

# TAHOE: STATE OF THE LAKE REPORT 2018

## METEOROLOGY



**UC DAVIS**

Tahoe Environmental  
Research Center

**METEOROLOGY**

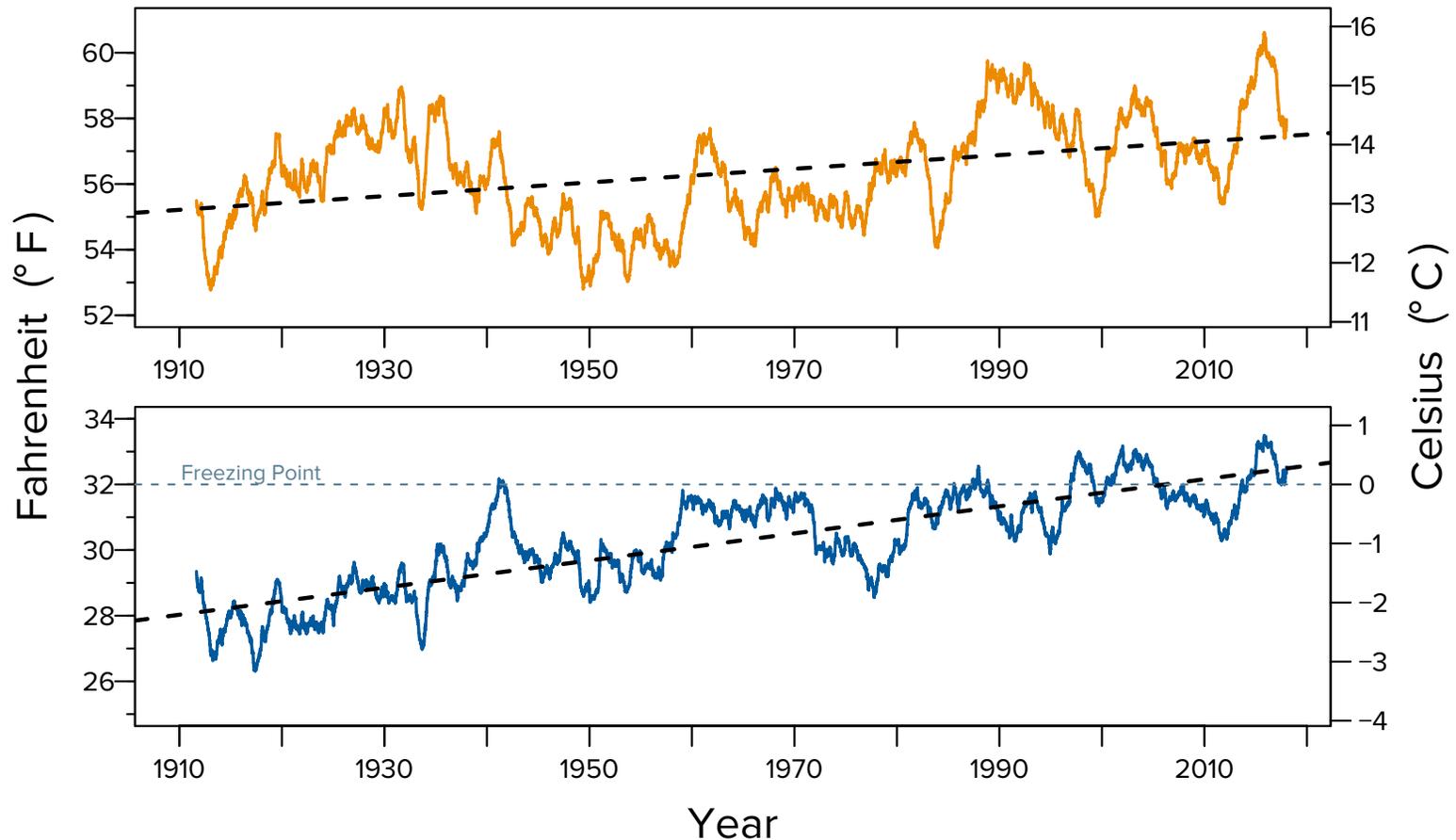
**Air temperature - smoothed daily maximum and minimum**

Daily since 1911

Over the last 100 years, daily air temperatures measured at Tahoe City have increased. The long-term trend in average daily minimum temperature (bottom figure) has increased by 4.4 °F (2.4 °C), and the long-term trend

in average daily maximum temperature (upper figure) has risen by 2.2 °F (1.2 °C). The trend line for the minimum air temperature now exceeds the freezing temperature of water, which is driving more rain and less snow, as well as earlier

snowmelt at Lake Tahoe. These data have been smoothed by using a two-year running average to remove daily and seasonal fluctuations. Data source: the long-term NOAA daily maximum and minimum temperatures data set.



