



SANTA CRUZ COUNTY WATER RESOURCES MANAGEMENT 2023 STATUS REPORT

**Prepared by County of Santa Cruz
Environmental Health**



Executive Summary

Santa Cruz County's water resources serve a critical role in providing municipal, domestic, and agricultural water supply, preserving fragile watersheds, providing resilient habitats, and supporting recreational and commercial activities. County staff, local agencies, organizations, and the community continue to work together toward long term adaptive solutions to sustain environmental quality and provision safe and reliable water resources to meet current and future water resource needs. This year's status report reflects the impacts of, and ongoing preparation for, changing hydrologic cycles. The term "whiplash weather" was coined to describe an increase in variability in the way we receive precipitation. Rain patterns are moving away from historical norms and toward violent swings between intense drought and severe floods. No two years in our records demonstrate this as well as 2022 and 2023. Projects and planning efforts undertaken by regional agencies and non-profits are preparing for a future with a greater variability in precipitation and temperature than Santa Cruz experienced when our existing infrastructure was built. This report encompasses activities that took place during calendar year 2023, and reflects water use and rainfall from the 2023 water year which began October 1, 2022 and ended September 30, 2023.

Water Resource Management activities during 2023 were influenced by:

- Rain: A three-year dry period was ended dramatically by two series of back-to-back atmospheric rivers in January and March that resulted in flooding throughout the County including communities along the San Lorenzo River, downtown Soquel, Capitola, and a breach in the Pajaro Levee that flooded the town of Pajaro just south of the County border.¹ Rainfall totals ended the year at 160% of normal.
- Infrastructure repair/upgrades: While development of new water supplies is happening throughout the County, a big focus this year has also been on investing in repairs and replacement of existing infrastructure. Water agencies and County crews experienced extensive storm damage that impacted all manner of water conveyance and monitoring, damaging pipes, intakes, culverts and roads. This was in addition to planned upgrades to critical infrastructure such as the Newell Creek Dam and Graham Hill Treatment Plant.
- Algal blooms: Large Harmful Alga Blooms (HABs) occurred throughout the County this year, most notably at Pinto Lake which was closed for nearly two months, and at Corcoran Lagoon. As a result, the County's Water Quality Program has improved their ability to identify Cyanobacteria (also referred to as blue-green algae) and other toxin-producing phytoplankton. They can also detect the toxins released by the most common HABs.

Key accomplishments include:

- Total municipal water use reached its lowest level since 1984 due to a combination of a wet winter and spring, a relatively cool summer, and permanent water efficiency measures put in place during the last droughts.

¹ Data from California Irrigation Management Information System, <https://cimis.water.ca.gov/>

- New Water Supply projects have been making progress including:
 - The San Lorenzo Valley Water District is moving forward with their Conjunctive Use project through preparing to release a Notice of Intent for an Environmental Impact Report in the coming spring, and is releasing a Request for Proposals for a Feasibility Study regarding their allotment of water from Loch Lomond in December 2023.
 - The City of Santa Cruz Water Department is developing their Aquifer Storage and Recovery (ASR) program to store surplus surface water in the Mid-County Groundwater Basin for use during the dry season and droughts. In 2023 they completed demonstration projects at two of their Beltz Wells and initiated the pilot testing on a third.
 - The Soquel Creek Water District Pure Water Soquel Advanced Purified Groundwater Replenishment Project is expected to be operational in late 2024. This project will recycle water from the City of Santa Cruz’s Wastewater Treatment Facility through an advanced water purification process and use it to recharge the Mid-County groundwater basin and protect against seawater intrusion. In 2023 The District made progress on the purification facility construction, the conveyance pipelines to and from the facility, and on the injection wells.
 - The Pajaro Valley Water Management Agency (PV Water) is moving forward on two large supply projects. The College Lake Project includes components required to store, treat, and deliver water from College Lake, for use as an irrigation supply in-lieu of pumped groundwater to reduce the rate of seawater intrusion while helping to preserve agriculture. PV Water began construction of the College Lake Project in spring 2023. The Watsonville Slough System Managed Aquifer Recharge and Recovery Projects (WSS-MARR) include upgrades of the existing Harkins Slough Managed Aquifer Recharge Facility and construction of the Struve Slough Project, to divert, convey, store, and recover surface water for use as an irrigation supply in-lieu of pumped groundwater. PV Water has completed the environmental impact report for the project, is working to complete final design, is advancing efforts to obtain all necessary permits, and will soon begin negotiations to acquire necessary property rights.

This report was written by staff in the Santa Cruz County Water Resources Program in Environmental Health. Updates were provided by four County departments and by partners throughout the county including the San Lorenzo Valley Water District, Scotts Valley Water District, City of Santa Cruz Water Department, Soquel Creek Water District, Central Water District, City of Watsonville, Pajaro Valley Water Management Agency, Regional Water Management Foundation, Pajaro River Flood Management Agency, and the Resource Conservation District of Santa Cruz County.

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Introduction

Santa Cruz County's water resources provide municipal, domestic and agricultural water supply, preserve fragile watersheds, provide resilient habitats, and support recreational and commercial activities. Responding to floods, drought, wildfires, a changing climate, and other uncertainties requires integrated and holistic approaches to building resilience and fostering sustainability. Nearly all of Santa Cruz's water supply is locally derived – a unique situation in a state supported by large federal and state water projects – and largely relies on rainfall and groundwater resources (see Figure 1). Domestic supply within the region is provided by five large public agencies, four medium water systems, over 100 small water systems and some 8,000 individual wells. Wastewater treatment includes centralized water reclamation facilities that collect and process water from sewered areas within the urban parts of the county, along with decentralized on-site systems that serve more rural areas.

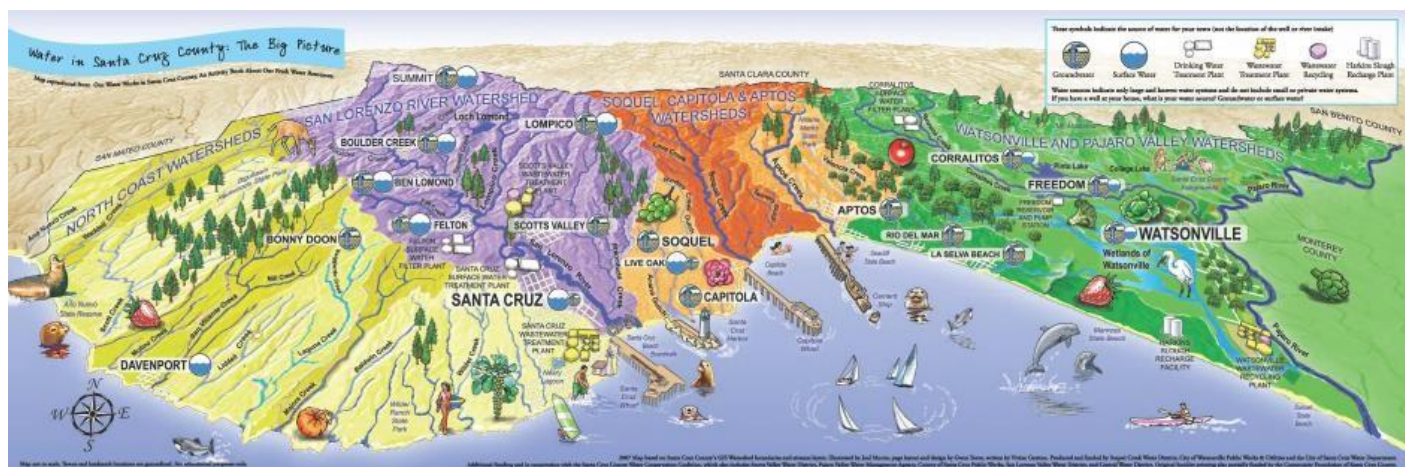


Figure 1: Overview map of Santa Cruz County water sources

Some of the challenges confronting our vulnerable water resources include inadequate water supply particularly during droughts, impaired water quality, overdrafted groundwater basins, flooding, diminished streams, and degraded riparian habitat. County staff, local agencies, organizations, and the community continue to work together toward long term adaptive solutions to sustain environmental quality and provision safe and reliable water resources to meet current and future water resource needs. Some water resource programs are mandated under state or federal regulatory requirements, while other programs are supported by grants or local initiatives. While it would be impossible to capture all the work undertaken every year, this report tries to capture activities of broad interest to the community. This status report is focused on the 2023 water year which began October 1, 2022 and ended September 30, 2023, with some activities described through December 31st, 2023.

Rainfall is critical to sustaining the County's surface and groundwater resources. Water year 2023 dramatically ended a three-year dry spell that preceded it (see Figure 2).² Though rainfall patterns vary significantly across the County, the story of the rain year is the same:

² Data from CIMIS (California Irrigation Management Information System):
<https://cimis.water.ca.gov/>

The water year started strong with some moderate events in November and December. That strong start escalated beginning December 31st with the first in a series of significant atmospheric river events in January, a break in February, and another series of events in March. Ultimately, rainfall reached over 160% of normal. According to the US Drought Monitor,³ the entire county went from experiencing Severe Drought at the beginning of the water year, to not experience any level of drought in the end.

Cumulative Precipitation Santa Cruz, CA Water Year 2023

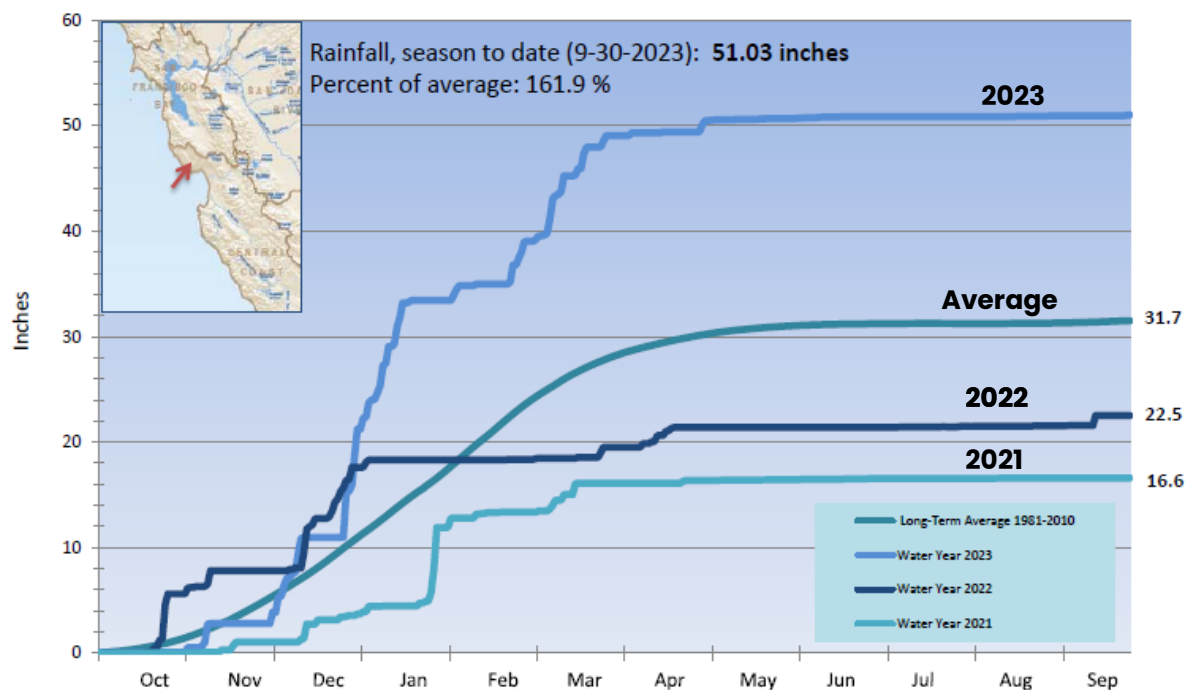


Figure 2. Rainfall in water years 2021–2023 compared to the long-term average, data from cimis, credit [City of Santa Cruz Water Department Water Conservation Program](#).

A comparison of water year 2022 and 2023 San Lorenzo River flows are shown in Figure 3,

demonstrating the remarkable difference one very wet winter can make for the duration of the water year. Loch Lomond, the only surface water reservoir in the County, filled during the winter and remained high, ending the water year at over 90% capacity⁴. Groundwater elevations react differently to rain depending on their depth and formation type. That said, all groundwater basins benefited this year from direct recharge and lower than average groundwater pumping due to ample surface water and cooler temperatures⁵.

³ <https://droughtmonitor.unl.edu/>

⁴ <https://www.cityofsantacruz.com/government/city-departments/water/weekly-water-conditions>

⁵ <https://sccwaterdata.us/#/overview/GroundwaterLevel>

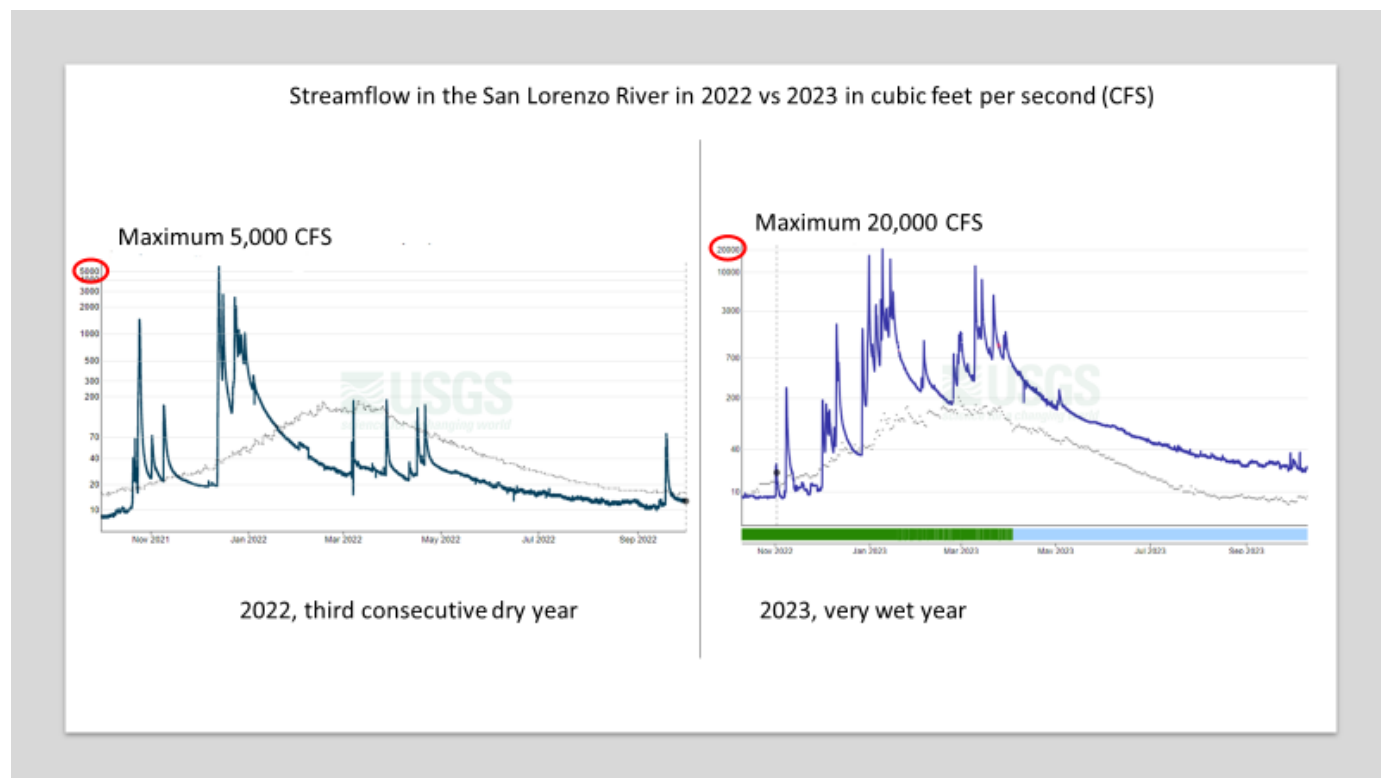


Figure 3. Water year 2022 Streamflow vs. 2023 Streamflow for the San Lorenzo River at the Big Trees gaging station ⁶in comparison to median values (1937-2023).

