

Sand Bar Characteristic Responses to Different Wave Energy Conditions

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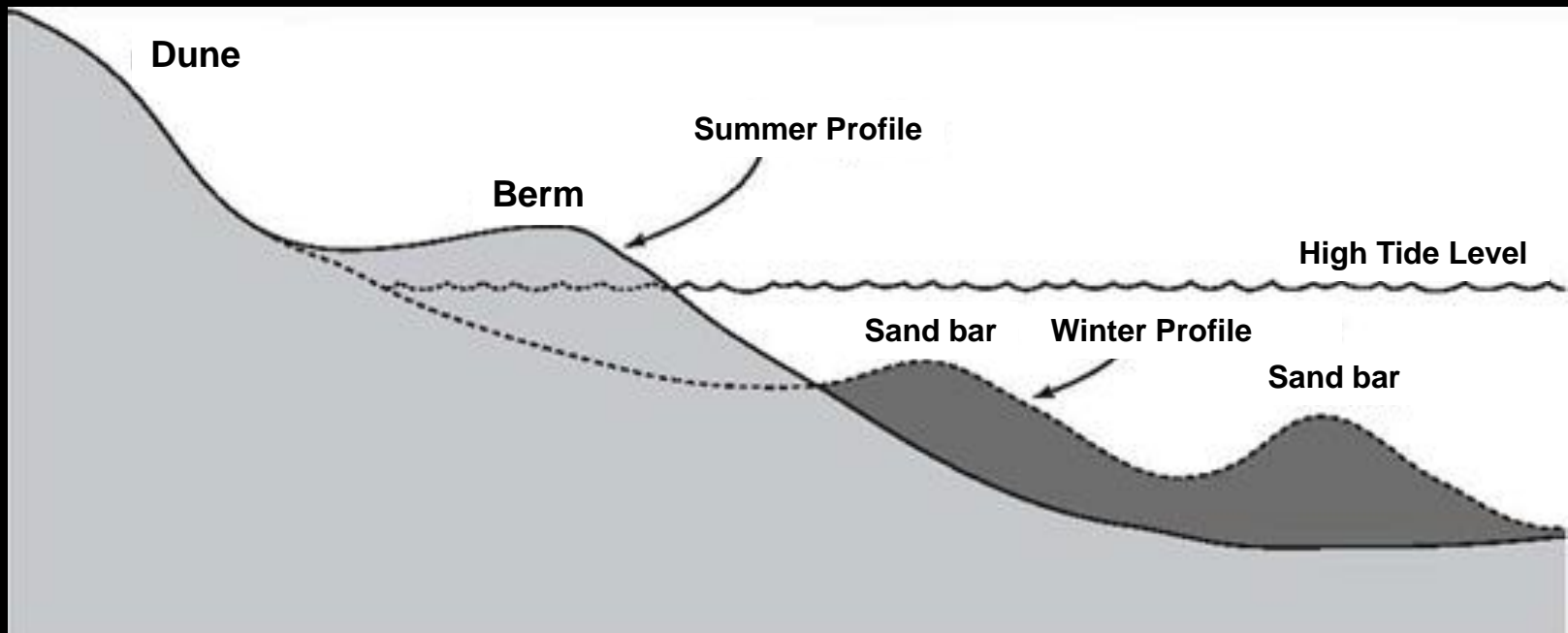
Florida Shore & Beach Preservation Association
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Introduction

Primary protection for the beaches

Respond to different wave conditions

Sediment balance is important for coastal management



Objectives

To understand the sand bar responses to different wave conditions

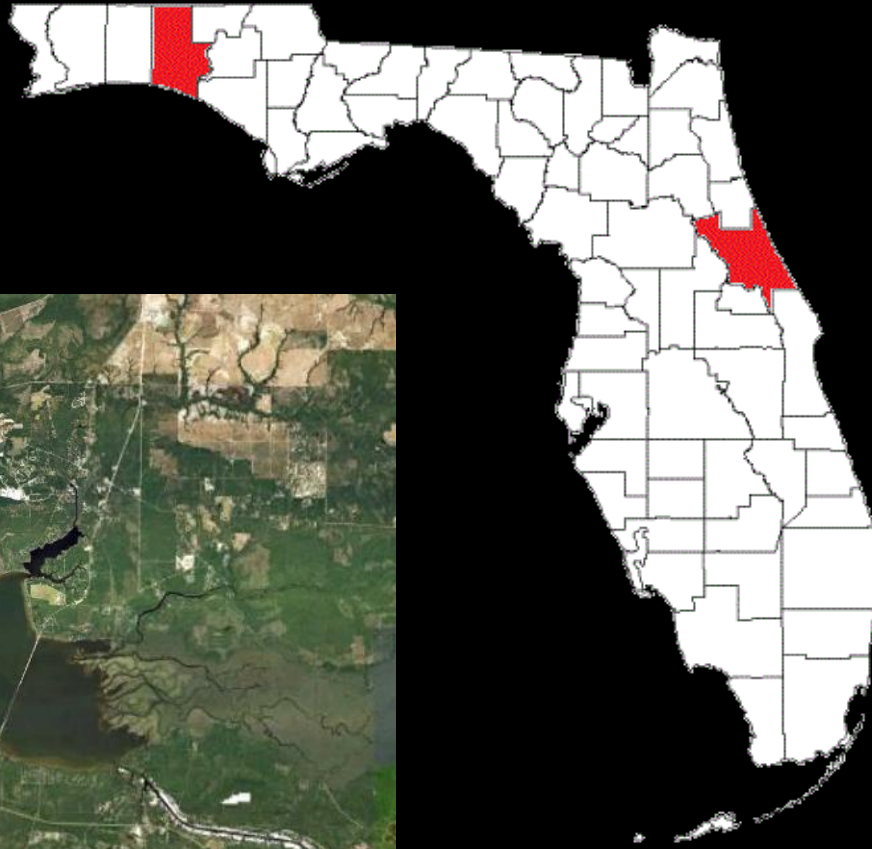
To quantify changes on the average number of sand bars through time

To quantify sand bar morphologic characteristics

Methodology

- Wave Data
 - Average Wave Energy
 - Energy Peaks
- Beach Profile Data
 - Definition of Sand Bars
 - Average Number of Sand Bars
 - Distance from the Sand Bars to the Beach
 - Sand Bar Depth

