

25 YEARS FROM RECOMMENDATION TO CONSTRUCTION OF THE UPHAM BEACH STABILIZATION PROJECT

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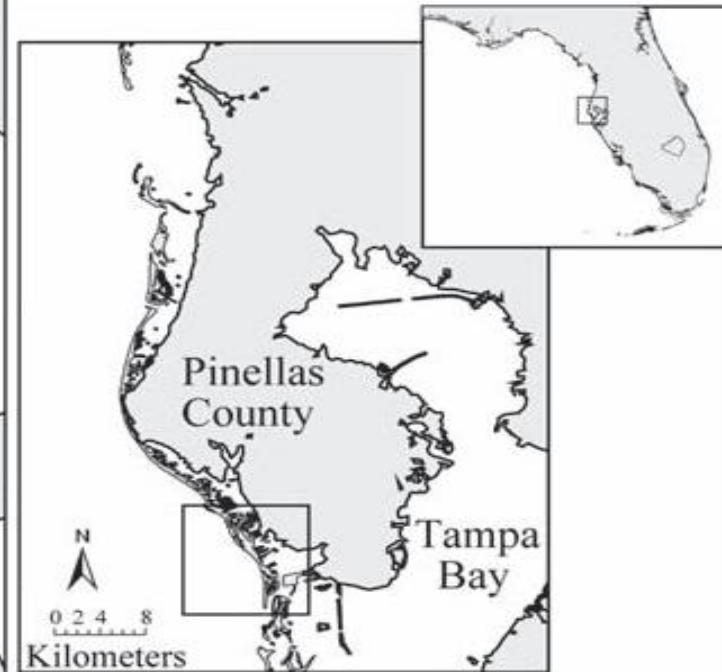
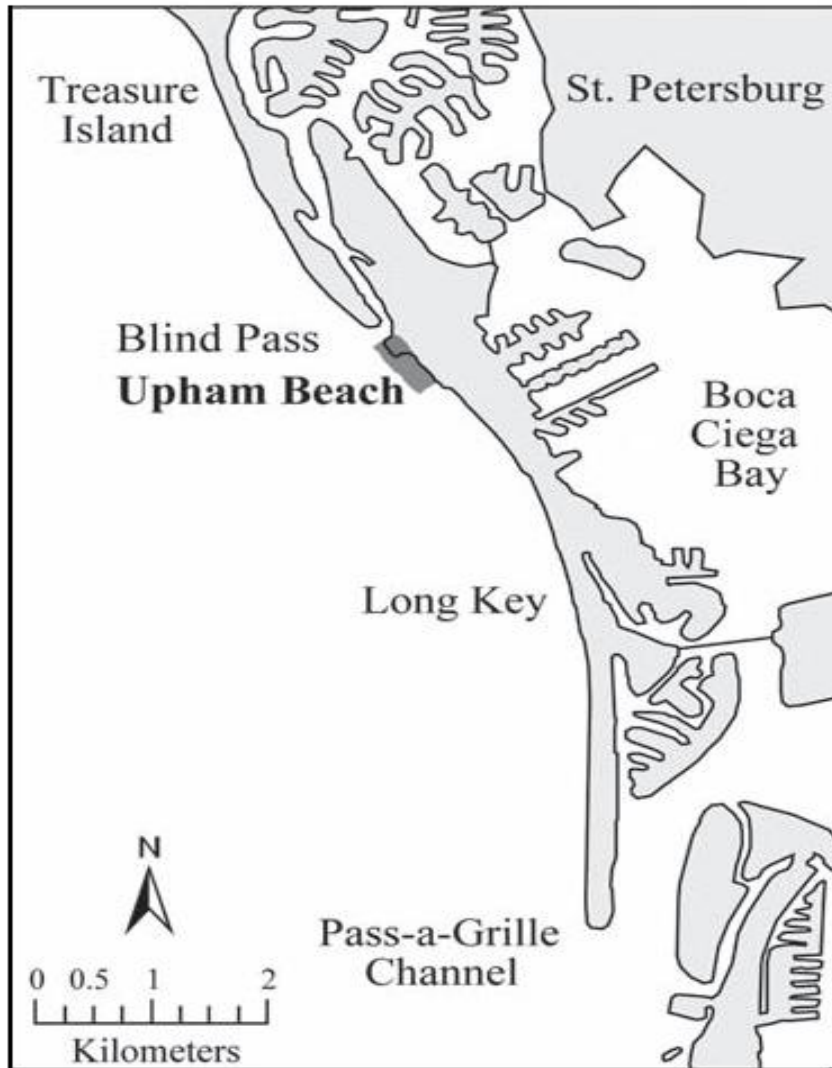


