

NEW STRATEGIES FOR COASTAL RESILIENCY, Winter 2014- 2015

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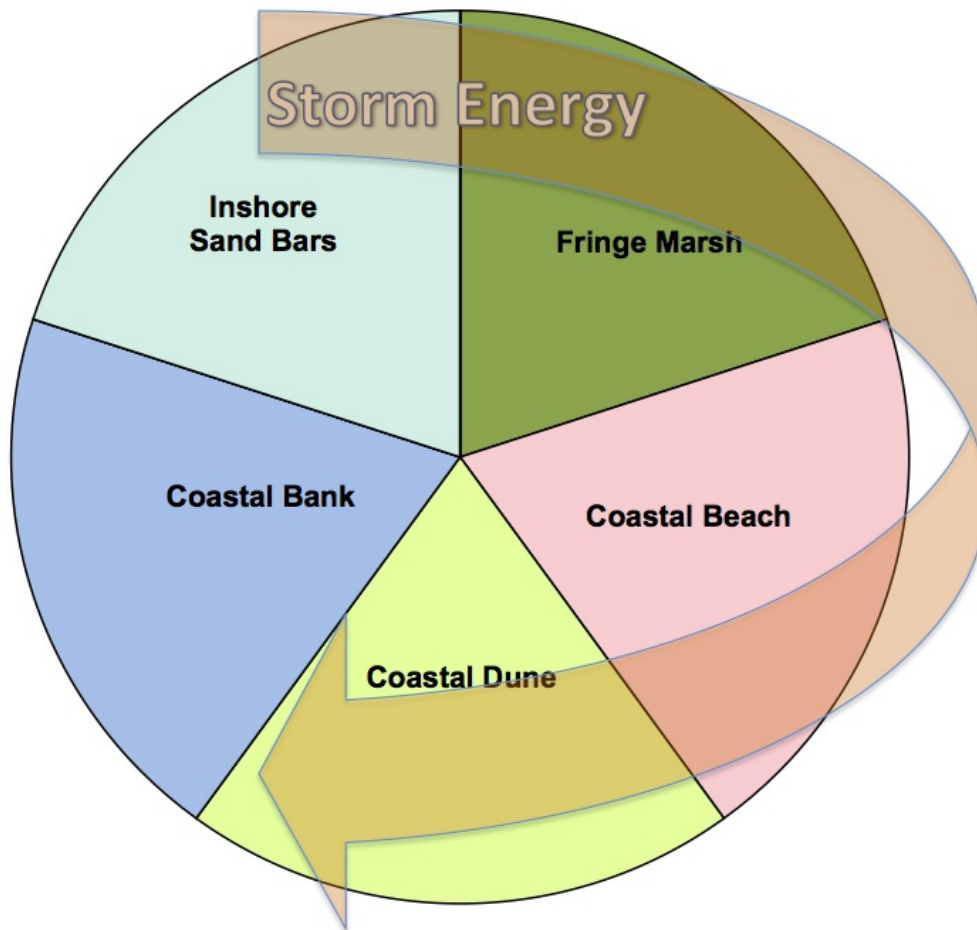
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I. Expanding the concept of “Green Infrastructure”. Taking a closer look at how adjacent coastal resources contribute to resiliency: Sand Bars; Eel Grass Beds; Fringe Marshes; Beaches and Dunes respond as “Connected Systems” to storm energy as they transmit and modify energy pulses. Should they be regulated as “Linked Systems”? **3 models.**

II. Exploring Wave Energy Management”. Reconfigurations of marine pilings or use of experimental, bimodal bathymetric friction systems can redirect storm wave energy to reduce impacts and erosion. **2 models.**

III. Restoring Eroded Coastal Dunes using Biomimicry. The strategy and techniques of an innovative, storm powered, adjustable sand collection system...

STORM ENERGY LINKS RESOURCE SYSTEMS



I. Expanding the concept of "Green Infrastructure"
Model 1: Eroded Barrier Beach, Sand Bars, Fringe Marsh



No sand sources for restoration except near shore sand bar.



