

Hyde County Resilience Strategy for Lake Landing / Engelhard

Proposed Projects

- Modeling and Stakeholder Engagement for Structural Protection Design and Phasing
- Engelhard Dike System
- Living Shorelines in High Erosion Areas
- Improve Mattamuskeet Association Flood Protection System
- Saltwater Intrusion Education & Research
- Improved Flood Data Collection (Tide gauge and/or FIMAN gauge)
- Septic System Retrofits and Conversions
- Far Creek Shoreline Stabilization
- Construct Resilient Docks
- Cored Dikes for Slocum Drainage District



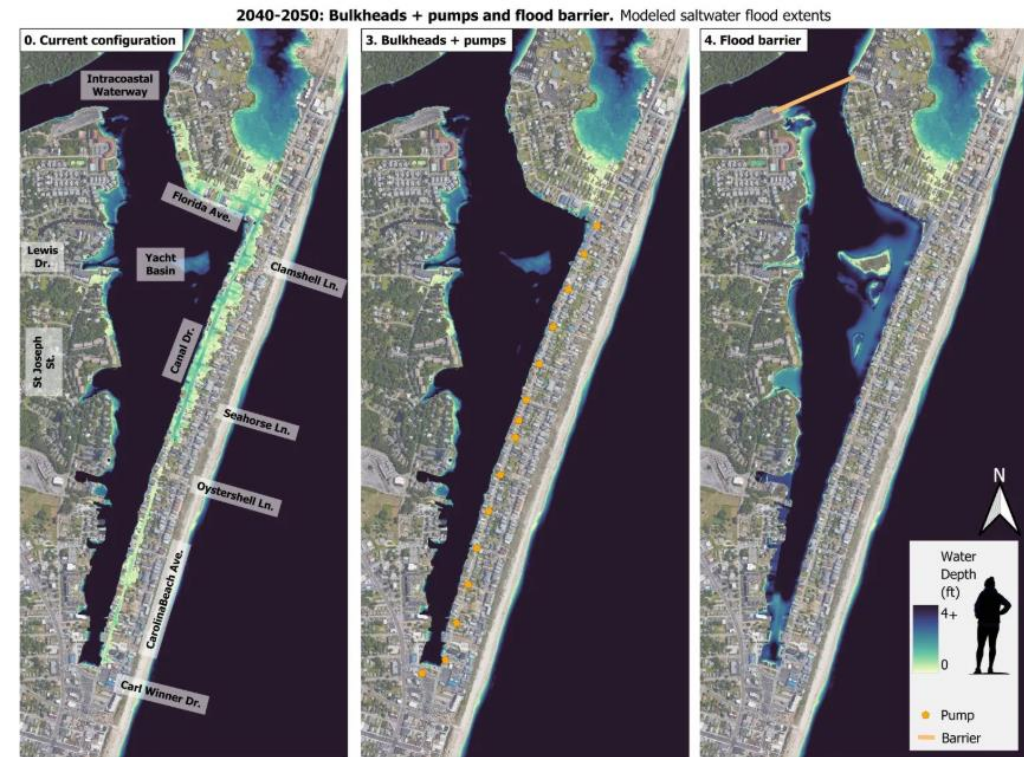
Modeling and Stakeholder Engagement for Structural Protection Design and Phasing

Project Description:

- Use modeling to evaluate and gather input on different flood protection strategies and phasing options that account for future conditions
- Prioritize potential dike location, height, width, gaps, and integration with existing infrastructure
- Explore other relevant flood protection strategies

Example: [Sunny Day Flooding – Carolina Beach](#)

Potential Partners	NCDEQ (DCM), Sunny Day Flooding Project, Carolinas Climate Adaptation Partnership (CAP)
Existing Funding	None.
Potential Funding Sources	NCDEQ (DCM), North Carolina Coastal Federation, NOAA's National Coastal Resilience Fund, Sunny Day Flooding Project
Estimated Cost	High – \$200,000+/-
Anticipated Benefit	High – A modeling project would enable the County and stakeholders to explore a range of potential strategies and choose the most feasible or appropriate project based on conditions and projections specific to Lake Landing
Priority Rating	Medium