HISTORY & BACKGROUND

- ▶ Over 25 years in development
- ▶ 1992 Inlet Management Plan
- ▶ Test configurations with geotextile tubes
- ▶ Monitoring data (USF)
- ▶ Stakeholder meetings
- ▶ Advanced numerical modeling
- ▶ Alternatives analysis
- ▶ Selection of structural solution
- ▶ State & Federal permitting
- ▶ Construction phase commenced July 2017
- ▶ Project deemed complete in October 2018



LOCATION MAP



UPHAM BEACH



May 1994

- ▶ Persistent erosion hotspot
- ▶ Periodic nourishment from multiple sources; acts as feeder beach
- ▶ Structural stabilization & geotextile tube experiment

January 2012



BLIND PASS INLET MANAGEMENT PLAN



- ▶ Required and cost-shared by FDEP
- ▶ Evaluated erosion related to inlet
- ▶ Recommended corrective actions
- ▶ Completed 1992

RECOMMENDED OPTIONS (1992 PLAN)

1. Dredge inlet / nourish Upham every 6 years
- 2. Install groins and dredge inlet / nourish Upham every 6 years**
3. Dredge inlet & deposition basin / nourish Upham every 4 years
4. Purchase and operate dedicated dredge
5. Crane mounted jet pump on Treasure Island
6. Jet pump / fluidizer system in inlet
- 7. Dredge inlet every 6 years / nourish Upham every 3 years**
8. Install breakwaters and dredge inlet / nourish Upham every 6 years



NOURISHMENT EVENTS (~2 MCY)

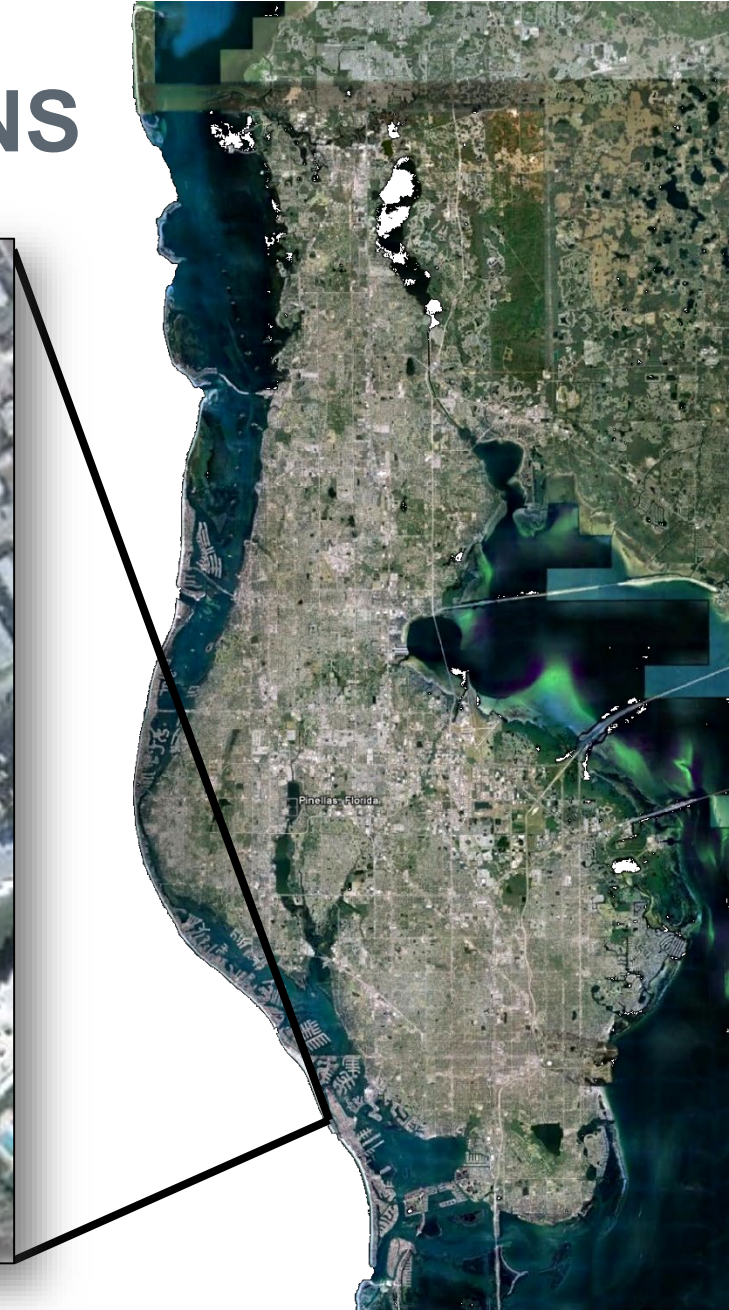
Project	Year	Length (ft)	Volume (cy)	Sand Source
City of St. Pete Nourishment	1975	2,500	75,000	Blind Pass
Initial Upham Beach Construction	1980	2,640	254,000	Blind Pass
1st Beach Renourishment	1986	2,400	97,000	Pass-A-Grille Channel
2nd Beach Renourishment	1991	2,400	230,000	Blind Pass
3rd Beach Renourishment	1996	2,400	225,000	Egmont Shoal
4th Beach Renourishment	2000	2,700	281,000	Blind Pass
5th Beach Renourishment	2004	3,600	385,000	Pass-a-Grille Channel/Shoal
2006 Storm Repair	2006	1,960	124,000	Egmont Shoal
6th Beach Renourishment	2010	2,000	160,000	Blind Pass
7th Beach Renourishment	2014	1,600	157,000	Egmont Shoal



