Values of Nature Based Approaches

Are you ready for the next big storm?
A workshop for hardy Cape Codders

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WHY STUDY SALT MARSHES?

Salt marshes and other coastal wetlands

- **Ecosystem services**
  - Erosion control, flood protection, nursery for commercial species, biodiversity protection, aesthetics, recreation, carbon storage, and nitrogen removal (water filtration)

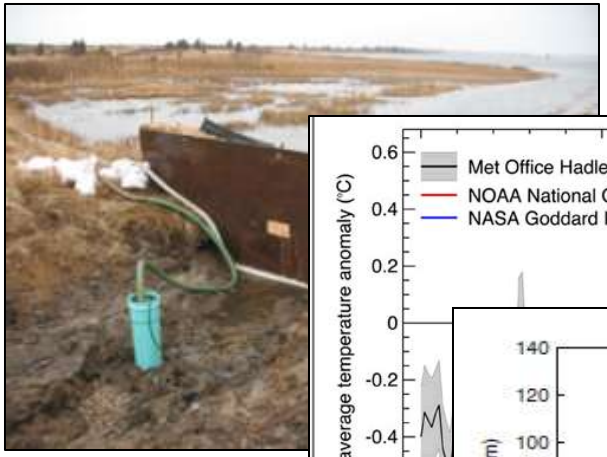
WHY STUDY SALT MARSHES?

Damage from Hurricane Sandy

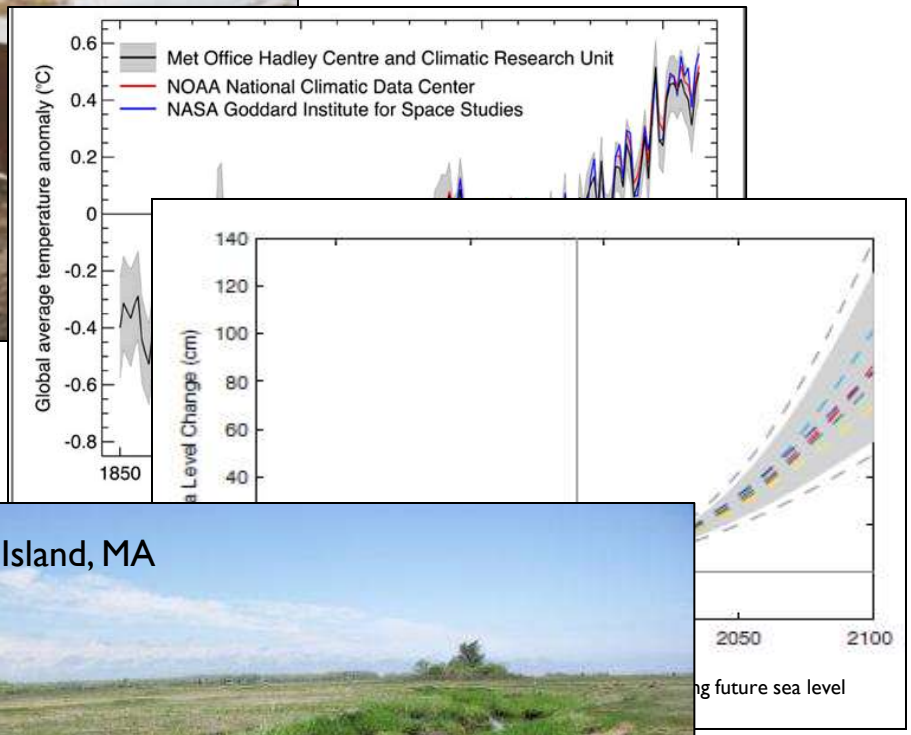
Areas with wetlands prevented an estimated $600 million in property losses

