

# Long Term Success and Future Approach of the Captiva and Sanibel Islands Beach Renourishment Program



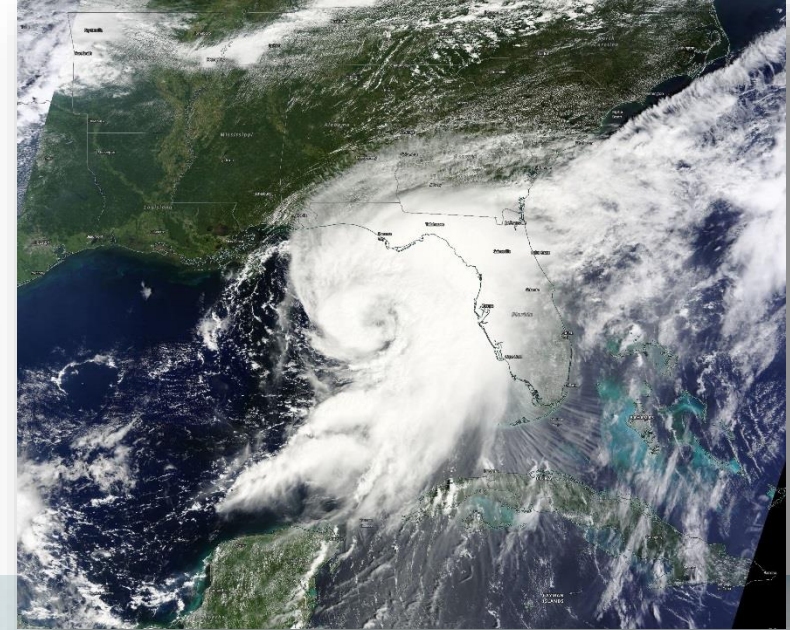
Thomas P. Pierro, PE, D.CE, Director, CB&I  
Michelle Pfeiffer, P.E., Senior Project Engineer, CB&I  
Stephen Keehn, P.E., Senior Coastal Engineer, CB&I  
Kathleen Rooker, Administrator, CEPD, Captiva, FL

## Acknowledgments

CEPD Board Members, Alison Hagerup, Tom Campbell, Bill Stronge



- Hurricane Hermine
- Windshield inspection 9/2/2016
- Beach buffered storm



- The District was established as a beach and shore preservation district June 19, 1959.

*“Our sole purpose and dedication is to Captiva beach and shore preservation.”*

– Kathy Rooker, Captiva Island Erosion Prevention District (2017)

- Lee County's Beach Management Plan traces its roots to Captiva Island.

*“Captiva Island was the birthplace of beach nourishment in Lee County.”*

– Steve Boutelle, Lee County Division of Natural Resources (2014)



- Captiva Island property owners overwhelming support beach projects.

