

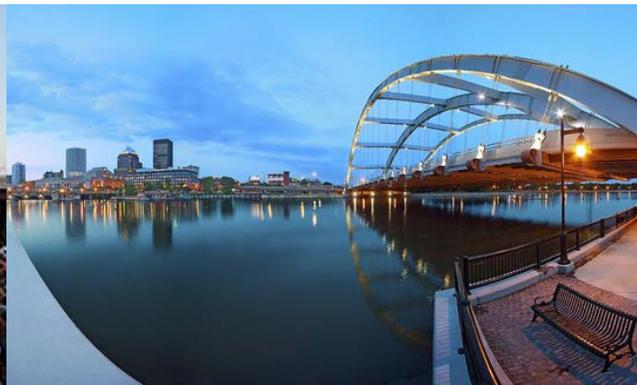
ROCHESTER CLIMATE VULNERABILITY ASSESSMENT

STAKEHOLDER ENGAGEMENT WORKSHOP

March 14, 2018



City of Rochester, NY
Lovely A. Warren, Mayor
Rochester City Council



Workshop Agenda

- I. Welcome
- II. Introductions
- III. Overview of the Rochester Climate Vulnerability Assessment Project
- IV. Presentation of climate change data & open discussion on potential climate impacts
- V. Presentation & open discussion on the recommendations of planning focus areas, systems, and critical assets/resources
- VI. Wrap up & next steps

Introductions

Project Team



City of Rochester, NY
Lovely A. Warren, Mayor
Rochester City Council

Anne E. Spaulding, Manager of Environmental Quality, Division of Environmental Quality

Melissa Chanthalangsy, Energy and Sustainability Analyst, Division of Environmental Quality



