Hell and High Water: Preparing New York’s communities for climate change

Mark Lowery
Climate Policy Analyst
Office of Climate Change
New York State Department of Environmental Conservation
Office of Climate Change Goals

- Contribute to stabilization of global atmospheric greenhouse gases at levels that minimize harms.
- Promote and facilitate investment in a green economy and green jobs in New York
- Achieve climate resiliency for New York State and its communities
Human activities are affecting the climate system

Overwhelming scientific consensus

Fossil fuel combustion releases formerly sequestered carbon to atmosphere

Warming greater than 2.0°C => dangerous consequences (already at 1.1°C)
1.1° C temperature rise since Industrial Revolution

>40% increase in atmospheric CO₂

Continuing high rate of GHG emissions

IPCC Fifth Assessment Synthesis Report
Feedbacks, abrupt climate change and climate surprises

Rapid ice melt
Methane release
• Tundra
• Clathrates
Changes in monsoons
Dustbowlification
Pest outbreaks
Higher Temperatures: Observed and Predicted

NYS Since 1970
• Annual mean +1.3°C
• Winter mean +2.4°C
• Less snow cover

Projections (Capital Region)
• Warmer!
  ▪ +1.9 to 3.9°C by 2050s
  ▪ +2.3 to 6.3°C by 2080s
  ▪ +2.4 to 7.6°C (13.6°F) by 2100

Hello, Atlanta!
More Extreme-heat Events

Capital Region

More extreme heat days (> 90°F)
- 14 to 23 days by 2020s (instead of 10!)
- 27 to 82 days by 2080s

More heat waves
- 2 to 4 by 2020s (instead of 1!)
- 4 to 9 by 2080s

Cardio-respiratory ailments
Heat stress

Adapted from IPCC (2001)
Too Much Water When We Don’t Want it, Too Little When We Do

- Reduced summer rainfall may affect supply
- Reduced flows on larger rivers
- Flooding potential to increase water pollution
- Changes in accretion and scour
- Landslides

Capital Region Projected Annual Precipitation:
- 2-15% increase by 2050s
- -1-26% increase by 2100
Unstoppable Sea-level Rise

WAIS collapse – 4 to 12 ft. SLR
Last interglacial – 13-20 ft. higher
Current global SLR commitment - 6.6 ft.

All of Hudson River subject to SLR

60-mile-long iceberg, B9B, detached from Antarctica in 2012.

www.columbia.edu/~mhs119/SeaLevel
Projected Sea-level Rise, Mid-Hudson (inches of rise relative to 2000-2004 baseline)

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Low</th>
<th>Low-medium</th>
<th>Medium</th>
<th>High-medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020s</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>2050s</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>2080s</td>
<td>10</td>
<td>14</td>
<td>25</td>
<td>36</td>
<td>54</td>
</tr>
<tr>
<td>2100</td>
<td>11</td>
<td>18</td>
<td>32</td>
<td>46</td>
<td>71</td>
</tr>
</tbody>
</table>
- Loss of populated areas
- Loss of tidal ecosystems
- Threats to infrastructure
- Salt-water intrusion
Effects in New York

• risks to people
• stressed infrastructure
• agricultural and ecosystem effects
Human Health Risks

Allergies
• More potent allergens
• Extended ragweed pollen season

Cardio-respiratory ailments

Heat stress

Water-borne diseases
  – Combined sewer overflows
  – Post-flooding

Vector-borne diseases
• Lyme disease
• West Nile virus
• Zika virus

Projected heat-related mortality, New York County
Agricultural and Ecosystem Effects

- Direct crop damage
- Delayed planting (wet springs)
- Drought
- Heat stress on livestock
- Frost and freeze damage
- Weeds and pests
- Reduced pesticide effectiveness

- Species distribution shifts
- Loss of synchrony (pollinators, food)
- More deer
- Loss of cold water fisheries
- Loss of critical habitats
- Pests and invasive species
Climate change will have consequences for the Earth system and human lives

