

TAHOE:
STATE
OF THE
LAKE
REPORT
2012

METEOROLOGY

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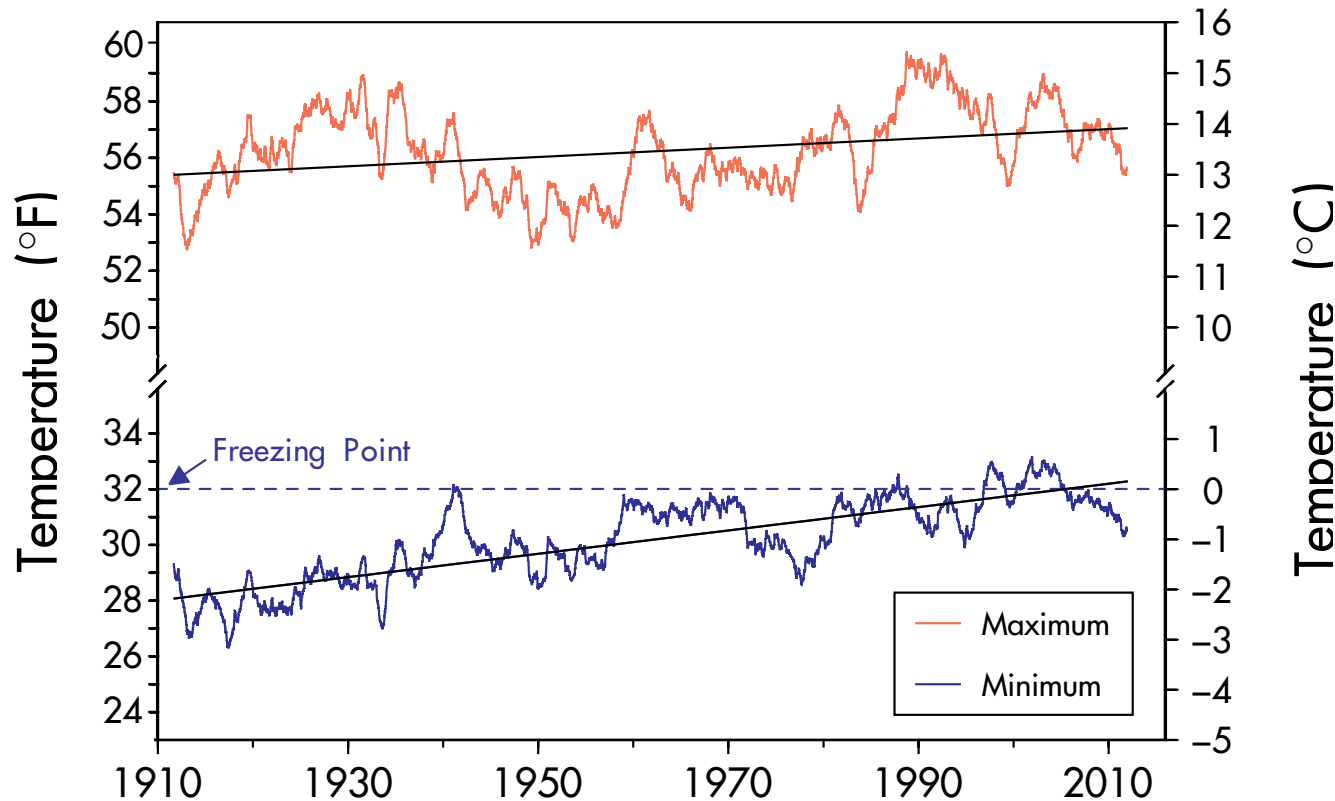
Air temperature

Daily since 1911

Daily air temperatures have increased over the 100 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 (1.1 degrees C). 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. 2011 was a particularly cool year at Lake Tahoe.