## METEOROLOGY

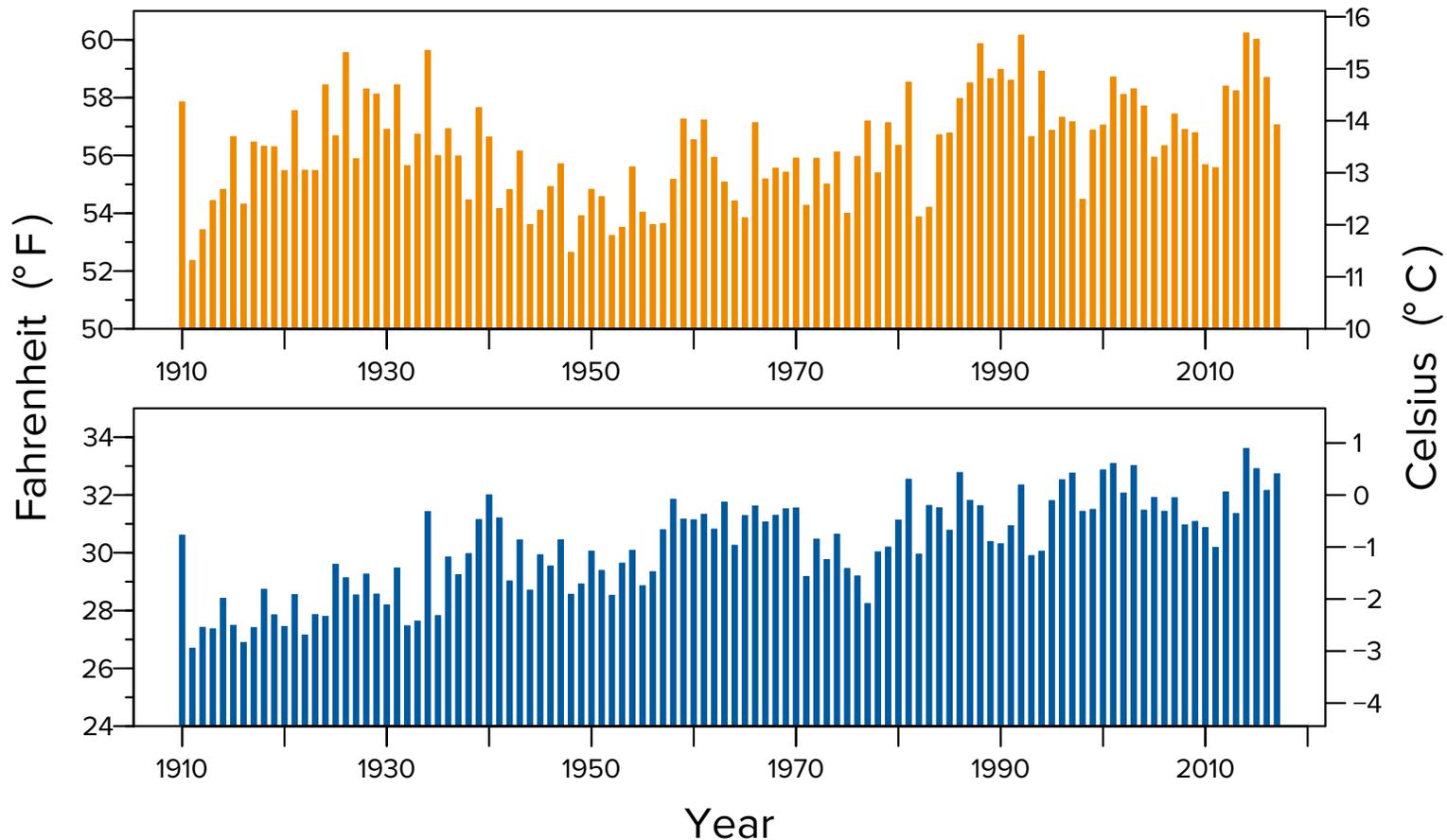
### Air temperature - annual average maximum and minimum