Threats to Salt Marsh Resiliency

- Tidal restrictions



- Climate change & sea level rise

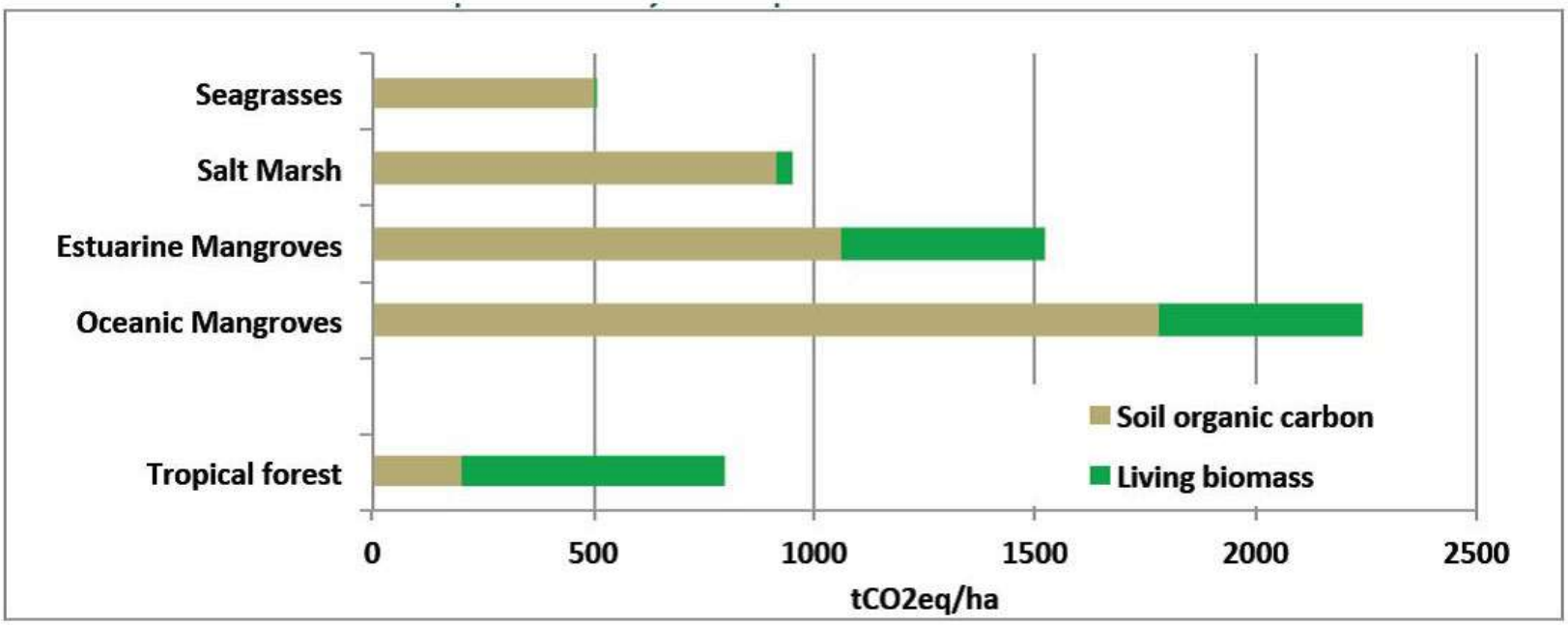


- Excess nitrogen loading

Deegan, L. A. D. S. Johnson, R. S. Warren, B. J. Peterson, J. W. Fleeger, S. Fagherazzi, W. M. Wollheim. 2012. Coastal eutrophication as a driver of salt marsh loss. *Nature* 490:388-392.

dcr Massachusetts

Blue Carbon



*Data is per unit area, where tCO2eq/ha is tons of carbon dioxide equivalents per hectare

Source: Murray, Brian, Linwood Pendleton, W. Aaron Jenkins, and Samantha Sifleet. 2011. Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute Report. NI R 11-04

