

# MANATEE COUNTY BOARD OF COUNTY COMMISSIONERS

## BEACH PROGRAM UPDATE

Charlie Hunsicker  
Thomas Pierro, PE, DCE  
Lauren Floyd

Director, Parks & Natural Resources  
Director of Operations, APTIM  
Senior Marine Biologist, APTIM

**February 12, 2019**



## TODAY'S OBJECTIVE

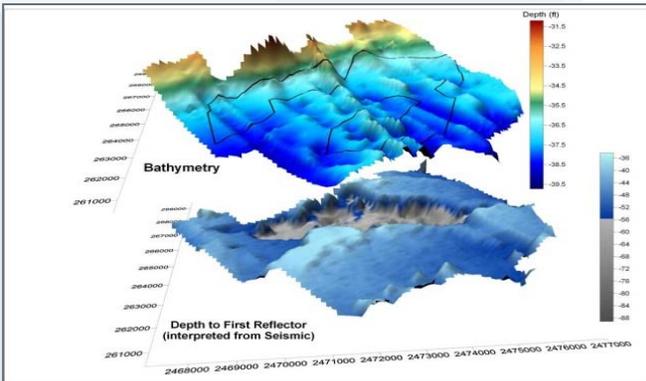
*Provide an overview of the program history of beach renourishment, the current and upcoming tasks for comprehensive beach management, and the associated costs, funding sources, and partners.*

# AGENDA

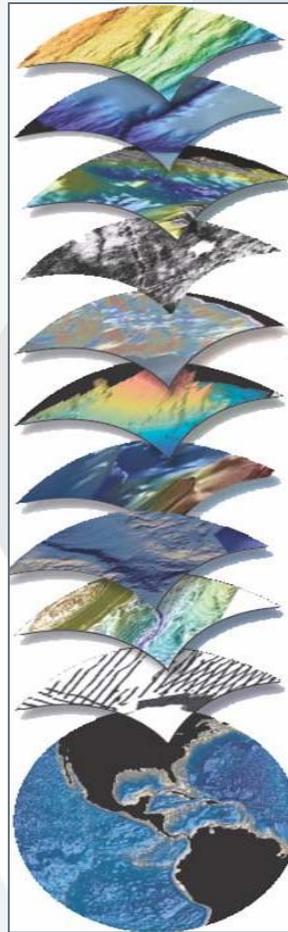
- Introduction to APTIM Consulting Engineers of Record
- Introduction to Beach Nourishment 101
- Manatee County's Beach Program Overview and Project History
- Anna Maria Island Coastal Environment Protection Requirements
- Longboat Pass Inlet Management with the Town of Longboat Key
- Upcoming Beach Management Projects, Status and Funding
- Discussion

# APTIM ENVIRONMENTAL & INFRASTRUCTURE, INC.

## ENGINEERING & MODELING

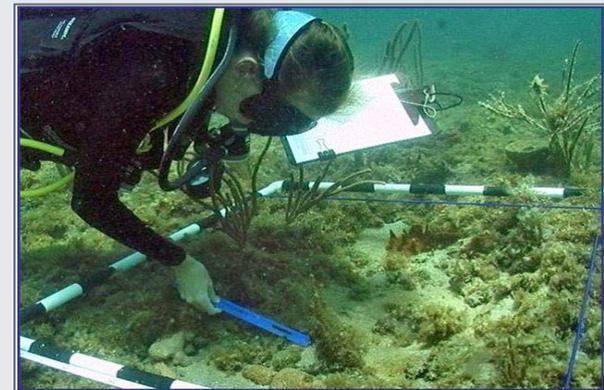


## COASTAL SURVEY



## GIS/CAD SERVICES

## COASTAL GEOLOGY



## BIOLOGICAL SCIENCES

# MANATEE COUNTY'S APTIM TEAM



**Senior Project Manager/  
Principal Engineer**  
Thomas Pierro, PE, DCE

**QA/QC Managers**  
Douglas W. Mann, PE, DCE  
Stacy Buck

**Program Advisor**  
Lindino Benedet, Ph.D., MBA

**Project Manager/  
Sr. Coastal Engineer**  
Michelle Pfeiffer, PE

**Coastal Engineering**  
Doris Otero  
Erica Carr-Betts

**Numerical Modeling**  
João Dobrochinski  
Morjana Signorin  
Zhifei Dong, Ph.D.

**Permitting & Environmental Monitoring**  
Lauren Floyd  
Katy Brown

**Survey & Mapping**  
Jeff Andrews, PSM, CH  
Michael Lowiec, PSM  
Franky Stankiewicz

**Geophysical/ Geotechnical**  
Beau Suthard, PG  
Quin Robertson, Ph.D.  
Kristina McCoy, PG  
Beth Forrest-Vandera, Ph.D.

**GIS/CAD**  
Angela Belden  
Heather Vollmer, GISP  
Gary Krystyniak

# MANATEE COUNTY PROJECT HISTORY

- 1989 Manatee County Beach Management Plan
- **1992-1993 Anna Maria Island Central Beach Nourishment Project**
- 1993 Artificial Mitigative Reef Construction
- 1994 Dune Restoration Project
- 1996-2004 Town of Longboat Key Canal Maintenance Project, Sarasota and Manatee Counties
- 2000 Limited Reevaluation Report
- **2002 Anna Maria Island Central Beach Renourishment Project**
- 2003-2004 (2006 monitoring) Seagrass Transplantation Project, Sarasota and Manatee Counties
- 2005 Artificial Mitigative Reef Construction
- **2005/2006 Anna Maria Island Storm Repair Project**
- 2006 Anna Maria Island Feasibility Study
- 2010 Manatee County Public Beach Pier Demolition, Design and Permitting
- 2010–2011 Artificial (Enhancement) Reef Biological Monitoring
- 2011 Longboat Pass Inlet Management Plan Study
- **2011 City of Anna Maria and Coquina Beach Nourishment Projects**
- 2011 Coquina Beach Offshore Mitigative Reef
- 2011 Longboat Pass North End Geotextile Tube Project
- 2012 Perico Preserve Habitat Restoration Modeling Study
- 2012 Tropical Storm Debby FEMA Impact Assessment, Coquina Beach Renourishment Project
- **2013/2014 Anna Maria Island Central and Coquina Beach Nourishment Projects**
- 2014/2015 Robinson Preserve Modeling Study
- 2015/2016 Cortez Groins Replacement Project
- 2016 Hurricane Hermine FEMA Impact Assessment, Coquina Beach Renourishment Project
- 2016 Hurricane Irma FEMA Impact Assessment, Coquina Beach Renourishment Project
- 2017/2018 Passage Key Inlet Management Study
- 2017/2018 Longboat Pass Jetty Reconstruction Feasibility Study
- 2018 Coquina Beach Structural Alternatives Analysis
- **2020 Next Central and Coquina Renourishment**

# ANNA MARIA ISLAND BEACHES



## ADAPTIVE MANAGEMENT WITH BEACH NOURISHMENT PROGRAMS

**Series of nourishment events that build up protection to maintain a healthy beach over time in a resilient and sustainable manner**