Since 1910

Annual average maximum (upper figure) and minimum (lower figure) air temperatures in 2017 were both well above the long-term average. The 2017 annual average minimum was 32.8 °F (0.4 °C)

an increase of 0.6 °F over the previous year. The maximum temperature was 57.1 °F (13.9 °C) a decrease of 0.6 °F over the previous year. The long-term means for the minimum and the maximum are

30.3 °F (-0.96 °C) and 56.4 °F (13.6 °C), respectively. Data source: the long-term NOAA daily maximum and minimum temperatures data set.



**METEOROLOGY**

**Below-freezing air temperatures**

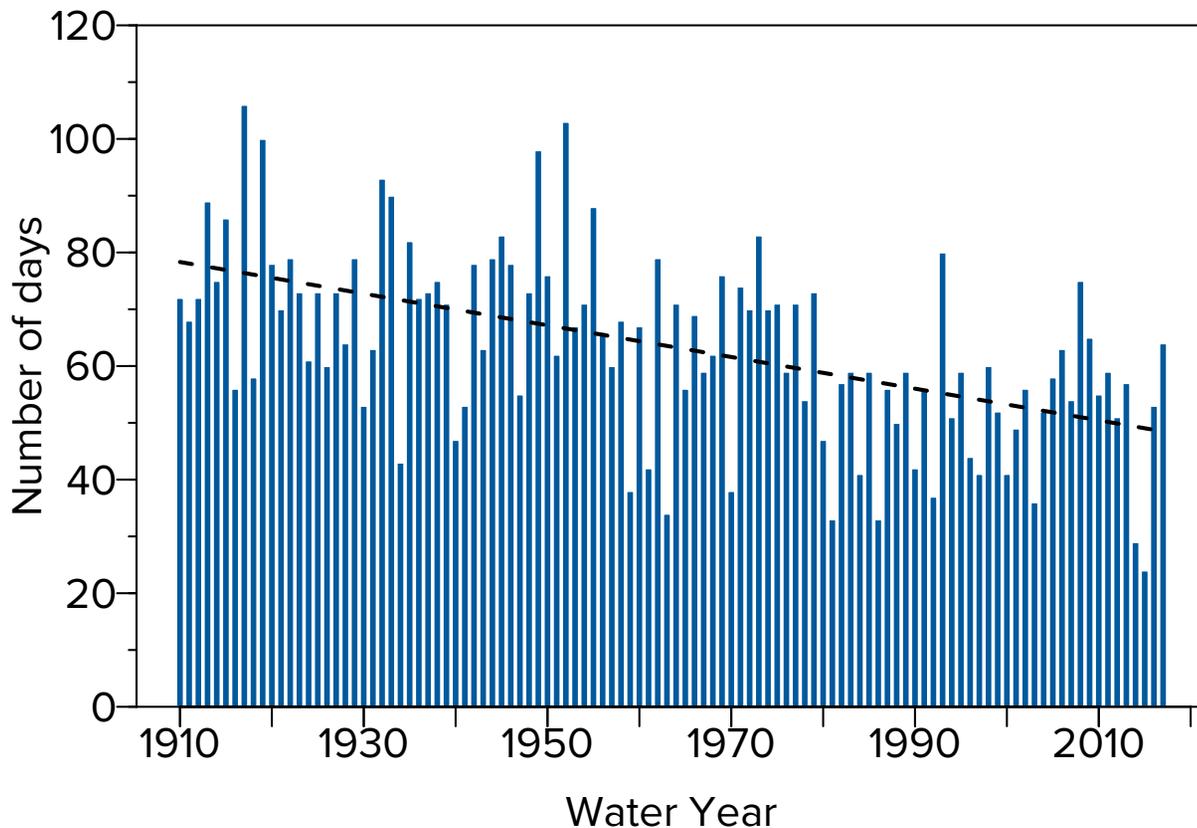
Yearly since 1910

The method used for this analysis sums the number of days with daily average temperatures below freezing between December 1 and March 31 for each Water Year (WY). Although year-to-year variability is high, the number of days

when air temperatures averaged below freezing has declined by about 30 days since 1911. In WY 2017, the number of freezing days was 64, reflective of the high snow year. Data source: the long-term NOAA daily maximum and

minimum temperatures data set.

