GOVERNOR'S HURRICANE CONFERENCE®

A Tale of Resiliency: Anna Maria Island's Response to the 2024 Hurricane Season

Thomas Pierro, PE, BC.CE, Coastal Protection Engineering
Morjana Signorin, MS, Coastal Protection Engineering
Charlie Hunsicker, Manatee County

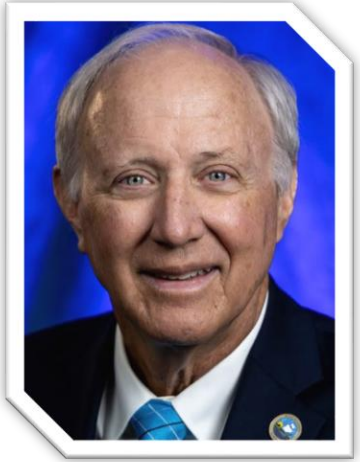
MODERATOR & SPEAKERS

Tom Pierro, PE, BC.CE

Principal Engineer,
Coastal Protection Engineering
Board-Certified Coastal Engineer with 25+ years of experience supporting local government coastal programs

Morjana Signorin, MS

Project Manager,
Coastal Protection Engineering
15 years of experience coordinating and managing multi-disciplinary teams



Charlie Hunsicker

Director, Natural Resources Department
Manatee County
40+ of safeguarding Anna Maria Island's coastline - leading beach renourishment, shoreline protection, and hurricane recovery efforts

WORKSHOP OVERVIEW

- **Part 1 – Anna Maria Island Coastal Program | Tom Pierro, CPE**

  Anna Maria Island coastal program context, 2022, 2023, & 2024 hurricane seasons, storm impacts

- **Part 2 – Storm Response Plan | Morjana Signorin, CPE**

  Pre-storm monitoring program, rapid post-storm assessments, sand sifting operations, data-driven recovery

- **Part 3 – The County's Perspective | Charlie Hunsicker, Manatee County**

  Local sponsor for beach program, damage assessment and recovery, building long term resiliency

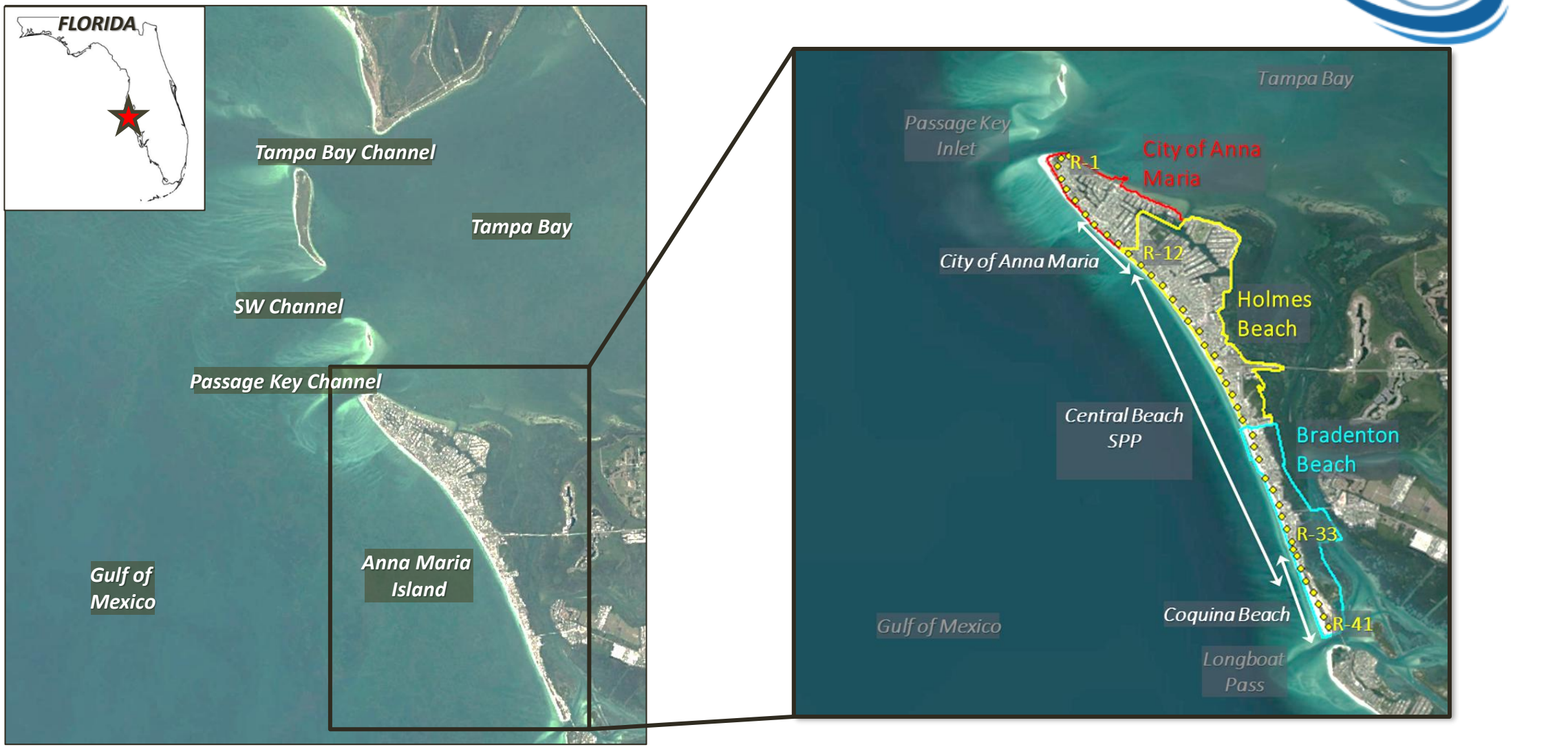
- **Part 4 – Wrap-Up + Q&A | All Presenters**

  Q&A, lessons learned, open discussion

PART 1: ANNA MARIA ISLAND COASTAL PROGRAM

Tom Pierro, PE, BC.CE | CPE

ANNA MARIA ISLAND, BRADENTON, FLORIDA



ISLANDWIDE COASTAL PROGRAM

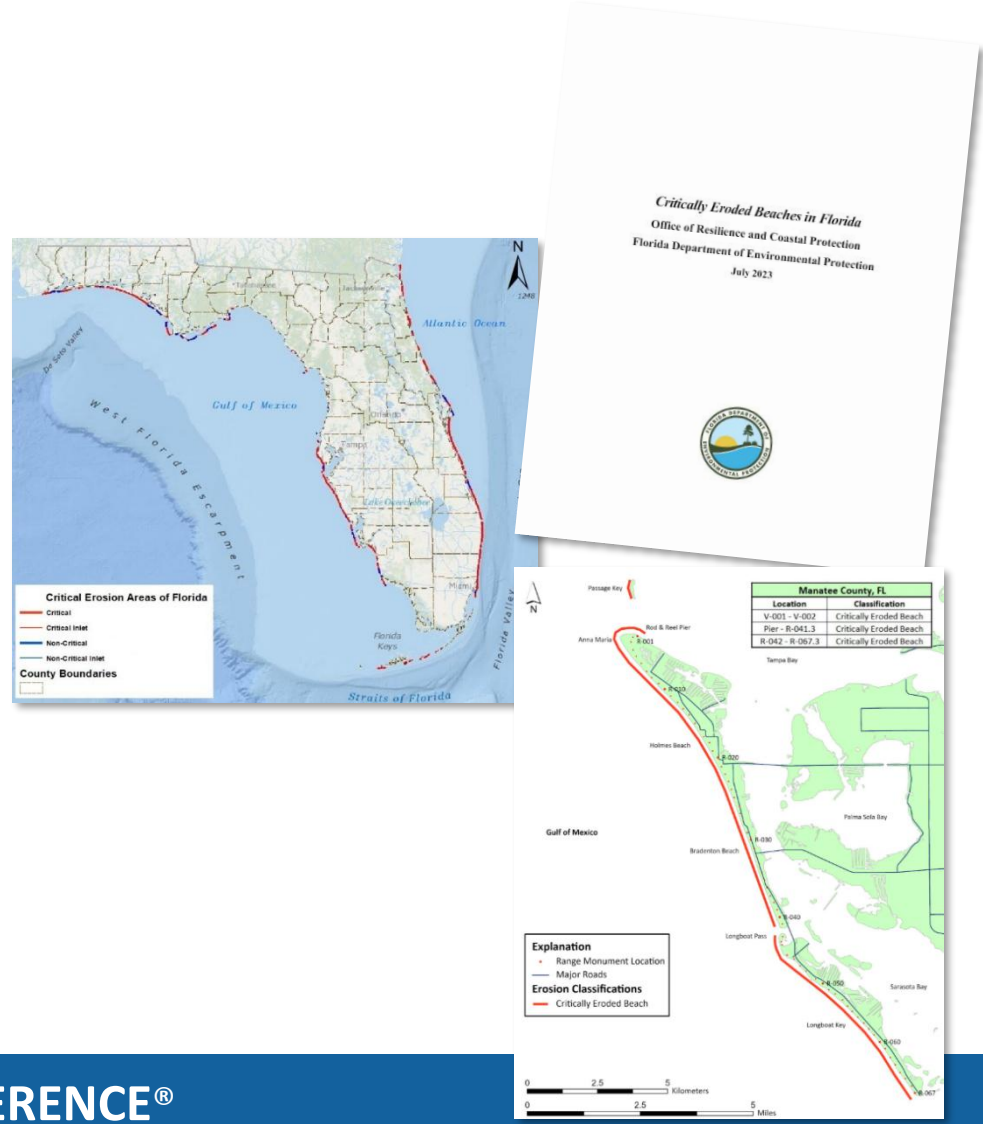
- Manatee County, Florida
- 7-mile-long barrier island
- Passage Key Inlet to north
- Longboat Pass to the south
- 6.8 million CY placed since 1992
- Coquina Beach:
  - Southern mile of island (erosional hotspot)
  - Public beach and recreation facility
  - Roadway and critical evacuation route
  - County managed coastal program

CRITICALLY ERODED BEACHES IN FLORIDA

- FDEP, pursuant to rule 62B-36.002(5), F.A.C., defines "critically eroded shoreline" as:

"a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost..."

