NEW YORK
STATE OF
OPPORTUNITY

Department of
Environmental
Conservation

Preparing for a Wetter New York

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New York State Department of Environmental Conservation

IPCC 1.5°C Special Report

If countries fulfill current climate commitments* but fail to raise ambition:

If the world starts reducing emissions now and reaches net-zero around mid-century:

WARMING CAN BE LIMITED TO 1.5°C

www.wri.org

- Current COP21 pledges lock in 1.5°C by 2030
- Meeting either 1.5 or 2.0 °C will require unprecedented transformation of energy system

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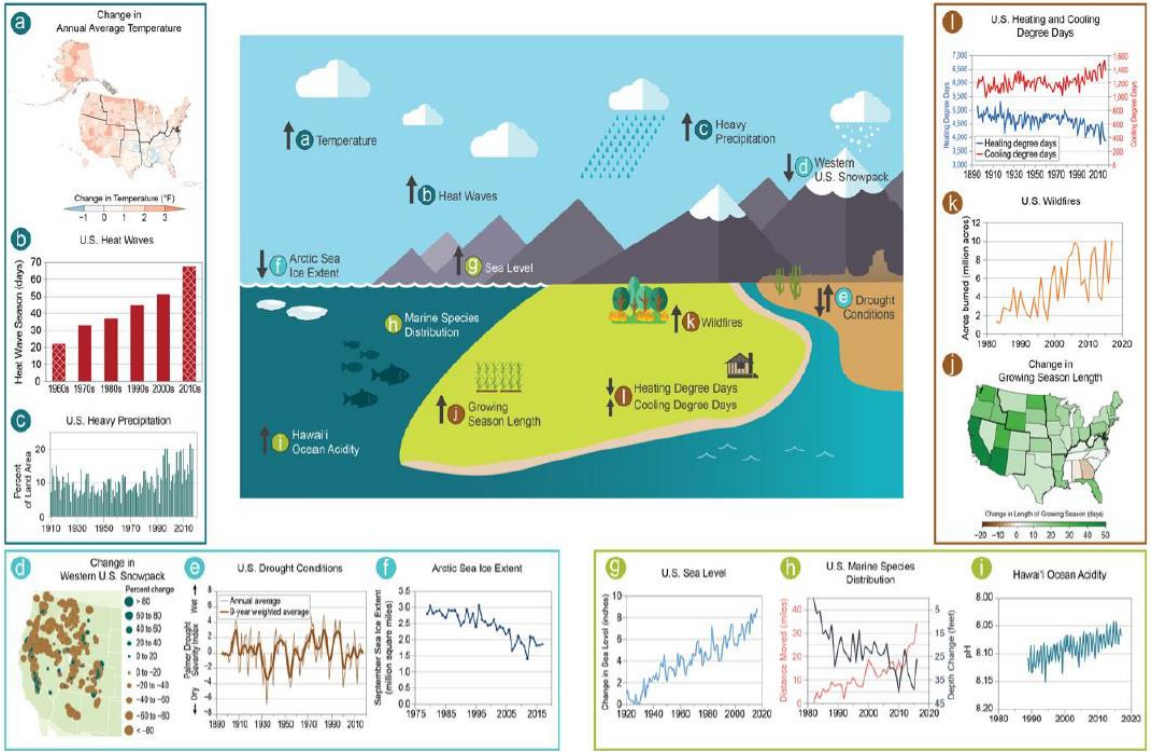
NCA4: Observed Change



U.S. Global Change Research Program

Key NE Vulnerabilities:

- Rural industries
- Marine & coastal environments
- Critical urban activities & infrastructure
- Public health

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Effects in New York

Higher temperatures
More precipitation
More frequent drought
Sea-level rise
More extreme events:
- Floods
- Heat
- Ice/snow
- Winds
- Coastal storms