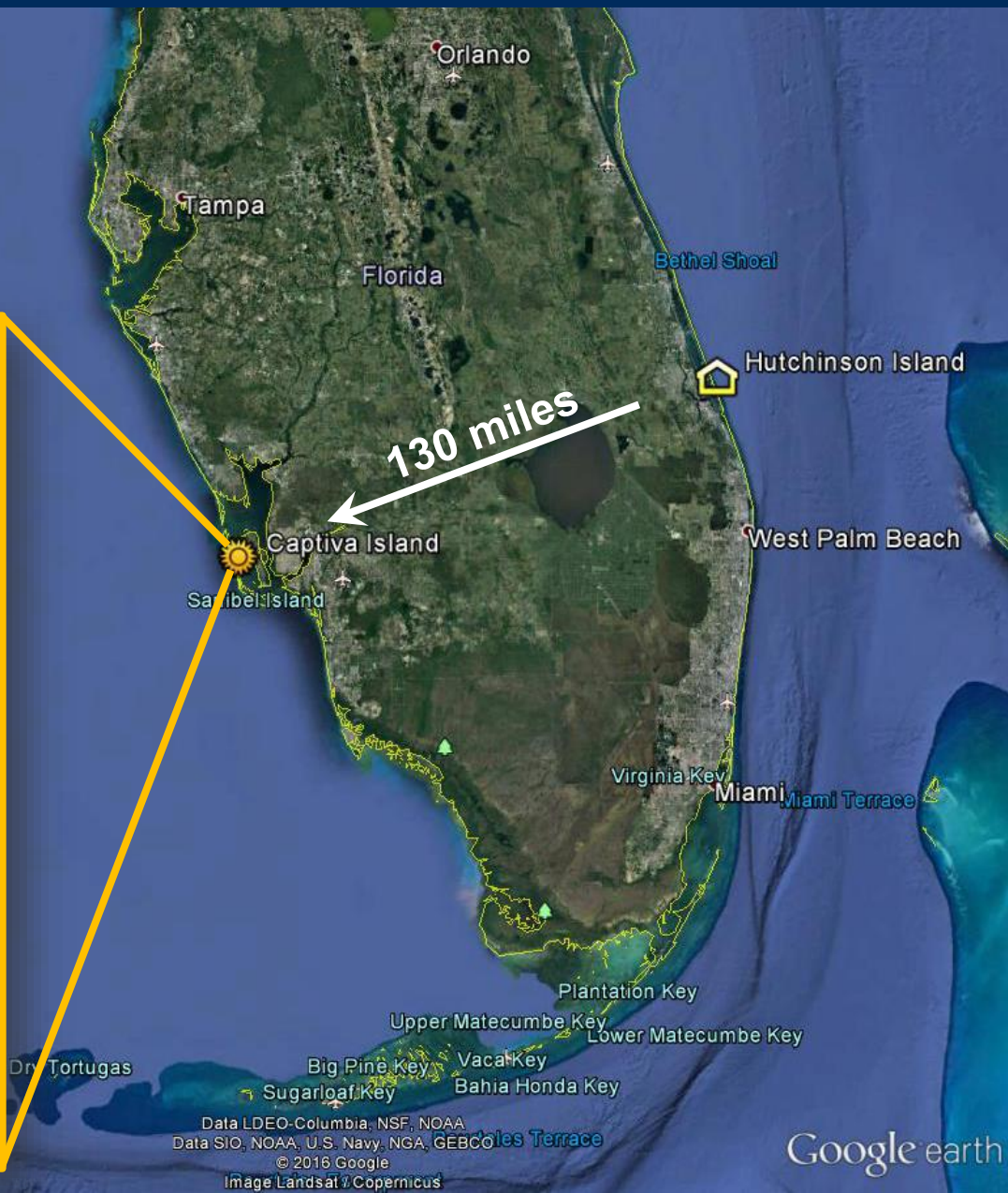
*“Its expected and accepted.”*

- Longtime property owner regarding the beach nourishment projects

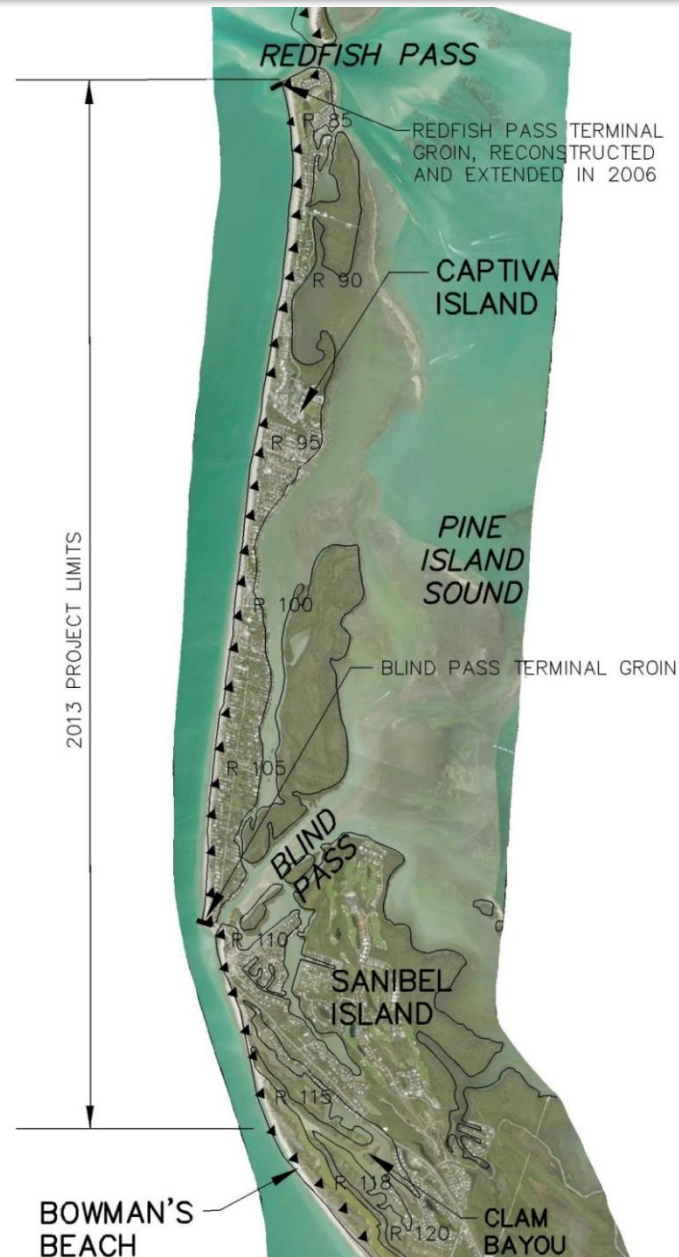




- Lee County
- Barrier island system
- Connected waterways

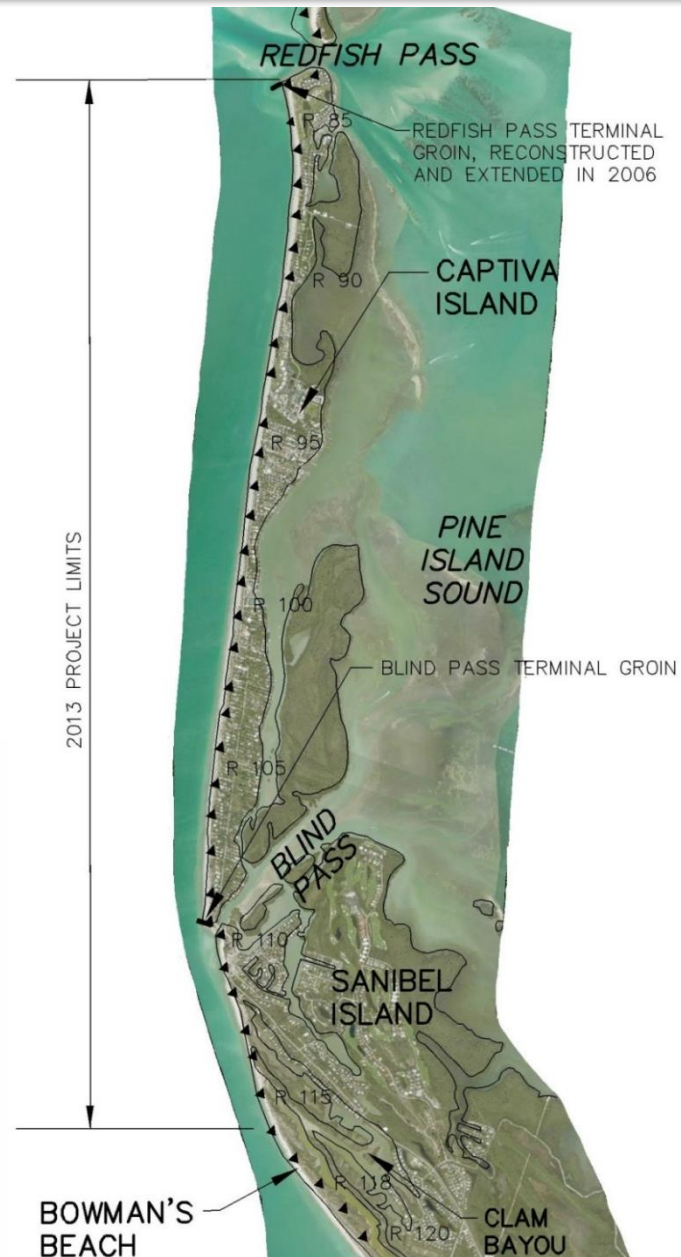


- Over 50 years of nourishment projects
- Limited fill placements in 1961 and 1981; 134 groins
- First island-wide nourishment in 1988/89
- Renourished in 1996 and 2005/06
- Supplement fill project in 2008 (Sunset Beach & the Village/Jensen's)
- Most recent renourishment in 2013





- Captiva Island's beach projects are designed to renourish the entire island each time a project is constructed.
- 4.4 MCY placed on Captiva since 1988
- 2.8 MCY remaining in June 2016 (63%)