Water Resource Management in Santa Cruz County is changing at a pace and scale not seen in 60 years. While climate models vary, all of the models used locally indicate a future with more frequent droughts, higher temperatures, and increasing variability of rain patterns – the last four years demonstrate this perfectly with three drought years followed by a series of atmospheric rivers in quick succession. Overall precipitation totals may stay the same or begin to decline, however the increased variability limits the ability to capture and infiltrate the water when it is available⁷. The systems that we rely on for water supply, and that support the environment that we cherish, rely on a climate that does not exist anymore. Loch Lomond was designed to fill every year, our groundwater basins were expected to recharge at certain rates, and our streamflows were sufficient to support important species. The last decade has shown us that those expectations no longer reconcile with reality.

In response to the new paradigm where historically normal is no longer the norm, every agency and organization committed to water resource management is working individually and collaboratively at an unprecedented scale to plan, develop, design, and implement projects and management actions to sustain and improve the three overarching and interconnected categories featured in this report: Regional Water Supply Resilience, Water

⁶ <https://waterdata.usgs.gov/monitoring-location/11160500/#parameterCode=00065&period=P7D>

⁷ https://www.smgwa.org/media/GroundwaterSustainabilityPlan/GSP_Sect2_PublicReviewDraft_Appendix2D-ModelReport.pdf

Quality, and Natural Resource and Flood Management. Like water, these categories are fluid and interconnected, which makes it challenging to meaningfully arrange activities into just one Section. While this report is broken out neatly into sections, Figure 4 demonstrates the way these different sections and the topics within are connected.

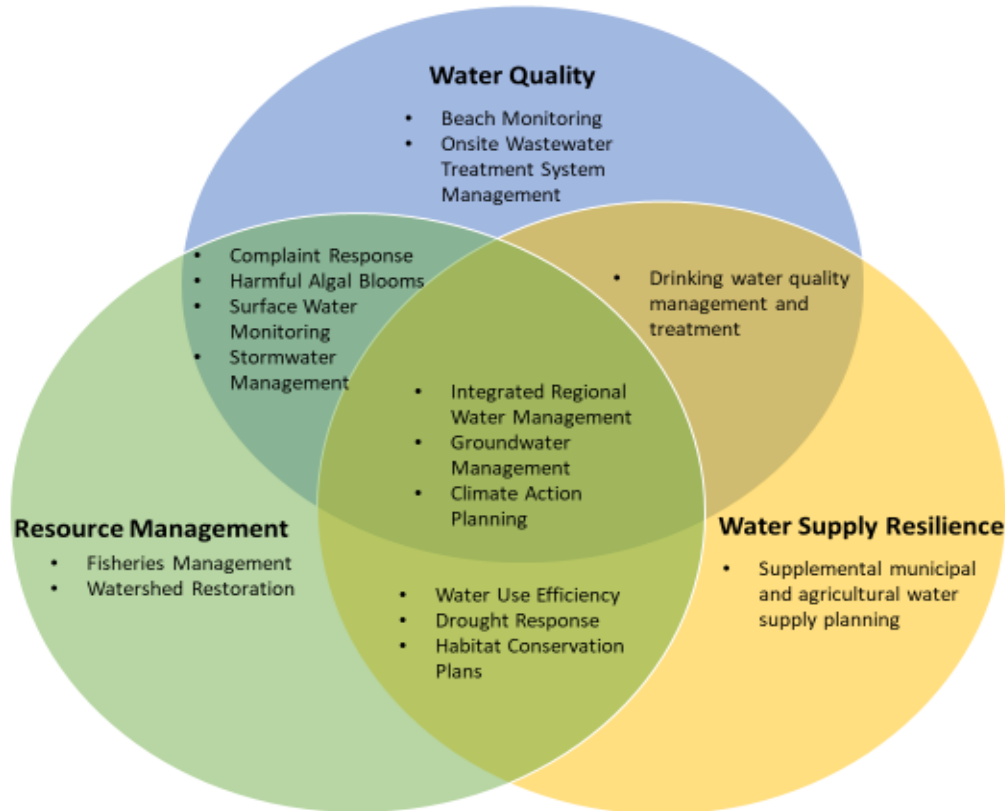


Figure 4: Interconnected Water Management Categories

The first effort to support the integrated nature of water management including water quality, environmental users, and water utilities was the Integrated Regional Water Management (IRWM) program, which has been underway in Santa Cruz County for over 20 years. Partner agencies continue to work together on the IRWM program, with the Regional Water Management Foundation (RWMF) serving as a hub for the 12 agencies in the Regional Water Management Group. The County and all the cities and public agencies dealing with water are signatories to the Santa Cruz IRWM Memorandum of Agreement, which will be updated in 2024. <http://www.santacruzirwmp.org/>.

The integration efforts between water and the agencies and organizations that manage it have continued beyond the IRWM program and now include regional efforts in water quality management and groundwater sustainability. Water exchanges through interties are becoming more common, a trend that will continue as a new intertie between the City of Santa Cruz Water Department and Scotts Valley Water District is under development. This intertie will complete the connection of every water system from the upper reaches of the San Lorenzo Valley Water District, all the way down to Central Water District.

Section 1: Regional Water Supply Resilience

This section focuses on efforts by the County, municipal water providers, Groundwater Sustainability Agencies, and non-profit organizations, to shore up existing water supplies and infrastructure, manage existing resources appropriately, and develop new water supplies.

As the effects of climate change become more pronounced, water sources will become increasingly stressed. To meet this challenge, county residents and agencies will have to continue their efforts to limit water waste. Using water as efficiently as possible will help reduce stress on our water supplies and make them more resilient to climate change. Local agencies have been tremendously successful in decreasing domestic water demand by financially supporting the transition to more efficient methods of water use and educating residents about water conservation. This success can be seen when looking at the number of water connections in the county compared to water production. Since 1984, the number of water connections has more than doubled while annual water production has decreased significantly. In fact, domestic water production peaked in 1997 and has dropped nearly 30% to date (see Figure 10). Water year 2023 marks a new low in municipal water use since 1984, beating the previous low in 2015 which was at the height of water restrictions due to a multi-year drought. This trend reflects a dramatic increase in water efficiency across indoor fixtures, like toilets and washing machines, as well as outdoor irrigation as low water landscaping has become the norm in Santa Cruz County.

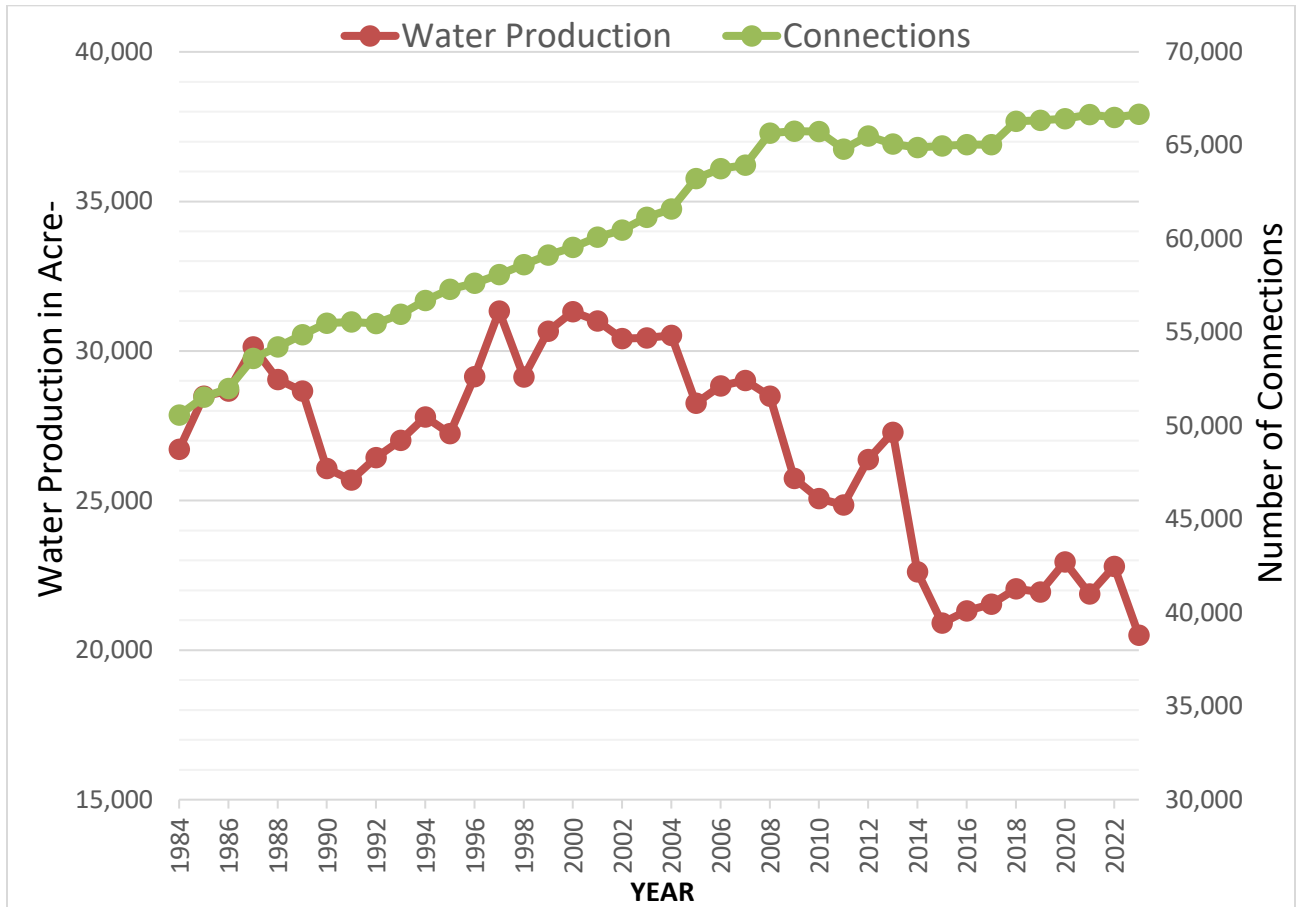


Figure 5: Water Production and Connections from large water systems, 1984-present

The County has, and will continue, to promote efficient water use is through the [WaterSavingTips.org](https://www.watersavingtips.org) website, which creates a single location for every county resident to find information on water conservation and what conservation incentives are provided by their water supplier.

As indoor fixtures have become increasingly efficient, outdoor water use is likely becoming a larger proportion of water waste. According to the California Department of Water Resources, outdoor water use statewide accounts for 30–60% of household usage⁸, which makes it a great candidate for further reductions. The nature of outdoor water use also makes it a particular challenge to our water resources because outdoor water use is highest during the driest times of the year, when water supplies are most stressed. This is illustrated in Figure 6, which shows the 2022 water extraction data of small Community water systems (<200 connections) in Santa Cruz County. The peak water demand in June was nearly double that of January, which can largely be attributed to increased outdoor water use.

⁸ [How to Save Water \(saveourwater.com\)](https://www.saveourwater.com)

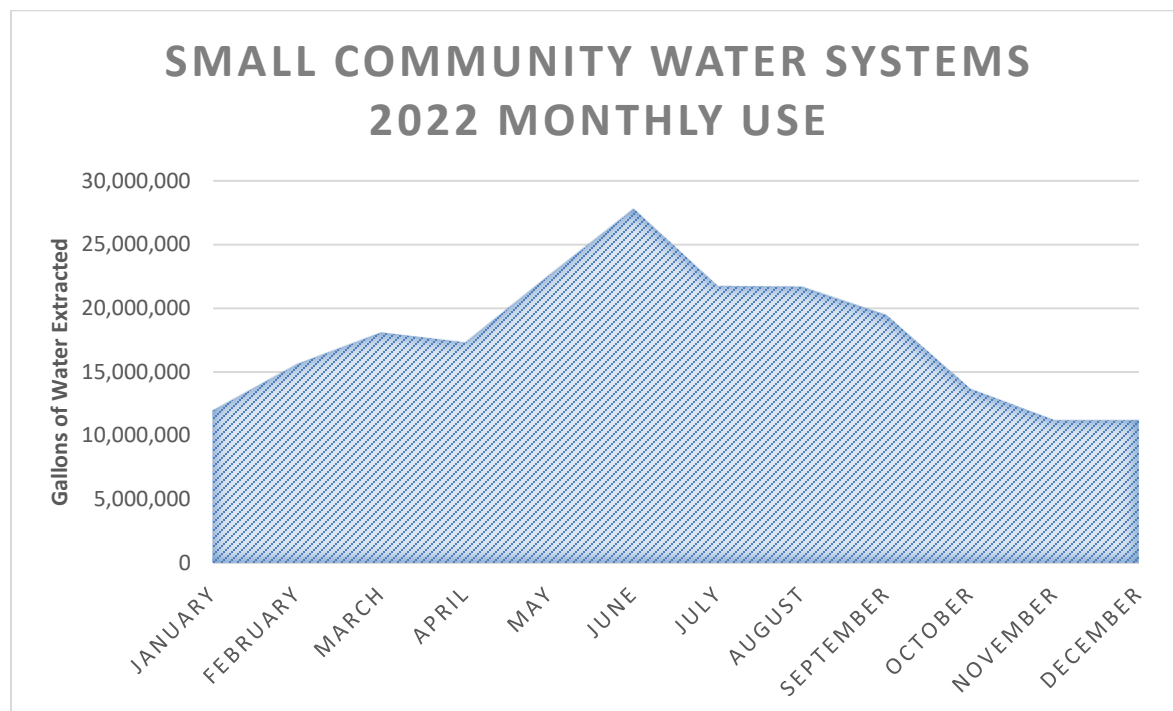


Figure 6: Small Community Water Systems 2022 Monthly Use, demonstrating an increase during the summer months.

Improving existing outdoor water use efficiency is a priority, but it is also important to recognize that low density development has greater potential for high outdoor water use. County Planning⁹ continues to encourage more infill development with both multi-family housing and Accessory Dwelling Units, which are water saving relative to lower density development. Additionally, the County implements a Water Efficient Landscape Ordinance that requires new development to meet outdoor irrigation standards.

