Santa Cruz County Water Resources Management Status Report for 2018

Santa Cruz County surface water and groundwater provide drinking water for residents and visitors, critical habitat to numerous threatened and endangered species, and opportunities for recreational and commercial activities. Like many other areas of California, the County faces water resource challenges including impaired water quality, inadequate water supply, 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, 130 small water systems, and some 8,000 individual wells. Local water agencies are working together toward long term solutions to ensure a reliable water supply balanced with maintaining environmental needs.

The 2018 water year was dry, with about 60% of average rainfall and only 36% of average runoff in the San Lorenzo River. December-February precipitation was almost 13 inches below average, however a wetter than average March and April did mitigate the worst impacts to some extent. In Mid-County limited inland groundwater recharge occurred (Figure 3). Most of the large County water agencies maintained some level of water use restrictions in 2018.

While Santa Cruz County has a long history of collaboration on water resource management, 2018 stands out for the numerous programs and projects that have taken place between different agencies. The Santa Margarita and Santa Cruz Mid-County Groundwater Agencies, both Joint Powers Authorities with multiple agencies, have begun planning towards long term groundwater sustainability. Our fisheries monitoring program, a collaboration of seven agencies, unveiled a new, award-winning website featuring data collected throughout the County at dozens of locations. The County's water quality team, operating out of the new water lab, is partnering with organizations throughout the County to monitor our rivers and beaches. The City of Santa Cruz and Soquel Creek Water District recently turned the valve to send water from the City's surface water sources to the District in a pilot project to reduce groundwater use.

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 activated undertaken in 2018, organized under six topic areas:

1. Groundwater Management
2. Water Supply and Conservation
3. Stormwater, Recharge, Flood Management, and Climate Change
4. Watershed Health and Aquatic Habitat
5. Water Quality
6. Small Water Systems

1. Groundwater Management

a) The Sustainable Groundwater Management Act of 2014 (SGMA) went into effect on January 1, 2015. 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 has been recognized by the State Department of Water Resources (DWR) as the Groundwater Sustainability Agency (GSA) for the basin. The MGA governing board includes three private well representatives and two representatives from each partner agency. In 2018, the 13-member Groundwater Sustainability Plan (GSP) Advisory Committee, which comprises representatives from various interest groups in the Basin, met monthly to discuss sustainability indicators for the Basin. They are working closely with staff, the technical team, and the groundwater model to assess groundwater conditions and develop management objectives. The Committee will ultimately be making policy recommendations to the MGA Board on sustainability targets for the basin, and how those can be achieved. A Surface Water Working Group met twice in 2018 to provide additional guidance to the Advisory Committee about surface water and groundwater interactions. The MGA received a $1.5 million grant from DWR for Plan development. More information is available at www.midcountygroundwater.org.

The Mid-County Basin is designated by the State as being in a condition of critical overdraft, which requires completion of the GSP by January 2020. The basin has experiences seawater intrusion in some areas, and offshore investigations have shown seawater close offshore in other areas. Groundwater extraction has also likely reduced streamflow. Reduced water use by Soquel Creek Water District customers has resulted in significant improvement of coastal groundwater levels (Figure 3) but further work is needed to ensure long term sustainability.

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 has been recognized by DWR as 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. In 2018 the SMGWA invested in an analysis of the existing groundwater model to identify improvements needed, and a facilitator to work with the Board to identify Guiding Principles. More information is available at www.smgwa.org. The SMGWA received a $1 million grant from DWR for Plan development.

The Santa Margarita Groundwater Basin is not designated as being in critical overdraft, but it has experienced a significant historical decline in groundwater levels and reduction in streamflow. The GSP for Santa Margarita must be completed by January 2022.

iii) The Pajaro Valley Water Management Agency (PV Water) is the designated Groundwater Sustainability Agency for the Pajaro Valley Basin.. PV Water submitted the Basin Management Plan Update (2014) along with the supporting programmatic Environmental Impact Report, the Agency Act, and other supporting documentation to DWR as a Groundwater Sustainability Plan Alternative in 2016. To date, DWR has not provided a response on the submittal. More information is available at https://www.pvwater.org and https://sgma.water.ca.gov/portal/#intro.

The Pajaro Valley groundwater basin is also designated as being in critical overdraft, with groundwater levels below sea level and seawater intrusion extending inland to

Highway 1. Preliminary results indicate that in 2017 groundwater levels in the Pajaro Valley Basin recovered several feet to levels observed in 2011 before the drought. In the spring of 2017, most of the basin had groundwater surface elevations at or above sea level, in the summer of 2017, water levels throughout portions of the basin were at or below sea level.

b) Mid-County Groundwater Agency received the results of a project to map seawater intrusion in the groundwater aquifers immediately offshore of the Mid-County area. The project involved recording geophysical measurements with a low-flying helicopter, using technology originally developed and used in Denmark. The results showed that the offshore freshwater/saltwater interface below the ocean floor is immediately off the coast in the Mid-County area. This indicates that there is immediate risk to coastal wells from seawater intrusion if the aquifer is not managed properly.

c) The County continues to work with a $250,000 grant from DWR to assist with outreach and Groundwater Sustainability Plan Development for the Mid-County Groundwater Basin. The grant is currently funding improvement of the groundwater model for the basin with particular emphasis on stream flow and the impacts of non-municipal pumpers. Initial findings suggest that inland pumping has little effect on coastal groundwater levels and resulting seawater intrusion.

d) 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.

