



Aransas National Wildlife Refuge - Dagger Point

# Dagger Point Coastal and Marine Habitat Protection and Restoration

## San Antonio Bay Partnership 10th Anniversary Conference & Celebration







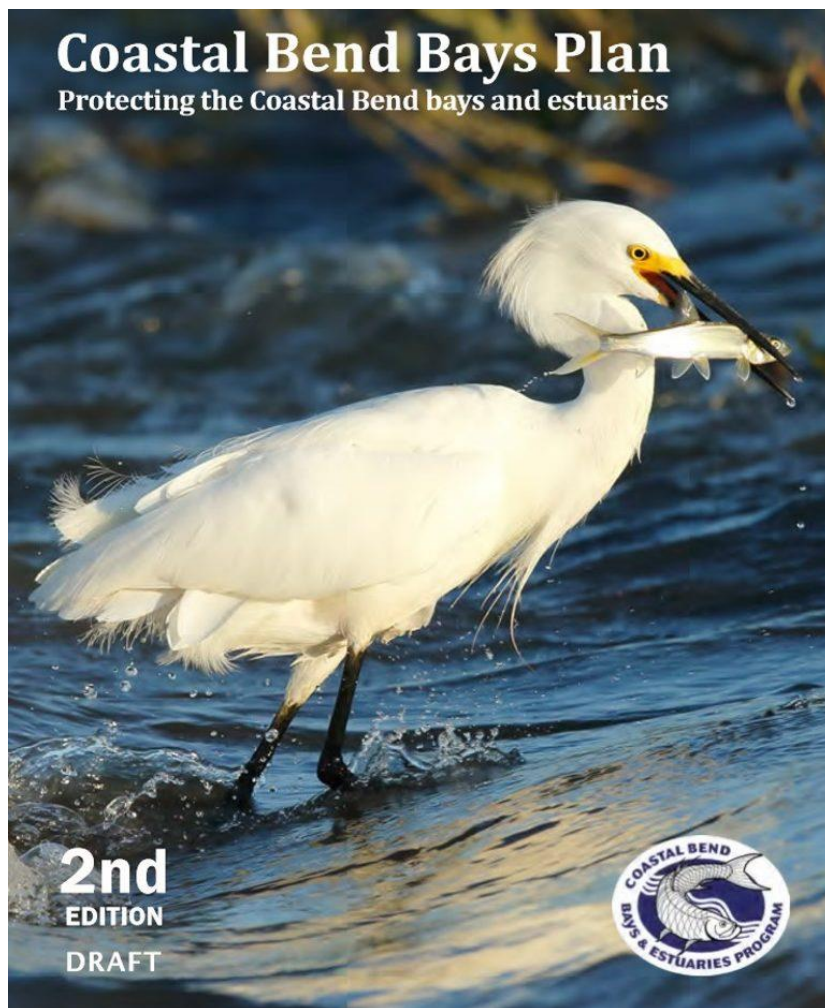
Aransas National Wildlife Refuge - Dagger Point

Panel Presentation by:

Rosario Martinez, Coastal Bend Bays & Estuaries Program  
Joe Saenz, U.S. Fish & Wildlife Service  
Cris Weber, P.E., Anchor QEA



# Coastal Bend Bays & Estuary Program



- Dedicated to
  - Protecting our bays and estuaries, and supporting continued economic growth and public use of the bays
- CBBEP Programs
  - Land Conservation Program
  - Coastal Bird Program
  - Delta Discovery Program
- Partnerships are key to success of the CBBEP program



# Coastal Bend Bays & Estuary Program

- ***Role as Facilitator***

Implementation Teams - CBBEP leads the annual process of identifying projects in priority areas as outlined in the Bays Plan, based on need/wants of stakeholders.

- Teams Composed Representatives From:

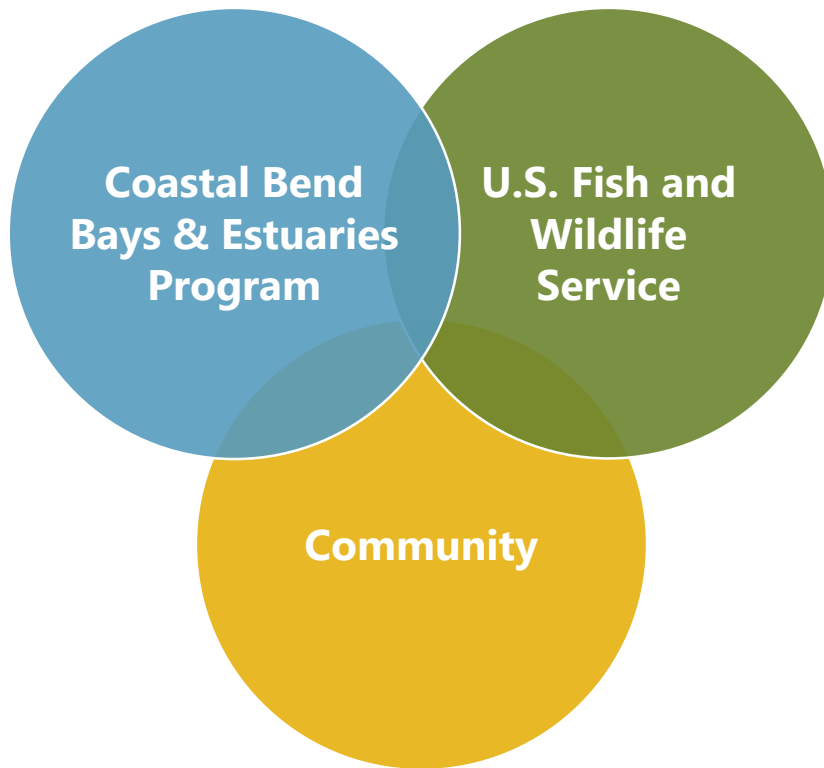
- ✓ State & Federal Agencies
- ✓ Non-profit organizations
- ✓ Universities
- ✓ City & County
- ✓ Business & Industry
- ✓ Elected officials
- ✓ Citizens



## ***Partnerships***

Alone our limited resources can only go so far but working with partners we can stretch those dollars and increase our impact.

