

# TAHOE: STATE OF THE LAKE REPORT 2017

## METEOROLOGY

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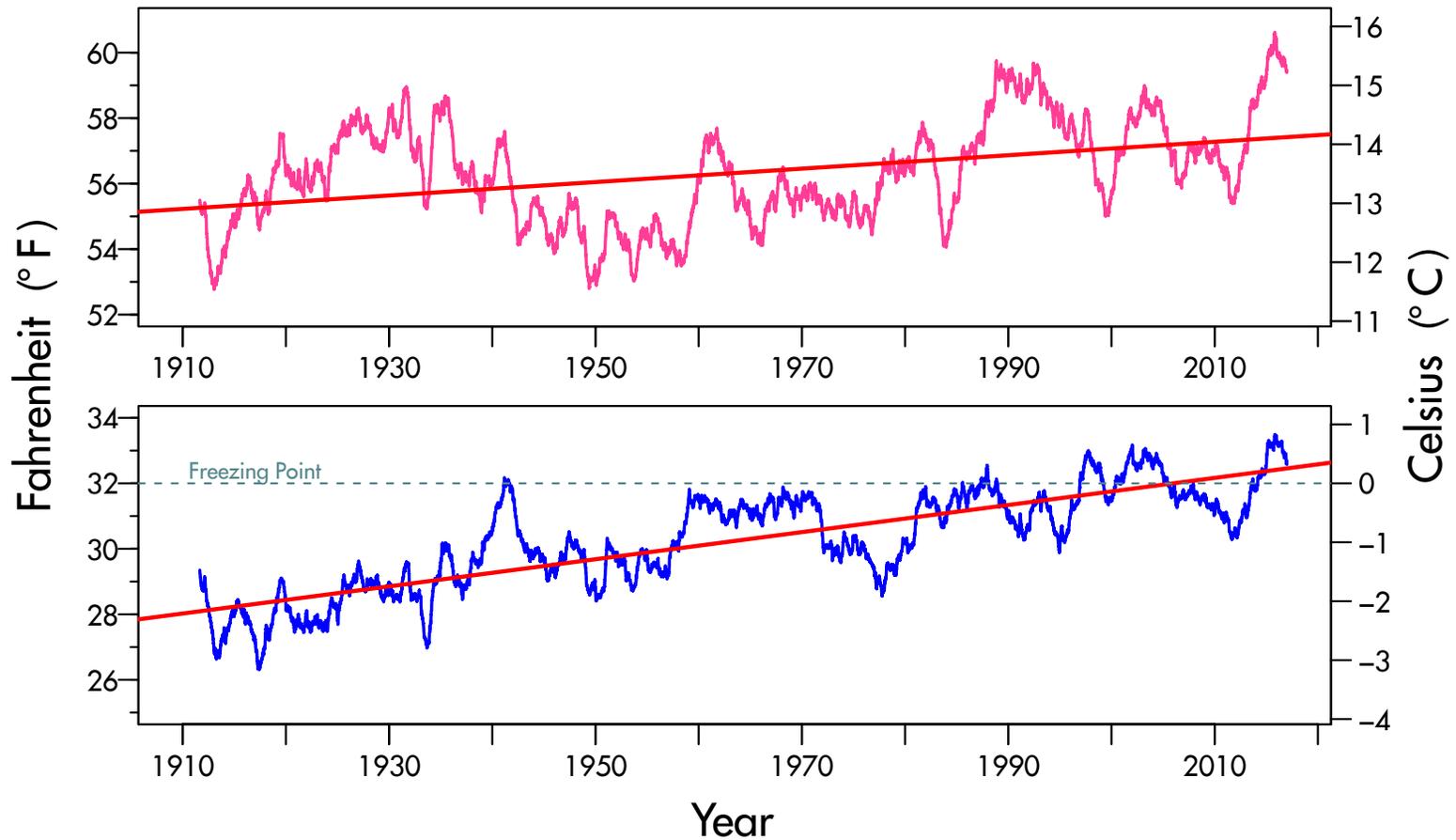
**Air temperature**

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 4.3 °F (2.4 °C), and the long-term trend in

average daily maximum temperature (upper figure) has risen by 2.0 °F (1.1 °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.



