

Indicators of Climate Change in California

Fifth Edition · October 2026



OEHHA
OFFICE OF ENVIRONMENTAL
HEALTH HAZARD ASSESSMENT



The Indicators of Climate Change in California Report documents how California's climate is changing and the cascading impacts on the state's water systems, terrestrial and marine environments, public health, and Tribal lands. Key findings from the fifth edition of this report are highlighted in this fact sheet.

49

INDICATORS

8

TRIBAL REPORTS

7

VOLUMES

100+

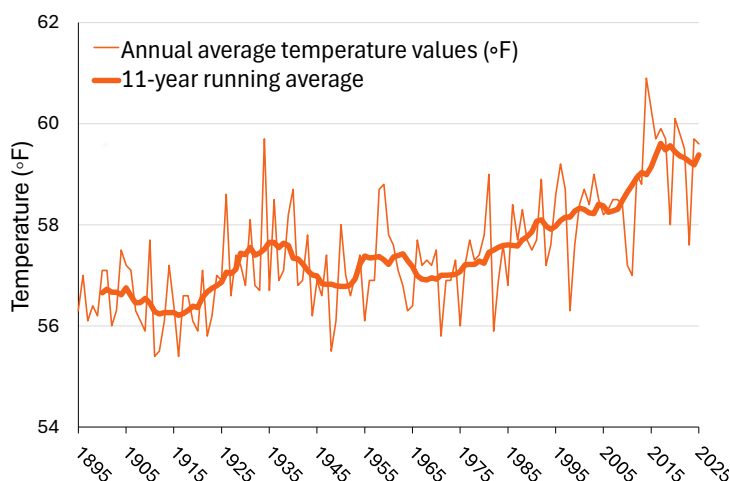
SCIENTIFIC COLLABORATORS

2009

FIRST EDITION

Increasing Air Temperatures

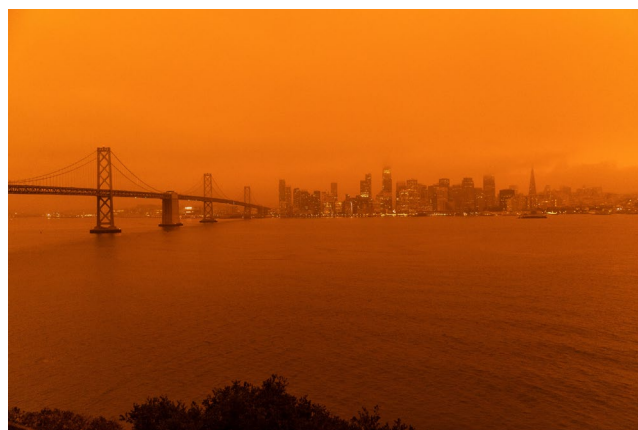
Annual average air temperatures **have risen by 2.6°F** since 1895.



Source: WRCC

Wildfire Smoke

All but two of the largest wildfires (by acreage) in California's history have occurred since 2000. In 2020, wildfire smoke and extreme heat occurred concurrently and affected 68% of California's land area, while exposing an estimated **16.5 million people**.



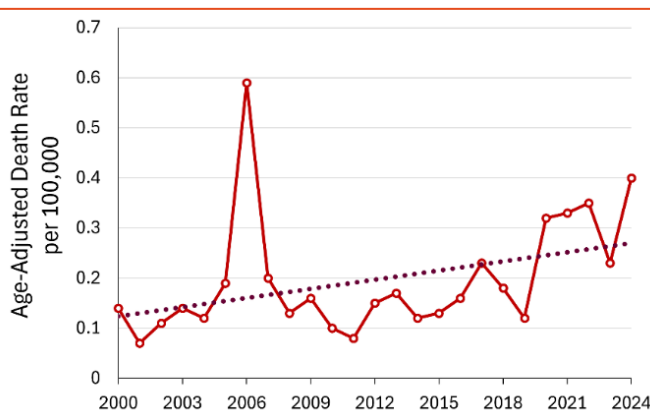
San Francisco-Oakland Bay Bridge at noon on September 9, 2020. Credit: Jason Doiy

Extreme Heat and the Mortality Burden

The number of heat-related deaths nearly **tripled** in 2024 compared to 2000 (right). Rates of occupational heat-related illnesses similarly increased. Hispanic workers account for **45%** of related ED visits and low-income workers are **5x** as likely to visit an emergency room due to heat illness than high-income workers.



