

# PANAMA CITY BEACHES SHORE PROTECTION PROJECT

HURRICANE MICHAEL, A STORM NOT TO BE FORGOTTEN

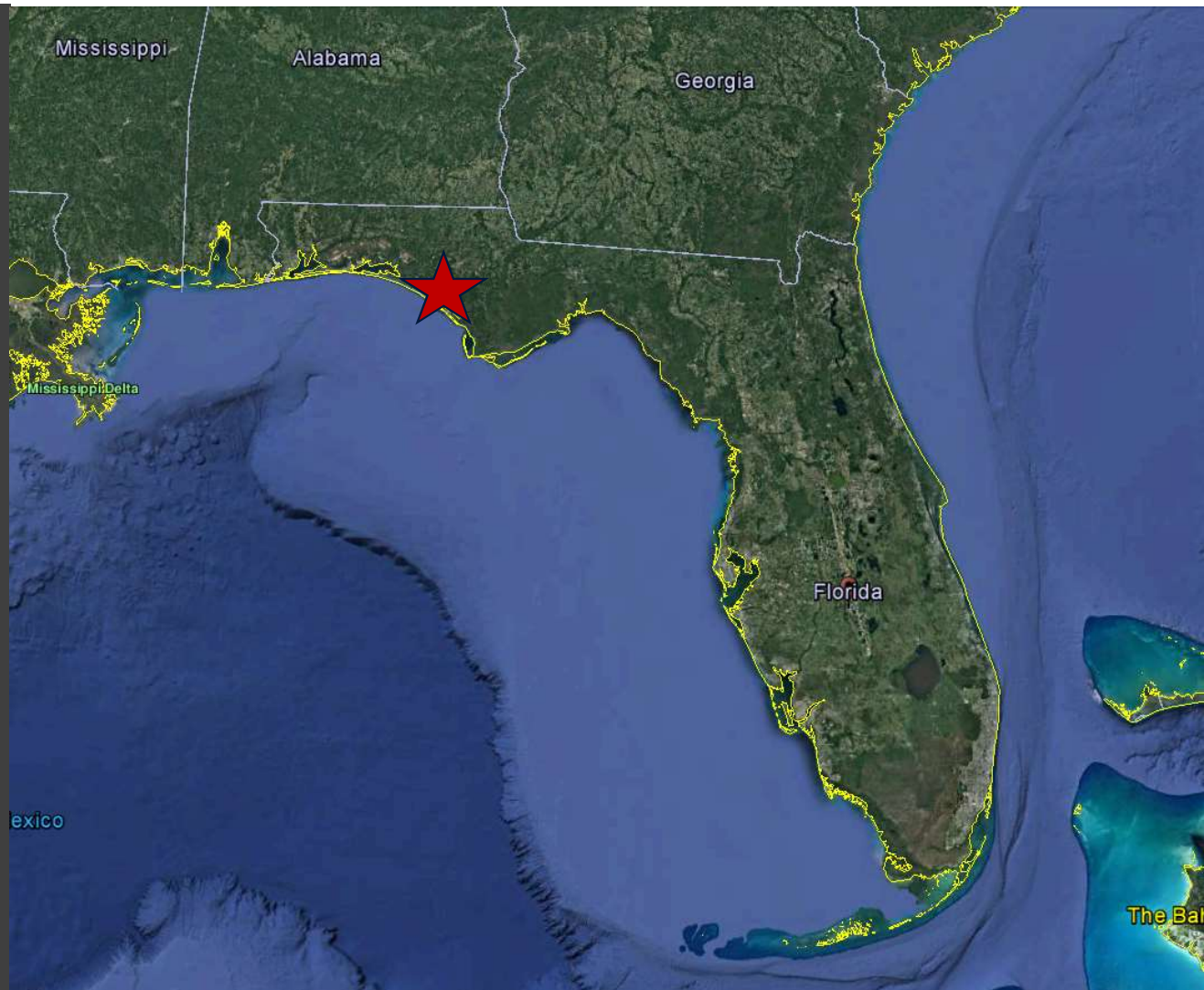
Tara Brenner, PG, PE, APTIM

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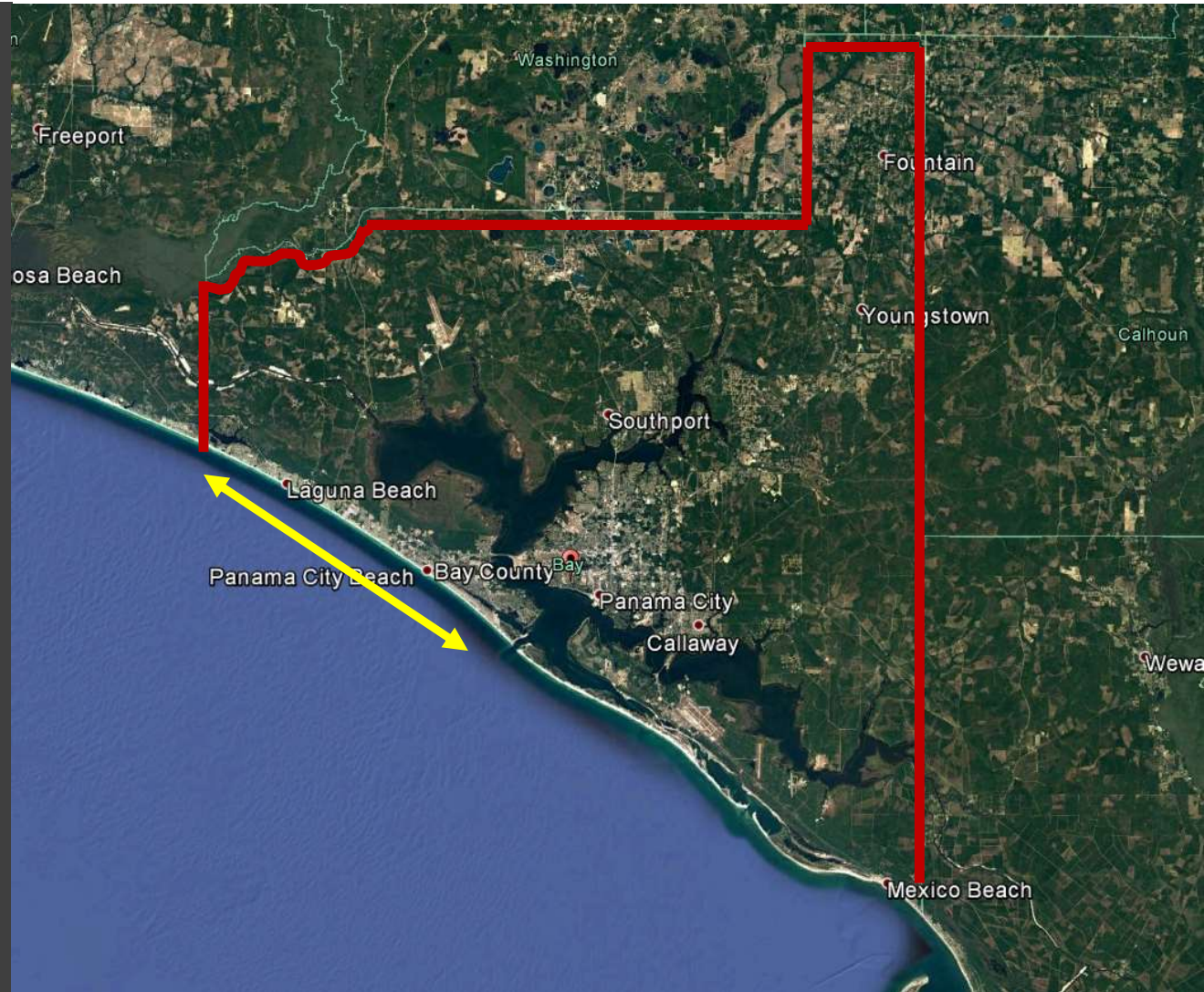
