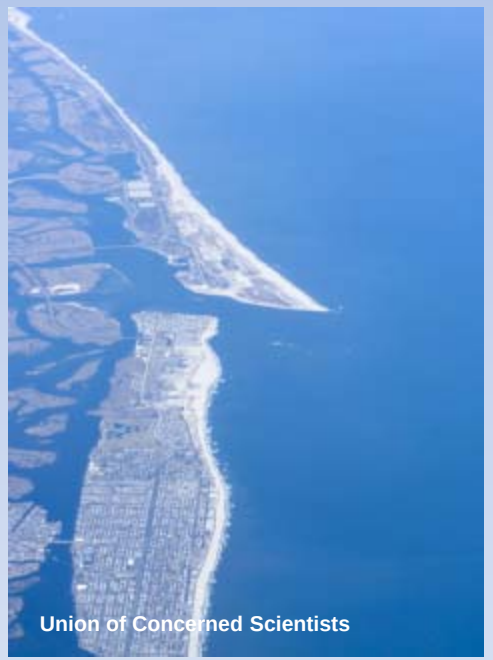
New York State Sea Level Rise Task Force

Report to the Legislature

Fred Anders, Task Force Steering Committee
New York State Department of State

New York State
Sea Level Rise Task Force

- Chapter 613, Laws of New York, 2007
- DEC Led – Commissioner is Task Force Chair
- 16 Task Force Members



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New York State
Sea Level Rise Task Force

- Charge: Evaluate ways to protect coastal ecosystems & increase community resilience
- Geographic Scope: Troy Dam to tip of Long Island
- Report submitted: January 1, 2011

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Findings

- Sea level rise will accelerate for the foreseeable future.
- Every New York community along the marine coast will be affected.
- 62% of the NYS population lives in marine coastal counties.
- Analysis of the costs and benefits of individual adaptation strategies was beyond the scope of the Task Force.

Other Initiatives to help NYS prepare for Climate Change

- NYS Climate Action Plan
- PlaNYC 2030 Climate Change Initiatives
  - Infrastructure Task Force
  - Vulnerable Neighborhoods Strategies
  - City-wide Adaptation Planning
- ClimAID: NYS Climate Impacts Assessment

Sea Level Rise Trends

Hudson Valley railroads are close to sea level

- Harbor tide gauges show rise of 4-6” since 1960
- 15” higher in NY Harbor in 150 yrs
- Causes: warm water expansion, melting ice sheets, geologic forces
- Sea level rise affects all of the Hudson estuary

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SLRTF-Sea Level Projections

Lower Hudson Valley & Long Island	**2020s**	**2050s**	**2080s**
Sea Level Rise[1]	+ 2 to 5 in	+ 7 to 12 in	+ 12 to 23 in
Sea Level Rise[2] Rapid Ice Melt	~ 5 to 10 in	~ 19 to 29 in	~ 41 to 55 in
Mid-Hudson Valley & Capital Region	**2020s**	**2050s**	**2080s**
Sea Level Rise[1]	+ 1 to 4 in	+ 5 to 9 in	+ 8 to 18 in
Seal Level Rise[2] Rapid Ice Melt	~4 to 9 in	~ 17 to 26 in	~ 37 to 50 in

[1] Shown is the central range (middle 67%) of values from model-based probabilities (16 models x 3 scenarios) rounded to the nearest inch.

[2] The rapid ice melt scenario is based on acceleration of recent rates of ice melt in the Greenland and West Antarctic Ice sheets and paleoclimate studies.

Note: Baseline is average sea level from 1971-2000.

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Storm surge

Suffolk County shoreline after the 1938 "Long Island Express" hurricane.

- Caused by low pressure, wind, tides
- Four Category 3 hurricanes have hit NYS since 1900:
  - 1938, 1944, 1954, 1985

Lessons learned

- SLR is happening now and will increase, affecting the entire NY ocean and estuarine coastline.
- NYS is highly vulnerable to a powerful coastal storm.
- Vulnerability will increase in area and magnitude over time.
- Planned adaptation offers a means to achieve resilience.

Ocean Beach, Fire Island

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What we've learned

- Natural features (like wetlands) provide critical human services at a large scale at little cost.
- NYS is rapidly losing tidal wetlands.
- Replicating these services with human solutions would be prohibitively expensive.
- Natural features and public access to beaches are at high risk from shoreline hardening.

Southampton, Suffolk Co.

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What we've learned

- Decisions must be site appropriate.
- Over the long term, environmental and economic costs associated with structural protection measures may make them more expensive and less effective than elevation and planned relocation away from the shoreline, particularly in less urban areas.

Southampton, Suffolk County

What we've learned

- NYS and local governments are investing in and permitting new infrastructure and development in high-risk areas.
- Decision makers need tools to identify areas at risk. Some information is lacking or out of date.
- Government response must be coordinated across all jurisdictions.

Freeport, Nassau County

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Key Concepts to Reduce Coastal Vulnerability

- Recognize SLR projections & storm surge risk
- Identify vulnerable areas
- Incorporate vulnerability in planning
- Adapt over time
- Use community selected, cost-effective measures
- Emphasize natural flood protection systems
- Do not rely on protective structures alone

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Recommendations

Adopt State SLR Projections

- Use best available science
- Incorporate into planning at state and local levels
- Update on a regular basis

Hurricane Earl, Smith Point. Photo: B. Young

Recommendations

- Define areas of greatest current vulnerability:
  - Use FEMA coastal high-hazard areas
    - V zones
    - "Areas of Moderate Wave Action" (A zone areas subject to wave action of 1.5 to 3 ft)
  - Apply existing state regulatory authority and guidance (SEQRA, Tidal Wetlands Act, etc.)