HIGHLAND
PLANNING

Susan R. Hopkins, Project Manager

M. André Primus, Planner

Kari Hewitt, Director of Sustainability



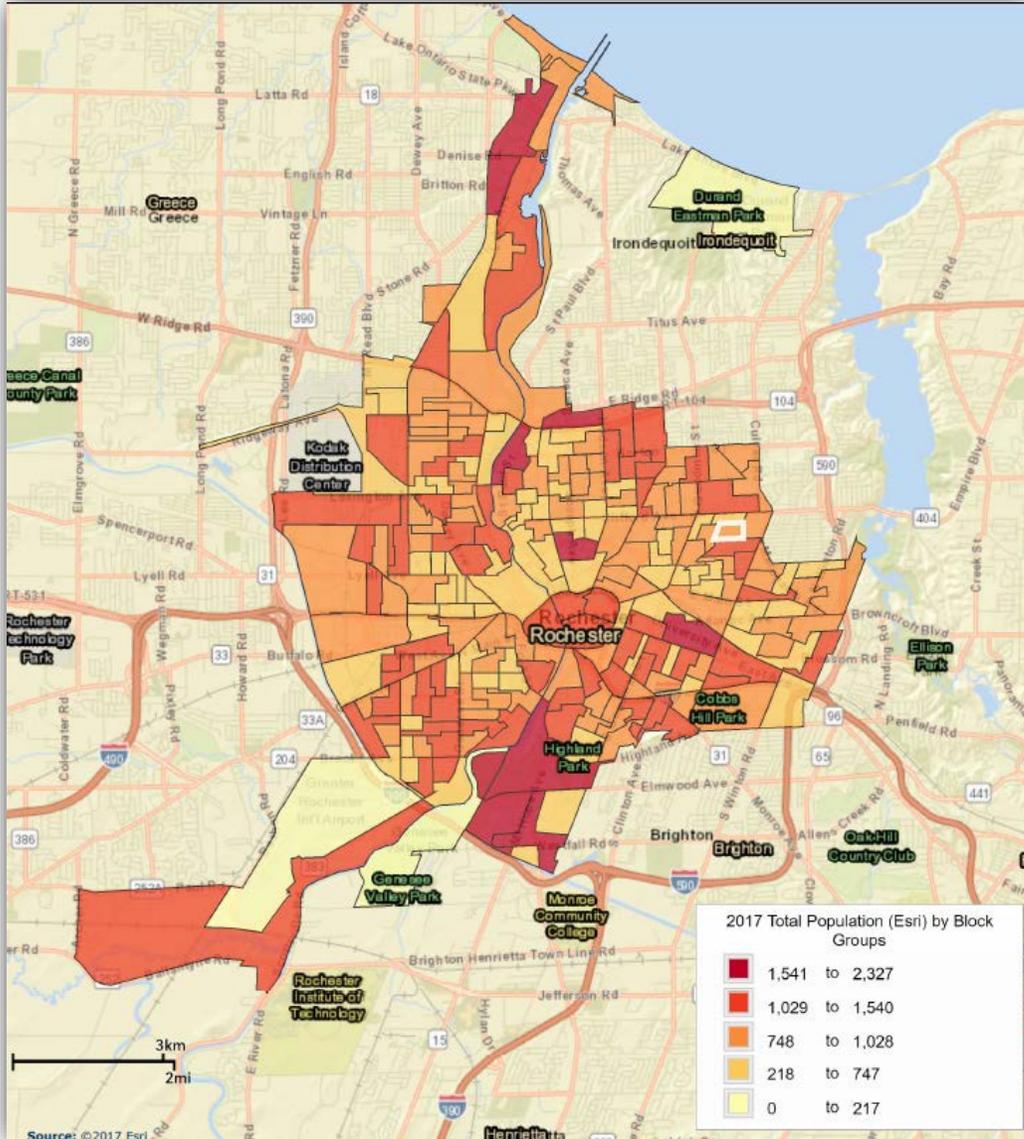
Van H. Du, Sustainability Planner

Role of the Stakeholder Committee

- I. Provide guidance, technical expertise, and feedback on the CVA
- II. Connect the Project Team with key stakeholder groups
- III. Participate in two workshops
- IV. Participate in Project outreach

Overview

Rochester by the Numbers



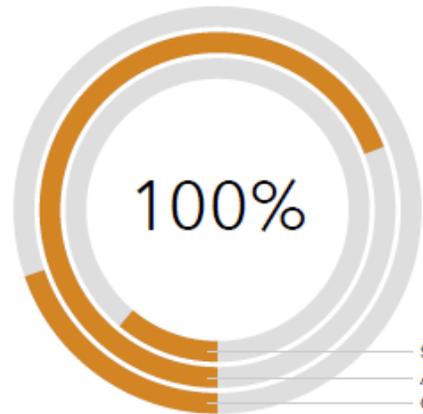
Source: 2011-2015 and 2017 data; provided by American Community Survey (ACS), Esri, Esri and Infogroup.

