Santa Cruz County
Water Resources Management
Status Report for 2019

Prepared by County of Santa Cruz
Environmental Health

Introduction

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 inadequate water supply, 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, 130 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 2019 water year was wet, with runoff rates in the San Lorenzo River Watershed 60% above average. Significant rainfall occurred through May. Water use continues to remain significantly below 2013 pre-drought levels, showing the effectiveness of permanent changes such as replacing old fixtures with more efficient ones, and removing lawns in favor of drought tolerant landscaping that were promoted during the drought.

The big story this year was progress towards groundwater sustainability. The State is requiring improved management of groundwater basins throughout California through the development of Groundwater Sustainability Plans. The Plan for the Pajaro Valley Basin was approved by the California Department of Water Resources (DWR) in July. The Plan for the Santa Cruz Mid-County Basin was locally adopted in November and will be submitted to DWR in January. Other exciting developments include that Soquel Creek Water District has received a grant for $50 million towards their PureWater Soquel purified water recycling and project, the County's Water Quality Laboratory expanded its analytical capabilities targeted at local water issues, and steelhead densities throughout the County are increasing, indicating an ongoing recovery from the drought years.

While 2019 offered plenty to celebrate, the water community also experienced great tragedy. On September 2, two incredible and passionate water enthusiasts were lost when the dive boat Conception sank. Vaidehi Campbell Williams was a beloved member of the Soquel Creek Water District family. As the District's Communications Specialist, her entire career was spent sharing her exuberance with the community about the District's water supply and the importance of preserving and protecting our precious resource. Vaidehi's passion for water was experienced by countless community members at local, county and even statewide educational and special events, working with teachers and presenting in local classrooms (from preschool to college), and wherever she had an opportunity to share her enthusiasm. Kristina Finstad (aka "Kristy") worked for the Watershed Section of the City of Santa Cruz Water Department for 10 years conducting hydrologic and fisheries monitoring as well as implementing environmental education programs with San Lorenzo Valley schools, internal staff and the general public. She was a passionate advocate for fisheries conservation and spent her life working and playing in water. She left employment with the City of Santa Cruz in 2015 to pursue her other dreams. They are and will continue to be greatly missed by the water and diving communities in Santa Cruz and worldwide.

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 2019, organized under seven topic areas:

1. Groundwater Management
2. Water Conservation
3. Water Supply Planning
4. Stormwater, Recharge, Flood Management, and Climate Change
5. Watershed Health and Aquatic Habitat
6. Water Quality
7. 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 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, which required 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. Despite significant improvement of coastal groundwater levels due to water conservation, further work is needed to ensure long term sustainability.

In 2019, the 13-member Groundwater Sustainability Plan (GSP) Advisory Committee, which comprised representatives from various interest groups in the Basin, made their policy recommendations to the MGA Board on sustainability targets for the basin. A Draft version of the GSP was released for public comment in July. Comments were received from 19 different individuals and organizations, many of which resulted in updates and clarifications to the GSP. The final GSP was adopted in November by the MGA Board and was submitted to the State before the January 31, 2020 deadline. More information is available at 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 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. In 2019, the SMGWA hosted a popular education series on water management issues, adopted their Guiding Principles, and hired a facilitator and technical consultant who will jointly lead the GSP development process. In the fall, the SMGWA led several Basin tours with Board

members and members of the public. More information is available at www.smgwa.org.

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), 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. More information is available at https://www.pvwater.org and https://sgma.water.ca.gov/portal/#intro.

b) Groundwater surface elevations in the Pajaro Valley Basin are regularly at or below sea level in much of the basin, with seawater intrusion extending inland to approximately San Andreas Road. Preliminary monitoring results from 2019 indicate a subtle increase in groundwater levels in the Pajaro Valley Basin over 2018, reflective of a year in which precipitation was 21% above the historical average. Groundwater levels are 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.