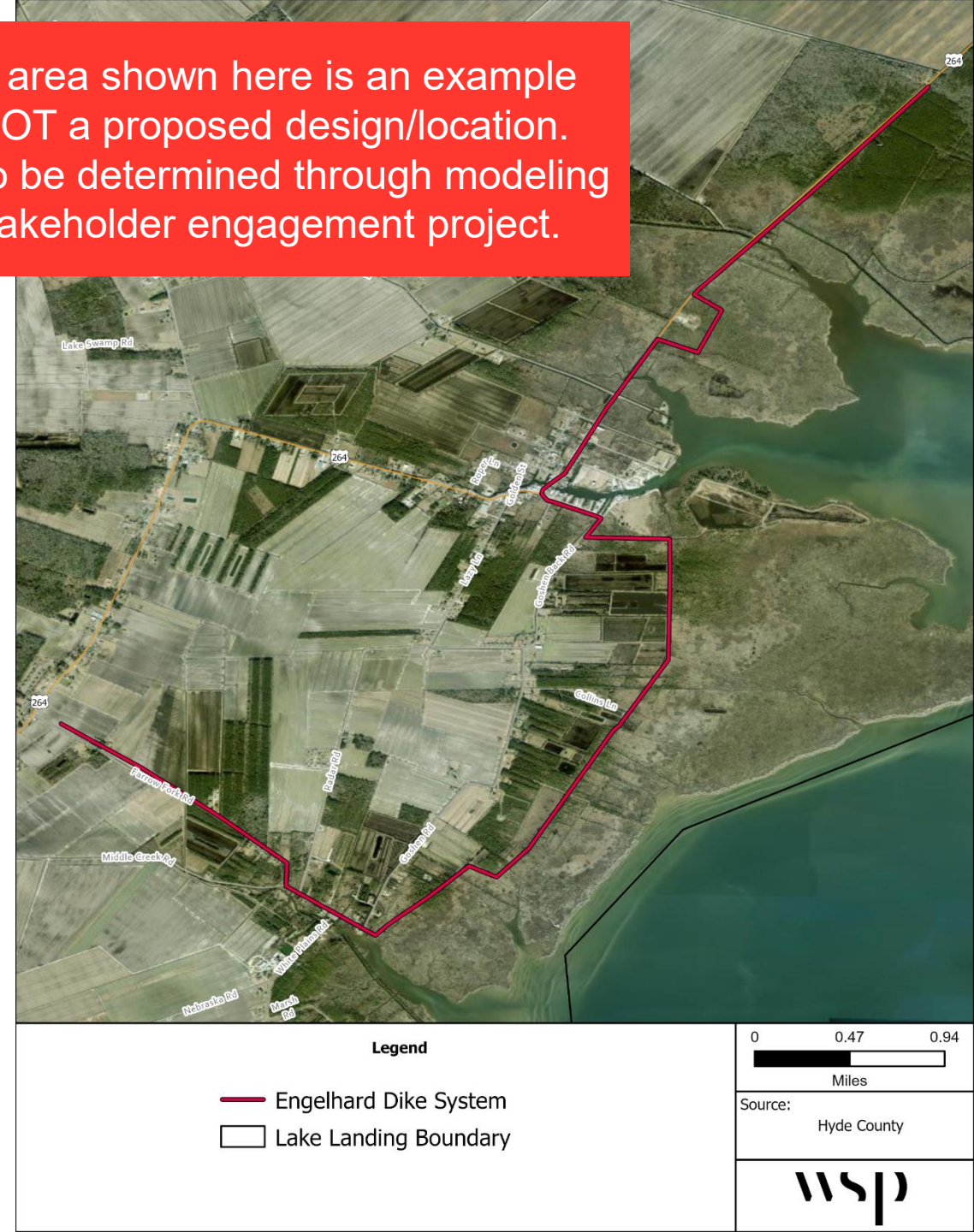
Engelhard Dike System

Project Description:

- Develop a dike to protect Engelhard from high tide flooding, storm surge, and sea level rise.
- Use findings from modeling and scoping project to determine specific location, structure type, and additional components

Potential Partners	NCDEQ (DCM), Sunny Day Flooding Project, Carolinas Climate Adaptation Partnership (CAP)
Existing Funding	None.
Potential Funding Sources	USACE, NCDEQ (DCM), NOAA National Coastal Resilience Fund
Estimated Cost	High – \$5M+ (Swan Quarter dike cost was \$13M for 18 miles)
Anticipated Benefit	High – A dike could protect Lake Landing and farmland/forestry land from flooding, salt water intrusion, and sea level rise up to a certain design level.
Priority Rating	Medium

Project area shown here is an example only, NOT a proposed design/location. Design to be determined through modeling and stakeholder engagement project.





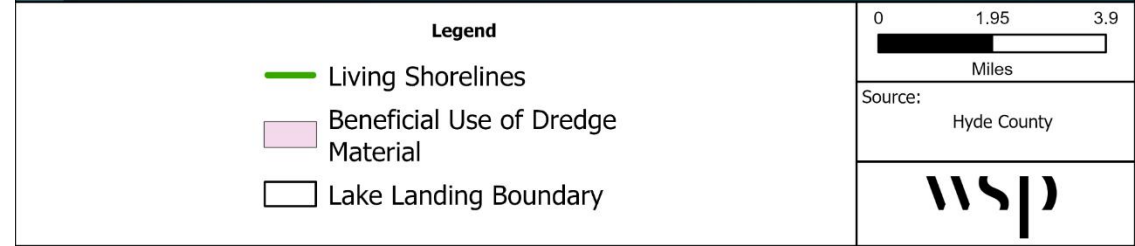
Living Shorelines in High Erosion Areas

Project Description:

- Implement living shoreline techniques to protect shorelines from erosion and to slow marsh migration.
- Ensure marsh sills are low profile and use a combination of natural vegetation and engineering techniques.
- Potential locations identified by NCCF to protect Far Creek harbor, farmland, vulnerable roads, cultural resources, and public lands



