



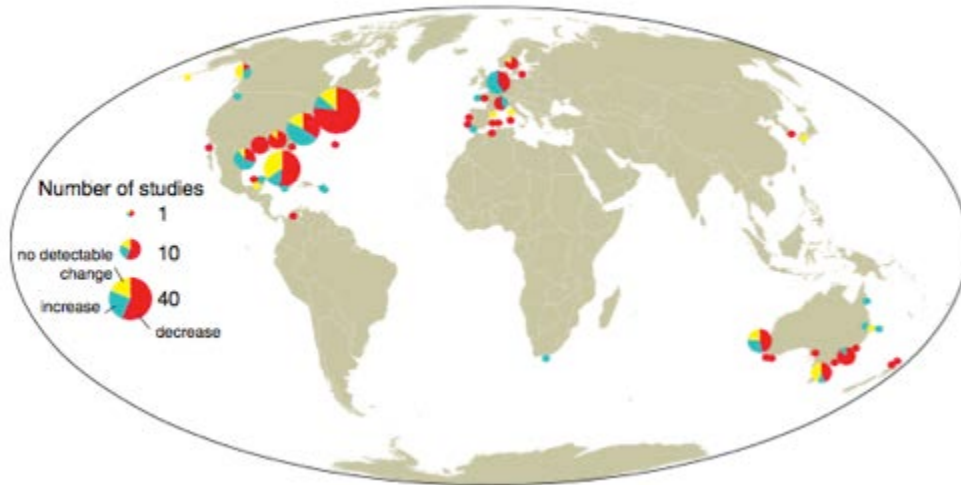
Living shorelines: Are we designing functional, sustainable, and resilient coasts?

Rachel Gittman
September 8, 2016



Habitat Degradation & Loss

Seagrass Losses >30%



Waycott et al. 2009

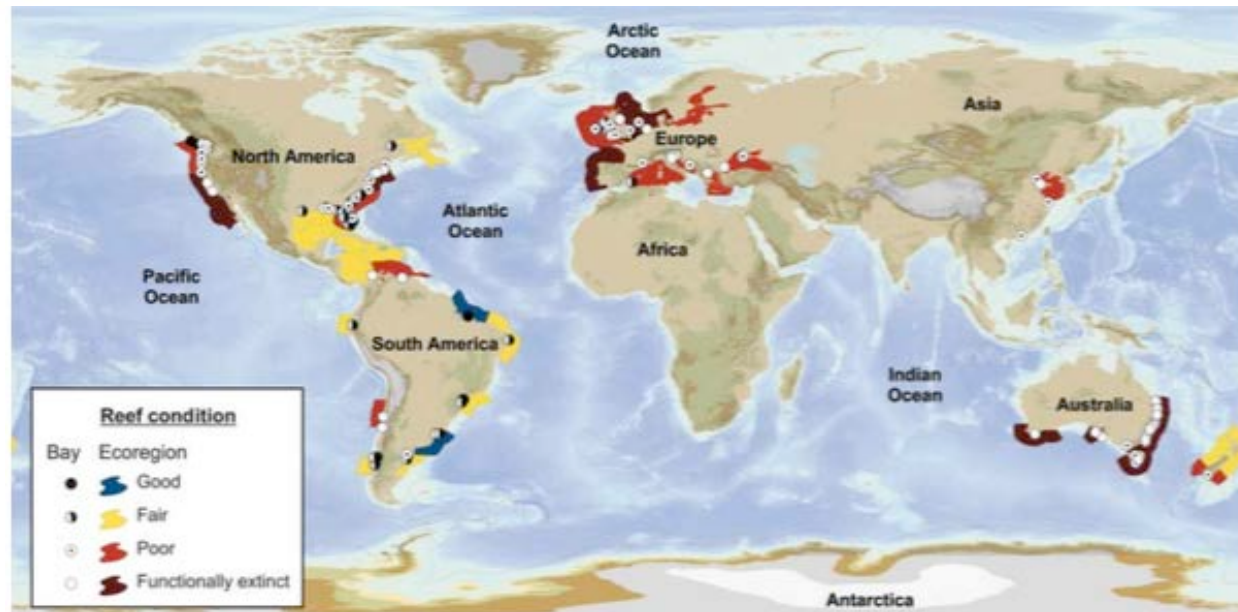
> 40% decline of
North American salt
marshes

Gedan and Silliman 2009

Oyster Losses – 65-85%

35% of mangroves

Valiela et al. 2001



Beck et al. 2011

Shoreline Hardening



14 % of the coastline of the continental United States is hardened

Do hardened shorelines provide functional habitat?



