



# INDIAN RIVER COUNTY SECTOR 3 BEACH AND DUNE RESTORATION PROJECT

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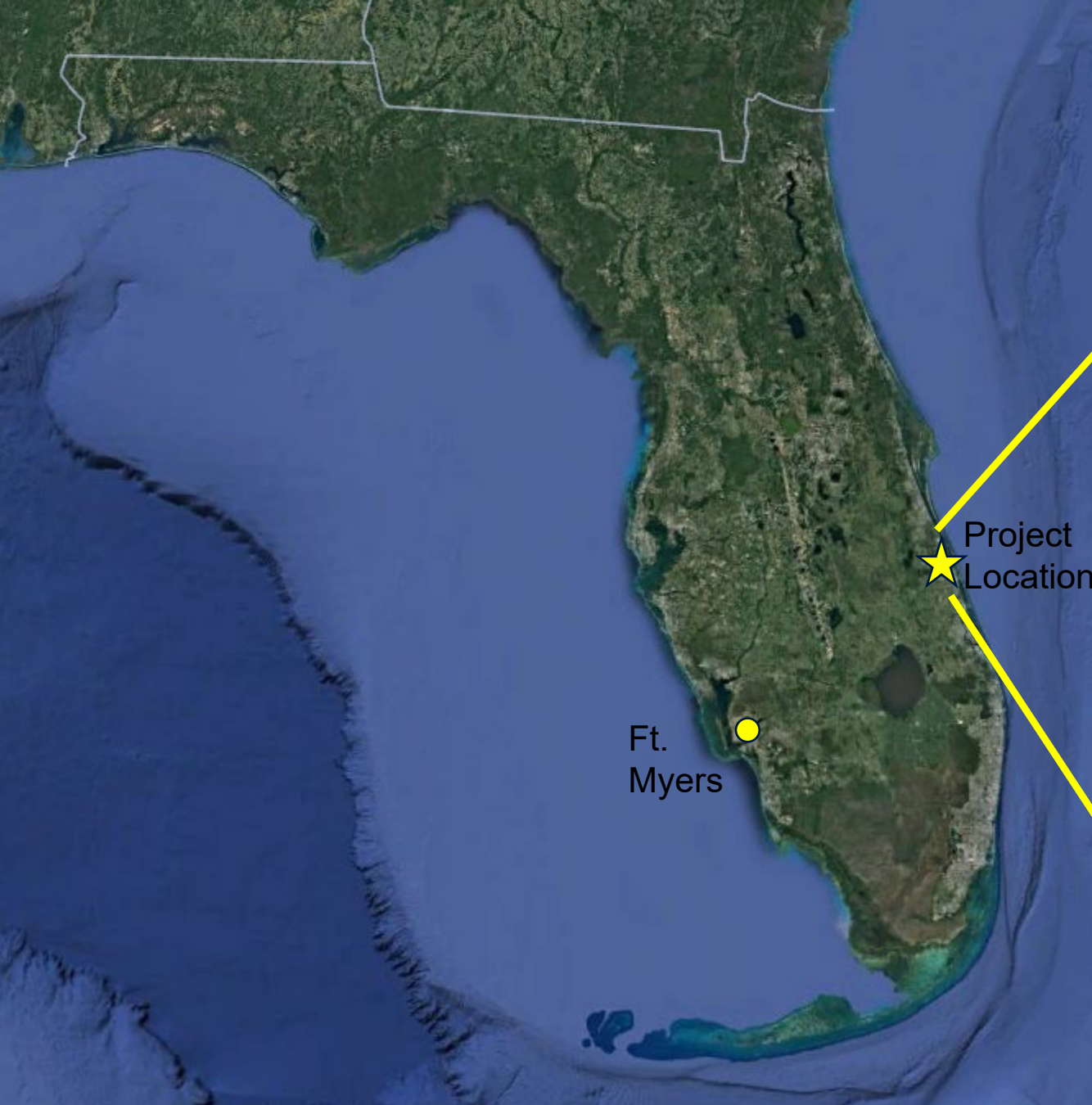
# ACKNOWLEDGMENTS

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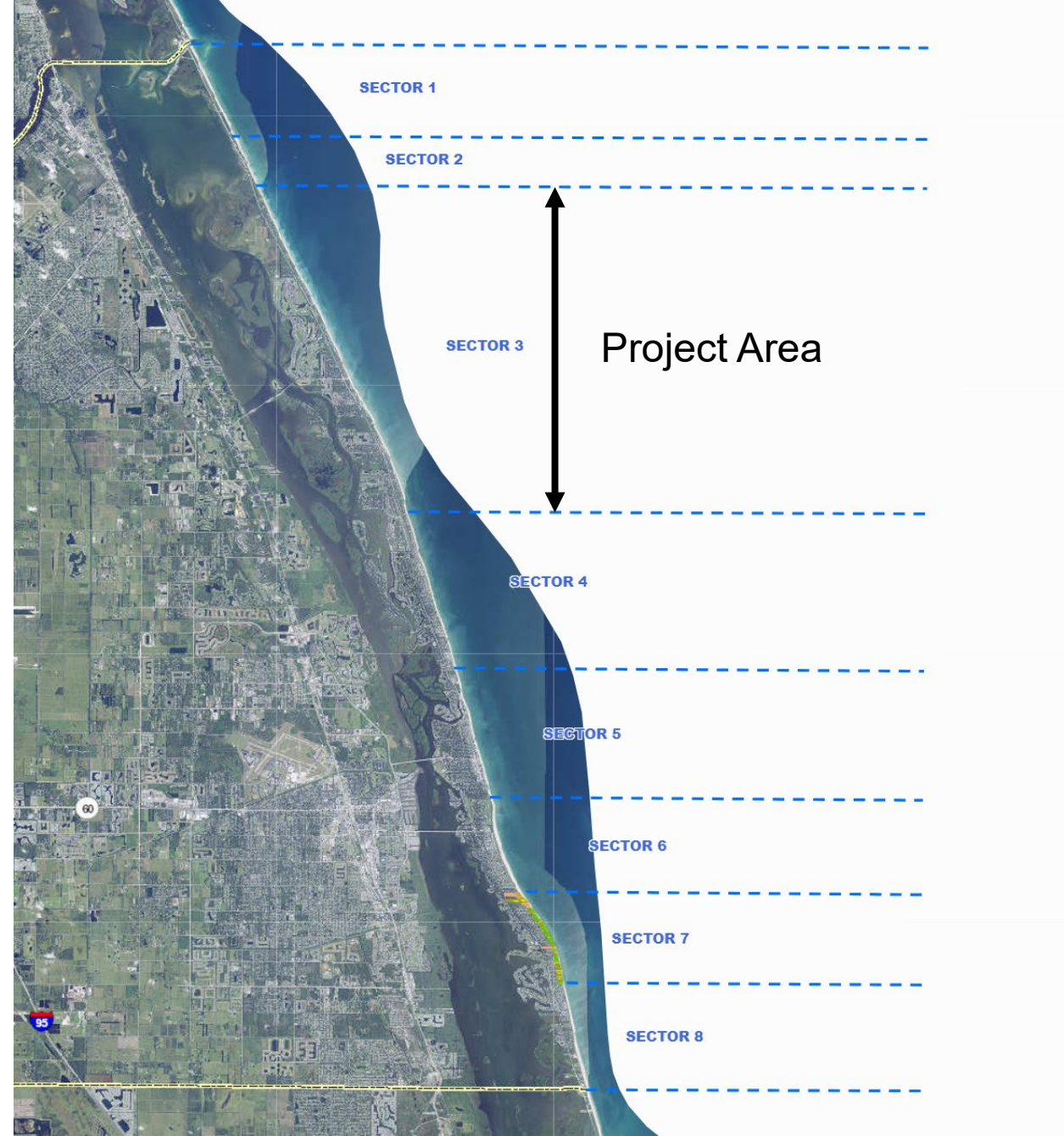


