SANTA BARBARA COUNTY
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
UPDATE 2019

Prepared for :

SANTA BARBARA COUNTY IRWM COOPERATING PARTNERS

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

UPDATE 2019

Prepared by:

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ACRONYMS AND ABBREVIATIONS

ACWA	Association of California Water Agencies
AEP	Association of Environmental Professionals
AFY	Acre-Feet Per Year
APA	American Planning Association
CARB	California Air Resources Board
CASGEM	California Statewide Groundwater Elevation Monitoring
CCWA	Central Coast Water Authority
CDPH	California Department of Public Health
CEDEN	California Environmental Data Exchange Network
CEIC	California Environmental Information Catalog
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CMA	Central Management Area
County	County of Santa Barbara
CRCD	Cachuma Resource Conservation District
CSD	Community Services District
DAC	Disadvantaged Community
DAU	Detailed Analysis Unit
Delta	Sacramento–San Joaquin Delta
DMS	Data Management System
DWR	California Department of Water Resources
EMA	Eastern Management Area
GHG	Greenhouse Gas
gpd	Gallons Per Day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IRWM	Integrated Regional Water Management
IRWM Plan	Santa Barbara County Integrated Regional Water Management Plan
LAMP	Local Agency Management Program
MCL	Maximum Contaminant Level
mgd	Million Gallons Per Day
mg/L	Milligrams Per Liter
MS4	Municipal Separate Storm Sewer System
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service

NPDES	National Pollutant Discharge Elimination System
OWTS	On-Site Wastewater Treatment Systems
ppb	Parts Per Billion
Region	Santa Barbara County IRWM Region
RMS	Resource Management Strategy
RWQCB	Regional Water Quality Control Board
SDAC	Severely Disadvantaged Community
SGMA	Sustainable Groundwater Management Act of 2014
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
UCSB	University of California at Santa Barbara
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
VAFB	Vandenberg Air Force Base
WMA	Western Management Area
WR	Water Rights
WWTP	Wastewater Treatment Plant

ACKNOWLEDGMENTS

Santa Barbara County Integrated Regional Water Management Plan

The Santa Barbara County Integrated Regional Water Management (IRWM) Plan 2018 is a result of combined efforts of many agencies, organizations, and individuals. These Cooperating Partners spent countless hours developing the information that is included in this IRWM Plan 2018 and reviewing its contents. The entire region appreciates the time and commitment of those listed below.

Cooperating Partners (Regional Water Management Group)

Cities

City of Buellton
City of Carpinteria
City of Goleta
City of Guadalupe
City of Lompoc
City of Santa Barbara
City of Santa Maria
City of Solvang

Special Districts

Carpinteria Sanitary District
Carpinteria Valley Water District
Cachuma Operation and Maintenance Board
Cuyama Community Services District
Goleta Sanitary District
Goleta Water District
Goleta West Sanitary District
Los Olivos Community Services District
Montecito Water District
Santa Barbara County Flood Control District
Santa Barbara County Laguna Sanitation District
Santa Ynez Community Services District
Santa Ynez River Water Conservation District
Santa Ynez River Water Conservation District, Improvement District No. 1
Vandenberg Village Community Services District

<u>Santa Barbara County Departments and Agencies</u>

Santa Barbara County Water Agency

<u>Non-Governmental Organization</u>

Heal the Ocean

<u>Mutual Water Companies</u>

La Cumbre Mutual Water Company

<u>Tribes</u>

Santa Ynez Band of Chumash Indian of the Santa Ynez Reservation

Santa Barbara County IRWM Plan 2019 – Plan Standards Review Tool

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1 INTRODUCTION TO IRWM PLAN UPDATE 2019

The Santa Barbara County Integrated Regional Water Management Plan (IRWM Plan) is responsive to the changing conditions, needs, and available information relevant to the region. Projects to implement the IRWM Plan are developed in response to newly identified needs and are updated on an ongoing basis in the project database (described in Section 8.4). As new, relevant planning documents are developed in the region, they are added as appendices to the IRWM Plan (see Appendices 2-A through 2-J, Appendix 3-A, Appendix 4-A, and Appendix 7-A; Appendices from the 2013 Plan are incorporated by reference and are on the IRWM website at http://www.countyofsb.org/pwd/wateragency.sbc). Objectives, priorities, and resource management strategies are revisited as necessary to respond to the changing conditions in the region and in response to new state-mandated requirements.

Throughout this IRWM Plan 2018 Update, the IRWM Plan will be referred to as the IRWM Plan, rather than referencing the most recent update, as has been done in previous updates. The most recent efforts to update the IRWM Plan will be described in an introductory paragraph rather than as text woven throughout the IRWM Plan. This will greatly simplify future updates, and provide a single location to reference the most recent changes to the IRWM Plan.

The overall boundaries of the Santa Barbara County IRWM Region (Region) have not changed, but through the Sustainable Groundwater Management Act, a number of new governmental agencies have formed, including the following:

- Cuyama Basin Water District
- Cuyama Valley Groundwater Sustainability Agency (GSA)
- San Antonio Basin GSA
- Santa Ynez River Valley Western Management Area GSA
- Santa Ynez River Valley Central Management Area GSA
- Santa Ynez River Valley Eastern Management Area GSA
- Montecito Groundwater Basin GSA

A water district is also forming within the San Antonio Groundwater Basin.

The IRWM Plan Update 2018 addresses the deficiencies of the IRWM Plan that were identified by the California Department of Water Resources (DWR), and conforms to the 2016 IRWM Planning Standards (DWR 2016a). The IRWM Plan 2018 updates the Santa Barbara Countywide Integrated Regional Water Management Plan (May 2007) and the IRWM Plan 2013.

Significant changes to the IRWM Plan as part of this update include the following:

- The issues and challenges identified and evaluated during the IRWM Plan Update 2018 have been carried forward from the IRWM Plan 2013.
- Climate change vulnerabilities were first prioritized for IRWM Plan 2013. As part of the IRWM Update 2018, the Cooperating Partners revisited the prioritization in the context of recent events, including extended drought, wildfires, flooding, and a catastrophic debris flow, as well as new climate change impact assessments. Cooperating Partners completed a survey in which the vulnerabilities were assigned a ranking of high, medium, or low. The results of this survey were then discussed in a County-wide stakeholder meeting during which it was determined that a "very high" vulnerability category was needed. This category was created in response to vulnerabilities that agencies are facing now that require immediate and targeted response. The vulnerability prioritization that resulted from the survey and stakeholder discussion is provided in Section 2 (see Table 2.20, Climate Change Vulnerability Issues for the Region). In addition to reprioritization, the Cooperating Partners also identified an additional vulnerability and recharacterized two vulnerabilities that were previously sub-vulnerabilities to larger issues. For water quality, "poor water quality in groundwater" was added to the vulnerability list, and "increased constituent concentrations" and "increase in treatment needs and costs" were made sub-vulnerabilities to both "poor water quality in groundwater" and "poor water quality in surface waters."
- Three subcommittees were formed and convened for the purpose of updating specific areas of the IRWM Plan. Participation in the meetings was open to the Cooperating Partners and Stakeholders. The Water and Culture Subcommittee met on May 9, 2018, and the Climate Change Subcommittee met on May 21, 2018, and the Disadvantaged Community (DAC) and Vulnerable Communities Sub-Committee met on June 6, 2018. The results of the Water and Culture Subcommittee meeting discussions are included in Section 2.1; the results of the Climate Change Subcommittee meeting are included in Section 2.12, Natural Hazards Requiring Emergency Planning, and Section 2.13, Climate Change; and the results of the DAC and Vulnerable Communities Sub-Committee are included in Section 2.11.2. Following all subcommittee meetings, a summary of the meetings was provided to the Cooperating Partners, and a presentation of next steps was discussed. These topic areas were then reabsorbed into the regular discussion, dialogues, and actions of the Cooperating Partners.
- The IRWM Plan was funded with both fiscal and in-kind contributions from the multiple agencies, cities, and non-profit organizations that make up the Santa Barbara County IRWM Regional Water Management Group, known as the Cooperating Partners.
- Within the IRWM Plan 2013, the IRWM Region was characterized with five sub-regions based on distinct watersheds. This IRWM Plan Update 2018 recognizes the distinct

character and watershed areas of the five regions; however, for efficient, effective, collaborative, and synergistic project planning and implementation, the Santa Ynez River Watershed and San Antonio Creek Watershed Planning sub-regions have been merged into the Mid-County IRWM Sub-Region.

- For the IRWM Plan Update 2018, the list of resource management strategies developed for the IRWM Plan 2013 were reviewed, and additional resource management strategies from the California Water Plan Update 2013 (DWR 2013, Chapter 26, Sediment Management; Chapter 29, Outreach and Engagement; and Chapter 30, Water and Culture), and two from the 2009 California Water Plan Update that had not been included in the IRWM Plan 2013 (DWR 2009, Chapter 29, Other Resource Management Strategies: Crop Idling for Water Transfers and Irrigated Land Retirement) were reviewed for relevance. In direct relationship to the resource management strategies and the sub-regions, the following list of watershed issues and challenges were identified and are discussed through the IRWM Plan Update 2018.

Santa Maria River Watershed Issues and Challenges

- Sediment accumulation in Twitchell Reservoir reduces storage capacity and threatens operability of release works.
- State Water Project (SWP) water deliveries and quality fluctuate due to annual variations in climate, hydrology, regulatory constraints, and operations.
- There is nitrate groundwater contamination.
- Potential releases from Twitchell Reservoir for fish migration may reduce available water supply for groundwater recharge.
- Continued groundwater monitoring and management is needed to ensure adequate supply and water quality for all users.
- Regional collaboration needed for conjunctive groundwater management.
- Urban and agricultural users rely on the same limited groundwater resources.
- Current monitoring may not be adequate to characterize effectiveness of salt and nutrient management.
- Lack of an affordable water supply in Casmalia (a "Disadvantaged Community" [DAC]).
- Harm from flooding is a risk in some areas.
- Cuyama Valley (a DAC) Groundwater Basin overdraft is causing increased pumping lift and costs for agricultural and domestic users and threatens water supply reliability for residents.

- Cuyama Valley Groundwater Basin was identified by the Department of Water Resources as "critically overdrafted" in 1980. This conditions has persisted and been exacerbated over the past 38 years. Water quality impairments and water sustainability are of concern.
- Cuyama Valley Groundwater Basin has naturally occurring arsenic problems that are treated by the Cuyama Community Services District (CSD).
- Wildfire danger could increase sediment accumulation in dams, rivers, and streams, and therefore increase the risk of flooding.
- Changes in clean water standards may require modification of stormwater and water quality management.
- Pollution of creeks and coastal waters could result from nonpoint sources and point-source runoff during rain events, particularly in 303d listed water bodies.
- There is a need to control stormwater to protect ocean water quality and public health, and increase capture to augment supply.
- Flooding is a risk in Cuyama where isolated thunder storms in the summer and high winter flows can wash out and damage roads and highways.

Santa Ynez River Watershed and San Antonio Creek Watershed Issues and Challenges

- Insufficient integration of adjacent systems constrains operational flexibility.
- Changes in clean water standards may require modification of stormwater and water quality management.
- Water quality exceeds certain enforceable maximum contaminant levels (MCLs) in shallow groundwater in the Santa Ynez Uplands, especially Los Olivos and Ballard and portions of Santa Ynez.
- Nitrate groundwater contamination from septic systems in Los Olivos.
- Continued need to manage impaired water bodies.
- Scour from gravel mining in Solvang may cause problems for infrastructure such as bridges and other facilities.
- There are challenges of complying with existing and emerging wastewater discharge standards.
- Wildfires cause habitat damage and extreme erosion, which adversely affects reservoir storage and water quality at Cachuma and Gibraltar Reservoirs.
- There is flood risk in the lower portion of the watershed.