dcr
Massachusetts

NERRS SCIENCE COLLABORATIVE GRANT

Nitrogen and Coastal Blue Carbon

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

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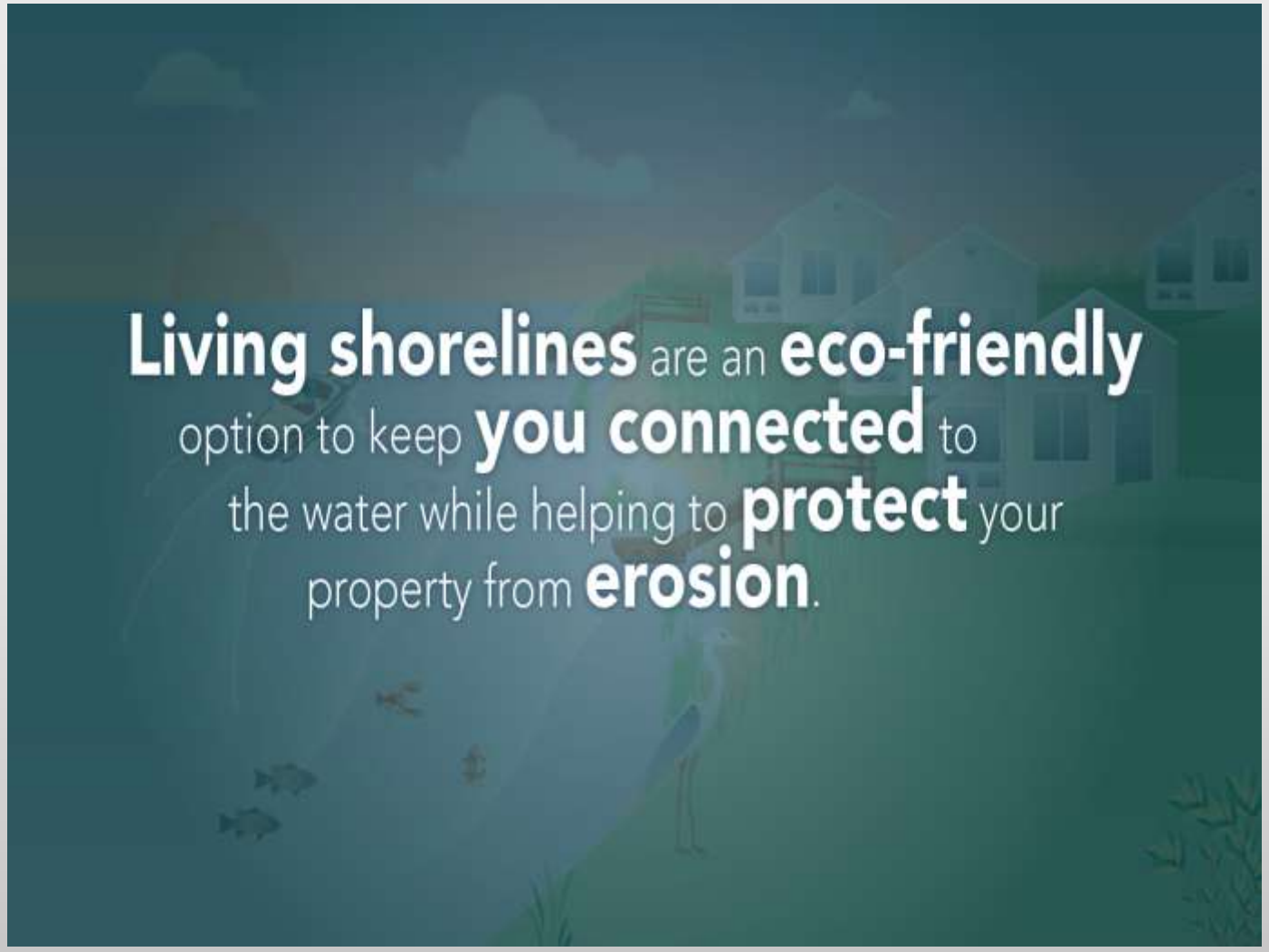

