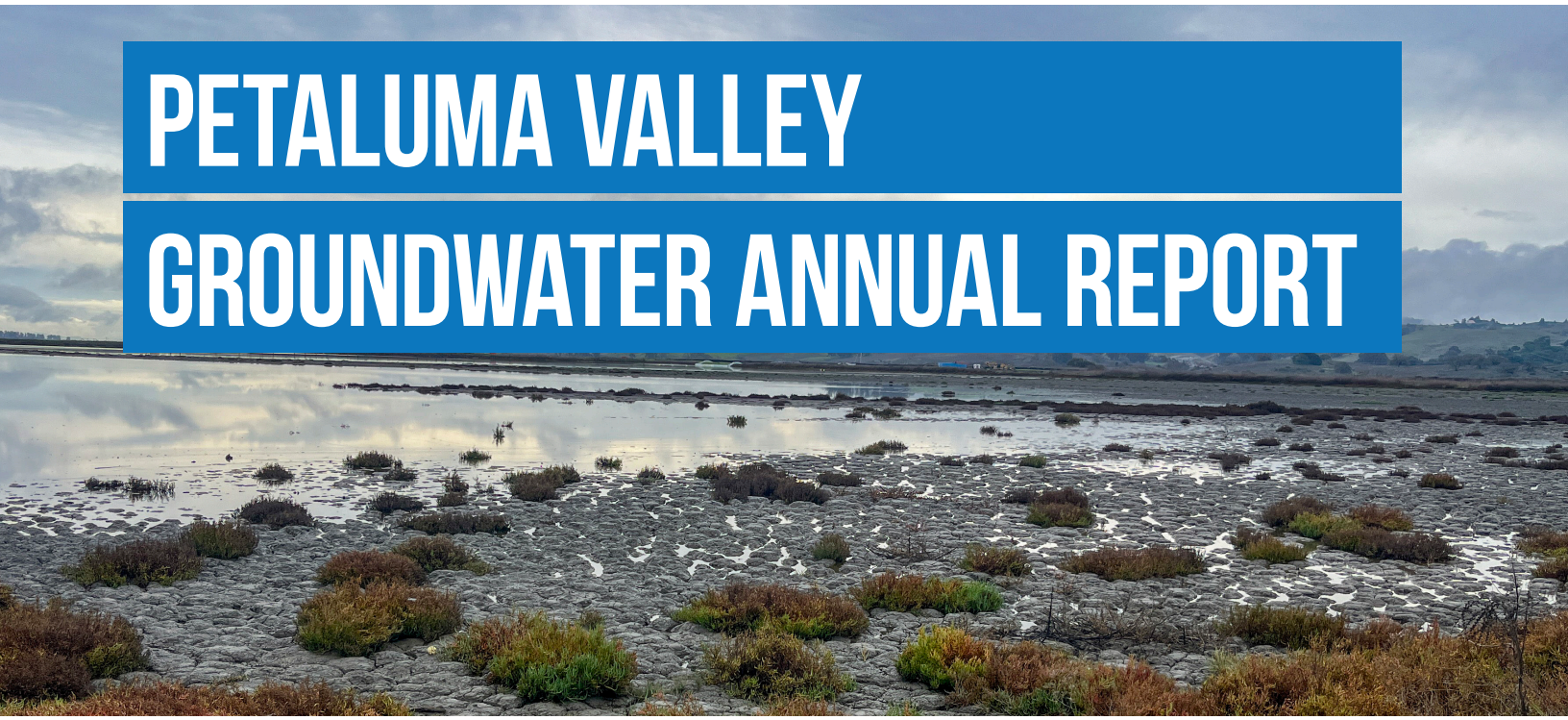


PETALUMA VALLEY GROUNDWATER ANNUAL REPORT

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 in the basin. 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 Petaluma Valley Groundwater Sustainability Plan was approved in January 2023. Each year the GSA must provide an Annual Report to comply with the Sustainable Groundwater Management Act, and provide a snapshot of groundwater conditions from the previous water year (Oct. 1 - Sept. 30). The Annual Report measures the basin's progress towards meeting defined sustainability goals and provides a status update of project implementation.

The GSA's Annual Report for Water Year 2023 was submitted to the California Department of Water Resources on April 1, 2024, and describes basin conditions from Oct. 1, 2022, through Sept. 30, 2023.