# Project Goals



- Shoreline Protection
  - Protection from erosion
  - Accretion, if possible
- Infrastructure Protection
- Habitat Creation
  - Creation and enhancement of coastal marsh and living resources
- Living Shorelines
  - Coastal resiliency and benefits for coastal habitats

# Aransas National Wildlife Refuge



*Dagger Point facing west, Mar. 2019*

- Benefits of the ANWR
  - Whooping cranes
  - Recreation
- Ongoing shoreline erosion
  - Public infrastructure
  - Dagger Point
- Post-Hurricane Harvey Opportunity
  - Storm impacts
  - Shoreline erosion protection



# ANWR Shoreline Erosion





*Dagger Point Facing north, Nov. 2016*



*Dagger Point facing west, Aug. 2016*







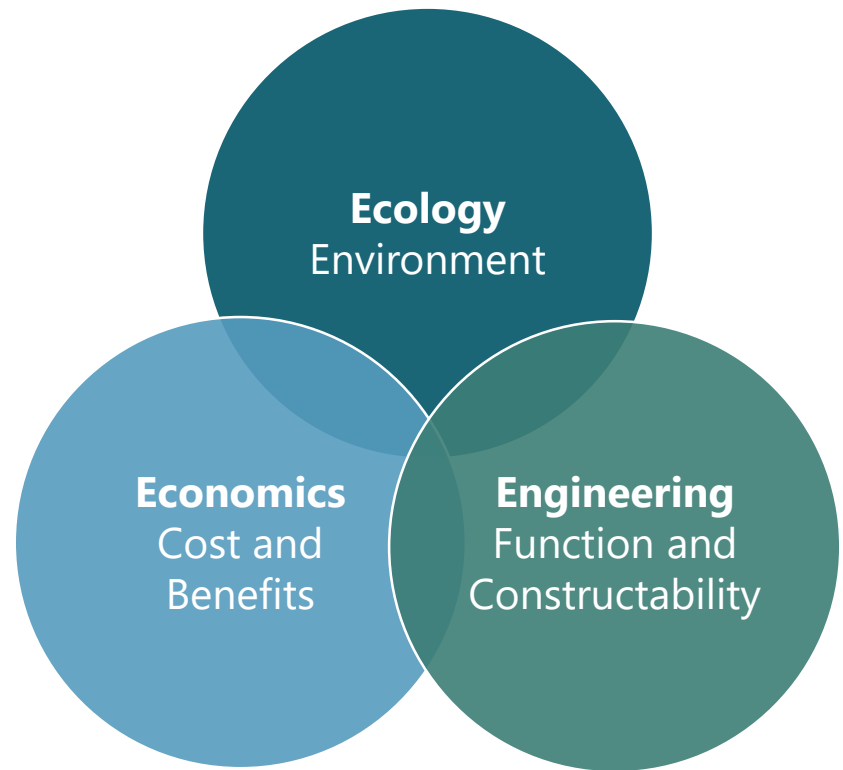
*Dagger Point facing west, Aug. 2019*



*Dagger Point facing west, Aug. 2019*

# Project Design *(Cris)*

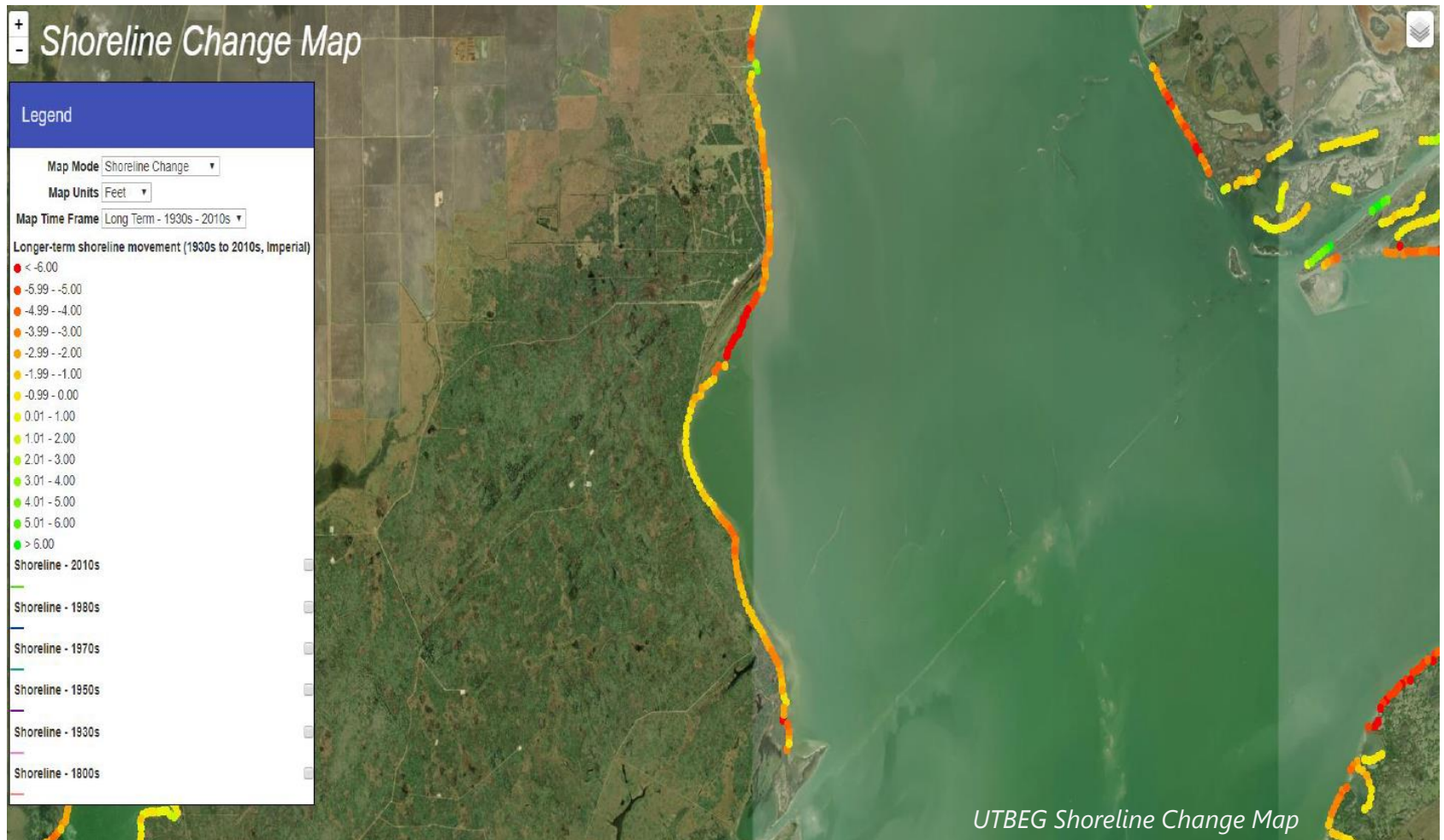
- Feasibility and Alternatives
  - Data collection
  - Alternative materials
- Challenges
  - Balancing goals (3 Es)
  - Seagrass
  - Sea level rise
  - Constructability
    - Bluff stabilization
- Aesthetics

