



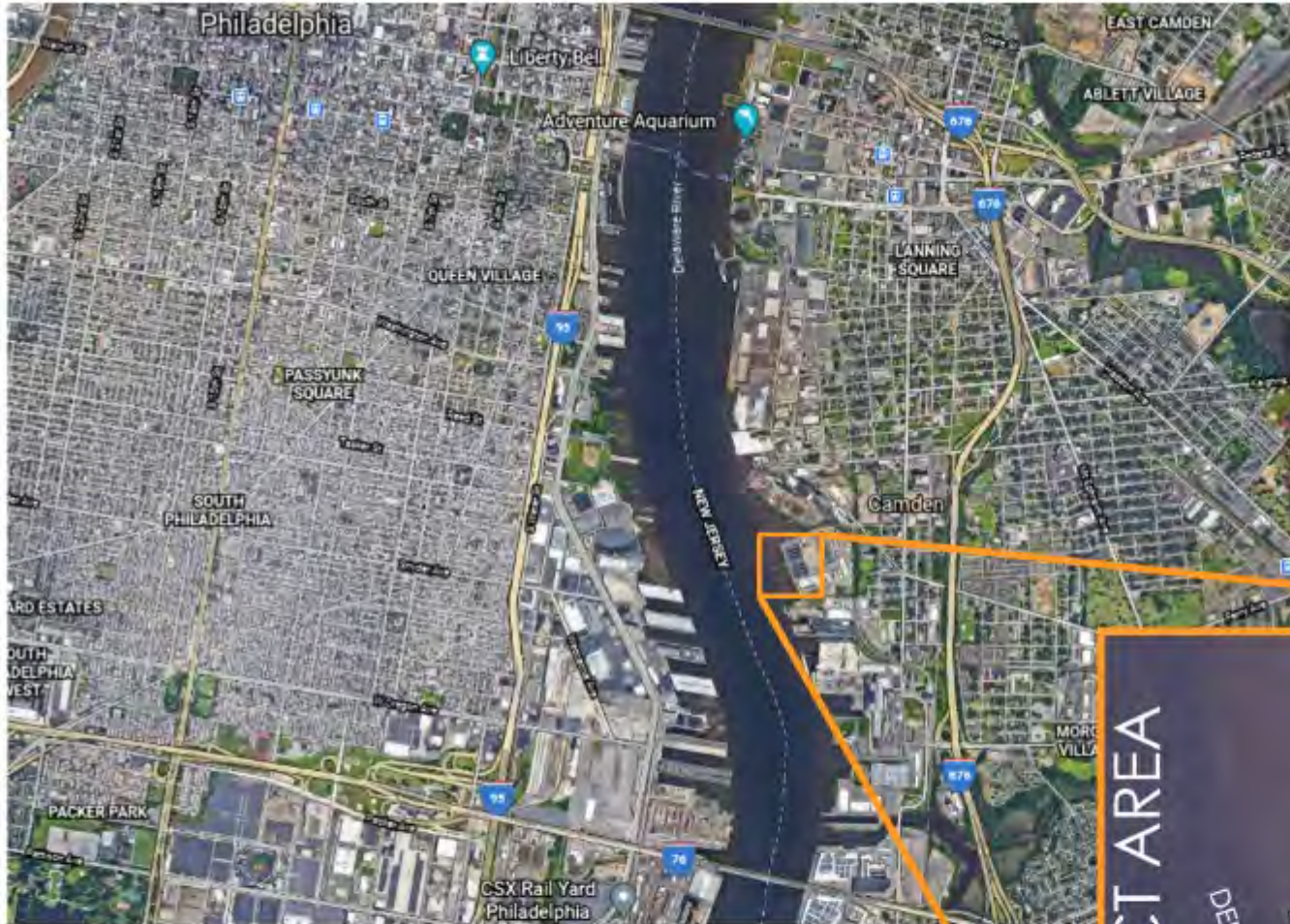
Camden County
Municipal Utilities
Authority Living
Shoreline Project

Delaware River Habitat
Enhancement Project





Project Location



4.7 acres along a 1000 ft steel bulkhead along the shore of the CCMUA wastewater treatment plant