Sea-level rise
Shifting climate zones
Species loss
Ocean acidification
Coral reef destruction
Extreme weather
Infrastructure destruction
Water shortages
Agricultural disruption
Poverty traps
Population displacement
Regional conflicts

Humanity’s Choice
The Mitigation Imperative

*If we don’t mitigate, we won’t be able to adapt*

http://www.sustainactbility.com
Trending toward Catastrophe

- On track to reach 560 ppm CO$_2$, mid- to late 21$^{st}$ century => 2 (more likely 3) to 4.5°C
- 3.5°C most likely by 2100 - Up to 5.5°C possible
COP21 Commitments Will Not Avert Dangerous Change

- Long-term goal: <3.6°F (2.0°C) below pre-industrial
- Aim: 2.7°F (1.5°C)
- Now in force
- Intended Nationally Determined Commitments => 2.7-3.5°C by 2100

U.S. Commitment
- Currently on path for 17% reduction by 2020
- 26-28% in 2025 – now highly unlikely
New York State Programs

State and local programs now more critical

“Climate change is an issue of society’s sustainability – and to deny that climate change is real is to deny reason. Today, New York is stepping up. We are demonstrating the leadership and focus that this issue demands. We are joining together and committing ourselves to tackling climate change and showing the nation what is possible. Now it is up to world leaders to follow suit.”

-Governor Andrew Cuomo
New York State emits approximately 212 million metric tons of CO₂ equivalent per year – about 0.5% of total annual global emissions.
New York State GHG-reduction Goals: 40% by 2030, 80% by 2050


Strong NYS electricity policies:
- Regional Greenhouse Gas Initiative
- Reforming the Energy Vision

80x50 will still be hard

Required:
- Electrification of cars and heating
- Waste reduction (organics and embedded emissions)
- Conversion to low-GWP refrigerants
- Deep efficiency improvements
2015 State Energy Plan: 2030 Targets

40% Reduction in GHG emissions from 1990 levels
Reducing greenhouse gas (GHG) emissions from the energy sector—power generation, industry, buildings, and transportation—is critical to protecting the health and welfare of New Yorkers and reaching the longer term goal of decreasing total carbon emissions 80% by 2050.

50% Generation of electricity from renewable energy sources
Renewable energy sources, including solar, wind, hydropower, and biomass, will play a vital role in reducing electricity price volatility and curbing carbon emissions.

23% Decrease in energy consumption in buildings from 2012 levels
Energy efficiency results in lower energy bills and is the single most cost-effective tool in achieving energy objectives. 600 trillion British thermal units (TBtu) in energy efficiency gains equates to 23% reduction in energy consumption by buildings.

“New Yorkers stand ready to do their part. We are committed to requiring that 50 percent of the power used in our state is from renewable resources by 2030.” - Governor Andrew Cuomo
Climate Smart Communities

- Interagency program to support local action
- Free, flexible and voluntary
- Start with pledge of commitment

**WHAT WOULD A CLIMATE SMART COMMUNITY DO?**

- **WILLIAMSON:** First NY municipality to power all its facilities with solar energy.
- **SYRACUSE:** Requires LEED Silver standards in public building construction/renovation.
- **RICHLAND:** Gets clean power from 100kW wind turbine.
- **CLIFTON PARK:** Capped its landfill with 3,000 solar panels.

- **ROCHESTER:** Climate action plan will reduce greenhouse gases citywide.
- **DEWITT:** Plans to reduce municipal greenhouse gases 25% by 2020.
- **WATERSLIE:** First NY municipality with curbside household organic waste composting.
- **CLINTON:** A waterfront flooding task force prepares community for rising sea levels.

- **SKANEATELES:** Solar and geothermal additions to village hall create NY’s first net zero energy municipal building.
- **KINGSTON:** Twenty low-emission fleet vehicles and eight EV charging stations.
- **BEDFORD:** LEED Platinum community center, with EV charging, solar, geothermal, and Nassau County’s first “gray water” system.

