Maine's Response to Sea-Level Rise

Roger Williams Marine Law Symposium

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William E. Taylor, Esq., Pierce Atwood

Maine's Coastal Zone

- 3,478 miles of tidal shoreline
- Extends to the inland boundaries of all towns, bordering tidal waters and includes all coastal islands
- Coastal population = 990,425
  - 75% of state population

Maine Coastal Program

- Partnership between federal, state and local agencies
- Developed and approved under the Coastal Zone Management Act – 1978
- Incorporates 19 State Laws - 4 state agencies
- Includes all coastal islands

Effects of Sea-Level Rise in Maine

- NRCM Study – most comprehensive review of impacts
- 1 Meter Rise = 20,000 acres of submerged land and loss of 53 miles of road
- Impacts to twenty high risk towns assessed

Maine Geological Survey – Impacts of Sea-Level Rise

- ✓ State planning survey based on assumed 2 foot rise in sea level - 100 years
- ✓ Modeled impacts to Rachel Carson Natural Wildlife Refuge and adjacent Drakes Island/Wells Beach (1-3 foot rise)

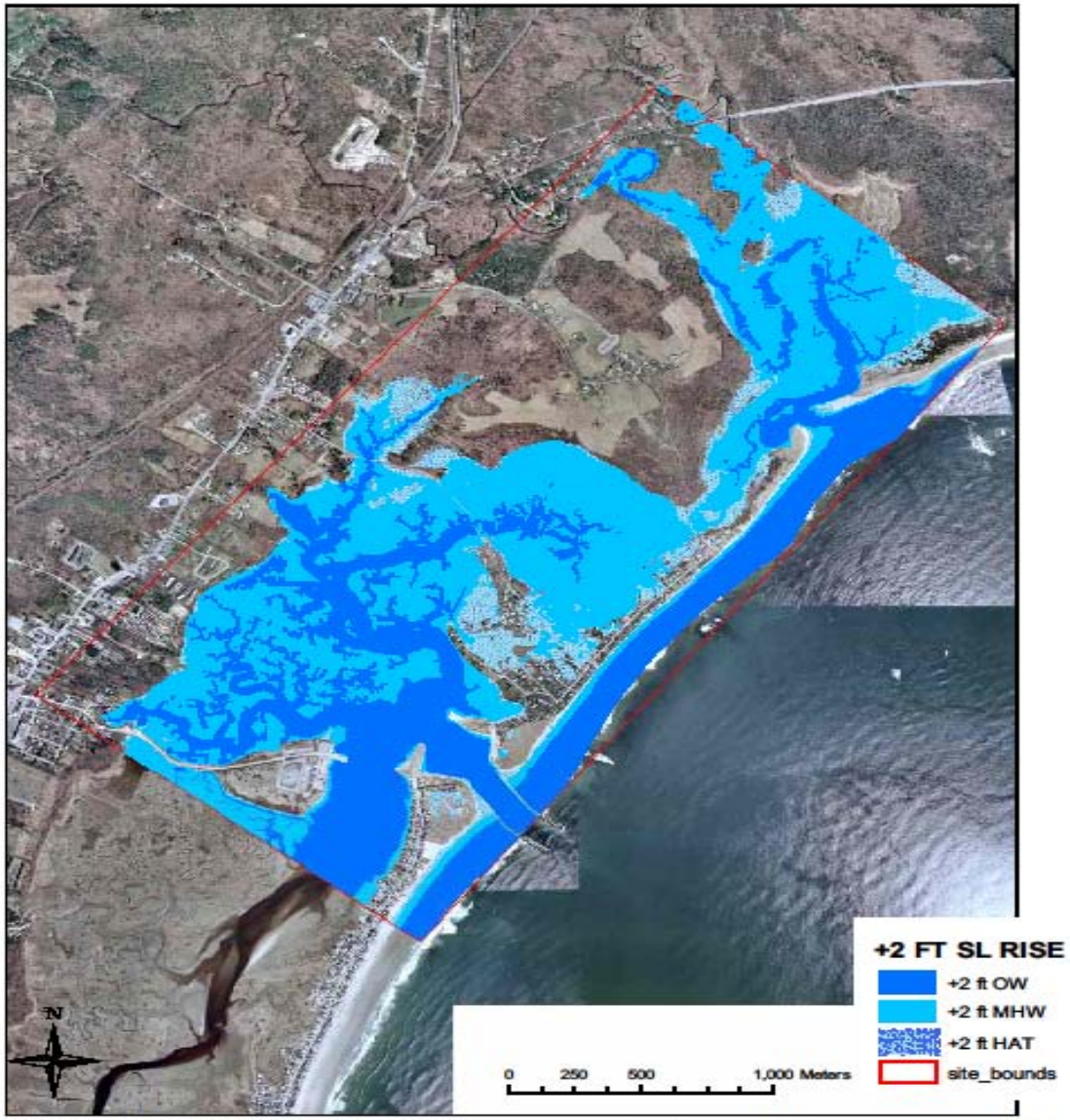
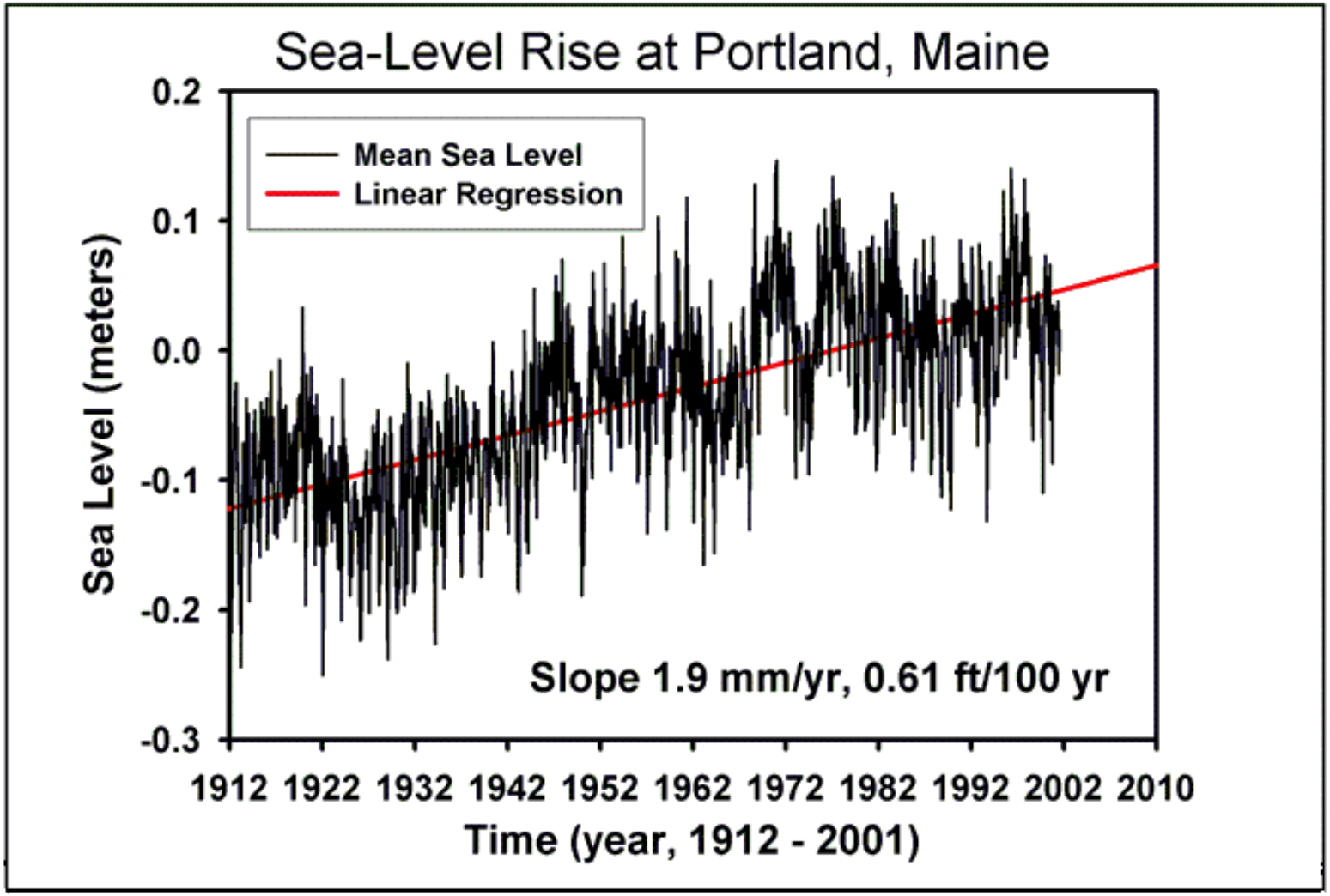