Project area extends about 300 ft from the bulkhead into the Delaware river





Project Purpose and Need





Project Purpose and Need





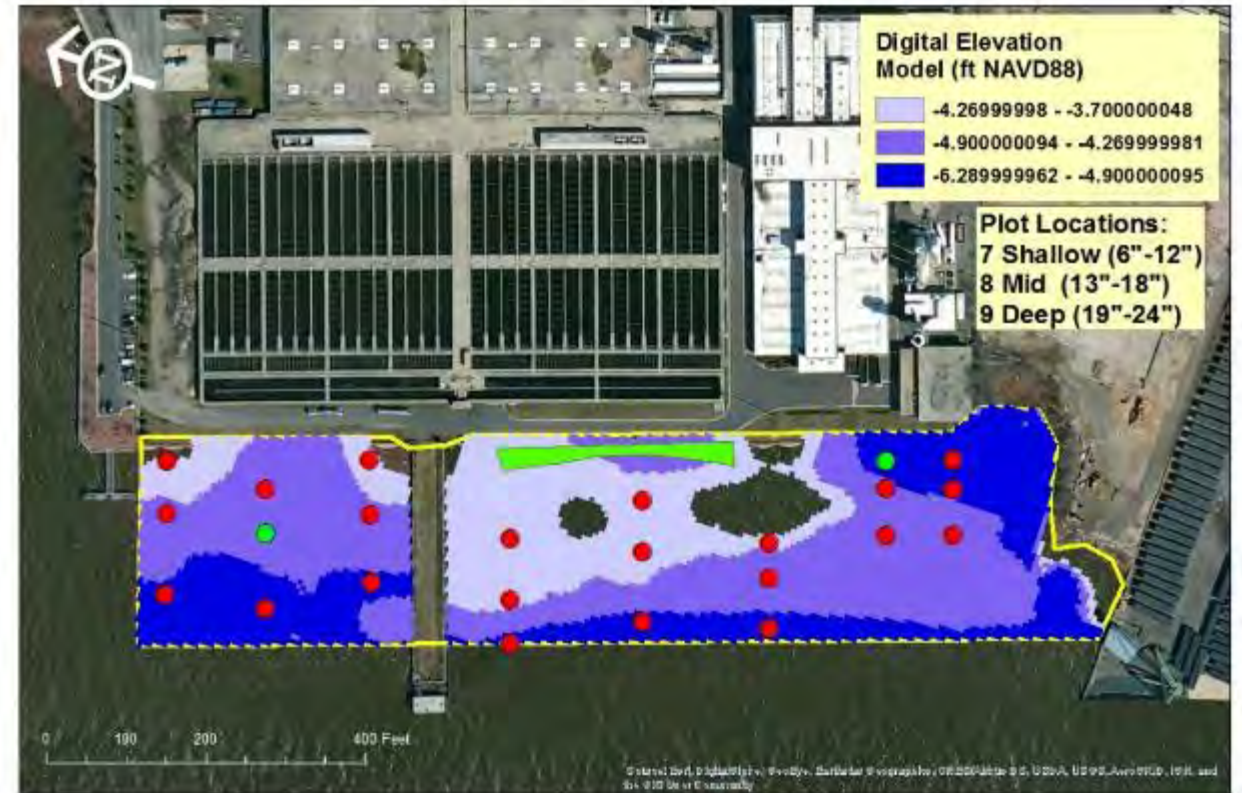
Existing Conditions





Habitat Restoration

- Receding marshes and mussel beds
- Project site: open water habitat
- Currently: minimal submerged aquatic vegetation and mussels present at the site
- Proposed project includes the establishment of:
 - Marsh
 - Mussel habitat
 - SAV habitat
 - Open water



Locations of Biological Sampling Plots

Method: Multi-Raster Mosaic
Map produced by Joshua Moody, Partnership for the Delaware Estuary 2017

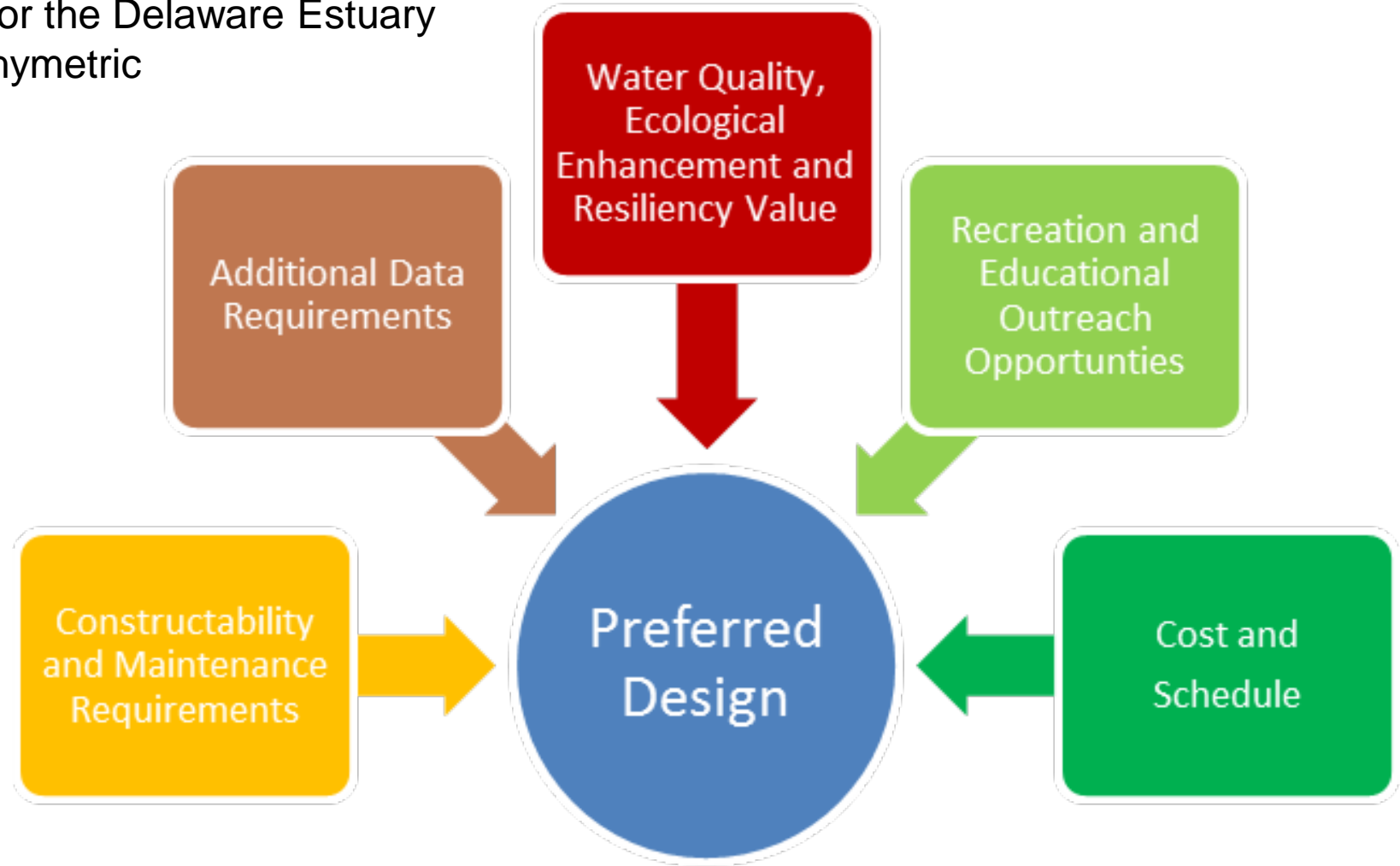
- Mussels Absent
- Mussels Present
- SAV Present