Study Area



Walton County

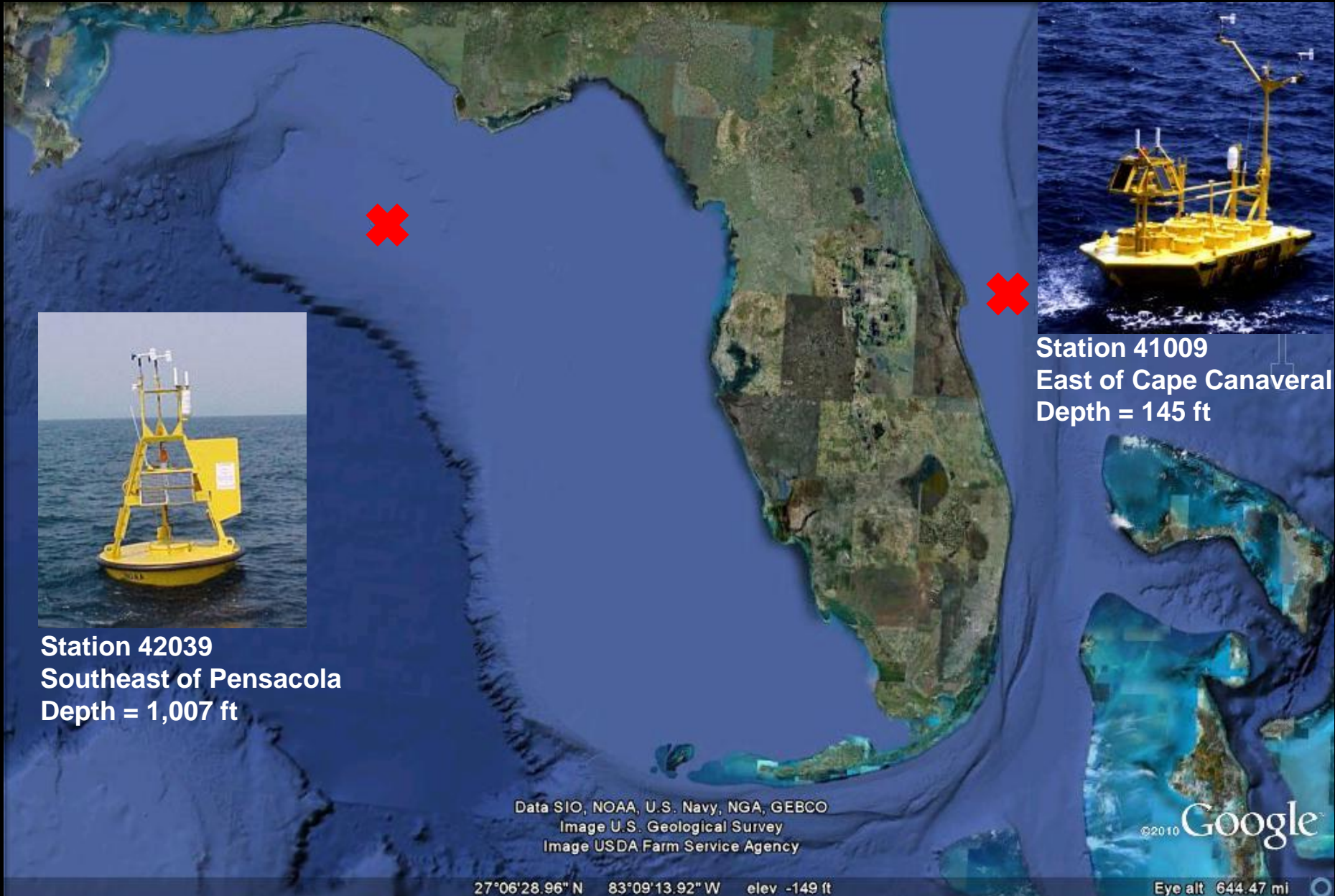
25 Miles
127 Monuments



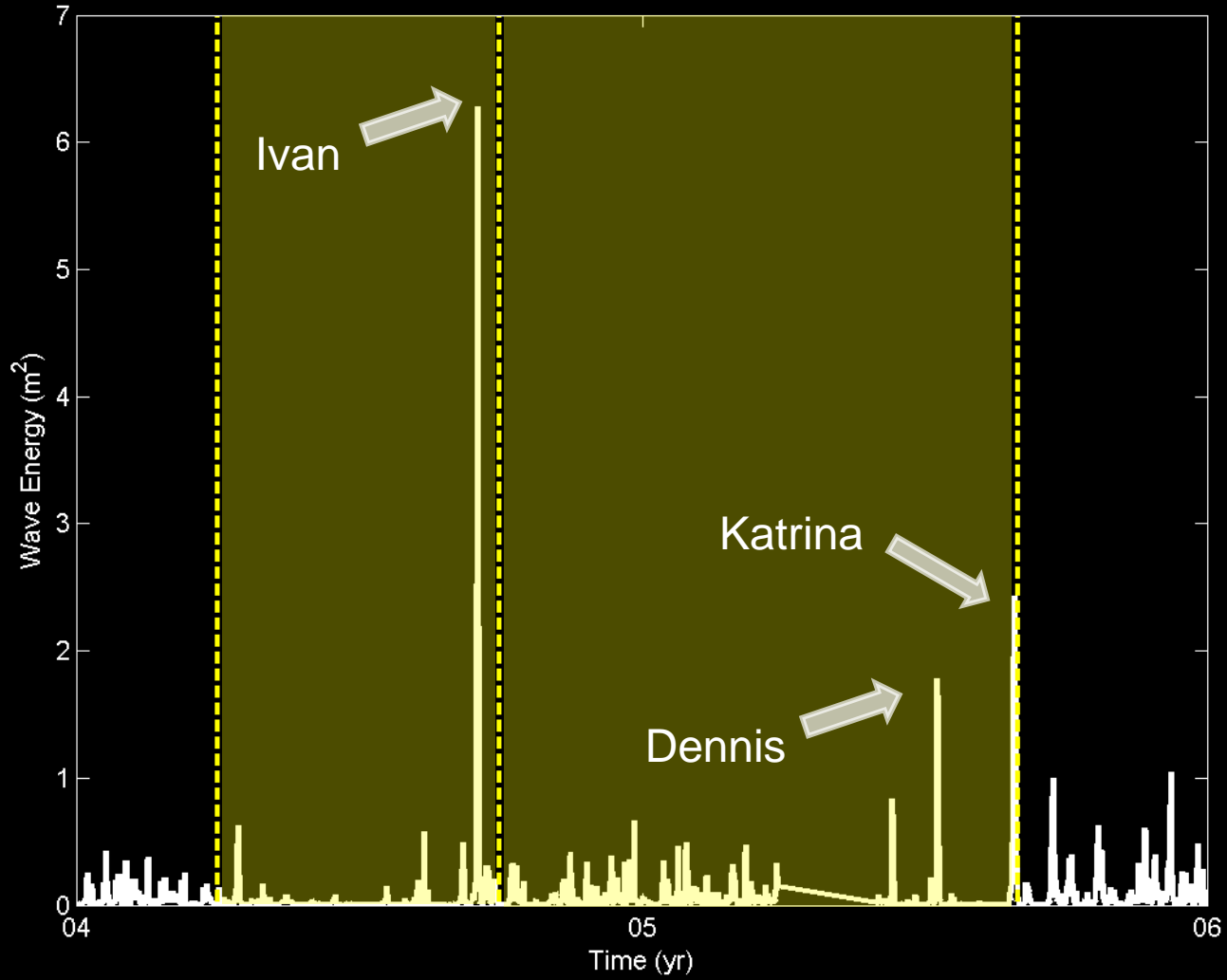
Volusia County

49 Miles
271 Monuments

Wave Buoys NOAA-NDBC

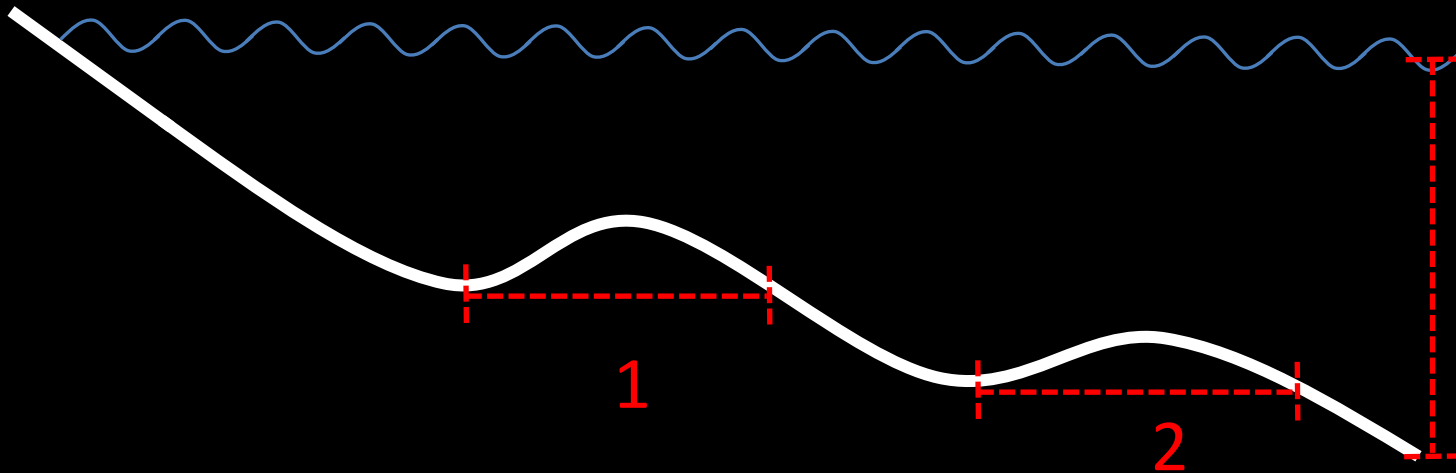


