

Chapter 7 Drought

7.1 Risk Assessment

7.1.1 Description of Hazards

Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the type location and extent of all natural hazards that can affect the jurisdiction.

Santa Cruz County surface water and groundwater resources provide drinking water for residents and visitors, critical habitat to numerous plant and animal species, and opportunities for recreational and commercial activities. Like many other areas of California, the County faces water resource challenges including inadequate water supply particularly during droughts, impaired water quality, overdrafted groundwater basins, depleted streams, and degraded riparian habitat. The overwhelming majority of Santa Cruz’s water supply is locally derived – a unique situation in a state supported by large federal and state water projects. Domestic supply within the region is provided by five large public agencies, four medium water systems, 115 small water systems, and some 8,000 individual wells. Water use in 2020 is shown in Table 19. 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.

Water Supplier	Connections	Population	Water Use acre-foot/year	Groundwater	Surface Water	Recycled Water	Imported
Santa Cruz City Water Department	24,561	97,417	8,375	5%	95%		
Watsonville City Water Department	14,855	65,966	7,201	100%			
Soquel Creek Water District	14,479	40,632	3,312	96.7%	3.3%		
San Lorenzo Valley Water District	7,900	23,700	1,953	53%	47%		
Scotts Valley Water District	3,807	10,709	1,339	87%		13%	
Central Water District	823	2,706	411	100%			
Big Basin Water Company	605	1,694	205	37%	63%		
Mount Hermon Association	494	2,850	155	100%			
Forest Lakes Mutual Water Company	326	1,076	40	100%			

Water Supplier	Connections	Population	Water Use acre-feet/year	Groundwater	Surface Water	Recycled Water	Imported
Smaller Water Systems (5-199 conn.)	2,616	7,691	1,552	91%	6%		3%
Individual Users*	8000	21,000	2,400	95%	5%		
Mid- & North County Agriculture			2,400	90%	10%		
Pajaro Agriculture (SC Co. only)**			22,250	92%	1%	7.2%	
Totals	78,466	275,441	51,593	78%	19%	3%	0.1%
Summary by Water Source (acre-feet/year)				40,027	9,788	1,776	47
Summary of Non-Agricultural Use (acre-feet/year)			26,943	17,397	9,326	174	47
*Values are Estimates							
**Includes a small number of water systems							
Source: 2020 Water Resources Annual Report							

Table 19 Water suppliers within Santa Cruz County

Nearly all of Santa Cruz County's water supply is derived from local surface water (streams and reservoirs - 20% of supply) and groundwater (80% of supply), which are fed entirely by precipitation and do not receive any imported water. A small amount of recycled water is produced for irrigation (4%). Partially because Santa Cruz County obtains all of its own water it is somewhat insulated from drought that has a greater impact on the portions of the state that rely on State or Federal water projects for their supply. However, the County continues to face major water supply challenges in that most groundwater basins have more water removed on an annual basis than is replaced and the major water supply agencies do not have sufficient sustainable supplies to meet current and future demand, even with very effective water conservation programs already in place.

While there are numerous small water diversions on many of the county streams, most of the stream water used is diverted from the San Lorenzo River Watershed, North Coast streams, and Corralitos Creek. Most groundwater is contained in permeable geologic basins, typically referred to as aquifers. There are three major groundwater basins in the county: the Santa Margarita, Santa Cruz Mid-County, and Pajaro.

Stream flow is inadequate to meet demands during a drought and all the major groundwater basins in Santa Cruz County are in some level of overdraft (i.e., more water is being extracted from the aquifers than is naturally recharged through the soils and stream valleys). In the Pajaro Valley, agricultural use far exceeds sustainable yield. In other parts of the County, historical development contributes to the overdraft both through demand but also because development covers the ground surface with impervious layers that greatly reduce groundwater recharge. Negative consequences of overdraft include declining groundwater levels, a decrease in groundwater quality, reduced streamflow, and seawater intrusion along the coast that destroys wells.