## BEACHES 101: WHAT IS BEACH NOURISHMENT?

**Introduction of sand to an existing beach to compensate for losses due to erosion**



## BEACHES 101: BEACH CONSTRUCTION PROCESS

**Sand is excavated from Gulf seafloor, ~ 4000 feet offshore of Anna Maria Island**



# BEACHES 101: BEACH CONSTRUCTION PROCESS

Sand is pumped to the beach through a pipeline



# BEACHES 101: BEACH CONSTRUCTION PROCESS

Controlled placement of sand to widen beach



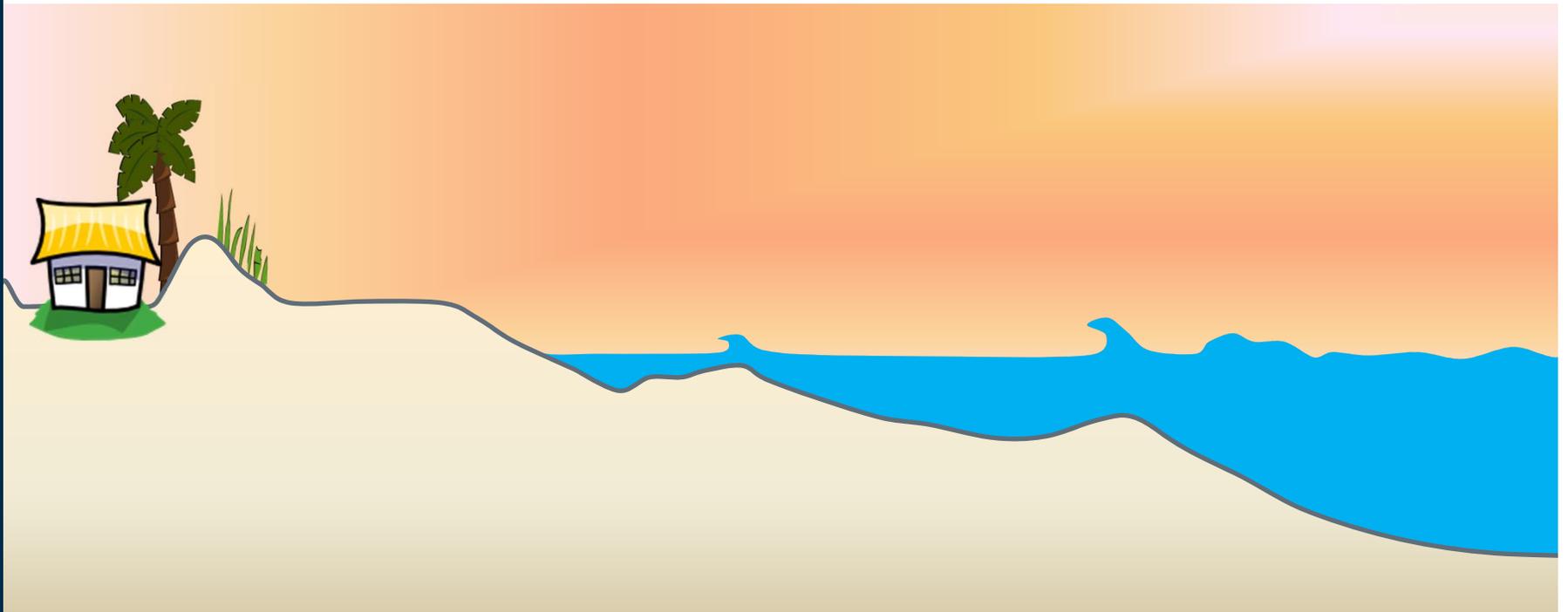
# BEACHES 101: BEACH CONSTRUCTION PROCESS