- Habitat management is problematic due to diverse multiple demands on water uses (e.g., water supply, protected species).
- Despite the adoption of operations protocol at Cachuma Reservoir, large and localized events can cause flooding of farm land and cities along the lower Santa Ynez River.
- There is a need to control invasive species, such as quagga mussels (*Dreissena bugensis*), pampas grass (*Cortaderia selloana*), Japanese dodder (*Cuscuta japonica*), and Arundo donax (*Arundo donax*).
- A State Water Resources Control Board (SWRCB) decision is needed on the Cachuma Project water rights permits that support those elements of the Cachuma Project Settlement Agreement under its jurisdiction to facilitate integration of water supply, downstream water rights, and public trust resources.
- Limited diversity of water supply in the City of Solvang.
- Total maximum daily loads (TMDLs) in development for chloride, E coli, fecal coliform, nitrate, salinity, total dissolved solids (TDS), chlorides, sedimentation, and siltation may require changes in water use and water management.
- Loss of surface water storage.
- Regional collaboration needed for conjunctive groundwater management.
- Miguelito Creek is the City of Lompoc's primary receiving water and is a 303(d) list water body, with standards.

South Coast Watersheds Issues and Challenges

- Current inability to capture untapped sources of renewable energy that could be made available through the redesign of the water system.
- Lack of redundancy and capacity in storage and distribution systems leaves the area vulnerable to water supply shortages during times of prolonged drought and in emergency situations.
- Aquifer zones in the Santa Barbara area may be susceptible to seawater intrusion during periods of surface-water shortages.
- Older infrastructure constrains system operability.
- Insufficient integration of adjacent systems constrains operational flexibility.
- Flooding causes public health and safety risks.
- Shallow groundwater contamination issues at orphaned sites.
- Contaminated soils at former industrial and commercial areas may result in polluted runoff.

- Continued conjunctive use is essential to ensure reliability of supplies.
- Pollution of creeks and coastal waters could result from nonpoint sources and point-source runoff during rain events, particularly in 303d listed water bodies.
- Wildfires cause habitat damage and extreme erosion, which adversely affect reservoir storage and water quality.
- Long-term sediment accumulation has reduced vital reservoir storage capacity and operations.
- Groundwater and surface water contamination occurs from septic systems.
- Containment of contaminants from former disposal sites is necessary.
- Anthropogenic (e.g., built, constructed) barriers such as lined flood control channels and bridges impede steelhead trout (*Oncorhynchus mykiss*) migration.
- Need to expand existing water supplies and develop new local supplies to address future water supply constraints and reduce dependence on the Delta.
- Need to control stormwater to protect ocean water quality and public health, and increase capture to augment supply.
- Low-lying coastal wastewater treatment plants—City of Santa Barbara's El Estero Wastewater Treatment Plant (WWTP) and Goleta Sanitary District's treatment plant—are vulnerable to flooding due to sea-level rise.
- Upstream sources of contaminants may be compromising water quality where Jalama Creek joins Jalama Beach.
- Reduced stream flow is leading to beach sand depletion from the Jalama watershed.
- Loss of surface water storage.
- Regional collaboration needed for conjunctive groundwater management.
- Older infrastructure and undersized mainlines threaten reliability in Isla Vista, a "Severely Disadvantaged Community" (SDAC).

1.1 Integrated Regional Water Management

Water resource managers in the Region have a long history of working cooperatively to resolve issues related to water and wastewater, including ensuring the adequacy of supplies and services, protecting and improving surface water and groundwater quality, and protecting and enhancing ecosystems. Together they have planned and implemented significant water resources projects; developed integrated supplies and delivery systems; managed resources to meet the needs of urban users, agriculture, and ecosystems; and developed adaptive management strategies to respond to changing circumstances.

Nonetheless, challenges remain, and the IRWM Plan is intended to increase the level of coordination among agencies and districts responsible for water resources planning, nongovernmental organizations, and interested members of the public to facilitate the optimal management of water resources within Santa Barbara County over the next 20 years. The process of coordination is ongoing and evolving, but it entails conducting regular Cooperating Partners meetings; presenting to organizations and non-governmental organizations (NGOs) in the community; speaking on panels and presentations to decision makers; meeting with elected officials; and holding targeted meetings with stakeholder groups, including agricultural communities and representatives (farm bureau, agricultural advisory committee, etc.), local environmental groups such as the Sierra Club, Community Environmental Council, Citizens Planning Association, and others. In identifying areas of coordination and conflict, although the IRWM is a good forum, it is not always the forum selected for conflict resolution. The IRWM, however, does function well to take advantage of efficiencies by virtue of the membership of the Cooperating Partners and structure of regular IRWM meetings to implement the Plan and evaluate Plan performance. There are discussions at regular IRWM meetings where agencies are prompted to report out on challenges, successes, and areas of concern. Cooperating Partners have the opportunity to collectively problem solve, share information, strategize, and collaborate.

Success of the Plan and the process also requires leadership from DWR and support from the legislature in the form of bond funding. Recognition of the IRWM Plan and process as well as support for IRWM projects is also desired throughout state agencies to ensure that agencies, which are permitting and/or funding projects, are aware of the rigorous and deliberative process projects and project proponents must adhere to in order to be adopted into the Plan and meet regional and statewide resource stewardship goals.

The planning framework established by the IRWM Plan can be modified, as needed, to respond to changing conditions, including regulatory requirements, and is designed to increase flexibility and efficiency by integrating multiple aspects of water resources management, such as water quality, local and imported water supplies, watershed protection, wastewater treatment and recycling, and protection of local ecosystems. The watersheds of the Santa Barbara County IRWM Region are described in Chapter 2, Regional Description.

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2 REGIONAL DESCRIPTION

2.1 Introduction

This chapter describes the process whereby the California Department of Water Resources (DWR) accepted the political boundaries of the County of Santa Barbara (County) as the physical boundary of the Santa Barbara County IRWM Region (see Figure 2.1, IRWM Region). This section also provides details about the watersheds, water systems, water quality conditions, and common water objectives and issues within the Region.

2.2 Regional Overview

2.2.1 Regional Acceptance Process

On April 2009, the County successfully completed the IRWM Regional Acceptance Process with DWR. The Regional Acceptance Process helped define the Santa Barbara IRWM Region, and was the Region's first step in becoming eligible for Proposition 84 grant funding. The Regional Acceptance Process identified the Region's Regional Water Management Group, known as the Cooperating Partners; stakeholder participation; governance structure; outreach; the regional boundary; water management issues; water-related components; and relationships with adjacent regions.

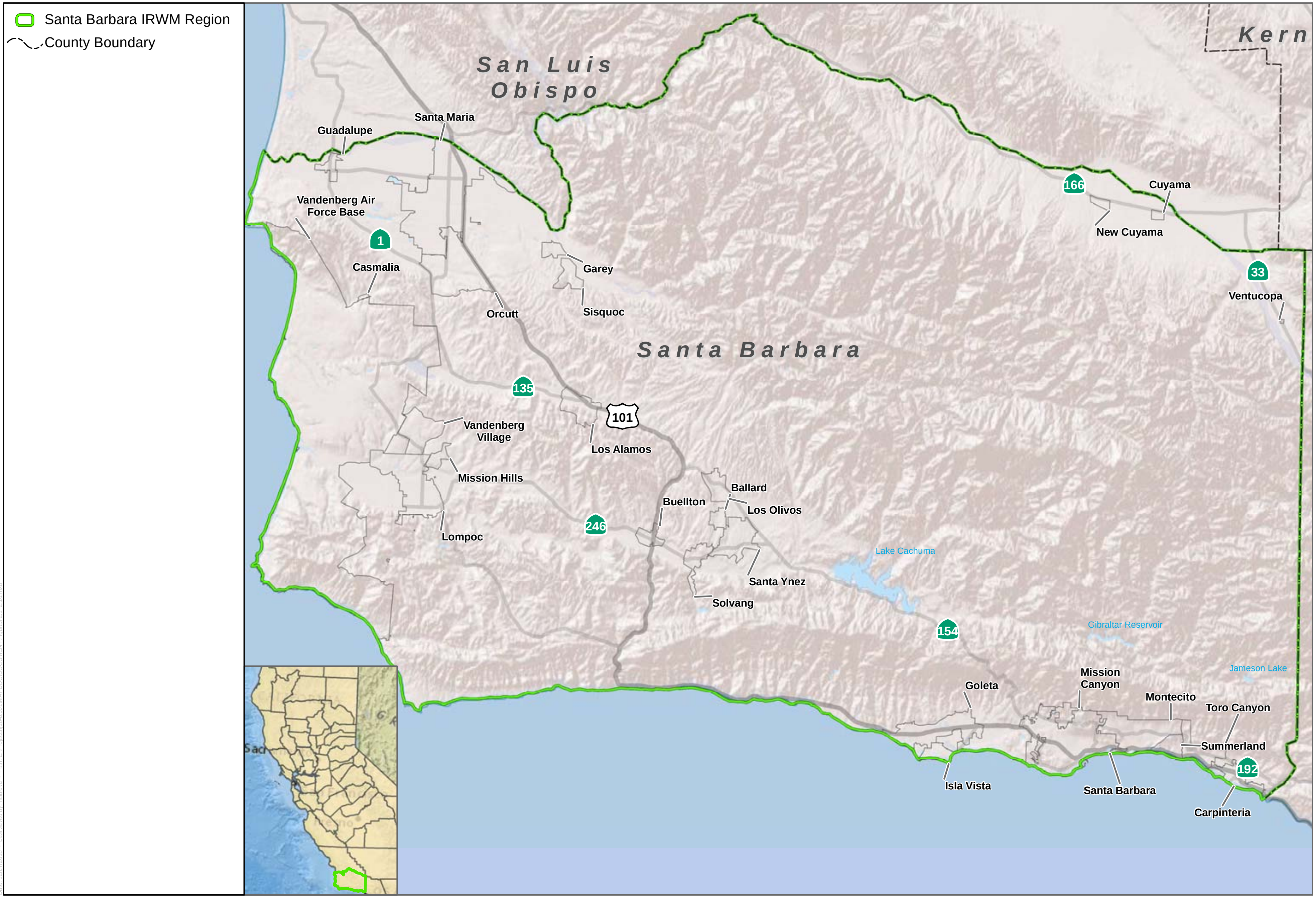
2.2.2 Internal Boundaries

The Cooperating Partners use the County of Santa Barbara jurisdictional boundary to define the Santa Barbara IRWM Region. This is the appropriate boundary for multiple practical management purposes, and maximizes the opportunities for integration of water management activities. The political/jurisdictional boundary to the north with San Luis Obispo County is defined by the Santa Maria River (formed by the confluence of the Sisquoc and Cuyama Rivers). Santa Barbara County is bounded by the Pacific Ocean to the west and south, and the jurisdictional boundary encompasses the Rincon Creek Watershed to the south and southeast on its border with Ventura County. Santa Barbara County's upper northeastern political boundary with Kern County crosses the Cuyama Valley.

The Region encompasses the entire County. Figure 2.1 shows the IRWM Region; Figure 2.2 shows the sub-regions; and Figure 2.3, Census Designated Places and Jurisdictional Boundaries, shows the regional boundary and the IRWM regions adjacent to the County (San Luis Obispo and Ventura Counties). The County is an appropriate region for integrated planning for several reasons:

- Different sub-regions within the County share water supplies and infrastructure, and water is managed as an interconnected system within the County's boundaries.

- Water and wastewater management entities must address issues and challenges that are specific to the Region and that would benefit from integrated management.
- Many of the entities within the County have a long history of working together to resolve water issues, and a framework already exists for addressing key issues related to water resource management.
- The County is largely geographically separate from neighboring counties. The County abuts Kern County only along its sparsely populated northeast corner. The portions of the Rincon Creek watershed shared by Ventura County and the Cuyama River watershed shared by Ventura and San Luis Obispo Counties have very low population densities, are smaller in size, and have no shared water infrastructure.



SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.1

IRWM Region

Santa Barbara County IRWM Plan Update

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SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.2

IRWM Sub-Regions

Santa Barbara County IRWM Plan Update

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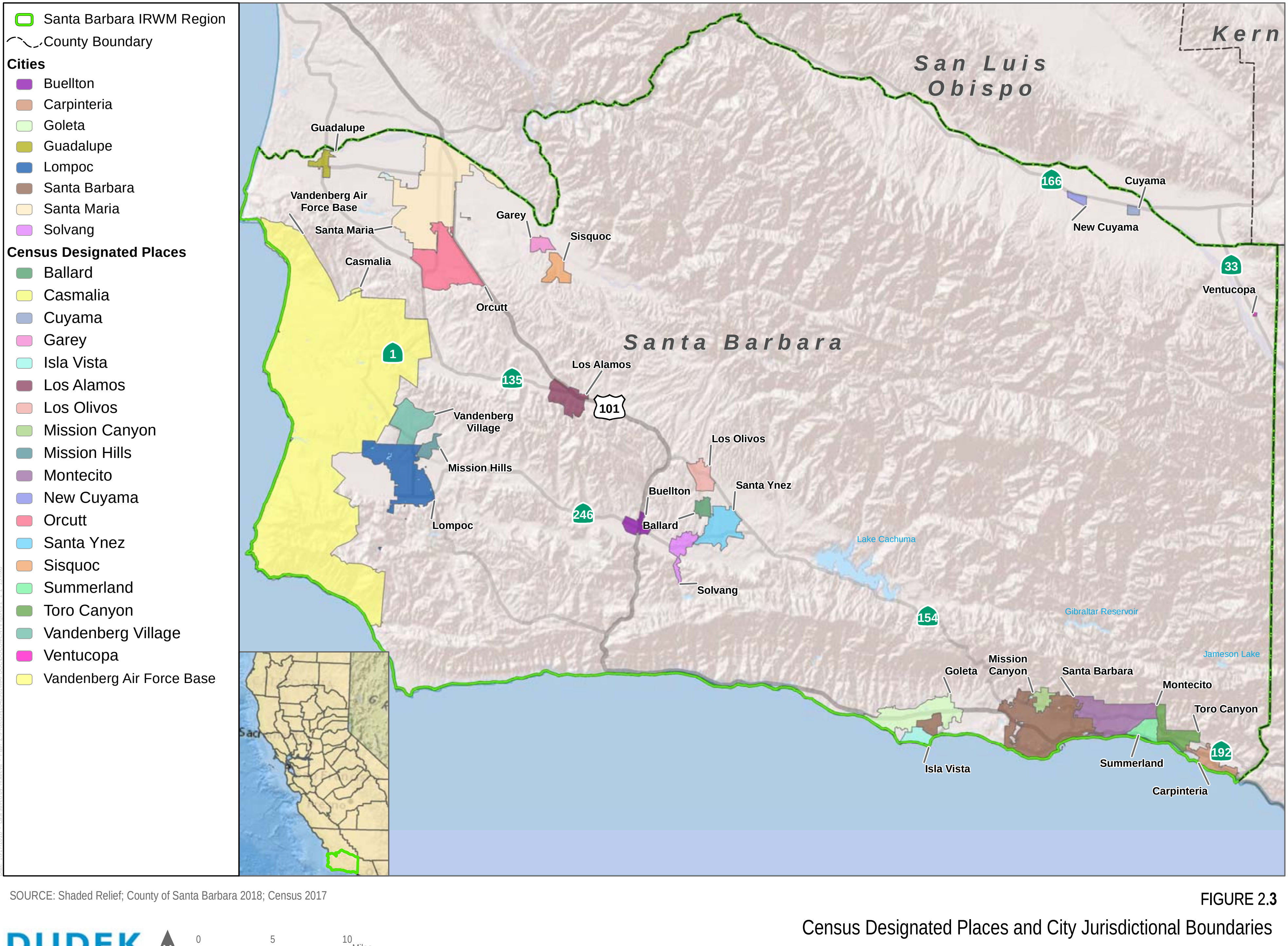

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.3

Census Designated Places and City Jurisdictional Boundaries

Santa Barbara County IRWM Plan Update

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2.2.3 Integrated Regional Water Resource Management in the Region

The County of Santa Barbara boundary has served as the boundary within which integrated water resource planning has occurred. The boundary has framed interagency planning, development of shared water supplies, joint management of resources and operational systems for multiple purposes, and interagency adaptive management responses to changing circumstances. The history of this water resource planning is provided below.

Maximizing Opportunities for Continued Integration of Water Management

In the context of this water management conversation, water management is taken to mean all water resources from potable to reclaimed/recycled water to desalination water. Types of water are differentiated for use and application purposes, but this discussion relates to the management and planning around all types of water, and water as a needed resource for all life and to support all uses. At time of print, the Santa Barbara County IRWM Region is still in drought, and over the past 4 years since the state's severe drought declaration and the award of Prop 84 Drought Round funding, as well as historic fires and sedimentation, Santa Barbara County municipalities, water, wastewater, and community services districts have been meeting to discuss optimization of resources. These meeting have been convened by SWRCB along with elected members of the Senate and Congress as well as at the request of the Office of Emergency Management and other County Departments. Municipalities, water, wastewater and community services districts have also met on sub-regional or local community level to plan for more judicious and responsible water resources use and re-use. IRWM meetings provide one forum for the dialogue related to more collaborative conversation, problem solving and project development towards a more drought-proof, interconnected water resources. Hence, the Santa Barbara County IRWM Region is actively engaged in pro-active, result oriented discussions and plans as well as projects for a more unified approach to water resources management.

Historic Interagency Planning and Integrated Water Supply Development

Historically, significant integrated water resource projects have been developed within the Region. Local agencies evaluated their service area needs; identified opportunities for addressing those needs; and, with community support and cross-agency integration and coordination, successfully implemented the projects. These projects are as follows:

- Cachuma Project (five Cachuma Member Units, Cachuma Operation and Maintenance Board, Cachuma Conservation Release Board, the U.S. Bureau of Reclamation, and the Santa Barbara County Water Agency)

- Twitchell Project (the U.S. Bureau of Reclamation, Santa Maria Valley Water Conservation District, and Santa Barbara County Water Agency)
- State Water Project (12 local agencies, three private parties, one federal agency, Santa Barbara County Flood Control District, Central Coast Water Authority [CCWA], and DWR)
- Goleta Valley Water Recycling Project (Goleta Water District and Goleta Sanitary District)
- City of Santa Barbara Desalination Project (City of Santa Barbara, Goleta Water District, and Montecito Water District)
- There is an interconnection between Mission Hills Community Services District and the City of Lompoc to supply emergency water in the event of a water supply emergency.
- Interconnections between south County water districts (Goleta Water District, City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District)
- Interconnections between central County water districts (City of Solvang and Santa Ynez River Water Conservation District, Improvement District No. 1)
- Interconnections between north County water districts (City of Santa Maria, Golden State Water Company) and Nipomo Community Services District (although outside of the IRWM boundary, it is within the central coast funding area and the San Luis Obispo County IRWM region)

The delivery of Cachuma Project water is provided through cooperation with the U.S. Bureau of Reclamation and an interagency agreement that established the Cachuma Operation and Maintenance Board, which operates key distribution systems. The South Coast Conduit delivers water from Lake Cachuma to the South Coast of Santa Barbara County. The Conduit's functionality and flexibility are essential to meeting both day-to-day needs and future demand. The nature and operation of the South Coast Conduit allows the South Coast Cachuma Member Units to integrate their various sources of water to provide conjunctive use of several groundwater basins and water exchanges among water users along its length. The South Coast Conduit is also integrated with water treatment plant operations at the City of Santa Barbara Cater Water Treatment Plant, which provides treated water to the City of Santa Barbara, the Montecito Water District, and the Carpinteria Valley Water District; and the Goleta Water District Corona Del Mar Water Treatment Plant, which provides treated water to the Goleta Valley. A series of integrated projects to protect the South Coast Conduit's integrity and increase its utility, reliability, and flexibility are an important part of this IRWM Plan.

The Santa Ynez River watershed is a resource with various entities holding water rights, including the Cachuma Member Units, the U.S. Bureau of Reclamation, and downstream water rights represented by the Santa Ynez River Water Conservation District. Two documents establish cooperative operations along the Santa Ynez River: the Upper Santa Ynez River Operations Agreement and the Cachuma Project Settlement Agreement.

Together these documents establish cooperative operation to account for the following:

- Loss of capacity due to siltation (Gibraltar Reservoir)
- Downstream releases consistent with the Gin Chow Judgment (Gibraltar)
- Reservoir releases for downstream water rights under SWRCB orders (Cachuma)
- Reservoir releases for downstream steelhead trout in accordance with the Cachuma Project Biological Opinion
- Conjunctive use of water rights releases and releases for the steelhead fishery
- Downstream water quality improvement based on mixing SWP water with Cachuma water at Bradbury Dam
- Exchange of Below Narrows Account water in Cachuma Reservoir with the Lompoc Plain Groundwater Basin (pending approval to modified Order Water Rights [WR] 89-18 by the SWRCB)

These agreements establish a high degree of integration of facilities planning and Cachuma Project operations affecting the Santa Ynez River, and minimize legal processes that could otherwise frustrate effective regional water management.

The Santa Ynez River/State Water Exchange Agreement was executed in 1993 between Santa Ynez River Water Conservation District, Improvement District No. 1; CCWA; Carpinteria Valley Water District; Goleta Water District; La Cumbre Mutual Water Company; Montecito Water District; Summerland County Water District (merged with Montecito Water District in 1995); and the City of Santa Barbara for the long-term exchange of all or a portion of Cachuma Project water available to Improvement District No. 1 for an equal amount of SWP water available to the South Coast Cachuma Project/SWP contractors. Through this mechanism, Improvement District No. 1 avoids construction, operation, and maintenance of a water treatment facility, and the South Coast Cachuma Project/SWP contractors avoid certain costs of pumping and re-treating SWP water and construction of a separate pipeline to Cachuma through the CCWA's acquisition of the Santa Ynez pipeline.

The Coastal Branch of the SWP is operated by the CCWA on behalf of 12 public agencies, the U.S. Air Force, three private interests, and the County of San Luis Obispo. This project and its operation integrate treated water supply operations along its 110-mile length, delivering water to 23 entities. In addition to its direct delivery function, the Coastal Branch is the vehicle for intra- and inter-regional water exchanges and sales. This integration of supply and delivery capacity is an essential part of meeting the Region’s long-term supply needs and allowing effective response in emergency circumstances, including prolonged drought. The Coastal Branch is also integrated with the Cachuma Project, and relies on Cachuma Project facilities, such as the South Coast Conduit, Tecolote Tunnel, and Lake Cachuma, for deliveries. The coordinated use of these facilities eliminated the need to construct a costly separate delivery system for SWP water.

Integrated Management of Emergency Operations

Agencies preparing Urban Water Management Plans (UWMPs) provide a section that describes a Water Shortage Contingency Plan, with elements such as water shortage emergency response, supplemental water supplies, long-term additional water supply options and irrigation, and urban water shortage policies.

Emergency Response Plans include provisions for interruptions to water and wastewater services. The CCWA prepared an Emergency Response Plan that provides detailed instructions for catastrophic interruption of its water supply. Emergency Response Plans are updated annually.

Interagency Adaptive Management Response to Changing Circumstances

Water-related projects now incorporate an adaptive management approach. Southern California steelhead management issues were addressed beginning in the early 1990s through an interagency “consensus group” focusing on the Santa Ynez River, which resulted in a comprehensive Fish Management Plan for the lower river and a federal Biological Opinion for Cachuma operations. Fisheries management is addressed in Santa Barbara, San Luis Obispo, and Ventura Counties through the Tri-Counties Funding for Improved Salmonid Habitat (FISH) Team. The Tri-Counties FISH Team is implementing the Santa Ynez and Ventura Rivers Technical Training and Education project (funded by the Central Coast Salmon Enhancement program), which trains and educates the restoration community and landowners in the Santa Ynez River Watershed regarding steelhead restoration and steelhead population monitoring. Training is offered to county and city planning and public works staff, water district staff, watershed group members, land conservancy staff and board members, private landowners, and the general public.