2. Water Supply and 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 1984-2018. Water use remains 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. All of the large public water systems continued to promote conservation and many have water rates that encourage low use. In 2018 the City of Santa Cruz had a Stage 1 alert, Soquel continued a Stage 3 Water Shortage and Groundwater Emergency, and SLVWD maintained Stage 2 water restrictions.

b) County staff have participated with all the countywide water agencies in the Water Conservation Coalition of Santa Cruz County to increase outreach and education to the public. The Coalition participated in numerous events including Earth Day and the County Fair, and maintained the website: www.watersavingtips.org.

c) 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 demand on the basin. 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.

In 2018, 50% of each development project's offset fee of $55,000 per acre-foot was directed toward future long-term water conservation projects be implemented by the District, and the remaining 50% was used to fund their enhanced toilet rebate program. As this offset requirement was dependent upon the rate in which District customers participated in the enhanced toilet rebate program, there was a wait list to purchase credits and receive Will Serve approval. Developers also had the option of directly installing ultra-high efficiency toilets or proposing an alternate offset effort to the District Board. In total, 33 Will Serve letters were granted by the District Board in 2018. In November 2018, the Board approved using available WDO fees to begin funding a water meter system upgrade that is anticipated to save 86 AFY due to earlier leak notification features.

d) The City of Santa Cruz Water Department and Soquel Creek Water District are continuing to work towards reducing groundwater pumping from the Mid-County Basin through a 5-year pilot program to provide winter surface water supply from the City to the District. After completing desktop and bench-top water quality studies and hydraulic modeling, the agencies turned the valve on December 3, 2018 to deliver treated surface water from the City's distribution system into the District's distribution system. Water quality and operational issues are being closely monitored this winter. If successful, next winter the District will purchase excess winter water again, if available, and increase the area of delivery. The water transfers pilot project ends in December 2020. This pilot project does not include provisions for returning water from Soquel to the City in the event of a drought. However, the two agencies continue to collaborate on the analysis to inform negotiations for longer term water exchanges and transfers.

e) Since 2015, Soquel Creek Water District has been evaluating and developing Pure Water Soquel, its groundwater replenishment and seawater intrusion prevention project (Project). Over the last year, an independent panel commissioned under the National Water Research Institute (NWRI) concluded that "The Project is plausible, feasible, and protective of public health, with respect to the following elements: quality of the source water that would be provided by the Santa Cruz Waste Water Treatment Facility and use of proven advanced treatment technologies to produce water that meets all drinking water requirements and is protective of public health and the environment." The District also had its feasibility study for the Project accepted as complete by the State Water Resources Control Board and the Bureau of Reclamation; it was awarded a $2M Prop 1 Planning Grant; won a National Award for its mobile educational trailer; and issued its Draft EIR June 2018. On December 18, the District certified its Final EIR and approved the Project.

   The Project addresses the state's newly approved goals within the Updated Recycled Water Policy (approved December 2018) to minimize the direct discharge of treated wastewater to ocean waters and maximize the use of recycled water in areas where groundwater supplies are in a state of overdraft. In addition, the District was invited back to submit a full proposal for a Prop. 1 Implementation Grant (for up to $50M dollars) which could, if awarded, reduce project costs by half.

f) The City of Santa Cruz Water Department is investigating the possibility of developing an Aquifer Storage and Recovery (ASR) program which would inject treated surface water into the Santa Margarita basin, and/or the Mid-County basin to increase storage. The intent would be to withdraw the water during drought years when surface water

sources are diminished. The water supply augmentation strategy estimated ASR to take 6-12 years before implementation, though there is a “go, no-go” decision point in 2020 after the next phase of feasibility pilot testing.

g) The City of Santa Cruz Water Department has embarked upon a project to modify existing water rights to address key issues needed to improve the City’s water system flexibility while enhancing stream flows for local anadromous fisheries. The project would include changes to the City’s existing water rights regarding flow requirements, places of use, diversion methods and points, and extension of time to beneficially use existing rights under existing permits. No changes to the authorized amounts of diversions under any of the City’s appropriative water rights is proposed.

h) The City of Santa Cruz is also considering the feasibility of several larger scale irrigation projects using recycled water, and is entering phase 2 of their analysis of recycled water alternatives to augment water supplies. The City Council recently prioritized recycled water over desal at this time, to meet the water supply augmentation strategy schedule. Projects they will be considering include ongoing support of the Pure Water Soquel project, support of advancing non-potable reuse together with the City’s Public Works Department, groundwater recharge with recycled water in both basins, and perhaps surface water augmentation in Loch Lomond. These alternatives will be better defined in the next few months and taken to the City’s water commission.