Seawalls/Bulkheads

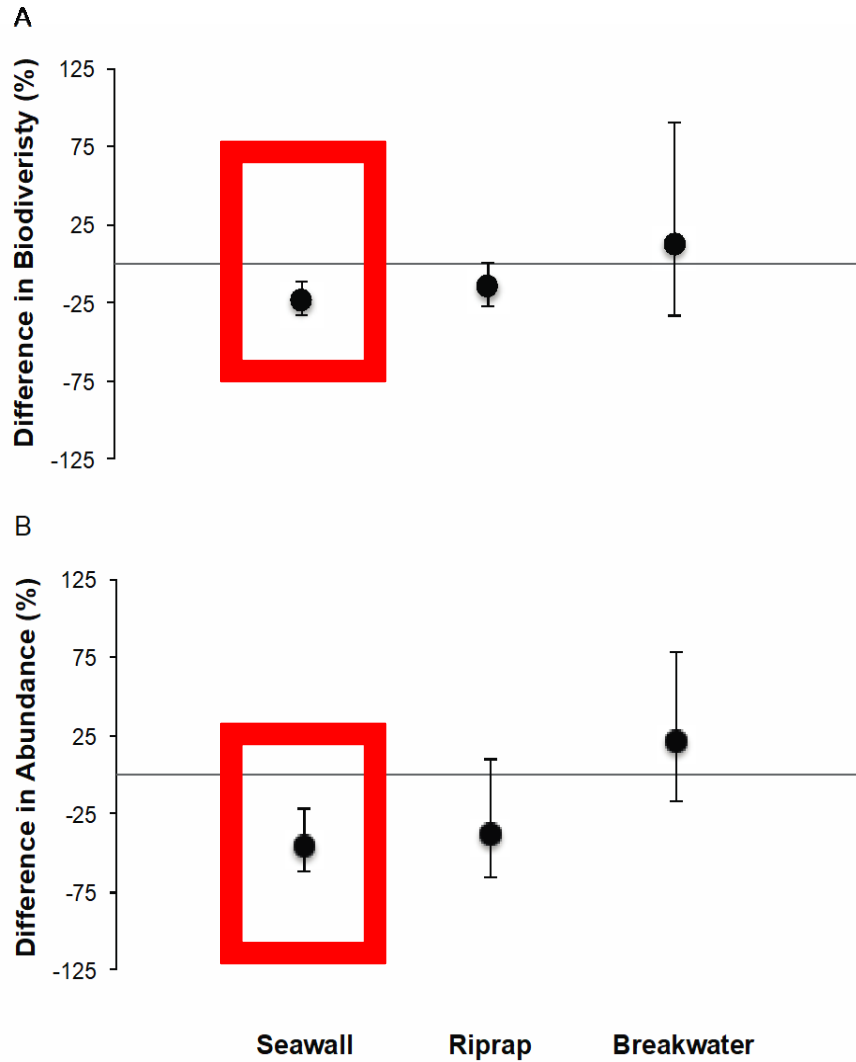


Riprap revetments



Breakwaters

Biodiversity and Abundance



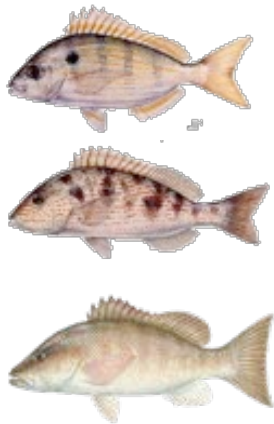
What are the alternatives?

Living shorelines “A living shoreline incorporates vegetation or other ‘soft’ elements alone or in combination with some type of harder shoreline structure (e.g. oyster reefs or rock sills) for added stability. Living shorelines maintain continuity of the natural land - water continuum and reduce erosion while providing habitat value and enhancing coastal resiliency. (NOAA 2015).



Do living shorelines provide better habitat than hardened shorelines?