Despite explicit Congressional acknowledgement of the loss of fish resources when Congress approved the Cachuma Project in the mid-20th century, local water agencies understood the need to address protection of public trust resources and changing community values in a proactive, constructive manner decades later. Stormwater and other nonpoint-source pollution issues continue to be addressed through a regional interagency committee, begun several years before the adoption of the state’s Phase II regulations. Communities throughout the Region developed a template for addressing the state’s General Permit.

2.3 Physical Setting

2.3.1 Location

Santa Barbara County is located approximately 100 miles northwest of Los Angeles and 300 miles south of San Francisco. The County occupies approximately 2,739 square miles. Bordered on the west and south by the Pacific Ocean, the County has 110 miles of coastline. Four of the Channel Islands—Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara—are in Santa Barbara County. These islands are not addressed in this IRWM Plan because they are largely owned and managed by the federal government as a national park and marine sanctuary. The County is highly diverse in terms of topography, economic activities, recreational opportunities, and social/economic structure. Additionally, there are five major ecological zones and numerous subareas, ranging from arid high desert in the interior to mountains and foothills to coastal plains.

2.3.2 Climate

Historically, Santa Barbara County has had a Mediterranean climate with several microclimatic regions. Summers are warm and dry and winters are cool and often wet. Annual precipitation ranges from 8 inches near Cuyama Valley to a maximum of approximately 36 inches at the uppermost elevations of the Santa Ynez Mountains. Average rainfall in the City of Santa Barbara is approximately 18 inches per year. The County’s topography has a unique physical orientation compared to the rest of California, with a series of east/west transverse mountain ranges. This topography causes an orographic effect when a storm approaches from the Pacific Ocean. Storms from the south can cause heavy precipitation on south-facing slopes, and storms from the north or west can concentrate precipitation on west- or north-facing slopes. Annual average rainfall at the highest elevation is twice that of the lowest elevation. Most precipitation occurs in November through March, with the exception of some far-inland mountain areas that may receive sporadic late-summer thundershowers. Moist air from the Pacific Ocean moderates temperatures in the coastal areas; lower winter minimums and higher summer maximums prevail in the inland valleys (County of Santa Barbara 2013).

Santa Barbara County weather is mainly controlled by the Pacific high-pressure system. In the dry season, from about May through September, the Pacific high-pressure system usually occupies the area northeast of Hawaii. During the winter months, it is weaker and positioned farther south. At times, the persistence of the Pacific high-pressure system keeps the Pacific storm track farther to the north. This “blocking high” results in either no precipitation for part or all of California, or, at most, light amounts of rainfall. This climatological scenario is the reason for most of California’s droughts, including those occurring in 1976 to 1977, 1986 to 1991, and the current drought that the County of Santa Barbara is still experiencing.

For discussion on climate change impacts, adaptation, and resilience, see Section 2.13.

2.3.3 Population

According to the U.S. Census Bureau, in 2017 the County population was approximately 446,170, with most of the people living in the coastal valleys and in the cities of Santa Barbara and Santa Maria (U.S. Census Bureau 2017). Other population centers on the South Coast include the cities of Goleta and Carpinteria, along with unincorporated areas such as Isla Vista, Hope Ranch, Mission Canyon, Montecito, Toro Canyon, Summerland, and the greater Gaviota Coast, including Hollister Ranch. The cities of Solvang and Buellton; the unincorporated communities of Los Olivos, Ballard, and Santa Ynez; and the Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation are located in the Santa Ynez Valley, north of the Santa Ynez Mountains. The City of Lompoc, the unincorporated communities of Vandenberg Village and Mission Hills, Vandenberg Air Force Base, and the Lompoc Federal Correctional Complex are in the Lompoc Valley, where the Santa Ynez River flows out to the ocean. Los Alamos is the only community in the San Antonio watershed. The cities of Santa Maria and Guadalupe, and the unincorporated towns of Orcutt, Casmalia, Betteravia, Garey, and Sisquoc, are located in the northern portion of the County. The City of Santa Maria is the largest city in Santa Barbara County. Northeast of the San Rafael Mountains is the dry and sparsely populated Cuyama Valley, where the community of New Cuyama is located (see Figure 2.4, Population).

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2010, 2017

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FIGURE 2.4

Population

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2.4 Land Use, Major Watersheds, and Water Systems

2.4.1 Land Use

Approximately 65% of the terrain of Santa Barbara County is hilly or mountainous, and most of the remaining 35% is composed of valleys and plains. The steep Santa Ynez Mountains bound the coastal plain on the north; farther north, the San Rafael Mountains rise to the highest elevations in the County; and the Sierra Madre Mountains occupy the northeast portion of the County. Approximately one-third of the land area within the County is located within the Los Padres National Forest, which includes two wilderness areas: the San Rafael Wilderness and the Dick Smith Wilderness. The Los Padres National Forest includes portions of watersheds that provide an important water source for coastal populations, as well as important habitat for several threatened, endangered, proposed, candidate, and sensitive species.

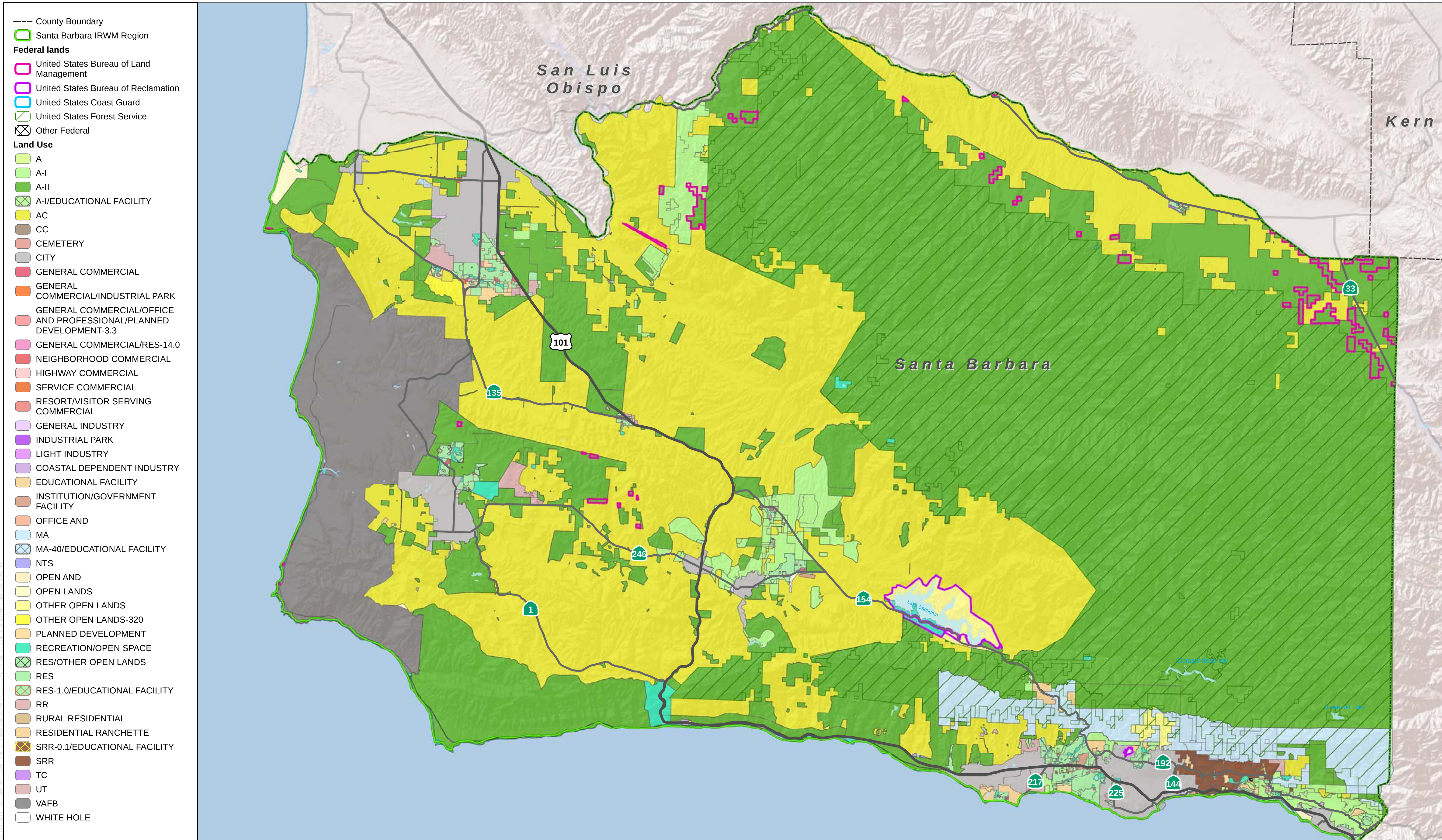
Major land use categories are shown in Figure 2.5, Santa Barbara IRWM Regional Land Use, which shows the amount of land dedicated to generalized land uses. The federal government is the largest land owner in the County; the United States Forest Service and Air Force have combined jurisdiction over nearly 46% of the land area. Los Padres National Forest and Vandenberg Air Force Base comprise approximately 748,000 acres combined. Vandenberg Air Force Base (VAFB) is headquarters for the 30th Space Wing, which manages Department of Defense space and missile testing and places satellites into polar orbit from the west coast. The Los Padres National Forest provides a scenic backdrop to many communities within north and south Santa Barbara County, and is managed for multiple purposes, including recreation, oil development, and grazing (County of Santa Barbara 2009).

The State of California owns approximately 1% of County lands, or 18,000 acres. Most of this land comprises the University of California at Santa Barbara (UCSB), which is adjacent to the City of Goleta; the Sedgwick Reserve, which is operated by UCSB as part of its Natural Reserve System and located east of Los Olivos in the Santa Ynez Valley; La Purisima Mission State Park, located near Lompoc; and several state parks located along the coast within the City of Santa Barbara and in the Santa Ynez Mountains. Less than 1% of land within Santa Barbara County is owned by the County or other local agencies, and the remainder is privately owned. The predominant land uses in the County on privately held land are the cultivation of a variety of high-value food crops, wine grapes, grazing, and ranching (County of Santa Barbara 2017a). In addition, with the passage of laws legalizing cannabis, agricultural land uses have been transitioning to cannabis and/or new cannabis cultivation has occurred. At the time this plan went to print, there was no accurate accounting of acreage in cannabis cultivation; however, it is anticipated to be a significant portion of greenhouse crop development as well as open field crop development within the region.

Approximately 34% of the County (554,000 acres) is under Williamson Act contract (County of Santa Barbara 2009), which accounts for approximately 75% of all privately held land in the County. The California Land Conservation Act of 1965 (Williamson Act) enables local governments to enter into contracts with private landowners for the purpose of restricting land to agricultural or open space use. According to a 2010 Report by the California Department of Conservation, Santa Barbara County has decreased acreage under contract from 2008 (CDOC 2010). Thirteen percent (206,000 acres) of land in the County is zoned for long-term agriculture (AG-II-100) for 100-acre or greater lot sizes, in addition to land zoned for long-term agriculture with both larger and smaller parcel sizes. Less than 3% of the County is within incorporated cities, 2% is within unincorporated urban areas, and less than 1% is zoned for hillside estate lots of 40 acres or more (County of Santa Barbara 2009).

The land use agencies in the Region are listed below and shown in Figure 2.6, Planning Departments. The Santa Barbara County Planning and Development Department's jurisdictional boundary includes the unincorporated areas of the County. City planning agencies' jurisdictional boundaries consist of their respective city boundaries.