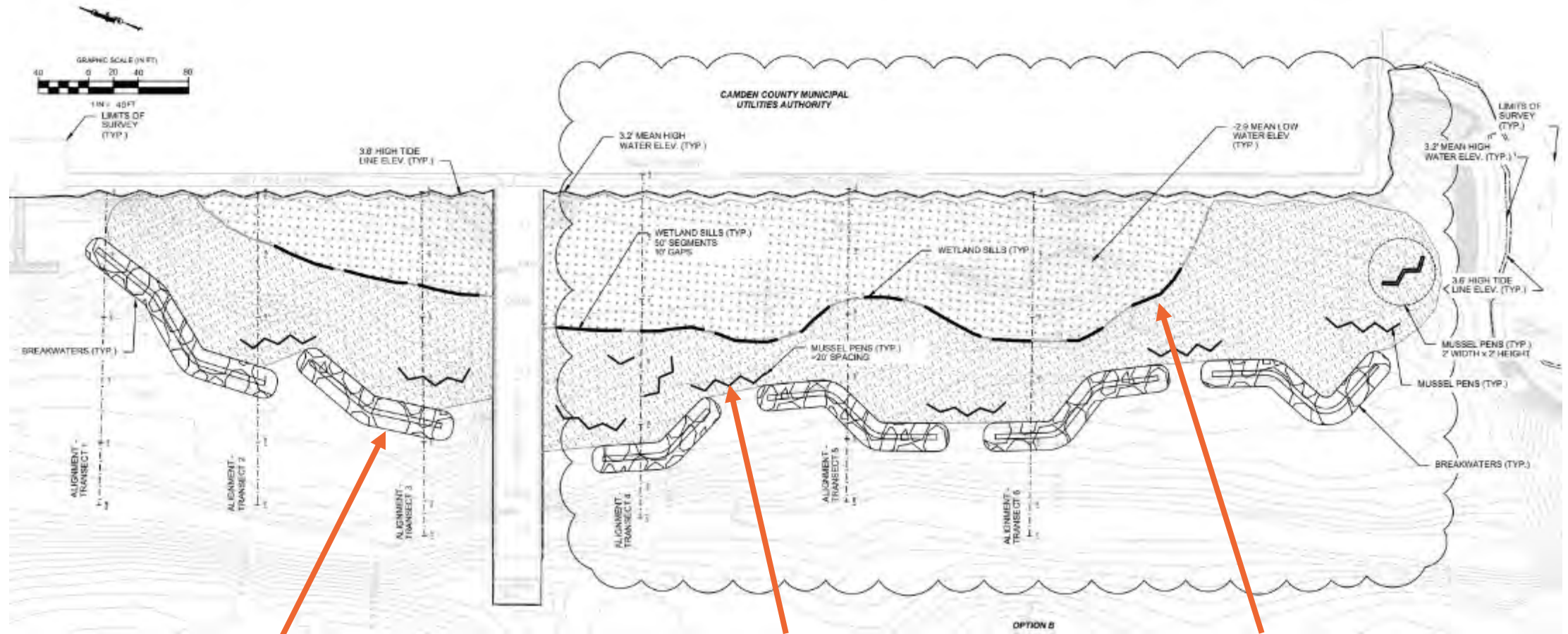
Design

- Surveys – Partnership for the Delaware Estuary
 - Topographic & Bathymetric
 - Biological
- Desktop Analysis
 - Water levels
 - Wave heights
 - Currents
 - Storms





