

# Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin

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## MLRA Explorer Custom Report

C - California Subtropical Fruit, Truck, and Specialty Crop Region  
14 - Central California Coastal Valleys

# MLRA 14 - Central California Coastal Valleys

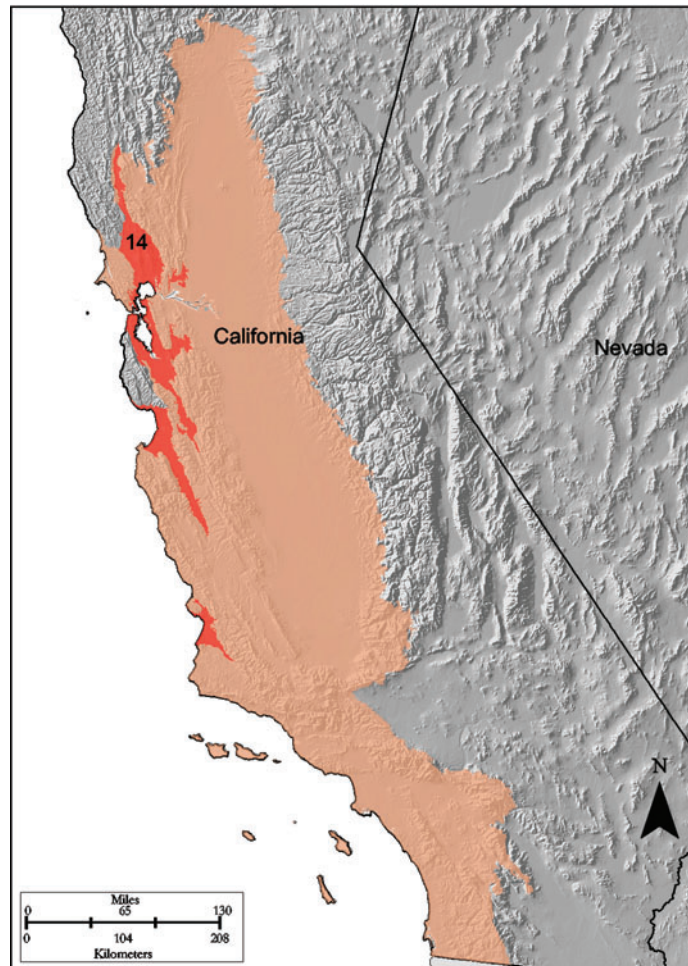


Figure 14-1: Location of MLRA 14 in Land Resource Region C

## Introduction

This area is entirely in California (fig. 14-1). It makes up about 3,170 square miles (8,215 square kilometers). There are three parts in the area. The northern part includes the cities of Ukiah, Santa Rosa, and Napa. The central part includes all the metropolitan areas surrounding San Francisco and San Pablo Bay. The major cities in this part are San Francisco, Berkeley, Vallejo, Oakland, and San Jose. The southern part includes the towns of Santa Cruz, Monterey, and Carmel on the shores of Monterey Bay. Hollister, the city of Salinas, and the agriculturally important Salinas Valley are in inland areas in the southern part. Interstate 80 ends on the San Francisco side of the Bay Bridge. United States Highway 101 and California State Highway 1 are scenic drives as well as major thoroughfares in this area.

A number of tourist destinations are in this area, including the cities of San Francisco, Napa, Oakland, and Monterey. Alcatraz, the Golden Gate Bridge, the wineries in Napa Valley, the Monterey Bay Aquarium, and the beaches on the Pacific Ocean coastline are all tourist attractions. Moffett Field, the United States Naval Fuel Depot and Naval Supply Station, and the Oakland Army Base are in the San Francisco area. The Presidio of Monterey and the Naval Postgraduate School are in the Monterey Bay area. There are a number of national wildlife management areas

and State parks along the coastline and bays in this area.

## Physiography

This area is in the California Coast Ranges Section of the Pacific Border Province of the Pacific Mountain System. It is a network of gently sloping valley floors bordered by higher and more sloping terraces and alluvial fans and by steep uplands. Elevation ranges from sea level to 1,970 feet (600 meters), but it is less than 985 feet (300 meters) in most of the area.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: San Francisco Bay (1805), 46 percent; Central California Coastal (1806), 38 percent; and Klamath-Northern California Coastal (1801), 16 percent. The Russian River flows through the northern part of the area, and the Napa and Petaluma Rivers empty into San Pablo Bay. The Salinas River is in the southern part of the area. The Hetch Hetchy Aqueduct brings Sierra Nevada Mountain water from the Yosemite area to the bay area for municipal, public supply, and industrial uses. The aqueduct empties into the Upper Crystal Springs Reservoir, in the San Andreas Fault zone directly south of San Francisco.

