

TAHOE: STATE OF THE LAKE REPORT 2016

METEOROLOGY

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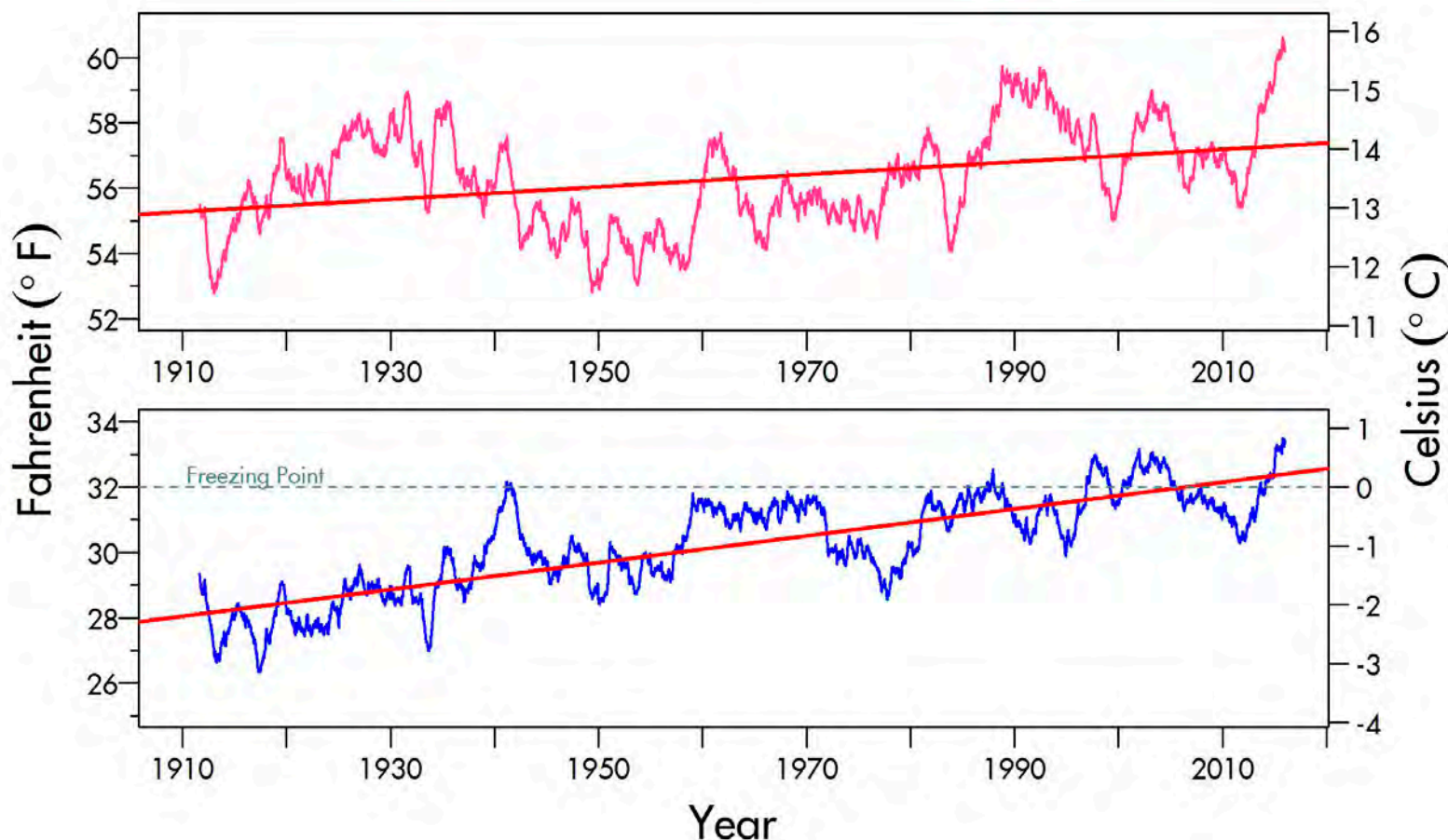
Air temperature