- Florida has 432.5 miles of critically eroded shoreline
- The entire 7.9 miles of Anna Maria Island has been deemed critically eroded (R-1 to R-41.3)
- Non-federal (County) participation eligible for State funding reimbursements of up to 50% of project costs



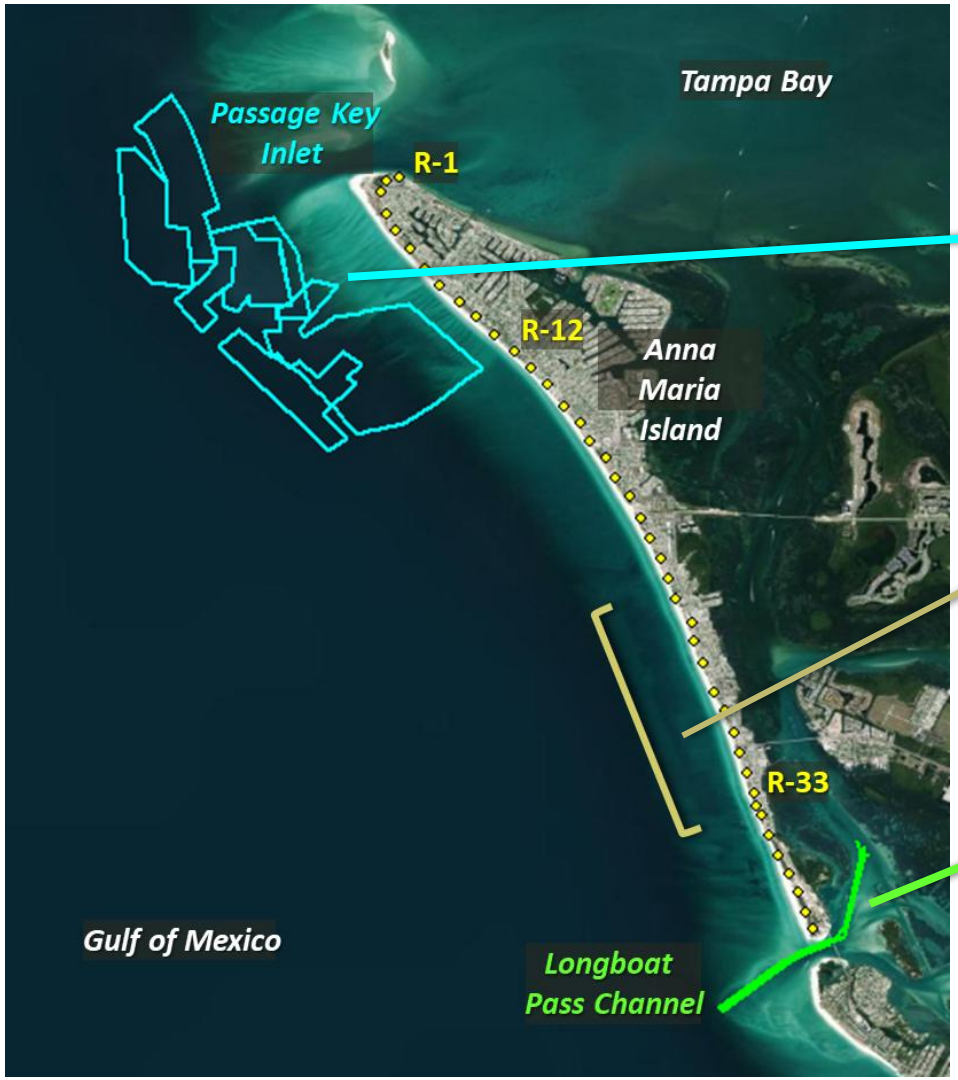
BEACH NOURISHMENT PROJECTS

City of Anna Maria
Non-federal

Central Beach
(Holmes Beach / Bradenton Beach)
Manatee County SPP
Cost-shared with USACE and FDEP

Coquina Beach
(Bradenton Beach)
Locally managed by Manatee County
Cost-shared with the FDEP & FEMA
(on eligible storm repairs)

BEACH NOURISHMENT SAND SOURCES

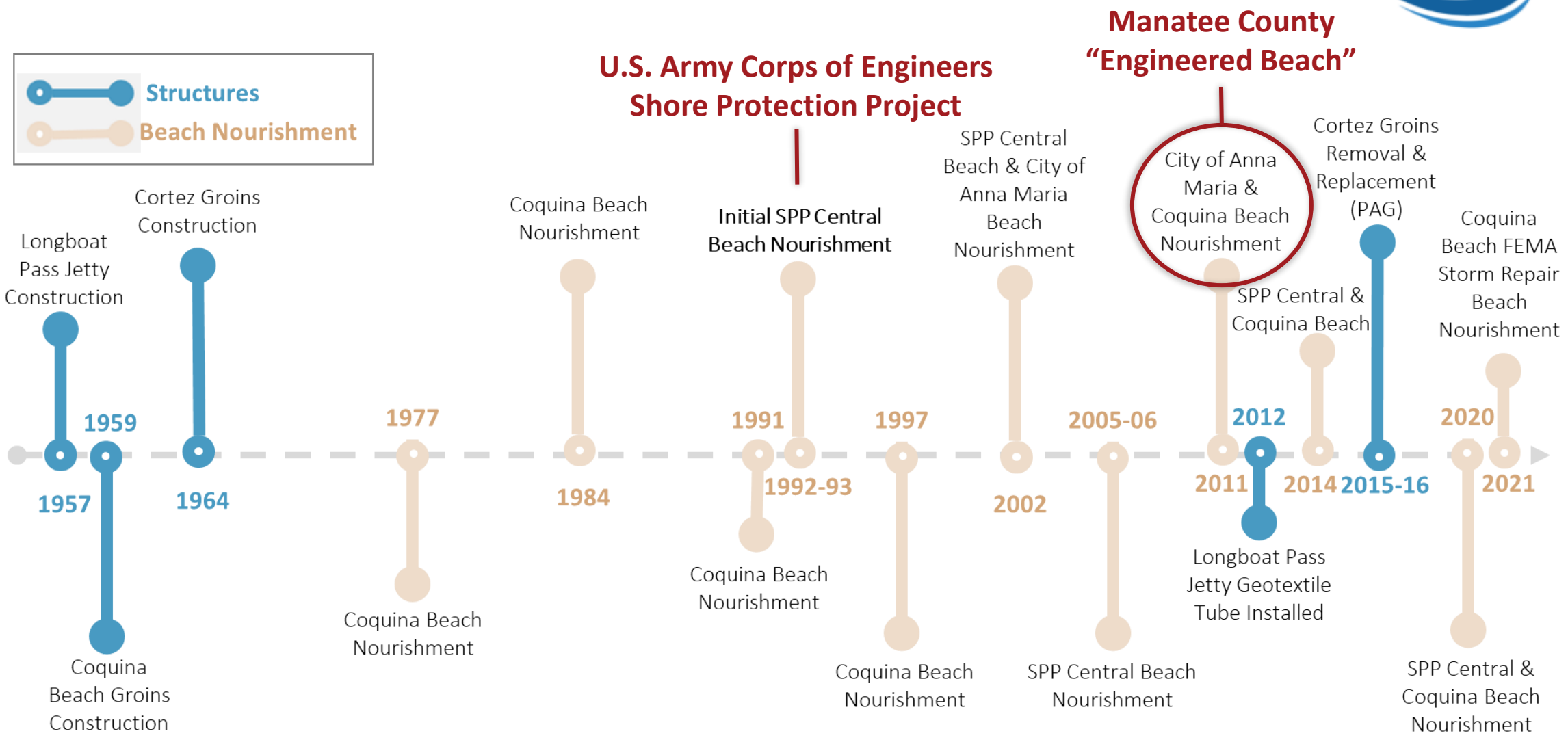


Passage Key Inlet
Several borrow areas permitted used in Anna Maria Island and Longboat Key