## PANAMA CITY BEACHES SHORE PROTECTION PROJECT

- Federally Authorized 1996
- Carillon Beach/Pinnacle Port added in 2011
- 18.5 mile project area



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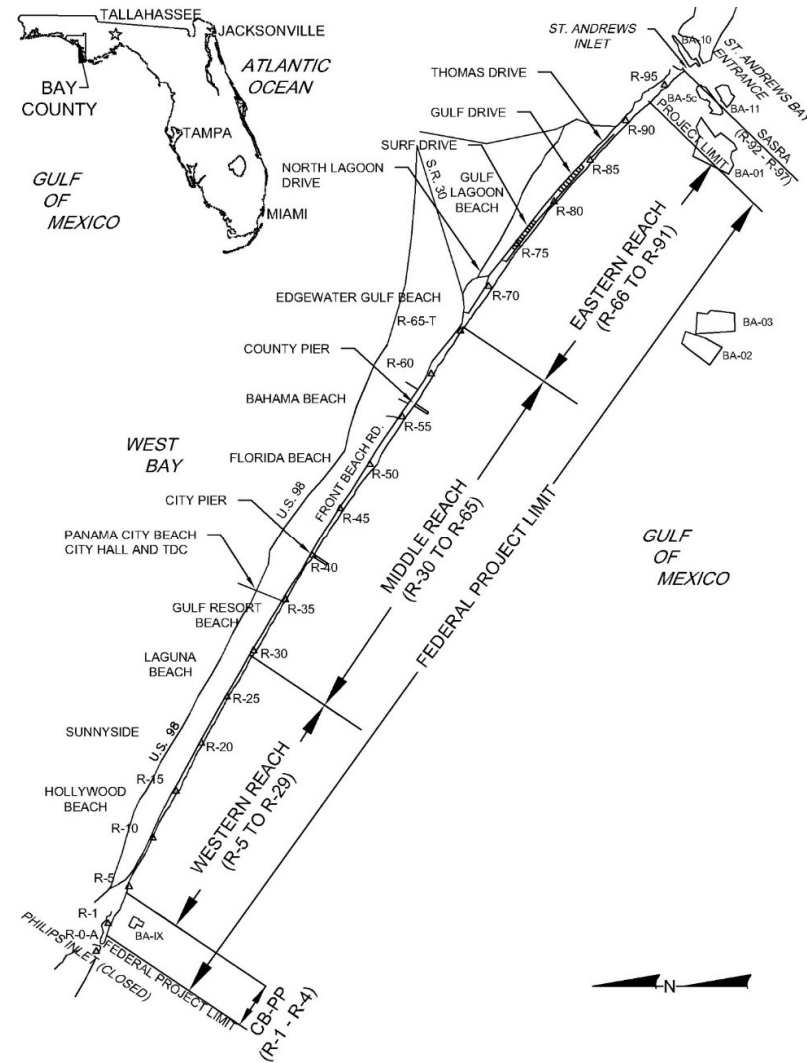