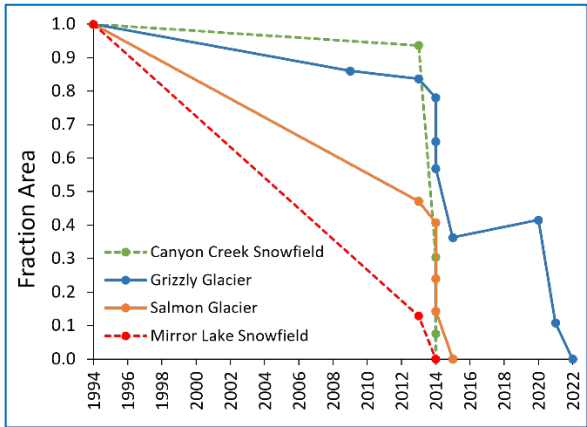
Workers pick cantaloupe melons on June 12, 2017. Temperatures reached 100 degrees on this day. Credit: Joe Proudman/UC Davis.



Heat-related deaths in California. Source: Tracking California and the Dept of Health Care Access and Information.

Glacier Change

The Trinity Alps glaciers of the Klamath Mountain range **disappeared** by 2023 (left). Since 1903, Sierra Nevada glaciers have also lost about 75% of their area, reflecting the consequence of sustained warming, not that of any single drought.



Source: Justin Garwood (CDFW)



Salmon Glacier in the Trinity Alps in 2009 (left) and 2015 (right). Credit: Justin Garwood (CDFW)

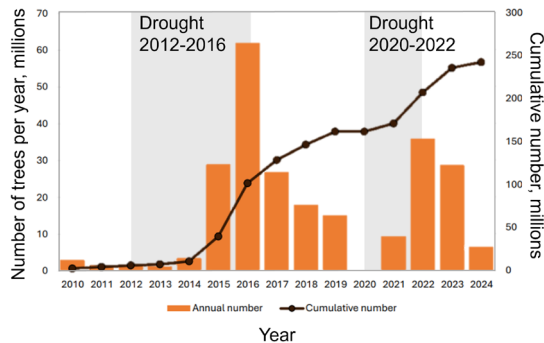
Tree Mortality and Range Shifts

An estimated **243 million trees died** in California's forest lands between 2010 and 2024. Large tree density has declined by approximately 50% in the Sierra Nevada highlands, Coast Ranges, and Northern California. In the Sierra Nevada, small mammal species surveyed have shifted their elevational ranges over the past century.



Dead trees in Sierra National Forest. Credit: USFS

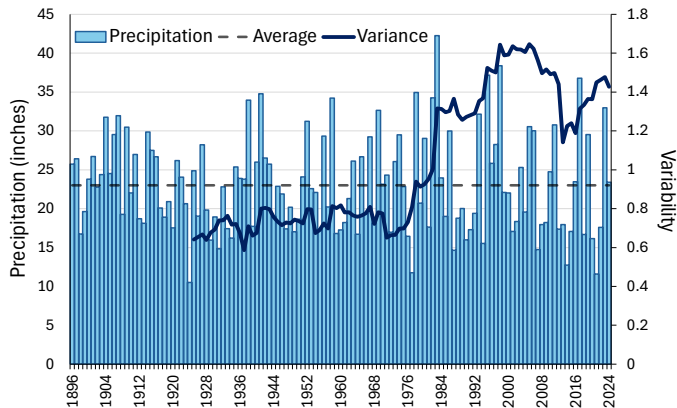
Estimated Number of Dead Trees in California



Black line shows cumulative number of dead trees. Source: USFS

Precipitation

Since the early 1980s, year-to-year precipitation has become **increasingly variable**, reflecting more frequent and abrupt shifts between extremely wet and dry years.