Daily since 1911

Over the last 100 years, the 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 strongly suggestive of 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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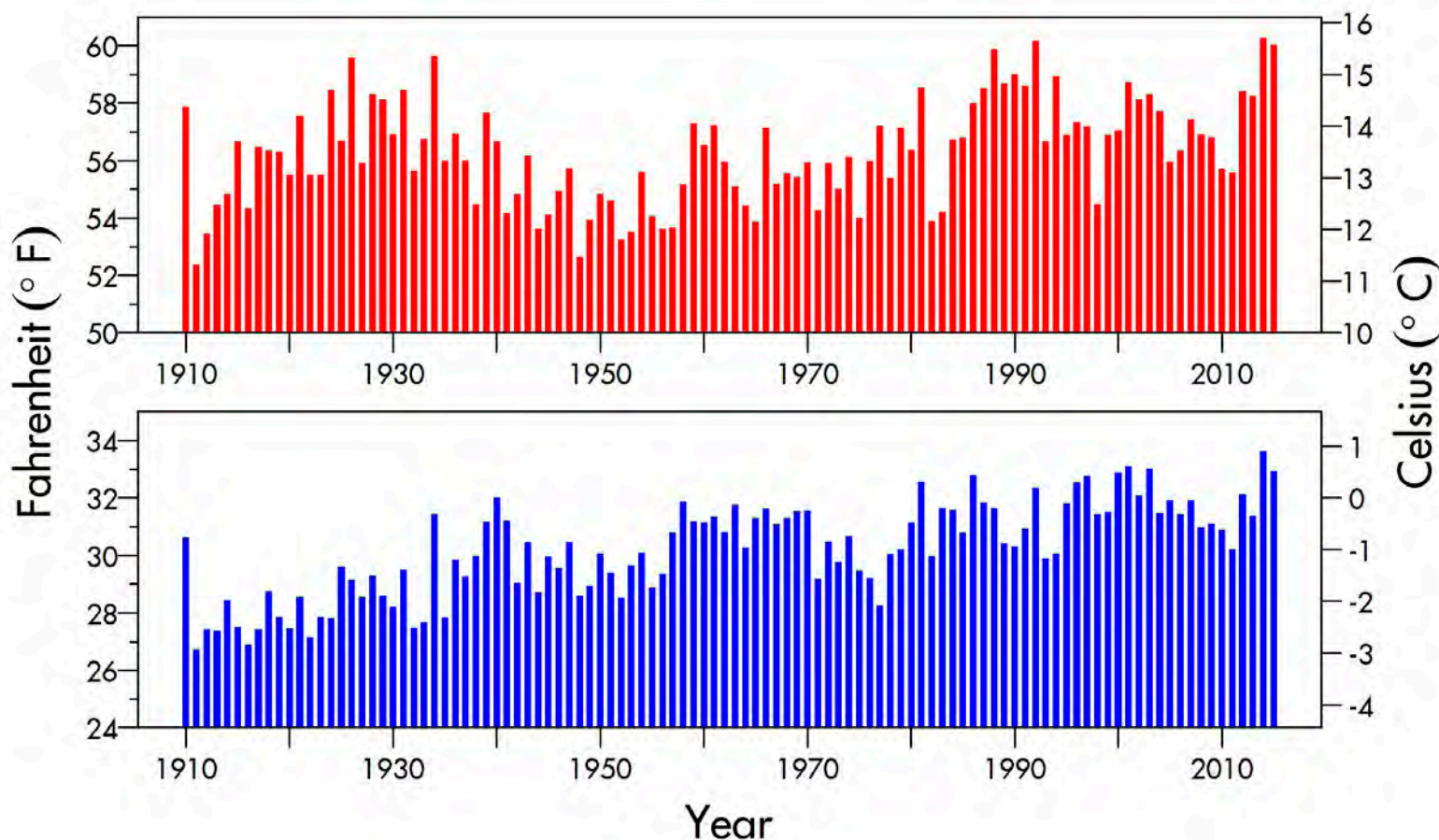
Air temperature - annual average maximum and minimum

Since 1910

Annual average maximum (red) and minimum (blue) air temperatures in 2015 were both well above the long-term average and slightly below the values for the previous year. The 2015 annual

average minimum was 33.0 °F (0.56 °C) a decrease of 0.7 °F over the previous year, and the fourth highest ever recorded. The maximum temperature was 60.1 °F (15.6 °C) a decrease of 0.2 °F over the

previous year, and is the third highest ever recorded. The long-term means for the minimum and the maximum are 30.3 °F (-0.96 °C) and 56.3 °F (13.5 °C), respectively.



