



Length of Growing Season

This indicator measures the length of the growing season in the contiguous 48 states.

Background

The length of the growing season in any given region refers to the number of days when plant growth takes place. The growing season often determines which crops can be grown in an area, as some crops require long growing seasons, while others mature rapidly. Growing season length is limited by many different factors. Depending on the region and the climate, the growing season is influenced by air temperatures, frost days, rainfall, or daylight hours.

Changes in the length of the growing season can have both positive and negative effects. Moderate warming can benefit crop and pasture yields in mid-to high-latitude regions, yet even slight warming decreases yields in seasonally dry and low-latitude regions.¹⁴ A longer growing season could allow farmers to diversify crops or have multiple harvests from the same plot. However, it could also limit the types of crops grown, encourage invasive species or weed growth, or increase demand for irrigation. A longer growing season could also disrupt the function and structure of a region's ecosystems and could, for example, alter the range and types of animal species in the area.

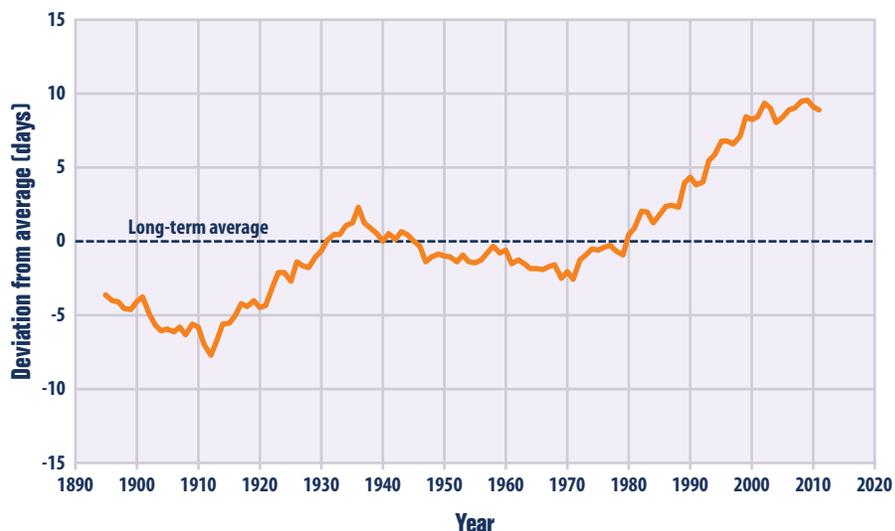
About the Indicator

This indicator looks at the impact of temperature on the length of the growing season in the contiguous 48 states, as well as trends in the timing of spring and fall frosts. For this indicator, the length of the growing season is defined as the period of time between the last frost of spring and the first frost of fall, when the air temperature drops below the freezing point of 32°F.

Trends in the growing season were calculated using temperature data from 750 weather stations throughout the contiguous 48 states. These data were obtained from the National Oceanic and Atmospheric Administration's National Climatic Data Center. Growing season length and the timing of spring and fall frosts were averaged across the nation, then compared with long-term average numbers (1895–2011) to determine how each year differed from the long-term average.

Figure 1. Length of Growing Season in the Contiguous 48 States, 1895–2011

This figure shows the length of the growing season in the contiguous 48 states compared with a long-term average. For each year, the line represents the number of days shorter or longer than average. The line was smoothed using an 11-year moving average. Choosing a different long-term average for comparison would not change the shape of the data over time.



Data source: Kunkel, 2012¹⁵

Figure 2. Length of Growing Season in the Contiguous 48 States, 1895–2011: West Versus East

This figure shows the length of the growing season in the western and eastern United States compared with a long-term average. For each year, the line represents the number of days shorter or longer than average. The lines were smoothed using an 11-year moving average. Choosing a different long-term average for comparison would not change the shape of the data over time.



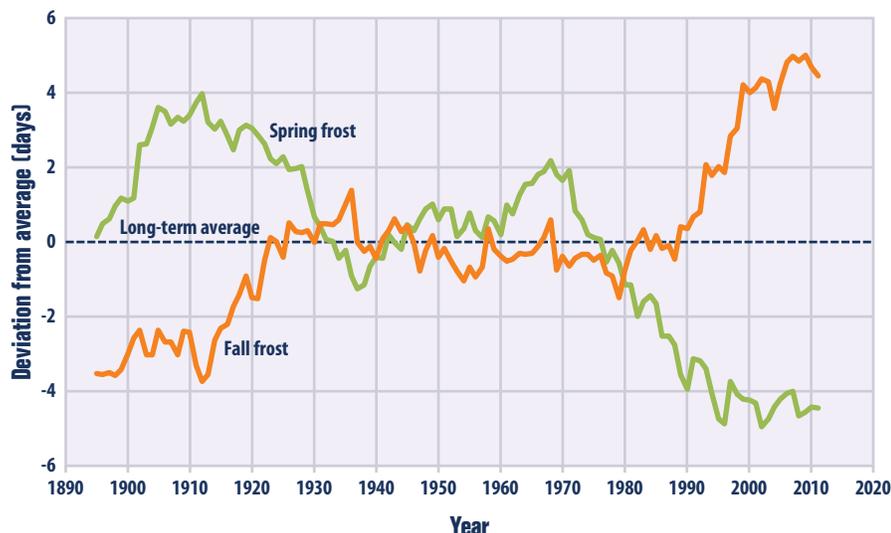
Data source: Kunkel, 2012¹⁶

Key Points

- The average length of the growing season in the contiguous 48 states has increased by nearly two weeks since the beginning of the 20th century. A particularly large and steady increase occurred over the last 30 years (see Figure 1).
- The length of the growing season has increased more rapidly in the West than in the East. In the West, the length of the growing season has increased at an average rate of about 22 days per century since 1895, compared with a rate of about eight days per century in the East (see Figure 2).
- The final spring frost is now occurring earlier than at any point since 1895, and the first fall frosts are arriving later. Since 1980, the last spring frost has occurred an average of about three days earlier than the long-term average, and the first fall frost has occurred about two days later (see Figure 3).

Figure 3. Timing of Last Spring Frost and First Fall Frost in the Contiguous 48 States, 1895–2011

This figure shows the timing of the last spring frost and the first fall frost in the contiguous 48 states compared with a long-term average. Positive values indicate that the frost occurred later in the year, and negative values indicate that the frost occurred earlier in the year. The lines were smoothed using an 11-year moving average. Choosing a different long-term average for comparison would not change the shape of the data over time.



Data source: Kunkel, 2012¹⁷

Indicator Notes

Changes in measurement techniques and instruments over time can affect trends. This indicator only includes data from weather stations with a consistent record of data points for the time period.

Data Sources

All three figures are based on temperature data compiled by the National Oceanic and Atmospheric Administration's National Climatic Data Center, and these data are available online at: www.ncdc.noaa.gov/oa/ncdc.html. Frost timing and growing season length were analyzed by Kunkel (2012).¹⁸