Population and Households


210,249
Total Population


87,262
Total Households


2.29
Average Household Size



Seniors 65+ 11.1%
Adults 15 to 64 69.2%
Children 14 under 19.7%


26,494

Households With Disability


1,855

Households Without Vehicle



25,478

Households Below the Poverty Level

Rochester by the Numbers

BUSINESS



8,554

Total Businesses



168,068

Total Employees



31,005

Median Household Income

9.3%

Unemployment Rate

TRANSPORTATION TO WORK



8.8%

Took Public Transportation



10.9%

Carpooled



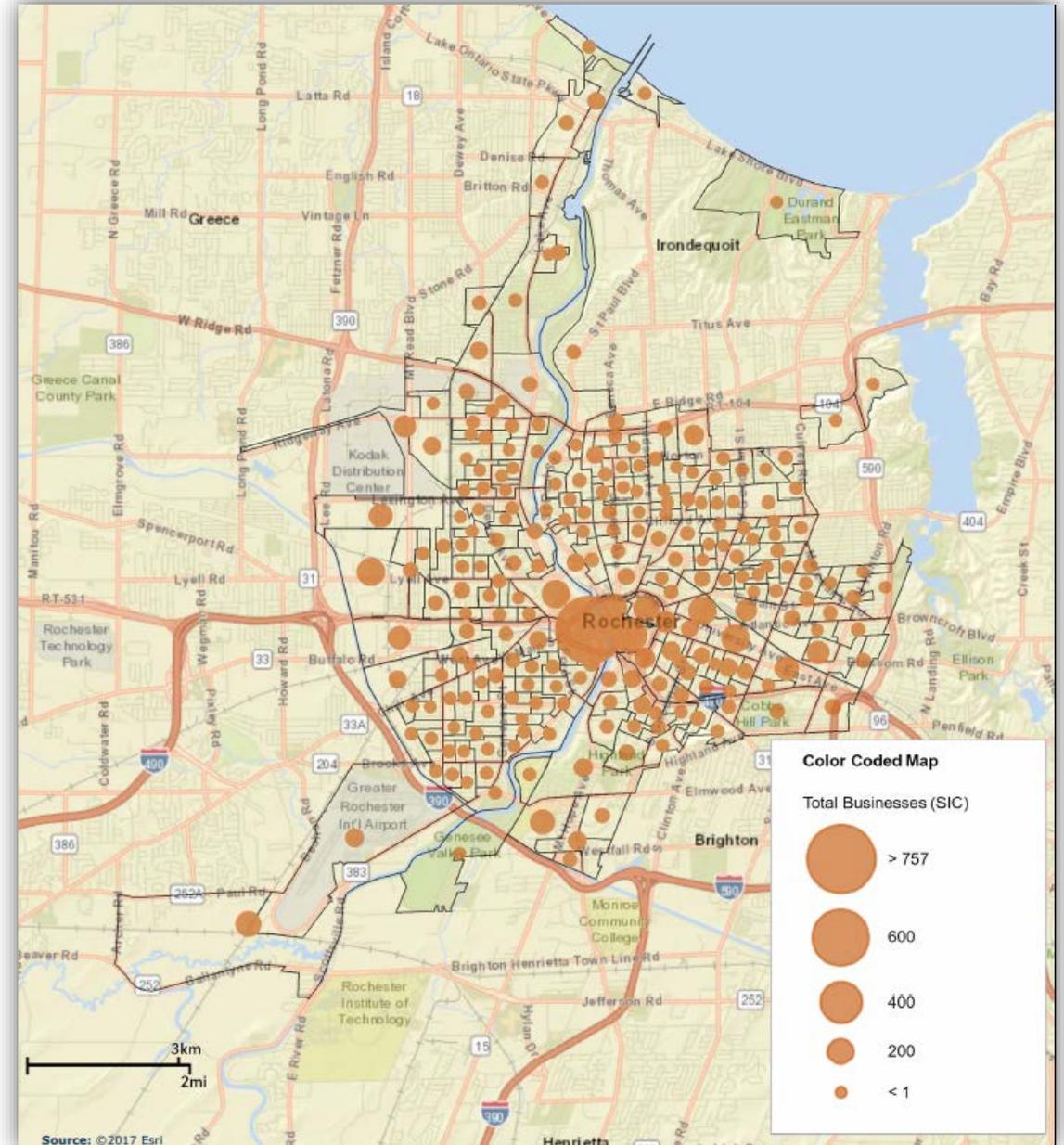
6.6%

Walked to Work



1.2%

Bike to Work



Rochester by the Numbers

	Rochester City, NY	Monroe County, NY	Syracuse City, NY	Buffalo City, NY
Total Population	210,249	755,765	146,839	260,428
Households with Population Age 65+	6,746	40,160	4,903	10,610
Households with Disability	26,494	71,963	16,369	33,891
Households Below the Poverty Level	25,478	42,178	16,463	31,881
Total Businesses	8,554	27,188	6,022	8,041
Total Employees	168,068	472,159	126,743	181,739
2017 Median Household Income	\$31,005	\$54,939	\$30,979	\$31,674
2017 Unemployment Rate	9.3%	5.3%	7.7%	8.8%
Households with No Vehicles	1,855	5,601	1,511	5,175
% of Workers Took Public Transportation	8.8%	2.9%	9.4%	11.7%
% of Workers Carpooled	10.9%	7.7%	9.4%	11.0%
% of Workers Biked	1.2%	0.5%	1.1%	1.1%
% of Workers Walked	6.6%	3.2%	11.1%	6.1%