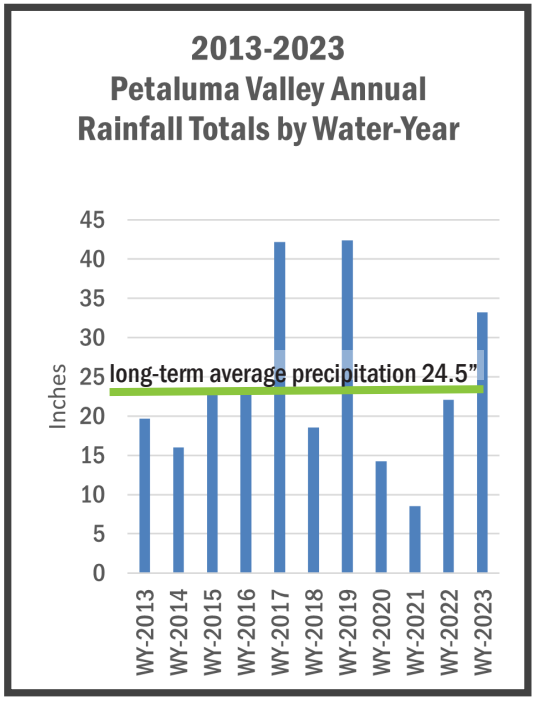
An end to the drought

Water Year 2023 brought much-needed precipitation to the region, following three years of drought. Rainfall was above average, but was preceded by three consecutive dry years, including the third driest year on record over the last 127 years.

Droughts are a natural part of California's climate. Creating alternative water storage opportunities during wet years will provide greater water resilience during times of drought.

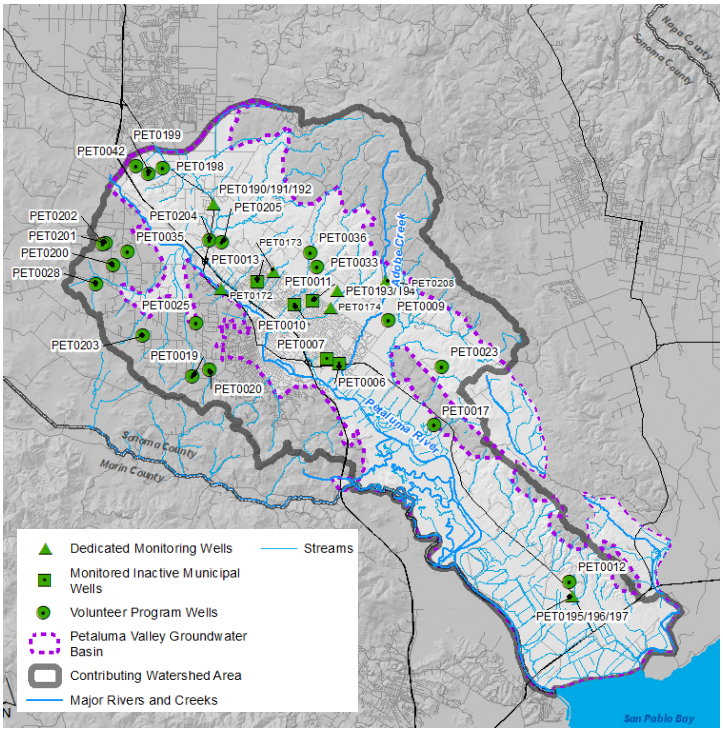
The long-term drought stressed our groundwater resources. The hope is that, with more rain, and strategic planning and design, more of this water will make its way underground and recharge our groundwater aquifers. Our efforts to monitor the basin help us track that infiltration to manage a sustainable water supply.

