

TAHOE:
STATE
OF THE
LAKE
REPORT
2011

METEOROLOGY

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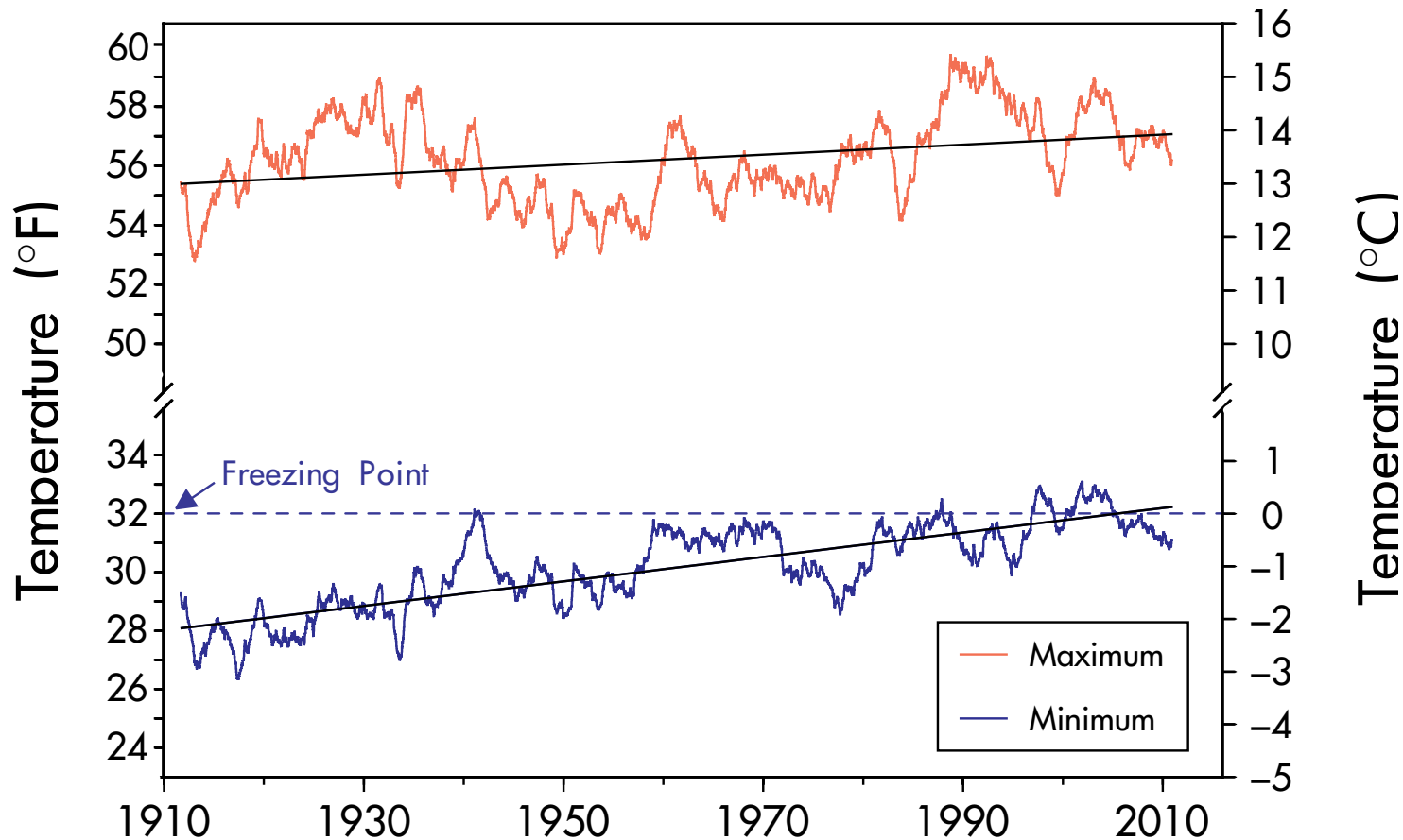
Air temperature

Daily since 1911

Daily air temperatures have increased over the 99 years measured at Tahoe City. The trend in daily minimum temperature has increased by more than 4 degrees F. (2.2 degrees C),

and the trend in daily maximum temperature has risen by less than 2 degrees F. The average minimum air temperature now exceeds the freezing temperature of water, which points

to more rain and less snow, as well as earlier snowmelt. These data have been smoothed by using a two-year running average to remove daily and seasonal fluctuations.