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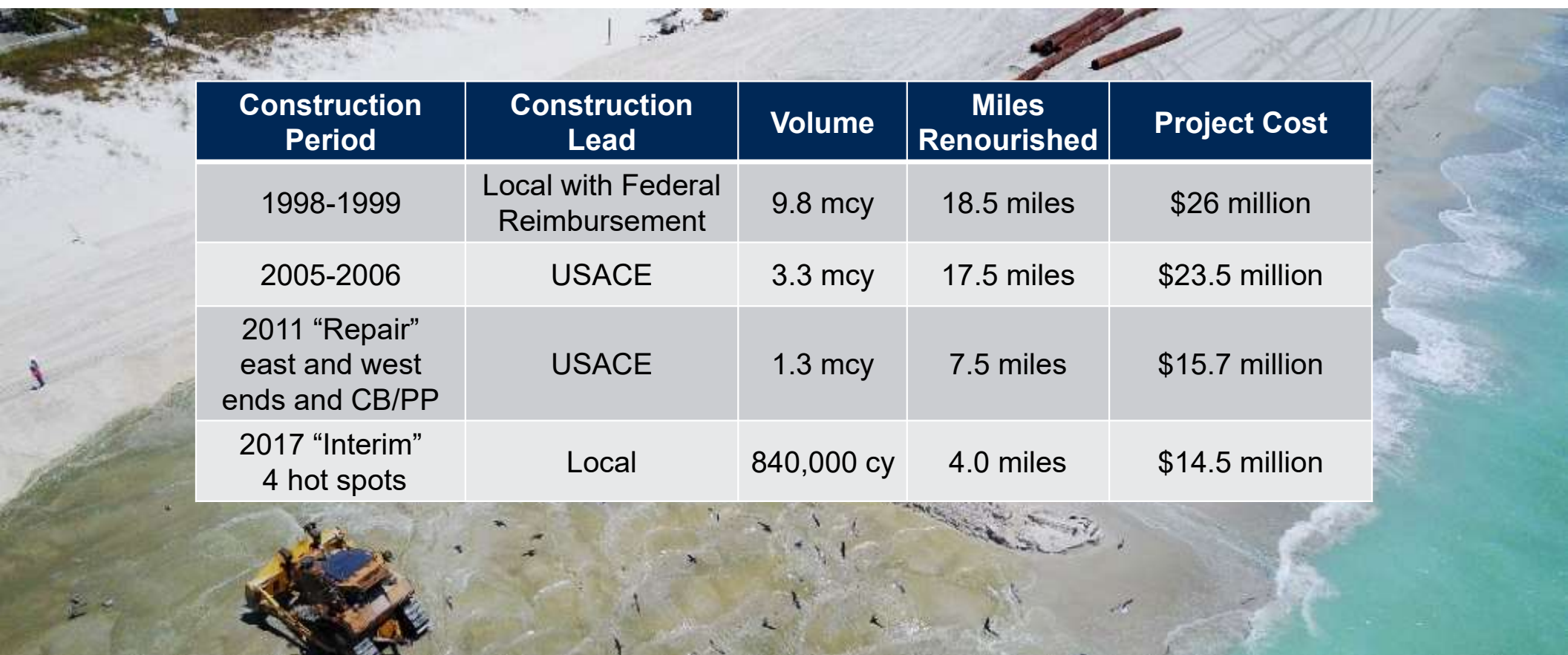
- 4 Reaches
- 30 to 50 ft. design beach width
- 7 ft. NGVD berm



Mid 1990s



# PROJECT HISTORY



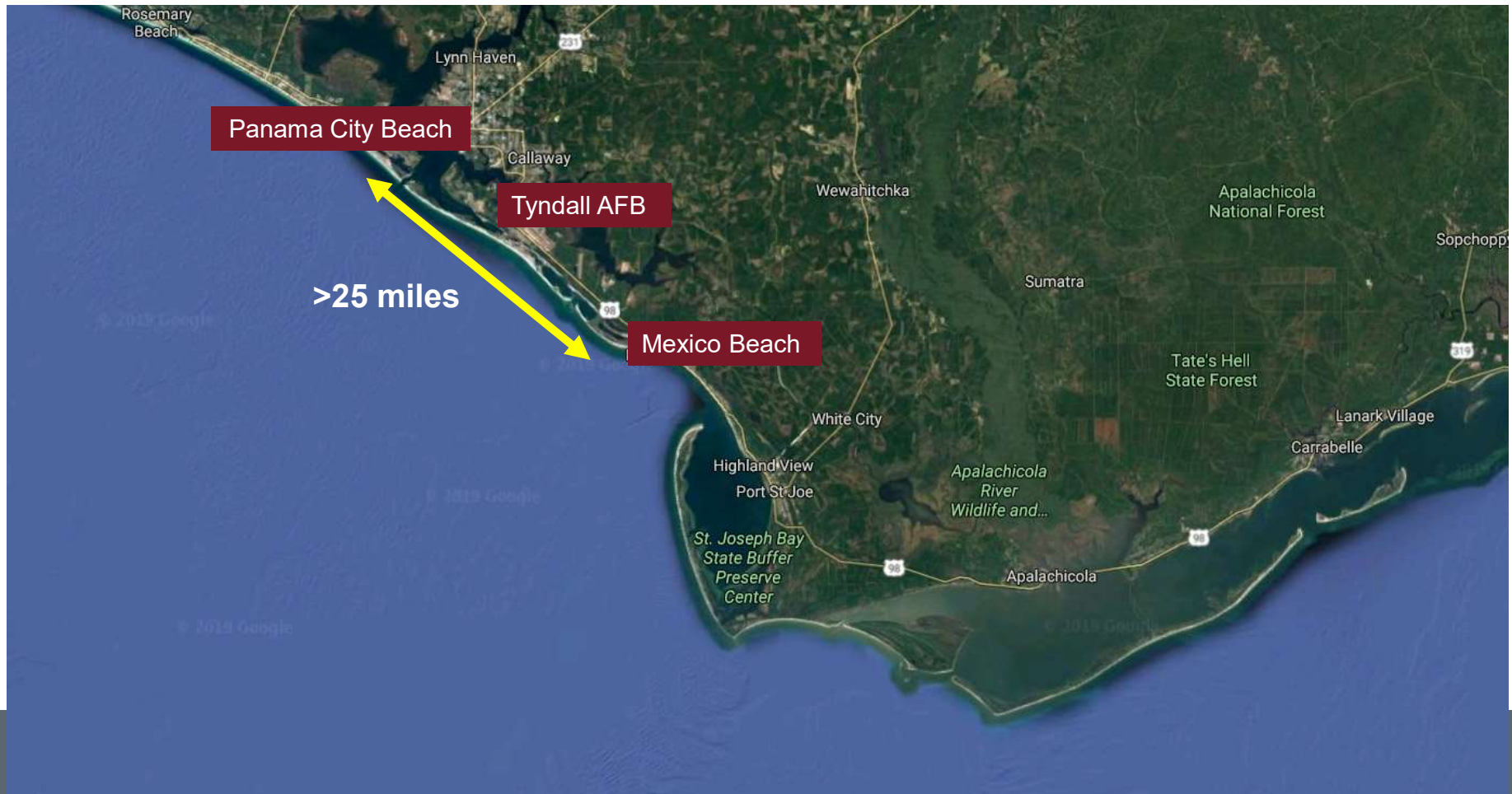
Construction Period	Construction Lead	Volume	Miles Renourished	Project Cost
1998-1999	Local with Federal Reimbursement	9.8 mcy	18.5 miles	\$26 million
2005-2006	USACE	3.3 mcy	17.5 miles	\$23.5 million
2011 “Repair” east and west ends and CB/PP	USACE	1.3 mcy	7.5 miles	\$15.7 million
2017 “Interim” 4 hot spots	Local	840,000 cy	4.0 miles	\$14.5 million



