

Climate Change and Agriculture in Vermont

Quick Guide: Observations, Projections, and Impacts

INTRODUCTION

Climate change is impacting Northeastern agriculture on a regional basis in differing ways and at varying magnitudes. Effects are largely dependent upon the dominant production methods and systems within a given area, as well as the localized shifts in climatic factors. Similarly, future effects will be governed by the degree of climate change that occurs, as well as the extent of adaptations and resilience measures adopted by producers. Past observations and future projections of climatic trends can help inform producers and service providers and aid in planning and developing effective management strategies. This fact sheet offers 1) a brief summary of observed climate trends in Vermont, 2) the most up-to-date modeled projections available, and 3) potential impacts on Vermont agriculture.

OBSERVED

- It is getting wetter. There has been a 9" increase in average annual precipitation over the past century¹
- Northern Vermont is becoming wetter at a faster rate than southern Vermont¹
- Very heavy precipitation events are more common, increasing 71% from 1958-2012 in the Northeast²
- There was a 2.5°F (approx.) increase in annual average temperature in VT over the past century¹
- The VT growing season has increased by 3.7 days/decade³
- Winter extreme minimum temperatures have become less cold across the Northeast¹



PROJECTED

Projections are all for the Lake Champlain Basin for the 2040-2069 time span⁴:

- Increase in annual precipitation by almost another 3 inches
- An increase in annual mean temperature of 5.6°F, with average winter temps increasing by 6.7°F
- Heat index will increase by almost four-fold (degree days)
- Growing season will increase by four weeks
- Expect 18 more days per summer that are over 90°F, and 32 fewer days where the avg. temperature is below freezing
- During the month of July, crop water needs will regularly be greater than incoming rainfall
- A decrease in maple sap production by seven days per year

POTENTIAL IMPACTS

- Increased erosion and loss of nutrients from fields
- Increased likelihood of damaging floods
- Wet soils resulting in reduced yields, increased compaction, and sub-optimal timing of field operations
- Increased need and demand for irrigation
- Increased pest and weed pressure
- Reduced yield/quality of cool season crops
- Increased risk of heat stress in livestock
- Increased risk of spring frost damage for fruit growers
- New opportunities and crops with extended growing season

References and Resources

- ¹National Oceanic and Atmospheric Administration, National Climatic Data Center: www.ncdc.noaa.gov
- ²Karl, T. R., J. T. Melillo, and T. C. Peterson, 2009: *Global Climate Change Impacts in the United States*. T.R. Karl, J.T. Melillo, and T.C. Peterson, Eds. Cambridge University Press, 189 pp.
- ³Galford, G.L., A. Hoogenboom, S. Carlson, S. Ford, J. Nash, E. Palchak, S. Pears, K. Underwood, and D.V. Baker, Eds. 2014. *Considering Vermont's Future in a Changing Climate: The First Vermont Climate Assessment*. Gund Institute for Ecological Economics, 219 pp.
- ⁴Guilbert, J., B. Beckage, J.M. Winter, R.M. Horton, T. Perkins, and A. Bombles. 2014. Impacts of projected climate change over the Lake Champlain basin in Vermont. *J. Appl. Meteorology and Climatology*. 53:1861-1875.