

# Precipitation

The yearly amount of precipitation over California has become more variable since 1980. With warmer temperatures, more precipitation has fallen as rain than snow in recent years.

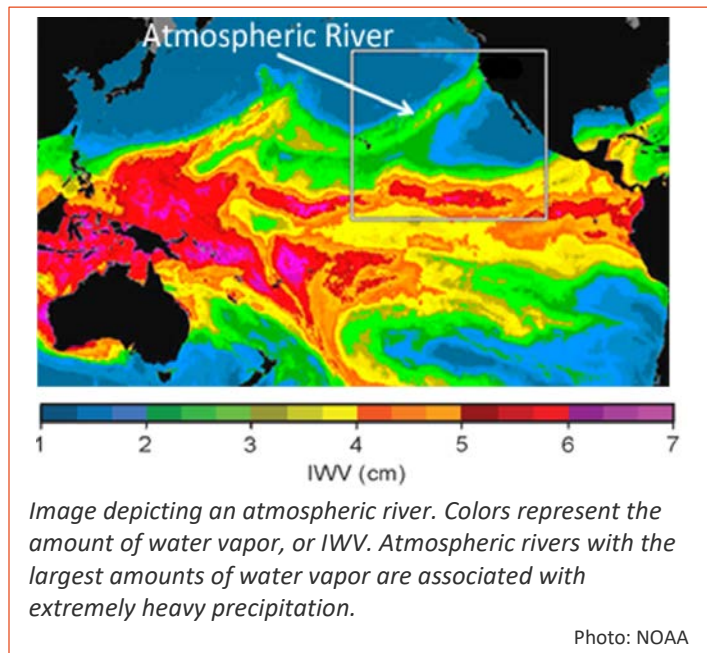
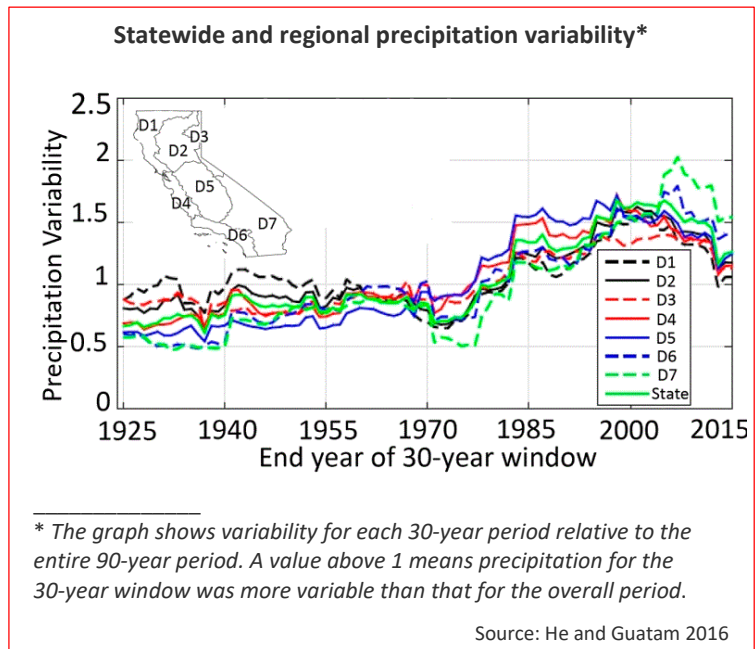


Extremely dry and extremely wet years have become more common in California. On average, the state receives 75 percent of its annual precipitation from November through March, with 50 percent occurring from December through February. As the winter months have become warmer in recent years, more precipitation has been falling as rain instead of snow over the watersheds that provide most of the state's water supplies.

## What does the indicator show?

No clear trend is evident in the amount of yearly precipitation statewide. However, since the 1980s, year-to-year precipitation has become more variable in most of California and statewide (see graph, right). This means years with extremely low and extremely high precipitation have become more frequent.