*“The need for beach and shoreline restoration can be no more graphically illustrated than to view pictures of Captiva's beach prior to the islandwide nourishment in 1988.” – CEPD Beach Briefs, Oct 2010*













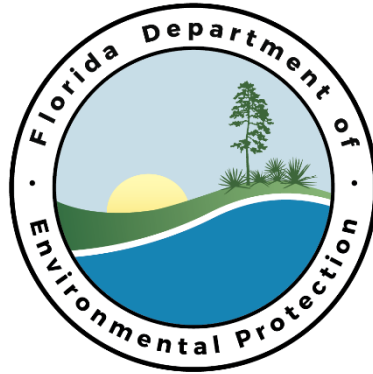
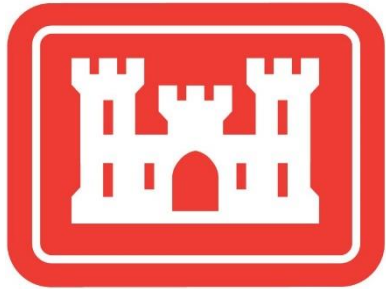






CEPD Commissioners (March 2013)





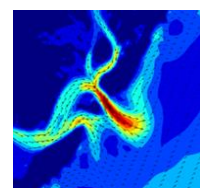
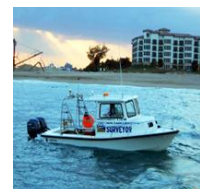
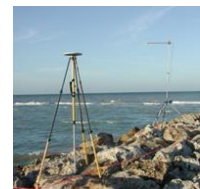
- U.S. Army Corps of Engineers
- State of Florida FDEP
- Lee County
- Captiva Island property owners
- Federal Emergency Management Agency



# FEMA

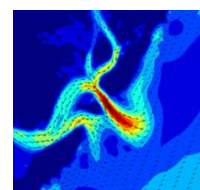
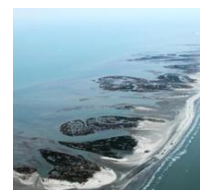
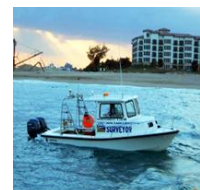
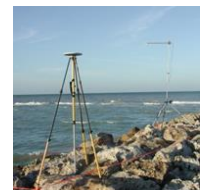