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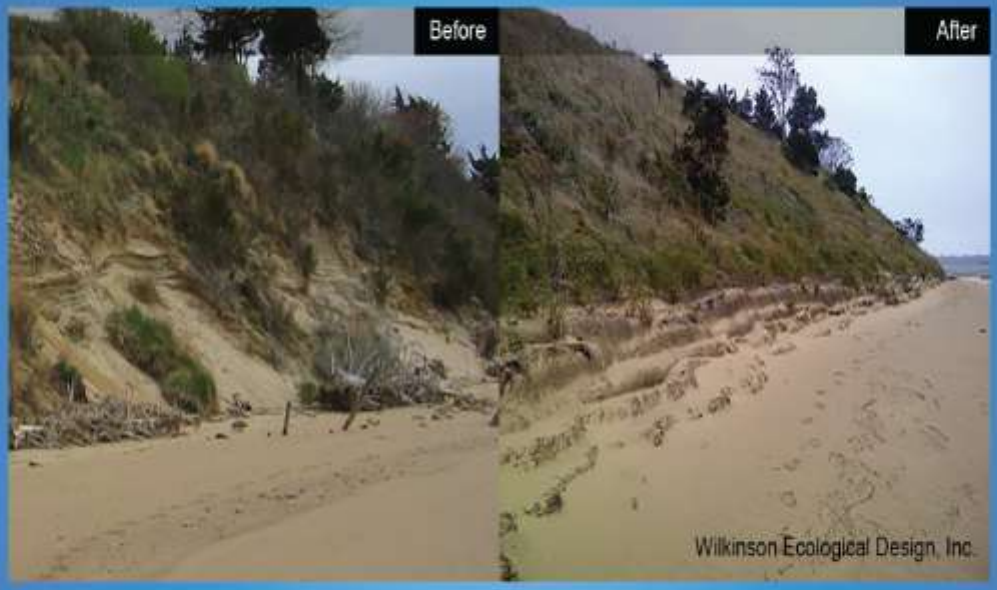
Living shorelines are:

An alternative shoreline protection option to rock or concrete structures.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

Living shorelines are:



Created using natural elements and materials
(sand, wetland plants, biodegradable materials, etc.)

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

Living shorelines are:

An approach that allows you to access your shoreline, benefits wildlife, and looks natural.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

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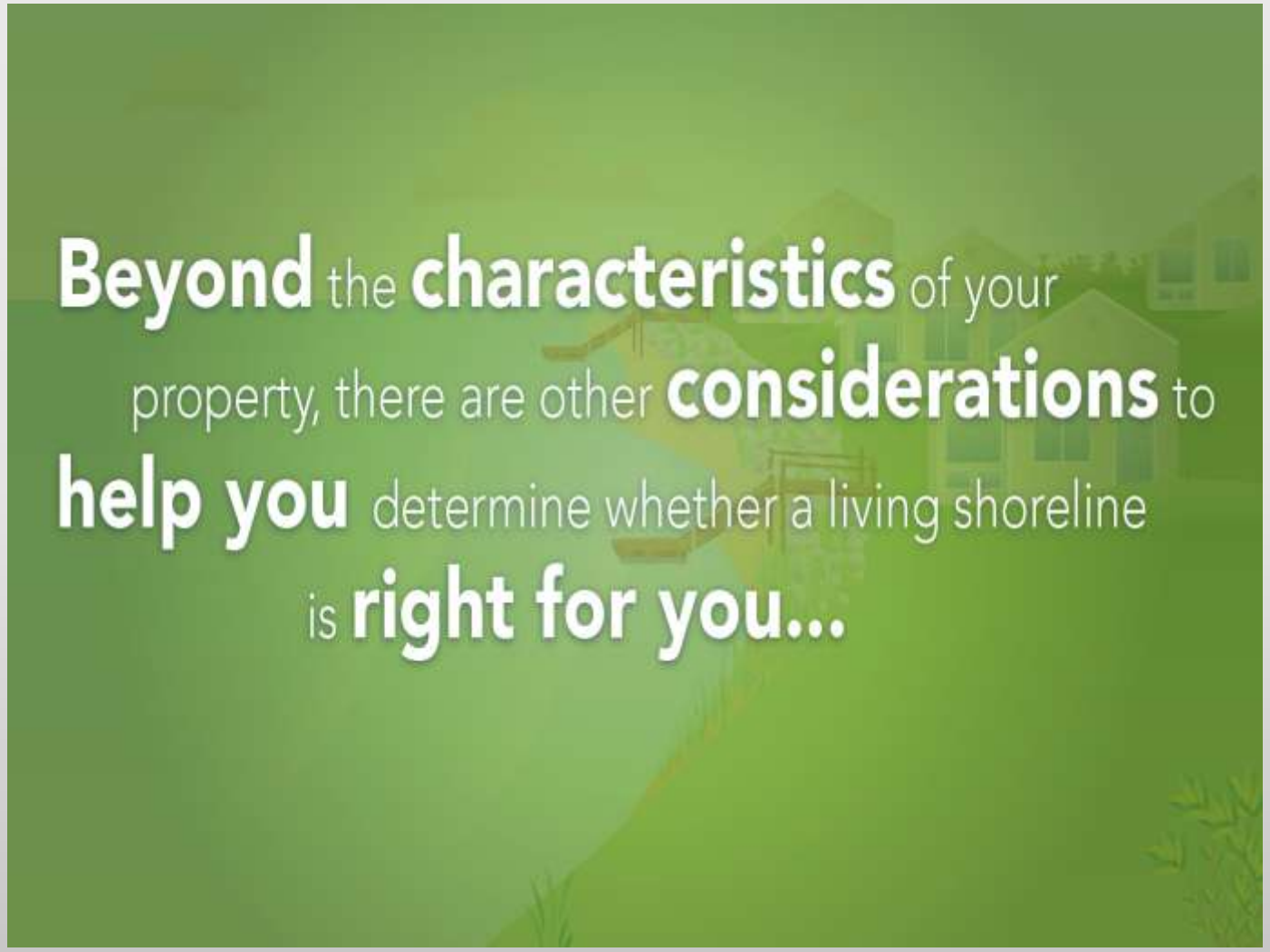