# HURRICANE MICHAEL



# DIFFERENT SIDES OF THE STORM

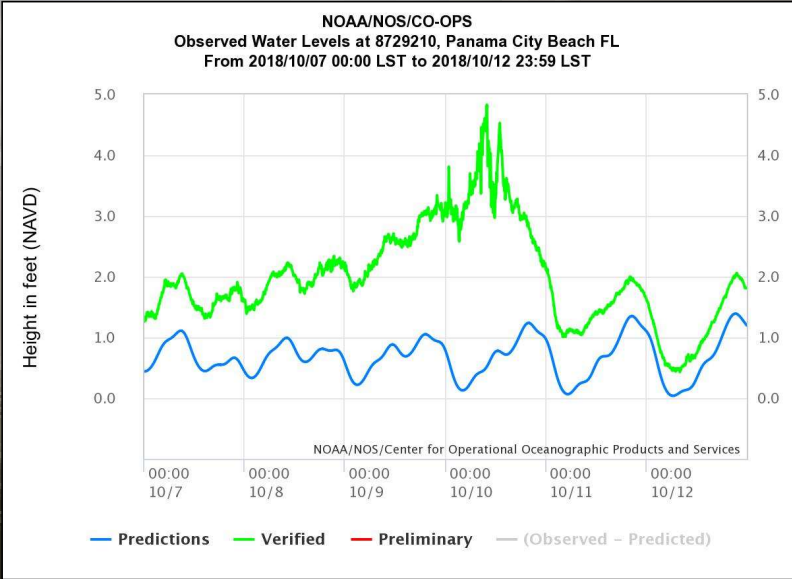
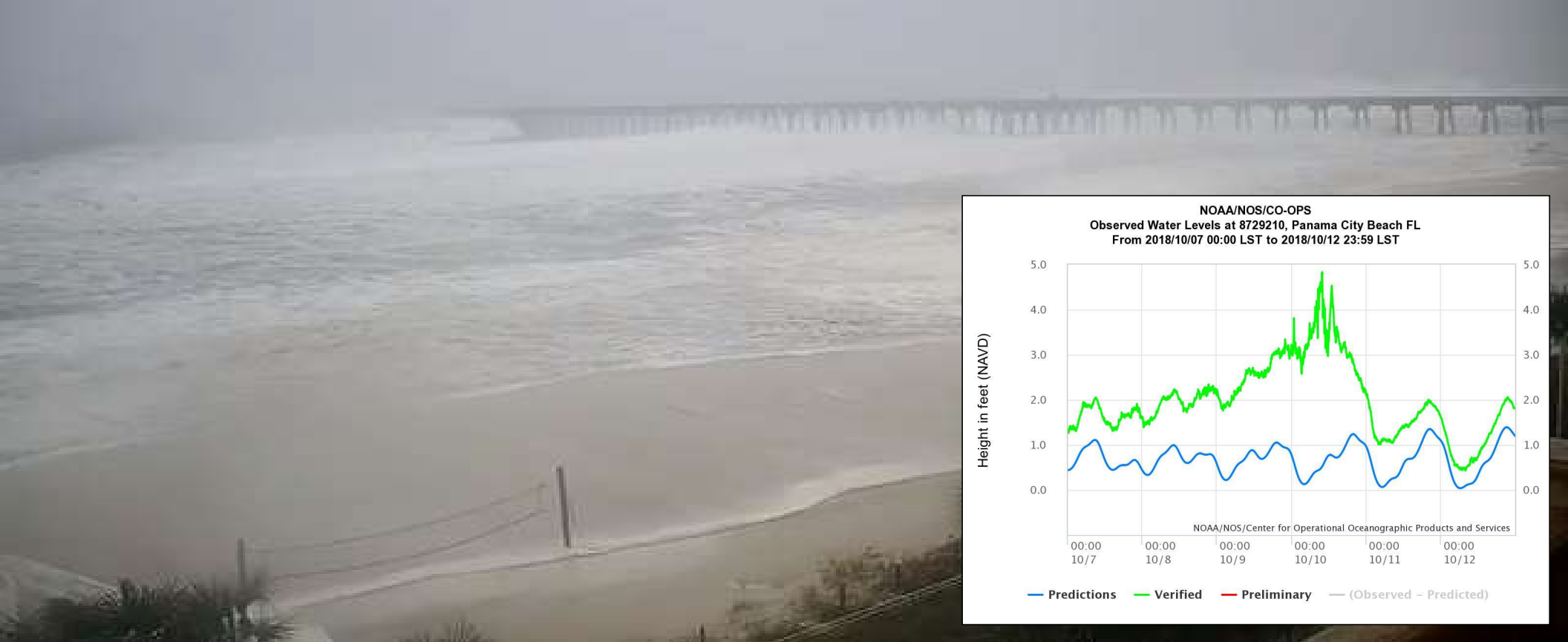


# PANAMA CITY BEACH - CITY PIER

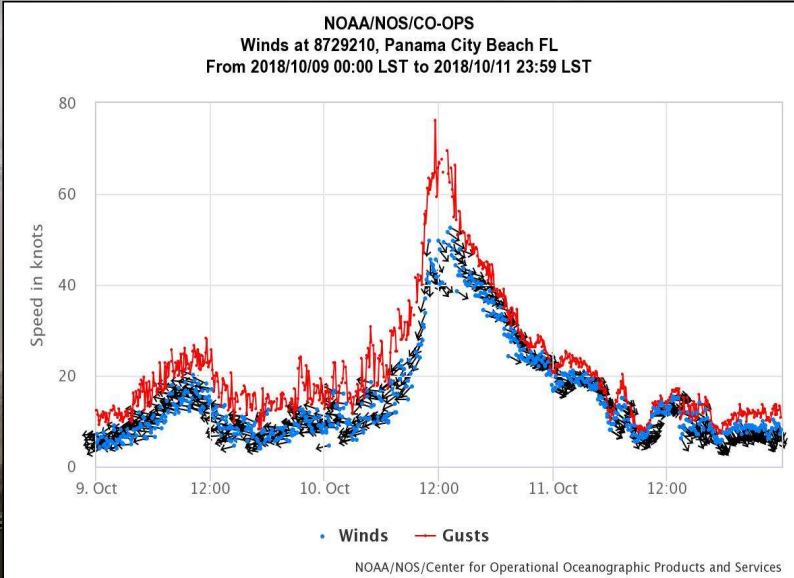
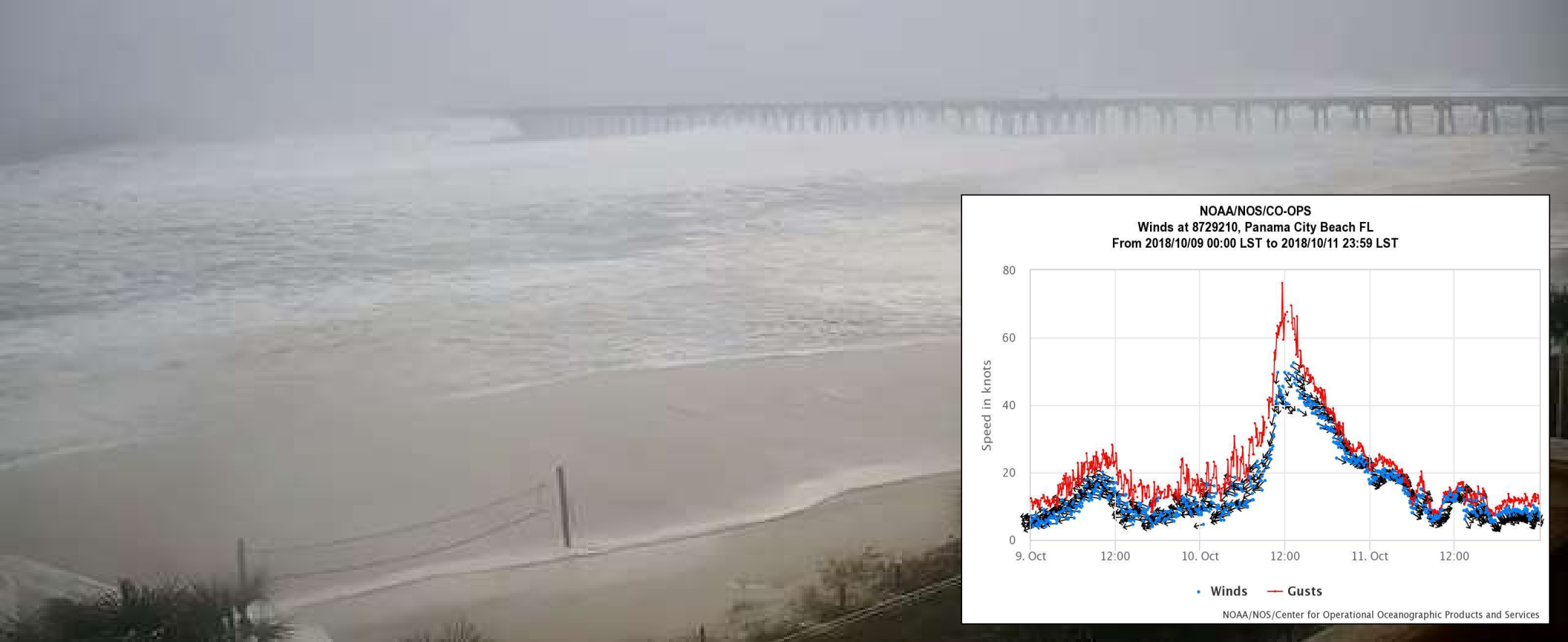