- CEPD, Lee County and the City of Sanibel
- Original agreement executed August 16, 1995
- Agreement renewed April 18, 2000
- Requires CEPD and County to place sand on Sanibel
- Replace eroded sand up to a maximum amount of 25,000 cubic yards per year, for each year from the last renourishment project
- 15 year agreement (expired in 2015)



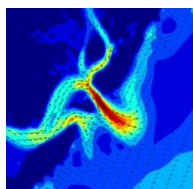
*“The enabling legislation of the CEPD requires that special assessments used to finance an erosion control project be levied against benefitting properties in proportion to the benefits received by the properties from the project.” - William B. Stronge, Ph.D. (2010)*

- All property owners are assessed a portion of the cost of construction of the project using a project benefits model unique to Captiva Island.
- Captiva voters overwhelmingly approved a referendum to borrow funds for the 2013 beach nourishment project.





- Designed to address background erosion and traditional hotspot areas
- 6 miles of shoreline on Captiva & Sanibel
- 965,000 cubic yards placed on two islands
- Borrow Area VI-E (9.5 miles offshore)
- October to December 2013
- Constructed locally without USACE participation



2013 Project: 965,000 cubic yards

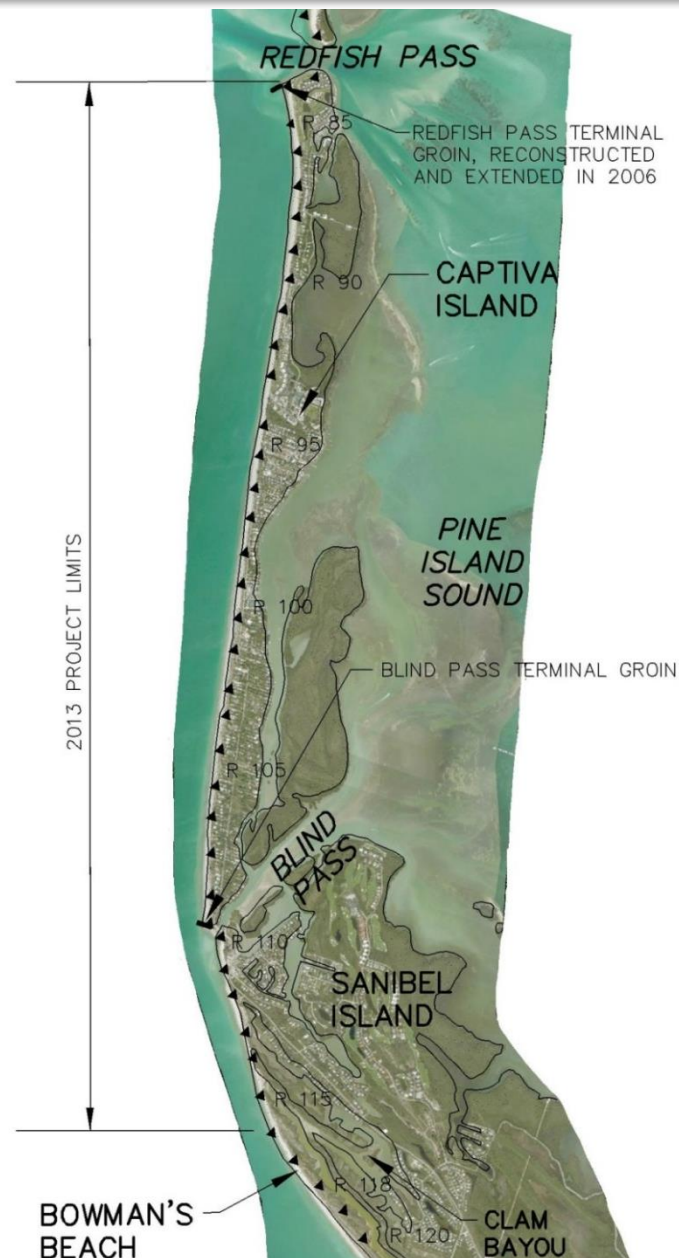
- Captiva: 860,000 cubic yards
- Sanibel: 105,000 cubic yards

Post-construction monitoring surveys:

