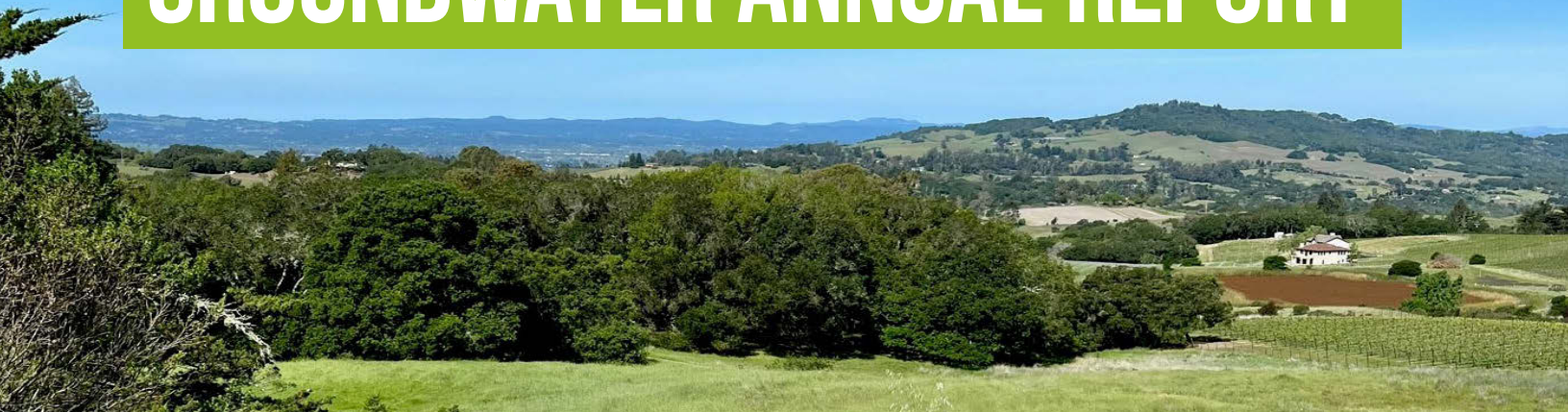


SONOMA VALLEY

GROUNDWATER ANNUAL REPORT



What is happening with groundwater in your community?

The Sonoma Valley 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.

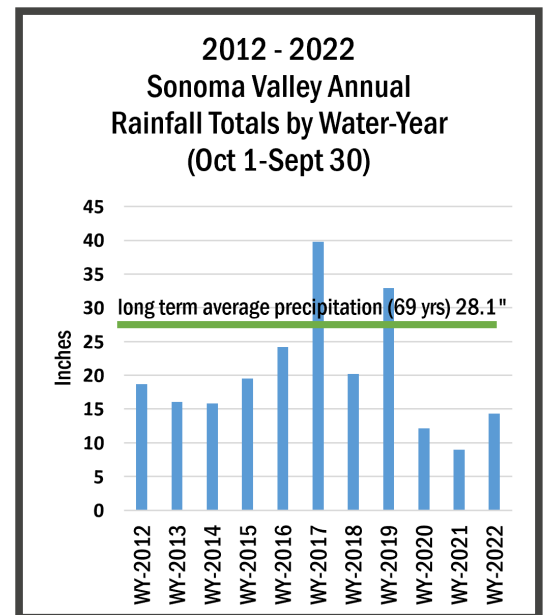
The annual report is a requirement of the Sustainable Groundwater Management Act (SGMA) and provides a snapshot of groundwater conditions and the basin's progress towards meeting its sustainability goals.

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.



VISIT OUR WEBSITE FOR THE FULL SONOMA VALLEY GROUNDWATER BASIN WATER ANNUAL REPORT SONOMAVALLEYGROUNWATER.ORG/ANNUAL-REPORTS



Groundwater levels

The Sonoma Valley 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 water year 2022, groundwater levels in the shallow aquifer were similar or slightly higher compared with water year 2021 – although declines of up to five feet were measured in the western and southern boundaries of the subbasin. In the deep aquifer, groundwater-levels were similar or slightly lower in water year 2022 compared with 2021. Declines of up to 20 feet occurred east of the city of Sonoma and east of the Eastside Fault (near 8th Street East) -- areas of chronic groundwater-level declines within the deep aquifer system.

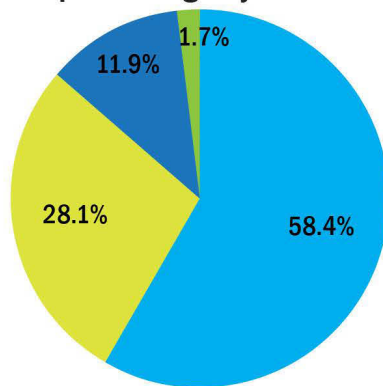
Groundwater levels measured in fall 2022 found that three of 13 representative monitoring wells in the shallow aquifer system and four of 10 wells in the deep aquifer system were below historical low elevations (minimum thresholds).

The GSA considers groundwater levels to be unsustainable if 20 percent of wells are below historical low elevations (minimum thresholds) for three years in a row. In water year 2022, 23 percent of wells were below minimum thresholds, with one well dropping below historical low elevations for two years in a row.

