Adaptation to a Changing Environment

Mainstreaming resiliency in New York State
Spring 2011 Snow Melt and Rain Event
Hurricane Irene - August 2011
Tropical Storm Lee - September 2011
Statewide impacts in 2011
Hurricane Sandy - October 2012

New York City Flood Extents

Nassau County Flood Extents
2011 – 2012 Declared Disasters Statewide

- Spring Flooding 2011
- Hurricane Irene
- Tropical Storm Lee
- Hurricane Sandy
More Extreme Precipitation & Flooding

- Observed: Modest increases in annual precipitation-most regions since 1900
- Projected: Up to 26% increase by 2100 in some regions of NYS
  - Mostly in winter
- Projected increasing frequency, duration, intensity of extreme events
- Rising sea levels
Political Reaction to Flooding

Governor Cuomo:

“Anyone who says there’s not a dramatic change in weather patterns, I think is denying reality.”

“When you talk about rebuilding, there is certain real estate that Mother Nature owns. She may not visit often, but she owns it, and when she decides to visit, she is going to come and reclaim the property.”
A Focus on Resiliency

One of Three Reports Commissioned in November, 2012
• NYS Respond
• NYS Ready
• NYS 2100
  ▪ Focus on Resilience and Strength of NYS Infrastructure
New York State Office of Storm Recovery

Overall Coordination
Funding for Communities hit by Irene, Lee or Sandy

Four Programs
• Housing Recovery
  • Includes Home Elevations and Buy-Outs
  • Elevations to Base Flood Elevation + 2’
  • Use Best Available Mapping Data
• Small Business
• Community Reconstruction
• Infrastructure
Innovative Mitigation

NY Rising Community Reconstruction Program

Planning Grants: $25 million; 124 Communities
• Public Engagement
• Asset Inventory
• Risk Assessment
• Needs and Opportunities Assessment
• Investment and Action Strategies
• Implementation Schedule

$3 million to $25 million to each Community for project implementation
Community Risk and Resiliency Act

- Signed into Law 9/22/2014
- Requires sea-level rise projections (DEC)
- Requires applicant demonstration of consideration of sea-level rise, storm surge and flooding in specified facility-siting regulations, permits and funding programs, and guidance on implementation (DEC, DOS)
- Adds mitigation of sea-level rise, storm surge and flooding to Smart Growth Public Infrastructure Policy Act criteria (DEC, DOS)
- Requires model local laws to enhance resiliency (DOS, DEC)
- Requires guidance on use of natural resiliency measures to reduce risk (DEC, DOS)
Regulatory Programs Covered by CRRA

**DEC Permits**
- Oil and natural gas wells
- Major projects:
  - Protection of waters
  - Freshwater wetlands
  - Tidal wetlands
  - Coastal erosion hazard areas
  - Mined land reclamation
  - Sewerage service
  - Liquefied natural gas and liquefied petroleum gas facilities

**DEC Facility-siting Regulations**
- Hazardous waste transportation, storage and distribution facility siting
- Petroleum bulk storage (including conformity with the uniform fire prevention and building code)
- Hazardous substance bulk storage
Funding Programs Covered by CRRA

- Water Pollution Control Revolving Fund (EFC)
- Drinking Water Revolving Fund (DOH, EFC)
- Local waterfront revitalization (DOS)
- Open space acquisition (DEC, OPRHP)
- Agricultural and farmland protection (DAM)
- Landfill closure assistance (DEC)
- Coastal rehabilitation project assistance (DEC)
- Open space project operation and maintenance agreements (OPRHP)

<table>
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<tr>
<th>Acronym</th>
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<tr>
<td>EFC</td>
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<td>DAM</td>
<td>Department of Agriculture and Markets</td>
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CRRA Implementation Step 1
Promulgate 6NYCRR Part 490, Projected Sea-level Rise

Inches of rise relative to 2000-2004 baseline

<table>
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<th>Time Interval</th>
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<th>Mid-Hudson</th>
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CRRA Implementation Step 2

Issue State Flood Risk Management Guidance

Available for incorporation into

- CRRA topical guidance and CRRA program-specific guidance, regulations, etc.
- Programs not covered by CRRA
- 6 NYCRR Part 502
- DEC’s model local law for flood damage prevention, optional additional language
- Uniform Fire Prevention and Building Code
Proposed Flood Risk Management Guidance

- General Guidance for All Flood Risk Areas
  - Avoid FEMA mapped 1% flood risk zone if possible
  - Flood risk-management criteria:
    - The elevation and horizontal flood hazard area resulting from adding an additional 2 ft. (3 ft. for critical facilities) to the base flood elevation
    - The area and elevation of the 0.2% annual chance flood (500-year flood)
    - Climate informed science approach where applicable
      - BFE + (SLR or projected flows) + current freeboard
- Specific criteria by structure type, tidal/nontidal
CRRA Implementation Step 3
Issue Additional Required Guidance

- Model Local Laws
- Smart Growth Public Infrastructure Project Assessment Guidance
- Use of Natural Resiliency Measures Guidance
Natural Resilience Measures Team Charge

Develop “guidance on use of resiliency measures that use natural resources and natural processes to reduce risk.”

• Principles for use of natural resiliency measures
• Recommended practices
• Protective feature summaries
• Erosion-risk reduction
CRRA Implementation Step 4

Issue Associated Guidance

• Observed and Projected Climate Change in New York
• ECL Article 15/CWA Section 401 Guidance
• Tidal Wetland Migration Guidance
• Mitigation of Floodplain Encroachment
• Coastal Consistency Review Guidance
Article 15/Section 401 Guidance

Guidance for review of bridges, culverts and other structures

a. General and specific design requirements
b. High-risk areas
   • conditions requiring larger structures
c. Low-risk areas
   • conditions where smaller structure, smaller height or less embeddedness may be allowed
CRRA’s Benefits

- Greater resiliency for communities, infrastructure and ecosystems
- Greater public and staff awareness of climate hazards and risk-reduction practices
- Written standards and guidance
- Inter-regional and cross-program consistency for standards and permit requirements
- Standardization of data sources, decision-support tools
Climate Change Science Clearinghouse
Maps, data and documents
Designed for agency and municipal decision makers

https://www.nyclimatescience.org
Thank You

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Connect with us:

- DEC: www.dec.ny.gov
- Community Risk and Resiliency Act: www.dec.ny.gov/energy/102559.html
- Climate Smart Communities: www.dec.ny.gov/energy/76483.html
- Facebook: www.facebook.com/NYSDEC
- Twitter: twitter.com/NYSDEC
- Flickr: www.flickr.com/photos/nysdec