Assessing the Risk

Climate risk in the Hudson Valley

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Responding to Climate Change in New York State

- Sponsored by NYSERDA, the Responding to Climate Change in New York State (ClimAID) Assessment Report was published in 2011.
- Climate projections for New York State were updated in 2014.
- These climate projections are now codified by the NYSDEC CRRA.
ClimAID Regions

- Regions grouped by similar characteristics including type of climate and ecosystems, watersheds, and dominant types of agricultural and economic activities.

- The Hudson Valley spans Region 2 (Catskills/West Hudson) and Region 5 (East Hudson/Mohawk Valley).

Source: NYSERDA
Local Climate Hazards

- Temperature
  - Heat waves, cold snaps

- Precipitation
  - Heavy downpours, snowfall, riverine flooding

- Sea Level Rise
  - Coastal flooding, coastal storms (rainfall and winds)

Source: NASA

Hudson River Flooding after Hurricane Irene
Observed Trends – Temperature and Precipitation

• Temperature
  • Temperatures in New York State are rising faster than the national and global average
  • Approximately 2 °F since 1970, with the greatest warming in winter

• Precipitation
  • Precipitation has become more variable and extreme
  • The Northeast United States has seen the greatest increase in the amount of rain falling in heavy downpour events

Source: USGCRP
Observed Trends – Sea Level Rise

• Sea level
  • For the lower Hudson River, sea levels has increased approximately 1 foot since 1900
  • The rate of sea level rise in the region is faster than the global average
  • In recent years, the rate of sea level rise has increased
  • Primary factors included thermal expansion and loss of land-based ice

Flooding in Stony Point, NY during Hurricane Sandy

Source: NYSDEC
Powerful computer models let us test and refine hypotheses.
Climate Projections for the Hudson River Valley

- **Mean annual temperatures** are projected to **increase** by 4.1 to 5.7°F* by the 2050s and by 5.3 to 8.8°F* by the 2080s.

- **Mean annual precipitation** is projected to **increase** 3 to 12 percent* by the 2050s and 5 to 15 percent* by the 2080s.

- **Frequency of heat waves** is projected to **triple** by the 2080s from 2 to 6 heat waves per year.

- **Sea level** is expected to **rise** 11 to 21 inches* by the 2050s, 18 to 39 inches* by the 2080s, and, for the high estimate, 6 feet by 2100.

- **Increase in the frequency and intensity of riverine flooding**

*Refers to the middle range (25th – 75th percentile) of model-based projections

Source: NYSERDA
A small change in the mean...

...can lead to large changes in extremes
### 6 NYCRR Part 490, Projected Sea-level Rise

Inches of rise relative to 2000-2004 baseline.

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>Region</th>
<th>Long Island</th>
<th>New York City/Lower Hudson</th>
<th>Mid-Hudson</th>
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<tbody>
<tr>
<td></td>
<td>Descriptor</td>
<td>Low Low-Medium</td>
<td>Medium High-Medium</td>
<td>High Low Low-Medium</td>
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</tbody>
</table>
Assessing flood risk and vulnerability in your community
Consortium for Climate Risk in the Urban Northeast (CCRUN)

The only RISA team with principal focus on urban settings

A partnership of six universities

CCRUN geographic domain defined by metropolitan area counties