c) Since 2015, Soquel Creek Water District has been evaluating and developing Pure Water Soquel, its groundwater replenishment and seawater intrusion prevention project (Project). The National Water Research Institute (NWRI) provided independent analysis that the "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 Environmental Impact Report (EIR) for the project was certified in 2018, and the District moved forward in 2019 with furthering technical studies and evaluations to support permitting and issued procurement for progressive design-build packages of the project. Other project milestones in 2019 included:

i. Interagency Project Agreement with the City of Santa Cruz was approved in June 2019
ii. US Environmental Protection Agency selected the Pure Water Soquel Project as one of 38 projects in 11 states across the United States in July 2019 to apply for a low interest loan through its Water Infrastructure Finance and Innovation Act (WIFIA) program.
iii. The State of California approved $36 million through its Seawater Intrusion Control Low-Interest Loan Program for the Pure Water Soquel Project on November 19, 2019.
iv. The Pure Water Soquel Project was included in the final Santa Cruz Mid-County Groundwater Sustainability Plan, locally approved on November 21, 2019, as a project to achieve basin sustainability.

v. The State of California awarded 7 projects under its Prop 1 Groundwater Grant, Round 2 Program, with the District being awarded a $50M grant on December 17, 2019.

d) The County completed a $250,000 grant from DWR to assist with Groundwater Planning for the Mid-County Groundwater Basin. The grant funded improvement of the groundwater model for the basin with particular emphasis on stream flow and the impacts of private wells and small water systems. It also helped staff develop a "Recharge Project Selection Strategy" to efficiently identify sites suitable for stormwater recharge projects. This funding enabled the County to partner with Soquel Creek Water District to evaluate numerous stormwater capture and infiltration project locations, and develop conceptual design plans for three of them.

e) 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.

f) The Resource Conservation District of Santa Cruz County (RCD) continues to facilitate the Community Water Dialogue, a stakeholder group addressing aquifer overdraft in the Pajaro Valley. In November 2019, the Community Water Dialogue held a community-wide event where attendees received updates on the present state of the Pajaro Valley Basin and management strategies being developed or implemented to reduce groundwater overdraft.

2. 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 1984-2019. 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. The large public water systems continue to promote conservation and many have water rates that encourage low use.

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. The Coalition participated in numerous events including Earth Day, the County Fair, the water conservation video contest, and the Water Harvest Festival, and maintained the website: www.watersavingtips.org.

c) The Scotts Valley Water District Advanced Metering Infrastructure (AMI) project that commenced in 2017 is under way with 70% 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 anticipates completing the project by Spring 2021.

d) Scotts Valley Water District's "Think Twice" water use efficiency program achieved an estimated annual water savings of 470,000 gallons in the last year.

e) 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 16 growers to monitor irrigation of their strawberry or vegetable row crops and provided irrigator training to over 50 irrigators.

f) 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 ADUs, which are all water saving relative to other types of development, as well as water saving landscapes. Planning will also implement the tri-annual update of the Building Code in January, which includes enhanced water conservation measures.

g) 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. 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 2019, each development project's offset fee of $55,000 per acre-foot was 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, 44 new water services were granted by the District Board in 2019.

3. Water Supply Planning

a) 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 increase summer stream flows in the immediate future and recommend further infrastructure improvements needed in the long run. In 2019 a Water Assessment Analysis was completed looking at 22 different conjunctive use scenarios. The District selected 4 for a fisheries analysis which was completed in the fall and will be incorporated into the final Plan.

b) 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 winter surface water when available to increase groundwater storage and water supply reliability and increase dry season stream flow.

c) 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 transfer of winter surface water from the City to the District. They completed the

first year ("Phase I") of the water transfer pilot from the City to the District, in which water was transferred from December 4, 2018 – April 30, 2019 to a portion of the District's service area that includes 2,300 customers. Water quality and operational issues were closely monitored, and results were summarized in a Technical Memorandum and presentation to the Soquel Board on October 15, 2019. Phase I was very successful with no fatal flaws in terms of water quality or operational issues. Phase II of the water transfer began on December 6, 2019 and is planned to extend through April 30, 2020. As with the initial pilot, the volume of water to be transferred and the length of time in which transfers are to occur will be dependent on the City's available excess water supply and Soquel Creek Water District's system demand in the expanded service area. This pilot project does not include provisions for returning water from Soquel to the City in the event of a drought. The volume of water that the District has currently budgeted for purchase for Phase II is 98 MG (300 acre-feet); the demand in the expanded service area will exceed this budgeted amount. The two agencies continue to collaborate to inform negotiations for longer term water exchanges and transfers. 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 Santa Margarita basin, and/or the Mid-County Basin - to increase storage. The City completed a pilot ASR test in their Beltz 12 production well located on Research Park Drive. The pilot test consisted of three cycles of injection, storage and recovery that began on January 18, 2019 and continued through July 31, 2019 when active recovery of Cycle 3 ended. Results appear favorable in that no operational or water quality issues were found. The City is preparing for a second year of pilot ASR at their Beltz 8 production well located in the Live Oak area of the MCGB. Similar to the previous pilot, the Beltz 8 pilot will consist of three cycles of injection, storage and extraction. Two monitoring wells are being installed as part of this pilot test program to enhance the data collection and evaluation of the project.