Efficiency in Existing Water Supply – Municipal Suppliers

For municipal water providers, water supply projects and activities encompass two primary categories. The first is using existing water sources efficiently by incentivizing low water use, reducing leaks, upgrading infrastructure, and using new tools to reduce irrigation water needs. Santa Cruz County is one of the most efficient counties in the state when it comes to per capita water use, and incentives and meter upgrades by the larger water suppliers continue to encourage efficiency. The second supply category is the creation of “new” water supplies through projects like groundwater recharge and wastewater recycling, and optimizing when existing surface and groundwater resources are used.

Activities being undertaken by water agencies to improve efficiency of current water supplies include the following:

⁹ Sustainable Santa Cruz County Plan (2014) and the Housing Element of the General Plan (2016-2023)

The San Lorenzo Valley Water District (SLVWD)

- SLVWD completed its Water Master Plan and is beginning implementation. The Master Plan provides a quantification of the existing system, including pipelines, storage reservoirs, treatment plants, pump stations, wells, and surface water intakes. The Plan reflects damage suffered during the CZU fires and not repaired as of September, 2021.
- The SLVWD has 8 pipeline and 6 water tank upgrade projects occurring in fiscal year 23/24. All project details are available on the SLVWD's website [here](#). Constructability Study/Conceptual Design of replacement raw water piping (5-Mile and Peavine pipeline) is ongoing.
- Replacement of Felton Heights tank is in design/land acquisition phase.
- Design of improvements necessary for consolidation of Bracken Brae and Forest Springs is ongoing.
- SLVWD customers continue to demonstrate commitment to ongoing conservation efforts, maintaining at least a 15-22% reduction in yearly water usage from 2013 consumption levels. SLVWD's 2022/2023 target water use is 85 GPCD. The SLVWD's 23,700 population served meets the 85 GPCD target with an average 50 GPCD for 2022.
- While the SLVWD continues to encourage customers to use water efficiently and implement voluntary water conservation, the Board of Directors in September 2023 downgraded the SLVWD to a Stage 1 water shortage designation.
- SLVWD actively pursues incidents of water waste by investigating, recommending corrective action, and providing follow-up documentation of resolution. As of October 2023, ~33% of the meters have been upgraded. The new meters, combined with the Badger Eye on Water engagement portal, allow the customers to view hourly usage history, and set up leak detection alerts and high bill notifications.
- In Fiscal Year 2022/2023 the SLVWD issued 74 rebates for grey water system, Energy Star rated washing machines, low-flow toilets, and weather-based irrigation controller installations. SLVWD conducts a variety of public education activities such as a dedicated Water Use Efficiency Page on its website, e-Newsletters, billing inserts, Instagram and Facebook postings.
- SLVWD's General Manager Rick Rogers retired in November after 49 years with the district. See the press release for Rick's retirement [here](#).

The Scotts Valley Water District (SVWD)

- SVWD continued assisting City of Scotts Valley in assessing the condition of the Scotts Valley Tertiary Treatment Plant and finding a mutually advantageous solution for wastewater operations, which provides the source of recycled water used throughout the City.
- SVWD utilized WaterSmart customer engagement portal for leak notification procedures and achieving continued reduction in the volume of water lost through leaks. Achieved 45% registration rate at WaterSmart in 2023.
- SVWD continued Think Twice Water Use Efficiency 2022 Program in response to the Stage 1 Water Condition. Program activities included, 2x Turf Rebate, Pool Cover Rebate and Recycled Water Fill Station.

- The SVWD is also working on rehabilitation of Bethany tank site, and modifications at Glenwood tank to prevent undermining of the tank foundation in reaction to a landslide that occurred below tank site during the winter storms of 2023.

The City of Santa Cruz Water Department (SCWD)

- Continuing design of major infrastructure improvements at the Graham Hill Water Treatment Plant (GHWTP) under an innovative design-build framework. Issued the Draft Environmental Impact Report in November, consideration of final EIR currently planned for spring 2024 and construction start winter 2024. Ongoing construction of the Concrete Tanks Replacement Project as a predecessor project to the larger infrastructure improvements at the GHWTP.
- Completed design documents for the Newell Creek Pipeline: Felton to Graham Hill Segment and Brackney Landslide Area Risk Reduction project in preparation for start of construction in 2024. The Newell Creek provides the critical pipeline connection between Loch Lomond Reservoir and the Graham Hill Water Treatment Plant.
- Completed construction of the Newell Creek Dam Inlet/Outlet Replacement Project, a major three-year duration project to replace aging inlet/outlet infrastructure at the City's only reservoir. A Large Woody Debris project was installed in Newell Creek downstream of the dam to improve instream habitat as compensatory mitigation for this project.
- Completed emergency design, permitting, and repairs to the Felton Diversion Pipeline that was damaged by erosion during winter 2023 storms.
- Provided uninterrupted water supply through several atmospheric river storm events that repeatedly flooded the Coast Pump Station on the San Lorenzo River
- Successfully treated the highest level of raw water turbidity ever recorded at the Graham Hill Water Treatment Plant.
- Removed over 3 tons of accumulated sediment from the San Lorenzo River intake.
- Removed accumulated sediment from behind the Majors Creek stream diversion and repaired pipelines damaged in the winter storms.
- Successfully installed and tested a Tesla Battery Pack station at the Coast Pump Station.

The Soquel Creek Water District (SqCWD)

- SqCWD's WDO program, a demand mitigation program for new developments, was intended to be a bridge to sustainable water supply and allow for planned growth in the District's service area without worsening overdraft and seawater intrusion. The program was ended in 2023, after 20 years, with the upcoming operation of Pure Water Soquel and the implementation of the advanced metering infrastructure (AMI) project.
- The District continues a robust conservation program including: a large variety of indoor and outdoor rebates, a landscape budget tool for commercial landscapes, high water use diagnostics via phone, and free water saving devices like hose nozzles,

faucet aerators, and low flow showerheads. The WaterSmart Customer Portal provides customers with their digital meter's daily and hourly water use, notifies them of potential leaks, and helps them diagnose the potential cause of high use. In addition to the WaterSmart Portal, staff assist customers by providing various tools (e.g., the Leak Guide, phone diagnostics, technician visits, etc.) to help them locate and resolve leaks. In 2023, average residential consumption was approximately 46 gallons per person per day.

- Work is underway on several components of the \$7.6 million Sustainable Groundwater Management Act Implementation Grant awarded to the Santa Cruz Mid-County Groundwater Agency that focus on District infrastructure and/or collaboration, including the:
 - Design and construction of a groundwater extraction well and design of the associated groundwater treatment plant on Cunnison Lane in Soquel. The new well will improve redundancy and flexibility and help redistribute groundwater pumping further inland.
 - Park Avenue transmission main/bottleneck improvements to increase system reliability and allow more flexibility to redistribute pumping inland away from coastal wells.
 - Regional Water Resources Optimization Study. In collaboration with the City of Santa Cruz, this project will conduct modeling and analyses to inform and advance the implementation of select programs and management actions identified in the Basin's Groundwater Sustainability Plan.

Central Water District

- The Central Water District (CWD) is continuing its efforts to install a new well that will ensure water resilience for the current and future needs of CWD.
- CWD customers continue to demonstrate commitment to ongoing conservation efforts with an astonishing reduction in pumping of 271-acre feet in the last 14 years. Currently pumping is at 357-acre feet for the last 12 months.
- CWD received over 60 inches of rainfall in the last rainfall water year; this has greatly assisted in lower usage by Central Water District customers and helped in the groundwater basin recovery efforts.
- In addition, CWD has been upgrading older water meters with the newest meter technology. Currently 12% of the meters have been upgraded with advanced metering technology. The new meters allow the customers to view hourly usage history, set up leak detection alerts, and receive high bill notifications.

The City of Watsonville Water Division (CoW):

- The City of Watsonville Water Division is nearing 100% design for a new 2.4MG water storage tank back-up. This new tank will help the City maintain and continue to provide its customers with safe and reliable potable water. It will also provide emergency storage in the event of a catastrophic event such as an earthquake,

drought, or in case of failure of the neighboring existing tank. Construction is expected to commence the first half of 2024.

- City of Watsonville residents and businesses continue to receive water conservation education and outreach provided by the City’s Outreach Team via the CoW’s website, social media, newsletter, events, workshops and in-person presentations. The CoW also continues to offer conservation devices and financial incentives to encourage conservation.

Regional Project Funding

- The Regional Water Management Foundation (RWMF) is providing grant administration and acting as coordinator on two IRWM implementation grants awarded to the RWMF on behalf of the Santa Cruz Region.
- Proposition 1 IRWM Implementation Grant Program Round 1 award is funding three projects that collectively benefit water supply, water quality, watershed stewardship, stormwater and flood management and habitat restoration.

Project Title	Lead Agency	Grant Award	Schedule
Countywide Sediment Reduction from Developed Parcels & Rural Roads	Resource Conservation District Santa Cruz County	\$851,237	2020 – 2025
Davenport Water Supply Tank	County of Santa Cruz, Davenport County Sanitation District	\$357,000	2020 – 2024
Watsonville Slough Farms Wetland Restoration	Resource Conservation District Santa Cruz County	\$478,305	2021 – 2025

- Work on the Proposition 1 IRWM Implementation Grant Program Round 2 grant award began in Fall 2023. The projects provide benefits to water supply, water quality, watershed stewardship, stormwater and flood management, habitat restoration, and climate change response.

Project Title	Lead Agency	Grant Award	Schedule
Fire Hardening of Critical Water Supply Infrastructure	San Lorenzo Valley Water District	\$305,000	2023 – 2027
Equalization Tank Replacement	County of Santa Cruz, Boulder Creek County Sanitation District	\$405,312	2023 – 2026
Decision-Support Tool - Understanding Climate Influenced River Flooding	City of Santa Cruz, Department of Public Works	\$179,375	2023 – 2025

Recreational Vehicle Sewage Dump Station	City of Santa Cruz, Department of Public Works	\$85,000	2023 – 2026
Atkinson Lane Integrated Flood Management and Watershed Restoration	City of Watsonville	\$545,000	2023 – 2027
Drinking Water Treatment System & Secondary Water Source Rountree Facility	County of Santa Cruz, General Services	\$800,000	2023 – 2026

Efficiency in Existing Water Supply – Agriculture

Ag Irrigation Efficiency Assistance

The RCD continues to assist growers with conserving water through improved irrigation efficiency and irrigation water use management, leveraging funds from PV Water, CDFA and NRCS. Assistance with nitrogen management (related to water quality protection) is also often incorporated into the irrigation efficiency assistance. During 2023, RCD assisted 27 farming operations to monitor and improve irrigation scheduling to achieve water conservation. The RCD also provided:

- irrigation system evaluations to identify operation and design improvement opportunities.
- irrigation system design recommendations to optimize irrigation efficiency.
- season-long monitoring of water applied, weather data, and soil moisture to inform growers of how the amount of water applied to their crops compares to the amount of water required by their crops,
- irrigator trainings in English and Spanish.
- technical and financial assistance to implement more efficient water use practices.

Through collaboration with PV Water, water conservation rebates for a total of almost \$40,000 were issued to participants in the Agricultural Water Conservation Program in 2023. Rebates and cost-share from PV Water helps growers purchase and install more efficient irrigation equipment such as lower flow sprinklers, sprinkler check valves, pressure regulators, pressure compensating drip tape, pipe retrofits, soil moisture sensors, irrigation monitoring equipment like flow meters and data loggers, and repairs of leaky pipe joints.

Managed Aquifer Recharge/ Recharge Net Metering Program

Managed Aquifer Recharge (MAR) is a landscape management strategy that can help support groundwater supply by capturing stormwater in an infiltration system (typically a strategically designed basin) where it can then infiltrate into the aquifer. Since 2016, the RCD, the University of California, Santa Cruz (UCSC) and private landowners have collaborated to implement three active MAR projects in the Pajaro Valley with funding from DWR, USDA NRCS, California Coastal Conservancy and State Water Resources Control Board. Monitoring results were received for 2 of 3 systems for the 2022 water year. The two systems infiltrated 103 af/yr

and 152 af/year in the 2022 rain year. The annual monitoring results of the other 1 system is still in progress. Additionally, water quality monitoring indicates that these projects likely help to improve groundwater quality. Data indicate that water infiltrated in the MAR basins had lower Nitrate [NO₃-N] levels than ambient groundwater.

The RCD, UCSC, PV Water and private landowners continue to collaborate to implement the Recharge Net Metering (ReNeM) Program in the Pajaro Valley. This innovative program includes collaborating with landowners to install MAR systems on their land, monitoring the performance of the systems, and providing a financial incentive to the landowners based on the volume of water infiltrated. The RCD in partnership with PV Water and UCSC secured funding from the Department of Water Resources and the Department of Conservation to assess, plan, and implement two additional MAR projects over the next three years.

Creation of New Water Supplies – Municipal

San Lorenzo Valley Water District (SLVWD):

- Conjunctive Use Project: Expect to issue a notice of intent (NOI) for an Environmental Impact Report in Spring 2024 for expanding surface water use within the SLVWD's jurisdiction and potentially with SVWD.
- Loch Lomond Feasibility Study's RFP is expected to be released in December 2023 to determine the best utilization of the SLVWD's 313 acre-foot Loch Lomond allotment.

Scotts Valley Water District (SVWD):

- Continued working with regional partners (City of Scotts Valley, City of Santa Cruz Water and Public Works) developing a strategic direction for maximizing wastewater utilization in the region and for the benefit of Santa Margarita Groundwater Basin.
- Applied and was awarded \$1.5 million in Urban and Multibenefit Drought Relief Grant to construct the Scotts Valley Transit Center LID Retrofit, Phase 2 Project.
- Working on the regional intertie 1 project and construct new production well (Grace Way Well)

The City of Santa Cruz Water Department (SCWD):

- Securing Our Water Future policy was adopted by the City Council of the City of Santa Cruz to provide guidance on water supply augmentation planning and implementation.
- The Water Supply Augmentation Implementation Plan is being developed as the road map towards meeting the City's reliability goals, 500 million gallons (1500 acre-feet) a year of additional water supply by 2027. The WSAIP will be completed in 2024.
- Initiated design for the Intertie 1 Project that constructs a pipeline to connect the City of Santa Cruz Water Department system with the Scotts Valley Water District water system. An addendum to the Santa Cruz Water Rights Project EIR was completed for CEQA compliance. Project is funded through a DWR grant awarded to the City of Scotts Valley. Construction is anticipated to begin in 2024.

- Continuing refinement of the Santa Cruz Water System Model in coordination with University of Massachusetts, Amherst research group. This new tool for water supply planning work incorporates a sophisticated approach to modeling for climate change allowing for analysis of thousands of scenarios to identify conditions that would particularly stress the water system.
- The Santa Cruz Mid-County Groundwater Agency (MGA) and its member agencies are advancing the five Components of the SGMA Implementation Grant. City components include completion of two aquifer storage and recovery wells at existing well sites, and groundwater modeling to support the evaluation of additional projects and management actions. Both components support the goals of the MGA as well as contributing toward the City's water supply augmentation needs.
- Ongoing coordination with State Water Resources Control Board for action on pending water rights petitions.
- Aquifer Storage and Recovery:
 - Completed demonstration projects at existing Beltz 8 and Beltz 12 wells and initiated design for conversion of these wells to permanent ASR facilities through the aforementioned SGMA grant.
 - Initiated pilot testing at Beltz 9 well.