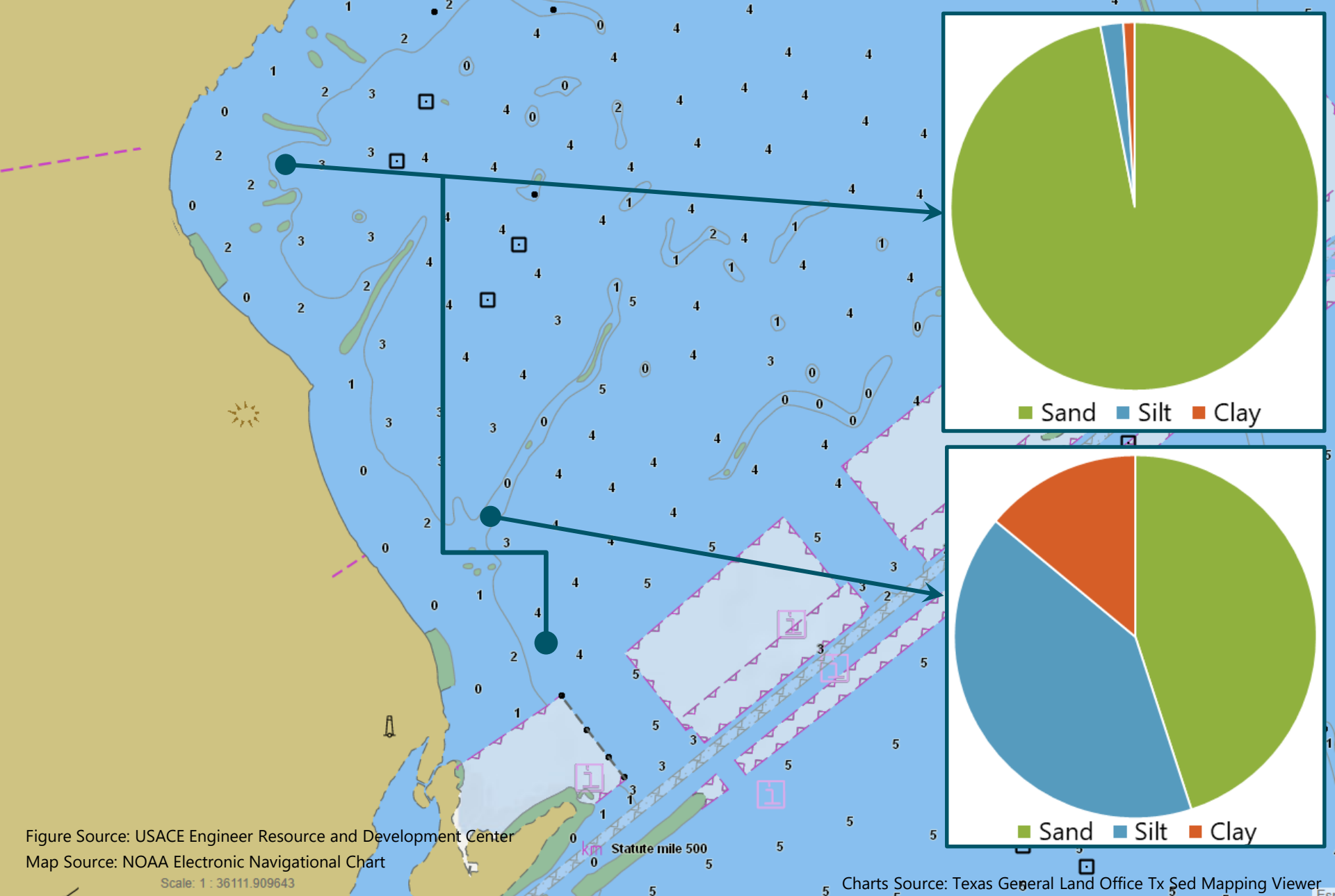




# Project Background

- Shoreline protection and restoration due to erosion



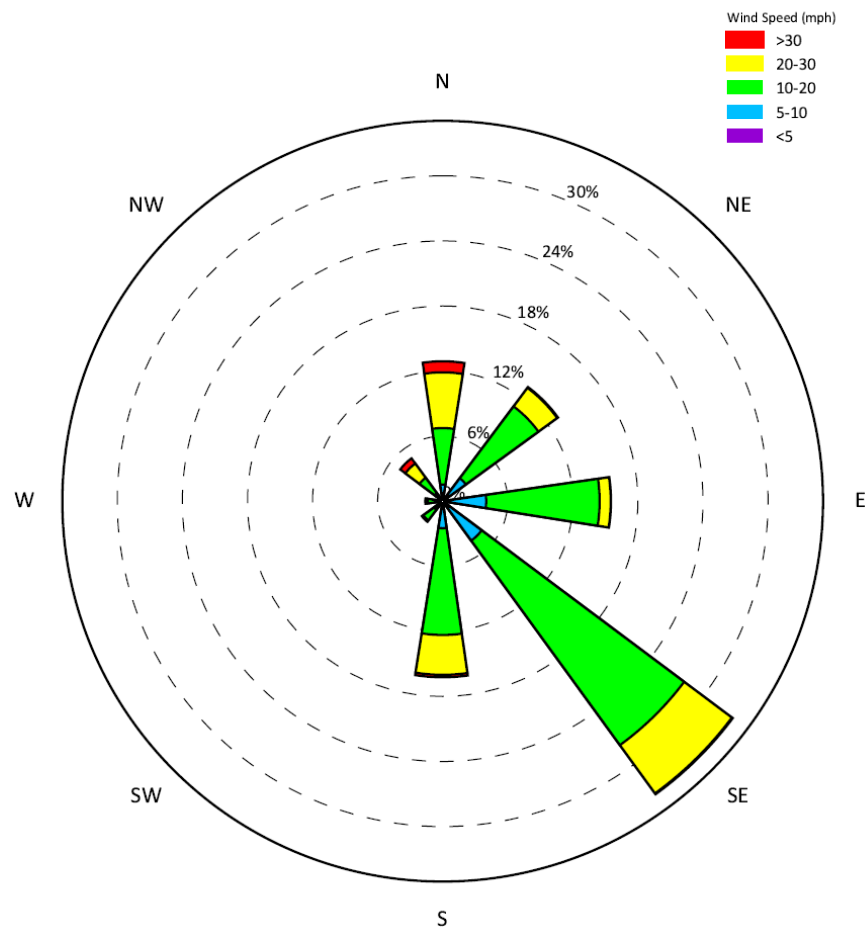