**Constructed beach is graded and dressed**



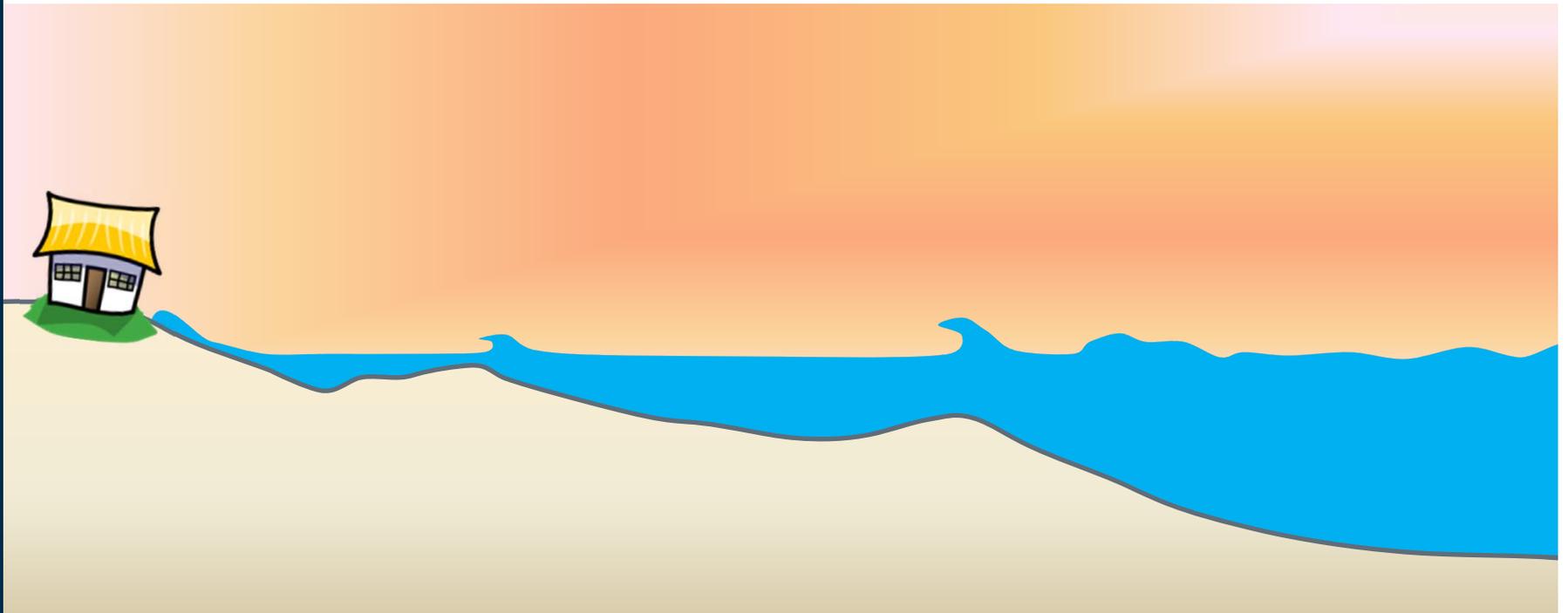
# BEACHES 101: TYPICAL BEACH PROFILE

Equilibrium Condition of a Stable Beach



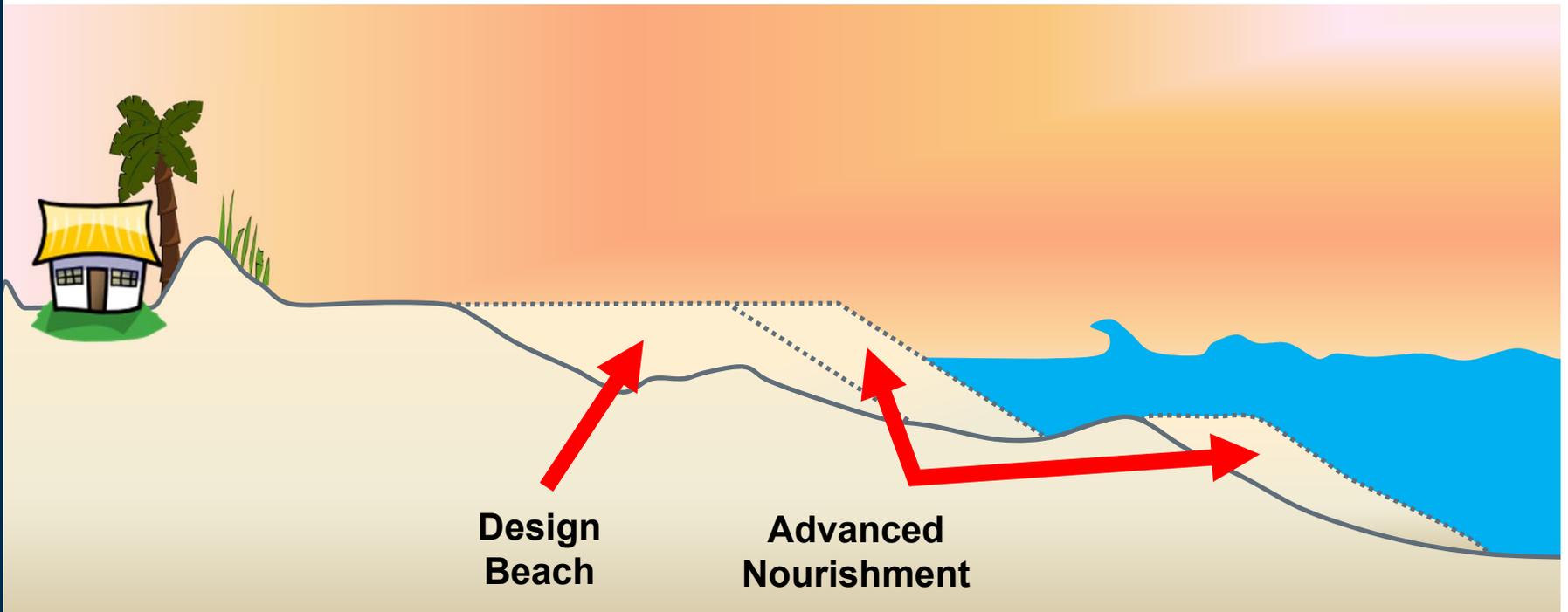
# BEACHES 101: STORM IMPACTS

## Post-Storm Beach Effects



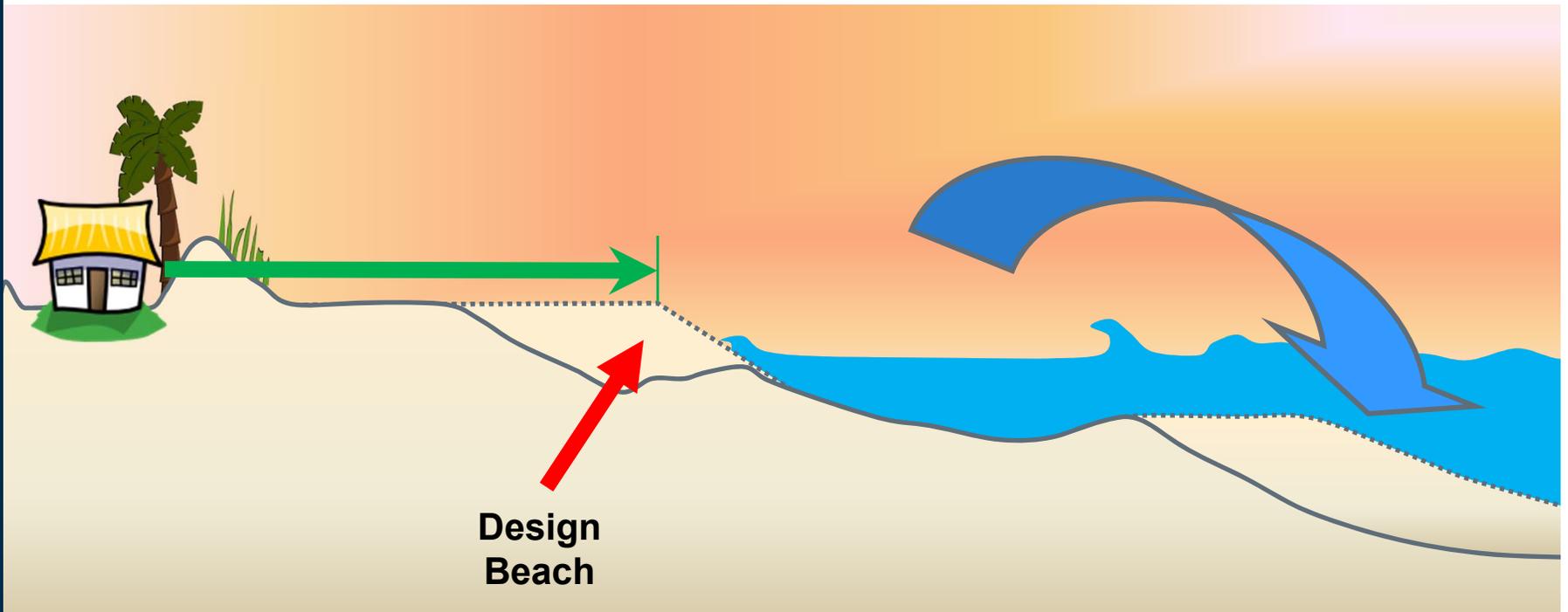
# BEACHES 101: BEACH NOURISHMENT PROGRAM

