Santa Cruz County
Water Resources Management
Status Report for 2020

Prepared by County of Santa Cruz
Environmental Health

Photo of burned water pipeline belonging to the San Lorenzo Valley Water District in September 2020. Credit Kristen Kittleson

Introduction

Santa Cruz County surface water and groundwater resources provide drinking water for residents and visitors, critical habitat to numerous plant and animal species, and opportunities for recreational and commercial activities. Like many other areas of California, the County faces water resource challenges including inadequate water supply particularly during droughts, impaired water quality, overdrafted groundwater basins, depleted streams, and degraded riparian habitat. The overwhelming 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. County staff, local agencies, organizations, and the community are continuing to work together toward long term solutions to ensure a reliable water supply balanced with maintaining environmental benefits.

The 2020 water year was mixed. By mid-January rainfall levels were well above average and there was hope for a substantial water year. Instead, the rain stopped leading to a complete lack of measurable precipitation the entire month of February. Significant rainfall did pick up in March and continue through May but discharge rates in the San Lorenzo River watershed remained below average after mid-January as did total precipitation.

There were two major stories that shaped 2020 at a local level, both of which had some impact on water. On March 16th local businesses, offices, tourist attractions, and hotels shut down, as the County locked down in response to the COIVD19 pandemic. That shift, while most dramatic in the spring, greatly changed the way the community uses water. There was a decrease in commercial water use from restaurants, hotels, camps and offices, and an increase in water use from residences as people sheltered in place. While there is still analysis to be done, it appears that there was an overall slight increase in water use over the previous year.

The next major story was the CZU Lightning Complex Fire. The fire was started by a rare and stunning lightning storm which struck on August 16th, and ultimately burned more than 85,000 acres of land in West Santa Cruz County. Over 900 houses were destroyed. Several water systems including the San Lorenzo Valley Water District, the City of Santa Cruz Water Department, and the Big Basin Water Company experienced damage to infrastructure and/or the watershed on which they rely. County Environmental Health worked with the Federal Emergency Management Agency and California Office of Emergency Services to quickly remove hazardous materials from the burn site, begin the process of removing debris, and take efforts to control possible toxic runoff before the region sees heavy rains. The County Water Quality Lab is working with staff from the City of Santa Cruz and San Lorenzo Valley Water District to monitor the impact of the fire on surface water quality. The ultimate impact of the fire and subsequent tree removal on water quality and habitat value will not be fully understood for at least a year or two. The potential for catastrophic landslides which could damage property and critical fish habitat is a big concern going into 2021.

One more big change is taking place in 2021. After over 40 years working on countywide water resources management, John Ricker is retiring at the end of 2020. John started working as a student worker for the County in 1974 and, with the exception of an extended sailing trip in the early 1980's, has been with the County ever since. His always calm and thoughtful approach to challenges, along with a strong commitment to partner with the other water management groups within the County, has shaped resource protection and built a strong foundation of positive collaboration in Santa Cruz. Appreciation has poured in from throughout the County and the State, thanking John for his decades of service and we all wish him well on his next adventure.

The County and its partner agencies continue to conduct a range of efforts for water resource management to address resource challenges. Following is a summary of some of the water resource management activities undertaken in 2020, organized under seven topic areas:

1. Water Quality

2020 was a dynamic year as the County Water Quality Lab navigated COVID-19 restrictions, responded to water quality concerns in the aftermath of the CZU lightning fires, expanded their drinking water testing program, and sustained ongoing beach and watershed monitoring. A big focus was to develop rapid screening methods for detecting the evidence of contamination in water systems impacted by the fires. In addition, significant progress was made on microbiological testing.

a) Fire recovery support: Two types of water quality issues were triggered by the CZU fires. Immediately after the fires, many local residents reported damage to wells, water tanks, pipelines, and onsite treatment systems. In addition, there are ongoing concerns about impacts of runoff, downed trees, and debris flow on local watersheds. The water quality program launched two parallel efforts in support of the fire recovery efforts.

i. Drinking water systems: Testing supplies and analytical tools were procured to enable rapid testing of drinking water systems that were directly or indirectly impacted by the fires.

The water quality program was able to go beyond the traditional testing approaches and implement new analytical capabilities to detect fire-related chemical contaminants. To date, the County has tested drinking water from about 30 sites in Ben Lomond, Bonny Doon, Boulder Creek, Brookdale, Davenport, and Empire Grade. The primary issue identified was bacterial contamination due to tank failures or loss of pressure. A more comprehensive testing program is planned for 2021 with a focus on detecting and mitigating fire-related chemical contamination.

ii. Ambient water resources: The County identified sentinel monitoring sites along the north coast and in the San Lorenzo Valley to try to detect evidence of fire-related contamination. To-date three sets of samples have been collected from about 20 locations. Immediately after the fires, access was limited due to safety concerns. In general, sites were monitored in three timeframes:

- within 3 weeks after the fires,
- post-fire and pre-rain, and
- post rain.

The County is also partnering with the City of Santa Cruz for monitoring some sites in the San Lorenzo Valley to track potential changes over the upcoming storm season.

iii. Following the CZU Lightning Complex Fire, the Volatile Organic Compound Benzene was detected above the state MCL in the Riverside Grove neighborhood of Boulder Creek. Following the detection, the San Lorenzo Valley Water District (SLVWD) issued a Do Not Drink, Do Not Boil Notice. Meanwhile, SLVWD crews:

- Continued to collect water quality samples in all fire affected zones
- Aggressively flushed the fire affected areas
- Physically removed from the distribution system all service laterals to connections of burned structures

VOC's were not detected above the state MCL's after 9/7/2020, as SLVWD's actions led to a quick recovery in water quality of the distribution system. The SLVWD will be monitoring fire impacted areas on a routine basis for VOC's until at least December 2022. The County's Water Quality program is also implementing testing for benzene and other VOCs on an as-needed basis.

b) Monitoring programs: The County's ongoing recreational water monitoring program includes routine monitoring of about 30 beach sites to track potential health risks due to bacterial contamination. During 2020, some sampling activities were curtailed due to COVID-19 restrictions and beach closures. The County also partnered with the City of Watsonville and Watsonville Wetlands Watch to implement bimonthly testing of Watsonville Sloughs. The County also continued monitoring programs to meet requirements of the Clean Water Act (CWA) Total Maximum Daily Loads (TMDLs) in local waterbodies. Coordination with other organizations: County staff continued to coordinate with the City of Santa Cruz, the City of Capitola, the City of Scotts Valley, and the County Sanitation District to implement projects and conduct monitoring to assess public health threats, reduce bacterial

contamination, and improve water quality. Data are posted on a website[1] and mobile dashboard[2] where the most recent water quality data are mapped for locations across the County.

i. County staff continued to collaborate and strategize with the City of Santa Cruz, Save the Waves Coalition, Surfrider Foundation, and the Sierra Club in the Cowell Beach Working Group, to better understand and control recurring episodes of elevated bacteria levels at Cowell. Ongoing City improvements and improved monitoring protocols have led to more consistent water quality, however there were still health advisories due to elevated bacteria (29 in 2017, 8 in 2018 13 in 2019, 67 in 2020). About 23% of the 2020 health advisories were associated with wet weather events. When there are elevated bacterial levels, the County strives to conduct follow-up testing within 48 hours to try to identify potential causes through supplemental water quality testing and bacterial speciation. The County continues to work closely with the City to ensure that posting of the beaches is accurate and up-to-date. The 2020 monitoring season provided an opportunity to conduct trials of EPA approved testing technologies that can provide same-day water quality results and enable more rapid follow-up investigations. These methodologies will be developed further in 2021.

ii. County staff continue to monitor harmful algae blooms in vulnerable waterbodies. The County partners with the City of Watsonville to monitor nutrient levels and cyanobacterial toxins in Pinto Lake. There was no evidence of release of cyanobacterial toxins in Pinto Lake during 2020, most likely due to mitigation measures and the in-lake treatment that was implemented in 2017. However, algal blooms were detected at nearby Kelly and Drew Lakes and also in several nearshore lagoons.

iii. County staff contribute monitoring data and statistical analyses of water quality in impaired watersheds (San Lorenzo, Soquel, Aptos, Pajaro, Corralitos/Salsipuedes, Watsonville Sloughs, Pinto Lake) in accordance with the Total Maximum Daily Load (TMDL) requirements of the Clean Water Act. County staff also conduct monitoring to in conjunction with flood control efforts, particularly in the lower Pajaro River.

c) Analytical capabilities: During 2020, the County's Water Quality Laboratory expanded its analytical capabilities to enable detection of organic contaminants in drinking water and surface water. The Laboratory also continued refining microbiological and biochemical test methods

i. *Organic contaminants*: In late 2020, the Laboratory installed a new gas chromatograph to enable screening of water samples to identify the presence of volatile organics in water, such as benzene. The Laboratory also implemented the use of fluorometry and enzyme methods to determine if benzo(a)pyrene or other fire-related contaminants are present in drinking water sources and in runoff in the aftermath of storm events.