Wave Data



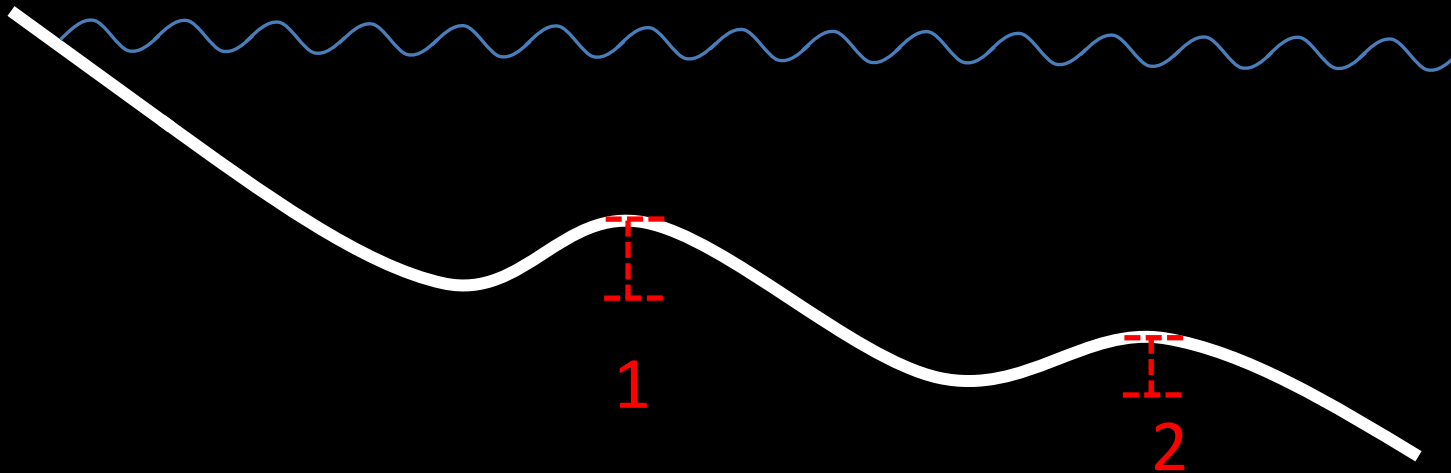
--- Beach Profiles

Definition of Sand Bars



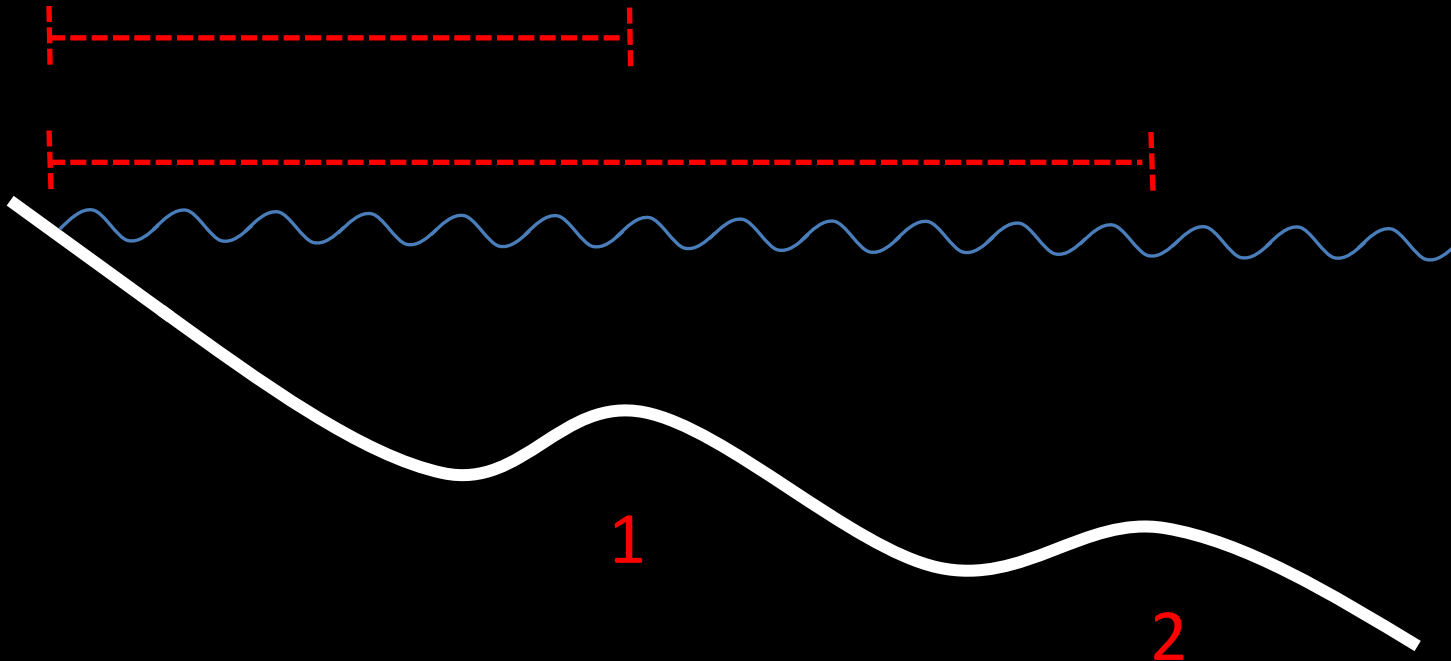
- Beach Profiles deeper than 16 ft
- Bar Width $>$ 80 ft

