# Local Climate Change Snapshot


## Lake County

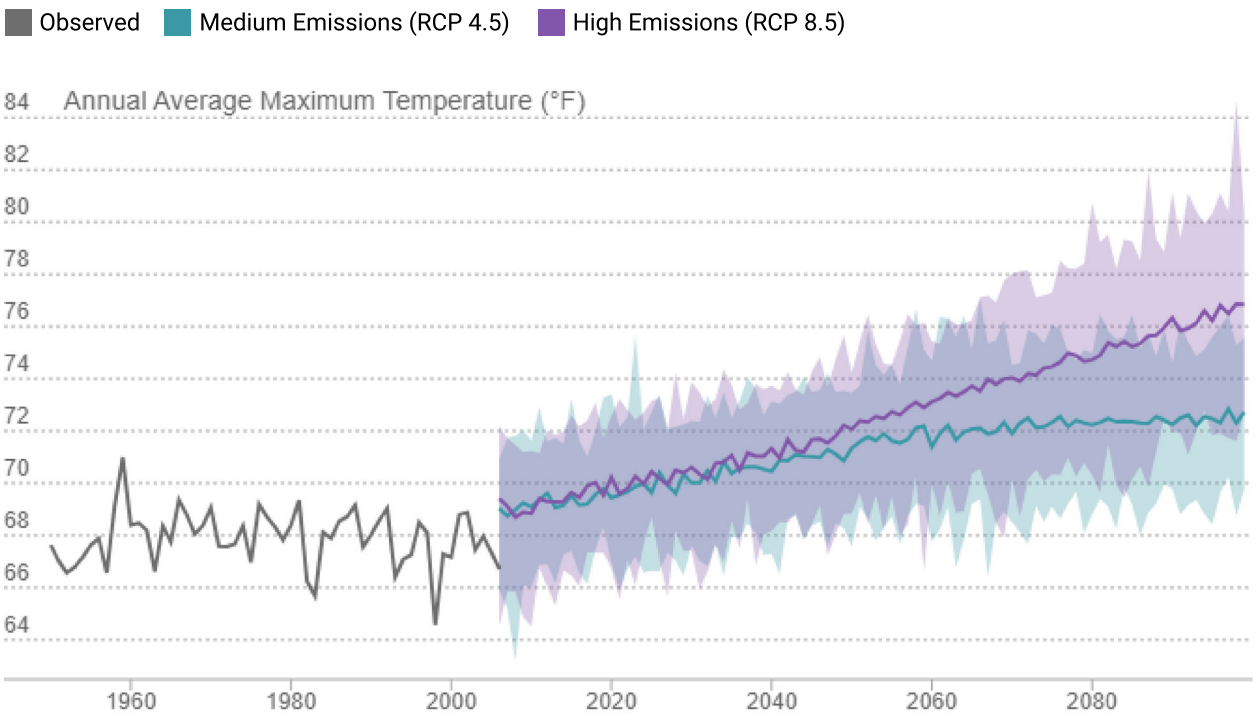
California

# Temperature

Overall temperatures are projected to rise in California during the 21st century. While the entire state will experience temperature increases, the local impacts will vary greatly with many communities and ecosystems already experiencing the effects of rising temperatures.

## Annual Average Maximum Temperature

Average of all the hottest daily temperatures in a year.




**Observed (1961-1990)** 30yr Average: 68.1 °F

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 67.7 °F | 67.5 - 68.0 °F |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +3.6 °F | 71.3 °F | 69.3 - 72.5 °F |
| HIGH EMISSIONS (RCP 8.5) | +4.4 °F | 72.1 °F | 69.2 - 73.4 °F |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +4.7 °F | 72.4 °F | 70.2 - 74.1 °F |
| HIGH EMISSIONS (RCP 8.5) | +7.7 °F | 75.4 °F | 71.1 - 77.7 °F |