[1] http://scceh.com/waterquality.aspx
[2] http://sccgis.maps.arcgis.com/apps/opsdashboard/index.html#/d500dbfbd292461a834462cb867c2224

ii. *Nutrient testing*: A key concern in the aftermath of fires is to determine if increased loading of nutrients and organic carbon to local watersheds can trigger algal blooms and release of cyanobacterial toxins. During 2020, the County expanded the scope of testing to allow for more detailed tracking of the form of nitrogen and phosphorus that are prevalent in each watershed.

iii. Microbiological testing: The Laboratory continued refining molecular and biochemical techniques to determine if microbiological contamination is due to human activities within the watershed (e.g. onsite wastewater systems, encampments, illicit discharges) The Laboratory implemented EPA methods for same-day detection of indicator bacteria (Enterococci) to complement ongoing beach monitoring activities. The Laboratory also explored the feasibility of implementing wastewater surveillance techniques to track the prevalence of COVID-19.

iv. Cyanobacterial toxins: The Laboratory continued development of capabilities to detect seasonal health risks in inland lakes and nearshore lagoons due to algal blooms and release of cyanobacterial toxins.

d) Outreach: County staff partnered with Citizen Science activities sponsored by the Coastal Watershed Council and the Watsonville Wetlands Watch to process samples and generate defensible water quality data. Due to COVID-19 restrictions, the annual May 'Snapshot Day' was cancelled in 2020. The County also hosted student interns from UCSC and from Whitman College. The students participated in field and laboratory activities and received hands-on experience in various aspects of the water resources program. They also were able to learn about potential career pathways.

e) Laboratory Accreditation: During 2020, the Water Quality Laboratory continued to meet accreditation requirements under the State's Environmental Laboratory Accreditation Program (ELAP) and provide analytical services for small drinking water systems, private wells, storm drains, and other local water quality testing requirements. The laboratory has applied for renewal of the ELAP accreditation, which currently expires in early 2021.

f) County staff maintain ongoing efforts for water quality protection through onsite wastewater system management, monitoring, and investigation, funded by County Service Area (CSA) 12. Properly functioning onsite wastewater systems are critical for maintaining in-stream flows in the San Lorenzo River to support fisheries and ecosystems. County staff submitted in November an updated sewage disposal ordinance and a Local Area Management Plan (LAMP) to the Central Coast Regional Water Quality Control Board for their review. The ordinance and LAMP must comply with State standards for onsite sewage systems.

2. Watershed Health, Aquatic Habitat, and CZU Fire Response

The County and partner agencies and organizations continue to prioritize the management of natural resources to benefit the plants and animals living within the County, many of which are threatened or endangered. 2020 was a particularly challenging year as groups throughout the County navigated the aftermath of the CZU fire which burned over 87,000 acres of land.

a) The County Water Resources Program and the Resource Conservation District of Santa Cruz County (RCD) developed and implemented a program to reduce toxic runoff from burned structures to protect community water supplies. This Toxic Runoff Control Program focused on approximately 400 high priority structures that were adjacent to streams or within water supply watersheds. The County and the RCD then worked with CalOES, the Dept of water Resources and the California Conservation Corps to install runoff control measures such as wattles and compost socks. The RCD secured additional support from the Fire Recovery Fund of the Community Foundation of Santa Cruz County and from the City of Santa Cruz to provide runoff control materials for additional sites, and completed several demonstration sites to train crews, volunteers, and landowners on proper installation of runoff and erosion control measures. For more information on the post-fire recovery services the RCD is providing, visit http://www.rcdsantacruz.org/post-fire

b) The RCD responded to community needs for post-fire recovery education, coordination, and technical assistance to support landowners as they were able to safely return to their properties. The RCD's outreach and education efforts include webinars, workshops, tabling events, supporting public communication through the Fire Safe Council of Santa Cruz County, and developing an online post-fire recovery resource library. Water Resources staff contributed a presentation about preparing for post-fire changes along streams and waterways. In partnership with the RCD, County Water Resources and Planning staff produced a Watershed Recovery Guide that includes the basics about post-fire property assessments, where to find more information and when to rely on nature for recovery. Water Resources staff assisted with messaging and outreach about debris flow hazards.

c) The RCD mobilized a team of experts with specialties in erosion control, rural roads, forestry and engineering to complete over 400 site visits to properties impacted by the CZU Lightning Complex Fire. Common areas of questions and concerns amongst landowners include erosion control (and proper installation of erosion control measures), impacts to roads and culverts, tree hazards, stream wood, and control of potential toxic debris runoff.

d) In August 2020 the SLVWD experienced significant fire damage during the CZU Lightning Fire Complex fires. Approximately, 1600 acres along the Ben Lomond Mountain, a key water supply watershed, were burned. SLVWD staff, the County, and Cal Fire are working on erosion control, restoration, and hazard tree removal. Prior to the CZU fires staff was working to prepare a Fire Management Plan through partnership with Panorama Environmental INC. The plan will improve mapping, road access for fire personnel and improve communications with Fire Prevention Agencies. Mapping proved valuable during the fire; it helped the SLVWD prepare for fire moving through the area, giving Cal Fire access to facilities. Staff is also working to create

Pipeline destruction, SLVWD

a post-fire plan to ensure the most efficient recovery of SLVWD's water resources following the CZU fire event.

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

f) The County partnered with the Central Coast Wetlands Group and the RCD to mentor two Americorps Watershed Stewards from October 2019 to August 2020. As part of their focus on riparian conservation, the Watershed Stewards completed an analysis of riparian conditions in the San Lorenzo Watershed. Riparian condition scores were primarily in the mid-range, with some very good and excellent condition sites. Narrow riparian width and non-native vegetation were 2 common reasons for lower scores.

g) County Water Resource Program staff continued to collaborate with local water agencies to monitor juvenile steelhead densities and stream habitat in four watersheds: San Lorenzo, Soquel, Aptos and Pajaro. Preliminary results for 2020 show overall decreased densities in all 4 watersheds compared to 2019. Densities observed in 2020 were more similar to those observed from 2014-2018. Growth rates ranged from average to below average at most sites with a majority of young steelhead growing into the larger size class (> 75 mm). In 2020, lower densities indicated fewer adult returns and less successful spawning during a dry winter. For Aptos lagoon, mark and recapture sampling resulted in the third highest juvenile steelhead estimate of the 8 sampling years. For Soquel lagoon, the population estimate was below average and fish were larger than in 2019. No juvenile steelhead were observed in the Pajaro lagoon.

h) County Water Resource Program staff continued to implement the Stream Wood Program to maintain large wood in streams for habitat value while allowing modification to manage flood risk and infrastructure protection. Staff responds to public requests, evaluates fallen trees and accumulations of wood, and provides a determination as to whether it is acceptable to leave wood in place or make modifications. Significant benefits of stream wood include pool formation and cover habitat, sediment retention and sediment sorting. The winter of 2019-20 created a low number (7) of new stream wood sites. The CZU Fire will likely result in a significant input of large wood within and downstream of the fire area.