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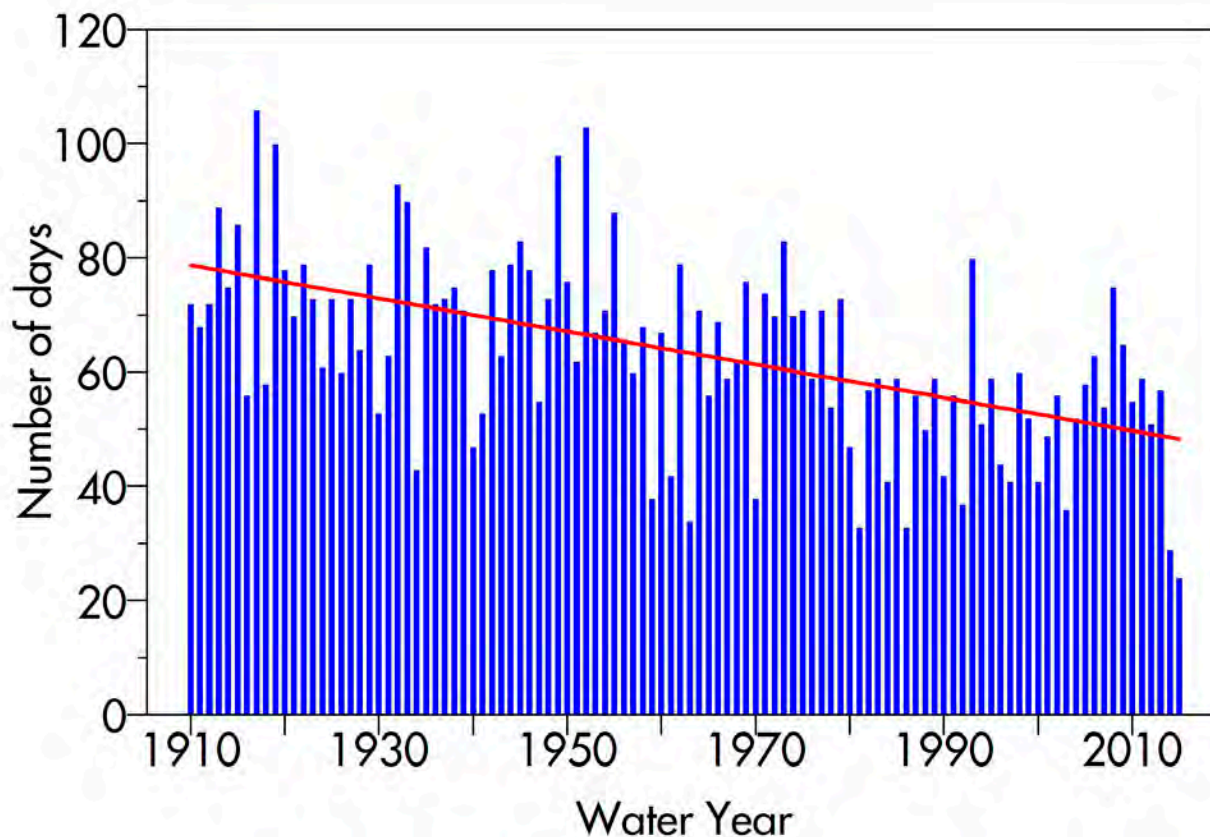
Below-freezing air temperatures

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 2015, the number of freezing days was 24, the lowest ever recorded.