Definition of Sand Bars

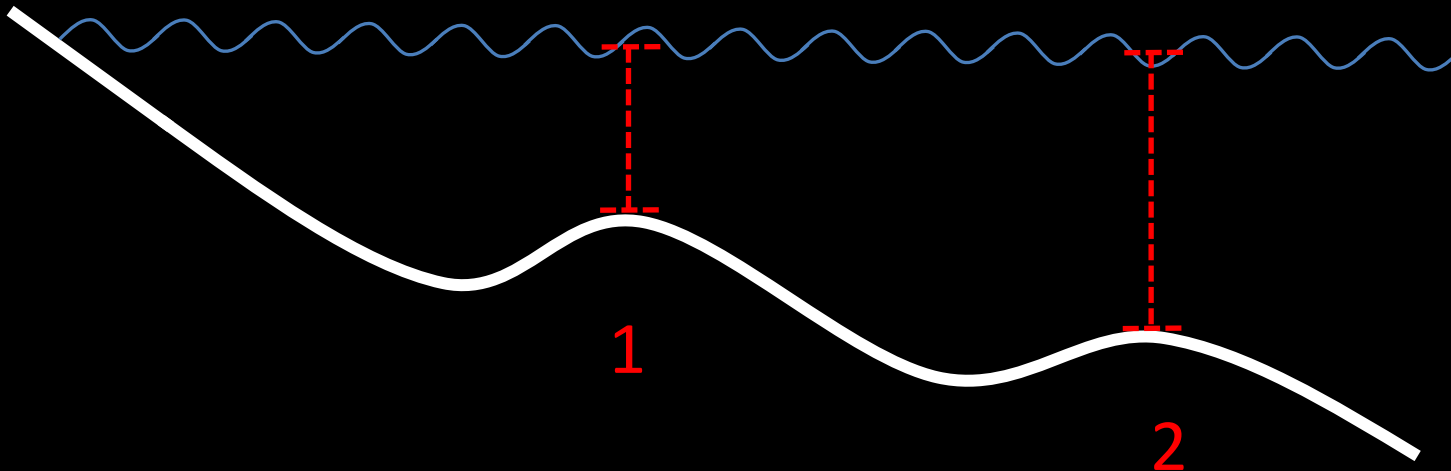


- Beach Profiles deeper than 16 ft
- Bar Width $>$ 80 ft
- Bar Height $>$ 0.5 ft

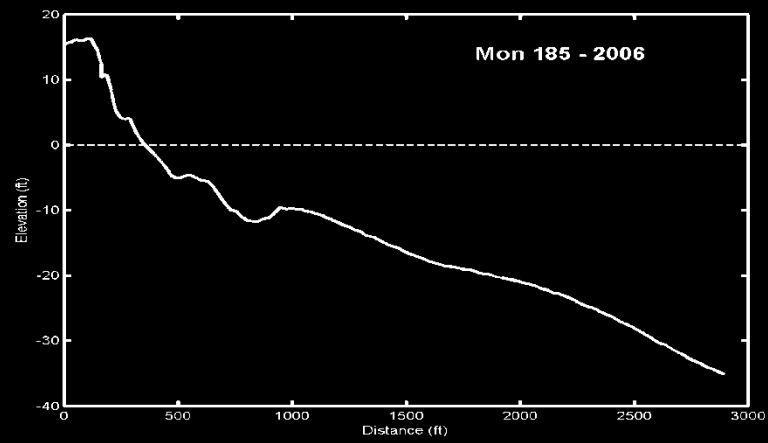
Distance from the Beach



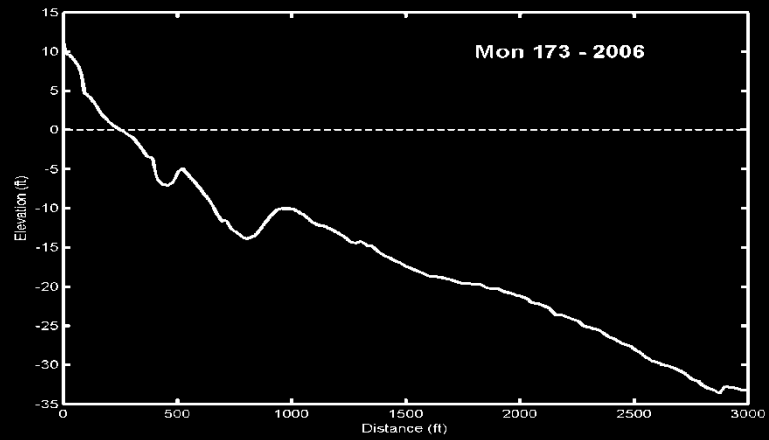