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Professional help

- Successful living shorelines are designed by teams of engineers, landscape architects, and ecologists.
- Discuss your property conditions and characteristics with them (slope, ice cover, etc.).
- Ask them about their living shoreline experience.
- Your state coastal management office can help point you in the right direction.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

Here are examples of permitted projects in New England:

Artificial dune and sand fencing for storm damage protection of a coastal bank.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

Here are examples of permitted projects in New England:

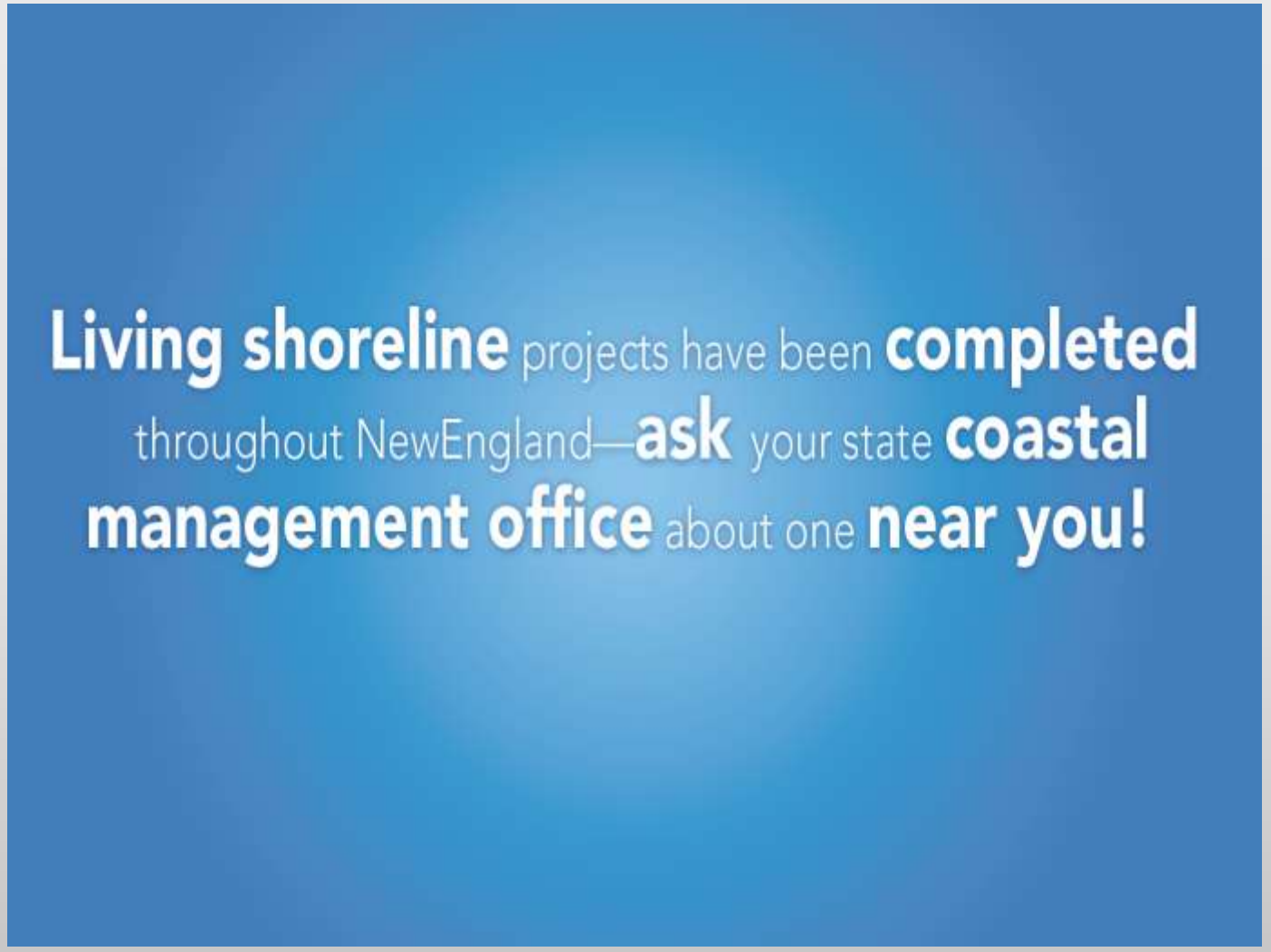
Flatten slope for salt marsh restoration.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker

Here are examples of permitted projects in New England:

"Reef balls" placed on the site to break waves, capture sediment, and help restore the salt marsh grasses planted behind them.

Source: NROC Living Shorelines Stacker; http://northeastoceancouncil.org/living-shorelines-stacker



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Put Green Infrastructure between Your Community and the Next Coastal Storm.

There are many benefits.

Tidal and Forested Wetlands
- Slow waves
- Filter and clean floodwaters
- Provide food and jobs

Green Streets
- Capture and clean stormwater
- Beautify streets and encourage economic development
- Provide pedestrian-friendly walkways

