

# COLLIER COUNTY EMERGENCY BERM PROJECT: 2023 PROJECT AND POST-IAN UPDATE

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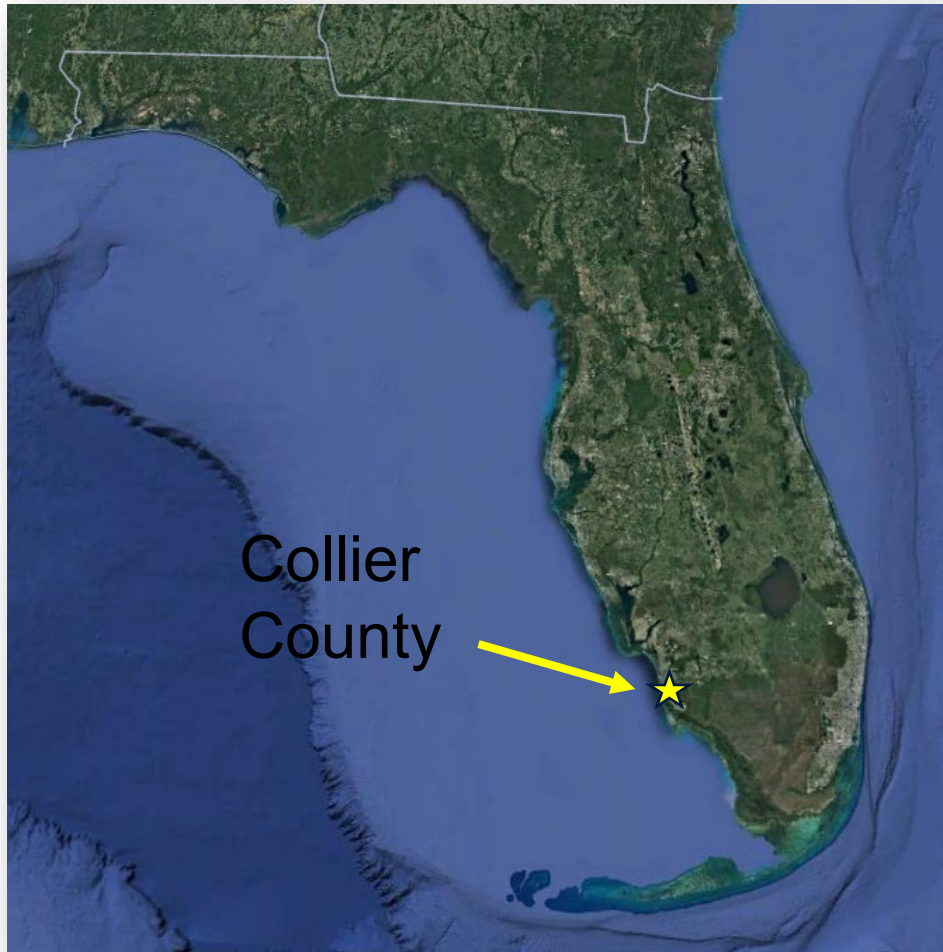
Steve Keehn, P.E. and James Austin, P.E., APTIM

# ACKNOWLEDGEMENTS

- › Collier County:
  - Andy Miller
  - Chris D’Arco
  - Larry Humphries
- › APTIM:
  - Steve Keehn
  - James Austin
  - Sean Ryan
- › FDEP
- › FEMA



# WHERE WE LEFT OFF...



Collier County Location	Hurricane Ian Surge Height
Vanderbilt Beach	11.77'
Barefoot Beach	11.76'
Delnor-Wiggins State Park	10.24'
Naples (12 <sup>th</sup> Ave)	8.03'
Marco Island	7.45'



# WHERE WE LEFT OFF...



Estimated \$2 billion in damages in Collier County



# WHERE WE LEFT OFF...



Bonita/Barefoot Beach



# WHERE WE LEFT OFF...



Vanderbilt Beach

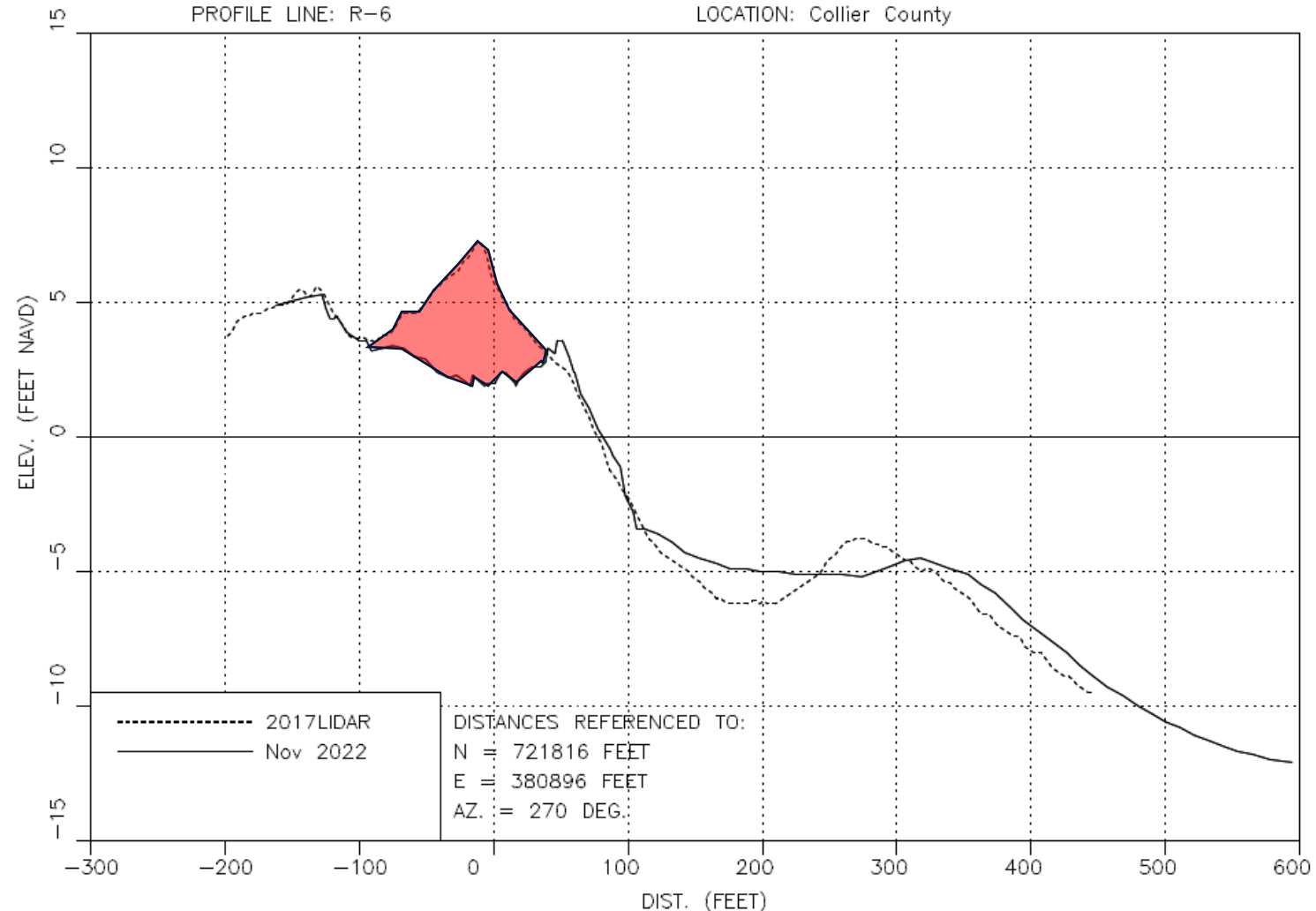


# WHERE WE LEFT OFF...



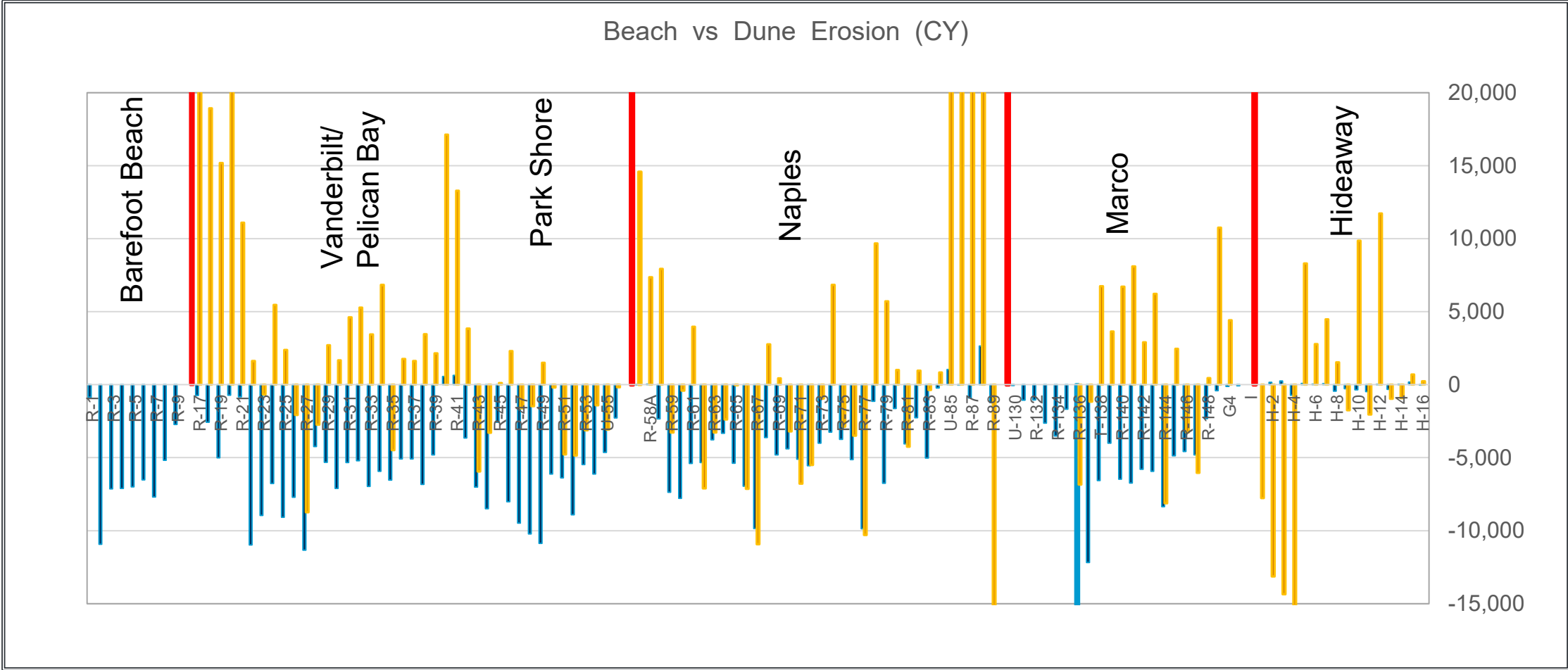
# GENERAL OBSERVATIONS

- › Dune breaching and overwash
- › Total dune loss from Hurricane Ian: 396,339 cubic yards
- › Removal of sand from private properties and stockpiling
- › Retreat/total loss of dune vegetation
  - Approx. 71 acres countywide





# GENERAL OBSERVATIONS



**BLUE = Dune Loss**    **TAN = Total Loss/Gain in Active Profile**





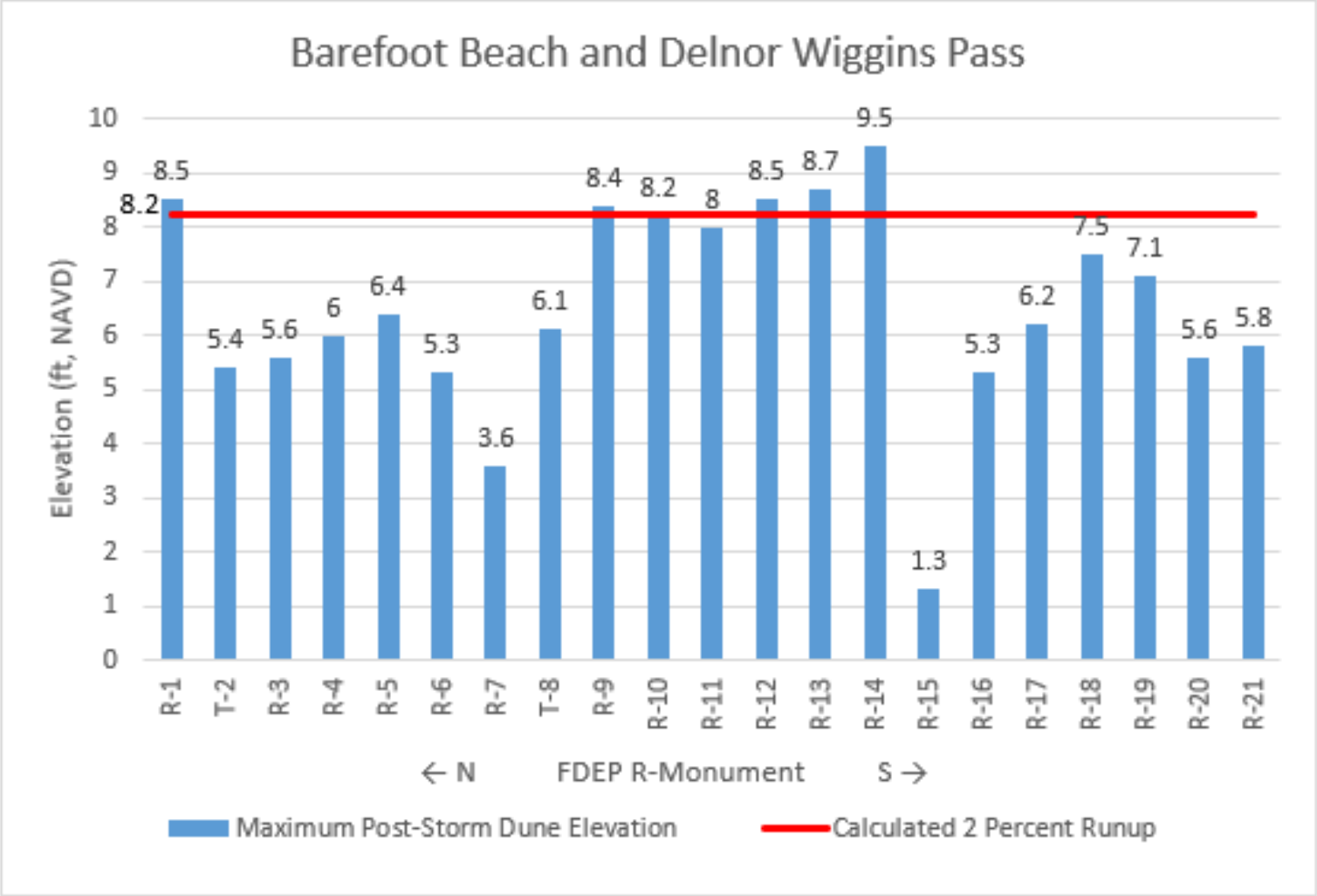
RECOVERY

# RECOVERY EFFORTS: EMERGENCY BERM

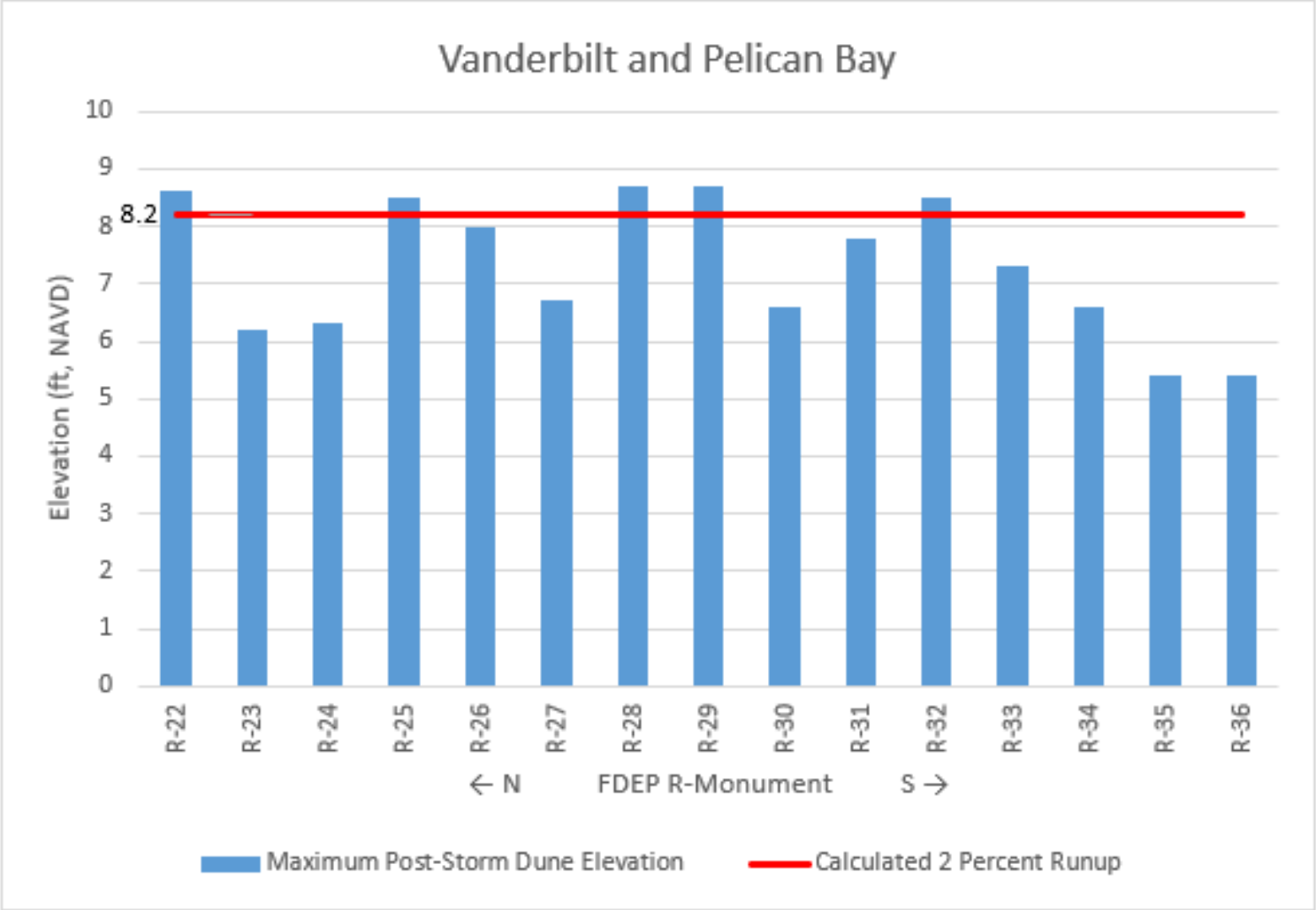
- › Minimal total profile loss and large dune/dry beach losses
- › Collier County peak dune elevation: +6.0 to +12.0 ft-NAVD
- › Protect upland infrastructure from 5-year level storm per FEMA guidance
  - +4.2 ft-NAVD (North County)
  - +4.6 ft-NAVD (South County)



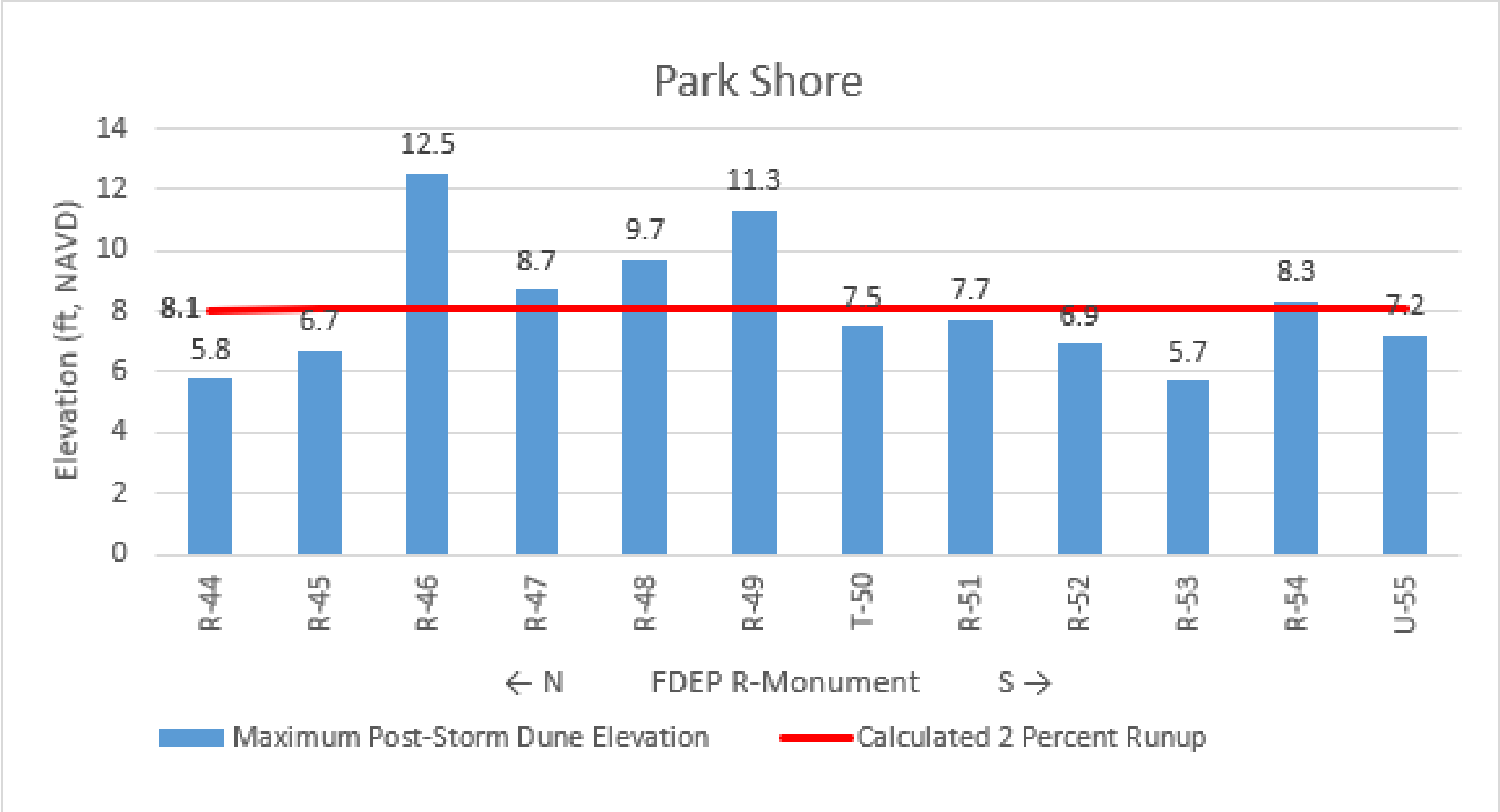
# MAX DUNE ELEVATION VS TOTAL RUNUP (5 YR STORM)



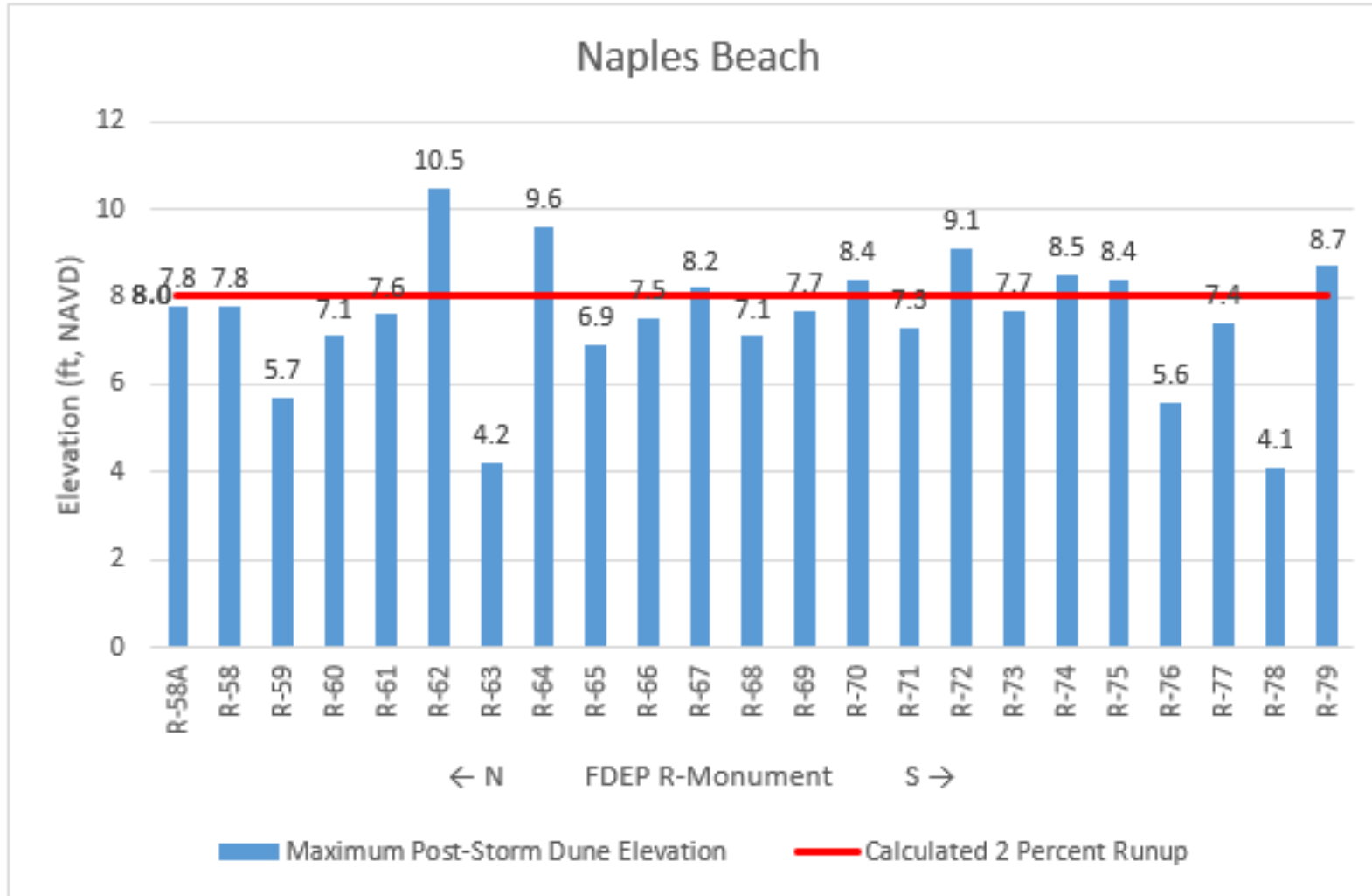
# MAX DUNE ELEVATION VS TOTAL RUNUP (5 YR STORM)



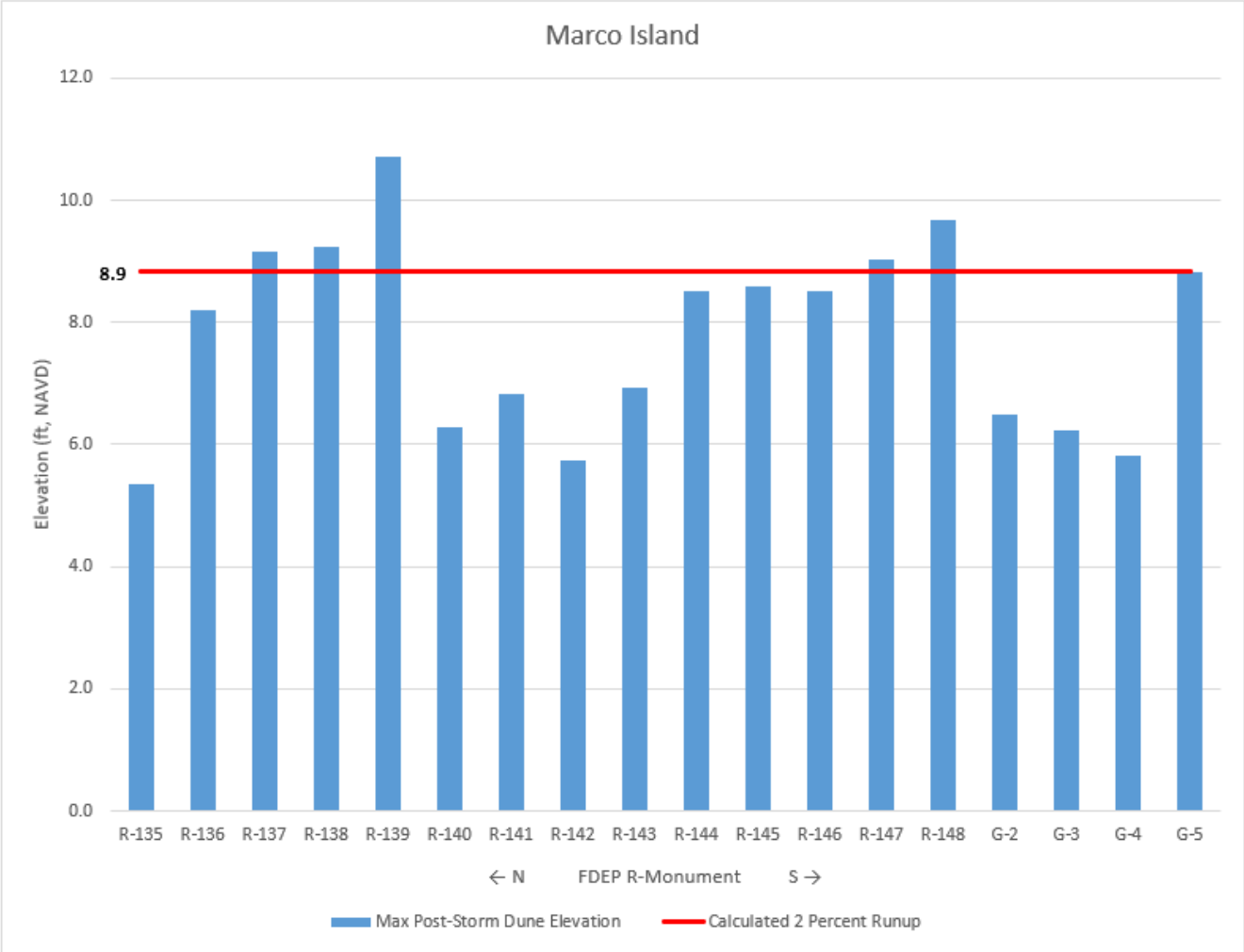
# MAX DUNE ELEVATION VS TOTAL RUNUP (5 YR STORM)



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# PROJECT AREAS

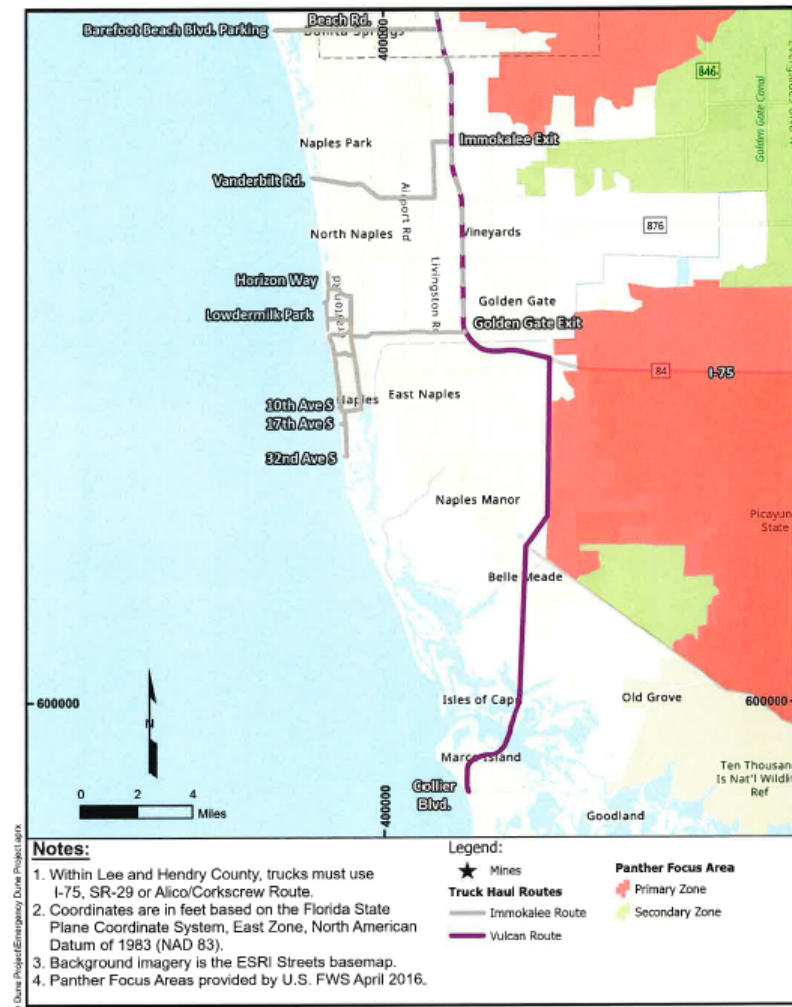
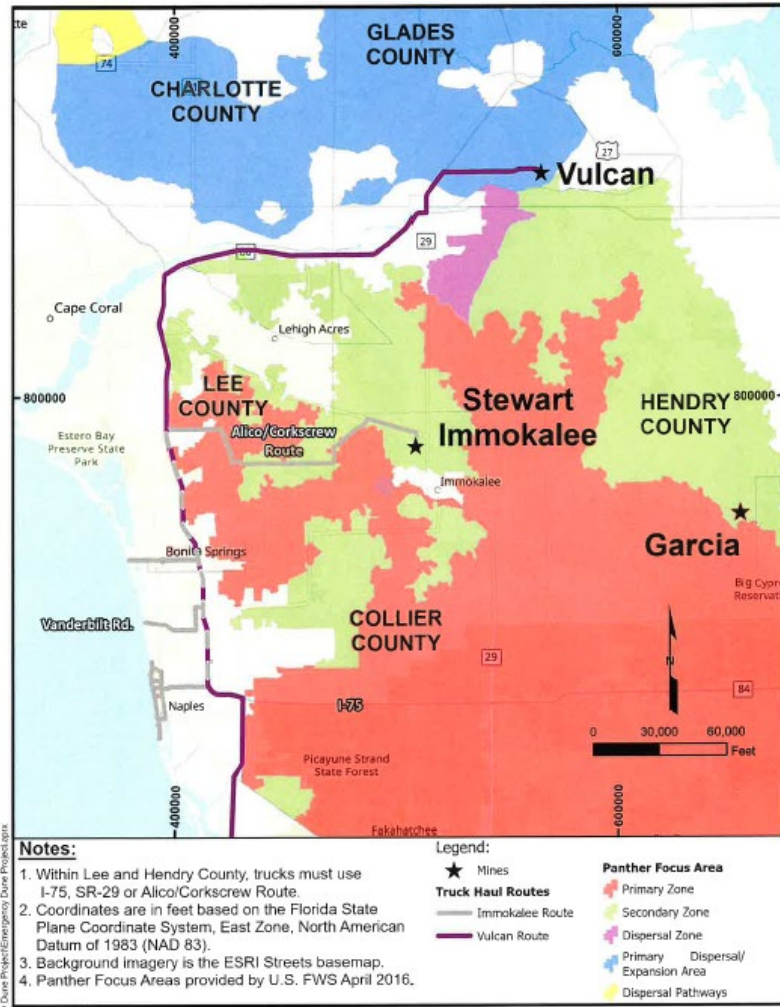


# EMERGENCY BERM DESIGN

- › FEMA protective berm (approx. 6 cy/lf)
  - Stewart and Vulcan Materials sands
- › Optimized based upon vulnerable areas
  - Upland infrastructure in peril
  - At risk for damage from moderate wave/surge events
- › Constructed under Emergency Final Order (2022-047-DAO)
- › Constructed within areas with obtained easements
- › Required rapid turn around to protect the community prior to upcoming hurricane season

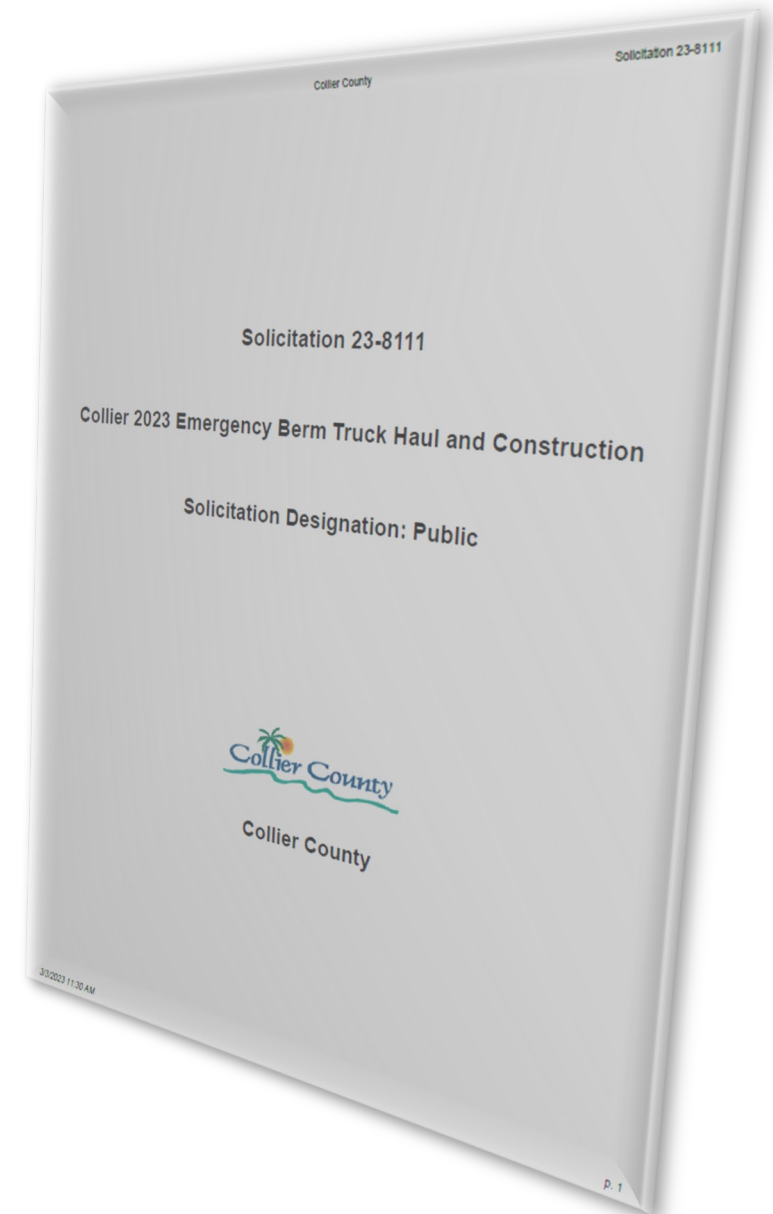


# TRUCK ROUTES



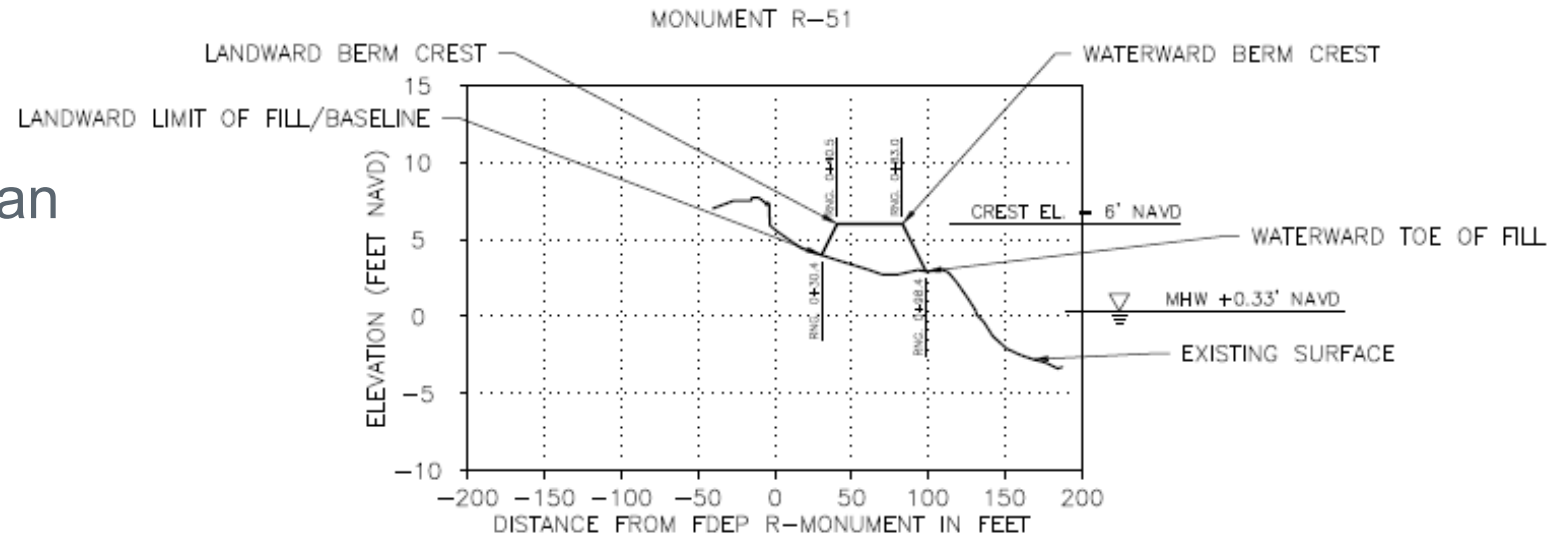
# EMERGENCY PROCUREMENT

- › Time was of the essence!
- › Accelerated bidding utilized
- › Bid advertisement: February 28, 2023
- › Bid opening: March 10, 2023
- › Project bid into two reaches
  - Resulted in two separate contractors to finish project before peak hurricane season



# EMERGENCY BERM: REACH A

- › Naples and Park Shore
  - R-44 to R-57+500
  - R-58A to R-79
- › Awarded to Phillips and Jordan
- › Stewart Immokalee mine
- › Multiple construction accesses:
  - Horizon Way
  - Lowdermilk Park
  - Haul Road (~R-63)
  - 17<sup>th</sup> Avenue South





# EMERGENCY BERM: REACH A

- › Project commencement: April 5, 2023
- › Project completion: May 26, 2023
- › Total Volume: 116,642 tons
- › Length: 32,624 feet



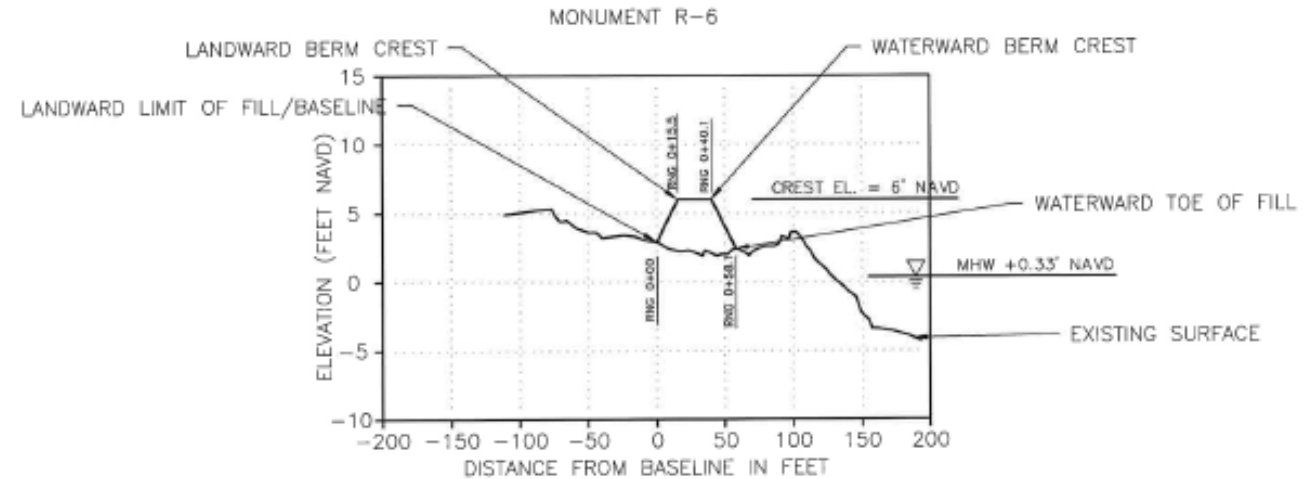
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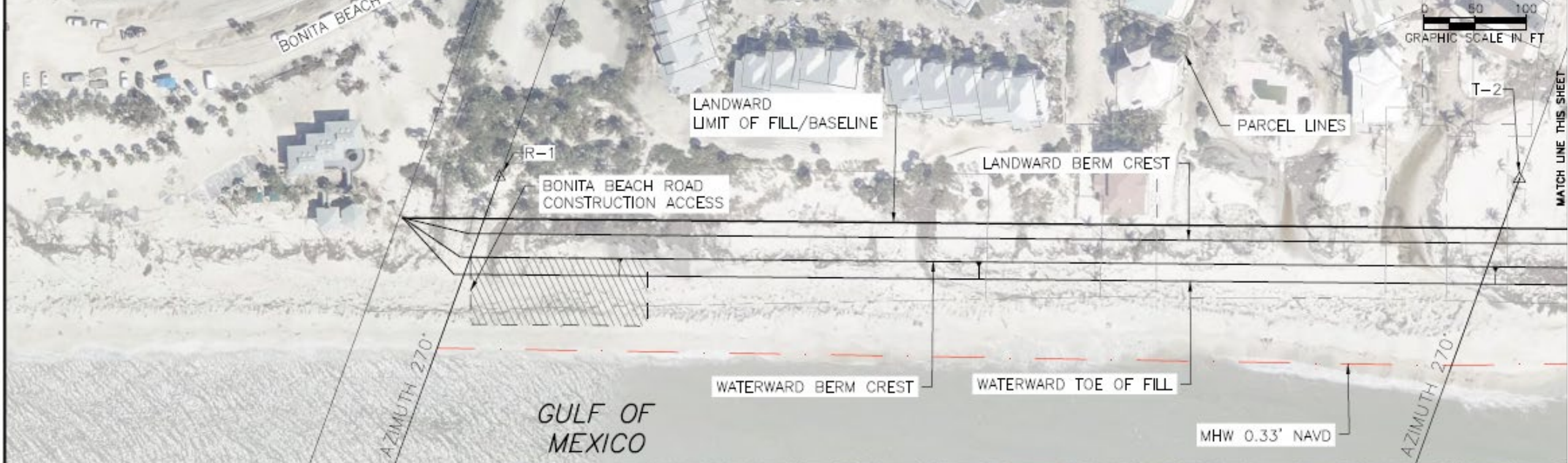




# EMERGENCY BERM: REACH B

- › Barefoot Beach, Vanderbilt Beach, Pelican Bay, and Marco Island
  - R-1 to R-9
  - R-22 to R-30
  - R-30 to R-36
  - R-142 to G-2
- › Awarded to Earth Tech Enterprises
- › Vulcan Materials Moore Haven sand
- › Construction accesses:
  - Barefoot Beach Park
  - Vanderbilt Beach Road





# EMERGENCY BERM: REACH B

- › Project commencement: April 17, 2023
- › Project completion: June 19, 2023
- › Total Volume: 214,871 tons
- › Length: 28,736 feet



# EMERGENCY BERM: REACH B



# PROJECT SUMMARY

Project Reach	Reach Extents	Distance (ft)	Design Volume (T)	Tonnage Placed	Volume Pre-Con to Post-Con Surveys (T)
Barefoot	R-1-80 to R-9+200	8,412	74,007	73,989	82,334
Vanderbilt	R-22+300 to R-30	8,376	66,141	63,196	69,806
Pelican	R-30+512 to R-36+10	5,769	43,244	41,319	37,194
Park Shore	R-44 to TR-57+500	13,479	67,272	68,879	77,474
Naples	R-58A to R-79	19,145	108,899	109,753	129,887
Marco Island	R-142+292 to G-2	6,179	36,392	36,367	37,145
<b>2023 Renourishment</b>	<b>R-1-80 to R-79 and R-142+292 to G-2</b>	<b>55,181</b>	<b>395,955</b>	<b>393,503</b>	<b>433,843</b>

The difference between tons placed and measured may be bulking during sand placement, which can be approximately 10%.

