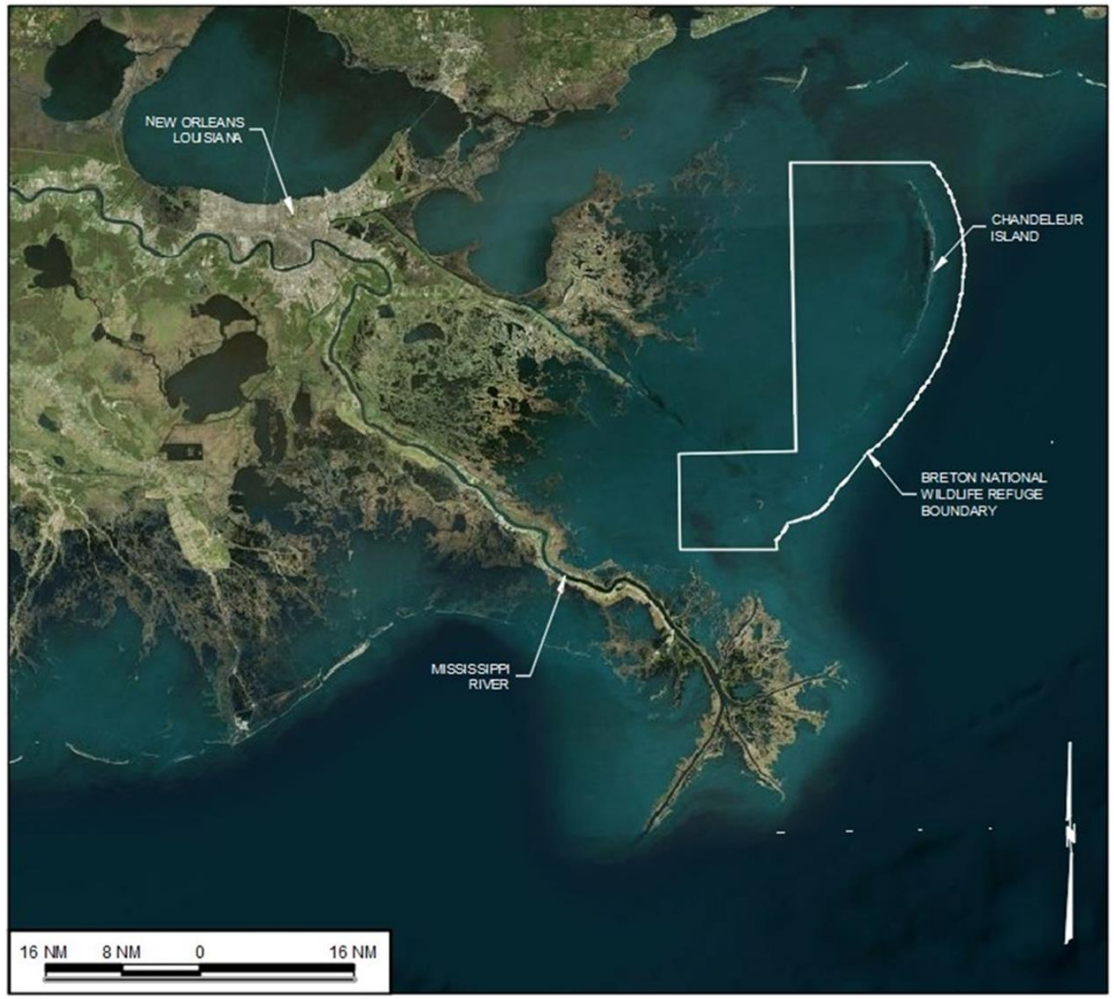
A DEEP DIVE FOR CHANDELEUR ISLANDS RESTORATION: SURVEYING 3,000 ACRES OF UNIQUE HABITAT ALONG LOUISIANA'S BARRIER ISLANDS

MAY 22, 2025| STATE OF THE COAST 2025
NEW ORLEANS, LOUISIANA
PRESENTER: STEPHANIE HEALEY, SWCA ENVIRONMENTAL CONSULTANTS

CHANDELEUR ISLAND RESTORATION TEAM

- Louisiana's Coastal Protection and Restoration Authority
  - Lead State Agency
- United States Fish and Wildlife Service
  - Lead Federal Agency
- Coastal Engineering Consultants, Inc. (CEC)
  - Prime, E&D Team Lead
- SWCA Environmental Consultants
  - Sub, Env, Seagrass, Sea Turtles, Marine Mammal

