Water cycle, including groundwater

Nature of groundwater
Pumping results in a “cone of depression” in the groundwater.

Pumping affects stream-groundwater connections.
Figure 71. The Central Valley aquifer system is located in a large structural trough in central California. The aquifer system is divided into three subregions on the basis of surface-water basins.

EXPLANATION

Central Valley

- Redding Basin—Included with Northern California basin-fill aquifers.

Central Valley aquifer system subregions

- Sacramento Valley
- Sacramento-San Joaquin Delta
- San Joaquin Valley
- Tulare Basin

Central Valley drainage basin boundary


Figure 77. Diagrammatic geologic sections show that (A) the Sacramento Valley contains a relatively thin section of continental deposits, whereas these deposits are very thick in the San Joaquin Valley, and (B) the marine rocks and the lake and marsh deposits in the San Joaquin Valley have minimal permeability.

EXPLANATION

- Holocene to Oligocene continental deposits
- Pliocene to Eocene marine rocks
- Oligocene to pre-Tertiary marine rocks and continental deposits
- Pre-Tertiary igneous and metamorphic rocks

Figure 73. Nearly all the recharge received by the Central Valley aquifer system is provided by runoff from the mountains that surround the Central Valley.

EXPLANATION

Average annual runoff (1951–80), in inches

- 1
- 10
- 20
- 30
- 40

Central Valley drainage basin boundary

Subsidence

Layer of permeable material (sand & gravel). It compacts less than clays when it is drained.

"Aquitard": less permeable layer with fines & highly compressible when drained.

Figure 93. Land subsidence has affected large areas of the Central Valley. Most of the subsidence is the result of compaction of fine-grained sediments, which has been caused by large withdrawals of ground water.

EXPLANATION:
- Subsidence due to water-level decline is more than 1 foot
- Extent of subsidence due to compaction of peat
- Extent of subsidence due to hydrocompaction

Groundwater Levels, 15S18E17R001M
San Joaquin Valley (Kings Basin)

E.S. Elevation = 319.50

Source: Department of Water Resources

Groundwater Levels, 10S17E12C001M
San Joaquin Valley (Madera Basin)

E.E. Elevation = 283

Source: Department of Water Resources

Depth to water below land surface, feet
Calendar Year

Elevation of water surface (NGVD)

* Questionable Measurement