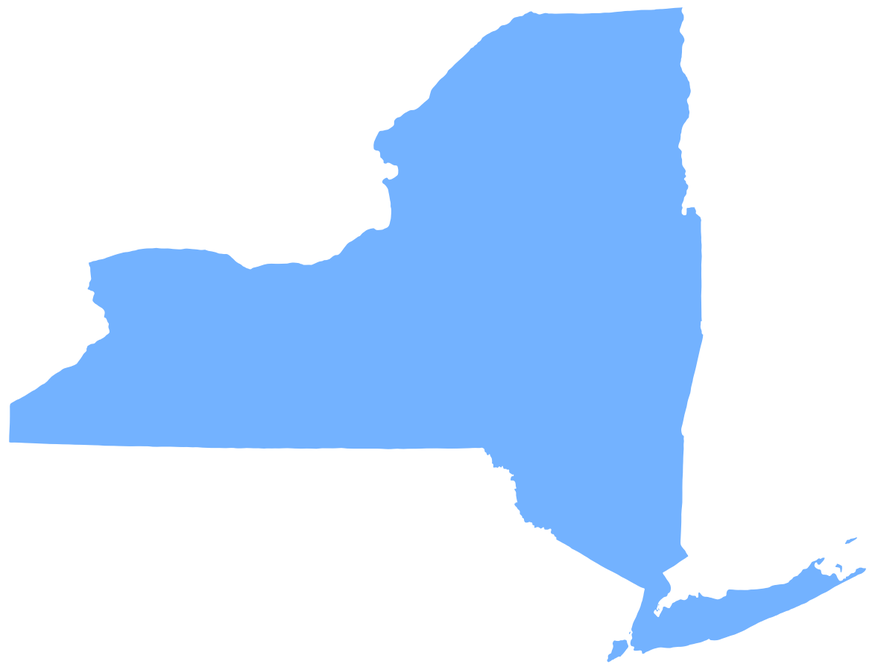
Climate Change and Public Health:
A Guide to Available Resources

CCHD
Clinton County HEALTH Department

2025

Table of Contents

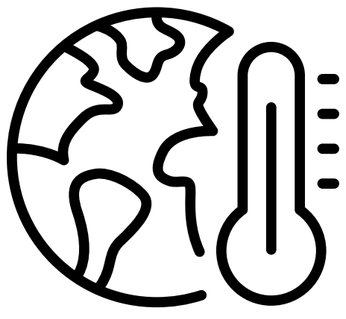


What Causes Climate Change?

Climate change is mainly caused by human activities, although natural factors also play a role. Natural factors like volcanic eruptions, changes in the sun's energy, and variations in the Earth's orbit also affect the climate. The main human activities that contribute to climate change include the burning of fossil fuels, deforestation, and changes in land use. When people burn fossil fuels like coal, oil, and natural gas for energy, it releases greenhouse gases such as carbon dioxide (CO_2) into the atmosphere. These gases trap heat which causes surface temperatures to warm up. This is known as the *greenhouse effect.* Cutting down trees and clearing forests release CO_2 into the air. Trees absorb CO_2, so when they are removed, less CO_2 is taken out of the atmosphere. This contributes to the warming of the planet.

See

- https://www.epa.gov/climatechange-science/causes-climate-change



How Climate Affects Health

Climate change is undeniably impacting residents of Clinton County and the Adirondacks region. The evidence of this transformation is visible in rising temperatures, shifting ecosystems, increased precipitation and storms, invasive species and a host of other significant impacts that affect agriculture, public health, and the local economy.

Rising Temperatures

The Champlain Valley is expected to experience some of the largest changes in temperatures in NYS. Temperatures in the region are projected to increase on average, between 4.6°F and 6.7°F by the 2050s and between 6.1°F and 10.8 °F by the 2080s compared with the 1981–2010 average. The number of very cold days in the region is expected to decrease.

For example, Dannemora, the weather station in this region with the best long-term weather records, has historically experienced an average of 21 days below 0°F. These very cold days are expected to become less common. By the middle of this century (the 2050s), Dannemora is projected to have only three to six days below 0°F, and by the end of this century (the 2080s), it is projected to have only 0.5 to four days below 0°F. (NYS Climate Assessment).

