Coastal Case Studies: Lessons Learned

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Middlefield, CT
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How do you protect against Coastal Storms like Sandy?
You can't
Coastal engineering structures

Large rip rap

smaller rip rap

breakwater

gabions
“Living Shorelines”
Beach replenishment

Stone + bioengineering

Photo by Wilkinson Ecological Design
Soft engineering not durable, but Permittable Bank restoration along tidal River.
After one year, plants established, Starting to gain land.
Established coastal bank
Bank protection using coir fascines also known as “biologs”
Coir covered with “sacrificial sand” and planted with beach grass
Native plants are Becoming established
Coastal bank 1m erosion/year
Little Compton, RI
Beach Grass in BioLog
Conditions after 10 years
Bank has naturalized
Beach Restoration - Spain
Dune restoration completed
Removal of infrastructure
Dune Restoration
Secondary dunes
Dune Restoration, Bay of Biscay
2007
High coastal bank (MA)
Unconsolidated sand on 30m high coastal bank
Install baffle system, plant, then hydro-seed slope
Establishment period.
Use flexible mesh biodegradable fabric to capture sand and to protect establishing vegetation.
After one year of growth
One year after establishment
After two years
Completed slope after two years
Rock Toe of slope, covered with sand
Creating wooden staging to prevent slope erosion during planting
Installation of baffles & dune plants
Hydro-seed slope with native seed mix

Completed: June, 2008
Site after one year
(August, 2009)
Connecticut River-Tidal bank Restoration 2013
Darien salt marsh and coastal bank Restoration- 2001
Post construction:
Salt marsh established
Bank re-vegetated
Restore or give up?
Hard Engineering (reduce wave energy)

- Groynes
- Revetment
- Gabions
- Rip Rap
- Sea Wall
- Cliff Drains
- Breakwaters

Pros: Effective erosion control, long life span

Cons: high cost, poor esthetics
Soft Engineering:
- beach nourishment
- Bio-engineering
- Dune stabilization
- Living shorelines

Pros: good aesthetics, wildlife use, low cost, easier to permit

Cons: cannot endure severe storms
Oakwood Beach, NY  Response to Sandy:

- buyout
- remove infrastructure
- Create wetland
- Mitigation bank
Ecological Restoration thoughts:

- do no harm!
- Plan ahead with defined goals/targets
- don’t force restoration
- use natural processes
- restore ecological trajectory
- Build in ecosystem stability
- Use Reference ecosystems
Comments/Questions?

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