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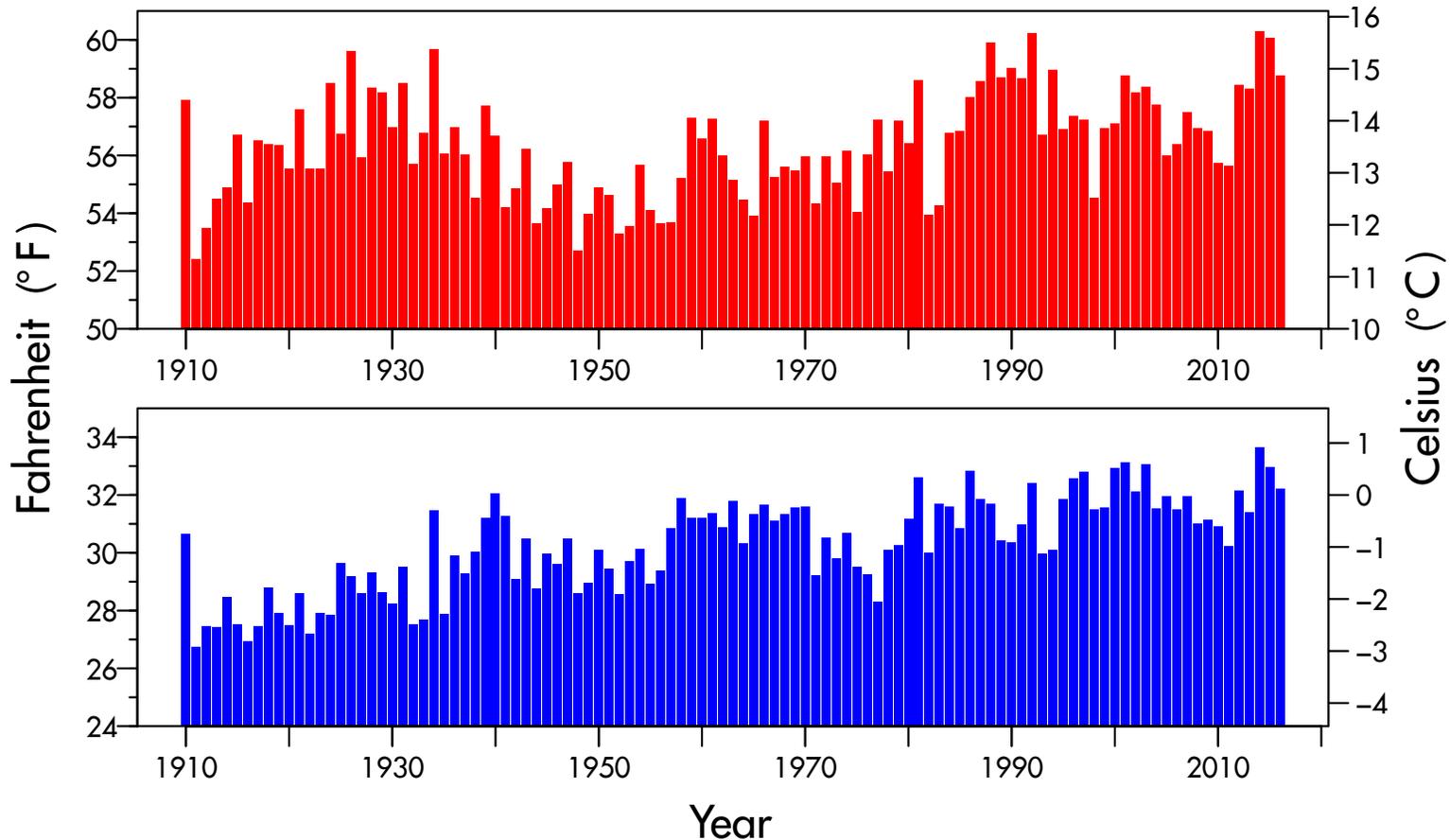
**Air temperature - annual average maximum and minimum**

Since 1910

Annual average maximum (red) and minimum (blue) air temperatures in 2016 were both well above the long-term average. The 2016 annual average minimum was 32.2 °F (0.56 °C) a decrease

of 0.8 °F over the previous year. The maximum temperature was 58.8 °F (14.9 °C) a decrease of 1.3 °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.