Figure 17 depicts the service areas of the major water agencies in Santa Cruz County. These agencies include the San Lorenzo Valley Water District (SLVWD), Lompico County Water District (merged with SLVWD), Scotts Valley Water District, City of Santa Cruz Water Department (CSCWD), Soquel Creek Water District, Central Water District, City of Watsonville Department of Public Works, and Utilities

(CWWD) and the Pajaro Valley Water Management Agency (PVWMA). With the exception of the recycled water project, the PVWMA does not provide water but rather is a management agency tasked with developing supplemental supplies and bringing the aquifers within its boundary into sustainable yield.

As with private well owners and stream diverters, the major water purveyors share the water resources in the County and most purveys obtain water from multiple sources. While most of the major purveyors depend solely on groundwater for their potable supply, the CSCWD, CWWD and SLVWD get a large portion of their water supply from local streams. The CSCWD is the largest user of surface water in the county, deriving approximately 90% of their supply from the San Lorenzo River Watershed and North Coast streams.

The water purveyors are working together to make our limited water resources sustainable for current and future generations of Santa Cruz residents. In fact, some of the most progressive water conservation programs in the country have been implemented by our local agencies and per-capita water use is far below state or national averages. Water Purveyors are working cooperatively and individually to develop additional sources of water, such as desalted sea water and recycled wastewater. An Integrated Regional Water Management Plan covers the County and has provided for ongoing collaboration between agencies as well as facilitated grant funding for project implementation.