# PROJECT LOCATION



# SECTOR 3 HISTORY

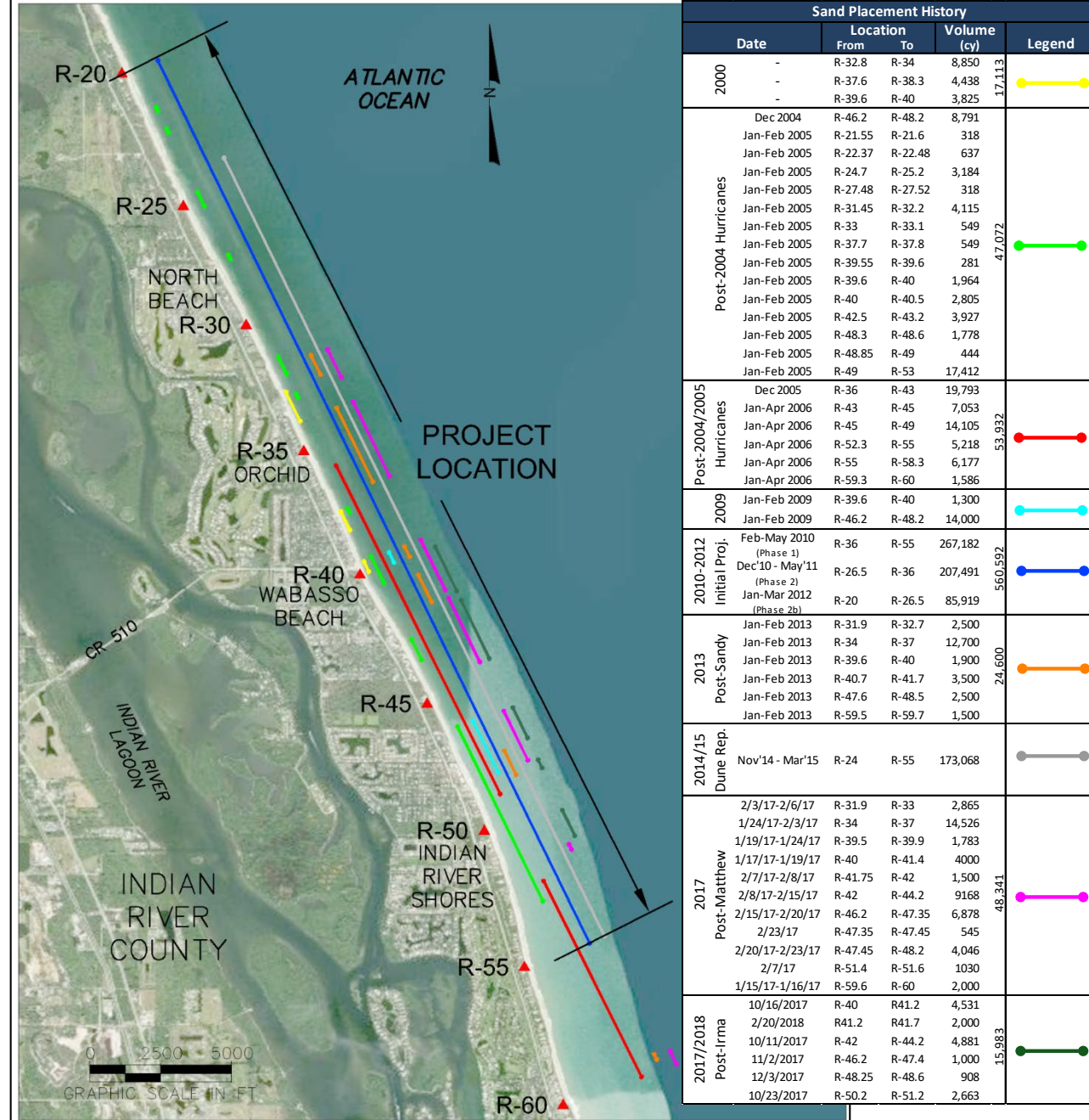
- ▶ Indian River County's coastline is divided into 8 sectors
- ▶ Sector 3 is approximately 7.1 miles
- ▶ Nourishments done by sector





# SECTOR 3 HISTORY

- ▶ Suffers from erosion and storm events
- ▶ Large scale nourishment is relatively new solution for Sector 3
- ▶ Small scale post-storm dune maintenance in 2004 and 2005
- ▶ First sector-wide beach nourishment occurred from 2010 to 2012
- ▶ Dune restoration in 2014/15 (Post-Sandy)
- ▶ Small scale post-storm maintenance in 2017 and 2018 (Post-Matthew and Irma)





