University of Vermont | Extension
College of Agriculture and Life Sciences

AGRICULTURE

Climate Change and Agriculture in Vermont

Fact Sheet: Observations, Projections, Impacts, Adaptation, and Resources

Vermont's climate is changing, and producers are directly experiencing these changes. The effects of climate change vary widely depending on farm type, production system, and location. Past climate trends, current observations, and future projections can help Vermont farmers and service providers assess emerging challenges, identify risk, recognize potential opportunities, and plan for adaptation that supports long-term viability.

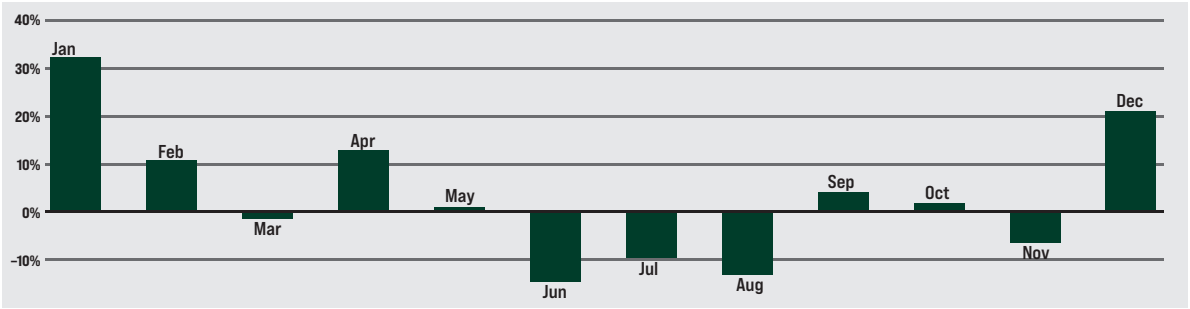
Observed Changes

- Vermont has warmed by about 3°F since 1900, with southeastern Vermont warming the most (+3.95°F).[1]
- Winters are warming 2–2.5x faster than annual averages.[1]
- The freeze-free season has lengthened by 7 days from 1900 to 2000, and an additional 16 days from 2000 to 2025.[2]
- Annual precipitation has increased by about 8" since the 1900s, with greatest increases in the northeast region of the state.[1]
- Precipitation is increasingly concentrated in fewer, more extreme events, with longer periods between storms.[6]
- Snowfall is decreasing as more winter precipitation falls as rain, leading to reduced snowpack.[5,8]
- Late summer drought risk is increasing, even as total annual precipitation rises.[1,6]
- Back-to-back extremes are more common, such as flooding and drought occurring in the same year.[3,4]

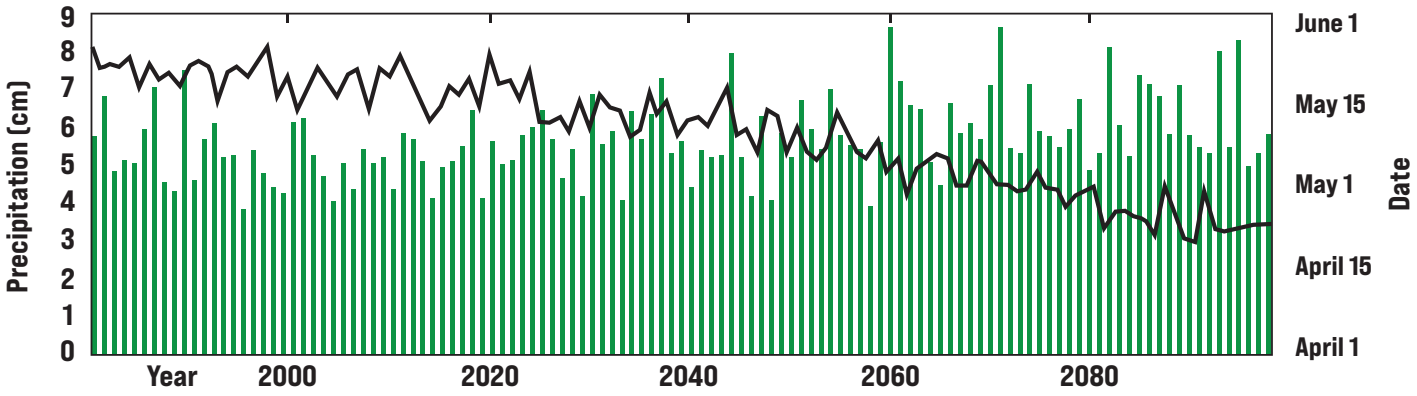
What's Expected in the Future

Projections under a high greenhouse gas emissions scenario:

- Total annual precipitation is projected to increase by up to 9" by 2100, with largest increases in winter and spring.[4]
- More extreme storms (>2") are expected.[4]
- Hot days will become more common, with day above 90°F increasing from 4 per year historically to 9 by mid-century.[4]
- Average annual temperatures are projected in increase by up to 9°F by 2100.[4]
- Warmer temperatures will increase water loss from soils and plants, contributing to late summer drought risk.[4]



Projected change in monthly precipitation in VT between 1980–1999 and 2050, showing increased seasonal variability[9]



Earlier last frost dates do not necessarily mean longer growing seasons. Burlington, VT projections show earlier last frost (black line) alongside increasing rainfall in the 21 days before last frost (green bars), which can limit field access and delay planting.[7] (For reference, 5 cm of precipitation is about 2 inches).

Climate-related physical challenges facing agriculture, associated impacts, and adaptation and resilience strategies

	Potential Impacts	Adaptation & Resilience
Excess Moisture, Flooding & Wet Soils	• Delayed planting and harvest • Fewer workable field days • Increased erosion, nutrient losses, compaction • Crop damage and losses • Increased disease pressure	• Tile drainage, surface grading, field ditching • Riparian buffers • Shift production to less flood-prone fields • Convert marginal acres to perennial cover • Plan crop placement based on flood risk
Drought & Water Stress	• Increased plant water stress • Reduced crop and forage quality • Unreliable water availability	• Expand irrigation capacity and efficiency (e.g. drip irrigation for vegetables) • Collect and store excess rainfall for later use
Warming & Heat Stress	• Heat stress in livestock • Reduced milk production and calving rates and fertility • Reduced crop quality in cool season crops • Greater weed and pest pressure • Earlier start to maple sugaring • Earlier budbreak and vulnerability to frost	• Fans, ventilation, misters (livestock) • Shade cloth • High vacuum tubing (maple) • Delayed budbreak varieties, frost protection (fruit) • Heat-tolerant crops and varieties • Double cropping • Extended growing and grazing seasons
Overall strategies for managing increased uncertainty: Investing in soil health, water management, high tunnels, diversification, equipment upgrades and maintenance, plant breeding, agroforestry, integrated pest management		

Resources & References

Climate Adaptation Resources for Farmers: **https://www.uvm.edu/climatefarming/**

Northeast Climate Hub: **https://www.climatehubs.usda.gov/hubs/northeast**

Your local UVM Extension Office: **https://www.uvm.edu/extension/office-directory**

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