- **ERIE COUNTY:** Employs an energy manager who maximizes efficient use of energy countywide.
- **ULSTER COUNTY:** Only NY county getting 100% of its electricity from renewable sources.
- **NORTH HEMPSTEAD:** LEED Platinum community center, with EV charging, solar, geothermal, and Nassau County’s first “gray water” system.
- **SUFFOLK COUNTY:** Requires bicycle lanes as part of all new road construction.

**NEW YORK STATE OF OPPORTUNITY**

**Department of Environmental Conservation**
What are the benefits?

• **Free technical assistance**, customized to NYS:
  • Clean Energy Community Coordinators

• **Guidance** on energy efficiency, renewables & preparing for severe weather:
  • Extensive website ([http://www.dec.ny.gov/energy/50845.html](http://www.dec.ny.gov/energy/50845.html))
  • Monthly webinars, email listserv, decision-support tools, manuals

• **Funding**: CSC grants, and better positioned to compete for other funds

• **Savings**: reduced GHG emissions, energy use & costs

• **Certification**: Recognition of leadership, framework for local action

• **Networking**: Learn with like-minded leading communities
What have Climate Smart Communities done?

- Climate and energy planning
  - 89 climate action plans
  - 112 community GHG inventories
  - 85 government operations GHG inventories
- Energy and transportation initiatives
  - 17 Solarize campaigns
  - Clean fleet policies
  - Right-sizing
- Vulnerability assessments
- Energy and adaptation planning
Where are the Climate Smart Communities?

Since 2009:

• 198 registered communities
• 10 certified communities
• One-third of New Yorkers (6.7 M)
• Smallest: V. of Van Etten (537)
• Largest: Suffolk County (1.5 M)

Full List of CSCs:
http://www.dec.ny.gov/energy/56876.html
CSC Certification

• Recognition of leadership
• Detailed certification manual
• Structured action framework for emissions reductions, energy savings, a more livable community, resiliency & adaptation
CSC Certification Priority Actions

1.1 Pass a resolution adopting the **CSC Pledge**
1.2 Create a community CSC **task force** focused on climate mitigation & adaptation
1.3 Appoint a CSC **coordinator**
1.4 Create an **internal green team** focused on climate mitigation & adaptation

2.1 Develop a government operations **GHG emissions inventory**
2.2 Develop a community **GHG emissions inventory**
2.3 Establish a government operations **emissions reduction target**
2.4 Establish a community **emissions reduction target**
2.5 Develop a government operations **climate action plan**
2.6 Develop a community **climate action plan**

3.1 Conduct **energy audits** of local government buildings
7.1 Conduct a **vulnerability assessment**

7.3 Review existing community plans & projects to identify **climate adaptation strategies** & policies or projects that may decrease vulnerability
Capital Region Climate Smart Communities

Albany County
- City of Albany (certified)
- County of Albany
- City of Cohoes
- City of Watervliet (certified)
- Town of Bethlehem
- Town of Knox
- Village of Green Island

Greene County
- Town of Cairo
- Town of Hunter
- Town of Jewett
- Village of Catskill

Columbia County
- Town of Ancram
- Town of Chatham
- Town of Copake
- Town of Ghent
- Town of Hillsdale
- Town of Kinderhook
- Village of Kinderhook

Rensselaer County
- City of Rensselaer
- City of Troy
- Town of East Greenbush

It’s time to
- commit (or recommit),
- organize,
- make a plan,
- get technical and financial help, and
- prepare for the long haul.
An open enrollment program that provides rewards and recognition to local governments that demonstrate clean energy leadership

**STEP 1:** BECOME A CLEAN ENERGY COMMUNITY by completing four out of ten high-impact actions designed to save money, foster a vibrant economy, and improve the environment. One action must be completed after August 1, 2016.

**STEP 2:** ACCESS GRANT FUNDING with no local cost share to support additional clean energy projects (up to $250,000).

Dedicated and knowledgeable local coordinators are available to assist communities as they implement high-impact actions including free on-demand technical support, step-by-step guidance, case studies, model ordinances, RFPs, etc.
Clean Energy Communities: 10 High-Impact Actions

1) Benchmarking
2) Clean Energy Upgrades
3) LED Street Lights
4) Clean Fleets
5) Solarize
6) Unified Solar Permit
7) Energy Code Enforcement Training
8) Climate Smart Communities Certification
9) Community Choice Aggregation
10) PACE Financing
How are the two programs related?