e) The City of Santa Cruz Water Department continues to implement the Santa Cruz Water Rights project. This project is seeking 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 includes changes to the City's existing water rights regarding places of use, points of diversion, 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. This project is needed to facilitate regional supply projects.

f) The City of Santa Cruz is continuing the evaluation of the role recycled water may play in a future water supply portfolio. In November 2018, City Council took action to prioritize recycled water over desalination as Element 3 of the Water Supply Augmentation Strategy. This decision was made following the completion and side by side evaluation of an update to the previous Desalination Program and a preliminary evaluation of recycled water opportunities. More detailed analysis is now required into several of the highly-ranked recycled water alternatives to better understand cost, timeliness and yield. City Council approved Phase 2 of the Recycled Water Feasibility Planning Study at their November 26 meeting. This yearlong study will begin in January 2020.

g) On November 12th, the Santa Cruz City Council held a joint meeting with the City's Water Commission. This is an annual occurrence to provide an update to the Council on

the progress being made, as vetted through the Water Commission, on the Water Supply Augmentation Strategy. In addition to an update on the elements described above, Council approved a modification of the Water Supply Augmentation Work Plan in two areas.

i. Phase implementation of the ASR program. The Water Supply Augmentation Strategy work plan contemplated ASR as a single element to be implemented at one time. Based on the last few years of analysis, staff recommended splitting ASR into three components: a near term project in the MCGB using existing infrastructure; a longer term project in the Mid-County Basin using new infrastructure; and a future ASR project in the Santa Margarita Groundwater Basin.
ii. Extend the implementation schedule. Because demands in the City remain low, and implementation of the near term ASR in the Mid-County Basin appears promising in terms of supplementing supply to some degree, staff recommended extending the overall implementation schedule to accommodate the stepwise approach described above.

h) 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. 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 recent analysis of groundwater extraction data during the period of 2014-2018 determined that the Pajaro Valley is approximately 36% of the way toward the 4,000 acre-feet per year conservation goal, for the area outside of the Delivered Water Zone, which makes up 80% of the water consumption in the Pajaro Valley. The 5,000 acre-feet/year benchmark established in the 2014 BMP is to achieve 75% progress toward the goal of reducing groundwater pumping by 2020 and 100% by 2023.

PV Water 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. PV Water is currently constructing the Phase II project: Disk Filter Improvement Project. Agency staff, in collaboration with a team of engineers, environmental scientists, and other experts, continue working to engage with stakeholders, refine project descriptions, develop preliminary designs with environmental documentation, apply for water rights, and seek grant funding to implement the 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 AFY of surface water for agricultural irrigation.
ii. *Watsonville Slough System Managed Aquifer Recharge and Recovery (Previously Watsonville Slough with Recharge Basins and Harkins Slough Facility Optimization)*. This proposed project has the potential to yield 2,400 AFY by diverting storm water runoff from the confluence of Struve and Watsonville Sloughs to a shallow aquifer system on the San Andreas Terrace for short-term storage and recovery.

i) 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 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 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/.

j) 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 region, including the Santa Cruz and Pajaro regions. This project is being administered by the RWMF.

k) The RWMF with the support of the Central Coast Wetlands Group is in the process of finalizing a Climate Change Vulnerabilities Assessment for the Santa Cruz IRWM Region. They plan to collect more agency input and complete the assessment in 2020. Information thus far gathered from the Vulnerability Assessment, the regional water agencies on water quality related to AB 1249 contaminants (arsenic, nitrate, chromium VI, and perchlorate) and various local studies such as the County's Climate Action Strategy and the City of Santa Cruz's Climate Adaptation Plan have informed an Addendum to the 2014 IRWM plan to address updates from the DWR 2016 Proposition 1 Guidelines. The Addendum was approved by the RWMG Steering Committee on 12/18/2019 and submitted to DWR on the same day. The submittal of this update has cleared the way for the Santa Cruz IRWM to apply for $2M in Prop 1 Implementation funds. They hope to receive those funds sometime in early summer 2020.

