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Why DEEP Limits Hard Structures: CCMA Implications for Shoreline Hardening

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Living Shoreline Workshop, UConn Avery Point



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What is “shoreline hardening?”

In general terms:

- erosion control practices
- using hard or “permanent” structures
- used with intent to armor or stabilize coast



Range of shoreline hardening in CT

FROM THIS



TO THIS



CT Statutory Definition

- “Shoreline flood and erosion control structures” are:
 - any structure the purpose or effect of which is to control flooding or erosion
 - includes the placement of concrete, rocks, or other significant barriers to waters or movement of sediments

Section 22a-109(c)



Breakwater



GROTON



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Bulkhead



GROTON



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Groin



CLINTON



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Jetty



MADISON



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Revetment



MILFORD



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Riprap



STRATFORD



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Seawall



NEW HAVEN



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CZM Program in historical context



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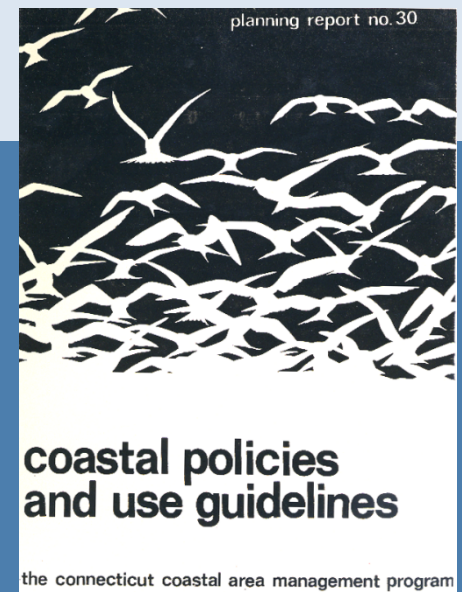
Structures Regulation in CT

- 1939 Structures, dredging and fill activities
- 1969 Tidal Wetlands Act
- 1980 Connecticut Coastal Management Act



What is the CCMA?

- Most important document
- Foundation for all decisions
- Purpose is to guide planning, development, acquisition, and regulatory activities
- Provides uniform standards and criteria for all public agencies – local, state, federal



How does the CCMA work?

- Defines adverse impacts to consider
- Defines coastal resources
- Each coastal resource has a set of specific enforceable policies pertaining to them
- Projects are evaluated for consistency with coastal policies and adverse impacts



How CCMA applies to shoreline hardening



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Regulatory process

- Because of significant potential impacts to coastal resources, there is a high threshold for permit approval
- CCMA specifies the eligibility criteria
- Applicant must meet ALL criteria



Structures are permissible when:

- Unavoidable AND
- Necessary to protect certain features AND
- No feasible, less environmentally damaging alternative is available AND
- All reasonable mitigation measures and techniques have been provided to minimize adverse environmental impacts

Sec. 22a-92(b)(2)(F), Sec. 22a-92(b)(2)(J)



Allowed: Infrastructure



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Allowed: Cemetery/Burial Grounds



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Allowed: Water-dependent uses



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Allowed: Pre-'95 inhabited structures



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NOTE! LS Exemption PA 12-101

- As of 2012, statutory definition of “shoreline flood and erosion control structure” was changed
- Definition now specifically excludes LS projects



Regulatory impact of PA 12-101

- Exempts structural components of LS projects from strict eligibility thresholds
- Provides some regulatory flexibility to consider wider range of LS projects
- DEEP needs to be careful of what we call “living shoreline”



