TAHOE:
STATE
OF THE
LAKE
REPORT
2015

METEOROLOGY
Over the last 100 years, the daily air temperatures measured at Tahoe City have increased. The long-term trend in daily minimum temperature has increased by 4.2 °F (2.3 °C), and the long-term trend in daily maximum temperature has risen by 1.8 °F (1.0 °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. In 2014, the average minimum temperature increased by 2.3 °F (1.3 °C) over 2013. The average maximum temperature increased 2.0 °F (1.1 °C) over 2013.
Meteorology

Air temperature - annual average maximum and minimum
Since 1910

Annual average maximum (red) and minimum (blue) air temperatures both increased in 2014. The 2014 annual average minimum was 33.7 °F (0.92 °C) an increase of 2.3 °F over the previous year, and is the highest ever recorded. The maximum temperature was 60.3 °F (15.7 °C) an increase of 2.0 °F over the previous year, and is also the highest ever recorded. The long term means for the minimum and the maximum are 30.2 °F (-0.97 °C) and 56.3 °F (13.5 °C), respectively.
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 29 days since 1911. In WY 2014, the number of freezing days was 29, the lowest ever recorded.

Note: The Water Year extends from October 1 through September 30.
In 2014, monthly air temperatures were distinguished by being warmer than the long-term mean in virtually every month of the year (except August). This trend is consistent with the global trend of 2014 being the warmest year on record. Months with more than 25 percent of days missing were omitted.
From 1910 to 2014, average annual precipitation (water equivalent of rain and snow) at Tahoe City was 31.41 inches. The maximum was 69.2 inches in 1982. The minimum was 9.2 inches in 1977. 2014 was well below average, with 19.32 inches, following the two previous dry years. The long-term mean of 31.41 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.)
2014 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 2014 was particularly lower than the long-term average between October and January. The monthly precipitation for Dec-2011 (WY 2012), and Jun-2014 (WY 2014) was 0 inches. The 2014 Water Year extended from October 1, 2013, through September 30, 2014.
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 34 percent in present times according to the line of best fit. In Tahoe City, snow represented 18 percent of the 2014 total precipitation, one of the lowest values 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.)
METEOROLOGY

April snowpack
Since 1916

The depth of the snowpack is measured at multiple locations throughout the Sierra throughout the year. Shown here are the readings taken on approximately April 1 for the period 1916 to 2015 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 3/27/2015 was 37 inches, the lowest value ever recorded. The average snow depth over the period 1916-2015 was 142 inches. Data source: USDA Natural Resources Conservation Service, California Monthly Snow Data.
**METEOROLOGY**

**Daily solar radiation**

In 2014

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.