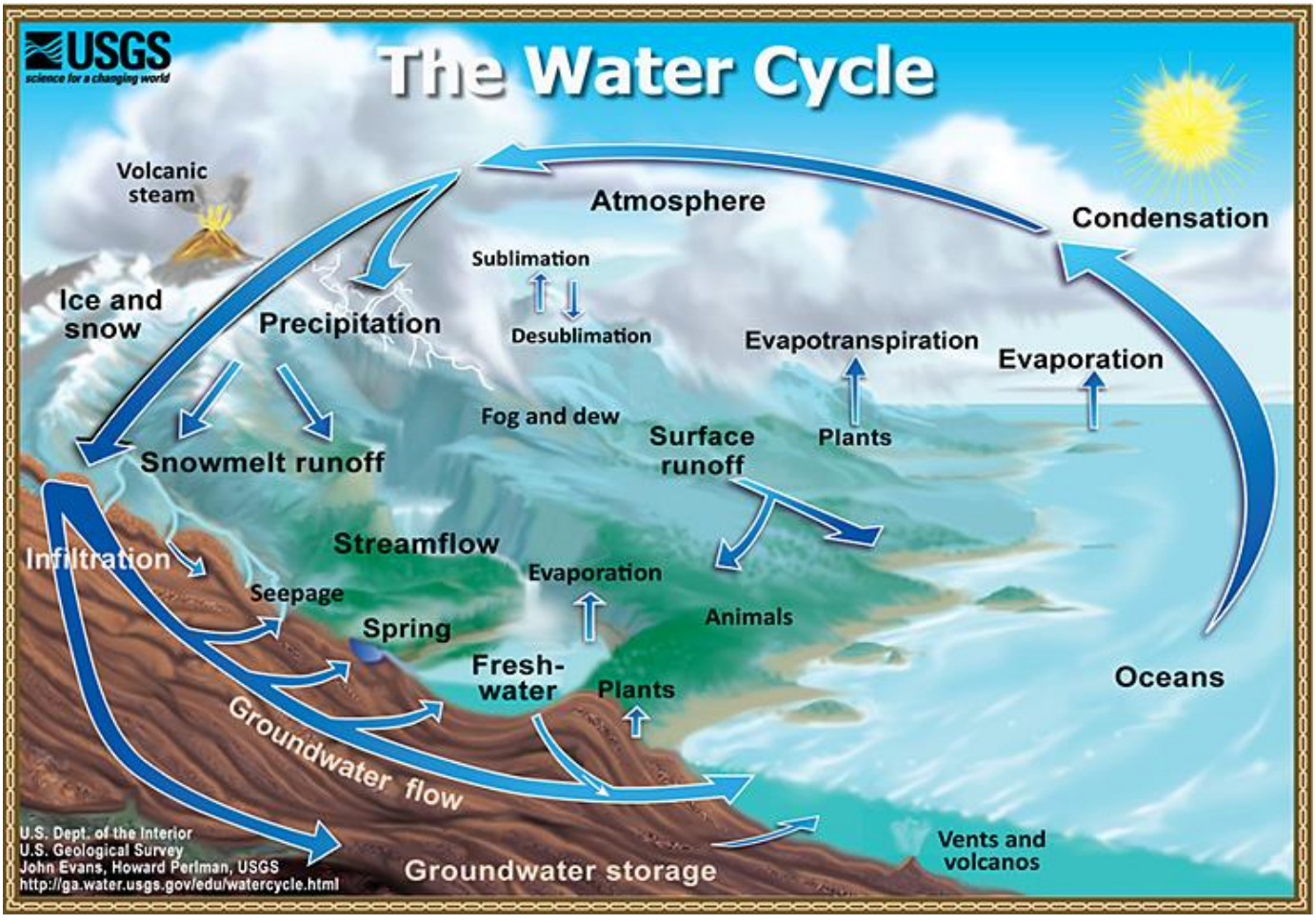
Santa Cruz County
Water Resources Management
Status Report for 2021



Prepared by County of Santa Cruz
Environmental Health

Executive Summary

Santa Cruz County's water resources serve a critical role in protecting public health, 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 status report reflects emphasis on linkages between water resources activities and they hydrologic cycle. The report encompasses activities that took place during calendar year 2021, and reflects water use and rainfall from the 2021 water year which began October 1, 2020 and ended September 30, 2021.

Water Resource Management activities during 2021 were influenced by:

- Drought conditions: water year 2021 was the second consecutive dry year.[1] While rainfall patterns varied throughout the County, there was only one major storm, leaving rainfall totals countywide at roughly half of average.
- Recovery from the aftermath of the CZU Lightning Complex Fire: Ongoing efforts to rebuild damaged water systems and monitor impacts to surface water quality have been conducted by several agencies.
- Groundwater management compliance: All three Groundwater Sustainability Agencies in the County met important milestones.

Key accomplishment include:

- Improved watershed health and restoration due to collaboration among local governments, organizations, agencies, and community stakeholders.
- Infrastructure and watershed enhancements in the aftermath of the CZU Lightning Complex Fire including more resilient pipelines and tanks, the use of stream wood to enhance habitats for endangered and threatened species.
- Laying the foundation for development of comprehensive drought response actions and implementing emergency preparedness as an integral part of water resources management.
- Improvements in water-use efficiency. Municipal water demand has decreased by 4.5% annually and remains significantly below the level it was in 2013.
- Increased capacity in identifying and mitigating water quality impairments through strategic enhancements to the County water quality capabilities.
- Progress in groundwater management through the acceptance of the Groundwater Sustainability Plan (GSP) for the Santa Cruz Mid-County Basin by the Department of Water Resources, the adoption of the GSP for the Santa Margarita Groundwater Agency by its Board of Directors, and the adoption of the 5-year update to the Basin Management Plan by the Board of Directors of the Pajaro Valley Water Management Agency.
- Building water supply resilience through project advancement including implementing the first phase of Soquel Creek Water District's Pure Water Soquel project and successful pilot testing of the City of Santa Cruz Aquifer Storage and Recovery project.

[1] Data from CIMIS (California Irrigation Management Information System): https://cimis.water.ca.gov/

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Introduction

Santa Cruz County's water resources serve a critical role in protecting public health, preserving fragile watersheds, providing resilient habitats, and supporting recreational and commercial activities. Responding to drought, wildfires, a changing climate, and other uncertainties requires integrated and holistic approaches to building resilience and fostering sustainability. The majority of Santa Cruz's water supply is locally derived – a unique situation in a state supported by large federal and state water projects. Domestic supply within the region is provided by five large public agencies, four medium water systems, 115 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 County along with decentralized on-site systems that serve more rural areas. Some of the challenges confronting our vulnerable water resources include inadequate water supply particularly during droughts, impaired water quality, overdrafted groundwater basins, depleted 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. This status report is focused on the 2021 water year which began October 1, 2020 and ended September 30, 2021.

Rainfall is critical to sustaining the County's surface and groundwater resources. Water year 2021 was the second consecutive dry year.[2] While rainfall patterns vary throughout the County, there was only one major storm, leaving rainfall totals countywide at roughly half of average. The US Drought Monitor[3] identified the entire county as experiencing Extreme Drought. On July 8, 2021, Governor Newsom declared a state of emergency due to drought conditions in Santa Cruz County. The County Board of Supervisors adopted a resolution acknowledging the state of drought emergency in September 2021.

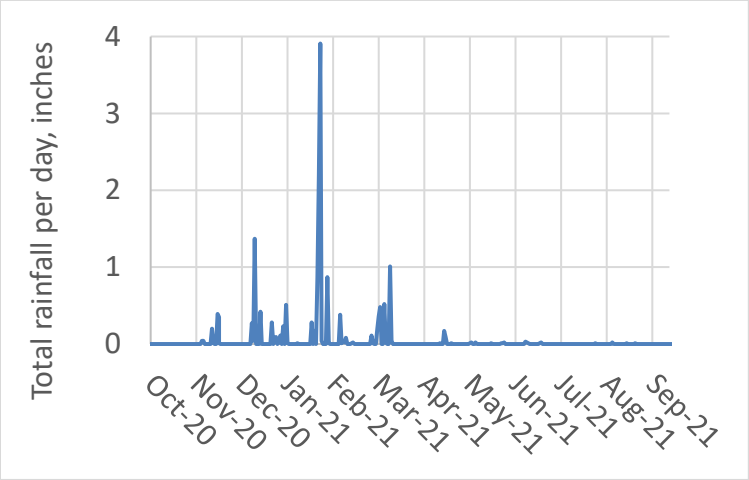


Figure 1. Daily rainfall in Santa Cruz (reported by CIMIS) during water year 2021

The drought led to reduced steamflows along with dry stream reaches, extremely dry vegetation, and increased fire risk. For example, water year 2021 San Lorenzo River flows are shown in Figure 2 in comparison to a 68 year median (1953-2021). The cumulative runoff, or total amount of flow in the San Lorenzo River, was less than 20% of average. In response to the drought, the water agencies in the County, and the County Board of Supervisors, requested water use reductions from their residents.

[2] Data from CIMIS (California Irrigation Management Information System): https://cimis.water.ca.gov/
[3] https://droughtmonitor.unl.edu/

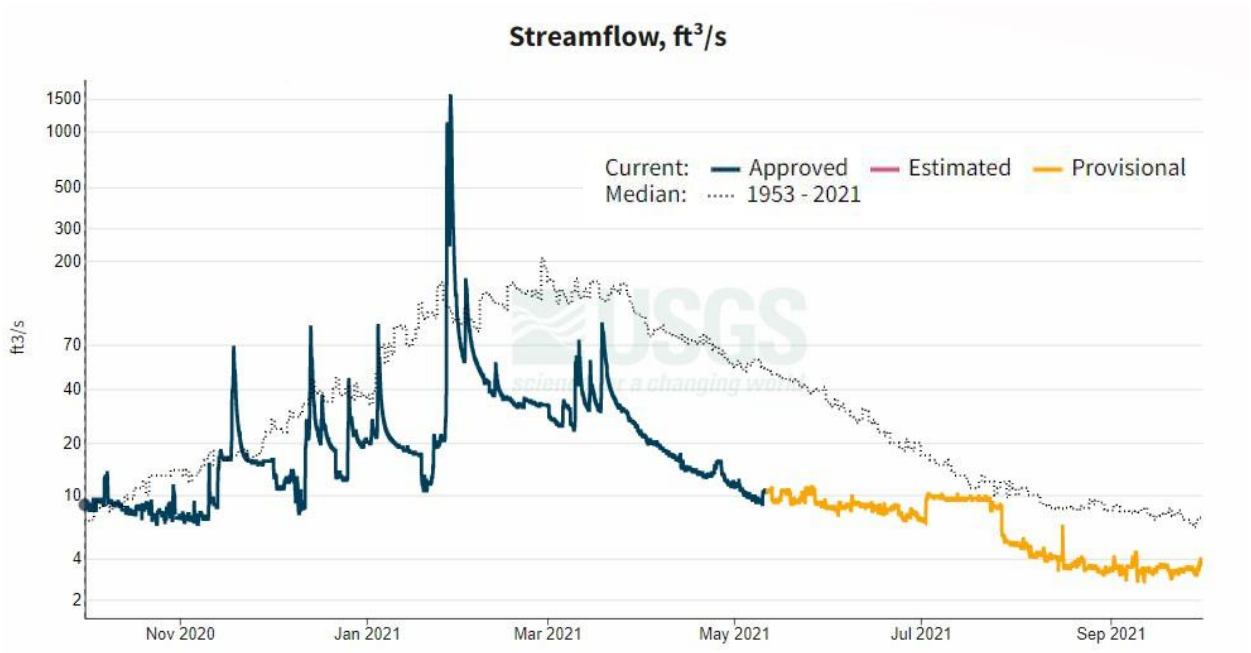


Figure 2. Water year 2021 Streamflow for the San Lorenzo River at the Big Trees gaging station [4] in comparison to median values.

The dry winter did bring with it a silver lining. The CZU Lighting Complex Fire that burned from August 16, 2020-September 22, 2020 impacted watersheds in the North County, several communities (Boulder Creek, Bonny Doon, Swanton, and Empire Grade), State and local parks, and nearly 20% of the San Lorenzo River watershed[5]. If there had been significant rainfall in the aftermath of the wildfires, the runoff could have triggered serious debris flows downslope of the burn scars. Potential consequences of debris flows include risks to homes, infrastructure, watersheds, and critical habitats. Water quality could also be compromised, depending on the proximity to the burn area, the extent of damage, stream flows, and the effectiveness of local mitigation efforts. Changes to surface water quality are somewhat site-specific. During and immediately after the fires there could be localized releases of pollutants and contaminants due to smoke deposition, potentially toxic debris, stream blockage due to downed trees and vegetation, and consequences of road-related runoff to support evacuations, fire suppression equipment, and other short-term actions. Drinking water quality can also be impaired, particularly if there is infrastructure damage. Longer term impacts remain unknown and could include releases from compromised on-site wastewater treatment systems, debris flow, and increased erosion, and changes in the quantity and quality of sediment associated with stormwater runoff.

The County and its partner agencies continue to conduct a range of efforts for water resource management to address resource challenges. This status report is organized into the thematic areas shown in Figure 3.