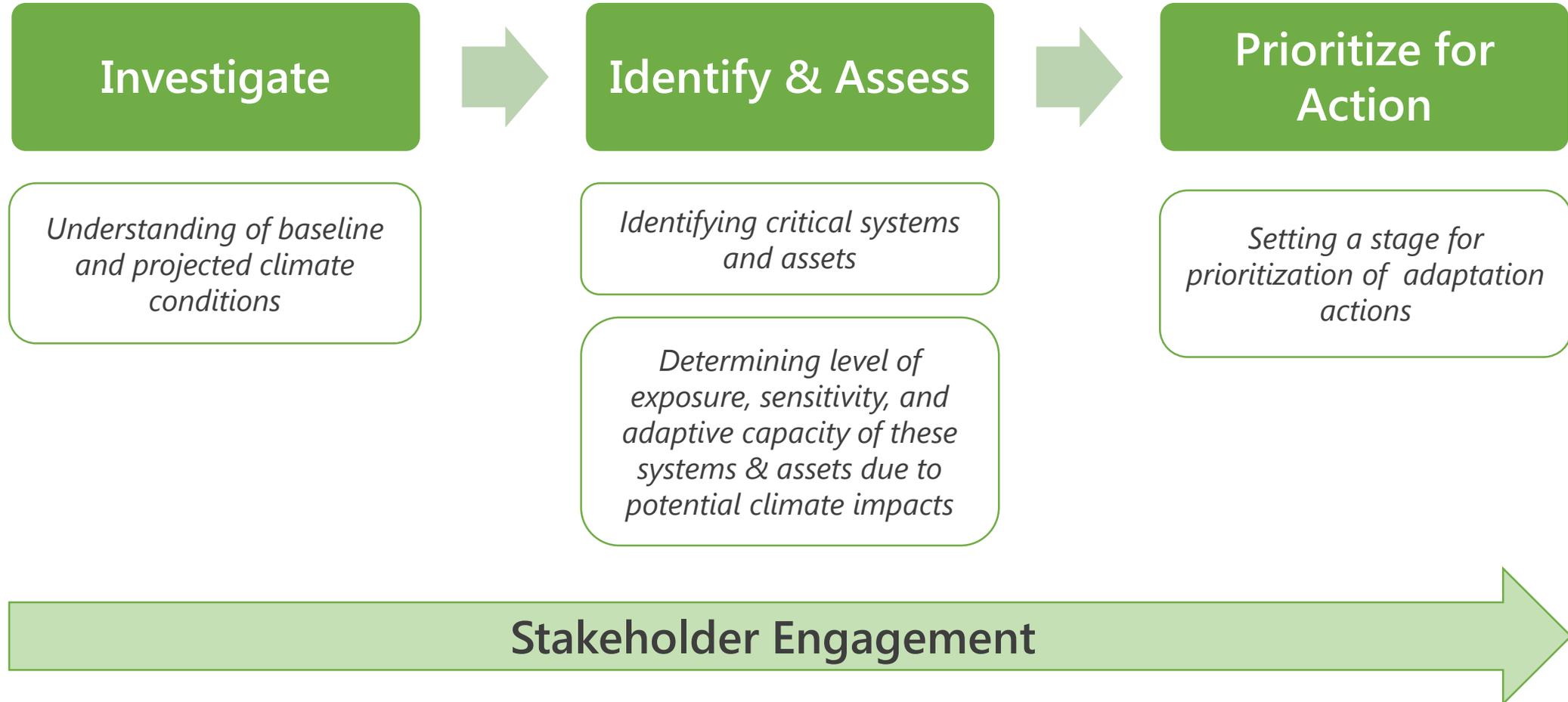
Source: 2011-2015 and 2017 data; provided by American Community Survey (ACS), Esri, Esri and Infogroup.

Rochester Climate Vulnerability Assessment (CVA)

- Continuation of the City of Rochester's climate planning efforts
 - *Supporting the adaptation and resiliency component of the Community-wide Climate Action Plan*
- Better understanding of the City's vulnerabilities and adaptive capacity
- Serving as guide to the City's capital project planning
- Making sure Rochester is a resilient city



Rochester CVA Approach



Stakeholder Engagement & Schedule

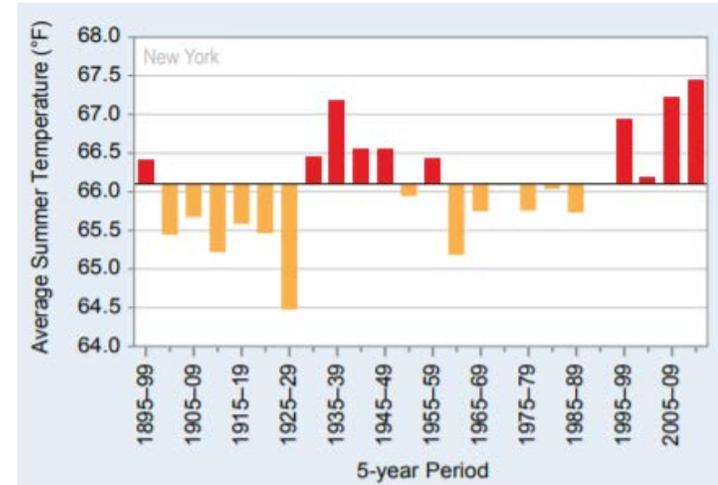
- ✓ Pre-Engagement Interviews – February
- Technical Advisory Committee Workshop #1 – March
- Targeted Focus Groups (3-5) – March/April
- Technical Advisory Committee Workshop #2 – May
- Public Meeting – August/September
- Final CVA Report – September