# Site Conditions



# San Antonio Bay Site Conditions

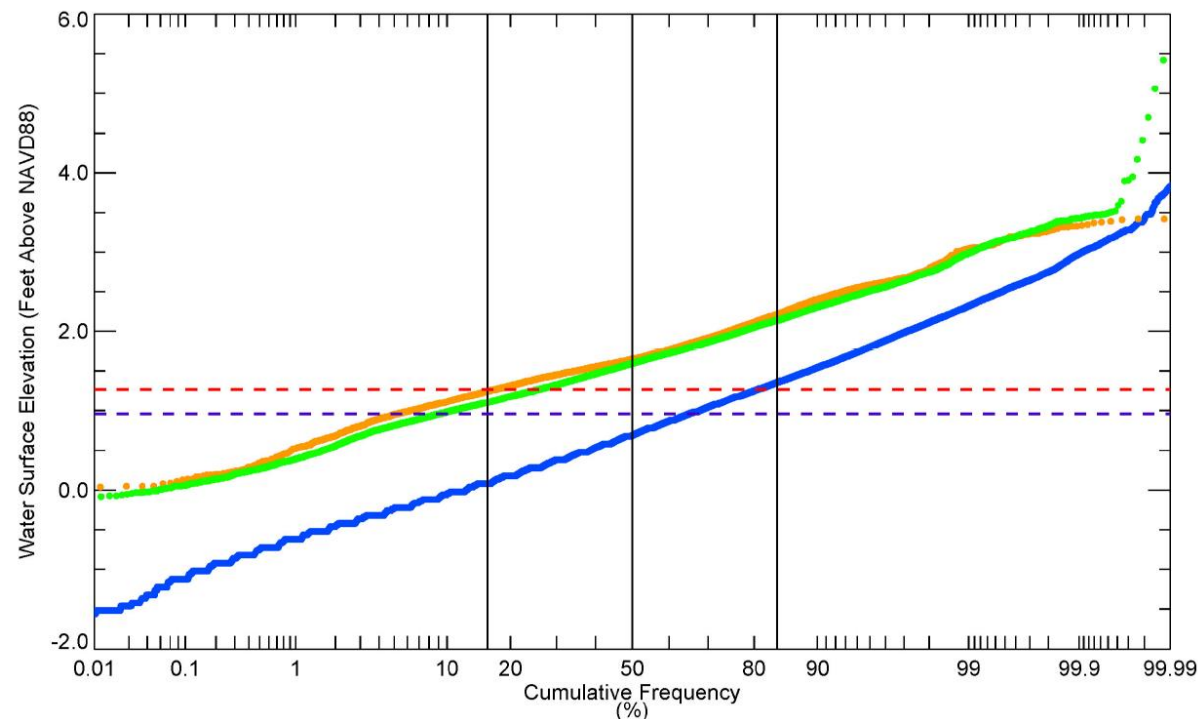
- Wind Rose
  - Predominant winds from southeast
  - Intense, Low frequency, winds from north