Gittman et al. 2016 *Ecological Applications*



Bulkhead



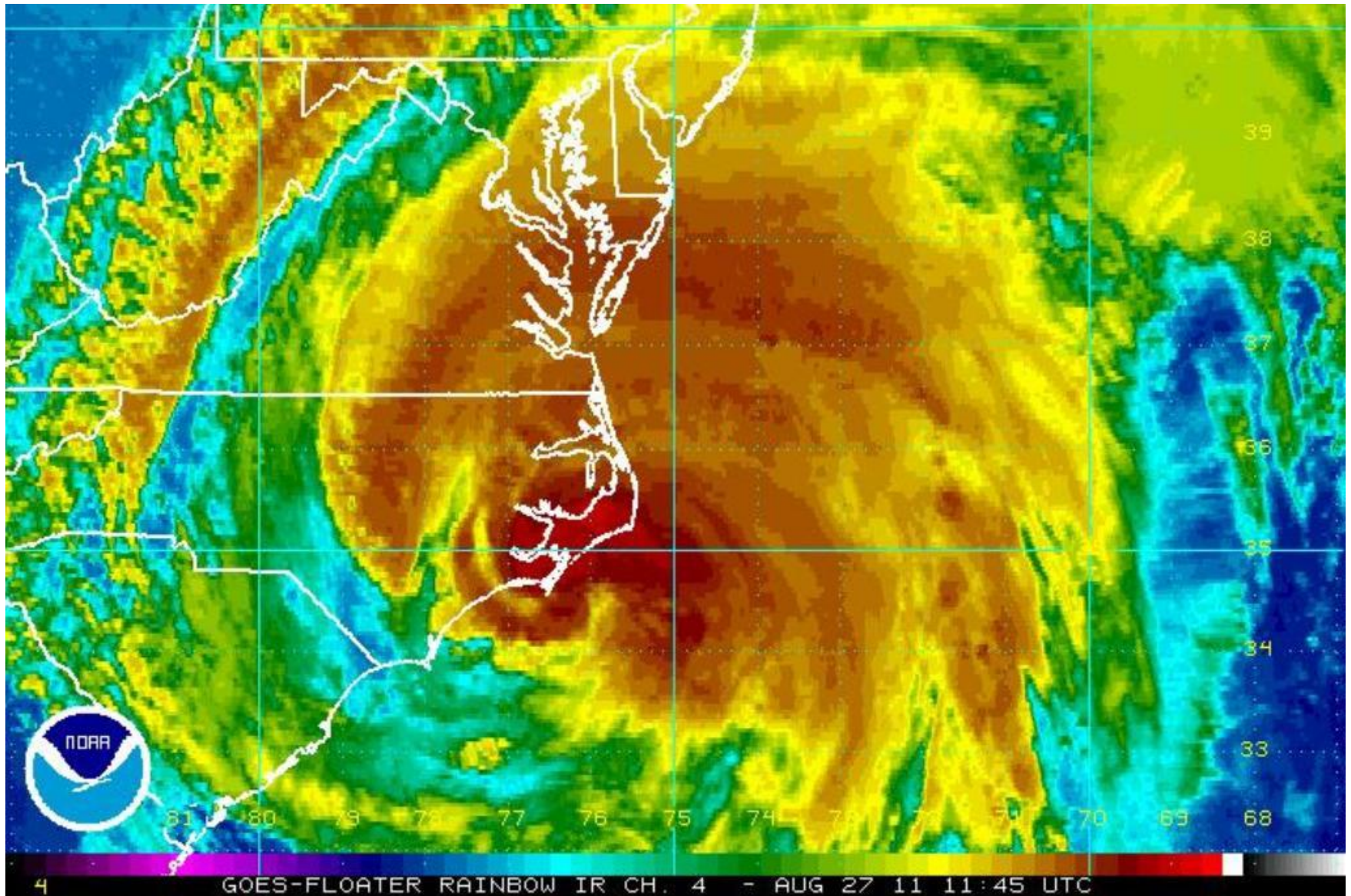
Marsh



Marsh and Sill



Are we creating sustainable & resilient shorelines?



Hurricane Impacts





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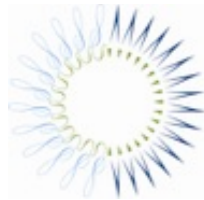
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