[4] https://waterdata.usgs.gov/monitoring-location/11160500/#parameterCode=00065&period=P7D
[5] https://www.cityofsantacruz.com/government/city-departments/water/water-quality/czu-fire-water-quality

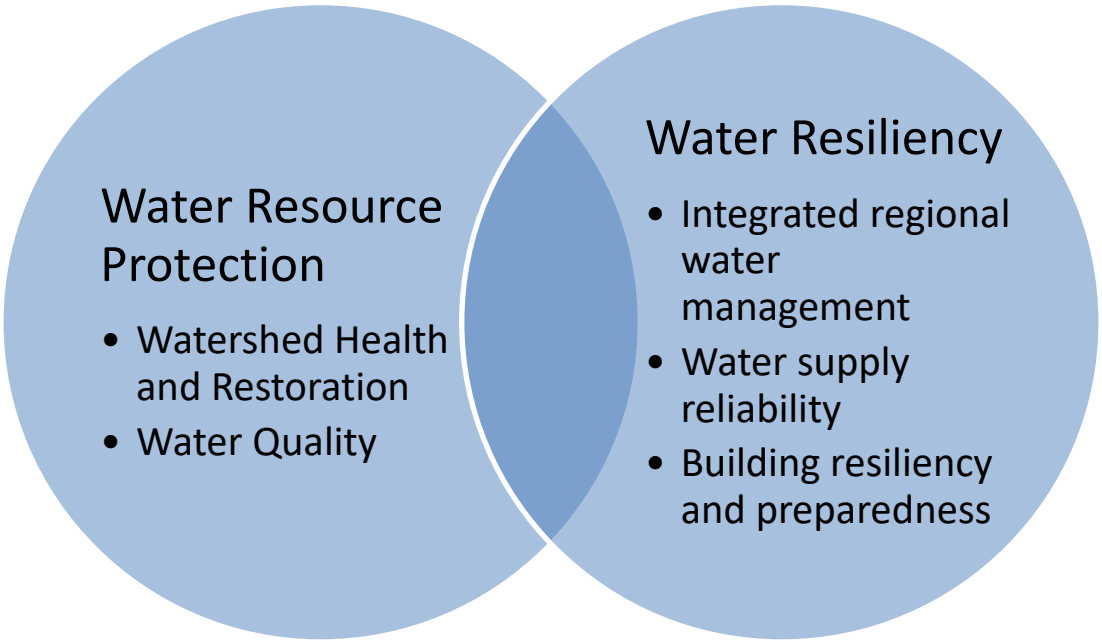


Figure 3. Focus areas of water resources programs during water year 2021.

Water Resource Protection

Santa Cruz County and partner organizations have a longstanding commitment to protect water resources and improve watershed health to support beneficial uses. Surface water resources include freshwater streams, lakes, creeks, and lagoons along with coastal estuarine and marine habitats. Groundwater resources serve as a source for drinking water, irrigation water, and contribute to instream flows. Groundwater is replenished from rainfall and can also be augmented by recharge from engineered systems that promote infiltration of stormwater, treated wastewater, or surplus freshwater into the subsurface. In dry years, there can be an imbalance between the amount of groundwater withdrawn and the available recharge, resulting in overdrafts and localized subsidence. In coastal areas, groundwater is also vulnerable to intrusion of saltwater from the ocean[6] which impairs water quality and can affect ecosystems and end-users of the groundwater. The County's watersheds provide critical habitat for several species that are classified as threatened or endangered, including Coho salmon.[7] Some water resource programs are mandated under state or federal regulatory requirements, while other programs are supported by grants or local initiatives.

[6] https://www.usgs.gov/mission-areas/water-resources/science/saltwater-intrusion?qt-science_center_objects=0#qt-science_center_objects
[7] https://www.fisheries.noaa.gov/species/coho-salmon-protected

Watershed Health and Restoration

During water year 2021, watershed health and restoration activities were focused on recovery efforts in the aftermath of the CZU Lightning Complex Fire. In addition, progress was made on fisheries and stream wood, restoration of critical habitats, and conservation planning.

View from Ben Lomond Mountain into the Boulder Creek basin following the 2020 CZU Lightning Complex Fire.

CZU Lightning Complex Fire Recovery

The County provided funding to the Resource Conservation District (RCD) to work directly with property owners to provide outreach and technical assistance on repairing and preventing storm related damage. The RCD visited properties at landowners' request and addressed concerns related to home drainage/erosion, roads, landslides, and streambank failures, permit assistance, fire preparedness, livestock management, invasive species control and habitat enhancement.

The County Water Resources Program and the Resource Conservation District (RCD)[8] continue to offer site assessments and technical assistance to landowners within the burn area impacted by the CZU Lightning Complex Fire, assisting with long term recovery. The RCD facilitated the exchange of woodchips from the fires to farms. The woodchips were used to replenish chips in a managed aquifer recharge basin, provide mulch and ground cover, and reduce erosion.

Approximately 1600 acres along the Ben Lomond Mountain, a key water supply watershed, were burned. SLVWD staff, the County, and Cal Fire are continuing to work on erosion control, restoration, and hazard tree removal. The SLVWD also received 500 redwood seedlings to be planted in high burn severity areas throughout the watershed.

[8] http://www.rcdsantacruz.org/post-fire

Fisheries

Since 2015, the City of Santa Cruz has increased the quantify of flow released for fish in Laguna, Majors, and Liddell Creeks, and the lower San Lorenzo River as a part of an interim agreement with the fishery agencies. The City continues to work on its Endangered Species Act compliance and is currently working on a final draft Habitat Conservation Plan (HCP) for anadromous salmonids that should be submitted for approval by NMFS and DFW in late 2021/early 2022. The City also completed the Operations and Maintenance Habitat Conservation Plan with the US Fish and Wildlife Service (USFWS) and began implementation of that plan.

The City of Santa Cruz and SLVWD continued efforts to monitor streamflow and habitat conditions in their drinking water watersheds in an effort to establish objectives for habitat improvement. In addition, permitting for the Fall Creek Fish Ladder project was secured by SLVWD in 2021 and construction is slated to begin in June 2022. The SLVWD filed a petition for instream flow dedication pursuant to Water Code section 1707 with the State Water Resources Control Board for its Lompico Creek, License 2733 (Application 4667) water right. Allowing the water to be dedicated to instream uses such as fish & wildlife.

This coho salmon smolt will be released into the Scotts Creek Watershed to support conservation efforts to rebuild regional populations.

Coho salmon are listed as endangered under state and federal Endangered Species Act (ESA) and are critically endangered in Santa Cruz County. Small populations of coho salmon persist in North Coast streams with the support of a conservation hatchery. Most of their current range was impacted by the CZU Fire, which is expected to create both positive and negative habitat impacts. The Kingfisher Flat Conservation Hatchery was severely damaged and will need bridge and structure repairs in order to continue operation. During 2021, the non-profit group Monterey Bay Salmon and Trout Project, California Department of Fish and Wildlife and NOAA Fisheries, made extraordinary efforts to continue the spawning and rearing of coho salmon in alternative locations.

Steelhead are listed as threatened under the Federal ESA and continue to persist in most county streams at low to moderate population numbers. Local organizations are collaborating on monitoring 41 sites for juvenile steelhead densities and stream habitat in four watersheds: San Lorenzo, Soquel, Aptos and Pajaro. Drought conditions continue to impact steelhead densities and access into the upper watershed sites. Current recovery actions focus on improving dry season streamflow and habitat complexity. County Water Resource Program staff completed a map update that shows current or recent coho and steelhead[9].

[9] https://sccgis.maps.arcgis.com/apps/View/index.html?appid=20f0bdf8d6f44a8691a6882154b9a4d0

The RCD continued to work with landowners and agency partners to plan and permit habitat improvement projects through the Integrated Watershed Restoration Program (IWRP). Projects implemented in 2020-21 included: removal of 3 fish passage barriers on Branciforte Creek, removal of the lower Mill Creek Dam, creating a salamander breeding pond in south county, and creating a red legged frog breeding pond on the UCSC marine campus.

Stream Wood Program

Fisheries are also supported by the Stream Wood Program which serves to maintain large wood in streams for habitat value while allowing modification to manage flood risk and infrastructure protection. Significant benefits of stream wood include pool formation and cover habitat, sediment retention and sediment sorting. Key elements of the program include responding to public requests, evaluating fallen trees and wood accumulations, and determining the efficacy of leaving the stream wood in place. During water year 2021, about thirteen new inputs of large wood were documented and outreach to property owners was conducted to address concerns. The RCD also initiated planning for large wood installation projects on Soquel and Aptos Creeks.

Water Resources staff coordinate the evaluation and monitoring of large wood in streams for habitat benefits balanced with property protection.

Restoration of Critical Habitats

County staff continue to participate in a multi-agency effort to restore natural lagoon and marsh dynamics at Scott Creek while constructing a new Highway 1 bridge at this location. The RCD is leading the project with a Technical Advisory Committee that includes regulatory and natural resource agencies.

Caltrans has developed a draft bridge design that will replace the existing bridge with a much longer bridge to accommodate the lagoon restoration and sea level rise.

Restoration efforts are also underway at Moran Lagoon to restore and enhance wetland habitat function and water quality with a long-term goal of fostering resilience to droughts, floods, and sea-level rise. Water Resources staff are partnering with County Parks to develop baseline data on water quality and investigate the prevalence of Tidewater Goby, an endangered species. During water year 2021, the water quality program developed a monitoring plan and initiated seasonal sampling to characterize water quality variations.

Watershed protection/restoration efforts spearheaded by the City of Santa Cruz include:

- watershed lands fire preparedness and overall forest management work,
- invasive species eradication,
- implementation of several mitigation/restoration projects,
- ongoing lagoon monitoring,
- resumption of interpretive work that had been interrupted by COVID-19,
- hosting the seventh annual State of the San Lorenzo River Symposium,
- maintenance of watershed and stream signs,
- patrols along the San Lorenzo River,
- management of houseless persons camps adjacent to the San Lorenzo River,
- cleaning up houseless persons encampments, and
- pursuing enforcement on illegal stream diversions and other environmental regulatory violations on critical streams.

In June 2020 the SLVWD's Board of Directors approved the Integrated Pest Management Policy (IPMP). The IPMP should alleviate pest problems with the least possible hazard to people, property and the environment and create procedures of future usage of pesticides, herbicides, and rodenticides on SLVWD properties. Implementation and hardening has occurred in 2021. In addition, SLVWD is preparing a Habitat Conservation Plan to mitigate the impacts to listed species in Sandhills habitat which result from the SLVWD's Capital Improvement Projects. The initial draft of the plan is aimed for completion in February 2022.

Restoration of the Watsonville Sloughs is a priority for the County and partner organizations. The Pajaro Storm Drain Maintenance District (PSDMD) is entering the feasibility phase of a multi-benefit tidal marsh and wetland restoration project in the lower Watsonville Slough. The purpose of the Project is to conduct feasibility analysis and initial design for a mostly nature-based infrastructure project that re-establishes and enhances wetland and tidal marsh habitat while providing flood risk reduction, climate change adaptation, and recreational opportunities to economically-disadvantaged local residents. Feasibility work has begun and stakeholder input is being sought so that an appropriate and responsive set of alternatives can be evaluated.

The City of Watsonville, Pajaro Storm Drain Maintenance District, and Watsonville Wetlands Watch were awarded a Proposition 1 IRWM grant for the Upper Struve Slough Habitat Restoration and Public Access Project. This project is a multi-benefit project that will reduce flooding, improve habitat, and restore water quality through Struve Slough. PSDMD will secure partial funding from the Army Corps of Engineers under the Section 1135 Continuing Authorities Program, and the remainder of necessary funding will come from a Prop 1 grant award from the Ocean Protection Council.

Habitat Conservation

County Water Resources Program staff have been engaged in the development of a Regional Conservation Investment Strategy (RCIS), an effort led by the Regional Transportation Commission (RTC) and the Resource Conservation District of Santa Cruz County (RCD). The plan identifies conservation priorities for a range of critical species and habitat types to support the wise investment of restoration and mitigation funding. The RCIS will be completed in 2022.

The County and San Lorenzo Valley Water District (SLVWD) completed a grant project through the Wildlife Conservation Board Streamflow Enhancement Program. The grant assisted in the development of a San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan. The Plan will be used to improve water supply reliability and increase summer stream flows in the immediate future and recommend further infrastructure improvements needed in the long run. In 2021 the Conjunctive Use Plan was drafted, an initial study – mitigated negative declaration (IS-MND) was completed, and water right petitions were initiated. However, SLVWD staff are recommending that the SLVWD Board of Directors authorize further technical studies and an Environmental Impact Report (EIR) for the CUP based on comments received on the IS-MND.

The Olympia Conservation Area Management Plan was completed in May 2020. This plan was developed to guide habitat management, restoration, enhancement, and monitoring within the Olympia Conservation Area—a 6.3-acre conservation area located within the SLVWD's 180-acre Olympia Watershed Property. The conservation area was set aside by SLVWD to mitigate impacts of its capital improvements and operations and maintenance projects on rare species and sensitive habitat in the Sandhills. SLVWD secured an AmeriCorps Team in March-April 2021 for a special project in the Olympia Watershed and its Kirby Water Treatment Plant for invasive plant removal.