Geotextile groins installed in 2005 to test stabilization of Upham Beach and evaluate reduction of nourishment needs



GEOTEXTILE TUBE GROINS



1995-2008 Time Series

Jan 8, 2008

2008 Condition

Image U.S. Geological Survey

Google

HOW DID WE DO??

- ▶ Two years after nourishment:



>100 ft wider beach!



PROJECT AREA MONITORING DATA

▶ 2 Years Post-
Construction Report:

“Overall, during the 2006-2008 nourishment monitoring period, the beach retained more sand [38%] with the structures as compared to the 2000-2002 nourishment monitoring period without structures.”

- (USF, 2009)



January 2008



FEEDER BEACH PROCESS



Downdrift shoreline is uniform and straight

February 2009



MOVING TO PERMANENT SOLUTION ...

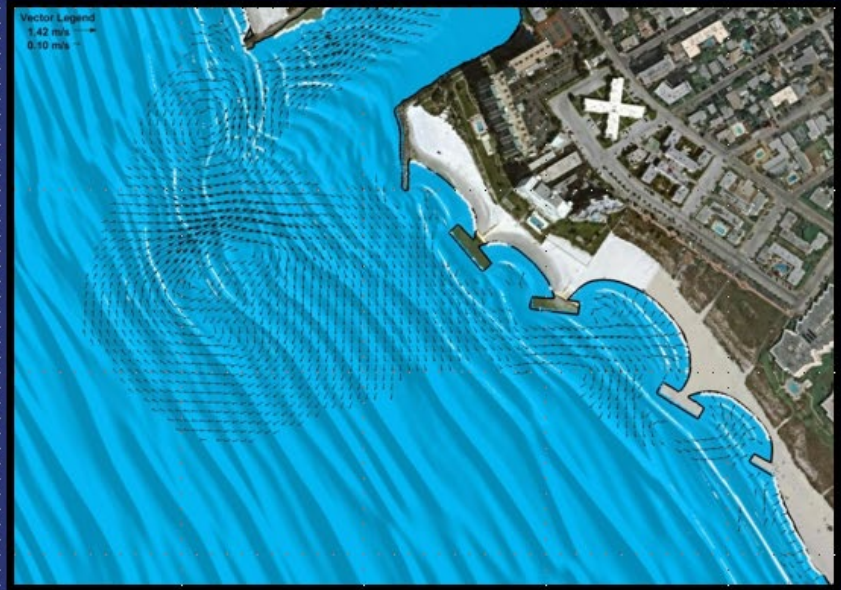
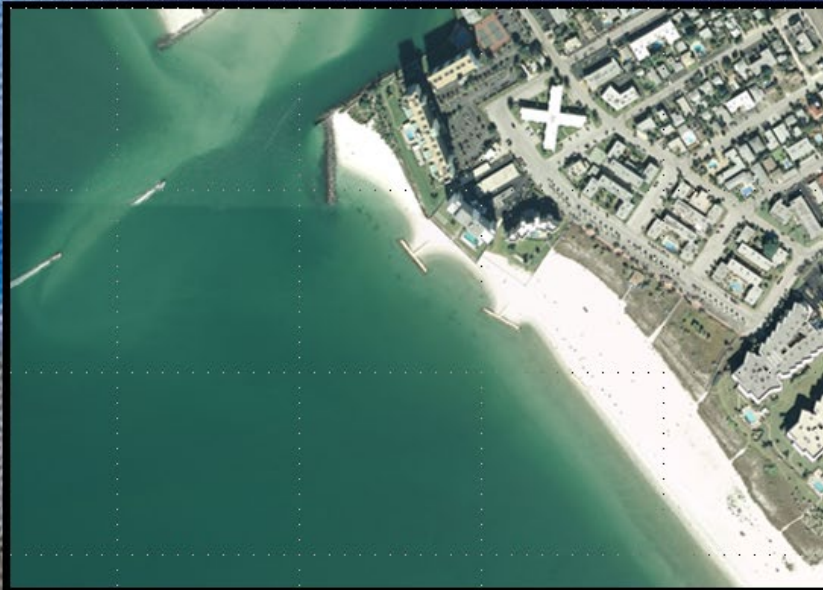
- ▶ Geotextile tubes installed in 2005 effectively reduced erosion without creating downdrift impacts.
- ▶ Performance monitoring:
 - > Geotextile tubes worked well, but sustained repeated damage
 - > Seawall only exposed after damage to geotextile tubes
 - > Some improvements can be made to design layout
- ▶ County desired to install permanent structures and received support from the City of St. Pete Beach (July 2008)
- ▶ County moved to development of a modeling study to evaluate structural alternatives to maintain storm protection and minimize impacts to beach users



PERMANENT STRUCTURES ANALYSIS

- ▶ Project area history and design phase presented FSBPA conference in February 2010 (Melbourne, FL):

UPHAM BEACH STABILIZATION PROJECT BOUSSINESQ WAVE MODELING TO ADDRESS CONCERNS OF LOCAL SURFING COMMUNITY



STAKEHOLDER MEETINGS

Two public meetings in Feb 2009 and June 2009:

- ▶ Damaged geotextile tubes
- ▶ Safety of beach goers
- ▶ Aesthetics and durability
- ▶ Effects on surfing: wave quality, break location, reflection