Figure 5. Conditions after a simulated 2 ft static rise in sea level. The low marsh (MHW) continues to overtake the high marsh areas, which is beginning to pinch out along steeper topography. Open water is now 19% of the study area, while low marsh comprises over 33%. Uplands have decreased to about 39% of the study area.

http://www.maine.gov/doc/nrimc/mgs/explore/marine/sea-level/mgs-open-file-06-14.pdf

Local Sea-Level Rise Planning

- City of Portland began sea-level rise adaptation plan
  - measured 7.2” rise in last 100 years
  - 9 other southern Maine towns also planning
  - Funded by NOAA
- Infrastructure impact assumptions
  - HAT + 11.8 ft MLLW
  - 1978 storm surge = 14.1 ft MLLW
  - Sea-level rise scenarios (1ft – 6ft)



http://www.maine.gov/doc/nrimc/mgs/explore/hazards/erosion/sealevel.htm

FEMA Floodplain Mapping - Maine

- Extensive new flood plain mapping began in 2008
- 24 coastal towns in five southern Maine counties
- FEMA used generic data
  - Towns hired consultants to refine the calculations/models
- Based on wind and wave measurements – 100 year storm event
- No consideration of climate change or sea-level rise
- Lack of agreement on what sea-level rise to use

Key State Laws

Shoreland Zoning Act

Submerged Lands Leasing Law

Natural Resources Protection Act

NRPA – "Protected Natural Resources"

- Wetlands – freshwater and coastal
- Sand dunes
- Great ponds
- Rivers, streams, brooks

Coastal Sand Dune Rules

- All permanent development on frontal and back dunes regulated
- Maintenance and repair allowed to existing structures
  - 50% of building value – 50% of structure
- Applicant must demonstrate that site will remain stable allowing for 2 foot rise in sea level over 100 years
- All new or modified buildings must be elevated on posts – 3 feet

Coastal Sand Dune Rules – cont'd

- No new seawalls
  - May replace sea walls with similar structure but no further seaward than original structure
- DEP evaluates damage to coastal dune system and habitat

Baker Design Consultants

07018 Stone Seawall Replacement

Prouts Neck; Scarborough, Maine

Site looked like this for 2.5 years while permitting took place.

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07018 Stone Seawall Replacement

Prouts Neck; Scarborough, Maine

Higgins Beach

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07018 Stone Seawall Replacement

Prouts Neck; Scarborough, Maine

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07018 Stone Seawall Replacement

Prouts Neck; Scarborough, Maine

Storm during construction.

Timber facing added for abrasion resistance and aesthetics.

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Prouts Neck; Scarborough, Maine

Completed Vertical Wall Replacement