CCMA in practice



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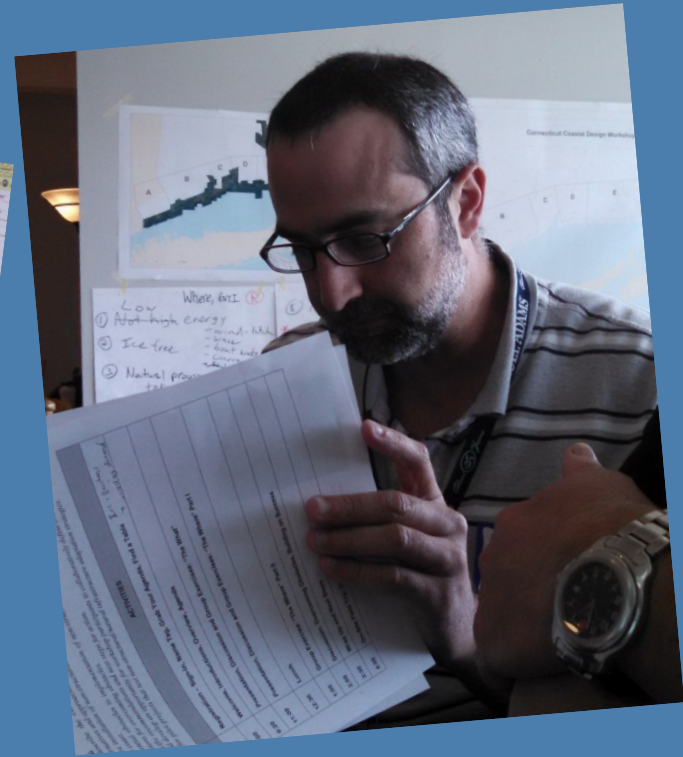
Applicant's Responsibility

- Applicant has burden of proof in coastal application process
 - must demonstrate consistency with ALL coastal policies
 - adverse impacts must be assessed
- DEEP must determine consistency



Flood & erosion control structures

- What are the relevant policies that DEEP staff must consider when reviewing applications?



Policy: Maintain erosion/deposition

- To maintain the natural relationship between eroding and depositional landforms and to minimize the impacts of erosion and sedimentation on coastal land uses

Sec. 22a-92(b)(2)(J)



Policy: Maintain erosion/deposition



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Policy: Protect bluffs/escarpments

- To manage coastal bluffs and escarpments so as to preserve their slope
- To disapprove uses that accelerate slope erosion and alter essential patterns and supply of sediments to the littoral transport system

Sec. 22a-92(b)(2)(A)



Policy: Protect bluffs/escarpments



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Policy: Protect beach systems

- To preserve the dynamic form and integrity of natural beach systems to provide critical wildlife habitats, reservoir for sand supply, buffer for flooding and erosion, and recreational opportunities

Sec. 22a-92(b)(2)(C)



Policy: Protect beach systems



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Policy: Protect beach systems



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Policy: Protect shoreline processes

- To insure that coastal uses are compatible with the capabilities of the system and do not unreasonably interfere with natural processes of erosion and sedimentation

Sec. 22a-92(b)(2)(C)



Policy: Protect shoreline processes



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Policy: Protect shoreline processes



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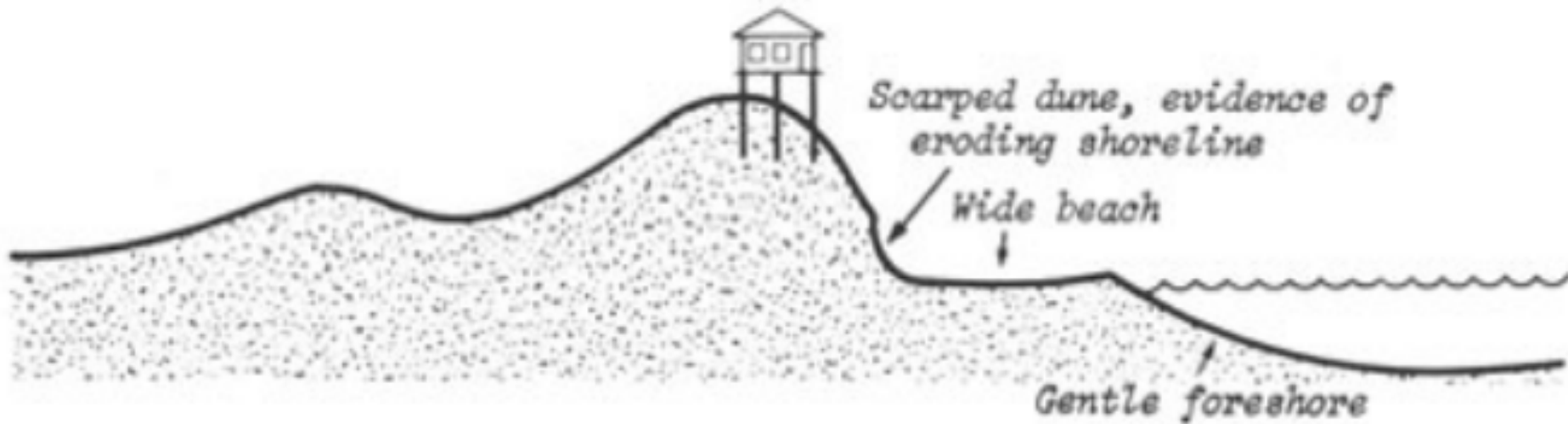
Science behind the impacts