Water Quality

During water year 2021, water quality efforts have focused on evaluating trends in freshwater watersheds, investigating algal and cyanobacterial blooms, and conducting ongoing monitoring of beaches to identify potential health risks. The County's environmental health laboratory continued to expand analytical capabilities to investigate waterborne contamination. The County's water quality program primary focus is microbiology and chemical fingerprinting.

Watershed Assessment

Several watersheds within Santa Cruz County have been identified by the State of California as 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 Basin[11] Plans, the National Pollutant Discharge Elimination System (NPDES)[12] permit program, and 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. An example of data from two monitoring locations along the San Lorenzo River in Figure 4.

[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

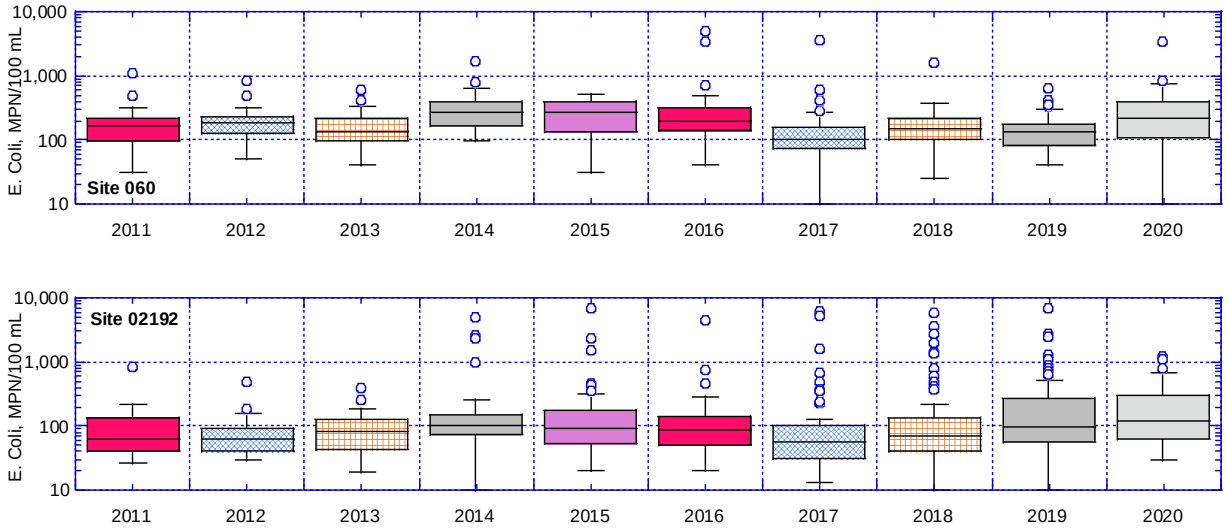


Figure 4. Boxplot of yearly E. Coli concentrations at the sampling sites adjacent to two USGS monitoring stations on the San Lorenzo River: Site 060-Big Trees (upper graph) and site 02192 – Vernon Street (lower graph) between 2011 and 2020. E. Coli data are from routine grab samples taken by the County of Santa Cruz Environmental Health Program.

The annual frequency of exceeding the single-sample E. Coli requirement of 400 MPN/100 mL is shown in Figure 5 along with rainfall data for both sites. During 2020, a higher percentage of E. Coli samples were above 400 MPN/100 mL at Big Trees than in the previous several years. The water quality staff have initiated microbial source tracking to try to determine the sources of contamination and develop potential mitigation strategies.

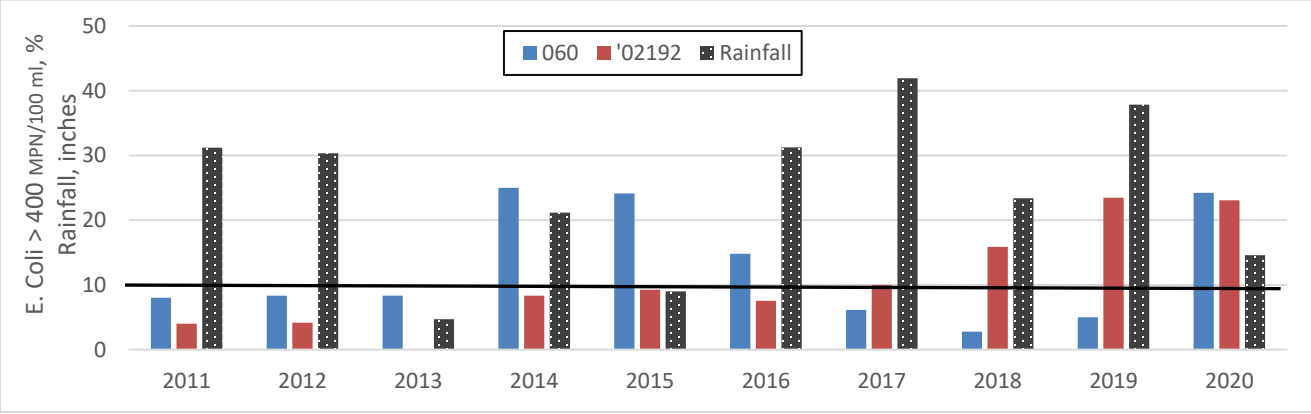


Figure 5. Frequency of exceeding the single-sample E. Coli limit (400 MPN/100 mL) at the sampling sites adjacent to two USGS monitoring stations on the San Lorenzo River: Site 060 (Big Trees) and site 02192 (Vernon Street) between 2011 and 2020. Rainfall data are from the California Irrigation Management Information System (CIMIS), site 104 (De Laveaga).

Monitoring Algal and Cyanobacterial Blooms

Pinto Lake is listed on the Clean Water Act section 303(d) List of impaired waterbodies due to seasonal and persistent cyanobacterial blooms that adversely affect the lake's aquatic ecosystem and recreational uses. Several factors affect the frequency and intensity of cyanobacterial blooms including nutrient loading (nitrogen and phosphorus), water temperature, and the extent of mixing within the lake environment. In 2017, several mitigation measures were implemented at Pinto Lake through the City of Watsonville's 319(h) grant (Agreement number 14-424-253)[14] and the Resource Conservation District of Santa Cruz County (RCDSCC)'s Proposition 84 Grant (Grant No.13-515-553-0)[15].

Nutrient data from 2020 and 2021 are shown in Figure 6. As shown, the levels of nutrients vary from site-to-site and season-to-season, however, it is difficult to detect any specific trends related to the lack of rainfall within the watershed during water year 2020-2021.

Figure 6. Comparison of nitrate and orthophosphate data from seven monitoring locations: CCC Creek (PL15), Amesti Creek (PL12), County Dock (PL 16), Dock at Villas Del Paraiso (PL11), the Boat Dock (PL 0) and downstream locations at Corralitos Creek (P302) and College Lake (P 31). Data are from grab samples taken by the County of Santa Cruz Environmental Health (May 2020-September 2021).

[14] https://www.waterboards.ca.gov/centralcoast/water_issues/programs/grants/docs/14424253_fr.pdf
[15] https://www.waterboards.ca.gov/centralcoast/water_issues/programs/grants/docs/grant_reports/13515553_sr.pdf

Microcystins are cyanobacterial toxins that can be released in conjunction with a cyanobacterial bloom. Data on microcystins measured at the Pinto Lake boat dock are shown in Figure 7. During water year 2021, toxins were detected during the summer, but the levels were consistently below the health advisory level. The peak concentrations were observed in mid-July.

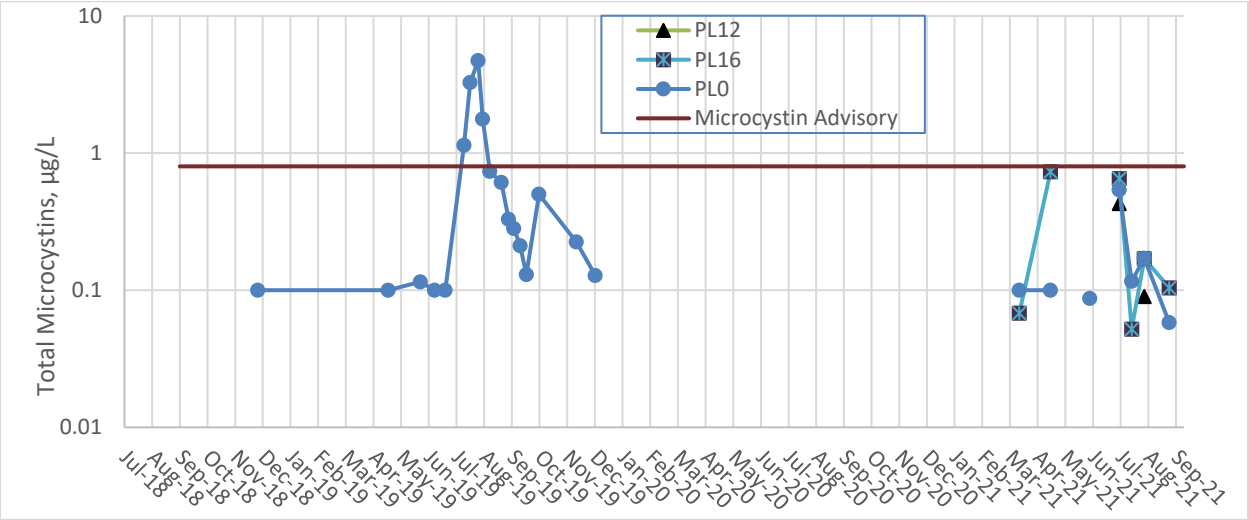


Figure 7. Time series of microcystin data from grab samples taken at Pinto Lake Boat Dock (PL0), Amesti Creek (PL12), and Pinto Lake at County Dock (PL16). Detection limit is 0.05 µg/L.

Preliminary screening of cyanobacterial and algal toxins was conducted in July 2021 in response to reports of 'red tide' and the prevalence of cyanobacterial/algal blooms in coastal lagoons. Seven coastal sites were sampled synoptically and tested for microcystins as an initial screening test. Physical-chemical parameters (temperature, dissolved oxygen, turbidity, and electrical conductivity), algal pigments (cholorophyll and phycocyanin), and fecal indicator bacteria were also tested. Results are summarized in Table 1. For this round of screening tests, water temperatures ranged from about 16 to 24 ° C. Microcystins were detected in three samples, but below the health advisory warning levels. There was no correlation between microcystin levels, algal pigments, or fecal indicator bacteria levels. The screening program will be refined in advance of the 2022 monitoring season.

Table 1. Summary of microcystin screening tests conducted in July 2021 (7/12/21)

Code	Site name	Physical parameters				Algal pigments, µg/L		Fecal indicator bacteria, MPN/100 mL			Microcystins, µg/L*
		Water temp, ° C	Dissolved Oxygen, mg/L	Turbidity, NTU	Electrical conductivity, µS/cm	Chloro-phyll	Phyco-cyanin	Entero-cocci	E. Coli	Total coliforms	
MR4	Antonelli Pond near Delaware	23.0	5.6	17.8	477	120	≤0.2	≤10	20	6,488	0.26
I0	Intel Creek at Mouth	16.5	1.3	10.0	600	60	≤0.2	723	243	4,884	<0.05
N2	Nearly Lagoon at Bay Street	20.3	3.8	31.1	546	9	0.3	2,046	794	3,873	<0.05
003	San Lorenzo River at Trestle	22.2	10.3	5.5	7,850	0.9	≤0.2	322	1,470	>24,196	<0.05
001	San Lorenzo River at Mouth	22.6	9.5	2.8	10,778	9	≤0.2	63	1,014	>24,196	<0.05
SW0	Schwan Lake at Mouth	22.8	8.9	10.2	31,707	6	≤0.2	20	>24,196	>24,196	2.77
R0	Corcoran Lagoon at Mouth	24.1	11.1	3.6	58,595	48	≤0.2	≤10	≤10	231	0.24

* California Health Advisories [16] for Microcystins are:

Total Microcystins, µg/L	Trigger Level
<0.8	No advisory
0.8-5.9	Caution (Tier 1)
6-19	Warning (Tier 2)
>20	Danger (Tier 3)

Recreational Water Quality Monitoring

During this reporting year, the County continued routine surveillance of over 30 ocean monitoring sites and adjacent creeks, streams, and lagoons in accordance with State requirements. Water quality data are reported on the County's website[17] within 30 hours of sample collection and local jurisdictions are notified whenever there is a health advisory. A pilot program was implemented for 'same-day' testing of Enterococci using molecular methods (qPCR) in accordance with EPA methodology.

Currently the qPCR data provide an 'early warning' of the need to resample. An example comparison of q-PCR data and cell culture data is shown in Figure 8 for sites sampled between April and June 2021 with detectable q-PCR Enterococci. In general, exceedances of cell culture Enterococci corresponded to q-PCR Enterococci values above 600 cell equivalents per 100 mL. The County is working with other water

[16] https://mywaterquality.ca.gov/habs/resources/habs_response.html
[17] http://scceh.com/waterquality.aspx

quality programs and the Water Board to identify ways for method optimization and streamlining. The use of digital PCR is also being investigated as a faster and more accurate tool.