Potential Partners	NCDEQ (DCM), North Carolina Coastal Federation
Existing Funding	None
Potential Funding Sources	NCDEQ (DCM), North Carolina Coastal Federation, NOAA, National Resource Conservation Service (NRCS), USFWS, NC Land & Water Fund
Estimated Cost	High (\$300-\$600 per linear foot); Proposed project areas range from 2,200 to 9,300 linear feet; approximately \$2M+ per project
Anticipated Benefit	High – Living shorelines protect estuarine shorelines from erosion, combining engineered structures with natural vegetation to maintain, restore, or enhance the shoreline’s natural ecosystem services.
Priority Rating	High



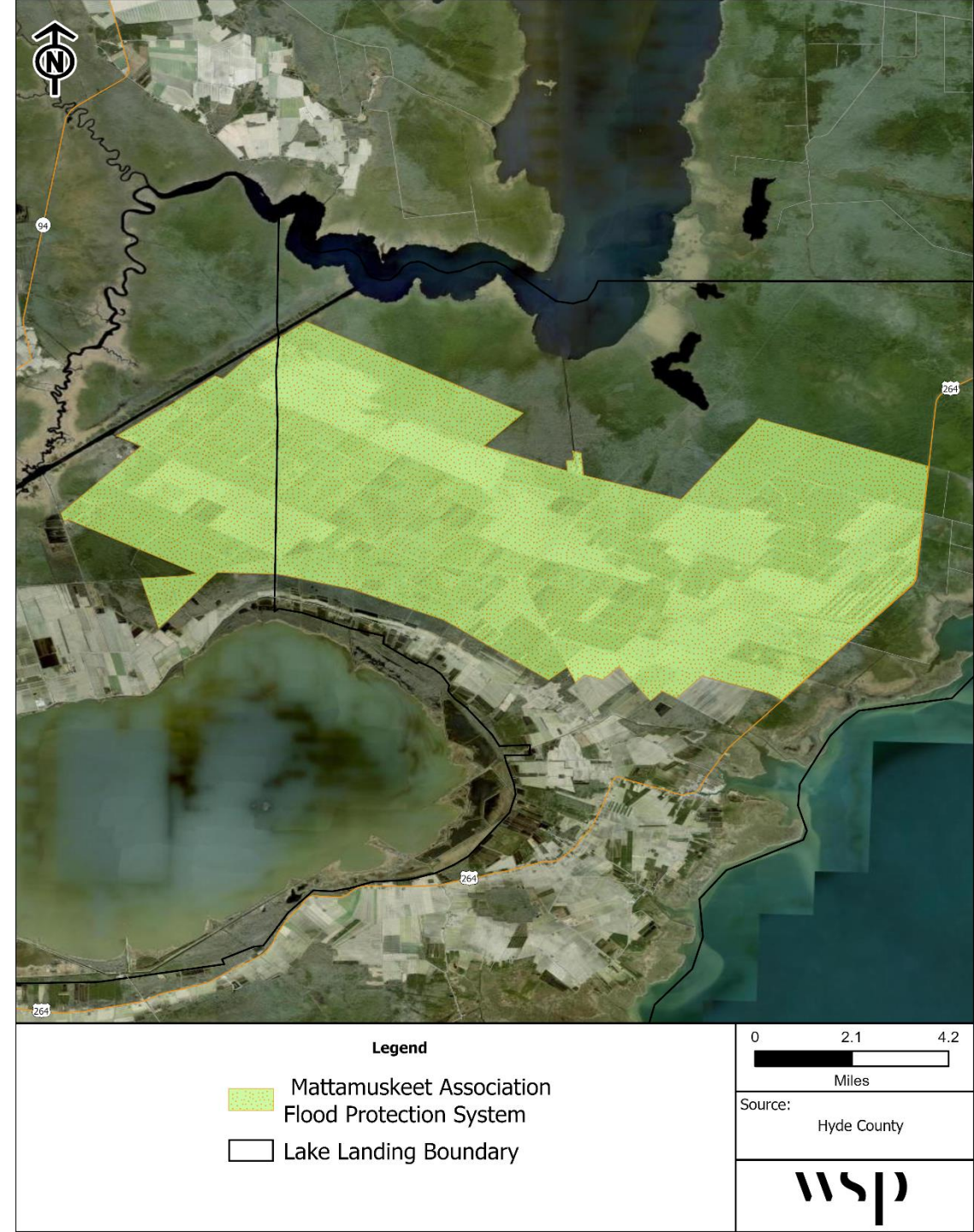


Improve Mattamuskeet Association Flood Protection System

Project Description:

- Improve the dike and upgrade the capacity of water pumps
- The dike system is old and was compromised and partially damaged by Hurricane Matthew
- Aging water pumps do not have the capacity to keep up with the amount of water

Potential Partners	Mattamuskeet Drainage Association
Existing Funding	None.
Potential Funding Sources	NCDEQ (DCM), USACE, NCEM
Estimated Cost	High – \$1M+
Anticipated Benefit	Medium – Improvements would provide better protection to farmland, houses, Hyde County Airport, and Engelhard Sanitary Sewer Treatment Plant.
Priority Rating	Medium