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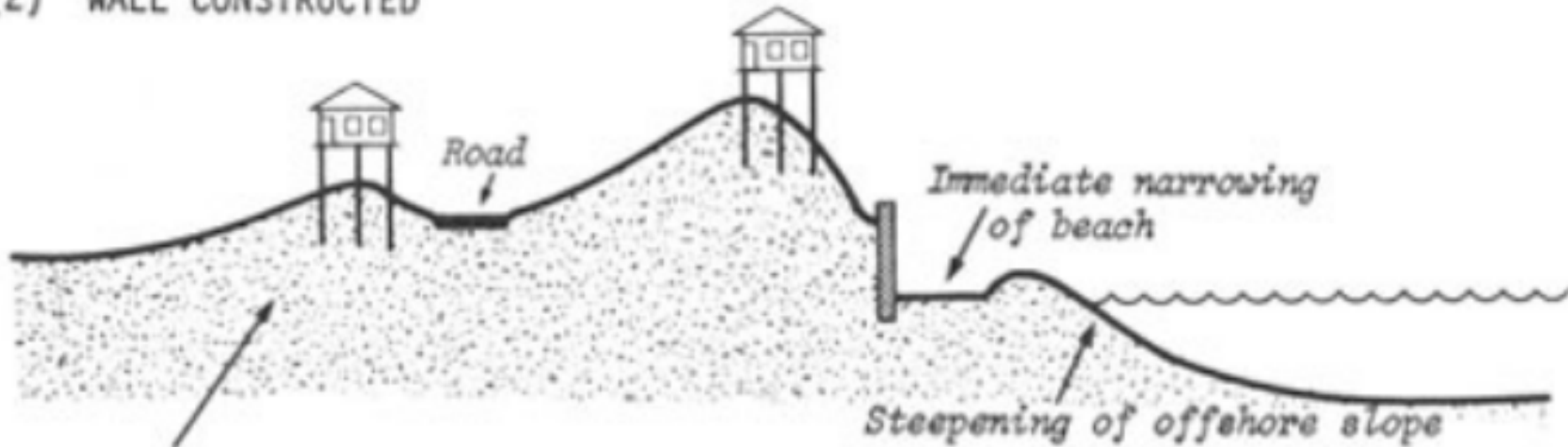
Effect of walls on beaches (1)

(1) BEFORE THE WALL



Effect of walls on beaches (2)

(2) WALL CONSTRUCTED



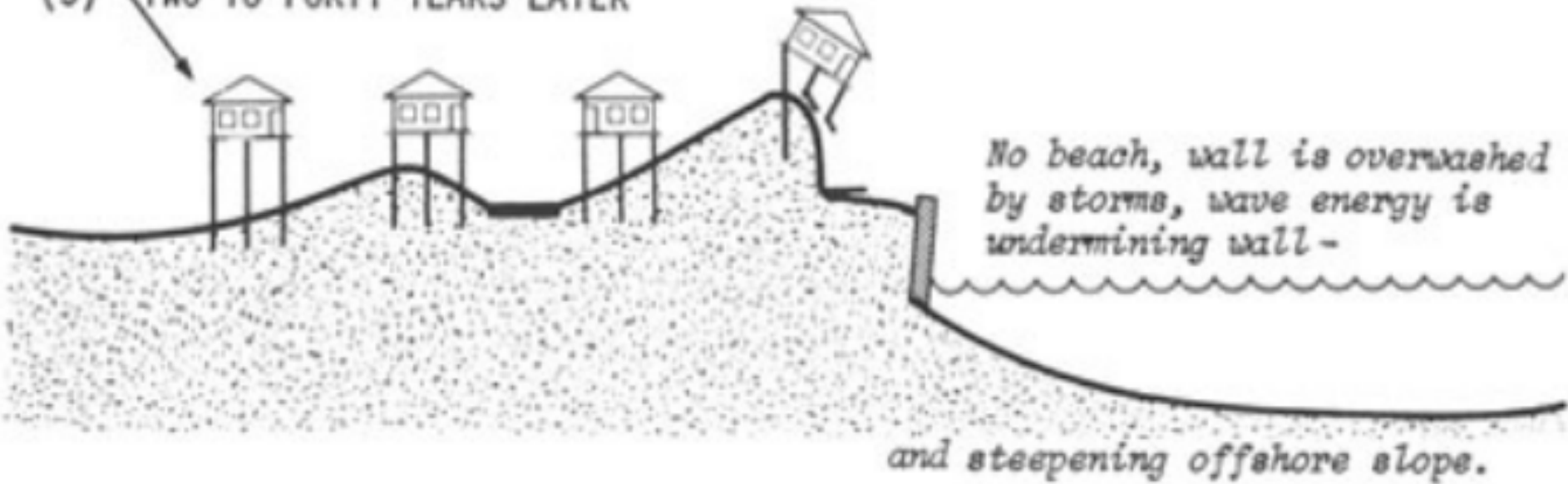
Development proceeds, as buyers believe property protected by wall.