Proposed Design



BREAKWATERS

REDUCE WAVE AND BOAT WAKE IMPACT TO THE SITE

MUSSEL PENS

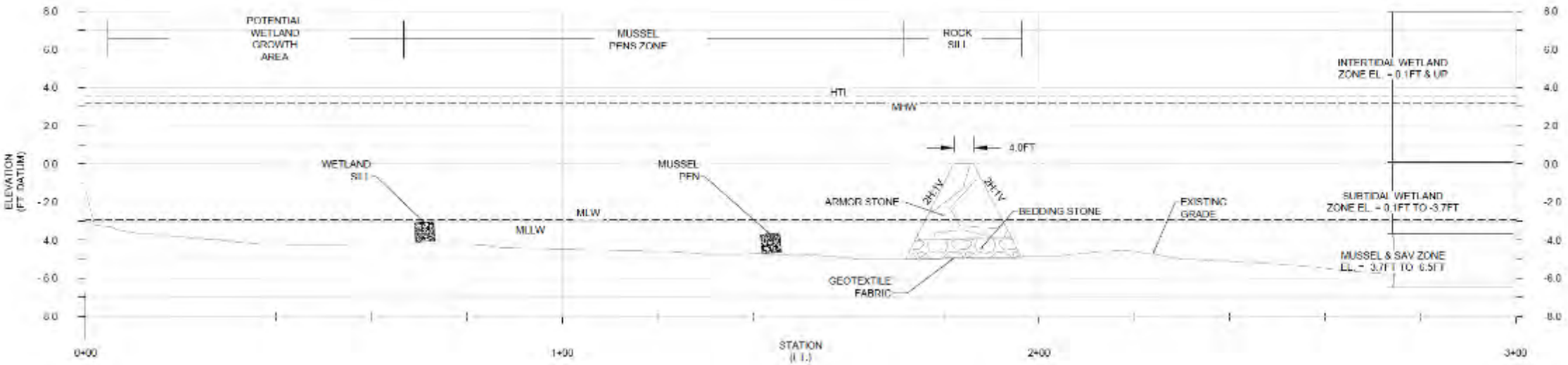
PROVIDE A SHELTERED AREA FOR MUSSEL GROWTH, AS WELL AS OTHER AQUATIC AND PLANT LIFE