The lowest total was recorded at 9.4 inches in 1924, and the highest at 41.66 inches in 2017 (not shown). Seven of the last ten years have been dry, with totals below the statewide average of 22.9 inches. The last decade also includes the driest consecutive four-year period, from 2012 to 2015.

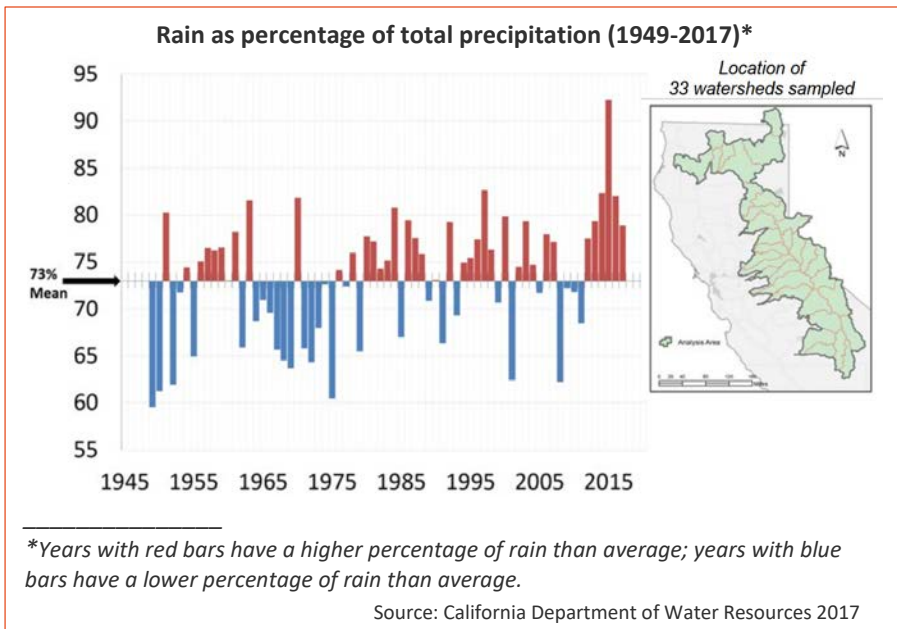


Much of the year-to-year variability has been linked to the occurrence of storms called “atmospheric rivers.” Atmospheric rivers carry moisture from the tropics to the earth’s poles in long, narrow bands of water vapor (measuring approximately 1,000 miles long and 250 to 370 miles wide; see image, left). On average, they provide 30 to 50 percent of California’s annual precipitation and 40 percent of the Sierra Nevada snowpack. Because of the copious amounts of moisture they can carry, atmospheric rivers play a role in ending droughts and in producing large floods in California.





The temperature of the air and the ground determines whether precipitation falls as rain or snow. The graph on the right shows the percentage of precipitation falling as rain each year over the 33 watersheds that provide most of the state's water supply (see inset map). Over the period shown, rain averaged 73 percent of the total precipitation.



In recent years, a greater percentage of rain than average has fallen, peaking at about 92 percent in 2015, when the snowpack was the lowest on record.

### Why is this indicator important?

The state relies on winter snowpack storing water during the cold months. Runoff from melting snowpack in the warmer months supplies the water needed by the state for municipal uses and agriculture. This snowmelt also provides water to sustain forests and cold water habitat for fish. Tracking trends in the amount and physical state of precipitation and in the patterns of storm events is critical in managing reservoirs for both water storage and flood protection in California.



*Flooding from Deer Creek reached Lefty's Grill in Nevada City during the atmospheric river storm on January 10, 2017.*

Photo: California Department of Water Resources

With climate change, more intense dry periods under warmer conditions are anticipated, leading to extended, more frequent drought in California. A higher proportion of precipitation falling as rain instead of snow and an increase in the duration, frequency, and intensity of warm, wet "atmospheric river" storms are also projected. This can result in greater flooding, and force reservoirs to release more water early in the spring, which means less water will be available for agriculture and municipal uses in the summer and fall.

For more information about this and other climate change indicators, visit:

<https://oehha.ca.gov/climate-change/report/2018-report-indicators-climate-change-california>