



Department of Fish and Wildlife
 Biogeographic Data Branch
 1416 9th Street, Suite 1266
 Sacramento, CA 95814

<http://atlas.dfg.ca.gov>

The Sierra Nevada Climate of California: A cold winter Mediterranean?

By Eric Kauffman

California is at a juncture of several major climate types, each distinctive in its own way, and yet they all have a "Mediterranean" character. Generally speaking, most of these climates have wet winters and dry summers as is typical of Mediterranean climates around the world.

The Mediterranean climate type only occurs in four locations outside of the region surrounding the Mediterranean Sea. Sometimes it is considered relatively "rare" when compared to other world climate types — many of which cover wide regions across the globe.

However, even rarer in this regard is the cold forest climate of the Sierra Nevada Range. This "cold-forest" climate is spread across the Sierra Nevada northward into the interior mountains of Oregon and Washington's Cascades, and eastward through Idaho's Bitterroot and Salmon Mountains. It is also mapped to a lesser degree in other western states, such as the high mountain ranges of Arizona, New Mexico, Utah, and southwestern Colorado.

Outside North America, this climate type has been mapped only in the region extending from eastern Turkey to northwestern Iran.

Western US Distribution of Köppen Climate Type "Ds"



Source: University of Idaho

Approximate area of "Ds" climate
 Eastern Turkey-Northwestern Iran



Source: Hammond Concise World Atlas.

Using the Köppen Classification System, this cold forest climate could be classified as "Mediterranean" in many respects. It is mostly dry and warm, not too hot during the summer, and wet during the winter.

Unlike the Mediterranean climate type, however, winter precipitation is often in the form of snow as a result of temperatures falling consistently below freezing — a condition not typical of Mediterranean climates.

Most large mountain ranges around the world receive summer as well as winter precipitation, and in many cases, summer precipitation outpaces what falls in winter.

A summer dry mountain range on the scale of the Sierra Nevada is a little bit unusual — except where there are adjacent Mediterranean climates. Which leads one to wonder....

Perhaps someday this Sierran climate might be classified as a "Cold Winter Mediterranean" climate type?

But that is for the climate experts to decide.

Köppen Criteria for Cold-forest climates

Climate Type Descriptions

Climate Type "Dsb"

- Average temperature of warmest month greater than 10°C.
- Precipitation in driest month of summer half of the year less than 4 cm and less than 1/3 the amount in the wettest winter month.
- Average temperature of each of four warmest months 10°C or above; temperature of warmest month below 22°C.

Climate Type "Dsc" (Cooler summers)

- Average temperature of warmest month greater than 10 °C.
- Precipitation in driest month of summer half of the year less than 4 cm and less than 1/3 the amount in the wettest winter month.
- Average temperature from one to three months 10°C or above; temperature of warmest month below 22°C.

(Source: Critchfield, Howard J. 1983 General Climatology. P. 156.)

Sources:

- Critchfield, Howard J. 1983 General Climatology.
- Hammond Concise World Atlas. 2000. Hammond World Atlas Corporation.
- Köppen Classification System for California. 2003. California Department of Fish & Game.
- Köppen Classification System for the Conterminous United States. 1999. University of Idaho, State Climate Services.