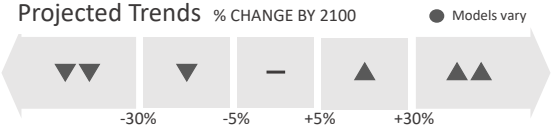
OBSERVED/PROJECTED CLIMATE CHANGES AND ASSOCIATED IMPACTS FOR CANTON & POTSDAM, NEW YORK



CLIMATE CHANGES	METRIC	TREND	OBSERVED/PROJECTED CHANGES
Air temperature	Annual temperature AVG DAILY TEMP (°F)	▲	+5.4°F by the 2050s; +10.6°F by the 2090s[1] COMPARED TO BASELINE OF 43.4°F FROM 1980–2009
	Summer temperature AVG DAILY JUN–AUG TEMP (°F)	▲	+4.6°F by the 2050s; +10.0°F by the 2090s[1] COMPARED TO BASELINE OF 65.8°F FROM 1980–2009
	Winter temperature AVG DAILY DEC–FEB TEMP (°F)	▲▲	+6.3°F by the 2050s; +12.2°F by the 2090s[1] COMPARED TO BASELINE OF 19.0°F FROM 1980–2009
	Frost days # OF DAYS WITH MIN TEMP < 32°F	▼	–24.8 days (–15%) by 2050s; –52.8 days (–32%) by the 2090s[1] COMPARED TO BASELINE OF 163.5 DAYS FROM 1980–2009
Extreme heat	Days over 90°F # OF DAYS WITH MAX TEMPS >90°F	▲▲	+11.7 days (+836%) by 2050s; +41.1 days (+2,036%) by 2090s[1] COMPARED TO BASELINE OF 1.4 DAYS FROM 1980–2009
Precipitation	Annual precipitation AVG INCHES PER YEAR	▲	+2.4 in (+6%) by the 2050s; +4.0 in (+10%) by 2100[1] COMPARED TO BASELINE OF 40.4 INCHES PER YEAR FROM 1980–2009
	Seasonality	▲	Significant increase in winter (+37%) and moderate increase in spring (+19%) precipitation; slight increase in summer (+4%) and decrease in fall (6%)[1]
Snow	Frequency & intensity	▼▼	Significant reductions in frequency of snowfall events and shorter season length[2] Uncertain changes in the intensity of individual snow events and frequency/intensity of ice storms and freezing rain[2]
Extreme precipitation	Frequency # OF DAYS WITH 2" RAIN IN 24 HOURS	▲	+0.02 days (+15%) by 2050s; +0.07 days (+54%) by 2090s[1] COMPARED TO BASELINE OF 0.13 DAYS FROM 1980–2009
	Amount 20-YEAR RETURN PERIOD TOTAL	▲	+13% increase in precipitation amount during 20-year events projected by 2050; +22% by 2100[3]
Storms & flooding	Frequency & severity	▲▲	Likely increase in occurrence of severe thunderstorms, including tornadoes[4] Increases in flood frequency, severity, and area vulnerable to flooding[5,6]
Drought	Frequency & severity	▲	Likely increase in the seasonal late-summer droughts; change in multi-year drought risk is currently unknown[2]

[1] New York Climate Change Science Clearinghouse Map (https://www.nyclimatescience.org/map), with county-scale temperature and precipitation projections presented as a range from the low-emissions to the high-emissions scenario (RCP 4.5 to RCP 8.5) for the average of 2040–2059 and 2080–2099 time periods (referred to as the 2050s and 2090s, respectively) compared to the average conditions between 1980 and 2009 (referred to as baseline conditions).

[2] R. M. Horton, D. A. Bader, C. Rosenzweig, A. T. DeGaetano, W. Solecki, "Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information" (Albany, New York, New York State Energy Research and Development Authority (NYSERDA), 2014), (available at https://www.nyserda.ny.gov/climaid).

[3] D. R. Easterling et al., in Climate Science Special Report: Fourth National Climate Assessment, Volume I, D. J. Wuebbles et al., Eds. (U.S. Global Change Research Program, Washington, DC, 2017; https://science2017.globalchange.gov/chapter/7/), pp. 207–230.

[4] N. S. Diffenbaugh, M. Scherer, R. J. Trapp, PNAS. 110, 16361–16366 (2013).

[5] P. D. Bates et al., Water Resources Research, 57, e2020WR028673 (2021).

[6] O. E. J. Wing et al., Nat. Clim. Chang. 12, 156–162 (2022).

LIKELY IMPACTS ASSOCIATED WITH PROJECTED CLIMATE CHANGES*	
 **Housing**	• Increased risk of damage to housing and critical infrastructure (e.g., utilities) following storms, floods, and extreme heat • Increased heat stress in developed areas, exacerbated by large areas of impervious surfaces and lack of vegetation • Increased energy demand during heat waves, straining electrical grids and potentially resulting in power outages and increased costs • Extreme heat and flooding exacerbate existing patterns of inequity for low-income neighborhoods and other vulnerable communities more likely to experience heat island effect and poor drainage and unable to afford increasing energy bills
 **Utilities**	• Increased stormwater capacity required to cope with precipitation increases and heavier rainfall during extreme events • Damage to critical infrastructure (e.g., wastewater treatment plants) during flood events • Increased energy demand during heat waves combined with greater stress on equipment designed to keep electrical infrastructure from overheating, potentially straining electrical grids and increasing costs for users • Increased concentration of contaminants and increased possibility of harmful algal blooms in water sources during drought periods, reducing effectiveness of water treatment
 **Transportation**	• Damage to transportation infrastructure (e.g., roads, bridges, culverts) following storms, floods, and extreme heat events • Road blockages following extreme events, impacting evacuation routes, emergency access, and critical travel • Loss of electricity due to flooding or heat waves, limiting use of electric vehicles and impacting public transit • Slower travel or road closures due to melting asphalt, overheating engines, and other impacts associated with extreme heat
 **Agriculture & Food Security**	• Increased length of the growing season and potential increases in heat stress, disease, and insect pests, impacting growth and productivity of agricultural crops • Increased presence of weeds and fungi that compete with crops for light, water, and nutrients • Reduced suitability of current crops for changing climate conditions, requiring shifts in crops/varieties and equipment needed for cultivation and processing • Economic impacts of crop failures and damage to agricultural operations following extreme events (e.g., floods), as well as supply chain disruptions that can impact community food accress • Increased food costs as a result of increases in food production and distribution, with disproportionate impacts on low-income populations • Increased health risks for agricultural workers exposed to extreme temperatures, vector-borne diseases, and other hazards

* All icons from the Noun Project: (1) Housing icon created by Carlos Dias; (2) Utilities icon created by Juan Pablo Bravo; (3) Road icon created by Jorge Namos; (4) Agriculture icon created by Vectors Point

Resources:

- New York Climate Change Science Clearinghouse (https://www.nyclimatescience.org/)
- Responding to Climate Change in New York State (ClimAID report: https://www.nyserda.ny.gov/climaid).
- Northeast Chapter of the Fourth National Climate Change Assessment (https://nca2018.globalchange.gov/chapter/18/)
- EPA's Environmental Justice Screening and Mapping Tool (https://ejscreen.epa.gov/mapper/)
- Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts (https://www.epa.gov/cira/social-vulnerability-report)
- Cleveland Racial Equity Tool (helps assess whether adaptation strategies will be equitable: https://www.sustainablecleveland.org/racial-equity)

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