Bar Depth



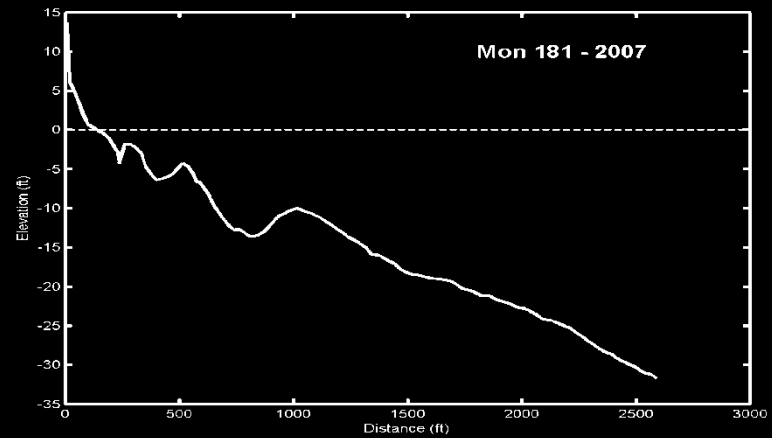
Example for Volusia County



1 Bar

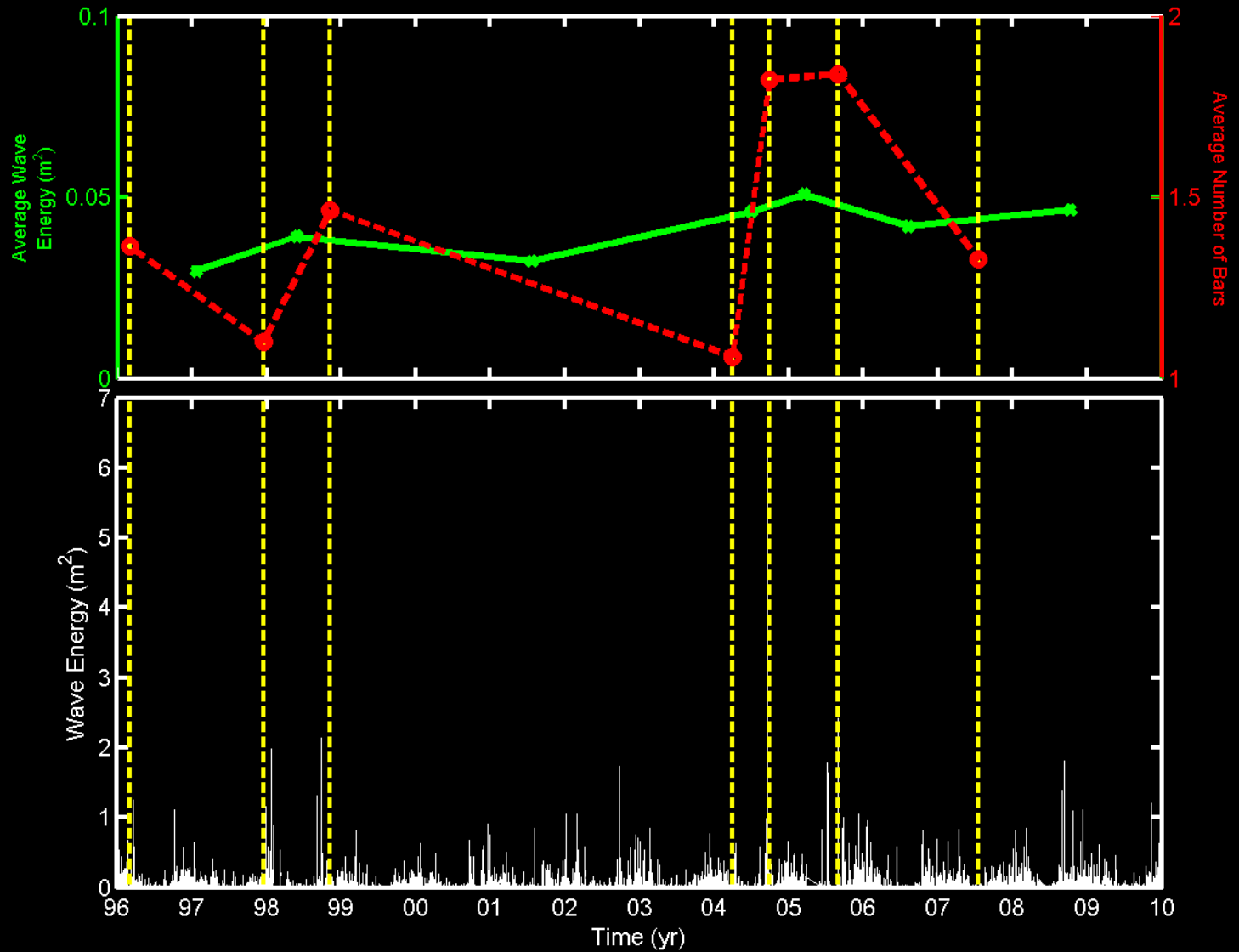


2 Bars

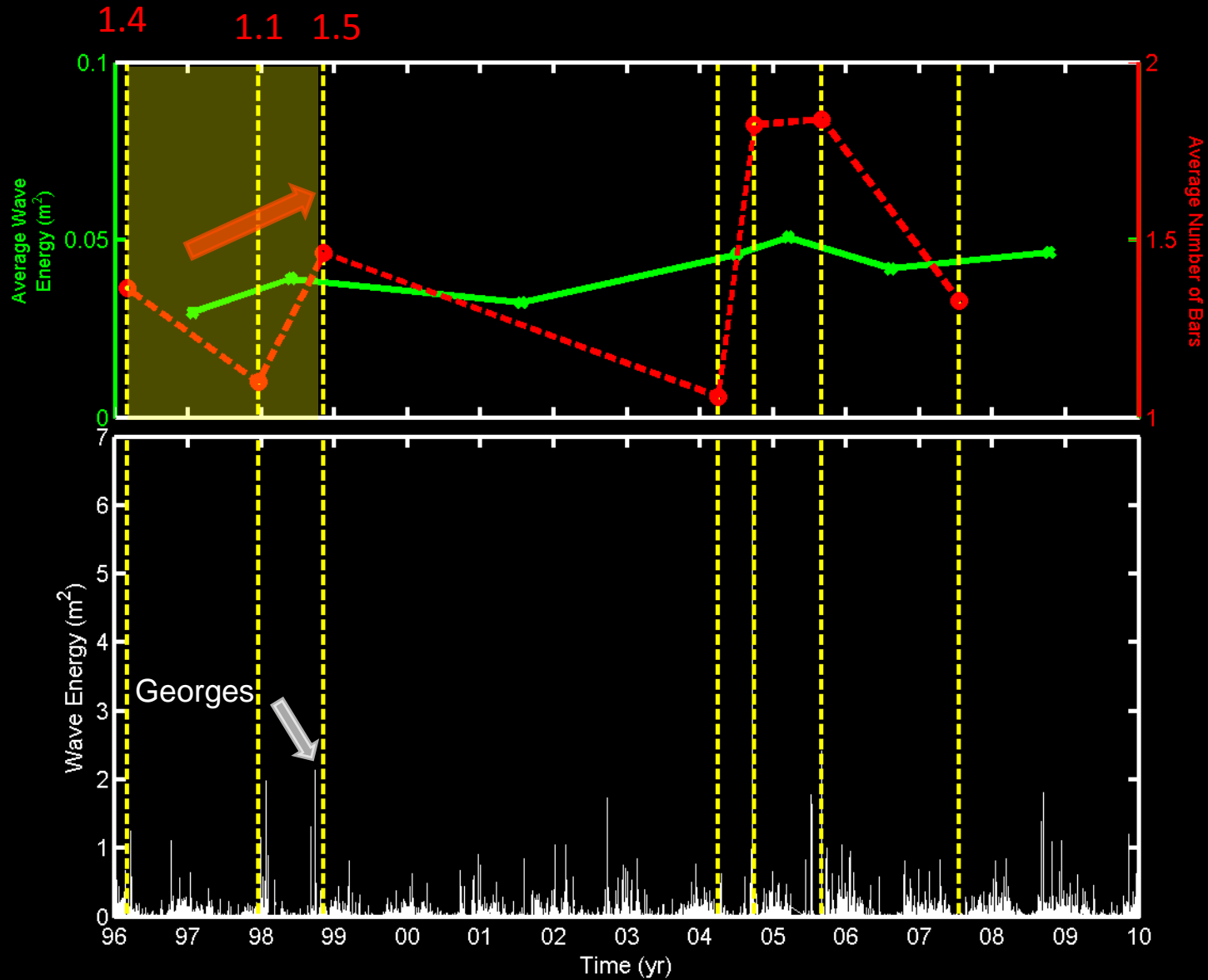


3 Bars

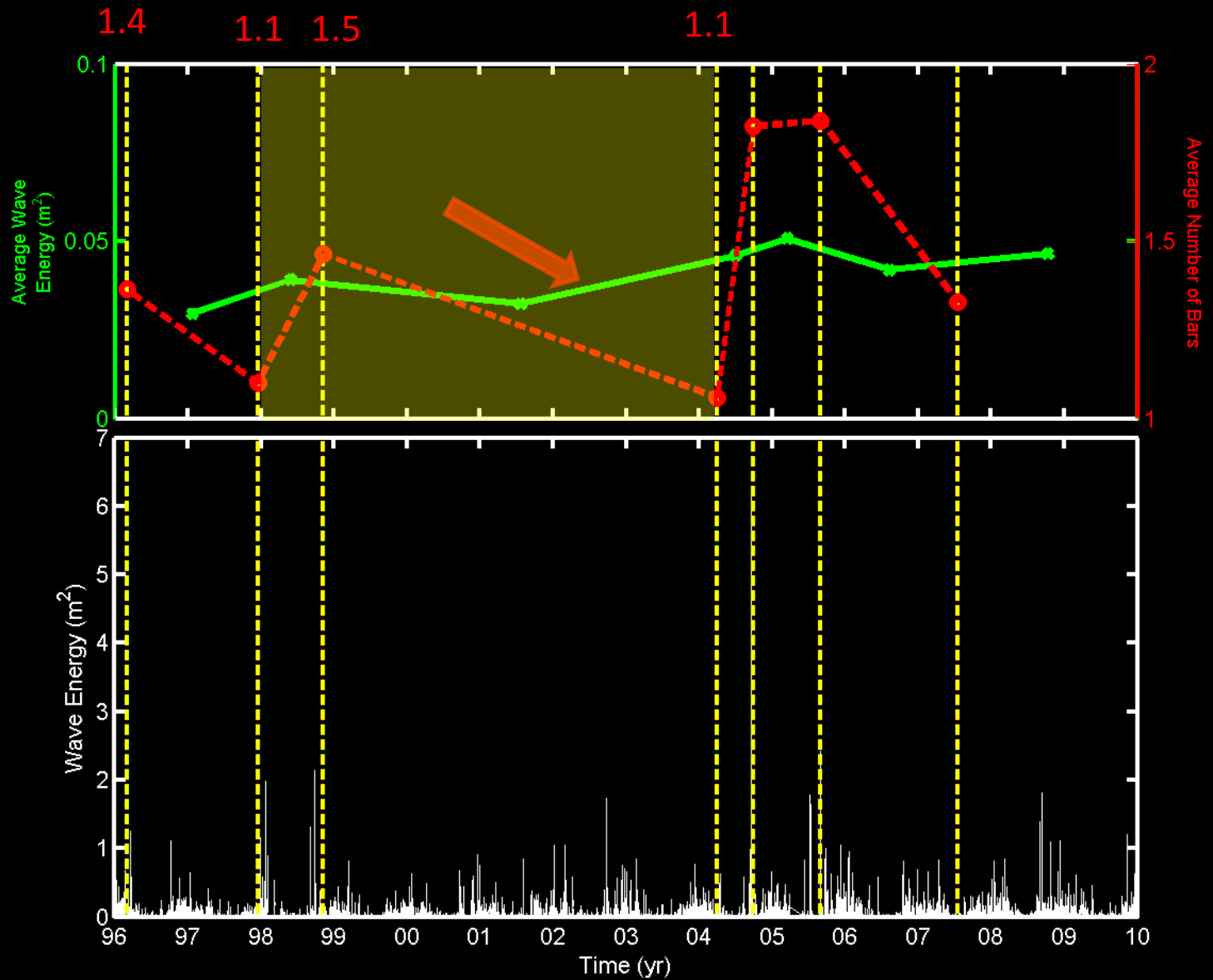