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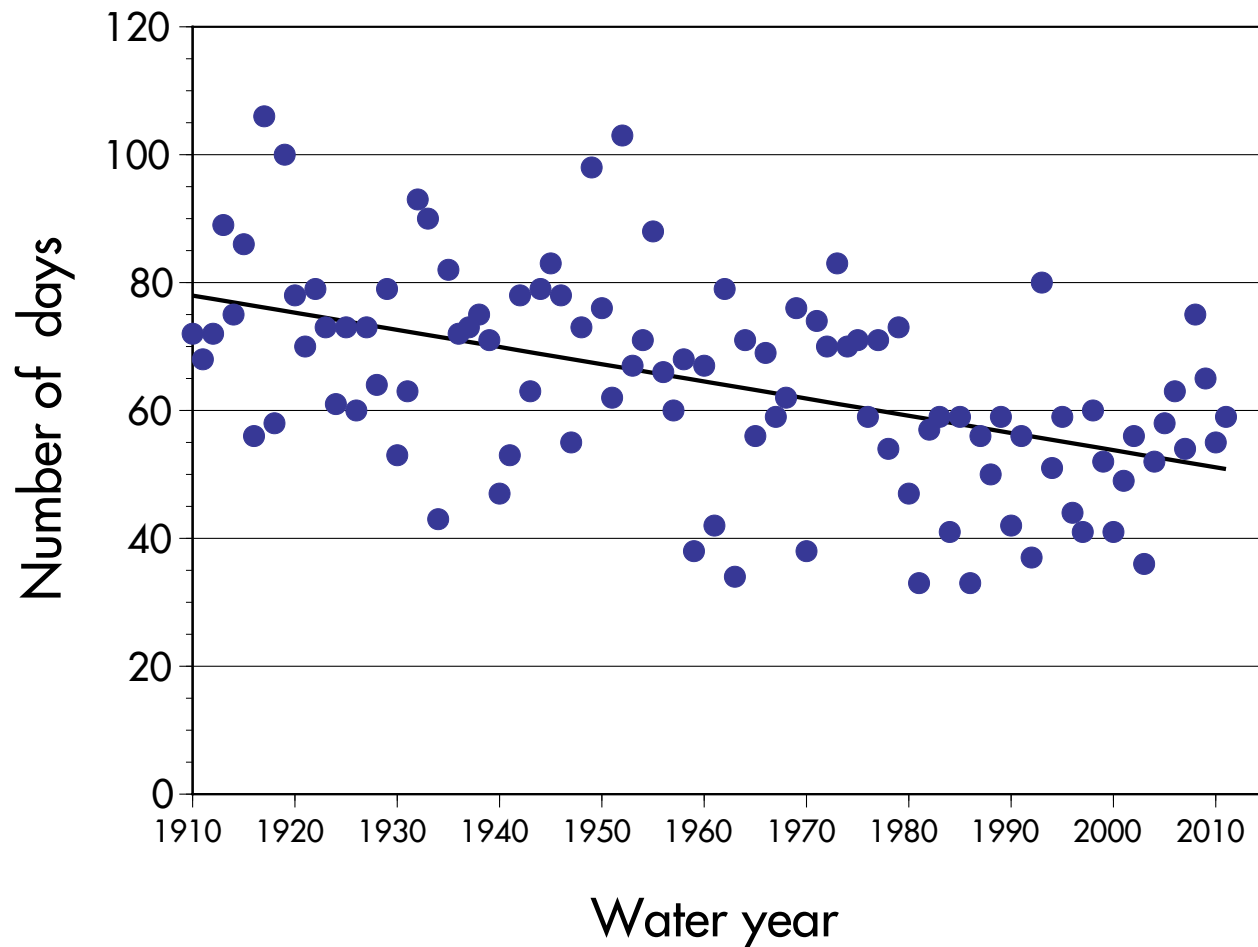
Below-freezing air temperatures

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 25 days since 1911. In 2011, the number of freezing days was above the

long-term trend for the seventh year in a row.