The Soquel Creek Water District (SqCWD)

- The Pure Water Soquel (PWS) Advanced Purified Groundwater Replenishment Project is expected to be operational in late 2024. This project will recycle water from the City of Santa Cruz's Wastewater Treatment Facility (SCWWTF) through an advanced water purification process and use it to recharge the critically overdrafted groundwater basin and protect against seawater intrusion. The District made the following progress on the three major components of PWS (conveyance, treatment and groundwater replenishment) in 2023:
 - Recycled Water Facility: Construction on the new recycled water facility, located at the SCWWTF is ongoing. This facility will include a pump station and brine return pipeline.
 - Conveyance: The conveyance pipeline will carry water from the SCWWTF to the Water Purification Center to the Seawater Intrusion Prevention (SWIP) wells. The construction of the conveyance pipeline was nearly completed in 2023.
 - Purification Center: Construction of the PWS Water Purification Center is ongoing. This Water Purification center will be the location of a three-step advanced water purification process involving microfiltration, reverse osmosis, and ultraviolet light with advanced oxidation with an ozone pre-treatment.
 - SWIP wells: Site work and equipping for the SWIP wells continued through 2023. These wells will deliver purified water to the groundwater basin.
 - Funding: In 2023, the \$30M grant from the Bureau of Reclamation's Title XVI Program was awarded. This grant, in addition to the \$63.25M in grants previously

awarded to the project from the State Water Resources Control Board through Prop 1 Groundwater Program and low interest loans through the CA Seawater Intrusion Control Loan Program and the US EPA's WIFIA Program, have demonstrated the investment and support by state and federal agencies on water sustainability in our region.

Groundwater Management

The Sustainable Groundwater Management Act of 2014 (SGMA) went into effect on January 1, 2015 and is a key driver for developing and implementing long-range plans for groundwater sustainability. SGMA required the formation of local Groundwater Sustainability Agencies (GSAs) to prepare Groundwater Sustainability Plans (GSPs) in all of the state's high and medium priority groundwater basins. Upon submittal of a GSP, GSAs have a 20-year implementation timeframe to demonstrate basin sustainability based on meeting locally defined sustainable management criteria. SGMA also requires annual reporting on GSP implementation progress to the Department of Water Resources (DWR) and evaluation of the GSP every five years.

Santa Cruz County has three basins that are subject to compliance under SGMA. For each of these basins, the associated GSAs and their activities towards implementing their respective GSPs in Water Year 2023 are described below.

Santa Margarita Groundwater Agency

Management of the Santa Margarita Basin is overseen by a Joint Powers Authority (JPA) consisting of the County of Santa Cruz (County), the Scotts Valley Water District, and the San Lorenzo Valley Water District. This JPA is referred to as the Santa Margarita Groundwater Agency (SMGWA), which is the GSA for the basin. The SMGWA governing board includes two private well representatives, two representatives from each partner agency, and one representative each from the City of Scotts Valley, the City of Santa Cruz, and the Mount Hermon Association. The Santa Margarita Groundwater Basin has experienced a significant historical decline in groundwater levels, particularly in the southern part of the Basin near Scotts Valley and has likely also seen reductions in streamflow. While groundwater levels stabilized and are no longer declining, they have seen only modest recovery. A groundwater model analysis indicates need to implement at least modest projects in order to maintain sustainability under future climate conditions. The GSP for Santa Margarita was adopted by the SMGWA Board in November 2021 and approved by the Department of Water Resources in April 2023.

In Water Year 2023, the SMGWA installed a network of seven monitoring wells in areas of known data gaps in the basin, with water level monitoring to commence at the beginning of Water Year 2024. Many of these wells are located near active stream gauges in the basin, which will help improve the understanding of the surface water-groundwater relationship in the basin as required by SGMA. SMGWA submitted an annual report to DWR for Water Year 2022 by the April 1, 2023 deadline.

Also during Water Year 2023, SMGWA facilitated project coordination meetings between the basin's water supply agencies as they continue to develop their respective projects needed for basin sustainability. Of note, Scotts Valley Water District was awarded grant funding to construct an intertie with the City of Santa Cruz. While the primary purpose of the intertie is to address water shortages during drought or emergency conditions, it can create opportunities for expanded conjunctive use to benefit the basin. San Lorenzo Valley Water District continued to take steps to conduct a feasibility analysis of the use of Loch Lomond Reservoir to expand conjunctive use in the basin by releasing a request for proposals for consulting services to support the analysis. That work is expected to begin in late 2023.

Santa Cruz Mid-County Groundwater Agency

Management of the Santa Cruz Mid-County Basin is overseen by a JPA consisting of the County, City of Santa Cruz, Soquel Creek Water District and Central Water District. This JPA is referred to as the Santa Cruz Mid-County Groundwater Agency (MGA), which is the GSA for the basin. The MGA governing board includes three private well representatives and two representatives from each partner agency. The Mid-County Basin is designated by the State as being in a condition of critical overdraft due primarily to the risk of seawater intrusion into the aquifers. Despite significant improvement of coastal groundwater levels due to water conservation and pumping redistribution, groundwater modeling analyses indicate that additional projects will be necessary to achieve sustainability. The GSP was adopted by the Board in November 2019 and approved by DWR in June 2021.

Work continues on GSP implementation. In October 2022, MGA completed construction of six monitoring wells in the Basin that are adjacent to stream gauges to improve understanding of surface water-groundwater interaction. The MGA completed a non-de minimis metering plan in December 2022 that defines priority areas for well registration and metering, and began developing a non-de minimis metering program. Also during the water year, MGA member agencies, Soquel Creek Water District and the City of Santa Cruz, began an optimization study to identify combinations of projects to achieve sustainability in the basin and improve water supply reliability for consumers.

The County has served an important role in supporting the MGA and SMGWA. In addition to being a JPA signatory to both GSAs, the County has served as the lead in procuring and managing contracted services that leverage opportunities to strategically pool resources to benefit both basins. The County led a process to develop a regional data management system (DMS) to help the GSAs meet the requirements of SGMA, and additionally to collect and organize data collected by all of the water agencies in the County. The system can now be viewed online at <https://sccwaterdata.us/#/html/home>. There are a few advantages to the regional system: it provides a robust storage system for critical historical data; it makes it easier to compare data across agencies; and the web portal makes it easy for interested parties to view results. The development of the DMS and its associated web portal was completed in Water Year 2023.

The MGA and SMGWA have no permanent staff and have instead relied historically on the member agency staff and consultants for SGMA planning and implementation support. In Water Year 2022, the County led a procurement process on behalf of MGA and SMGWA on a joint effort for contracted support services to provide administration and coordinate GSP implementation for each agency. The County has contracted with the Regional Water Management Foundation (RWMF) to lead ongoing administrative and planning services for the agencies. A Senior Planner that works approximately half-time for each GSA and oversees the day-to-day implementation of the respective GSPs started with RWMF at the beginning of Water Year 2023.

Pajaro Valley Water Management Agency (PV Water)

The Pajaro Valley Water Management Agency is a special district created in 1984 by the legislature and is the GSA for the Pajaro Basin, with its Basin Management Plan serving as an alternative GSP. PV Water's efforts to achieve sustainable groundwater resources directly support drinking water resilience. Drinking water in the Pajaro Valley is derived nearly entirely from groundwater. Chronic groundwater overdraft and the resulting seawater intrusion are two major threats to groundwater resources. PV Water's projects and management actions are developed to achieve multiple objectives including preserving the beneficial uses of groundwater in the Pajaro Valley. The two biggest beneficial uses of water are domestic consumption and agricultural irrigation. As part of an update of PV Water's central planning document to achieve groundwater sustainability, the [Basin Management Plan: Groundwater Sustainability Update 2022](#) (GSU22), PV Water conducted a well depth analysis of more than 1,150 domestic and agricultural wells to inform the development of sustainable management criteria developed to protect beneficial users of groundwater from significant and unreasonable negative impacts, as well as enhance the resiliency of drinking water and irrigation water supplies. The GSU22 is the most current version of PV Water's adaptive planning documents, which are updated periodically following analysis of the results of basin conditions following implementation of water supply projects and management actions.

PV Water operates several water supply facilities that reduce groundwater extractions through development, distribution, and use of supplemental water supplies. In addition, PV Water funds and manages a robust water conservation program targeting both agricultural water users and domestic water users. PV Water also partners with UCSC, and the RCD on a program called "Recharge Net Metering," in which private landowners develop infiltration basins to capture and infiltrate rainwater runoff into the groundwater basin. These facilities and programs advance progress toward achieving sustainable groundwater resources and improve the resiliency of the basin's water supplies.

PV Water's existing supplemental water supply facilities, the Recharge Net Metering Program, and water conservation program are described in greater detail below.

- **Coastal Distribution System (CDS):** The CDS is a distribution system composed of nearly 22 miles of pipeline used to deliver supplemental water supplies to farms in coastal areas in the Pajaro Valley. The area currently served by the CDS incorporates

approximately 6,100 irrigated acres and is referred to as the Delivered Water Zone or the Delivered Water Service Area. Water delivered through the CDS replaces groundwater that would otherwise be pumped from coastal wells. Delivered water provides “in-lieu recharge” to the Pajaro Valley Groundwater Basin; it helps to eliminate the problems of groundwater overdraft and seawater intrusion, while helping to keep agriculture viable in the Pajaro Valley.

- **Harkins Slough Managed Aquifer Recharge and Recovery Facility (Harkins Slough Facility):** The Harkins Slough Facility diverts surface water from Harkins Slough and conveys it to a recharge basin where it percolates into the surficial aquifer of the San Andreas Terrace located near the coast. PV Water utilizes a series of wells to recover recharged water and deliver it to coastal farms through the CDS. The Harkins Slough Facility commenced operations in 2002 and has recharged approximately 10,800 acre-feet through September 2023.
- **Watsonville Area Recycled Water Treatment Facility (RWF):** PV Water constructed the RWF and operates it in partnership with the City of Watsonville. Located at the Watsonville Wastewater Treatment Plant, the RWF has the capacity to produce 4,000 acre-feet per year of tertiary treated disinfected recycled water. Recycled water is augmented with water from the Harkins Slough Facility, Blend Wells, and the City of Watsonville’s potable water to increase supply and improve the quality for agricultural irrigation needs. The RWF commenced operations in 2009 and has produced more than 38,500 acre-feet through September 2023.
- **Blend Wells:** PV Water operates three production wells near the inland boundary of the Delivered Water Zone that augment the supplemental water supply and improve water quality.
- **Recharge Net Metering (ReNeM):** PV Water, along with program partners from UCSC and the RCD, and participating private landowners are implementing ReNeM to enhance recharge in the Pajaro Valley. The program incentivizes recharge projects by providing rebates to landowners based on the volume of water infiltrated. The rebates are intended to help offset maintenance costs incurred by landowners. Currently, the program includes three infiltration basins, with additional sites under evaluation. The ReNeM program team is currently evaluating the 2023 performance of the three systems and anticipates a record-breaking year as a result of the exceptionally wet conditions of 2023.
- **Water Conservation:** PV Water has set a goal to achieve 5,000 acre-feet per year of water conservation when compared to the baseline period 2006–2010. The program focuses on agricultural water conservation but also provides conservation services for domestic users. The conservation program leverages numerous partners, grants, and

their programs including the RCD, the Natural Resources Conservation Service, UC Cooperative Extension, Resource Conservation District of Monterey County, and private consultants. The main components of the program are conservation outreach; partner collaboration, program coordination, demonstrations, rebates for efficient devices/materials; workshops and trainings; an irrigation efficiency program; and irrigation efficiency program evaluation. In December 2020, the PV Water Board of Directors approved a \$1.25 million agricultural conservation program to support services through December 2023. Over the most recent evaluated rolling 5-year period (2018-2022), total agricultural water use was approximately 3,800 acre-feet less than the baseline period.

While the result of operating the existing facilities and programs has been effective, PV Water is working to construct and implement additional projects and management actions to achieve sustainable groundwater resources and provide resiliency for drinking water and other beneficial uses. These additional efforts are described below.

- **College Lake Integrated Resources Management Project (College Lake Project):** The College Lake Project includes components required to store, treat, and deliver water from College Lake, for use as an irrigation supply in-lieu of pumped groundwater to reduce the rate of seawater intrusion while helping to preserve agriculture. The components include an adjustable weir structure designed to accommodate safe fish passage, intake pump-station, water treatment plant, a 6-mile conveyance pipeline, and two groundwater wells to support project operations. The weir will be capable of raising the lake water level by 2.4 feet and increasing the total storage to approximately 1,800 acre-feet. An annual average of 1,800-2,300 acre-feet will be collected through a screened intake compliant with screening criteria for anadromous salmonids. Water will then be conveyed to the water treatment plant and then to the CDS where it will offset an equal amount of groundwater production. PV Water began construction of the College Lake Project in spring 2023. Construction is anticipated to reach substantial completion in fall 2024.
- **Watsonville Slough System Managed Aquifer Recharge and Recovery Projects (WSS-MARR):** WSS-MARR includes upgrades of the existing Harkins Slough Managed Aquifer Recharge Facility (Harkins Slough Facility) and construction of the Struve Slough Project, a new managed aquifer recharge and recovery project. WSS-MARR includes project components to divert, convey, store, and recover surface water for use as an irrigation supply in-lieu of pumped groundwater. The components include upgrading the existing Harkins Slough Facility to install fisheries-compliant intake screens, upgrading the pump-station, development of a new recharge basin, and constructing recovery and monitoring wells. The Struve Slough Project includes a new screened intake on Struve Slough, a pumping-station to be located adjacent to the slough, as well as 7,150 foot conveyance pipeline. Collectively, WSS-MARR is designed

to yield an estimated annual average of approximately 2,000 acre-feet for recharge and subsequent recovery. PV Water has completed the environmental impact report for the project, is working to complete final design, is advancing efforts to obtain all necessary permits, and will soon begin negotiations to acquire necessary property rights. Construction could begin as early as 2025.

- **Increased Recycled Water Deliveries:** PV Water continues efforts to increase recycled water deliveries to customers. PV Water is working to achieve this by increasing demand for recycled water and increasing storage to supply more water during periods of high demand. The goal aims to increase demand by approximately 1,000 acre-feet per year and shoulder season demand by approximately 250 acre-feet per year. Prior infrastructure improvements developed to increase recycled water deliveries included the construction of a 1.5-million-gallon storage tank, approximately 3.2 miles of additional CDS pipeline; an expanded RWF filter train; and improvements to the distribution pump station. PV Water will continue to work closely with customers to maximize deliveries and increase recycled water use.

Guided by the GSU22 and future updates of the Groundwater Sustainability Plan, PV Water will continue efforts to achieve sustainable groundwater and evaluate basin conditions against metrics established to provide resilient water supplies. The next major update is planned for 2027 with implementation performance assessments planned in the years prior.

County of Santa Cruz Well Ordinance Update

The Santa Cruz County Well Ordinance (currently Chapter 7.70 of the County Code) was first adopted in 1971 and the Individual Water System ordinance (Chapter 7.73), including yield and quality requirements, was adopted in 1975. The ordinances have been periodically updated, on average about once every 10 years. The most recent major update of the Well Ordinance took place over a six-year period concluding in March 2009, with approval of the amendments by the California Coastal Commission. Because the Well Ordinance is a local Coastal Program implementing ordinance, it requires approval by the Coastal Commission. The process included the formation of a Well Ordinance technical advisory committee consisting of well drillers, hydrogeologists, and other technical experts.