Disease and pests

- Risks to people
- Stressed infrastructure
- Agricultural and ecosystem effects

Conservation Value Notes

Greenpeace Internationa

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PhillipC/flickr

T.B. Ryder

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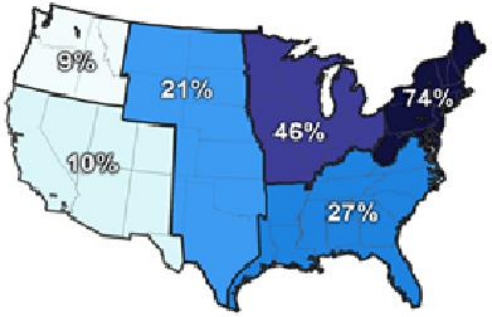
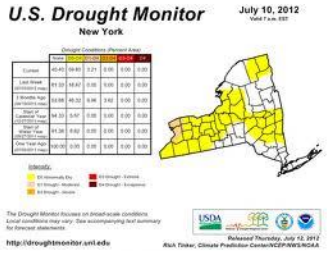
Too Much Water When We Don't Want it, Too Little When We Do

- 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:
  - up to15% increase by 2050s
  - Up to 26% increase by 2100

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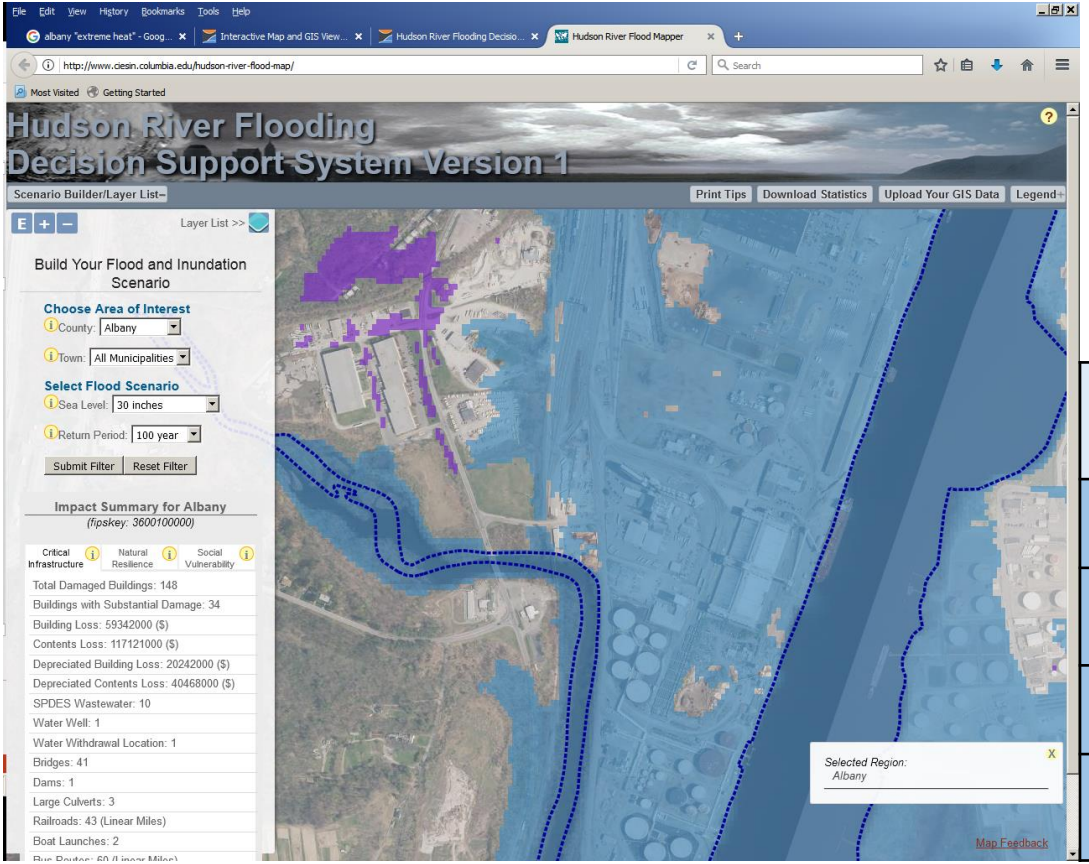
Unstoppable Sea-level Rise