Climate Trends & Projections

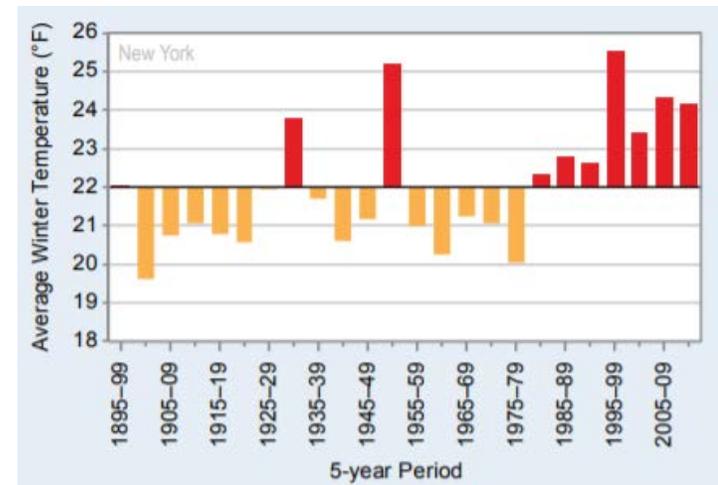
Regional and Local Climate Trends

- Increase in average annual temperature observed in all regions across the state of New York.
 - *Statewide average annual temperature has increased approximately 2.4°F since 1970, with winter warming exceeding 4.4°F.*
- Spring has been starting earlier and winter snow cover is decreasing compared to a few decades ago.
 - *The average freeze-free season length during 1991-2010 was approximately 10 days longer than during 1961-1990.*
- Since 2006, Lake Ontario has remained below 30% ice-cover (except during the cold 2013–2014 winter).

Observed Summer Temperature



Observed Winter Temperature



Regional and Local Climate Projections

- *Increase in temperatures*

	Baseline (1971 – 2000)	Mid-Century (2050 – 2079)	End of Century (2080 – 2100)
Average Annual Temperature	47.7°F	52°F to 54°F	54°F to 59.4°F
Number of Days \geq 90°F	8 days	22 to 34 days	27 to 57 days
Number of Days \leq 32°F	133 days	86 to 96 days	68 to 88 days
Number of Heatwaves	\leq 1 event	3 to 4 events	3 to 8 events
Duration of Heatwaves	4 days	4 to 5 days	4 to 6 days

Source: NYSERDA ClimAID 2014 Report
NOAA
NCA 3

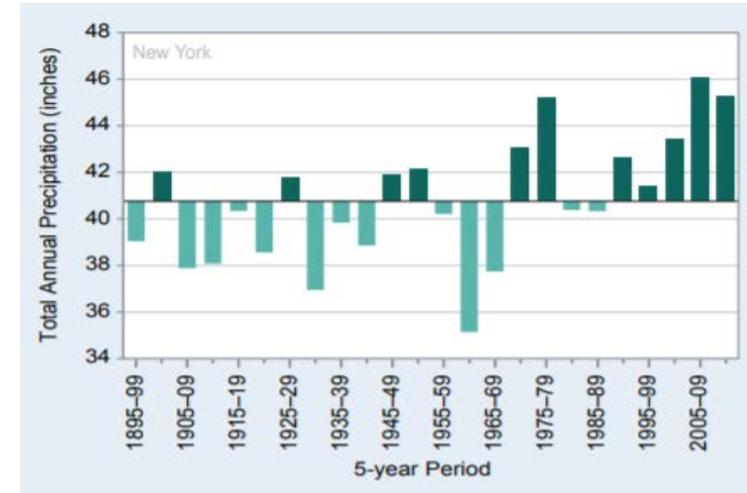
Potential Climate Impacts from Increased Temperature Days & Duration

- Increase in pollen production which may exacerbate asthma, allergies, and other respiratory conditions
- Changes or loss of ecosystems and biodiversity (especially in nearby Lake Ontario)
- Quality of soil and crop yields reduced
- Increased demand for water for irrigation
- Depletion of water supply
- Increase in public health and safety risks, particularly for the elderly, children, and pregnant women populations
- Urban heat island effects
- Increase in growing season, but potential shift in crop production and livestock areas due to climate shift
- Reduced demand for heating (reduced energy consumption), but at the same time, energy demand for cooling may increase
- More frost heaves and potholes on road and bridge surfaces due to more freeze-thaw conditions