i) Scotts Valley Water District completed a recycled water study targeted at evaluating groundwater recharge with recycled water. The study concluded that 550 acre-feet per year would be available to such use and made a recommendation on the location. SVWD just signed a contract to do an environmental study of the project.

j) The Scotts Valley Water District’s “Think Twice” water use efficiency program achieved an estimated annual water savings of 7.67 acre-feet per year (AFY) in the last year.

k) In the last decade three stormwater infiltration systems have been constructed in Scotts Valley. Scotts Valley Water District monitors all three – the combined infiltration total for water year 2018 was 22.43 AFY

l) To improve the customer engagements, reduce water waste and increase efficiencies, Scotts Valley Water District launched Advance Metering Infrastructure program in 2016. They decided to use a phased approached and use in-house resources for the conversion. Approximately 50% of the meters have been installed so far and they have contracted with WaterSmart to design a robust Customer Engagement Portal.

m) The County and San Lorenzo Valley Water District have been working 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 increased summer stream flows in the immediate future, and recommend further infrastructure improvements needed in the long run. The County and San Lorenzo Valley Water District have implemented stream flow gaging and inflow studies to better understand availability of surface water, and a comprehensive analysis of the water supply impacts of different conjunctive use scenarios was completed.

n) The County, City of Santa Cruz, San Lorenzo Valley Water District, 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 surface water when available to increase groundwater storage and water supply reliability and increase dry season stream flow.

o) In partnership with the County and the Community Water Dialogue (a stakeholder group addressing aquifer overdraft in the Pajaro Valley), the RCD facilitated the development of the "Pajaro Valley Covered Fallow Plan" in February 2018. The plan came in response to landowner and grower interested in exploring voluntary rotational fallowing as one of many actions for conserving water. The results of this planning process can inform future incentive programs.

p) 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 of water use efficiency and irrigation scheduling improvements, practical field guides and irrigator trainings in English and Spanish, rebates for cover crop seed to reduce stormwater erosion and improve infiltration.

q) In January 2017, the Pajaro Valley Water Management Agency (PV Water) Board of Directors approved an action to proceed with the implementation of water supply projects described in the stakeholder developed Basin Management Plan (BMP). The BMP describes a three-part approach 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. Led by agency staff, a team of engineers, environmental scientists, and others, began working to meet with stakeholders, refine project descriptions, develop preliminary designs with environmental documentation, apply for water rights, and seek grant funding to implement three proposed water supply projects:
    i. *College Lake Integrated Resources Management Project*. When constructed this proposed project would collect, store, treat, and deliver approximately 2,400 acre-feet per year (AFY) of freshwater for agricultural irrigation.
    ii. *Watsonville Slough with Recharge Basins*. This proposed project has the potential to yield 1,200 AFY by diverting storm water runoff from the Watsonville Slough system to a shallow aquifer system on the San Andreas Terrace.
    iii. *Harkins Slough Facility Optimization*. This proposed project would improve both the existing diversion and recovery facilities, allowing PV Water to optimize the performance of its managed aquifer recharge and recovery facility and recovery up to 1,200 AFY.

r) Over the past year, the PV Water staff and environmental experts have been studying the proposed College Lake Integrated Resources Management Project (Project) that would develop facilities to use the lake water as an alternative to groundwater for agricultural irrigation. This fall, the environmental experts completed studies for the proposed Project under the California Environmental Quality Act (CEQA). The results of these studies are now in review. Hydrologic and hydraulic modeling analyses, along with biological, cultural, geologic and other studies support the development of the Draft Environmental Impact Report (DEIR), which will be available for public review and comment in spring 2019. The proposed Project would increase the storage capacity of

College Lake to approximately 1,700 acre-feet and allow an estimated average of more than 2,000 acre-feet of water per year to be stored, treated, and delivered for agricultural irrigation, reducing the amount of groundwater pumped from the overdrafted basin.

s) PV Water has completed Phase 1 of a grant funded project to provide 1.5 million gallons of additional storage of recycled water at the Watsonville Treatment Plant. Implementation of the three phases is projected to provide750 AFY of additional recycled water.

t) Santa Cruz County partner agencies continue to work together on integrated regional water management (IRWM), with the Regional Water Management Foundation (RWMF) serving as a hub for the 12 partner agencies. 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 $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.

u) The region continues to work to utilize IRWM grant funds to further evaluate and address the water needs of disadvantaged communities in the Central Coast region, including the Santa Cruz and Pajaro regions. This project is being administered by the RWMF.