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

a) 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 and released by the Army Corps of Engineers for public review and comment in October 2017. A finalized GRR/EA is expected by March 2020, Zone 7 and MCWRA are seeking federal and state investment for design and construction.

b) 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.

c) 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.

d) 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 2020.

e) The City of Watsonville received a California Office of Emergency Services Pre-Disaster Mitigation grant to write a City Local Hazard Mitigation Plan. Zone 7 staff are serving on the Steering and Planning Committees.

f) 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 (4) 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 (2) additional projects, in Monterey County but within the Pajaro Groundwater Basin, are currently being evaluated 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 .

g) 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 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.

h) PV Water has collaborated with the U.S. Geologic Survey (USGS) to conduct climate change model simulations 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.

i) 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 2019 was over 25 acre-feet.

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

k) 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.

5. Watershed Health and Aquatic Habitat

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.

a) 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 2019 show overall increased densities in all 4 watersheds compared to 2018 and show continued recovery from low densities during the drought (2012-2015). Growth rates were good at most sites with many young steelhead growing into the larger size class (> 75 mm). In 2019, higher densities indicated higher adult returns and successful spawning despite winter storms. For Aptos lagoon, mark and recapture sampling resulted in the highest juvenile steelhead estimate of the 7 sampling years. For Soquel lagoon, the estimate was higher than average, indicating that juveniles from late spring spawning recruited to the lagoon.

b) County Water Resource Program staff partnered with the Central Coast Wetlands Group and the Southern California Coastal Water Resources Project to develop a data analysis website for the steelhead monitoring program. Users can actively interact with and explore the data using web-based analysis tools. This new website is intended to both improve the accessibility of the data and evaluate if the current monitoring methods are providing the information needed to make conservation decisions. The data analysis shows that the current monitoring program captures overall trends in juvenile populations, how trends vary for watershed and juvenile size class and demonstrate recovery from recent drought conditions. The data analysis is currently being used to assist with groundwater and water resources planning in the Soquel Watershed. The website and data analysis can be accessed at http://scceh.com/steelhead.aspx .

c) 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. The winter of 2018-19 created a moderate number (26) of new stream wood sites. The total inventory of stream wood in County streams continues to increase and a focus for the upcoming year will be to monitor sites. Significant benefits of stream wood include pool formation and cover habitat, sediment retention and sediment sorting.

d) County Water Resource Program staff collaborated with the Resource Conservation District (RCD) of Santa Cruz County to implement the Upper Zayante Stream Wood Enhancement Project on San Lorenzo Valley Water District and City of Santa Cruz

properties. The project installed 16 stream wood structures to improve sediment retention and sorting and to provide high flow refuge, spawning and rearing habitat for salmonids.

e) County Water Resource Program staff continue to develop a program to enhance the condition of the riparian corridor in streamside residential areas. Through 2019, staff monitored a 2018 pilot project and completed riparian assessments for several properties for native planting projects that will be implemented in 2020. Project goals included evaluating the time and effort to implement riparian plantings and to field test riparian plants for suitability in landscaped areas.

f) 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 a draft lagoon and marsh restoration plan. In addition, the Regional Transportation Commission recently received a grant to fund the initial bridge design with Caltrans.

g) 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. From July 1, 2018- June 30, 2019, the RCD responded to 67 requests for assistance, delivering on-site technical assistance at 33 properties for issues including home drainage/erosion, roads, landslides, and streambank failures. These site visits allowed the RCD to leverage $54,000 in fee for service funds and helped the RCD in securing a $799,000 grant for sediment reduction in the San Lorenzo Watershed. The RCD held two workshops on “Living on Rural Properties in the Santa Cruz Mountains” which were attended over 150 landowners.