## Post-Nourishment Benefits



# BEACHES 101: STORM IMPACT BUFFER

Post-Storm Condition After Nourishment



# MANATEE COUNTY BEACH PROGRAM OVERVIEW AND PROJECT HISTORY



**City of Anna Maria**

**Holmes Beach / Bradenton Beach (Central Beach)**

**Bradenton Beach (Coquina Beach)**

- Beach Nourishment
- Artificial Reef
- Jetty Sand Tightening Testing

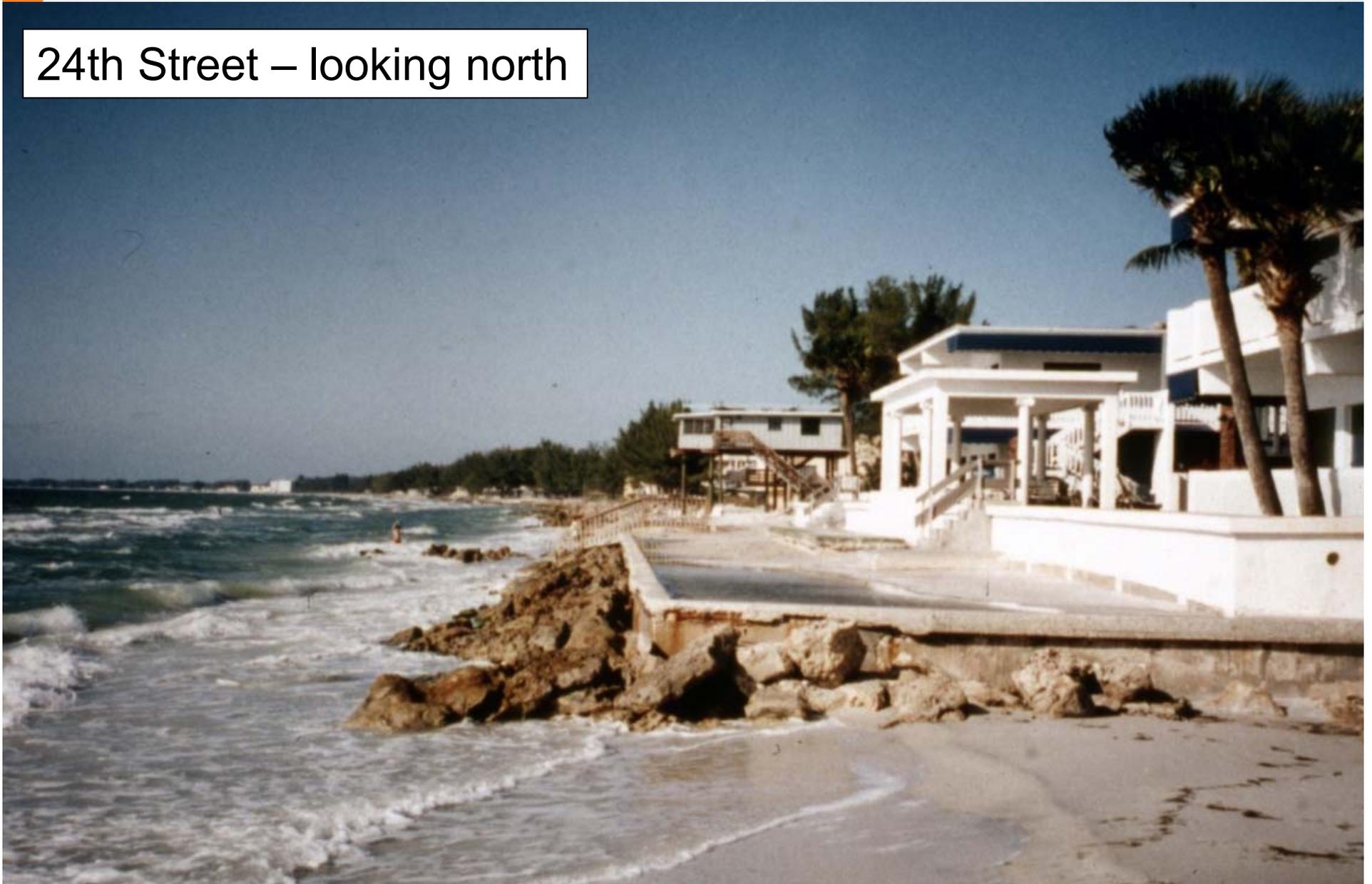


# THE BUILDING OF COQUINA BEACH CIRCA 1957



# ANNA MARIA ISLAND - 1992

24th Street – looking north



# ANNA MARIA ISLAND - 1992

33rd Street – looking south

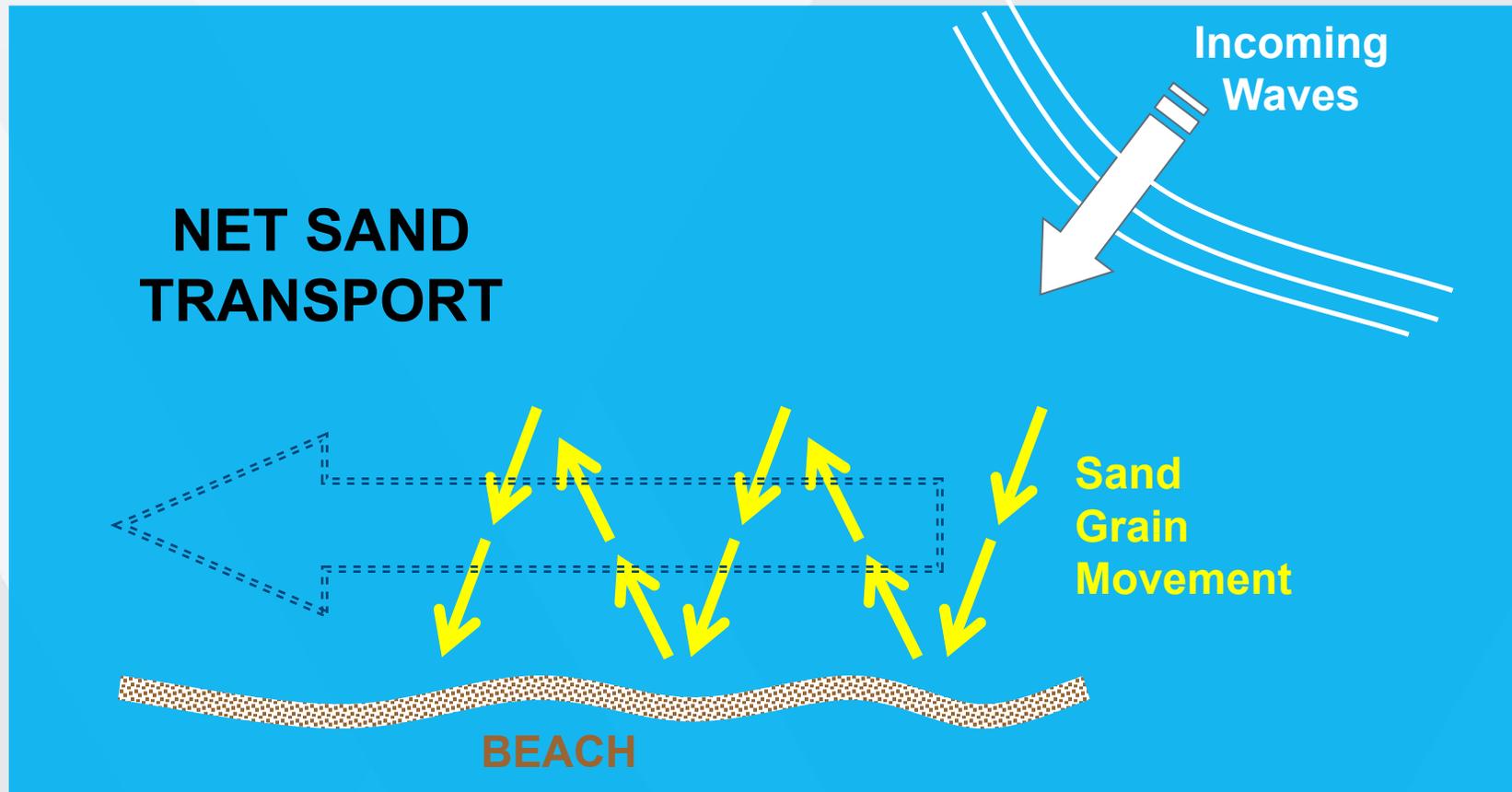


# ANNA MARIA ISLAND - 1992

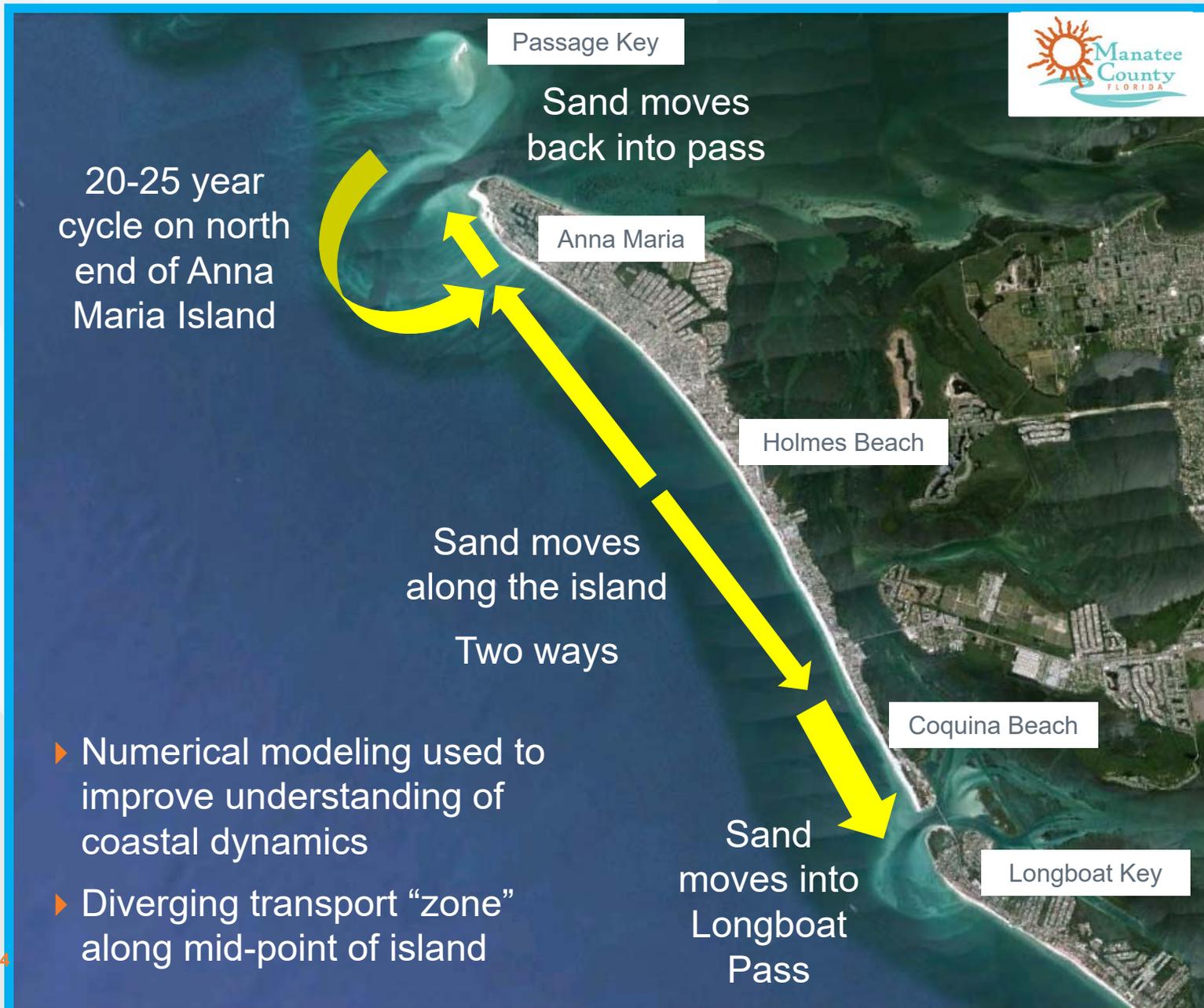
Bridge Street – looking north



# BEACHES 101: SUCCESSIVE WAVES CARRY SAND DOWNDRIFT WITH THE LONGSHORE CURRENT



# ANNA MARIA ISLAND COASTAL DYNAMICS



# MANATEE COUNTY BEACH PROGRAM OVERVIEW AND PROJECT HISTORY

- Beach nourishment has been the primary means of erosion control along the island since the 1990s
- Central Project is a federally authorized shore protection project
- Coquina Beach is a State authorized shore protection project
- Projects constructed in 1992-1993, 2002, 2005-2006, 2011 and 2013-2014
- 5.7 million cubic yards of sand introduced from offshore borrow sites since 1992
- Beach projects are supported by coastal structures such as the Cortez Groins and the Longboat Pass Jetty

