use upland areas for beach expansion
- Avoid nearshore seagrass



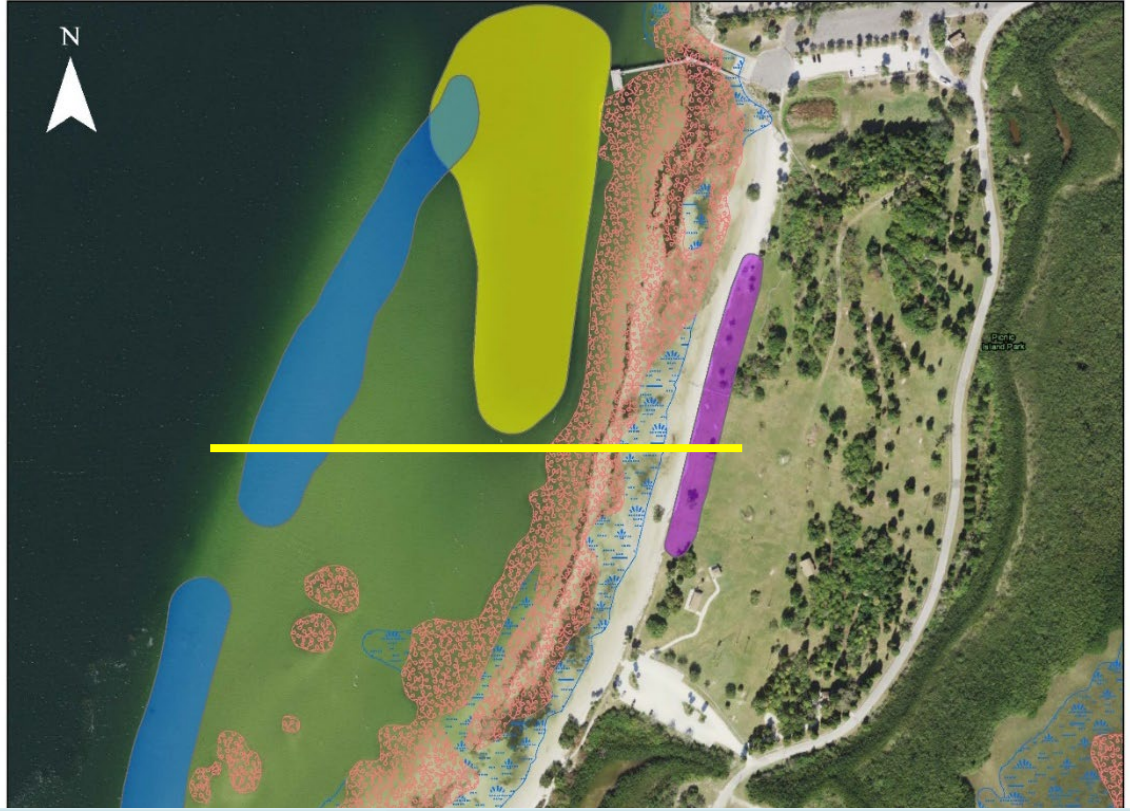
Intervention 5 – Reinforced Dune

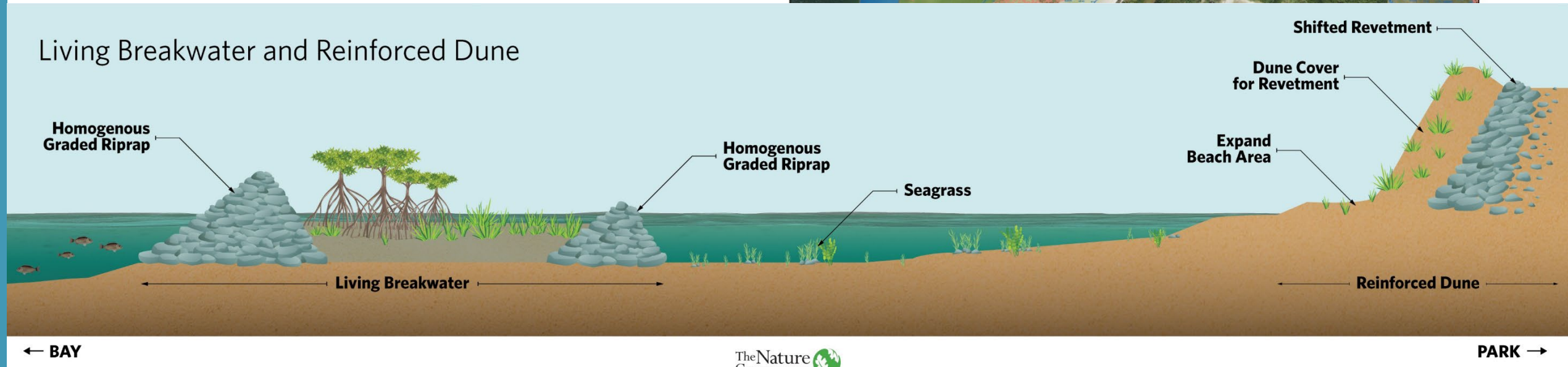
- Graded uplands to create beach area
- Re-use and supplement existing riprap to create new revetment
- Cover revetment with sand – create dune feature
- Plant with sea oats – dune species