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2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
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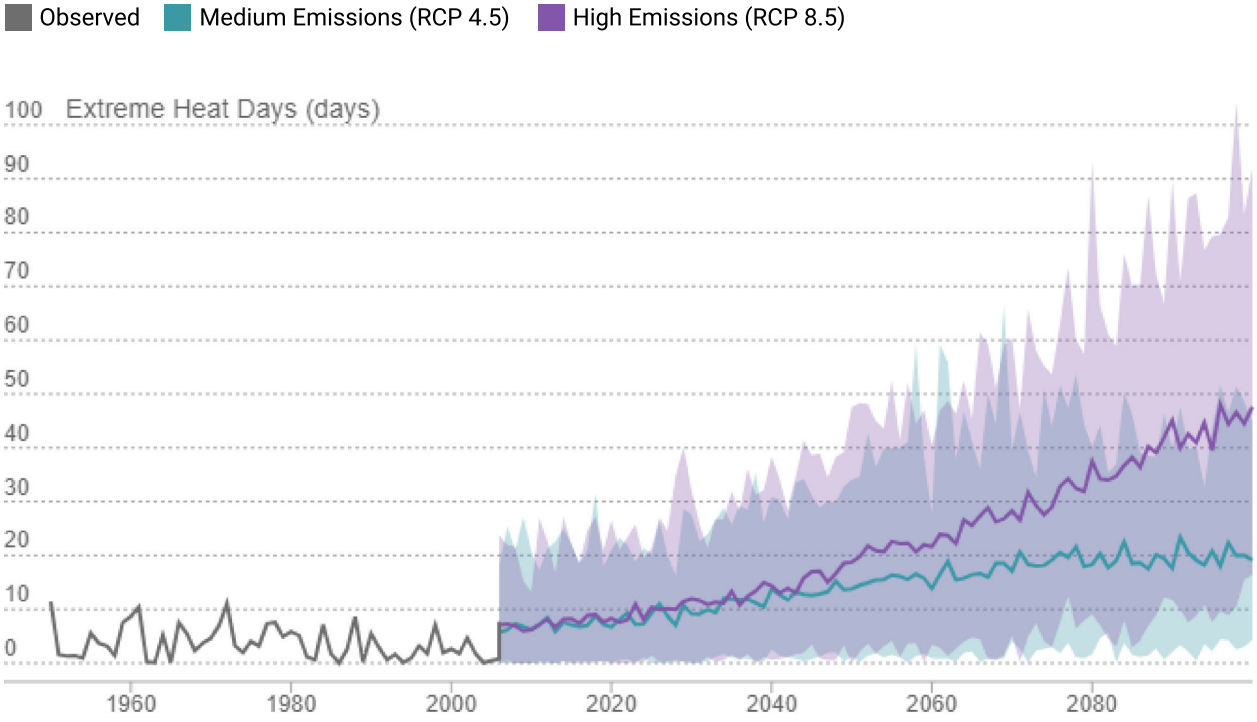
## Extreme Heat Days

Number of days in a year when daily maximum temperature is above a threshold temperature




**Observed (1961-1990)** 30yr Average: 4 days

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 4 days | 3 - 5 days |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +10 days | 14 days | 3 - 22 days |
| HIGH EMISSIONS (RCP 8.5) | +14 days | 18 days | 4 - 28 days |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +15 days | 19 days | 6 - 34 days |
| HIGH EMISSIONS (RCP 8.5) | +33 days | 37 days | 10 - 57 days |

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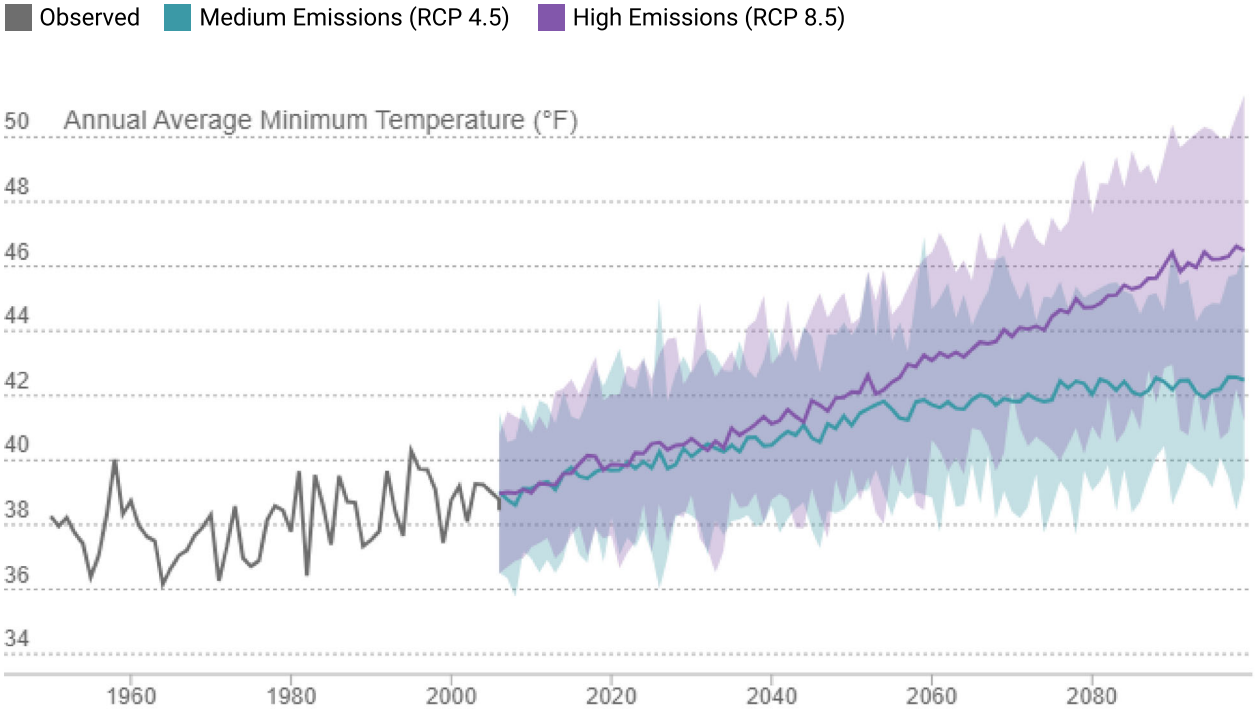
## Annual Average Minimum Temperature

Average of all coldest daily temperatures in a year.