Hourly Wind Data Obtained from USACE WIS Station 73046 for Years 1980 through 2014  
Calm and Variable Winds: 0.0%  
Maximum Recorded Wind Speed: 53.7 mph  
Wind data are presented as the "blowing from" direction.

# San Antonio Bay Met-Ocean

- Cumulative Freq. Dist. of Water Surface Elevation
  - MHHW is 1.27-ft (above NAVD88)
  - MLLW is 0.96-ft (above NAVD88)



Notes: NAVD88 = North American Vertical Datum of 1988, WSEL = Water Surface Elevation, WLR = Wildlife Refuge, MHHW = Mean Higher High Water, MLLW = Mean Lower Low Water

- Measured Hourly WSEL at Rockport, TX (NOAA 8774770 - All Available Data, 1937 to 2019)
- Measured Hourly WSEL at Rockport, TX (NOAA 8774770 - October 2018 to September 2019)
- Measured Hourly WSEL at Aransas WLR, TX (NOAA 8774230 - November 2015 to August 2019)
- MHHW at Dagger Point Project Site
- MLLW at Dagger Point Project Site



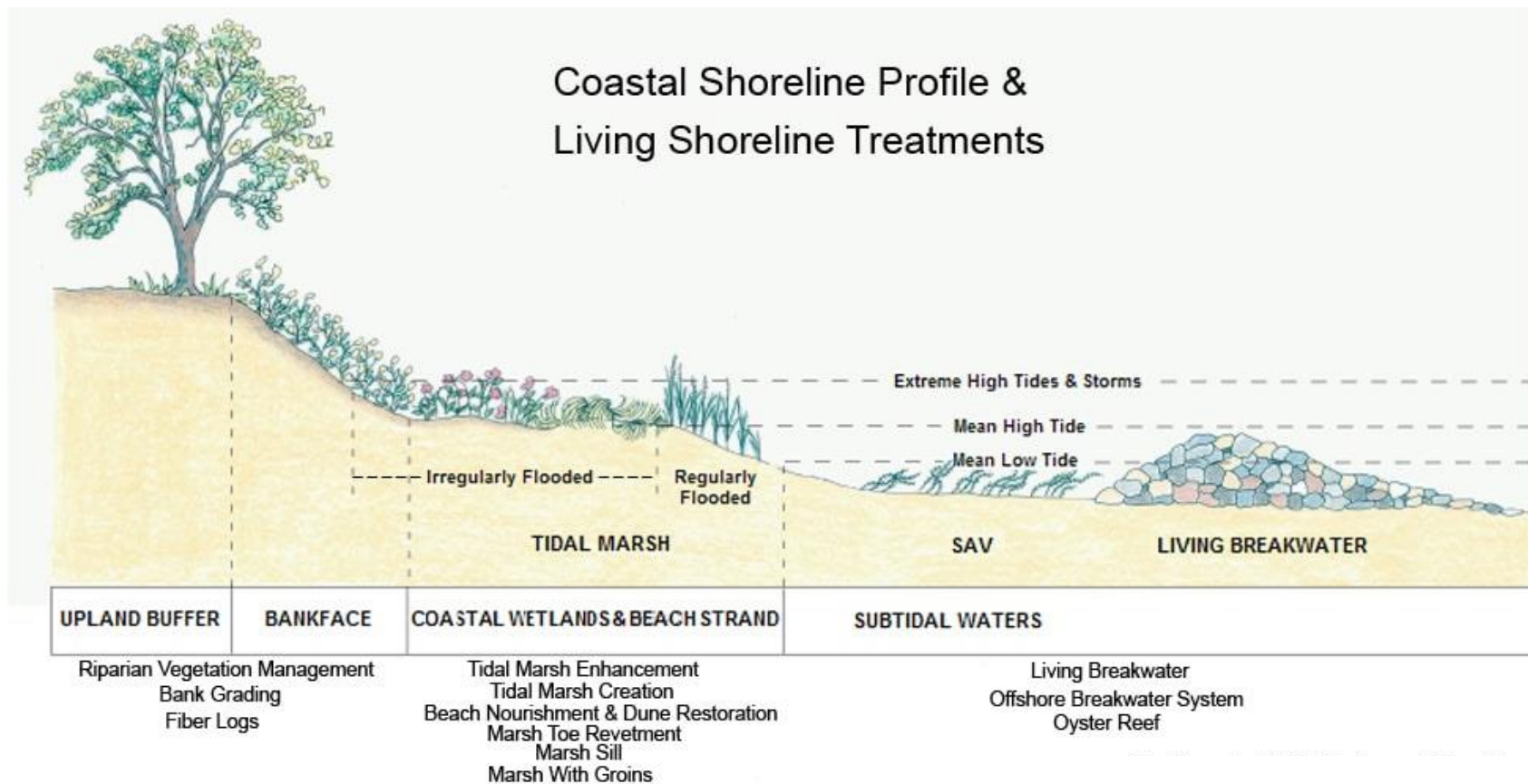


# Proposed Project Design

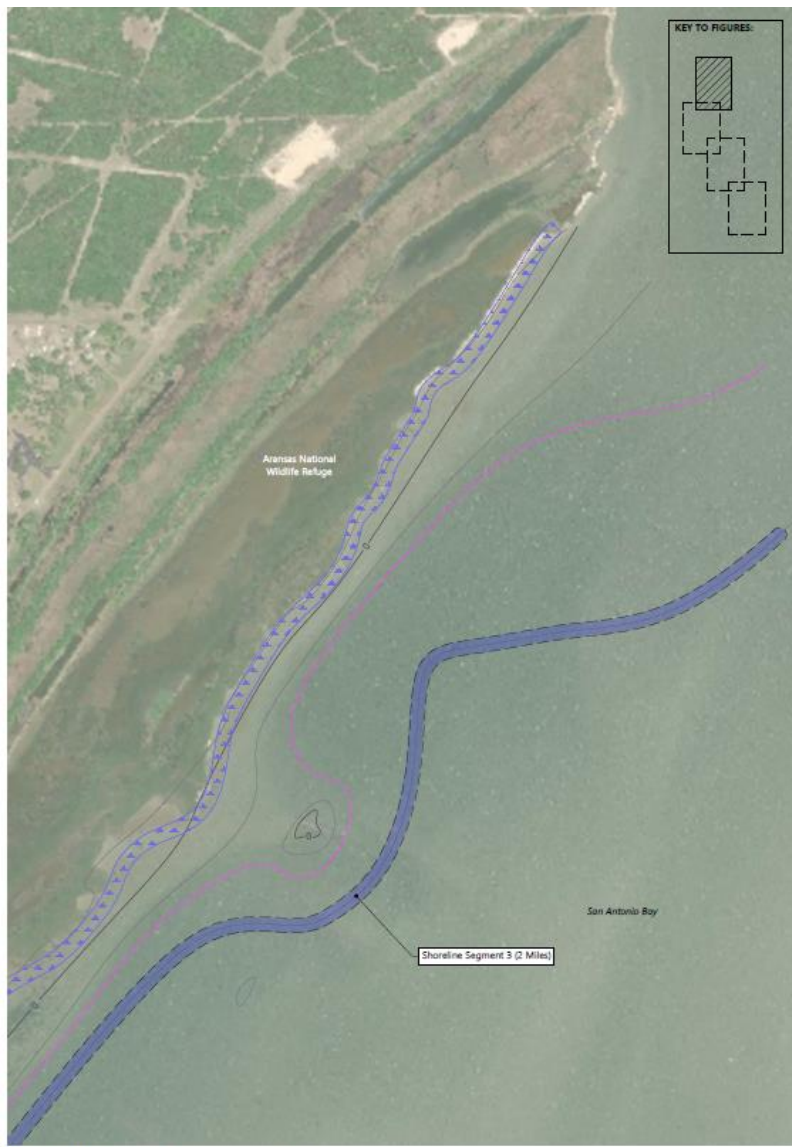
- Nearshore living shoreline
  - Primary objective is wave attenuation and habitat creation
  - Proposed nearshore alignment
  - Three primary regions alongshore (northern lowlands at Thomas Pond, Dagger Point Bluff, southern lowlands at Mustang Lake)
  - High-bluff and low-bluff toe protection concepts
- Project materials
  - Primary design is rock rubble breakwater
  - Additional material considerations for existing lowland areas
    - Oyster/shell-hash gabions
    - Manufactured concrete system



