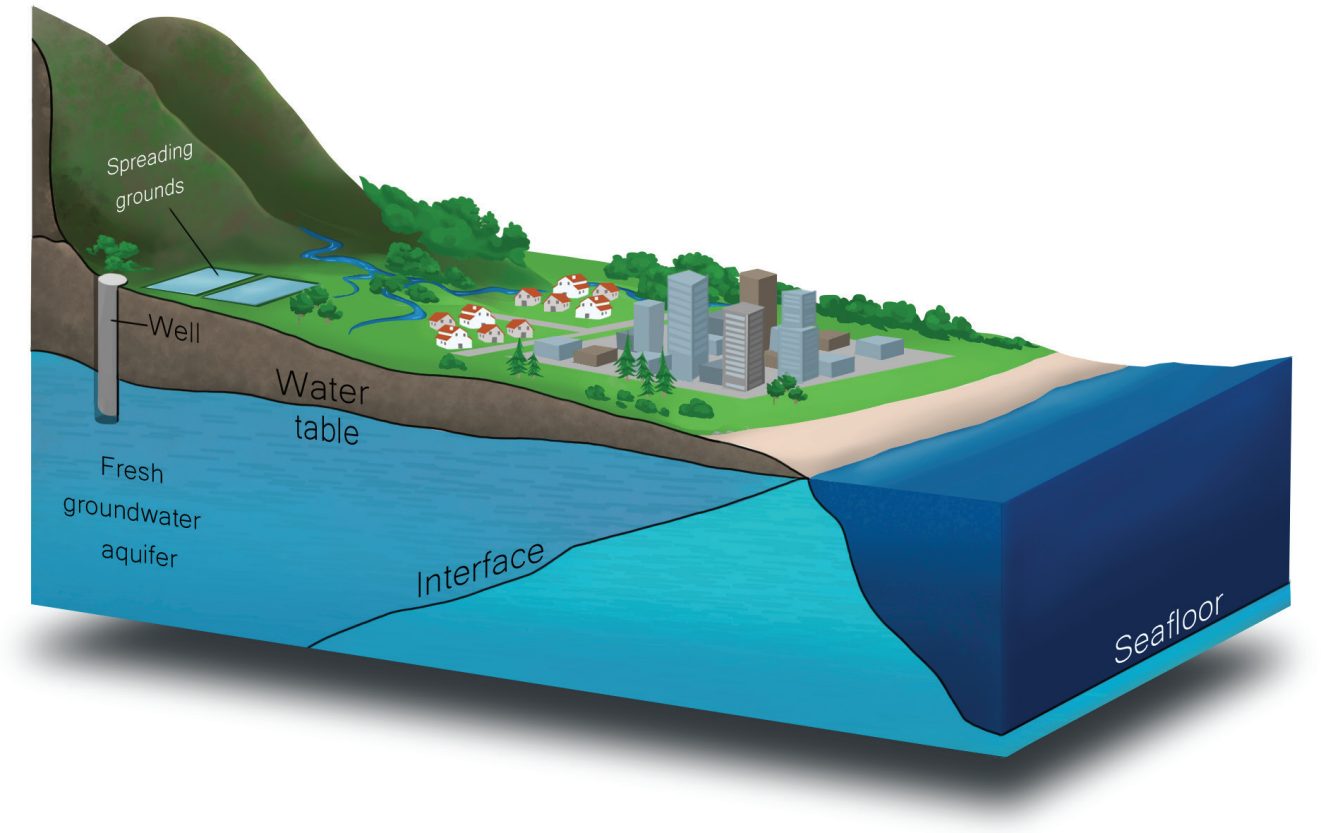
GROUNDWATER FACT SHEET

WHAT IS **GROUNDWATER?**

Groundwater is stored underground primarily in sands, gravels, and fractured rock. Groundwater is foundational in our daily lives. We rely on it for our drinking supply, agriculture, industry, and to sustain wildlife habitats.