**Observed (1961-1990)** 30yr Average: 37.8 °F

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 38.0 °F | 37.7 - 38.3 °F |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +3.2 °F | 41.2 °F | 39.7 - 42.4 °F |
| HIGH EMISSIONS (RCP 8.5) | +4.1 °F | 42.1 °F | 40.1 - 43.5 °F |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +4.2 °F | 42.2 °F | 40.3 - 44.2 °F |
| HIGH EMISSIONS (RCP 8.5) | +7.3 °F | 45.3 °F | 41.9 - 47.8 °F |

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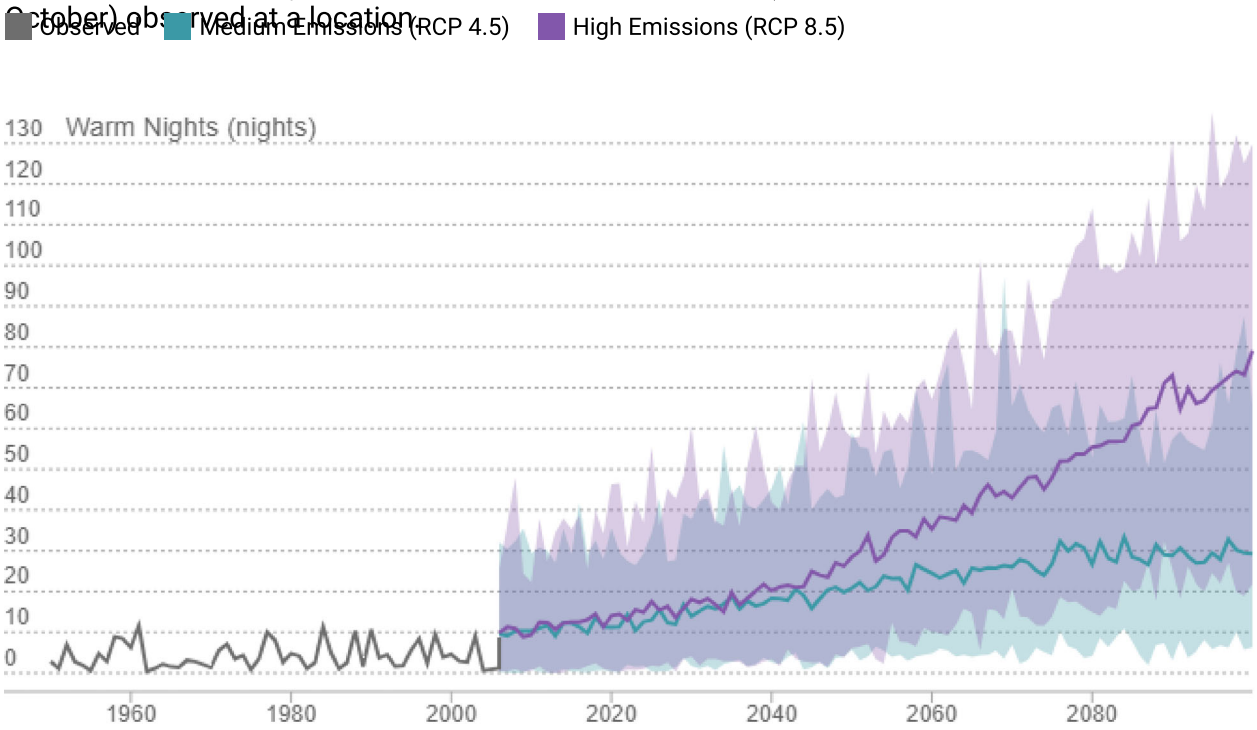
## Warm Nights

Number of days in a year when daily minimum temperature is above a threshold temperature of 97.1 °F

Note: Threshold temperature used in this tool is location specific. It is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at a location.




**Observed (1961-1990)** 30yr Average: 4 nights

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 6 nights | 2 - 13 nights |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +15 nights | 21 nights | 9 - 35 nights |
| HIGH EMISSIONS (RCP 8.5) | +22 nights | 28 nights | 13 - 44 nights |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +23 nights | 29 nights | 13 - 48 nights |
| HIGH EMISSIONS (RCP 8.5) | +54 nights | 60 nights | 31 - 91 nights |

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4. Threshold temperature for a location is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at that location.