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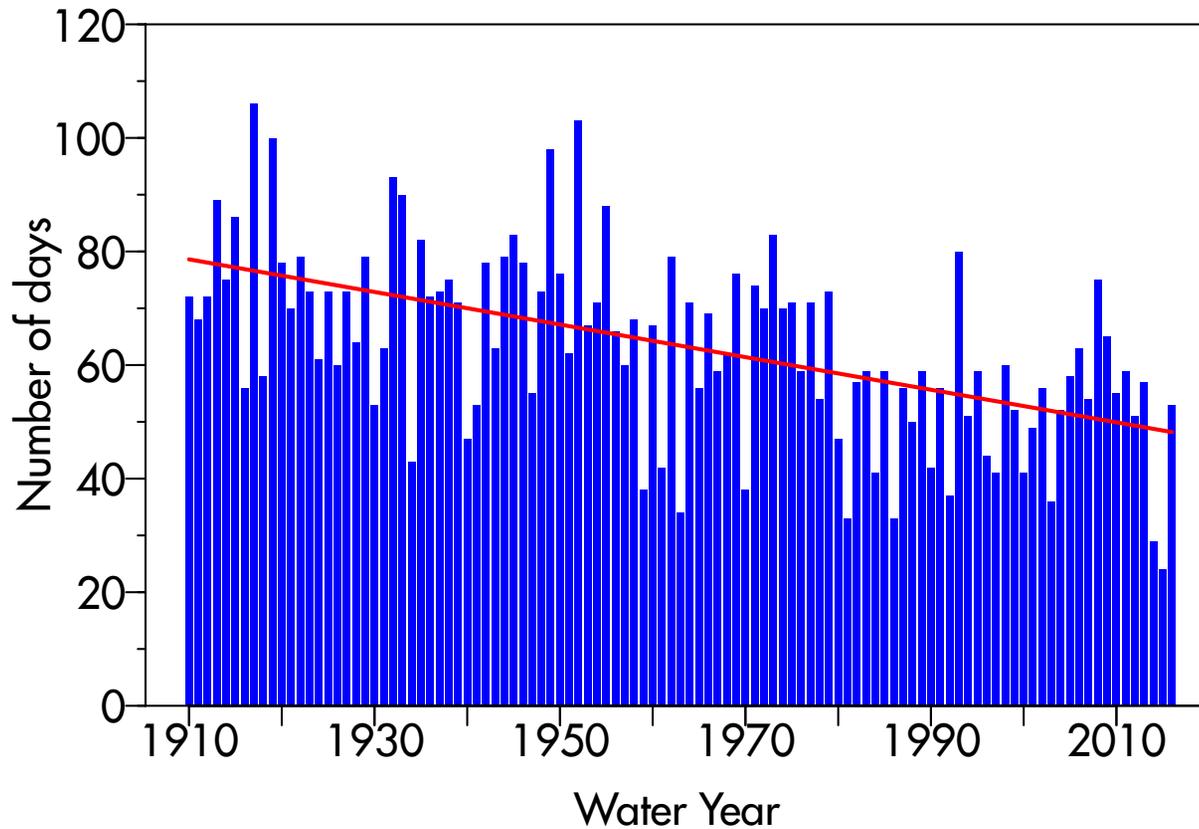
**Below-freezing air temperatures**

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 2016, the number of freezing days was 53, reflective of the generally cooler year compared with the previous two years.