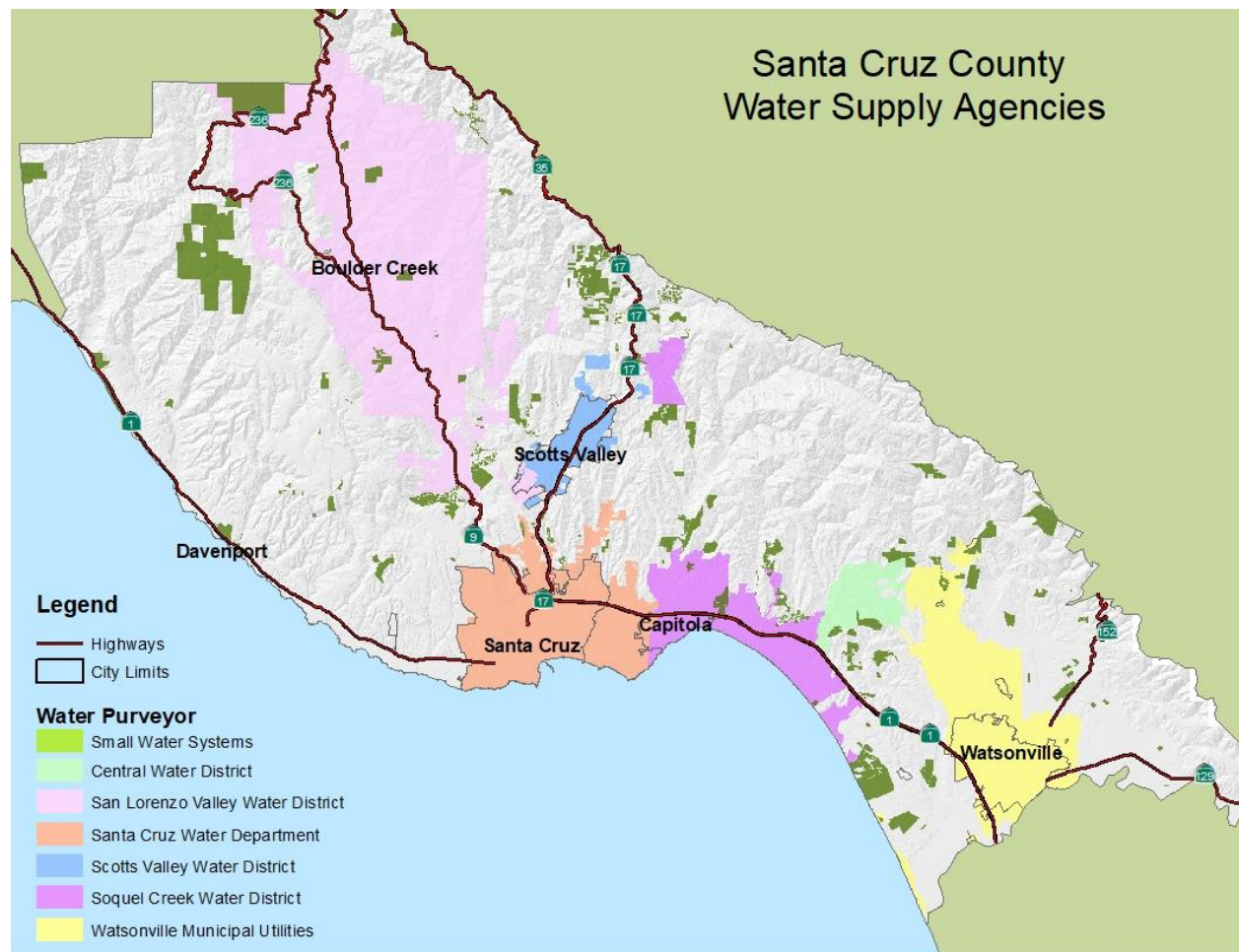


Figure 17 Santa Cruz County major water purveyors

Santa Cruz County has no direct authority over the entities that provide water supply to county residents. The two largest suppliers are governed by the city councils elected by city residents. Independently elected Boards govern the other public entities. The California Public Utilities Commission oversees the privately owned water systems to some extent. All water systems are governed by state and federal safe drinking water regulations. The larger systems with more than 200 connections are regulated directly by the California Department of Public Health.

The County serves as an agent of the state, ensuring compliance with the state regulations for 115 small water systems with 5-199 connections. The County also permits individual water systems to serve new homes in rural areas. Typically, these are on wells. Although well yield standards for new development are conservative, it is possible that individual wells and older wells serving small water systems may experience diminished yield or go dry during an extended drought. The County has no ongoing oversight of water use for individual water systems after the initial development permit is approved.

7.1.2 Previous Occurrences

Requirement §201.6(c)(2)(i): The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

A drought is a period of dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. Droughts may not be predictable, but they should be expected. They occur with some regularity and varying levels of severity. The magnitude and duration of a drought is something that can be predicted based on historical records and should be taken into account in water resources planning. In recent history, Santa Cruz County experienced 3 drought periods: 1976-77, 1987-1992, 2007-09, and most recently in 2012-15. It is expected that the effects of climate change will result in more severe droughts of longer duration.

The expected effects of climate change will also increase the risk of drought. Numerous climate models have been run with various predictions for the Santa Cruz County area. Although it is unclear whether the average amount of rainfall will increase, it is apparent that the timing and intensity of rainfall will change, which will lead to more severe extended droughts. More intense rainfall will contribute to relatively diminished groundwater storage, which will reduce groundwater storage and dry season stream baseflows, which will have adverse impacts on water supply. The projected increase in temperatures will also lead to an increase in water demand for irrigation, particularly in the inland parts of the county that are less influenced by coastal fog. It will also lead to greater rates of evapotranspiration, further exacerbating reduced stream flow. The county water agencies are currently pursuing more detailed assessments, which will help to better quantify the expected impacts of climate change.

7.1.3 Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Vulnerability to drought varies with the different water agencies and their sources. Agencies with a greater reliance on surface water are more vulnerable than those that rely entirely on groundwater. County water agencies have installed interties among jurisdictions to be able to exchange water in the event of an emergency or shortage.

The countywide decline in groundwater levels and streamflow is indicative of the continuing need to reduce any non-essential water use throughout the county by small and large water systems, private wells, and stream diversions. Conservation programs, curtailment programs, and plans to increase water supply are all components that will decrease the vulnerability of the community to drought.

7.1.4 Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Structures and facilities are not vulnerable to drought. Physical losses would probably be limited to public and private landscaping. However, the impacts to surrounding natural plant communities (and wildlife) that occur as the result of severe drought conditions also increase the risk of wildfire and subsequent damage to structures as a result.

7.1.5 Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.

While structures are not at risk, significant losses may occur as a result of severe rationing during a water shortage. One of the County's major industries is tourism. The vulnerability to drought (or more specifically water shortages as a result of drought) reaches its peak during the summer tourism season. Restaurants, hotels, amusement parks and other tourist serving businesses would all be at risk of closing or severe restrictions during a critical drought. This is critical to funding ongoing County services because of the County's reliance on the Transient Occupancy Tax (TOT). Other industries such as agriculture, food processing, contractors, landscapers, nurseries, golf courses, public landscaping and school grounds would all experience losses, and other water dependent businesses would suffer economic damages. These economic losses have not been calculated.