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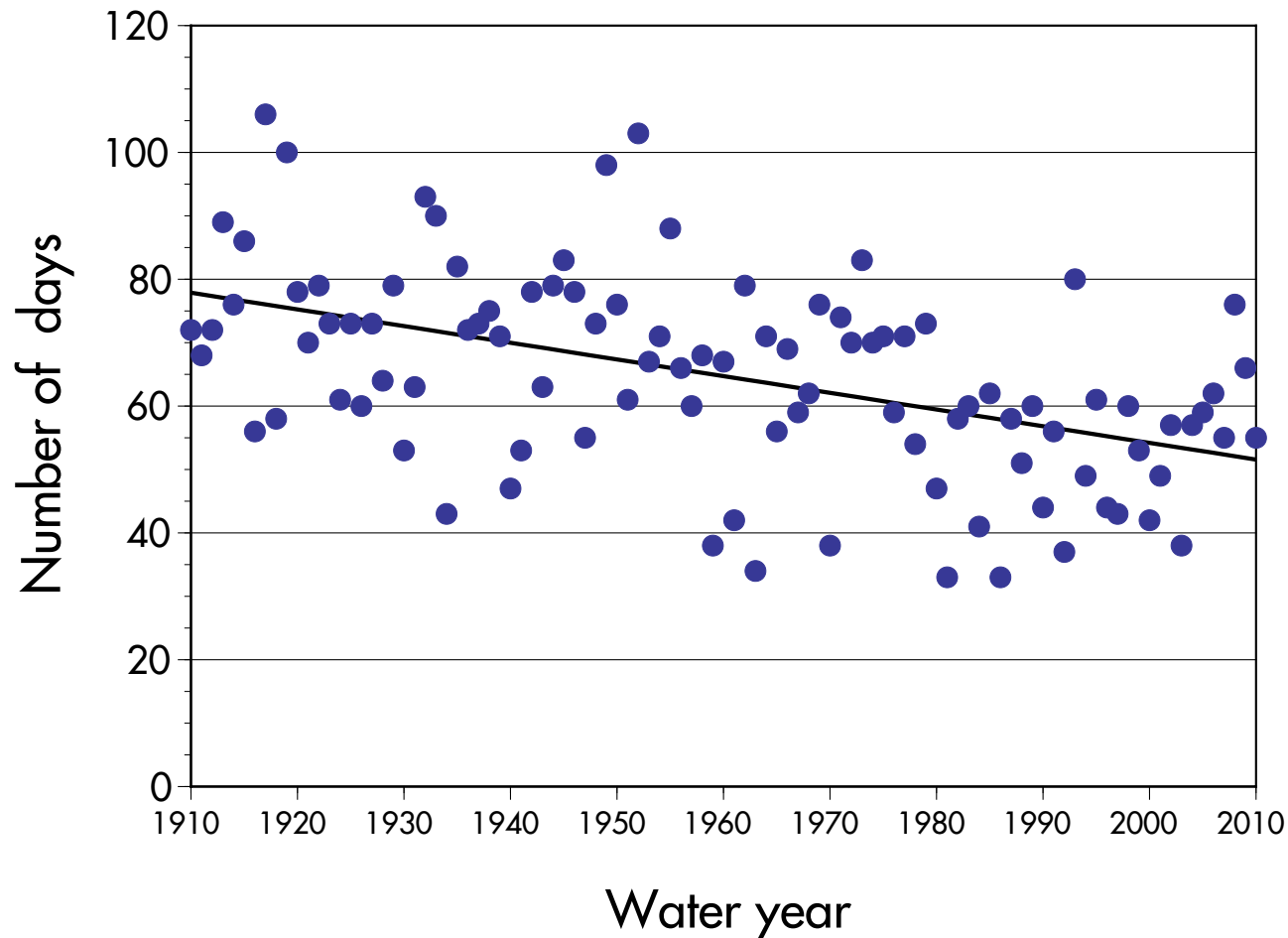
Below-freezing air temperatures

Yearly since 1910

Although year-to-year variability is high, the number of days when air temperatures averaged below freezing

(32 degrees F) has declined by about 30 days since 1911. In 2010, the number of freezing days was slightly

above the long-term trend at 55 days.