## Geology

With the possible exception of the Santa Maria Valley to the south, the coastal valleys in this area are structural basins. The elongated shape and northwest-southeast orientation of the valleys are strongly controlled by right-lateral strike-slip movement along a regional set of faults that includes the San Andreas, Rogers Creek, Hayward, and Calaveras Fault Zones and other potentially active and inactive faults. The San Andreas Fault Zone is a transform boundary where the North American plate is moving northwest relative to the Pacific tectonic plate to the west. The probability of a large magnitude earthquake is considered to be particularly high along the Rogers Creek-Hayward Fault Zones, which together extend from approximately Healdsburg, southeastward beneath San Pablo Bay, towards Milpitas.

These coastal valleys are partly filled with unconsolidated and semiconsolidated marine sedimentary rocks that were deposited during periodic encroachment of the sea and with unconsolidated nonmarine alluvial, flood-plain, alluvial-fan, and hillslope deposits derived from bedrock weathered from the adjacent uplands. Older, more consolidated eolian, lacustrine, and terrace deposits also occur. The coarser, more permeable nonmarine sand and gravel store relatively large volumes of fresh ground water; these coastal basin aquifers are variably confined, semiconfined, and unconfined and are in areas at risk of saltwater intrusion and overdraft.

Mesozoic and Tertiary bedrock exposed in the hills, foothills, and uplands in this MLRA include the Sonoma Volcanics exposed in and around Napa and Sonoma Valleys; graywackes, chert, ophiolites, and other units of the Franciscan Formation; metamorphics and granitics of the Salinian block flanking the Salinas Valley; and sedimentary formations exposed near the Salinas and Santa Maria Valleys. Landslides are common in steep areas underlain by rocks weakened by faulting and deformation (e.g., Central Belt Franciscan) and/or lack of cementation (e.g., Tertiary sedimentary shale formations).

## Climate

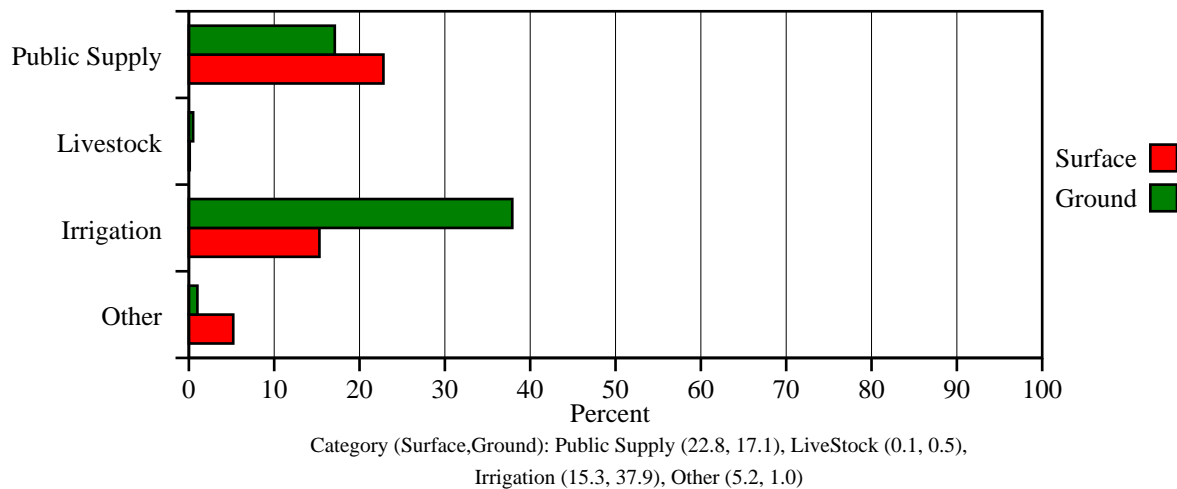
The average annual precipitation in this area is 11 to 66 inches (280 to 1,675 millimeters). The higher amounts of precipitation occur at the higher elevations in the area north of San Francisco. Most of the rainfall occurs as low- or moderate-intensity, Pacific frontal storms during winter. This area is very dry from mid spring to mid autumn. Snowfall is rare. The average annual temperature is 56 to 61 degrees F (13 to 16 degrees C). The freeze-free period averages 315 days and ranges from 265 to 365 days. It is longest near the coast, and it becomes shorter with elevation.