- Santa Barbara County Planning and Development Department, North County and South County Santa Barbara County Planning and Development Department
- City of Carpinteria Community Development Department
- City of Santa Barbara Community Development Department
- City of Goleta Planning and Environmental Review
- City of Buellton Planning Department
- City of Solvang Planning and Community Development Department
- City of Lompoc Economic and Community Development Department
- City of Santa Maria Community Development Department
- City of Guadalupe Building and Planning Department
- Santa Barbara Local Area Formation Commission



SOURCE: Shaded Relief, County of SB 2014, Census 2017

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FIGURE 2.5

Santa Barbara IRWM Regional Land Use

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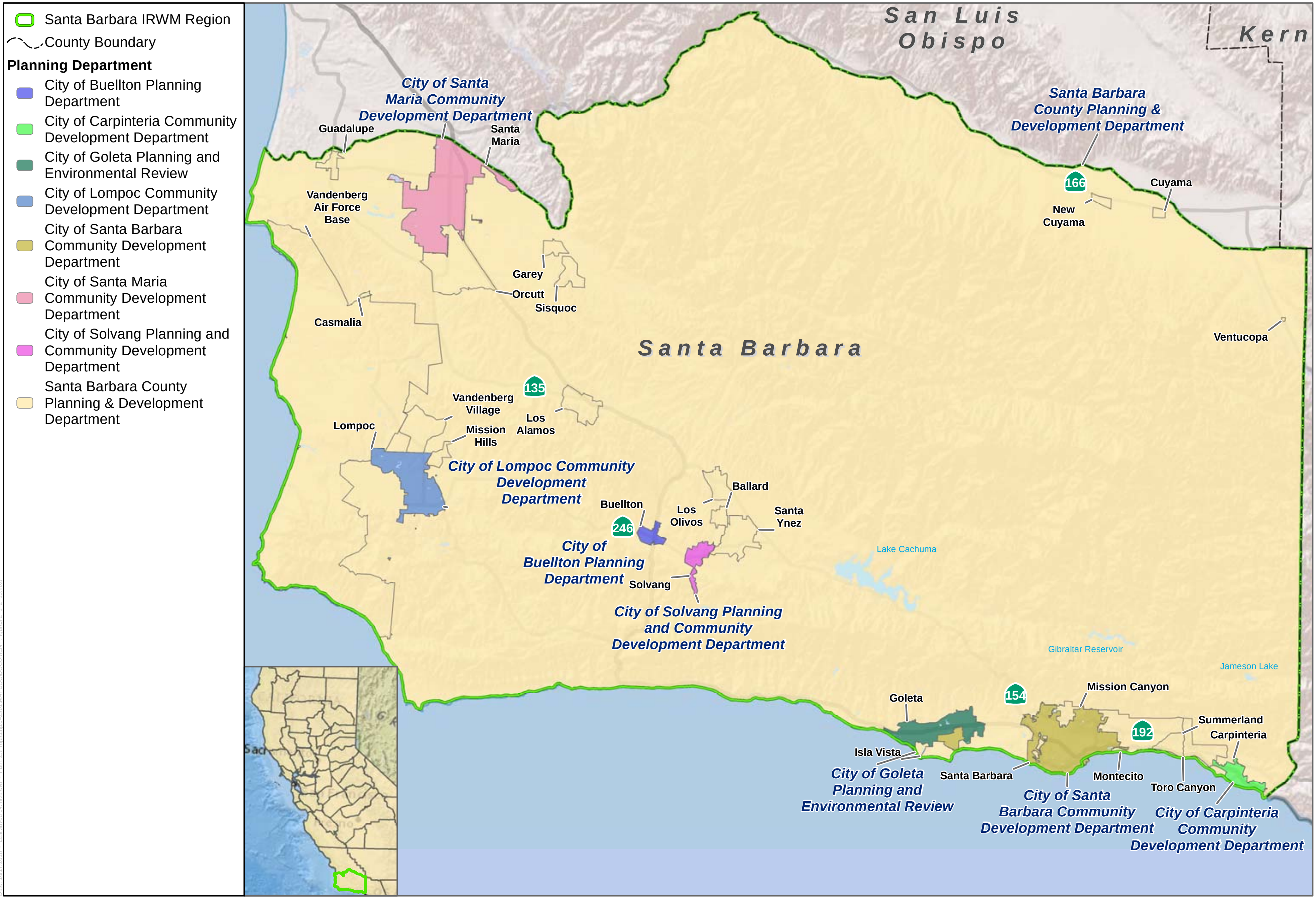

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.6

Planning Departments

Santa Barbara County IRWM Plan Update

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2.4.2 Watersheds

The County contains four principal watersheds. These watersheds are Santa Maria, which includes the Cuyama and Sisquoc watersheds and covers 1,845 square miles; San Antonio Creek, which covers 165 square miles; Santa Ynez, which covers 900 square miles; and the South Coast, which is composed of 50 short, steep watersheds extending from the ridge of the Santa Ynez Mountains to the Pacific Ocean and covers 416 square miles. For the purposes of IRWM Planning, the San Antonio Creek and Santa Ynez watersheds have been combined into one sub-region. The headwaters of the principal watersheds are generally undeveloped, and the middle and lower sections are often developed with urban uses or are in agricultural use. The four major rivers draining these watersheds are the Santa Maria, Sisquoc, Cuyama, and Santa Ynez. Rainfall is variable, and streamflow is flashy. Streamflow is generated directly from rainfall with little base flow contribution from headwaters. Most rivers and the lower reaches of streams are dry in the summer. Figure 2.7, Watersheds, shows the regional watersheds (County of Santa Barbara 2009).

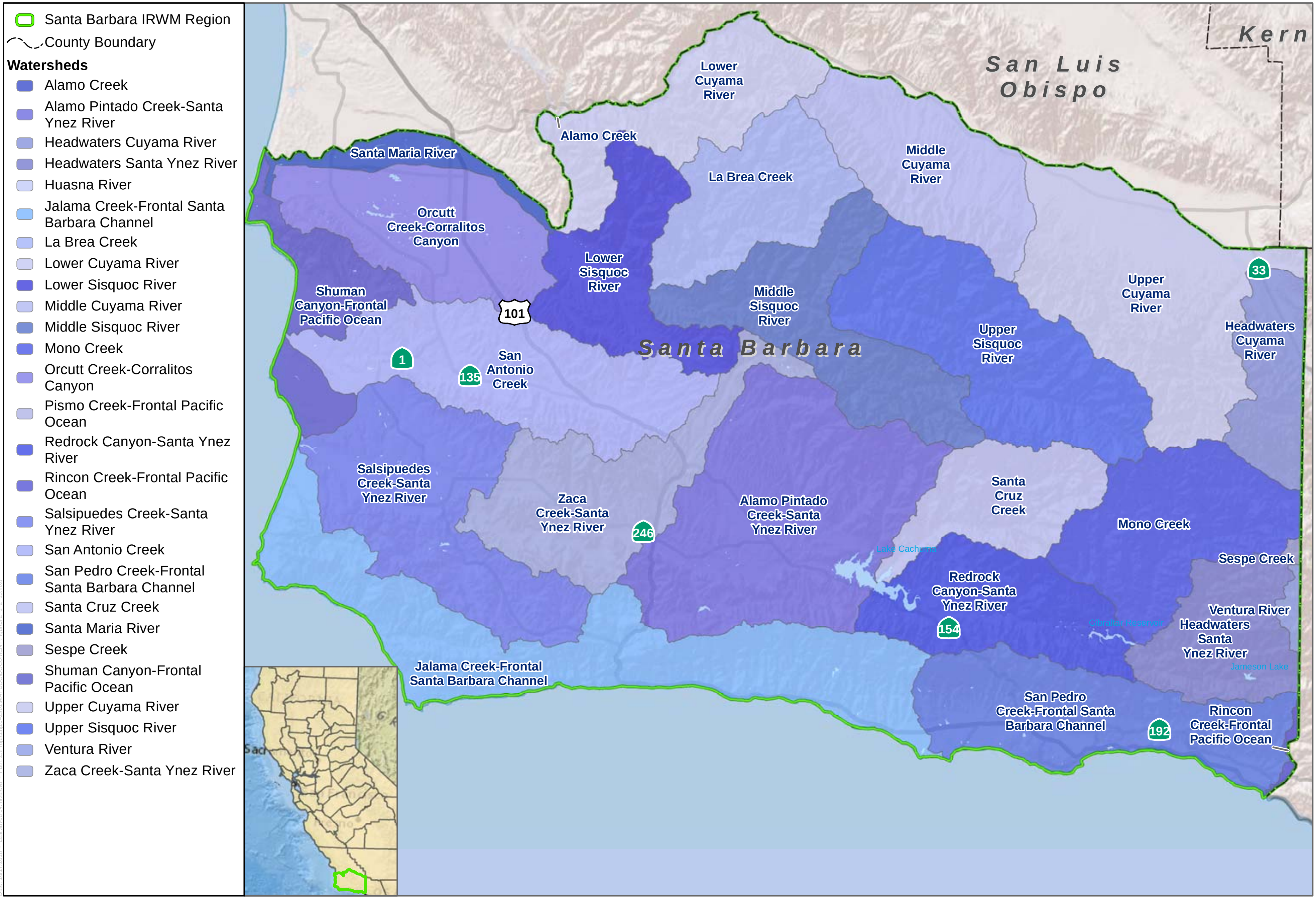
Santa Maria Valley Watershed

The 1,140-square-mile Santa Maria Valley Watershed is drained by the Santa Maria River, which is one of the largest rivers on the central coast of California between Point Lobos and Point Conception and is formed by the confluence of the Cuyama and Sisquoc Rivers at Fugler Point, 20 miles inland from the coast. Elevations range from sea level to 6,828 feet at Big Pine Mountain, which is at the headwaters of the Sisquoc River (County of Santa Barbara 2002). Much of the watershed is a large alluvial plain that is broad and wide near the ocean and tapers as it moves inland. The plain’s boundary is defined by upland/mesa areas, foothills, and mountain complexes. The watershed also contains the Guadalupe-Nipomo Dunes complex, which is one of the most extensive coastal dune and dune wetland areas in the United States.

The Santa Maria River, downstream of Highway 1, is free-flowing and unaltered. There is a natural riverbed with riparian habitat of mostly willows. Where the river flows through the ubiquitous cultivated agricultural fields, there are earthen agricultural levees. Upstream from Highway 1, the river is altered with earthen and rock levees (constructed by the United States Army Corps of Engineers [USACE] in the 1950s and rehabilitated in three phases from 2009 to 2014) to protect the City of Santa Maria and adjacent agriculture from flooding. It is dry for most of the year but does flow intermittently during rainfall events and shortly after rainfall events, as well as during releases from Twitchell Dam. Vegetation in this reach of the river is characterized by willows, mulefat (*Baccharis salicifolia*), mock heather (*Ericameria ericoides*), coyote brush (*Baccharis pilularis*), and other coastal scrub species on higher terraces. There is little or no vegetation along the reaches with levees or in scour zones. Downstream from Highway 1 there is shallow surface water and greater amounts of riparian vegetation, and in some areas, habitat is quite dense. During the dry season, there can be flows in the river, but these are attributed to agricultural and urban runoff, as well as Twitchell Dam releases (County of Santa Barbara 2013).