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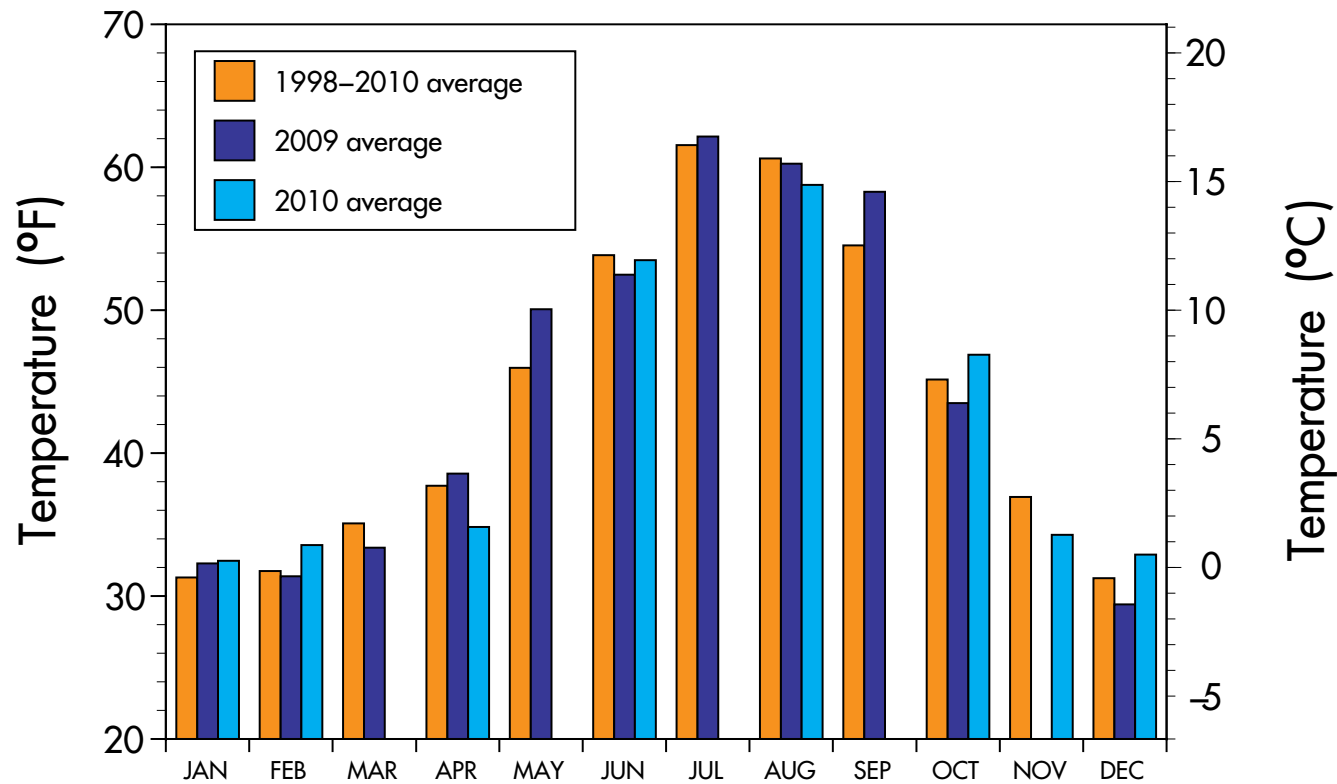
Monthly air temperature

Since 1998

In 2010, January, February, October and December were warmer than either the previous year or the twelve-

year average. The months of April and August were cooler than the previous year and the twelve-year average.

Missing bars represent months where there was insufficient data to calculate a representative monthly average.