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



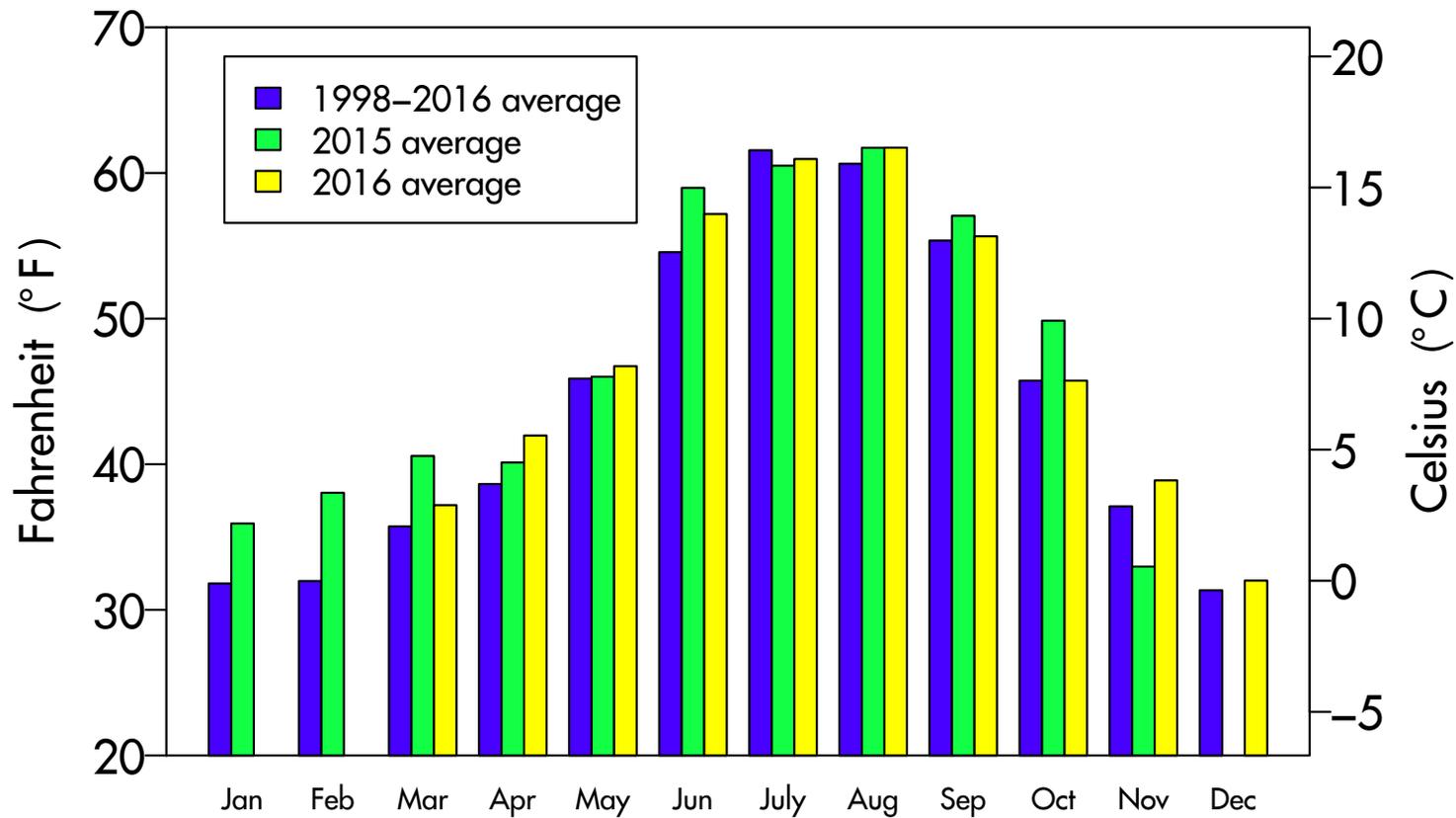
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**Monthly air temperature**

Since 1998

In 2016, monthly air temperatures were largely indistinguishable from the 1998-2016 average. Months with more than 25

percent of days missing are omitted from the figure below.