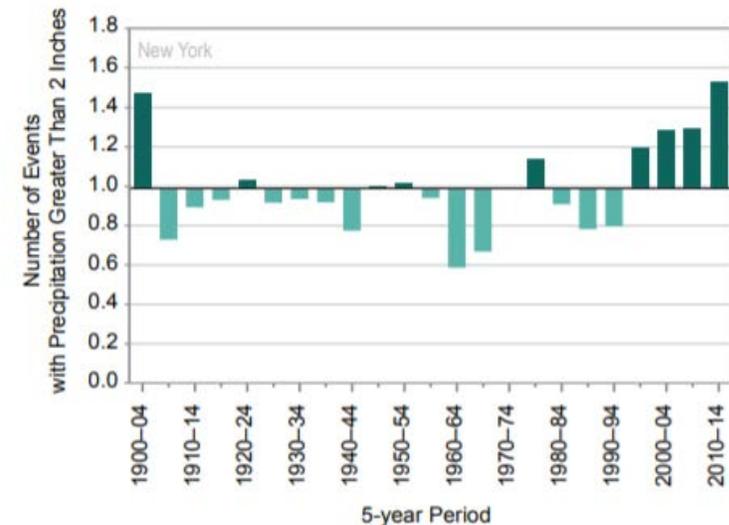
Regional and Local Climate Trends

- Statewide annual precipitation has ranged from a low 31.6 inches in 1964 to a high of 55.7 inches in 2011.
- Increase in average annual precipitation since 1900, at a rate of 0.4 inches per decade during 1895-2011.
 - *The wettest multi-year period was 2007-2011 with an average of 46.04 inches, compared to the statewide annual average of 40 inches.*
- More extreme precipitation and more frequent flooding (including from rivers) being experienced.
 - *While Rochester was not in the direct path of Hurricane Irene in August 2011, the City experienced flooding from remnants of the storm (and other tropical systems).*

Observed Annual Precipitation



Observed Number of Extreme Precipitation Events



Regional and Local Climate Projections

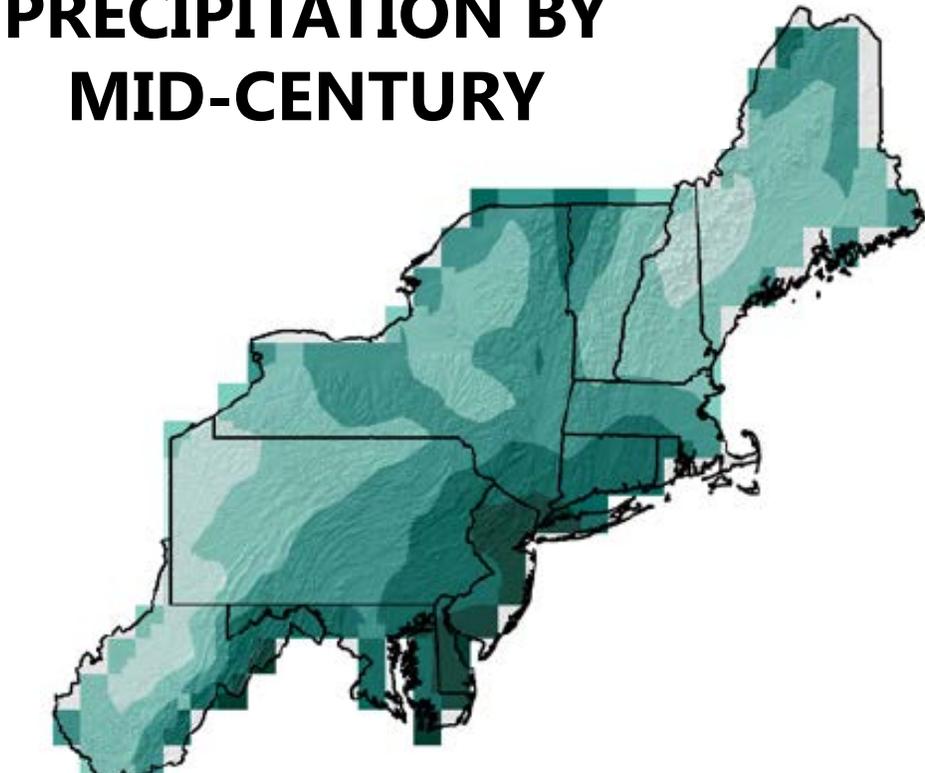
- *Changes in precipitation*

	Baseline (1971 – 2000)	Mid-Century (2050 – 2079)	End of Century (2080 – 2100)
Average Annual Precipitation	34 inches	4% to 10% increase	4% to 19% increase
Days per Year with Over 1" Rainfall	5 days	5 days	5 to 6 days
Extreme weather events	2-3 times more frequent by end of century		
Annual snowfall	Less frequent snowfall, shorter snow season		
Drought	Increase in short-duration drought during summer season by end of century		

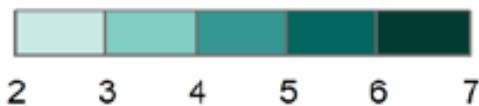
Source: NYSERDA ClimAID 2014 Report
NOAA
NCA 3

