

SANTA ROSA PLAIN

GROUNDWATER ANNUAL REPORT



What is happening with groundwater in your community?

The Santa Rosa Plain Groundwater Sustainability Agency (GSA) monitors, tracks and annually reports on groundwater levels, storage, and quality. The GSA is also required to measure whether groundwater pumping is causing land subsidence, intrusion of seawater, and affecting creeks, streams and other surface water.

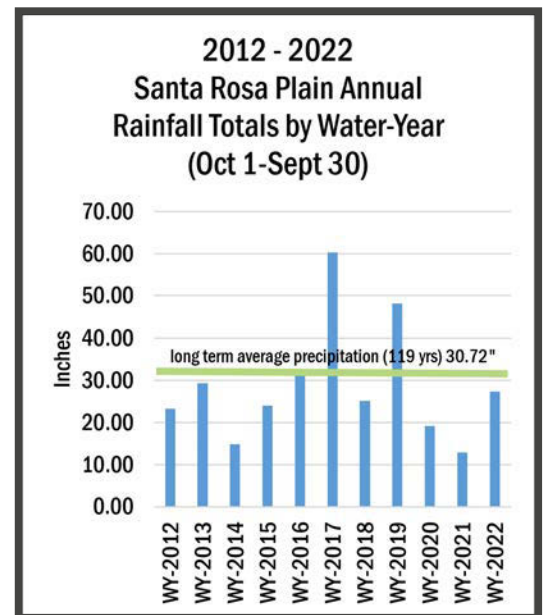
The annual report is a requirement of the Sustainable Groundwater Management Act (SGMA) and provides a snapshot of groundwater conditions and the basin's progress towards meeting its sustainability goals.

The GSA's Water Year 2022 Annual Report was submitted to the California Department of Water Resources on April 1, 2023, and describes basin conditions from October 1, 2021, through September 30, 2022 (the water year).

Third dry year in a row.

Water year 2022 was the third year of below average rainfall, a period which includes water year 2021 – the third driest year on record. The total precipitation during those three years was equivalent to the amount of rainfall the region normally receives during a two-year period.

Drought impacts groundwater in several ways. More water is needed to irrigate thirsty plants, crops and livestock, so rural residents and farmer may increase pumping. With less Russian River water available to cities and water districts, municipal water providers may use more groundwater to meet customer demand. Less rain means less water infiltrating and recharging aquifers.



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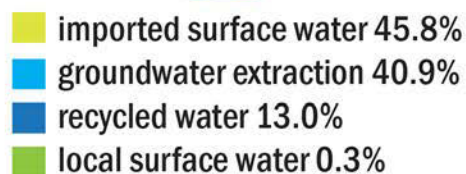
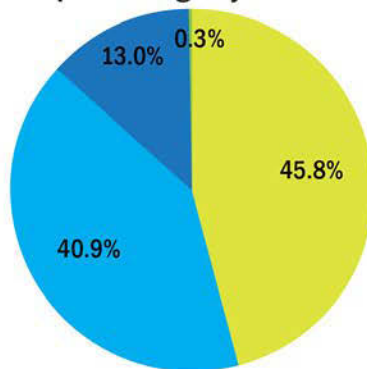
Groundwater levels

The Santa Rosa Plain subbasin is characterized by two aquifer systems: A shallow system (less than 200 feet deep) and a deep system (greater than 200 feet deep). In both the shallow and deep aquifer systems, groundwater-levels were similar in water year 2022 compared with. In the shallow aquifer system, where residential drinking water wells are usually located, there were isolated areas of declines and increases of up to about five feet occurring throughout the subbasin. In the deep aquifer system, areas of declines approaching and exceeding five feet primarily occurred in the vicinity of Rohnert Park and along the Laguna de Santa Rosa between Cotati and Sebastopol.

The GSA considers groundwater levels to be unsustainable if 10 percent of wells decline below historical observations or levels are above the 98th percentile of nearby drinking water wells for three years in a row. A drought factor is built in for stable wells. (For a more detailed explanation, go to Section 4.5 of the Santa Rosa Plain GSP). In water year 2022, none of the wells were below minimum thresholds. At one location in the southeastern area of Rohnert Park, groundwater levels have declined approximately 30 feet over the past three dry years and are approaching the established "warning-level" threshold. The GSA will continue to investigate groundwater level trends in this area of the subbasin in water year 2023.

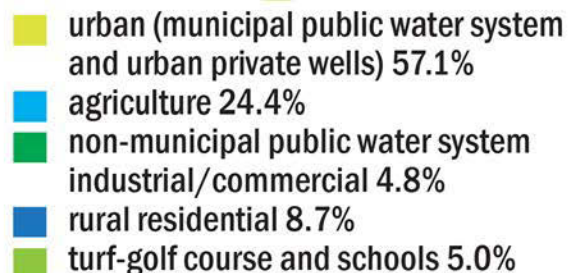
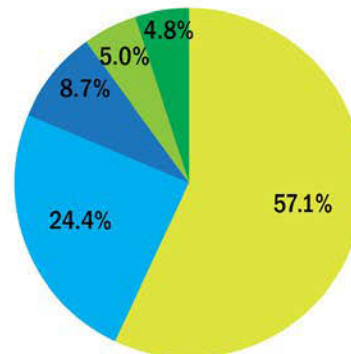
Water Use in the Santa Rosa Plain Groundwater Basin for Water Year 2022

percentage by source



For more information, see figure 3-15 on page 26 of the full text annual report.

percentage by sector





Groundwater storage

The amount of groundwater stored in the subbasin is estimated based on changes in groundwater levels. The drought likely contributed to the estimated 400 acre-feet decline in the amount of groundwater in storage in water year 2022. Between 2019 and 2022, the groundwater-level change method estimates a decline in storage of approximately 9,900 acre-feet. An acre-foot is equal to approximately 326,000 gallons, or enough to meet the annual indoor and outdoor needs of three average households in Sonoma County.