1992-1993 Borrow area
Used one time in the initial Central Beach SSP

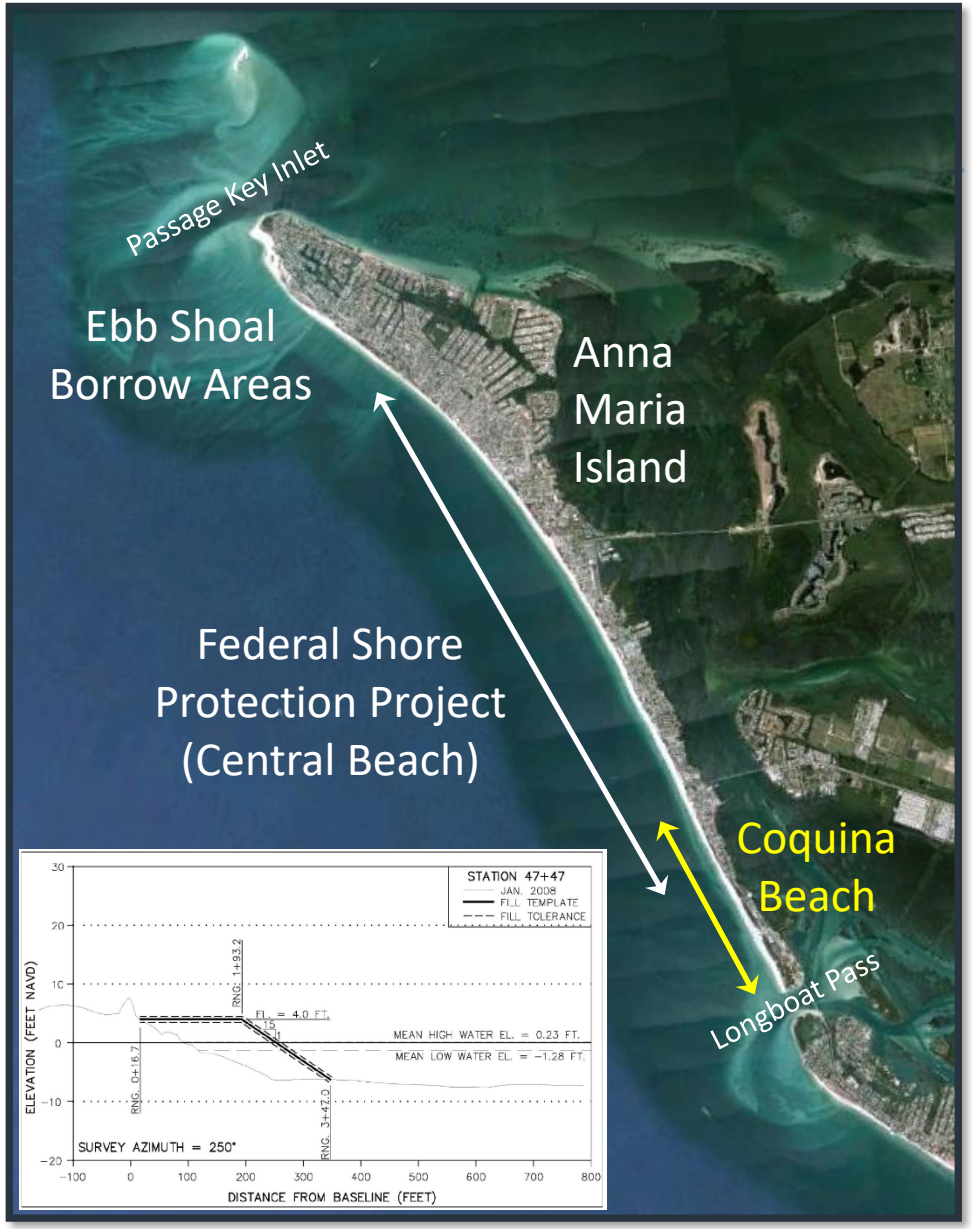
Longboat Pass Federal Channel
Used multiple times for Coquina Beach & Longboat Key

DECADES OF COMMITMENT TO BEACHES

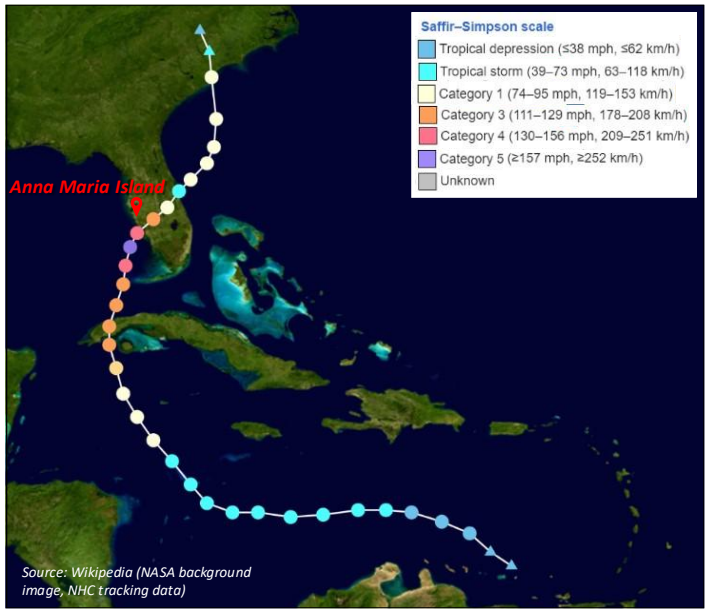


COQUINA BEACH PROJECT

- 1.5 miles from 4th St. S to Longboat Pass
- Initial restoration in 2011
- Meets FEMA “Engineered Beach” standard
- Renourished in 2013-2014 and 2020
- FEMA repair project completed 2021
- Hurricanes Ian & Nicole in 2022
- Hurricane Idalia in 2023
- Hurricanes Debby, Helene, & Milton in 2024

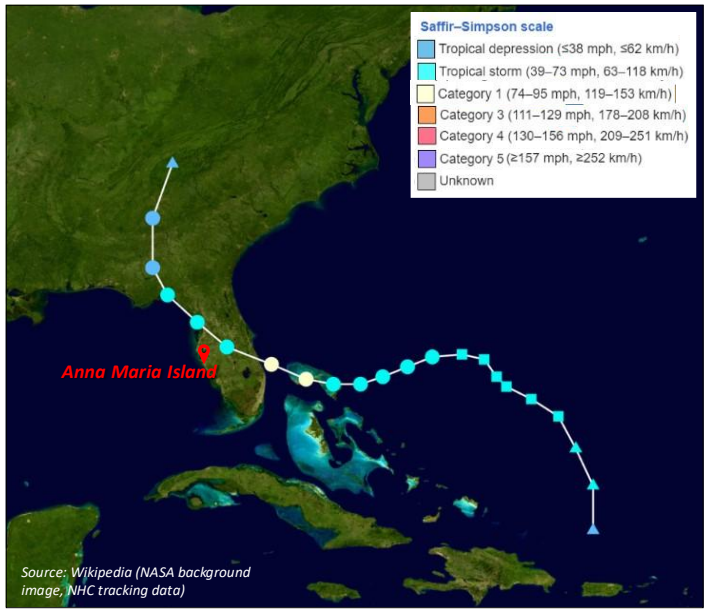


THE 2022-2023 HURRICANE SEASONS



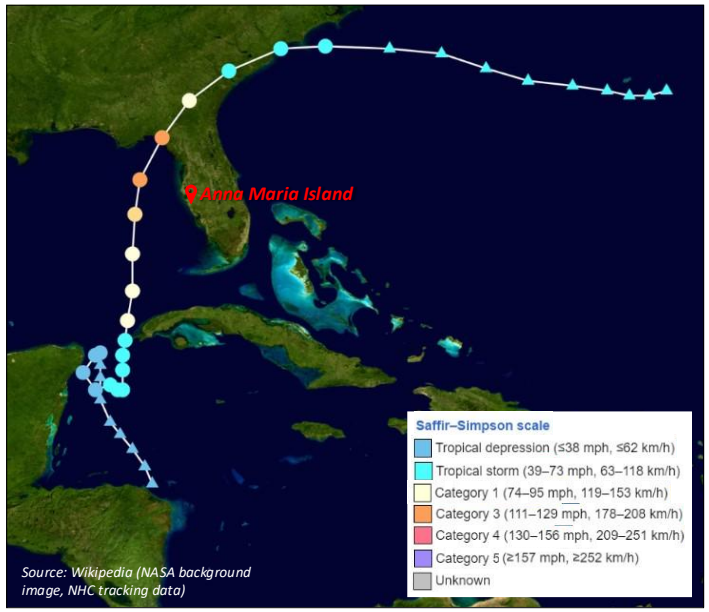
Hurricane Ian

- September/November 2022
- Federal disaster, DR-4673-FL
- Landfall in the Cayo Costa as Cat 4
- **Major reverse surge (drawdown)**
- **Minor impacts from surge and waves**
- FEMA approved Categories A-G