# MEASURED WATER LEVELS



# MEASURED WINDS & GUSTS



# HISTORIC STORM IMPACTS



# HURRICANE IVAN – 2004 CAT 3



Lost the end of City Pier



# HURRICANE MICHAEL - INLAND



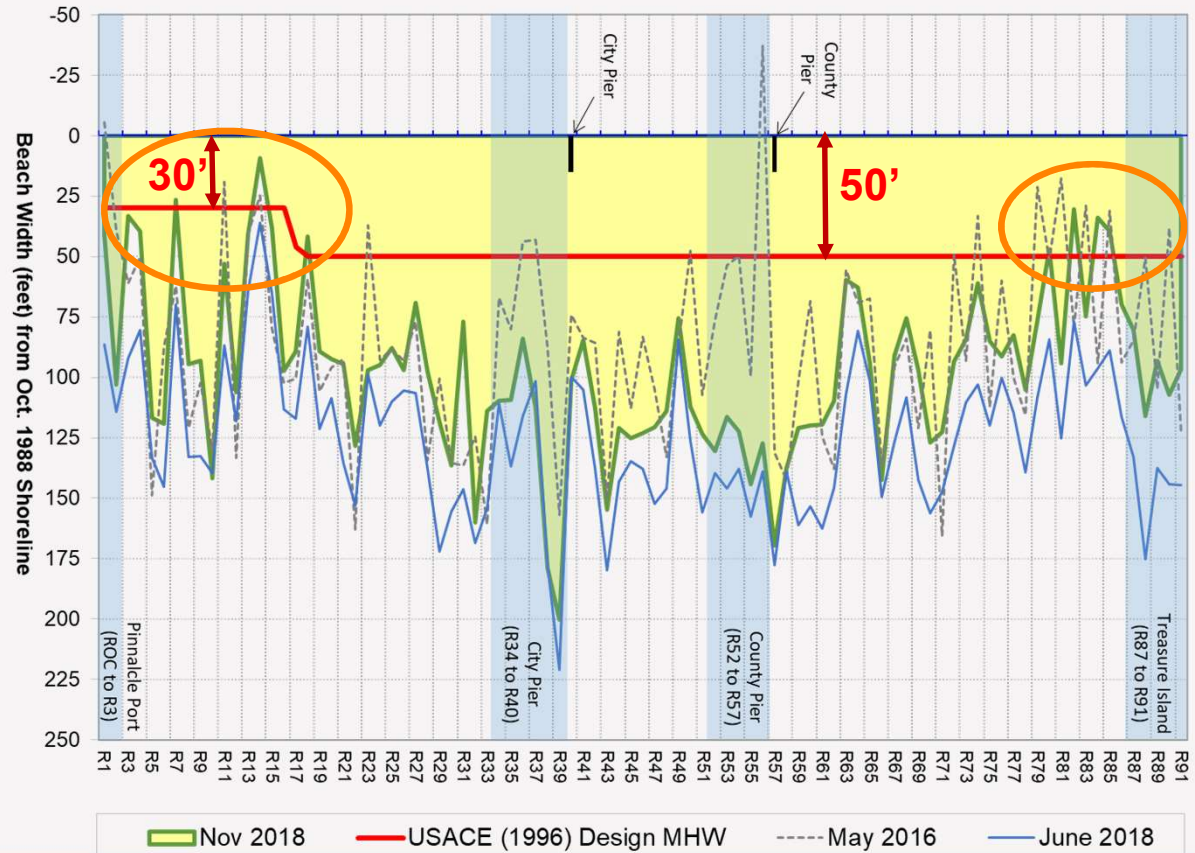
# HURRICANE MICHAEL - COASTAL



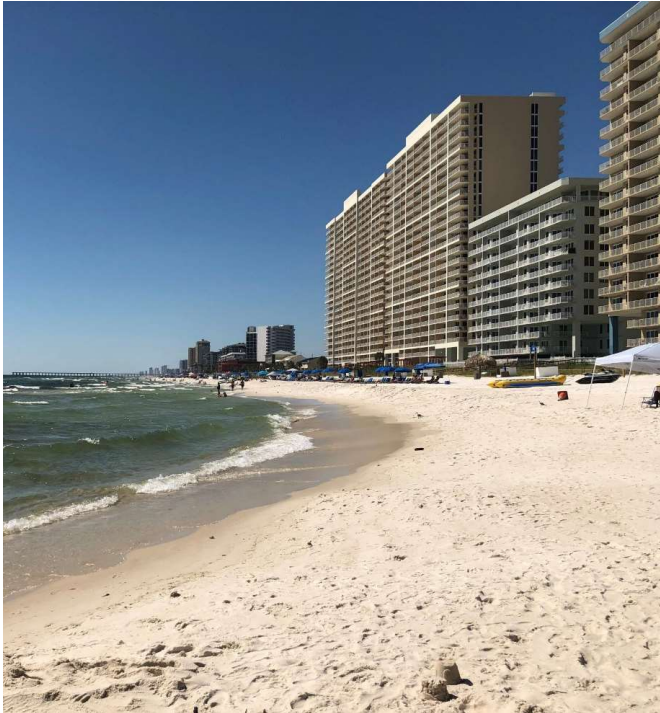
# HURRICANE MICHAEL - COASTAL



# STORM IMPACTS







# REPAIR PROJECT COORDINATION & SITE VISIT 9-6-19

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September 18, 2019

FSBPA Annual Conference