## COMPLETED PROJECTS

# CENTRAL BEACH NOURISHMENT PROJECT IN THE CITIES OF HOLMES BEACH AND BRADENTON BEACH

- Federally authorized project
- Extends from 77<sup>th</sup> Street in Holmes Beach to 13 Street S in Bradenton Beach
- ~ 5 miles
- 1992/93, 2002, 2005/06, 2013/14
- Passage Key Inlet ebb shoal borrow area since 2002
- Mitigation (1993 and 2005 ARs)



# COMPLETED PROJECTS COQUINA BEACH AND CITY OF ANNA MARIA NOURISHMENT PROJECTS

- Coquina Beach
  - Extends from about Bridge Street S in Bradenton Beach to Longboat Pass
- City of Anna Maria
  - Extends from about Elm Ave to Maple Ave
- 2011 (both) and 2013/14 (Coquina)
- Passage Key Inlet ebb shoal borrow area



# COMPLETED PROJECTS 2013/14 CONSTRUCTION COST SAVINGS

- Central (federally funded) and Coquina Beach (State funded) projects constructed in one continuous fill
- Federal dredge contractor retained to complete State funded beach section
- **Saved \$4+ million in dredge company mobilization cost**
- Improved project performance across a continuous beach fill of 5.4 miles



# COMPLETED PROJECTS

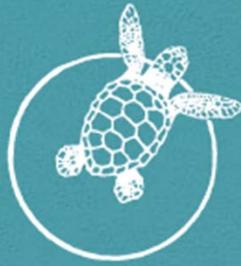
## CORTEZ GROINS REMOVAL AND REPLACEMENT

- Removal of 3 existing derelict groins and replacement with 3 Permeable Adjustable Groins (PAG's)
- Protection for Gulf Drive with a stable beach
- Total Construction Cost \$6.8M (State Share \$3.4M / Local Share \$3.4M )
- Groin permeability can be adjusted through adding/removing concrete elements in the groin structures



# ANNA MARIA ISLAND COASTAL ENVIRONMENT PROTECTION REQUIREMENTS

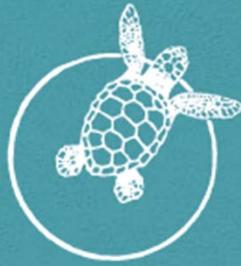




## Anna Maria Island Turtle Watch & Shorebird Monitoring

- Sea turtle monitoring and nest relocation
- Public outreach and education
- In 2018, total 534 nests recorded



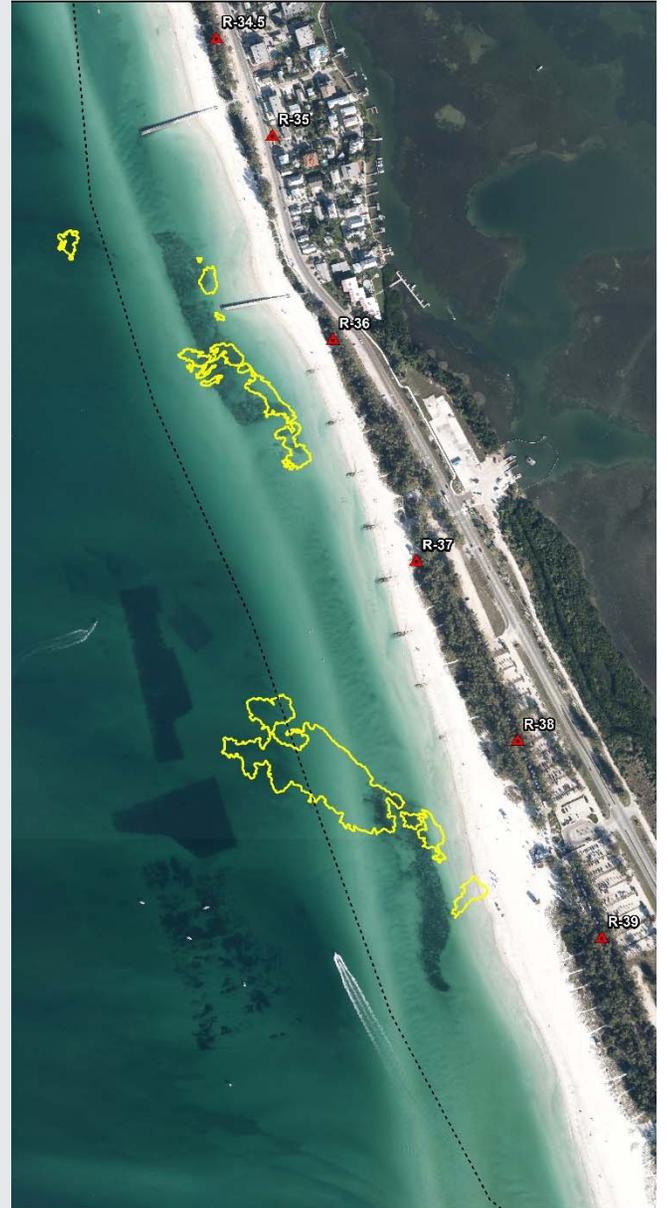
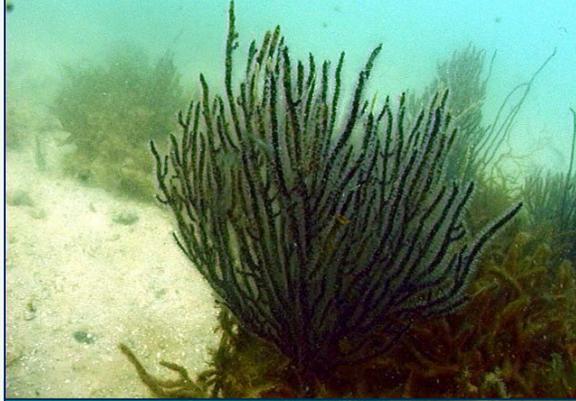
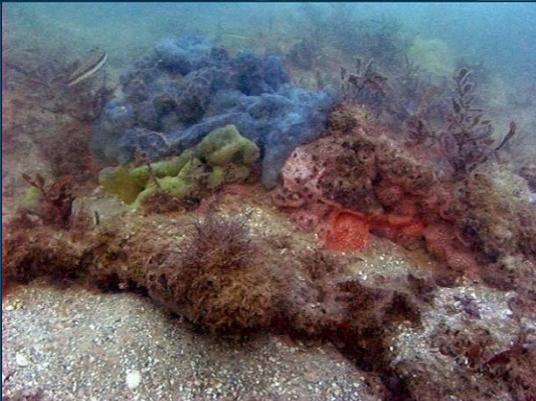
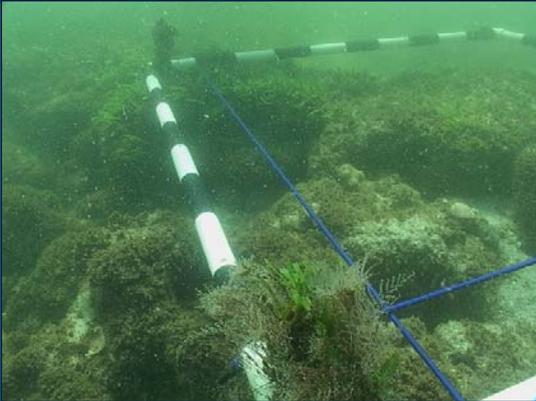
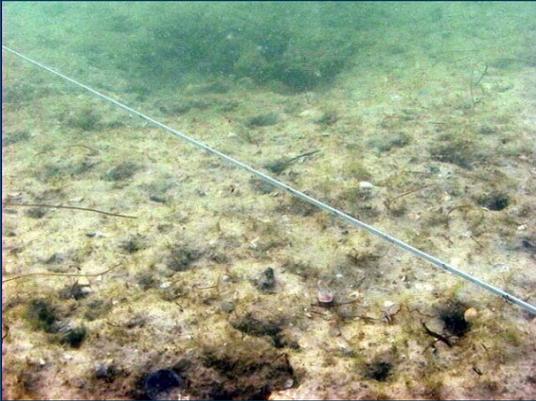