Walton County



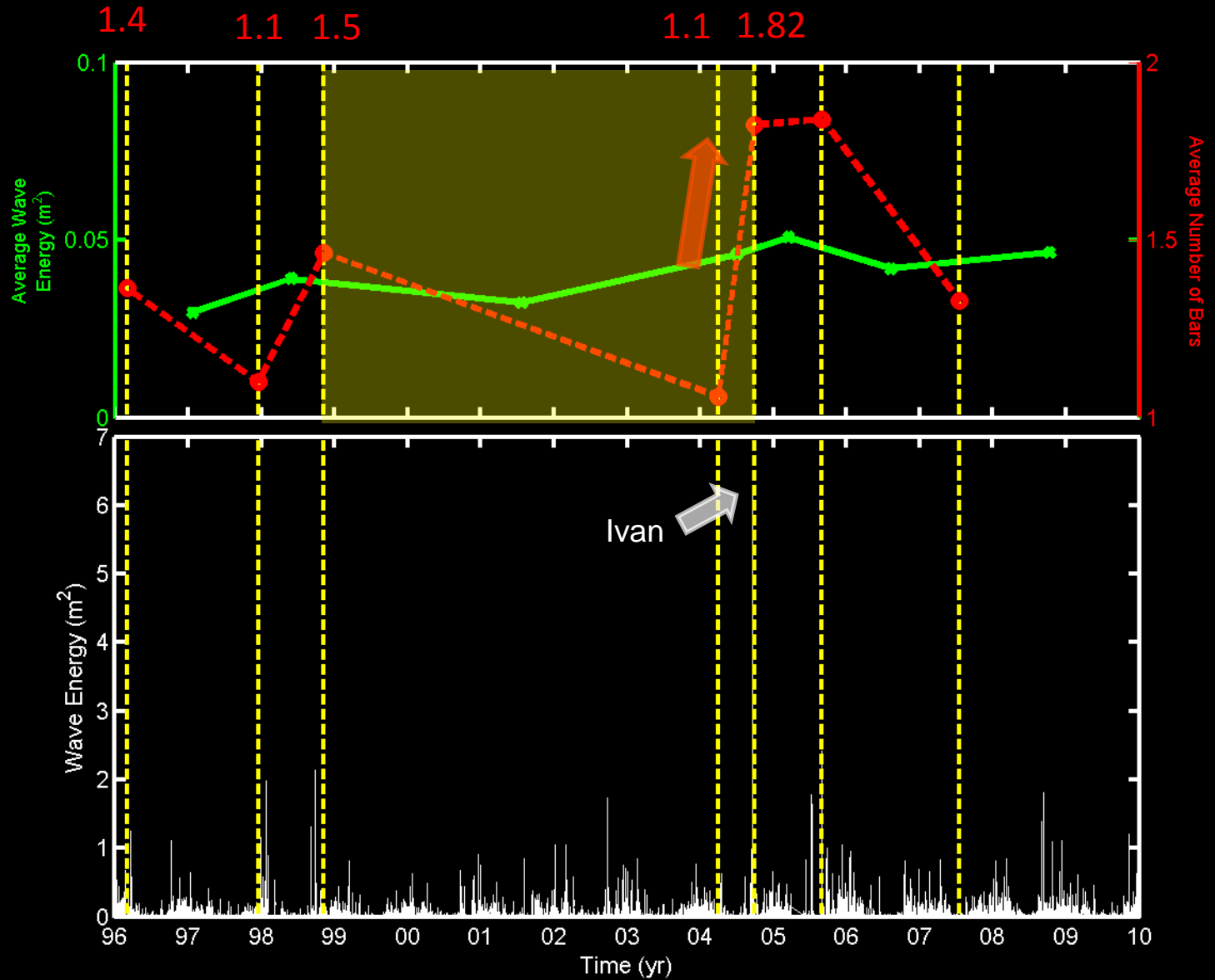
Walton County



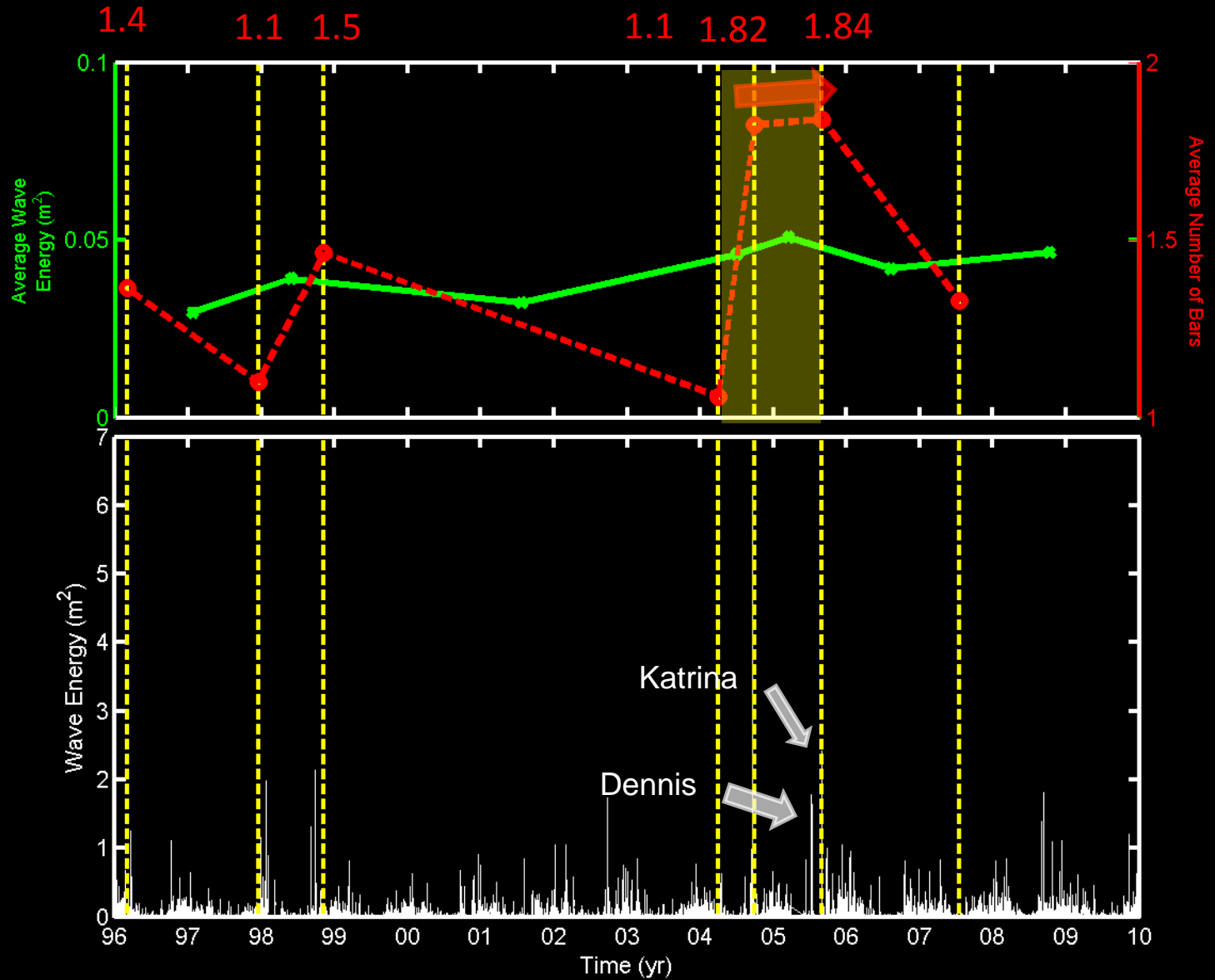
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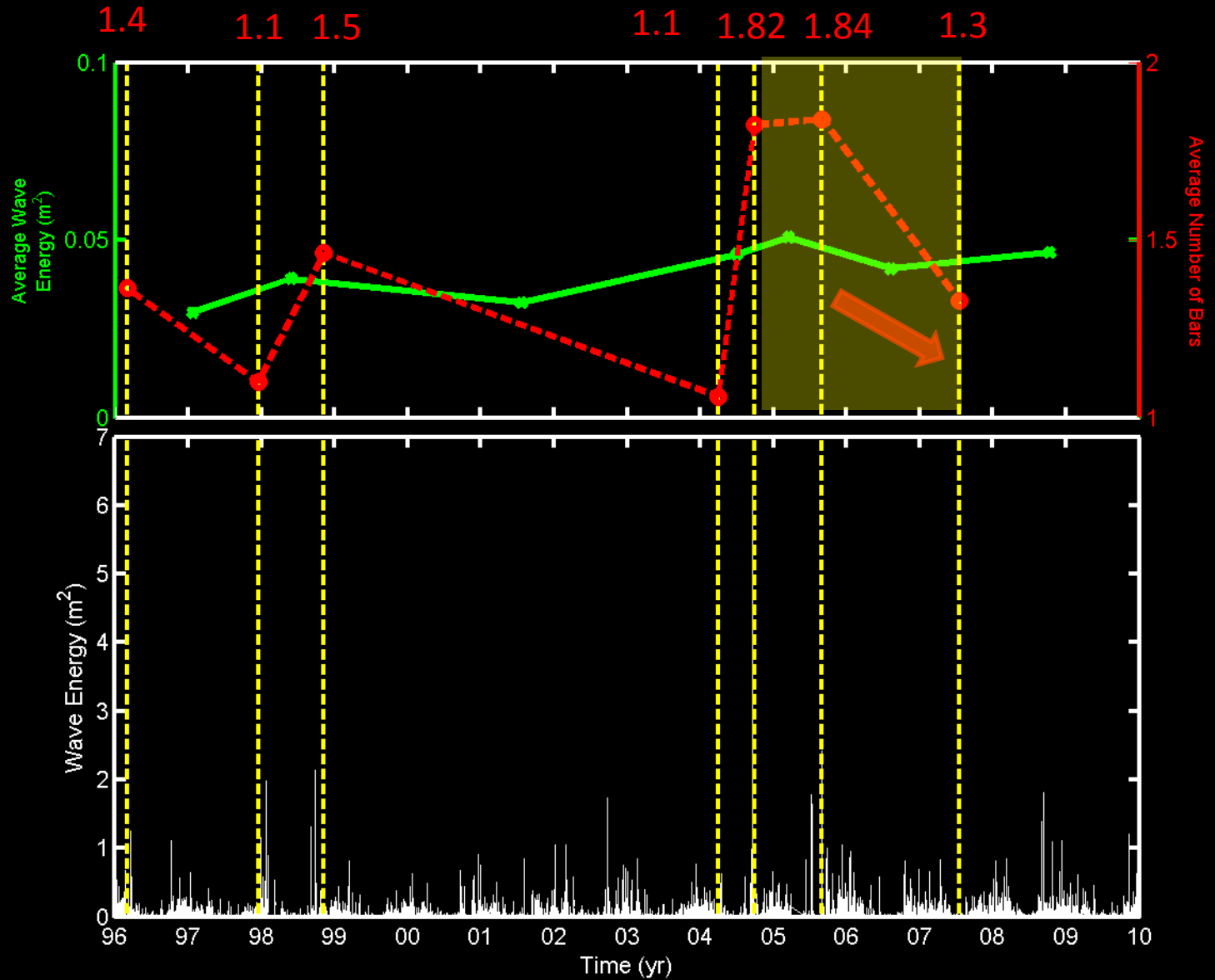
Walton County