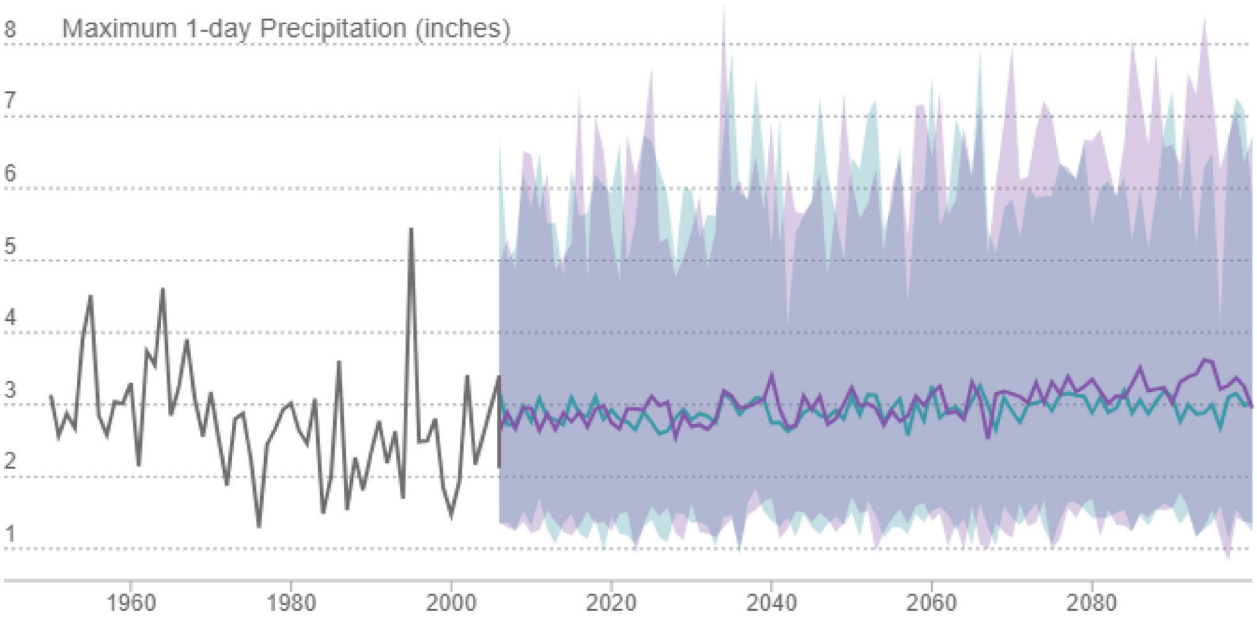
# Precipitation

California's climate varies between wet and dry years. Research suggests that for much of the state, wet years will become wetter and the dry years will become drier. Dry years are also likely to be followed by dry years, increasing the risk of drought. While California does not see the average annual precipitation changing significantly in the next 50-75 years, precipitation will likely be delivered in more intense storms and within a shorter wet season. We are already seeing some of the impacts from a shift towards larger year to year fluctuations.

## Maximum 1-day Precipitation

The maximum daily precipitation amount for each year. In other words, the greatest amount of daily rain or snow (over a 24 hour period) for each year.

Observed  Medium Emissions (RCP 4.5)  High Emissions (RCP 8.5)




**Observed (1961-1990)** 30yr Average: 2.692 inches

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 2.728 inches | 2.462 - 3.088 inches |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +0.186 inches | 2.914 inches | 2.454 - 3.687 inches |
| HIGH EMISSIONS (RCP 8.5) | +0.242 inches | 2.970 inches | 2.420 - 3.811 inches |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +0.267 inches | 2.995 inches | 2.523 - 3.561 inches |
| HIGH EMISSIONS (RCP 8.5) | +0.525 inches | 3.253 inches | 2.602 - 4.202 inches |

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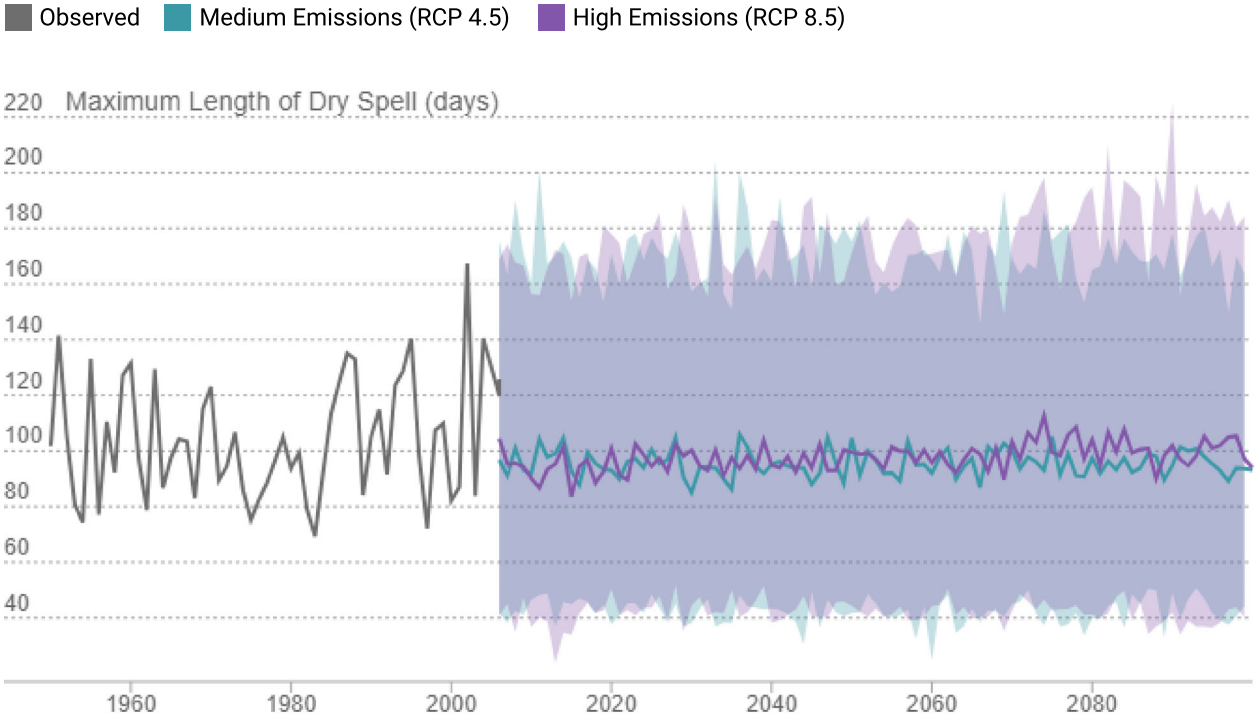
## Maximum Length of Dry Spell