h) The RCD, in partnership with Trout Unlimited and the County, has performed three years of summer streamflow monitoring at four gaging sites along Soquel Creek to better understand surface water availability and human water use patterns. The ultimate goal of the project is to identify off-stream storage opportunities and other water conservation projects to reduce the impacts of dry season diversions and shallow well use.

i) 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.

j) 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.

k) Since 2015, the City of Santa Cruz has 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. The City continues to work on its Endangered Species Act compliance and is currently working on an administrative

draft Habitat Conservation Plan (HCP) for anadromous salmonids that should be submitted for agency review by the end of FY 2020.

l) The City of Santa Cruz conducted a number of other watershed protection efforts, including watershed lands fire preparedness work, ongoing lagoon monitoring, expanding their interpretive programming to include monthly tours on the “Newell Jewell” at Loch Lomond, hosting the fifth annual State of the San Lorenzo River Symposium, conducting patrols along the San Lorenzo River, cleaning up homeless camps, and pursuing enforcement on illegal stream diversions on critical streams. In Fall 2019, the City observed pink salmon juveniles for the first time in the San Lorenzo River lagoon during their annual seining surveys. This was the first time pink salmon had been observed in the San Lorenzo River since 1915.

m) The City of Watsonville, Pajaro Storm Drain Maintenance District and Watsonville Wetlands Watch are actively pursuing 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. It would also extend the trail network through the slough system.

6. Water Quality

a) During 2019, the County’s Water Quality Laboratory expanded its analytical capabilities and demonstrated proficiencies in chemical, microbiological, and immunological assays targeted at local water issues. The Laboratory implemented new testing methods for cyanobacterial toxins to provide accurate information on seasonal health risks in inland lakes and nearshore lagoons. The Laboratory is also developing 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 also implemented a rigorous quality assurance protocol to reduce reliance on single-use plastic containers, eliminating over 1,000 containers from the waste-stream. 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 2019, the Water Quality Laboratory hosted student interns from Cabrillo College and UCSC.

b) 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 2019, weekly sampling was conducted between April and October at heavily visited beaches in accordance with AB411 and the Clean Water Act. County staff hosted State Water Board representatives for a training session on the use of molecular techniques for microbial source tracking. The County continues to collaborate with the State on improving sampling methods, analytical protocols, and data interpretation for monitoring marine and freshwater systems.

c) 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 an updated website[1] and mobile dashboard[2] where the most recent water quality data are mapped for locations across the County.

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, 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. Ongoing City improvements and improved monitoring protocols have led to more consistent water quality and fewer health advisories (29 in 2017, 8 in 2018 and 13 in 2019). About 30% of the 2019 health advisories were associated with wet weather events.

e) 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 2019, 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.

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.

g) County staff began working with the City of Watsonville and Watsonville Wetlands Watch to develop a more comprehensive water quality monitoring plan for the Watsonville Slough system. This partnership utilizes the citizen community science volunteers to collect samples and measure in-field water quality measurements. While the City's Public Utility Laboratory and County of Santa Cruz Environmental Health Laboratory analyze the samples for pathogens and nutrients.

h) 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. County staff also conduct monitoring to in conjunction with flood control efforts, particularly in the lower Pajaro River.

i) 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 in support of the May 2019 'Snapshot Day' in and the 'First Flush' sampling at the onset of the rainy season in 2019.

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

7. Small Water Systems

The Drinking Water Program staff continue to assist and oversee for the state, 115 small water systems (SWSs) with 5 to 199 connections, including neighborhoods, schools, outdoor camps, and businesses with their own source of drinking water. The 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) A small group of vulnerable SWSs are being tested for Per- and Polyfluoroalkyl Substances, also known as PFASs. 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 are ongoing to determine the extent of any contamination locally, particularly around landfills and the Watsonville airport. State regulations are currently under development.

b) The Drinking Water Program met and exceeded its annual evaluation goal for water system inspections established with the State Water Resources Control Board.

c) 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.

d) The Drinking Water Program staff continues to hold meetings and trainings for SWSs to help build their technical, managerial, and financial capacity. Topics included the role of the Santa Cruz Local Agency Formation Commission (LAFCO), groundwater management updates, and reviewing water quality monitoring data through the State's Drinking Water Watch site. For the fourth year, County staff also held a separate workshop in the County computer training room to provide hands-on training and assistance for systems to complete their Electronic Annual Report to the State via the Drinking Water Information Clearinghouse (DRINC) Portal.

e) The Drinking Water Program Projects of importance from 2019 include oversight of well construction (including wells for large water districts), storage tank and water main replacement, treatment upgrades, and troubleshooting bacteriological issues. County staff also provided guidance and resources to private well owner inquiries regarding water quality and system operation.

