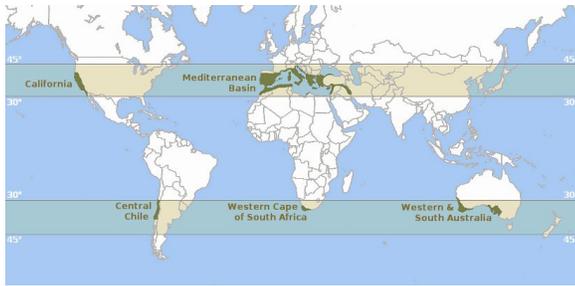


THE DEFINITION OF THE MEDITERRANEAN CLIMATE – A CALIFORNIAN PERSPECTIVE

BY RUSS BEATTY

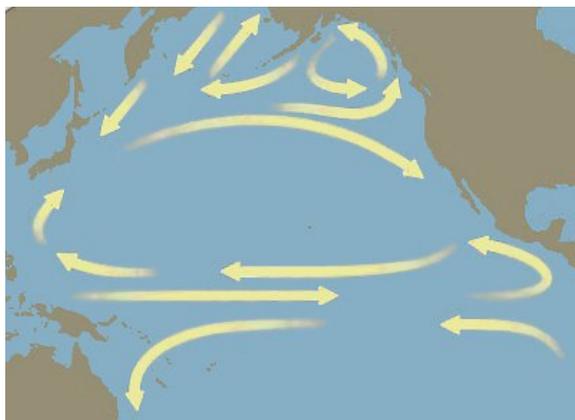
In simplest terms, a mediterranean climate is characterized by long, warm to hot, dry summers and mild, wet winters. This winter-wet, summer-dry pattern occurs in only five regions of the world: California, central Chile, southwestern South Africa, southern and southwestern Australia, and the Mediterranean Basin, from which the climate type gets its name. Together, these regions occupy less than two percent of the earth's land surface. Yet, over 230 million people live in these regions, with the majority in the Mediterranean Basin and in California.



A unique set of physiographic and maritime influences combine to create a climate in California that is considered more mediterranean than that of the Mediterranean Basin itself. Eighty-five percent of California's rain falls during the winter months (compared to an average of sixty-five percent in other mediterranean-climate regions), making the summers longer and drier than most other regions with a similar climate. The state's great length (covering ten degrees of latitude), its succession of north-south trending mountain ranges, and its relationship to the vast, cold Pacific Ocean

are the three major factors that determine California's climate and its many microclimates.

Offshore, the Japanese Current circulates south and east out of the Gulf of Alaska bringing cold water along the Pacific littoral. As the current approaches the Continental Shelf, some fifty miles offshore, the cold water is thrust up to the surface by the steep ocean floor. In summer, the resulting cold surface water chills the moist and somewhat warmer marine air being pushed eastward by the Pacific High (a large high-pressure cell positioned far out in the Pacific). As this marine air comes into contact with the cold up-welling current, fog is formed by the condensation of moisture in the warmer air.



Simultaneously, inland of the Coast Ranges in the Central Valley, the land surface heats up in an endless succession of cloudless days. The rising heat causes a low-pressure zone to form, and the maritime air being pushed ashore by the Pacific High is literally sucked inland through San Francisco Bay and over the lowest ridges of the Coast Ranges. Higher ridges limit the fog to a narrow coastal strip only a few miles wide, leaving the leeward interior landscape hot and dry. The thick bank of fog cools the coast and tempers the inland heat with cool afternoon breezes. As the temperature differential moderates, the pressure difference begins to even out and the fog layer recedes.

These cycles of fog are further influenced by the position of the Pacific High. The more northward it moves, the stronger is the pressure differential and the more persistent is the onshore flow of wind. As it slips southward in autumn, the pressure differential weakens, and the coast, for a few weeks, basks in clear warm days. Warm, offshore winds are common this time of year, and fire danger becomes extremely high as these winds sear a landscape already parched by several rainless months.

As the days shorten, the high-pressure system moves further southward, opening a door for the storm track, originating in the Gulf of Alaska, to reach California; the first of autumn's rains usually begin in October. Through the winter months, moisture-laden storms bring rain to the coast and interior valleys and snow to the Sierra and occasionally to the highest ridges of the Coast Ranges. As the days lengthen in spring, the Pacific High makes its return trip northward, bringing a gradual reduction in precipitation and an increase in sunny, dry weather. By May, the rains have usually disappeared completely until the following autumn.

The interior areas, east of the Coast Ranges, are governed more by continental influences. Summer heat and pervasive clear skies give way in winter to frequent radiation frosts of short duration and, under the right circumstances, the formation of a dense ground-hugging blanket of winter fog (tule fog). Such fog keeps day and night temperatures cool, moderating the sharp fluctuations generally associated with clear, calm weather.



During clear, calm winter days, night temperatures throughout Northern California may plunge to the mid to low 20s F for a few hours, returning to the 50s and low 60s on the following day. Despite normal radiation frosts and occasional severe freezes, as in December 1972 and 1990, the number of hours of sub-freezing temperatures rarely exceeds three percent of the total.

In contrast to normal radiation frosts, the occasional severe freezes can cause extensive damage to plants. Such phenomena result from large, cold-air masses moving into California from the continental north and may last for several days, with extreme night-time temperatures in the teens and day-time temperatures rising barely above freezing. Strong, desiccating winds usually accompany such

freezes, further exacerbating plant damage. Plants that are only marginally hardy (to the low to mid-20s F) can be severely damaged or killed.

Though these characteristics of our mediterranean-type climate are fairly well understood and predictable, mediterranean-climate zones are rather precarious and subject to change. Squeezed between deserts on their equatorial sides and temperate zones pole-ward, our climate type is subject to subtle shifts in worldwide climate. A global warming trend can and may already be creating more frequent droughts in California, as well as more severe and unpredictable winter storms. Misuse and over subscription of the state's limited water supplies have begun to affect our arid and semi-arid regions.

Therefore, it is imperative that we learn more about where we live and make better attempts to adapt our lifestyles and our gardens to this rich, beautiful, fragile mediterranean landscape. As gardeners, we can become familiar with the unique qualities and opportunities our climate offers, so that our efforts will improve and enhance these landscapes rather than impose incongruous imprints upon the land.

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