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



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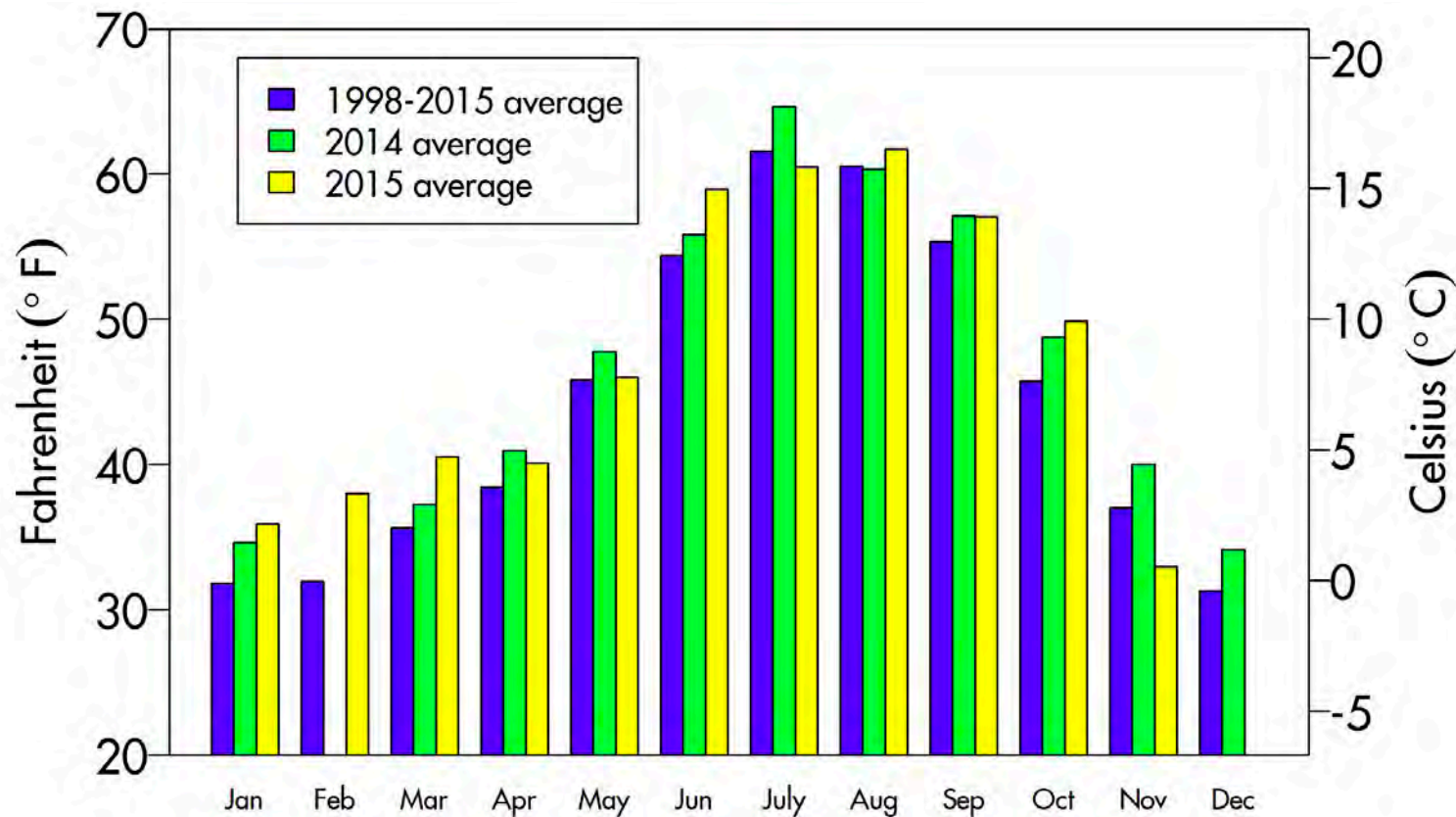
Monthly air temperature

Since 1998

In 2015, monthly air temperatures were distinguished by being warmer than the long-term mean during seven months of

the year. This trend is consistent with the global trend of generally warming temperatures. The winter months (Jan-

March 2015) were significantly warmer. Months with more than 25 percent of days missing were omitted.