Source: WRCC

Snow-melt Runoff

The proportion of spring (April–July) unimpaired snowmelt runoff flowing into the Sacramento River and San Joaquin River has **declined** by 20% and 12% over the past century.



Source: Dale Kolke/DWR

Rivers, Salmon, and Fishery Closures

After an unprecedented 3-year closure, California's commercial salmon fishery **finally reopened** in 2026. The rivers that support salmon are warming toward physiological stress thresholds, threatening the species' long-term survival.

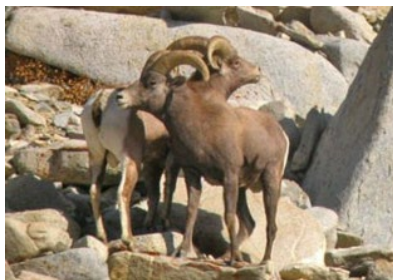


Left: Chinook salmon jumps in the Feather River. Credit: Supercaliphotoshistic

Right: The Salmon River, second largest tributary to the Klamath River. Credit: USDA Forest Service

California Tribes and Climate Change

Climate change **threatens the health of California Tribes** – all Tribes report reduced populations of plants and animals that are essential to their lifeways.



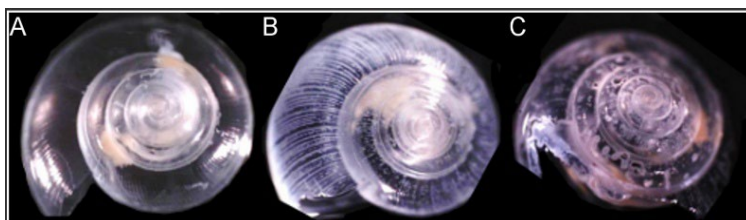
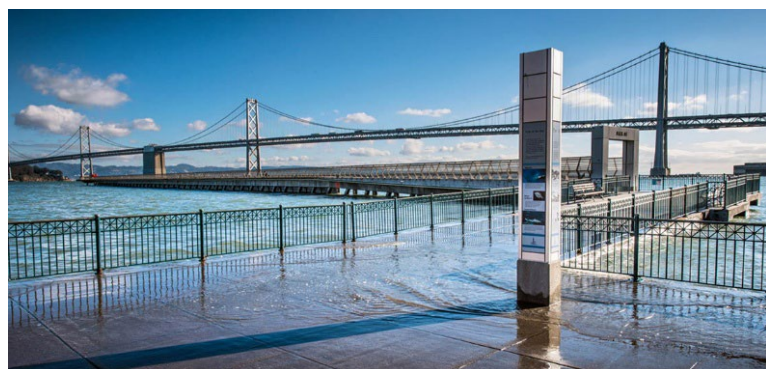
Top: Bighorn sheep, once a staple of the Owens Valley Paiute life, have been impacted by drought. Credit: CDFW.

Right: Culturally important fish called Hitch being rescued from what remains of a dry creek. Credit: Big Valley Band of Pomo Indians



Ocean Warming, Acidification, and Rising Sea Levels

Sea levels along the California coast are rising at **three times the 20th-century rate**, record marine heatwaves have occurred six of the past seven years (2019 to 2025), and rising carbon dioxide levels are changing ocean chemistry and affecting marine organisms.



Left: Embarcadero Waterfront in San Francisco. Credit: Michael Filippoff

Right: (A) Pelagic snails with visible corrosion (B) and shell perforations (C). Source: Busch et al. (2014)

What's New

This edition introduces six new indicators and incorporates the voices of three new Tribes.

Coastal Flooding
Kelp Populations
Krill Length and Biomass

Brandt's Cormorant Reproductive Success
Fruit and Nut Pest Abundance
Farmworker Exposure to Pesticides (emerging indicator)

Mono Lake Kootzaduka'a Tribe of California
Nevada City Rancheria Nisenan Tribe
Wiyot Tribe