PROJECT SCOPE AND HIGHLIGHTS



Chandeleur Islands in St. Bernard Parish, LA

- Deployment from Bay St. Louis MS – Approximately 30 nm

Chandeleur Barrier Island Restoration Project

- Restoration Planning, Engineering and Design of a Barrier Island Restoration Project – Chandeleur and New Harbor Island
- Multi-phase project
  - Data-gap analysis, Island topo/bathy, island magnetometer survey, geotechnical investigations
  - Borrow area surveys
  - Ecological Studies
  - Habitat Restoration Goals and Restoration Plan Development
  - Alternatives development, analysis and E&D

SEAGRASS STUDY GOALS

1. Summarize the existing information on historical seagrass extent to guide the development of our survey plan allowing us to contribute to existing knowledge through consistency and reproducible data.
2. Determine the 2022 spatial distribution of seagrass beds utilizing new aerial data specifically collected for the Project and use Summer 2022 field surveys to verify boundary edge.
3. Characterize the 2022 Seagrass communities by species composition, percent cover, patchiness, and basic water quality parameters.

STUDY PLAN DEVELOPMENT

- Tiered Monitoring Approach
  - Tier 1 – Larger Ecosystem Evaluation
  - Tier 2 – Site Specific Data Collection
  - Tier 3 – Long-term Monitoring
- Adaptable to scale it to project size and overall objectives at this Phase
- This monitoring approach has successfully been used for seagrass monitoring across the Gulf, and other SAV ecosystems nationwide.

SURVEY DESIGN

Tier 1 – Ecosystem Evaluation

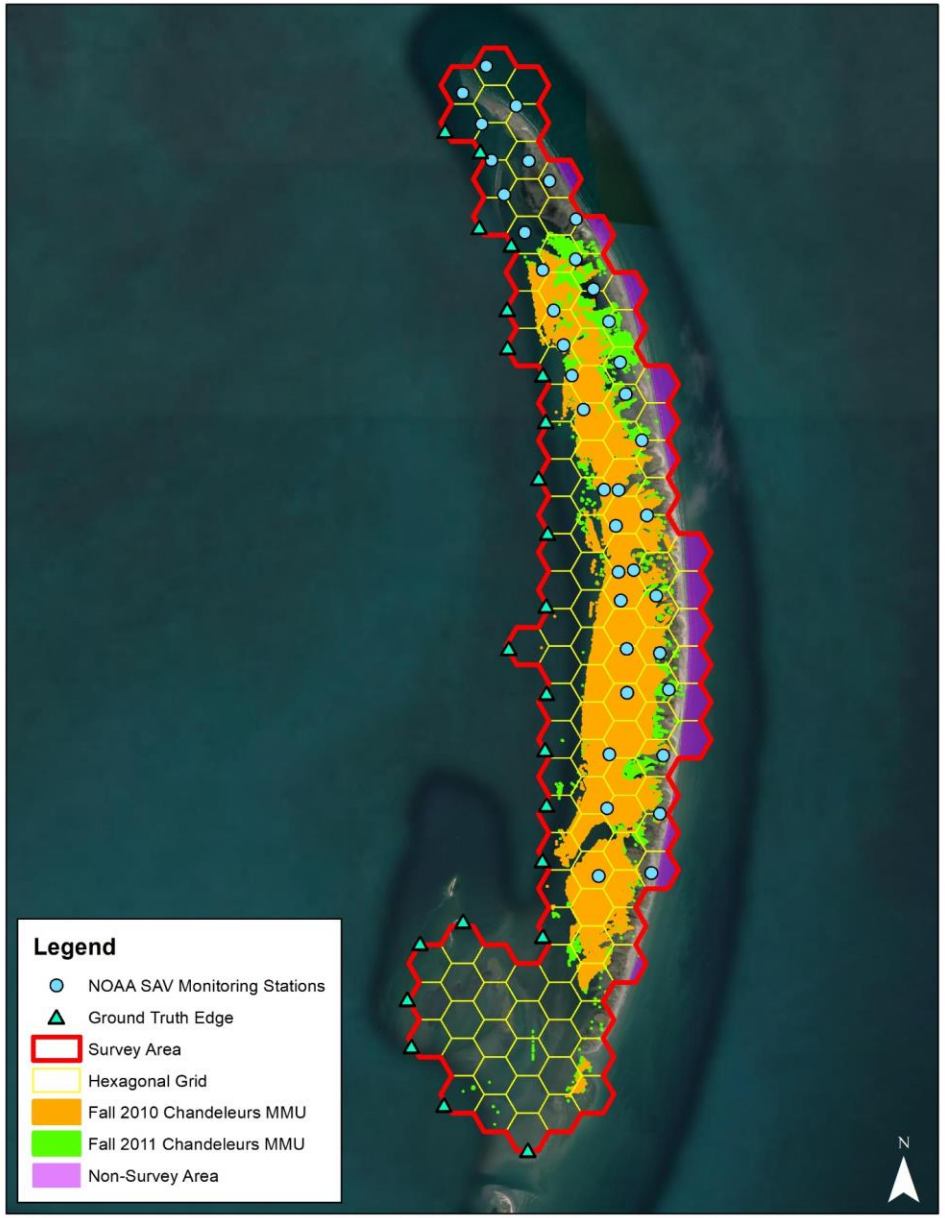
- Aerial data analysis to establish current survey area
  - Define initial survey area from NOAA 2010 and 2011 sampling program
  - May 2022 project specific aerial data acquisition
  - September 2022 – near real time satellite data capture