While potential economic losses have been considered, they have not been calculated; therefore, there is no loss estimate.

7.1.6 Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The greater Santa Cruz area is a compact urban area surrounded by mountains, greenbelt, and the Pacific Ocean. The sizes of the water service areas are generally fixed by the County's urban services line. Water service areas for all jurisdictions have generally remained constant over time due to policies limiting water main extensions to unserved areas. The only extensions of service or agency boundaries have involved incorporating an existing developed area into a larger district, which has better capabilities for providing reliable water service. Accordingly, any growth and redevelopment that does happen going forward is expected to be concentrated within the confines of the existing service area boundaries.

Within the City of Santa Cruz, the San Lorenzo Valley, and other areas only a relatively small amount of land remains undeveloped. Because of the relative scarcity of raw buildable land, the majority of future growth in the area is likely to be achieved through redevelopment, remodeling, infill, and increased density on underutilized land, along with new construction on the little amount of vacant land remaining. In other words, the service areas are relatively fixed and not growing outward. There has not been a residential subdivision in rural areas of the county since the adoption of Measure J, the County's growth management plan, in the late 1970s. Both the City of Watsonville and the City of Santa Cruz have also established urban growth boundaries.

The housing elements of the County and the cities have recently been updated to address the required regional fair share housing needs established by AMBAG. These documents set forth goals and objectives for housing production, rehabilitation, and conservation. The plans identify generally where sites are available for housing to be built and describe programs to facilitate new housing opportunities, but this does not necessarily mean such housing actually will be constructed.

The County has adopted growth management policies and ordinances that limit growth. According to annual Growth Management Reports, there have been 909 new residential structures built in the County since 2010 (Table 12).

New development is required to incorporate water conservation measures to mitigate potential impacts from drought. These requirements implement the drought mitigation strategy described below.

7.2 Mitigation Strategy

Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

Each water supply agency that serves more than 3,000 connections is required to prepare and maintain an urban water management plan, which among other things, outlines the susceptibility of the supply to drought over a 30-year planning horizon. Those plans have been completed by all the large agencies and take into account expected population growth and climate change impacts.

Local governments, agencies, organizations in Santa Cruz County share a history of long-range planning efforts at the scale of individual groundwater basins, watersheds, and jurisdictions. In 1998, a variety of entities came together to support coordinated programs for water resources and watershed management. Between 2002 and 2004, local agencies and special districts began integrated planning efforts, including coordination of water bond funding. In 2005, local agencies collaborated on the development initial Integrated Regional Water Management Plan (IRWMP) to address the region's water supply, water quality, and resource stewardship needs. In 2006, the Partner agencies signed a Memorandum of Agreement and most formerly adopted the IRWMP. The IRWMP was updated in 2014. Development of the IRWMP has helped secure millions of dollars of grant funding for high priority water resource projects.

In 2011, the California Department of Water Resources (DWR) awarded \$999,750 to the Regional Water Management Foundation to support an update of the Region's IRWMP and to complete key technical studies to inform water resources management. This work provided critical data to evaluate resource management strategies to address the water resource challenges facing the Region. In 2016, DWR awarded a \$1.2 million grant to partially fund the implementation of three projects, including two drinking water supply reliability projects and upgrades to a wastewater/recycled water treatment facility. An addendum to the IRWMP was completed in 2019 to update and expand content in the Plan to meet the state's IRWMP Standards, including new information on water quality and climate change vulnerabilities.

The County has worked with the water districts and purveyors, small water system operators, and private wells for many years to manage groundwater, a critical source of drinking water in the county. The existing collaborations laid the groundwork for complying with the Sustainable Groundwater Management Act of 2014 (SGMA) went into effect on January 1, 2015. In addition to the work required under SGMA, the individual agencies that depend on groundwater for some or all of their water supply continue to implement projects and management actions.