WETLAND SILLS

WILL NATURALLY RECRUIT SEDIMENT OVER TIME, CREATING MARSH HABITAT

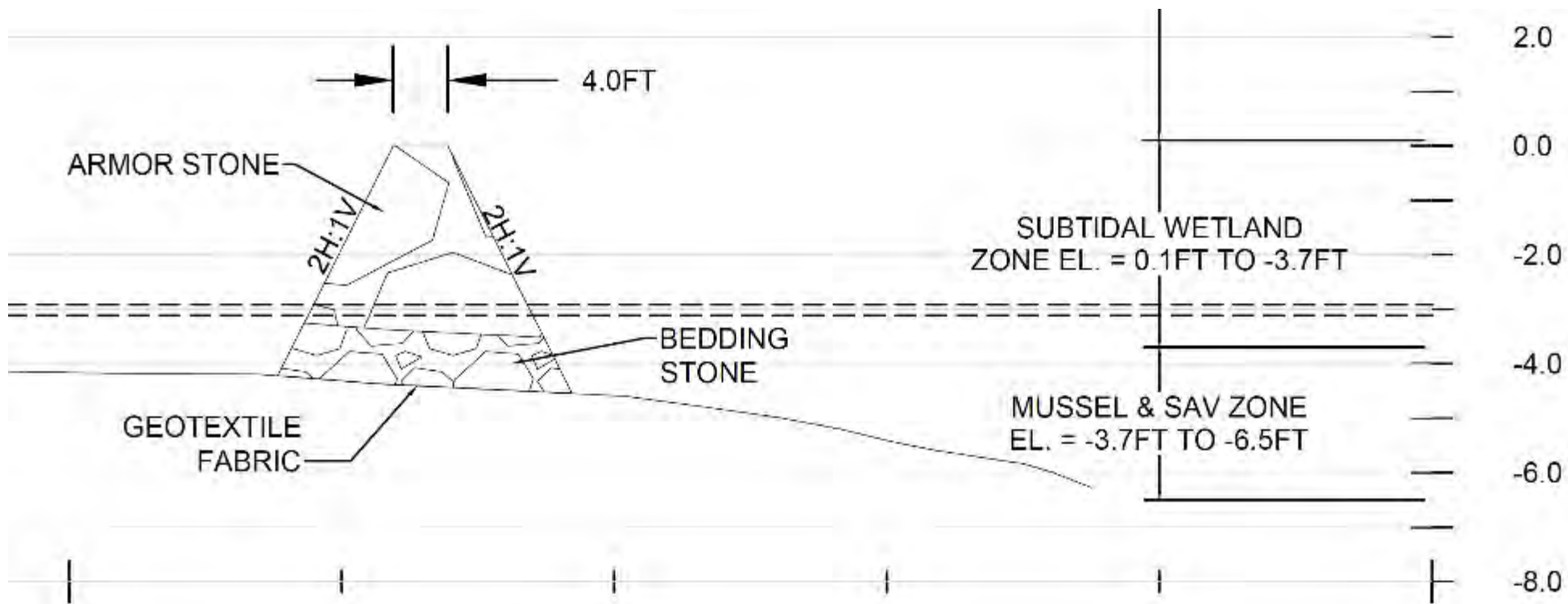


Proposed Design



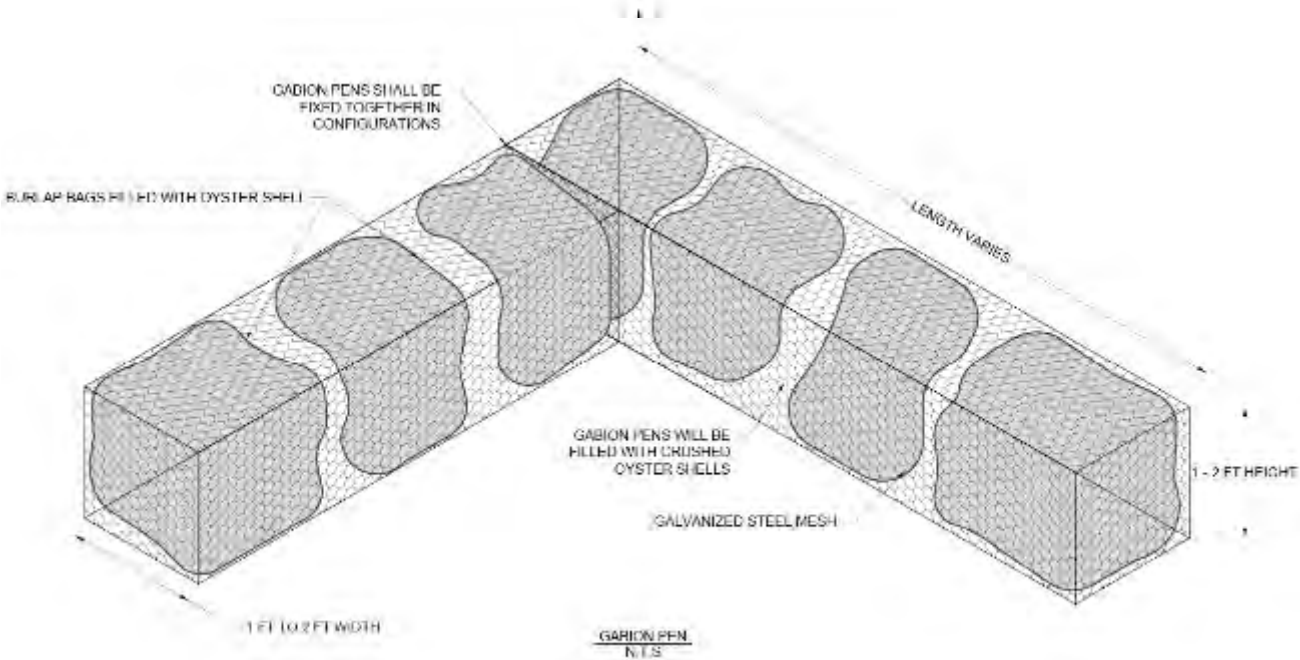
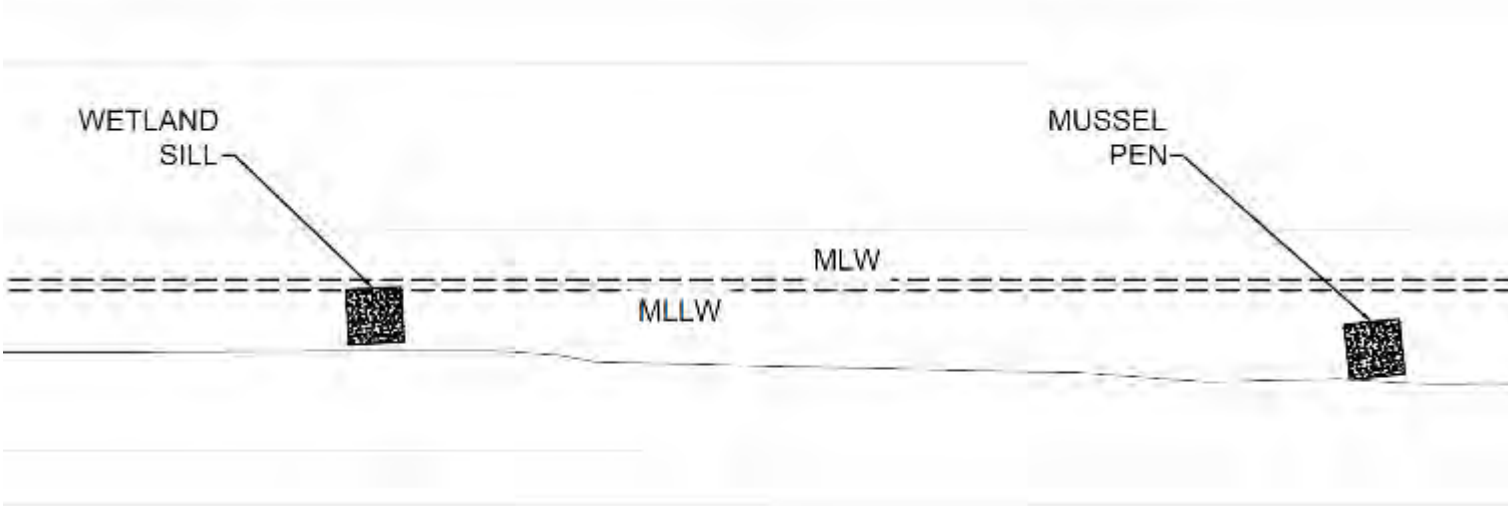