2021 Pre-construction



2014 Pre-construction



2021 Post-construction



2014 Post-construction





# PROGRAM HISTORY

November 2008

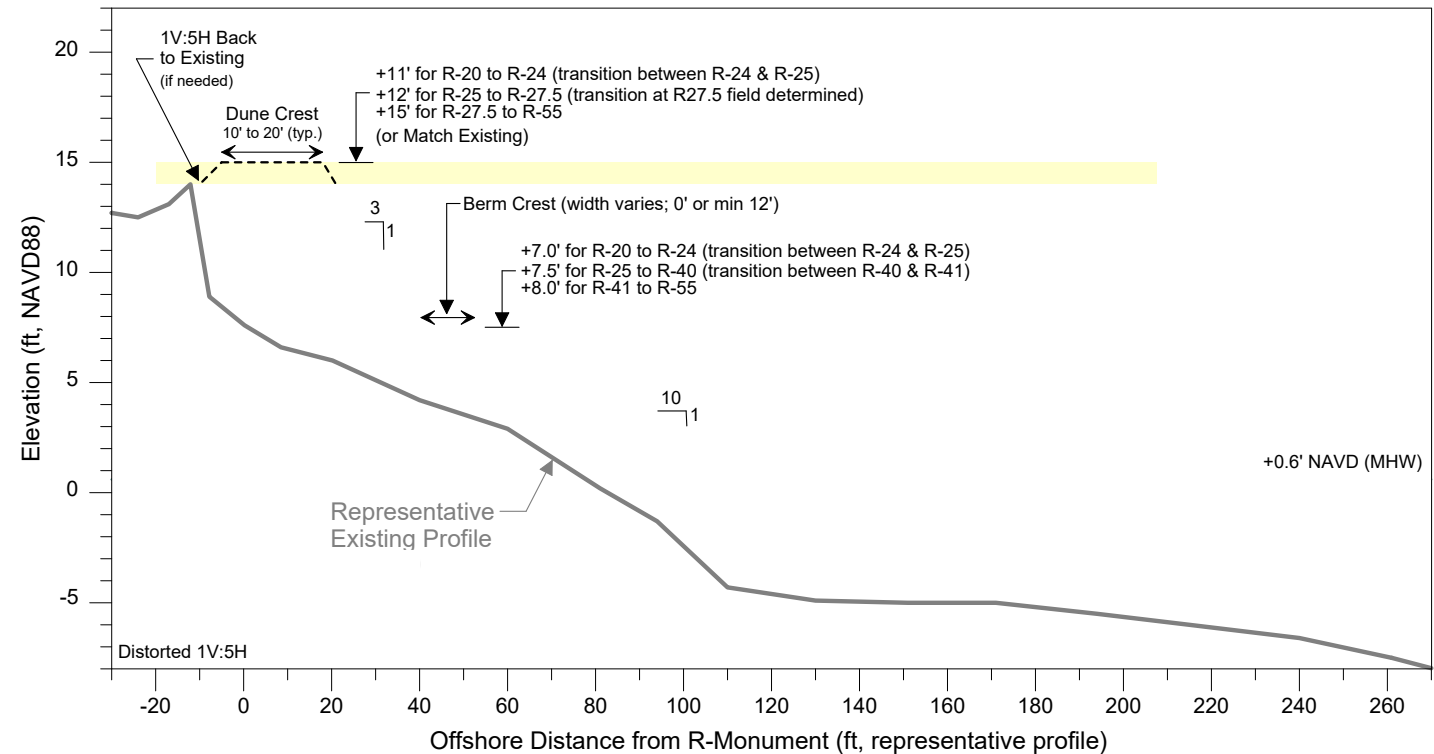


January 2021



# SECTOR 3 ENGINEERING GOALS

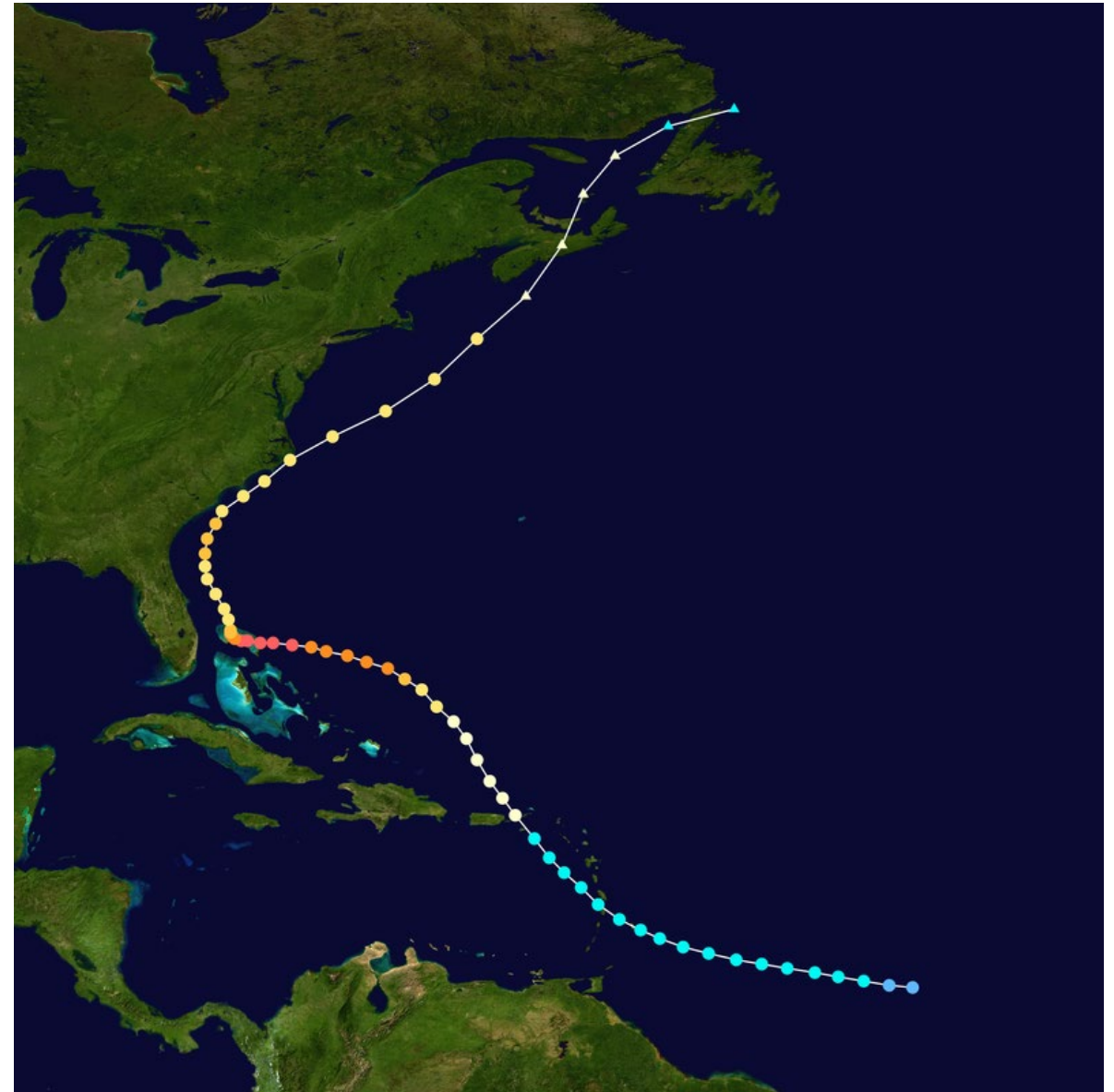
- ▶ Mitigate for losses to initial design
- ▶ Maximize storm protection
- ▶ Avoid hardbottom impacts
- ▶ Restore/maintain recreational beach
- ▶ Habitat for nesting sea turtles and shorebirds
- ▶ Develop a constructable fill template