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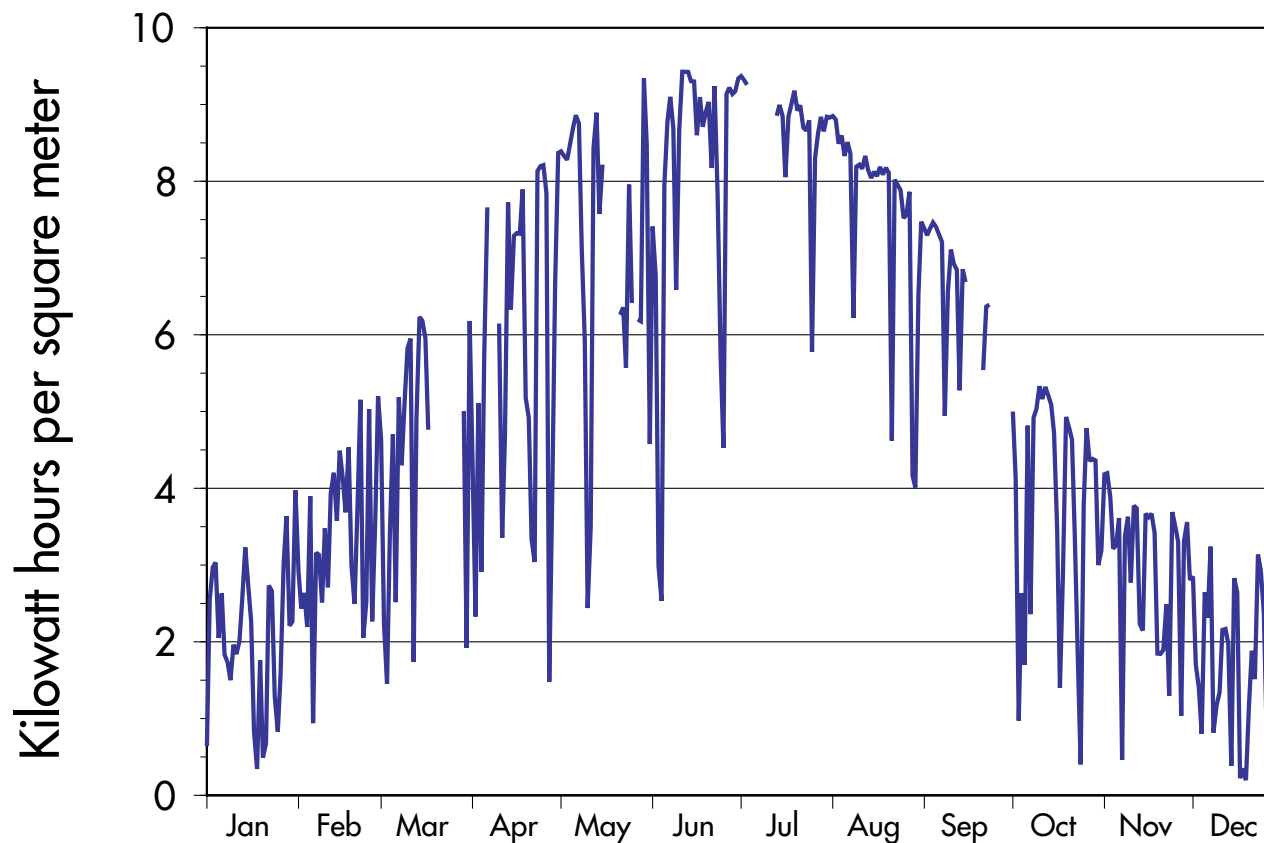
Daily Solar Radiation

Daily in 2010

Solar radiation showed the typical annual pattern of increasing then decreasing, 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.