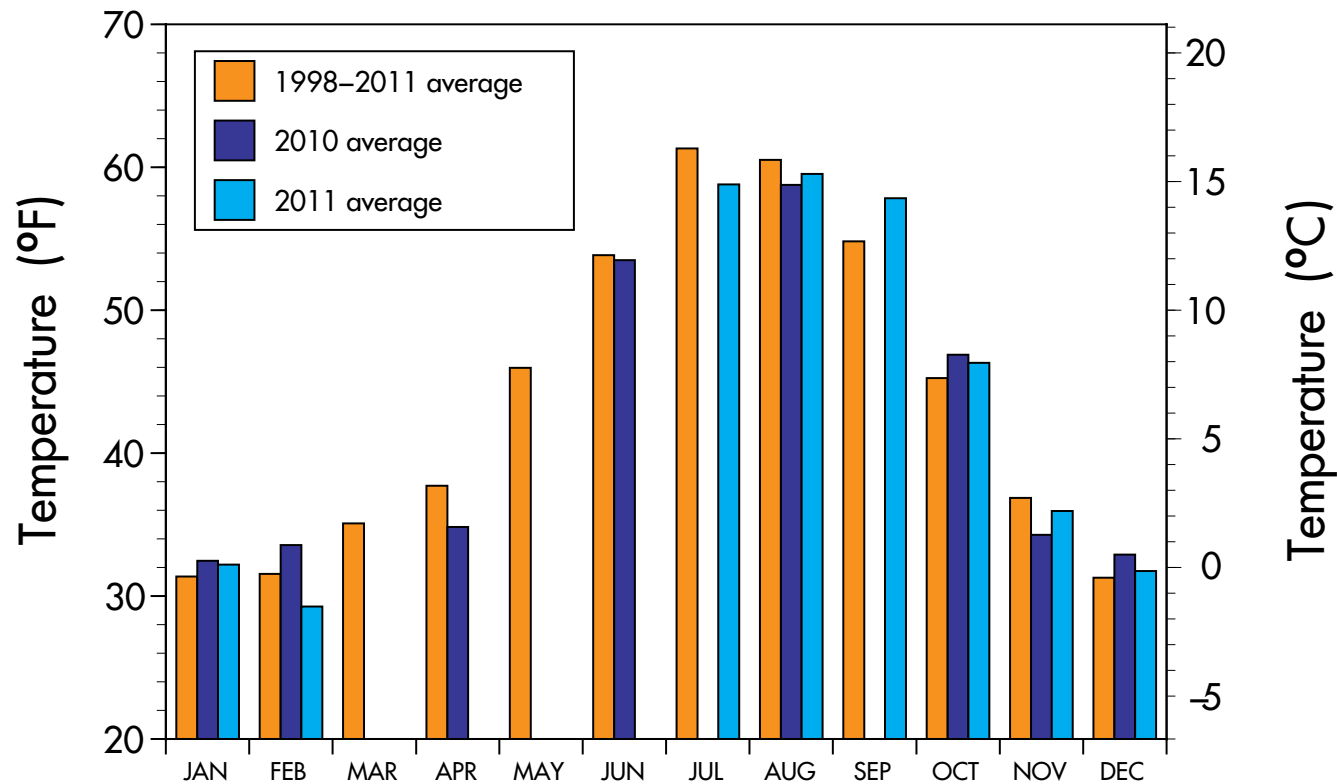
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Monthly air temperature

Since 1998

In 2011, months where there was sufficient data appeared to be similar or slightly cooler than the previous

year or long term average. Any month with more than 25 percent of the daily data missing were not plotted.