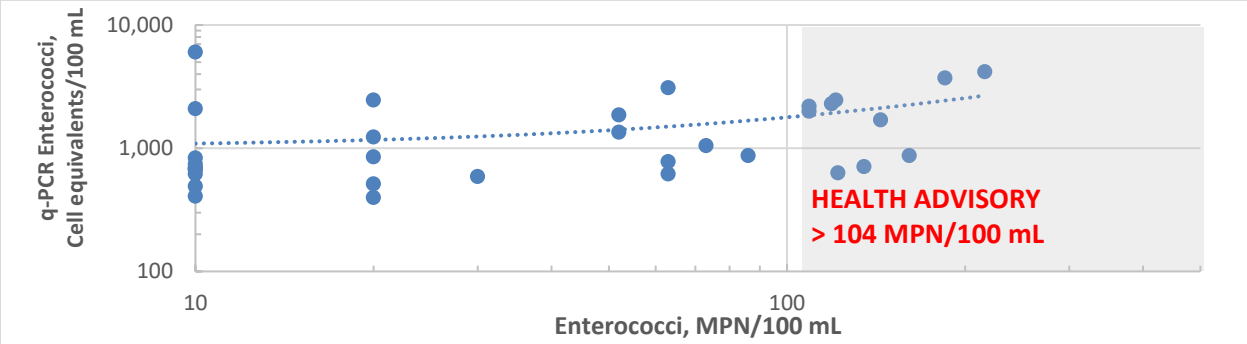


Figure 8. Comparison of q-PCR Enterococci data with cell culture Enterococci data for samples with q-PCR levels above the limit of quantification (LOQ) Data From April Through June 2021.

Towards the end of this reporting year, the County began screening for potential health risks associated with exposure to cyanobacterial toxins. Preliminary microscopic screening was initiated in samples from lagoons and ocean beaches when bloom conditions are suspected (due to temperature, evidence of water discoloration, or concerns reported by beachgoers). Where feasible, the dominant algal and cyanobacterial species were identified and micrographs were catalogued for future reference. An example of algal species identified in a beach sample is shown in Figure 9. The County is exploring the use of enzyme-based test-methods and also qPCR for evaluating toxins during algal blooms. The toxin testing is focused on microcystins, cylindrospermopsin, anatoxins, and saxitoxins.

Figure 9. Example micrographs of algae identified during a 'Red Tide' event at Seacliff State Beach.

Wastewater Management

In 2021, Environmental Health staff completed the County's Local Area Management Program (LAMP) for Onsite Wastewater Treatment Systems (OWTS). The LAMP is 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 have initiated the process

to make related updates to the General Plan and County code, which will be completed in 2022. Implementation of the LAMP will provide for increased protection of public health and water quality by requiring increased setbacks from public water supply sources, drainageways, and karst features. The LAMP also specifies increased groundwater separation and provides detailed requirements for:

- 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,
- nitrogen reduction 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.

The Santa Cruz County Sanitation District secured a $1,393,000 loan from the State Water Resources Control Board to relocate a sewer main crossing Valencia Creek. Valencia Creek is on the Central Coast Water Board's list of impaired water bodies. This project will consist of installation of a HDPE sewer main along a new alignment that will serve to replace the deteriorated main in a more secure location to protect water quality in the creek.

The Santa Cruz County Sanitation District completed the Soquel Pump Station and Force Main Replacement project in November 2021. This project served to control potential sewer leaks to Soquel Creek and Capitola Beach. The old, potentially leaking, sewer force main under Soquel Creek was replaced by a new jointless HDPE main. Upgrades at the Soquel Pump Station will increase reliability of the station and reduce the potential for sanitary sewer overflows. This project was funded by a $1,976,731 Clean Beaches Grant, $5,000,000 State Water Resources Control Board Clean Water Loan, and District funds.

The Santa Cruz County Sanitation District completed replacement or lining of over 10,000 linear feet of aging sewer mains and lined and sealed multiple sewer manholes. This work reduces the potential for sewer to exfiltrate into the ground water, and also reduces the risk of sanitary sewer overflows which could reach bodies of water.

The Freedom County Sanitation District completed Phase 1 of the Sewer Rehabilitation project. This included replacement of over 13,000 linear feet of aging sewer mains and lined and sealed multiple sewer manholes. This work reduces the potential for sewer to exfiltrate into the ground water, and also reduces the risk of sanitary sewer overflows which could reach bodies of water. This project was funded by a $4,497,000 loan and $4,492,628 grant from the United States Department of Agriculture Rural Development Water & Environmental Program.

As part of the County Sanitation's Sewer Lateral Program, the County reviewed over 600 sewer lateral videos and required repairs on over 350 laterals. Repairs fix defects that could lead to sewer exfiltration or cause sanitary sewer overflows.

In May 2021, the homeowners of Community Service Area (CSA) 2- Place De Mer approved the formation of an assessment district in the amount of $2.8 million to fund sanitary sewer improvements to replace a failing community septic system and gravity sewer mains. The project includes an advanced wastewater treatment system that will treat the CSAs wastewater to a higher than secondary treatment,

reduce nitrogen, and remove the existing precast concrete tanks that have failed. The replacement of gravity sewer mains will reduce the possibility of infiltration and exfiltration.

Water Resource Linkages with Agriculture Practices

The Central Coast Regional Water Quality Control Board's Agricultural Order 4.0 regulates discharges from irrigated agricultural lands to protect surface water and groundwater quality. It was adopted by the Regional Water Board in April 2021 and is expected to take effect in spring 2022. RCD staff provided detailed comments and recommendations related to the strategies and requirements included in draft Ag Order 4.0. Staff continued to participate in a technical advisory group, including UC researchers and other experts, to provide the Water Board with a metric that growers can use to report how much nitrogen was removed from their fields (relative to the volume of nitrogen applied) during the reporting period. In addition, RCD staff participated in monthly "brown bag" meetings with stakeholders and Water Board staff to help inform the successful development of a third-party cooperative group that will offer growers an alternative route for meeting many of the Ag Order 4.0 requirements. That third-party group's proposal (from Central Coast Water Quality Preservation, Inc.) was subsequently approved by the Regional Water Board and future collaborations are planned to advance improvements to water quality on watershed scales.

RCD staff collaborated with Central Coast Water Quality Preservation, Inc., non-profits, growers, other RCDs and UC researchers to help advance the development of a best management practice using biochar filtration in agricultural settings to remove pesticides. RCD supported outreach, implementation and monitoring for a number of projects incorporating biochar, which is now documented as an effective treatment for reducing pesticides in agricultural water. Looking ahead, partners will work to develop a BMP design that is simple, cost-effective and scalable.

RCD Agricultural Program staff continue to work with NRCS, researchers, management agencies, funders and industry to get effective water quality best management practices developed and on the ground. Additionally, RCD is providing assistance to growers to submit applications for funding to 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. RCD staff helped growers submit applications through December 2021, and anticipate that well over 20 applications will be submitted from Santa Cruz County growers during this round of funding, with a high likelihood of receiving awards.

The RCD continues assist growers with conserving water through irrigation efficiency and soil health improvements leveraging funds from PV Water, CDFA, and NRCS. Assistance with nitrogen management is often incorporated into the irrigation efficiency assistance. During 2021, RCD assisted 23 growers to monitor and/or improve the efficiency of their irrigation. The RCD also provides:

- irrigation system evaluations and recommendations,
- season-long monitoring to inform growers of how the volume of water applied to their crops compares to the volume of water required by their crops,
- irrigator trainings in English and Spanish, soil moisture monitoring, and
- technical and financial assistance to implement more efficient water use practices.

Through collaboration with PV Water, over $25,000 was issued to participants in the Agricultural Water Conservation Program. Rebates and cost-share from PV Water helps growers purchase and install more

efficient irrigation equipment such as lower flow sprinklers, pressure compensating drip tape, pipe retrofits, soil moisture sensors, irrigation monitoring equipment like flow meters and data loggers, and repairs of leaky pipe joints.

PV Water expanded the Coastal Distribution System in 2020 with funding provided by the Department of Water Resources adding 9,900 feet of new pipeline on the San Andreas Terrace to provide delivered water service to up to 700 acres of farmland and alleviate coastal groundwater pumping.

The Pajaro Valley Water Management Agency (PV Water) continues to monitor water quality, hydrologic, and land use conditions throughout the Pajaro Valley Basin. Agency staff routinely collect and analyze water quality data from approximately 40 surface water monitoring sites. PV Water also maintains a large network of autonomous dataloggers and measure discharge to monitor stream conditions. In 2021, PV Water completed its eleventh consecutive annual summer land use survey which is used to characterize water demand in basin modeling and identify changes of land use in the watershed

Groundwater elevations in portions of the Pajaro Valley Basin are frequently at or below sea level for significant periods during each year. Seawater intrusion, as determined from chloride concentrations in groundwater exceeding 250 mg/L, extends inland to approximately San Andreas Road. Preliminary monitoring results from 2021 indicate an average decrease of approximately 3 feet in groundwater levels in the Pajaro Valley Basin since fall 2020 during a year with slightly more than 60% of average annual precipitation. PV Water continues to implement its Groundwater Sustainability Plan (GSP) Alternative, which includes optimizing existing water supplies, conserving water resources, and developing new water supply projects such as the approved College Lake Integrated Resources Management Project and the Watsonville Slough Systems Managed Aquifer Recharge and Recovery Projects.

Water Resiliency

Water resiliency activities include integrated regional water management, water supply reliability, and focused efforts to build resiliency and preparedness. Priorities during water year 2021 were dictated by the aftermath of the CZU Lightning Complex Fire and the drought conditions.

Integrated Regional Water Management

Santa Cruz County partner agencies continue to work together on the Integrated Regional Water Management (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 of the cities and public agencies dealing with water are signatories to the Santa Cruz IRWM Memorandum of Agreement, which was updated in 2016. The agencies contribute a combined $82,000 annually to support maintenance of the IRWM efforts. The RWMF is also providing administrative services to the Santa Cruz Mid-County Groundwater Agency, and grant administration for the Santa Margarita Groundwater Agency[18].

The Santa Cruz and Pajaro IRWM regions, as well other four other IRWM regions along the Central Coast, continue to work to utilize IRWM grant funds to further evaluate and address the water needs of disadvantaged communities in the Central Coast, including the Santa Cruz and Pajaro regions. This project is being administered by the RWMF.

[18] www.santacruzirwmp.org/

In July 2021, the RWMF executed a $2.3M grant agreement with the California Department of Water Resources (DWR) on behalf of the IRWM Region. The award is from Round 1 of the Proposition 1 IRWM Implementation grants. It will support multiple projects featuring work to:

- enhance watershed and stream conditions by reducing sediment runoff
- improve water supply reliability for the community of Davenport
- capture stormwater runoff for groundwater recharge in the Mid-County groundwater basin and,
- implement habitat restoration projects in Watsonville Sloughs.

Local project sponsors include: Resource Conservation District Santa Cruz County; County of Santa Cruz Environmental Health; and the Davenport County Sanitation District. Implementation partners include Land Trust of Santa Cruz County and Soquel Creek Water District among others. The Santa Cruz County Flood Control and Water Conservation District Zone 6 project for storm drainage improvements for the Rio del Mar Flats was previously to be funded in part by this grant but the County is no longer advancing that project. This grant is being administered by the RWMF. Work will occur from 2021 to 2024.

Infrastructure

The County Zone 5 Master Plan is being updated. The update is scheduled for completion by December 2022. One main goal of this Master Plan update is to generate detailed cost estimates for the maintenance and CIP upgrade of all the large drainage conveyances, 36” or larger in pipe diameter. That estimates will be utilized to seek additional sustainable funding sources for the maintenance and the CIP implementation from the benefiting property owners in the Zone. In addition, impact fee nexus analysis and impact fees calculations will be conducted based on the CIP results to evaluate the funding sources attributed to impervious area generation associated with land development projects in the zone.

Stormwater Management

County staff from Public Works and Environmental Health continue to implement the County’s stormwater management program and update the program to address evolving State and Federal requirements.

In the last decade three stormwater infiltration systems have been constructed in Scotts Valley by the Scotts Valley Water District and private developers. The SVWD monitors all three – the combined infiltration total for water year 2021 was over 16 acre-feet.

The City of Watsonville completed a grant from the Santa Cruz IRWM to leverage current engagement efforts on pollution prevention related to stormwater in disadvantaged community block groups. of Watsonville also completed a grant through the Santa Cruz IRWM’s Disadvantaged Community Involvement Grant to plan a stormwater project centrally located in the City that has water quality and habitat restoration benefits to Middle Struve Slough. This project was in partnership with Watsonville Wetlands Watch.

Water Supply Reliability and Water Use Efficiency

Ensuring that drinking water systems are capable of provisioning safe water throughout the County is a key element of building resilience. A number of parallel efforts are addressing the availability of water including water use efficiency, groundwater management, and supplemental water supply projects

Drinking Water Systems

The Santa Cruz County Drinking Water Program oversees 109 active small water systems (SWSs), including community systems with 5 to 199 residential connections and noncommunity systems such as schools, outdoor camps, and businesses with their own source of drinking water. Drinking Water

Program staff work with these systems to maintain compliance with evolving federal, state, and local public health requirements and meet the ongoing needs of the people and communities that rely upon them. County oversight includes regulation of water quality, quantity, monitoring, treatment, distribution, and system organization. These systems are required to test for up to 84 different constituents on an ongoing basis.