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

a) 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 Resource Conservation District (RCD) and UCSC worked with two landowners to implement MAR projects in the Pajaro Valley with funding from DWR and the USDA NRCS. Together with a third MAR project already completed, these systems are designed to recharge collectively ~300 AF/year. The RCD and UCSC continue to assess site suitability 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.

b) The County of Santa Cruz Environmental Health received a $35,000 grant from the State Water Resources Control Board to validate the results of a pilot project to use DualEM geophysical survey equipment to assess potential recharge locations initially identified through the MAR suitability maps. The device measures the electrical resistivity at different depths to provide a detailed evaluation of subsurface conditions. In November 2017, nine locations in and around the Mid-County Basin were surveyed with the DuelEM equipment. The new grant funds will allow staff to conduct soil borings and percolation tests at the locations identified as most suitable.

c) The RCD, UCSC, and the PV Water are working to implement the Recharge Net Metering program. This is a unique 5-year pilot program that provides a financial incentive to landowners in the form of a rebate issued by PV Water for building a managed aquifer recharge (MAR) system on their property. The program will be tested for five years to assess the benefits to the Pajaro Valley Groundwater Basin 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

d) 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 General Reevaluation Report and Environmental Assessment (GRR/EA) were completed by the Corps of Engineers and released in October 2017 for public review and comment, and a finalized GRR/EA is expected by March 2019 accompanied by a signed Director's Report. Zone 7 and MCWRA are seeking Federal and State investment for design and construction.

e) 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.

f) The Santa Cruz County Flood Control and Water Conservation District – Zone 7 (Zone 7) has recently completed extensive vegetation management in the Pajaro River and Salsipuedes Creek that provides flood flow conveyance through the existing U.S. Army Corps of Engineers Flood Control Project, consistent with the requirements of the 1949 Operations and Maintenance Manual requirements. Additionally, through coordination with Zone 7, the U.S. Army Corps of Engineers recently completed approximately $6.5 million in storm damage rehabilitation assistance in the Pajaro River and Salsipuedes Creek system, restoring damages to sections of the levee system that occurred during the Presidentially-declared disasters of January/February 2017.

g) County staff continue to implement the County's stormwater management program and update the program to address evolving State and Federal requirements.

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

4. Watershed Health and Aquatic Habitat

a) County Water Resources staff continue to implement various programs to benefit steelhead and coho salmon, which are two anadromous salmonid species that have historically occurred in County watersheds but have experienced a severe drop in numbers as a result of habitat and watershed degradation. Coho are designated as endangered and steelhead are designated as threatened under the federal Endangered Species Act.

b) Water Resources staff continued to work with water agencies to conduct annual sampling of juvenile salmonids and stream habitat in four watersheds: San Lorenzo, Soquel, Aptos and Pajaro. In 2018, Water Resources staff completed 12-years of managing the annual sampling, which will now be overseen by the City of Santa Cruz. In the high baseflow year of 2017, steelhead juvenile densities and growth increased compared to severe declines during the drought. Preliminary results for 2018 show decreased numbers at San Lorenzo sites, with mixed results in the Soquel and Aptos watersheds. The population estimate for Soquel Lagoon was alarmingly low but the population estimate for

Aptos Lagoon was encouraging. In all three watersheds, passage conditions were good but growth rates were lower than 2017.

c) Water Resources staff partnered with the Information Services Department to complete a database and an interactive website to manage and display the results of fish monitoring efforts that were started by the County in 1981: http://scceh.com/steelhead.aspx. The website's StoryMap (interactive overview of the program) won third place in an international contest for natural resource content. Agency and public feedback has been very positive with this new on-line access to the steelhead monitoring program. County staff has completed additional portions of the database and are currently working to complete a data analysis website that will allow users to actively interact with the data.

d) Water Resources staff continued to implement the Stream Wood Program to maintain large wood in streams for habitat value without increasing flood risks or jeopardizing public safety. Staff respond to public requests, evaluate fallen trees and accumulations of wood, and make a determination as to whether it is acceptable to leave wood in place or make minimal modifications as needed for public safety. While the moderate winter of 2018 created fewer new stream wood sites (20 compared to more than 50 in 2017), the total inventory of stream wood in County streams has increased over the past 10 years. There are now at least 45 sites with stream wood being monitored by the program. Significant benefits include pool formation and cover habitat, sediment retention and sediment sorting. Current efforts include training a new Public Works crew and improving data collection and reporting.

e) Water Resources staff continue to work with Planning to develop a program to enhance the condition of the riparian corridor in streamside residential areas. In 2018, Water Resources staff and partners implemented a riparian planting project on the mainstem San Lorenzo River. With several partners, including the property owner, California Conservation Corps, Central Coast Wetlands Group and the Watershed Stewards Project, 138 native plants were installed at 3 sites. Project goals included evaluating the time and effort to implement riparian plantings and to field test riparian plants for fitting well into landscaped areas. Staff continued to develop plans for the Riparian Demonstration Garden to showcase native riparian plants that will a part of the new Felton Library site. The San Lorenzo 2025 group completed a plan for a Riparian Conservation Program, that includes the other efforts to improve riparian areas countywide. Partners are currently seeking funding to plan implementation efforts.