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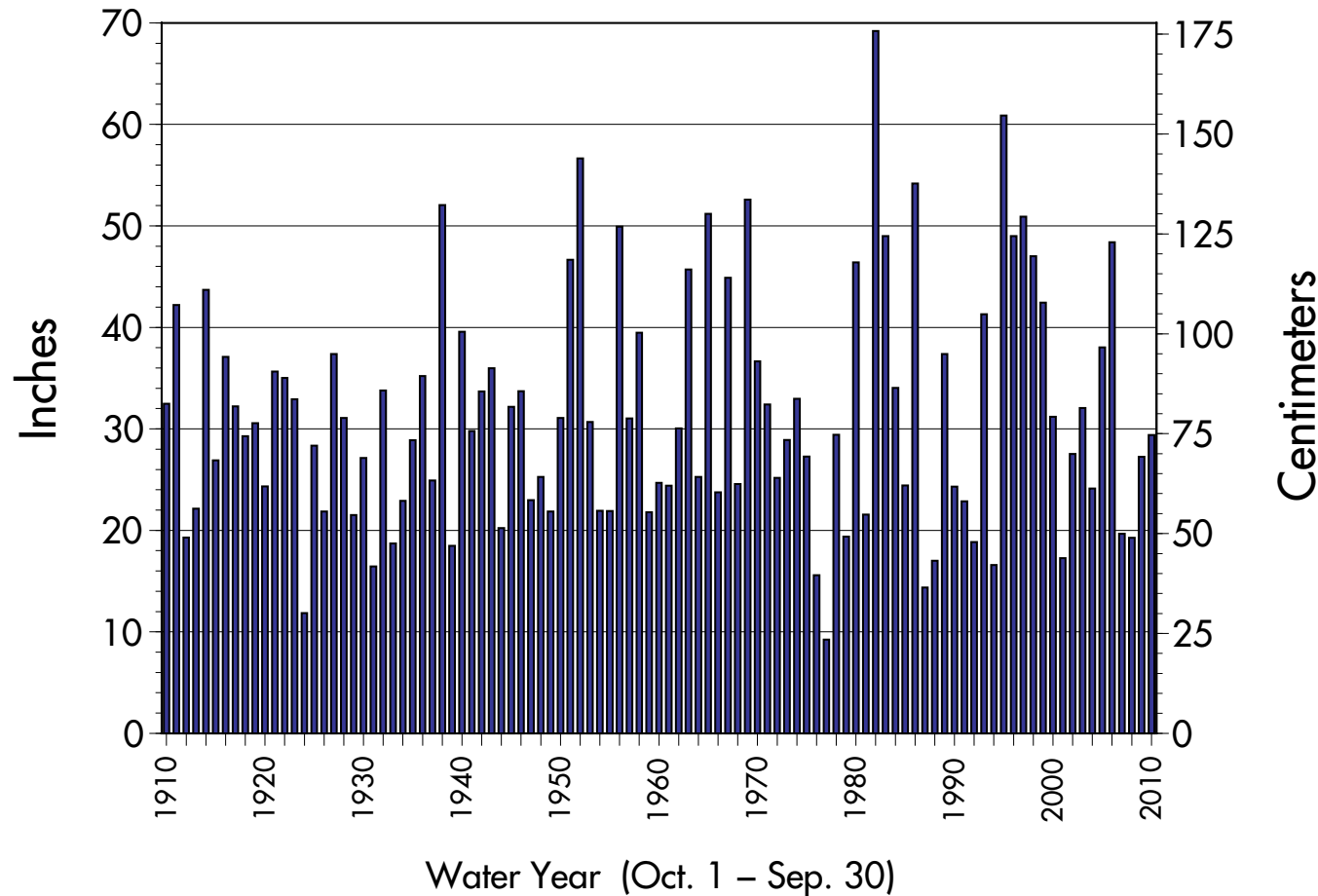
Annual precipitation

Yearly since 1910

From 1910 to 2010, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.5 inches. The maximum was 69.2 inches in 1982. The minimum was