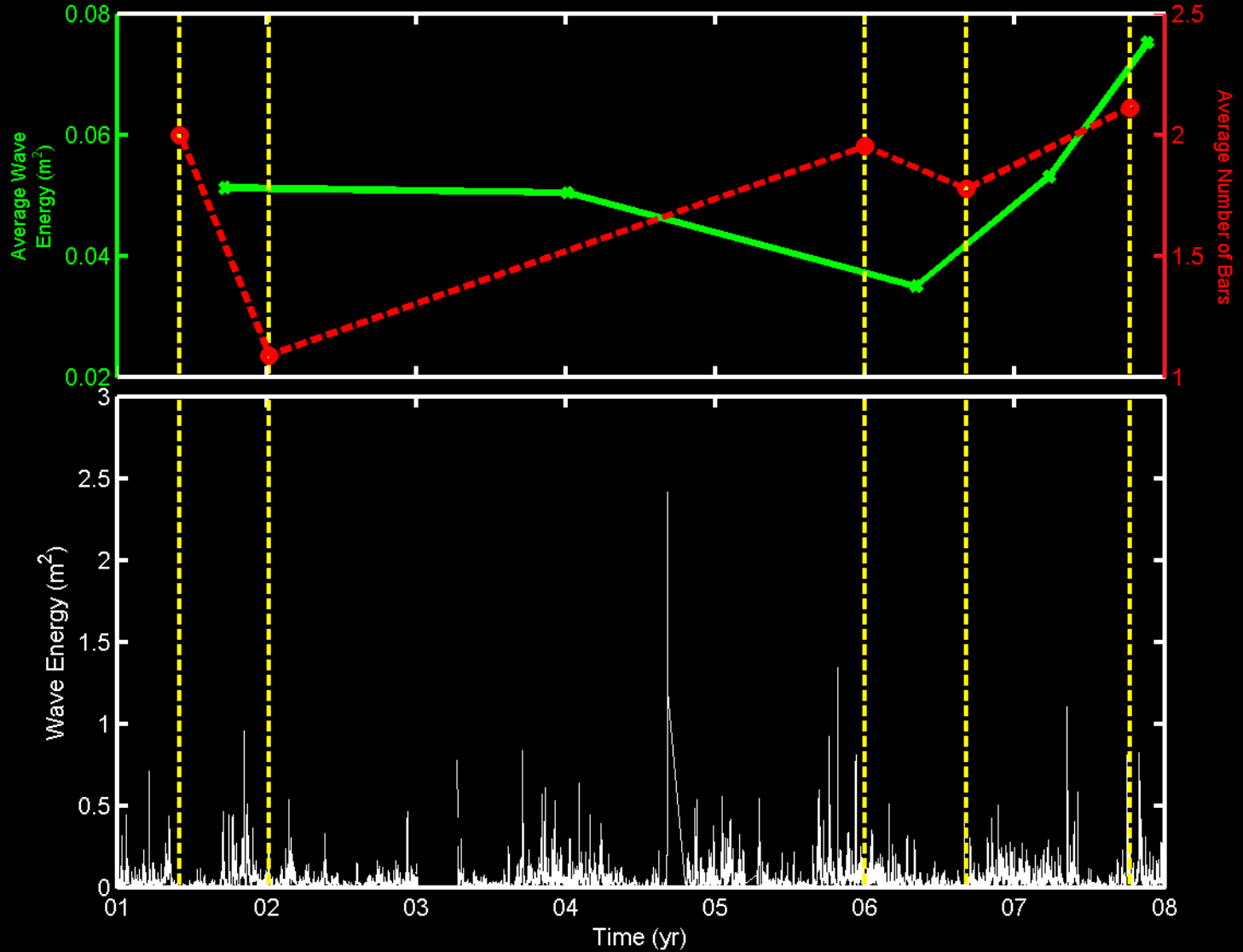
Walton County



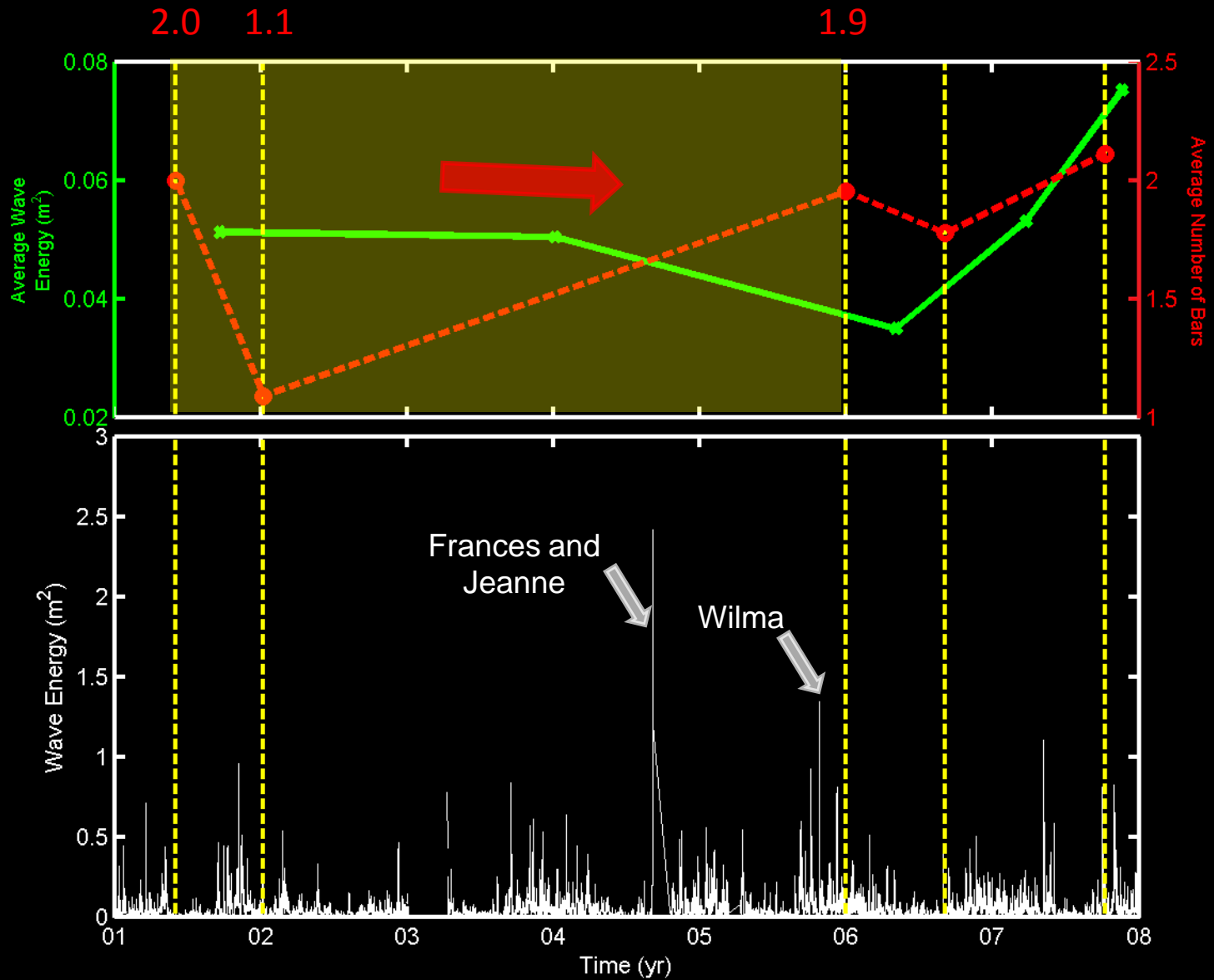
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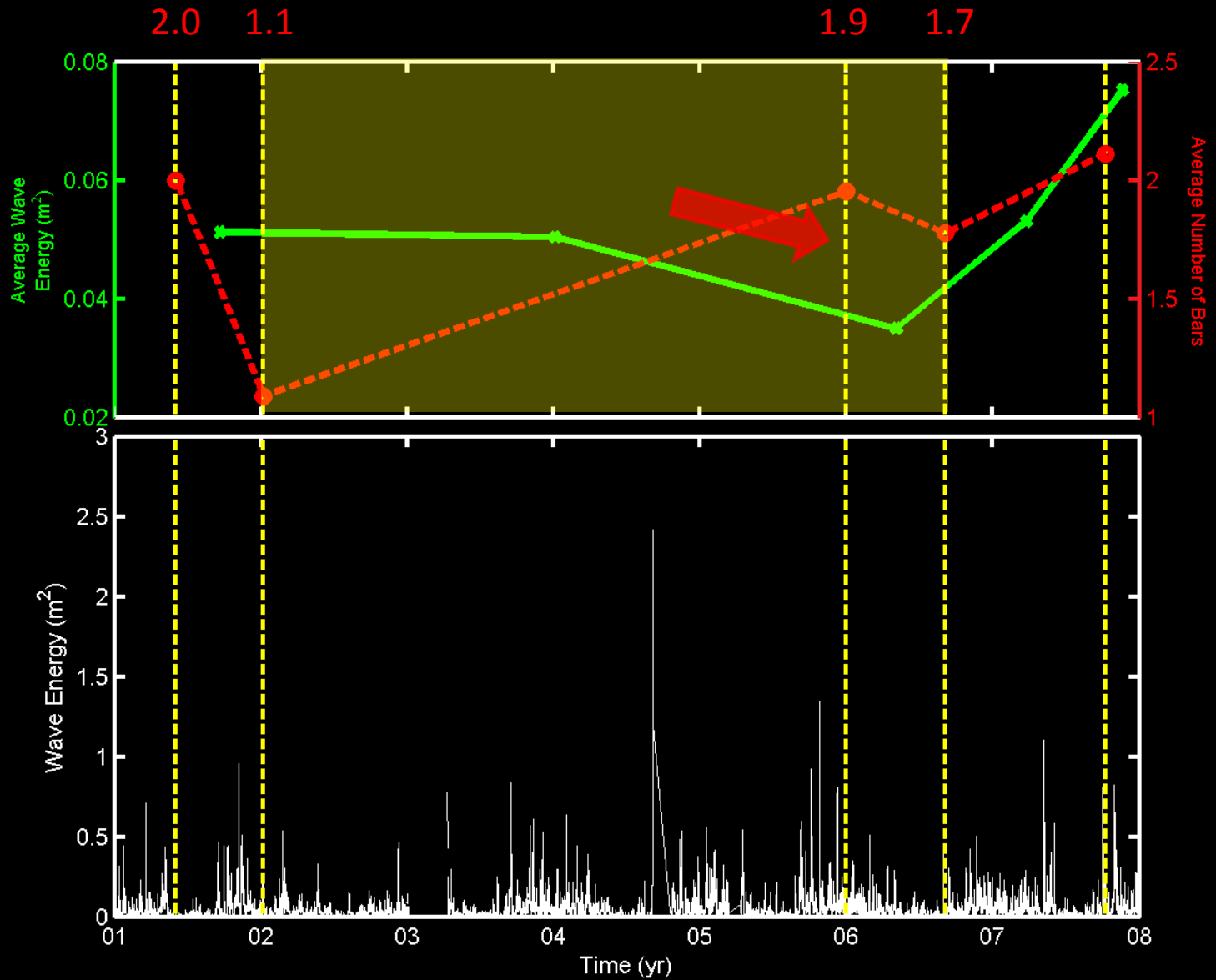
Volusia County