ALTERNATIVES ANALYSIS

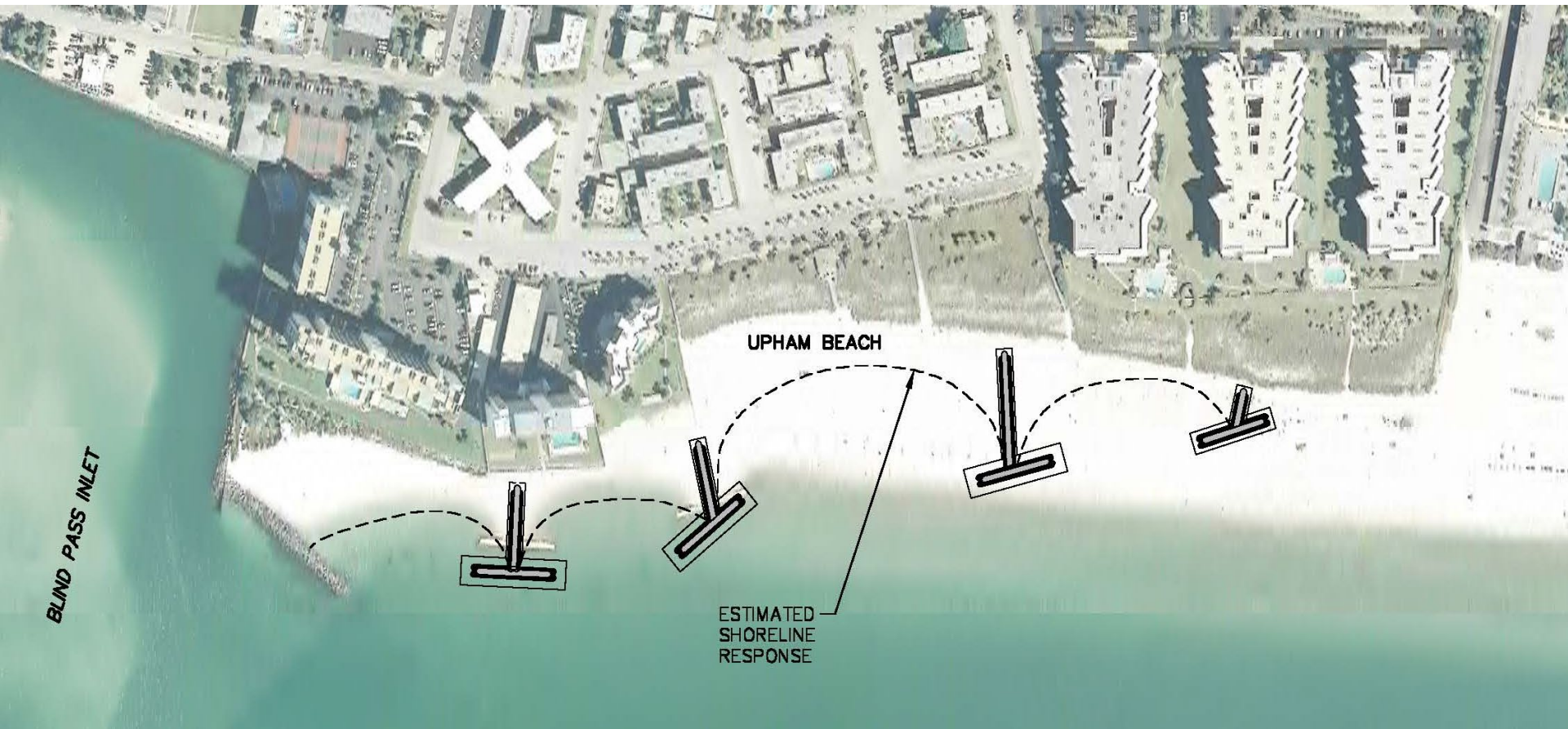
- ▶ Existing geotextile tube configuration and four alternatives:
 1. Straight Groins with Extended Jetty
 2. Modified T-Head Design (4 structures)
 3. Curved T-Heads with and Artificial Reef
 4. Modified Existing Design (5 structures)

- ▶ BOUSS2D Wave Modeling:
 - > Simulates waves and surface currents
 - > Replicated existing conditions very well
 - > Verified through comparison with observed conditions
 - > Model simulations included cold fronts and hurricane conditions