The watershed straddles northwestern Santa Barbara County and southwestern San Luis Obispo County. In addition, a small portion of the northeastern watershed is in Ventura County. The river flow is regulated by Twitchell Dam (constructed in the 1950s by the U.S. Bureau of Reclamation), which serves a flood protection and water conservation function. USACE constructed levees for the Santa Maria River in the 1950s. The USACE levees extend to Fugler Point (near Garey) and terminate at the upstream side of the Highway 1 Bridge in Guadalupe (The Dunes Center et al. 2004). Major tributaries to the Cuyama River are Huasna River and Alamos Creek. Most of the river and its tributaries have intermittent flows, although some reaches of the river have surface water most of the year. Some of the major tributaries also have perennial flows in some reaches. Since 1959, flow in the Santa Maria River has been regulated by Twitchell Reservoir, which delays a portion of intercepted storm flow for later release and percolation to the Santa Maria Groundwater Basin. Orcutt Creek drains most of the southwest quadrant of the Santa Maria Valley, an area of approximately 81.5 miles. The stream is actually a tributary of the Santa Maria River, but does not merge with it until it nears the ocean. The only permanent natural lakes are the Dune Lakes complex that includes three ponds with surface areas of 50, 40, and 9 acres, which are part of the Rancho Guadalupe Beach and the adjoining Guadalupe Dunes Preserve that extends south along 3 miles of coastline from the Santa Maria River to Mussel Rock. The dunes reach 500 feet in places, making them the highest sand dunes along the coast. To the north is the Guadalupe-Nipomo Dunes National Wildlife Refuge, protected as a nesting place for the endangered snowy plover (*Charadrius alexandrinus*) during part of the year. More than 100 species of rare plants and animals are found in the refuge. The entire dunes complex spreads for 18 miles along the coast. The northern parts are included in the Oceano State Vehicular Recreation Area, which is in San Luis Obispo County.

The Sisquoc River, which is designated as a Wild and Scenic River, receives runoff from a watershed area of approximately 470 square miles. The watershed of the Sisquoc River is defined by the northwestward-trending Sierra Madre Mountains on the north and the westward-trending San Rafael Mountains on the south. Most of the Sisquoc River drainage lies within the boundaries of the Los Padres National Forest. Except for wilderness areas in the Los Padres National Forest, all of the land within the watershed is used for some form of agriculture. Other industries of significance include oil and gravel mining, and recreation (County of Santa Barbara 2013).



SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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0 5 10 Miles

FIGURE 2.7

Watersheds

Santa Barbara County IRWM Plan Update

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The main groundwater basin in the Santa Maria Watershed is the Santa Maria River Valley Groundwater Basin (see Figure 2.8, Groundwater Basins). This groundwater basin underlies the Santa Maria Valley in the coastal portion of northern Santa Barbara County and southern San Luis Obispo County. Natural recharge to the basin is mainly from seepage losses of major streams, rainfall percolation, and subsurface inflow. Additional recharge occurs from agricultural return flow and percolation of treated sewage effluent (County of Santa Barbara 2013).

Due to concerns raised by residents regarding groundwater overdraft in the Cuyama Valley, a comprehensive report on the current and future water availability of the Cuyama Valley Groundwater Basin was conducted from 2008–2014 by the Santa Barbara County Water Agency in cooperation with the U.S. Geological Survey (USGS). The study includes data compilation, new data acquisition, model development, and analysis of water availability, the results of which are presented in several publications and reports that can be found on the USGS website (USGS 2017a). Study results show substantial water-level declines in selected sub-regions and land subsidence in the Main Zone sub-regions (USGS 2015a).

Numerous sensitive species in the watershed are listed by the California Department of Fish and Wildlife. Sensitive plant species include beach layia (*Layia carnosa*), spectacle pod (*Dimorphocarpa wislizeni*), dune larkspur (*Delphinium parryi* ssp. *blochmaniae*), La Graciosa thistle (*Cirsium loncholepis*), sand mesa manzanita (*Arctostaphylos rudis*), and Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*). Sensitive mammals include giant kangaroo rat (*Dipodomys ingens*), San Joaquin kit fox (*Vulpes macrotis mutica*), and American badger (*Taxidea taxus*). Sensitive birds include American peregrine falcon (*Falco peregrinus*), brown pelican (*Pelecanus occidentalis californicus*), least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), light-footed clapper rail (*Rallus longirostris levipes*), and California least tern (*Sterna antillarum browni*). Amphibians and reptiles include arroyo toad (*Bufo californicus*), California red-legged frog (*Rana aurora draytonii*), California tiger salamander (*Ambystoma californiense*), and California horned lizard (*Phrynosoma coronatum*). Southern California steelhead and tidewater goby (*Eucyclogobius newberryi*) are sensitive fish (County of Santa Barbara 2013).

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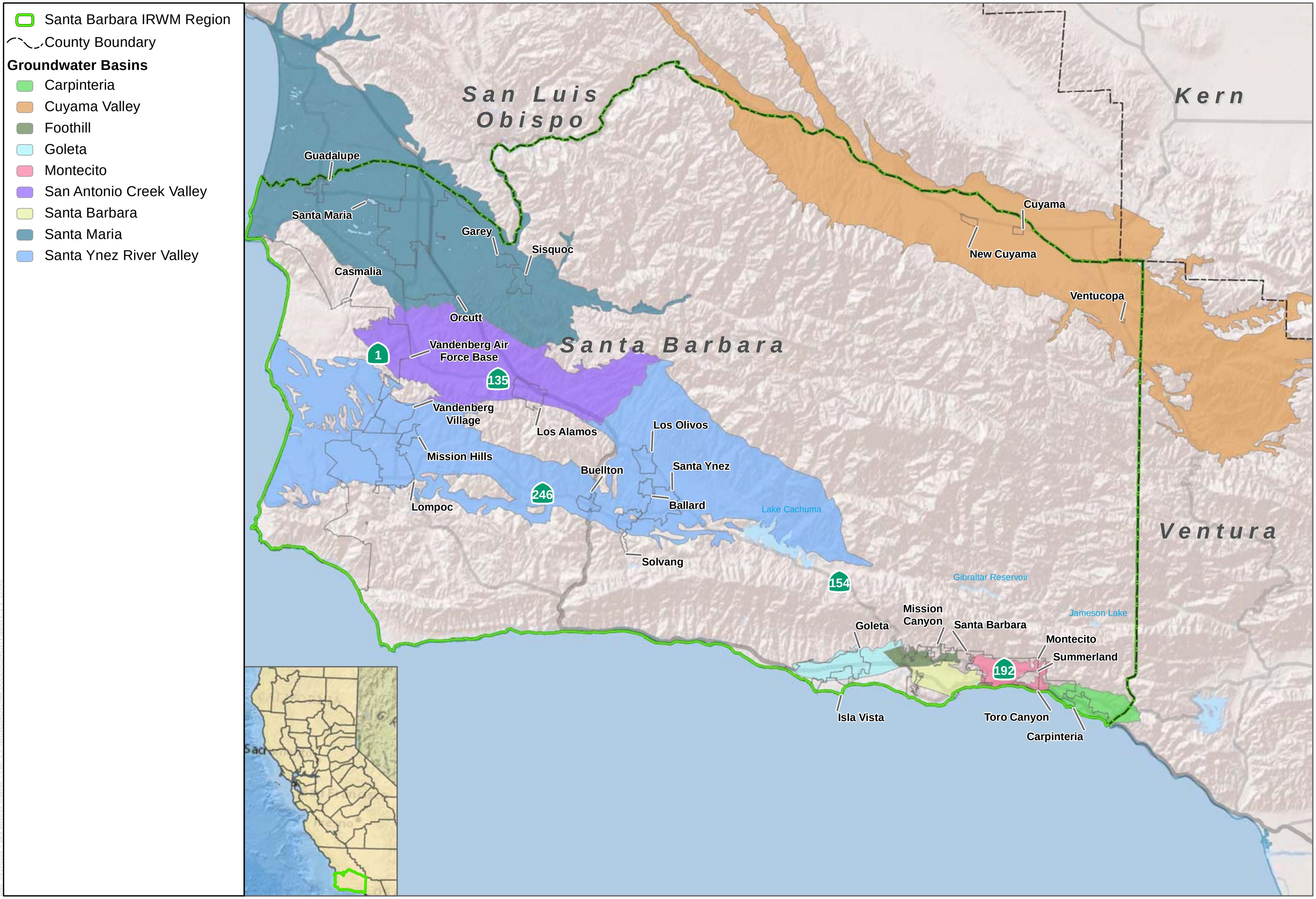

SOURCE: Shaded Relief; County of Santa Barbara 2018; Bulletin 118 2018; Census 2017

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FIGURE 2.8

Groundwater Basins

Santa Barbara County IRWM Plan Update

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San Antonio Creek and Santa Ynez River Watersheds

San Antonio Creek flows westerly from the Solomon Hills through the Los Alamos Valley, the Barka Slough, and the San Antonio Valley to the Pacific Ocean north of Purisima Point. The San Antonio Valley is approximately 30 miles long by 7 miles wide and is nestled between the Solomon-Casmalia Hills to the north, the Purisima Hills to the south, the Burton Mesa to the west, and the westernmost flank of the San Rafael Mountains to the east. The San Antonio Valley is approximately 130 miles and the underlying groundwater basin is approximately 110 miles (County of Santa Barbara 2013).

The drainage system of the San Antonio Creek Watershed starts approximately 10 miles east of Los Alamos. It traverses generally to the west through Los Alamos and VAFB to the ocean. The groundwater basin is rather narrow, averaging approximately 8 miles in width. The lower reaches throughout VAFB have a perennial flow, in part because of irrigation tail water, but primarily because surfacing of an impermeable geologic unit near Barka Slough causes upwelling. The chief land uses in the watershed include ranching and agricultural cultivation. Specifically, this includes annual or vegetable crops in the flat areas; wine grapes in the transitional uplands; and dry farming, which requires no supplemental irrigation. Crops that are irrigated depend on groundwater resources (County of Santa Barbara 2013).

The Santa Ynez River originates in the San Rafael Mountains in the Los Padres National Forest near the eastern border of the County. The watershed itself is bounded by the San Rafael Mountains to the northeast, the Purisima Hills to the north, and the Santa Ynez Mountains to the south. A small portion of the Santa Ynez River Watershed lies in Ventura County. The river flows westerly approximately 90 miles to the ocean, passing through Jameson Lake, Gibraltar Reservoir, and Lake Cachuma. The Santa Ynez River Basin is the largest drainage system that is wholly located in Santa Barbara County. The 621,577 acres that it drains is approximately 40% of the mainland part of the County. It is the primary source of water for about two-thirds of Santa Barbara County residents, including those within the watershed and the heavily populated south-coastal urban areas. Three dams have been constructed on the river to store and divert water to the South Coast. None of the reservoirs on the Santa Ynez River has a prescriptive requirement for a flood control storage area, although Cachuma Reservoir operations have been modified to provide flood benefit during large storm events. All of the water diversions to the South Coast from the dams are by tunnels cut through the Santa Ynez Mountains to terminal reservoirs near urban areas (County of Santa Barbara 2013).

Approximately 260,000 acres in the Santa Ynez River Watershed are public land, 215,000 acres of which is within the Las Padres National Forest and is relatively pristine. Riparian habitat in that area is well preserved and there has been no channelization. The remaining public lands are, for the most part, on VAFB. Agriculture in the watershed includes truck crops, wine grapes, irrigated forage crops, and livestock. Livestock consists of beef cattle and horses of various breeds. Most of the relatively flat lands between Buellton and Lompoc are used for growing a variety of irrigated crops, including vegetables, wine grapes, and beans. Most of the irrigated land is located in Lompoc Valley west of Lompoc. That area is similar to Santa Maria Valley in that the marine influences allow year-round crop production. All irrigation water is pumped from underground resources. Almost all of the upland areas are used as range to raise beef cattle. Other important industries are oil production, diatomaceous earth mining, and human resources support for VAFB.

High-quality riparian habitat also occurs on private land in the lower river and tributaries. High-quality spawning and rearing habitat for steelhead/rainbow trout (*Oncorhynchus mykiss*) occurs below Bradbury Dam and includes Hilton, Quiota, Salsipuedes, and El Jaro Creeks. These habitats continue to support a naturally reproducing rainbow trout population that retains ancestral ties to the native steelhead population. This rainbow trout population does contribute outmigration of individuals to the persistent remnant anadromous steelhead population downstream of Bradbury Dam (COMB 2017; Stoecker Ecological Consulting 2004). Other tributaries of the lower river through the urban area of Lompoc have been channelized, including Miguelito Creek, and the aquatic habitat and vegetative habitat have been degraded or removed.