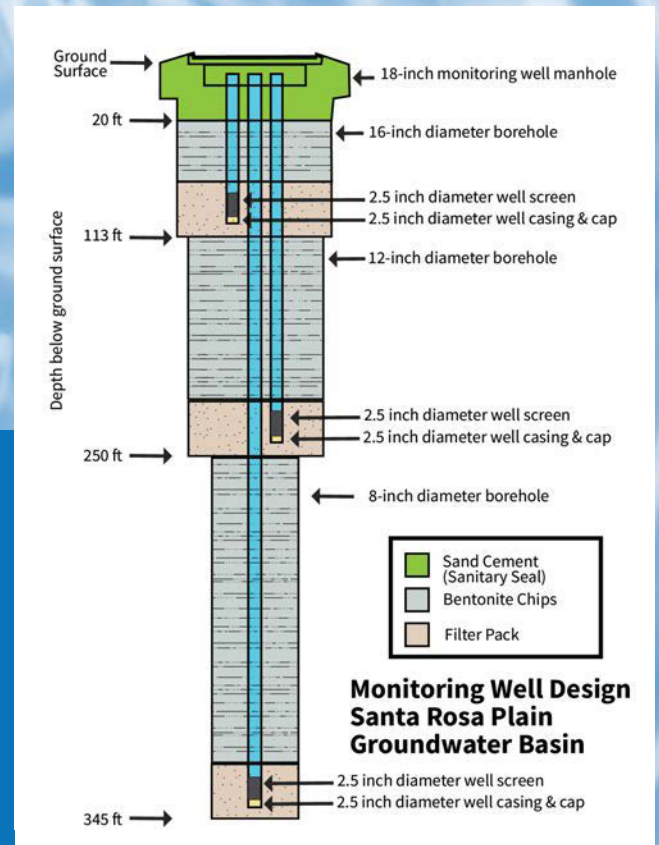


Groundwater quality

The GSA monitors the basin for arsenic, nitrates and total dissolved solids (TSD, or salt) to determine if GSA projects or groundwater pumping is degrading water quality. Groundwater is tested by public water suppliers to determine the concentration of each constituent and compared with maximum contaminant levels established by the State. The GSA considers groundwater quality to be degrading if two additional wells (above the baseline number of wells) are above maximum contaminant levels. In water year 2022, there were no exceedances of minimum thresholds for water quality.

How do we know what's happening underground?

Monitoring wells are used to measure seasonal changes in groundwater levels. Over several years, well level data for a single well starts to paint a picture of what is happening in that specific area; a network of monitoring wells provides a picture of what's happening throughout the basin. In Santa Rosa Plain, there are gaps in the well monitoring network, so the picture is fuzzy in some areas of the basin. In Water Year 2022, the GSA installed three new monitoring wells to help fill these gaps and the GSA recently applied for a grant to construct additional monitoring wells to help fill in these gaps. Information about streamflows, rainfall, groundwater pumping, and water quality help round out the picture.





Land subsidence

In some parts of California, particularly the Central Valley, the land surface is dropping (known as subsidence) due to groundwater pumping. Permanent (or inelastic) subsidence can damage aquifers and, on the land surface, destroy roads, bridges and other infrastructure. GSAs are responsible for managing inelastic subsidence caused by lowered groundwater elevations. In Santa Rosa Plain, there is no indication that groundwater pumping is causing land subsidence. The GSA is monitoring potential subsidence using satellite data and there was no evidence of subsidence in water year 2022.



Depletion from creeks, streams and other surface water

It is extremely complicated to determine if, when and where groundwater pumping is depleting creeks, streams and other surface water. Currently, the GSA does not have the data needed to determine the relationship between pumping and drops in surface water. A working group of scientific experts advised the GSA on how to improve its information and to develop criteria needed to determine the relationship between groundwater pumping and creeks and streams. In the interim, the GSA is using groundwater levels in seven wells near creeks as a proxy to measure sustainability. In water year 2022, five of the seven proxy wells showed increased groundwater levels. It is unknown whether levels increased due to reductions in groundwater pumping or surface water pumping or other factors.



Total water use

Total water use within the subbasin is estimated to be 45,605 acre-feet in 2022. The total annual groundwater extraction estimated using a parcel-based method developed for the fee study is approximately 18,638 acre-feet for 2022 which is within the estimated sustainable yield for the subbasin of 23,900 acre-feet. The GSA is planning for and implementing projects and management actions to increase or supplement water supplies to keep future groundwater extractions within the sustainable yield.



The full Santa Rosa Plain Groundwater Basin Water Annual Report, Water Year 2022 also includes a description of the work the GSA has been doing to fill data gaps and advance the planning and implementation of projects and actions to achieve sustainability and can be found at

santarosaplaingroundwater.org/annual-reports



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