*Note: The Water Year extends from October 1 through September 30.*



**METEOROLOGY**

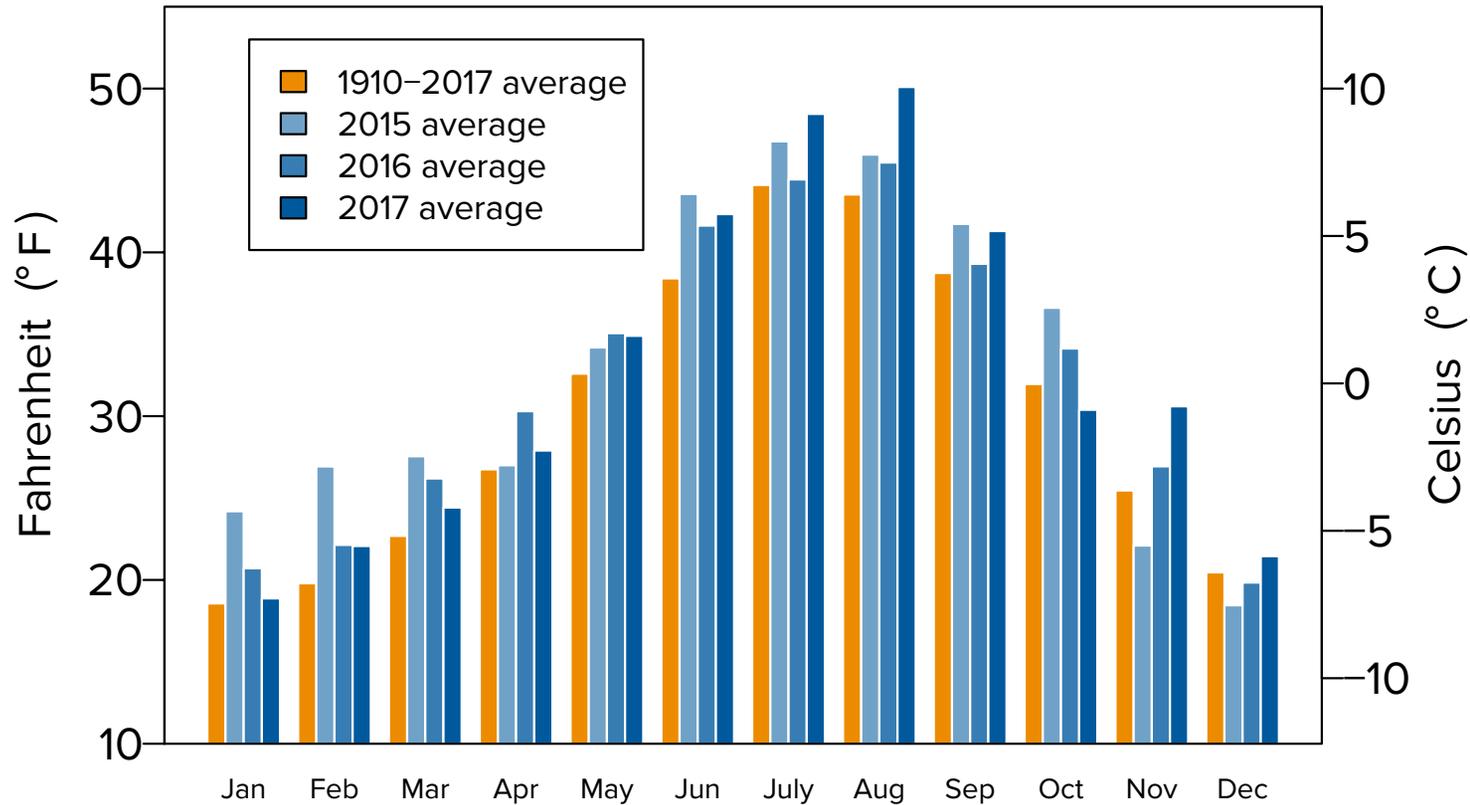
**Monthly air temperature**

Since 1910

In 2017, monthly air temperatures were generally cooler than recent years during the winter months, but warmer during the summer. In 11 out of 12 months,

the monthly air temperature was higher than the 1910-2017 average, and in four of those months it was warmer than the previous two years. Data source: the

long-term NOAA daily maximum and minimum temperatures data set.