- Loss of populated areas
- Loss of tidal ecosystems
- Threats to infrastructure
- Salt-water intrusion



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

	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

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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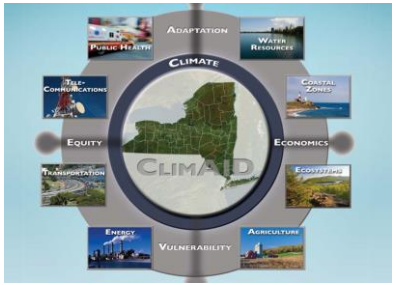
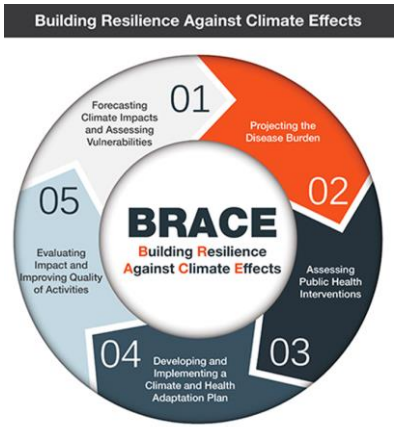
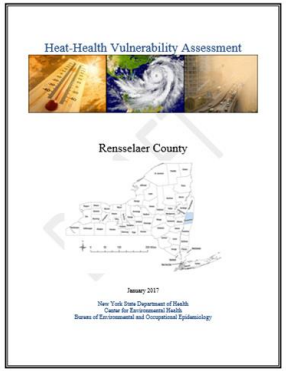
New York State Adaptation Programs

- Integrated Vulnerability Assessment (ClimAID)
- Interagency Climate Adaptation and Resilience Work Group
- Climate Risk and Resiliency Act
- NYSDOH County-Heat Health Profiles
- Climate Smart Communities
- State Agency Vulnerability Assessments
- Information Resources







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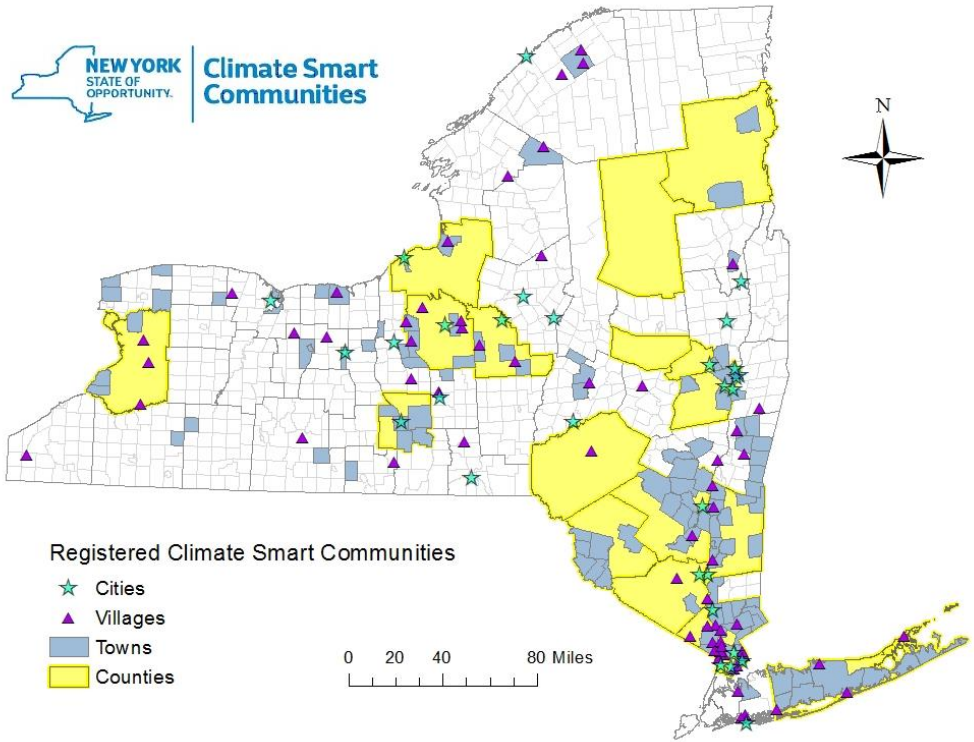
Climate Smart Communities