Drinking Water Infrastructure

In July 2020, the Integrated Regional Water Management Foundation recommended to the Department of Water Resources funding for water tank repurposing and rehabilitation in Davenport, under the 2019 Proposition 1 IRWM Implementation Grant Program. Davenport County Sanitation District proposed to repair, line, and coat an existing water tank to be repurposed for the storage of raw water that would be available for treatment when source water is unavailable due to turbidity or low flows. In 2021, the District requested additional grant funding from DWR to cover cost increases that have occurred since the proposal was filed. Actual improvements will depend on the amount of funding received.

In October of 2021, the Davenport County Sanitation District kicked off the Feasibility Study with consultant Kennedy Jenks that will study if a pump station can be constructed at the San Vicente Creek intake to pump water to a domestic water main that would be constructed in an existing roadway paralleling the creek. Currently the water supply line is a gravity-fed pipe owned by CEMEX, that is exposed and routed within the creek channel. This line is subject to natural disasters and damage from fire. The new line would provide a more resilient water supply for the town. The study is funded by a $93,023 Community Development Block Grant.

The SLVWD and SLVWD-Felton systems have an interconnection, which allows for the transfer of water between the two systems on an emergency basis. In 2020, the SLVWD received approximately 13.47 million gallons of water from the SLVWD-Felton system, or approximately 2.5% of its total supply; while the SLVWD-Felton system received approximately 9.62 million gallons of water from the SLVWD system, or approximately 7.7% of water provided to the SLVWD-Felton system.

Water System Reliability

The SLVWD is working on a multi-tier effort to optimize operations, sustainably manage water supply and diversify the SLVWD's water supply portfolio to ensure a resilient water supply for a changing climate through:

- Water Conservation
- Improving System Efficiencies through Conjunctive Use (Using surface water when available to rest and recharge groundwater sources)
- Capital Improvement (increasing pipeline sizes, reducing leaks, and increasing storage tank capacities)
- Permit Intertie Pipelines to optimize operations and sustainably manage water supply.
- Sustainable Groundwater Management (SMGWA.ORG)
- Climate Adaptation and Mitigation (The Climate Registry)

The SLVWD, working with consultant Akel Engineering, has developed a Water Master Plan, including development of a dynamic system model and a Capital Improvement Program.

- 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 Fire and not repaired as of September 2021.

- The dynamic system model is based on the existing system as outlined in the Master Plan, and allows for evaluation of potential system changes, as well as quantification of existing service. The District's hydrant pressure and flow schedule was developed using the dynamic model.
- The Capital Improvement Program identifies deficiencies within the system and provides recommendations for system repairs and upgrades. The Program anticipates approximately 20-years of continuous repair and upgrade by the District.

Water Use Efficiency

On a County-wide scale, optimizing water-use efficiency can serve to build water supply resilience. Water use efficiency includes prudent practices for using water, water-conserving fixtures, infrastructure maintenance, and strategic irrigation. A comparison of the amount of water produced in Santa Cruz County and the number of service connections from 1984 through 2021 is shown in Figure 10. It is interesting to note that, while the number of water connections has more than doubled, the net amount of water produced has decreased. This trend reflects increasing water conservation along with improvements in water-use efficiency. County staff, countywide public water agencies, and Ecology Action collaborate on outreach and education through the *Water Conservation Coalition of Santa Cruz County*. Though most in-person events were cancelled this year, the Coalition developed the "Value of Water" social media campaign[19] to encourage residents to learn more about water infrastructure sustainability. Initial activities included a quiz and an opportunity to earn prizes from local businesses. The website logged 957 views and 94 residents taking the quiz. The Coalition's booth at the 2021 Santa Cruz County fair featured an educational video on the importance on water infrastructure, information on County-wide conservation programs, and free water saving devices. In the coming year, the Coalition plans to build on the "Value of Water Campaign" and resume in-person events and landscaper trainings.

[19] watersavingtips.org

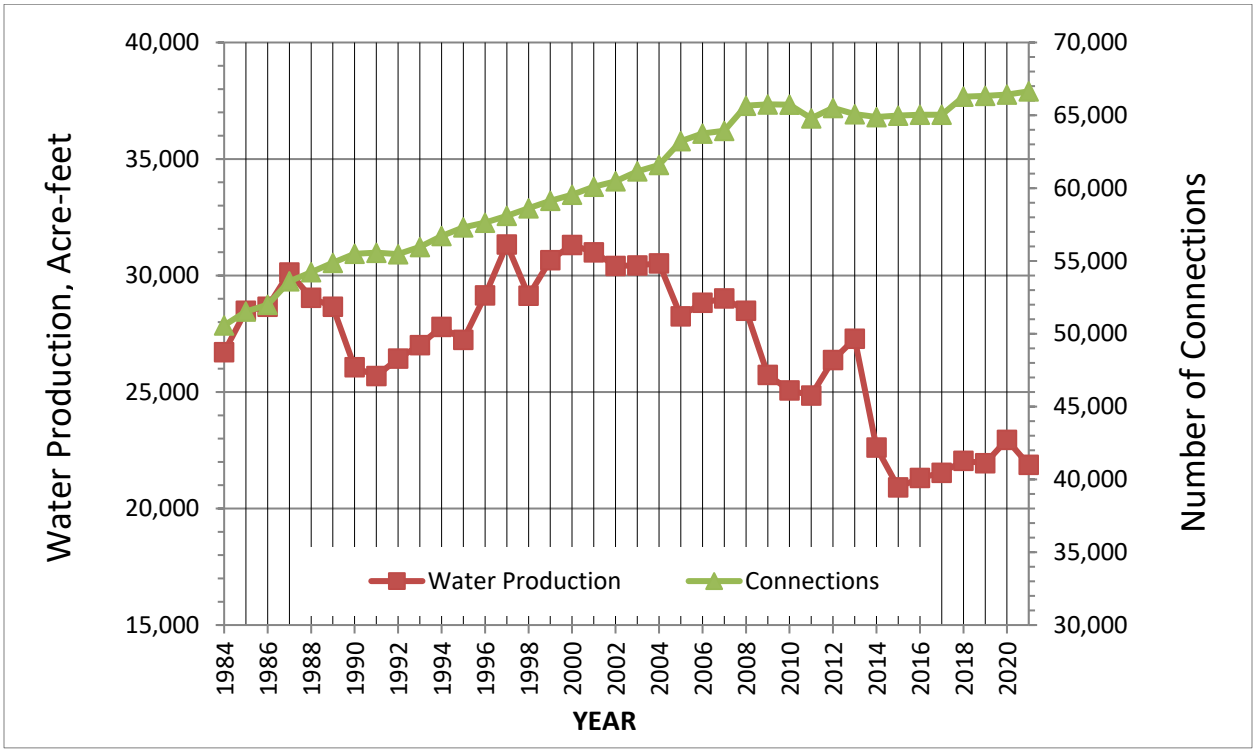


Figure 10. Water use relative to number of connections for all major municipal suppliers, combined, 1984-2021

Water use efficiency activities across the County included developing criteria for new developments and infrastructure, metering and leak detection programs, rebate programs, and landscape guidance. Generating awareness and maintaining consistency is critical for the success of these efforts.

Criteria for New Developments and Infrastructure

- County Planning[20] continues to encourage multi-family development, smaller units and Accessory Dwelling Units, which are all water saving relative to other types of development, as well as water saving landscapes.
- The Soquel Creek Water District's Water Demand Offset (WDO) program which, in lieu of a building moratorium, allows new development to proceed without increasing water demand on the overdrafted groundwater basin. (Note: The WDO program no longer applies to the construction of Accessory Dwelling Units due to the 2019 passage of Senate Bill 13). The WDO program is intended to serve as a bridge until a supplemental water supply can be secured. The program requires developers to fund a reduction in existing water use and/or increase in supply amounting to 200% of their projected new water use. Since 2019, each development project's offset fee of $55,000 per acre-foot has been directed toward funding a water meter system upgrade from drive-by Advanced Meter Reading to Advanced Metering Infrastructure. The upgrade was initially estimated to save 86 acre-feet of water per year due to earlier leak notification features; thus, 86 acre-feet of offset credit was made available to new water service applicants for purchase. As of October 31, 2021, approximately 53 acre-feet of offset credit remains available for purchase. In 2021 to date, 24 Conditional Will Serves and 8 Unconditional Will Serves have been granted.

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

- 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 2020/2021 target water use is 85 GPCD. The SLVWD's 23,700 population served meets the 85 GPCD target with an average 80 GPCD for 2020.

Metering and Leak Detection

- In July 2016 the SLVWD's Board of Directors approved the Badger Meter project with the goal of installing the advanced metering technology at all meters. As of November 2021 about 29% 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, setup leak detection alerts and high bill notifications. In compliance with SB555, SLVWD has been conducting and submitting water loss audit reports to the Department of Water Resources (DWR). SLVWD has been improving its audit score every year from 49 in 2016 to 59 in 2020.
- The Scotts Valley Water District Advanced Metering Infrastructure (AMI) project commenced in 2017 and achieved 100% installation in January of 2021. The meters (dubbed "Intelligent Meters" or i-Meters by staff) are supported by a web portal that helps customers to manage their water usage to be more water efficient. The District activated automated leak alerts that resulted in total excess water tracked through Leak Adjustment Program to be reduced by more than 50% (from 7 million gallons in FY19 to 3.5 million gallons in FY20 to 2.5 million gallons in FY21). The SVWD is currently developing and refining a targeted messaging procedure that leverages AMI to implement a significantly more robust system of notification regarding customer-side water leaks. Data analysis of leak trends is also underway to identify additional ways this technology can be used for water use efficiency efforts.

Rebates

- In Fiscal Year 2020/2021 the SLVWD issued 29 rebates for grey water system, Energy Star rated washing machine, low-flow toilet, and weather-based irrigation controller installations.
- During the January 1, 2021 through Nov 1, 2021 The City of Watsonville Municipal Utilities distributed a total of 27 lawn rebates, 7 Sewer Lateral Rebates, 29 High Efficient Energy Star Washing Machine Replacements, 16 Toilet Rebates , and 662 water conserving devices conserving over a million gallons of water annually.

Landscape and Irrigation Water Use Efficiency

- Scotts Valley Water District's Turfs Up special lawn rebate program ran from March to the end of June 2021 and provided a temporary increased rebate rate for lawn removals ($2/square foot up from $1/sqft). The limited-time program resulted in the replacement of approximately 63,000 square feet of irrigated turf and the total estimated water savings are between 3 and 8 AFY.
- The Turf's Up program generated a noticeable increase (approximately 450%) in participation for regular lawn rebate program (28 applications on file for Q1 FY22 up from 8 applicants in Q1 FY20 and 4 in Q1 FY19).
- PV Water is continuing to support water conservation efforts in the Pajaro Valley through voluntary agricultural and residential conservation programs. Both programs provide information, technical advice, and rebates to incentivize reducing water consumption. PV Water's agricultural conservation program is supported through contracts with the Resource Conservation District of Santa Cruz County and the University of California Cooperative Extension to utilize the region's technical experts and leverage the trusted reputations the institutions have built over decades in the farming community. The technical experts evaluate current irrigation practices, provide recommendations, and assist farmers in tracking water and

fertilizer use through time. The residential conservation program supports residents through providing information about indoor and outdoor water efficient use practices, issuing rebates for rainwater catchment and graywater systems, and offers free water saving devices.

- At the end of 2020, the PV Water Board of Directors took action to provide $1.2 million in funding to bolster the conservation program. This included a commitment to fund the agricultural program for three years at approximately $400,000 per year and includes $100,000 allocated for rebates to encourage farmers to utilize new irrigation equipment that conserves water while keeping crop yields at or above previous levels. PV Water's overall conservation program goal is to conserve 5,000 acre-feet per year, as detailed in the Basin Management Plan Update (2014), with an interim milestone of 75% progress toward the goal by 2020, and achieving 100% by 2023. In 2021, PV Water performed a review of recent basin water use and determined that the program had achieved the 75% interim milestone during the 2020 water year. Conservation program efforts will continue as PV Water works to achieve the 5,000 acre-feet per year goal by 2023.

Outreach and Education

- 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.
- RCD staff also participate in groundwater management planning forums, stakeholder forums, and outreach events to provide updates and receive feedback from the community related to conservation and sustainable water management.

Groundwater Management

The County has worked with the water agencies, small water system operators, and private wells for many years to manage groundwater, a critical source of drinking water in the county. The County continues to coordinate submission of groundwater level data to the State's 'CASGEM' groundwater monitoring program. In addition to this required monitoring, County staff is also offering free well soundings to private well owners throughout the county.

The City of Santa Cruz (City) and Soquel Creek Water District (SqCWD) are continuing to analyze the efficacy of water transfers in reducing groundwater pumping from the Mid-County Basin. A 5-year pilot project occurred from November 2015 through December 2020 and was extended through April 2026 to capture five winter seasons. The pilot study includes transferring water from the City's to SqCWD's distribution system to evaluate any water quality, water quantity and operational challenges. The first year of transfer (Phase I) began in December 2018. Phase II of the water transfer began on December 6, 2019 and extended through February 1, 2020 when the intertie was closed due to the lack of available supply. Transfers are dependent upon the City's available excess water supply and SqCWD's system demand that included all of Service Area 1 with approximately 5,200 connections. In WY 2020, approximately 35 million gallons were transferred to SqCWD. Over the course of the initial 5-year pilot project, approximately 269 afy was transferred from the City to SqCWD. The ongoing drought prevented the City from transferring water for the remainder of the agreement's term, December 31, 2020. The City did accept 2MG of water from Soquel Creek during an emergency transfer when the City was facing operational challenges.