## Anna Maria Island Turtle Watch & Shorebird Monitoring

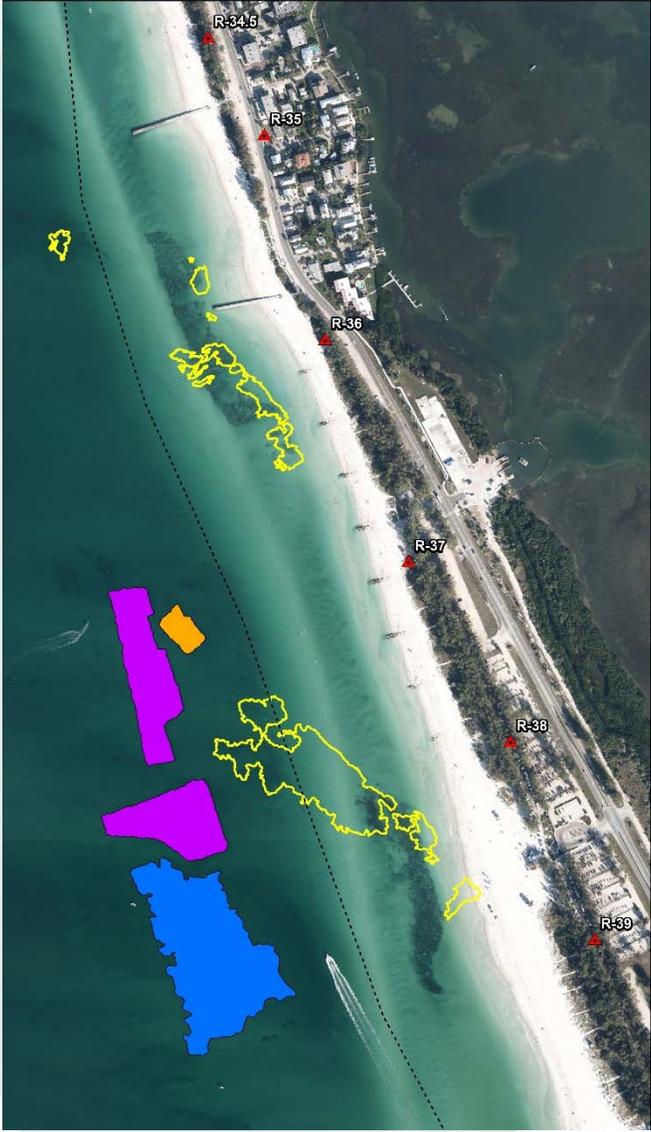
- Shorebird monitoring for listed species
- Required by State and federal permit
- Monitoring for summer breeding and overwintering



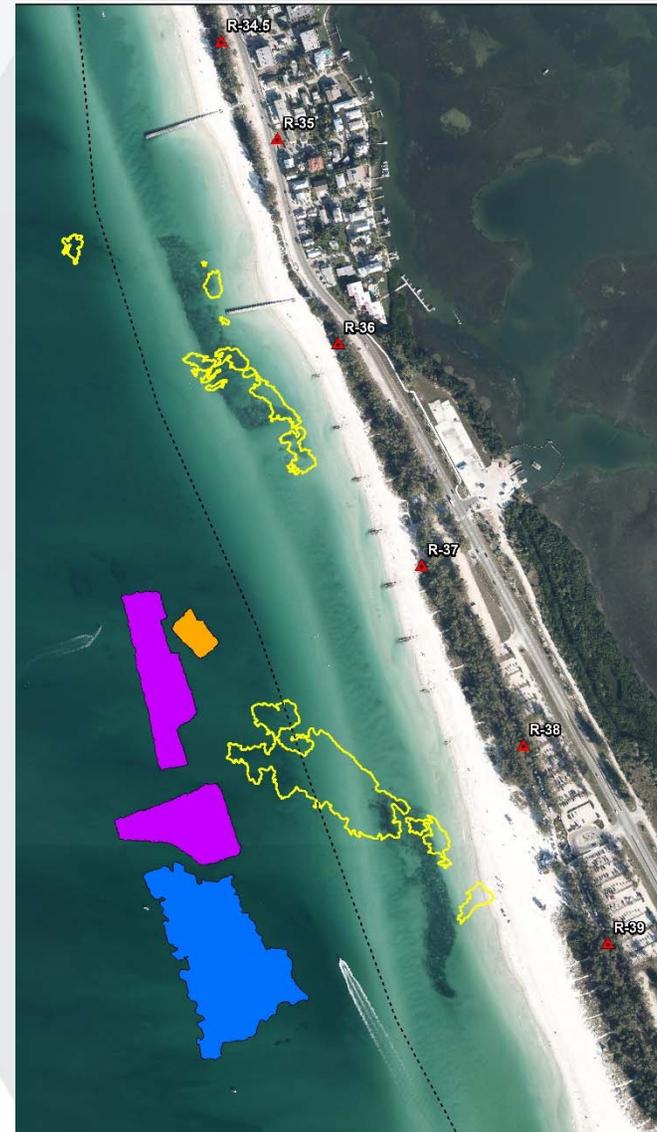
# NATURAL HARDBOTTOM HABITAT



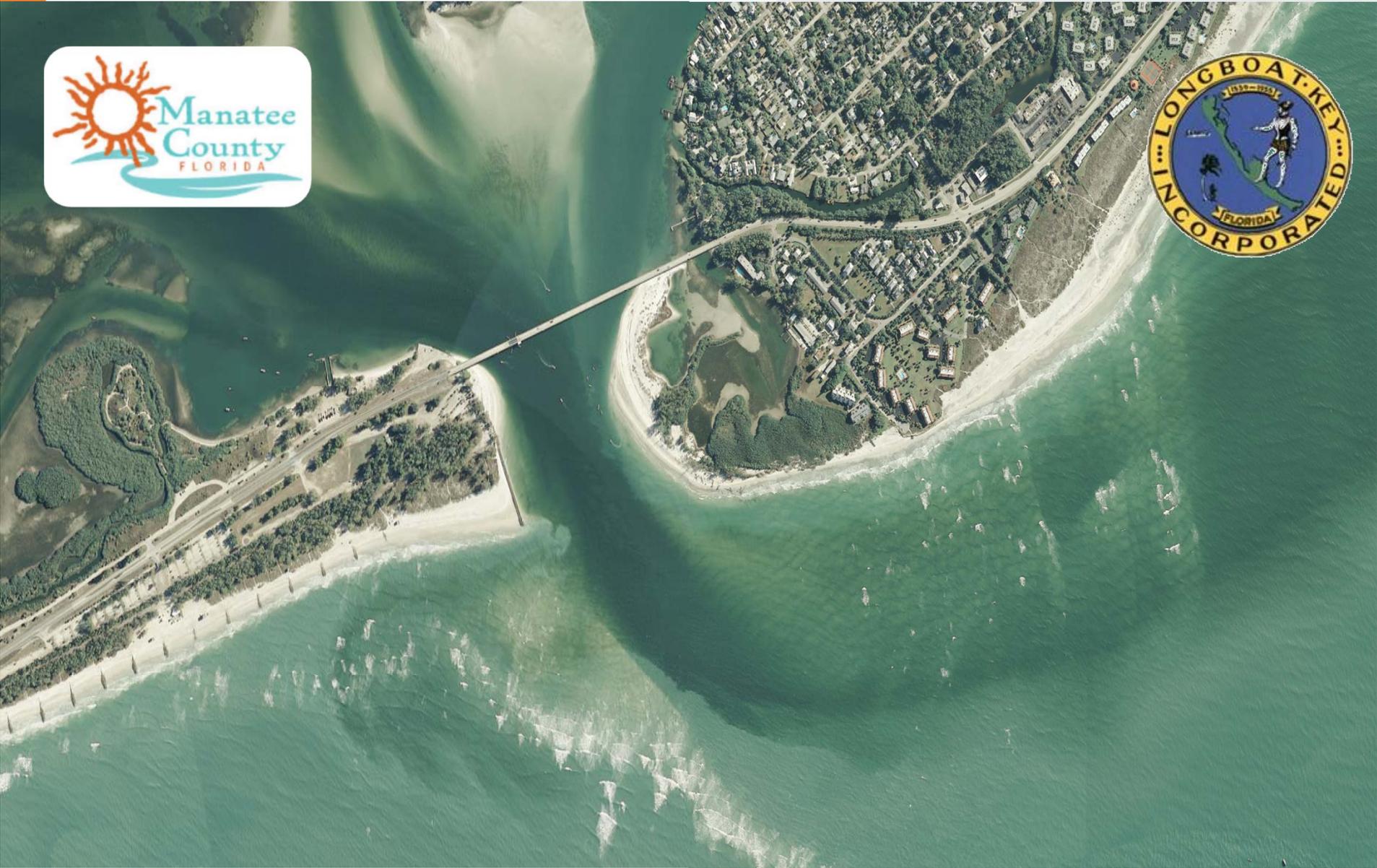
# MITIGATIVE ARTIFICIAL REEF CONSTRUCTION