- **252 Registered** (since 2009)
  - 39% of New Yorkers live in these “pledged” communities (over 7.6 million people)
  - 16% of ~1607 local gov’ts
- **24 Certified** (since 2014)
  - Leaders who have documented progress

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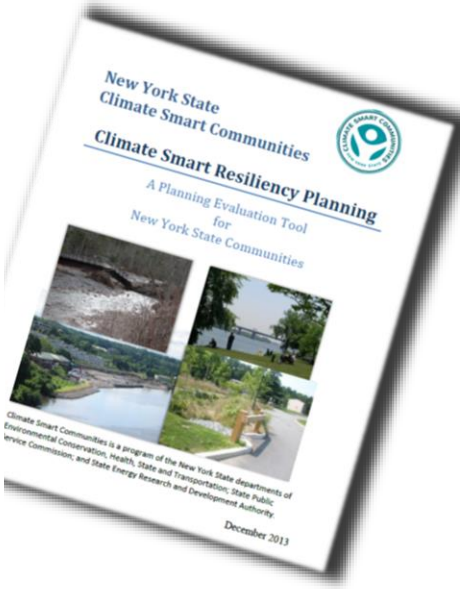
Full list at https://climatesmart.ny.gov/actions-certification/participating-communities/

Climate Smart Resiliency Planning: A Planning Evaluation Tool for New York State Communities

Checklists:

1. Vulnerability & Risk Assessment
2. Public Outreach & Engagement
3. Planning Integration
4. Disaster Preparedness & Recovery
5. Hazard Mitigation

Section 2 – Risk and Vulnerability Assessments	Yes	No	Other	N/A	Notes
2.1 Does the municipality have a localized hazard risk and vulnerability assessment?			X		In progress- Waterfront Resiliency Task Force (DOS hazard risk assessment, COAST vulnerability assessment)
2.2 Have current and future climate hazards been identified?			X		Some- sea level rise flooding, in progress- Waterfront Resiliency Task Force
2.3 Are previously identified coastal hazards and disasters mapped through historical information, existing plans and reports, scientific knowledge, and local knowledge?		X			LWRP describes some coastal (and riverine) hazards, but no maps
2.4 Are hazard probability, frequency, magnitude and duration defined?			X		Partially- in progress- Waterfront Resiliency Task Force
2.5 Is coastal erosion and/or shoreline change identified as a hazard?	X				LWRP- refers to coastal erosion areas in recommending non-construction mitigation measures and site planning (coastal erosion protection is requires in waterfront site plans)
2.6 Is sea level rise identified as a hazard?			X		In progress- Waterfront Resiliency Task Force
2.7 Has the municipality adopted projections of sea level rise?		X			
2.8 Are extreme temperature and heat waves identified as hazards?		X			
2.9 Are extreme precipitation and drought identified as hazards?		X			
2.10 Are conditions identified that could amplify the effect of a hazard, e.g., storm surge inundation at a high tide or erosion of stabilized shorelines?	X				LWRP- coastal and slope erosion identified as hazards, but not specifically addressed as amplifying factors; In progress- Waterfront Resiliency Task Force (identified storm surge)
2.11 Have potential vulnerabilities been prioritized?		X			Partially- in progress- Waterfront Resiliency Task Force
Probability of a given climate hazard, e.g., high, medium, low		X			
Likelihood of effect occurrence, e.g., virtually certain/already occurring, high, moderate, low		X			
Magnitude of consequence, e.g., internal operations, capital and operating costs, number of people affected, public health, economy, and environment		X			
2.12 Have adaptation strategies been identified and categorized?			X		Partially- in progress- Waterfront Resiliency Task Force
Type			X		
Administration			X		
Condition			X		
Timing			X		
Geography			X		
2.13 Have adaptation strategies been evaluated and prioritized?			X		Partially- in progress- Waterfront Resiliency Task Force
Strategy cost			X		
Strategy feasibility			X		
Timing of implementation			X		
Efficacy			X		
Resiliency rating			X		
Co-benefits			X		