Subsequent to 2009, there have been a number of state and local actions relative to groundwater oversight that require consideration and updates to the Well Ordinance, including:

- Adoption of the Sustainable Groundwater Management Act (SGMA) in 2014, formation of Groundwater Sustainability Agencies (GSAs), and development of Groundwater Sustainability Plans (GSPs).
- Issuance of the Governor's Executive Order N-7-22 that required a determination that new non-de minimis wells be consistent with local GSPs and will not impact existing wells.

- Passage of SB 552 requiring counties to develop drought response plans, including drought mitigation measures for private wells and state small water systems.
- Court cases finding that wells may be discretionary permits subject to review under CEQA.
- Court cases requiring greater consideration of the impact of wells on streamflow and associated public trust resources.
- County staff have also identified a need to require proper destruction procedures for monitoring wells and soil test boreholes, consistent with requirements of state water code and regulations of most other jurisdictions.

The County has formed a Technical Advisory Committee to assist in the update of the Code to meet current and future needs. Updates are provided through the website:

<https://scceh.com/NewHome/Programs/WaterResources/WellOrdinanceUpdate.aspx>

Small Water Systems and Domestic Wells

The Santa Cruz County Drinking Water Program oversees 106 active small water systems (SWSs) through a delegation of responsibility from the State, including water systems with 5-199 residential connections and systems serving at least 25 people per day for 60 or more days per year. These systems include housing developments and mutual water companies, in addition to facilities such as schools, office buildings, outdoor camps, and stores. These systems rely on well and spring sources. Larger water systems and small systems that rely on surface water are regulated directly by the State. SWSs can have greater water supply vulnerabilities than larger systems because they tend to have few sources, often just one well, and a small population to bear the cost of replacement if the source stops producing.

The water quality and reliability of these systems is of critical importance to the County residents and visitors that depend on them. Recent drought conditions have heightened some of the vulnerabilities of these systems, such as lack of redundancy and aging infrastructure. Recent legislation such as SB 552 (drought planning for small water suppliers and rural communities) require SWSs, subject to funding availability, to implement specific resiliency measures such as joining a mutual aid network or obtaining a backup source of electricity.

While SWS drinking water quality in Santa Cruz County is generally very good, water quality challenges are still a reality for some systems. Nitrate contamination is an issue in some areas, particularly in South County near agricultural land uses. Drinking Water Program staff have been working with an agricultural facility supplied by a well with high Nitrate levels to permit the installation of affordable point-of-use treatment devices on drinking water faucets, while the facility provides bottled water to on-site staff in the interim.

Another contaminant of local concern is Hexavalent Chromium, also known as Chromium-6. Chromium-6 occurs naturally in the Aromas Red Sands aquifer, present in parts of Aptos and Watsonville. Drinking Water Program staff are working with 10 small water systems in this area with elevated levels of Chromium-6 to prepare for the proposed Maximum Contaminant Level (MCL) of 10 micrograms per liter expected to take effect in 2024. Water Resources staff, along with representatives from small and large water systems met with State Senator John Laird to discuss compliance challenges and potential solutions related to Chromium-6.

The County has secured a 3-year contract with a bulk, potable water hauler to respond to drought-related water supply problems that may affect residents. Eligible residents will receive up to 50 gallons of bottled water per person per month or 3,800 gallons of hauled water per household every 6 weeks at no cost, while a permanent solution is pursued by the property owner. Well users currently have access to other direct forms of assistance including well soundings to monitor water levels and water quality testing.

County staff are also involved with coordinating several long-term projects to improve water supply reliability for SWSs. Renaissance High School is currently working to consolidate with the Soquel Creek Water District due to a lack of backup sources for its single supply well, and water quality concerns including hexavalent chromium. The Crestwood Heights Water Association is working to consolidate with the City of Watsonville due to diminishing water supply from their source wells and a lack of funds to upgrade their system.

The County General Services Department has secured an \$800,000 grant from the Department of Water Resources (DWR) Proposition 1 Implementation Grant Program via the Integrated Regional Water Management Program to install a treatment system for Chromium-6 and PFAS, and to study options to improve source quality and reliability at the Rountree Facility in Watsonville. The system is served by a single well and is proactively working to address these emerging contaminants and improve the resiliency of the system.

The County has also been awarded \$97,800 in grant funding from DWR's Small Community Drought Relief Program for improvements to the Waterman Gap water system, a small water system at the northern edge of the County in Boulder Creek. The current stream source has declined in flow, and the system's backup wells have limited capacity. These funds will cover the cost of reconstructing a water line to an existing stream intake on Little Boulder Creek and installing four storage tanks to improve the system's ability to provide a reliable supply to residents.

Services Offered by the County

On December 1, 2021, the Water Advisory Commission (WAC) voted to take responsibility for implementing Senate Bill (SB) 552. SB 552 required the County to write a plan that includes potential water shortage risk analysis and proposed interim and long-term solutions for State Small Water Systems and domestic wells. This plan is now referred to as the Santa Cruz County Drought Response and Outreach Plan (DROP). The Water Quality Specialist in the Water Resources Division has taken the lead on the implementation of the DROP.

Since the Board of Supervisors approved the DROP in December of 2022, staff created web portals for both [domestic wells](#) and [State Small Water Systems](#) that utilize the information gathered in creating the DROP. These pages are intended to act as a single repository for both informational and direct support resources. To gather feedback on these webpages, draft versions were presented to private well owners that participate in the County well sounding program and the State Small Water Systems regulated by the County. This effort resulted in 16 survey respondents. County staff will provide access to this survey again during future public outreach events.

The County also finalized a grant agreement with the State Water Resources Control Board that will pay for staff time, outreach, water quality testing, water hauling, bottled water, and treatment devices for qualifying residents. The County also received a further \$125,000 grant from DWR to focus on gaps in the DROP such as a comprehensive wells GIS layer and clarity regarding the consolidation process.

Santa Cruz County Environmental Health was awarded funding through the SWRCB Safe and Affordable Funding for Equity and Resilience (SAFER) grant program and the DWR Urgent Drinking Water grant in 2021 and the contract was executed in 2023. This funding will be used to make progress to implement this plan, beginning with the tasks outlined in Table 1: Funding Received by Santa Cruz County below (subject to change as the work progresses).

Table 1: Funding Received by Santa Cruz County to support Individual and State Small Water Systems.

Task	Funding allocated	Funding source
Water Quality Testing	\$150,000	State Water Resources Control Board
GIS database update to identify and map all parcels served by domestic wells, and investigate consolidation feasibility	\$95,000	Department of Water Resources
Small system & domestic well outreach and POU/POE treatment systems* (*recipients must meet income requirements)	\$360,000	State Water Resources Control Board
Contract with bulk, potable water hauler	\$90,000	\$80,000 state Water Resources Control Board program, recipients must be income limited + \$10,000 Department of Water Resources
Local Guide to Consolidation	\$15,000	State Water Resources Control Board

A contract is currently in place for emergency water hauling services to support wells that go dry due to drought conditions. In addition, County staff is preparing a Request for Proposal (RFP) for what they are calling Water Quality Assistance Services. The intention will be to assist private well owners and state small waters systems with known water quality problems install treatment devices that can remove common contaminants in our area like nitrate,

arsenic, and chromium. As these services become available, applications will be added to the webpages to allow individuals to request the service.

To raise awareness of the resources above, and services already offered by the County such as well soundings, staff will be creating and distributing mailers to parcels served by a domestic well and holding at least two in person events in 2024 to spread the word about these programs. The County will also host a Small Water Systems Forum meeting on the topic.

Big Basin Water Company

Big Basin Water Company (BBWC) is a privately-owned utility serving 540 households with drinking water and 30 parcels for wastewater management in the San Lorenzo Valley. BBWC has been beset by years of financial mismanagement and lack of investment in critical infrastructure, leading to repeated service interruptions for customers, difficulty rebuilding for CZU survivors and litigation by the State Water Resources Control Board on the drinking water side and Regional Water Quality Control Board on the wastewater side. On September 30, 2023, this resulted in the court appointment of a Receiver to oversee Big Basin Water Company's drinking water operations, followed five weeks later by appointment of the same Receiver over the wastewater plant. Shortly after the Receiver was named, the out-of-state company that had been overseeing operations of both services abruptly left.

In order to keep the water system operating while the Receiver transitioned into the role after the departure of the operator, the County was able to provide a small grant of \$40,000 to the BBWC and secured an additional \$850,000 grant from the Department of Water Resources. County staff have been meeting regularly with the regulatory agencies as well as elected officials to work towards a sustainable resolution to the challenges of the BBWC. The ultimate hope is that the wastewater system can be consolidated with the County's CSA 7, and that the drinking water system can be consolidated with the San Lorenzo Valley Water District.

Section 2: Water Quality

As shown in Figure 7, several watersheds within Santa Cruz County have been identified by the State of California as having impaired waterbodies pursuant to Section 303(d) of the Federal Clean Water Act (CWA)¹⁰. By definition, 303(d) listings and adopted TMDLs are related to impacts on one or more beneficial uses and the need to control the source(s) of these impairments. The Regional Water Board has oversight over these waterbodies and manages water quality through implementing Total Maximum Daily Loads (TMDLs) that are incorporated into Basin¹¹ Plans, and the National Pollutant Discharge Elimination System (NPDES)¹² permit program, including the Storm water (MS4)¹³ program. The County of Santa Cruz and the Cities of Santa Cruz, Capitola, Scotts Valley, and Watsonville conduct extensive water quality monitoring and there is ongoing collaboration to exchange data among the individual stakeholders.



Figure 7: Map of watersheds with impaired water bodies in the County as identified by the [Central Coast Regional Water Quality Control Board](#).

¹⁰ https://www.waterboards.ca.gov/water_issues/programs/tmdl/background.html

¹¹

https://www.waterboards.ca.gov/centralcoast/publications_forms/publications/basin_plan/

¹² https://www.waterboards.ca.gov/water_issues/programs/npdes/

¹³ https://www.waterboards.ca.gov/water_issues/programs/stormwater/municipal.html

Santa Cruz County Water Quality Program and Laboratory

This reporting period provided an opportunity to evaluate the composite effects of the intense storms of 2022 and 2023 in the aftermath of multi-year prolonged drought conditions and recovery from the 2020 CZU fires. An overview of the County's freshwater and coastal water quality monitoring sites is shown in Figure 8, with the colors representing public health advisories based on the most recent sample date. Coastal sites are monitored for fecal indicator bacteria in accordance with the California Beach Water Quality Program.¹⁴ Freshwater sites are also monitored for fecal indicator bacteria along with other chemical and biological analyses.



Figure 8: Example of water quality monitoring location and results as displayed on the County's Water Quality Viewer: [Water Quality Status \(santacruzcounty.us\)](https://www.santacruzcounty.us/water-quality/status)¹⁵

Cyanobacterial blooms

While there are site-to-site and season-to-season variations at different locations across the County, the major issue that emerged during this water year was the prevalence and persistence of cyanobacterial blooms. The influx of nutrients during the rainy season coupled with extended periods of warm weather and stagnant water contributed to elevated levels of cyanobacteria and associated toxins in several locations including Cororan Lagoon, Highlands Park, Pinto Lake, Kelly Lake, and Drew Lake. Photographs of the cyanobacterial blooms are shown in Figure 9.

¹⁴ https://mywaterquality.ca.gov/safe_to_swim/

¹⁵ <https://scceh.com/NewHome/Programs/WaterResources/SurfaceWaterStewardship/WaterQualityMonitoring/SurfaceWaterQuality.aspx>



Figure 9: Cyanobacterial blooms at Corcoran Lagoon (left) and Pinto Lake (right), summer 2023

Qualitative microscopy and chemical analyses were conducted to track the progress of the blooms and evaluate potential health risks. Example photomicrographs are shown in Figure 10. There were site-to-site differences in the overall density of microorganisms and also differences over the duration of the cyanobacterial bloom.

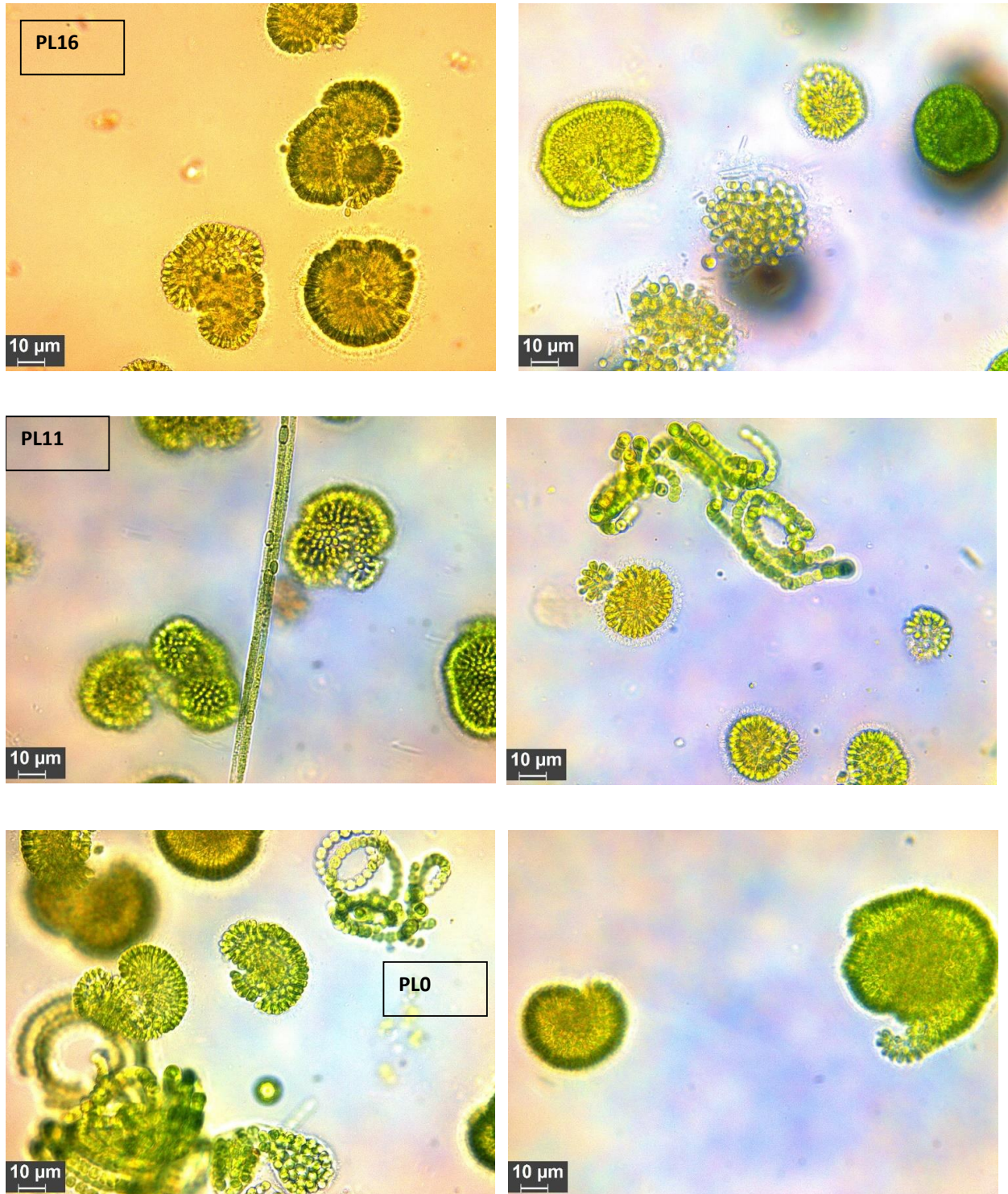


Figure 10: Photomicrographs from Pinto Lake County Dock (PL16), Villas Del Paraiso (PL11), and Boat Rental (PL0). Micrographs from samples collected on September 6 (left panel) and September 12 (right panel). Courtesy of Eric Baugher, County of Santa Cruz

The cyanobacteria can release toxins into the environment that are harmful to people and pets who are exposed to the water. The dominant toxin detected during the cyanobacterial blooms was microcystin. Microcystin levels between 6 and 20 parts per billion are of concern and levels exceeding 20 parts per billion pose significant health risks. A comparison of

microcystin levels at Pinto Lake is shown in Figure 11 over the duration of the 2023 cyanobacterial bloom. In general, the trends were consistent across the three sites with slightly higher concentrations observed at the Villas del Paraiso site (PL 11). Ambient water temperatures ranged from about 19 to 26 ° C.