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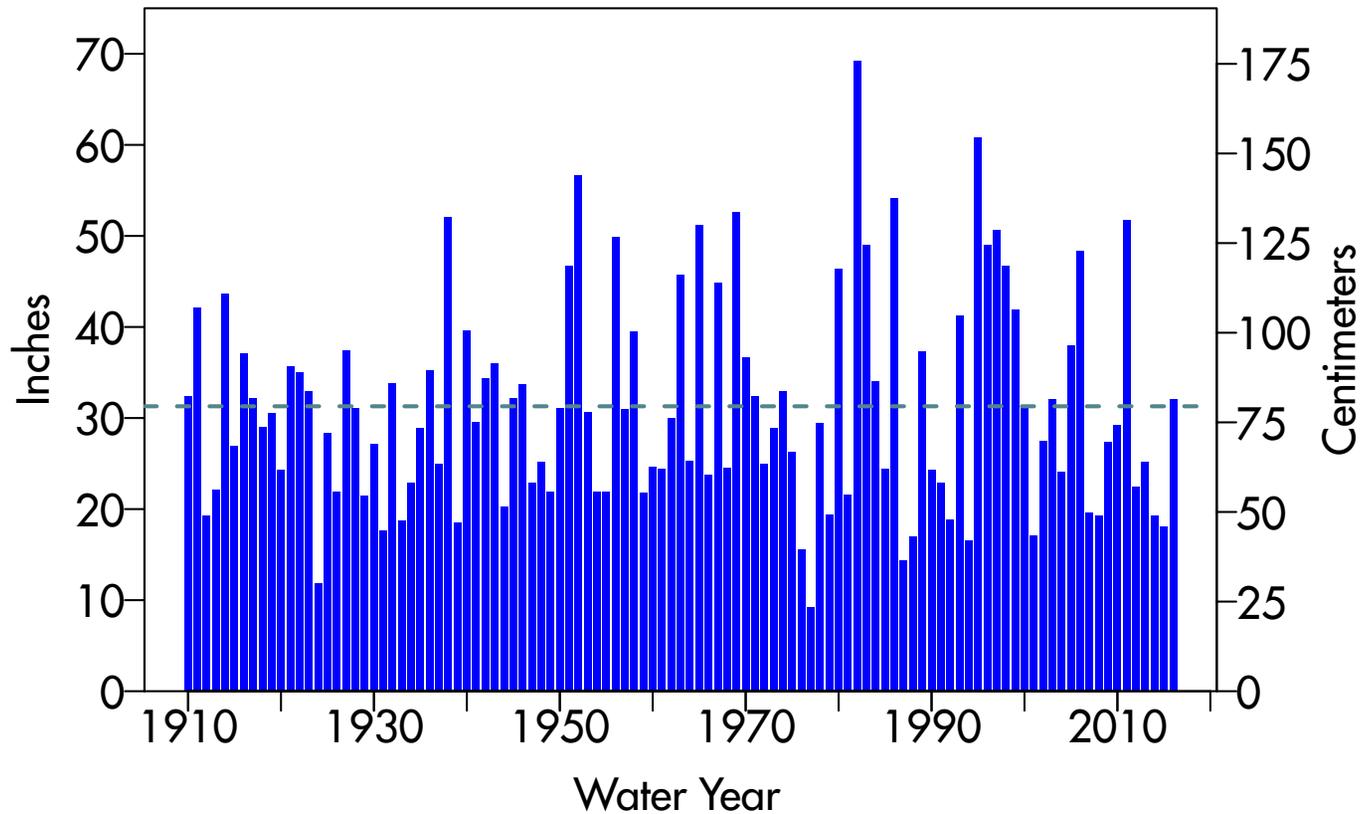
**Annual precipitation**

Yearly since 1910

From 1910 to 2016, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.3 inches. The maximum was 69.2 inches in 1982. The minimum was 9.2 inches in 1977. 2016

was close to the average, with 32.1 inches, following the three previous dry years. The long-term average of 31.3 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.)