The RCD continues to facilitate the Community Water Dialogue (CWD), a stakeholder group addressing aquifer overdraft in the Pajaro Valley. During 2021, the CWD Guidance Team held quarterly meetings and exchanged updates on managed aquifer recharge, conservation, and groundwater sustainability planning. The CWD email list-serve was used to perform outreach for the Pajaro Valley Groundwater

Sustainability Update Community Meeting in Sept. 2021. The Guidance Team decided not to hold an in-person community outreach event this year.

Sustainable Groundwater Management Act Compliance

The Sustainable Groundwater Management Act of 2014 (SGMA) went into effect on January 1, 2015 and is a key driver for developing long-range plans for groundwater sustainability. In addition to the work required under SGMA, the individual agencies that depend on groundwater for some or all of their water supply continue to implement projects and management actions. The County led a process to develop a regional data management system to help the Groundwater Sustainability Agencies (GSAs) meet the requirements of SGMA, and additionally to collect and organize data collected by all of the water agencies in the County. There are several advantages to a regional system, it will provide a robust storage system for critical historical data, it will make it easier to compare data across agencies, and the portal will make it easy for interested parties to view results. The data management system will use the Water Information System by Kisters (WISKI) software. Historical data from all the water agencies has been added and the vendor is now creating the public portal, which should go live in early 2022.

The County is actively working with local water agencies to pursue sustainability for the three major groundwater basins in the County as follows:

- **Santa Margarita Basin** Management of the Santa Margarita Basin is overseen by a 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 South part of the Basin near Scotts Valley and has also seen reduction in streamflow. While groundwater levels stabilized and are no longer declining, they have not seen any recovery. The analysis shows a clear need to implement at least modest projects in order to maintain sustainability. The GSP for Santa Margarita was adopted by the GSA Board in November 2021 and submitted to DWR in January 2022. DWR has until 2024 to review the GSP[21].

- **Santa Cruz Mid-County Basin** Management of the Santa Cruz Mid-County Basin is overseen by a Joint Powers Authority (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 on the aquifers. Groundwater extraction has also reduced streamflow in parts of the Basin. Despite significant improvement of coastal groundwater levels due to water conservation and pumping redistribution, the groundwater modeling done for the GSP demonstrates that projects will be necessary to achieve sustainability.

  In June 2021, the MGA learned that their Groundwater Sustainability Plan[22] had been approved by Department of Water Resources (DWR). As of the writing of this report, the GSP remains one of only two approved Plans, the other is that of the nearby Salinas Valley Basin Groundwater Sustainability Agency. Work continues on GSP implementation, with current efforts including

[21] www.smgwa.org
[22] www.midcountygroundwater.org

expanding the monitoring network of wells and stream gages, and developing a metering program for large private water users.

Soquel Creek Water District (SqCWD) continues to implement the Pure Water Soquel Program (Program)[23] to address the Santa Cruz Mid-County Groundwater Basin overdraft situation and prevent seawater intrusion from moving further inland. The Program's design capacity is 1,500 acre-feet per year (afy) and it has been included as a primary Group 2 Project in the Santa Cruz Mid-County Groundwater Sustainability Plan (GSP). Collaboration with the regional agencies (City of Santa Cruz, County of Santa Cruz, City of Capitola, and the Regional Transportation Commission) continues to be an important part of the Program. In 2021, the Seawater Intrusion Prevention Wells Project was completed, construction began on the Conveyance Infrastructure Project, and design was completed on the Treatment Facilities Project.

- **The Pajaro Valley Water Management Agency** The Pajaro Valley Water Management Agency (PV Water) is the designated groundwater sustainability agency (GSA) of the Pajaro Valley Basin. PV Water submitted the Basin Management Plan Update (2014), the Integrated Hydrologic Model of Pajaro Valley Report, the Salt and Nutrient Management Plan, and other supporting documentation to DWR as a Groundwater Sustainability Plan (GSP) Alternative in 2016. In July 2019, DWR determined that the GSP Alternative satisfies the objectives of the Sustainable Groundwater Management Act and issued approval, making the Pajaro Valley Basin the first critically overdrafted basin in California to have an approved plan.

  In October 2020, PV Water initiated the Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22). The GSU22 effort is a mandated 5-year update of PV Water's GSP Alternative that focuses on addressing ten recommendations from DWR to strengthen the plan and facilitate its review. The GSU22 process was guided by a 17-member Ad Hoc Sustainable Groundwater Planning Advisory Committee and included the development of sustainable management criteria for seawater intrusion, surface water depletion, groundwater dependent ecosystems, interconnected surface waters and chronic lowering of groundwater levels. The final GSU22 was adopted by the PV Water Board of Directors in November 2021 and will be submitted to DWR by January 1, 2022.

  As part of the GSU22, PV Water in collaboration with the United States Geological Survey (USGS) and consultants, conducted climate change and sea level rise model simulations of the Pajaro Valley Basin. The modeling evaluated a series of potential scenarios and impacts to the Pajaro Valley Basin from sea level rise and climate change consistent with guidance from DWR for climate-based water resource assessments. The projected water budgets indicated that the GSP Alternative projects and management actions are likely to achieve their intended effects, increasing groundwater in storage and reducing the rate of seawater intrusion, through 2040. However, after 2040 climate change and sea level rise begin to outpace the influence of projects and programs and additional management actions may be required.

  In addition to the GSU22, in 2021 PV Water continued implementation of the projects and programs identified in the GSP Alternative which are described in the water supply section of this report. More information is available at https://www.pvwater.org and https://sgma.water.ca.gov/portal/#intro.

[23] www.soquelcreekwater.org/pws

Managed Aquifer Recharge

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. (A fourth system, a drywell recharge system, was also installed but is not providing desirable results.) Monitoring results for the three systems indicate that to date, they have collectively contributed about 565 acre-feet of water through infiltration into the groundwater basin. During water years 2020 and 2021 (two rainfall years) about 221 acre-feet of water were infiltrated as a result of these projects. 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, University of California at Santa Cruz, 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. Initially launched in 2016 as a 5-year pilot program, in September 2021 the PV Water Board of Directors approved continuation of the ReNeM Program beyond its pilot phase, based on the positive, cost-effective results of the program to date. Since water year 2017, the program has resulted in a total 553 acre-feet of water infiltrating into the groundwater basin resulting in $63,002 in rebates issued to landowners/growers by PV Water.

During water years 2020 and 2021, two MAR systems were included in the ReNeM program, and a third was enrolled. During summer 2021, these three infiltration systems were carefully prepared by the landowners/growers to optimize infiltration during this water year (water year 2022). Maintenance included scraping and removing fine sediments that had accumulated in the basins, disking the floor of the basins, and in one basin, adding carbon amendments in the form of woodchips to the base of the infiltration basin to enhance removal of nitrate from water as it infiltrates. UCSC researchers instrumented the systems with a variety of monitoring equipment to determine volume captured, volume infiltrated, and quality of water infiltrated during this water year.

Building Resiliency and Preparedness

The importance of resiliency and preparedness for emergencies of varied scope, intensity, and duration has been demonstrated repeatedly. Multiple stressors on water resources include drought, the aftermath of the CZU Lightning Complex Fire, and responding to changing water use patterns in response to the COVID19 pandemic. The Board of Supervisors created the new Office of Response, Recovery and Resilience (OR3) in November 2020 in the aftermath of the CZU Lightning Complex Fire. The new OR3 employs a comprehensive approach to manage the impacts of disasters and build resilience through community preparedness, climate change awareness and adaptation, hazard mitigation, coordinated response and recovery. With the County of Santa Cruz water supply resources managed by a collection of public and private water agencies, private wells as well as small water communities the OR3 will support efforts to consolidate and build resilience to all water providers and will support collaborative efforts to identify new funding to build County climate change resilience water supply and water quality projects.

Drought Response

Water year 2021 was the second consecutive dry year: rainfall was around 50% of average in 2021 following only 75% of average rainfall in 2020. All the large water supply agencies are in a declared

drought stage (see Attachment 2). Vulnerability to water supply challenges, system preparedness, and the need for back-up or emergency water supply is a focus of each community system sanitary survey and inspection.

Senate Bill (SB) 552, approved by Governor Newsom September 23, 2021, requires the creation of a county drought task force to improve preparedness for state small water systems (5-14 connections) and domestic wells with less than 5 connections. Drinking Water Program staff are working the County Water Advisory Commission, along with staff from the County Office of Response, Recovery and Resilience (OR3) to establish this task force. Representatives from local and state governments, community organizations, local water suppliers, and residents will be invited to participate in this effort. During this process, the task force will identify potential drought and water shortage conditions and propose short-term and long-term solutions.

Drinking Water Program staff have coordinated with small water systems to evaluate current drought impacts and identify needs. The County has requested state funding from the Department of Water Resources and the State Water Resources Control Board for specific small water system infrastructure needs and drought recovery resources for domestic wells. Small water systems will be required to implement certain resiliency measures per SB 552, depending on system type and size. These requirements fall under the purview of the Drinking Water Program, and County staff will work with water systems to ensure these measures are implemented.

In response to the current drought conditions, the state has made emergency drought funding available for local agencies and small water systems. The region is poised to take advantage of these State-developed drought relief programs as follows:

- The County Water Resources program has submitted a request for $426,000 to build the County's capacity to respond to drought and help the community, particularly private wells and small water systems that are otherwise on their own. Funding would be used to conduct outreach to private well owners to inform them about resources, provide well soundings and water quality testing, and create a reserve fund for hauled water and water quality point of use equipment.
- In September 2021, Davenport County Sanitation District applied for $3.6M grant funding through the Department of Water Resources' Small Community Drought Relief Program. The funding will enable permitting, design, and construction of a 700,000-gallon water tank to store treated water during drought conditions or if surface water quality is unsuitable for treatment. The stored water could also be used for fire protection.
- The SLVWD's Board of Directors approved consolidation with Big Basin Water Company, Forest Springs Mutual, and Brackenbrae Mutual. In November 2021 the District was approved for grant funding through the Department of Water Resources Small Community Drought Relief Program to consolidate the two small water systems of Bracken Brae and Forest Springs been impacted by drought into SLVWD.

The State Water Resources Control Board approved a Temporary Urgency Change Petition for the City of Santa Cruz in order to preserve storage in Loch Lomond during the dry conditions characterizing 2021. Other supplemental water sources include the use Aquifer Storage and Recovery (ASR) to increase groundwater storage for use during drought. The City of Santa Cruz is evaluating the efficacy of injecting treated surface water into the Mid-County and/or Santa Margarita groundwater basin. The City completed a pilot ASR test in their Beltz 12 production well located on Research Park Drive in July 2019 with no operational or water quality issues found. The second phase of pilot testing involved the second of four existing groundwater wells, Beltz 8. Two new monitoring wells were drilled at the Beltz 8 site and Pleasure Point between January and March 2020 and pilot testing to inject and extract water over three

increasingly-longer cycles commenced shortly thereafter. Cycles 1 and 2 were completed in May; Cycle 3 was postponed until further data collection and evaluation could be completed related to unexpectedly higher levels of Arsenic. ASR pilot testing at the Beltz 8 site resumed late March 2021 and continued through June 2021. The Cycle 3 test program was split into Cycles 3a and 3b to generate the data needed to validate the geochemical evaluation to understand any risk associated with elevated arsenic concentrations appearing during Cycle 2. Beltz 8 ASR Cycle 3a consisted of two weeks of injection, four weeks of resting, and two weeks of extraction. Similar to Beltz 8, an ASR Demonstration Study at Beltz 12 is also scheduled for the period of January 2022 through December 2023.

- The analysis of data resulting from Cycle 3a indicates that the presence of arsenic in the aquifer matrix initially exposed during ASR Cycles 1 and 2 decreased during ASR Cycle 3a and indicated further arsenic reduction with incremental ASR cycles and longer storage time of the injected water. Based on these findings the City decided to conduct piloting for an extended duration, referred to as an ASR Demonstration Study.
- This Demonstration Study is similar to the pilot study in that infrastructure will not be improved or made permanent, and data collection objectives are established to inform a permanent facility, but differs in that the scale (i.e., the seasonal nature of injections and extractions, injection and extraction rates and seasonal volumes) matches that of a full-scale permanent operation. The demonstration study will continue to evaluate arsenic mobilization as well as other operational characteristics such as sustainable flow rates, plugging characteristics, overall well operations, etc.

Since 2014 when the Soquel Creek Water District's (SqCWD) Board of Directors declared a Groundwater Emergency due to groundwater overdraft and seawater intrusion, SqCWD has been in a Stage 3 water supply shortage. The current Stage 3 shortage calls for SqCWD customers to collectively use 25% less water than SqCWD's expected highest production of 3,900 acre-feet per year. This curtailment target equates to an efficient residential water use guideline of 50-55 gallons per capita per day (gpcd). While SqCWD groundwater production has rebounded several hundred acre-feet from the 2015 low (during the height of the statewide drought) of approximately 3,100 acre-feet, residential customers are still using water efficiently at a rate of about 55 gpcd based on a running 2021 annual average.