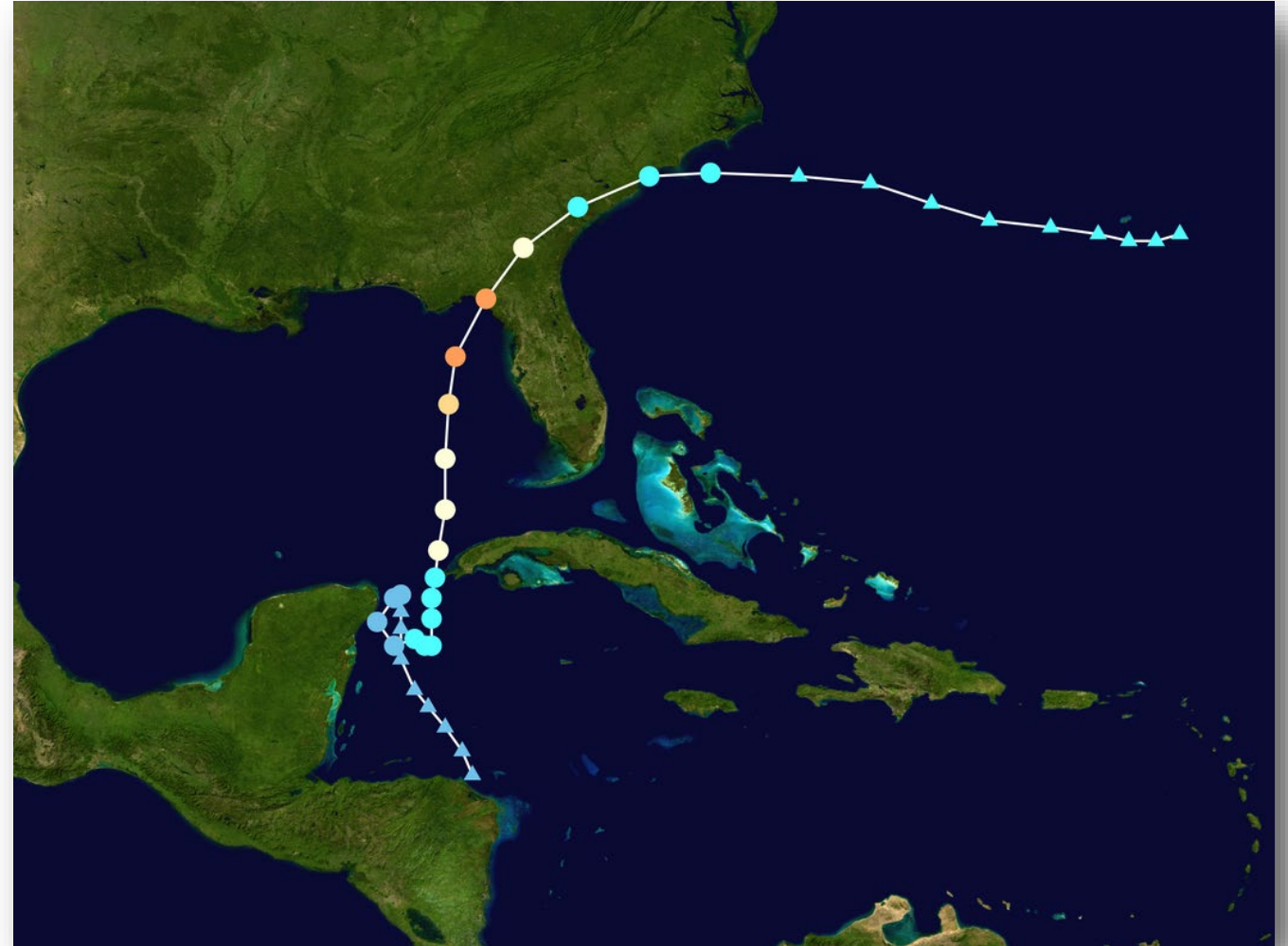


# EMERGENCY BERM VS. HURRICANE IDALIA



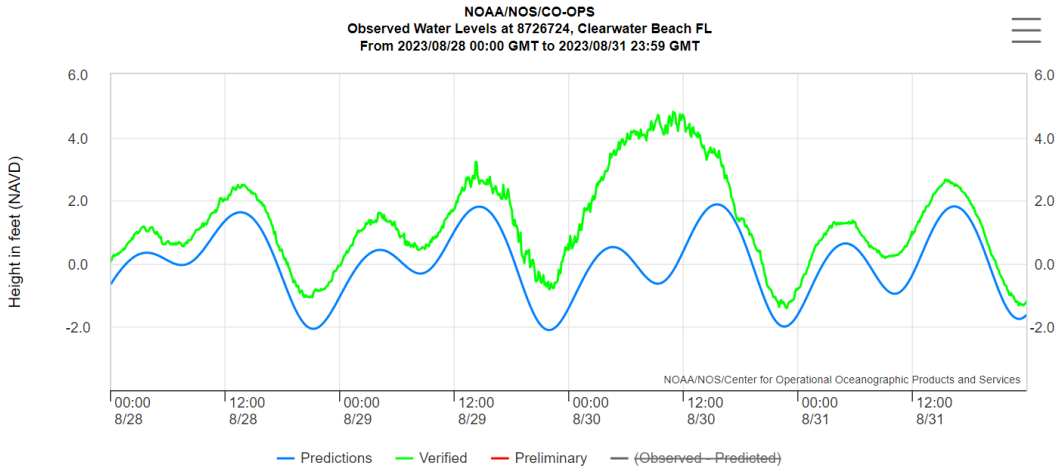
# HURRICANE IDALIA STATS

- › Powerful Category 4 hurricane
  - Underwent rapid intensification
- › Made landfall in Keaton Beach, FL on Aug. 30th
  - Category 3
  - Sustained winds of 125 mph
  - Storm surge of 7 to 12 feet across coastal Taylor/Dixie Counties



# HURRICANE IDALIA COLLIER IMPACTS

- › Eye passed approx. 180 miles from Collier
  - Wind gusts of 50 mph
- › Occurred during King Tides
  - Storm surge of approx. 3 feet on top of tides
- › Caused coastal flooding and road closures on Aug. 29<sup>th</sup> and 30<sup>th</sup>







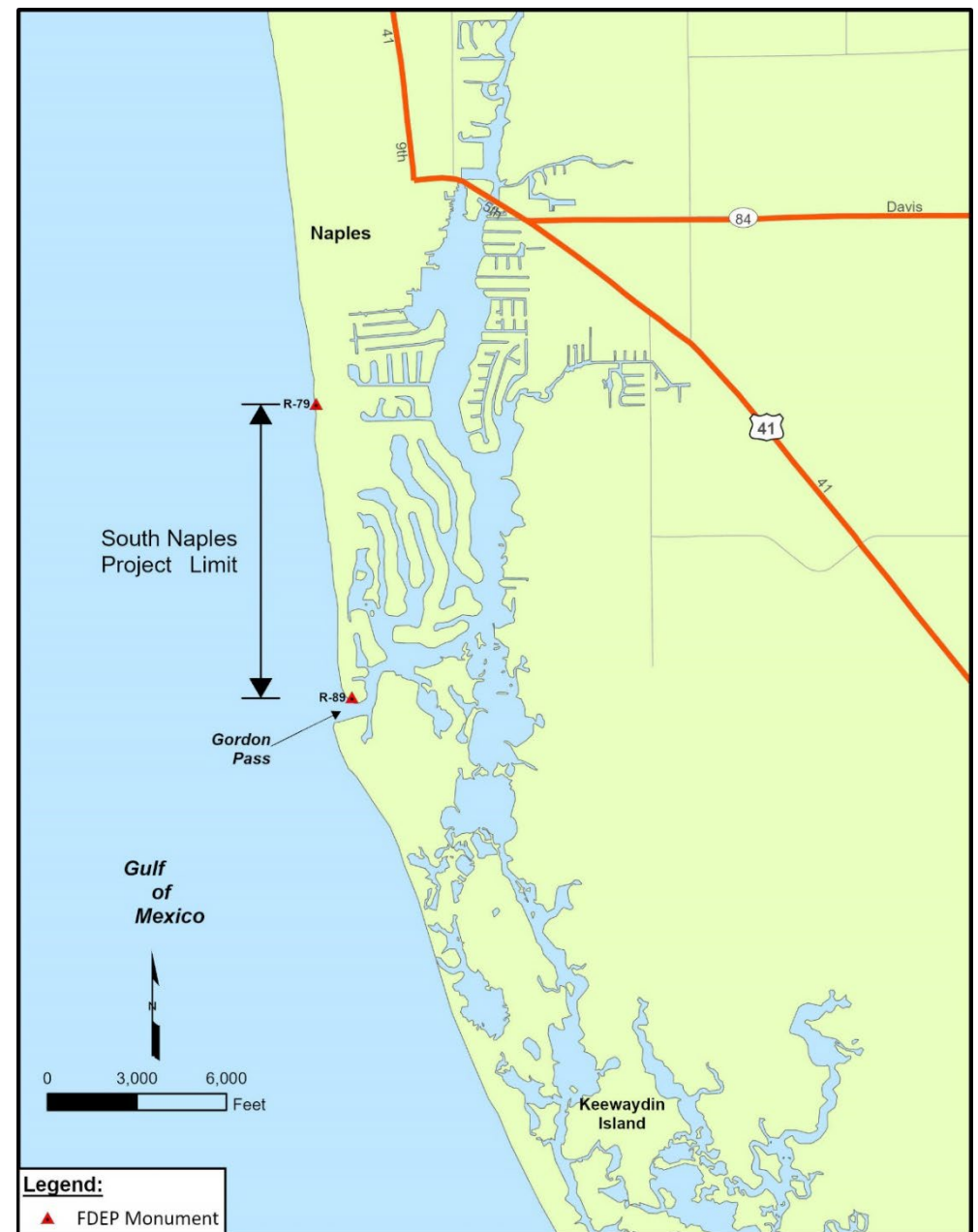


# IN PROGRESS/NEXT STEPS



# RECOVERY EFFORTS

- › Continued debris removal
- › Emergency repair/storm protection
  - Walkways
  - Overwalks
  - Dune
- › Complete South Naples reach (R-79 to R-89)
  - Estimated completion in Spring 2024
  - Approx. 45,000 tons



# RECOVERY EFFORTS

- › Comprehension plan
  - Finish immediate/emergency repairs
  - Bring periodic nourishments up to date
  - Add improvement for a higher & wider beach and improved dune
- › This is a MARATHON...not a sprint.



# QUESTIONS

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**Expect the Extraordinary.**