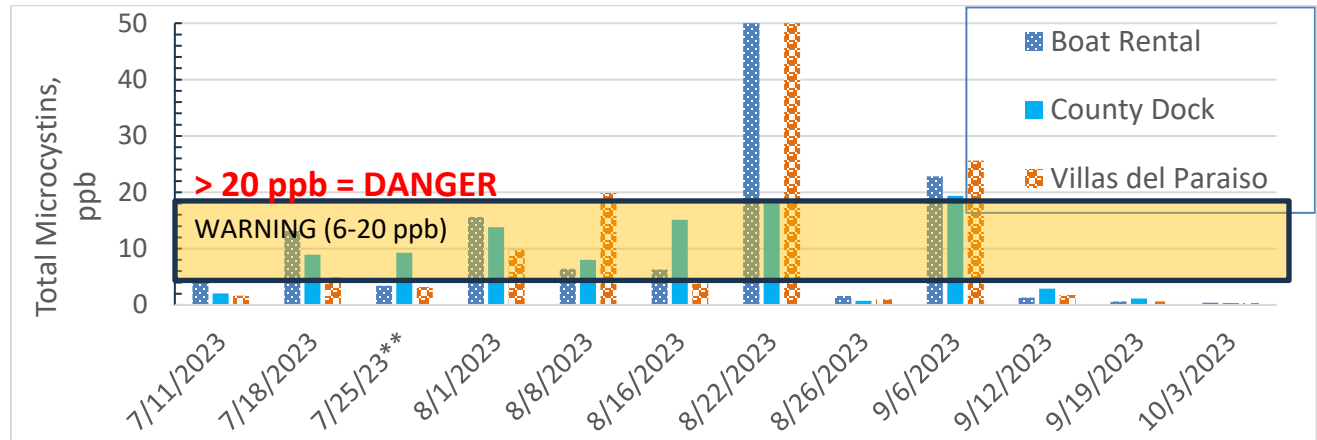
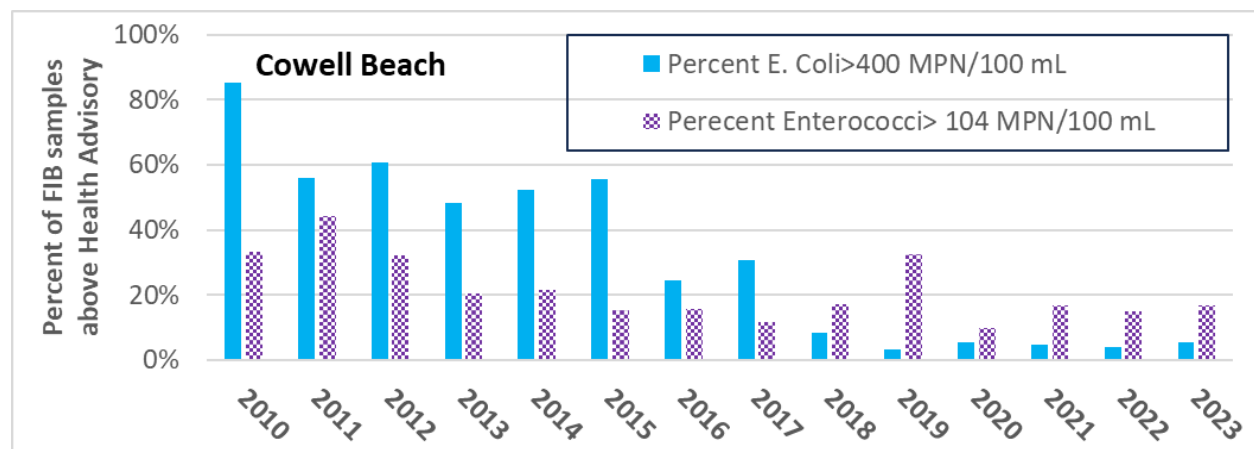


Figure 11. Variation of microcystin levels at three in-lake sampling sites from July through October 2023 at Pinto Lake at County Dock (PL16), Pinto Lake at Villas Del Paraiso (PL11), and Boat Rental (PL0). Data are from grab samples taken by the County of Santa

Additional work on cyanobacterial speciation will be conducted using molecular testing (digital PCR) in parallel with microscopy, analysis of algal pigments (chlorophyll and phycocyanin), and toxin surveillance. The detection of active cyanobacterial blooms will trigger supplemental testing, and areas experiencing exceedances are posted, with very high levels triggering restricted access.

Beach Water Quality

Water quality at the County’s beaches was consistent with previous years, with periodic observations of elevated fecal indicator bacteria (E. Coli and Enterococci). A thirteen-year timeline is shown in Figure 12 for two beaches, Cowell Beach and Capitola Beach. These two beaches generally have the highest occurrences of exceedances, likely due to naturally reduced circulation based on location, and the presence of a wharf where birds can roost.



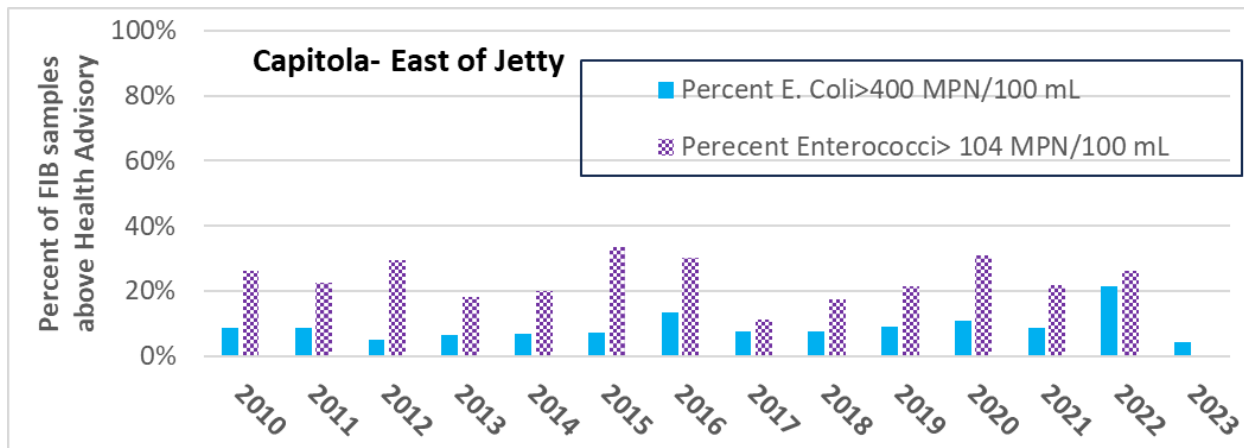


Figure 12: Annual exceedances of E. Coli and Enterococci health advisory levels at Cowell and Capitola Beaches between 2010 and 2023. Data are from grab samples taken by the County of Santa Cruz Environmental Health.

County Regulatory Programs

Community Development and Infrastructure (CDI) Public Works continue to review land development projects in the county and require stormwater mitigations for all projects that add or replace over 500 sq ft of impervious area, with quantitative mitigations for those over 5,000 sq ft. This will maintain, and in some cases improve on existing infiltration conditions, help reduce flash flooding, filter runoff from developed areas, while also increasing infiltration of rainwater to lessen the impacts on groundwater resources resulting from land developments.

In 2023, Environmental Health staff continued the process for implementation of the County’s Local Agency Management Program (LAMP) for Onsite Wastewater Treatment Systems (OWTS). The LAMP was required to be consistent with requirements of the State OWTS Policy and was developed in consultation with local stakeholders and staff from the Central Coast Regional Water Quality Control Board. The Regional Board approved the LAMP on October 14, 2021 and authorized the County to begin implementation immediately. Staff completed the process to make related updates to the General Plan and County code, which were adopted by the Board of Supervisors in August and October of 2022, and certified by the California Coastal Commission on February 10, 2023. Implementation of the LAMP provides for increased protection of public health and water quality through increased water quality monitoring and surveillance of OWTS performance. and more stringent requirements for installation and maintenance of new and replacement OWTS:

- increased setbacks from public water supply sources, drainageways, and karst features,
- increased groundwater separation,
- shallow dispersal trenches,
- use of site-specific assessment and mitigation of site constraints in lieu of minimum lot sizes in broadly mapped constraint areas,
- maintenance of one-acre minimum lot size in water supply watersheds,

- increased use of enhanced treatment systems for new and replacement OWTS,
- enhanced treatment for nitrogen reduction in sandy soils in all nitrate constraint areas,
- locally approved and qualified service providers and designers,
- property owner requirements for proper OWTS operation and maintenance, and
- system evaluation at time of property transfer.

Implementation of the new requirements is proceeding relatively smoothly, but the significantly increased cost of enhanced treatment systems presents a challenge to property owners wanting to upgrade or repair their system. Over 47% of the recent OWTS installations are using enhanced treatment, but the number of OWTS repair permit applications has declined by 70% since 2018, when the more stringent rules went into effect. EH staff are seeking ways to reduce the costs and possible options to provide some funding assistance to property owners.

Drinking Water Quality and Supply Protection

San Lorenzo Valley Water District (SLVWD)

- Required water quality monitoring through the Unregulated Contaminant Monitoring Rule (UCMR5) was completed, demonstrating no PFAS at the Pasatiempo Wells and they Lyon Tank.

Scotts Valley Water District (SVWD)

- The Scotts Valley Water District Conducted a pilot filter media study at Well 10A Treatment Plant to determine if utilizing Greensand filter media will improve the efficiency of iron and manganese removal.
- SVWD will begin monitoring for UCMR5 at all entry points to the distribution system in November 2023. UCMR 5 monitoring includes 28 PFAS compounds and Lithium.

City of Santa Cruz Water Department (SCWD)

- The City of Santa Cruz Completed Watershed Sanitary Survey update that looks at drinking water source watersheds and treatment processes and assesses where improvements can be made to both to better protect public health.
- Processed over 37,000 water samples testing for microbial, inorganic, pesticides and herbicides, organic and radioactive contaminants.
- Continued ongoing monitoring of the Loch Lomond (4400912) and Santa Cruz (4410010) potable drinking water systems in compliance with drinking water permit regulations and bacteriological sample siting plan.
- Began fifth unregulated contaminant monitoring rule (UCMR5) sampling
- Continued ongoing management and monitoring of Loch Lomond Reservoir for cyanobacteria and cyanotoxins.
- Continued ongoing monitoring of raw source water and treated finished water for unregulated contaminants of emerging concern such as PFAS, pharmaceuticals and personal care products

- Monitoring of Beltz Wells 8 and 12 as part of the aquifer storage and recovery (ASR) demonstration
- 2022 Consumer Confidence Report
- Voluntarily performed monitoring for unregulated emerging constituents with State notification levels (NLS) such as boron, chlorate, per- and polyfluoroalkyl substances (PFAS), and vanadium. All unregulated constituents collected from treatment plant finished water were below their respective NLS.
- Initiated Tait Diversion Salinity Study to better understand potential water quality impacts due to sea level rise and climate change.
- Initiated CEQA compliance for the Graham Hill Water Treatment Plant Facility Improvements Project
- Initiated the lead and copper customer-side service line inventory.
- Installed new oxygenation aeration system at Loch Lomond.

Soquel Creek Water District (SqCWD)

- Replacement of Soquel Creek Water District's Country Club well. Construction of the new well is part of a larger plan to build a water treatment plant at the location to treat 1,2,3 – Trichloropropane.
- As part of the SqCWD's Well Master Plan and the Santa Cruz Mid-County Basin's Groundwater Sustainability Plan, the District continues to redistribute groundwater pumping further inland where possible to reduce seawater intrusion at the coast.
- SqCWD maintains a network of monitoring wells along the coastline to track groundwater levels and water quality to track seawater intrusion.

City of Watsonville Water Division (CoW)

- The City of Watsonville Environmental Sustainability Division is striving to implement multi-benefit projects that incorporate climate change, natural hazard mitigation, green infrastructure and habitat restoration benefits. The following grant funded projects are active:
 - Middle Struve Slough Water Quality and Habitat Improvement Project funded by the Ocean Protection Council in partnership with Watsonville Wetlands Watch is in implementation. This project will implement water quality measures and habitat restoration. This year, this project area was part of World Wetlands Day.
 - Upper Struve Slough Wetland Enhancement and Public Access project funded by the Department of Water Resources in partnership with Watsonville Wetlands Watch is in implementation. This project will reduce localized flooding and improve habitat.
 - Watsonville Ramsay Park Phase IV California Natural Resource Agency grant will implement green infrastructure elements at the new Nature Center. Improvements include a green roof, bioswale, and reduction of heat island effects.

- Pinto Lake experienced a significant cyanobacteria harmful algal bloom this year. The CoW had to restrict access for approximately 2 months beginning in July– August 2023. The CoW worked with the County of Santa Cruz to plan the closures. Additionally, the CoW submitted the CDFW Aquatic Invasive Species Annual report for Pinto Lake. The Lake is in compliance with regulatory standards.
- The Water Division continues to monitor its groundwater quality. The presence of perfluorohexanesulfonic acid (PFHxS) has been detected in one of our groundwater wells and required public notification. The City will continue its quarterly monitoring.
- The Water Division continues to closely follow the State DDW proposed maximum contaminant level (MCL) for hexavalent chromium regulation and is prepared to respond accordingly an MCL is determined.

Rural roads and home drainage

The RCD completed site visits to 10 unique properties requesting technical assistance related to rural roads or drainage and erosion issues around their home. Recommendations were provided based on specific concerns. RCD discussed improvements that would also reduce sediment runoff. The RCD also designed five sediment reduction projects and constructed four. Projects included:

- Private road along nearly one mile of in the Bear Creek watershed that included rolling dips, road grading, stream crossing and ditch relief culverts.
- Road decommissions and stream bank repair along Lompico Creek.
- Failing culvert replacement on a tributary to Gold Gulch.
- Small floodplain restoration on Bid Creek.