i) County staff provided logistical and planning assistance to the Salmonid Restoration Federation in hosting the 2020 conference in Santa Cruz. The conference, cancelled due to COVID-19, would have provided a state-wide showcase for local efforts to support steelhead and coho salmon conservation.

j) 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 begun initial bridge design.

k) 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. The project just reached a major milestone with the completion of 65% designs for the Scotts Creek lagoon and marsh restoration project. In addition, CalTrans is advancing the initial bridge design and integration with the restoration project elements in collaboration with the RCD, the Regional Transportation Commission, and the Technical Advisory Committee.

l) The County provided funding to the 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 with concerns related to home drainage/erosion, roads, landslides, and streambank failures, permit assistance, fire preparedness, livestock management, invasive species control and habitat enhancement. The annual Living on Rural Properties and other education and outreach activities were postponed due to COVID-19 and staff focused on the urgent fire response needs. These funds helped the RCD write and submit a grant proposal to the California Fire Safe Council (to support countywide fire preparedness) and IRWMP (to support countywide sediment reduction from rural roads and rural residential properties) that were both awarded and will start in 2021.

m) 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 include: fish passage barrier removals on Branciforte Creek, large wood installation on Soquel and Aptos Creeks, south county salamander breeding pond creation, and removal of the lower Mill Creek dam. Other projects underway or completed include: rural road upgrades, managed aquifer recharge projects, stormwater management and community education.

n) In June 2020, the RCD completed a three-year project funded by a US EPA Clean Water Grant through an agreement with the State Water Resources Control Board. The goal of the project was to reduce pesticide loading and toxicity to surface and groundwater in the Pajaro River watershed by collaborating with growers and landowners and providing cost-share funding to implement a variety of voluntary management practices. Working with many partners including UC Davis, NRCS, Point Blue Conservation Science, and other RCDs, growers and landowners on nine farms in the Upper and Lower Pajaro Watershed implemented projects ranging from tried and true practices like hedgerows and grassed filter strips, to more innovative, multistep, collective treatment systems incorporating biochar filtration. This resulted in a total of 1,685 irrigated agricultural acres that receive water quality benefits through these projects.

o) The City of Santa Cruz and San Lorenzo Valley Water District continued efforts to monitor streamflow and habitat conditions in their drinking water watersheds in an effort to establish objectives for habitat improvement.

p) The City of Santa Cruz has continued to bypass significantly more flow for fish than in previous years 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 completed an administrative draft Habitat Conservation Plan (HCP) for anadromous salmonids at the end of FY 2020. A

draft HCP for species under US Fish and Wildlife Service jurisdiction also moved into final review at the end of FY 2020.

q) The City of Santa Cruz continued work on a number of other watershed protection efforts, including watershed lands fire preparedness work, ongoing lagoon monitoring, San Lorenzo Lagoon water surface elevation control management, Integrated Pest Management program development, conducting patrols along the San Lorenzo River, cleaning up homeless camps and pursuing enforcement on illegal stream diversions on critical streams. In the summer of 2020, the City observed coho salmon young of the year for the first time in 15 years in Laguna Creek lagoon during their annual seining surveys. Additionally, the City observed coho salmon young of the year for the first time in Majors Creek during snorkel surveys in the fall of 2020.

r) While the City and partners (including the County Water Resources Program) were able to hold the 6th annual State of the San Lorenzo River Symposium, the City's interpretive programming was severely affected by COVID-19. Many events ranging from Loch Lomond interpretive tours to elementary school programming simply could not proceed safely. In response, the City has recently developed limited curriculum for remote participation and is actively planning additional resources to support FY 2021 work. Several videos related to this work can be found here: https://www.youtube.com/channel/UCyHCA2YNIF2Q_TSOlhiCFGw

s) 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 would improve water quality and water conveyance through Struve Slough.

t) 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 January 2021.

u) The Olympia Conservation Area Management Plan was completed by May 31st, 2020 and is available for public review as of July 18th, 2020. This plan was developed to guide habitat management, restoration, enhancement, and related activities, (collectively, 'management') 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.

v) 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.

w) 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 over thirty surface water monitoring sites. PV Water also maintains a large network of autonomous dataloggers and measure discharge to monitor stream conditions. In 2020, PV Water completed its tenth 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.

3. Groundwater Management

The County has worked with the water districts and purveyors, small water system operators, and private wells for many years to manage groundwater, a critical source of drinking water in the county. The existing collaborations laid the groundwork for complying with the Sustainable Groundwater Management Act of 2014 (SGMA) went into effect on January 1, 2015. 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.

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

   i. Management of the Santa Cruz Mid-County Basin is overseen by a Joint Powers Authority (JPA) consisting of the County of Santa Cruz, 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 Groundwater Sustainability Agency (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. Despite significant improvement of coastal groundwater levels due to water conservation, further work is needed to ensure long term sustainability.

      In January, the MGA submitted their completed Groundwater Sustainability Plan to the Department of Water Resources (DWR). DWR received dozens of comments on the GSP and now has until 2022 to review and determine whether they will accept the Plan. In the meantime, the MGA is continuing to monitor the Basin and pursue GSP implementation. The completed GSP can be found at the website www.midcountygroundwater.org.

   ii. Management of the Santa Margarita Basin is overseen by a JPA consisting of the 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 also seen reduction in streamflow. The GSP for Santa Margarita must be completed by January 2022. In 2020, the SMGWA Board has been actively defining the statements of significant and unreasonable, and the groundwater model has been calibrated and is now being used to analyze baseline conditions, what conditions would have looked like with no pumping, and studying the impacts of proposed projects and management actions. More information is available at www.smgwa.org.

   iii. The Pajaro Valley Water Management Agency (PV Water) is the designated GSA 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 (collectively “Plan”) to DWR as a Groundwater Sustainability Plan Alternative in 2016. In July

2019, DWR determined that the Plan 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. PV Water continues to implement the projects and programs identified in the Plan and in September 2020, initiated a 5-year update of the Plan guided by a stakeholder committee. More information is available at https://www.pvwater.org and https://sgma.water.ca.gov/portal/#intro.

b) The County led a process to hire and select a vendor to develop a regional data management system to help the GSAs meet the requirements of SGMA, and additionally to collect and organize data collected by all of the water agencies in the County. 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 database selected is the Water Information System by Kisters (WISKI) software.

c) The RCD, in partnership with the three Santa Cruz County GSAs, submitted a grant application to the Dept. of Conservation Sustainable Groundwater Management Act (SGMA) Watershed Coordinator Program. If funded, RCD will support the GSAs to coordinate and collaborate on regional groundwater management strategies, develop information and monitoring strategies needed to achieve sustainability, and build community support for local management initiatives.

d) Groundwater elevations in the Pajaro Valley Basin are frequently at or below sea level in much of the basin, with seawater intrusion extending inland to approximately San Andreas Road. Preliminary monitoring results from 2020 indicate a subtle increase in groundwater levels in the Pajaro Valley Basin over 2019 during a year with below average precipitation. Groundwater levels remain approximately 4 feet higher than the conditions observed in 2015 at the end of the most recent drought. PV Water continues to implement the Basin Management Plan, which includes optimizing existing water supplies, conservation, and the development of new water supply projects such as the approved College Lake Integrated Resources Management Project and the proposed Watsonville Slough Systems Managed Aquifer Recharge and Recovery Projects. In 2020, PV Water constructed approximately 9,900 feet of new pipeline to expand the Coastal Distribution System and provide supplemental water to 700 acres of farmland west of San Andreas Road. The expanded service will alleviate groundwater pumping in an area impacted by seawater intrusion and will provide “in-lieu” recharge to groundwater.

e) Soquel Creek Water District (SqCWD) continues to implement the Pure Water Soquel Program, to address the critical overdraft condition of the Santa Cruz Mid-County Groundwater Basin and prevent seawater intrusion from moving further inland. Pure Water Soquel, at its currently designed capacity of producing up to 1,500 acre-feet per year (afy) of purified water, has been included as a primary Group 2 Project in the Santa Cruz Mid-County Groundwater Sustainability Plan (GSP) with the goal of being operational by the end of 2022/early 2023. In 2020, the City of Santa Cruz and Soquel Creek Water District continued to collaborate on the design efforts of the tertiary treatment facility that will be located at the Santa Cruz Wastewater Treatment Facility; the Willowbrook seawater intrusion prevention (SWIP) well was drilled and the Twin Lakes Church Pilot SWIP Well was redeveloped; and design efforts of the conveyance infrastructure and the treatment facilities were nearing completion. In 2020, SqCWD executed a California Prop 1 Groundwater Grant for $50 million and closed a low-

interest loan through the federal Environmental Protection Agency's Water Infrastructure Finance and Innovation Act (WIFIA) Program for up to $88 million. For more information, visit www.soquelcreekwater.org/pws.