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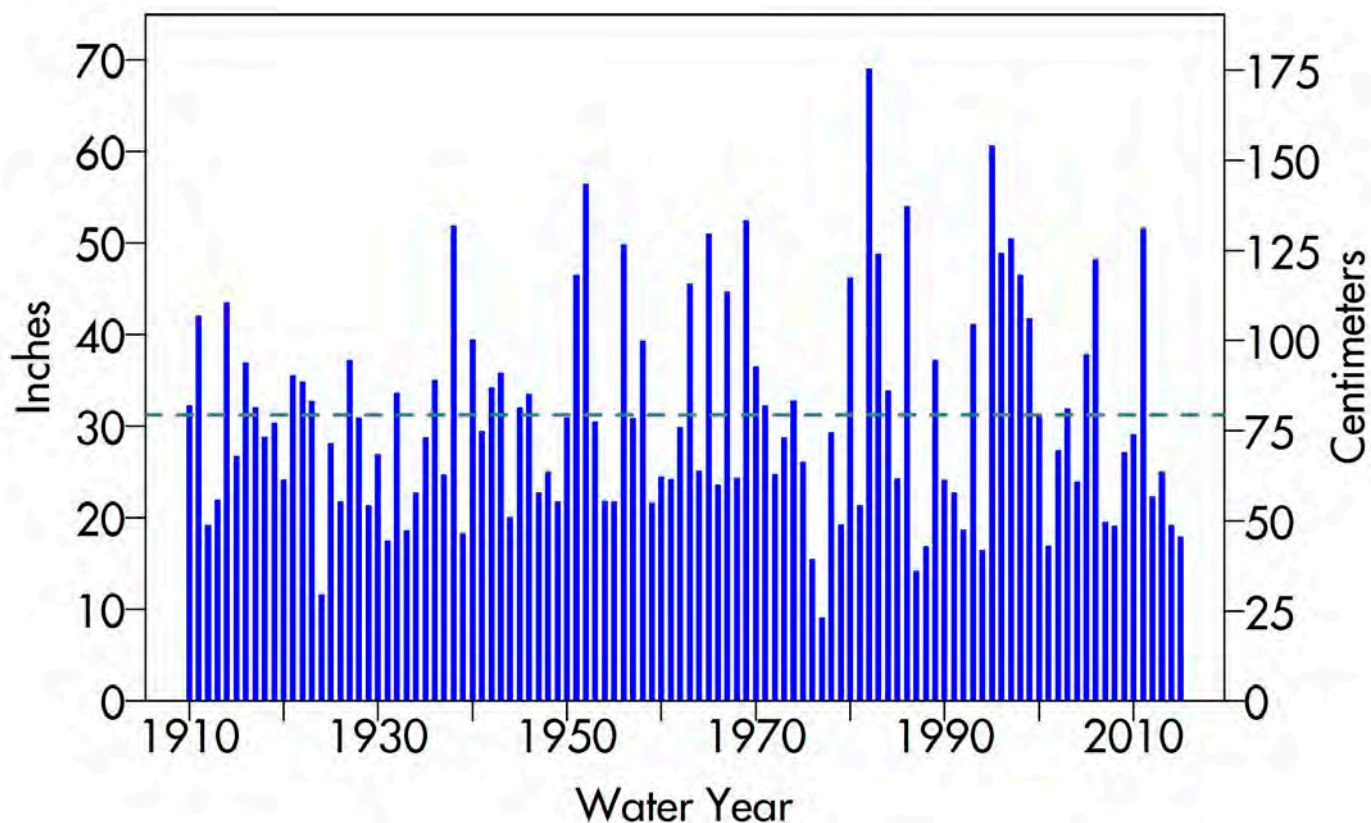
Annual precipitation