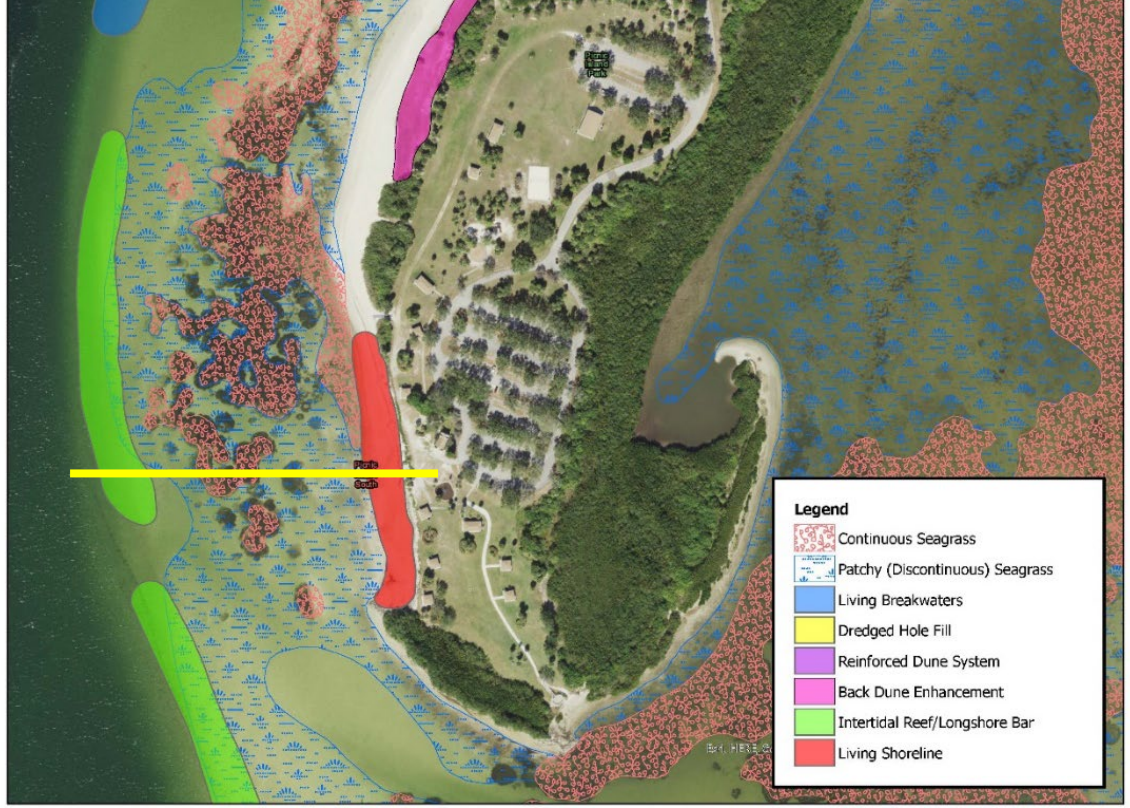
Combined Interventions



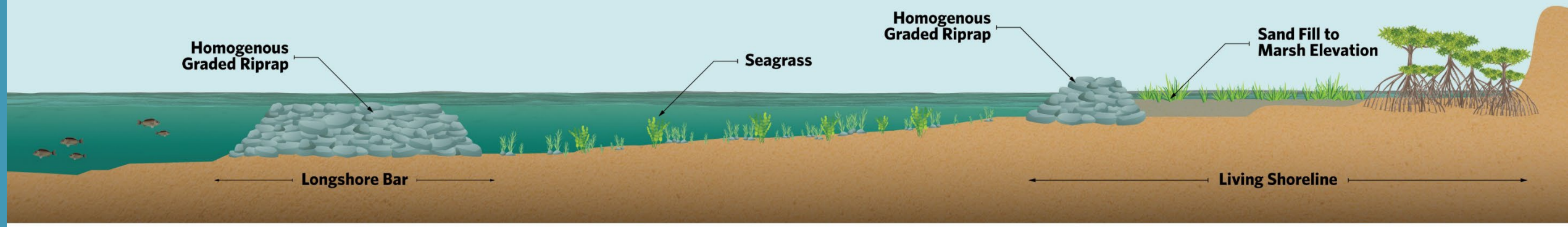


The Nature Conservancy Florida

Combined Interventions



Longshore Bar and Living Shoreline



← BAY

PARK →

Conceptual Cost Estimates

- Consider costs per foot or acre
- Range based on recent project costs
- Conservative quantity and costs
- High contingency (30%)
- Refined during detailed design

Intervention 1 – Conceptual Costs

- Beneficial use – incremental costs
- 7.5-acre area
- Estimated quantity of 380,000 cy

Intervention 1 – Dredge hole filling estimated unit costs	
Low Range ($/cy)	**High Range ($/cy)**
$10	$26

Intervention 2 – Conceptual Costs

- Import materials to site
- Conducted from uplands and using typical upland based equipment
- Planting costs included assume placing marsh plants at 3 ft on center
- Project approximately 650 feet in length

Intervention 2 – Living shoreline estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$1,100	$1,350

Intervention 3 – Conceptual Costs

- Outer breakwater at approx. -6 ft NAVD and inner sill at approx. -4 ft NAVD
- Fill range: beneficial use (low) to importing upland fill/placing by barge (high)
- Two living breakwater segments avg. 750 feet - footprint of approx. 5 acres

Intervention 3 – Living breakwater estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$2,700	$4,000

Intervention 4 – Conceptual Costs