**METEOROLOGY**

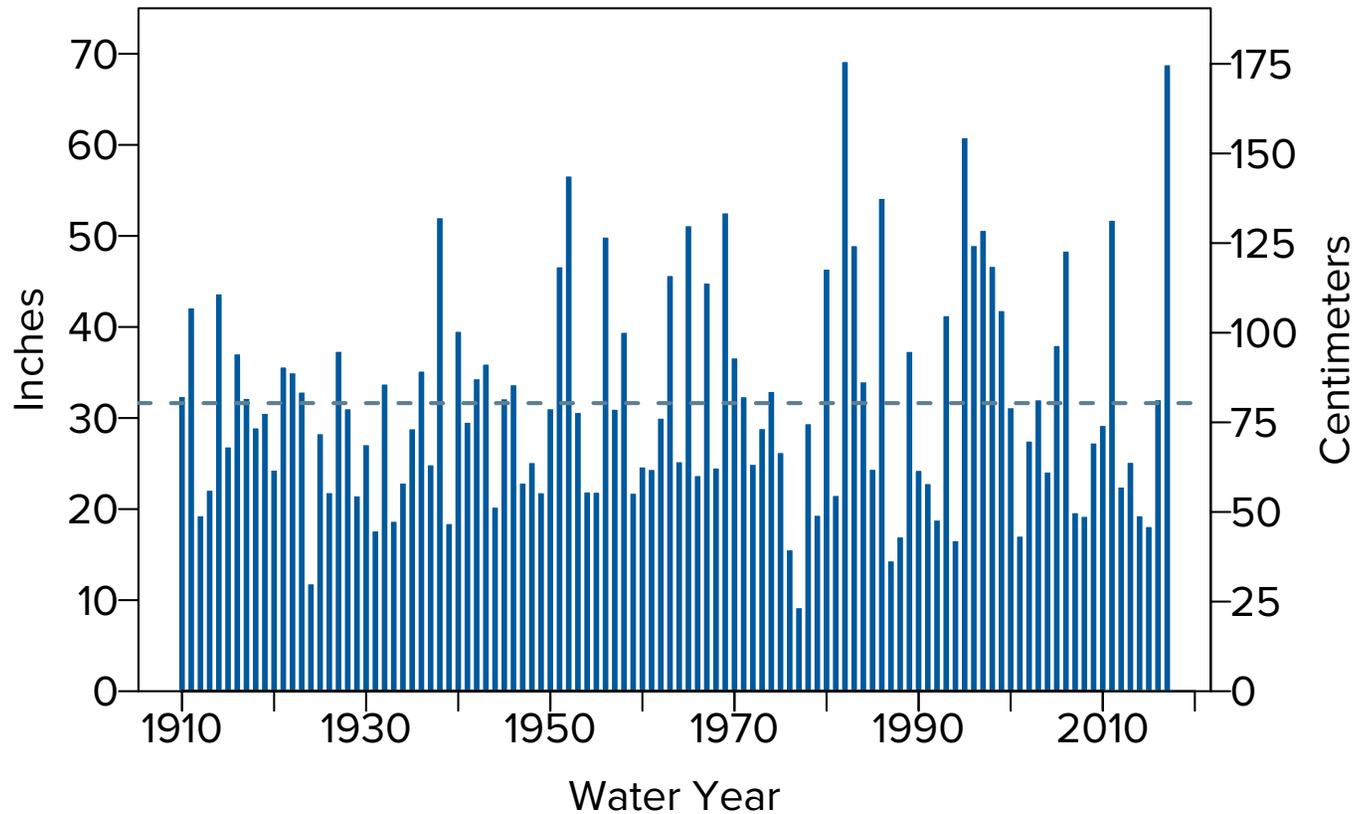
**Annual precipitation**

Yearly since 1910

From 1910 to 2017, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.6 inches. The maximum was 69.2 inches in 1982. The minimum was 9.2 inches in 1977. 2017 was the second highest recorded

year, with 68.9 inches, following the five previous dry years. The long-term average of 31.6 inches is shown by the dashed line. Generally there is a gradient in precipitation from west to east across Lake Tahoe, with almost twice as much

precipitation falling on the west side of the lake. Precipitation is summed over the Water Year, which extends from October 1 through September 30. Data source: the long-term NOAA daily precipitation data set.