Effect of walls on beaches (3)

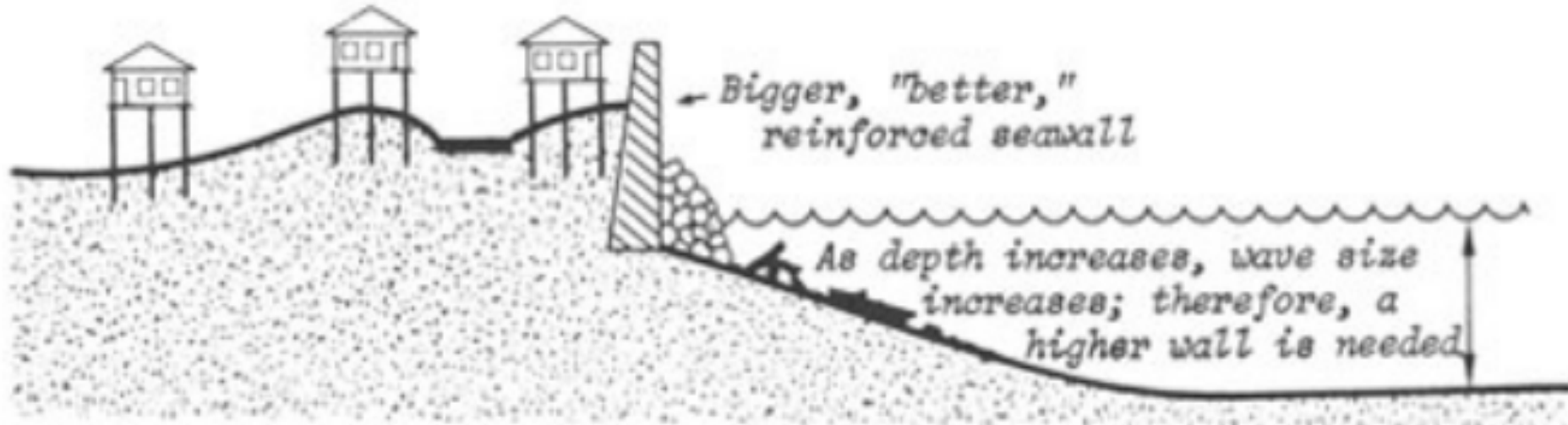
Development proceeds, as buyers believe property protected by wall.

(3) TWO TO FORTY YEARS LATER



Effect of walls on beaches (4)

(4) TEN TO SIXTY YEARS LATER → ("New Jerseyization")



ULTIMATE RESULTS: Development is behind wall, no beach is available, and the seafloor is cluttered with fallen walls and groins.



Impacts: Seawall failure



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Impacts: Seawall undermine



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Impacts: Wave energy redirected



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Impacts: Houses not protected



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Impacts: Exposure of septic



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Impacts: Loss of TW vegetation



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Impacts: TW vs SLR adaptation



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Impacts: TW vs SLR adaptation