Tier 2 – Study Area Definition and In-water Survey

- Tessellated hexagonal grid (500 m sides) with randomly selected fix sampling locations within
- Water quality and other abiotic metrics (Stressors)
- Seagrass and habitat metrics (Condition indicators)

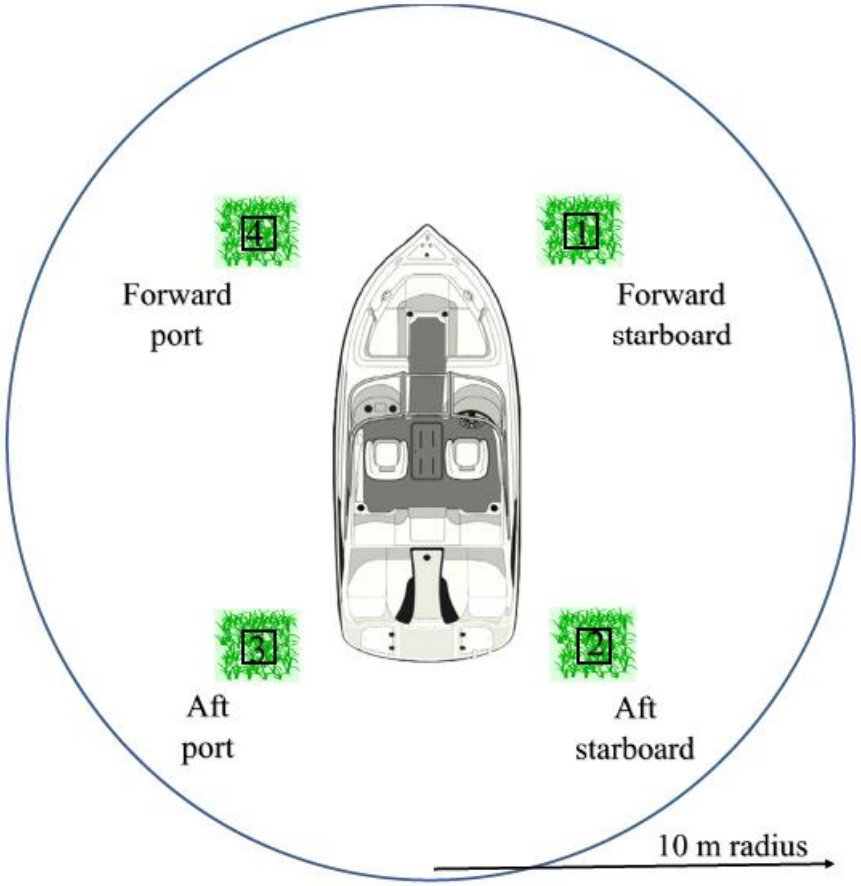
Tier 3 – Long-term Monitoring

- Study design allows for long term monitoring during the evolution of the barrier island reconstruction project



