



What's At Stake?

Vermont will face considerable disruption to the local food system and farm profitability and viability because of climate change.¹ In addition, the significant impact of climate change on global food production and supply chains intensifies the need to increase the resilience of Vermont farming and local food systems and maintain our agricultural land base. Supporting Vermont farmers' efforts to adapt will also reduce greenhouse-gas emissions, improve water quality, and perhaps make farmers more competitive with farms outside Vermont. Additional training, education, financial support, and research on adaptation will help farmers be resilient and innovative as the climate continues to change.

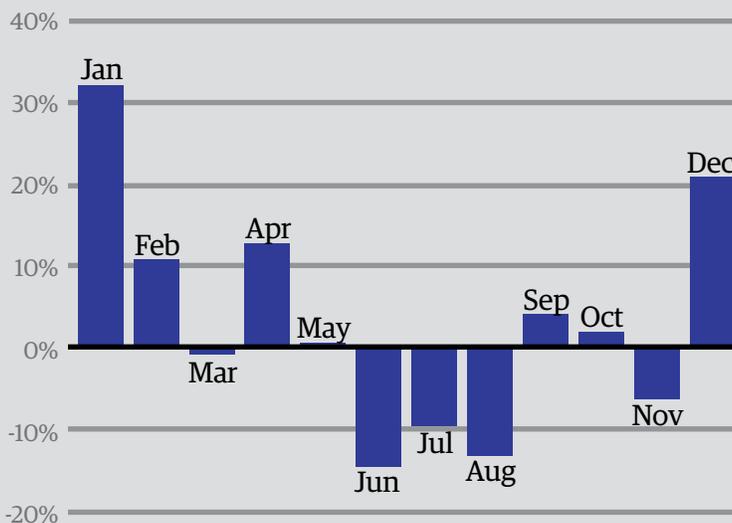
Current Conditions

Climate change effects on Vermont agriculture are largely dependent upon the type of farm, its specific production system, and its location and exposure to extreme events (e.g., flooding). Observed climatic changes include an increase in annual precipitation, a greater frequency of heavy storms, warming in annual average temperature, and higher temperature extremes. Projections estimate that these trends will continue to intensify, with more rain through the winter and spring months, and an increased risk of drought in late summer. For farms, this means increased pest and disease pressure, water stress on crops, and more heat stress on livestock.

Wet soils are already a significant concern and will continue to exacerbate resulting soil compaction, along with the risk of greater runoff, erosion, and nutrient loss from fields due to heavy storms. Overall, farms may face fewer field-working days due to wet soils in the spring, despite a lengthening of the growing season. At the same time, reliable water sources will become increasingly important for all farms, and efficient irrigation will be critical to sustain fruit and vegetable production. Apple growers will face an increased risk of frost damage as a result of warmer winter and early spring temperatures. Sugar maple sap runs may occur earlier in the winter, and result in a sugar season with fewer days when sap can be collected.

Farmers are adapting to the observed changes to some degree, but many lack the capacity to invest in adequate adaptation measures. There is also significant interest by farmers in employing management practices that store carbon and help mitigate climate change, but financial incentives for doing so are currently lacking. More action is necessary to maintain agricultural viability into the future.

Vermont's precipitation has been changing, and will continue to change. This figure shows projected change in **monthly average precipitation** between the period 1980-1999 and 2050.



Very heavy precipitation events have been increasing. From 1958 to 2016, the Northeast experienced:

- a **55%** increase in volume of precipitation falling in the heaviest 1% of events, and
- a **27%** increase in the maximum daily precipitation in consecutive five-year periods.
- In both of these metrics the Northeast saw the greatest increase of any U.S. region.

Bottlenecks & Gaps

- A recent survey indicated that vegetable and berry growers utilized crop insurance at a very low rate (7%) due to restrictive guidelines or structure of the programs.²
- A large majority of farmers understand they are vulnerable to extreme weather conditions. Fewer claim to have the knowledge and skill to deal with the threats. Only 45% say they have the financial capacity to deal with the threats.³
- Climate change adaptation is not currently funded by any financial and technical assistance program in Vermont.
- Applied research on specific adaptation practices is lacking for a variety of farm types, enterprises, and sizes.

Opportunities

- With research and by drawing upon agricultural knowledge and practices now being used in regions south of Vermont, new enterprises and crops can be adopted that are more resilient to the expected climate conditions and associated impacts.
- New programs could be developed to pay farmers to implement practices that help mitigate climate change and/or provide other ecosystem services (e.g., water quality, soil health, etc.).
- Significant greenhouse gas emission reductions and carbon sequestration on a national and international scale can help slow down climate change, giving Vermont agriculture more time to adapt. Vermont can support and partner with larger movements to encourage climate action.

Recommendations

- Fund a training program to be given to all agricultural service providers on the observed and projected changes in Vermont's climate, how it can affect agriculture, and basic adaptation principles. What is learned in these trainings can then be shared with their farm clients. Existing farmer networks can be utilized for climate change outreach and education, especially through peer-to-peer connections.
- Further investigate market mechanisms and existing systems, nationally and internationally, including voluntary, bilateral, and compliance, for providing payments to Vermont farmers for sequestering carbon and reducing greenhouse gas emissions.
- Investigate innovative funding mechanisms for assisting with implementation of climate change adaptation practices (such as cover crops and building organic matter in soil), crop insurance for diversified Vermont-scale farms, and emergency recovery following extreme weather events, so that we are better prepared to respond when climate change related events occur. Even with technical assistance program support, some water quality Best Management Practices (BMPs) that assist with climate change resiliency are still financially out of reach for many farms.
- By 2023, create carbon sequestration offsets protocols within Vermont's rules for the Regional Greenhouse Gas Initiative and the emerging, analogous Transportation Climate Initiative.

Farm to Plate is Vermont's food system plan being implemented statewide to increase economic development and jobs in the farm and food sector and improve access to healthy local food for all Vermonters.

The Vermont Agency of Agriculture, Food & Markets (VAAFMM) facilitates, supports, and encourages the growth and viability of agriculture in Vermont while protecting the working landscape, human health, animal health, plant health, consumers, and the environment.

This brief was prepared by:
Lead Author: Joshua Faulkner, *UVM Extension*
Contributing Authors: Alissa White, *UVM Graduate Student* | Alex DePillis, *VAAFMM*

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