

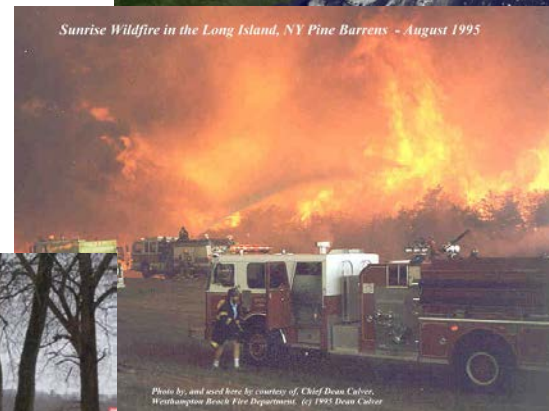
Hell and High Water: Preparing *New York's* *communities for climate change*

Mark Lowery

Climate Policy Analyst

Office of Climate Change

New York State Department of
Environmental Conservation



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

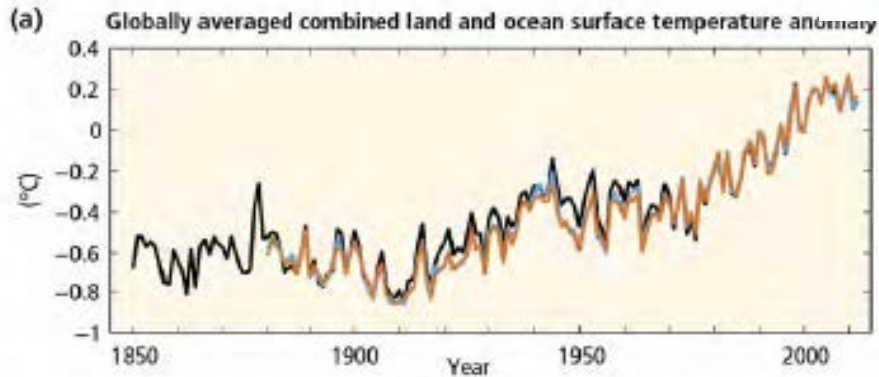
Warming greater than 2.0°C
=>dangerous consequences
(already at 1.1°C)

www.skepticalscience.com

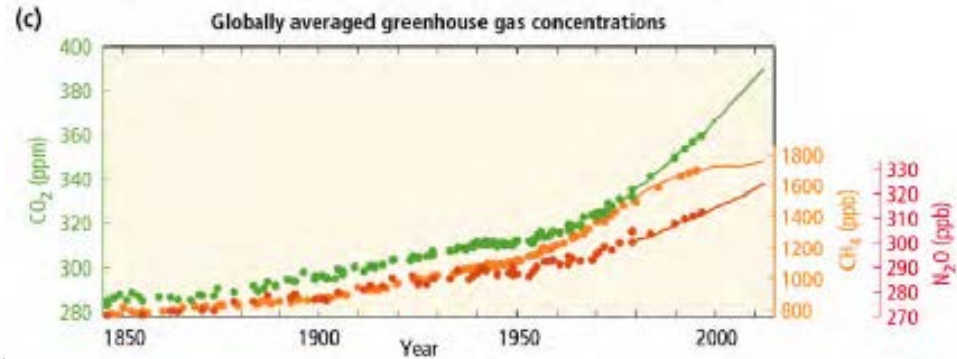
Studies into scientific agreement on human-caused global warming



>40% increase in
atmospheric CO₂



IPCC Fifth Assessment Synthesis Report



1.1° C temperature rise
since Industrial Revolution

Continuing high rate of GHG emissions



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Feedbacks, abrupt climate change and climate surprises