- Placement of graded riprap along the -5 ft NAVD contour
- Low range - narrow reef (10 ft crest), high range - wider reef (30 ft crest)
- 3 segments up to 500 feet each in length

Intervention 4 – Longshore bar estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$1,300	$2,150

Intervention 5 – Conceptual Costs

- Upland material to be excavated will be sand and suitable for use in the dune
- Revetment will likely need to be supplemented with stone
- Planted with sea oats and other dune plant species
- 750-foot project length south of dog park - inside the dog park up to 500 feet

Intervention 5 – Reinforced dune estimated unit costs	
Low Range ($/lf)	**High Range ($/lf)**
$610	$850

Next Steps

- TNC/Tampa/UM submitted proposal to NFWF 2022 National Coastal Resilience Fund to continue project development: site assessment and preliminary design
  - NFWF prioritizes nature-based solutions, community resilience, and habitat restoration
- TNC submitted “project idea” to RESTORE Funded Priorities List 3b: Gulf Coast Resiliency Program:
  - Program addresses stressors/threats from sea level rise; hazards associated with extreme weather; coastal inundation; and habitat loss and fragmentation
  - Funds can be used for planning and design of living shorelines; management of coastal and submerged lands; and acquisition to protect habitats that enhance resiliency
- Dialog with USACE/Port on BU opportunities
- Resources mapping

Discussion