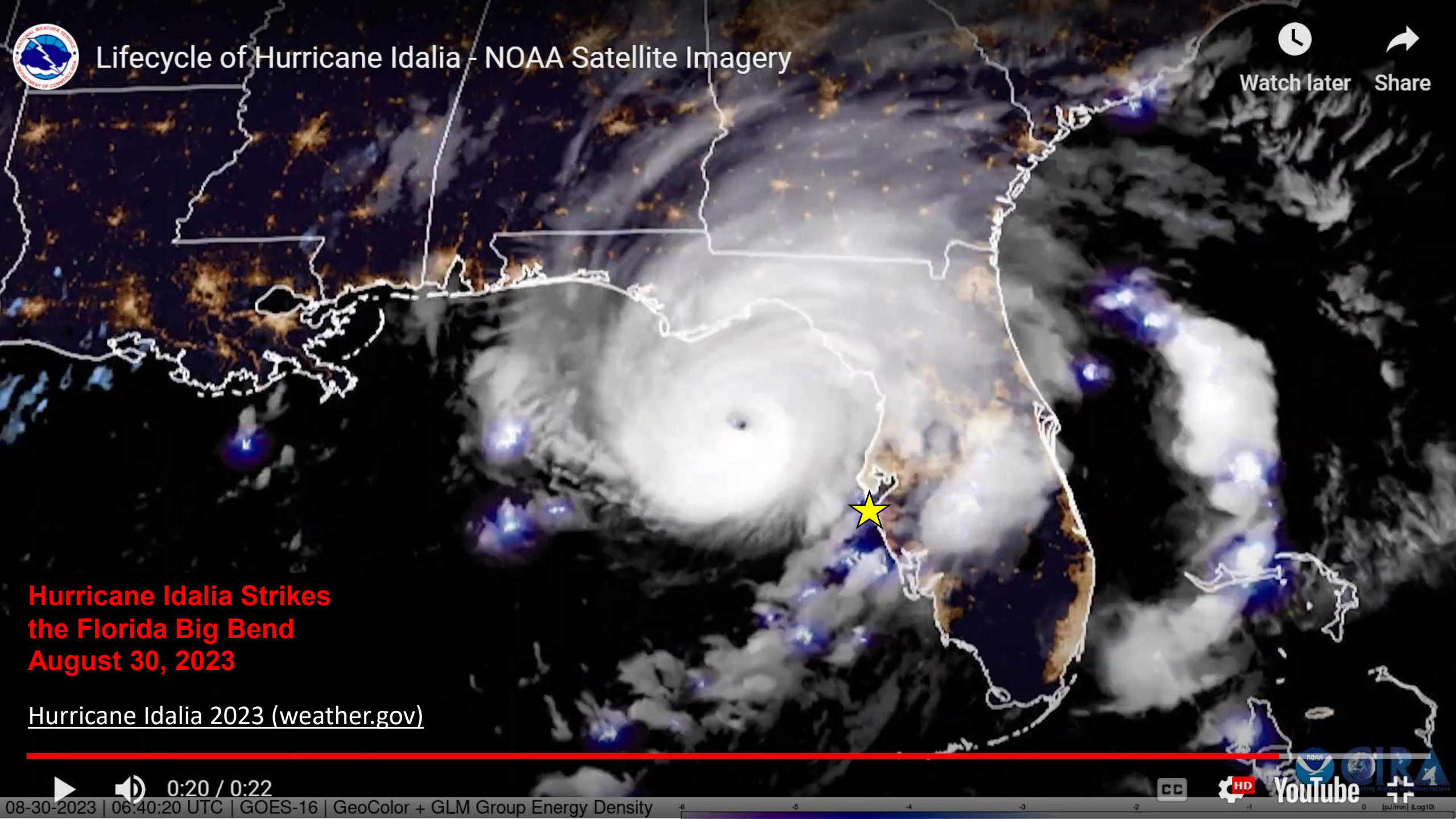
Hurricane Nicole

- November 2022
- Federal disaster, DR-4680-FL
- Two landfalls as Cat 1 and T.S.
- **Minor surge event**
- **Indirect impacts from surge and waves**
- FEMA approved Category B only



Hurricane Idalia

- August/September 2023
- Federal disaster, DR-4734-FL
- Landfall in the Big Bend as Cat 3
- **Direct impacts from surge and waves**
- **Documented storm induced erosion**
- FEMA approved Categories A-G


Lifecycle of Hurricane Idalia - NOAA Satellite Imagery
Watch later
Share
Hurricane Idalia Strikes
the Florida Big Bend
August 30, 2023
Hurricane Idalia 2023 (weather.gov)
0:20 / 0:22
08-30-2023 | 06:40:20 UTC | GOES-16 | GeoColor + GLM Group Energy Density

HURRICANE IDALIA (2023)

- **+4.7 ft storm surge (peak)**
  - 40-year return interval
- **15.9 ft wave height (peak)**
  - >100-year return interval
- USACE rehabilitation assistance requested for Central Beach (FCCE)
- FEMA storm damage repair funding requested for Coquina Beach (Cat G)
- Continuous coordination with FEMA and USACE ongoing into 2024

POST STORM ASSESSMENT

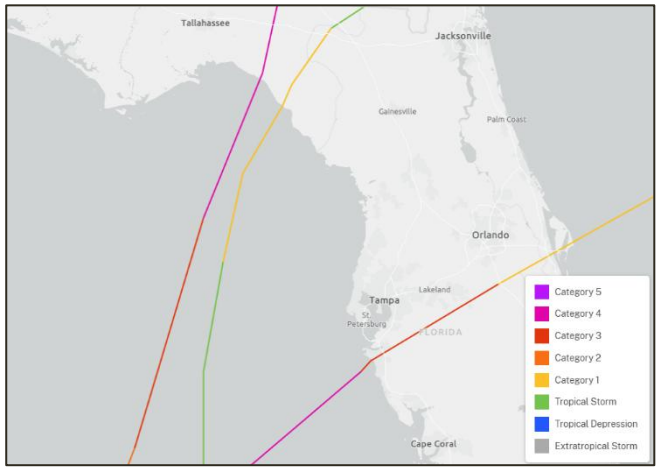
R-35.6 (Southernmost Cortez Groin)

March 25, 2021 (Post-Construction)

August 31, 2023 (Post-Idalia)

- FEMA Public Assistance Program
  - Category G – Parks, Recreational Facilities, …
  - Publicly owned facilities, i.e. “Engineered Beach”
  - Storm Damage Report submitted January 2024
- Storm Damage Volume Estimates
  - -91,200 cy Pre (Dec 2022) to Post (Oct 2023)
  - +16,400 cy background erosion
  - -74,800 cy storm-induced change (to DOC)
- FEMA Approved Cost: $4,202,623.75
  - Cat G + 406 HMP @ 75% Federal Share

2024 HURRICANE SEASON: THREE STORMS IN 60 DAYS



HURRICANE DEBBY
(August 12, 2024)

Category 3
Landfall in FL Big Bend Region

Water Levels
5-yr Return Period

Waves
30-yr Return Period

Beach overtopping and deflation but no substantial dune erosion

HURRICANE HELENE
(September 26, 2024)

Category 4
Landfall in FL Big Bend Region

Water Levels
>100-yr Return Period

Waves
>100-yr Return Period

Significant beach damage, substantial sand erosion, dune retreat and destruction, major sand overwash

HURRICANE MILTON
(October 9, 2024)

Category 2
Landfall near Siesta Key, FL

Water Levels
<1-yr Return Period

Waves
>100-yr Return Period

Storm surge drawdown, alongshore transport, and intense wave action

GULF DRIVE - SEPTEMBER 30, 2024

PART 2: STORM RESPONSE PLAN

Morjana Signorin, MS | CPE

ANNA MARIA ISLAND COASTAL PROGRAM: 30+ YEARS OF INVESTMENT

- **Ongoing monitoring programs**
  - Annual island-wide topographic and bathymetric surveys
  - Biological and hardbottom monitoring as required by permits

- **Annual FDEP Local Government Funding Requests (LGFR) submitted each July**
  - Funding agreements cover field investigations, design, permitting, construction, and monitoring

- **Long-term program continuity created the institutional knowledge and documentation infrastructure that enabled rapid 2024 response**