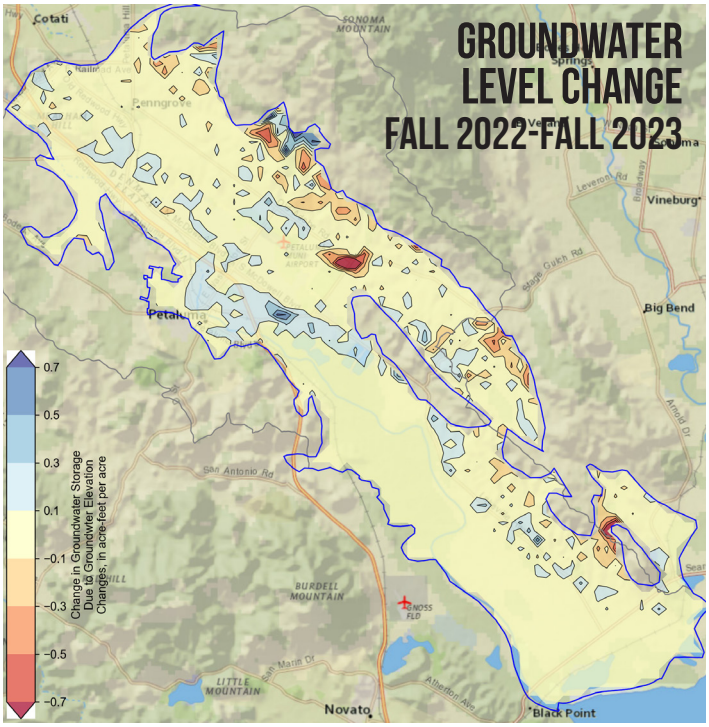
PETALUMA VALLEY
GROUNDWATER
SUSTAINABILITY AGENCY



petalumavalleygroundwater.org

SUSTAINABILITY INDICATORS





Groundwater levels

Compared with Water Year 2022, groundwater levels in Water Year 2023 were stable or rose on average two-to-five feet throughout much of the basin.

The Representative Monitoring Point Network for Petaluma Valley Basin is made up of eleven wells that show areas with lowering groundwater levels. The full network inclues 27 wells within the basin, plus 36 within the contributing watershed area.

In spring, when levels reach their seasonal high, five of the 11 monitoring points were above measurable objectives, which are quantifiable goals for maintaining or improving groundwater conditions. In fall, when levels are usually at their lowest, all 11 points measured above minimum thresholds.

Although levels were above the minimum threshold in 2023, some areas have exhibited a pattern of decline over several years, particularly in the area near Stage Gulch Road and Old Adobe Road and in the northern basin boundary. These will be closely monitored and prioritized in planning efforts to fill 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.

Groundwater storage

The amount of groundwater stored in the basin is estimated based on changes in groundwater levels. The annual change in groundwater storage within the basin for Water Year 2023 is estimated to have increase by approximately 1,070 acre-feet.

An acre-foot is equal to the area of a football field filled with one foot of water, which is enough to meet the annual indoor and outdoor needs of three average households in Sonoma County, approximately 326,000 gallons.

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. The GSA worked with scientists to develop a proxy for monitoring depletion of interconnected surface water, and found that there were no exceedances of minimum thresholds in Water Year 2023. There are ongoing and planned activities to address the data and information gaps related to this indicator as part of the sustainability plan.

Groundwater quality

The GSA monitors the basin for arsenic, nitrates and total dissolved solids (TDS, 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 2023, there were no exceedances of minimum thresholds for water quality.

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 in 2023.

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 through voluntary sampling, construction of new monitoring wells and evaluation of alternative monitoring technologies. Additional chloride data, which is an indicator of seawater intrusion, is anticipated to be available for inclusion in future annual reports.

The complete Petaluma Valley Groundwater Basin Water Annual Report, Water Year 2023, with detailed information, data, graphs, maps and more can be found at

petalumavalleygroundwater.org/annual-reports

Groundwater Sustainability Plan Implementation

The Groundwater Sustainability Plan was submitted to the California Department of Water Resources in January 2022 and approved on Jan. 26, 2023. The plan establishes a standard for sustainability of groundwater management and use and determines how the basin will achieve this standard by 2042. In October 2023, the GSA received funding from the state to begin implementing projects outlined in the plan.

Communication and Stakeholder Engagement

► Holding public GSA Board, Advisory Committee and community meetings.
► Developing, launching, maintaining and updating the on-line Groundwater User Information and Data Exchange (GUIDE) program to exchange parcel-specific water use information with groundwater users has continued. (see petalumavalleygroundwater.org/user)
► Direct outreach to growers and rural well owners for voluntary monitoring, voluntary metering, water-use efficiency programs and recharge initiatives will begin in Water Year 2024.

Land Use Planning and Well Permitting Integration/Coordination

► Continued establishing protocols and procedures for the sharing of groundwater information between Permit Sonoma and the GSAs in Sonoma County.
► Coordinated with Permit Sonoma to comply with the Governor's Drought Executive Order N-7-22 that included new well permitting requirements for local agencies, including GSAs.
► Participation in the county's Well Ordinance Technical and Policy Working Groups to provide technical expertise and policy perspectives from the GSA for addressing public trust resources during well permitting decisions.
► Coordination with the county in development of countywide Drought Resilience Plan to address domestic wells vulnerable to groundwater-level declines.