Breakwaters





Mussel Pens & Wetland Sills





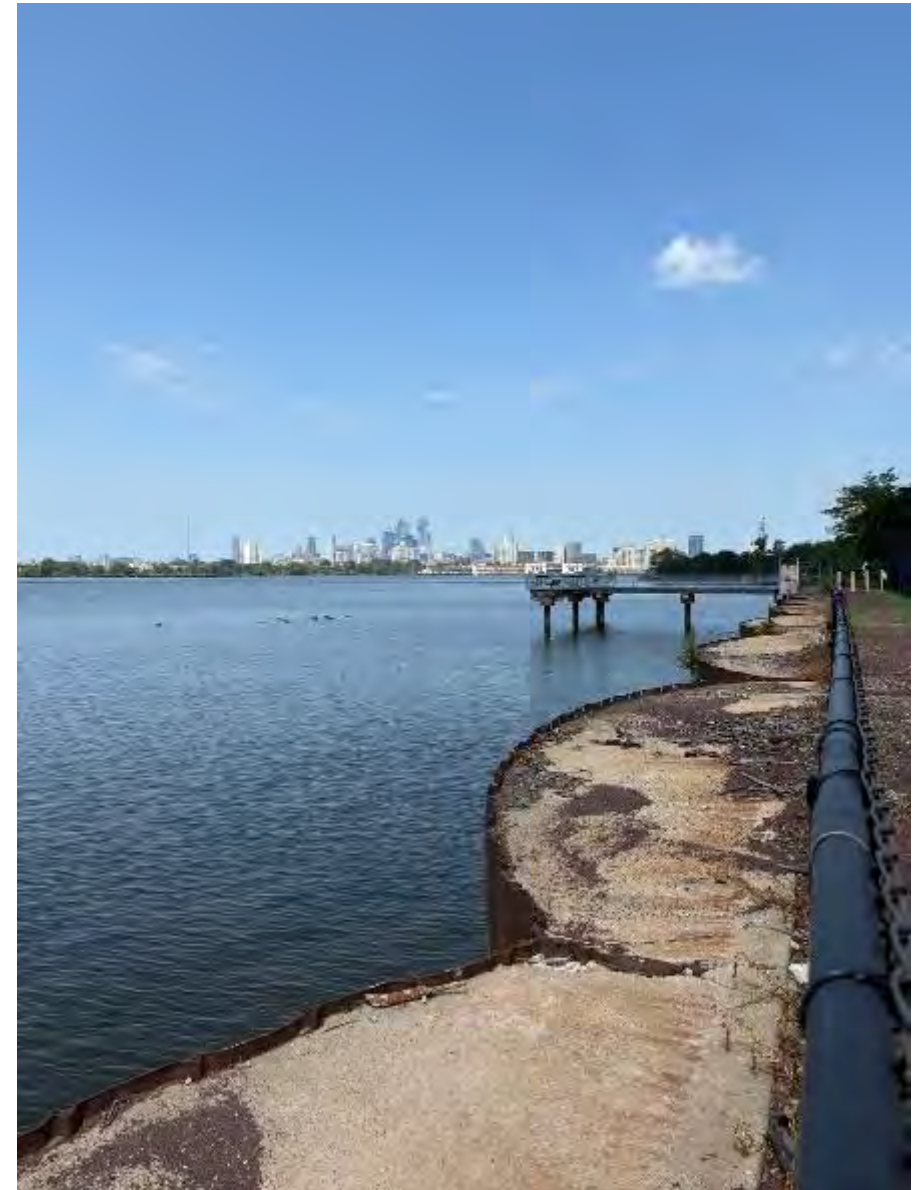
Permitting & Funding

Permitting

- Permitted through USACE and NJDEP in 2021
- Nation Wide Permit 27: Aquatic Habitat Restoration, Enhancement, and Establishment Activities
- General Permit 24 Habitat Creation/Restoration/Enhancement
- Permit extensions: 2025 and 2026

Funding

- NJDEP Section 319(h) Grant
- National Fish and Wildlife Foundation's Emergency Coastal Resilience Fund (ECRF)





Construction

Construction began in December 2025

- Method: barge & crane
- Sequence: landward to seaward
 - Filling gabion pens
 - Stakes
 - Wetland sills
 - Mussel Pens
 - Breakwaters





Construction: Limitations

Tides

- Construction crew had to work with the tides
- Water levels rise quickly, limiting construction to short windows