9.2 inches in 1977. 2010 was slightly below average, with 29.4 inches of precipitation. 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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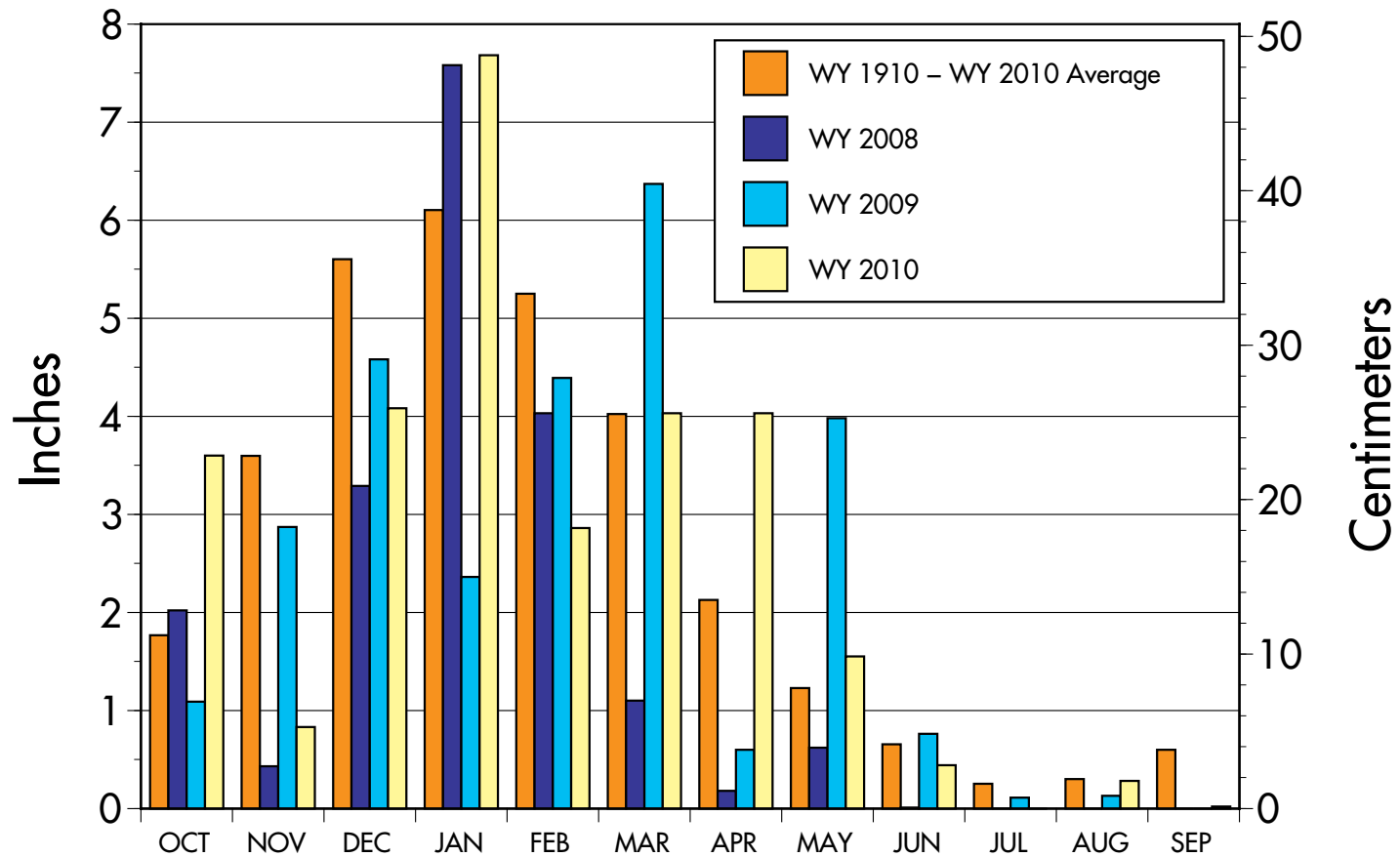
Monthly precipitation

2008, 2009, 2010 and 1910 to 2010 Average

2010 was almost an average year in total precipitation. However, five months were below the long-term

average precipitation. October, January, April and May all had above average precipitation. Summer of 2010 was dry.

The 2010 Water Year extended from October 1, 2009, through September 30, 2010.



