
*“Functional Characteristics of
Groins vs Detached Breakwaters”*

FSBPA Meeting

Melbourne, FL

February 3, 2010

Bob Dean

University of Florida

Two Types of Beach Stabilization Structures:

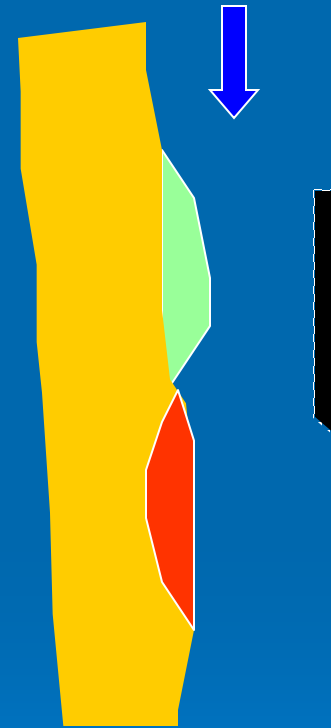
Ø Groins

Ø Detached Breakwaters





Groin



Detached (Offshore) Breakwater

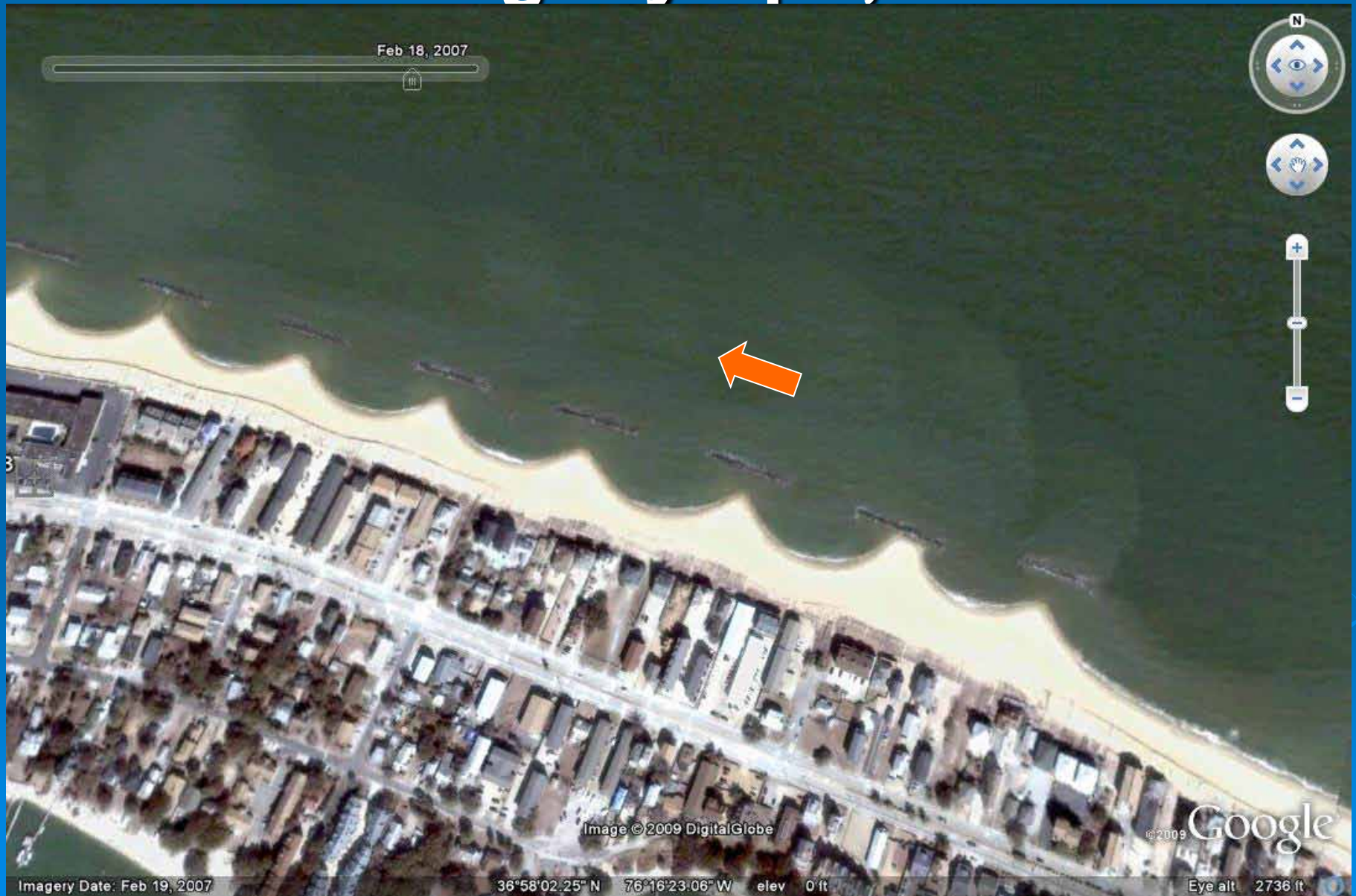
RATIONALE FOR THIS (AND FUTURE?) SIMILAR SESSIONS

