

Climate and Topography

By Eric Kauffman

California is one of the few places where five major climate types occur in close proximity. Here, the Desert, Cool Interior, Highland, and Steppe climates border a smaller region of Mediterranean climate. Perhaps the only other place like California is central Chile, where this convergence is made even more extreme by the dramatic Andean topography.

As climates go, the Mediterranean climate is rare. Outside of the Mediterranean Sea region, it is limited to five locations: two in Australia, one in South Africa, one in Chile, and one in California.

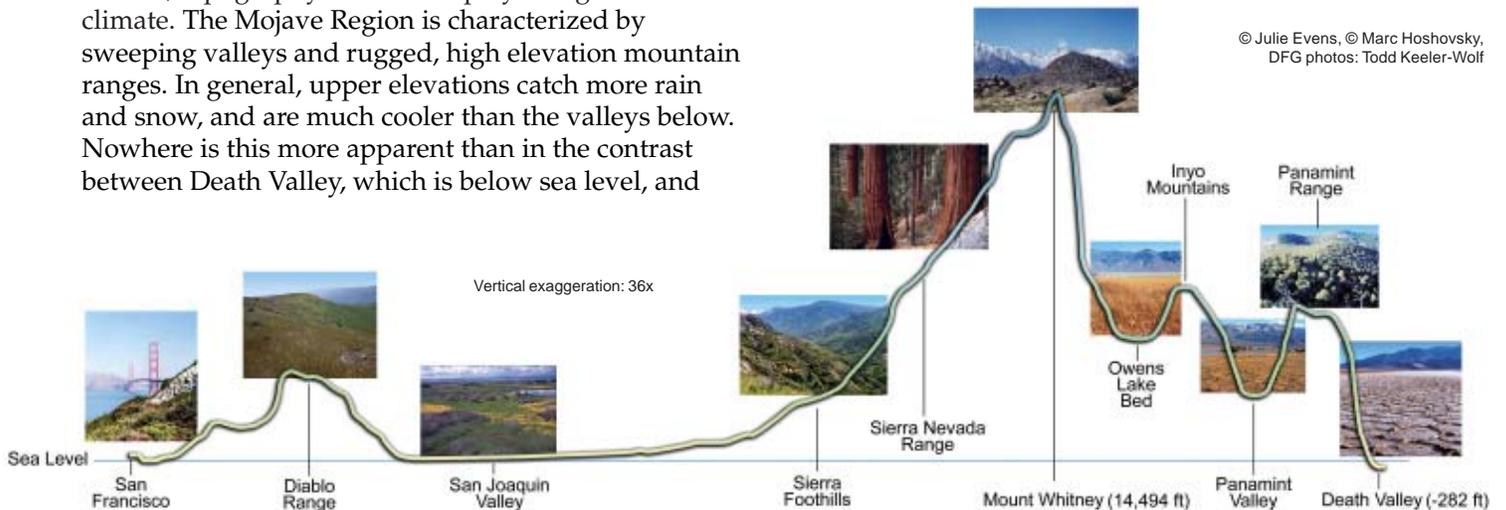
In California, the Mediterranean climate has three variations. One is the cool summer/cool winter climate found along the coast and the western slope of the Sierra Nevada. A second variation, also along the coast, is similar but has frequent summer fog. The third is an interior valley version with hotter summers and cooler winters. With all types, most of the precipitation falls in winter—not summer—which is unusual for much of the world, where the opposite is true.