Modified sand collection system set up in over wash area.



Storm energy pulse modified by transport of sand from bars to beach where it was captured in over wash area and stabilized.



Nearly 2 feet of new elevation was established during the storm season, providing a lower risk platform for replanting of American Beach grass.

I. ***Expanding the concept of “Green Infrastructure”***
Model 2: Eroded barrier beach, sand bars, fringe marsh.



Elevations were recorded. Collection system placed in over wash area.



On shore storm pulse over washed sand collection system.



By the end of the storm season, elevations were high enough to plant American Beach grass in 50% of previously eroded areas.

II. *Exploring Wave Energy Management. Model 1*, Chronic storm damage to harbor side restaurant.



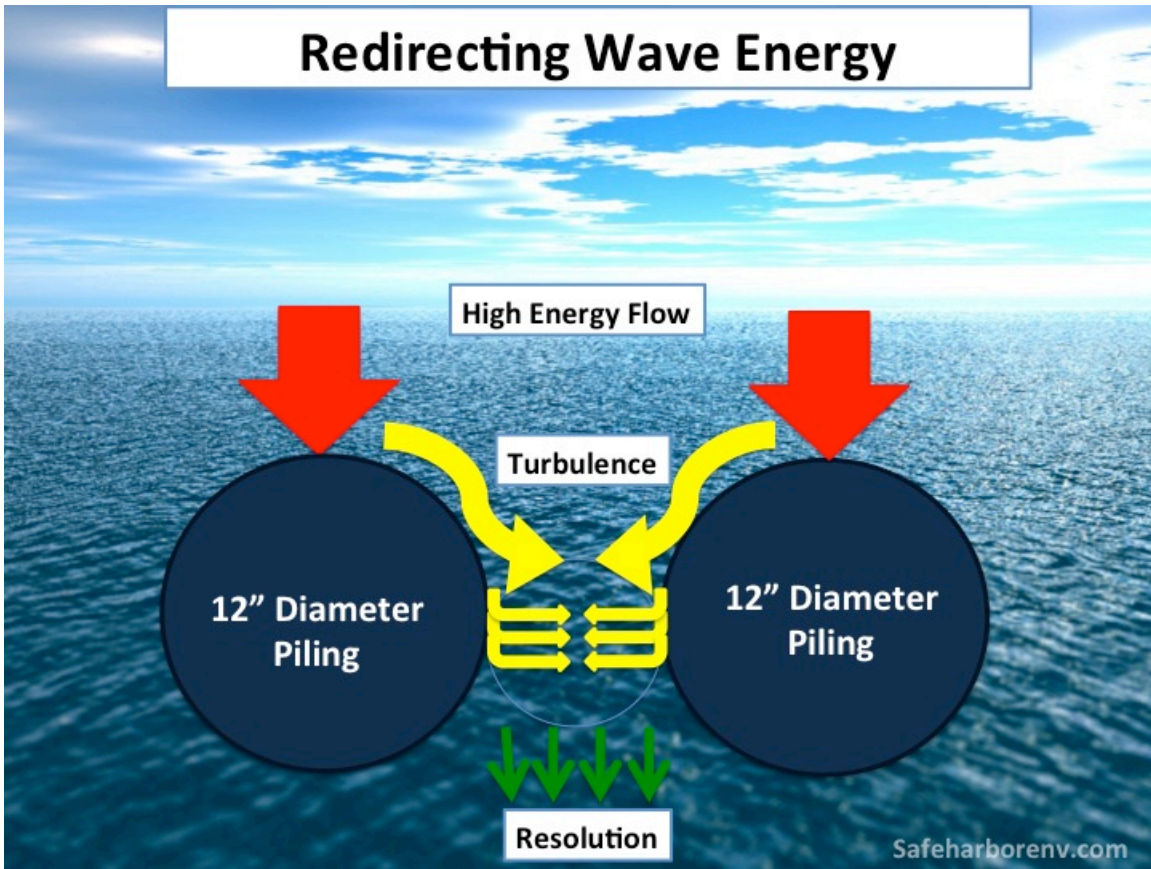
Previously installed piling system blocked wave energy, sending it through restaurant.