Hurricane Earl, Suffolk Co. Photo: B. Young

Recommendations

- Identify areas of greatest <u>future</u> vulnerability:
  - Map areas at greatest risk from SLR and storm surge, and sites of potential wetland migration
  - Add review under existing state regulatory programs and guidance (SEQRA, Tidal Wetlands Act, etc.)

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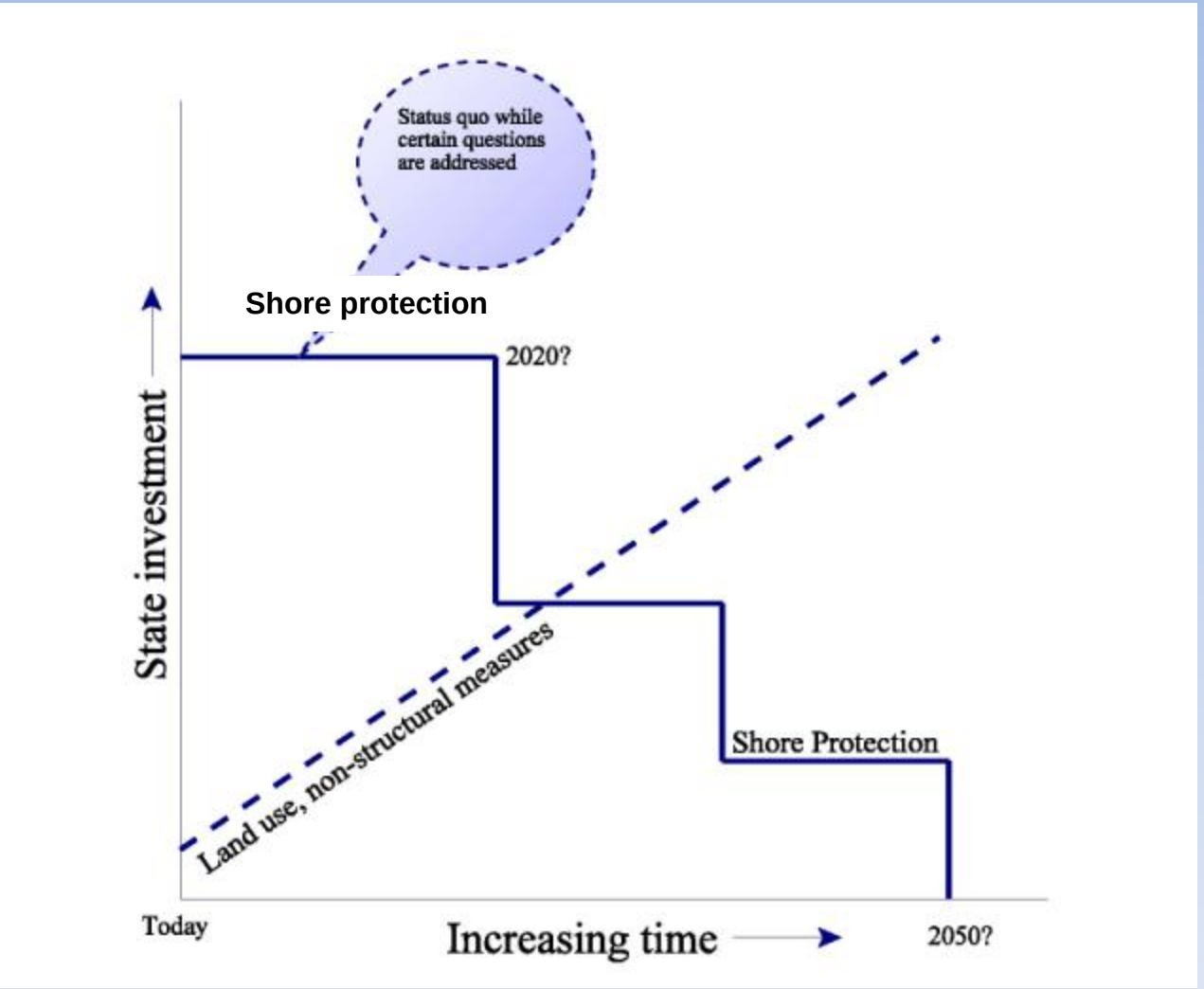
Scarborough Metro North Station. Photo: B. Fratianni

Conceptual model



Recommendations

- Reduce vulnerability in coastal areas and increase effective non-structural measures and natural protective features to reduce coastal hazard impacts.
  - Phase in over time
  - Emphasize coastal planning to adapt
  - Direct new development away from high risk areas
  - Develop programs to fund elevation and/or relocation of structures or systems in high-risk areas

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Half Moon Restaurant on the Hudson. Photo: B. Fratianni

Recommendations

- Update maps and provide tools for decision makers
- Provide financial assistance, guidance and information resources for community planning and adaptation
- Amend state laws and regulations as needed
- Evaluate public health risks and emergency response needs
- Raise public awareness of vulnerabilities to SLR and strategies to adapt

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Recommendations

- Require all relevant agencies to incorporate SLR into decision making
- Ensure long-term interagency coordination on science and policy
- Develop funding mechanisms to implement
- Conduct research and monitoring to track coastal change and impacts
- Seek changes to federal programs consistent with these recommendations

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