Pure Water Soquel is also identified as a Group 3 Project in the GSP whereby an expansion of up to 3,000 afy of purified water could be developed should the region need to meet water shortage drought needs or the Basin needs additional supplies to meet sustainability goals based on project performance and monitoring of the GSP's implementation measures.

f) The Santa Cruz County Sanitation District Enforcement Compliance Unit is working in conjunction with the City of Santa Cruz on the supply side of the Pure Water Soquel project. This entails monitoring all permitted, Significant Industrial Users (SIU) for additional parameters to meet the Division of Drinking Water's requirements for recycled wastewater use in groundwater recharge. At this time, the Sanitation District is required to monitor SIUs only once for the Pure Water Soquel parameters. This exercise was done during the fourth quarter of 2020.

g) The County continues to coordinate submission of groundwater level data to the State's 'CASGEM' groundwater monitoring program. County staff is also offering free well soundings to private well owners in the Santa Margarita and Santa Cruz Mid-County basin boundaries. This service is made available on the agency websites.

h) The RCD continues to facilitate the Community Water Dialogue, a stakeholder group addressing aquifer overdraft in the Pajaro Valley. In August 2020, the Community Water Dialogue Guidance Team met to receive an update on the progress of the Agricultural Water Conservation Program implemented as part of the PV Water Basin Management Plan, and provided feedback on strategies to improve the effectiveness of the program.

4. Water Supply Planning

In the face of a changing climate, improving water supply reliability is a key component of resiliency planning. Changing rainfall patterns will affect recharge rates, impacting already strained surface and groundwater supplies. The CZU fire served as a wakeup call that even current supplies are vulnerable. All the water suppliers in the County are working on diversifying their water supply portfolios with an eye to the future.

a) The County and San Lorenzo Valley Water District (SLVWD) continue to work on a grant from the Wildlife Conservation Board Streamflow Enhancement Program to develop 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 2020 a draft of the Plan was completed, the water rights work is beginning, and a CEQA consultant has been brought onboard.

b) The County, City of Santa Cruz Water Department (City), 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.

c) The City and Soquel Creek Water District (SqCWD) are continuing to analyze the role water transfers has in reducing groundwater pumping from the Mid-County Basin. A 5-year pilot project was in place from November 2015 through December 2020. The pilot study has consisted of transferring water from the City's to SqCWD's distribution system to evaluate any water quality, water quantity and operational issues. 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. The volume of water transferred and the length of time in which transfers occurred were dependent on the City's available excess water supply and SqCWD's system demand which included all of Service Area 1 with approximately 5,200 connections.

On February 1, the intertie was shut down entirely for the season due to the lack of precipitation and operational issues. Just under 34 million gallons (104 acre-feet) of water, averaging roughly 0.6 million gallons per day was transferred during Phase II. The only water quality issue identified during Phase II were elevated disinfection byproducts in the District's distribution system, which briefly exceeded the maximum contaminant levels (MCLs) for both total trihalomethanes and haloacetic acids. The exceedances were not MCL violations.

City and District staff have engaged in discussions regarding the potential extension of the current water transfer agreement to provide a better understanding of the agencies to understand benefits to the groundwater basin, and the potential for water being transferred back to the City. For more information, visit https://www.soquelcreekwater.org/Water-transfers

d) The City of Santa Cruz Water Department continues to pursue development of an Aquifer Storage and Recovery (ASR) program which would inject treated surface water into the Mid-County and/or Santa Margarita groundwater basin to increase groundwater storage for use during drought. 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. It is too early to determine if the presence of arsenic will be a fatal flaw for ASR moving forward at this well or if concentrations will "peak" at some point and drop off over time.

Monitoring well near the Beltz 8 well.

e) The City of Santa Cruz Water Department continues to implement the Santa Cruz Water Rights project to improve the City's water system flexibility while enhancing stream flows for local anadromous fisheries. The project includes changes to the City'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. No change to the authorized amounts of diversions is being proposed. This project is needed to facilitate regional supply projects. The Draft Environmental Impact Report is scheduled for public review April 2021.

f) The City of Santa Cruz is continuing the evaluation of the role recycled water may play in a future water supply portfolio by implementing Phase 2 of the Recycled Water Study. Unlike the Phase 1 study that considered a wide-range of alternatives to make use of recycled water, Phase 2 focuses on only those alternatives that contribute to water supply. Those alternatives include groundwater injection in the Mid-County and/or Santa Margarita groundwater basins, use for irrigation, and direct potable. This study is scheduled to conclude fall 2021.

g) As the City of Santa Cruz Water Department begins to wrap up the various technical and pilot studies of the work plan recommended by the Water Supply Advisory Committee in 2015, staff has begun the work of developing a water supply implementation plan that consists of projects and schedules for constructing those projects. The plan will also be informed by a vulnerability analysis of the water system that will recognize the highly uncertain future with respect to climate change and supply variability as well as the inherent vulnerabilities of the water system. This work is ongoing through calendar year 2021.

h) In 2017, the Scotts Valley Water District (SVWD) had prepared a Recycled Water Groundwater Replenishment Program Facilities Planning Report that considered potential alternatives to expand the use of recycled water. Due to the recent issues and challenges at the City of Scotts Valley's Wastewater Reclamation Facility, the SVWD decided to evaluate additional project alternatives and contracted with Kennedy Jenks Consultants to conduct another study that was presented to the SVWD Board in September 2020. The study scored and ranked three local and three regional conceptual projects based on technical, financial, and social aspects.

i) 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 the following efforts:

- 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)

j) 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 and Alternative to a GSP. The Plan describes 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. A description of the PV Water conservation program is included in the Water Conservation section.

PV Water previously completed Phase I of Recycled Water Facility improvements, a project that included 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. PV Water also expanded the Coastal Distribution System adding 9,900 feet of new pipeline on the San Andreas Terrace to provide supplemental water to 700 acres of farmland and alleviate coastal groundwater pumping. Agency staff, in collaboration with a team of engineers, environmental scientists, and other experts, continue working to engage with stakeholders, refine project descriptions, advance project designs, prepare environmental documentation, apply for water rights, and seek grant funding to implement the new water supply projects summarized below:

i. *College Lake Integrated Resources Management 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 proposed 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 short-term storage and recovery.

k) In October 2020, PV Water kicked off the Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22). The GSU22 effort is a mandated 5-year update of PV Water's Alternative to a GSP and will address ten recommendations from the Department of Water Resources (DWR) to strengthen the plan and facilitate DWR review. The update process will be guided by a 17-member stakeholder committee and includes the development of sustainable management criteria for seawater intrusion, surface water depletion, and chronic groundwater lowering. The effort will culminate in the submission of the GSU22 by January 1, 2022.

l) 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 $80,000 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. http://www.santacruzirwmp.org/.

m) The Santa Cruz and Pajaro IRWM regions 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.

n) The RWMF with the support from the Central Coast Wetlands Group and in coordination with the Regional Water Management Group agencies completed an addendum to the 2014 IRWM Plan. The addendum included new information on climate change

vulnerabilities and selected water quality contaminants. The addendum, submitted to the Department of Water Resources (DWR) for review in December 2019, was approved by DWR as consistent with the State's IRWM Guidelines in April 2020.

o) In February 2020, the RWMF on behalf of the IRWM Region submitted a grant proposal to fund the implementation of five projects and grant administration. In July 2020, the proposal was recommended by the DWR for funding under the 2019 Proposition 1 IRWM Implementation Grant Program. The grant agreement and lead project sponsor agreements are anticipated to be completed in early 2021 and work will initiate. The $2.3 million dollar grant award will be matched by local and federal dollars to fund the following projects identified in the table below.

