

AGRICULTURE AND FOOD SYSTEMS

OVERVIEW

Climate change is reshaping Vermont’s food system and farmers, farmworkers, businesses, policymakers, and communities need reliable, actionable information to navigate emerging risks, uncertainties, and opportunities. Increasingly frequent extreme weather events, along with shifting temperature and precipitation patterns, are already creating challenges for agricultural production and food system infrastructure. Although a changing climate may create new opportunities, it also threatens crops, infrastructure, and the long-term viability of farms and food businesses. Proactive adaptation and resilience planning can help reduce these risks while strengthening the food system’s capacity to respond to future change.



24 days

Increase in the average growing season since 1900s



>\$82M

Food system losses in 2023 and 2024 due to extreme weather



45%

Farmers who cannot afford to deal with extreme weather impacts



15.8%

Share of GHG emissions from the agricultural sector

LONGER, LESS PREDICTABLE GROWING SEASON

Vermont’s growing season is extending, which might mean: increasing crop productivity, increasing viability of new crops, shifting harvesting and planting dates, and increasing pest pressures. Growing season length—calculated as the number of consecutive days above freezing—increased significantly from 1900–2024 by over three weeks (24 days; 20% increase; Figure 1). The last spring freeze is occurring earlier, and the first fall freeze is occurring later compared to the 1900s, with accelerating changes observed in the last three decades (1990–2024). While first and last freeze timing has shifted over time, variability from year to year remains high, creating uncertainty for farmers and maple producers.

Growing Season Length in Vermont (1900-2024)

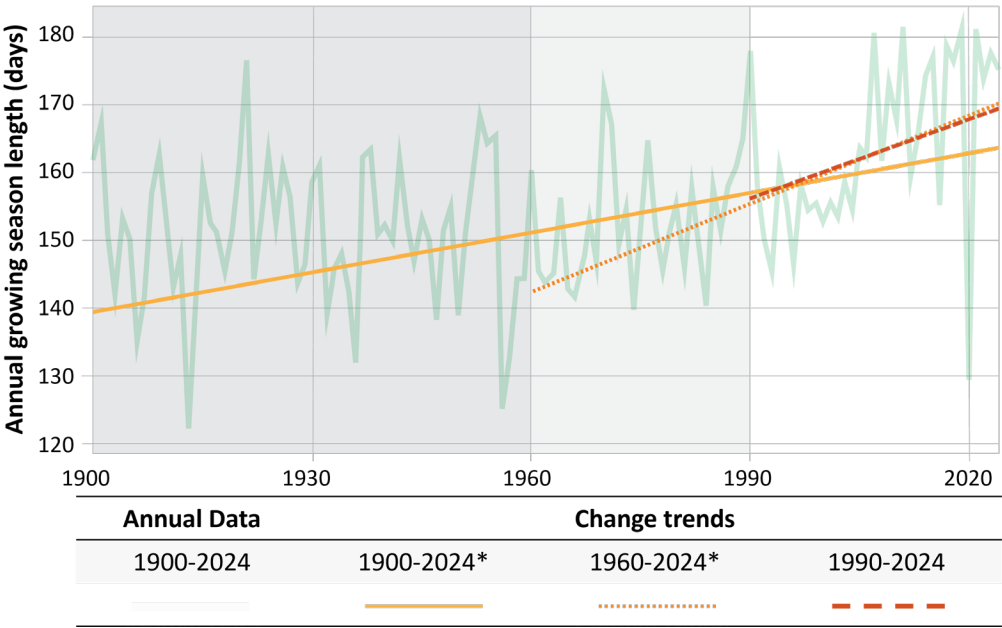


Figure 1 Growing season length in Vermont from 1900–2024 (n=15). Despite interannual variability, growing season length has increased, with a greater increase observed in the last 65 years compared to the long-term average. Statistically significant trends are marked with an asterisk in the legend at a 95% confidence level

Source: NOAA NECI (2026)

EXTREME EVENTS IMPACT FARM OPERATIONS

More rain and intense storms, especially in spring and winter, impact farm operation schedules, degrade soil function, and increase potential for crop disease (Table 1). In 2023 and 2024, flooding caused more than \$82 million in food systems damages and will likely continue to cause damages and disruptions to cropland, farm infrastructure, processing facilities, and distribution networks. That highlights the importance of disaster recovery and landscape adaptation. Similarly, summer drought in 2025 negatively impacted the quality and amount of forage, animal production, and increased demands for irrigation.

Table 1 Climate impacts, adaptation and resilience strategies across agricultural sectors

	Climate 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
Warming & Heat Stress	- Heat stress in livestock - Reduced milk production and calving rates - Reduced crop quality in cool season crops - Greater weed and pest pressure - Earlier start to maple sugaring - Earlier bud break 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: Soil health, water management, high tunnels, diversification, equipment upgrades and maintenance, integrated pest management, plant breeding, agroforestry		

HEAT STRESS IMPACTS PRODUCTION AND PRODUCERS

Average annual temperatures are rising, bringing hotter, more humid summers and milder winters to Vermont. Warming temperatures reduce crop and forage yields and quality, increase heat stress in livestock, decrease milk and meat production, and increase disease pressures that threaten animal health and productivity (Table 1). Heat stress can also endanger workers and bring new challenges to food safety throughout the supply chain. While the number of heat stress days in Montpelier has historically averaged below 20 days, this is projected to increase to over 80 days by the end of this century without significant global climate change mitigation efforts (Figure 2).

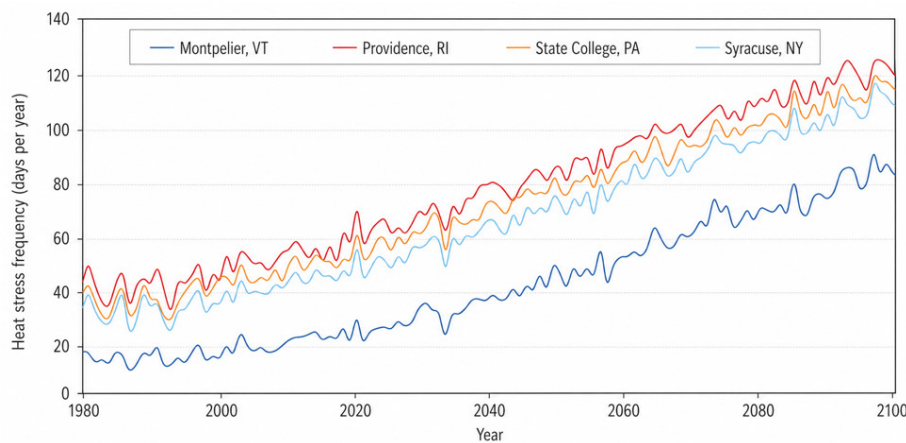


Figure 2 Projected increase in heat stress frequency in four locations in the Northeast U.S. assuming a business-as-usual greenhouse gas emissions scenario. Heat stress frequency is estimated as the number of days each year when temperature-humidity index exceeds 70. Montpelier, Vermont is in dark blue

Source: USDA (2020)

FOOD SYSTEMS ADAPTATION & RESILIENCE

Vermont’s food systems are already responding to climate change using a range of strategies including improving soil health, water management, and infrastructure; enterprise and crop diversification; integrated pest management; and expanding nature-based solutions (Table 1). Public policy can provide incentives for climate adaptation and mitigation, technical assistance, and financing to support disaster recovery. Strong local networks, economic and social support systems, and effective policy are required to strengthen resilience to future climate impacts.