The warming climate is leading to shorter and milder winters, a change that significantly impacts the region’s environment and way of life. The winter season, which has long been a defining characteristic of the Adirondacks, is becoming less reliable, affecting activities such as skiing, snowboarding, and ice fishing that are central to the region's cultural and economic identity.

Changing Ecosystems

The rise in temperatures is causing shifts in the types of plants, insects, and wildlife that can thrive in the Champlain Valley and the Adirondacks. Species that are currently found in higher elevations are gradually moving northward or to cooler, higher altitudes (top of the mountain).

This shift disrupts local ecosystems and impacts industries like fishing, hunting, and tourism, which are vital to the region’s economy. For instance, brook trout, a species native to the cold waters of the Adirondacks, is facing habitat challenges due to warming water temperatures. The changing ecosystem dynamics also have a cascading effect on the food web, further altering the region's biodiversity.

Increased Precipitation and Storms

Climate change is leading to more frequent and intense precipitation events, including heavy rainfall and storms. Clinton County and the Adirondacks are experiencing an increase in the number of extreme weather events, which results in flooding, soil erosion, and damage to infrastructure. Roads, bridges, and buildings are more vulnerable to these weather extremes, leading to higher maintenance and repair costs.

Additionally, the increased runoff from heavy rains can lead to water quality issues in lakes and rivers, affecting both aquatic life and human water supplies.For example, in 2023, two extreme storms (one in early July and one in late December) caused water levels to rise dramatically as Lake Champlain received runoff from hundreds of rain-swollen lakes and streams in New York State and Vermont.

The December storm caused Lake Champlain water levels to rise to about four feet above the annual average water level of the lake (NYS Climate Impacts Assessment).

See

- https://www.health.ny.gov/environmental/emergency/weather/cold/
- https://www.health.ny.gov/environmental/emergency/weather/hot/
- https://www.health.ny.gov/environmental/emergency/flood/

Drought

While NYS has abundant water resources, periods of dryness or drought can occur. The Adirondack region typically has 'normal drought' conditions but can experience more severe drought when there is little to no rainfall for extended periods of time. Due to climate change, New York will see varying precipitation patterns and more days over 90° which may lead to more drought days per year. Drought conditions can impact agriculture negatively and decrease the availability of water in wells. As a result, drought can increases the chances of wildfire which can impact air quality.

See

- https://dec.ny.gov/environmental-protection/water/water-quantity/drought

Impact on Agriculture

The agricultural sector in Clinton County is also feeling the effects of climate change. Warmer temperatures and altered precipitation patterns can impact crop yields, water availability, and the overall viability of farming.

For example, dairy farming, a significant agricultural activity in the region, is challenged by heat stress on livestock and the availability of forage crops. Farmers are having to adapt their practices to cope with these changes, including altering planting schedules, investing in irrigation systems, and exploring new crop varieties that are more resilient to the changing climate (NYSDEC Climate Change Effects and Impacts).

See

- https://nysclimateimpacts.org/explore-the-assessment/case-studies/climate-change-threatens-apple-production/

Public Health Concerns

Climate change in the Champlain Valley will have impacts to public health and wellbeing. Rising temperatures can lead to heat-related illnesses, particularly among vulnerable populations such as the elderly and those with pre-existing health conditions.

Poor air quality, resulting from increased temperatures and the frequency of wildfires, can aggravate respiratory problems like asthma. Additionally, the spread of vector-borne diseases like Lyme disease is a growing concern as warmer temperatures allow ticks to expand their ranges and increase in numbers (NYS Climate Impacts Assessment).