Project Title	Lead Agency	Grant Amount
Countywide Sediment Reduction from Developed Parcels & Rural Roads	Resource Conservation District Santa Cruz County	$701,283
Stormwater to Groundwater Recharge Project	County of Santa Cruz, Environmental Health	$234,410
Davenport Water Supply Tank Project	County of Santa Cruz, Davenport County Sanitation District	$154,120
Storm Drainage Improvements for the Rio del Mar Flats	Santa Cruz County Flood Control and Water Conservation District - Zone 6	$599,904
Watsonville Slough Farms Wetland Restoration Project	Resource Conservation District Santa Cruz County	$478,305
Grant Administration	Regional Water Management Foundation	$135,000

p) All of the current water supply planning projects take into account projected impacts of climate change and population growth, including increased water demand, reduced groundwater recharge, more significant droughts, and increased rainfall intensity.

5. Stormwater, Recharge, Flood Management, and Climate Change

The County along with other regional partners are working towards shared goals of reducing negative impacts of stormwater and instead viewing runoff as a possible resource. While the region is typically facing the problem of not enough water, the County is also always preparing to deal with situations in which we have too much water. The extremes of the pendulum swing between too wet and too dry are likely to be exacerbated by climate change.

a) The County of Santa Cruz Water Resources recently was awarded a grant to fund a stormwater recharge project at the Seascape Golf Course. The project is funded by a Proposition 1 Integrated Regional Water Management grant and is a partnership between the County, the Soquel Creek Water District, and the Golf Course. When complete, the project will recharge approximately 11 acre-feet per year near the coast in an area of seawater intrusion.

b) The Santa Cruz County Flood Control and Water Conservation District – Zone 7 (Zone 7), Monterey County Water Resources Agency (MCWRA), City of Watsonville, and other entities 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. The draft Final Reevaluation Report and Environmental Assessment (GRR/EA) was completed and released by the Army Corps of Engineers in February 2019 and included a revised Addendum and signed Directors Report in December 2019. The Directors Report acknowledges the project's 1966 Congressional authorization and pivots the project into the Design Phase. The federal government has now awarded the project $1.8M to start the Design Phase and the Army Corps has requested an additional $2.91M in federal funds to complete the first phase of design. The Governor of California also signed AB 489 which allows the State to invest upwards of approximately $100M in the project in the absence of federal participation.

c) 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. County Public Works Department (DPW) 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.

USGS rainfall/soil moisture gage that was recently installed for the CZU burn scar above Boulder Creek. Ownership of the equipment will transfer to the County following initial technical support and maintenance

d) 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.

e) 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. 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 in the amount of $850,000. Feasibility work is expected to begin in January 2021.

f) The City of Watsonville completed drafting the single jurisdiction Local Hazard Mitigation Plan through a Pre-Disaster Mitigation Grant award from California Office of Emergency Services. It has been approved by both the California Office of Emergency Services and FEMA once approved and adopted by City Council.

g) 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.

h) The City of Watsonville was awarded two CivicSpark Climate Action Fellows to assist the City with implementation of projects that focus on the following Climate Action and Adaptation goals: community empowerment and resilience, food security, disaster preparedness, and grassroots implementation of climate action strategies.

i) The City of Watsonville was awarded an additional grant from the Santa Cruz IRWM to leverage current engagement efforts on pollution prevention related to stormwater in disadvantaged community block groups.

j) Managed Aquifer Recharge (MAR) is a landscape management strategy that can help reduce aquifer overdraft by facilitating stormwater capture and infiltration into the aquifer. The RCD and the University of California, Santa Cruz (UCSC) have implemented four MAR projects in the Pajaro Valley with funding from DWR, the USDA Natural Resource Conservation Service (NRCS), and State Coastal Conservancy. These systems could recharge collectively more than ~500AFY. Two additional projects, in Monterey County but within the Pajaro Groundwater Basin, are currently being evaluated. The RCD and UCSC continue to assess site suitability, explore new technology to survey subsurface conditions, and develop additional MAR projects. The results of the MAR Suitability Study by Dr. Andrew Fisher from UCSC and the RCD are available at http://www.rcdsantacruz.org/managed-aquifer-recharge .

k) The RCD, UCSC, and the PV Water are partnering to implement the Recharge Net Metering (ReNeM) program. This is a unique 5-year pilot program that provides a financial incentive to landowners that collaborate to build a managed aquifer recharge basin on their property. The program will be tested for five years to assess the benefits to the Pajaro Groundwater Basin, its businesses, and its residents. The primary focus of the ReNeM program is on stormwater collection directed to infiltration facilities, using a variety of techniques, to improve groundwater supplies.

l) PV Water has collaborated with the U.S. Geologic Survey (USGS) to conduct climate change model simulations of the Pajaro Valley Basin with projections through 2100. The climate change analysis evaluated potential impacts to the Pajaro Valley Basin from a combination of sea level rise and three climate change scenarios used by the California Department of Water Resources for climate-based water resource assessments.

m) In the last decade three stormwater infiltration systems have been constructed in Scotts Valley by the Scotts Valley Water District and private developers. The District monitors all three – the combined infiltration total for water year 2020 was over 19 acre-feet.

n) 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.

6. Small Water System Oversite

The Drinking Water Program continues to oversee 115 small water systems (SWSs) with 5 to 199 residential connections and noncommunity systems including schools, outdoor camps, and businesses with their own source of drinking water. Drinking Water Program staff work with these systems to maintain compliance with public health standards 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, water system organization, and compliance with evolving federal and state compliance requirements. These systems are required to test for up to 84 different constituents on an ongoing basis.

a) The CZU Lightning Complex Fire impacted more than 20 water systems in Santa Cruz County, affecting thousands of residents over the course of the disaster. Critical activities have included input during the repopulation process, inspection of evacuation shelters, and management of public notification requirements for residents allowed to return to properties served by damaged water systems. Drinking Water Program staff continue to work in cooperation with these systems and with state and local agencies on the recovery process. Volatile Organic Chemical (VOC) contamination from the CZU fire has been found to be less severe than in other recent wildfires in the state, with benzene detections at lower levels and within smaller portions of the service areas. Aggressive pipe replacement and flushing procedures have been implemented in response to lessons learned from previous fires. The larger water systems in Santa Cruz County which had to issue Do Not Drink notices have lifted them for most of their customers and will be implementing long-term VOC monitoring plans.

b) During the COVID-19 pandemic, safe and reliable drinking water is even more important. Drinking Water Program staff have provided guidance on COVID-19 impacts to water systems and continue to conduct site visits and inspections following standard safety protocols. Shelters established to provide additional housing were inspected for water system safety, including at the Santa Cruz County Fairgrounds and the Seventh Day Adventist Soquel Conference Grounds.

c) Water system testing for Per- and Polyfluoroalkyl Substances, also known as PFAS, is ongoing. These chemicals have been the focus of national attention due to their status as unregulated contaminants and were previously used in firefighting foam and consumer products such as nonstick pans. Monitoring and investigation efforts to determine the local extent of contamination are focused particularly in areas around landfills and the Watsonville airport. There have been some detections of PFAS in the South County area, near the Buena Vista landfill. State regulations are currently under development, which will guide potential solutions, including consolidation, treatment, and source modification.

d) County staff continue to work with SWSs to track water production. This information is critical for the assessment of rural water use, an important component of groundwater management. System managers can also operate more effectively using this data to identify usage trends and potential leaks.

e) County Staff continues to assist public water systems with state reporting requirements, which continue to change. In particular, the electronic Annual Report often has complicated questions that smaller system operators may be less familiar with.