Table 1: Water Use in Santa Cruz County, 2019 (Data for smaller systems is from 2018)

Water Supplier	Connections	Population*	Water Use acre-feet/year	Ground water	Surface Water	Recycled Water	Imported
Santa Cruz City Water Dept.	24,500	98,000	8,104	6%	94%		
Watsonville City Water Service	14,821	65,966	6,989	97%	3%		
Soquel Creek Water District	14,438	40,500	3,250	96%	4%		
San Lorenzo Valley Water District	7,900	23,700	1,960	31%	69%		
Scotts Valley Water District	3,807	10,629	1,139	87%		13%	
Central Water District	818	2,706	377	100%			
Big Basin Water Company	596	1,680	161	28%	72%		
Mount Hermon Association	494	2,850	126	100%			
Forest Lakes Mutual Water Company	326	1,076	43	100%			
Smaller Water Systems (5-199 conn.)	2,340	7,157	770	77%	14%		9%
Individual Users*	8,000	21,000	2,630	95%	5%		
Pajaro Agriculture (SC Co only)**			20,700	92%	1%	7%	
Mid- & North-County Agriculture*			2,400	90%	10%		
Totals	**78,040**	**275,264**	**48,649**	**76%**	**21%**	**3%**	**0.1%**
Summary by Water Source (acre-feet/year)				**36,854**	**10,112**	**1,638**	**1,638**
Summary of Non-Agricultural Use (acre-feet/year)			**25,549**	**15,650**	**9,665**	**148**	**69**

*Values are Estimates

** Includes a small number of water systems

Figure 1: Water use relative to number of connections for all major municipal suppliers, combined, 1984-2019