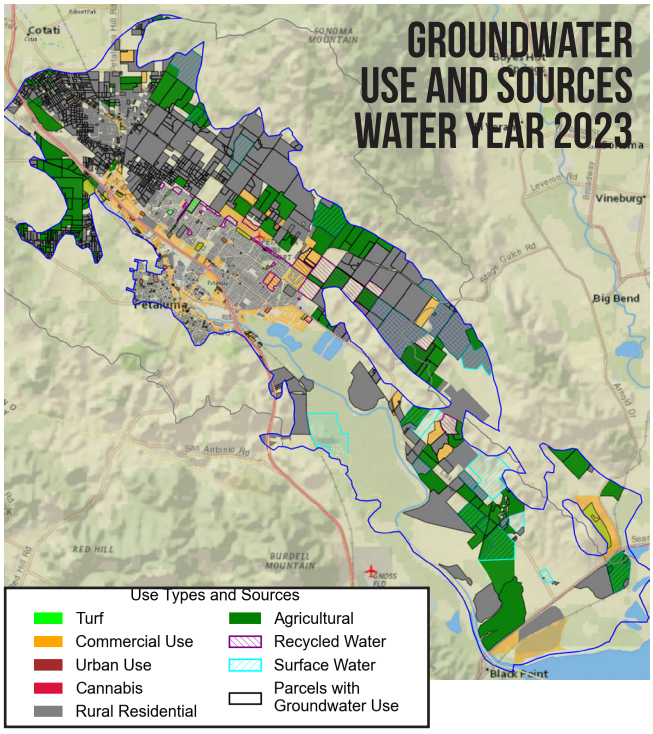
Addressing Data Gaps

► Outreach for refining and expanding the voluntary groundwater-level monitoring program has been initiated.
► Refinement of groundwater use estimates through the GUIDE program.
► Developing an assessment approach that includes groundwater-dependent ecosystems and interconnected surface water data gaps.

Total water use

Total water use within the basin is based on the estimated and metered uses of groundwater, surface water and recycled water. The majority of water use is estimated using the best available science and information. The Groundwater Sustainability Plan outlines strategies to fill this data gap.

The total annual groundwater extraction estimated using a parcel-based method developed for the fee study is approximately 2,685 acre-feet for 2023. This is equal to 80% of the total water use in water year 2022, which was an extreme. drought year.



TOTAL SUBBASIN WATER USE BY SOURCE (ACRE-FEET), COMPARED OVER THREE WATER YEARS

	2021	2022	2023
Groundwater Extraction	2,993 (21%)	3,345 (29%)	2,685 (23%)
Surface Water	9,516 (66%)	6,283 (56%)	7,762 (67%)
Recycled Water	1,944 (13%)	1,661 (15%)	1,204 (10%)
TOTAL	14,453	11,289	11,651

TOTAL WATER-USE IN SUBBASIN FROM ALL SOURCES (ACRE-FEET) COMPARED OVER TWO YEARS

Water-use sector (text color corresponds to map legend above)	Water-use from groundwater extraction		Water-use from all sources combined	
	WY 2022	WY 2023	WY 2022	WY 2023
Agriculture	1,406 (42%)	1,090 (41%)	2558 (23%)	2802 (24%)
Urban: municipal water systems and urban private wells	344 (10%)	11 (0%)	6,804 (60%)	7,014 (60%)
Rural residential	632 (19%)	650 (24%)	632 (6%)	650 (6%)
Turf - golf course and schools	186 (6%)	177 (7%)	518 (5%)	418 (3%)
Non-municipal public water system: industrial and commercial	777 (23%)	757 (28%)	777 (7%)	757 (7%)
Total	3,345	2,685	11,289	11,641

► Developing a seawater intrusion monitoring workplan.

Projects and Management Actions

Initiation of activities related to project and management actions within the basin including:
► Development of the policy options management action.
► Scoping for a project to assess and implement conservation and groundwater-use efficiency opportunities.
► Planning and implementation of a voluntary metering program will begin in Water Year 2024.
► Expansion of the City of Petaluma's recycled water supplies to offset groundwater pumping funded through the Sustainable Groundwater Management Act Implementation Grant will occur in Water Year 2024.
► The GSA will continue coordinating with the City of Petaluma in planning aquifer storage and recovery.