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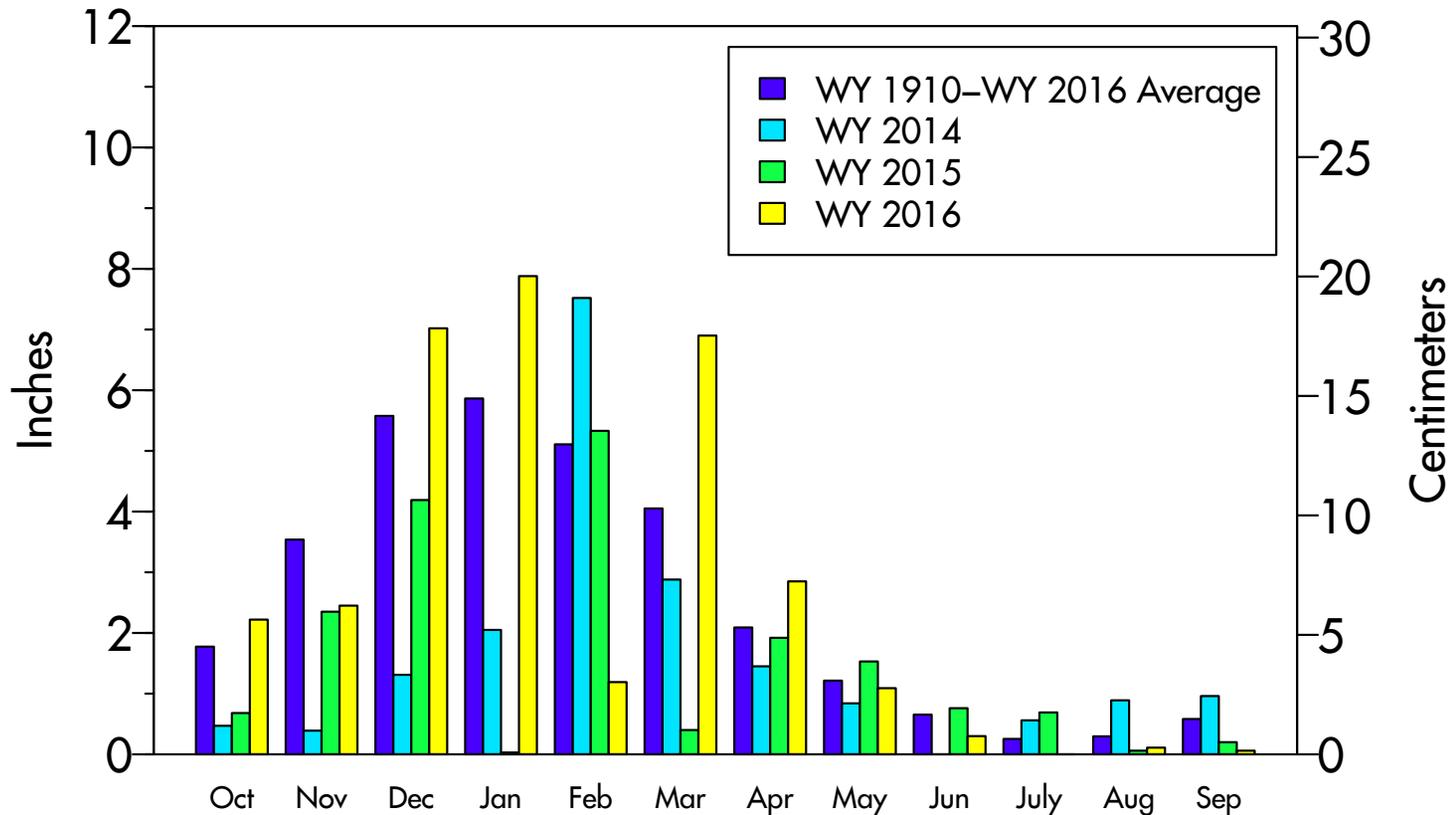
**Monthly precipitation**

2014, 2015, 2016 and 1910 to 2016

2016 was close to the average in total precipitation but was much higher than the previous two drought years. This is clearly evident in the comparison of the monthly precipitation with 2014 and

2015 and the long-term average. Monthly precipitation in WY 2015 was noticeably lower than the long-term average during summer, especially in July, August, and September. The monthly precipitation

for Jul-2016 (WY 2016) was 0 inches. The 2016 Water Year extended from October 1, 2015 through September 30, 2016.