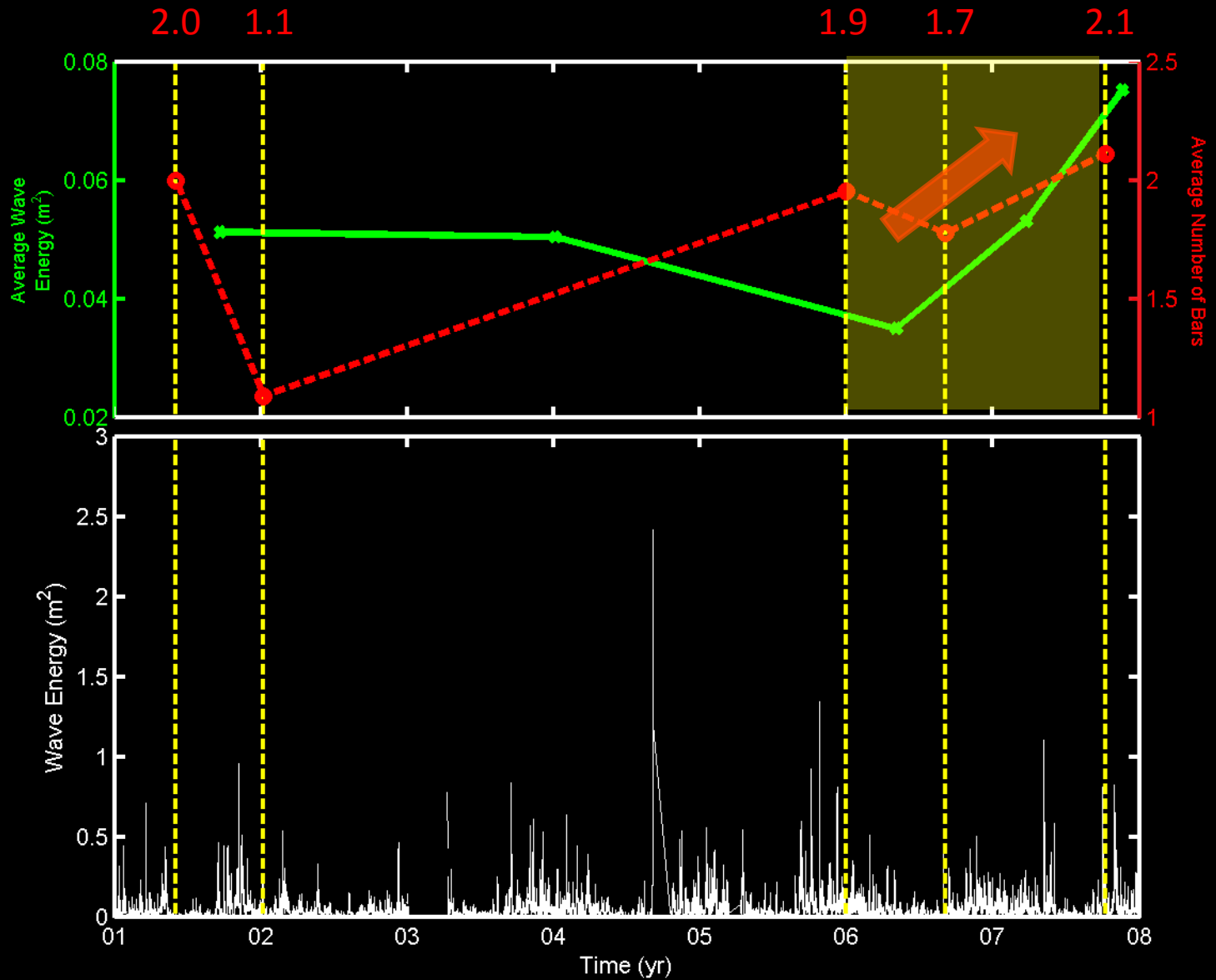
Volusia County



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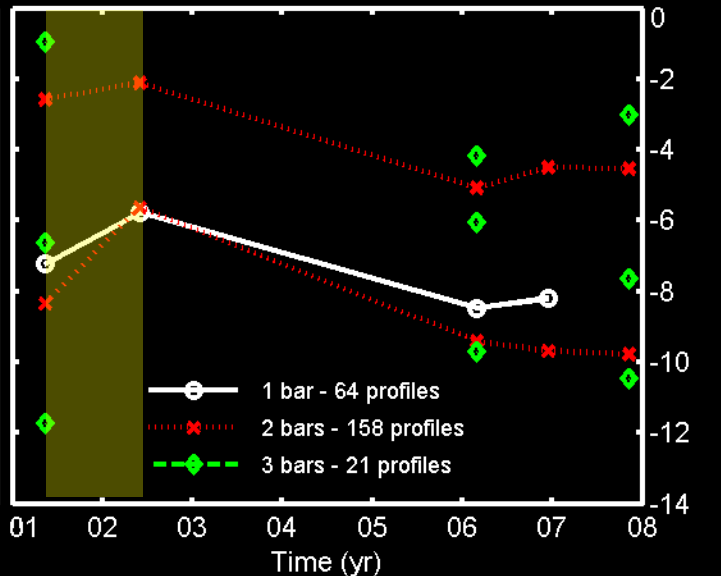
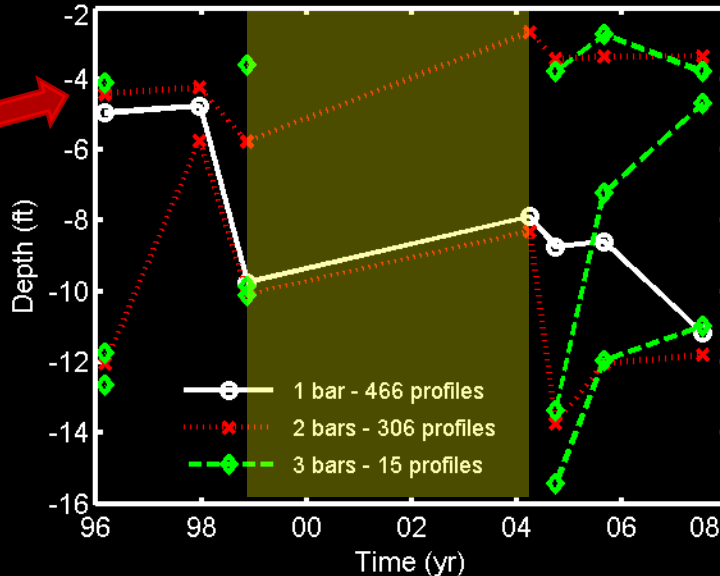
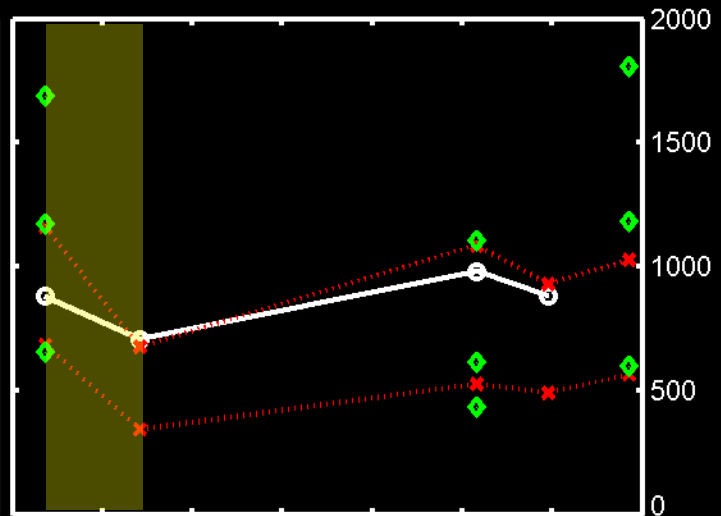
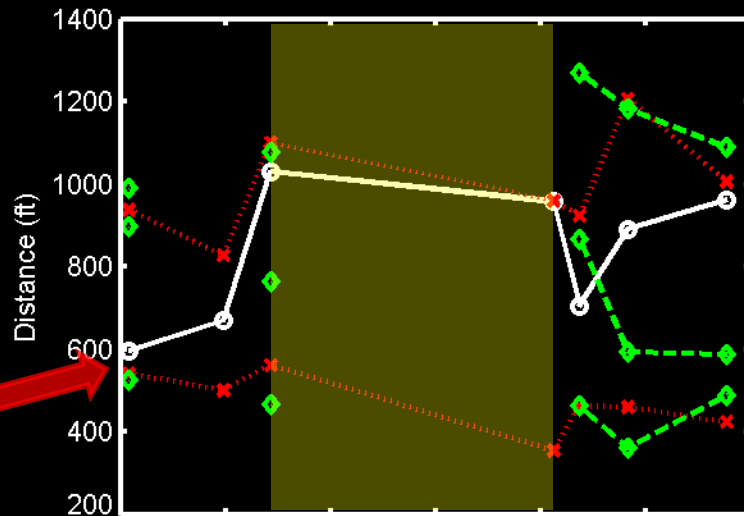


Volusia County



Walton County

Volusia County



—○— 1 bar - 466 profiles
- - - × - - - 2 bars - 306 profiles
- - - ◆ - - - 3 bars - 15 profiles

—○— 1 bar - 64 profiles
- - - × - - - 2 bars - 158 profiles
- - - ◆ - - - 3 bars - 21 profiles

Conclusions

The average number of sand bars is well correlated with the average wave energy

The bars migrated offshore to deeper areas with the passage of energetic events

The inner bar is more stable (location) than the outer bar in multiple bar profiles

The “new” bar is formed at the shore and migrates offshore