# What Is a Living Shoreline?

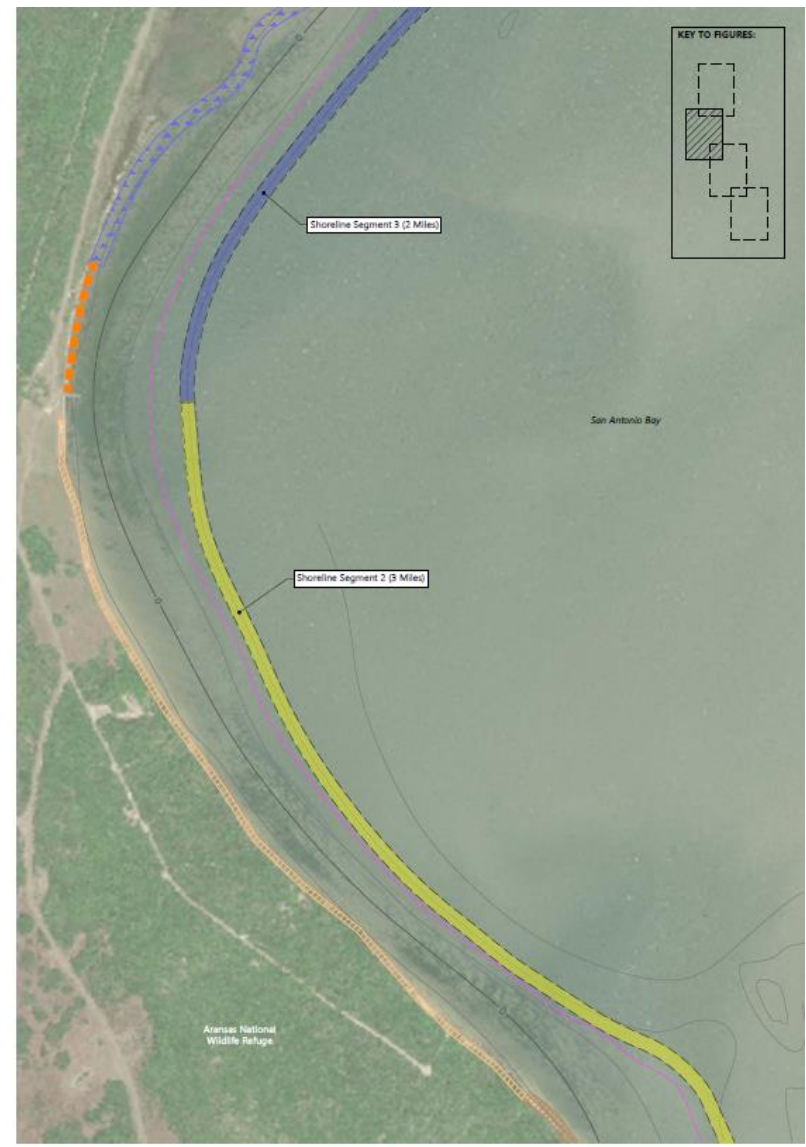


Graphic courtesy of Burke Environmental Associates



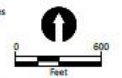
**SOURCE:** ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNES (2019) Distribution Airbus (DS)  
**HORIZONTAL DATUM:** Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet  
**VERTICAL DATUM:** North American Vertical Datum of 1988 (NAVD88)  
**NOTE:** Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

**LEGEND:**  
 Existing Bathymetry (1' Interval)  
 Elevation -2' Bathymetric Contour  
 Marsh Area  
 Rock Rubble Breakwater (Alternatives 1 & 2)  
 Rock Rubble Breakwater (Alternative 1) or Proprietary Material Breakwater (Alternative 2)

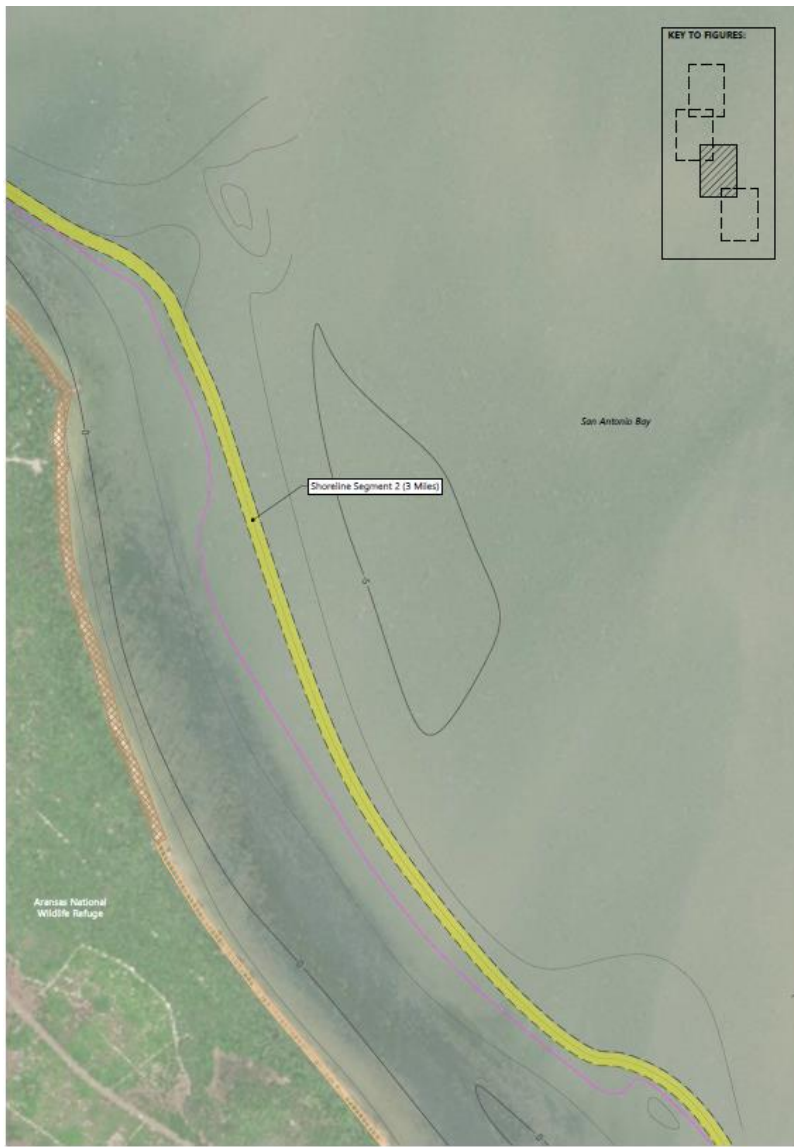


**SOURCE:** ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNES (2019) Distribution Airbus (DS)  
**HORIZONTAL DATUM:** Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet  
**VERTICAL DATUM:** North American Vertical Datum of 1988 (NAVD88)  
**NOTE:** Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

**LEGEND:**  
 Existing Bathymetry (1' Interval)  
 Elevation -2' Bathymetric Contour  
 Marsh Area  
 Low Bluff Area  
 High Bluff Area  
 Area of Existing Concrete Mattresses  
 Rock Rubble Breakwater (Alternatives 1 & 2)  
 Rock Rubble Breakwater (Alternative 1) or Proprietary Material Breakwater (Alternative 2)