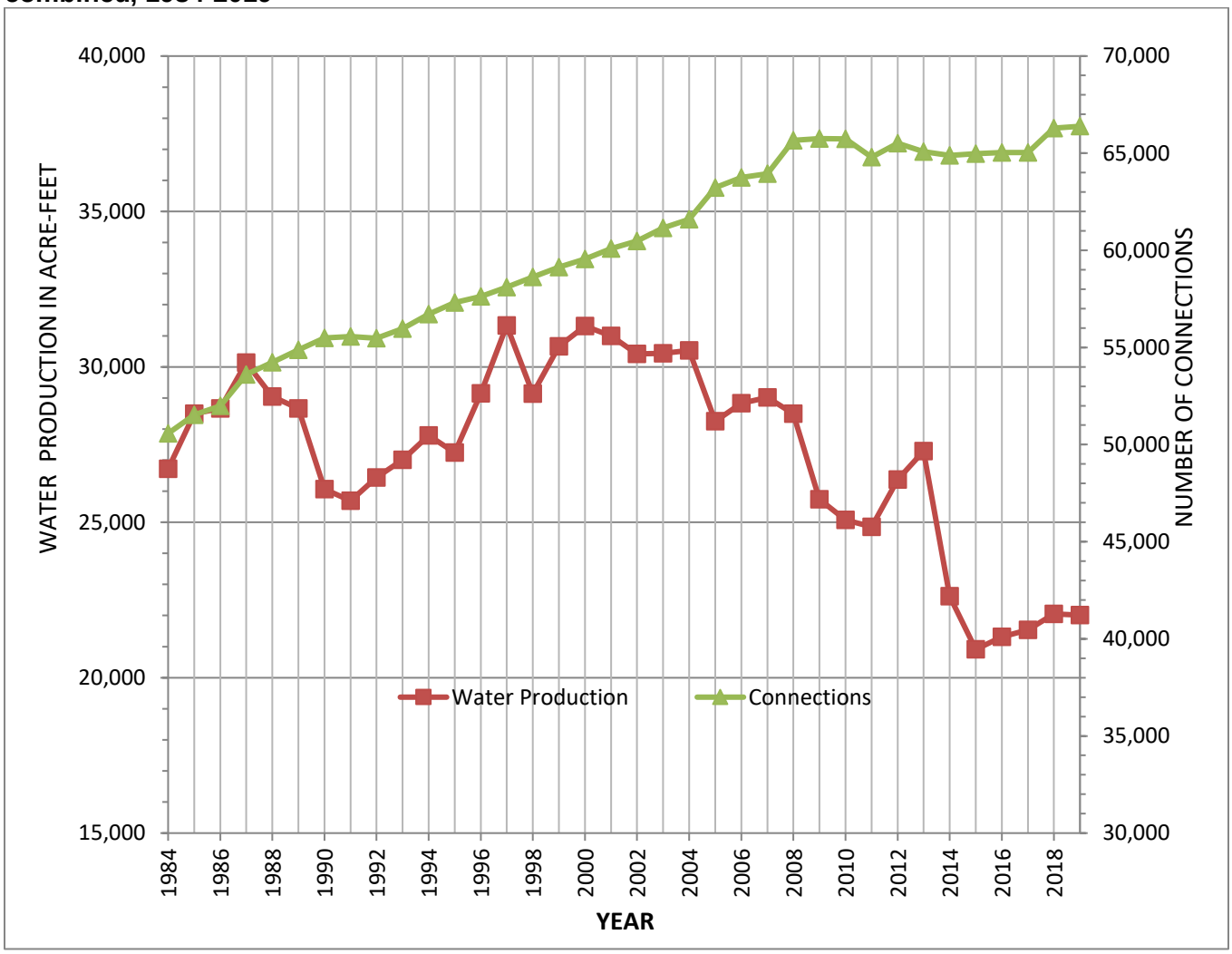

Figure 2: Municipal water use and rainfall, 1984-2019

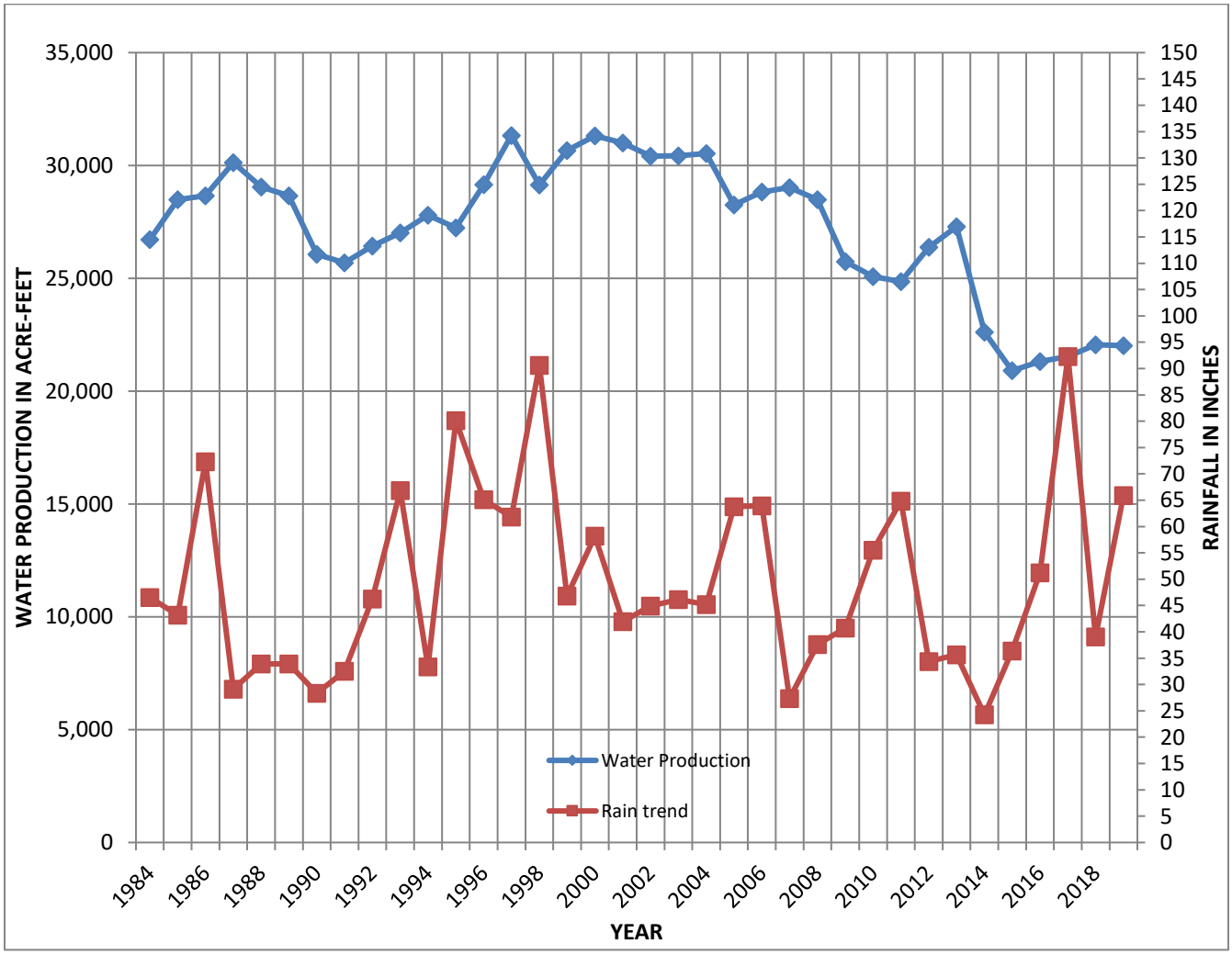