The RCD also hosted a Living on Rural Properties workshop on November 6, 2023 in Felton with over 160 attendees, and has received 16 requests for on-site assistance related to erosion and drainage issues.

Agricultural Water Quality Programs

- In 2023, PV Water continued to operate multiple basin water quality monitoring programs in addition to operating water supply projects that achieve the dual purpose of augmenting water supply needs while helping to maintain or improve basin water quality. These programs are described below.
 - **Surface Water Quality Monitoring Program:** PV Water staff routinely collects and analyzes water quality data from approximately 40 locations to provide information on the condition of streams, creeks, rivers, sloughs, and lakes in the Pajaro Valley. In addition, PV Water also maintains a large network of autonomous data loggers, and measures discharge to monitor hydrologic conditions with major focuses on the Watsonville Slough System, Pajaro River, and College Lake watershed.

- **Supplemental Water Quality Monitoring Program:** PV Water staff routinely collect and analyze water quality data from the CDS sources and points of delivery to provide information on changing water quality, suitability for agriculture customers, and to assess nutrient and salinity inputs into the soil and groundwater in the Delivered Water Service Area.
- **Groundwater Quality Monitoring Program:** PV Water staff directly monitor groundwater quality from a network of over 180 public monitoring and private production wells that staff routinely visit to obtain water level and water quality information. At minimum, staff visit these wells in the spring and fall of each year with a subset of wells monitored more frequently. PV Water’s groundwater monitoring network is supplemented by data collected by local water purveyors and other publicly available water quality data.
- **Salt and Nutrient Management Plan:** PV Water developed and continue implementing the Salt and Nutrient Management Plan to ensure attainment of water quality objectives for protection of beneficial water uses and guide management of salts, nutrients, and other significant chemical compounds within the groundwater basin. As part of the plan implementation, PV Water works with community partners, such as the RCD and U.C. Cooperative Extension, to continue to offer resources and education opportunities to growers for efficient nutrient application and management.
- RCD Agricultural Program staff continued to work with NRCS, researchers, management agencies, funders and industry to get effective water quality best management practices developed, incentivized, and on the ground. RCD staff collaborated with California FarmLink and Kitchen Table Advisors to deliver a variety of technical assistance services targeting socially disadvantaged farmers and ranchers (SDFRs), including assistance with improved soil and nitrogen management for water quality regulatory compliance (Ag Order 4.0). Additionally, RCD continued to support growers to receive funding and implement projects through the California Department of Food and Agriculture (CDFA) State Water and Energy Efficiency Program (SWEEP) and the Healthy Soils Program (HSP). The SWEEP program offers growers the opportunity to apply for up to \$200,000 for projects that improve water and energy use efficiency, and the HSP program offers growers up to \$100,000 to help implement practices that improve soil health. In 2023 CDFA received additional funding and launched a pilot “block grant” program to support further distribution and implementation of SWEEP projects. The RCDSCC was awarded one of these block grants, in partnership with RCDMC and SMRCD. Through this block grant these three RCDs will be able to offer an additional solicitation (funding pool) for water and energy conservation projects in the central coast region. The RCD also secured funding to launch a compost cost-share program supporting growers to further the adoption of compost application to boost soil organic matter and increase soil water holding capacity.

- In the course of the year RCD staff completed permitting and all stages of construction for a 1.75-acre sedimentation basin that will receive pumped water from surrounding farmland. It has a capacity to hold 22 ac/ft. of stormwater and will be able to be kept filled through the use of pumps. As the underlying geology of the site was not deemed suitable for recharge, the main purpose of the basin is to retain sediments that would otherwise flow into, and contribute to impairment, of nearby creeks and rivers. The landowners are also exploring options for reusing the detained water for irrigation purposes.

Section 3: Natural Resources and Flood Management

Watershed management is a critical component of water supply and water quality. What happens on the landscape and in the watersheds impacts the availability and quality of water, and the damage caused by droughts and storms alike. Watershed health is also critical to the environmental users of water. The County has made deep commitments to fisheries resources and along with regional partners, and continues multi-faceted approaches to ensuring those species thrive. As these species are an indicator of overall watershed health, efforts to improve these populations have cascading benefits for all users of the watershed.

Storm and Flood Preparation and Response

- Logs and other wood can provide a host of benefits to streams, such as reduced bank erosion, creation of pools and riffle habitat for fish, and retention of important sediments. The Stream Wood Program continues to facilitate the retention of naturally recruited wood by educating landowners about the benefits of stream wood and modifying stream wood when necessary to protect property or other resources. The program received a record high number of requests for assistance during the 2023 water year, both in response to the extreme storm events and in response to concerns about another potentially high rainfall year in 2024. Program staff responded to ~95 requests for assistance in 2023. Roughly 25% of those were referred to Public Works or other agencies due to potential impacts to roads or other infrastructure. Of the roughly 73 sites that were addressed by Water Resources staff, wood was modified (either partially cut or entirely cut) at about half, in order to mitigate risks to homes or infrastructure. At ~21 sites, wood was not modified and was left as is. A higher percentage of wood was modified in 2023 compared to a typical year, when the majority of stream wood is preserved. Water Resources staff continue to respond to requests for assistance, adopt new data management tools, and are seeking funding to augment the program.
- The Pajaro Regional Flood Management Agency (PRFMA) is a joint powers authority of the County of Santa Cruz, Santa Cruz County Flood Control and Water Conservation Zone No. 7, the County of Monterey, the Monterey County Water Resources Agency, and the City of Watsonville. Formed in 2021, the agency will plan, finance and implement projects and programs to reduce flood risk from the lower Pajaro River and its tributaries in Santa Cruz and Monterey Counties. Some of the PRFMA's accomplishments in 2023 include:
 - The federal Pajaro River Flood Risk Management Project has completed the design phase, with design for Reach 6 between Green Valley Road and East Lake Avenue on Corralitos Creek completed in December 2023. The design of other project reaches will occur in the construction phase of the project, while Reach 6 (and then other reaches) are built.

- A construction agreement, called a Project Partnership Agreement, has been executed between the Pajaro Regional Flood Management Agency and the US Army Corps of Engineers. This is a monumental milestone in the history of this project and signals the beginning of construction. Actual earth moving and construction related activities are slated to begin during the 2024 construction season, in summer of 2024.
- Governor Newsom signed AB 876 into law on October 13, 2023 under an urgency clause, making the law enacted upon signature. AB 876 provides state regulatory exemptions for the Pajaro River Project as originally formulated in 1966, including exemptions to CEQA and state permitting. Importantly, the originally formulated project includes the federal Pajaro River Flood Risk Management Project being implemented by PRFMA and the USACE, as well as future components including the Pajaro River Bridge to Bay Project, improvements to the Highway 1 bridge over Pajaro River, and other improvements to the flood risk reduction system on the Pajaro River and Salsipuedes/Corralitos Creeks.
- The State of California has executed a Subventions Cost Sharing Agreement with the PRFMA, which unlocks to roughly \$200 million in State funding that will be used to advance the non-federally cost-shared components of the Pajaro River Flood Risk Management Project. Importantly, this agreement will advance funds to PRFMA to implement project requirements, unlike typical grant programs which reimburse a sponsor.
- The Pajaro Regional Flood Management Agency (PRFMA) has hired all staff and has officially taken over the maintenance responsibility for the levee and river system as built in 1949, as well as for the improvements made to the system under the Pajaro River Flood Risk Management Project and other forthcoming projects.
- CDI's Floodplain Manager submitted the material to FEMA ISO office for the Community Rating System (CRS) 5-year cycle audit in Spring 2023. The CRS is a voluntary program the County participates in to improve floodplain management and increase development standards within the flood hazard areas. Results of the 5-year audit are pending review.
- During and immediately following the extreme storms of 2023 the RCD mobilized a response team of RCD and NRCS staff, Certified Erosion Control Specialist, and a consulting engineer to respond to landowner requests for assistance. The team completed over 200 site visits (often with multiple neighbors) to assess damages related to erosion, drainage, culvert damage, streambank failure, debris jams, etc, providing recommendations and referrals. Additionally, the RCD hosted a storm recovery webinar viewed by over 500 during the live event or through the online recording.
- The RCD provided technical assistance and conservation planning assistance to forestland managers throughout the county. These projects serve to improve ecosystem function, protecting source waters from sedimentation and other potential impacts that may result from catastrophic wildfire. In 2023 the RCD completed

implementation of a 27 acre forest health and ecological restoration project within the CZU burn area, and initiated implementation of a second landscape scale forest health project within the CZU burn area. Partnering with State Parks, the RCD completed the 62 acre Fall Creek Truck Trail shaded fuel break project. In partnership with the Santa Cruz Mountain Alliance, the RCD completed implementation of a 5.6 mile shaded fuel break along Summit road engaging over 150 private landowners, and advanced a number of other priority forest health and wildfire risk reduction projects. The RCD's no-cost chipping program supports defensible space creation for homes in the wildland urban interface. In 2023 the RCD served a record number of households, with over 1080 served during the Spring program, and 79 served during the Fall rebate program.

Fisheries Monitoring and Protection

County Water Resource Program staff and partner agencies and organizations continue to implement various programs and projects to benefit steelhead and coho salmon habitat that is degraded due to historic and current land and water use. Coho salmon are listed as endangered under both the state and federal Endangered Species Act (ESA) and are critically endangered in Santa Cruz County. Water Resource staff continue to assist coho salmon conservation efforts. Steelhead are listed as threatened under the Federal ESA and continue to persist in most county streams at low to moderate population numbers. Current recovery actions focus on improving dry season streamflow and habitat complexity.

- **Fish Monitoring in North County Streams:** During summer of 2023, NOAA conducted snorkel surveys throughout the Scott Creek watershed and observed a total of 1,131 juvenile coho salmon, mostly rearing in the upper watershed. High winter and spring streamflows likely destroyed many coho salmon redds in the lower mainstem of Scott Creek.
- **Monitoring in Gazos and Waddell Creeks** indicates that the heavy storms in January through March of 2023 may have contributed to reduced spawning success and reduced survival of fry and yearlings, due to logjams that may impede fish passage, sedimentation, and high flows. No coho were captured in either stream in 2023, and steelhead were very scarce.
- **Steelhead Monitoring:** Water Resources continues to collaborate with local water agencies and consulting fishery biologists to monitor 41 sites for juvenile steelhead densities and stream habitat in four watersheds: San Lorenzo, Soquel, Aptos and Pajaro. In 2023, 39 stream sites (26 in San Lorenzo River, 9 in Soquel Creek, and 4 in Aptos Creek watersheds) and 2 lagoons (Aptos and Pajaro) were sampled. Due to the high winter stormflows, adult steelhead had access to all sampling sites. However, densities of young-of-the-year steelhead were generally below average, probably due to poor egg survival during high stormflows that likely scoured out many redds. No coho were detected during this monitoring effort.

- In November 2023, Santa Cruz County staff completed an inventory of historical, anthropogenic (human-built) structures on the San Lorenzo River that affect fish passage. These historical structures affect upstream and downstream passage for adults and juveniles, especially during dry years or periods of low base flow in the river. This study focused on documenting 37 historical structures that completely or partially span the San Lorenzo River. Of those 37 historical structures, 24 structures span the channel and substantially affect fish passage. This report recommends the removal or modification of channel-spanning historical structures that substantially affect fish passage. Specifically, this report recommends that the County, CDFW, and NOAA Fisheries work together to facilitate the removal or modification of historical structures rated as Medium or High Passage Severity.
- Caltrans FishPAC: Water Resources staff participate in the Caltrans FishPAC, a group dedicated to improving fish passage at state road crossings. In Santa Cruz County, Caltrans is actively working on 4 of the 6 highway crossings identified as high priority for replacement or remediation. In 2023, Caltrans secured federal funding from the Bipartisan Infrastructure Law to replace a culvert where Highway 9 goes over the San Lorenzo River. This will facilitate the removal of the 10' culvert and replace it with a roughly 50' bridge span, restoring natural water flow.
- County of Santa Cruz Stream Crossing Inventory and Fish Passage Evaluation: The County of Santa Cruz Stream Crossing Inventory and Fish Passage Evaluation report identifies current priorities for fish passage among the County's road stream crossings. The 2022 update identifies locations on Casserly, Lompico and East Liddell creeks where culvert replacement could improve passage for steelhead, aquatic and terrestrial animals. An identified culvert in Soquel (SC-058), where Main St intersects with Bates Creek, failed catastrophically during the 2023 winter storms. In response to the failure, a new culvert is being installed that will meet fish passage criteria.
- RCD watershed restoration program staff, in coordination with the City of Santa Cruz Public Works and Water departments, completed the next phase of the Branciforte Creek Flood Control Channel Fish Passage Enhancement Project. With funding from the State Coastal Conservancy, the project team completed a feasibility study to identify preferred design alternatives that will ultimately help salmonids pass through this barrier in order to access critical spawning grounds higher up in the watershed. The RCD continues to support the City in seeking funding to move the project into the next design phase.
- The City of Santa Cruz Water Department completed public review for National Environmental Policy Act (NEPA) and CEQA compliance for the Anadromous Salmonid HCP with National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW).

- The City of Santa Cruz continued ongoing monitoring related to fisheries, hydrology, water quality and rare terrestrial species relative to Water Department environmental regulatory compliance. Notable observations include:
 - Coho found in Laguna Creek for the 4th year in a row.
 - Non-native chinook found in the San Lorenzo River.
 - Adult hatchery steelhead of undetermined origins in the San Lorenzo River.
 - Juvenile steelhead in Pogonip Creek.
- The RCD supported the San Lorenzo Valley Water District (SLVWD) to implement the Fall Creek Fish Ladder Improvement Project. Constructed approximately 30 years ago as the primary water intake for the town of Felton, the District's Fall Creek Fish Ladder was comprised of four concrete weirs, with four-foot-wide flashboards, spanning the entirety of the channel. The fish ladder limited limiting fish passage for both juvenile and adult salmonids under some flows.

The improvements will provide hydraulic conditions conducive to fish passage and consistent with the fish passage requirements from California Department of Fish and Wildlife and the National Marine Fisheries Service. The pools below each weir are sized to provide adequate pool volume to dissipate energy generated from the water plunging over the weirs without becoming excessively turbulent at design fish passage flows. During low flows, the weir pools will continue to provide rearing habitat for juvenile salmonids. SLVWD will continue to operate water diversions at the Fall Creek Fish Ladder and Diversion facility consistent with existing practices.

- The Scott Creek Coastal Resiliency Project is a unique, integrated bridge replacement and ecological restoration project with multi-benefits. This project will improve community and highway resilience to climate change and sea level rise, will implement a major recovery action for endangered coho salmon and a suite of other listed species, and will improve public coastal access, amongst many other benefits. For nearly 10 years the Resource Conservation District of Santa Cruz County, the Santa Cruz County Regional Transportation Commission, and Caltrans, along with our state and federal resource agency partners, have collaborated to re-envision how to plan for major transportation infrastructure projects by focusing on first understanding the needs of the ecosystem, then designing infrastructure and restoration activities together to meet those needs. This year, with funding from CDFW, the RCD completed the remaining technical coastal studies identified by the Technical Advisory Committee as essential for informing bridge design and selection of a preferred alternative bridge span and alignment. Caltrans secured \$4.5M in SHOPP funding to move the project into environmental review, and the RCD secured funding from the Coastal Conservancy to continue active engagement of the Integrated Watershed Restoration Program Technical Advisory Committee in the process, and to advance ecological components of the project in partnership with Caltrans.
- In coordination with state agency partners, RCD watershed restoration program staff helped advance designs and secure funding for streamwood enhancement projects

on Soquel Creek (Soquel State Demo Forest) and Aptos Creek (Nisene Marks State Park) that are slated for implementation in 2024. In addition, RCD staff continue to work with private landowners to advance barrier removal projects in the Branciforte Creek watershed, a focal watershed for salmonid recovery, conducting landowner outreach and site visits.