Santa Ynez and San Antonio Creek Groundwater Basins

The groundwater basins within the Santa Ynez River and San Antonio Creek Watersheds include the San Antonio Creek Groundwater Basin and the Santa Ynez Groundwater Basin (see Figure 2.8).

The following municipalities, water districts, and community services districts, all of which are members of the Regional Water Management Group (Cooperating Partners), are within the Mid-County IRWM Sub-Region:

- City of Lompoc
- Vandenberg Village CSD
- City of Buellton
- City of Solvang
- Santa Ynez River Water Conservation District
- Santa Ynez River Water Conservation District, Improvement District No. 1
- Santa Ynez CSD
- Los Alamos CSD

- Casmalia CSD
- Cachuma Resource Conservation District

Within the Mid-County IRWM Sub-Region, specifically the Santa Ynez River Watershed, a hexavalent chromium (chromium-6) issue has been identified. This issue is specifically affecting the Santa Ynez River Water Conservation District, Improvement District No. 1, and several mutual water companies in the area (see Figure 2.9, Water Districts and Water Service Providers).

Occurrence of Chromium in Groundwater

The presence of chromium in groundwater can be derived from either or both natural and anthropogenic (i.e., human-caused) sources. Locally, chromium is only found in chromium-rich rock formations and as natural deposits weathered from these materials. This is discussed in greater detail in the water quality section of this document.

South Coast Watersheds

The south coastal region generally includes all of the southerly drainages from Point Concepcion to the Ventura County line. Its approximately 50 watersheds range from 162 acres to 30,572 acres, with an average size of 3,209 acres. This area is heavily influenced by the ocean because of the southerly aspect and the ocean current, which is usually approximately 10 degrees warmer than the ocean current north of Point Concepcion during the winter months. Topography is precipitous, rising abruptly from sea level to greater than 4,300 feet in places along the crest of the Santa Ynez range. Annual rainfall varies from approximately 16 inches on the coast to approximately 30 inches along the crest of the Santa Ynez range (County of Santa Barbara 2013).

Virtually all the subtropical fruit (principally avocados) and approximately 75% of the nursery and hot-house products of the County are raised in the South Coast, mostly in the vicinity of the urban complex between Goleta and Carpinteria. Irrigation water is provided from a variety of sources, including pumped groundwater; diversions from Cachuma, Gibraltar, and Juncal Reservoirs; and, to a lesser degree, from on-farm surface entrapments (County of Santa Barbara 2013).

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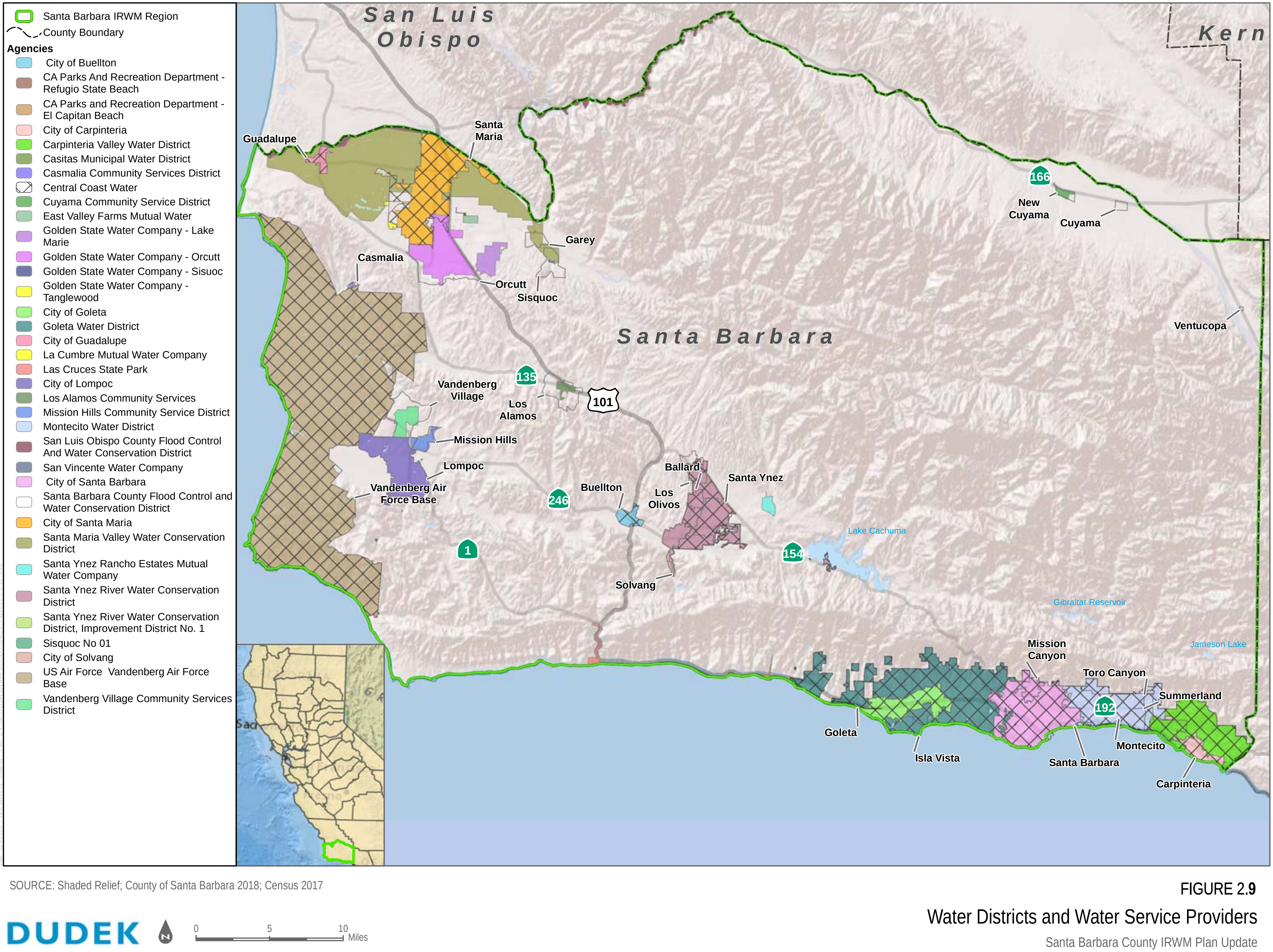

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.9

Water Districts and Water Service Providers

Santa Barbara County IRWM Plan Update

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The southeastern part of the south coastal region is heavily urbanized, and includes the contiguous communities of Goleta, Santa Barbara, Montecito, Summerland, and Carpinteria. The Rincon Creek Watershed is considered part of the South Coast Watershed for purpose of the IRWM Plan, and is composed of 9,532 acres in the southeastern portion of the County, with a small portion of the watershed extending into Ventura County. The watershed reaches approximately 7.5 miles northward from the Pacific Ocean. Other than agriculture, important industries include tourism; electronic products manufacturing; city and County government; and higher education, including UCSB (County of Santa Barbara 2013).

Five of the larger watersheds are discussed below (CCC 2006, as cited in County of Santa Barbara 2013; URS 1999).

- The Goleta Slough Watershed covers approximately 45 square miles and includes six creeks: Tecolotito, Carneros, Las Vegas, San Jose, Atascadero, and Maria Ygnacio. The slough drains the Goleta Valley and watershed and receives the water of all of the major creeks in the Goleta area, including from the southern face of the Santa Ynez Mountains. The Goleta Slough Watershed is an area of estuaries, tidal creeks, tidal marsh, and wetlands. The slough primarily consists of the filled and unfilled remnants of the historic inner Goleta Bay, approximately 8 miles west of the City of Santa Barbara. The slough empties into the Pacific Ocean through an intermittently closed mouth at Goleta Beach County Park, just east of the UCSB campus and Isla Vista. The slough is one of the few coastal wetlands that remain in the state, and it is important for enhancing water quality by filtering pollutants. It also provides recreational opportunities, including bike paths, parks, and bird watching along many of Goleta Slough creeks, and protects wildlife habitat for endangered steelhead trout, red-legged frog, and tidewater goby (CCC 2006, as cited in County of Santa Barbara 2013).
- Mission Creek begins in the Santa Ynez Mountains above the Santa Barbara Botanical Gardens in Rattlesnake Canyon and winds its way down through the City of Santa Barbara until it reaches the ocean east of Stearns Wharf. The watershed encompasses approximately 7,786 acres. It extends approximately 7.5 miles from the ocean to the ridge of the Santa Ynez Mountains at 3,985 feet in elevation. There are two main tributaries, Rattlesnake Creek and Old Mission Creek. The entire watershed encompasses a mixture of residential, urban, and natural environments. A lagoon is present at the creek mouth. Mission Creek lagoon extends from just east of Stearns Wharf to Yanonali Street, approximately 2,100 feet upstream from the bottom of the lagoon. Over the entire watershed, open space of the Los Padres National Forest comprises approximately 47% of the watershed, and residential and commercial land uses contribute approximately 31% and 17%, respectively. Agriculture accounts for only 2% of the total watershed (URS 1999).

- The Arroyo Burro Creek begins in the Santa Ynez Mountains and flows south until it empties into Arroyo Burro Beach (Hendry's Beach). The watershed encompasses approximately 6,217 acres. It extends approximately 7 miles from the ocean to the ridge of the Santa Ynez Mountains at 3,800 feet in elevation. Tributaries to Arroyo Burro Creek consist of Las Positas Creek, Barger Creek, San Roque Creek, and Lauro Canyon Creek. A small lagoon is present at the end of the creek at Arroyo Burro Beach. There are two main tributaries that make up the upper reaches of the Arroyo Burro Watershed. San Roque Creek makes up 48% of the watershed with its headwaters beginning above Lauro Canyon Reservoir. Barger Creek makes up 14% of the watershed and begins in Barger Canyon above Foothill Road and later enters Arroyo Burro Creek (URS 1999).
- The Carpinteria Creek Watershed is located in the southeastern portion of Santa Barbara County. The watershed encompasses 9,410 acres. It extends approximately 7 miles from the ocean to the ridge of the Santa Ynez Mountains at 4,568 feet elevation. Most of the watershed encompasses agricultural lands with scattered residences. Carpinteria Lagoon is present at the creek mouth; it begins 50 feet above the ocean and extends 650 feet to the railroad tracks. The lagoon is located in Carpinteria State Beach Park. Most of the lower and middle sections of the watershed are dominated by residential and commercial development, particularly downstream of Highway 101. The upper watershed is composed of greenhouses, orchards, scattered residences, and the open space of the Los Padres National Forest. The latter comprises approximately 79% of the entire watershed. Agricultural uses encompass approximately 17%, and the combined residential and commercial uses account for less than 2% of the entire watershed (URS 1999).
- The Rincon Creek Watershed occurs within both Santa Barbara and Ventura Counties. The watershed encompasses 10,219 acres. It extends approximately 7.5 miles from the ocean to the ridge of the Santa Ynez Mountains at 4,800 feet in elevation. Long Canyon and Casitas Creek are the two main tributaries to the main stem of the watershed. Land use in the watershed is predominantly agriculture, with scattered residences. The watershed is generally undisturbed and its riparian corridors are mostly intact and dominated by native vegetation. Open space of the Los Padres National Forest comprises approximately 64.5% of the watershed. Agricultural lands are the next dominant land use type, covering approximately 32% of the watershed. Residential land uses only account for less than 2%, and commercial development is absent. Overall, the creek maintains its natural state, with the exception of the lower reaches of the watershed. There are two tributaries to Rincon Creek: Long Canyon and Casitas Creek (URS 1999).