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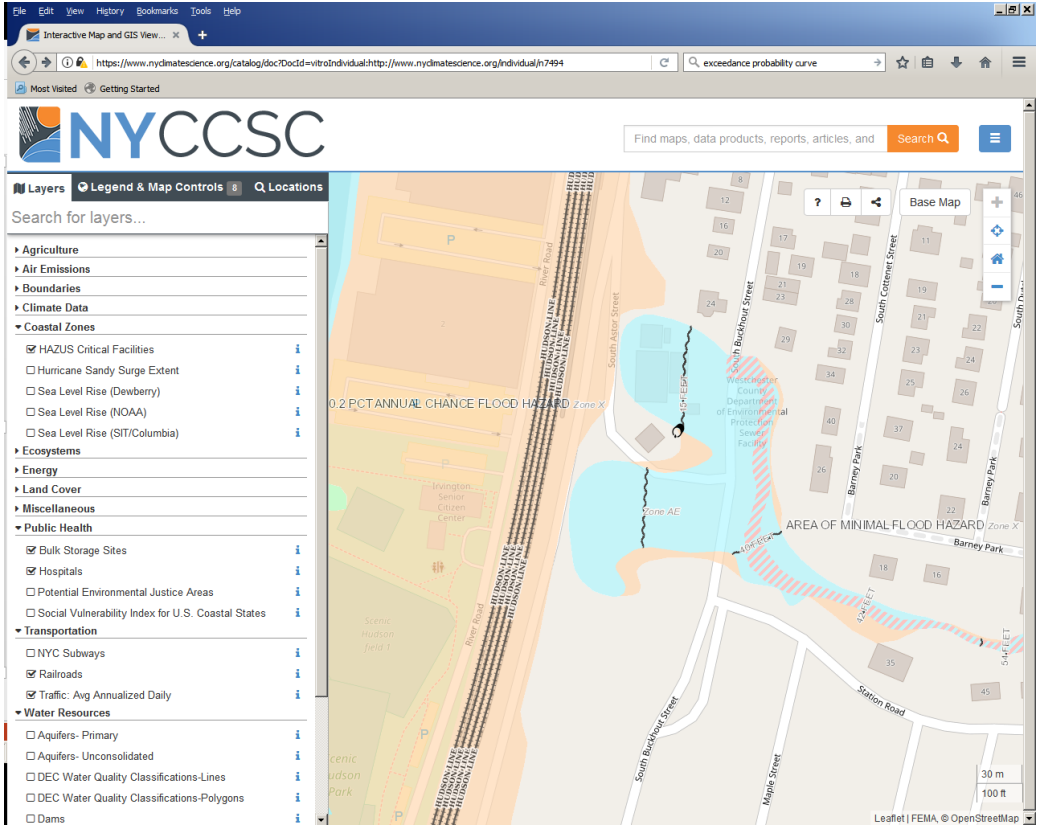
NY Climate Change Science Clearinghouse