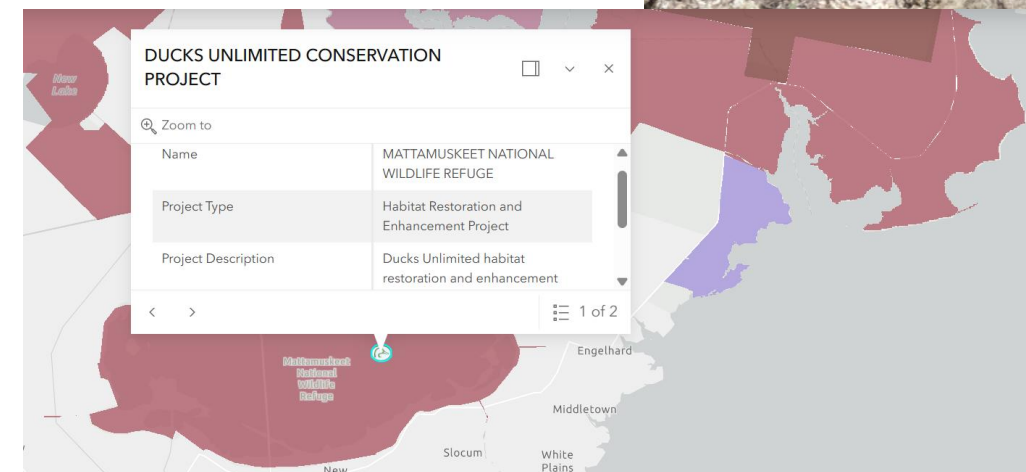


Saltwater Intrusion Education & Research

Project Description:

- Implement an educational program that targets farmers and duck pond owners about saltwater intrusion and negative effects of over pumping; coordinate with Hyde County Cooperative Extension and Ducks Unlimited
- Support ongoing research to understand where saltwater intrusion is occurring and what areas may become vulnerable soon

Potential Partners	NC Cooperative Extension, Ducks Unlimited
Existing Funding	Ducks Unlimited
Potential Funding Sources	Operating Budget, Ducks Unlimited
Estimated Cost	Medium – \$50,000+
Anticipated Benefit	Medium – Early messaging about the consequences of over pumping can prevent duck pond owners from worsening saltwater intrusion on their land and the surrounding area. This information can also provide existing farmers with alternatives that can help alleviate and mitigate already impacted land.
Priority Rating	Medium