7. Water Conservation

a) County water use has declined greatly since 2000 even as the population has grown (Figure 1). Figure 2 shows precipitation and water use from 1984-2020. Water use remains 15-20% below the pre-drought levels due in part to permanent water conservation measures such as plumbing fixture retrofits and drought tolerant landscaping that many residents implemented during the drought. That said, water use has increased slightly since the drought ended. The impact of the pandemic has shifted water use as the commercial sector was limited and people spent more time in their houses and gardens. With the limited data available, it is hard to say whether the increase in water use in 2020 over 2019 was due to the pandemic, or simply to the fact that it was a dry year.

b) County staff have continued to participate with all the countywide water agencies in the Water Conservation Coalition of Santa Cruz County to increase outreach and education to the public. Though most in-person events were cancelled this year, the Coalition presented the “Value of Water” campaign. “Value of Water” is a social media campaign that drives residents to the watersavingtips.org site to learn more about water infrastructure around the county and to engage with a quiz and earn prizes from local businesses. The Water Conservation Coalition is a collaboration between Ecology Action, Santa Cruz County, the City of Watsonville, the City of Santa Cruz, Soquel Creek Water District, Pajaro Valley Water, San Lorenzo Valley Water District and Central Water District. Recently, this campaign logged 957 views and 94 residents taking the quiz. The Coalition and maintains the website: www.watersavingtips.org.

c) The Scotts Valley Water District Advanced Metering Infrastructure (AMI) project that commenced in 2017 is under way with 90% of all meters replaced. The i-Meters (Intelligent Meters) are supported by WaterSmart web portal that helps customers to monitor their water usage to be more water efficient (https://www.svwd.org/customer-info/i-meters). The District activated leak alerts in WaterSmart that resulted in total excess water tracked through Leak Adjustment Program to be reduced by about 50% (from 7 million gallons to 3.5 million gallons). It is anticipated that the i-Meter installation will be complete by Spring 2021.

d) Scotts Valley Water District’s Think Twice Water Use Efficiency Program comprised 118 rebates generating water savings of 880,000 gallons/year.

e) The City of Watsonville conserved at least 2,666,144 gallons of water through rebate and conservation device programs in July 2019 through June of 2020. There were 9 lawn replacements, 21 toilet replacements, 42 washing machine replacements, and 339 water conservation devices and education.

f) Nine hundred thirty-one resident students received in person or online education about Watsonville City tap water and water recycling in the 2019-2020 School year with the goal of building a next generation that is knowledgeable about and engaged with conserving fresh water resources.

g) The City of Santa Cruz’s water conservation program efforts continued through water year 2020. Major areas of focus were on various rebate programs supporting water efficient fixtures, appliances and the replacement of turf with water efficient landscaping. Additional efforts focused on reviewing and improving data collection related to lost and

non-revenue water resulting from system leaks and inefficient metering. In response to aging metering infrastructure, the City also initiated a project to fully replace customer water meters with new metering infrastructure that will allow leak notices to be communicated to customers immediately and assist customers to further monitor and manage their water use. All regulatory requirements related to customer water use and lost water were met during water year 2020.

h) 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 Stage 3 shortage calls for SqCWD customers to reduce water usage by 25% as compared to 2013 levels. This equates to a water use guideline of 50 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 56 gpcd based on a running annual average from 2014.

i) The Soquel Creek Water District continued to maintain their Water Demand Offset (WDO) program which, in lieu of a building moratorium, allows new development to proceed without increasing water demand on the 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 is anticipated to save 86 acre-feet of water per year due to earlier leak notification features. In total, 12 Conditional Will Serves and 7 Unconditional Will Serves (i.e. final guarantee of water service) were granted by SqCWD in 2020.

j) 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 target water use is 84 GPCD. The SLVWD's 22,795 population served (not including the Felton system which only relies on surface water) meets the 84 GPCD target.

k) SLVWD actively pursues incidents of water waste by investigating, recommending corrective action, and providing follow-up documentation of resolution. 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 April 2020 about 20% 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 50 in 2019.

l) The majority of the SLVWD's customer accounts are residential; therefore, the SLVWD targets indoor and outdoor water savings programs toward these customers. In Fiscal Year 2019/2020 the SLVWD issued 20 rebates for grey water system, Energy Star rated washing machine, low-flow toilet, and weather-based irrigation controller installations.

SLVWD conducts a variety of public education activities such as a dedicated Water Use Efficiency Page on its website, e-Newsletters, billing inserts, Instagram and Facebook postings.

m) The RCD continues providing a number of programs to assist growers with conserving water through irrigation efficiency and soil health improvements. Services include irrigation system evaluations, 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, providing technical and financial assistance to implement water use efficiency and irrigation scheduling improvements, practical field guides and irrigator trainings in English and Spanish, and rebates for cover crop seed to reduce stormwater erosion and improve infiltration. During 2019, RCD assisted 23 growers to monitor and/or improve the efficiency of their irrigation. The RCD assisted growers of strawberry, caneberry, vegetable and nursery operations with monitoring and evaluating irrigation relative to crop need, monitoring soil moisture, and/or implementing more efficient irrigation practices. The Pajaro Valley Water Management Agency provided a total rebate amount of $26,865 to growers for implementing practices recommended through this program during fiscal years 19/20 and 20/21. The RCD prepared irrigator Tool Kits (used to train irrigators to measure pressure in drip and sprinkler systems) for 45 irrigators, though distribution of the kits is postponed due to COVID-19 restrictions. Additionally, RCD and partners authored monthly articles in the Santa Cruz County Farm Bureau newsletter, Between the Furrows, focused on agricultural water management or other land management topics.

n) PV Water is continuing to support water conservation efforts valley-wide 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 RCD and the University of California Cooperative Extension, utilizing the region's technical experts and the trusted reputations the institutions have built over decades in the farming community. 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 offering free water saving devices. PV Water's overall goal is to achieve conservation of 5,000 acre-feet per year, as established in the Basin Management Plan Update, with an interim milestone of 75% progress toward the goal by 2020, and achieving 100% by 2023. Although 2020 is not yet complete, based on five years of water use data from 2015-2019, PV Water anticipates it will fall short of the 2020 target. PV Water has initiated an effort to evaluate additional programs and practices for potential implementation in order to achieve the overall conservation goal of 5,000 acre-feet per year.

o) As articulated in the Sustainable Santa Cruz County Plan (2014) and the Housing Element of the General Plan (2016-2023) County Planning 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.

Table 1: Water Use in Santa Cruz County, 2020 (Data for smaller systems is from 2019)

Water Supplier	Connections	Population	Water Use Acre-Feet/Yr	Ground water	Surface Water	Recycled Water	Imported from Outside County
Santa Cruz City Water Dept.	24,561	97,417	8,375	5.0%	95.0%		
Watsonville City Water Service	14,855	65,966	7,201	100.0%	0.0%		
Soquel Creek Water District	14,479	40,632	3,312	96.7%	3.3%		
San Lorenzo Valley Water District	7,900	23,700	1,953	53.0%	47.0%		
Scotts Valley Water District	3,807	10,709	1,339	87.0%		13.0%	
Central Water District	823	2,706	411	100.0%			
Big Basin Water Company	605	1,694	205	37.0%	63.0%		
Mount Hermon Association	494	2,850	155	100.0%			
Forest Lakes Mutual Water Company	326	1,076	40	100.0%			
Smaller Water Systems (5-199 conn.)	2,616	7,691	1,552	91.0%	6.0%		3.0%
Individual Users*	8,000	21,000	2,400	95.0%	5.0%		
Pajaro Agriculture (SC Co only)**†			22,250	92.0%	1.0%	7.2%	
Mid- & North-County Agriculture*			2,400	90.0%	10.0%		
Totals	**78,466**	**275,441**	**51,593**	**78%**	**19%**	**3%**	**0.1%**
Summary by Water Source (acre-feet/year)				**40,027**	**9,788**	**1,776**	**47**
Summary of Non-Agricultural Use (acre-feet/year)			**26,943**	**17,397**	**9,326**	**174**	**47**

*Values are Estimates
** Includes a small number of water systems
† Recycled water source is the City of Watsonville

Figure 1: Water use relative to number of connections for all major municipal suppliers, combined, 1984-2020