Fire Response and Preparedness

Following the CZU Lightning Complex Fire, the SLVWD, in conjunction the State Water Resources Control Board Division of Drinking Water (DDW), issued a Do Not Drink-Do Not Boil (DND-DNB) water notice on August 28th, 2020 as a precaution to all service areas impacted by the fire. Prior to and following the issuance of the DND-DNB notice, SLVWD crews executed a comprehensive flushing and water quality testing of over 400 samples[24]. Inside of the DND-DNB notice area, SLVWD crews physically removed SLVWD owned service laterals connecting the water main to any structures that had burned from the water distribution system. Based on water quality test results, the DND-DNB notice was lifted on October 27th, 2020. In addition, the SLVWD developed a Long-Term VOC Monitoring Plan to track potential contamination in the distribution system in the months and years following the CZU Lightning Complex Fire. All results of the Long-Term VOC Monitoring are regularly posted on the SLVWD's website[25]

Immediately post-fire, the SLVWD engaged multiple contractors repair critical infratructure:

[24] Monitoring parameters included: Volatile Organic Compounds (VOC's), Nitrate, bacteriological samples and general physical samples.
[25] www.slvwd. com/water-quality/pages/long-term-voc-monitoringpost-czu-fire

- Foreman Creek diversion and pipeline to Lyon treatment plant. This allowed the treatment plant to be brought back online and resume providing treated surface water to the North system.
- Piping between Lyon tank, Little Lyon tank, and Big Steel tank. The replacement of this burned pipeline allowed the Lyon and Little Lyon tanks to be returned to service.
- Little Lyon tank was recoated, interior and exterior, to eliminate VOC contamination.
- Riverside Grove Pump Station was re-roofed to correct fire damage

The SLVWD prepared a Fire Management Plan in 2020 through partnership with Panorama Environmental INC. The plan includes mapping, road access for fire personnel and improve communications with Fire Prevention Agencies. The final plan was adopted by Board of Director's on June 3, 2021 and implementation is beginning to take place through state grant funding. In 2020/2021 the District has secured the following fuel reduction and planning grants: $200,000 through the Coastal Conservancy's Wildfire Resilience Grant program; $6,822.00 through CALFIRE's California Forest Improvement Program (CFIP); and $440,000 through CALFIRE's Forest Health Grant.

Flood, Climate Change, and Emergency Preparedness

Governor Newsom signed SB 496 (Laird) on September 24, 2021, which authorizes the California Department of Water Resources (DWR) to provide 100% cost share of non-federal capital costs to critical investments in emergency preparedness. SB 496 underscores DWR's commitment to prioritize multi-benefit projects in communities where residents are economically disadvantaged. This legislation will enable communities to implement and maintain necessary and long-awaited flood risk reduction solutions.

The Santa Cruz County Flood Control and Water Conservation District continues to refine and expand County-wide stream and rain gage monitoring capability to support enhanced situational awareness and emergency response. This activity includes enhanced web-based, publicly accessible data as well as improved communication and support of the County Emergency Operations Center and Emergency Management personnel. District staff continue to maintain operation of the Automated Local Evaluation in Real Time (ALERT) flood warning system. This system has recently been expanded to include 7 additional rain gaging sites and additional online monitoring features in support of emergency response for debris flows emanating from the CZU Lightning Complex burn scar. Staff have also been highly engaged with the State WERT Team, other federal and State technical specialists, and the County Geologist in assessing debris flow hazards and working to support emergency warnings and response for debris flows.

The City of Watsonville adopted the 2030 Climate Action and Adaptation in October of this year. The plan lays out a pathway for the City to cut emissions, prepare for the impacts of climate change, and engage in ecological restoration. Strategies to reduce emissions will focus on electric vehicle adoption, building electrification, and organic waste management. The plan builds on the City's Local Hazard Mitigation Plan to develop further adaptation strategies. The ecological restoration section focuses on projects and concepts that will help to draw excess carbon from the atmosphere and return it to the soil. The plan also recognizes that significant support from the State and Federal government, along with policy changes, are necessary to achieve the level of action required to adequately address climate change. The plan was developed with input from stakeholders and community members and includes efforts to foster green job creation and community development.

The Santa Cruz County Flood Control and Water Conservation District – Zone 7 (Zone 7), Monterey County Water Resources Agency (MCWRA), City of Watsonville, County of Santa Cruz, and County of Monterey have joined together to form the Pajaro Regional Flood Management Agency—a regional Joint Powers Agency that will oversee operations and maintenance of the Pajaro River levee systems as

well as capital improvements addressing flood risk reduction in the Pajaro Valley area, including the levee reconstruction project on the Pajaro River.

The Santa Cruz County Flood Control and Water Conservation District has been awarded a Flood Emergency Response Grant from the California Department of Water Resources in the amount of $725,467 to fund the configuration, installation, and operation of an enhanced weather monitoring system. The system will monitor real-time rainfall across the County via X-band radar and will drastically improve the predictive capability of flooding events through the provision of higher spatial and temporal resolution of inbound and overhead storm systems. Using a competitive Invitation for Bid, a contractor has now been selected to build the radar system. Initial installation of the system is expected to occur in early 2022, with the hope that operational testing of the system can be initiated in winter of 2022-23.

The Pajaro Regional Flood Management Agency (PRFMA), with the two existing non-federal project sponsors (Zone 7 and MCWRA), continue to pursue implementation of a flood risk reduction project with the Army Corps of Engineers to significantly upgrade the flood conveyance system to provide an adequate level of flood protection for the Pajaro River, Salsipuedes Creek, and Corralitos Creek. Sufficient federal funding has now been awarded ($4.615M) to complete the Preconstruction Engineering and Design Phase for the Project, which is expected to take 2-3 years. Project sponsors are currently seeking federal investment in construction through the pending infrastructure package that leverage the Project's Natural and Nature-based Solution using setback levees and the Project's protection to disadvantaged communities in Watsonville and Pajaro.

The City of Watsonville was awarded a $200,000 Climate Resiliency Challenge grant through the Bay Area Council Foundation to create a Green Infrastructure and Implementation Plan (GIIP). Through the GIIP, the City will look for opportunities to reduce impacts of climate change to the community by increasing water quality supply, reducing flooding, combating urban heat island effect, and improving neighborhood vitality and overall community aesthetics. The City is finalizing the priority projects and working on implementation of key concepts through the City's Ramsay Park Master Plan effort. The Green Infrastructure and Implementation Plan will be used in parallel with future City wide planning efforts in order to reduce the effects of climate change in the urban environment.

Supplemental Water Supply Projects

The County, City of Santa Cruz Water Department (SCWD), SLVWD, and Scotts Valley Water District continue to collaborate on a Memorandum of Agreement to work together on exploring conjunctive water use options in the San Lorenzo Watershed and Santa Margarita Groundwater Basin. These efforts will explore many ways to utilize excess winter surface water when available to increase groundwater storage and water supply reliability and increase dry season stream flow.

The SCWD continues to implement the Santa Cruz Water Rights project to improve the SCWD's water system flexibility while enhancing stream flows for local anadromous fisheries. The project includes changes to the SCWD's existing water rights in terms of places of use (including diversion to groundwater storage), points of diversion, and extension of time to beneficially use existing rights under existing permits. The SCWD is not proposing to increase any rate or total amount of water diverted. This project is needed to facilitate regional supply projects. Certification of the Final Environmental Impact Report will be considered by City Council at their December 14, 2021 meeting.

The SCWD is continuing the evaluation of the role that recycled water may play in a future water supply portfolio by implementing Phase 2 of the Recycled Water Study to consider alternatives that contribute to water supply: groundwater injection in the Mid-County and/or Santa Margarita groundwater basins, use for irrigation, and direct potable.

The SCWD has begun developing a water supply implementation plan for the work plan recommended by the Water Supply Advisory Committee in 2015. The plan will also be informed by a vulnerability

analysis of the water system that incorporates future uncertainties related to climate change and water supply variability in the context of the inherent water system vulnerabilities. The vulnerability assessment uses a modeling approach to simulate changes in climate and weather, river flow, and system operations. The Weather Generator is one model that provides insights into thresholds of changes in key climate parameters that impact system resiliency, and in finalizing a new operations model. This work is ongoing through the remainder of the calendar year and will inform the implementation plan in Calendar Year 2022.

In September 2020, the Scotts Valley Water District board received a final report (prepared by Kennedy Jenks Consultants), which scored and ranked three local and three regional recycled water project alternatives. Due to the recent issues and challenges at the City of Scotts Valley's Wastewater Reclamation Facility, the City commissioned Kennedy Jenks Consultants to prepare an options study for their wastewater treatment facility. The SVWD is waiting for the results of that study to help to determine the recycled water supply strategy. Meanwhile, the SVWD is having preliminary discussions with the City of Santa Cruz and Soquel Creek Water District to assess the viability of regional recycled water supply projects.

In January 2017, PV Water's Board of Directors approved an action to proceed with the implementation of water supply projects described in the stakeholder developed Basin Management Plan Update (2014) and later incorporated into GSP Alternative. The plan includes a three-part approach designed to eliminate groundwater overdraft and halt seawater intrusion: 1) conservation of water, 2) optimization of existing water supplies, and 3) development of new water supplies.

In 2021 agency staff, in collaboration with a team of engineers, environmental scientists, and other experts, continued working to engage interested parties, advance project designs, prepare environmental documentation, pursue the procurement of property rights, continue water rights permitting processes, and sought grant funding to implement the College Lake Integrated Resources Management Project (College Lake Project) and the Watsonville Slough System Managed Aquifer Recharge and Recovery Projects summarized below. Key activities included development of a revised rural alignment of the College Lake Pipeline; preparation of 100% designs for the College Lake Project water treatment plant, adjustable weir, fish passage, and pump station; preparation of the College Lake Project draft Adaptive Management Plan; the expected issuance of the College Lake Project water right permit; and the acceptance of the Struve Slough water right permit application

i. *College Lake Integrated Resources Management Project (College Lake Project)*. When constructed this project would collect, store, treat, and deliver approximately 1,800 to 2,300 acre-feet per year (AFY) of surface water for agricultural irrigation in the coastal area.

ii. *Watsonville Slough System Managed Aquifer Recharge and Recovery Projects*. This project has the potential to yield 2,400 AFY by diverting storm water runoff from Harkins Slough and the confluence of Struve and Watsonville Sloughs to a shallow aquifer system on the San Andreas Terrace for storage and recovery.

PV Water completed the first of a 3-Phase Recycled Water Facility Optimization Project, which received funding from the State Water Resources Control Board and the Bureau of Reclamation in late 2017, with construction of a 1.5 million gallon recycled water storage tank and distribution pump station improvements. In 2020, construction of Phase II, the Disk Filter Improvement Project, finished and was placed into service improving operational efficiency and capacity. Phase III of the project will equip a second ultraviolet (UV) disinfection light train is currently being considered and will likely proceed.

Attachment 1: Water Use in Santa Cruz County, 2021 (Data for smaller systems is from 2020)

Water Supplier	Connections	Population	Water Use acre-feet/yr	Ground water	Surface Water	Recycled Water	Imported
Santa Cruz City Water Dept.	24,589	96,168	7,914	5.0%	93.0%	2%	
Watsonville City Water Service	14,884	65,231	7,040	100.0%	0.0%		
Soquel Creek Water District	14,500	40,644	3,259	100.0%	0.0%		
San Lorenzo Valley Water District	7,900	23,700	1,961	70.0%	30.0%		
Scotts Valley Water District	3,946	10,749	1,299	84.0%		16%	
Central Water District	825	2,706	405	100.0%			
Big Basin Water Company*	482	1,120	150	100.0%			
Mount Hermon Association	494	2,850	155	100.0%			
Forest Lakes Mutual Water Company	326	1,076	42	100.0%			
Smaller Water Systems (5-199 conn.)	2,616	7,691	1,561	87.0%	6.0%		7%
Individual Users*	8,000	21,000	2,350	95.0%	5.0%		
Pajaro Agriculture (SC Co only)**†			23,750	94.0%	1.0%	5%	
Mid- & North-County Agriculture*			2,400	90.0%	10.0%		
Totals	**78,562**	**272,935**	**52,286**	**80%**	**17%**	**3%**	**0.2%**
Summary by Water Source (acre-feet/year)				**41,973**	**8,637**	**1,524**	**109**
Summary of Non-Agricultural Use (acre-feet/year)			**26,136**	**17,488**	**8,160**	**337**	**109**

*Values are Estimates

** Includes a small number of water systems

† Recycled water source is the City of Watsonville

Attachment 2: Current Water Use Restrictions and Conservation Services in Santa Cruz County