Rapid ice melt

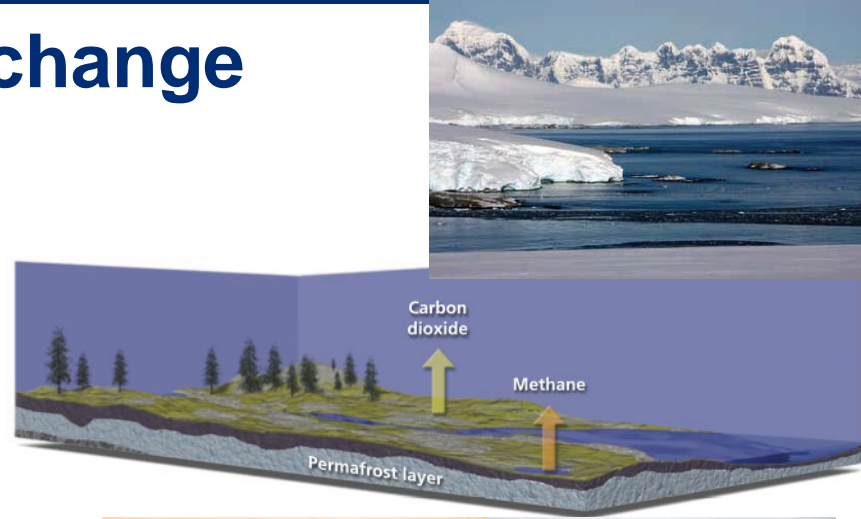
Methane release

- Tundra
- Clathrates

Changes in monsoons

Dustbowlification

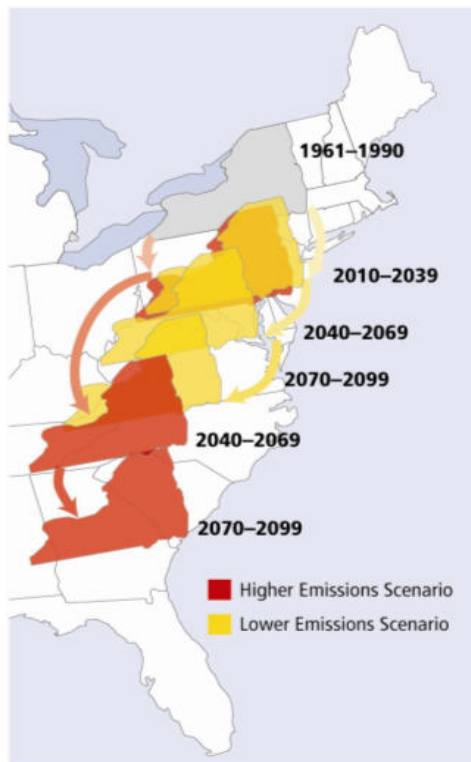
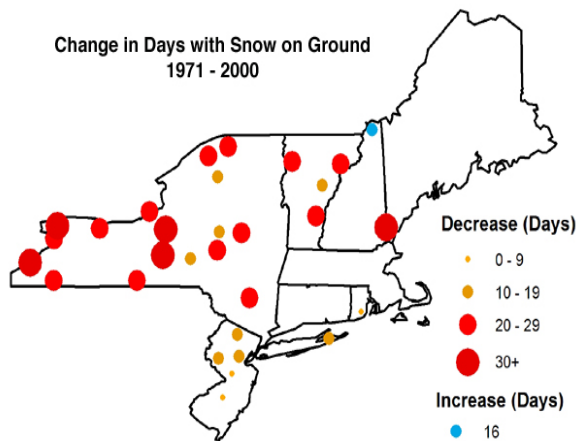
Pest outbreaks



Higher Temperatures: Observed and Predicted

NYS Since 1970

- Annual mean $+1.3^{\circ}\text{C}$
- Winter mean $+2.4^{\circ}\text{C}$
- 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 ($> 90^{\circ}\text{F}$)

- 14 to 23 days by 2020s (instead of 10!)
- 27 to 82 days by 2080s

More heat waves

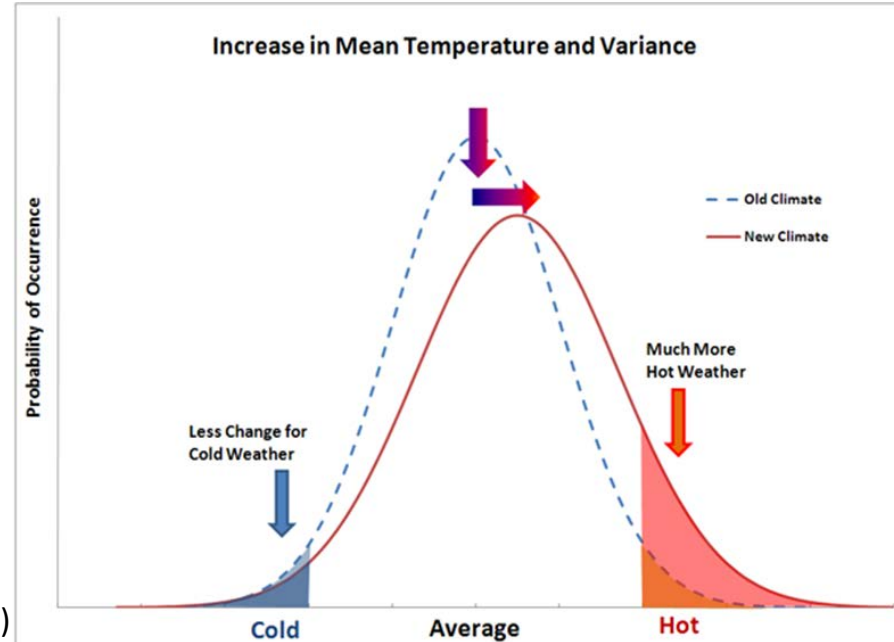
- 2 to 4 by 2020s (instead of 1!)
- 4 to 9 by 2080s

Cardio-respiratory ailments

Heat stress




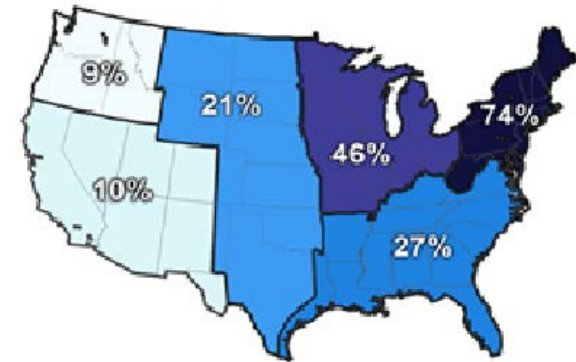
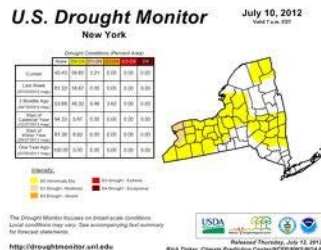
AP Photo/Peter Morgan



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
- 



Increase in extreme precipitation events since 1950s.

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

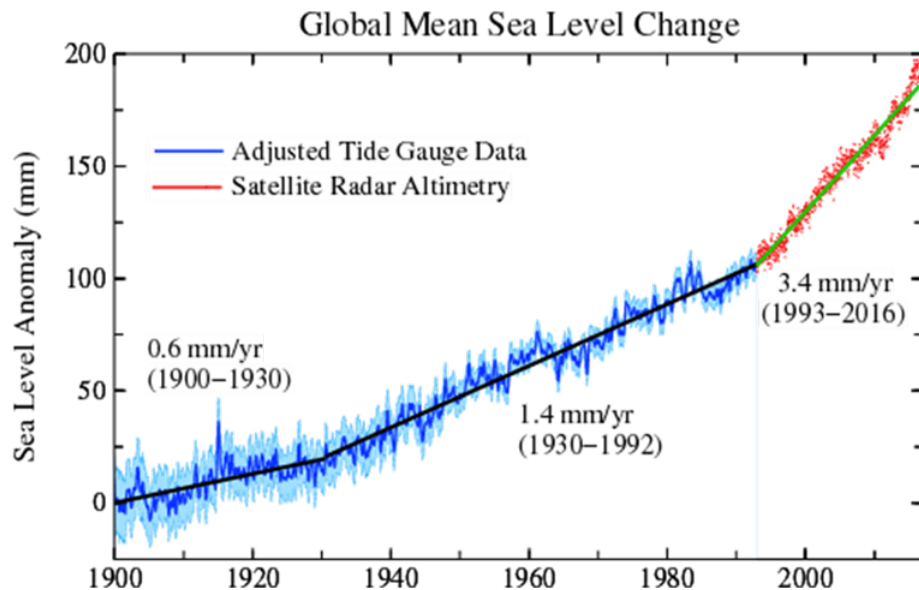


Unstoppable Sea-level Rise

WAIS collapse – 4 to 12 ft. SLR

Last interglacial – 13-20 ft. higher

Current global SLR commitment - 6.6 ft.



www.columbia.edu/~mhs119/SeaLevel



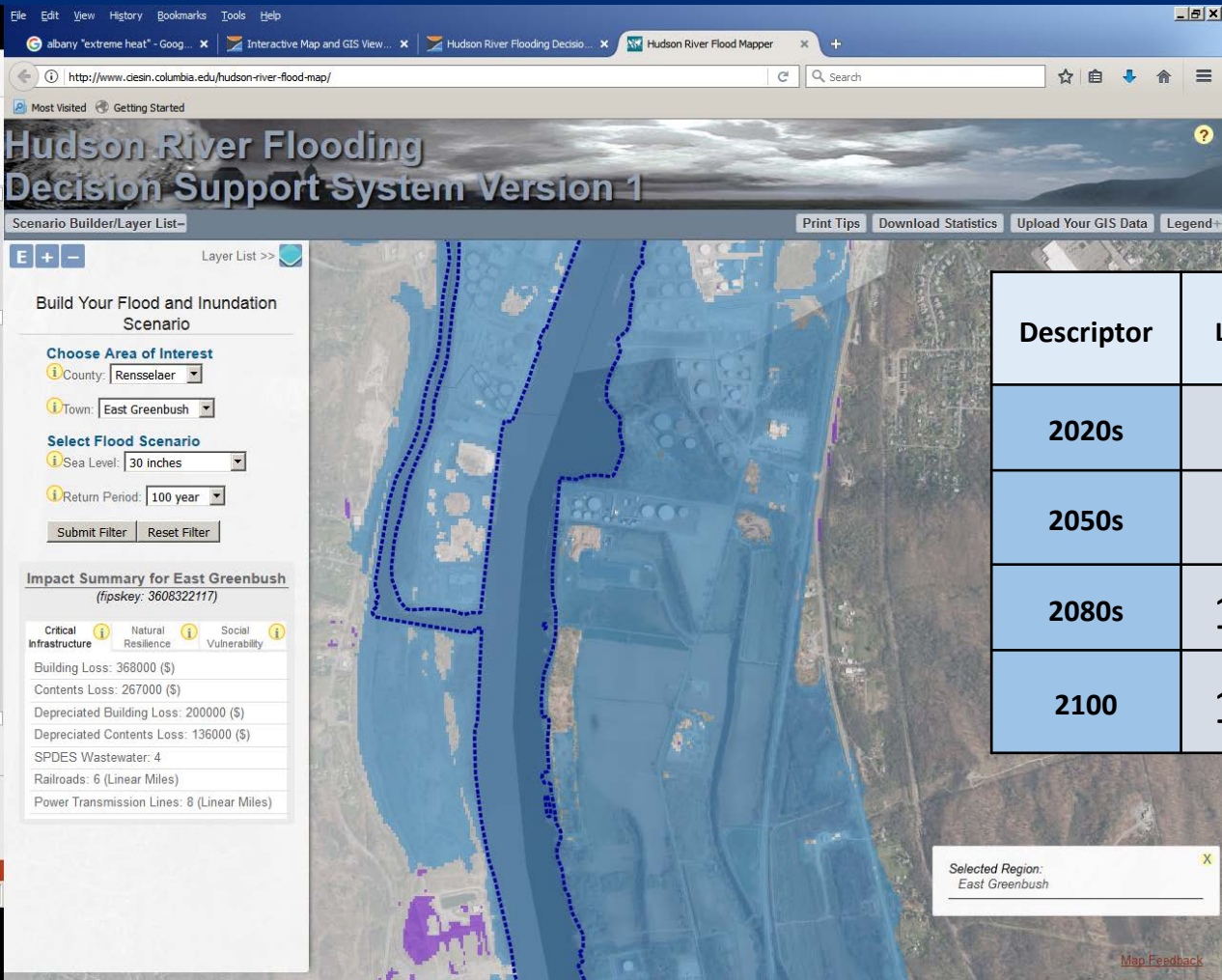
60-mile-long iceberg, B9B, detached from Antarctica in 2012.

All of Hudson River subject to SLR



NEW YORK
STATE OF
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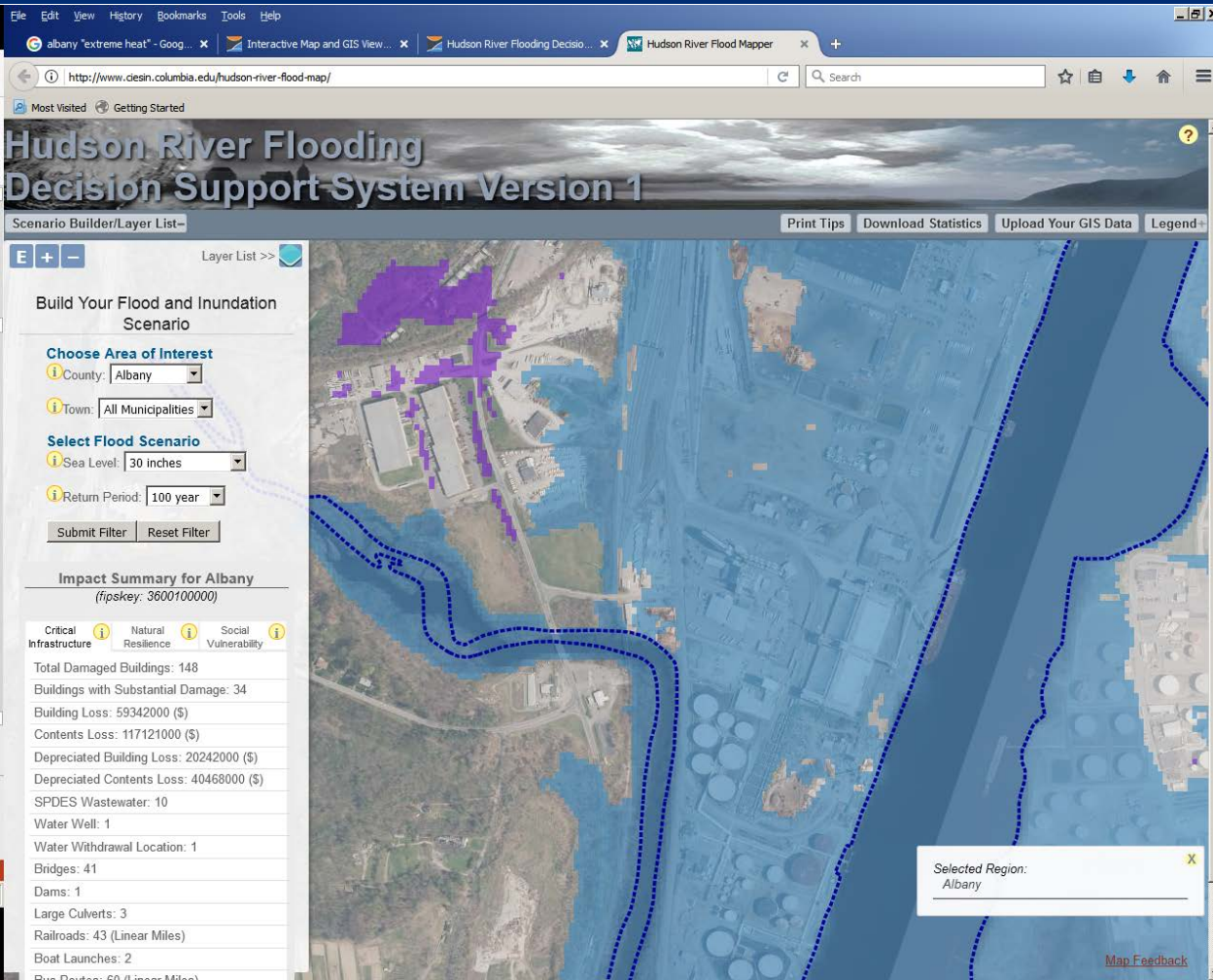


Projected Sea-level Rise, Mid-Hudson
(inches of rise relative to 2000-2004
baseline)

Descriptor	Low	Low-medium	Medium	High-medium	High
2020s	1	3	5	7	9
2050s	5	9	14	19	27
2080s	10	14	25	36	54
2100	11	18	32	46	71



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- 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



T.B. Ryder



Conservation Value Notes



Greenpeace International



PhillipC/flickr



NYSDEC



NYSDEC



NYSDEC



NYSDEC



© George Shinn



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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



Global warming may have expanded the environments mosquitoes can thrive in

First appearance of the "tiger mosquito"



Vox

Projected heat-related mortality, New York County



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Agricultural and Ecosystem Effects

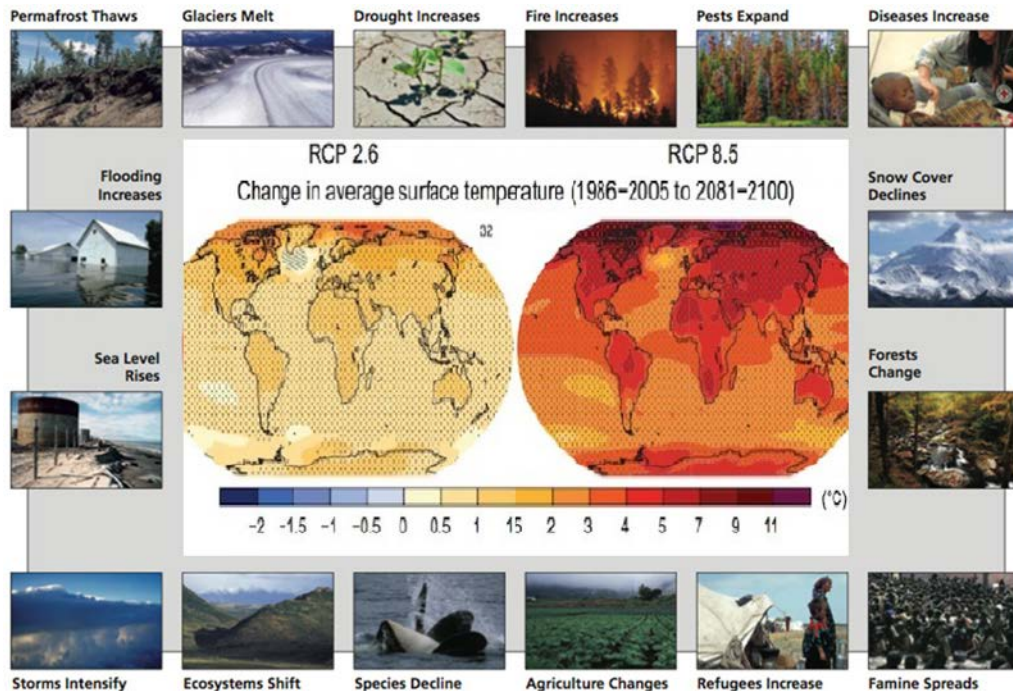
- Direct crop damage
- Delayed planting (wet springs)
- Drought
- Heat stress on livestock
- Frost and freeze damage
- Weeds and pests
- Reduced pesticide effectiveness
- Species distribution shifts
- Loss of synchrony (pollinators, food)
- More deer
- Loss of cold water fisheries
- Loss of critical 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



PROCRASTINATE NOW
AND
PANIC LATER

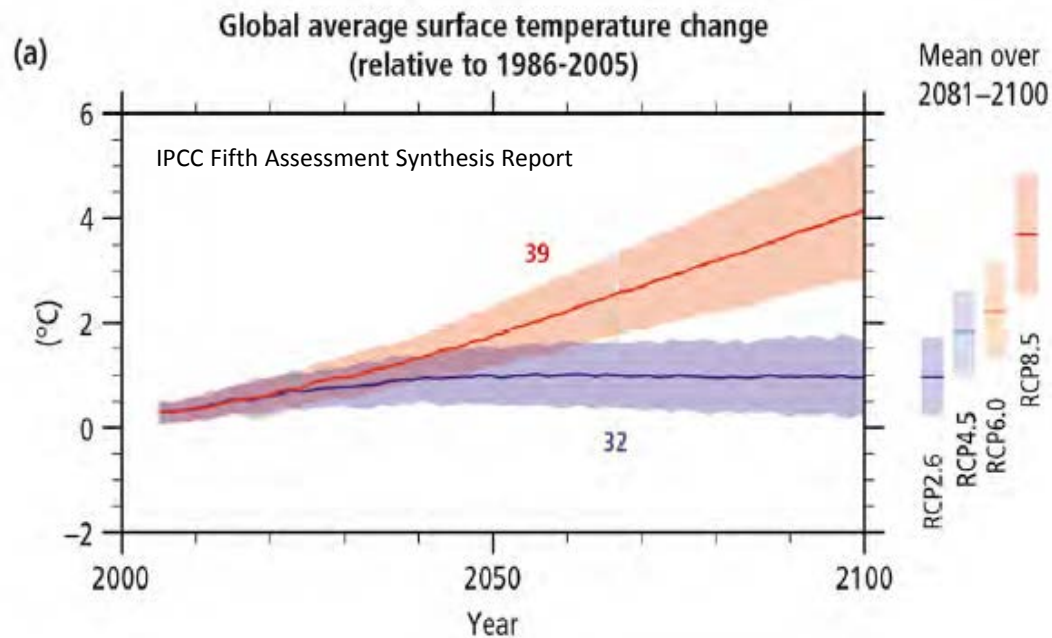
<http://www.sustainactbility.com>



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Trending toward Catastrophe

- On track to reach 560 ppm CO₂, mid- to late 21st 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

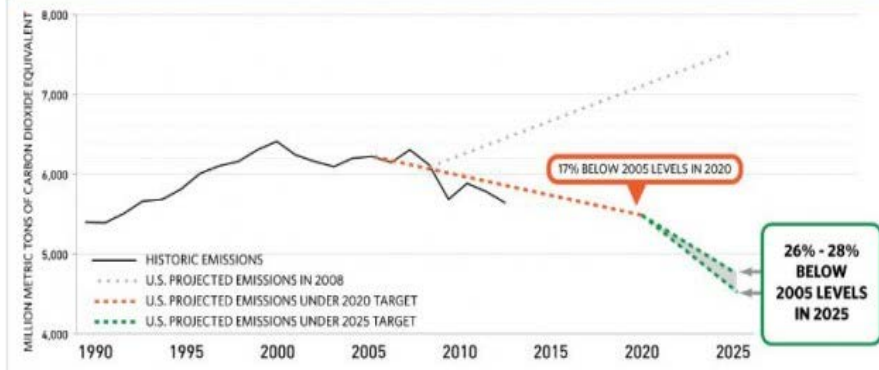
- Long-term goal: $<3.6^{\circ}\text{F}$ (2.0°C) below pre-industrial
- Aim: 2.7°F (1.5°C)
- Now in force
- Intended Nationally Determined Commitments $\Rightarrow 2.7\text{-}3.5^{\circ}\text{C}$ by 2100

U.S. Commitment

- Currently on path for 17% reduction by 2020
- 26-28% in 2025 – **now highly unlikely**



U.S. EMISSIONS UNDER 2020 AND 2025 TARGETS





New York State Programs

State and local programs now more critical



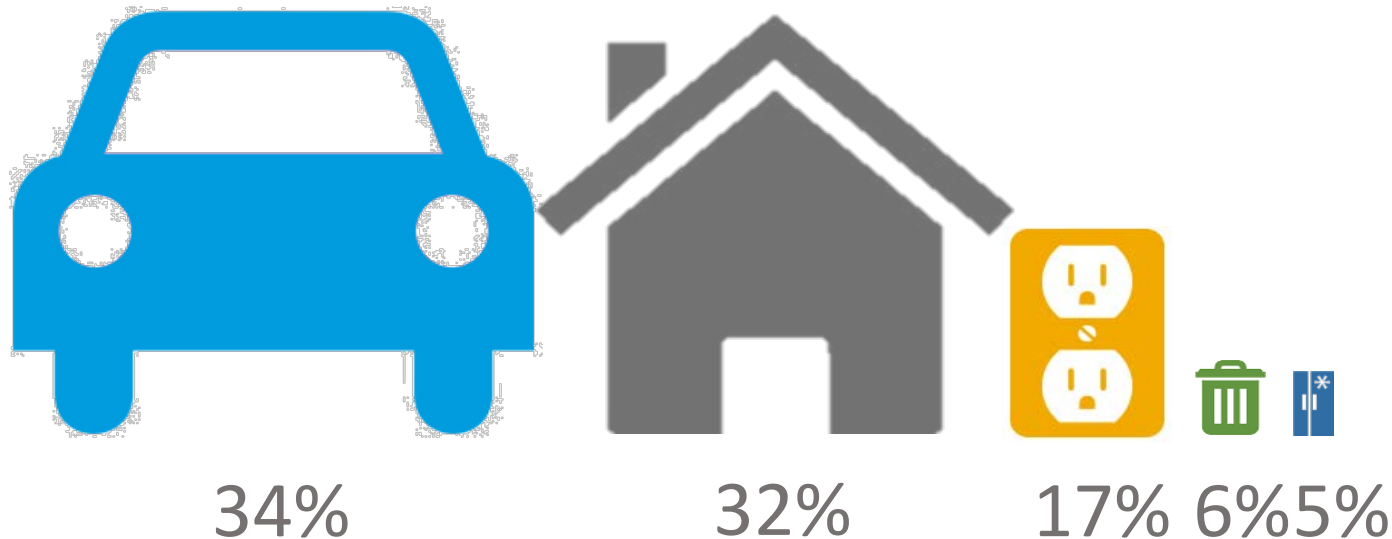
“Climate change is an issue of society’s sustainability – and to deny that climate change is real is to deny reason. Today, New York is stepping up. We are demonstrating the leadership and focus that this issue demands. We are joining together and committing ourselves to tackling climate change and showing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

-Governor Andrew Cuomo



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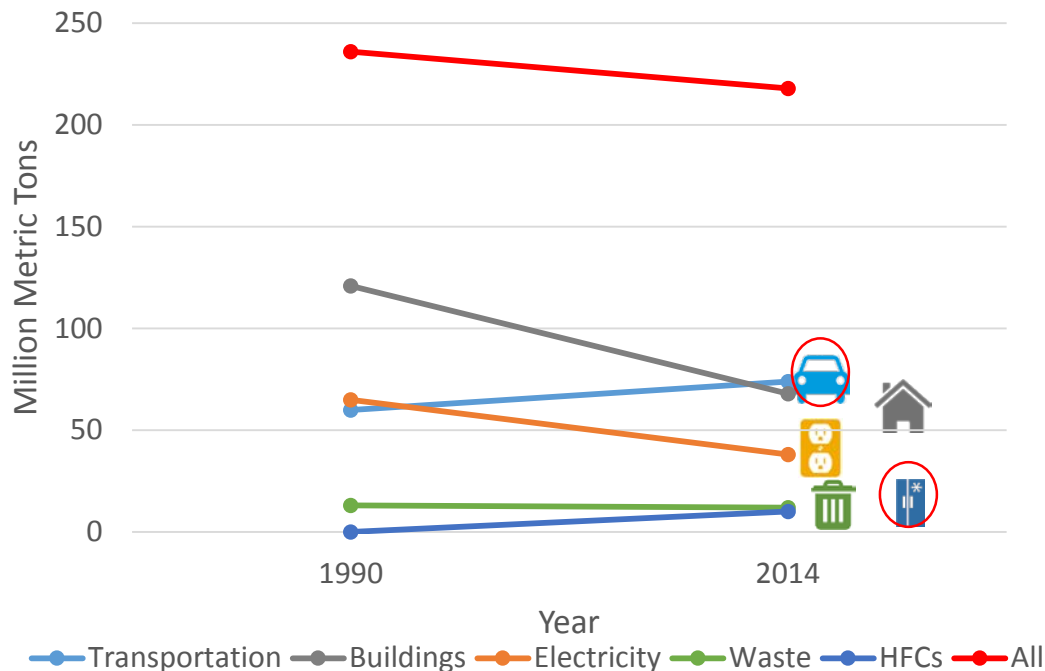
Main Sources of Greenhouse Gases in NYS



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

New York State Greenhouse Gas Emissions, 1990-2014



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



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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

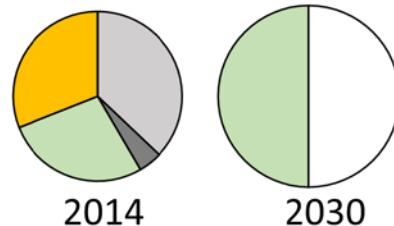
Renewable energy sources, including solar, wind, hydropower, and biomass, will play a vital role in reducing electricity price volatility and curbing carbon emissions.

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 (BTU) in energy efficiency gains equates to 23% reduction in energy consumption by buildings.

NY Generation

Gas and Oil Coal
Renewable Nuclear

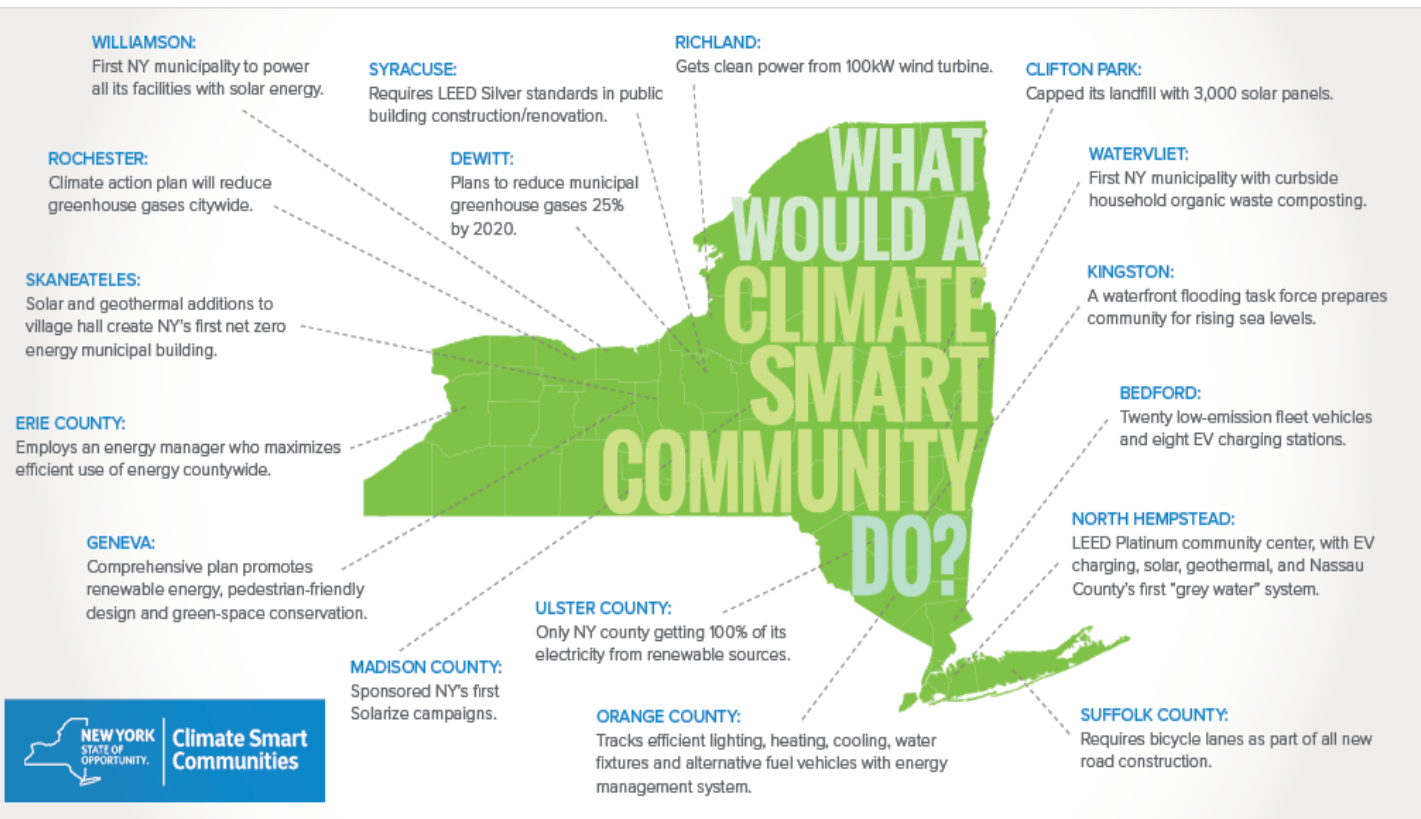


“New Yorkers stand ready to do their part. We are committed to requiring that 50 percent of the power used in our state is from renewable resources by 2030.” - Governor Andrew Cuomo



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Climate Smart Communities



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



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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>)
 - 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



Climate Smart Communities

TC CPI Tompkins County Climate Protection Initiative



Mobilizing Regional Climate Action in Tompkins County

Peter Bardsley
Climate Smart Community Webinar
March 12, 2015

Climate Smart Communities Profile

April 2015

Program Overview

The Climate Smart Communities Program is a voluntary, non-regulatory program that provides technical assistance and funding to local governments to help them reduce greenhouse gas emissions and improve energy efficiency. The program is designed to help local governments develop and implement a comprehensive climate action plan that addresses energy efficiency, renewable energy, and other climate change mitigation strategies.

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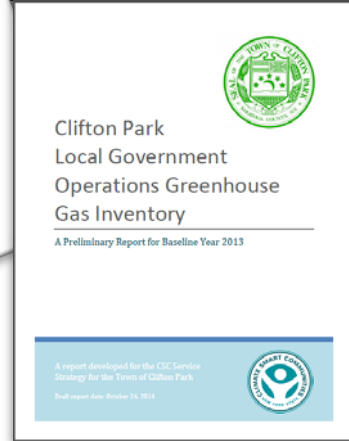
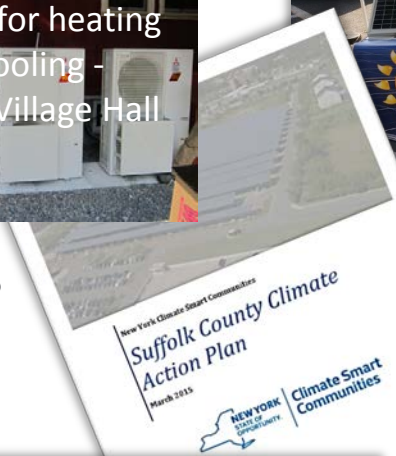
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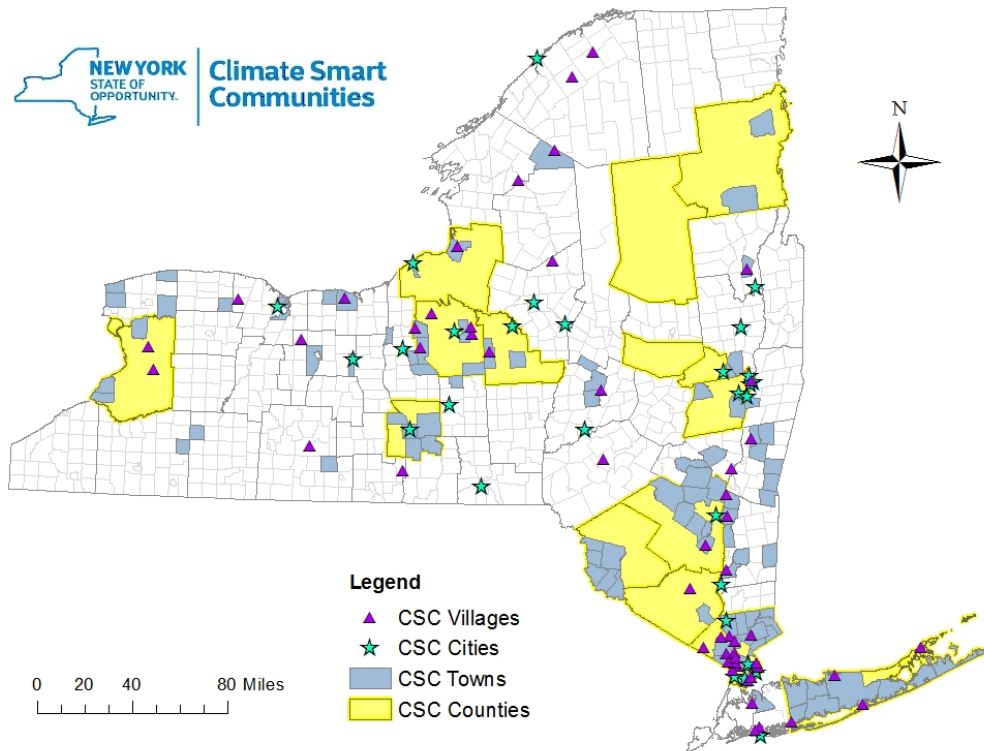
What have Climate Smart Communities done?

- **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**



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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



Climate Smart
Communities
Certified



Climate Smart
Communities
Certified Bronze



Climate Smart
Communities
Certified Silver



Climate Smart
Communities
Certified Gold



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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



**Climate Smart
Communities**
Certified



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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.