1. There has been a near hiatus in the construction of coastal stabilization structures in Florida.
2. There is strong interest in installing such structures in the future.
3. These structures have the potential to negatively impact the adjacent beaches as contrasted with beach nourishment.
4. Structures tend to last forever..should “get it right the first time”.

QUESTIONS

1. **Are The Two Types of Systems Functionally Interchangeable?**
2. **Are They Equally Sensitive to Uncertainties in Complex Nearshore Processes?**
3. **Can They be Pre-filled to Absolutely Negate Any Downdrift Impact?**
4. **Do Adjustable Groins Have Special Merit?**
5. **Selection Criteria For Your Design (If Applicable)?**
6. **Can Numerical Models Differentiate Between Their Effectivenesses?**

Detached Breakwaters at Willoughby Spit, VA



Groins at Willoughby Spit, VA

Feb 18, 2007

1,000 Feet



Willoughby Spit, Norfolk, VA 23503

Image © 2009 DigitalGlobe

© 2009 Google

Imagery Date: Feb 19, 2007

36°58'07.20" N 76°16'56.96" W elev 0 ft

Eye alt 2736 ft

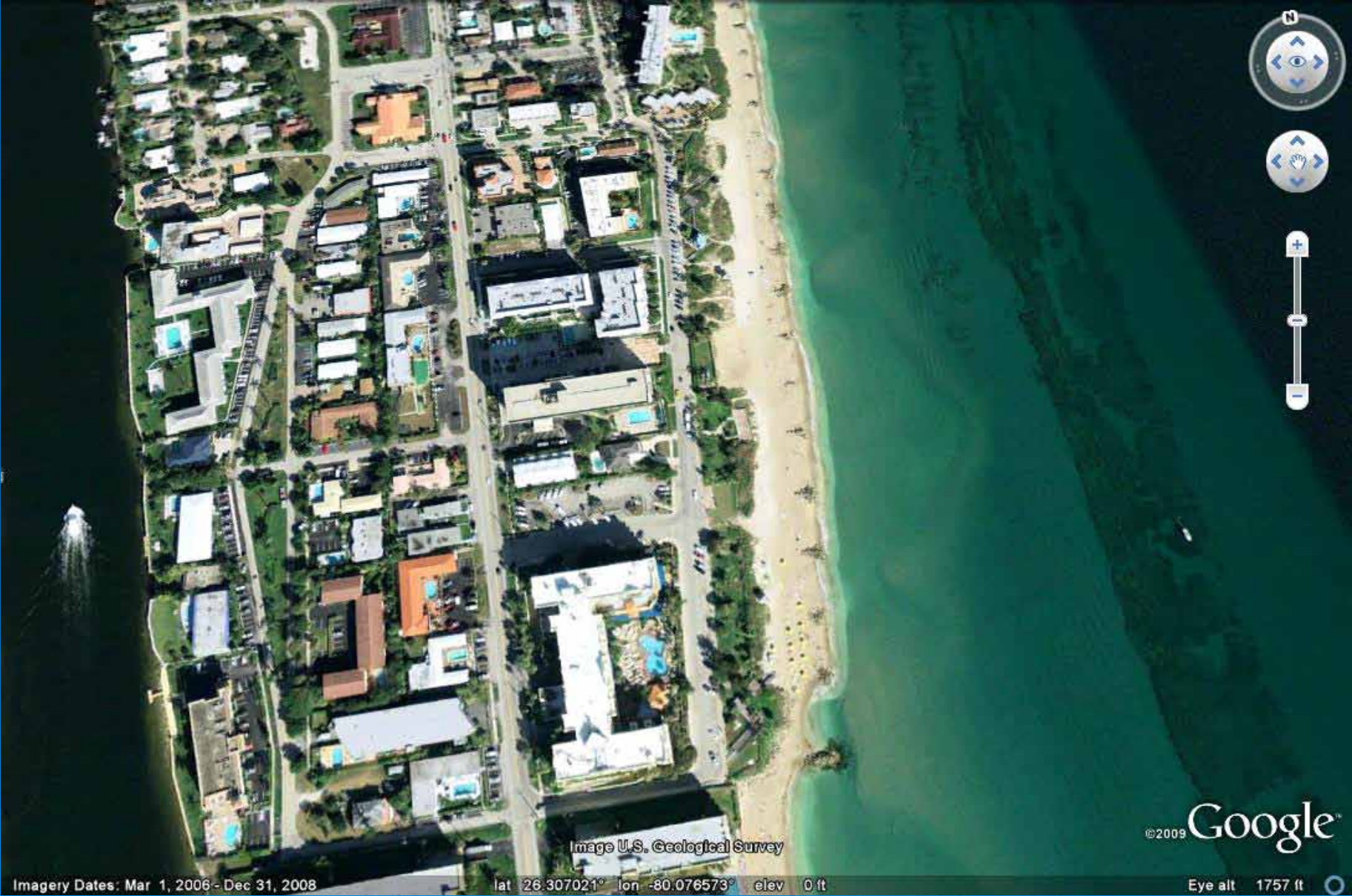
Redington Shores, FL



Virginia Key, FL



Deerfield Beach, FL



Imagery Dates: Mar 1, 2006 - Dec 31, 2008

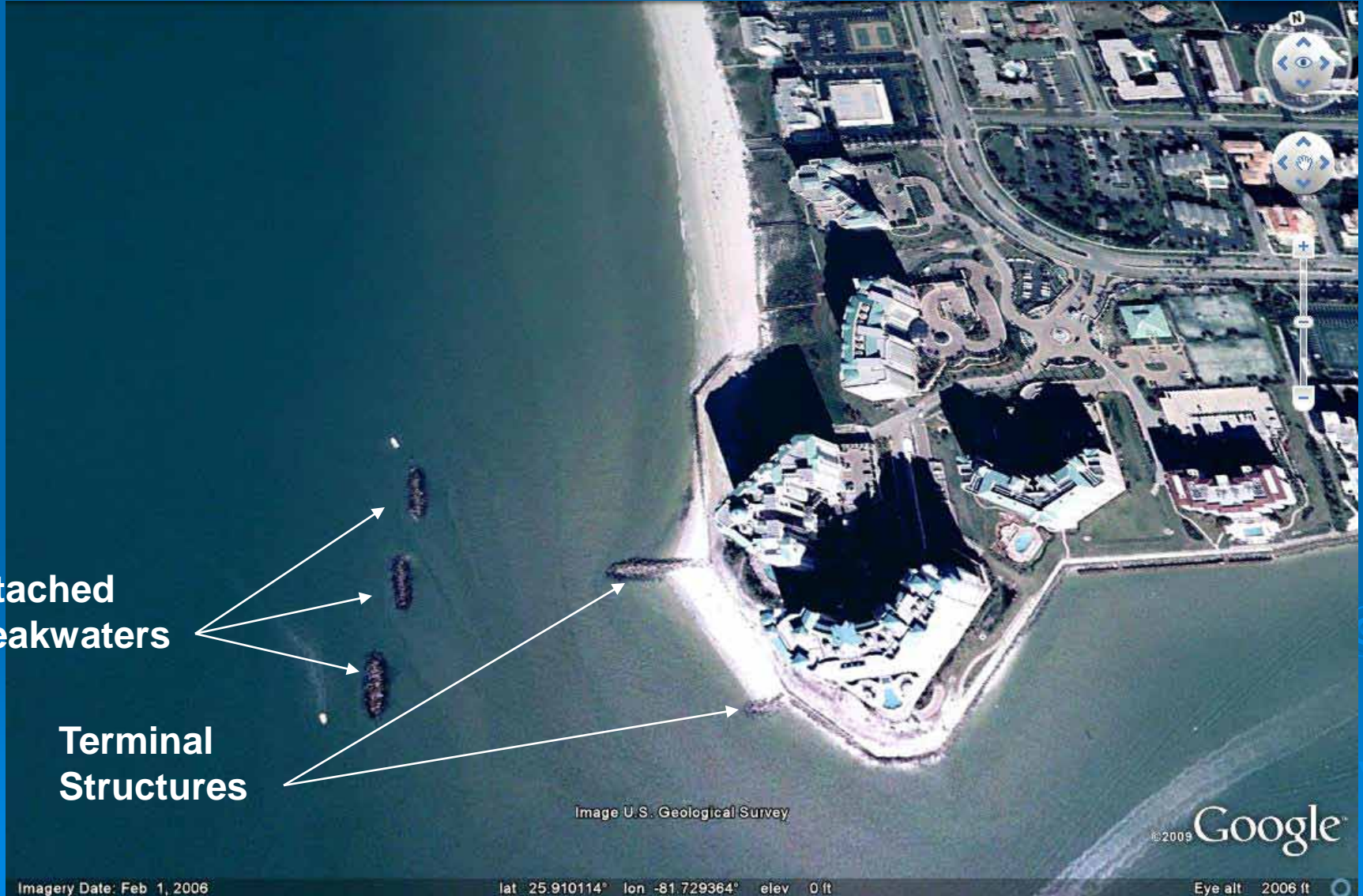
lat 26.307021° lon -80.076573° elev 0 ft

Eye alt 1757 ft

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Image U.S. Geological Survey