The three groundwater basins subject to SGMA are the Pajaro Valley Basin, the Santa Cruz Mid-County Basin, and the Santa Margarita Basin. The County is a member of the two agencies tasked with overseeing sustainable management of the Mid-County and Santa Margarita Basins. A Groundwater Sustainability Plan for the Mid-County Basin was adopted in 2019 and the Plan for the Santa Margarita basin is expected to be adopted in 2021. The Pajaro Valley Water Management Agency is currently updating their Basin Management Plan. All three agencies have received grant money from the Department of Water Resources for their planning efforts.

An assessment of the combined mitigation strategies of the water agencies and the County as part of this 5-year plan update indicates the strategy is effective for reducing potential losses identified in the risk assessment. The drought risk has not changed since the previous plan was adopted. No adjustments are needed to address a change in circumstances. A number of mitigation strategies have been effectively implemented during the current drought during the five-year update period.

7.2.1 Mitigation Goals

Requirement §201.6(c)(3)(i): The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Given that the County does not have any direct authority over water supply, the County is limited in the actions it can take to mitigate drought, other than to support the efforts of various water supply entities to address drought. Goals to reduce the impacts of drought are contained in the various plans described above such as the Urban Water Management Plans and the IRWMP, and the Groundwater Sustainability Plans.

Drought Goals

Drought 1 - Reduce near-term drought shortages through water conservation and water supply projects.

Drought 2 - Provide a reliable supply that meets long-term needs while insuring protection of public health and safety as well as environmental users of water.

Drought 3 - Support land use patterns that encourage higher density residential development along major transit corridors, as this type of residential living product uses less water per capita than conventional stand-alone single family residential development.

7.2.2 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Drought mitigation strategies include the following actions. The alpha-numeric identifiers after each action are further described in Chapter 15 Mitigation Strategy.

- Implement water conservation to maximize the use of existing water resources. (A-7)
- Support the development of additional water supplies (A-8)
- Promote more effective use of groundwater storage through increased groundwater recharge and conjunctive use among agencies. (A-9)
- Promote drought planning by the 115 small water systems under County jurisdiction. (B-15)
- Passage of the Sustainable Santa Cruz County Plan to support higher density development along major transit corridors. (C-12 New)

Drought does not present a direct hazard to buildings. Proper maintenance and weed abatement including removal of dead landscape vegetation adjacent to buildings will reduce the threat of structure fire during dry years.

See Part 4 for a complete discussion of process and criteria used to prioritize mitigation actions. Individual water supply master plans, groundwater management plans, and urban water management plans were developed with a process for technical review and public review, which resulted in a prioritization of recommendations for each water supply agency. The Santa Cruz IRWMP maintains a list of projects from the various plans prepared by the water supply agencies. In addition, the Groundwater Sustainability Plans outline diverse and coordinated projects to bring groundwater basins into sustainability. The projects included in those plans are at varying levels of design, and are largely comprised of the following project types:

- Stormwater capture and recharge
- Recycled water for both irrigation and potable use
- Active recharge of groundwater basins with surplus surface water when available (Aquifer Storage and Recovery)
- Conjunctive use of surface and groundwater resources within and between water agencies to allow groundwater wells to rest when surface water is available (in-lieu recharge)
- Redistribution of pumping to protect water supply and natural resources.

2021 Progress Report

The Board of Supervisors has adopted a number of water conservation measures, including water efficient landscaping, prohibition on inefficient use of water, an update of the requirement for the retrofit of water efficient toilets and showerheads upon property transfer, and measures to encourage drought planning among small water systems will be considered. The County participates in regional collaborations and partnerships such as the IRWMP and the Water Conservation Coalition of Santa Cruz County.

Although the County is not a large regional water purveyor or manager (the County operates the Davenport water system), there are a number of actions the County has been taking to address water conservation as detailed in the Annual Water Resources Status Reports to the Board of Supervisors.