f) The County provided funding to the Resource Conservation 'District of Santa Cruz County (RCD to work directly with property owners to provide outreach and technical assistance on repairing and preventing storm damage. From January 1, 2017 – July 1, 2018 the RCD responded to 123 requests for assistance, delivering on-site technical assistance at 52 properties for issues including home drainage/erosion, roads, landslides, and streambank failures. The RCD held two workshops on "Living on rural properties in the Santa Cruz Mountains" in June 2018 attended by 126 landowners.

g) The RCD in partnership with Trout Unlimited and the County, is investigating the possibility of offstream storage and other methods for property owners along Soquel Creek to reduce dry season stream diversions. Several new stream gages have been installed along the creek to monitor flows.

h) The RCD continued to work with landowners and agency partners to complete habitat improvement projects through the Integrated Watershed Restoration Program (IWRP). These projects include wetland restoration, fish barrier removal, rural road upgrades, stream habitat improvement, managed aquifer recharge projects, stormwater management and community education.

i) 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.

j) Since 2015, the City of Santa Cruz released 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. In Fall 2018, the City observed coho salmon juveniles for the first time in Liddell Creek during their annual North Coast snorkel surveys. They also arrived at agreement on long-term instream flow goals for water operations with the Department of Fish and Wildlife and National Marine Fisheries Service. The City has initiated the environmental review process to formalize these increased streamflows as part of an update of City water rights.

k) The City of Santa Cruz conducted a number of efforts, including ongoing lagoon monitoring, expanding their school interpretive programming, hosting the fourth annual State of the San Lorenzo River Symposium, and pursuing illegal stream diversions on critical streams.

5. Water Quality

a) During 2018, the County relocated the Water Quality Laboratory to a modernized space in 1060 Emeline. The scope of the Laboratory's analytical capabilities was expanded to enable more comprehensive monitoring of beaches, surface water, groundwater, and drinking water. The County also initiated a major database management upgrade for the Water Quality Program to provide more robust information on quality assurance and quality control. The Water Quality Laboratory is currently accredited under the State's Environmental Laboratory Accreditation Program (ELAP) and provides analytical services for small drinking water systems, private wells, storm drains, and other local water quality testing requirements. During 2018, the Water Quality Laboratory hosted several student interns.

b) The County's ongoing recreational water monitoring program includes weekly monitoring of about 25 beach sites on a weekly basis to track potential health risks in compliance with AB411 and the Clean Water Act. County staff provided State Water Board representatives with field and laboratory workshops and continue to collaborate with the State on improving sampling methods and analytical protocols for monitoring recreational water quality.

c) County staff continued to coordinate with the City of Santa Cruz, the City of Capitola, and the County Sanitation District to implement projects and conduct monitoring to assess public health threats, reduce bacterial contamination, and improve beach water quality. Data are posted on the County's website.

d) County staff continued to participate with the City of Santa Cruz, Save the Waves Coalition, Surfrider Foundation, and the Sierra Club in the Cowell Beach Working Group,

meeting monthly to better understand and control the elevated bacteria levels at Cowell Beach that have resulted in it being named as one of the most polluted beaches in the State. The County conducted an intensive review of sampling and analytical protocols in comparison to data generated by the City of Santa Cruz. Ongoing City improvements continue to identify and eliminate significant sources of human contamination, resulting in significant improvements in water quality at Cowell Beach.

e) County staff continue to work with the City of Watsonville to monitor harmful algae blooms in Pinto Lake. Reductions in the frequency and intensity of algal blooms during 2017 and 2018 are likely due to the sediment basin and treatment system, implemented in 2017. The Pinto Lake bloom in 2017 occurred much later in the year and was of shorter duration than previous years. There was no evidence of release of algal toxins in Pinto Lake during 2018. The County continues to monitor and maintain warning signs as needed at both Pinto and Kelly Lakes.

f) County staff maintain ongoing efforts for water quality protection through septic system management, monitoring, and investigation, funded by County Service Area (CSA) 12. Properly functioning onsite sewage systems are a good method of groundwater recharge and contribute to approximately 14% of the San Lorenzo River's summer baseflow. County staff are working on updating the sewage disposal ordinance and preparing a Local Area Management Plan to comply with State standards for onsite sewage systems.

g) County staff contribute monitoring data and statistical analyses of water quality in impaired watersheds (San Lorenzo, Soquel, Aptos, Pajaro, Corralitos/Salsipuedes) in accordance with the Total Maximum Daily Load (TMDL) requirements of the Clean Water Act.

6. Small Water Systems

a) County staff continue to assist and oversee 125 small water systems with 5 to 199 connections to maintain compliance with public health standards and meet the ongoing needs of the people and communities that rely upon them. (An additional 15 small systems with surface water sources are directly supervised by the SWRCB Drinking Water Division.) County oversight includes regulation of water quality, quantity, treatment, distribution, water system organization, and meeting evolving federal and state compliance requirements. Notable examples include:

- Approving and inspecting the development of a water system and treatment plant serving the new visitor's center at Castle Rock State Park.
- Overseeing a hazardous materials abatement project, permitting addition of new wells, and facilitating a grant from the State Revolving Fund to add needed water storage at Bonny Doon school for drinking water and emergency purposes.
- Facilitating consolidation of a local commercial private water system and a small residential water system with nearby large public systems.
- Permitting nitrate removal treatment installation at Gizdich Home Ranch.
- Working with the Cal Poly Corp. to establish the installation of a new water system, treatment plant, and 100,000 gallon finished water storage tank.
- Working with neighboring jurisdictions to implement the use of chloramine disinfectant for 6 water systems in the Summit area that purchase water from San Jose Water Works through the Montevina pipeline.

- Overseeing the installation of numerous new wells for large water districts and small water systems.
- Overseeing the installation of numerous replacement storage tanks and distribution systems to prevent ongoing bacteriological water quality issues.
- Assisting with the completion of two Capital Improvement Plans for two water systems.
- Continued oversight of individual connection metering within small water systems.

b) The Drinking Water program met and exceeded its annual evaluation goals and objectives for water system permitting and inspections established with the State Water Resources Control Board.

c) The County is tracking water use information based on the 2015 requirements for metering and reporting of water use by all small water systems. This provides additional information for assessment of rural water use and provides the County and the water systems with tools to identify and reduce excessive water use. As a result of this new information, the calculated water use of small water systems and rural properties was reduced by 25% and 18% respectively, from previous estimates. In addition, the community systems with 15 or more connections are working on installing meters on individual connections.

d) County staff continues to hold the Small Water Systems Forum to help build technical, managerial, and financial capacity among the small water systems within the community. Meetings topics included regulatory updates, well rehabilitation, non-profit technical assistance organizations such as the California Rural Water Association, and increased public access to water system information.

e) Now in its third year, County staff held a workshop providing hands-on training and assistance for systems to complete their report in the State electronic annual reporting system.

Table 1: Water Use in Santa Cruz County, 2018 (Data for smaller systems is from 2016)

Water Supplier	Connections	Population	Water Use acre-feet/yr	Ground water	Surface Water	Recycled Water	Imported
Santa Cruz City Water Dept.	24,500	98,000	8,104	6%	94%		
Watsonville City Water Dept	14,821	65,966	6,989	97%	3%		
Soquel Creek Water Distirct	14,437	40,515	3,347	100%			
San Lorenzo Valley (SLVWD)	7,900	25,485	2,092	41%	59%		
Scotts Valley Water Distirct	3,807	10,629	1,139	87%		13%	
Central Water District	819	2,700	379	100%			
Big Basin Water Company	596	1,680	135	95%	5%		
Mount Hermon Association	499	1,283	141	100%			
Forest Lakes Mutual Water Company	326	1,076	41	100%			
Smaller Water Systems (5-199 conn.)	2,340	7,157	1,100	77%	14%		9%
Individual Users*	8,000	21,000	2,630	95%	5%		
Pajaro Agriculture (SC Co only)**			22,430	93%		7%	
Mid- & North-County Agriculture*			2,400	90%	10%		
Totals	**78,045**	**275,491**	**50,927**	**78%**	**18%**	**4%**	**0.2%**
Summary of Water Source (acre-feet/year)				**39,510**	**9,352**	**2,037**	**75**
Summary of Non-Agricultural Use (af/yr)			**26,097**	**16,985**	**9,112**	**170**	**75**
*Values are Estimates							
**Ag water use on the Monterey County side of the Pajaro Basin, was 18,555 AF in 2016							

Figure 1: Water Use relative to number of connections for all major municipal suppliers, combined, 1984-2018

