

# PETALUMA VALLEY

# GROUNDWATER ANNUAL REPORT

## What is happening with groundwater in your community?

The Petaluma 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.

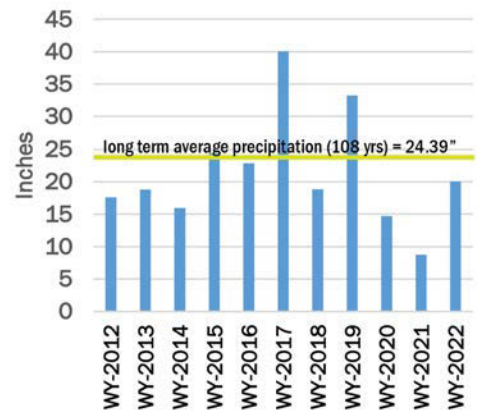
The GSA's Water Year 2022 Annual Report was submitted to the California Department of Water Resources on April 1, 2023, and describes basin conditions from October 1, 2021, through September 30, 2022 (the water year).

### 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 farmers 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.

2012 - 2022  
Petaluma Valley Annual  
Rainfall Totals by Water-Year  
(Oct 1-Sept 30)



VISIT OUR WEBSITE FOR THE FULL PETALUMA VALLEY GROUNDWATER BASIN WATER ANNUAL REPORT - [PETALUMAVALLEYGROUNWATER.ORG/ANNUAL-REPORTS](https://PETALUMAVALLEYGROUNWATER.ORG/ANNUAL-REPORTS)



## Groundwater levels

Overall, groundwater levels measured during the fall in water year 2022 were similar to water year 2021 levels, with a decline of less than 1 foot in most areas. A few

locations showed greater declines: In the southern area of the city of Petaluma and in the eastern hills near the border of the basin, groundwater levels dropped between five to 10 feet and, while remaining above minimum thresholds, groundwater levels continue to drop in two wells located in the northeast and northern margins of the basin. The GSA will be closely monitoring and prioritizing these locations for filling data gaps in the monitoring network.

The GSA considers groundwater levels to be unsustainable if 25 percent of wells are below historical low elevations (minimum thresholds) for three years in a row. In water year 2022, nine percent of wells were below minimum thresholds.

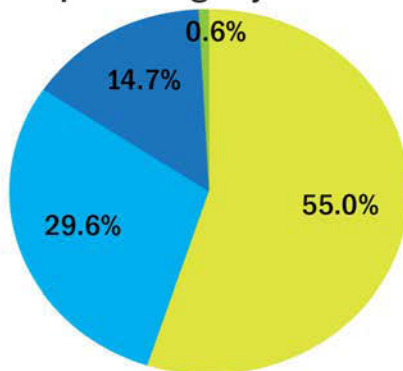


## Groundwater quality

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.

## Water Use in the Petaluma Valley Groundwater Basin for Water Year 2022

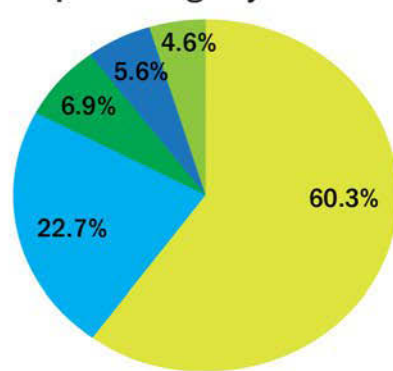
percentage by source



- imported surface water 55.0%
- groundwater extraction 29.6%
- recycled water 14.7%
- local surface water 0.6%

For more information, see figure 3-14 on page 24 of the full text annual report.

percentage by sector



- urban (municipal public water system and urban private wells) 60.3%
- agriculture 22.7%
- non-municipal public water system 6.9%
- industrial/commercial 5.6%
- rural residential 5.6%
- turf-golf course and schools 4.6%





## 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 4,200 acre feet decline in the amount of groundwater in storage 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.

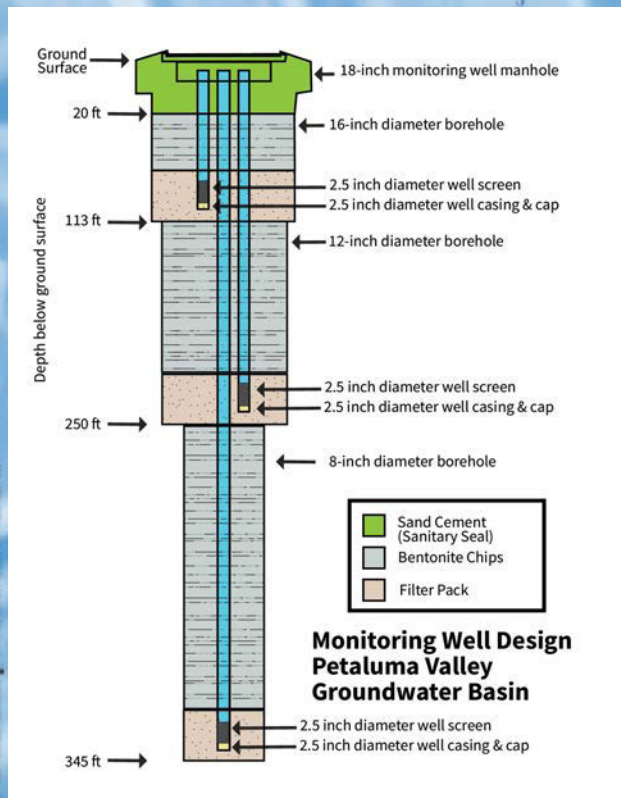


## Seawater intrusion

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 Petaluma 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 Petaluma 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.



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## 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 Petaluma 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 three 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 11,289 acre-feet in 2022. The total annual groundwater extraction is estimated to be approximately 3,345 acre-feet for 2022 which exceeds the estimated groundwater extraction from the previous two years of 2,993 acre-feet for 2021 and 2,650 acre-feet for 2020. 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 Petaluma 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](https://sonomavalleygroundwater.org/annual-reports)



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