The maximum length of dry spell for each year. In other words, the maximum number of consecutive days with precipitation < 1mm for each year. of 55.6 °F




**Observed (1961-1990)** 30yr Average: 99 days

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 89 days | 77 - 104 days |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +6 days | 95 days | 80 - 116 days |
| HIGH EMISSIONS (RCP 8.5) | +8 days | 97 days | 80 - 117 days |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +7 days | 96 days | 80 - 115 days |
| HIGH EMISSIONS (RCP 8.5) | +12 days | 101 days | 71 - 137 days |

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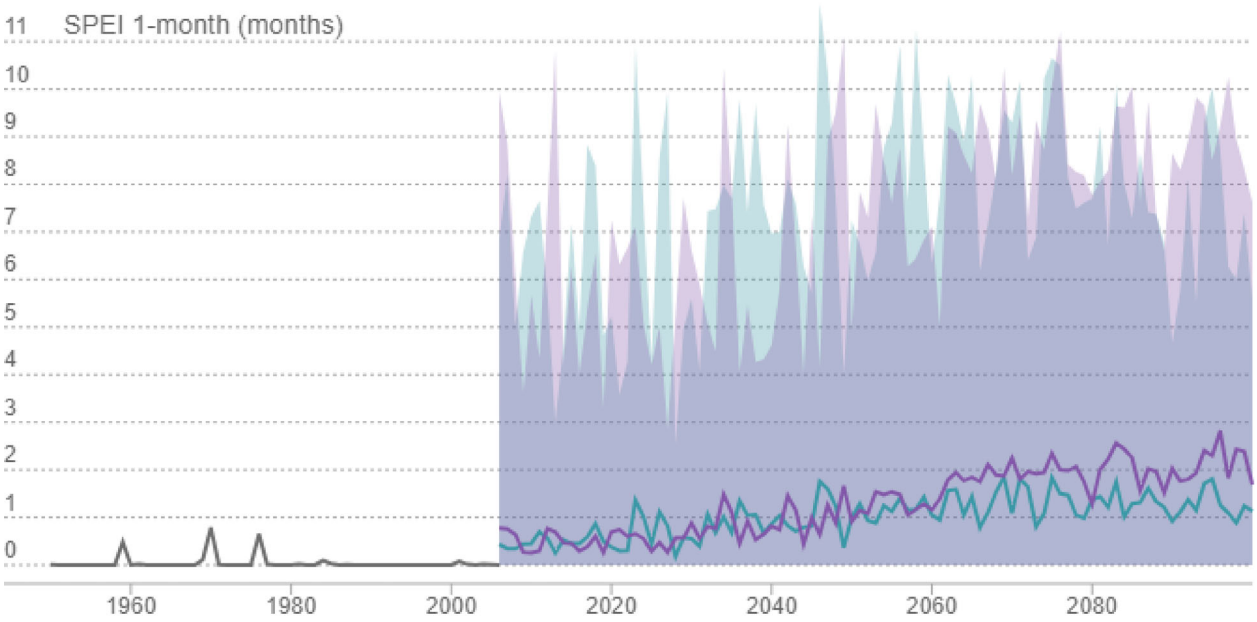
## SPEI 1-month

Number of months in a year with a Standardised Precipitation-Evapotranspiration Index (SPEI) <= -1. SPEI is a multi-scalar drought index and can be used to detect, monitor and analyze droughts.

The standardized precipitation-evaporation index (SPEI) depicts the combined impacts of precipitation deficits and potential evapotranspiration on soil moisture. SPEI does not include impacts from effects like wind speed, relative humidity or solar radiation impacts (typically short-term forcing) – making it more reflective of long-term hydrological and ecological drought conditions. Here we present SPEI calculated for a 9-month period, attempting to reflect a length slightly longer than California's typical




**Observed (1961-1990)** 30yr Average: 0.1 months

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 0.2 months | 0.0 - 0.5 months |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +0.9 months | 1.1 months | 0.1 - 2.1 months |
| HIGH EMISSIONS (RCP 8.5) | +0.9 months | 1.1 months | 0.2 - 2.5 months |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +1.1 months | 1.3 months | 0.2 - 2.4 months |
| HIGH EMISSIONS (RCP 8.5) | +1.9 months | 2.1 months | 0.3 - 4.0 months |