See

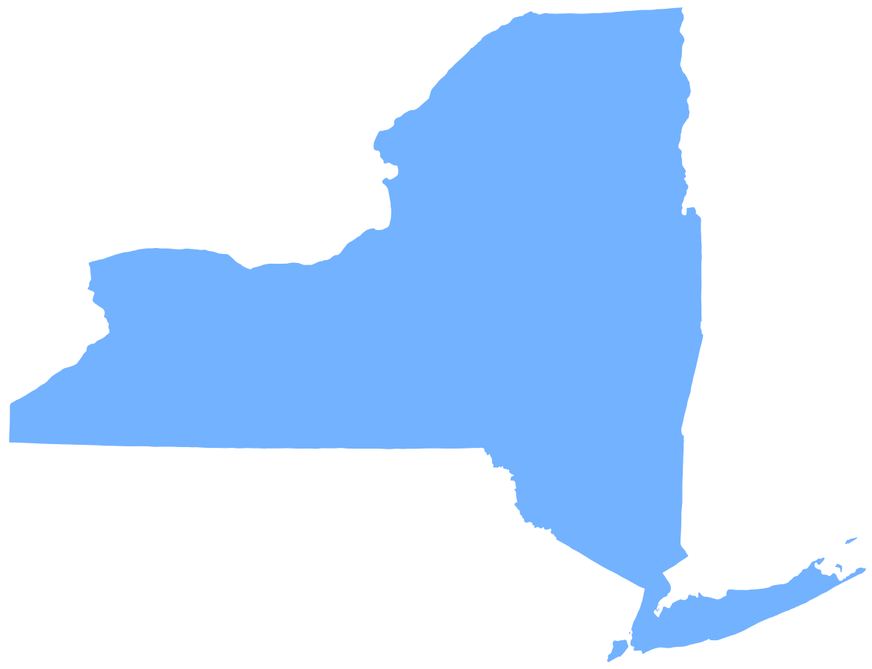
- https://www.health.ny.gov/diseases/communicable/lyme/

Cultural and Economic Impact

The cultural identity of the Adirondacks, shaped by its winter activities and outdoor lifestyle, is at risk due to climate change. The shorter and milder winters not only affect winter sports but also have broader implications for the local economy, which relies heavily on tourism. Seasonal businesses that depend on snow and ice are facing uncertainty, and communities are exploring ways to diversify their economic base to remain resilient in the face of climate change. The changing climate also influences property values and insurance costs, as areas prone to flooding and other climate-related hazards become riskier to invest in (NYS Climate Impacts Assessment).

Conclusion

Climate change is having a profound impact on Clinton County and the Adirondack region, affecting temperatures, ecosystems, agriculture, public health, and the local economy. While the challenges are significant, there are opportunities for adaptation and resilience. Communities, policymakers, and individuals must work together to mitigate the effects of climate change and protect the natural and cultural heritage of this unique region for future generations



Resource Guide Links

Description	Link
New York State Climate Impacts Assessment	https://nysclimateimpacts.org/explore-the-assessment/new-york-states-changing-climate/
NYS DEC Extreme Heat	https://dec.ny.gov/environmental-protection/climate-change/effects-impacts/extreme-heat#Action
DEC Climate Smart Communities	https://climatesmart.ny.gov/
HEAP Cooling Benefits	https://otda.ny.gov/programs/heap/#cooling-assistance
NYSERDA Clean Energy Programs	https://www.nyserda.ny.gov/All-Programs/Residential-and-Property-Owner-Income-Eligible-Programs#forOwners https://www.nyserda.ny.gov/Residents-and-Homeowners/Save-Energy-in-Your-Apartment
Extreme Heat	https://www.health.ny.gov/environmental/emergency/weather/hot/
Extreme Cold	https://www.health.ny.gov/environmental/emergency/weather/cold/
Extreme Weather	https://www.health.ny.gov/environmental/emergency/flood/

Resource Guide Links con’t.

Description	Link
Yale Climate Opionion Maps 2024	https://climatecommunication.yale.edu/visualizations-data/ycom-us-2024/
Lyme Disease	https://www.health.ny.gov/diseases/communicable/lyme/
Asthma	https://www.health.ny.gov/diseases/asthma/
Flooding	https://www.dhses.ny.gov/floods
Outdoor Air Quality	https://www.health.ny.gov/environmental/outdoors/air/
Algae Blooms	https://www.health.ny.gov/environmental/water/drinking/bluegreenalgae/
EEE	https://www.health.ny.gov/diseases/communicable/eastern_equine_encephalitis/
West Nile Virus	https://www.health.ny.gov/diseases/west_nile_virus/fact_sheet.htm