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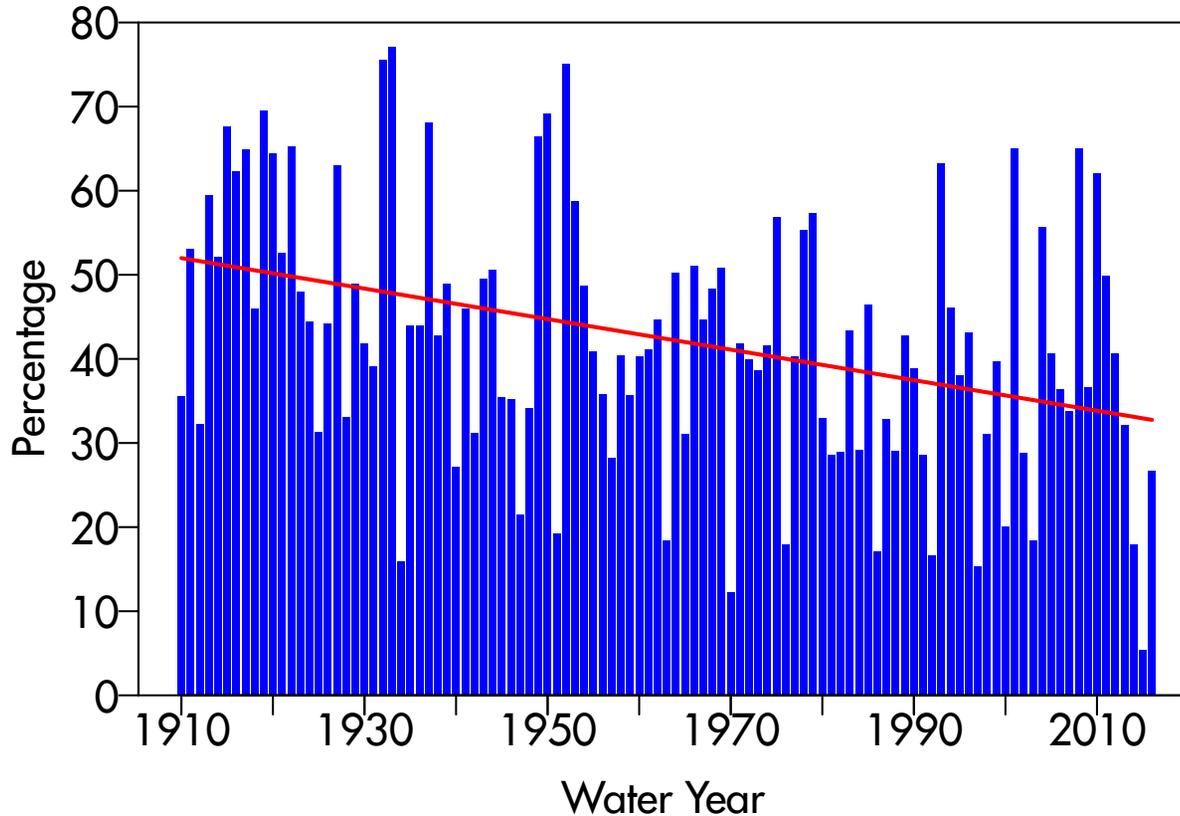
**Snow as a fraction of annual precipitation**

Yearly since 1910

Snow has declined as a fraction of total precipitation, from an average of 52 percent in 1910 to 33 percent in present times according to the line of best fit. In Tahoe City, snow represented 26.7

percent of the 2016 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.)