Groundwater and surface water, such as streams, lakes, and wetlands, are connected in California and in most landscapes. Groundwater may rise to the surface naturally as a spring, or it may discharge into rivers and streams when supplies reach high levels.[1] Groundwater and surface water represent the same precious resource and their use is highly integrated in California.



GROUNDWATER FAST FACTS

- The layers of soil, sand, gravel and fractured rock where groundwater is found are known as aquifers. Aquifers are naturally occurring groundwater storage reservoirs. We access groundwater from aquifers through wells drilled into them.
- Water enters aquifers through a process called recharge. Recharge occurs when water from the surface moves underground. Rain and melted snow are two major sources of natural recharge. Excess irrigation from agriculture and urban land uses also recharge aquifers.
- Groundwater recharge can be supplemented with water from other sources, using spreading grounds. Many of Southern California's aquifers are used to store recycled water, treated stormwater, and imported water.

Why is **groundwater important** for Southern California?

California uses more groundwater than any other state in the nation. Approximately 85 percent of Californians depend on groundwater for a part of their water needs. Some rely on groundwater as their primary or only source of water.[2]

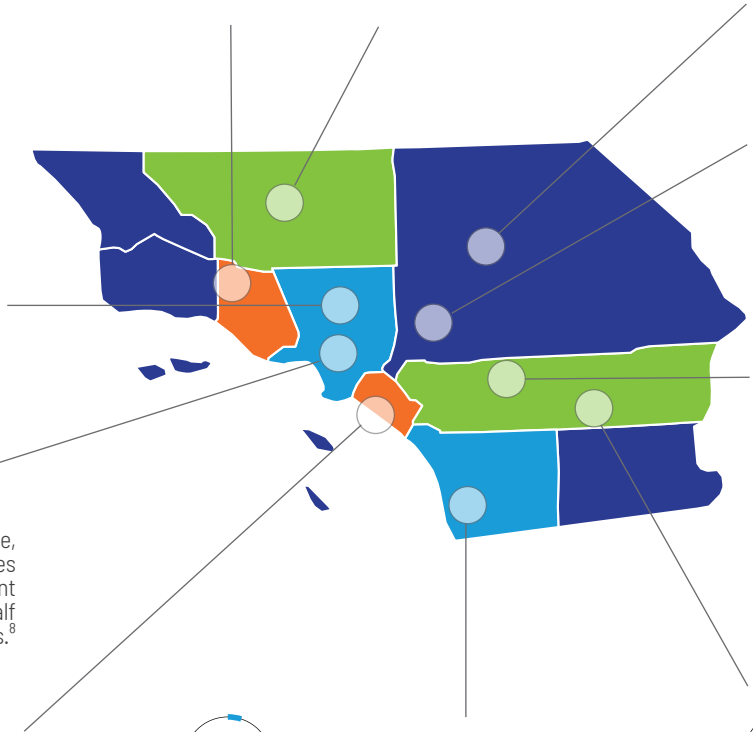
Groundwater is especially vital for Southern California, spanning Los Angeles, Orange, San Diego, San Bernardino, Riverside, Ventura, Kern, and Imperial counties. These areas include growing urban metropolises, agricultural producers, industrial centers, and desert communities – all of which rely on water to thrive.

SOUTHERN CALIFORNIA GROUNDWATER RELIANCE

California tracks groundwater use by hydrologic regions, which cross many city and county boundaries. The state's ten hydrologic regions are areas that have a common climate and geologic and topographical structure.

Groundwater use varies by community. Some communities rely heavily on groundwater to provide water to its residents, while others use more imported water.

Examples of how different parts of Southern California use groundwater



63% **854,223** service population

Ventura County relies on groundwater for 63 percent of its water needs.[6]

36% **893,000** service population

Groundwater makes up 36 percent of Kern County's water resources.[9]

99% **875,000** service population

Nearly all water supplied to businesses, homes and farms in the high desert is pumped from groundwater, according to the Mojave Water Agency.