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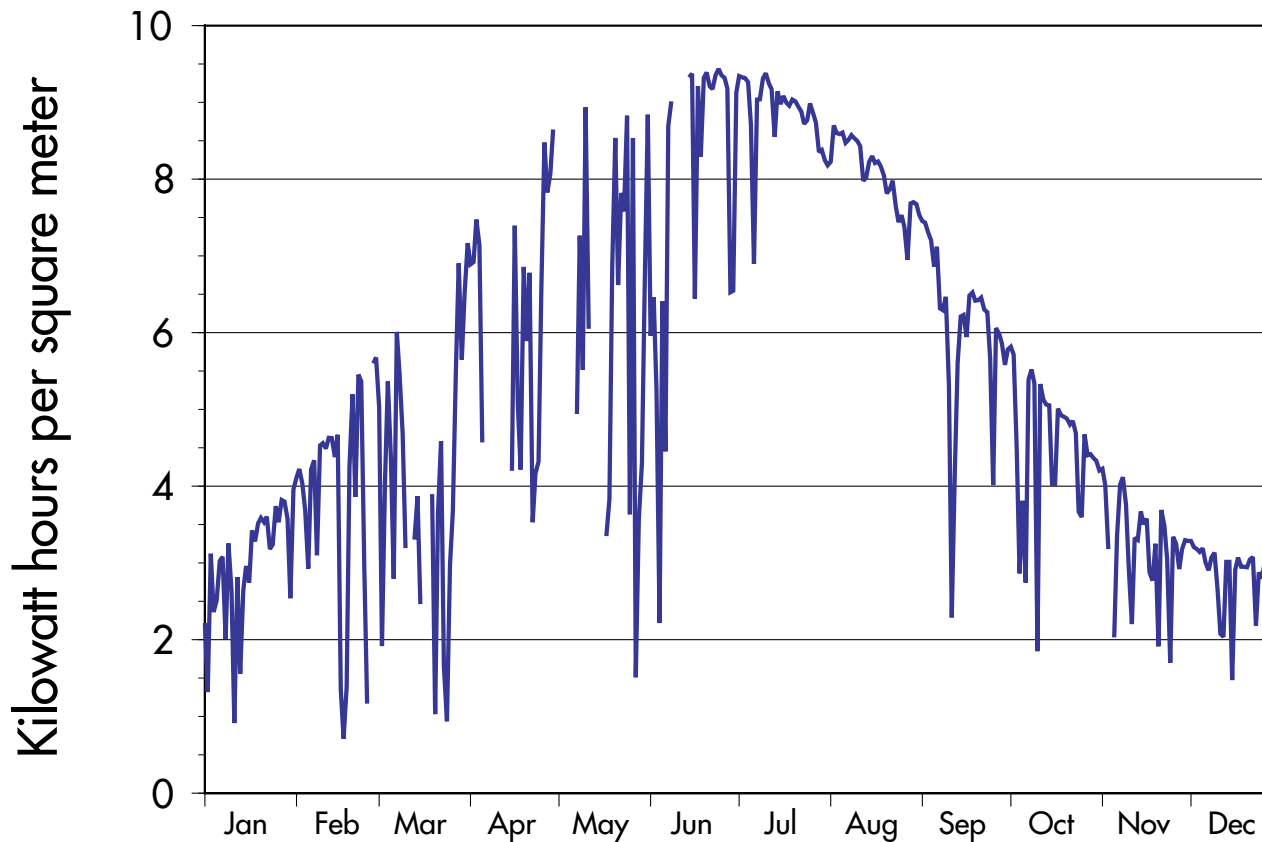
Daily Solar Radiation

Daily in 2011

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.