Marco Island, FL



Detached
Breakwaters

Terminal
Structures

Image U.S. Geological Survey

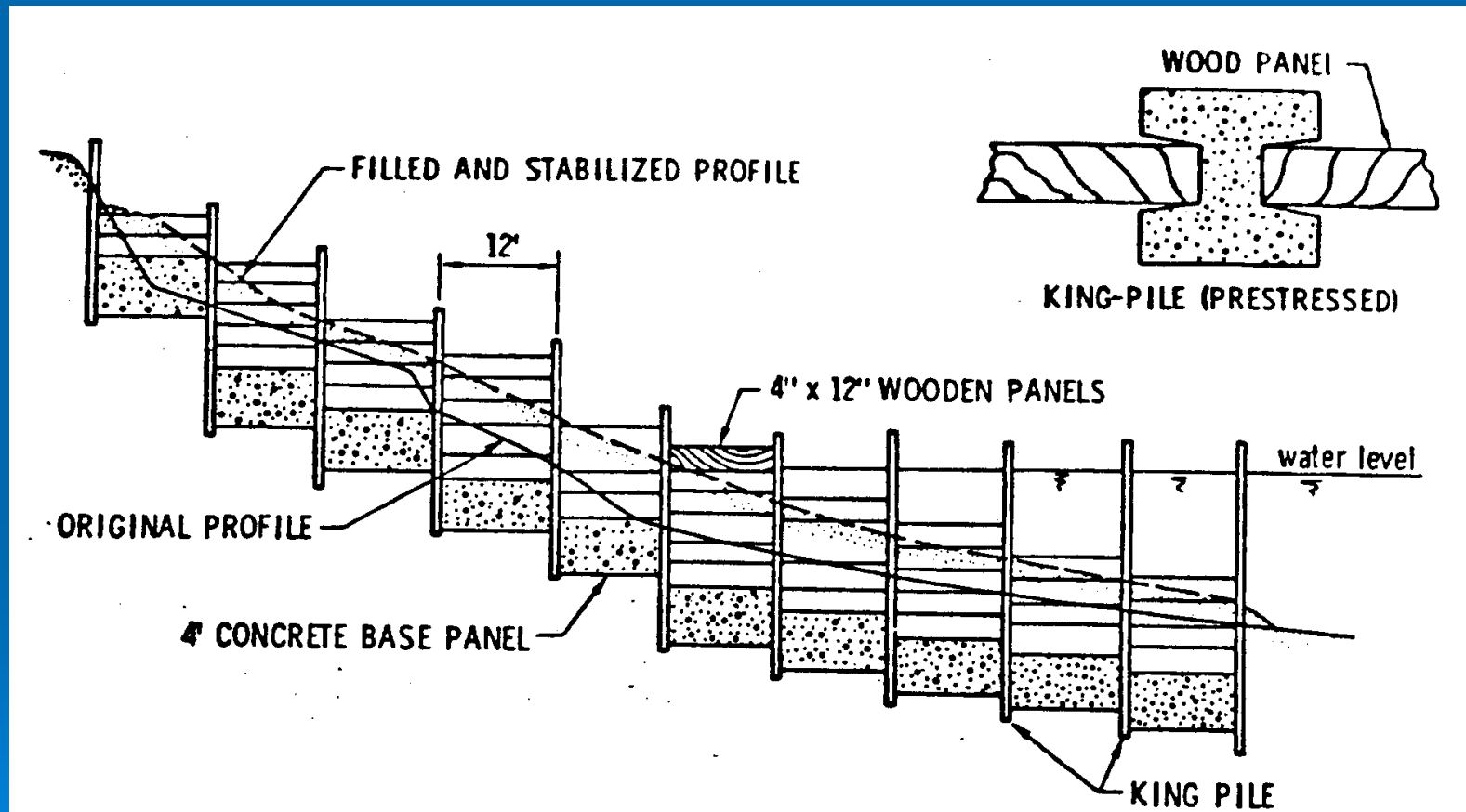
©2009 Google

Imagery Date: Feb 1, 2006

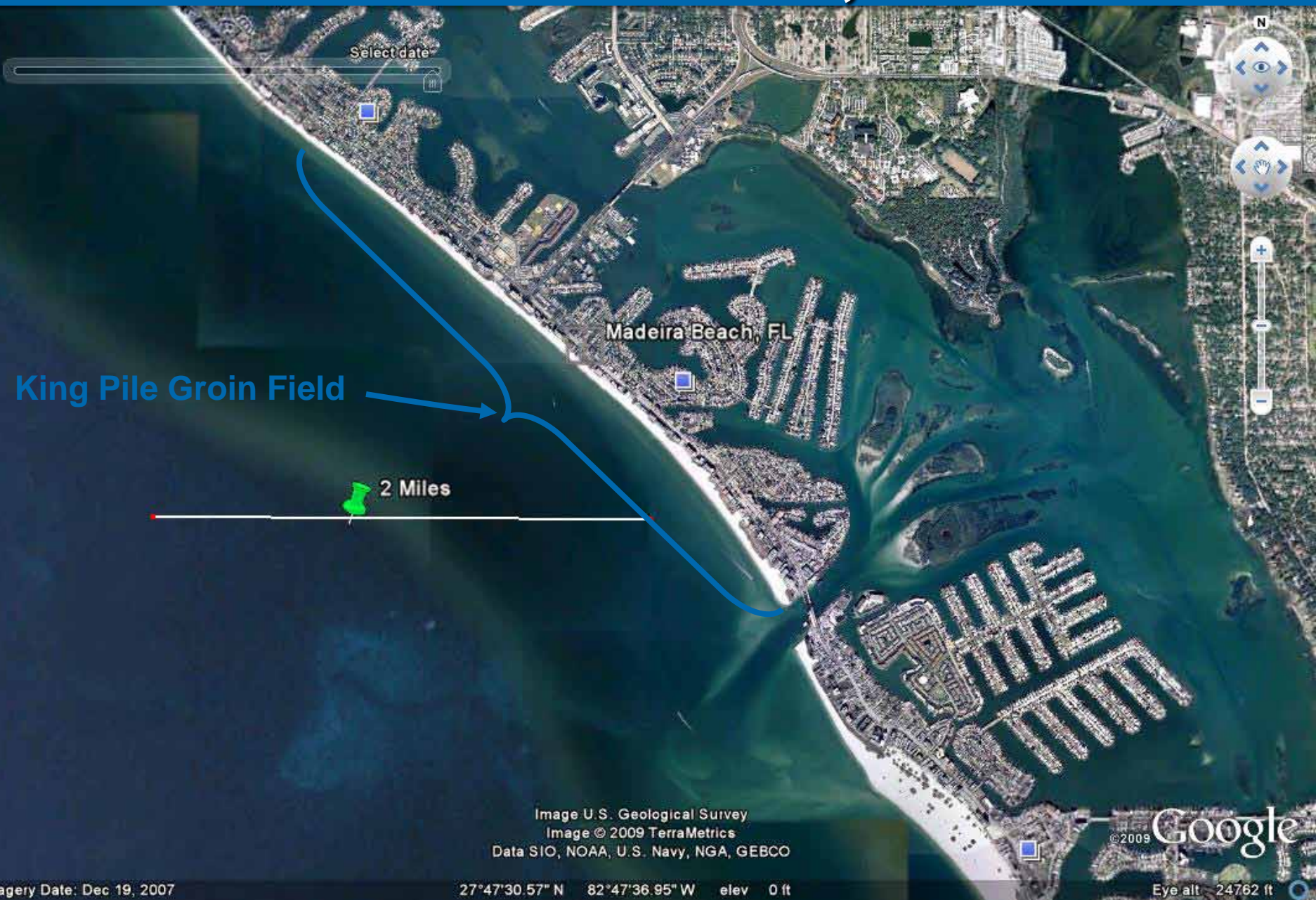
lat 25.910114° lon -81.729364° elev 0 ft

Eye alt 2006 ft

Schematic of "King Pile" Adjustable Groin



Madeira Beach, FL



King Pile Groin Field

2 Miles

Image U.S. Geological Survey
Image © 2009 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google
© 2009

Close Up View Near Johns Pass



Select date

0.25 Miles

Image U.S. Geological Survey

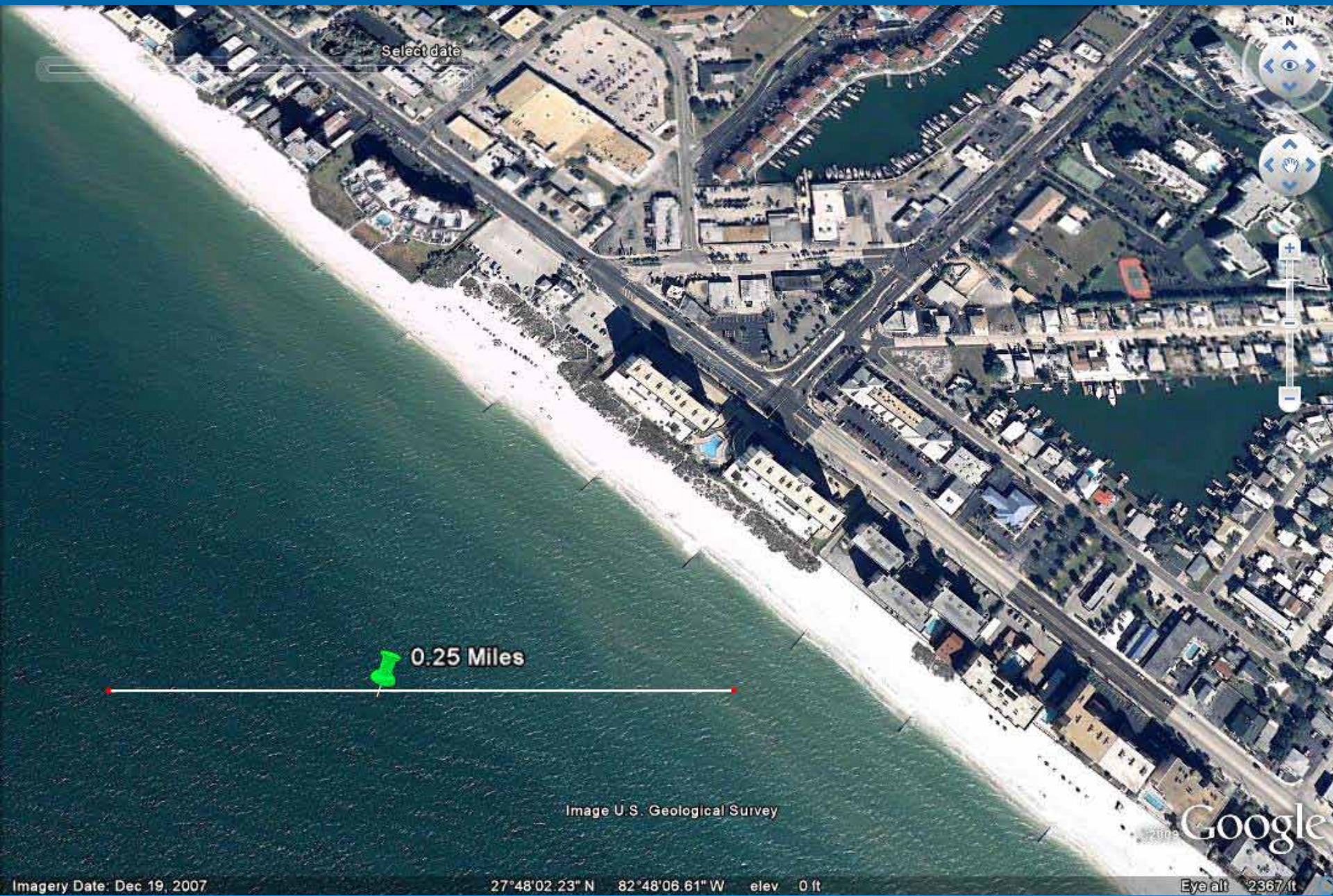
Google

Image Date: Dec 10, 2007

37°47'00.15" N 82°46'57.27" W

4522.4

1.5 Miles North of Johns Pass



Select date

0.25 Miles

Image U.S. Geological Survey

Google

Summary

Hopefully, this session is the initiation of an effort to “sharpen our technical pencils” to be better able to:

- ∅ Quantify the interaction between groin and detached breakwater designs with the adjacent beach systems.
- ∅ Understand the uncertainties in performance.
- ∅ Ensure that structures constructed are the most appropriate for the particular setting.

Now, The Program



Questions?