Regional and Local Climate Projections

CHANGES IN ANNUAL PRECIPITATION BY MID-CENTURY



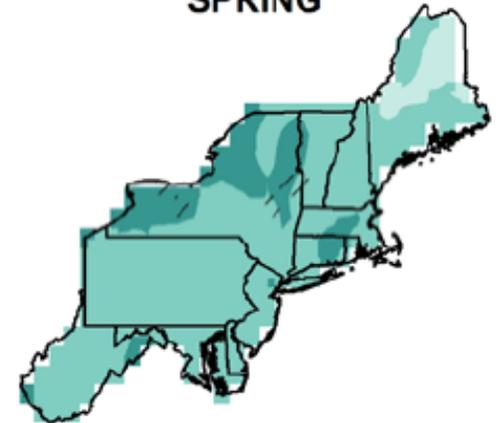
Percent Change



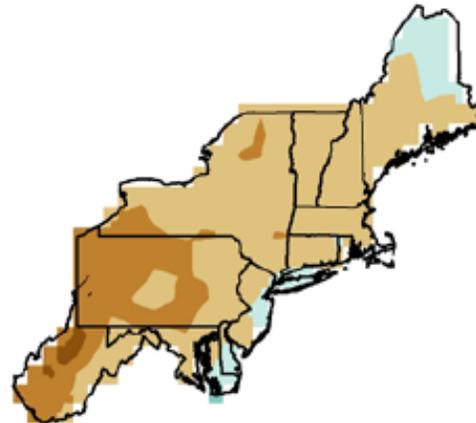
WINTER



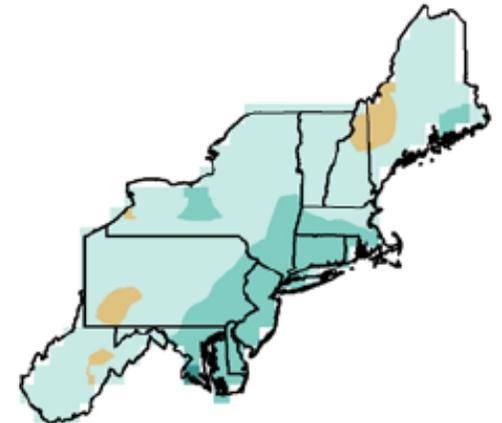
SPRING



SUMMER



FALL



Percent Change



Potential Climate Impacts from Changing Frequency and Intensity of Precipitation

- Increase in sediment and contaminants in water bodies
- Increase in soil erosion and runoff due to greater flood or flash flood risk
- Potential sanitary sewers and stormwater management systems overflow, pollutant run-offs, and therefore putting water quality and recreational activities at risk
- Increase in mold problems in homes and businesses
- Increase in travel delays
- Potential damage to power plants, rail lines, trees, during extreme weather events

Pre-Engagement Interviews: What we heard

How is Rochester most vulnerable?

- ✓ Flooding
- ✓ Increased temperatures
- ✓ Energy grid
- ✓ Disruptions to agriculture
- ✓ Influx of people who have been impacted due to impacts of climate change in other locations (i.e. Puerto Rico)
- ✓ Already strained services become even more strained during a crisis

Most vulnerable populations?

- ✓ Seniors
- ✓ Children
- ✓ Low-income
- ✓ Disabled
- ✓ Non-native English speakers
- ✓ Undocumented
- ✓ Refugees (climate and/or political)
- ✓ Those without the ability to access resources in a crisis (i.e. family, friends, financial resources)

Biggest opportunities for this study?

- ✓ Moving the conversation beyond the “choir”
- ✓ Shape future funding priorities for infrastructure, emergency preparedness and response
- ✓ Opportunity to improve/update environmental infrastructure
- ✓ Plan for ways to use/reallocate existing resources to help the most vulnerable
- ✓ Build on emergency preparedness planning and strengthening partnerships with Monroe County and State agencies

Open Discussion

- *Which other present and potential implications of climate change impacts do we need to consider for Rochester?*
- *Who are the most vulnerable populations?*
- *What do you find most surprising from this climate data overview?*

Recommendations of Planning Subject Areas, Systems and Sub-systems

Rochester CVA - Planning Subject Areas

PLANNING SUBJECT AREAS			
SYSTEMS	INFRASTRUCTURE	NATURAL RESOURCES	SOCIOECONOMIC
	Transportation	Environmental Resources	Public Health
	Utilities	Natural Habitat	Economy
	Water	Recreational & Open Spaces	Cultural Resources
	Building & Facilities		Social System/Human Services



System	Sub-System / Sector	Key Assets
TRANSPORTATION	Road and bridges	<ul style="list-style-type: none"> • Major roadways: <ul style="list-style-type: none"> • NY State Routes • Major arterials in the City • Bridges
	Public transportation	<ul style="list-style-type: none"> • Regional Transit Service (RTS) – Monroe routes • RTS Transit Center
	Highway	<ul style="list-style-type: none"> • I-390, I-490, I-590 • New York State Thruway
	Bike/pedestrian network	<ul style="list-style-type: none"> • Genesee Riverway Trail
	Airport & port	<ul style="list-style-type: none"> • Greater Rochester International Airport (ROC) • Port of Rochester • Amtrak Rochester Station • Greyhound/Trailways Bus Station
	Railways	<ul style="list-style-type: none"> • CSX railroad