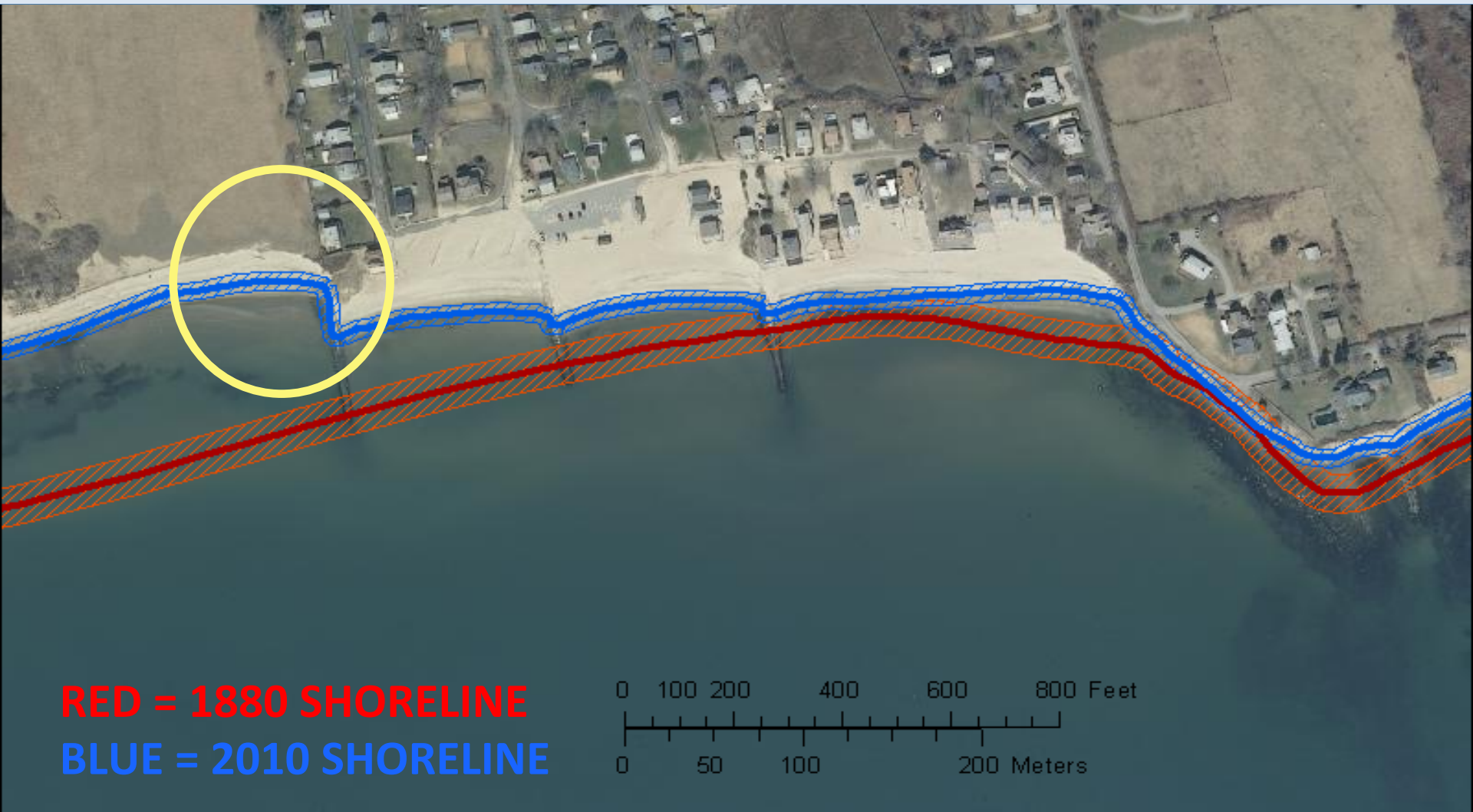
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Impacts: Beach width reduced



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Impacts: Beaches erode



Impacts: Loss of sand in system



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Impacts: Beaches erode



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Impacts: Imperiled houses



Other drawbacks of armoring projects

- Are expensive
- Are not permanent
- Can require costly maintenance
- Can reduce storm damage protection
- Imperil infrastructure
- Divert stormwater and waves onto other properties
- Create a false sense of security and can spur development in unsafe areas



So ... what can we do?



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Low impact alternatives

- Move infrastructure/buildings away from shoreline
- Elevate houses
- Remove hard structures
- Use natural shoreline treatments where appropriate



Alternatives: House elevation



Alternatives: House elevation



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Alternatives: Allow dunes



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Alternatives: Vegetated shoreline



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Alternatives: Vegetated shoreline



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Alternatives: Coir logs



Questions?

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