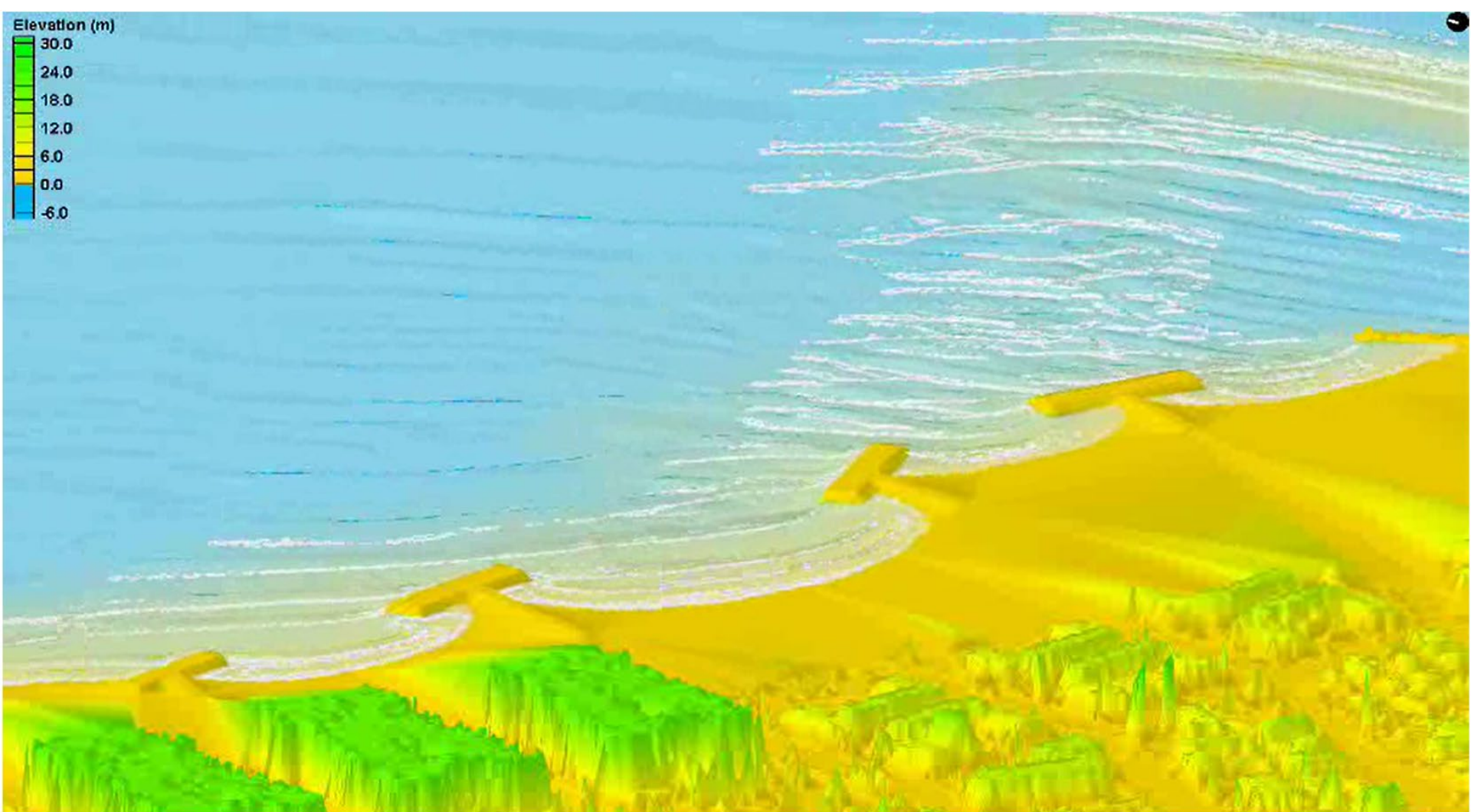


SELECTED ALTERNATIVE (#2)

- ▶ Modified design for improved protection with one less structure
- ▶ Less wave reflection and reduced obstruction along public beach



BOUSS2D SIMULATION: ALTERNATIVE 2



STUDY RESULTS

- ▶ Repair existing geotextile tubes to retain sand
- ▶ Move forward with permit application for structures
- ▶ Support from the City of St. Pete Beach (11/2009):

“It maintains an area for the surfing stakeholders thus creating a win-win situation for all.”

- Steven J. Hallock, Public Services Director, City of St. Pete Beach.

Memorandum



To: Beach Stewardship Committee
From: Steven J. Hallock, Public Services Director *SPC*
Date: November 12, 2009
Re: Upham Beach Recommendation
Copy: Mike Bonfield, City Manager
William Davis, Pinellas County
Andrew Squires, Pinellas County

Over the years the City has been closely monitoring the Upham Beach Stabilization project and reviewing all related documentation as it became available. With all of this information and a final decision regarding the permanent structures needed we are now prepared to make a recommendation to the Beach Stewardship Committee based on the latest study's findings and we are proposing "Alternative 2 – Modified T-Head Design". The reasons for this are as follows:

- It will provide the storm protection needed for resident homes. The modifications to T-heads 1 and 2 should protect the northern beach even better than it is now.
- It maintains the minimum 40 foot wide white sandy beach and provides more beach front for visitors. It is important to note that the beach will be much wider than this the vast majority of the time and the minimum may never be reached.
- It provides permanent structural stabilization to hold the sand in place and addresses the problem of what some people think is the fastest eroding beach in the State of Florida.
- It does not cause down drift erosion of sand so the beaches to the south are protected.
- Not only does it save the tax payer \$1.0M to \$1.5M in initial construction costs; it also reduces the frequency and volume of beach renourishment and thus saves the tax payer an estimated \$31.0M over the next 25 years.
- It reduces the number of T-groins from 5 to 4 so that the public beach is not divided by a T-groin, and because T-groins come with inherent safety concerns it reduces the risk for all beach visitors.
- The Blind Pass Inlet is the sole source of sand and the channel is dredged on a routine schedule to ensure navigation which is a primary goal of the Blind Pass Inlet Management Plan (IMP).
- Since the design is so similar to the existing one it should not slow down the permitting process because the design has been tested and proven.
- **It maintains an area for the surfing stakeholders thus creating a win-win situation for all.**

In order to verify "Alternative 2 – Modified T-Head Design" meets all of the project goals we are also recommending that during the renourishment in the spring of 2010 that this design be installed utilizing the temporary structures. This way the final design can be tested and evaluated over the next 2 to 3 years before the permanent structures are installed. If the design performs as expected than the permanent structures can be installed with a very high level of confidence. If the design does not perform as expected than the final and permanent design can be adjusted based on the additional data collected in the next few years.



PERMITTING

- ▶ Remove five (5) temporary geotextile tube structures
- ▶ Replace with four (4) permanent rock groin structures in a modified layout

- ▶ Florida Department of Environmental Protection (FDEP)
Joint Coastal Permit File No. 0308348-001-JC:
 - > Application filed: September 2011
 - > Permit issued: October 2012

- ▶ U.S. Army Corps of Engineers (USACE)
Permit No. SAJ-2011-02914 (SP-TEH):
 - > Public Notice: December 2011
 - > Permit issued: February 2014



CONSTRUCTION

- ▶ Weeks Marine, Inc. with subcontractor Luhr Bros, Inc.
- ▶ NTP issued March 2017; mobilization in July 2017
- ▶ Constructed the project from south to north
- ▶ **Removal of temporary geotextile tube groins and construction of the new rock groins occurred from August 2017 to August 2018**
- ▶ Temporary pause in work from December 2017 to May 2018
- ▶ Rock placement operations were completed on August 31, 2018
- ▶ Deemed substantially complete in September 2018
- ▶ Punch list items and clean-up
- ▶ Final completion in October 2018
- ▶ **582 days from NTP to completion (approx. 144 actual work days)**



STRUCTURAL SPECIFICATIONS

- ▶ Two sizes of armor: 5.5 tons head stone; 2.1 tons stem stone
- ▶ Tolerances to accommodate limestone/granite (145 pcf minimum)
- ▶ Marine mattress foundation (72,000 SF)
- ▶ Multiple quarries needed
- ▶ Tonnage bid/placed (voids):
 - > Head: 30,700 / 18,195 (41%)
 - > Stem: 9,400 / 6,502 (31%)
- ▶ QC at quarry and QA at site
- ▶ Construction Cost:
 - > Estimate = \$8.2M
 - > Bid Price = \$8.7M
 - > Payment = \$7.1M



CONSTRUCTION



CONSTRUCTION BY LAND ...



CONSTRUCTION BY SEA ...



SUBSTANTIAL COMPLETION CONDITION

September 2018



PRE-CONSTRUCTION CONDITION

- ▶ July 26, 2016 - Approximately 1 year prior to construction



POST-CONSTRUCTION CONDITION

- ▶ September 5, 2018 - Substantial completion



CLOSING REMARKS

- ▶ Structures have a place in modern coastal management
- ▶ Permitting & design efforts benefit from clear objectives and planning
- ▶ Stakeholder involvement is critical (public & government)
- ▶ Monitoring data, advanced design techniques (analytical & numerical), and engineering judgment form the basis of assurance
- ▶ Marine construction requires flexibility to be successful
- ▶ Persistence (and science) pays off!

Special thanks to Pinellas County, City of St. Pete Beach, FDEP, USACE, Ping Wang, Nicole Elko, the local residents & APTIM staff.



THANK YOU!



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Expect the Extraordinary.