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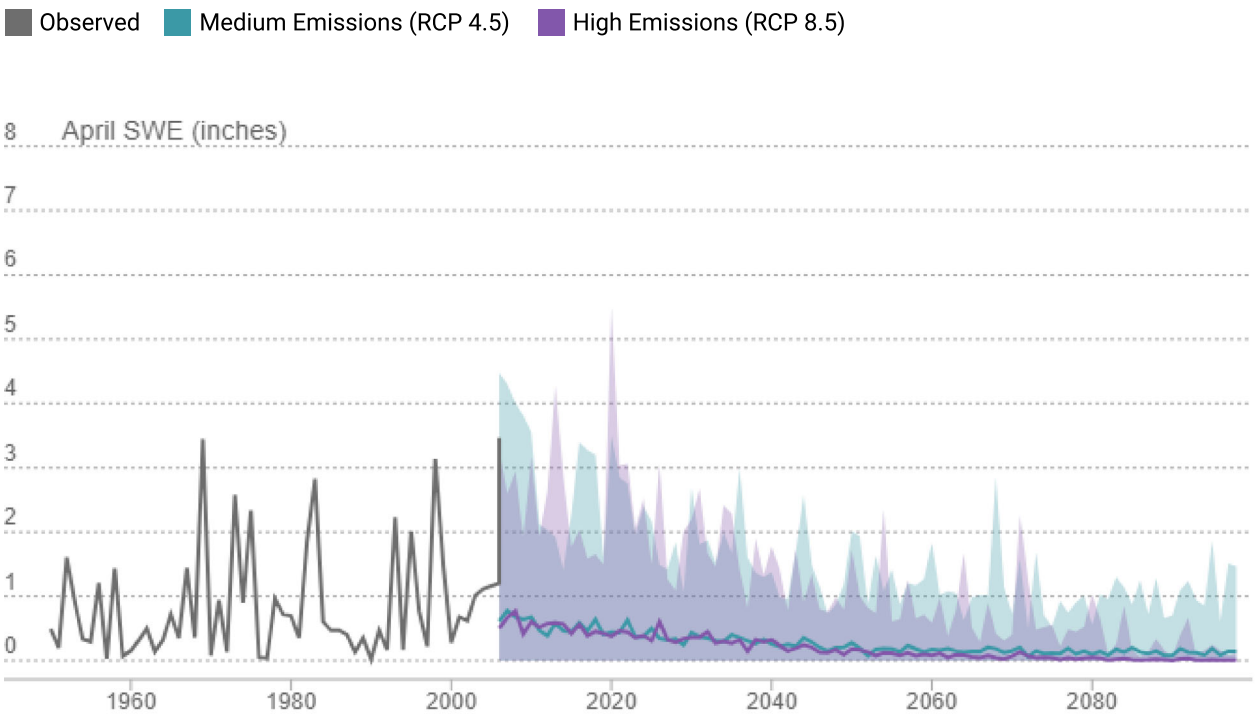
## April SWE

Snow Water Equivalent (SWE), is a commonly used measurement used by hydrologists and water managers to gage the amount of liquid water contained within the snowpack.




**Observed (1961-1990)** 30yr Average: 0.8 inches

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 0.9 inches | 0.6 - 1.4 inches |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | -0.7 inches | 0.2 inches | 0.1 - 0.5 inches |
| HIGH EMISSIONS (RCP 8.5) | -0.7 inches | 0.2 inches | 0.0 - 0.6 inches |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | -0.8 inches | 0.1 inches | 0.0 - 0.5 inches |
| HIGH EMISSIONS (RCP 8.5) | -0.9 inches | 0.0 inches | 0.0 - 0.2 inches |

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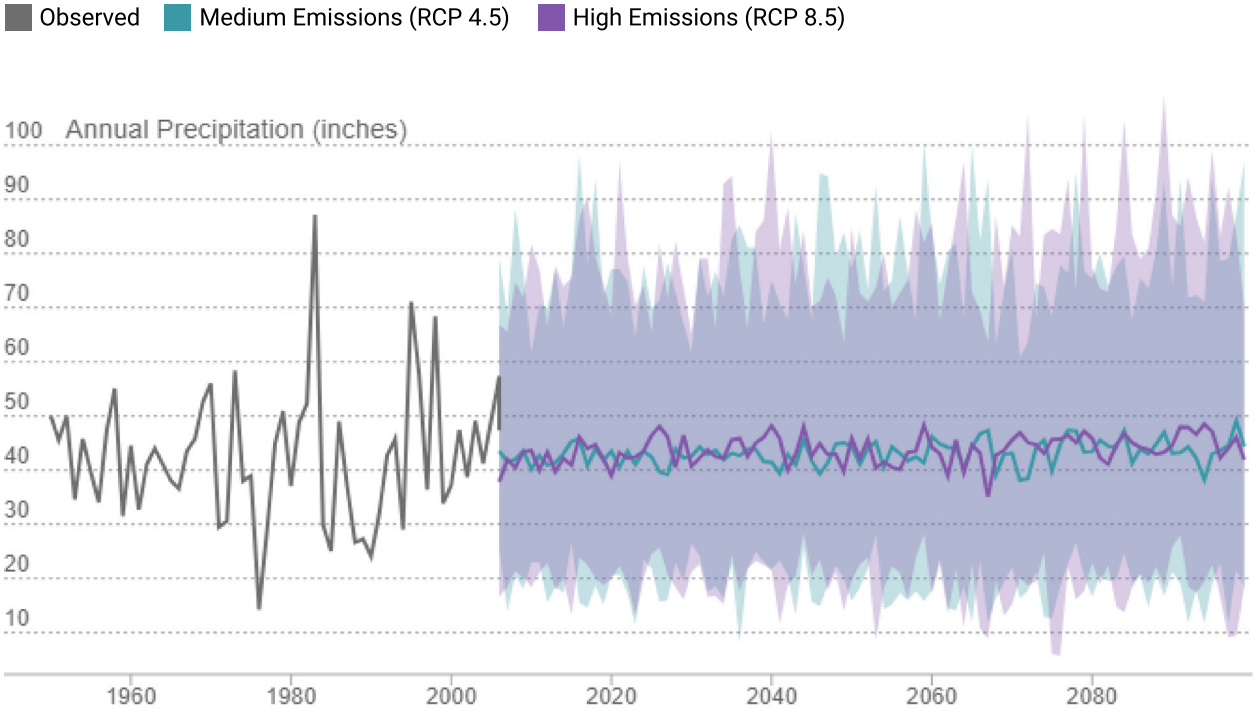
## Annual Precipitation