Construction: Limitations

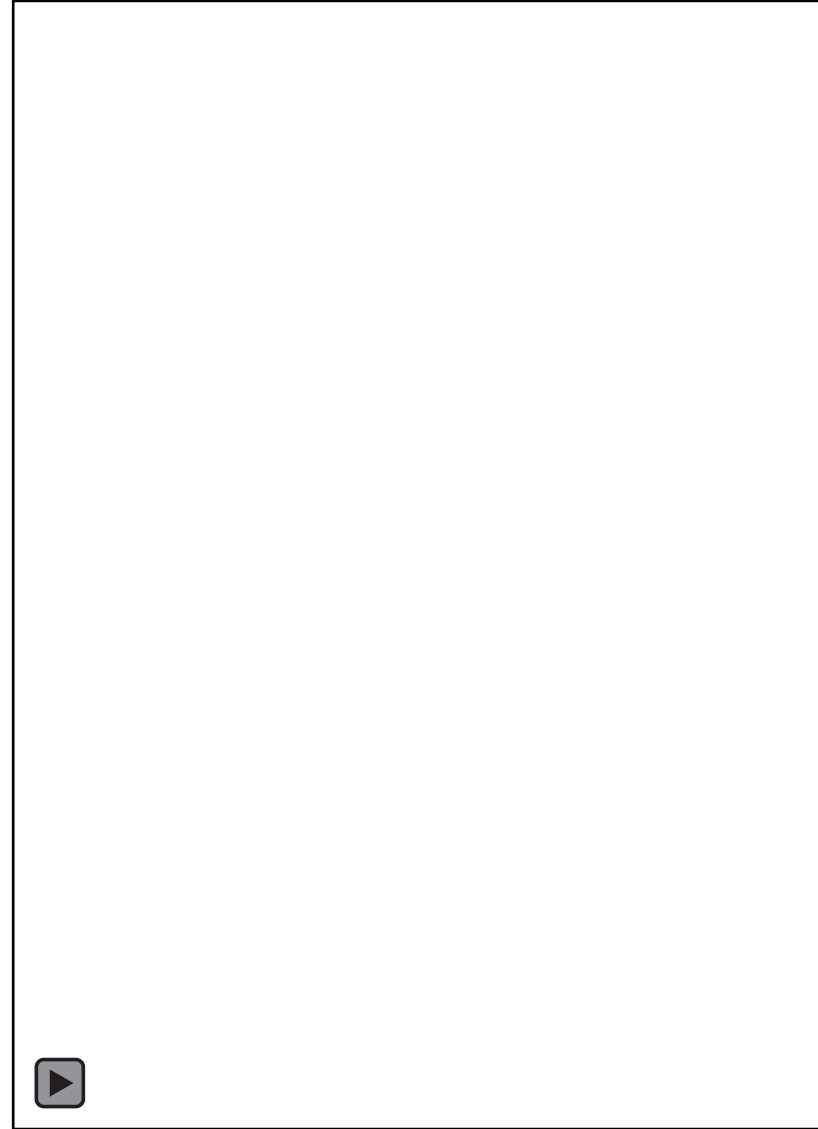
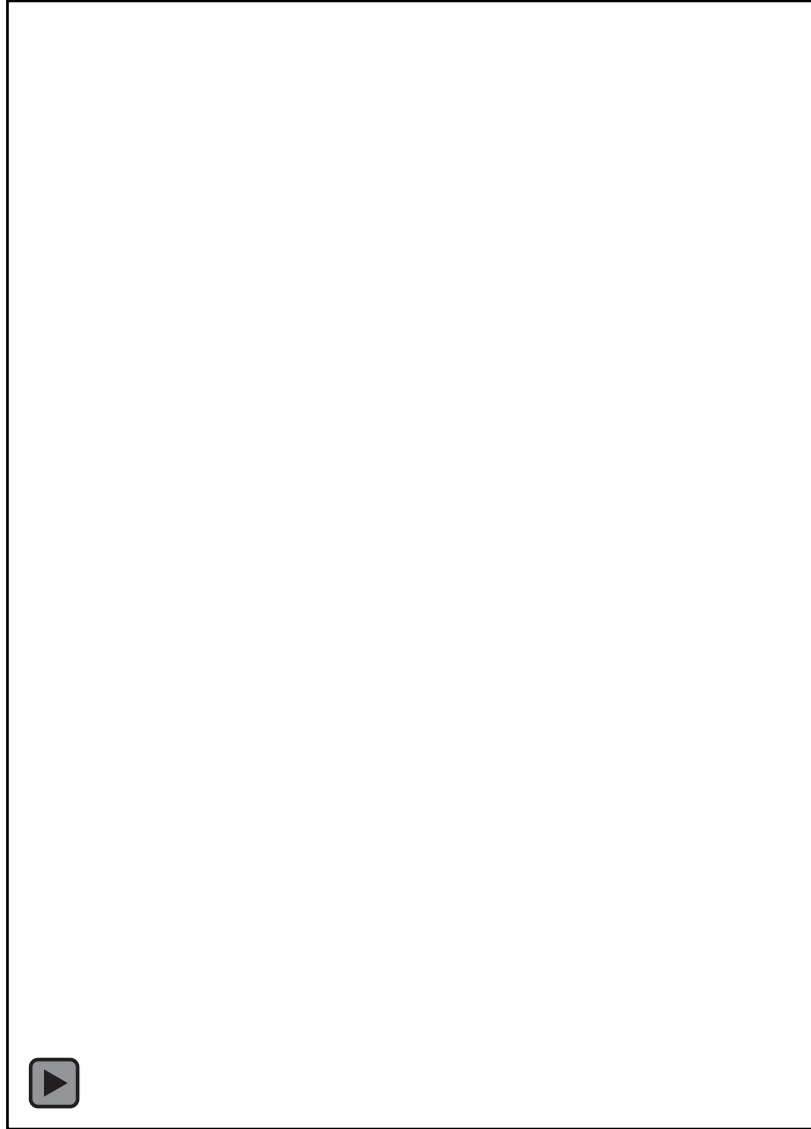
Ice