## METEOROLOGY

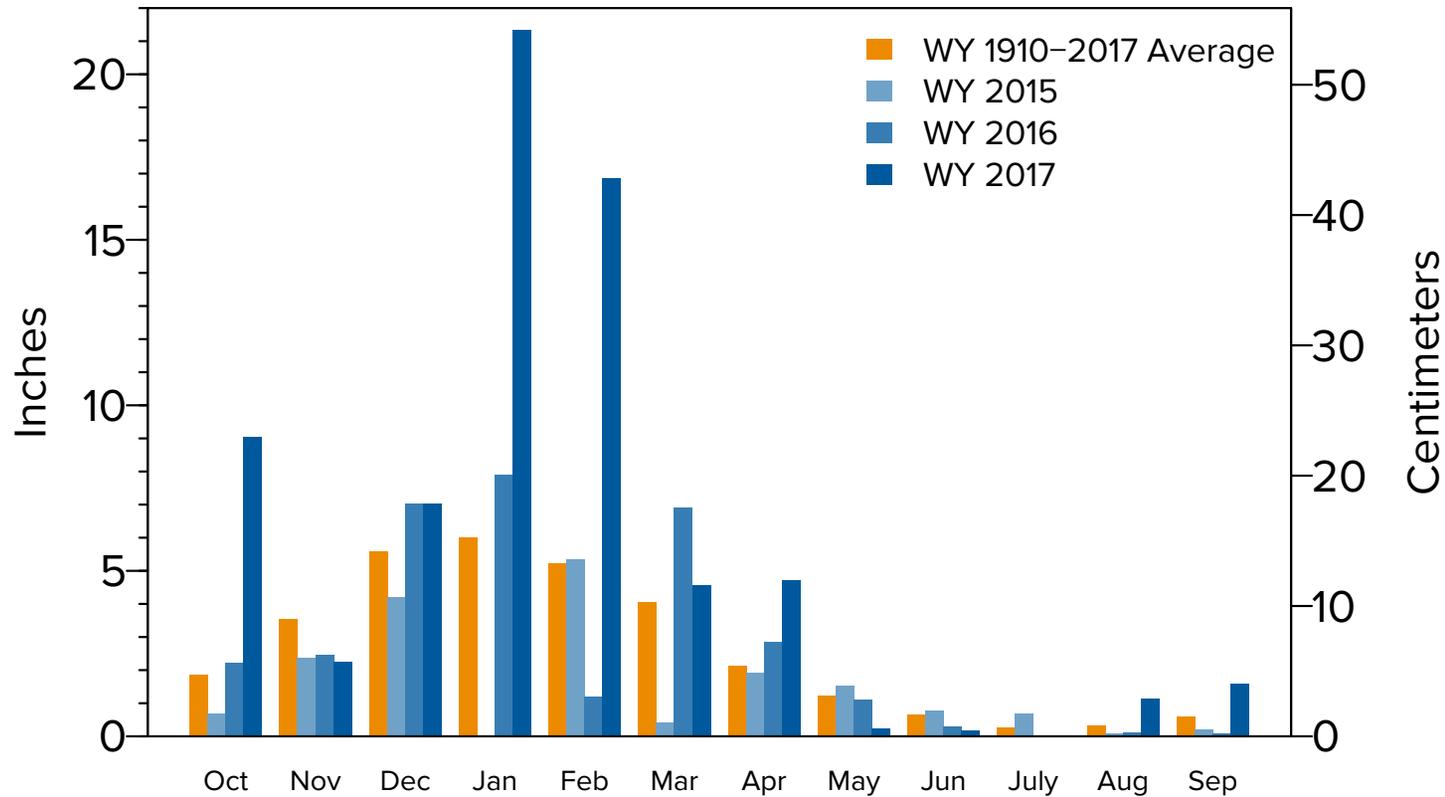
### Monthly precipitation

2015, 2016, 2017 and 1910 to 2017

2017 was well above average in total precipitation at 68.9 inches over the Water Year, compared with the long-term average of 31.4 inches. Monthly precipitation was above the long-term average in

eight months of the year. The monthly precipitation for January and February were particularly large. Months with more than 25 percent of days missing are omitted from the figure below. The 2017

Water Year extended from October 1, 2016 through September 30, 2017. Data source: the long-term NOAA daily precipitation data set.