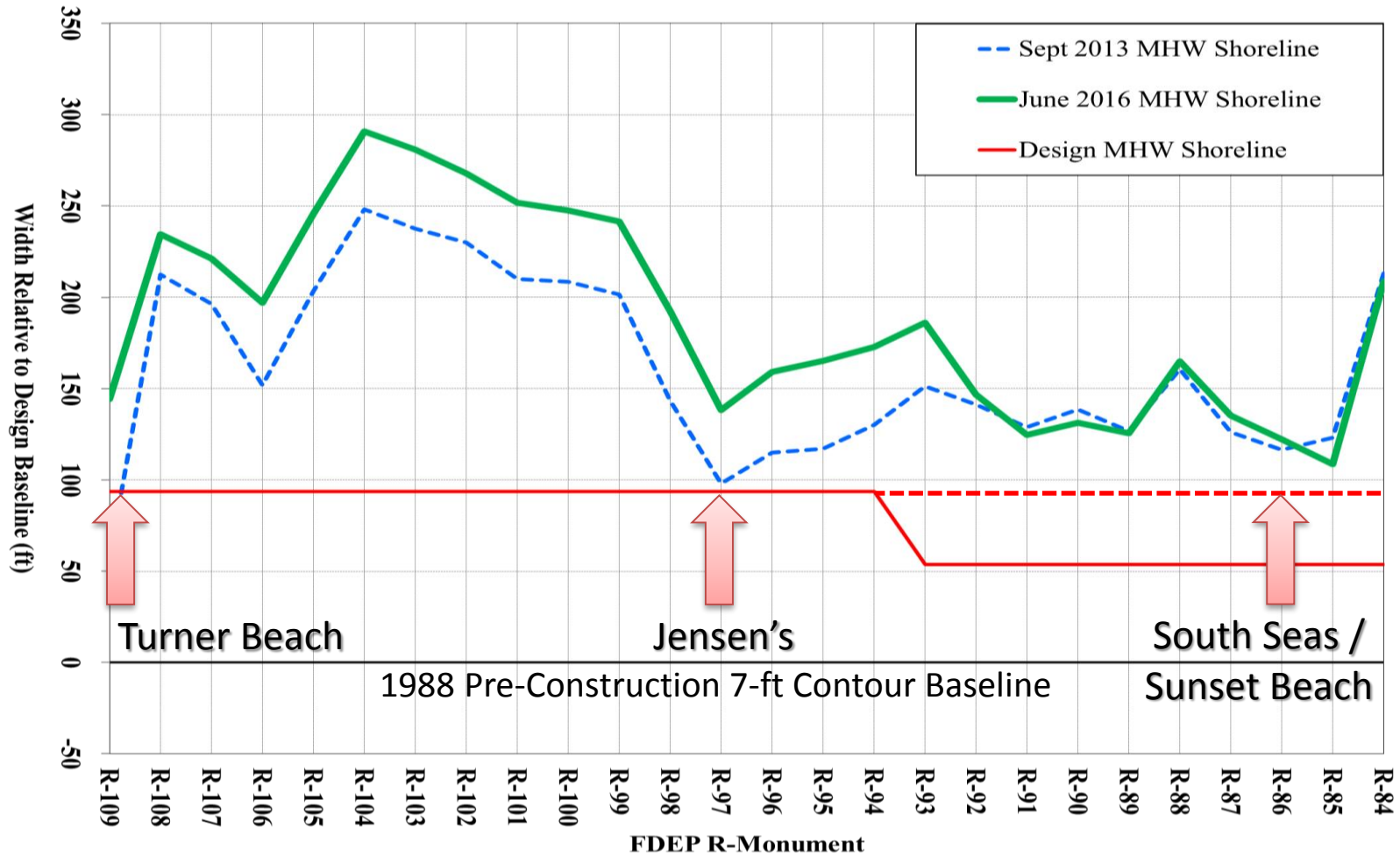
- Pre-construction (September 2013)
- Post-construction (January 2014)
- 1-Year (waived)
- 2-Year (May 2015)
- 3-Year (June 2016)

FDEP R-monuments in monitoring areas:

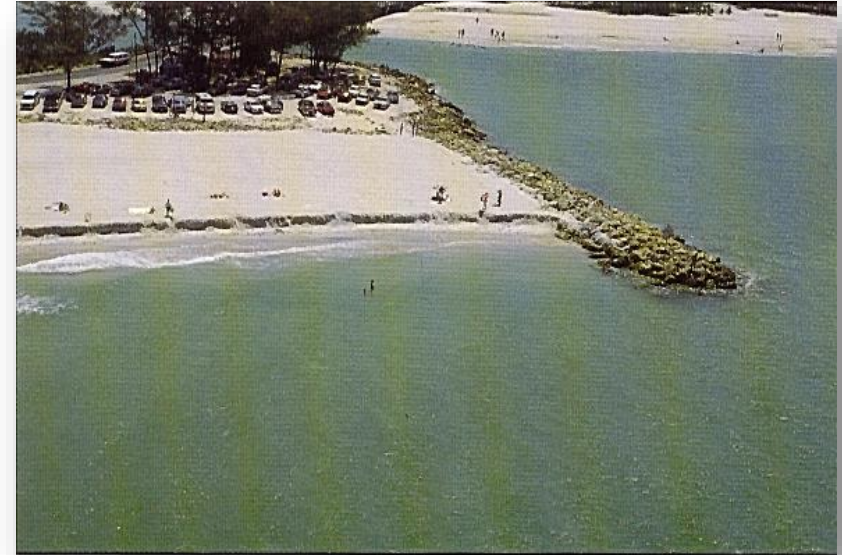
- Captiva: R-83 to R-109
- Sanibel: R-110 to R-123







- Initial constructed in 1972
- Protects Turner Beach
- Extended 100' in 1988/89
- Stabilizes beach fill on Captiva