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



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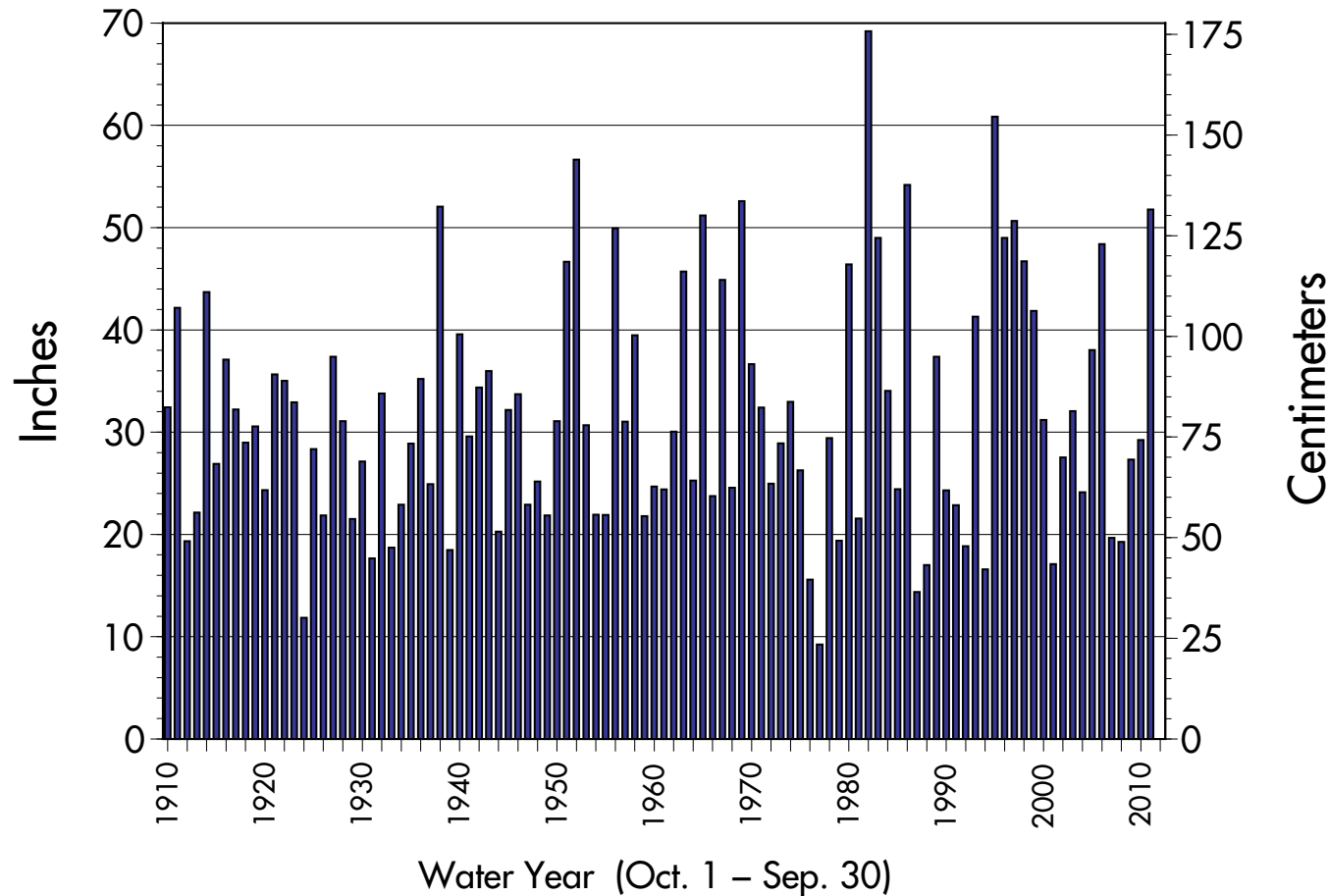
Annual precipitation