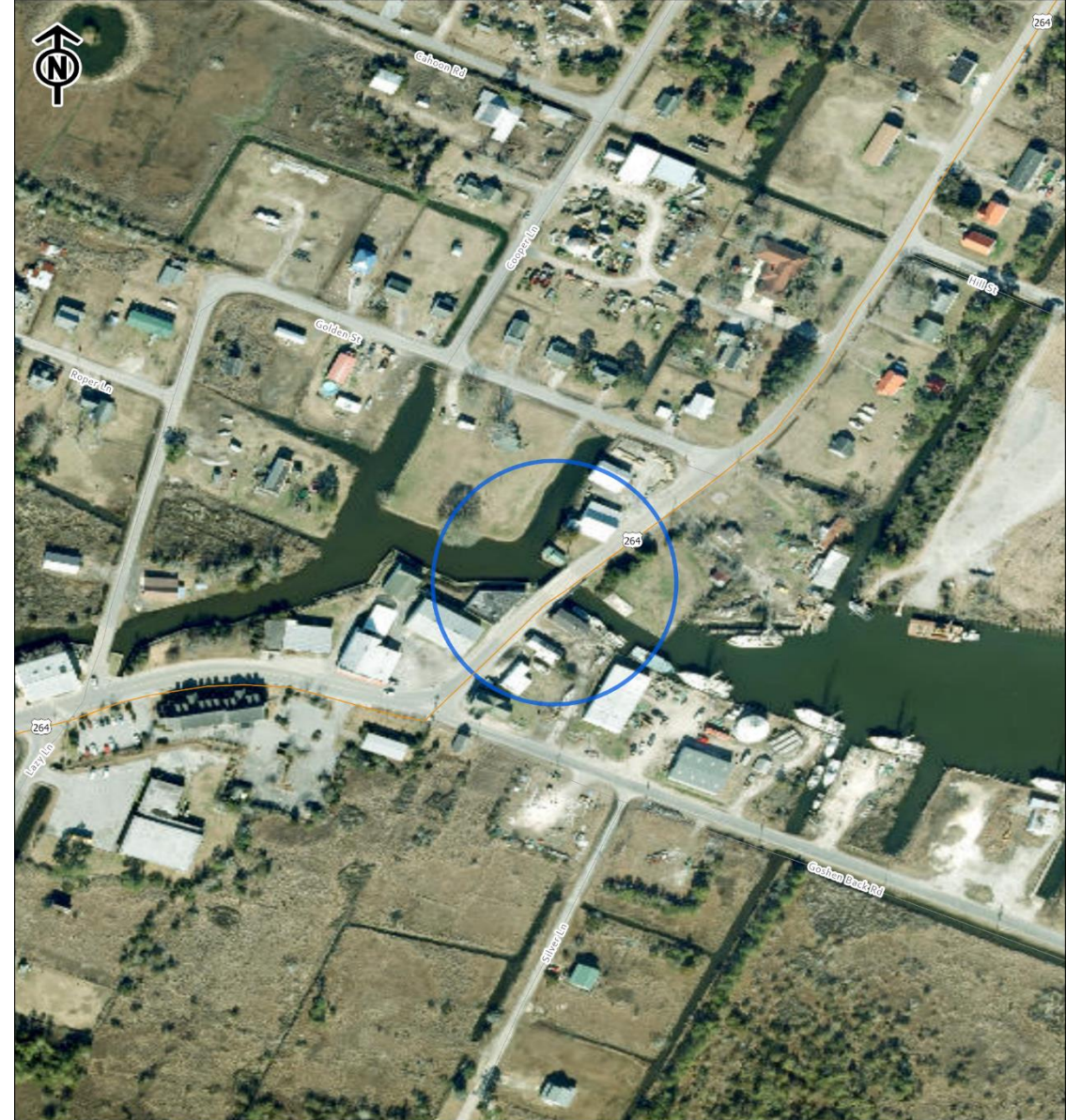


Improved Flood Data Collection: New Tide Gauge and/or FIMAN Improvements

Project Description:

- Install new tide gauge that provides more accurate water level data related to tidal flooding along estuarine shoreline of Pamlico Sound
- Coordinate with NCEM and NCDOT to improve FIMAN gauge operation and data outputs

Potential Partners	NCEM, NCDOT, DCM, NC Coastal Federation, Sea Grant
Existing Funding	None
Potential Funding Sources	NCDEQ (DCM), NCEM, NCDOT, Southeast Coastal Ocean Observing Regional Association (SECOORA), Sea Grant
Estimated Cost	Low – \$2,500 for new gauge plus operating & maintenance cost; up to about \$11k for FIMAN updates
Anticipated Benefit	Medium – The existing gauge has experienced maintenance and reliability challenges. The CAT reports that the data from the existing gauges misrepresents current and future conditions. Improvements and additional tide gauge would provide more accurate data and better predictions.
Priority Rating	Medium



Legend

- Improved Flood Data Collection
- Lake Landing Boundary

0 0.04 0.07
Miles

Source: Hyde County

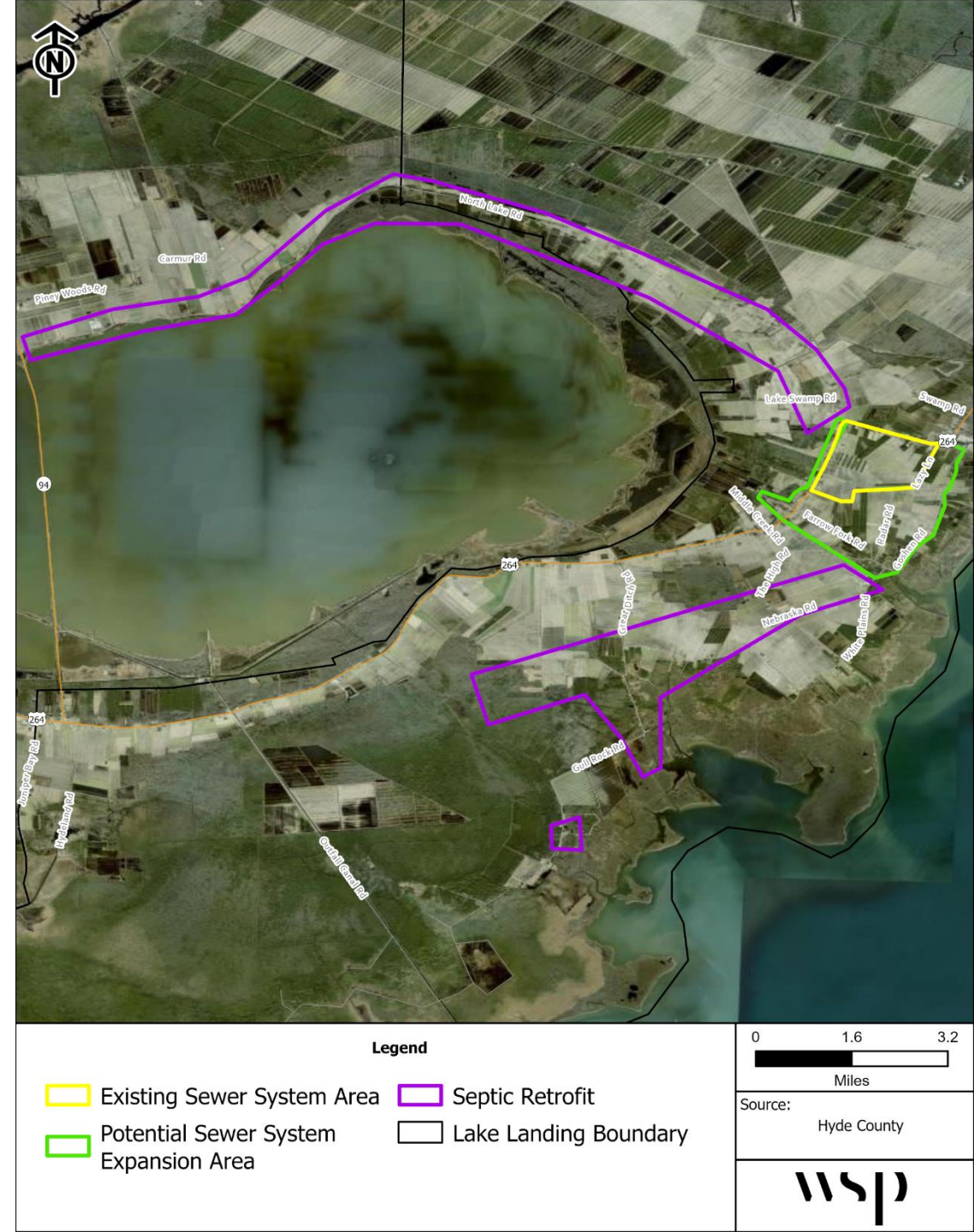


Septic Retrofits & Conversions

Project Description:

- Assist property owners to retrofit or replace failing septic systems.
- Where appropriate, encourage conversion to sewer system.
- Expand sewer system to support greater participation.
- Coordinate this effort with findings from Hyde County's Septic System Risk Assessment to prioritize project implementation.

Potential Partners	Office of Resilience
Existing Funding	Closing America's Wastewater Gap repair, replacement, and assistance funding
Potential Funding Sources	USDA Rural Development Program, NCDEQ Clean Water State Revolving Fund
Estimated Cost	High - \$20,000+ per septic system, \$250,000+ for sewer district expansion
Anticipated Benefit	Medium - This project will reduce potential for septic tanks to malfunction and minimize pollution of surrounding soil, surface water, and wells.
Priority Rating	Medium



Source: Hyde County



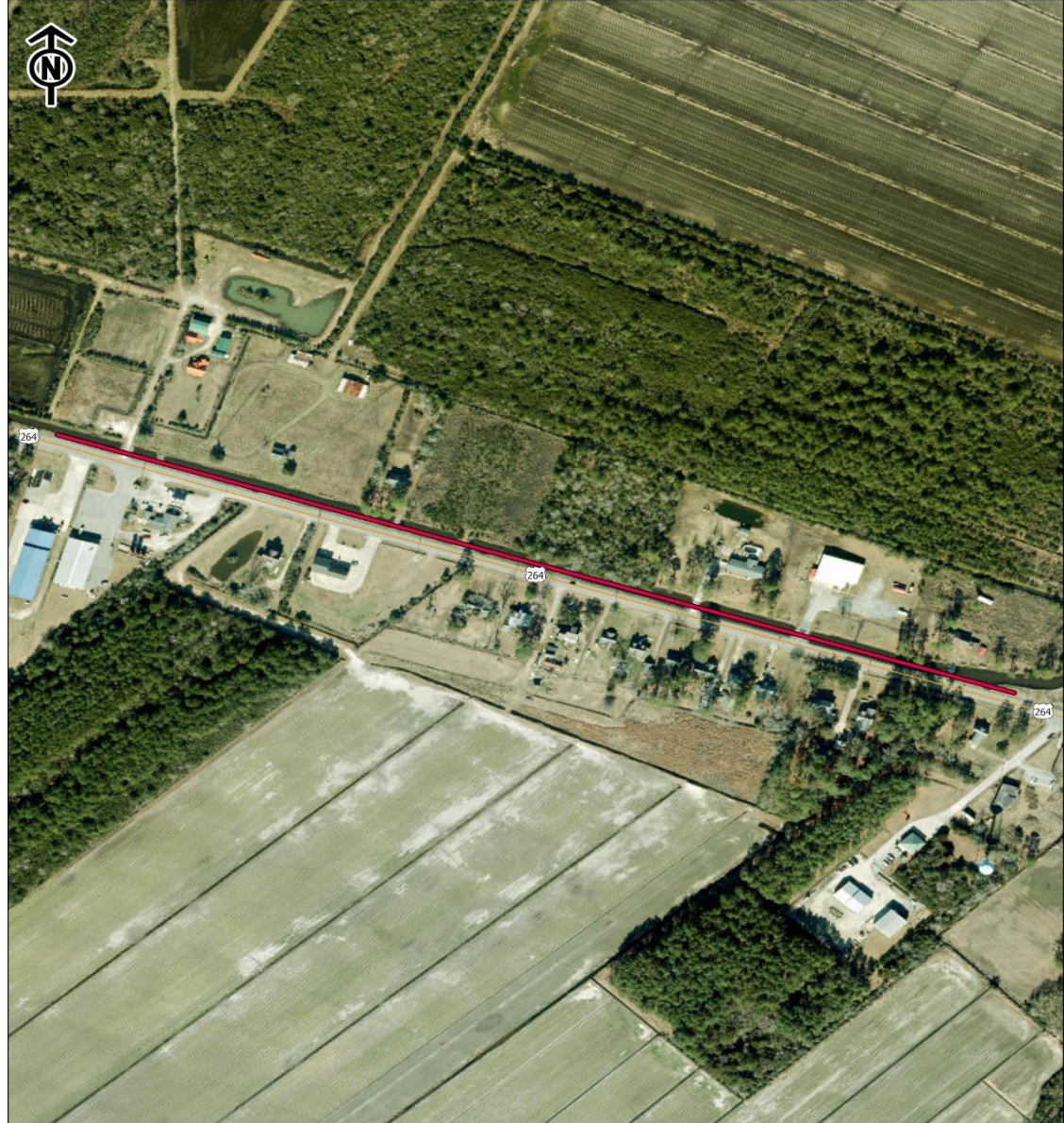


Far Creek Shoreline Stabilization

Project Description:

- Stabilize the creek that runs along US Hwy 264 to prevent further encroachment and damage to the road and utility infrastructure
- Reinforce existing utility infrastructure along this project area.
- Explore opportunities to integrate nature-based solutions or green infrastructure

Potential Partners	NCDOT
Existing Funding	None
Potential Funding Sources	NCDEQ (DCM), NCLWF Flood Risk Reduction Grant Program, NCDOT
Estimated Cost	High – estimated at \$500 per linear foot; approximately \$1M+
Anticipated Benefit	Medium – Shoreline stabilization would prevent canal migration and the inundation of Hwy 264 which is an access road for the Engelhard Fire Department and an evacuation route
Priority Rating	High



Legend

- Far Creek Shoreline Stabilization
- Lake Landing Boundary

0 0.06 0.11
Miles

Source: Hyde County

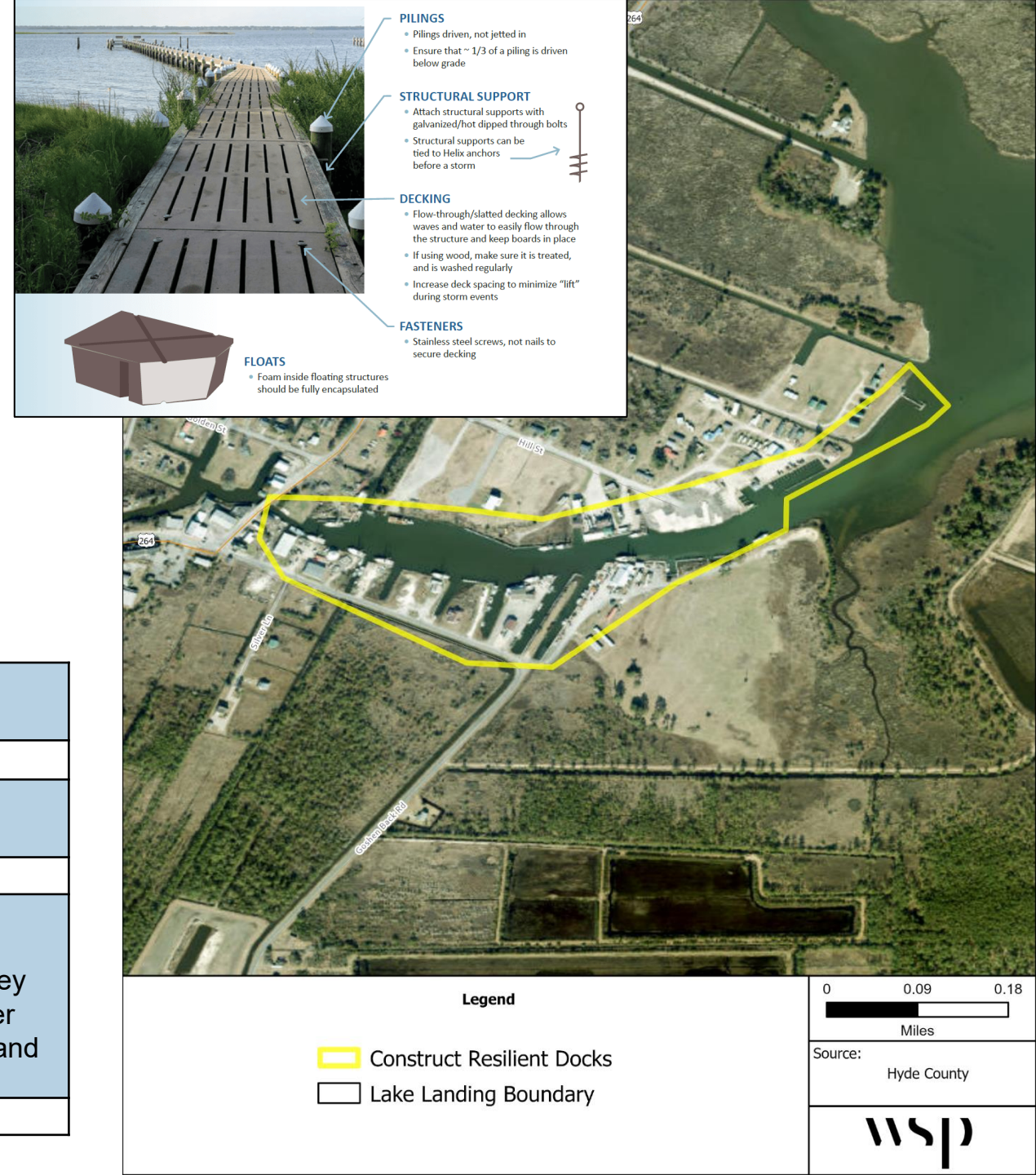


Construct Resilient Docks

Project Description:

- Improve docks with treated lumber or composite decking, poles for reinforcement, and other measures that improve resilience and ability to withstand storms
- Strengthening docks can enable faster recovery by reducing interruptions to fishing operations and minimizing income loss