Watershed Management Activities

- CDI has continued to oversee the timber harvests in the county to ensure robust water quality and habitat protection during timber harvests, and to cover staff time on enforcing violations of the erosion control, riparian and wetland protection, and grading ordinances that may impact water quality and riparian habitat. On those violations that require a notice of violation staff diligently pursues enforcement and restoration of riparian habitat and prevention of sediment from entering our streams. The Planning Department took the lead in cleaning up a homeless encampment on Carbonera Creek, adjacent to the County Emiline Campus, and funded new informational signage for the Planning Department public space regarding resource protection. CDI continues to work towards establishing a multi-department task force to address other homeless encampments that impact habitat and water quality.
- CDI's code compliance section continues to prioritize enforcement of properties that impact water quality via sediment or septic impacts, as well as general waste associated with unmanaged properties, and staff have developed a good working relationship with the CDFW enforcement staff and our district attorney to pursue larger-scale violations that impact water quality and riparian habitat.
- The County Zone 5 Master Plan is being updated, scheduled for completion by December 2023. Zone 5 covers, generally, the urban unincorporated areas of Soquel, Live Oak and the Pleasure point areas as well as the City of Capitola. The Zone 5 Master Plan update's scope of work includes condition and capacity assessment of the large stormwater conveyances, 36" or larger in pipe diameter, within the Zone. Evaluation of the maintenance program and recommendation for improvements on that will also be made as part of the Zone 5 Master Plan update. Aside from assessing the condition and capacity of the larger storm water conveyances within the Zone, an additional goal of this Master Plan update is to generate detailed cost estimates for the current and proposed maintenance and Capital Improvement Program (CIP) upgrade of all the large drainage conveyances. That estimates will be utilized to seek additional sustainable funding sources for the improved maintenance and the CIP implementation from the benefiting property owners in the Zone.
- The City of Santa Cruz Water Department continued ongoing management work including:
 - Maintenance of watershed divide and stream crossing signs,
 - Fuel management around Loch Lomond Reservoir, Laguna and Zayante watershed properties,

- Invasive species control at Loch Lomond Reservoir,
 - Regulatory response to operational emergencies,
 - Watershed interpretive program implementation including addition of additional “Loch Walk” events
 - Completion of several restoration/mitigation projects including the Newell Creek stream wood project,
 - Initiation of the Non-Flow Conservation Fund restoration work with the Resource Conservation District and other partners,
 - Continued assistance with San Lorenzo River lagoon management,
 - Coordination of federal funding for fish passage improvements in the Branciforte Flood Control Channel,
 - Pursued enforcement on illegal stream diversions and other unpermitted developments that have potential water resources implications,
 - Completion of the Drinking Water Sanitary Survey update,
 - Renewed coordination with hazardous materials spill incident responders,
 - Branciforte Creek P,I,T, antennae installation coordination with Cal Trout,
 - Oversight of County-wide juvenile steelhead and stream habitat monitoring project.
- The City of Santa Cruz has also participated heavily in the regional response to the houseless community and threats to drinking water sources including coordination on flood – related riparian camp evacuations, patrols of key riparian areas along the San Lorenzo River and coordination of camp cleanups.
 - In 2023, PV Water continued to work with technical experts such as aquatic ecologists, archeologists, biologists, and Native American monitors, as well as state and federal resource management agencies, to support the operation of existing water supply facilities, guide development of future projects, and implement mitigation measures and permit compliance monitoring during project construction. The work performed included programs to observe and collect information on environmental and biological resources in and around the Harkins Slough Facility as well as the proposed Struve Slough Project and College Lake Project locations with focused interest in cultural resources, waterfowl/nesting birds, South-Central California Coast Steelhead, and California Red Legged Frogs.
 - Earlier this year in advance of College Lake Project construction, PV Water hired an environmental consultant, SWCA, to implement PV Water’s robust mitigation and monitoring program outlined in the College Lake Project EIR to protect environmental resources during construction. The project itself includes construction of a fish passage structure which would allow movement of fish into and out of College Lake. Currently fish do not have passage through College Lake, likely impacts endangered steelhead.

- PV Water also continues implementation of the College Lake Integrated Resources Management Project Adapted Management Plan 2022 which guides project operations and lake management. The plan provides adaptive management framework, including metrics, triggers, and management actions, to guide operations and maintenance of the project with a focus to mitigate impacts to the College Lake ecosystem.
- As part of PV Water's broader basin management activities and planning under the Sustainable Groundwater Management Act (SGMA), it evaluated and considered groundwater dependent ecosystems (GDEs) when developing the GSU22 and adopting sustainable management criteria for interconnected surface waters. It was determined that currently there was minimal connection between surface water and groundwater and that there is no potential for significant and unreasonable depletions of interconnected surface water due to the existing disconnect. However, PV Water through implementation of projects and programs to achieve sustainable groundwater resources, aims to increase the frequency and duration of hydraulic connectivity between groundwater and surface water where reasonably achievable. Enhanced connectivity would provide greater opportunity for groundwater dependent ecosystems to be restored, developed, expanded, and/or improved.
- PV Water has continued to improve, update, and expand the capabilities of the Pajaro Valley Hydrologic Model (PVHM) including the simulation of future scenario planning with climate change. The PVHM is one of the principal planning tools for the agency and in collaboration with the United States Geological Survey, will be used to evaluate future basin conditions that support sustainable water resources for all beneficial uses including instream needs. Climate scenario modeling included modeling of future variable climate scenarios as well as an uncertainty analysis to support basin management planning.
- The RCD, in partnership with the Santa Cruz County Regional Transportation Commission (RTC), facilitated development of the Santa Cruz County Regional Conservation Investment Strategy (RCIS), which was finalized in April 2023. The goal of the RCIS is to leverage the wealth of local knowledge and conservation planning into a comprehensive, regional, voluntary strategy to protect Santa Cruz County's unique biodiversity and the ecological communities that support it and promote resilience to foreseeable pressures and stressors. The RCIS will also help direct conservation investments, including mitigation dollars, to the highest and best use. The RCIS outlines conservation goals, objectives, actions and priorities for natural communities and focal species, including the following related directly to water resources: bar-built estuary, riparian and riverine, coho salmon, ponds lakes and reservoirs, Santa Cruz Long-toed salamander, freshwater wetlands, southwestern pond turtle, beaches dunes and rocky cliffs, karst formations, habitat connectivity, and working lands.

Attachment 1: Water Use in Santa Cruz County, 2023 (Data for smaller systems is from 2022)

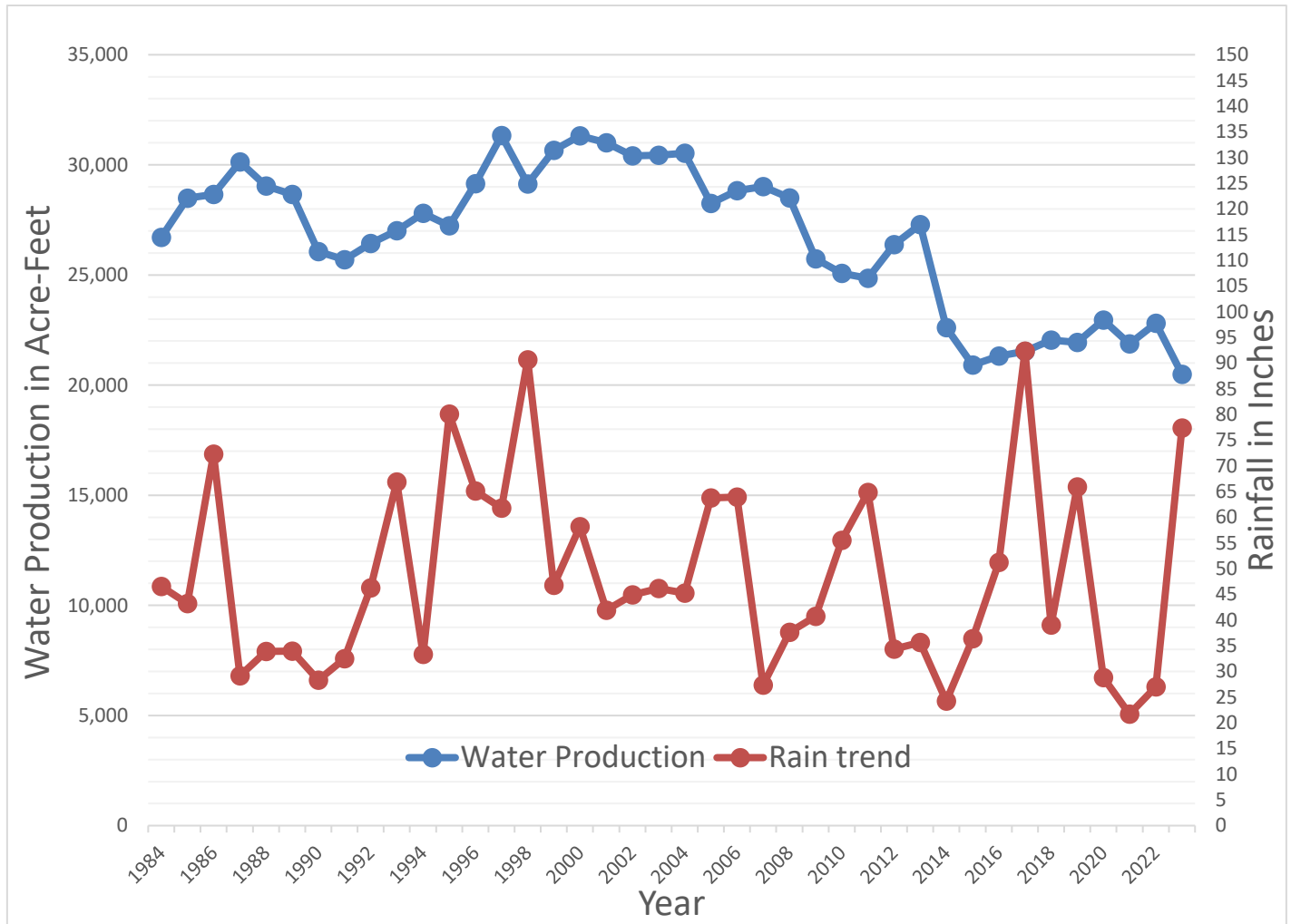
Water Supplier	Connections	Population	Water Use acre- feet/yr	Groundwater	Surface Water	Recycled Water	Imported from Outside the County
Santa Cruz City Water Dept.	24,821	95,829	8,040	5.0%	93.0%	2.0%	
Watsonville City Water Service	14,602	65,231	6,389	99.6%	0.4%		
Soquel Creek Water District	14,532	40,779	2,777	100.0%			
San Lorenzo Valley Water District	7,900	23,700	1,772	36.0%	64.0%		
Scotts Valley Water District	3,975	10,789	1,161	88.1%		11.9%	
Central Water District	829	2,706	357	100.0%			
Big Basin Water Company*	540	1,120	130	100.0%			
Mount Hermon Association	494	2,850	149	100.0%			
Forest Lakes Mutual Water Company	326	1,067	32	100.0%			
Smaller Water Systems (5-199 conn.)	2,570	8,061	888	85.0%	9.0%		7%
Individual Users*	8,000	21,000	2,350	95.0%	5.0%		
Pajaro Agriculture (SC Co only)**†			18,400	92.6%	0.2%	7.2%	
Mid- & North-County Agriculture*			2,400	90.0%	10.0%		
Totals	78,589	273,132	44,845	76%	20%	3.6%	0.1%
Summary by Water Source (acre-feet/year)				34,057	9,111	1624	62
Summary of Non-Agricultural Use (acre-feet/year)				24,045	14,858	8,834	299
Summary of Non-Agricultural Use (percent of water use)				53.6%	43.6%	97.0%	100.0%

*Values are Estimates

** Includes a small number of water systems

† Recycled water source is the City of Watsonville

Attachment 2: Water Use Relative to Rainfall for all Major Municipal Suppliers, Combined, 1984-2023



Attachment 3: Common Acronyms

AF	Acre Foot
AFY	Acre Foot per Year
BMP	Best Management Practices
CDI	Community Development and Infrastructure Department
CEQA	California Environmental Quality Act
CoW	City of Watsonville
CWD	Central Water District
DMS	Data Management System
DWR	Department of Water Resources
EIR	Environmental Impact Report
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IRWM	Integrated Regional Water Management
JPA	Joint Powers Agreement
LAFCO	Local Agency Formation Commission
LID	Low Impact Development
MGA	Santa Cruz Mid-County Groundwater Agency
MGD	Million Gallons per Day
MGY	Million Gallons per Year
O&M	Operations and Maintenance
OR3	Office of Response, Recovery, and Resiliency
PPB	Parts Per Billion
PV Water	Pajaro Valley Water Management Agency
RCD	Resource Conservation District of Santa Cruz County
RWMF	Regional Water Management Foundation
SCWD	City of Santa Cruz Water Department
SGMA	Sustainable Groundwater Management Act
SLVWD	San Lorenzo Valley Water District
SMGWA	Santa Margarita Groundwater Agency
SqCWD	Soquel Creek Water District
SVWD	Scotts Valley Water District
UCSC	University of California, Santa Cruz

Attachment 4: Online Resources

County Water Resources Program	http://scceh.com/Home/Programs/WaterResources.aspx
County Water Quality Map	http://scceh.com/waterquality.aspx
County Steelhead Monitoring Program	http://scceh.com/steelhead.aspx
Santa Cruz County Office of Response, Recovery, and Resiliency	https://www.co.santa-cruz.ca.us/OR3.aspx
Central Water District	https://sites.google.com/view/centralwaterdistrict
City of Santa Cruz Water Department	https://www.cityofsantacruz.com/government/city-departments/water
City of Watsonville Public Works and Utilities	https://www.cityofwatsonville.org/590/Public-Works-Utilities
San Lorenzo Valley Water District (SLVWD)	https://www.slvwd.com/
Scotts Valley Water District (SVWD)	https://www.svwd.org/
Soquel Creek Water District (SqCWD)	https://www.soquelcreekwater.org/
Pajaro Valley Water Management Agency (PV Water)	https://www.pvwater.org/
Santa Cruz Mid-County Groundwater Agency (MGA)	https://www.midcountygroundwater.org/
Santa Margarita Groundwater Agency (SMGWA)	https://smgwa.org/
Resource Conservation District of Santa Cruz County (RCD)	http://www.rcdsantacruz.org/
Santa Cruz Integrated Regional Water Management Plan (IRWM)	http://www.santacruzirwmp.org/
Water Conservation Coalition of Santa Cruz County	https://watersavingtips.org/
Santa Cruz Countywide Data Viewer	https://sccwaterdata.us/#/html/home