Primary Data Collection

- Water quality and other abiotic metrics (Stressors)
  - One measurement at each location, where location is the vesse location
  - Deployment of WQ equipment:
    - Multiparameter sonde, LI-COR sensors, secchi
- Seagrass and habitat metrics (Condition indicators)
  - Four measurements (stations) surrounding vessel location
  - Data collection within 0.25 m quadrat at each station
    - Species composition, percent cover, Canopy height

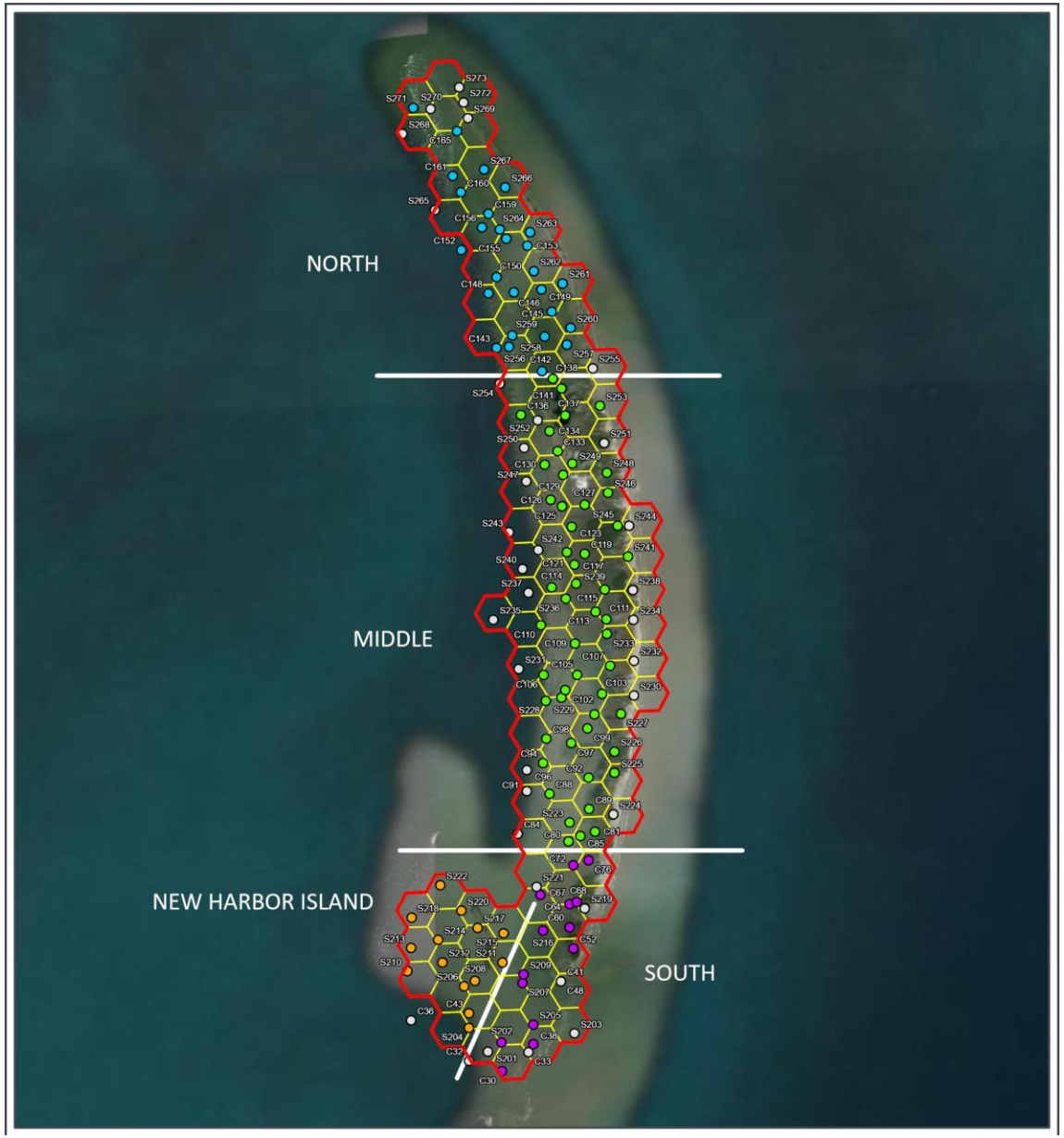


Peak Season Fring Mapping

- May 2022 Aerial Flight Data Acquisition
- On September 14, 2022, Planet Labs SkySat aerial imagery was obtained (50-cm resolution satellite data)
- Aerial fringe delineation with diver-verified spot checks occurred on September 26