Yearly since 1910

From 1910 to 2011, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.68 inches. The maximum was 69.2 inches in 1982. The minimum was 9.2 inches

in 1977. 2011 was well above average, with 51.78 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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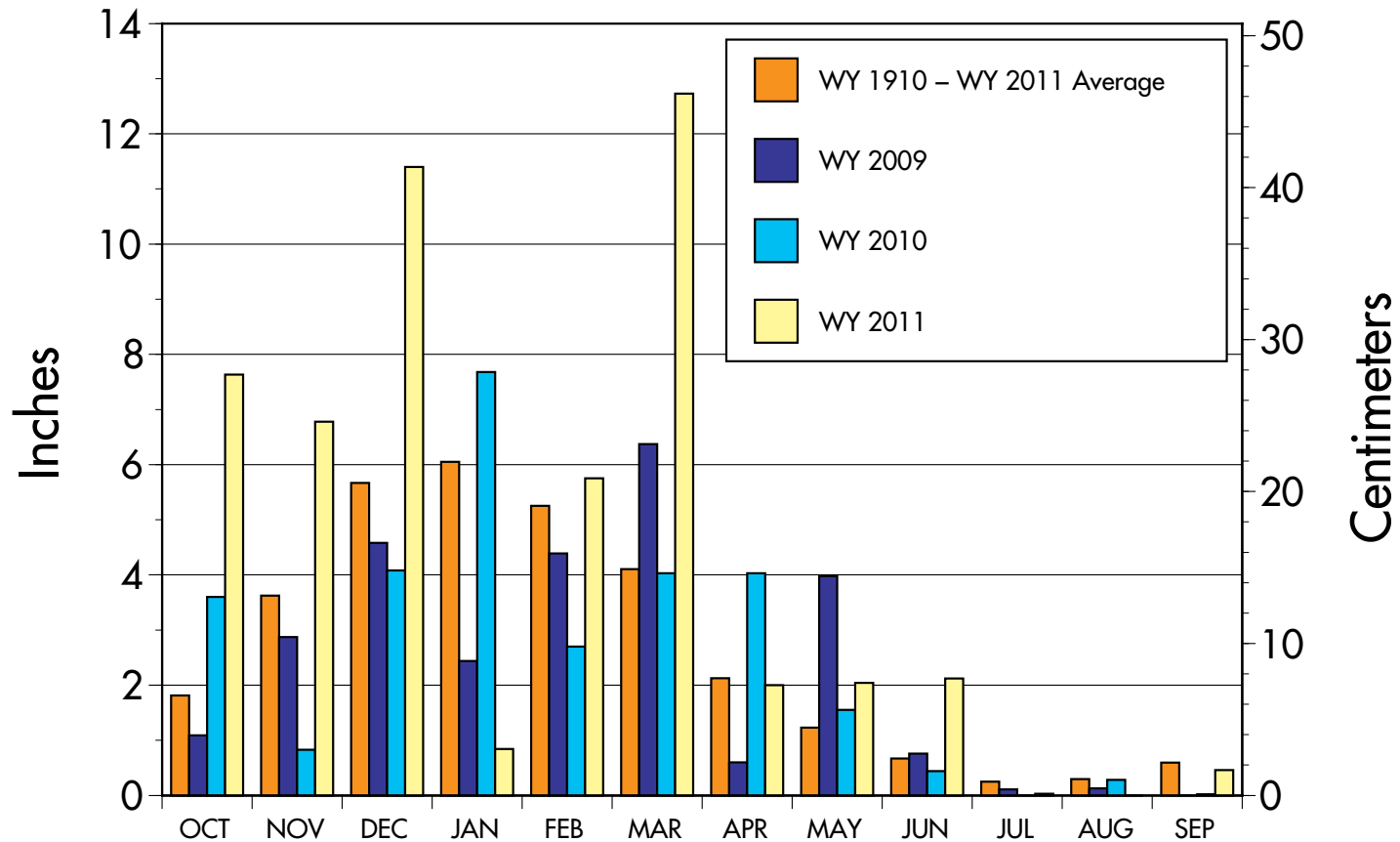
Monthly precipitation

2009, 2010, 2011 and 1910 to 2011 Average

2011 was well above average in total precipitation. The first five months of the water year were particularly

wet, with October and March having over three times the long term mean and December and June having twice

the long term mean. The 2011 Water Year extended from October 1, 2010, through September 30, 2011.