Should the declining trends continue at the deep aquifer system representative monitoring points in WY 2023, undesirable results for the chronic lowering of groundwater levels will occur. The GSA will closely monitor trends, evaluate the potential for impacts to shallow domestic wells, and prioritize filling data gap in these areas. The GSA is also focused on advancing planning and implementation of projects and management actions to address the declining trends.

Water Use in the Sonoma Valley Groundwater Basin for Water Year 2022

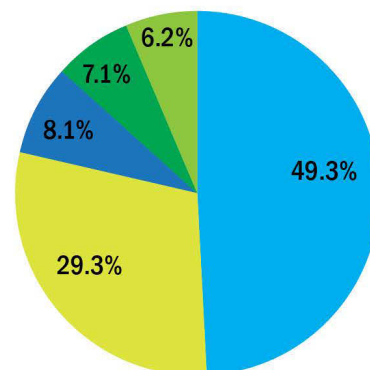
percentage by source



- groundwater extraction 58.4%
- imported surface water 28.1%
- recycled water 11.9%
- local surface water 0.6%

For more information, see figure 3-16 on page 28 of the full text annual report.

percentage by sector



- agriculture 49.3%
- urban (municipal public water system and urban private wells) 29.3%
- rural residential 8.1%
- non-municipal public water system industrial/commercial 7.1%
- turf-golf course and schools 6.2%



Groundwater storage

The amount of groundwater stored in the Basin is estimated based on changes in groundwater levels. The drought likely contributed to the estimated 480-acre feet decline in the amount of groundwater in storage in the shallow aquifer system and a 10-acre feet decline in the deep aquifer system in water year 2022. 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 one additional well (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.

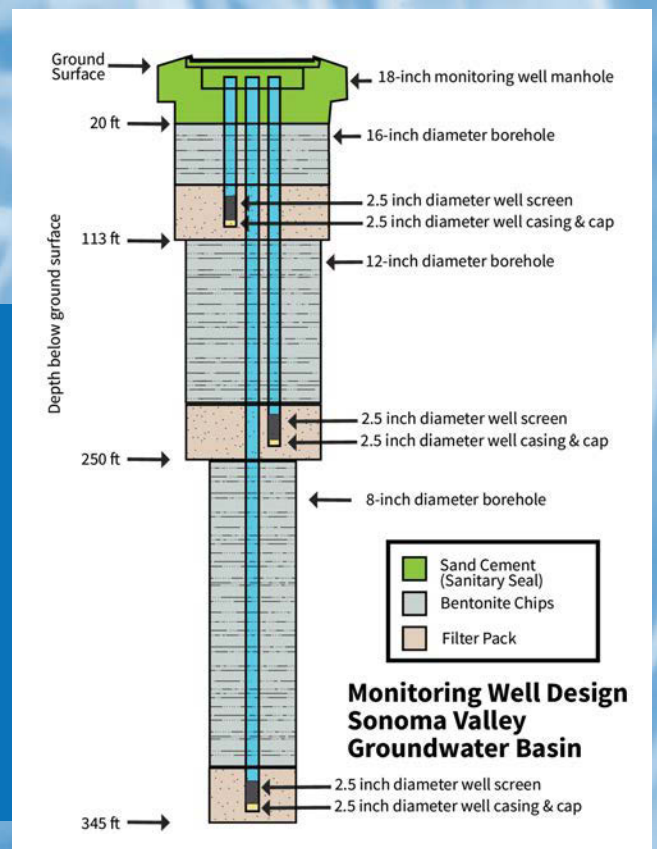


Seawater Intrusion

In some communities, groundwater pumping near the coast or bays has lowered groundwater levels below sea level allowing seawater to migrate inland. Seawater intrusion has the potential to contaminate groundwater wells and is difficult and expensive to reverse. Because there has been very little groundwater monitoring in the southern area of the Sonoma Valley, near San Pablo Bay, it is difficult to determine if seawater intrusion is a problem and if it's getting better or worse. A recently constructed new monitoring well will help fill the data gap and the GSA plans to further address this data gap through voluntary sampling, construction of new monitoring wells and evaluation of alternative monitoring technologies, such as geophysics.

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 Sonoma Valley, 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 Sonoma Valley, 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 three wells near creeks as a proxy to measure sustainability. In water year 2022, two of the 10 proxy wells showed declining groundwater levels. It is unknown whether levels dropped due to the drought, groundwater pumping or surface water pumping.



Total water use

Total water use within the subbasin is estimated to be 11,446 acre-feet in 2022. The total annual groundwater extraction is estimated to be approximately 6,679 acre-feet for 2022 which exceeds the estimated sustainable yield for the subbasin of 5,400 acre-feet. The GSA is pursuing planning and implementing projects and management actions that include both demand management programs and projects intended to increase or supplement water supplies in order to keep future groundwater extraction within the sustainable yield.



The full Sonoma Valley 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

sonomavalleygroundwater.org/annual-reports



SONOMA VALLEY
GROUNDWATER
SUSTAINABILITY AGENCY