PRE- AND POST-STORM DOCUMENTATION

Anna Maria Island Beaches Storm Preparedness and Response Plan

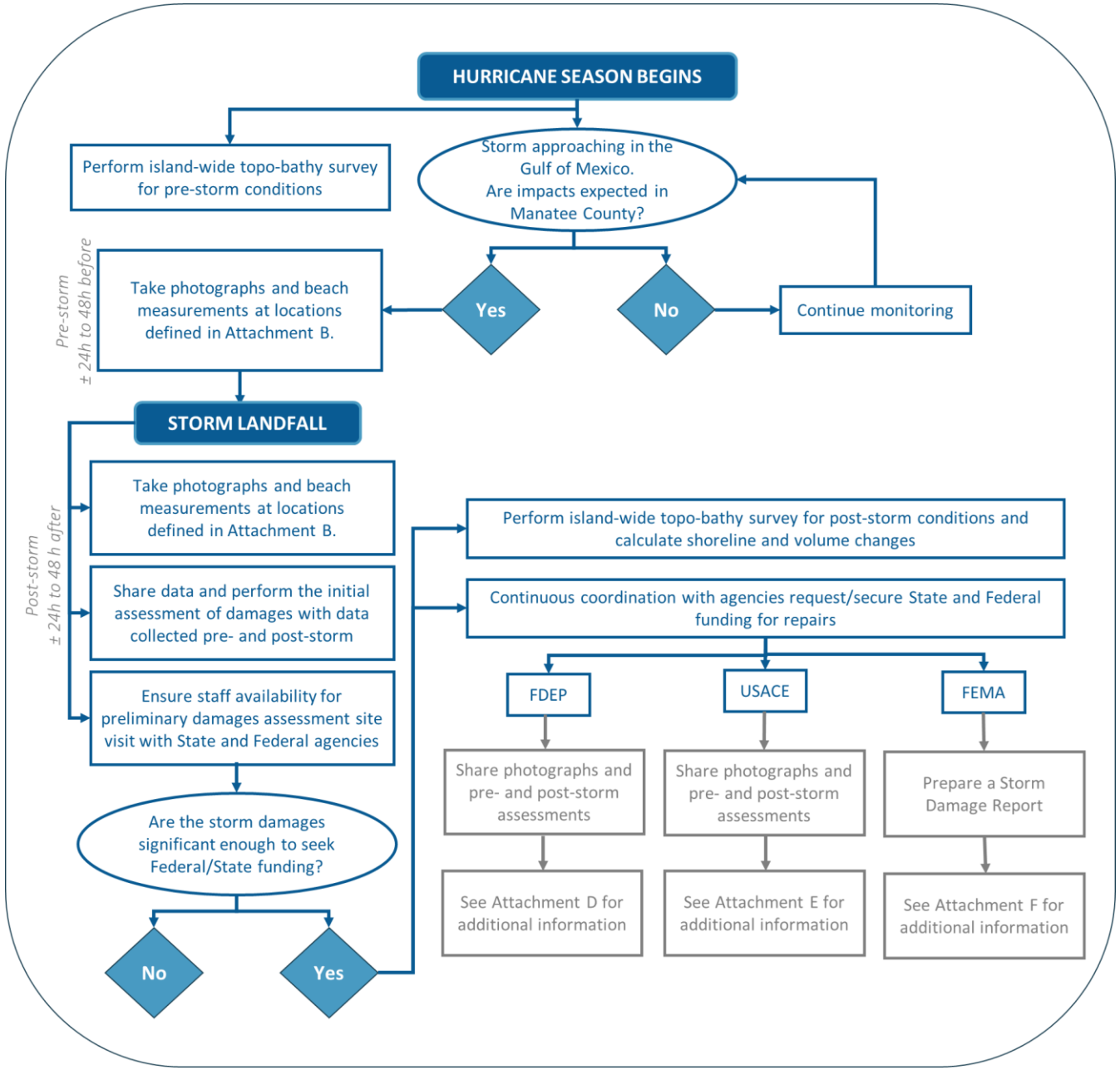
III. PRE-SEASON / PRE-STORM ACTIONS

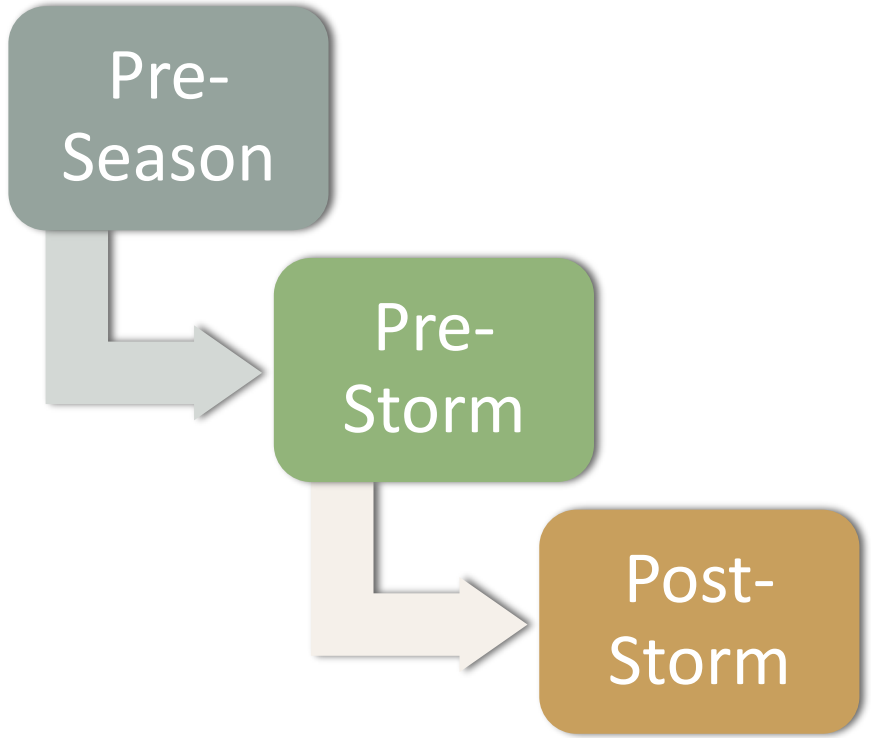
A Flow Chart summarizing all phases of this Plan is provided as Attachment A, and Attachment B provides Transect Locations for collection of photos and beach measurements. Attachment C provides the list of contacts from each agency, and Attachments D, E, and F provide detailed information about FDEP, USACE, and FEMA pre- and post-storm guidance, respectively. Tasks 1a to 1e listed below should be completed to the best extent possible in preparation for a storm event.

Task #	Action	Timing	County	Consultant
1a	**Survey:** Perform island-wide topographic and bathymetric survey at the beginning of the hurricane season to obtain pre-storm conditions in Anna Maria Island.	Pre-season		x
1b	**Monitor:** Monitor Atlantic tropical cyclones and disturbances during the entire extension of the hurricane season to determine if any of the storms could potentially affect Manatee County.	Throughout season		x
1c	**Notices:** Notify the County if any impacts are expected on Anna Maria Island.	3 to 5 days pre-storm		x
1d	**Beach Measurements and Photos:** Take pre-storm photographs and collect beach measurements at the transects specified in **Attachment B**. Ideally, this task would be performed within 24 to 48 hours before the storm's forecasted landfall, if possible.	24 to 48 hours pre-storm	x	
1e	**Coordination:** Maintain open lines of communication to keep all parties informed throughout the process.	Throughout season	x	

- Manatee County's proactive strategy for managing tasks during major coastal storms that threaten the beach and dune system.
- Defined actions for pre-season, pre-storm, post-storm, and post-season to improve preparedness and response to erosion impacts.