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NYSERDA's Clean Energy Communities

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.



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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



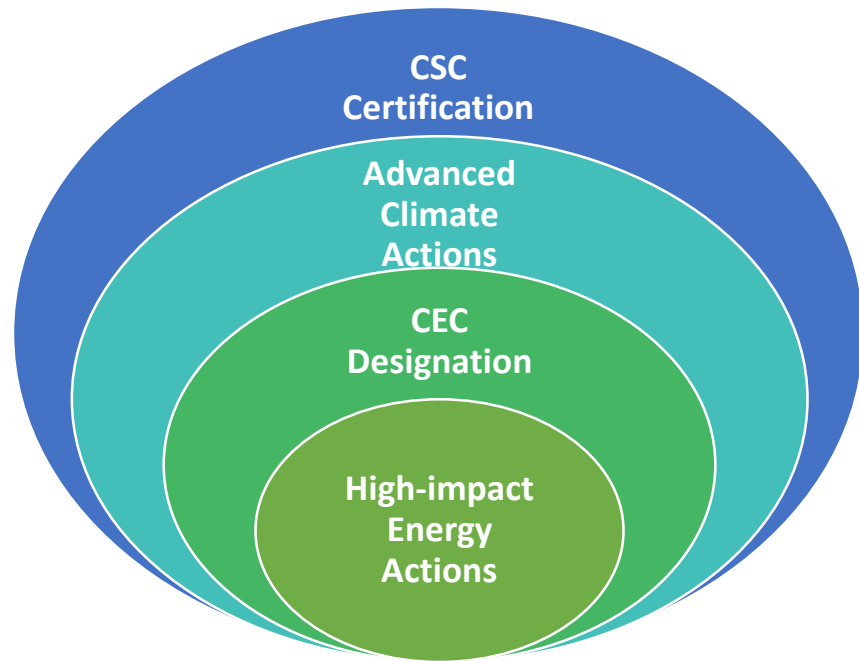
How are the two programs related?

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>

For more info, contact Libby Zemaitis

Climate Outreach Specialist, Hudson River Estuary Program

Libby.zemaitis@dec.ny.gov | (845) 256-3153



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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



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Fact sheet available: 20 funding programs for waterfront resilience

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



Municipal planning



Collaboration and public outreach



Resilient structures



Waterfront economy



Emergency management



Floodplain protection



☑ CFA = grants included in the NYS Consolidated Funding Application

<https://goo.gl/QYEurF>



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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



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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



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Climate Policy Analyst

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Connect with us:

- DEC: www.dec.ny.gov
- 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



*We can solve this problem,
but only if we have the will.*



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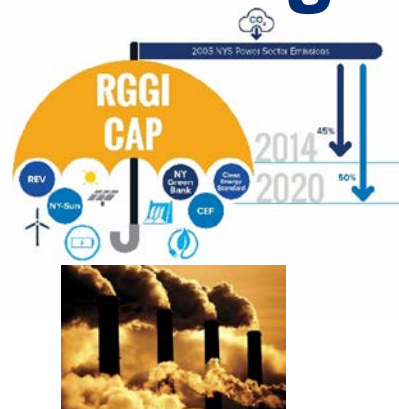
Additional Information



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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



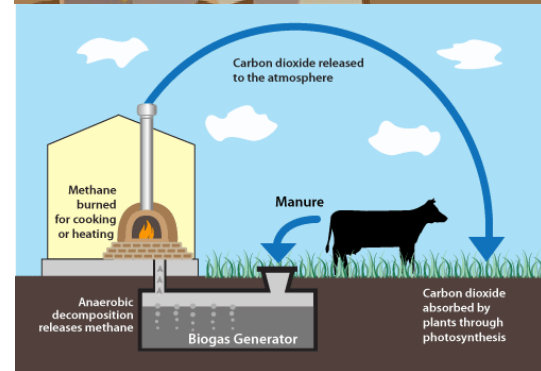
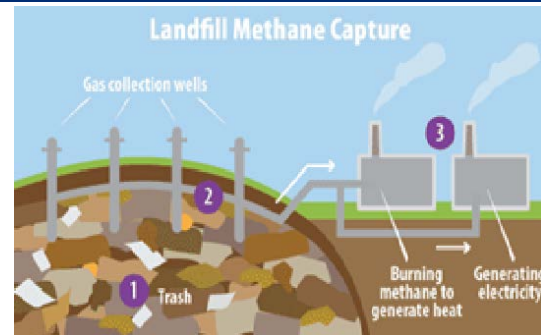
Reforming the Energy Vision



Department of Environmental Conservation

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

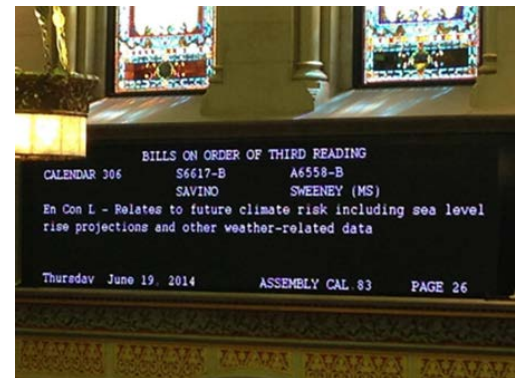
- State Sea Level Rise Task Force
- Integrated Vulnerability Assessment (ClimAID)
- Emergency Response Commissions
- Interagency Work Group on Adaptation
- Climate Risk and Resiliency Act
- State Agency Vulnerability Assessments



Community Risk and Resiliency Act

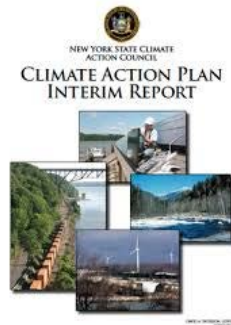
Mainstreaming consideration of climate change

- 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



**Climate Smart
Communities**



**Department of
Environmental
Conservation**