**Climate Smart Communities Certification**
- Comprehensive climate program
- 138 unique actions
- Accumulate points toward certification and improve score on CSC grant applications

**Clean Energy Communities**
- Focused on clean energy
- 10 High-impact actions
  - 1 of the 10 is CSC Certification
  - Complete 4 Actions to be designated and access grant funding

- Earn points toward CSC Certification by doing CEC actions.
- Do both! They are complementary programs.
The Estuary Program: your partner in climate adaptation and resiliency planning in the Hudson Valley

- **Grants + free technical assistance**
- Focus areas include *planning, community engagement, water infrastructure + emergency management*
- New program: *Climate-Adaptive Design* – using design to inspire tinyurl.com/CornellCAD
Sign up for grant announcements + more!

*Climate Resilience in the Hudson River Estuary* newsletter

[http://goo.gl/6dwphW](http://goo.gl/6dwphW)

For more info, contact Libby Zemaitis
Climate Outreach Specialist, Hudson River Estuary Program

[Libby.zemaitis@dec.ny.gov](mailto:Libby.zemaitis@dec.ny.gov)  |  (845) 256-3153
Open now: $1.2M in Estuary Program grants

*Tributary Restoration and Resiliency* ($1M)
*remove dams + right-size/replace culverts*

*Restoration of Watershed Connectivity* ($200K)
*assess, plan and design to mitigate aquatic barriers and associated flooding*

Due April 6th and 14th, 2017

http://www.dec.ny.gov/lands/5091.html

Coming soon: Stewardship Planning and River Access and Education grants
Fact sheet available: 20 funding programs for waterfront resilience

State and federal grants and low cost loans address the following categories:

- Municipal planning
- Resilient structures
- Emergency management
- Collaboration and public outreach
- Waterfront economy
- Floodplain protection

CFA = grants included in the NYS Consolidated Funding Application

https://goo.gl/QYEurF
The Climate-Adaptive Design studio supports Hudson River communities to envision their future

Using design to inspire

A collaboration with Cornell University Department of Landscape Architecture
What can you do?

• Calculate your personal GHG footprint (epa.gov/climatechange/wycd)
• Reduce energy usage, waste and emissions at home, at work, on the road and at school
• Support a price on carbon and other climate-protection policies

• Make your community climate-smart
• Talk
  ▪ to your family, friends and neighbors
  ▪ elected officials
  ▪ those who want your vote
We can solve this problem, but only if we have the will.
Additional Information
New York Emission Reduction Programs

- Regional Greenhouse Gas Initiative
- Transportation and Climate Initiative
- Power Plant Performance Standards
- Vehicle Emissions Standards
- State Energy Plan: Reforming the Energy Vision
- Clean Energy Standard, Clean Energy Fund
- EE/RE/ZEV Incentives
- State Environmental Quality Review Act GHG Policy
Methane Action Plan

- Reductions at landfills
- Regulation from new or modified equipment in oil and gas sector, e.g., leakage at metering and regulatory stations
- Capture and combustion of methane at farms and landfills to generate power
- Methane reduction criteria in state agriculture funding programs
- Pilot installation of methane detection system in residential areas
- Market-based incentive programs for addressing methane leakage in utility and customer-owned pipelines that prioritize both safety and climate change mitigation
New York State Adaptation Programs

- State Sea Level Rise Task Force
- Integrated Vulnerability Assessment (ClimAID)
- Emergency Response Commissions
- Interagency Work Group on Adaptation
- Climate Risk and Resiliency Act
- State Agency Vulnerability Assessments
Community Risk and Resiliency Act

Mainstreaming consideration of climate change

- 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 guidance on use of natural resiliency measures to reduce risk (DEC, DOS)
- Requires model local laws to enhance resiliency (DOS, DEC)
New York State Cross-cutting Programs

- Executive Order 24 and climate action planning process
- Climate Smart Communities
- Smart Growth Public Infrastructure Act