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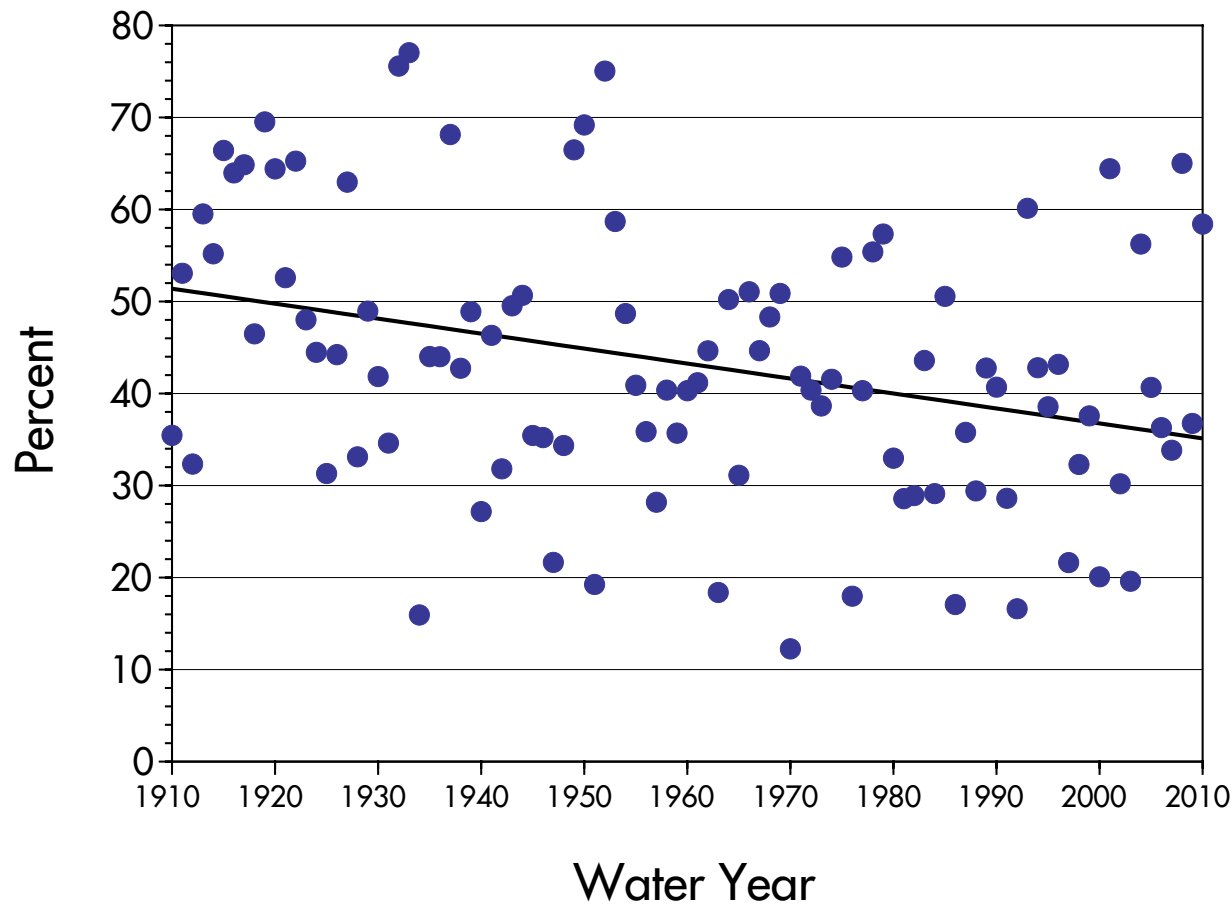
Snow as a fraction of annual precipitation

Yearly since 1910

Snow has declined as a fraction of total precipitation, from an average of 52 percent in 1910 to 34 percent in present times. In Tahoe City, snow represented

59 percent of 2010 total precipitation, much higher than the long-term trend. These data assume precipitation falls as snow whenever the average daily

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



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Shift in snowmelt timing

Yearly since 1961

Although the date on which peak snowmelt occurs varies from year to year, since 1961 it has shifted earlier an average of 2 ½ weeks. This shift is statistically significant and is one effect of climate change on Lake Tahoe. In 2010, peak discharge

occurred closer to historical timing. Peak snowmelt is defined as the date when daily river flows reach their yearly maximum. Daily river flows increase throughout spring as the snow melts because of rising air temperatures, increasing solar radiation

and longer days. The data here are based on the average from the Upper Truckee River, Trout Creek, Blackwood Creek, Ward Creek, and Third Creek.