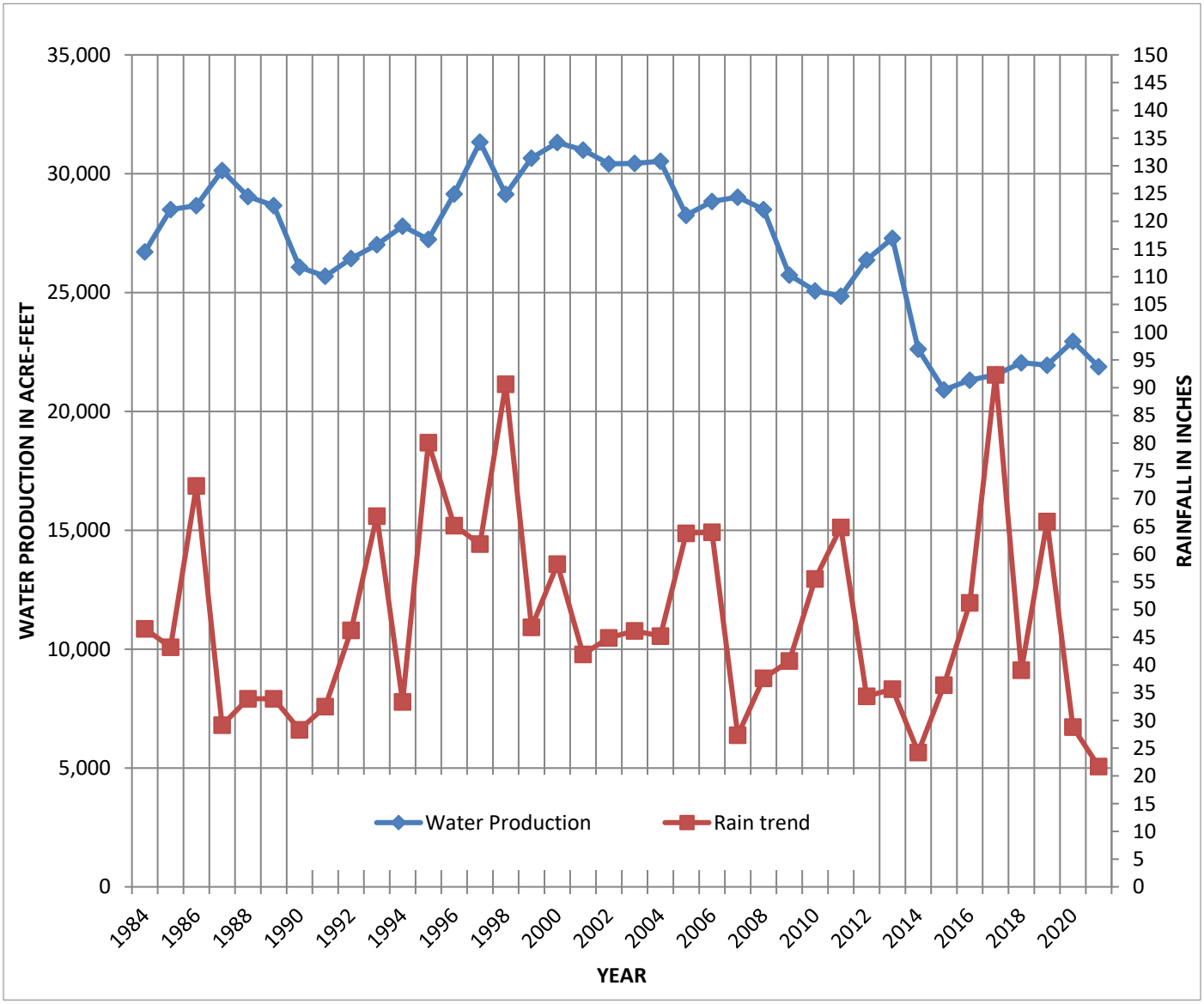
Agency	Water Source	Drought Stage (Locally Defined)	Current Restrictions	Services being Offered	Supplemental Supply Projects
City of Santa Cruz Water Department	**Surface Water** (95%) **Ground Water** (5%)	**Stage 1 Water Shortage**	**Plumbing Retrofit Program:** Homes must be retrofitted with low flow fixtures at time of sale During a Stage 1 Water Shortage Warning, each customer class (residential, commercial, irrigation,) is provided with a monthly allotment of water. No overage fees assessed in Stage 1 • Landscape Irrigation budgets reduced by 25%	**Home water survey** **Free conservation devices** **WaterSmart leak notification** **Rebates** • Toilet replacement • Energy Star appliances • Laundry to landscape • Lawn replacement • Rain barrels • Hot water recirculation	Aquifer Storage and Recovery Water Exchanges with Soquel Creek Water District during high surface water flow periods Santa Cruz Mid-County Groundwater Agency Member Santa Margarita Groundwater Agency Cooperating Agency
Scotts Valley Water District	**Ground Water** (100%)	**Stage 2 Water Shortage**	**Plumbing Retrofit Program:** Homes must be retrofitted with low flow fixtures at time of sale Customers asked to water outdoors not more than two times a week. Restaurants encouraged to only serve water upon request Recommended that hotels give guests an option to not launder bed sheets every day.	**Free conservation devices** **WaterSmart leak notification** **Rebates** • Toilet replacement • Pressure reducing valves • Graywater irrigation • Lawn replacement • Rainwater catchment • Downspout diversion • Replace hardscape with permeable surfaces • Weather Smart irrigation controllers • High volume to rotary spray head replacement	Recycled Water facility for Irrigation Stormwater Capture for Groundwater Recharge Santa Margarita Groundwater Agency Member

Agency	Water Source	Drought Stage (Locally Defined)	Current Restrictions	Services being Offered	Supplemental Supply Projects
Soquel Creek Water District	**Ground Water** (100%)	**Stage 3 Water Shortage**	Efficient water use: annual average of 50-55 gallons per person, per day Car Washing Restriction: a waterless spray, a bucket and hose with an automatic shut-off nozzle, and/or a pressure washer. Minimize water running off the property. Exterior Structure Washing Restriction: No exterior washing of structures unless for sanitation and health purposes, or if preparing to paint or stain and a pressure washer is used.	**Free conservation devices** **WaterSmart leak notification** **Grants for projects promoting conservation awareness** **Rebates** • Landscape replacement • Toilet replacement • Showerhead replacement • Washing machines • Drip irrigation retrofit • Graywater irrigation • Weather Smart irrigation controller • Rain sensors • Hot water recirculation • Pool covers • Pressure reducing valves • Rain catchment • Downspout diversion • Sub-metering	Construction of Pure Water Soquel to limit seawater intrusion Surface Water transfers from City of Santa Cruz Stormwater Capture for Groundwater Recharge Santa Cruz Mid-County Groundwater Agency Member
San Lorenzo Valley Water District	**Surface water** & **Ground Water** (% Varies)	**Stage 2 Water Shortage**	• No watering between the hours of 10AM - 5PM. • Outdoor irrigation is permitted only 2 days a week • Do not wash down hard or paved surfaces. • Do not initially fill or refill residential swimming pools.	**Free water-wise audit** **Free conservation devices** **Rebates** • Toilet replacement • High efficiency washer • Graywater irrigation	Conjunctive Use of Surface and Groundwater sources Santa Margarita Groundwater Agency Member

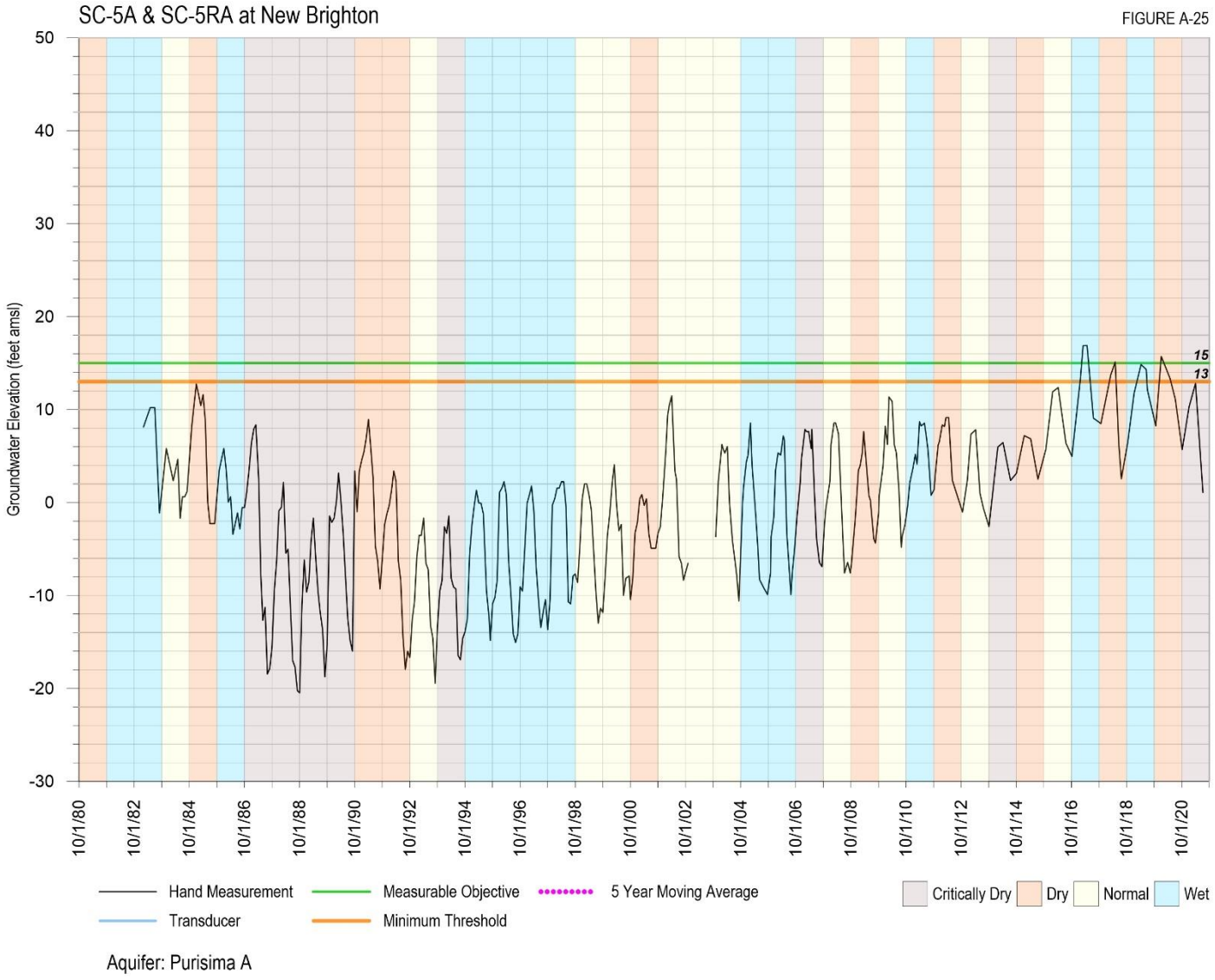
Agency	Water Source	Drought Stage (Locally Defined)	Current Restrictions	Services being Offered	Supplemental Supply Projects
			• Shut-off nozzles are required on all hoses.	• Weather Smart irrigation controllers	
City of Watsonville	**Surface water** (10%) **Ground Water** (90%)	**Stage 1 Water Shortage**	**Plumbing Retrofit Program:** Homes must be retrofitted with low flow fixtures at time of sale	**Water consultations** **Rebates** • Landscape replacement • Toilet replacement • Washing machines	Water source for Recycled Water Treatment Facility which provides recycled water for crop irrigation
Central Water	**Ground Water** (100%)	**None Declared**	Subject to County restrictions	**Rebates** • Toilet replacement • High efficiency washer	Santa Cruz Mid-County Groundwater Agency member agency
Pajaro Valley Water Management Agency	**Ground Water Manager**	**Not Applicable**	Does not supply potable water, however does supply recycled water for crop irrigation.	**Recharge Net Metering** **Rebates** • Rainwater catchment • Laundry to landscape **Delivered recycled water for irrigation along the coast.**	Coastal Distribution System-Pipeline Expansion Project College Lake Integrated Resources Management Project Watsonville Slough System Managed Aquifer Recharge and Recovery Projects

Agency	Water Source	Drought Stage (Locally Defined)	Current Restrictions	Services being Offered	Supplemental Supply Projects
County of Santa Cruz **Regulates:** Small Water Systems (5-199 connections) Private Well Owners	**N/A**	**Acknowledged State of Drought Emergency**	**Plumbing Retrofit Program:** Homes must be retrofitted with low flow fixtures at time of sale • No wasteful water use • No operating ornamental fountain or cooling system that doesn't re-circulate water • Outdoor water restrictions ○ No hosing off hardscapes ○ No irrigation run-off ○ Shut-off nozzle required on hoses ○ Leaks must be repaired ○ Limit outside watering to 2 days per week for 15 minutes ○ No spray irrigation 10am-5pm	**Well sounding** **Water quality testing** **Developing drought response program**	Santa Cruz Mid-County Groundwater Agency Member Santa Margarita Groundwater Agency Member Stormwater Capture for Groundwater Recharge

Attachment 3: Water Use Relative to Rainfall for all Major Municipal Suppliers, Combined, 1984-2021



Attachment 4: Coastal Groundwater Levels, Mid-County Basin, New Brighton area



Attachment 5: Common Acronyms

AF	**Acre Foot**
AFY	**Acre Foot per Year**
BMP	**Best Management Practices**
CEQA	**California Environmental Quality Act**
CWD	**Central Water District**
DMS	**Data Management System**
DPW	**Santa Cruz County Department of Public Works**
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**
PPB	**Parts Per Billion**
RCD	**Resource Conservation District of Santa Cruz County**
RWMF	**Regional Water Management Foundation**
SCWD	**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**

Attachment 6: 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 Fire Recovery	http://www.co.santa-cruz.ca.us/FireRecovery.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/