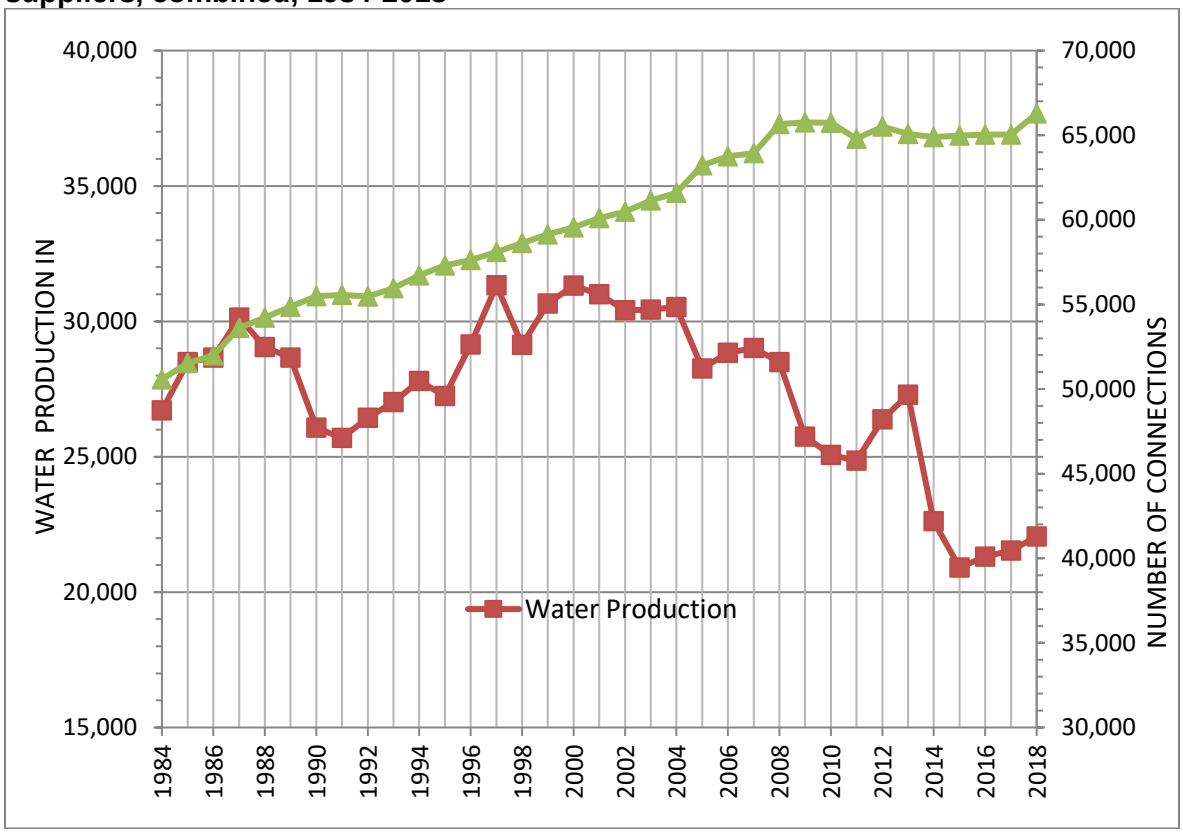

Figure 2: Municipal water use and rainfall, 1984-2018

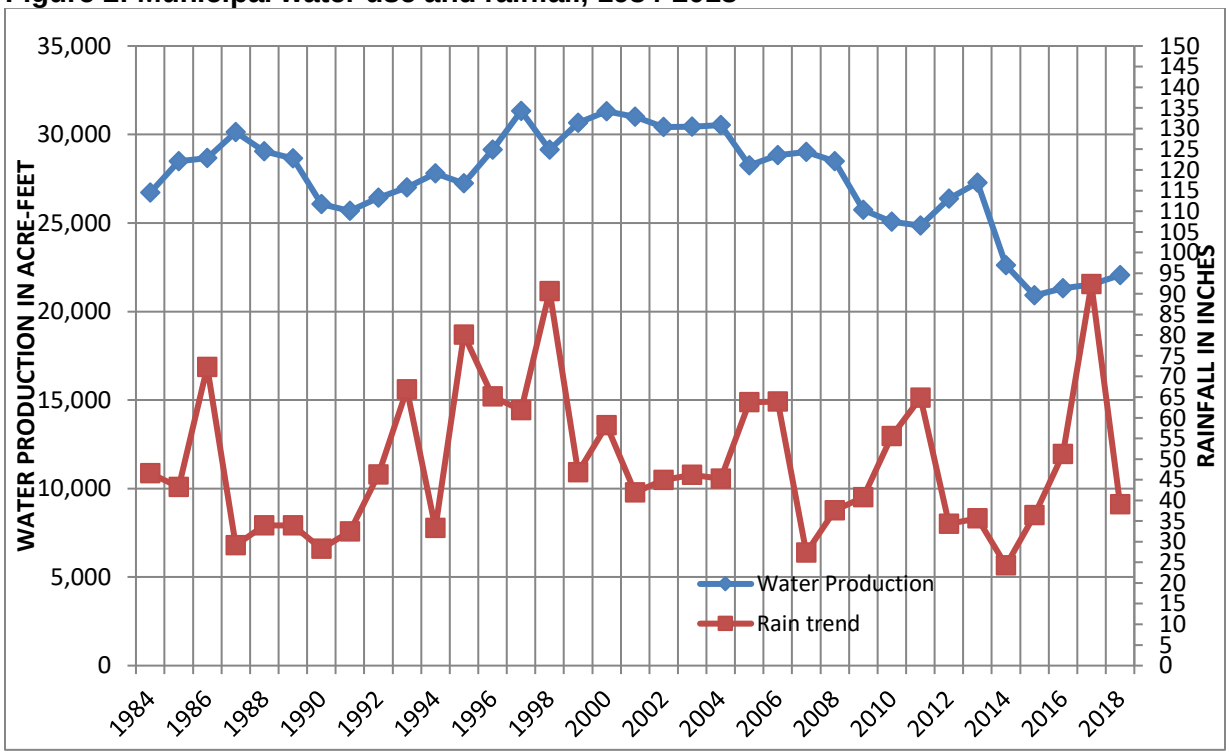

Figure 3: Inland Groundwater Levels, Mid-County Basin, Soquel Hills