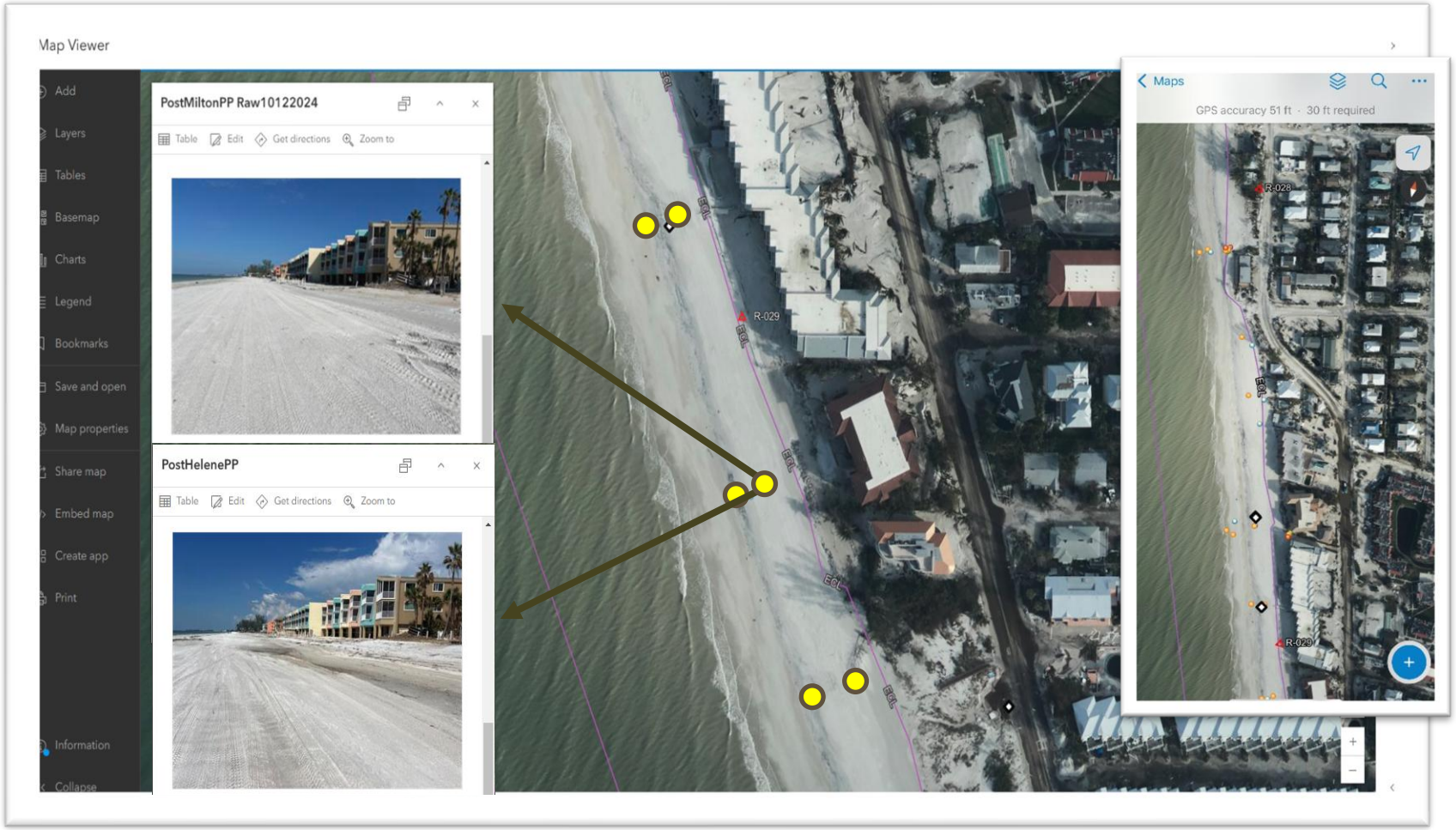
RESPONSE PLAN FLOW CHART



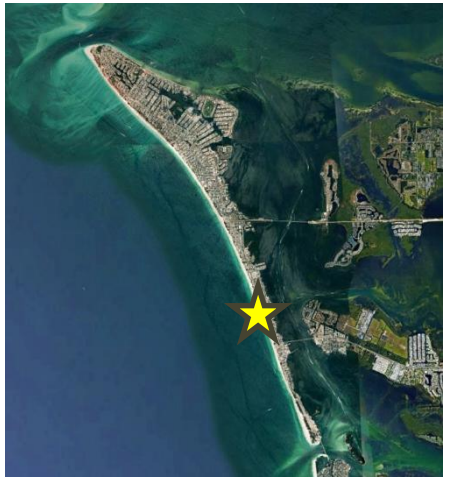


PRE- AND POST-STORM DOCUMENTATION

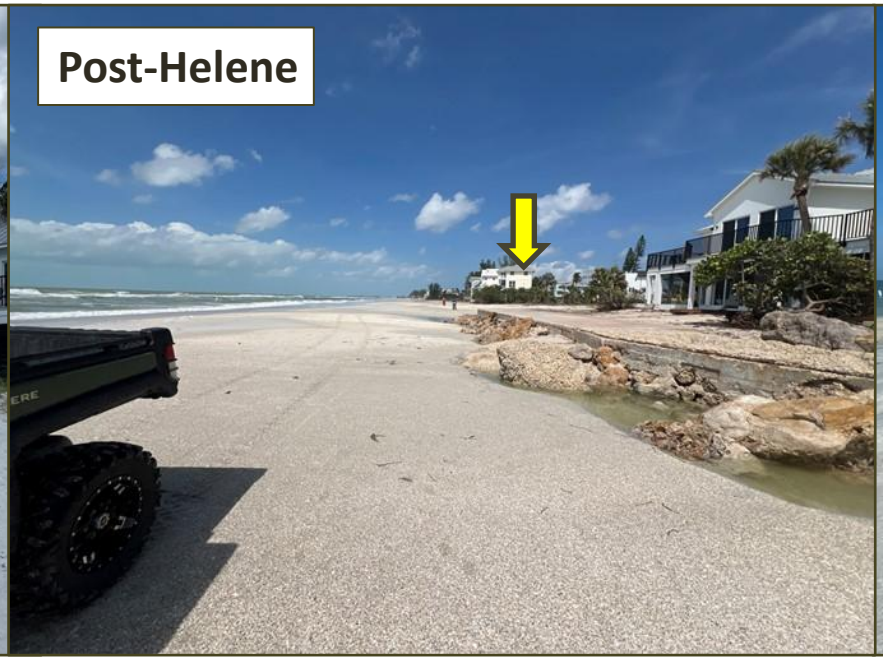
- 26 transects in Anna Maria Island
- Photos & beach width measurements
- ArcGIS Field Maps