Total precipitation projected for a year




**Observed (1961-1990)** 30yr Average: 40.3 inches

| | Change from baseline ⓘ | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 42.5 inches | 38.7 - 46.1 inches |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +0.4 inches | 42.9 inches | 36.6 - 55.4 inches |
| HIGH EMISSIONS (RCP 8.5) | +1.0 inches | 43.5 inches | 34.8 - 57.4 inches |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +1.3 inches | 43.8 inches | 37.1 - 53.9 inches |
| HIGH EMISSIONS (RCP 8.5) | +2.6 inches | 45.1 inches | 33.7 - 58.6 inches |

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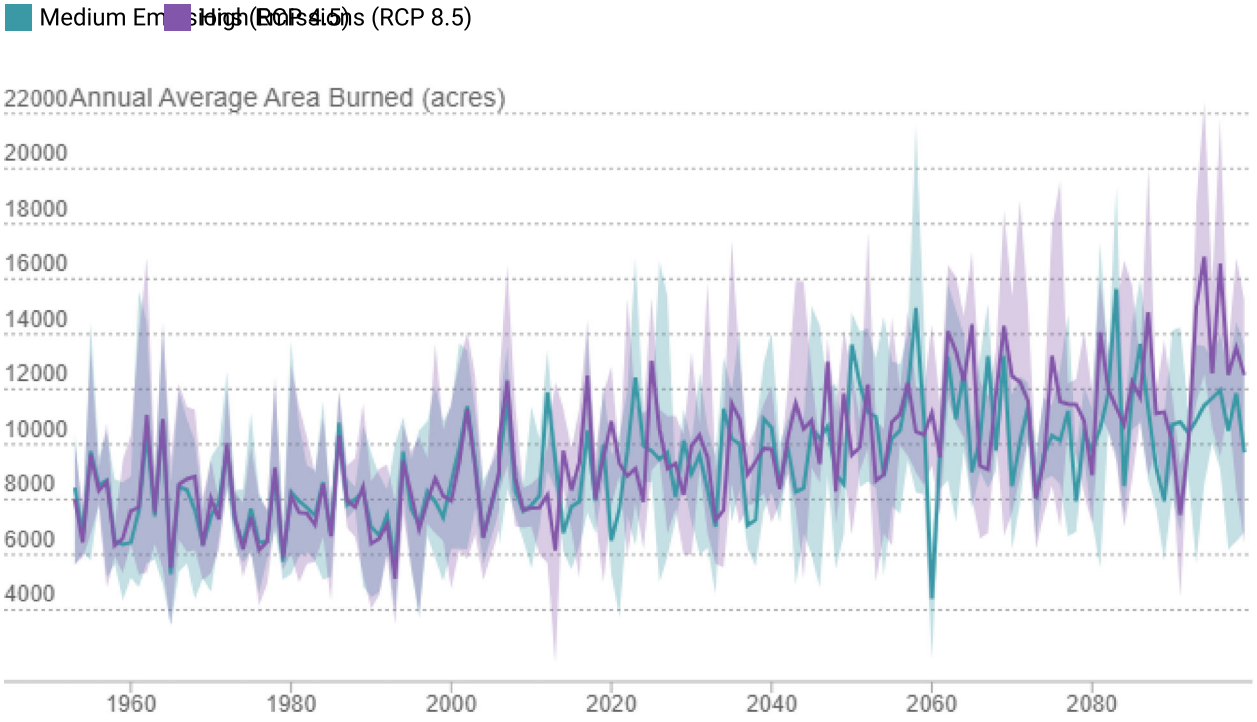
# Wildfire

The frequency, severity and impacts of wildfire are sensitive to climate change as well as many other factors, including development patterns, temperature increases, wind patterns, precipitation change and pest infestations. Therefore, it is more difficult to project exactly where and how fires will burn. Instead, climate models estimate increased risk to wildfires. The Annual Average Area Burned can help inform at a high level if wildfire activity is likely to increase. However, this information is not complete - many regions across the state have no projections (such as regions outside combined fire state and federal protection responsibility areas), and more detailed analyses and projections are needed for local decision-making. These projections are most robust for the Sierra Nevada given model inputs. However, as we have seen in recent years, much of California can expect an increased risk of wildfire, with a wildfire season that starts earlier, runs longer, and features more extreme fire events. Fire danger is complex. It is impacted by human activity, vegetation, wind, temperature, relative humidity, atmospheric stability, etc. The Keetch-Byram Drought Index (KBDI) represents a simplified proxy for favorability of occurrence and spread of wildfire but is not itself a predictor of fire.