66% **875,000** service population

Groundwater makes up 66 percent of the water served in the Inland Empire Utilities Agency service area.[5]

75%

25 cities in the San Gabriel Valley meet 75 percent of their water needs using local groundwater.[4]

25% **825,000** service population

25 percent of the drinking water provided by Eastern Municipal Water District is supplied by its groundwater wells. EMWD serves seven cities in Riverside County, including Moreno Valley, Murrieta, and Temecula.[10]

50% **4,000,000** service population

Los Angeles, Long Beach, Torrance, Inglewood and the rest of the 43 cities served by the Water Replenishment District of Southern California get half their water from local groundwater wells.[8]

75% **2,500,000** service population

Northern and central Orange County sources approximately 75 percent of its water supply from the Orange County Groundwater Basin.[3]

5% **3,300,000** service population

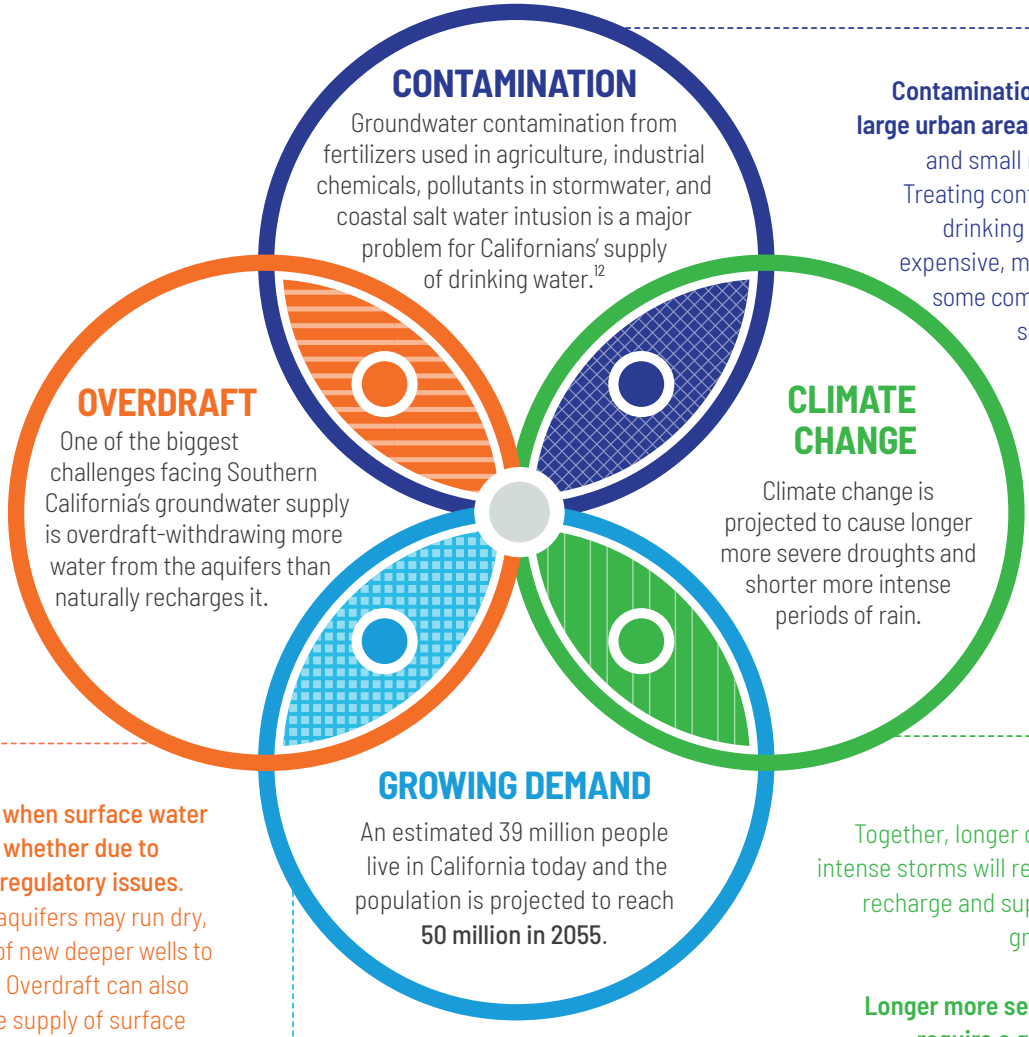
Local groundwater accounted for five percent of San Diego County's water supply in 2018. San Diego County also relies on imported water, some of which may be sourced from groundwater supplies outside of the county.[11]