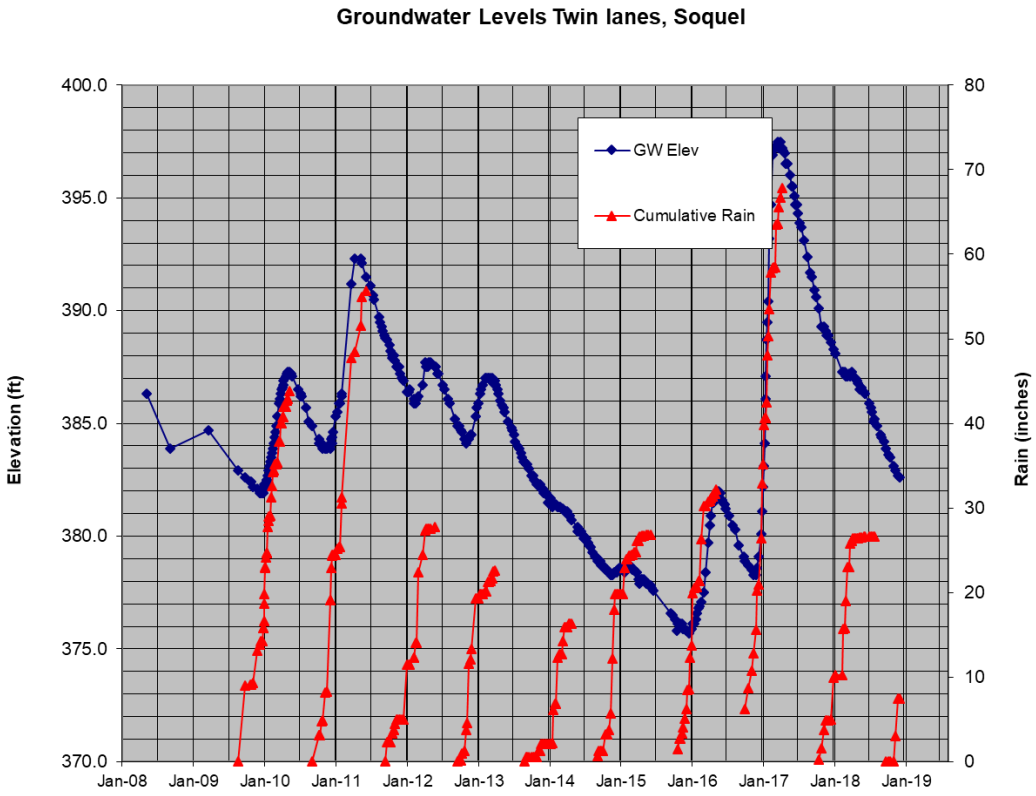

Figure 4: Coastal Groundwater Levels, Mid-County Basin, Capitola, Monitoring Well SC-5A

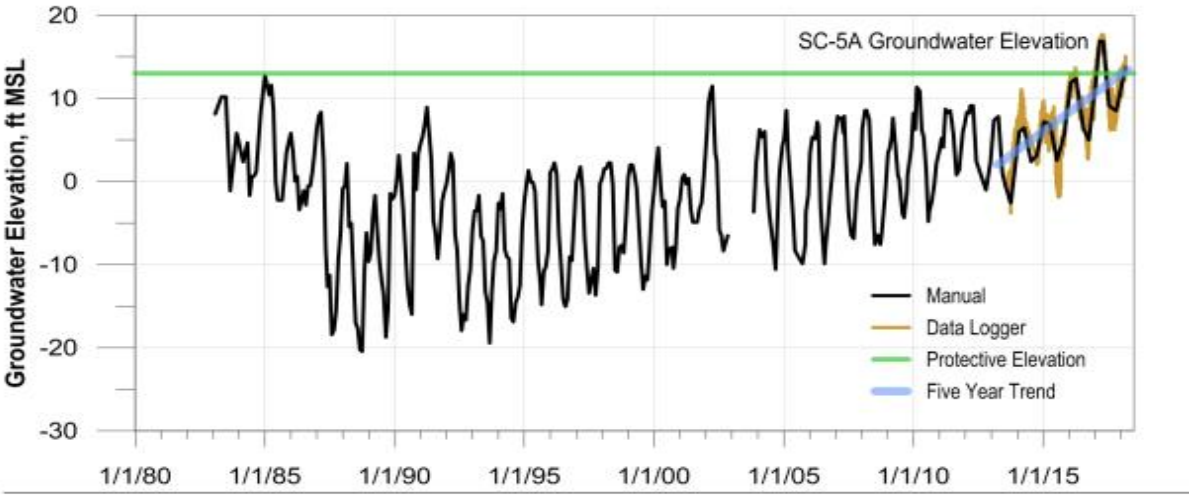

Figure 3: Steelhead Monitoring Website: http://scceh.com/steelhead.aspx