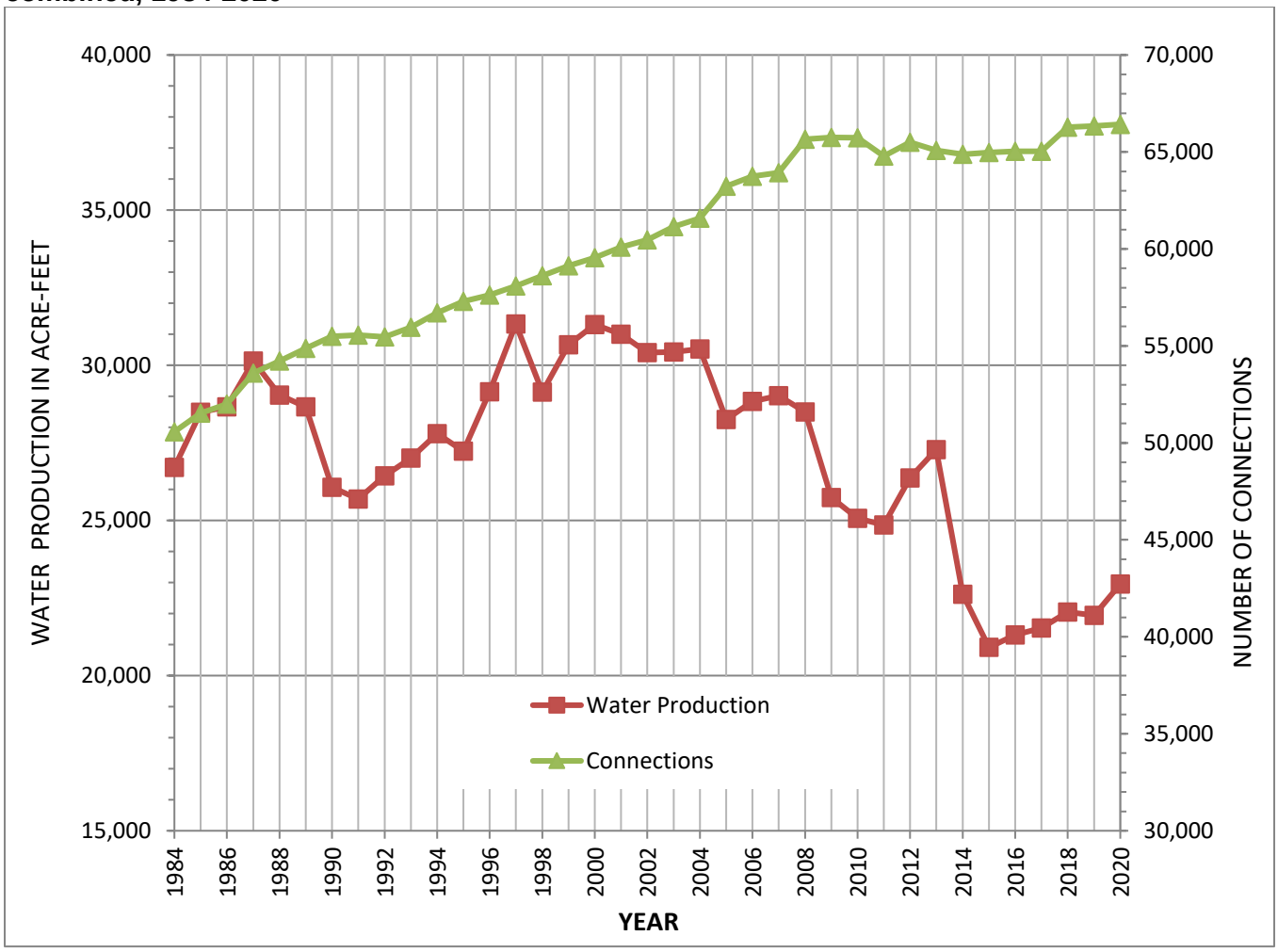

Figure 2: Municipal water use and rainfall, 1984-2020

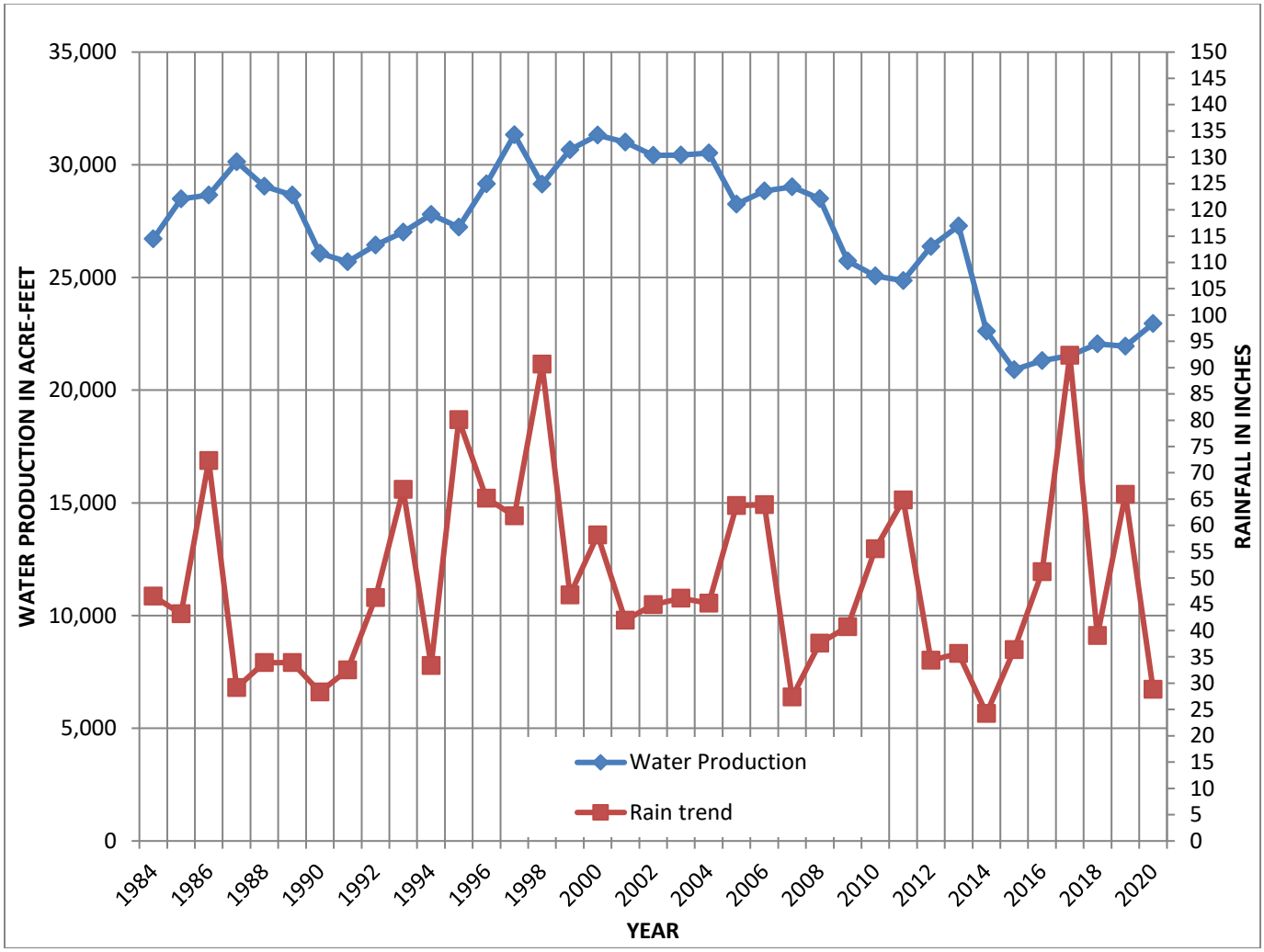

Figure 3: Inland Groundwater Levels, Mid-County Basin, Soquel Hills

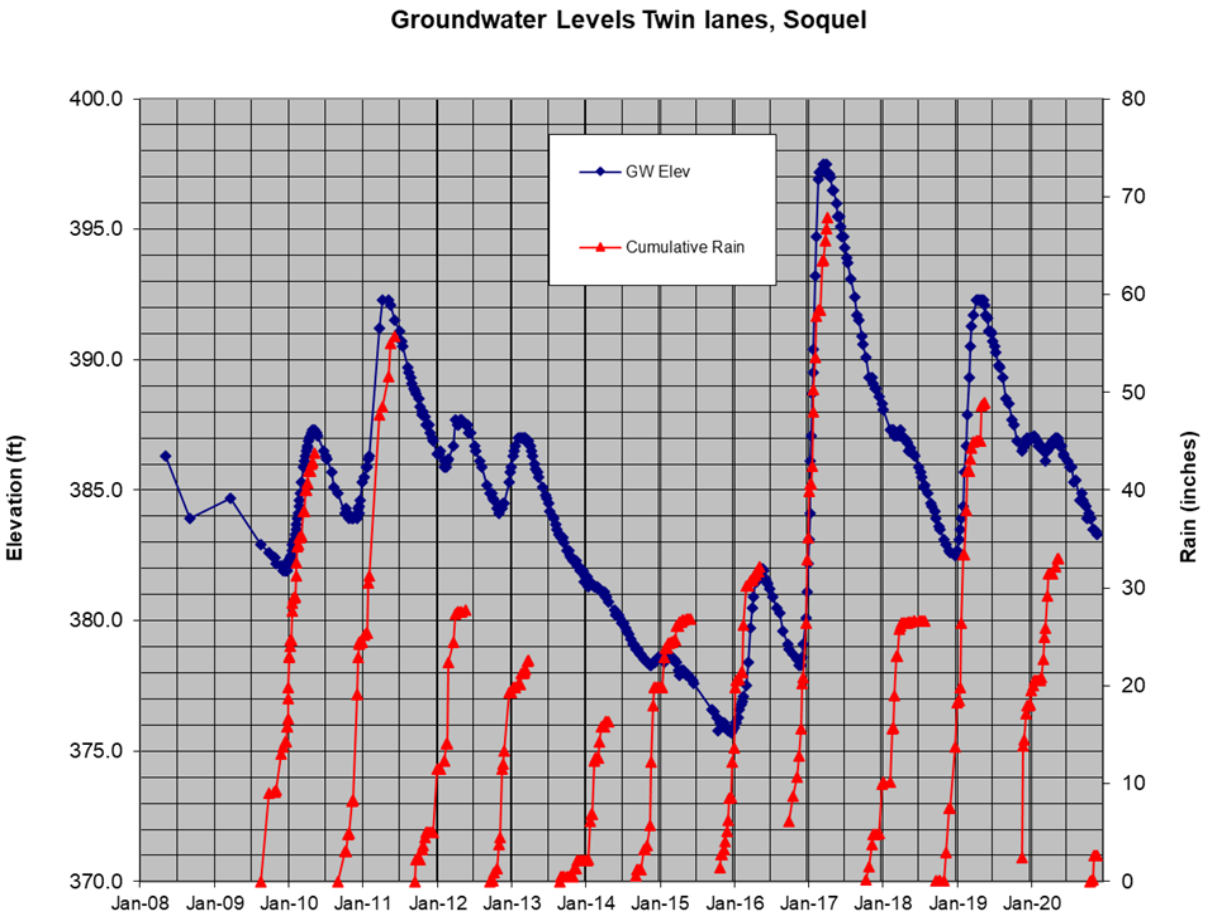

Figure 4: Coastal Groundwater Levels, Mid-County Basin, New Brighton area

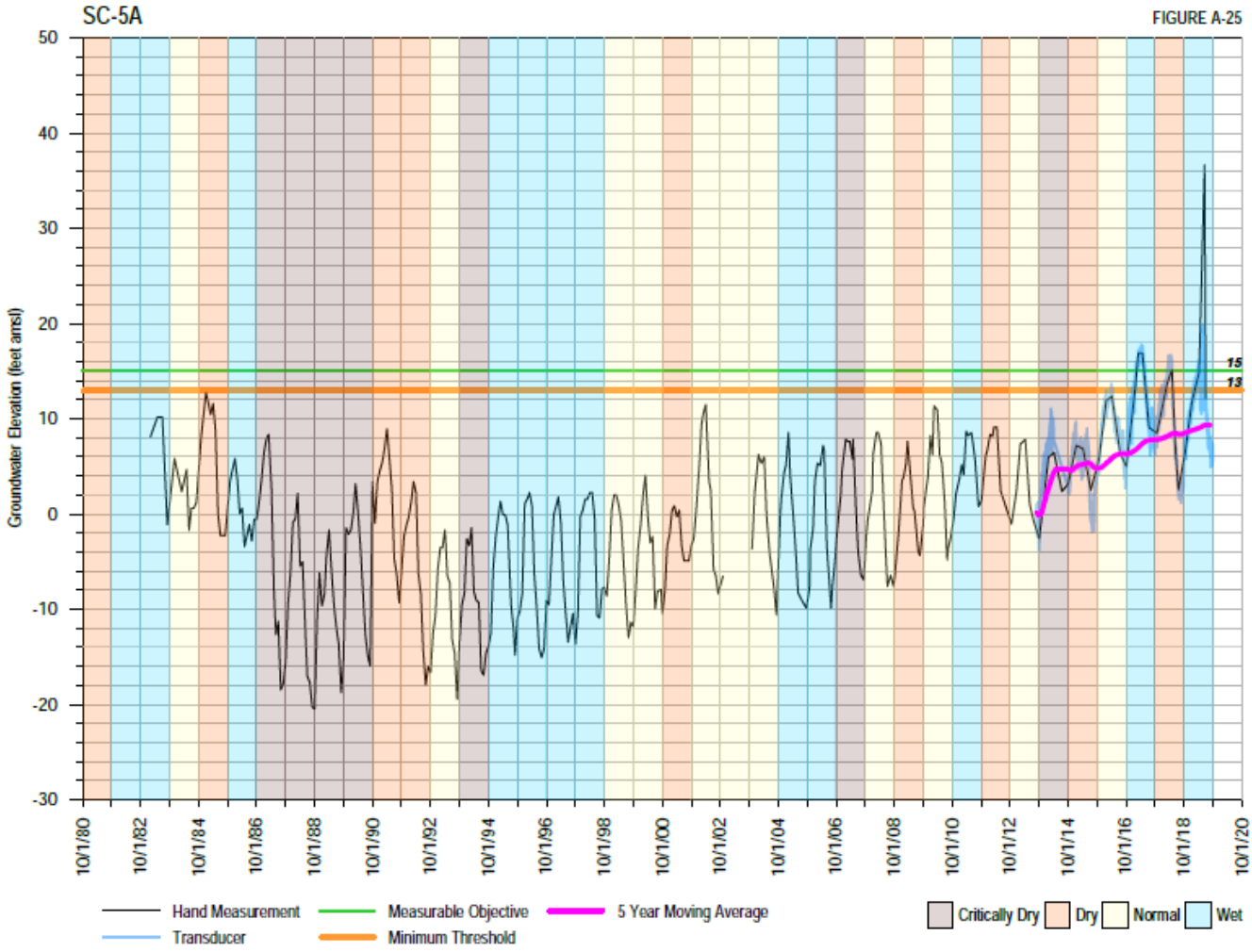

Table 2: Useful Resources for More Information.

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	https://www.slvwd.com/
Scotts Valley Water District	https://www.svwd.org/
Soquel Creek Water District	https://www.soquelcreekwater.org/
Pajaro Valley Water Management Agency	https://www.pvwater.org/
Santa Cruz Mid-County Groundwater Agency	https://www.midcountygroundwater.org/
Santa Margarita Groundwater Agency	https://smgwa.org/
Resource Conservation District of Santa Cruz County	http://www.rcdsantacruz.org/
Santa Cruz Integrated Regional Water Management Plan	http://www.santacruzirwmp.org/
Water Conservation Coalition of Santa Cruz County	https://watersavingtips.org/