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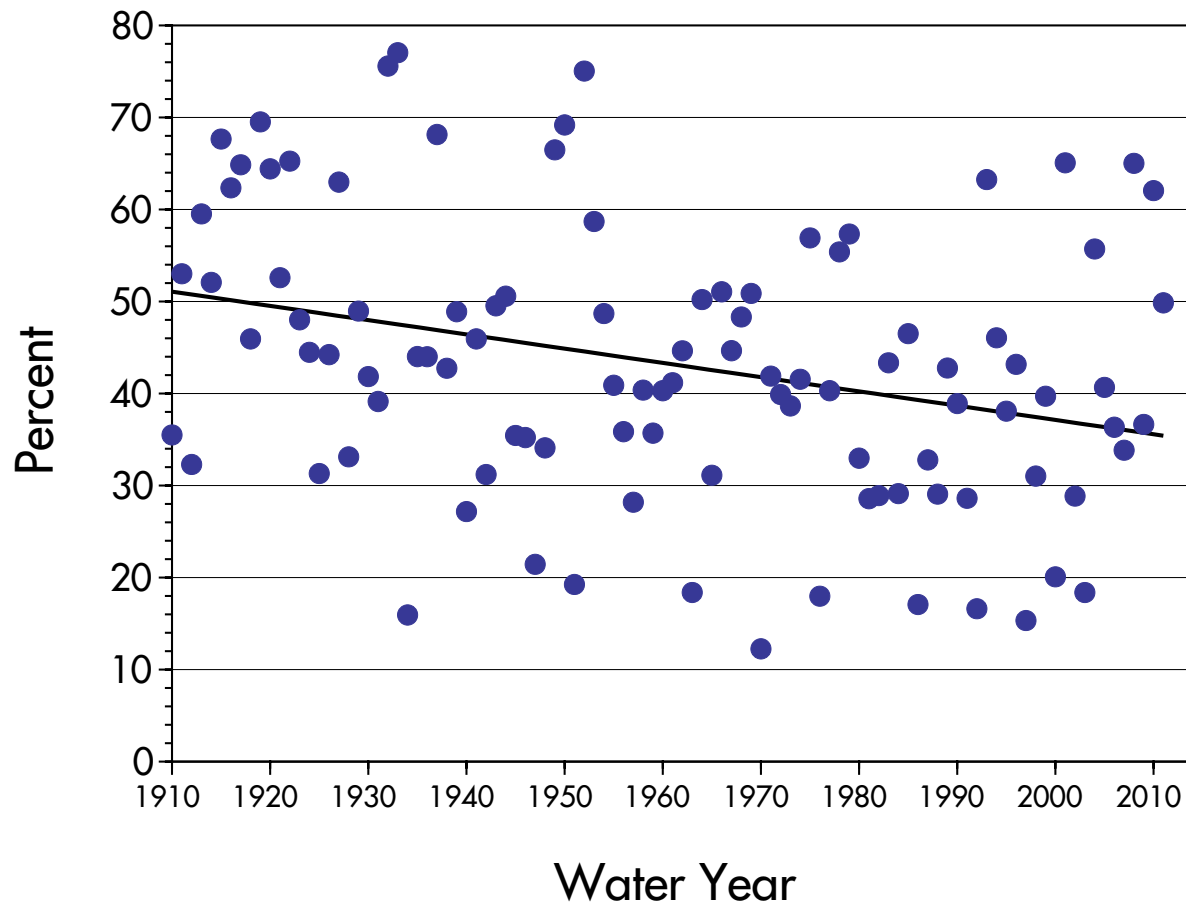
Snow as a fraction of annual precipitation

Yearly since 1910

Snow has declined as a fraction of total precipitation, from an average of 52 percent in 1910 to 36 percent in present times. In Tahoe City, snow represented

50 percent of 2011 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 weeks (14.5 days). This shift is statistically significant and is one effect of climate change on Lake Tahoe. In 2011, peak discharge

occurred later in early June and 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.