56% **880,000** service population

Groundwater makes up 56 percent of the water served in the Western Municipal Water District service area.[7]

SOUTHERN CALIFORNIA WATER COALITION

What challenges are **IMPACTING THE GROUNDWATER SUPPLY** in Southern California?



CONTAMINATION

Groundwater contamination from fertilizers used in agriculture, industrial chemicals, pollutants in stormwater, and coastal salt water intusion is a major problem for Californians' supply of drinking water.[12]

Contamination is a problem for large urban areas like Los Angeles and small rural communities. Treating contaminated water to drinking water standards is expensive, making it difficult for some communities to access safe drinking water.

OVERDRAFT

One of the biggest challenges facing Southern California's groundwater supply is overdraft-withdrawing more water from the aquifers than naturally recharges it.

Overdraft can occur when surface water supplies are scarce, whether due to climate, drought, or regulatory issues. Wells in overdrafted aquifers may run dry, requiring the drilling of new deeper wells to access groundwater. Overdraft can also negatively impact the supply of surface water and water quality.[13]

Extreme overdraft in aquifers with compressible soil can cause land subsidence, the sinking of the ground's surface. This can lead to settlement of buildings and roads and permanently reduce the aquifer's capacity to store water.

CLIMATE CHANGE

Climate change is projected to cause longer more severe droughts and shorter more intense periods of rain.

Together, longer droughts and more intense storms will reduce groundwater recharge and supplies and degrade groundwater quality.

Longer more severe droughts will require a greater reliance on groundwater and expensive improvements in groundwater management. Stronger storms will require expensive improvements for flood control and stormwater management. Sea level rise associated with climate change will lead to water quality degradation through increased seawater intrusion in coastal aquifers and estuaries. Some of these impacts are already being felt today.[15]

GROWING DEMAND

An estimated 39 million people live in California today and the population is projected to reach **50 million in 2055.**

Diversifying our water supply through local supply projects such as water recycling and recharge, ensuring a stable baseline supply and increasing conservation efforts are all part of how we will meet future demand

The state will need to carefully manage its groundwater to supply to meet the water needs of millions of new residents.[14]

SOUTHERN CALIFORNIA WATER COALITION

HOW CAN WE PROTECT GROUNDWATER **FOR THE FUTURE?**

Southern California's future depends on a commitment to smart, innovative, and integrated water management. It's what we call an "all-of-the-above" approach for the region that acknowledges there is no one answer to our water issues. Instead we must invest in many different types of projects to ensure future water supply resilience and reliability. State and local agencies are taking important steps to modernize our systems, increase conservation, and move toward a more integrated approach.

PREVENTING OVERDRAFT AND REPLENISHING GROUNDWATER

California enacted the Sustainable Groundwater Management Act in 2014 to help communities stop groundwater overdraft and create balance between groundwater use and replenishment. This will help improve the sustainability of groundwater supplies in the future.[16] Before 2014, many of the groundwater basins across the state, mostly in Southern California, were successfully managed under a watermaster or other form of governance to ensure sustainable groundwater pumping and replenishment.

PREVENTING CONTAMINATION AND TREATING CONTAMINATED GROUNDWATER

Treating contaminated water is difficult and expensive. Preventing contamination from fertilizers, chemicals, and other pollutants in the first place is the best way to keep our groundwater supply safe.