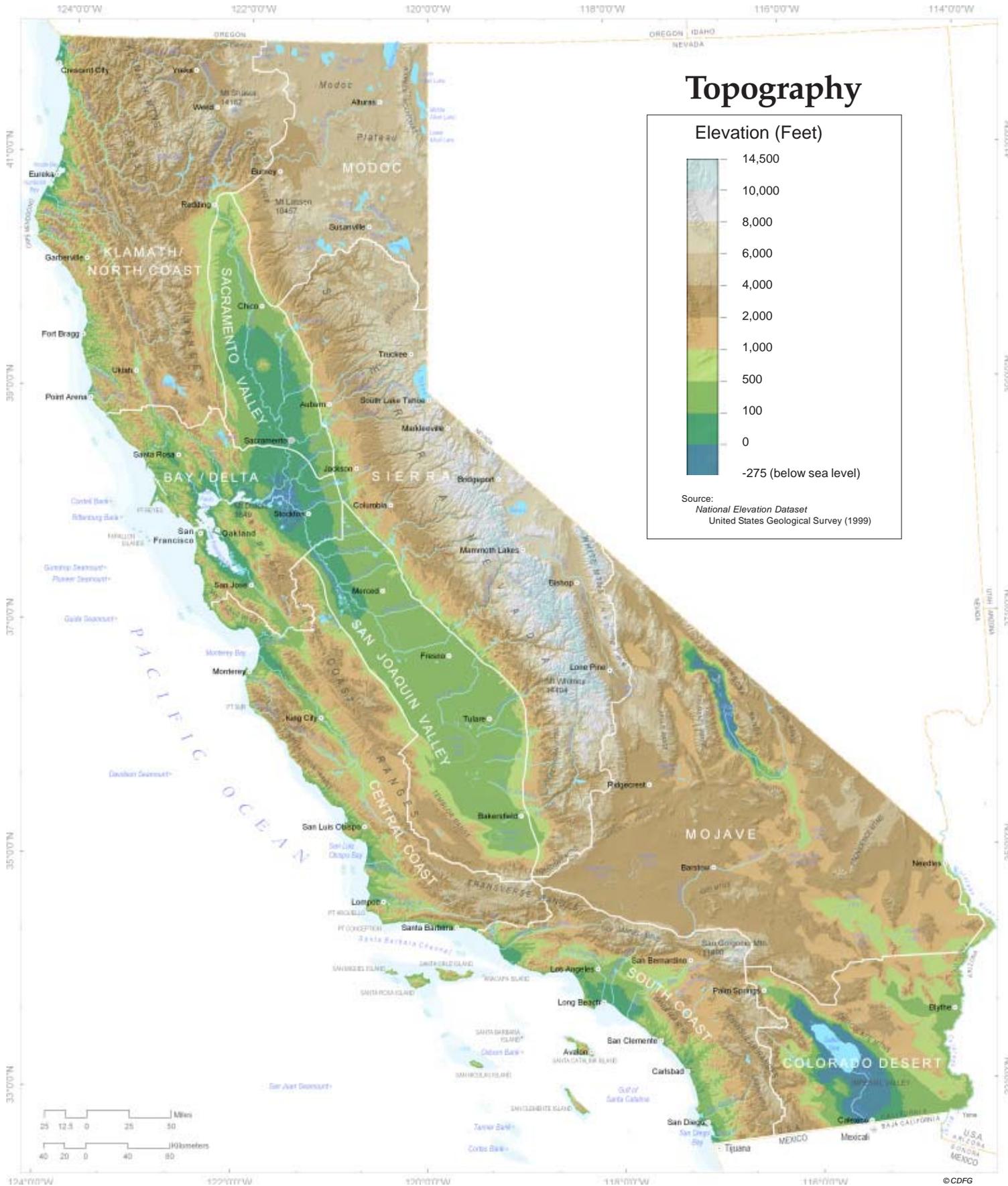
The mild temperatures and winter rain of the Mediterranean climate support some of the highest species richness in the state. Interestingly, however, California's Desert climates rival the Mediterranean for plant and animal species richness. For California's deserts, topography comes into play along with climate. The Mojave Region is characterized by sweeping valleys and rugged, high elevation mountain ranges. In general, upper elevations catch more rain and snow, and are much cooler than the valleys below. Nowhere is this more apparent than in the contrast between Death Valley, which is below sea level, and

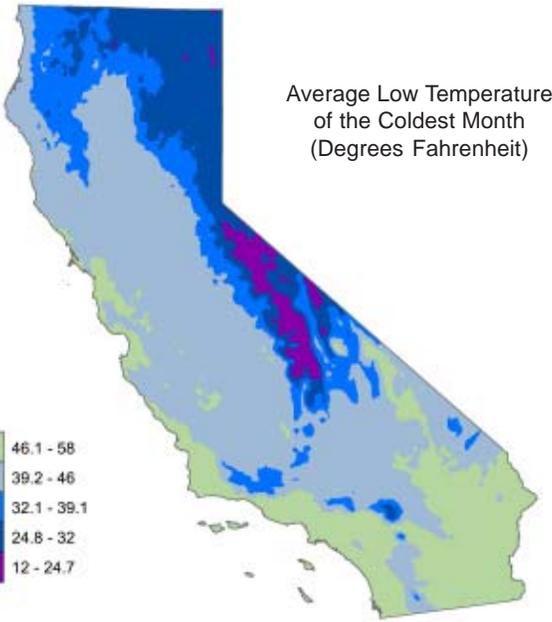
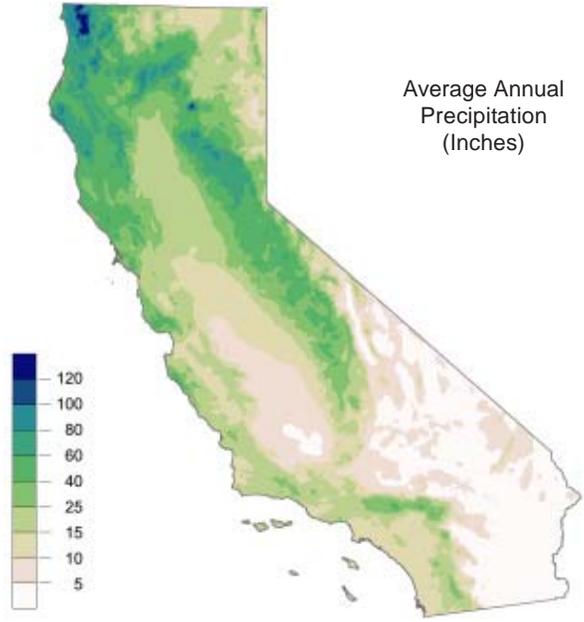
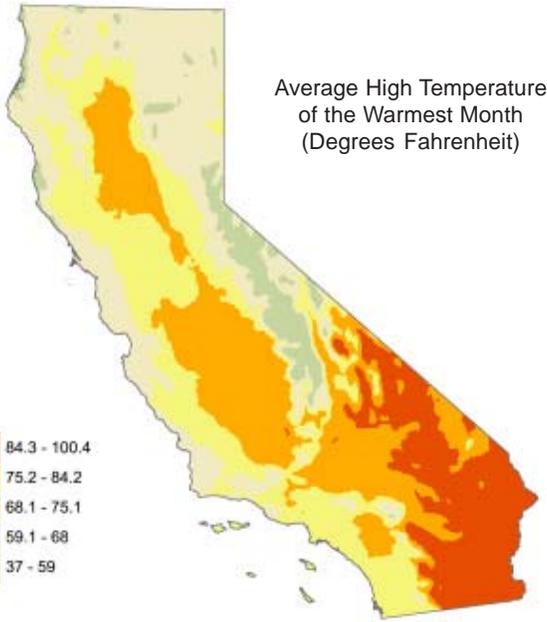
the Panamint Range, with peaks as high as 10,000 feet above sea level. In Death Valley, plants and animals may bake in 115 degree summer heat while 12 miles away and 2 miles up, cool breezes blow through the dark green needles of bristlecone pine (*Pinus longaeva*) and the delicate leaves of mountain maple (*Acer glabrum*).