Yearly since 1910

From 1910 to 2015, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.4 inches. The maximum was 69.2 inches in 1982. The minimum was 9.2 inches in 1977. 2015

was well below average, with 18.1 inches, following the three previous dry years. The long-term mean 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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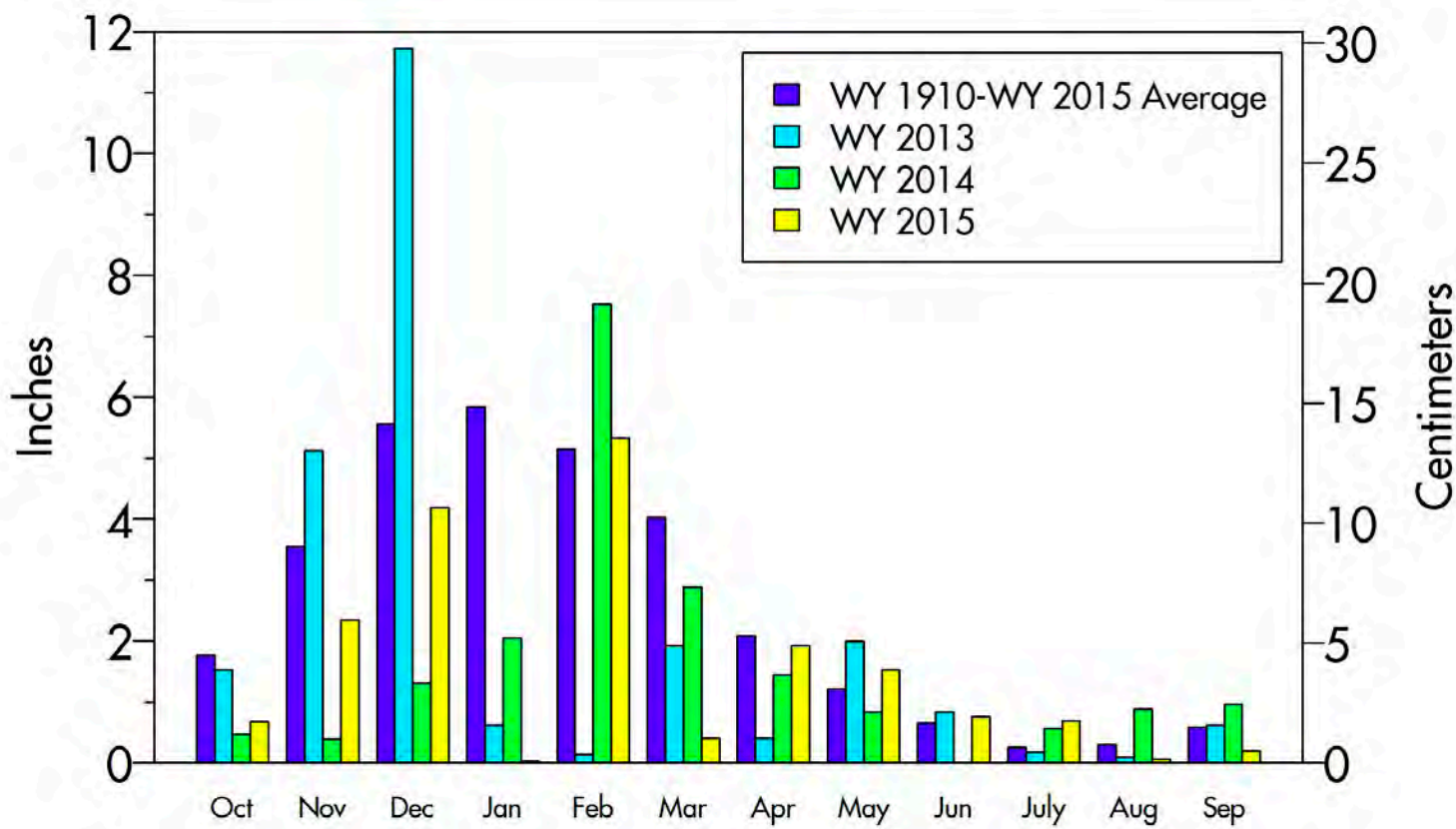
Monthly precipitation

2013, 2014, 2015 and 1910 to 2015

2015 was well below average in total precipitation. This is clearly evident in the comparison of the monthly precipitation with the previous two years and the long-

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

precipitation for Jun-2014 (WY 2014) was 0 inches. The 2015 Water Year extended from October 1, 2014, through September 30, 2015.