Maps, data and documents to support decision making

https://www.nyclimatescience.org/

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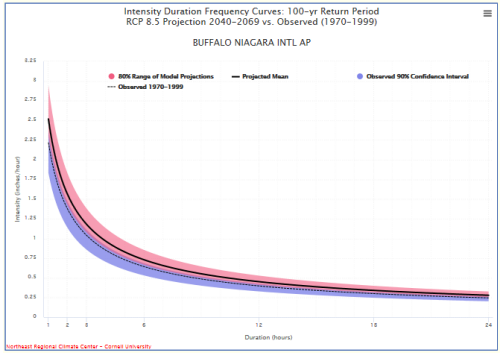
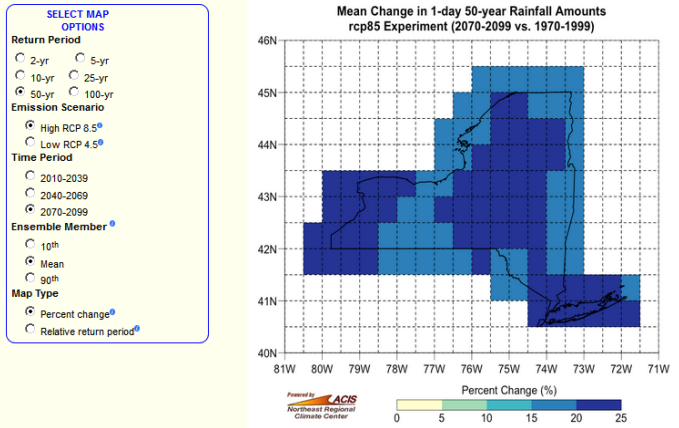
Resources: Future Extreme Precipitation



Duration (hrs)	Projected 2040-2069 Intensity Ensemble Member 10th	Mean	90th	Observed 1970-1999 Intensity with Confidence Interval (CI) Bounds Low CI	Mean	High CI
1	2.30	2.52	2.95	1.83	2.22	2.37
2	1.42	1.56	1.83	1.14	1.38	1.47
3	1.08	1.18	1.38	0.86	1.04	1.11
6	0.67	0.73	0.86	0.53	0.64	0.69
12	0.41	0.45	0.53	0.33	0.40	0.43
18	0.31	0.34	0.40	0.25	0.30	0.32
24	0.26	0.28	0.33	0.20	0.25	0.28

Station-specific IDF Graphs

Statewide Projected Change Maps



http://ny-idf-projections.nrcc.cornell.edu/

Powered by ACIS Regional Climate Centers

Cornell University

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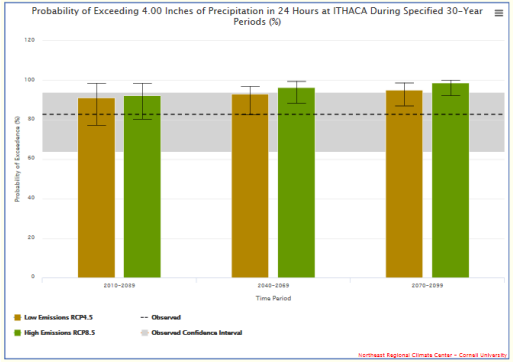
Exceedance Probabilities