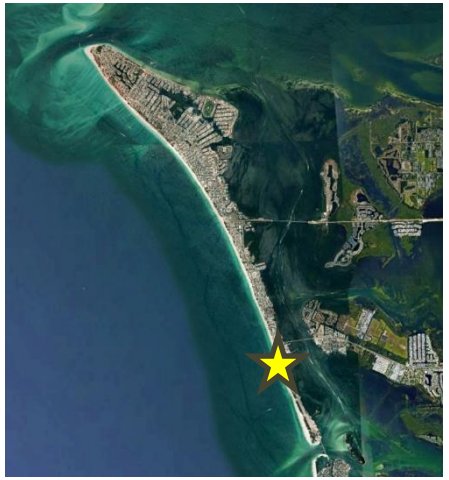
PRE- AND POST-STORM CONDITIONS



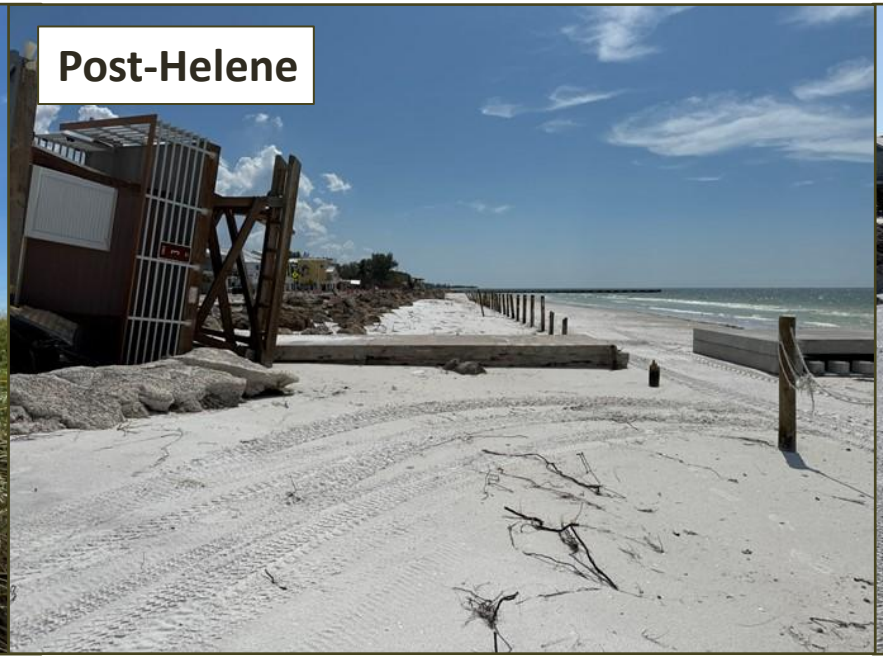
- Central Beach, R-30, facing North



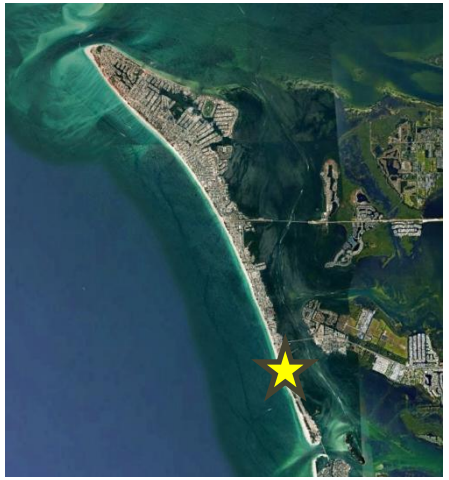
PRE- AND POST-STORM CONDITIONS



- Cortez Beach, R-34, facing South

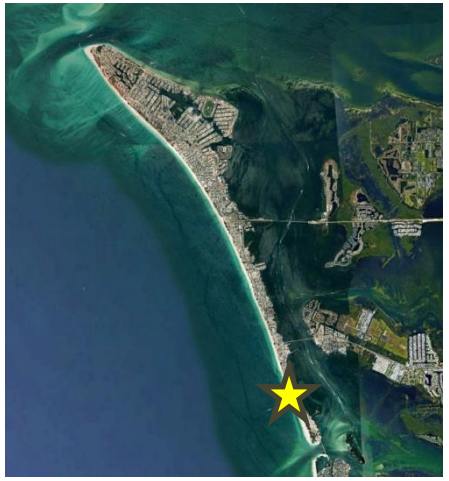


PRE- AND POST-STORM CONDITIONS



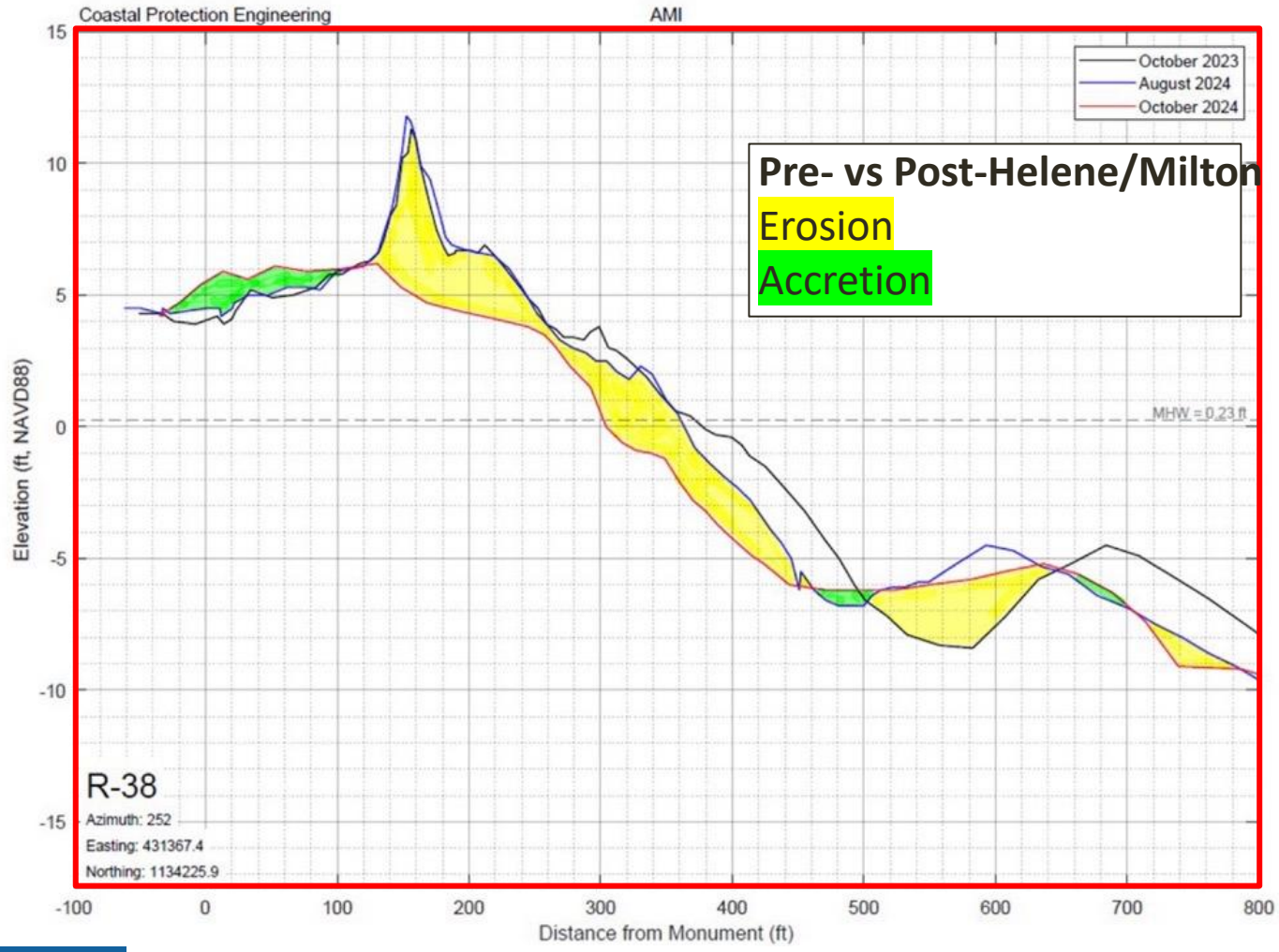
- Coquina Beach, R-35, facing West

PRE- AND POST-STORM CONDITIONS



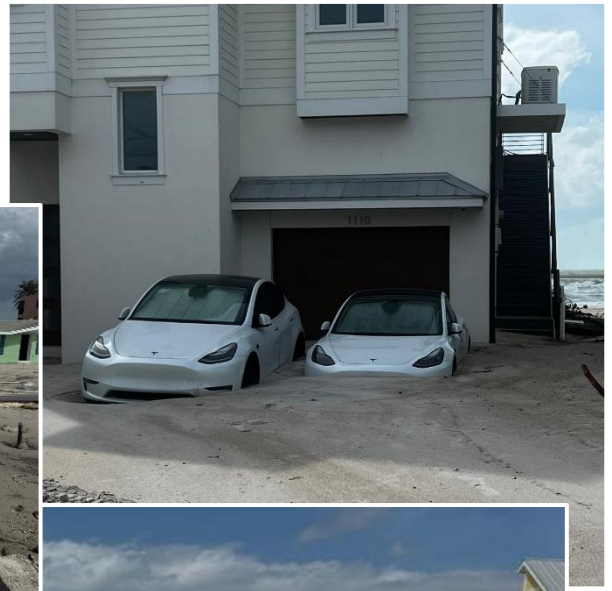
- Coquina Beach, R-37, facing East

ISLANDWIDE VOLUMETRIC CHANGES



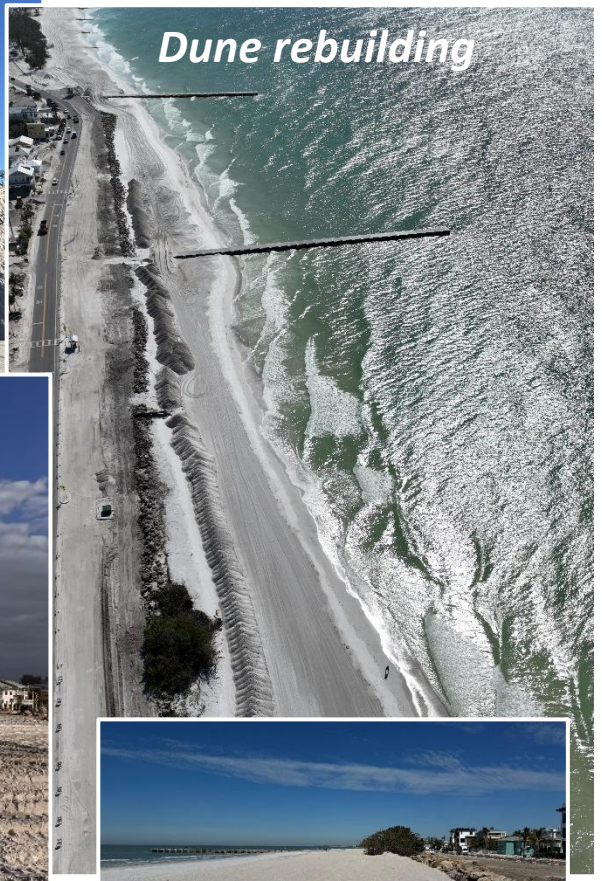
RECOVERY OF OVERWASHED SAND

- FDOT cleared roads and restored access
- Outreach to other local governments with similar post-storm recovery experience
- Sand and debris stockpiled at Coquina Beach
- Quick decisions on sand management:
  - County managed all the incoming sand from Anna Maria Island's three municipalities
  - Sand Debris Management Team created
  - Sand piles separated by source and condition
  - "Uncontaminated" sand was sifted and reused
  - Dune rebuilding and County parks, trails, roads



SAND SCREENING AND REPLACEMENT

- Sand recovered from roads and public areas considered suitable for replacement on beach
- All sand to be returned to the beach was screened with a ¾ inch diamond pattern screen
- Placement on public beaches
- 3.3 cy/lf dune template created along the entire extent of Coquina Beach (1.4 miles)
- Some locations doubled/tripled up
- 36,000 cy of sand replaced



A YEAR'S WORTH OF WORK IN 45 DAYS…

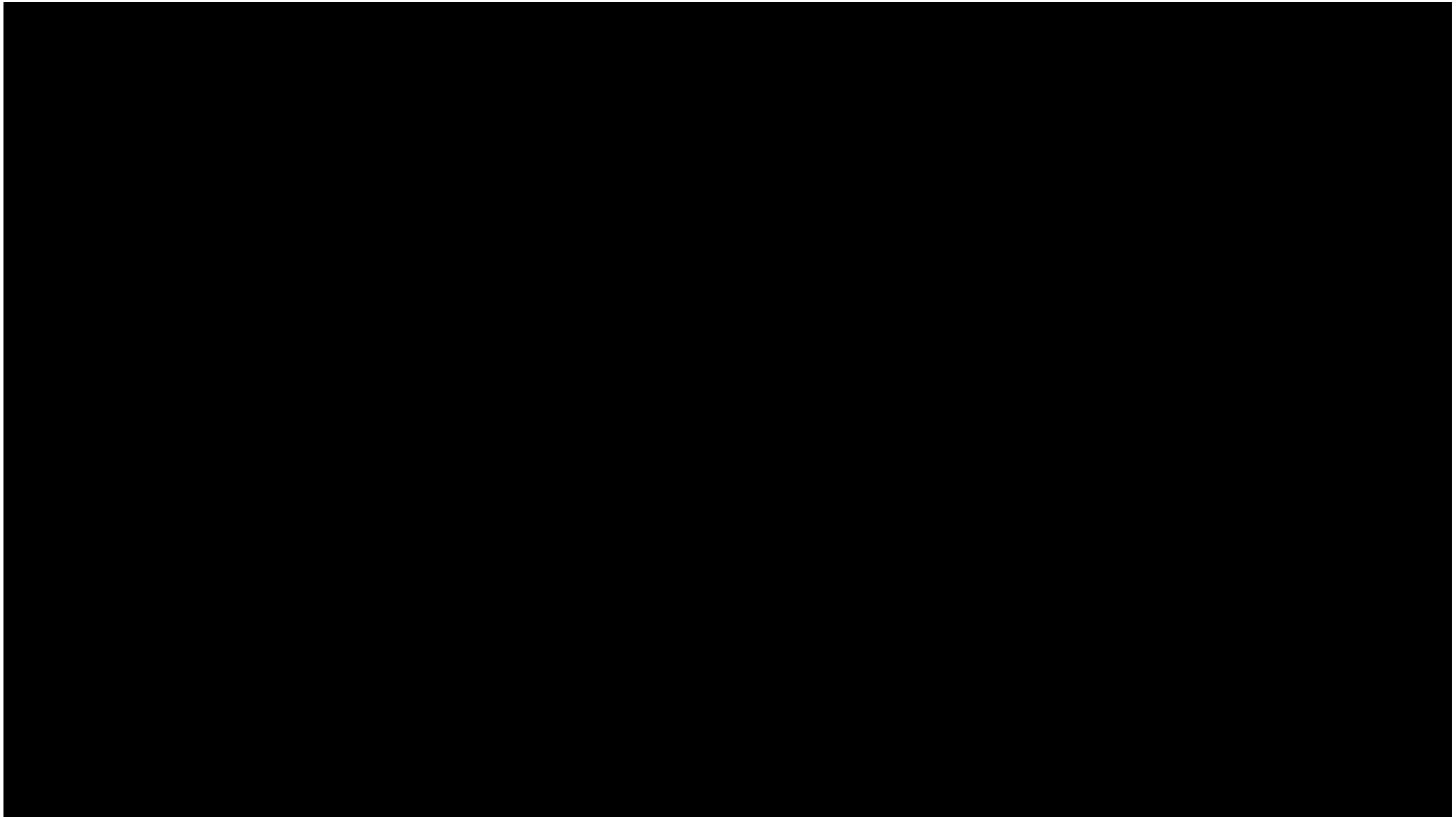
PART 3: THE COUNTY'S PERSPECTIVE

Charlie Hunsicker | Manatee County Natural Resources

RESPONSE AND RECOVERY

- **Federal Government**
  - USACE, FEMA
- **State of Florida**
  - Office of the Governor
  - FDEM, FDOT
- **Manatee County**
  - All Departments
- **Local Cities**
  - City of Anna Maria
  - City of Holmes Beach
  - City of Bradenton Beach


Manatee
County
FLORIDA
The Recovery Process



TEAM EFFORT!