Pre-1988



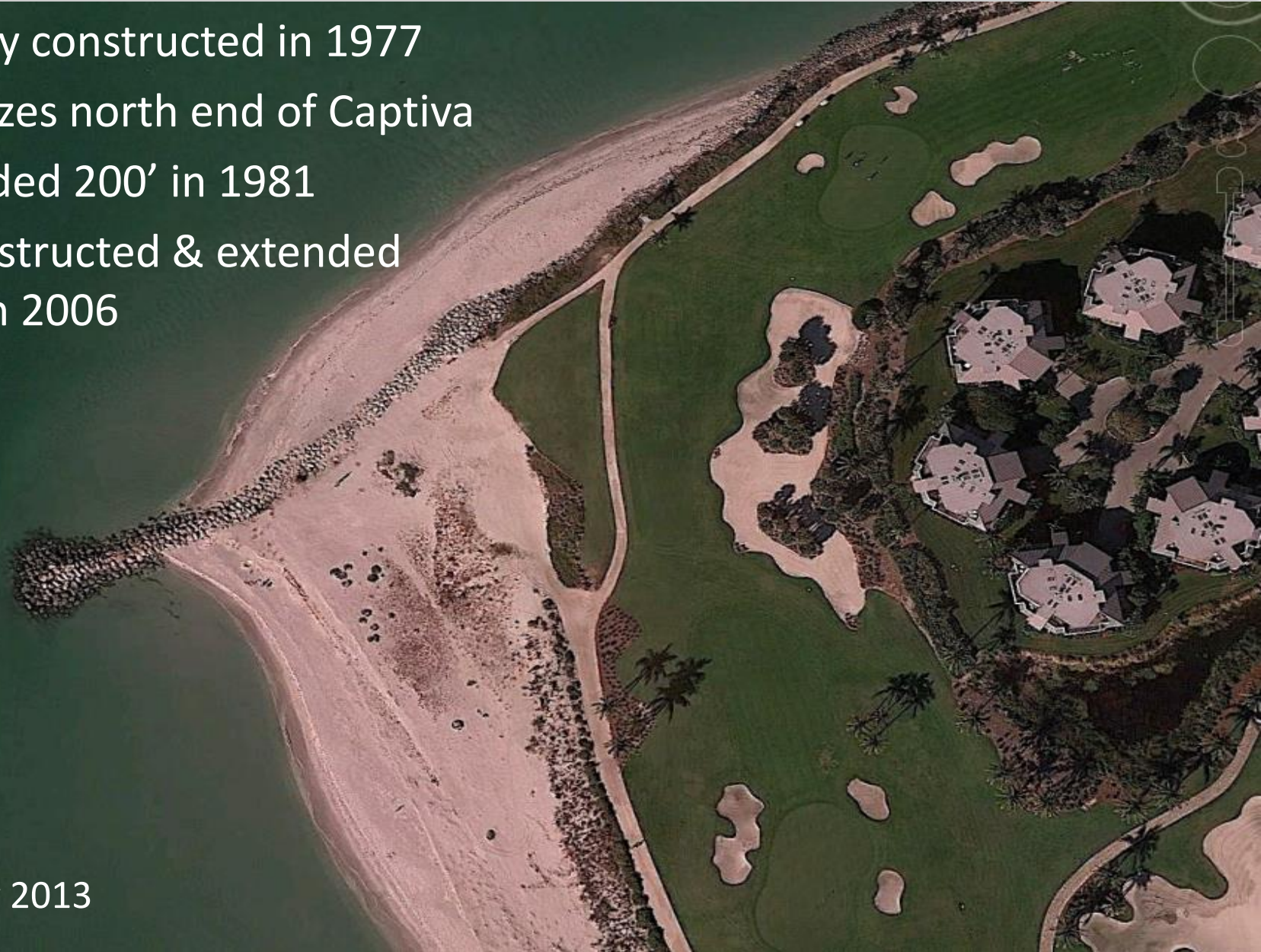
June 2016





- Initially constructed in 1977
- Stabilizes north end of Captiva
- Extended 200' in 1981
- Reconstructed & extended 100' in 2006

January 2013

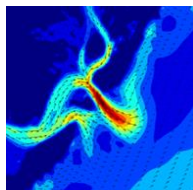
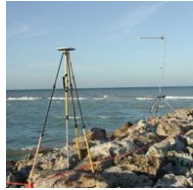