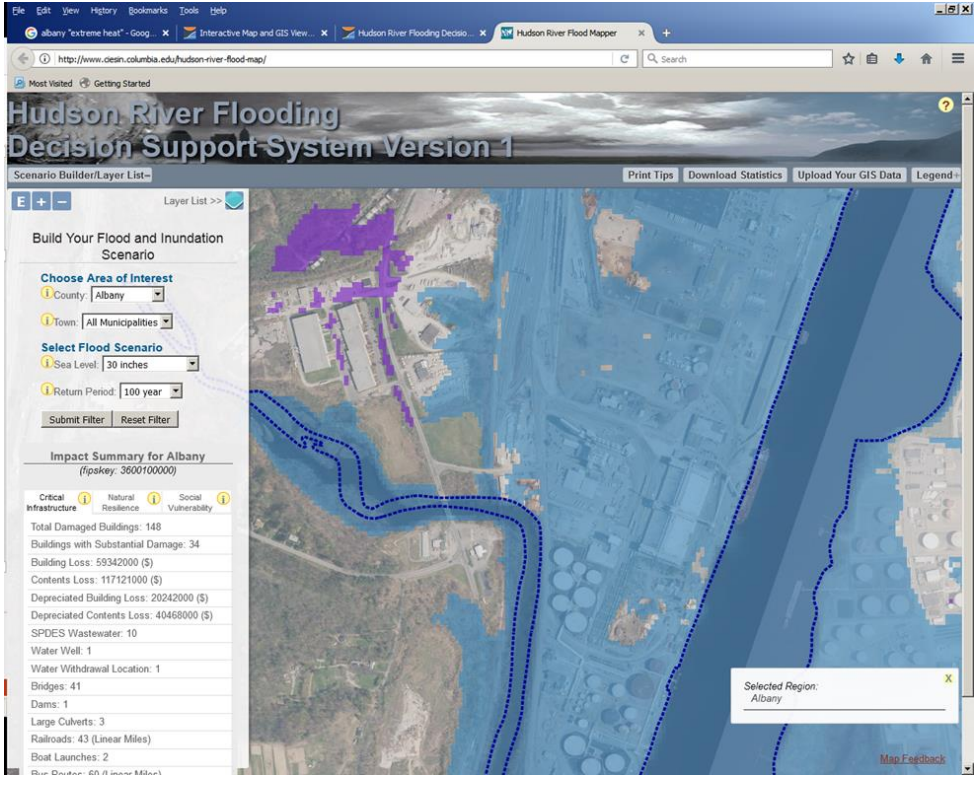
Probability of Exceeding 4.00 Inches of Precipitation in 24 Hours at ITHACA During Specified 30-Year Periods (%)

	Observed (1970-1999)	Projected (2010-2039) RCP 4.5	RCP 8.5	Projected (2040-2069) RCP 4.5	RCP 8.5	Projected (2070-2099) RCP 4.5	RCP 8.5
Mean	83	91	92	93	96	95	99
Lower Bound	64	77	80	83	88	87	92
Upper Bound	94	98	98	97	99	99	100

Resources: Hudson River Flooding Decision Support System

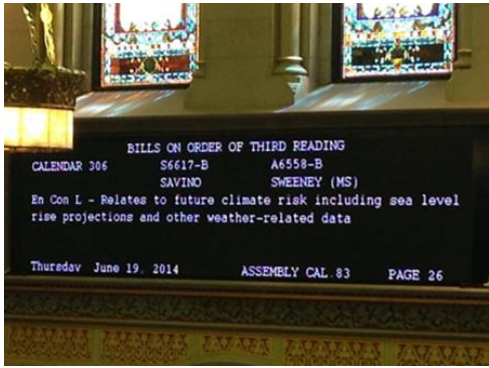
- Available for ten Hudson Valley counties
- Statewide system in progress
- Accessible directly or through NYCCSC

http://www.ciesin.columbia.edu/hudson-river-flood-map/



2014 - Community Risk & Resiliency Act

- Requires sea-level rise projections (DEC)
- Requires applicants demonstrate consideration of sea-level rise, storm surge & flooding in specified permits & funding programs, & guidance on implementation (DEC, DOS)
- Adds mitigation of sea-level rise, storm surge & 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)



http://www.dec.ny.gov/energy/102559.html

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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

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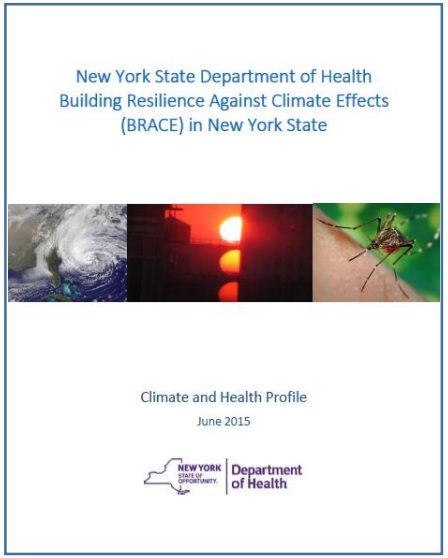
CRRA Model Local Laws, Basic Land Use Tools for Resiliency (DOS)