This image shows classical marine pile protection system side by side with innovative reconfigured marine pile system.

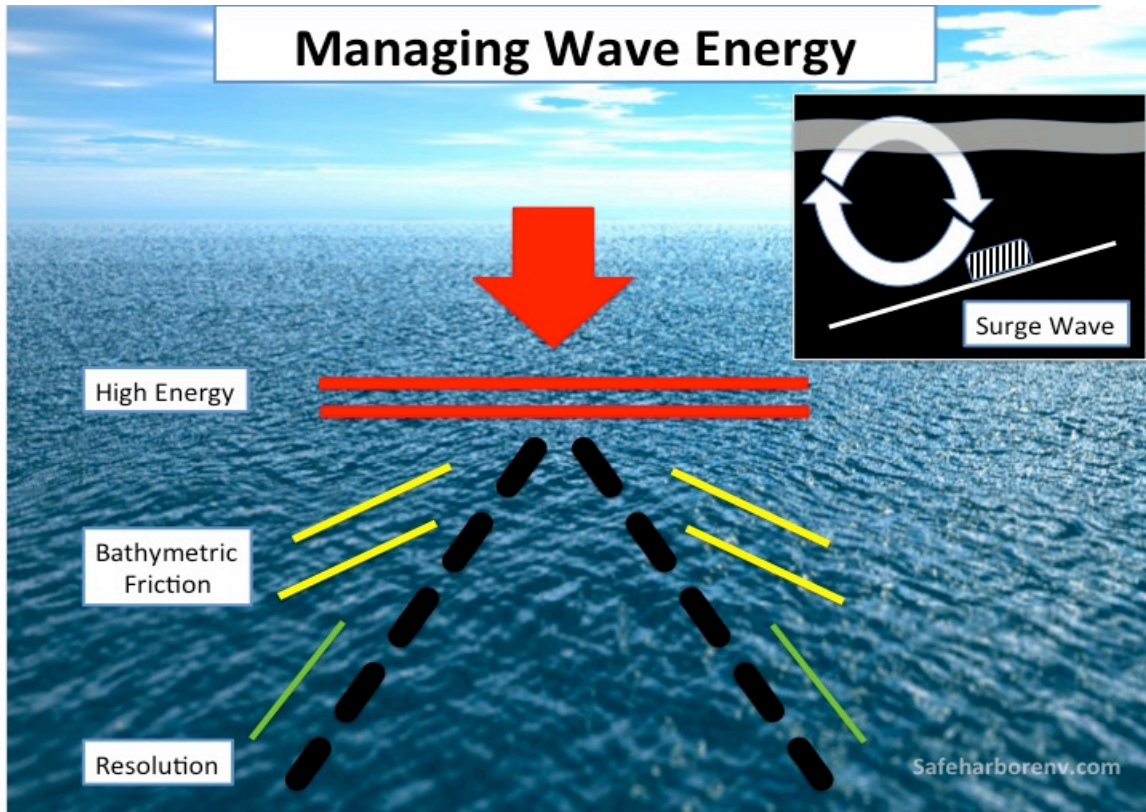


In nearly a decade, the reconfigured piles have remained true, with no erosion at the base and no further damages to the restaurant.



II. Exploring Wave Energy Management. Model 2, experiment with bimodal bathymetric friction, using a wave's own energy to redirect itself.





III. Restoring Eroded Coastal Dunes using Biomimicry: Model 1 Ocean Beach, using Biomimicry system to restore toe of Coastal Dune
 Storm winds deliver sand, biomimicry system can be pulled higher.



The breached barrier dune over washed into a fresh water marsh at the head of a river system for 19 years.



Image above shows 24 inch sand fencing and biomimicry



Following two winter storm seasons including Hurricane Sandy and three Mega Storms, 24-26 foot elevations were re-established.