Charlie Hunsicker (Natural Resources, Manatee County)

Sherri Swanson (Natural Resources, Manatee County)

Natalie Moreno (Natural Resources, Manatee County)

Annette Cottrell (Natural Resources, Manatee County)

Joseph Mandara (Natural Resources, Manatee County)

Vicki Hommel (Financial Management, Manatee County)

Brad Szink (Public Safety, Manatee County)

Albert Rosenstein (Public Works, Manatee County)

Chad Butzow (Public Works, Manatee County)

Pat Shea (Utilities, Manatee County)

Carmine DeMilio (Property Mgmt, Manatee County)

Chet Brown (Public Safety, Manatee County)

David Shurmur (Parks, Manatee County)

Aimie Johnson (Parks, Manatee County)

Shane Fitzgerald & Team (Ashbritt)

ICS Materials

TetraTech

Hagerty Consulting

Tom Pierro (CPE)

Morjana Signorin (CPE)

Lauren Floyd (CPE)

Chelsea Ryan (CPE)

Dylan Nestler (CPE)

Akash Sahu (CPE)

Katie Velasquez (CPE/MRD)

Frank Marshall (CPE-NC)

Daniela Cordeiro (CPE)

Chase Davis (CPE)

Michelle Pfeiffer (CPE)

APTIM

EOMAP

FDEP

FEMA

USACE

COUNTY POST STORM REQUIREMENTS

- First in - Damage Reports
- FEMA Documentation
- Coordination with Island Cities
- Scopes of Work: Repair vs Recovery
- FDEP Cost Share Approvals
- County Commission Approvals
- Procurement Steps
- Emergency Orders

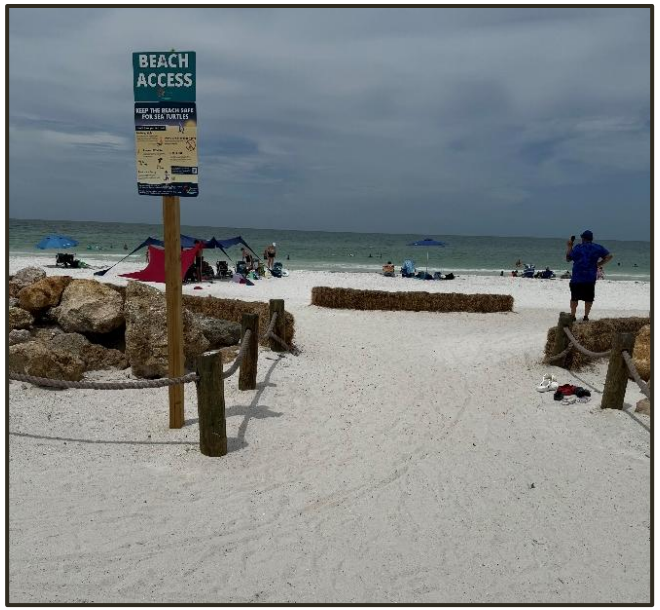
Manatee County FLORIDA

CORTEZ BEACH RECOVERY AND LONG-TERM RESILIENCE

- Rebuilt dune system, walk, and parking to restore access and protection
- Interim measure to stabilize shoreline and public use
- Ongoing study for resilient revetment/seawall reconstruction

SEA TURTLE NESTING PROTECTIONS

- Hay bales installed to block gaps in rocks and pathways to prevent turtles and hatchlings from getting trapped
- Temporary seasonal measure while engineered shoreline stabilization measures are being designed and permitted



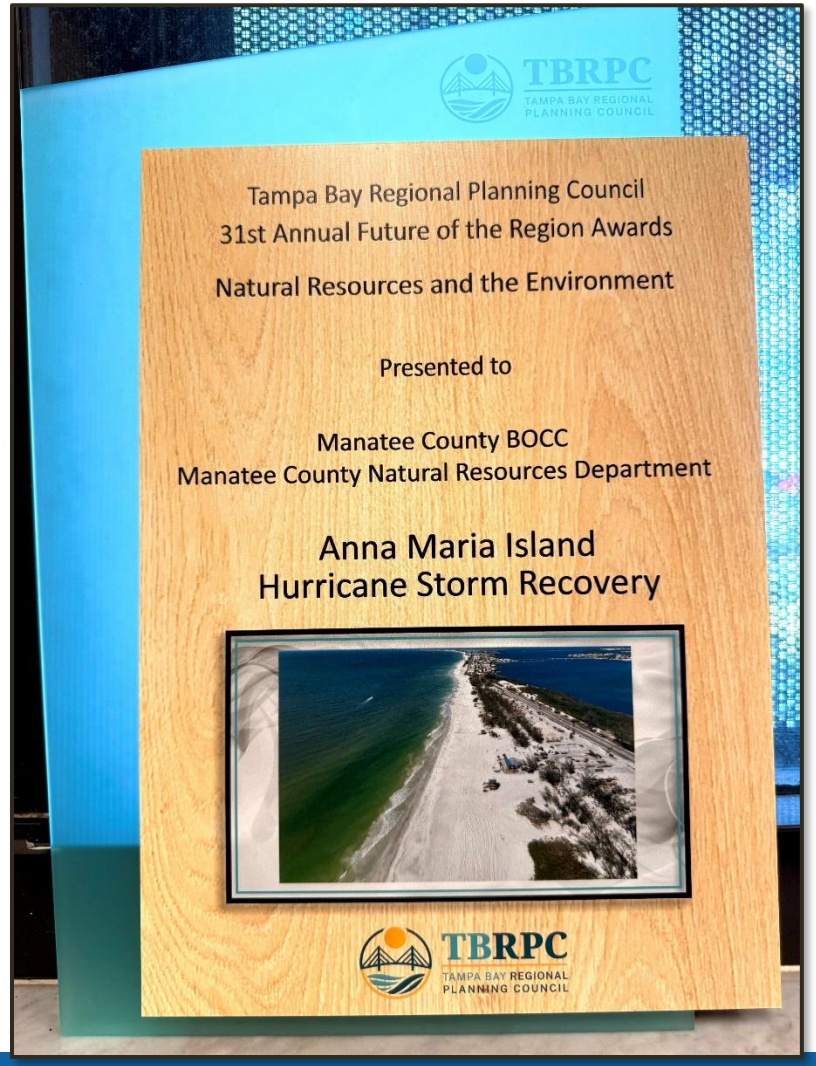
RESTORING ISLAND RESILIENCE THROUGH DUNE PLANTING

- Volunteer events to restore dunes and enhance coastal protection
- Non-Profit Keep Manatee Beautiful event (July) mobilized 300 volunteers to plant 12,000 sea oats on Anna Maria Island

Manatee County FLORIDA

MANATEE COUNTY RECOGNIZED FOR REGIONAL EXCELLENCE

- Manatee County received a series of awards by the Tampa Bay Regional Planning Council (TBPRC) for its continued cooperation, community coordination and solution sharing with fellow governments in Citrus, Hernando, Hillsborough, Pasco and Pinellas Counties, including:
  - Natural Resources Department received the Future Region Award in the Natural Resources & Environment Category for the Anna Maria Island Hurricane Recovery, which saved the County around $4.5M



NEXT STEPS: THE LONG ROAD AHEAD

- **Funding secured:**
  - FCCE funding secured for Central Beach SPP reconstruction
  - FEMA Storm Damage Report submitted for Coquina Beach
- **Ongoing and planned work:**
  - Reconstruct Central Beach and Coquina Beach
  - Complete armoring revetment at Cortez Beach/North Coquina
  - ADA-compliant dune overwalks, lifeguard towers, overwash scour pad replacement
  - Continued dune planting and revegetation program
- **Long-term resilience:**
  - Coquina Beach Stabilization Project (breakwaters replacing deteriorated groins)
  - Longboat Pass Jetty rehabilitation
  - Annual monitoring program — continued investment in pre-storm baselines

PART 4: WRAP UP + Q&A

All Presenters | Open Discussion

TOP LESSONS FOR BEACH COMMUNITIES

1. **Invest in monitoring before the storm**

   Annual baseline surveys and a documented response plan are prerequisites for funded recovery

2. **Cumulative stress compounds damage exponentially**

   Three 2024 storms in 60 days on a system already impacted by Idalia in 2023, Ian & Nicole in 2022

3. **Speed matters, but coordination matters more**

   Multi-department, multi-municipal coordination enabled 36,000 cy of sand recovery in ~45 days

4. **Data-driven decisions save real money**

   Drone surveys, volume calculations, and photo documentation strengthened damage claims

5. **Proactive programs protect beaches and budgets**

   FEMA and USACE funding is based on documented pre-storm conditions and reimbursement requires evidence

6. **Recovery is a long road**

   Sand screening and dune repair are interim measures - full nourishment reconstruction is still underway

7. **Persistence pays off**

   Public assistance is a long, complicated process that requires tracking, multi-agency feedback, and continuous attention

GOVERNOR'S HURRICANE CONFERENCE®

THANK YOU

Thomas Pierro, PE, BC.CE, Coastal Protection Engineering
Morjana Signorin, MS, Coastal Protection Engineering
Charlie Hunsicker, Manatee County

Coastal Protection Engineering

Manatee County Florida