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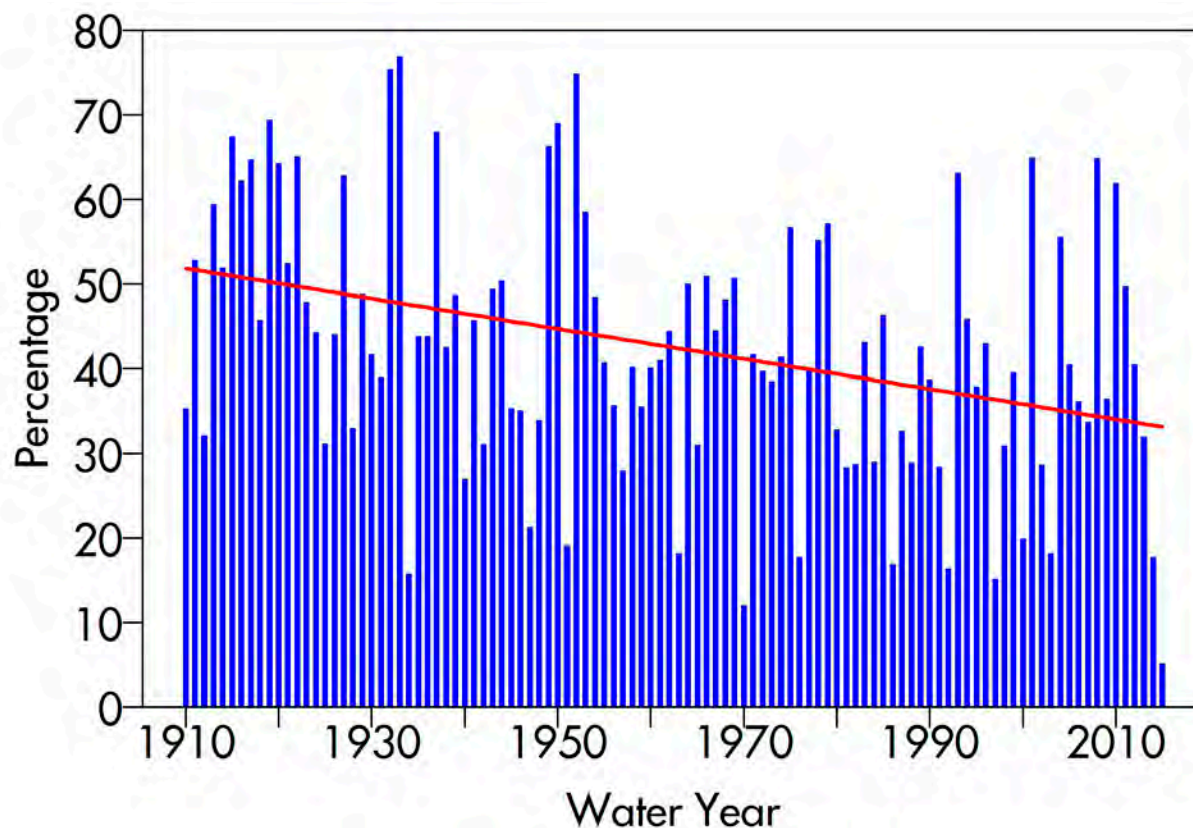
Snow as a fraction of annual precipitation

Yearly since 1910

Snow has declined as a fraction of total precipitation, from an average of 51 percent in 1910 to 33 percent in present times according to the line of best fit. In Tahoe City, snow represented 5.4 percent

of the 2015 total precipitation, the lowest value on record. These data are calculated based on the assumption that precipitation falls as snow whenever the average daily temperature is below-freezing.

(Precipitation is summed over the Water Year, which extends from October 1 through September 30.)