- Reducing agricultural, commercial, and personal reliance on polluting substances and improving waste management helps to eliminate the sources of water contamination before they reach the groundwater supply.
- Avoiding overdraft in coastal areas reduces the risk of sea water contamination. Over-pumping can cause ocean water to flow inland and contaminate depleted fresh water sources.

CONSERVATION

Reducing water consumption and recycling wastewater are two important steps to protect existing groundwater supplies and ensure Southern California's water future. Conservation is just as important during wet years as dry years. Increased rainfall in the last year has dramatically improved the statewide water supply, but it will take more rain and continued conservation to help aquifers recover all the water that was used in the most recent draught.

- Using less water at home, in agriculture, and in industry reduces the burden on our groundwater supply and helps prepare us for future droughts. Rebate programs that help businesses and residents use less water and water conservation regulations are effective ways to reduce water usage.
- Recycling wastewater helps ensure we get the most use of our water supply. Wastewater can be recycled through treatment processes that remove contaminants. Recycled water can be used for needs like irrigation or toilet flushing and can also be used to replenish aquifers if treated to drinking supply standards.

While treatment of contaminated groundwater is expensive, it helps to create and maintain local water supplies that are more reliable and environmentally sound than imported water sources. Treating contaminated water produces fewer greenhouse gases than importing water and stops the spread of contamination in the aquifer system.

STORMWATER CAPTURE AND RECHARGE

Capturing and treating polluted stormwater instead of allowing it to empty directly into rivers, streams,and oceans conserves water and reducesa source of groundwater contamination. It is an important part of groundwater replenishment and quality improvement.

END NOTES

1. Mount, Jeffrey. "The Connection between Groundwater and Surface Water." *PPIC*(blog), October 15, 2018. Accessed April 24, 2019. https://www.ppic.org/blog/the-connection-between-groundwater-and-surface-water/.
2. Chappelle, Caitrin, Ellen Hanak, and Thomas Harter. *Just the Facts: Groundwater in California*. May 2017. Accessed April 24, 2019. https://www.ppic.org/publication/groundwater-in-california/.
3. *Orange County Water District*. July 2017. Accessed April 24, 2019. https://www.ocwd.com/media/5976/ocwd-brochure-july-2017.pdf.
4. TBD
5. Sriboonlue, Sarina, and Lisa Morgan-Perales. *Inland Empire Utilities Agency 2015 Urban Water Management Plan*. Report. CA, 2016.
6. "Groundwater Info." Watersheds Coalition of Ventura County. Accessed April 24, 2019. http://wcvc.ventura.org/groundwater_info.htm.
7. Kennedy/Jenks Consultants. *Western Municipal Water District Integrated Regional Water Management Plan 2008 Update*. Report. CA, 2008.
8. "What Is WIN?" Water Replenishment District of Southern California: Los Angeles Groundwater. July 31, 2017. Accessed April 24, 2019. https://www.wrd.org/content/what-win.
9. "Water in Kern County." Water Association of Kern County. Accessed April 24, 2019. https://www.wakc.com/water-overview/kern-county/.
10. "Water Supply." Eastern Municipal Water District. Accessed April 24, 2019. https://www.emwd.org/water-supply.
11. "Water Supplies." San Diego County Water Authority. Accessed April 24, 2019. https://www.sdcwa.org/water-supplies.
12. Chappelle, et al. *Just the Facts: Groundwater in California*.
13. Chappelle, et al. *Just the Facts: Groundwater in California; California Water Plan: Investing in Innovation and Infrastructure*. Report. Department of Water Resources, State of California Natural Resources Agency. CA, 2013,(2-7).
14. California Department of Finance. "Department of Finance Releases New Population Projections." News release, March 8, 2017. Accessed April 24, 2019. http://www.dof.ca.gov/Forecasting/Demographics/Projections/documents/P_PressRelease.pdf.
15. *California Water Plan: Investing in Innovation and Infrastructure*, (2-12).
16. SGMA Groundwater Management." California Department of Water Resources. Accessed April 24, 2019. https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management.

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Published June 20, 2019