

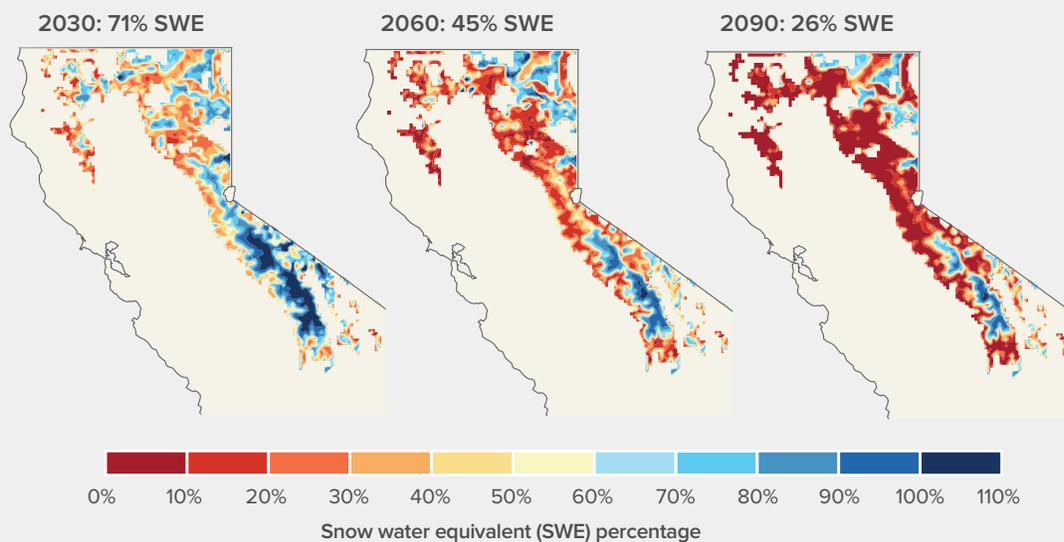
Storage is essential for managing California's water

Water stored during California's wet winter and spring months provides supplies for its dry summers and frequent droughts. Stored water is also used for recreation, hydropower, and to mitigate harmful effects of dams on river and wetland ecosystems. During large storms, storage reduces peak flood flows and downstream damage.

Water storage in California takes many forms. As much as a third of the state's supply comes from snowpack, which releases water during spring and summer when demand is highest. Water stored in soils supports plant growth and helps regulate storm runoff. Some 1,400 surface reservoirs can store up to 42 million acre-feet—a year's supply for farms and cities. The state's 515 groundwater basins hold at least three times as much usable water as the surface reservoirs, and decades of groundwater depletion have created unused space in many aquifers.

California faces numerous challenges in managing water storage: balancing competing goals, such as flood protection versus water supply; reducing environmental harm from dams; addressing long-term deterioration of groundwater resources from excess pumping and pollution; and adapting to a smaller snowpack as the climate warms. Groundwater users across California have begun implementing the 2014 Sustainable Groundwater Management Act (SGMA), the first statewide effort to manage groundwater. The state has also been preparing to disburse \$2.7 billion in bond funds for water storage projects under 2014's Proposition 1.

RISING TEMPERATURES WILL SHRINK THE SIERRA NEVADA SNOWPACK



SOURCE: Modeling and mapping by Daniel Cayan, David Pierce, and Laurel DeHaan, Scripps Institution of Oceanography, and Noah Knowles, US Geological Survey (2016), with support from the California Energy Commission, California Department of Water Resources, the US Geological Survey (Southwest Climate Science Center), the National Oceanic and Atmospheric Administration (through the California Nevada Applications Program), and the US Army Corps of Engineers.

NOTES: Snow water equivalent (SWE) measures the amount of water stored in the snowpack. It is expressed as a percentage of estimated recent historical conditions (1965–2005). These scenarios are based on projected temperature increases—1.8°C (2030), 3.5°C (2060), and 5.2°C (2090)—from 10 different climate models, over temperature averages during recent historical conditions (1965–2005). SWE and temperature values for 2030, 2060, and 2090 are averages over 19 years centered on these dates. These projections are based on the Representative Concentration Pathways 8.5 high greenhouse gas emissions scenario, in which emissions continue to rise throughout the 21st century.

Groundwater is California's most important drought reserve

Groundwater is California's largest source of storage. On average, it supplies about a third of the water cities and farms use annually, and more in some regions. During droughts groundwater can supply more than half of statewide water. Aquifers can be replenished, but they fill more slowly than surface reservoirs.