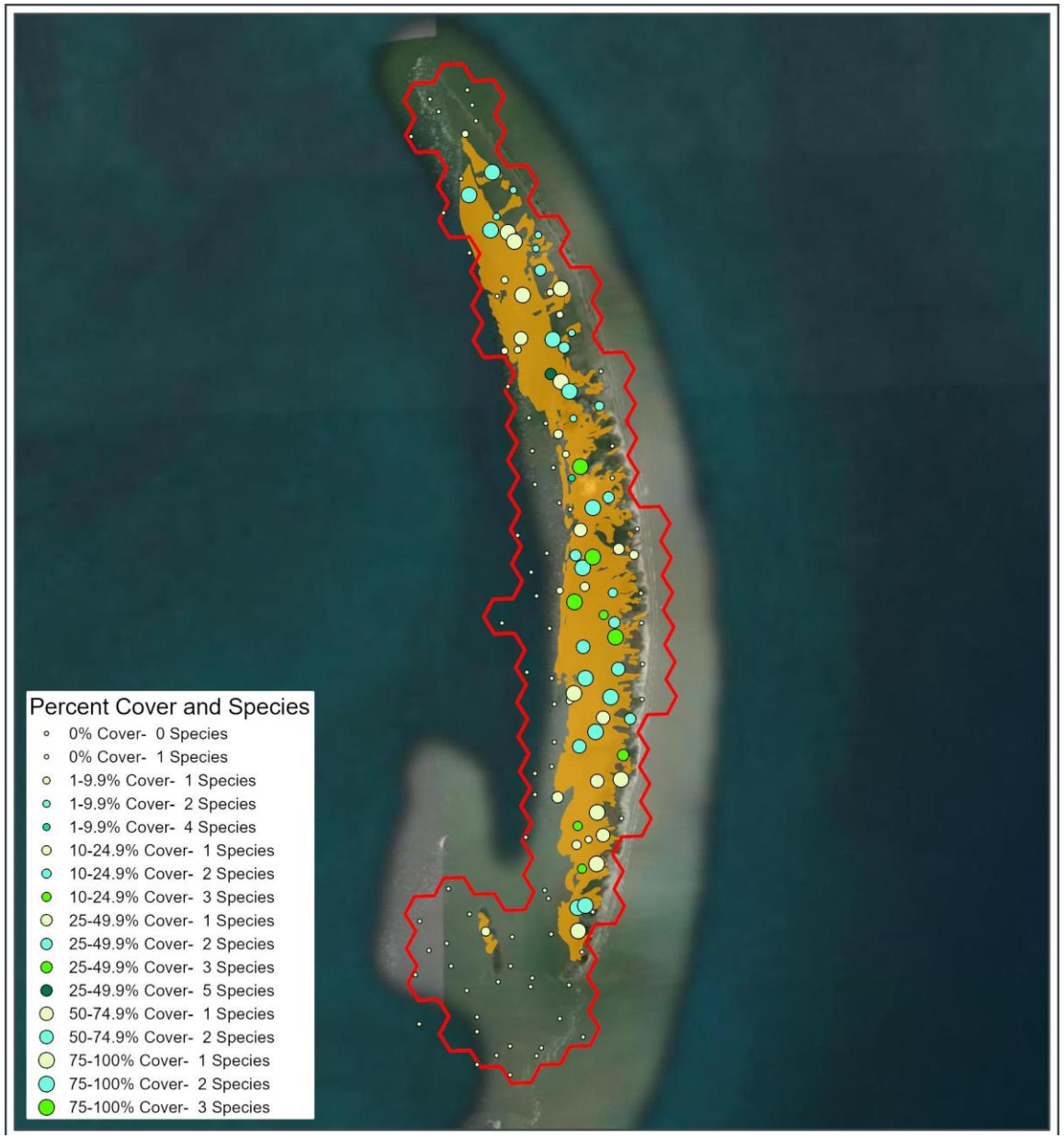
Island Zonation Definition

- North Zone: highly dynamic area, heavily impacted by sedimentation and washover from the island; minimal to no discernable land mass above sea level
- Middle Zone: Located behind the island with elevation above sea level and structural vegetation, providing protection from wind and wave action.
- South Zone: Located behind the island with above sea level land mass, however exhibit evidence of erosion, and show lack of supporting back marsh systems.
- New Harbor Island (NHI Zone): Separated from the main island by a deep wide channel, and border smaller mangrove islands