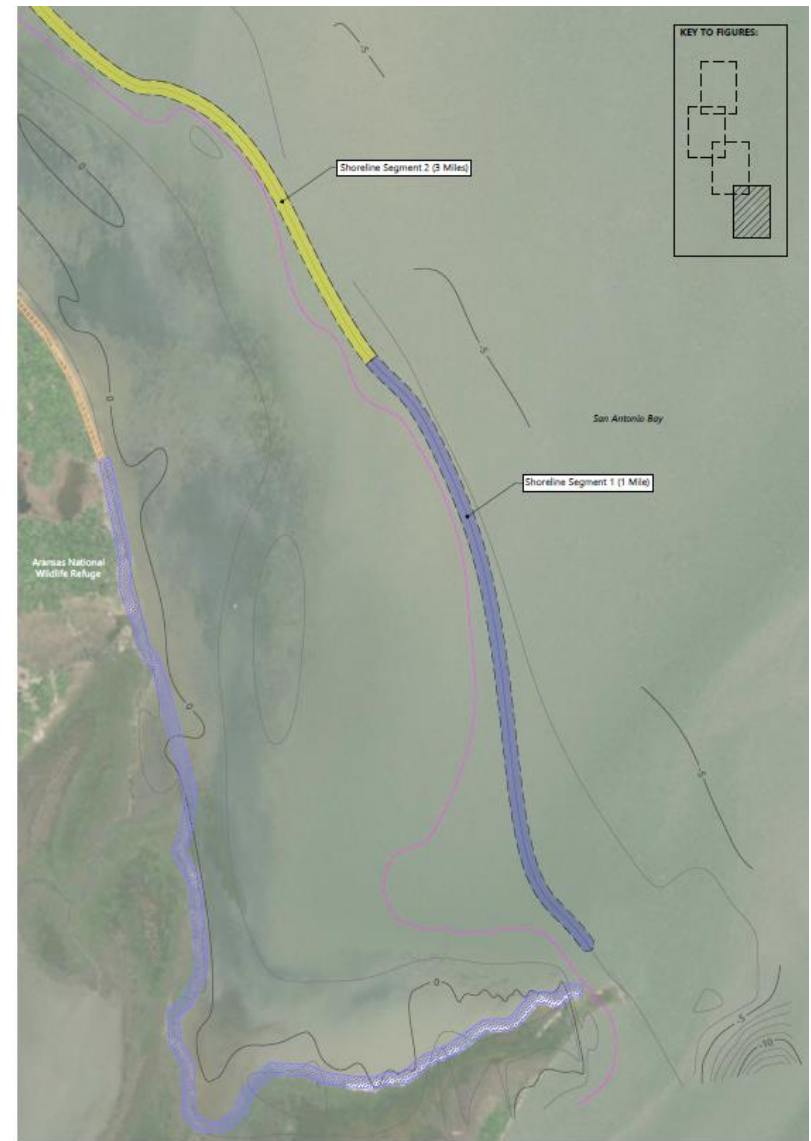




SOURCE: ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNES (2019) Distribution Airbus (DS)  
**HORIZONTAL DATUM:** Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet  
**VERTICAL DATUM:** North American Vertical Datum of 1988 (NAVD88)  
**NOTE:** Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

**LEGEND:**  
 Existing Bathymetry (1' Interval)  
 Elevation -2' Bathymetric Contour  
 Low Bluff Area  
 High Bluff Area

Rock Rubble Breakwater (Alternatives 1 & 2)  
 Rock Rubble Breakwater (Alternative 1) or Proprietary Material Breakwater (Alternative 2)



SOURCE: ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNES (2019) Distribution Airbus (DS)  
**HORIZONTAL DATUM:** Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet  
**VERTICAL DATUM:** North American Vertical Datum of 1988 (NAVD88)  
**NOTE:** Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

**LEGEND:**  
 Existing Bathymetry (1' Interval)  
 Elevation -2' Bathymetric Contour  
 Low Bluff Area  
 Lowland Area

Rock Rubble Breakwater (Alternatives 1 & 2)  
 Rock Rubble Breakwater (Alternative 1) or Proprietary Material Breakwater (Alternative 2)



# Current Project Status & Next Steps

- Completed field work
  - Geotechnical probing is complete
  - Topographic and bathymetric survey is complete
- Pending field work
  - Cultural resources survey is pending review by Texas Historical Commission (THC)
  - Coastal Boundary Survey is pending review by Texas General Land Office (GLO)
- Draft Feasibility Report was submitted for review
- Numerical modeling for existing conditions is underway



# Next Steps

- Complete numerical modeling for proposed alternatives
- Develop engineering design plans and specifications and detailed costs for construction
- Preliminary meeting with regulatory personnel
- Complete permit application

# Questions/Discussion



**Rosario Martinez**  
**Coastal Bend Bays & Estuary Program**  
Sr. Project Manager  
[rmartinez@cbbep.org](mailto:rmartinez@cbbep.org)

**Joe Saenz**  
**Aransas National Wildlife Refuge**  
Wildlife Refuge Manager, USFWS  
[joe\\_saenz@fws.gov](mailto:joe_saenz@fws.gov)

**Cris Weber, PE**  
**Anchor QEA**  
Sr. Managing Coastal Engineer  
[cweber@anchoragea.com](mailto:cweber@anchoragea.com)



# Breakwater Living Shoreline Material Examples