Water Conservation. Both the state water law and the County's General Plan call for a strong emphasis on water conservation and elimination of water waste to stretch existing sources, minimize the need for new water sources, and protect the environment. Most of the water agencies have strong conservation programs, which are supported by the County. Long term water conservation measures have been implemented by major water agencies, resulting in declining total demand. During the recent drought, agencies reduced water use from 2013 to 2016 by 25%, and subsequent water use has remained much lower than pre-drought levels. The County has implemented additional prohibitions on wasteful water use practices (Chapter 7.69) and has implemented the Water Efficient Landscape Ordinance (Chapter 13.13). Water efficiency measures for large users are required as a condition of obtaining a well permit (Chapter 7.70). Small water systems are required to install meters and report water use (Chapter 7.71). County staff continue to provide education and outreach on water conservation and respond to complaints of excessive water use. The Pajaro Valley Water Management Agency has been partnering with the Resource Conservation District of Santa Cruz County to promote conservation in agricultural water use as well. (A-7)

Recycled Water and Groundwater Storage. There are currently three water recycling plants in the County, all focusing on tertiary treatment for irrigation: one operated by the City of Scotts Valley, one by the Pasatiempo Golf Course, and one by the City of Watsonville and Pajaro Valley Water Management

Agency. The first potable recycled water is in the final development stages with construction expected to start in 2021. The Pure Water Soquel project is being spearheaded by Soquel Creek Water District in partnership with the City of Santa Cruz who will provide the source water. The project will purify 1500 acre-feet of water per year, which will be injected into the Mid-County Groundwater Basin for use as both a supply and for seawater intrusion prevention. The City of Santa Cruz is investigating the use of the Mid-County Basin as a place to store excess surface water through an Aquifer Storage and Recovery program. The City is currently piloting the feasibility of using surplus winter flows and injecting them into the Basin for future use. They are also in the process of updating their water rights to allow flexibility in the use of their surface water sources. The County is considering investigating the feasibility of septic consolidation and centralized sewage treatment in a portion of the San Lorenzo Valley, which would make recycled water available to mitigate water supply constraints and/or for fire suppression. (A-8)

Water Transfers, Recharge and Conjunctive Use. County staff are supporting the efforts of the water agencies to evaluate more possibilities for water exchanges and conjunctive use options which would have the potential to utilize more surface water during wet periods, increase use of recycled water, increase groundwater storage, increase stream baseflow, and potentially make more groundwater available to surface water users during drought periods. County staff is also pursuing various methods to increase groundwater recharge through projects and policies to restore and maintain storm water infiltration. City of Santa Cruz, San Lorenzo Valley Water District, Scotts Valley Water District and Soquel Creek Water District are all actively evaluating conjunctive use options and negotiations are underway for transfer of surface water to reduce groundwater use. In particular, the City of Santa Cruz and Soquel Creek Water District have been actively transferring water since 2019 and just negotiated a 5-year extension of that program. The County has received Integrated Regional Water Management grant funds to implement a stormwater recharge project at the Seascape Golf Course. The Resource Conservation District is continuing to develop projects to capture and recharge groundwater from agricultural areas of South County. Stormwater regulations have been amended to require maintaining infiltration rates at pre-development levels for new development and redevelopment. The Pajaro Valley Water Management Agency has recently certified two water supply project EIRs. One is for their College Lake Project which will supply approximately 1,800 to 2,300 acre-feet per year of water to growers in the Pajaro Valley. The other is for their Watsonville Slough Managed Aquifer Recharge project which temporarily stores excess surface water underground for use as irrigation water during the dry season. (A-9)

Drought Planning for Small Water Systems. The County requires water use measurement and reporting by the small water systems (5-199 connections) that the County oversees. Under drought conditions it is appropriate to require individual meters on connections within the water systems so that the system operators and individual users can better measure the effectiveness of the water conservation efforts. During the recent drought, the County frequently communicated with small water systems to provide water saving suggestions and technical assistance as needed. (B-15)

The County has dedicated significant staff resources and leadership to water conservation and supply issues. By using various planning mechanisms to implement mitigation actions the County has demonstrated progress in reducing the risk and consequences of drought. Further explanation of how the previous mitigation plan has been implemented over the last five years is included in Appendix L. The worksheets in Appendix L also describe how the current mitigation strategy, including the goals and hazard mitigation actions, will be implemented over the next five years. The projects described in

Mitigation Actions A-7, A-8, A-9, and B-15 are still relevant and will continue to be implemented over the next five years.

The County did not use a formal cost benefit analysis. Costs were carefully considered when determining goals and objectives but there was not an emphasis on cost benefit review to maximize benefits.