GENERAL FINDINGS

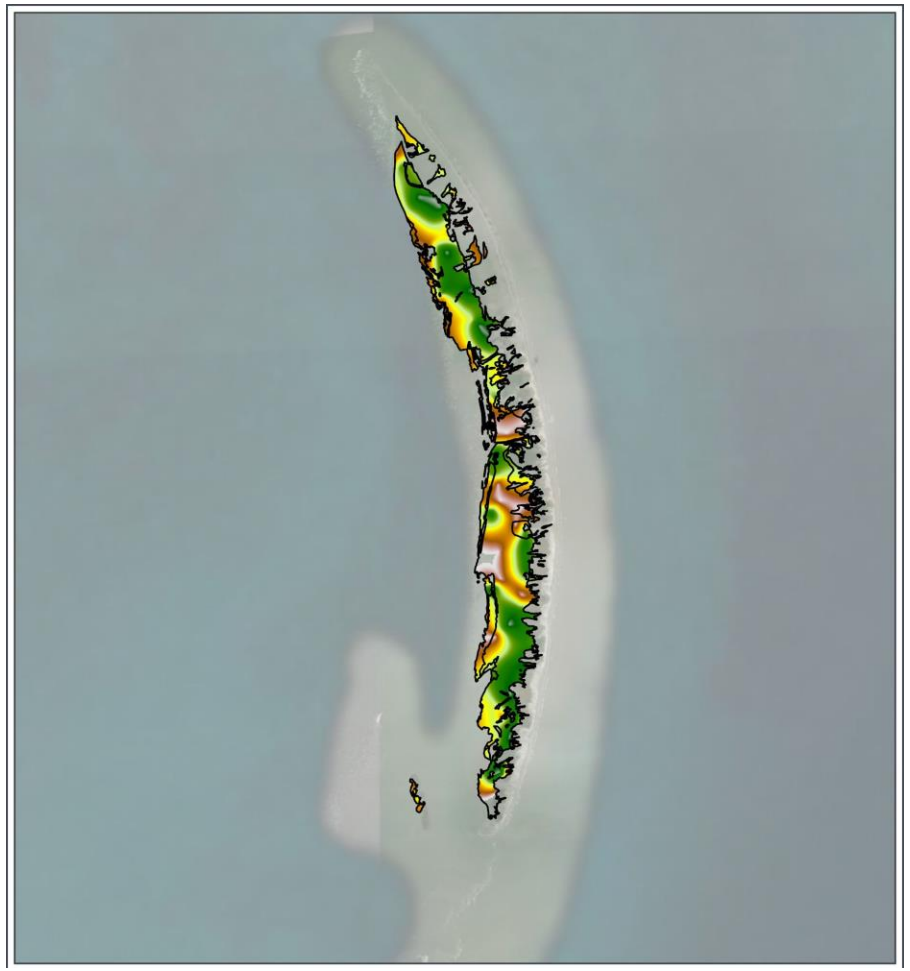
- Species known to inhabit the subtropical waters of the northern Gulf
  - Turtle grass (*Thalassia testudinum*)
  - Manatee grass (*Syringodium filiforme*)
  - Shoal grass (*Halodule wrightii*)
  - Star grass (*Halophila engelmannii*)
  - Widgeon grass (*Ruppia maritima*)
- Analyze aerial imagery
  - Photointerpretation and image analysis of satellite imagery



Data Interpolation Modeling

- Cover classification utilized Braun Blanquet cover classification scores Mapping completed using the nearest neighbor interpolation method within ArcGIS Pro

Thalassia modeled coverage



Haloduli modeled coverage

ONGOING NEXT STEPS

- Development of habitat restoration goals
  - Various habitat types for diverse faunal usage
  - Seagrass community types to support diversity
- Expectation of seagrass assemblage based on the engineering design of the barrier island and adjacent habitats

Thank you!