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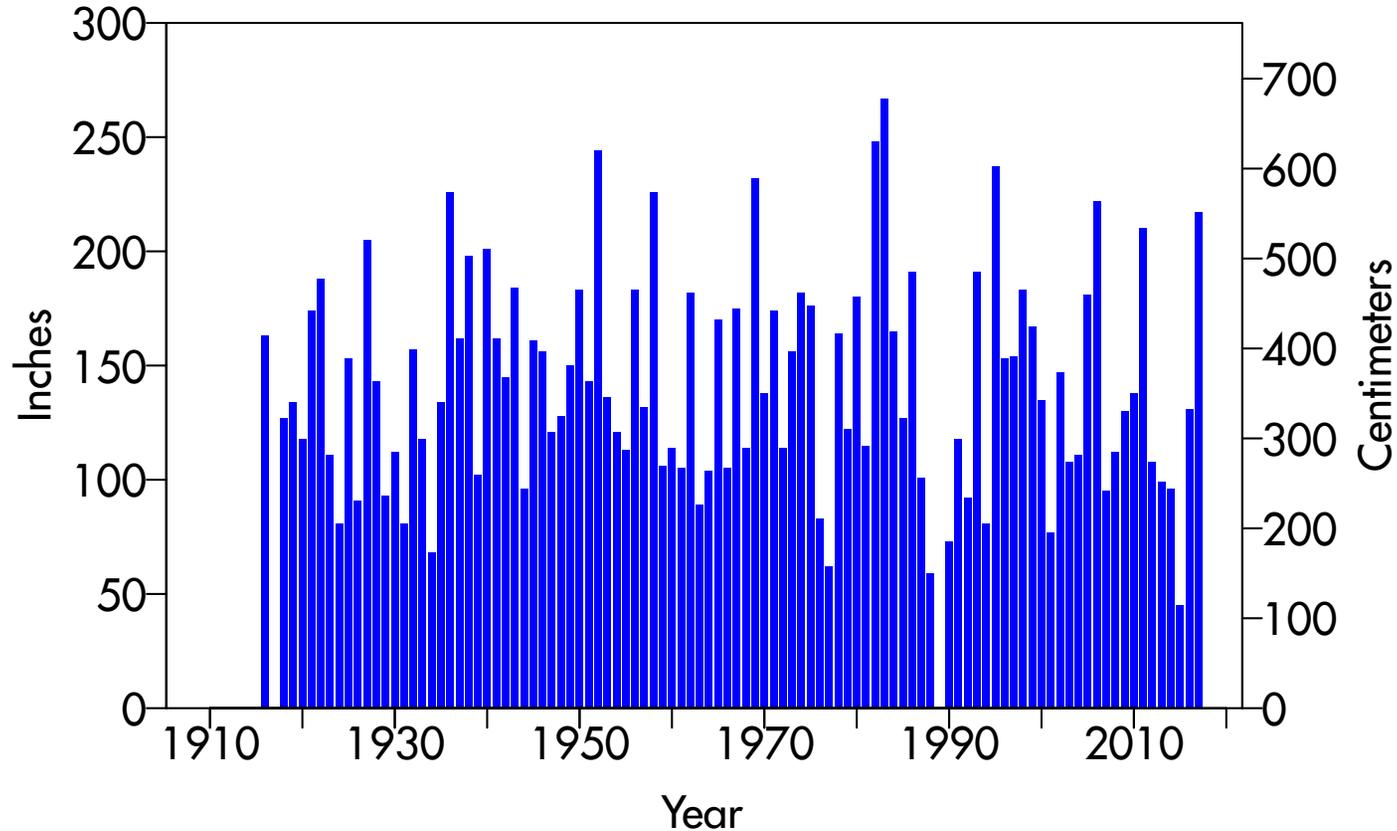
**April snowpack**

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 for the period 1916 to 2017 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, representing a high snow year compared

to the record low value in 2015. The average snow depth over the period 1916-2017 was 143 inches. Data source: USDA Natural Resources Conservation Service, California Monthly Snow Data.



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### Daily solar radiation

In 2016

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 station

where these data are collected is located on the U.S. Coast Guard dock at Tahoe City. The instrument was not operating for the first three months of 2016.