Potential Partners	Engelhard Marine Industrial Park, seafood businesses, NCDEQ (DCM), NC Coastal Federation
Existing Funding	None
Potential Funding Sources	NCDEQ (DCM), Private owners
Estimated Cost	High - \$1M+ for all docks in harbor
Anticipated Benefit	Medium – When docks are damaged by storms, fishing operations and marina businesses cannot resume until repairs are complete. People often lose income while they wait for repairs. Building resilient docks can enable faster recovery and reduce interruptions to fishing operations and minimize income loss.
Priority Rating	Medium



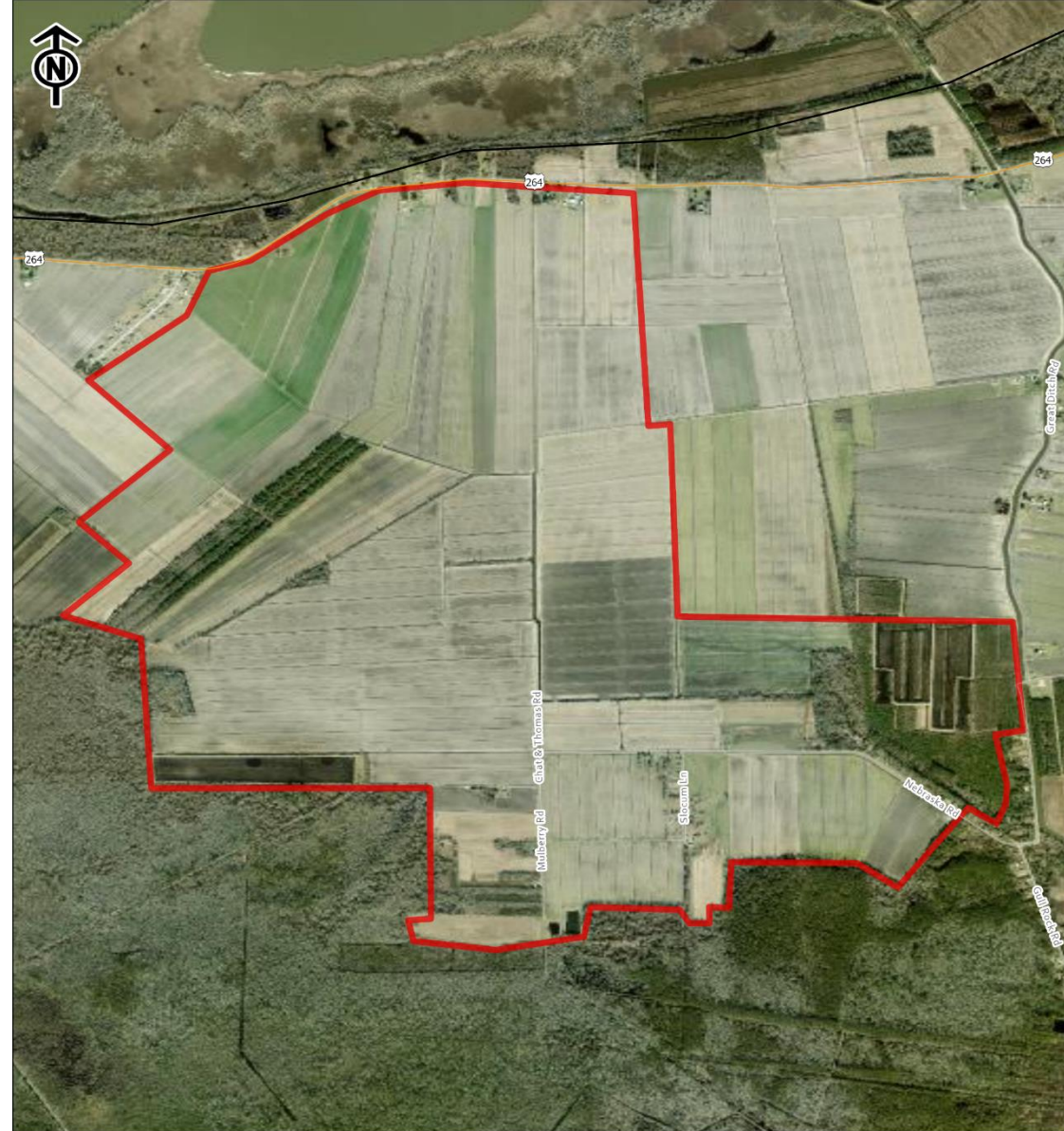


Cored Dikes for Slocum Drainage District

Project Description:

- Develop cored dikes to protect farmland from flooding & saltwater intrusion
- Explore options for integrating additional pumps, tide gates, and filtration through land held in easements to manage water

Potential Partners	NC Coastal Federation, NC Cooperative Extension
Existing Funding	None
Potential Funding Sources	NCDEQ (DCM, 319 program), NC Attorney General's Environmental Enhancement Program
Estimated Cost	High - \$1M+
Anticipated Benefit	Medium – The cored dike can help manage water, protecting low-lying land from regular tidal inundation and flooding and saltwater intrusion.
Priority Rating	Medium



Legend

- Cored Dikes for Farmland (Slocum Drainage District)
- Lake Landing Boundary

0 0.3 0.61
Miles

Source: Hyde County