Figure 3: Inland Groundwater Levels, Mid-County Basin, Soquel Hills

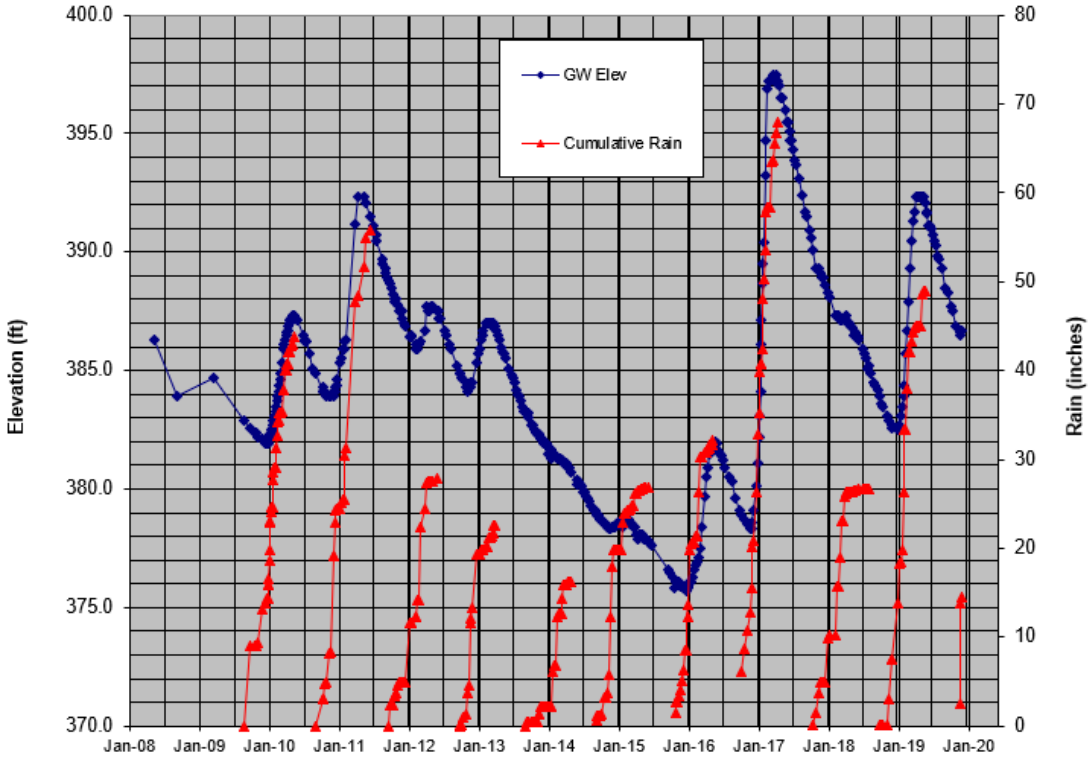

Figure 4: Coastal Groundwater Levels, Mid-County Basin, New Brighton area