California's higher elevations, such as those found in the Modoc and Sierra regions, generally have two major climate types: a Cool Interior climate and a Highland climate. In these areas, the conditions that determine most other climates (latitude, prevailing winds, and temperature) are strongly modified by elevation, slope, and aspect. Aspect, or the direction a slope faces, is very important. South facing slopes catch the sun's rays and heat, making them warmer and drier, while shaded north facing slopes are cooler and wetter. West facing slopes tend to catch more precipitation from storms moving inland from the Pacific Ocean. The result is vegetation diversity—even on a single mountain. For example, a ridge may have oaks and open grass areas on one side and a dense canopy of fir or pine trees on the other.

California's Steppe climate of the San Joaquin Valley Region is hot like a desert, but averages enough moisture to support grasslands and other vegetation not commonly found in the desert.

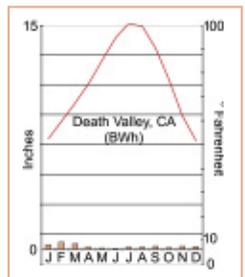
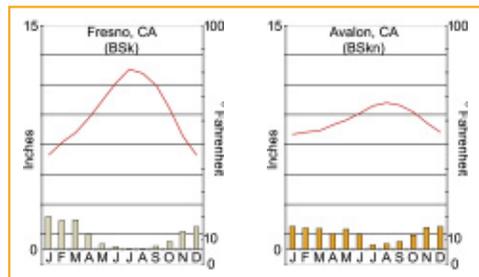
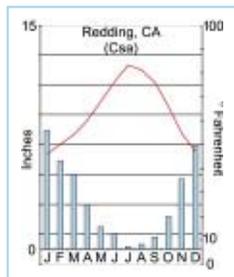
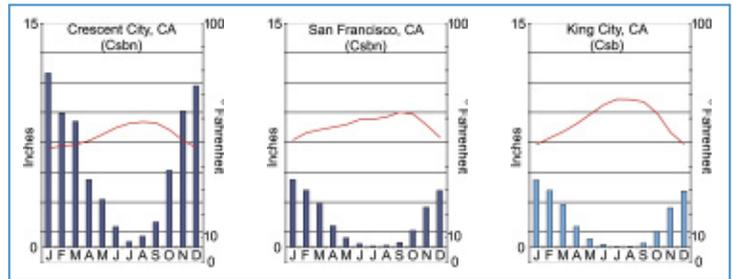
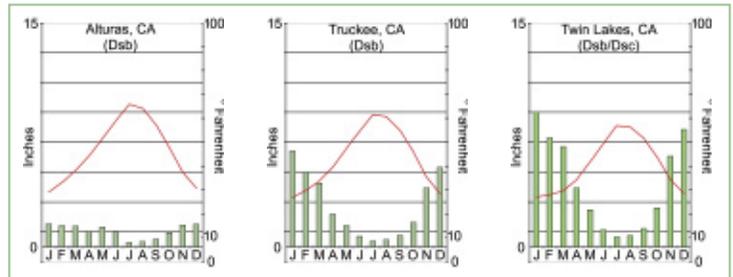






Climographs for Selected Climate Stations

(See map on opposite page.)



- Average Monthly Precipitation (inches)
- Average Monthly Temperature (degrees Fahrenheit)

Sources:
California Average Monthly and Annual Precipitation
California Average Monthly and Annual Temperature
The Climate Source (1998a and b)
Weather Observation Station Records
National Climatic Data Center (2002)