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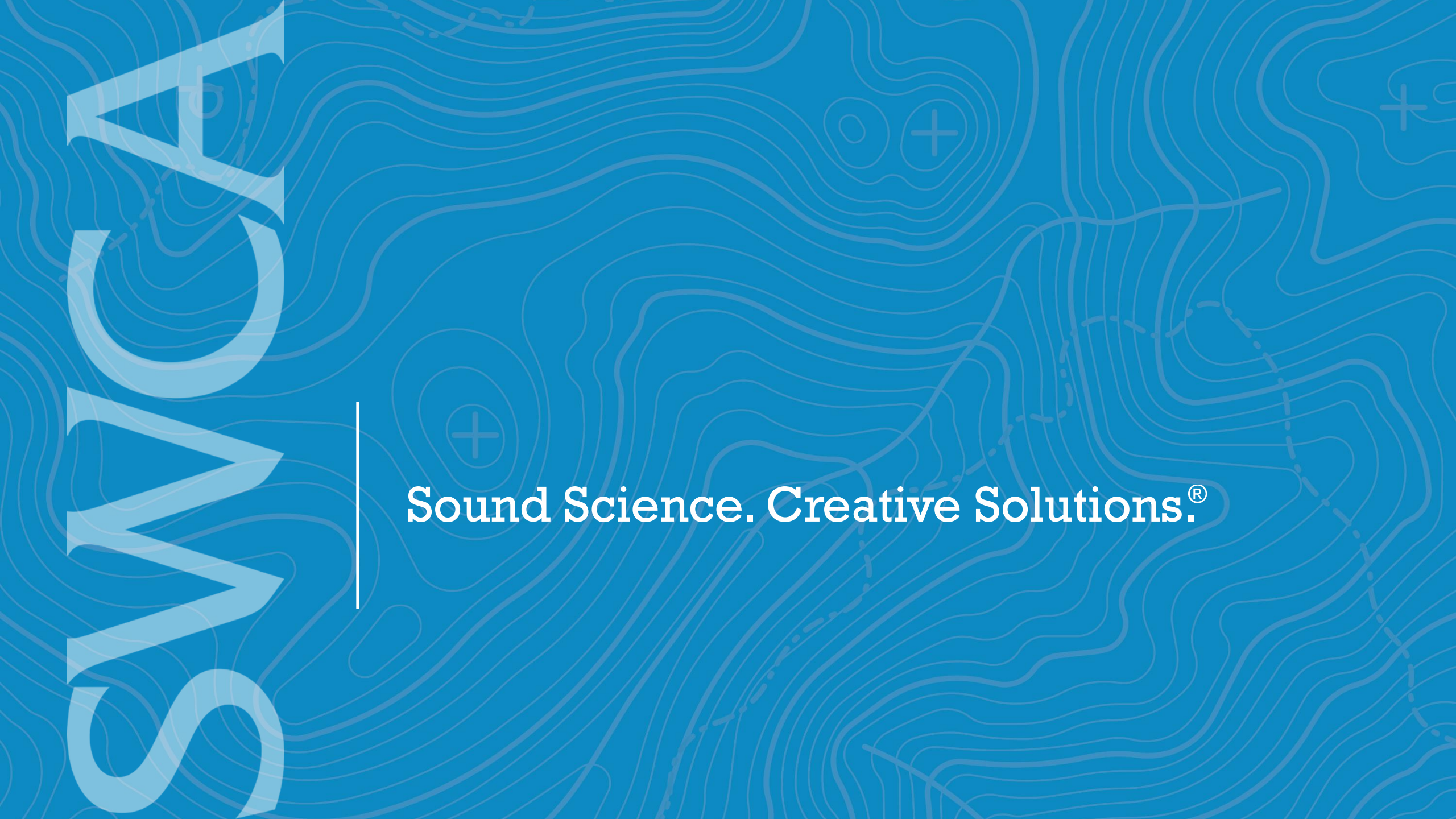
This survey effort would not have been possible without the support of SWCA's administrative support and talented field crews representing offices in Houston, Baton Rouge, Pensacola, Jacksonville, and Philadelphia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