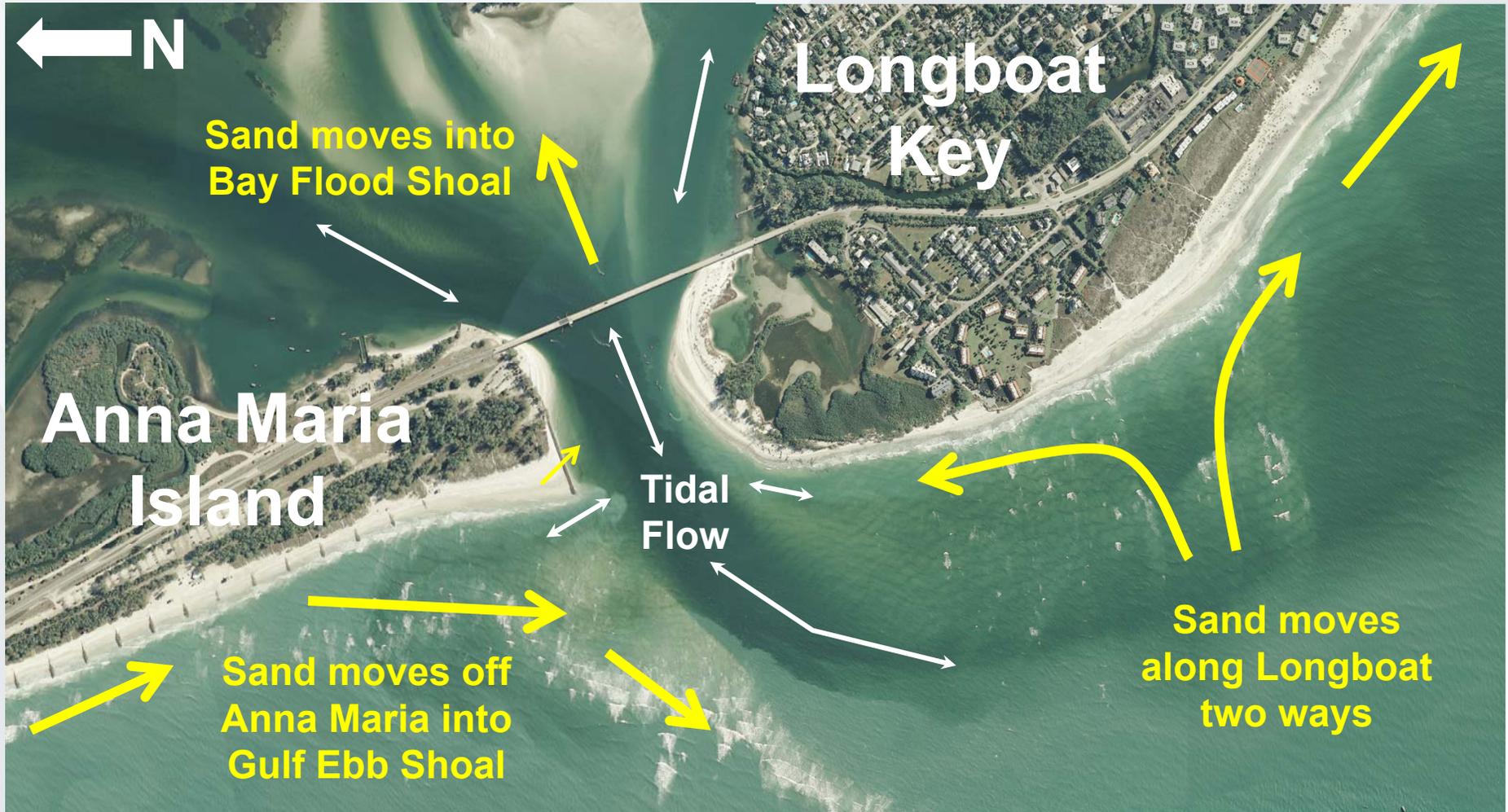
# MITIGATIVE ARTIFICIAL REEF OUTCOMES



# LONGBOAT PASS INLET MANAGEMENT STUDY



# LONGBOAT PASS INLET MANAGEMENT STUDY

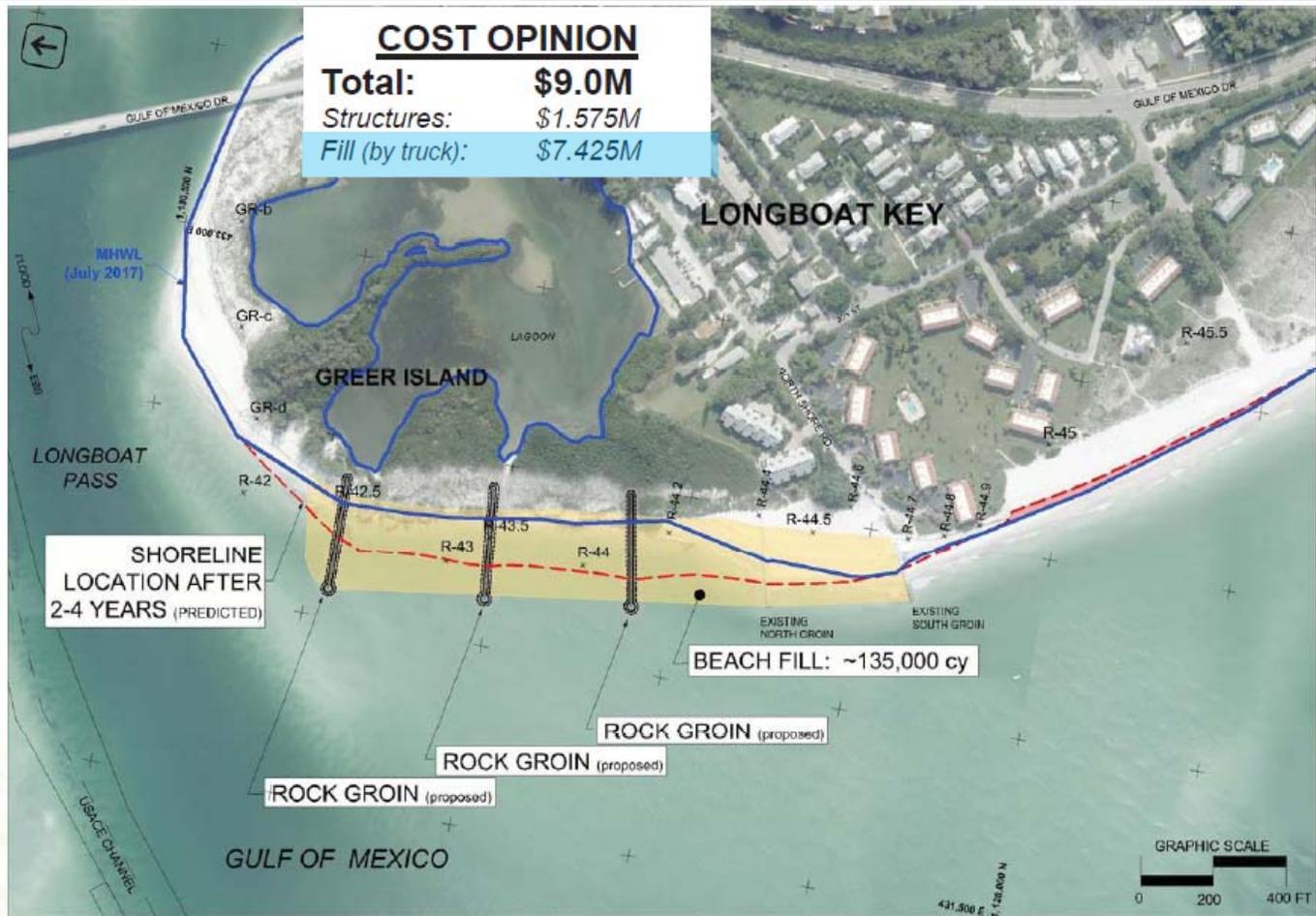


# LONGBOAT PASS INLET MANAGEMENT 2019 IMPLEMENTATION PLAN

- 2019 inlet maintenance dredging with sand placed on Coquina Beach
- Excess dredged sand remaining after completion of Coquina Beach will be provided by agreement to the Town of Longboat Key for placement as part of Greer Island terminal groin construction, at considerable costs savings to the Town.
- Hurricane Hermine and Hurricane Irma FEMA Supplemental Funding
- Future placement intervals between Longboat Key and Coquina Beach will be determined based upon respective needs for erosion control through beach renourishment as provided for in the Longboat Pass Inlet Management Plan and permits.

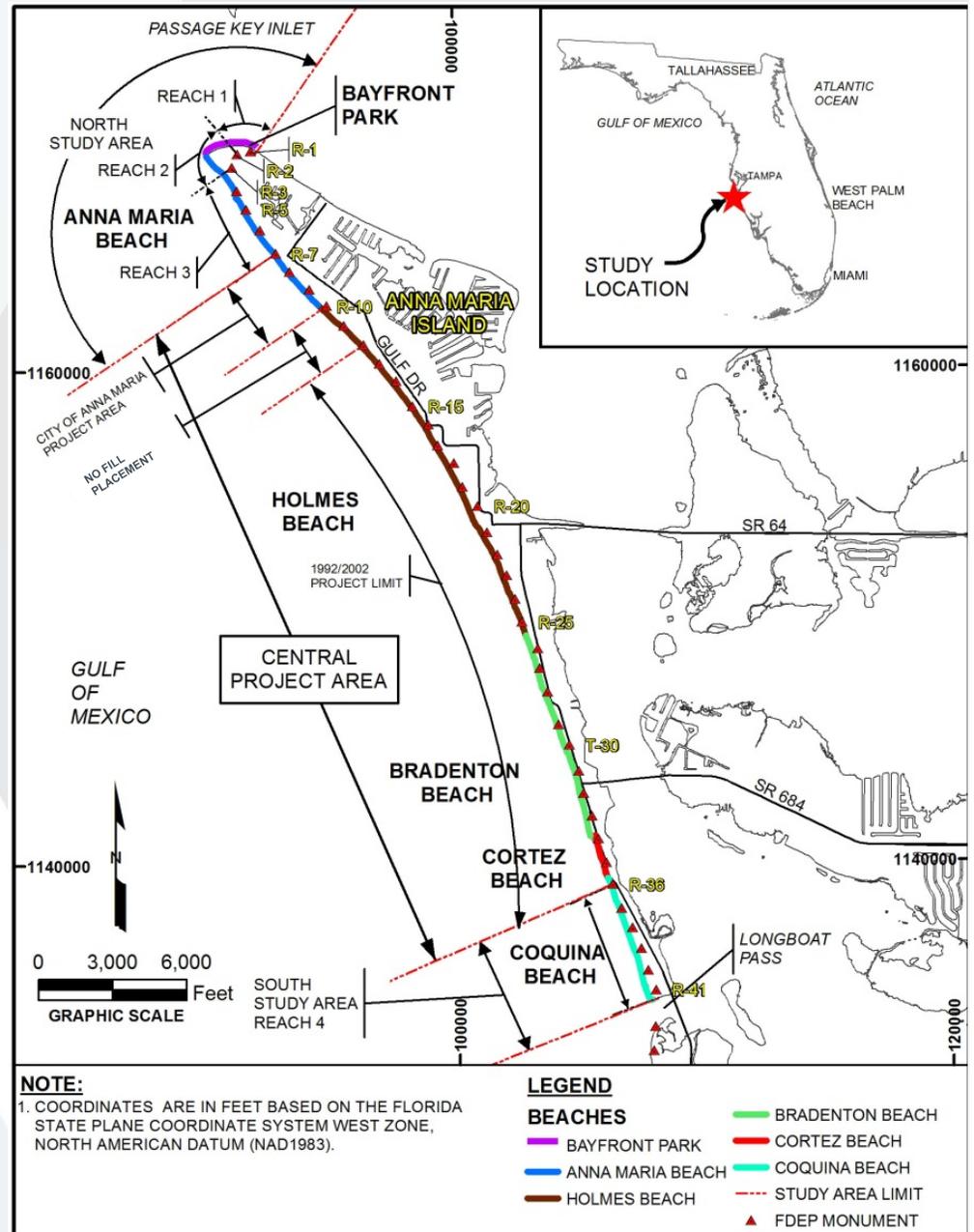
# TOWN OF LONGBOAT KEY NORTH END STABILIZATION PLAN AS PROPOSED NOVEMBER 13, 2017

## Option #3



# UPCOMING BEACH MANAGEMENT PROJECTS

- Central Beach Nourishment
- Coquina Beach Nourishment
- Coquina Beach FEMA Storm Damage Repair
- Additional Mitigation Reef Requirements
- Longboat Pass Jetty Reconstruction
- Coquina Beach Structures Solution



# 2018 CONGRESSIONAL SUPPLEMENTAL APPROPRIATIONS BILL FOR THE U.S. ARMY CORPS OF ENGINEERS

- ▶ \$17.4 Billion for impacts from Hurricanes Harvey, Irma, and Maria
- ▶ \$1.1 Billion for Florida impacts
- ▶ \$14.3 Million for federally authorized Manatee County Shore Protection Project (aka Central Beach Nourishment Project)
- ▶ Expedited construction schedule to maintain funding stream