**METEOROLOGY**

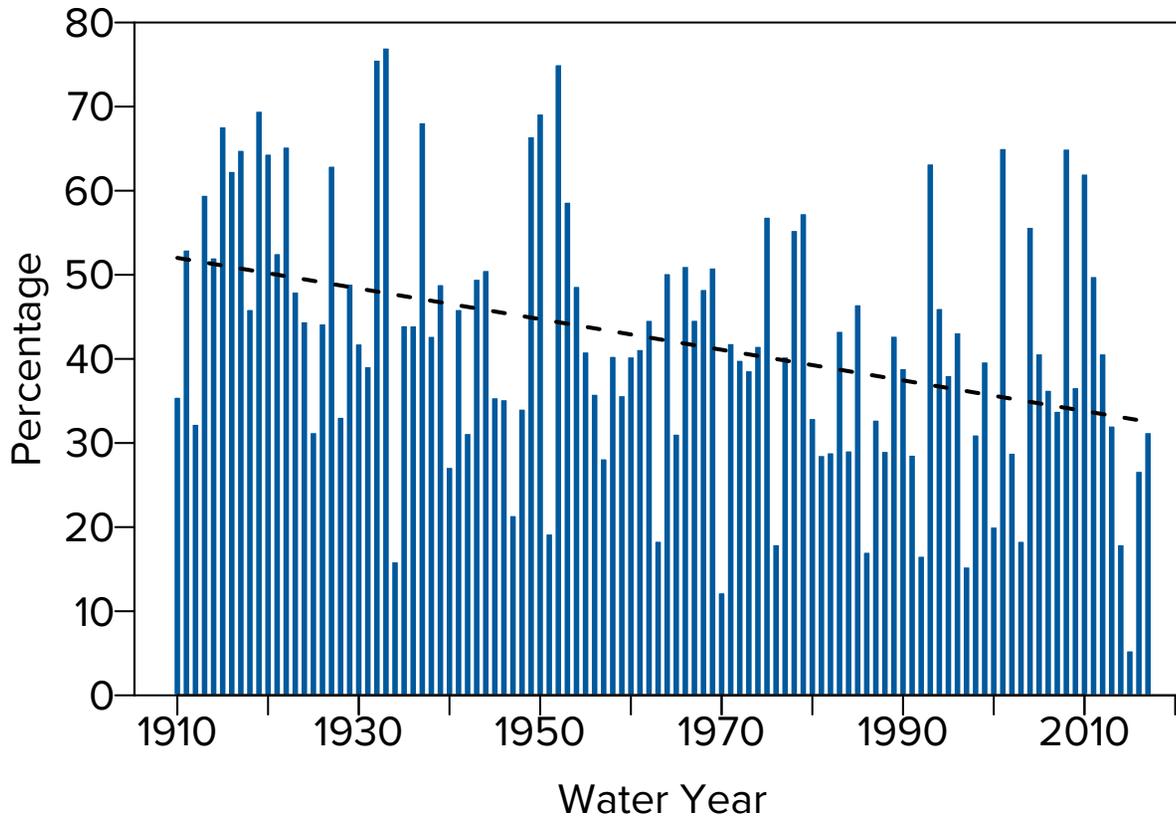
**Snow as a fraction of annual precipitation**

Yearly since 1910

Snow has declined as a fraction of total precipitation, from an average of 52 percent in 1910 to 32 percent in present times, according to the line of best fit. In Tahoe City, snow represented 31.3 percent of the 2017 total precipitation.

These data are calculated based on the assumption that precipitation falls as snow whenever the average daily temperature (the average of the daily maximum and minimum temperatures) is below-freezing. (Precipitation is summed over the Water

Year, which extends from October 1 through September 30.) Data source: long-term NOAA daily air temperature and precipitation data sets.