- Project area froze over in February
- Permitting extension needed to continue construction into March





Project in Action!





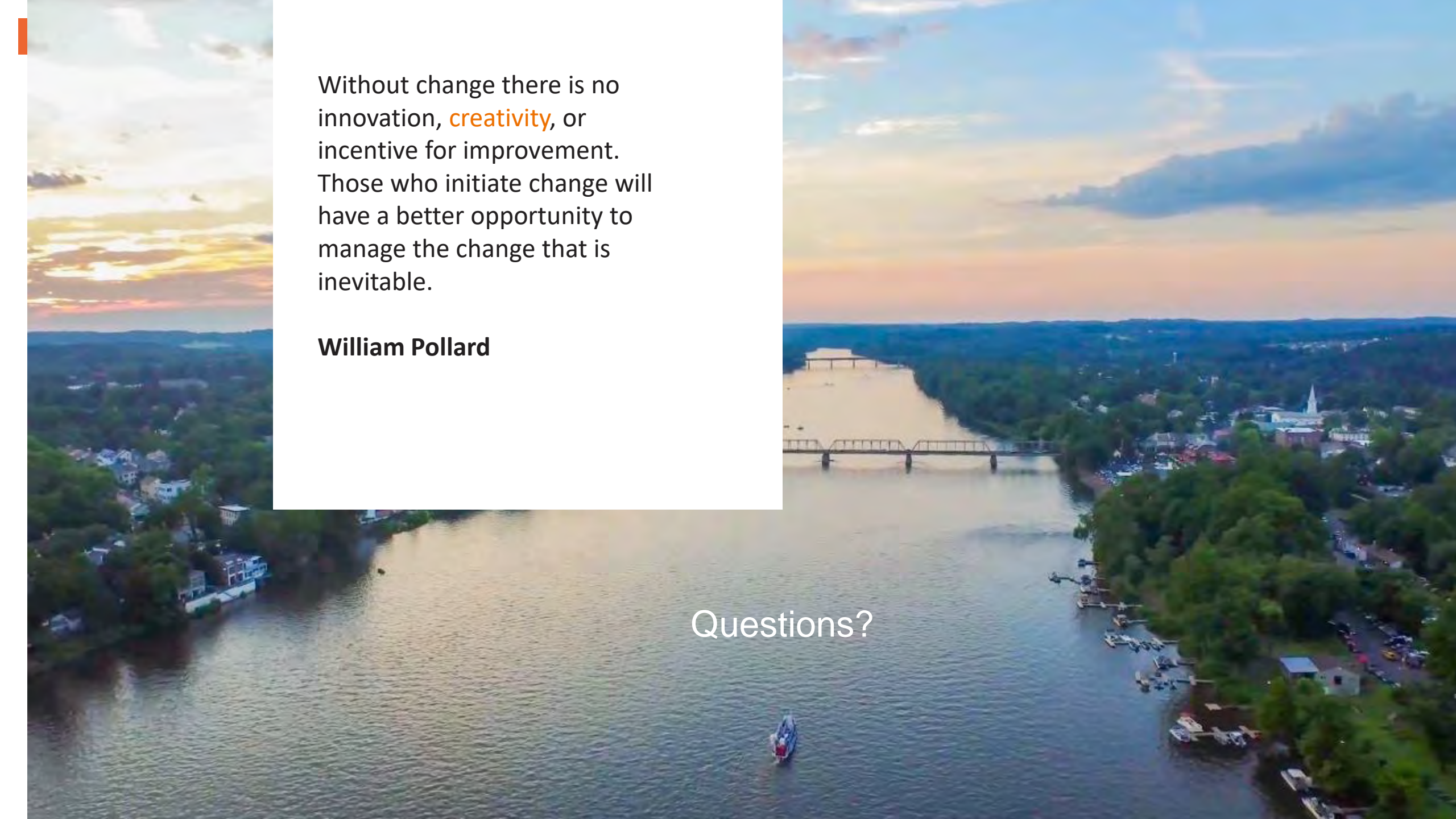
Project Purpose and Need





Future Plans



An aerial photograph of a wide river at sunset. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. A bridge spans the river in the middle ground. In the foreground, a small boat is visible on the water. The riverbanks are lined with green trees and some buildings. The overall scene is peaceful and scenic.

Without change there is no innovation, **creativity**, or incentive for improvement. Those who initiate change will have a better opportunity to manage the change that is inevitable.

William Pollard

Questions?