Past Sea Level Rise

Documented Sea Level Rise

- 2.0 mm/yr (1929-2006)
- 2.1 mm/yr (1947-2006)
- 1.8 mm/yr (1912-2009)
- 1.8 mm/yr (1926-2001)

Based on measurements, about 7-8' (0.6-0.7 feet) of sea level rise has occurred along the Maine coast.

Source: Adapting to Sea Level Rise Presentation, Slovinsky/Lockman
A Changing Climate

Evidence that surface temperatures around the globe have been rising. The increased temperatures are expected to affect numerous aspects of our earth’s climate as well as other natural processes.

2 key potential threats to coastal communities:

- Sea Level Rise
- Stronger Storm Events
Continued Sea Level Rise

Global average sea level rise (1990 - 2100) for the six SRES Scenarios

Source: IPCC, Fourth Assessment Report, 2007
Stronger, More Frequent Storms

With the possibility of more intense and/or more frequent storm events, the result would be a greater stress to the coastlines, both for the existing natural features and for man-made coastal structures.
Potential Impacts

Potential for 2’ Sea Level Rise (SLR)

Conceptual illustration for static rise in sea level based on USACE LiDAR data

Legend
- Areas Potentially Impacted by a 1 - 2 Sea Level Rise
- Interstate
- U.S. Highway
- State Route
- Other Roads
- Commuter Rail Station
- MBTA Commuter Rail
- Water
- Undeveloped Land
- Developed Land
Potential Impacts

2’ SLR with 8’ rise in sea level

<table>
<thead>
<tr>
<th>Legend</th>
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</thead>
<tbody>
<tr>
<td><strong>Areas Potentially Impacted by a 100-year Storm Surge (approx. 8’ Elev.)</strong>*</td>
</tr>
<tr>
<td><strong>Estimated to be a typical future 10-year storm</strong></td>
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<tr>
<td><strong>Areas Potentially Impacted by a 1 - 2’ Sea Level Rise</strong></td>
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</tbody>
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**Transportation**
- Interstate
- U.S. Highway
- State Route
- Other Roads
- Commuter Rail Station
- MBTA Commuter Rail

**Land Use**
- Undeveloped Land
- Developed Land
- Water

* The 2007 USACE LiDAR data only covers approximately 1 kilometer (3,280 feet) inland. Mean Sea Level line is estimated based on LiDAR data elevation between bathymetry and topography.
Potential Impacts

As result, prior assumption about certain infrastructure will likely not hold true for the future. This includes:

- Design and performance of coastal structures
- Shoreline changes in front of coastal structures

Source: Jason Burtner, MA CZM
Potential Impacts

Migration/Loss of Environmental Features
Planning Ahead

Adaptation = anticipate and respond to potential future conditions

- Protect
- Accommodate
- Retreat

Identify a menu of Adaptation Strategies for roadways and buildings as well as for open space

- Many of the strategies mutually supportive
Adaptation for the Built Environment

Property

- **Land Acquisition**: Undeveloped lands, Vulnerable Properties that have sustained significant damage, etc.

Source: MassDEP

Source: NOAA Ocean and Coastal Resource Management