2.4.3 Groundwater Basins

The groundwater basins in the County have been divided into the North County, Santa Ynez River, and South Coast Groundwater Basins, and are listed in Table 2.1 and shown in Figure 2.8. The North County Groundwater Basins are the Santa Maria, San Antonio Creek, and Cuyama. The Santa Ynez Groundwater Basins are the Santa Ynez Upland, Buellton Upland, Lompoc, and Santa Ynez River Alluvial Basin. The South Coast Groundwater Basins (located between the Santa Ynez Mountains and the Pacific Ocean) are the Carpinteria, Montecito, Santa Barbara, Foothill, Goleta North/Central, Goleta West, More Ranch, Ellwood to Gaviota Coastal Basins, and Gaviota to Point Conception Coastal Basins.

Table 2.1
Groundwater Basins and Land Use

Groundwater Basin	Size (Acres)	Land Use Summary Boundaries
North County Groundwater Basins		
Santa Maria	110,000, with 80,000 within Santa Barbara County	Land use: Two cities, extensive unincorporated urban area (Santa Barbara County), extensive irrigated agriculture, petroleum production. Bordered by the Nipomo Mesa and Sierra Madre foothills to the north, the San Rafael Mountains to the east, the Solomon-Casmalia Hills to the south, and the Pacific Ocean to the west.
San Antonio Creek	70,400	Land use: One town, extensive agriculture, some petroleum production, Vandenberg Air Force Base. Located between the Solomon-Casmalia Hills to the north, the Purisima Hills to the south, the Burton Mesa to the west, and the westernmost flank of the San Rafael Mountains to the east.
Cuyama	441,600, with 81,280 within Santa Barbara County	Land use: Extensive agriculture, some petroleum production, very low population density. Located north of the City of Santa Barbara and bound by the Sierra Madre Mountains on the south and the Caliente Range on the north.
Santa Ynez River Groundwater Basins		
Santa Ynez Upland	83,200	Land use: Three towns, one city, and other medium-density residential; varied high-value agriculture. Underlies 130 square miles approximately 25 miles east of Point Arguello and north of the Santa Ynez River.
Buellton Upland	18,560	Land use: Agriculture, one city. Encompasses approximately 29 square miles located approximately 18 miles east of the Pacific Ocean and directly north of the Santa Ynez River.
Lompoc (including the Terrance, Plain and Upland Sub-basins, the Santa Rita sub-area is included in the Upland sub-basin)	48,000	Land use: One city, two areas of unincorporated urban development, Vandenberg Air Force Base, varied agriculture, petroleum production, Federal Penitentiary Complex. Consists of three hydrologically connected sub-basins: the Lompoc Plain, Lompoc Terrace, and the Lompoc Upland. Encompasses approximately 76 square miles. The Lompoc Plain Groundwater Basin surrounds the lower reaches of the Santa Ynez River and is bordered on the north by the Purisima Hills, on the east by the Santa Rita Hills, on the south by the Lompoc Hills, and on the west by the Pacific Ocean. Lompoc Terrace is south of Lompoc Plain. The Lompoc Upland is bordered on the west by the Burton Mesa,

Table 2.1
Groundwater Basins and Land Use

Groundwater Basin	Size (Acres)	Land Use Summary Boundaries
		on the north by the Purisima Hills, on the east by a topographic divide that separates it from the Buellton Upland Basin, and on the south by the Lompoc Plain Alluvial Basin and the Santa Rita Hills.
Santa Ynez River Alluvial Basins	12,000 (three subunits)	Land use: Two cities and 7,300 acres of irrigated cropland. Extends 36 miles from Bradbury Dam to the Lompoc Plain.
South Coast Groundwater Basins		
Carpinteria	7,680	Land use: One city; unincorporated urban development; orchards, irrigated crops, and greenhouses. Underlies approximately 12 square miles in the Carpinteria Valley and extends east of the County line into Ventura County.
Montecito	4,288	Land use: Primarily low-density residential use; unincorporated. Encompasses approximately 6.7 square miles between the Santa Ynez Mountains and the Pacific Ocean.
Santa Barbara	4,480	Land use: Primarily residential, industrial, and commercial. Underlies an area of approximately 9 square miles nestled between the Montecito Groundwater Basin and the Foothill Groundwater Basin.
Foothill	2,880	Land use: Primarily residential and commercial. Encompasses 4.5 square miles and located along the base of the Santa Ynez Mountains in the northwest Santa Barbara and Goleta areas.
Goleta North/Central	5,700	Land use: Primarily residential, industrial, and commercial. Located south of the Santa Ynez Mountains and north of the Pacific Ocean. It is west of the Santa Barbara and Foothill Groundwater Basins on the County's South Coast. It is approximately 8 miles long and 3 miles wide. It is divided into three sub-basins: the Central Sub-Basin, the West Sub-Basin, and the North Sub-Basin.
Goleta West	3,500	Land use: Primarily residential, industrial, and commercial.
More Ranch	502	Land use: Primarily open space; limited residential/agriculture.
Ellwood to Gaviota Coastal Basins	67,200	Land use: Agriculture, primarily orchards and grazing; limited municipal/industrial.
Gaviota to Point Conception Coastal Basins	23,040	Land use: Agriculture, primarily grazing.

Sources: City of Lompoc 2010; Milner-Villa Consulting 2011; SBCWA 2013; Public Works Department Water Resources Division Water Agency 2011, all as cited in County of Santa Barbara 2013.

The following conclusions regarding groundwater basins are taken from the Santa Barbara County Groundwater Report (SBCWA 2012). References to overdraft pertain to safe yield and not perennial yield. Safe yield is defined as the maximum amount of water that can be withdrawn from a basin (or aquifer) on an average annual basis without inducing a long-term progressive drop in water level. Perennial yield is defined as the amount of water that can be withdrawn from a basin (or aquifer) on an average annual basis without inducing economic or water quality consequences.

The information and conclusions contained in the Santa Barbara County Groundwater Report reflect data developed by the Santa Barbara County Water Agency and data contained in documents and reports listed under References on page 95 at the back of the report (SBCWA 2012, 2014a) (see Appendix 2-A, County of Santa Barbara Groundwater Basins Status Report). In the report, the Santa Barbara County Water Agency stated that other individuals/agencies might reach different conclusions based on different sources of data or interpretations, but that the report drew on the best available information, in some cases referencing conclusions from studies conducted from more than a decade ago. It was acknowledged that basin conditions could change along with changes to water supply, land use, and other factors. Information from more recent studies was included where applicable, and sources of new information were noted in the text (SBCWA 2012). The 2014 report summarizes the status of groundwater basins as follows (SBCWA 2014a):

- An in-depth groundwater basin study completed in 2014 by the Santa Barbara County Water Agency in conjunction with USGS confirmed that parts of the Cuyama Valley Groundwater Basin are in a state of significant overdraft, and some water quality impairments are of concern (USGS 2015b). It is unclear at this time how this will affect the future economic viability of the Region and its economy.
- In the litigation of Santa Maria Valley Water Conservation District versus the City of Santa Maria et al., the court ruled that, based on a preponderance of evidence, the Santa Maria Groundwater Basin is not currently in a state of overdraft. Management of this groundwater basin is subject to the terms of the adjudication and ongoing supervision of the court.
- Past studies of the San Antonio Groundwater Basin have shown that the basin is in a state of overdraft of approximately 9,500 acre-feet per year (AFY) of water. Water levels have fallen significantly, but no regional economic or groundwater quality problem has been documented. The County of Santa Barbara, in cooperation with USGS and VAFB, is currently conducting a detailed evaluation for this basin (USGS 2018).
- The Lompoc Basin:
    - Lompoc Plain Groundwater Sub-Basin is in equilibrium under the SWRCB Decision WR 89-18 because natural recharge is augmented with periodic water releases from Cachuma Reservoir to maintain groundwater levels in the basin. The basin is managed by the Santa Ynez River Water Conservation District.
    - Lompoc Upland Groundwater Sub-Basin has apparently reached equilibrium since, over time, water levels have been lowered to approach the elevation of the Lompoc Plain and Santa Ynez River, which now contribute underflow to the Upland Basin.
    - The Santa Rita subarea of the Lompoc Basin is in a state of overdraft of approximately 800 AFY based on a 2001 study (see SBCWA 2014a). However, water levels in some

parts of this area have declined significantly in the past few years, and, thus, in the future, some economic effects may occur if pumping lifts and costs increase.

  - The Terrace sub-basin is not used.

- The South Coast Basins are in equilibrium through management by local water districts and the Wright Suit Settlement.[1] The City of Santa Barbara practices conjunctive use of groundwater resources in the Foothill Basin and Storage Unit 1 of the Santa Barbara Groundwater Basin. Relatively minor amounts of pumping occur during average and wet years. More pumping occurs during droughts to replace supplies of diminished surface water. Due to management of pumping by South Coast public water purveyors and various private pumpers, the basins are in long-term balance.

2.4.4 Major Infrastructure

This section describes major surface reservoirs, water distribution systems, desalination, and water and wastewater treatment facilities (see Figure 2.10, Major Water-Related Infrastructure). Much of the County's infrastructure is more than 40 years old, and elements have been upgraded in the last 10 years. However, several key parts need to be evaluated to comply with increasingly stringent regulatory requirements, including drinking water quality standards for disinfection by-products that require expensive new treatment components. For example, increasing the reliability of wells in the Santa Ynez River alluvium requires development of a regional water treatment plant to comply with the Surface Water Treatment Rule. Another example is that portions of the South Coast Conduit, built in the 1950s, need to be expanded or replaced to meet increasing demand and to provide adequate reliability. Urban delivery infrastructure also must be modified to meet the needs of a growing population; upgrades are needed to reduce water loss, prevent increased inflow and infiltration during storms, and improve performance (County of Santa Barbara 2013).

Surface Storage Reservoirs and Associated Distribution Systems

The County's four major reservoirs are managed for various uses, including water supply, groundwater recharge, flood control, recreation, and ecological benefits. Lake Cachuma is owned and operated by the federal government. Twitchell Reservoir is owned by the federal government and operated by the Santa Maria Water Conservation District. Gibraltar Reservoir is owned and operated by the City of Santa Barbara. Jameson Lake is owned and operated by the Montecito

[1] The 1989 Wright Suit Settlement served to adjudicate the water resources of Goleta North/Central Basin and assigned quantities of the basin's safe yield to various parties, including the Goleta Water District and the La Cumbre Mutual Water Company. The judgment also ordered the Goleta Water District to bring the North/Central Basin into a state of hydrologic balance by 1998. The district has achieved compliance with this order through the importation of State Water Project water and the development of other supplemental supplies. These supplemental supplies have offset the court-mandated reduction in pumpage from the basin. Given that the basin has been adjudicated and pumpage is controlled by the court, overdraft is not foreseeable in the North/Central Basin.

Water District. Lake Cachuma, Gibraltar Reservoir, and Jameson Lake are all located in the Santa Ynez River Watershed. The three reservoirs on the Santa Ynez River supply most of the water used in the South Coast area of Santa Barbara County and for Santa Ynez downstream users. Twitchell Reservoir provides water for groundwater recharge and impoundment for flood control. As discussed below, Twitchell, Jameson, and Gibraltar Reservoirs, and to a lesser extent Lake Cachuma, are being filled with sediment, reducing their storage capacity and making it increasingly important to enhance local water supply reliability through conservation and other methods (County of Santa Barbara 2013).

Gibraltar Reservoir was completed in 1920 with a storage capacity of 14,000 acre-feet. Water from the reservoir is transported through the Mission Tunnel to the South Coast. Although the dam was raised 23 feet in 1948, the current storage capacity of the reservoir has been reduced to 4,968 acre-feet, with a long-term average annual yield of 4,330 AFY (MNS 2017; Stetson 2013). The reservoir is the source of about one-third of the City of Santa Barbara's water supply. The long-term loss of storage capacity is mitigated by the pass-through provision of the Upper Santa Ynez River Operations Agreement, which allows the City of Santa Barbara to pass through Gibraltar's yield and deliver it through Cachuma Reservoir (County of Santa Barbara 2013).

Jameson Lake was dedicated in 1930 with a storage capacity of 7,500 acre-feet. