



U.S. and Global

This indicator describes trends in average precipitation for the United States and the world.

Background

Precipitation can have wide-ranging effects on human life and ecosystems. Rainfall, snowfall, and the timing of snowmelt can all affect the amount of water available for drinking and irrigation, and can also determine what types of animals and plants (including crops) can survive in a particular place. Changes in precipitation can disrupt a wide range of natural processes, particularly if these changes occur abruptly and plant and animal species do not have time to adapt.

As average temperatures at the Earth's surface rise (see the U.S. and Global Temperature indicator on p. 22), more evaporation and cloud formation occurs, which, in turn, increases overall precipitation. Therefore, a warming climate is expected to increase precipitation in many areas. However, just as precipitation patterns vary across the world, so will the effects of climate change. By shifting the wind patterns and ocean currents that drive the world's climate system, climate change will also cause some areas to experience decreased precipitation.

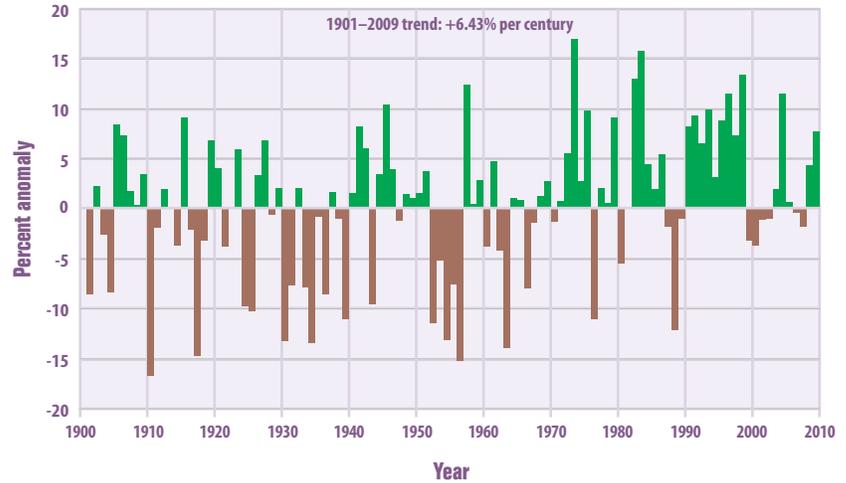
About the Indicator

This indicator examines U.S. and global precipitation patterns from 1901 to the present, based on rainfall and snowfall measurements from land-based stations worldwide. Data were provided by the National Oceanic and Atmospheric Administration, which keeps historical records from weather stations around the world.

This indicator shows annual anomalies, or differences, compared with the average precipitation from 1901 to 2000. These anomalies are presented in terms of percent change compared with the baseline.

Figure 1. Precipitation in the Lower 48 States, 1901–2009

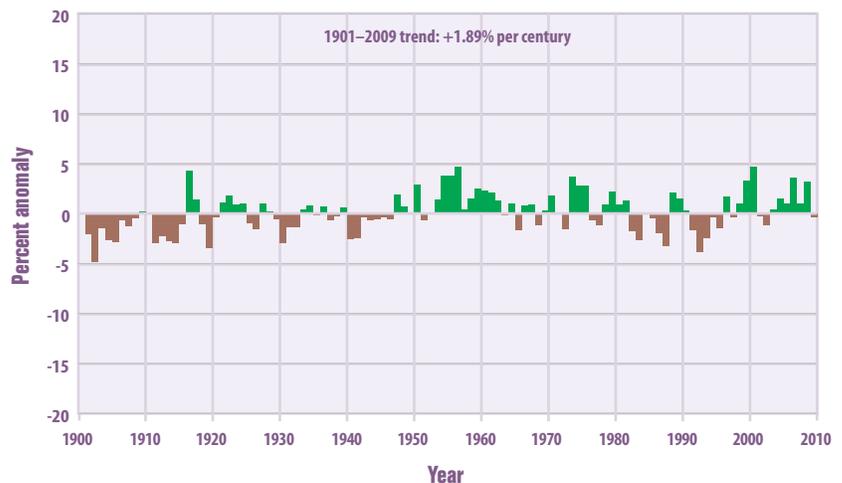
This figure shows how the amount of precipitation in the lower 48 states has changed since 1901. This graph uses the 1901 to 2000 average as a baseline for depicting change. Choosing a different baseline period would not change the shape of the trend.



Data source: NOAA, 2010¹⁵

Figure 2. Precipitation Worldwide, 1901–2009

This figure shows how the amount of precipitation globally has changed since 1901. This graph uses the 1901 to 2000 average as a baseline for depicting change. Choosing a different baseline period would not change the shape of the trend.



Data source: NOAA, 2010¹⁶

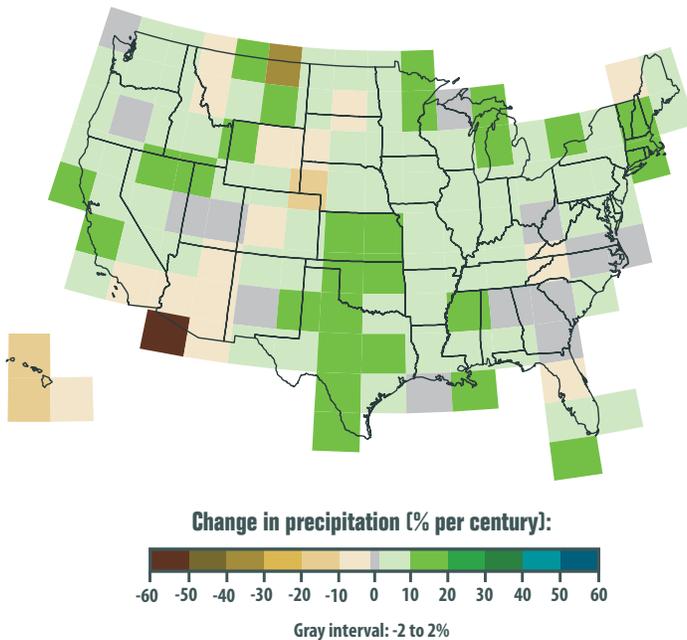
Precipitation

Key Points

- Average precipitation has increased in the United States and worldwide (see Figures 1 and 2). Since 1901, global precipitation has increased at an average rate of 1.9 percent per century, while precipitation in the lower 48 states has increased at a rate of 6.4 percent per century.
- Some parts of the United States have experienced greater increases in precipitation than others. A few areas such as Hawaii and parts of the Southwest have seen a decrease (see Figure 3).

Figure 3. Rate of Precipitation Change in the United States, 1901–2008

This figure shows how the amount of precipitation has changed in different parts of the United States since the early 20th century (since 1901 for the lower 48 states; since 1905 for Hawaii). Alaska is not shown because of limited data coverage.



Data source: NOAA, 2009¹⁷

Indicator Limitations

Data from the early 20th century are somewhat less precise because there were fewer stations collecting measurements at the time. However, the overall trends are still reliable. Measurement instruments and methods have also changed over time, and some stations have moved. Where possible, the data have been adjusted to account for these kinds of changes.

Data Sources

The data for this indicator were provided by the National Oceanic and Atmospheric Administration's National Climatic Data Center, which maintains a large collection of climate data online at: www.ncdc.noaa.gov/oa/ncdc.html. Global, U.S., and regional precipitation anomalies were calculated based on monthly values from a network of long-term monitoring stations.