## Water

The total withdrawals average 3,100 million gallons per day (11,735 million liters per day). About 56 percent is from ground water sources, and 44 percent is from surface water sources. The low or moderate rainfall and local streamflow are inadequate for present water needs. Water from adjoining MLRAs is brought in for agriculture and for the domestic and industrial requirements of the many large cities. For example, most of the public water in the bay area is provided by an aqueduct from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The quality of the water in this reservoir is excellent. The quality of the water in the rivers in the valleys is not as good. Agricultural runoff, municipal and industrial wastes, and irrigation return flows are all sources of contamination of local surface water.

The major ground water sources in this area are the alluvium and older sediments in the coastal valleys. Surface water infiltrating from irrigated areas mixes with the shallow ground water in this aquifer, so some of the water that is pumped is a combination of surface and ground water. This water is very hard and requires softening for public, municipal, or domestic uses. It typically contains more than 1,000 parts per million (milligrams per liter) total dissolved solids, which exceeds the national drinking water standard. The yield of ground water in the deeper alluvial deposits, especially in the Santa Clara Valley, is declining, and the intrusion of seawater is becoming a problem. Nitrate and pesticide contamination in the shallow aquifer in the Salinas Valley also is becoming a concern.

**MLRA 14 Water Use by Category**



## Soils

The dominant soil orders in this MLRA are Alfisols, Entisols, Mollisols, and Vertisols. The soils in the area dominantly have a thermic soil temperature regime, a xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are very deep, somewhat excessively drained to somewhat poorly drained, and loamy or clayey. Haploxeralfs (Arbuckle and Pleasanton series) and Xerofluvents (Metz and Yolo series) formed in alluvium on alluvial fans and stream terraces. Fluvaquents (Reyes series) formed in alluvium in marshes. Xeropsamments (Oceano series) formed in eolian deposits on dunes. Argixerolls (Chualar and Lockwood series) and Haploxerolls (Elder, Mocho, Salinas, and Sorrento series) formed in alluvium on alluvial fans and stream terraces. Endoaquerts (Clear Lake series) formed in alluvium in basins and swales. Haploxererts (Cropley series) formed in alluvium on alluvial fans and flood plains.

## Biological

This area supports grasses, brush, and trees. Naturalized annual grasses and forbs are dominant in many areas. Soft chess, wild oats, bromes, fescues, filaree, burclover, and some remnant perennials are the major species. Scattered valley oak grows on the well drained soils. Saltgrass, iodinebush, and other salt-tolerant plants grow in tidal areas. Some areas have a few remnant stands of redwood trees.

Some of the major wildlife species in this area are turkey, California quail, mourning dove, meadowlark, blackbird, white-crowned sparrow, white-tailed kite, robin, mockingbird, thrush, brown towhee, and cedar waxwing.

## Land Use

Most of the MLRA is in farms and ranches. The acreage used for urban development is increasing rapidly. The gently sloping soils in the valleys are intensively used for many kinds of crops. Truck crops, wine grapes, strawberries and other fruits, cut flowers, small grains, hay, and pasture are the principal crops grown on irrigated land. Small grains are the principal crops in dry-farmed areas. Dairy farming is an important enterprise near the large cities. The more sloping fans and foothills, making up one-fourth or more of the area, are in native range used for livestock grazing. Sites along streams are susceptible to flooding and bank cutting.

The major soil resource concerns are erosion, maintenance of the content of organic matter in the soils, and water quality. The erosion hazard is slight on the soils in valleys and on terraces and benches of the valleys, except where improper irrigation practices are more damaging than rainfall. If the surface is unprotected in winter, the hazard of sheet and gully erosion is severe on the sloping soils on coastal terraces and benches and on upland soils. Salinity and encroachment of seawater into ground-water basins are problems in areas of valleys near sea level.

The conservation practices that are important on cropland are those that control erosion. These practices include mulching, cover crops, irrigation water management, and tailwater return systems on the steeper irrigated slopes. The conservation practices that are important on dairy farms are manure-handling systems, including nutrient management. Prescribed grazing, fencing, and water management are the most important practices on rangeland and other grazing land.

**MLRA 14 Land Use by Category**