## Annual Average Area Burned

Average of the area projected to be at risk to burning in a year.




| | Change from baseline | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | - | 7834.3 acres | 7706.2 - 7893.4 acres |
| HIGH EMISSIONS (RCP 8.5) | - | 7849.1 acres | 7724.8 - 7908.7 acres |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +2376.0 acres | 10210.3 acres | 9627.1 - 10720.9 acres |
| HIGH EMISSIONS (RCP 8.5) | +2783.6 acres | 10632.7 acres | 10165.0 - 11112.8 acres |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +2758.0 acres | 10592.3 acres | 9876.2 - 11128.3 acres |
| HIGH EMISSIONS (RCP 8.5) | +4062.5 acres | 11911.6 acres | 11484.5 - 12165.7 acres |

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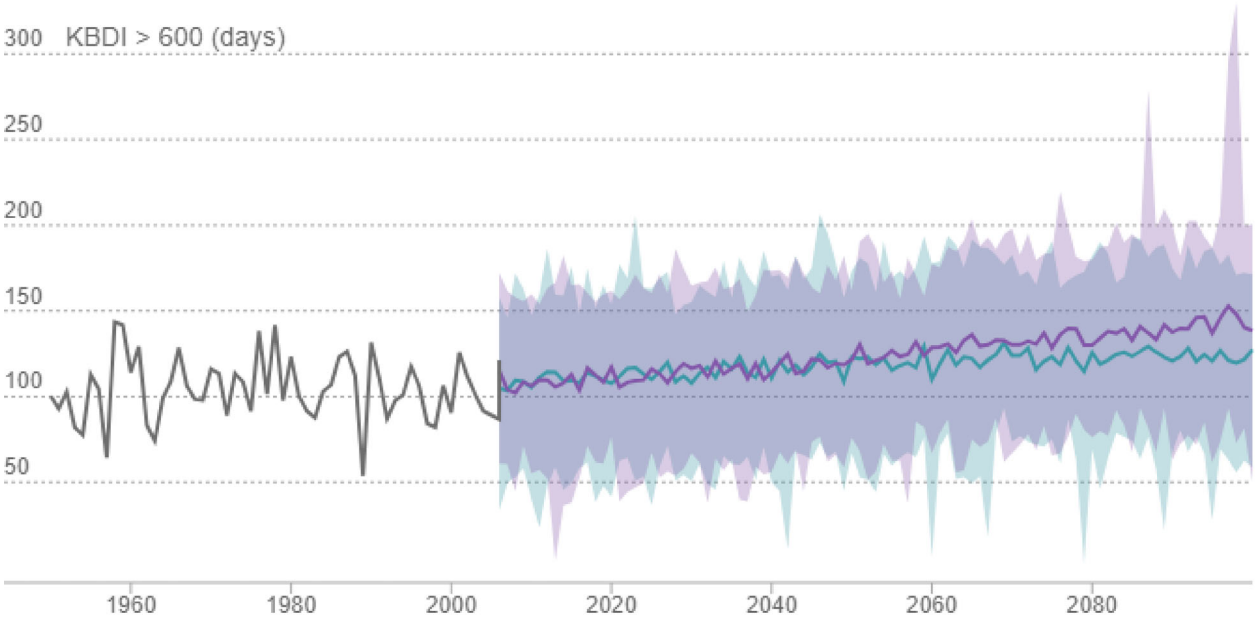
4. Lake County boundary may contain locations outside the combined fire state and federal protection responsibility areas. These locations were excluded from wildfire simulations and have no climate projections.

## KBDI > 600

Number of days in a year where Keetch-Byram Drought Index (KBDI) > 600. KBDI provides an estimate for how dry the soil and vegetative detritus is.

KBDI is cumulative. The KBDI values increase on dry and warm days and decrease during rainy periods. In California we would expect KBDI to increase from the end of the wet season (spring) into the dry season (summer & fall). The list below explains what values of KBDI represent:
0–200
200–400
400–600
600–800

Observed  Medium Emissions (RCP 4.5)  High Emissions (RCP 8.5)




**Observed (1961-1990)** 30yr Average: 107 days

| | Change from baseline | 30yr Average | 30yr Range |
|---|---|---|---|
| **Baseline (1961-1990)** | | | |
| MODELED HISTORICAL | - | 96 days | 76 - 113 days |
| **Mid-Century (2035-2064)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +23 days | 119 days | 97 - 138 days |
| HIGH EMISSIONS (RCP 8.5) | +26 days | 122 days | 106 - 139 days |
| **End-Century (2070-2099)** | | | |
| MEDIUM EMISSIONS (RCP 4.5) | +27 days | 123 days | 103 - 141 days |
| HIGH EMISSIONS (RCP 8.5) | +42 days | 138 days | 117 - 162 days |

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