System	Sub-System / Sector	Key Assets
UTILITIES	Energy	<ul style="list-style-type: none">• RG&E Transmission and Distribution Infrastructure• RG&E hydropower plants• Eastman Business Park energy generation systems• Rochester District Heating Cooperative (RDH) infrastructure• University of Rochester cogeneration facility
	Telecommunications	<ul style="list-style-type: none">• Emergency Response & Communication Systems

System	Sub-System / Sector	Key Assets
WATER	Water Supply	<ul style="list-style-type: none"> • Cobbs Hill, Highland Park, and Rush Reservoirs (and Hemlock and Canadice Lakes) • Hemlock Water Filtration Plant • Pump stations
	Wastewater	<ul style="list-style-type: none"> • Northwest Quadrant and VanLare WWTF • Sanitary sewer system*
	Stormwater	<ul style="list-style-type: none"> • Storm drains • Storm sewer system* • Outfalls
	Dam	<ul style="list-style-type: none"> • Mount Morris Dam

System	Sub-System / Sector	Key Assets
BUILDING & CRITICAL FACILITIES	Commercial	<ul style="list-style-type: none"> • Eastman Business Park • Major businesses • Commercial corridors and districts
	Residential	<ul style="list-style-type: none"> • Senior centers • Homeless shelters
	Industrial	<ul style="list-style-type: none"> • Eastman Business Park • Gleason Works • RF Harris Communications • Delphi
	Institutional	<ul style="list-style-type: none"> • University of Rochester • Rochester Institute of Technology • Monroe Community College • K-12 Schools
	Critical Facilities	<ul style="list-style-type: none"> • UR-Strong Memorial Hospital • Rochester General Hospital • Highland Hospital • Emergency Response Facilities (Fire stations, police stations, designated community centers, cooling centers)
	Municipal / Public Facilities	<ul style="list-style-type: none"> • Neighborhoods • Community centers

System	Sub-System / Sector	Key Assets
ENVIRONMENTAL RESOURCES	Waterway	<ul style="list-style-type: none"> • Genesee River • Irondequoit Bay • Lake Ontario • Erie Canal
	Wetlands	<ul style="list-style-type: none"> • State regulated freshwater wetlands
	Urban forest	<ul style="list-style-type: none"> • Street trees • Park trees
	Conservation land	<ul style="list-style-type: none"> • Conkey Corner Park • El Camino • Local Waterfront Revitalization Program (LWRP) designated areas

System	Sub-System / Sector	Key Assets
NATURAL HABITAT	Sensitive and Rare Habitats	

System	Sub-System / Sector	Key Assets
RECREATIONAL & OPEN SPACE	Public Park & Facilities	<ul style="list-style-type: none">• Genesee Valley Park• Highland Park (also reservoir)• Cobb's Hill Park (also reservoir for City's drinking water)• Seneca Park/Seneca Park Zoo• Turning Point Park• Durand Eastman Park• Public recreational facilities & playgrounds

System	Sub-System / Sector	Key Assets
PUBLIC HEALTH	Health services	<ul style="list-style-type: none"> • Health care providers • Health clinics • Monroe County Department of Public Health
	Emergency services	<ul style="list-style-type: none"> • Public safety, fire and police officers/volunteers • Community Emergency Response Team (CERT) • Emergency Communications Center (911 facility)
	Air quality	<ul style="list-style-type: none"> • N/A

System	Sub-System / Sector	Key Assets
SOCIAL SYSTEM/HUMAN SERVICES	Food systems	<ul style="list-style-type: none"> • Community gardens • Food pantries / Emergency food pantries, soup kitchens • Rochester Public Market • Local farmer's markets

System	Sub-System / Sector	Key Assets
CULTURAL RESOURCES		<ul style="list-style-type: none"> • The Strong Museum • Rochester Museum and Science Center • Memorial Art Gallery • Preservation Districts: Designated buildings of historic values (DBHV) • Heritage Trail

System	Sub-System / Sector	Key Assets
ECONOMY	Access to services	<ul style="list-style-type: none"> • Community gardens • Food pantries / Emergency food pantries, soup kitchens
	Jobs/Workforce	
	Key industries / employers	

Next Steps

- I. Conducting focus group discussions
- II. Conducting sensitivity and adaptive capacity analysis
(Stakeholder Engagement Workshop #2)
- III. Preparing a Draft Final Report
- IV. Hosting an public open house/workshop to solicit community feedback
- V. Developing Final CVA Report