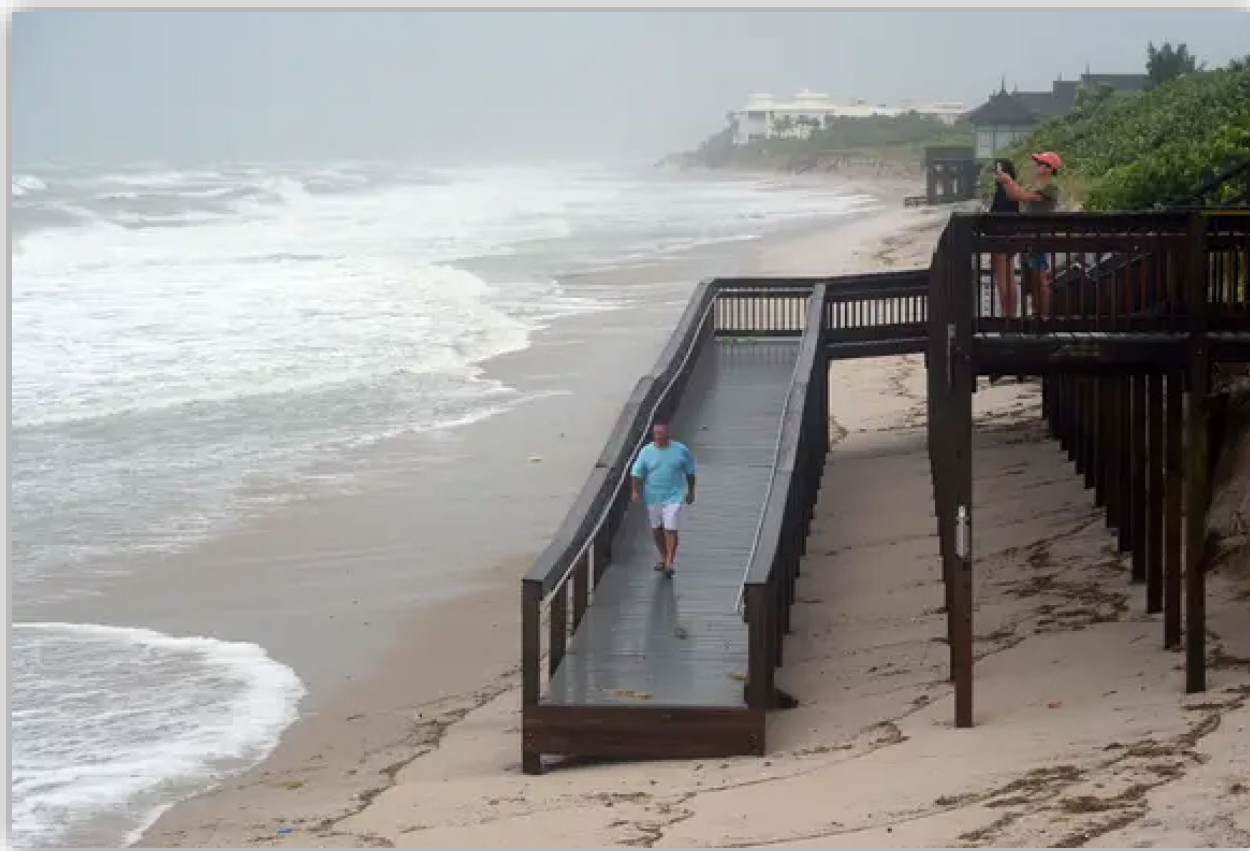


# HURRICANE DORIAN

- ▶ Devastating Category 5 hurricane
  - Peak intensity 185 mph
- ▶ Made 2 landfalls in the Bahamas
- ▶ Eye passed ~100 miles offshore of Indian River County



# HURRICANE DORIAN IMPACTS

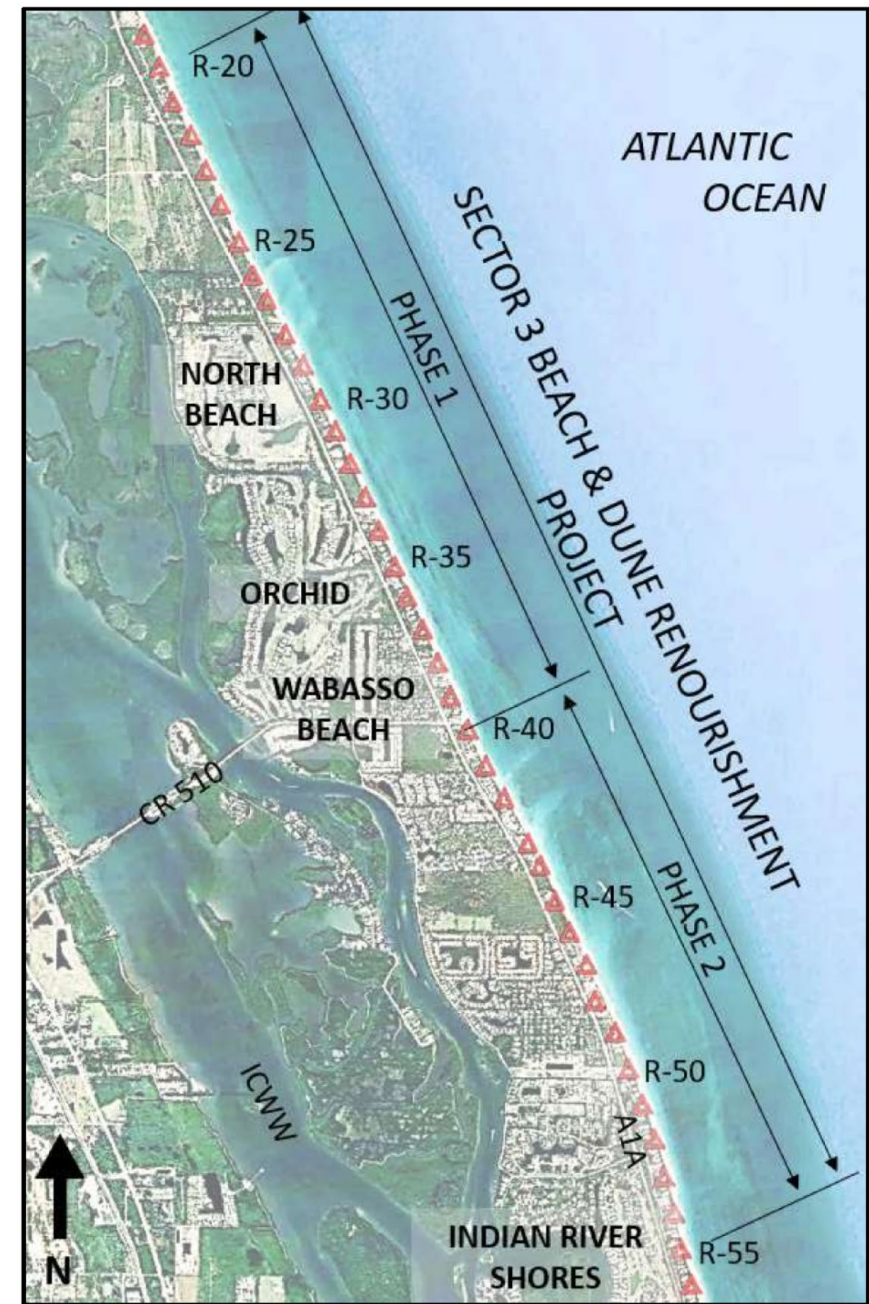


- ▶ Large wind field and slow progression resulted in erosion
- ▶ 72,000 CY of loss
- ▶ Hurricane force winds extended 60 miles from center
- ▶ Produced wave heights of 15 ft offshore of the County's coastline



# 2021 PROJECT ELEMENTS

- ▶ New project design for increased protection
- ▶ Restore dune with narrow berm
- ▶ Project was designed to nourish Sector 3 in two phases
  - Phase 1: January 2021 to December 2021
  - Phase 2: November 2021 to March 2022
- ▶ Designed to address background erosion and storm damage
- ▶ Truck Haul from Stewart Materials in Ft. Pierce
- ▶ Permit limits construction to occur between November 1 and May 1.
- ▶ 6.6 miles of shoreline



# BIDDING APPROACH

- ▶ Phase 1 went out to bid October 2020
- ▶ Phase 2 went out to bid August 2021



- ▶ Phase 1 lowest bid = \$11,987,010
- ▶ Phase 2 lowest bid = \$14,174,738





# FUNDING

- ▶ FEMA: \$9.75 million
- ▶ FDEP: \$7.32 million



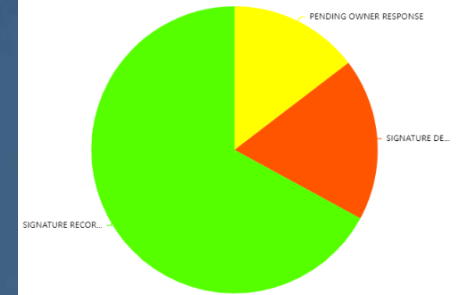
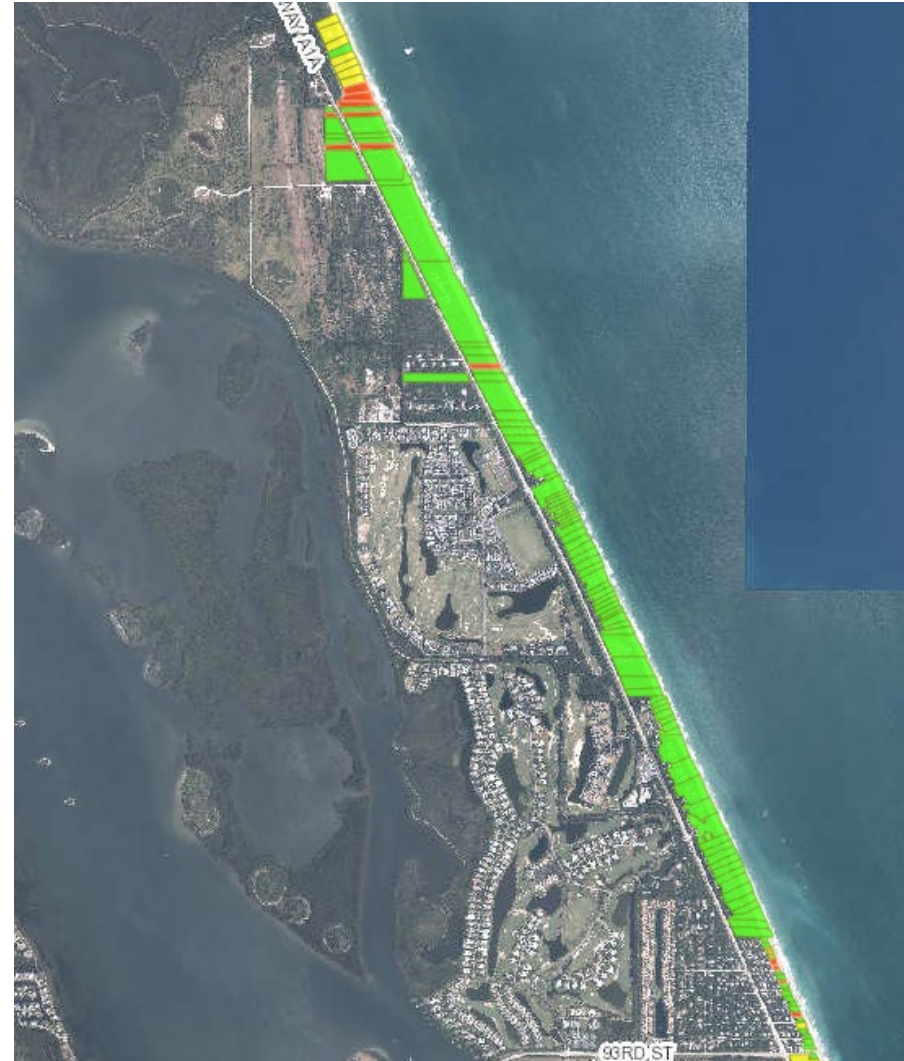
**FEMA**





# PRE-CONSTRUCTION CHALLENGES

- ▶ Easements
- ▶ A County requirement for placement of sand
- ▶ Allow for use of beach by public and for construction
- ▶ GIS map with current easement status
- ▶ [www.ircgov.com/easements](http://www.ircgov.com/easements)



Status of Construction Easement Packages

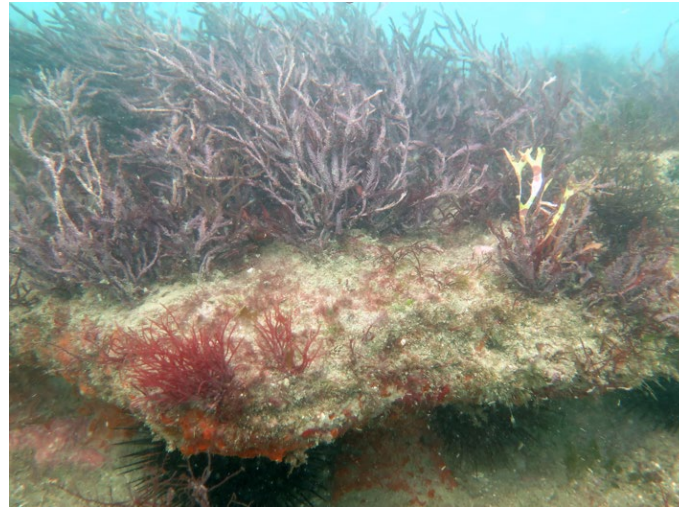
- ▶ SIGNATURE RECORDED
- ▶ SIGNATURE DENIED
- ▶ SIGNATURE UNDER REVIEW
- ▶ PENDING OWNER RESPONSE





# PRE-CONSTRUCTION CHALLENGES

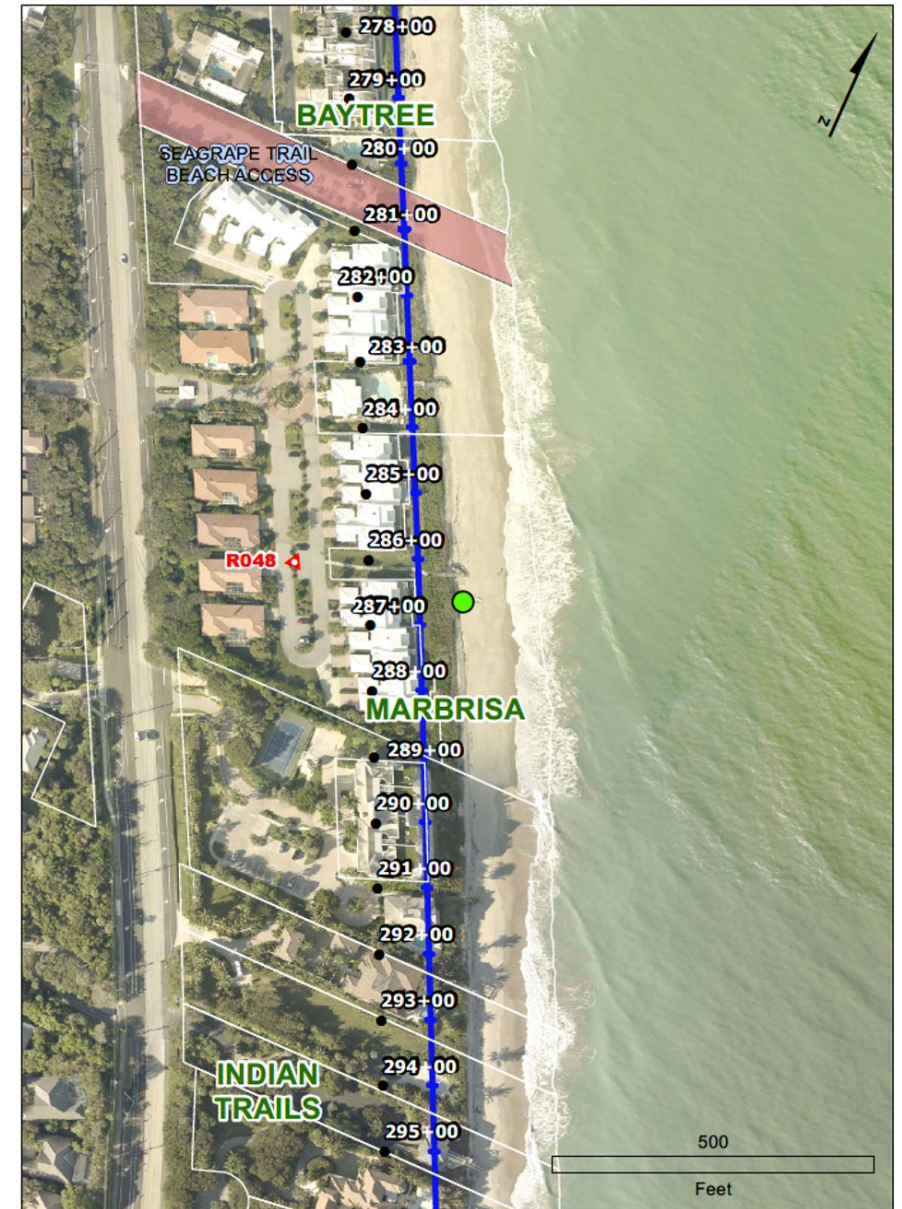
- ▶ Nearshore Hardbottom
  - Avg. distance to shoreline = 257 ft
  - Avg. depth = -12 ft NAVD
- ▶ Designed to avoid hardbottom
- ▶ Permits restricted covering of hardbottom
  - No mitigation required





# CONSTRUCTION CHALLENGES

- ▶ Sea turtles
- ▶ 500 ft buffer from sea turtle nest
- ▶ Nest dictated construction method





# CONSTRUCTION AND THE PUBLIC





# DUNES

- ▶ Sector-wide dune constructed and planted
- ▶ Required coordination with property owners for dune walkovers
- ▶ Seawalls prevented dunes in some areas





# VEGETATION

- ▶ Dune crest was planted approximately 18” O.C.
- ▶ 713,359 total plants
  - 587,477 sea oats
  - 50,353 panic grass
  - 75,529 railroad vine
  - 75,529 dune sunflower
  - 75,529 beach elder



# CONSTRUCTION SUMMARY AND STATS



- ▶ Constructed between January 1, 2021 and March 2, 2022
- ▶ Contractor = Guettler Brothers Construction, LLC
- ▶ 552,400 CY placed
- ▶ 5 beach parks used as construction access.



2021 Pre-Construction



2022 Post-Construction



Wabasso Beach Park





Golden Sands Beach Park





# HURRICANE IAN

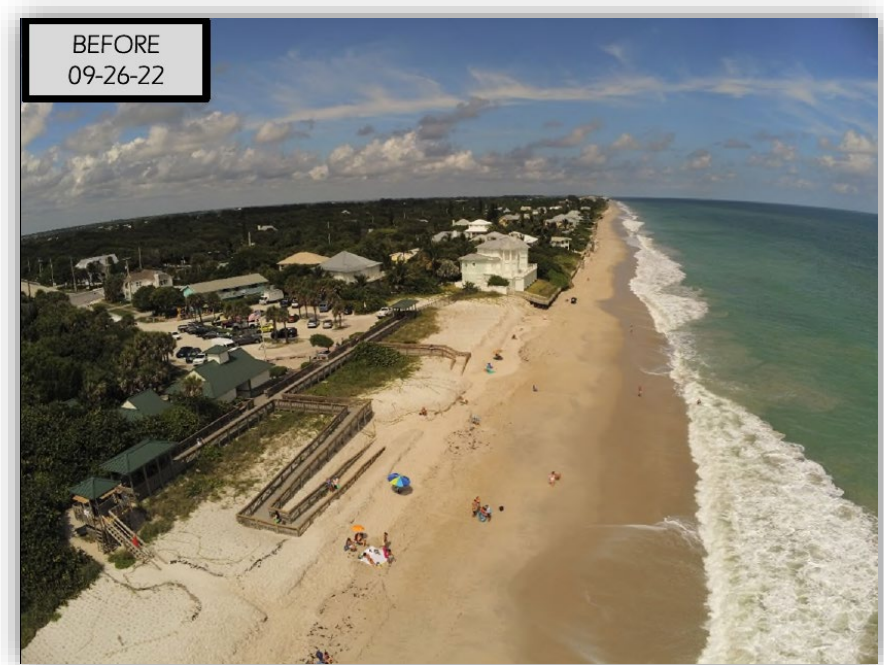
- ▶ Devastating Category 4 hurricane
  - Peak intensity 155 mph
- ▶ Made Landfall in Lee County
- ▶ Impacted IRC as tropical storm





# HURRICANE IAN IMPACTS

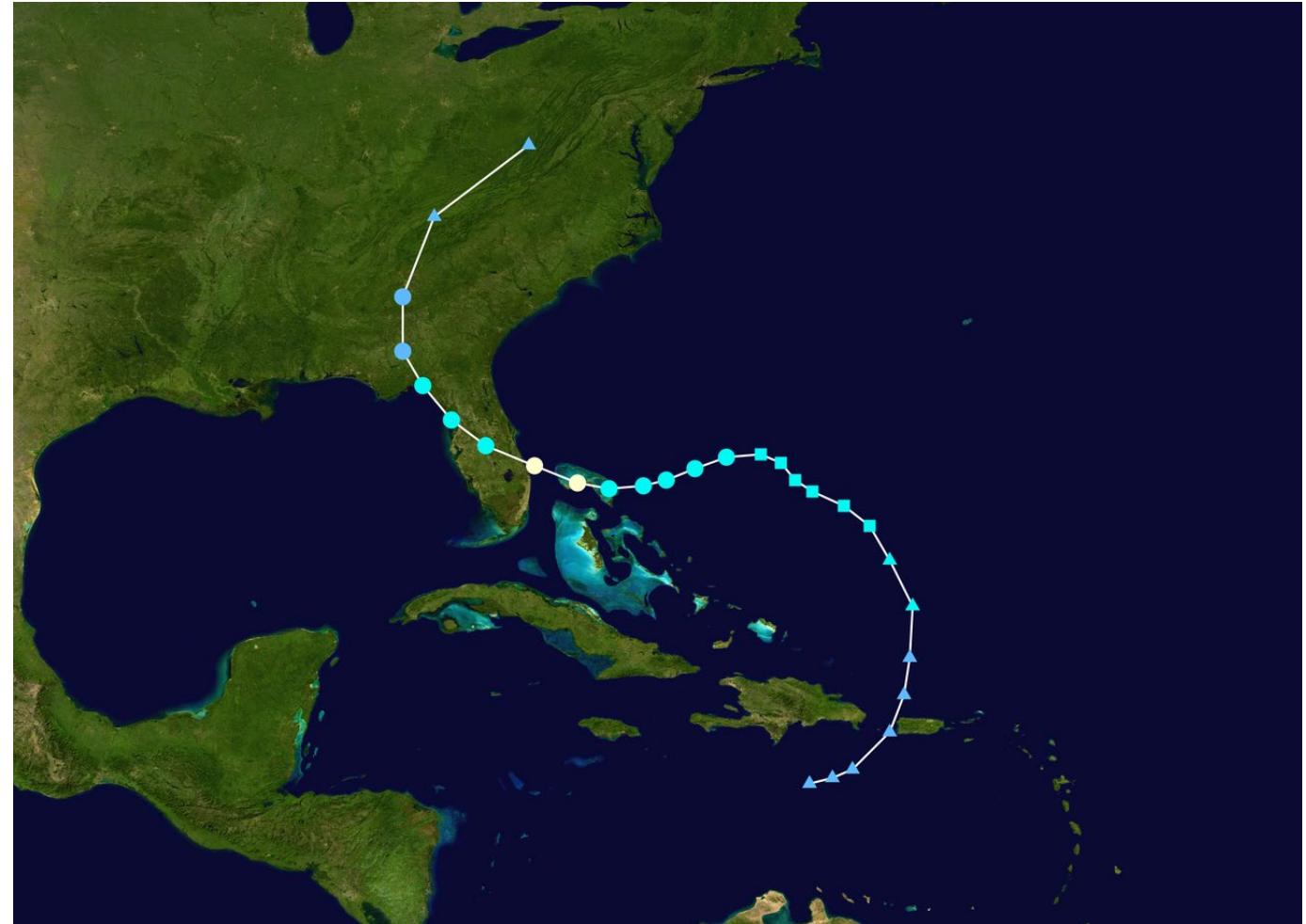
- ▶ Large storm surge and wave action
- ▶ Wind gusts up to 65 mph
- ▶ Caused escarpments 2 to 6 feet
- ▶ Substantial dune impacts