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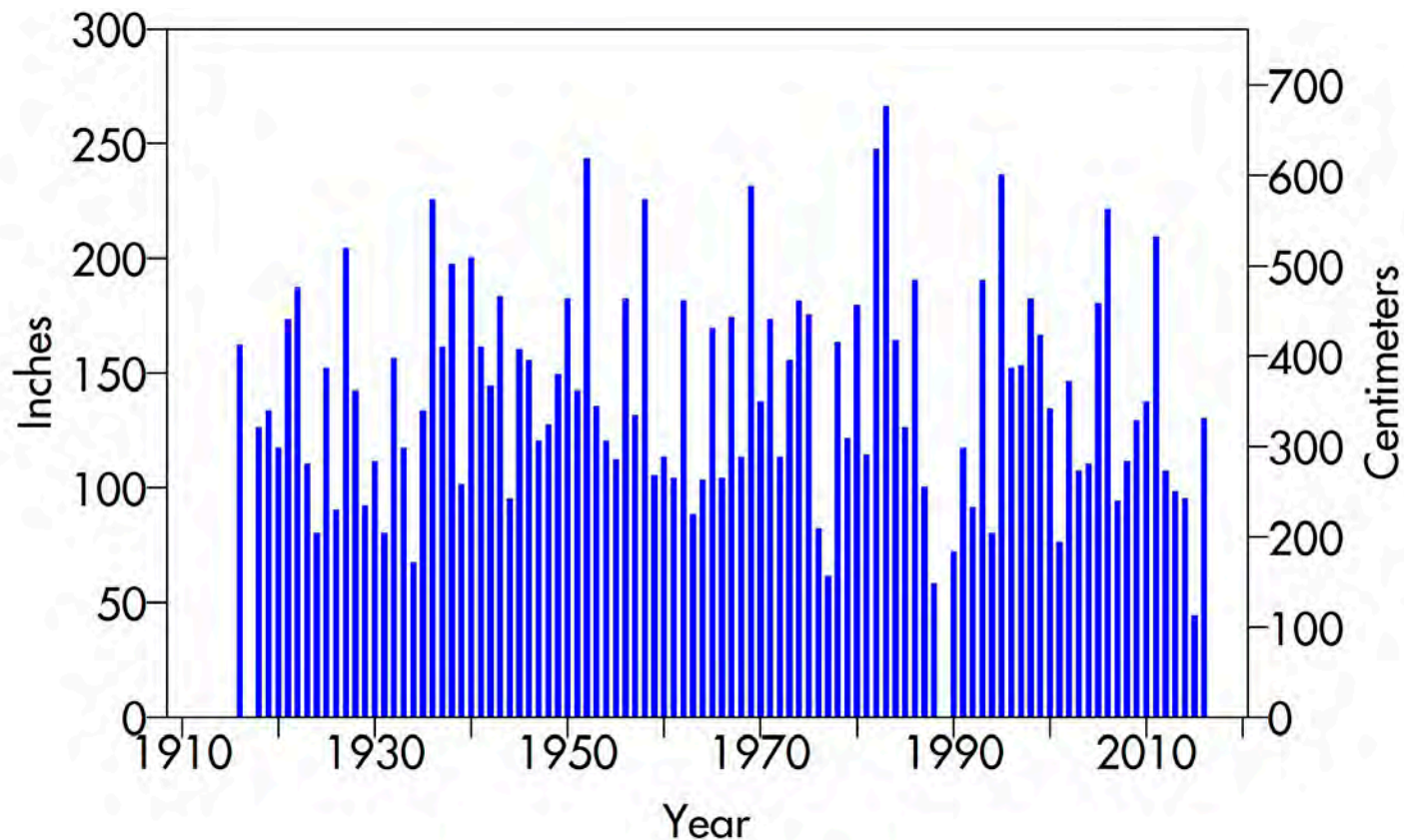
April snowpack

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 2016 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, 2016 was 131 inches, representing a more normal year

compared to the record low value in 2015. The average snow depth over the period 1916-2016 was 142 inches. Data source: USDA Natural Resources Conservation Service, California Monthly Snow Data.



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Daily solar radiation

In 2015

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.