  - Army Corps schedule has Central Beach Project construction to be completed by July 2020
  - Manatee County and Army Corps working to include Coquina Beach Project in same contract and construction schedule

# CENTRAL AND COQUINA BEACH NOURISHMENT PROJECTS

- Federal Central Beach Renourishment (R-12 to R-36)
- Early 2020 construction (estimated 500,000 cubic yards)
- Total Project Cost = \$16M
  - Federal Cost-Share = \$8M
  - State Cost Share = \$4M
  - Local Cost Share = \$4M
- Coquina Beach Additional Work with Passage Key Sand Source
- Early 2020 construction (estimated 200,000 cubic yards)
- Total Project Cost = \$6.5M
  - State Cost Share = \$3.25M
  - Local Cost Share = \$3.25M

# ADDITIONAL MITIGATION REEF REQUIREMENTS

- Constructed late 2020, following beach nourishment projects
- 2 acre limestone boulder mitigation reef
- Total Project Cost = \$2.2M
  - Federal Cost-Share = \$0M
  - State Cost Share = \$1.1M
  - Local Cost Share = \$1.1M



# CURRENT PROJECTS FUNDING PLAN

- The Anna Maria Island Federal Central Beach project was #8 out of 39 beach projects in the FDEP's preliminary ranking of FY2019/2020 Local Government Funding Requests (LGFRs). The Cumulative State Share Request to #8 is \$33.73 million.
- The Coquina Beach State funded project was #11 out of 39 beach projects in the FDEP's preliminary LGFR ranking. The Cumulative State Share Request to #11 is \$33.88 million.
- The Florida legislature will prioritize the appropriation of State matching funds recommended by FDEP to leverage Federal funds.
- Source of County matching funds is the Tourist Development Council (TDC) Bed Tax. Currently one penny dedicated from five pennies collected/dollar.

# DISCUSSION