# HURRICANE NICOLE

- ▶ Category 1 hurricane
  - Peak intensity 75 mph
- ▶ Made 2 landfalls in Florida
  - South of Vero Beach
  - Northwest of Cedar Key
- ▶ Impacted with Indian River County directly





# HURRICANE NICOLE IMPACTS



- ▶ High storm surge and wave action
  - Resulted in some loss of infrastructure
- ▶ Wind gusts up to 58 mph
- ▶ Caused escarpments 4 to 6 feet
- ▶ Substantial dune impacts

# HURRICANE NICOLE IMPACTS

Pre-storm



Post-storm



Wabasso Beach Park





# HURRICANE NICOLE IMPACTS

Pre-storm



Post-storm

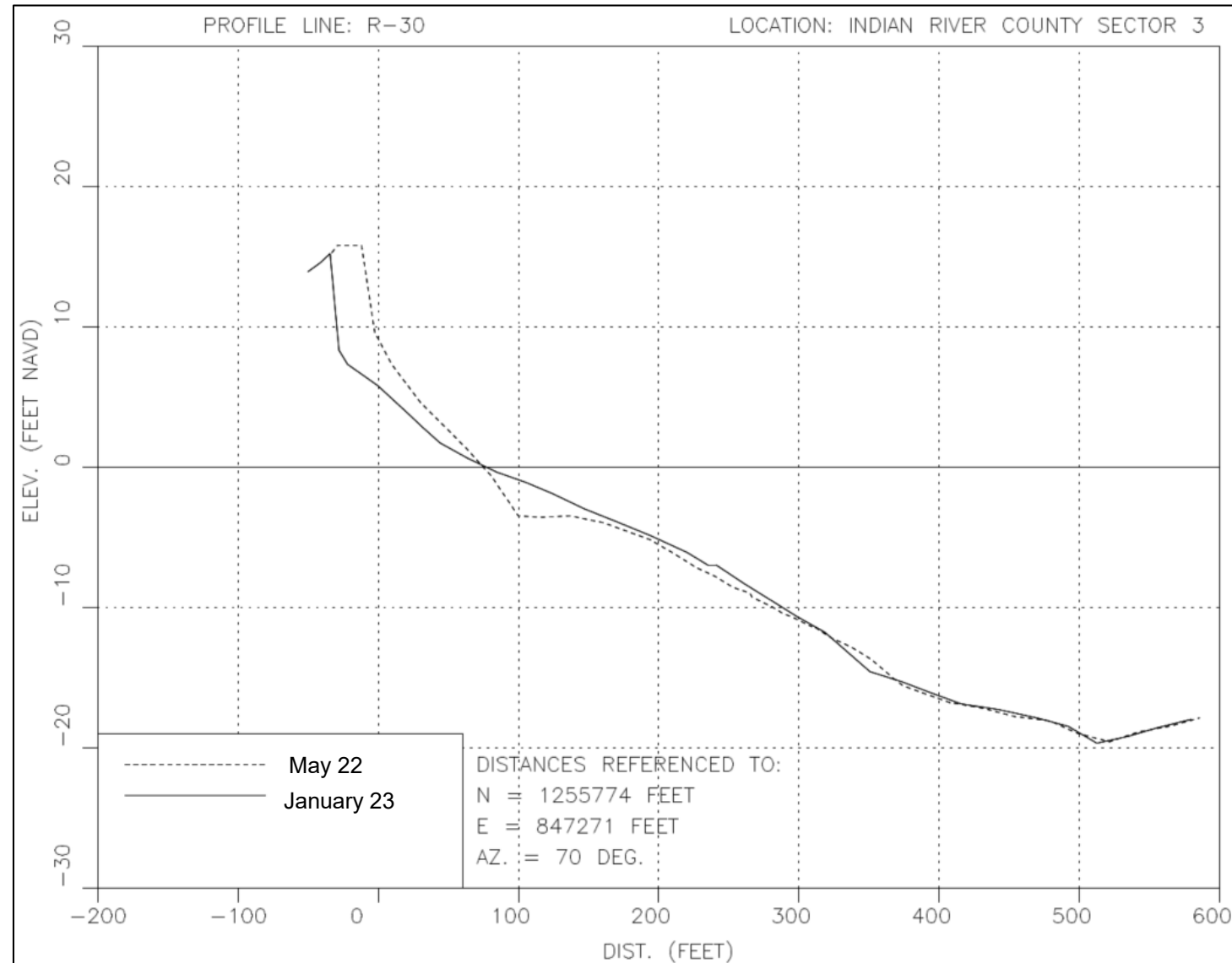


Turtle Trail Beach Access



# PRELIMINARY RESULTS

- ▶ 275,900 CY of loss above MHW
- ▶ 153,400 CY of loss above DOC
- ▶ Upland infrastructure was minimally impacted due to dune in place





# NEXT STEPS

- ▶ County implemented a post-storm survey
- ▶ Losses are being assessed
- ▶ County is coordinating with FEMA
- ▶ Emergency projects at County parks





# CLOSING REMARKS

- ▶ Storm impacts and background erosion contribute to critically eroded designation
- ▶ Design limited by factors such as hardbottom
- ▶ Balance between protecting infrastructure with environment
- ▶ Sector 3 benefits from frequent renourishments
- ▶ Recent hurricanes contributed to dune loss







# QUESTIONS?

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**Expect the Extraordinary.**