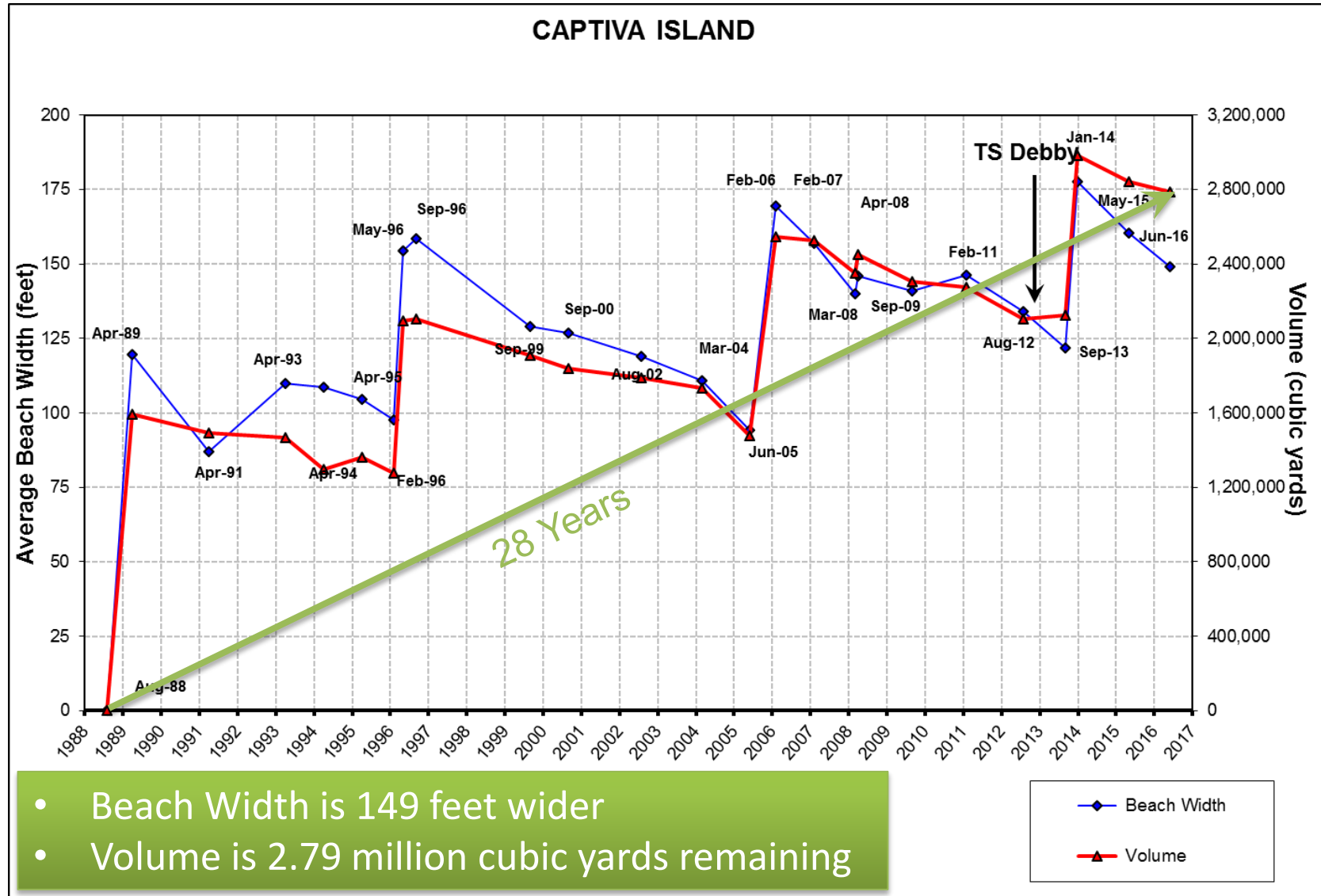






- Persistent hotspots identified over time
- Use monitoring data as guide to revise design
- Triggers vs. project wide performance
- Overfilling hotspots may add sand to “cold” spots
- Build up volume for long term storm protection
- Ongoing adjustments







- 15 Year permit
- Multiple nourishment events
- Modified beach fill template (width and elevation)
- Dunes
- Offshore borrow sources
- Upland sand sources for truck haul



**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
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 TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT  
GOVERNOR

CARLOS LOPEZ-CANTERA  
LT. GOVERNOR

CLIFFORD D. WILSON III  
INTERIM SECRETARY

**CONSOLIDATED JOINT COASTAL PERMIT AND SOVEREIGN SUBMERGED LANDS AUTHORIZATION**

**PERMITTEE:**

Captiva Erosion Prevention District  
 c/o Kathleen Rooker  
 11513 Andy Rosse Lane, Unit 4  
 Captiva Island, Florida 33924

**PERMIT INFORMATION:**

Permit Number: 0200269-009-JC

Project Name: Captiva and Sanibel Island Beach Nourishment

County: Lee

Issuance Date: December 11, 2014

Expiration Date: December 11, 2029

**AGENT:**

Michelle Pfeiffer  
 Coastal Planning and Engineering, Inc.  
 2481 N. W. Boca Raton Blvd.  
 Boca Raton, Florida 33431

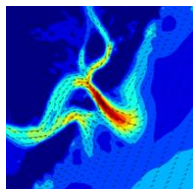
**REGULATORY AUTHORIZATION:**

This permit is issued under the authority of Chapter 161 and Part IV of Chapter 373, Florida Statutes (F.S.), and Title 62, Florida Administrative Code (F.A.C.). Pursuant to Operating Agreements executed between the Department of Environmental Protection (Department) and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing and taking final agency action on this activity.

**PROJECT DESCRIPTION:**

The activity is to periodically nourish the beach at the Captiva Island segment of the federally-authorized Lee County Shore Protection project, to restore the northern tip of Captiva Island and to nourish the northern portion of Sanibel Island. Two previously-permitted borrow areas (III-B and VI-E), will be utilized as sand sources for this project. The elevation of the design beach berm inclines from +6.5 feet North American Vertical Datum (NAVD) at the dune line to +4.5 feet NAVD at the crest of the foreshore face of the berm, where it has a seaward slope of 1:10 vertical:horizontal (V:H) to the existing profile.