*“Wide beaches and high dunes” help reduce storm damages.*

- Qualitative

THEN



NOW



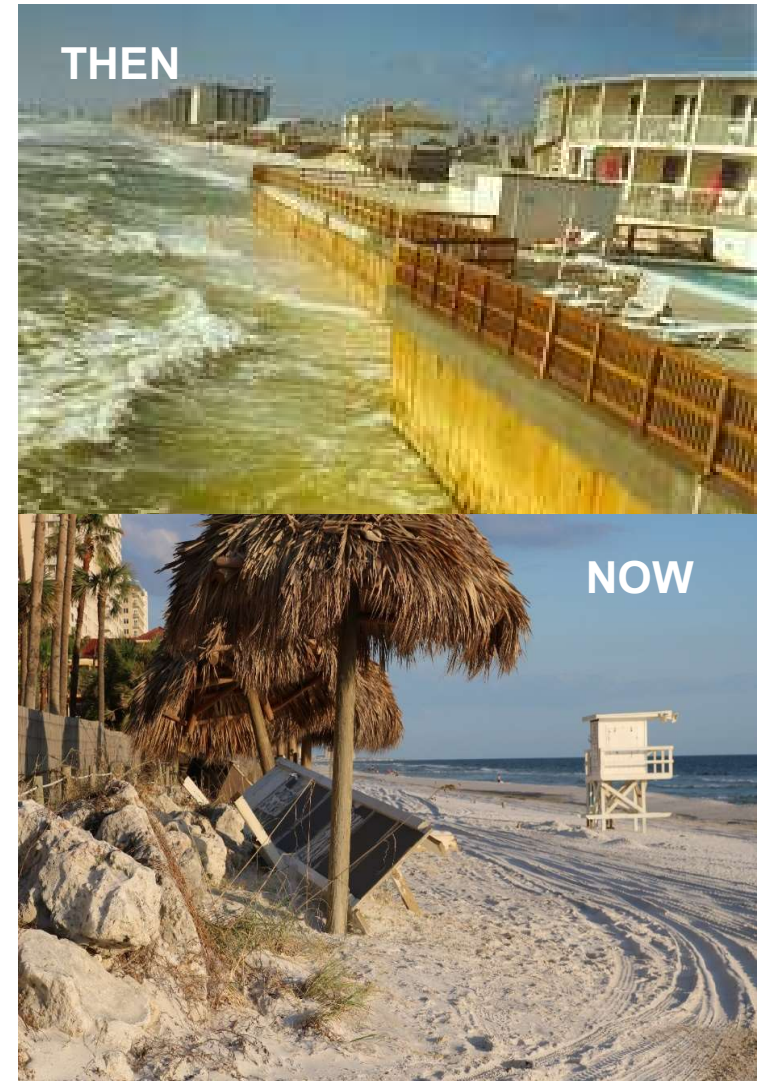
*“Wide beaches and high dunes” help reduce storm damages.*

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## COASTAL RESILIENCE INDEX QUANTITATIVE PILOT STUDY FOR USACE ERDC

Coastal Resilience Index (CRI) calculations consider three parts of contribution

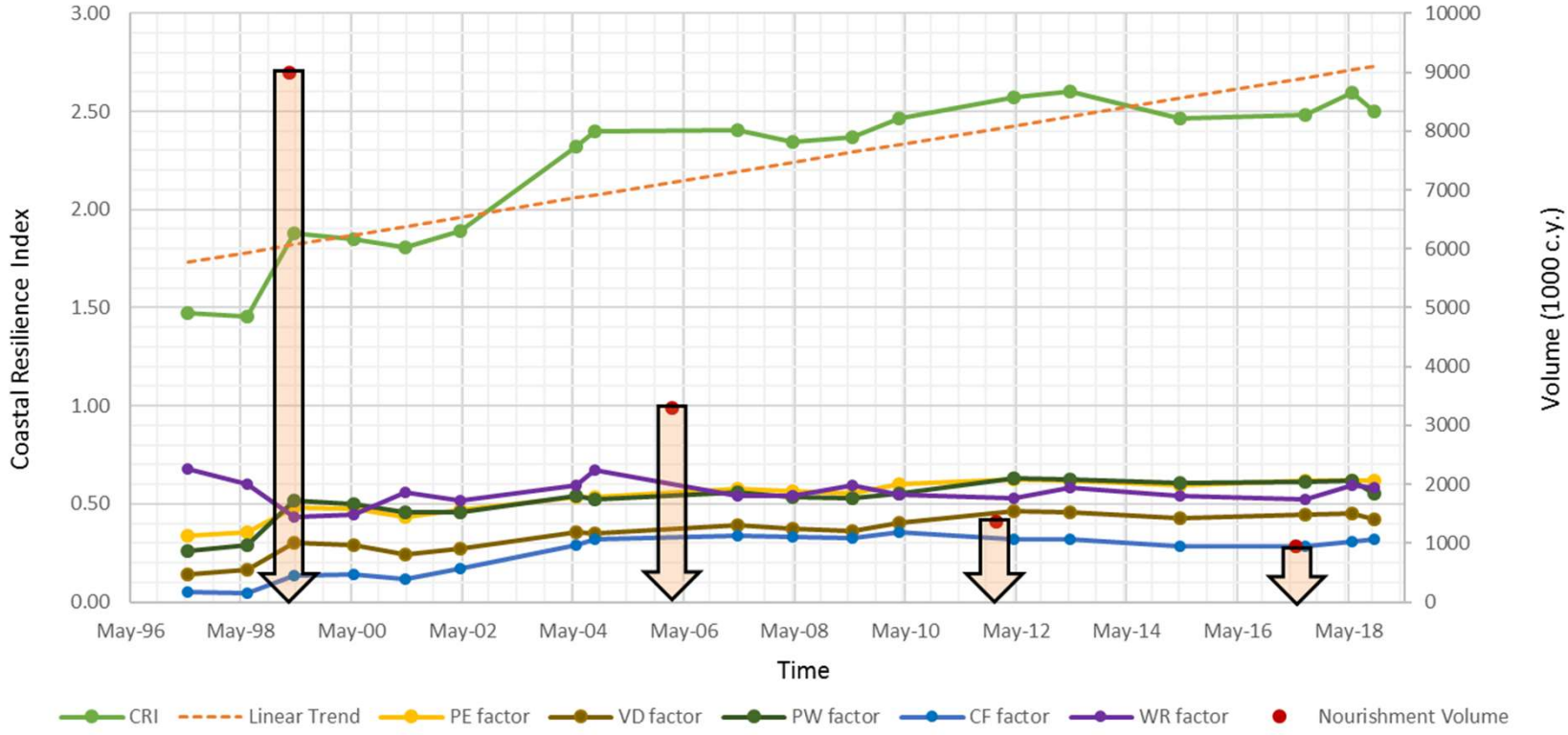
- ▶ Beach and dune system
- ▶ Storm surge
- ▶ Waves