- Chapter 1: Basic Land Use Tools
- Chapter 2: Wetland and Watercourse Protection Measures
- Chapter 3: Coastal Shoreline Protection Measures
- Chapter 4: Management of Floodplain Development
- Chapter 5: Stormwater Control Measures

2015 - Climate Smart NY

- Climate Resilient Farms Program
- State Agency Vulnerability Assessment

2015 - NYSDOH Climate and Health Profile



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2018 - Resilient NY

"to dramatically enhance community resiliency in the face of extreme weather"

- DEC issue resiliency guidelines (CRRA State Flood Risk Management Guidance)
- DOS recommend building code updates
- DEC update and improve wetland and coastal risk maps
- State agencies develop individual adaptation plans
- Financial support for local flood resiliency plans
- Emergency flood response training

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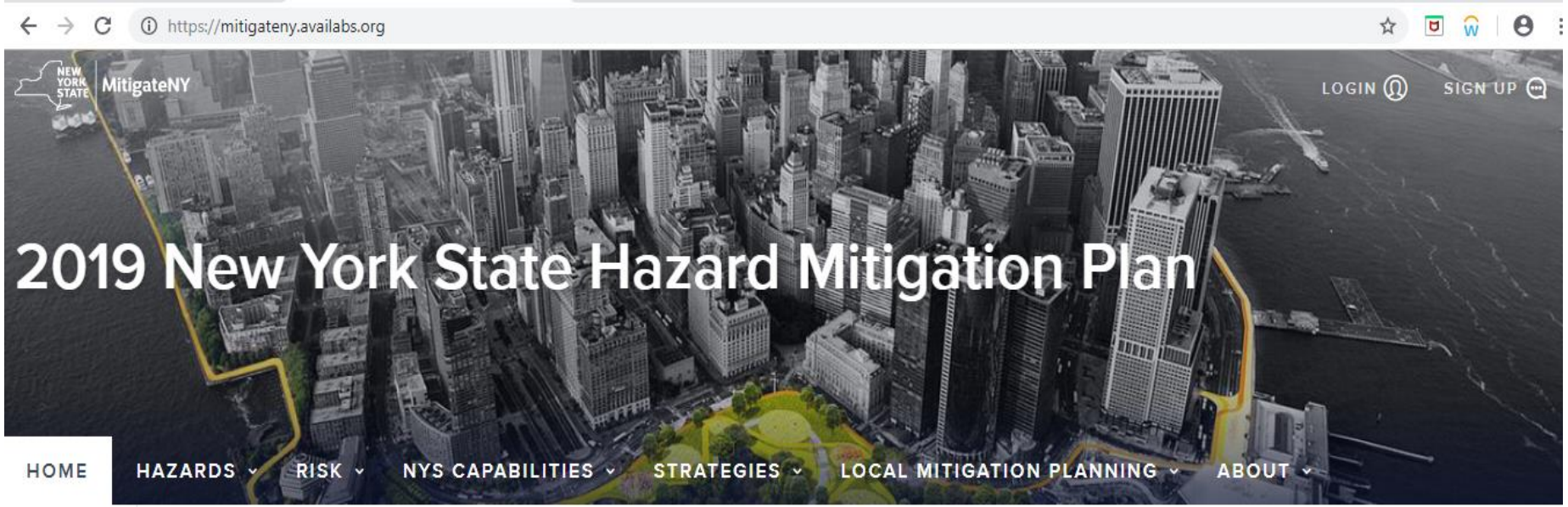
2018 – Mitigate NY



Assessing Climate Vulnerability

- *What major management challenges do you deal with at work?*
- *What are the ways climate change will affect this work? How will climate change affect my agency's ability to carry out its mission and achieve its strategic goals?*
- *What are the ways to respond to the challenges presented by climate change?*
- Consider human and built assets, natural resources, clients, constituents, customers

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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
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