**METEOROLOGY**

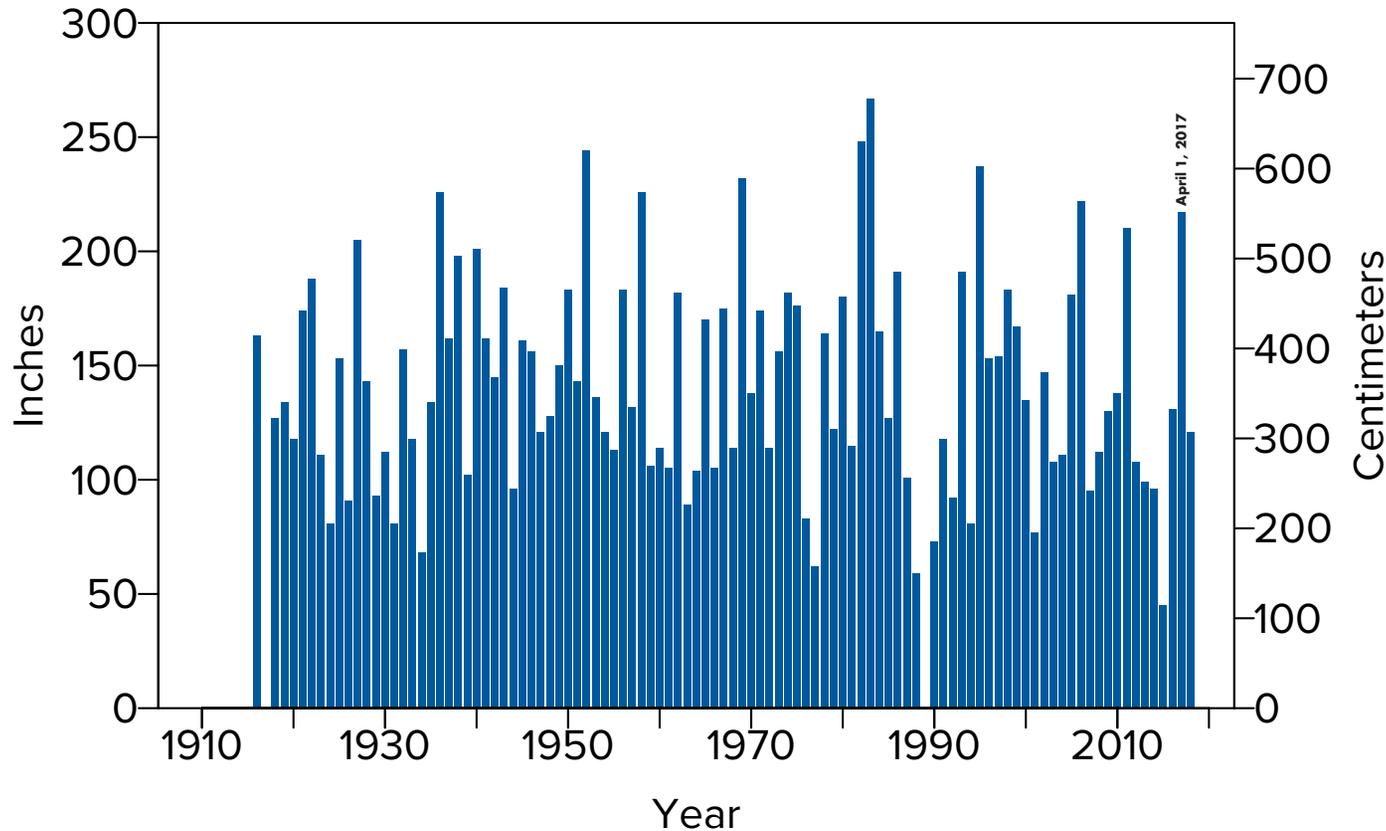
**April snowpack**

Since 1916

The depth of the snowpack is measured at multiple locations throughout the Sierra over the year. Shown here are the readings taken on approximately April 1 since 1916 at the Lake Lucille Snow Course Station (located in

Desolation Wilderness, elevation 8,188 feet, Lat 38.86 Long -120.11). Note: April snow depth data are not available for 1917 and 1989. The snow depth on April 1, 2017 was 217 inches, the highest value since 2006. The highest value on record is

267 inches on April 5, 1983. The average snow depth over the period 1916-2017 was 142.3 inches. Data source: USDA Natural Resources Conservation Service, California Monthly Snow Data.



## METEOROLOGY

### Daily solar radiation

In 2017

Solar radiation showed the typical annual pattern of increasing then decreasing sunlight, peaking at the summer solstice on June 21 or 22. Dips in daily solar radiation are due primarily to

clouds. Smoke and other atmospheric constituents play a smaller role. It is noteworthy that solar radiation on a clear day in mid-winter can exceed that of a cloudy day in mid-summer. The TERC

meteorological station where these data are collected is located on the U.S. Coast Guard dock at Tahoe City.

