Weather & Climate

Weather» **Short-run atmospheric conditions- Temp., RH, Clouds & Precip., wind, etc.**
Climate» **Long-Iron atmospheric conditions- seasonal temperature and precipitation patterns, (average weather over a long period of time (usually > 30 years)).**

In other words, weather is used to describe present atmospheric conditions, and to predict short-term atmospheric changes, whereas climate describes a Location's average weather throughout the year.

The two primary controls of climate are *temperature* and *precipitation.*

Temperature* **relative measures** hot, warm, cool, cold.**
absolute measures average temperature; temperature range**

Precipitation* **relative measures** wet or dry on average**
absolute measures average precipitation; year to year variability**
timing wet or dry year round or seasonally wet or dry**

California Climate

Climate Controls for California

1. **Proximity to the Ocean»** Temperature range increases and the air mass becomes drier with distance from the ocean.

2. **Elevation*** Average temperature decreases, and average precipitation increases with increasing elevation.

3. **Latitude*** Average temperature decreases, temperature range increases, and average precipitation increases to the north.

4. **Windward/Leeward Position*** The windward sides of the mountains average cooler and more humid conditions, whereas the leeward sides of the mountains average warmer and drier conditions.

5. **El Nino/La Nina Cycle*** H Nino conditions tend to bring above average precipitation to California (but not always), and La Nina conditions tend to bring below average precipitation to California (but not always). The result is a highly variable precipitation pattern, with most years well above or well below "normal."

The Mediterranean Climate

- 30 - 40° N&S latitude
- along west coasts of continents
- adjacent to a cold ocean

- California, Chile, Mediterranean Basin, South Africa, and Southwestern Australia.

Classifying California's Climates

There are 2 basic Koppen Climate types in California:

B climates = arid/ semi-arid [Potential Evapotranspiration (POTET) exceeds Precipitation (PREIP) in all months]

C climates = humid/ sub-humid [Precipitation exceeds Potential Evapotranspiration in at least one month]

Climate Types of California

Lower Elevation Hot Desert (BWh)	Arid & hot, low elevation subtropical & midlatitude desert [Colorado & Mojave Desert below 750 m (2500 ft.); Low Desert Scrub]
Middle Elevation Warm Desert (BWk)	Arid & warm, middle elevation subtropical & midlatitude desert [Colorado & Mojave Desert between 750- 1500 m (2500-5000 ft); High Desert Scrub, Joshua Tree Woodland]
Higher Elevation Steppe (BSk)-	Semi-arid & cool, higher elevation midlatitude steppe [Great Basin Desert above 1200 m (4000 ft), and the Modoc Plateau; Great Basin Sage Scrub, Pinyon and/or Juniper Woodlands]
Temperate Rainforest (Cfb)-	Humid coastal climate with abundant precipitation— pricip. in all months with peak in winter and heavy fog in summer [Northwest Coast; Coast Redwood Forest]
Mediterranean (Csa & Csb)-	Sub-humid with warm/hot dry summers and cool rainy winters [Coast and valley regions of northern, central & southern California; Coastal Sage Scrub; Chaparral; Oak Woodland]
Highlands (H)-	Locally variable climates; typically cool with abundant precip. and winter snow (Klamath, Cascade, Sierra Nevada, Transverse, and northern Peninsular Mountains; Mixed Conifer Forest, Sub alpine Forest]

Characteristic Plant Communities of California' Major Climate Zones Lower Elevation

Hot Desert (BWh)

Low Desert Scrub (LDS) » Mix of drought and heat tolerant shrubs and succulents (cacti), with an under story of winter annuals in wet years. Found in the Colorado & Mojave Deserts below 750 meters elevation.

Middle Elevation Warm Desert (BWk)

Joshua Tree Woodland (JTW) » Mix of high desert drought tolerant species including several important members of the Lily Family such as the Mojave Yucca & Joshua Tree. Found only in the Mojave Desert between 750 and 1500 meters elevation.

High Desert Scrub (HDS> Mix of high desert drought tolerant species similar to JTW but without the Joshua Tree component Found in the Colorado & Mojave Deserts between 750 and 1500 meters elevation.

Higher Elevation Steppe (BSk)

Great Basin Sage Scrub (GBSS) » Mix of Great Basin Sagebrush and other drought tolerant Great Basin species found throughout the Great Basin Desert of eastern California and Nevada. GBSS is also a common under story community associated with Pinyon and/or Juniper Woodlands in the Great Basin and Modoc Plateau regions.

Pinyon- Juniper Woodland (PJW) » Mix of Pinyon Pines and Junipers interspersed with Great Basin Sage Scrub. Found at higher elevations within the Great Basin Desert south of Lake Tahoe. The Pinyon Pine does not grow north of Lake Tahoe, therefore, on the Modoc Plateau this community consists solely of scattered Junipers with an under story of Great Basin Sage Scrub.

Temperate Rainforest

Coast Redwood Forest (CRF> Coastal forests dominated by the Coast Redwood Tree (tallest tree in the world) in Humboldt and Del Norte counties. Other trees include Douglas-fir, Grand Fir, Hemlock, and Sitka Spruce. The continually moist environment provides for a dense under story of ferns, fungi, and epiphytes.

Mediterranean (Csa & Csb)

Coastal Sage Scrub (CSS> Open growth of scrubby vegetation found at lower elevation coastal sites from Sonoma County to Ensenada. This community consists of shrubs and sub-shrubs interspersed with winter annuals (wildflowers and grasses). Sage and Coastal Sagebrush species are important components of this community. This is an endangered community in California due to exotic plant invasions, urban sprawl, and other development pressures.

Mixed Chaparral (MC) » Thick growth of scrubby vegetation found on the lower and middle elevation windward slopes of the Sierra Nevada, Peninsular, Transverse, and Southern Coast Ranges. Chaparral has a similar scrubby look as found in CSS but different structure and species composition—the shrubs are larger, more densely arranged, and only interspersed with winter annuals immediately following fire.

Oak Woodland (OW) » One or more species of oak interspersed with a dense cover of herbaceous grasses and wildflowers. Very common landscape community in the interior valleys adjacent to the central coast of California (San Luis Obispo). In southern California, the Oak Woodland community is restricted to higher elevation mesas and interior valleys. This is a threatened community throughout California due to exotic plant invasions, and heavy grazing pressure by domesticated livestock.

Highlands (H)

Mixed. Conifer Forest (MCF> Mix of Pine, Fir, and Oak species with a sparse under story of scattered shrubs and/or grasses. This community is typically found between 1200 and 2300 meters throughout the mountains of California. This is the forest type associated with old growth Douglas Fir, Ponderosa Pine, and Giant Sequoia (most massive tree on earth) in the Sierra Nevada.

Sub alpine Forest (SF) » Mix of long lived, slow growing pines above 2300 meters elevation, extending to tree line on the highest peaks. This is the forest type associated with the Foxtail and Whitebark Pines of the Sierra Nevada and the Bristlecone Pine (the oldest living tree on Earth) of the White and Panamint Mountains of Eastern California. Due to the high elevation requirements, this community is not found in San Diego County.

CLIMATES OF CALIFORNIA

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H climates = highlands with variable climates typically cool with abundant precip and winter snow