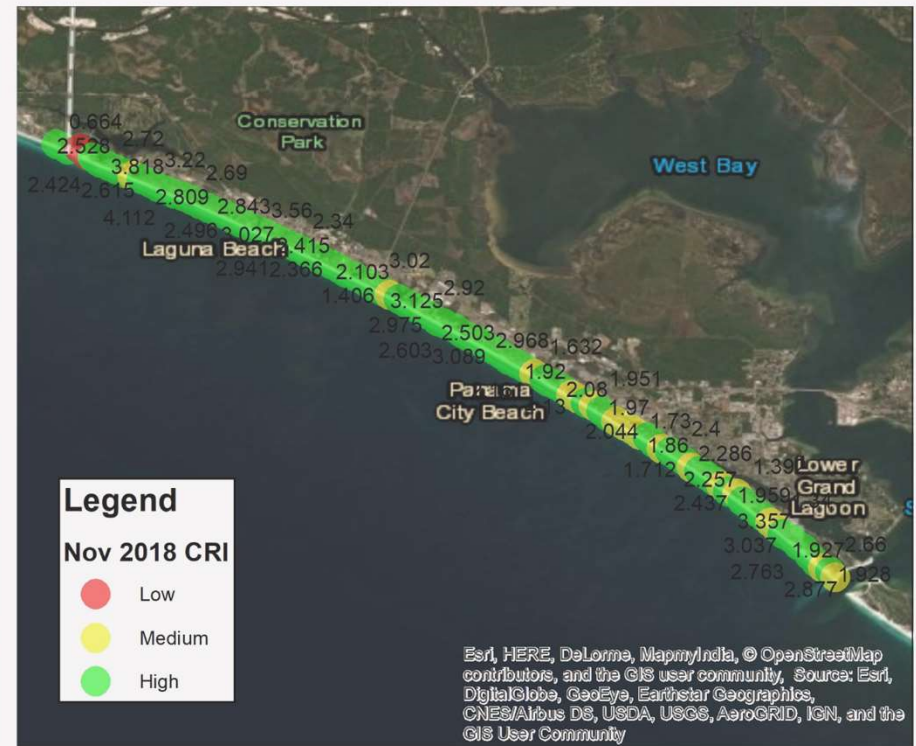
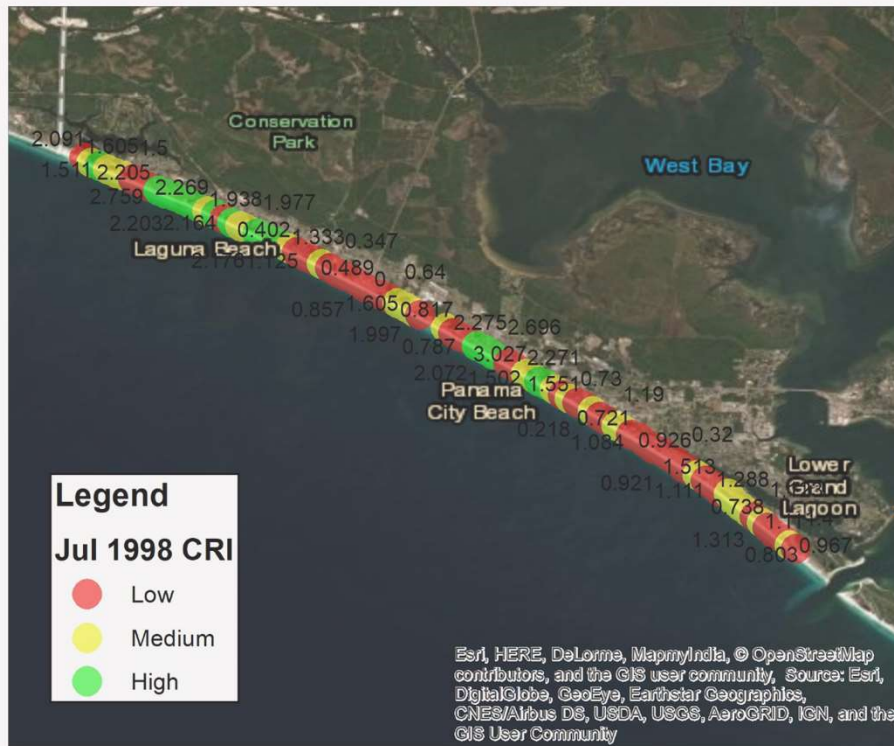
# PANAMA CITY BEACH

## MEAN CRI

Mean CRI & Beach Nourishment Projects



# PANAMA CITY BEACH MEAN CRI



# QUESTIONS?

Tara Brenner, PG, PE

[Tara.Brenner@aptim.com](mailto:Tara.Brenner@aptim.com)

Phone: 631-896-9137

Boca Raton, Florida





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