- Routine nourishment at 8-10 year intervals using two offshore borrow areas.
- Emergency nourishment (including larger hotspots) in response to major storm erosion.
- Smaller hotspot nourishment using upland sand sources.
- Inlet management

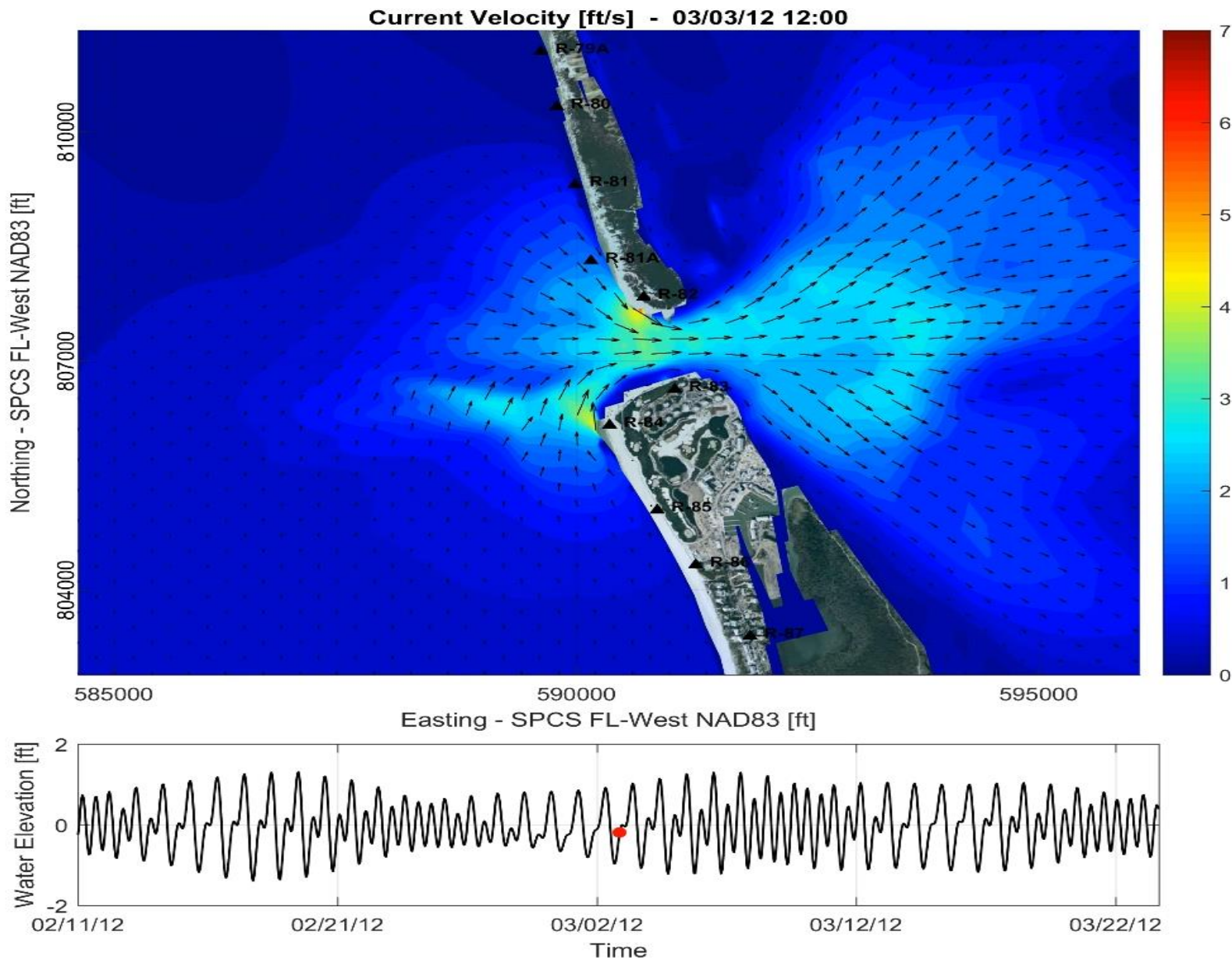




- Update sediment budget
- Evaluate sustainable dredging practices
- Address Sunset Beach hotspot
- Assess potential impacts to coastal system
- Recommend inlet management plan for adoption

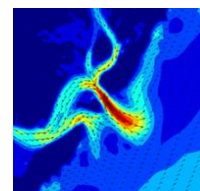
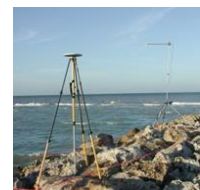


1999 Conditions





1. Beach nourishment works
2. Lest we forget ...
3. Define a nourishment schedule and stick to it
4. Refine program to maximize funding eligibility
5. Coordinate with neighbors
6. Use monitoring data as a guide to improve design
7. Build flexibility into program and permits
8. Manage the sediment budget wisely (structures, inlets)
9. Install and maintain vegetated dunes
10. Keep learning





Thank You!

**CB&I Contact:**

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