Place-Based Climate Solutions

Marjorie Kaplan, Dr.P.H.
Associate Director
Rutgers Climate Institute

September 26, 2018
Preparing New Jersey For Climate Change
“New Jersey Climate Adaptation Alliance”
njadapt.rutgers.edu

- Policymakers
- Private & Public Sector Practitioners
- Business Leaders
- Nongovernmental Organizations
- Academics
- Work Via Existing Delivery Systems
- Facilitated by Rutgers University
- Pre-dated Sandy
- Follows Strategic Workplan and Advisory Committee Direction
• **Sector specific reports:** impacts, best practices, recommendations.

• **Stakeholder engagement:** identification of policy gaps.

• **Analyses to “make the case”:** evidence-based, wide-ranging.

http://njadapt.rutgers.edu/resources/njcaa-reports
• **Community-based decision support**: tools, assistance, demonstration projects.

• **Communications**: materials, workshops, videos
### Central Estimate
- **Year**: 50% probability SLR meets or exceeds...
- **Likely Range**: 67% probability SLR is between...
- **1-in-20 Chance**: 5% probability SLR meets or exceeds...
- **1-in-200 Chance**: 0.5% probability SLR meets or exceeds...
- **1-in-1000 Chance**: 0.1% probability SLR meets or exceeds...

<table>
<thead>
<tr>
<th>Year</th>
<th>Central Estimate</th>
<th>Likely Range</th>
<th>1-in-20 Chance</th>
<th>1-in-200 Chance</th>
<th>1-in-1000 Chance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>0.8 ft</td>
<td>0.6 – 1.0 ft</td>
<td>1.1 ft</td>
<td>1.3 ft</td>
<td>1.5 ft</td>
</tr>
<tr>
<td>2050</td>
<td>1.4 ft</td>
<td>1.0 – 1.8 ft</td>
<td>2.0 ft</td>
<td>2.4 ft</td>
<td>2.8 ft</td>
</tr>
<tr>
<td>2100</td>
<td>Low emissions</td>
<td>2.3 ft</td>
<td>1.7 – 3.1 ft</td>
<td>3.8 ft</td>
<td>5.9 ft</td>
</tr>
<tr>
<td>2100</td>
<td>High emissions</td>
<td>3.4 ft</td>
<td>2.4 – 4.5 ft</td>
<td>5.3 ft</td>
<td>7.2 ft</td>
</tr>
</tbody>
</table>
Apply an Equity lens

High Social Vulnerability and Flood Risk

Summary of High Social Vulnerability Areas in New Jersey

Census Tracts with High Social Vulnerability*

- Counties
- Municipalities

Number of Vulnerabilities by Census Tract
- No Data (2.3% of Census Tracts)
- 0 (46.8% of Census Tracts)
- 1 (37.7% of Census Tracts)
- 2+ (15.4% of Census Tracts)


Legend
- Counties
- 100-yr Floodplain
- 500-yr Floodplain

Number of Vulnerabilities by Census Tract
- No Data (2.3% of Census Tracts)
- 0 (46.8% of Census Tracts)
- 1 (19.5% of Census Tracts)
- 2+ (15.6% of Census Tracts)


Water Resource Planning: Delaware River Basin Commission

Freshwater Hydrologic Climate Considerations:
- Precipitation
- Flow
- Temperature
- Evapotranspiration
- Snowpack

Salt Water Climate Considerations:
- Sea Level Rise

Salt Line Location: September 13, 2017

Normal Sept. Location: RM 76

9/13/2017 Location: RM 72

Images courtesy of S. Tambini, DRBC
Preliminary Evaluation: Sea-Level Rise

Summary

• Sea level rise and its impact to salinity in the estuary most likely pose the greatest drought-related climate impacts in the basin.

• Sea level rise in the Estuary is expected to be greater than global sea level rise averages.

• Additional water (storage) may be needed to meet freshwater water flow objectives and flow objectives may need to be adjusted to maintain the salt front.

• Water users in the Estuary need to plan for sea level rise impacts.
Living shorelines

Incorporates natural features to reduce erosion and create habitat

Two complementary goals:
1. Stem erosion that can lead to rapid loss of marsh surface
2. Accelerate sediment accretion to assist the marsh in keeping pace with SLR and thus reduce flooding

Integrates ecological principles into engineering design

Courtesy: Jenny Paterno Shinn, Rutgers University
Gandy’s Beach, NJ: Partners include PDE, TNC, USFWS, RU

Image credit: The Partnership for the Delaware Estuary
NJ Audubon addressing climate change impacts to forests, by developing and implementing Forest Stewardship Plans on Public and Private Lands statewide.

Beach nourishment/habitat restoration for horseshoe crabs and shorebirds, with oyster reefs to add resiliency to the restored beach and adjacent communities;

Green Stormwater Infrastructure projects in urban and suburban areas, both for immediate benefits in problematic sites as well as for demonstration purposes (Bridgeton, Cohanseey and Maurice River watersheds).
NJ Forest Adapt

Forest Carbon

Tree Species Distribution & Future Projections
Resiliency of Wild Trout Streams to Future Climate Change

- NJDEP BFF measuring stream and air temperature data at Brook Trout streams
- Input to models to assess how specific streams will fare at different temperature increases
- Will inform which stream habitats in NJ will support native brook trout and potential management strategies

Image courtesy of S. Crouse, NJDEP

Data courtesy S. Collenburg, NJDEP
Planning based on future climate conditions

Collective Impact

climatechange.rutgers.edu
njadapt.rutgers.edu
NJADAPT.ORG

kaplan@envsci.rutgers.edu