Oyster and Coral Reefs
- Slow storm surge
- Provide food
- Clean water

Sand Dunes
- Buffer waves as a first line of defense
- Build economy through tourism

Open Space and Parks
- Store floodwaters and recharge aquifers
- Increase property values

Urban Trees
- Reduce runoff and absorb floodwaters
- Shade and cool homes and businesses
- Provide clean air and water

Living Shorelines
- Slow waves and reduce erosion
- Protect property

Aesthetics of natural approaches

Photo: Tracy Skrabal, North Carolina Coastal Federation

Create Natural Shorelines

Create living shorelines using oysters, marsh grass, and other natural materials to absorb wave energy and reduce erosion.

How do we know it works? North Carolina properties that used natural shoreline protection measures withstood wind and storm surge during Hurricane Irene better than properties using seawalls or bulkheads.

http://ccrm.vims.edu/livingshorelines/images/Vegetation%20Mgmt/NoMowGraphic250.jpg

http://ccrm.vims.edu/livingshorelines/photo_gallery/index.html

Summary

- Coastal vegetation is highly valuable
  - Storm protection- slow wave energy
  - Absorb flood water, reduce erosion
  - Blue carbon resource
- Homeowners can protect their property and create habitat value with several tools
  - Living shorelines – marsh, dunes, seagrass, shellfish
  - Soften or remove hard infrastructure
- Storms happen- planning for impacts from personal to community and higher levels is: wise stewardship, cost effective and safer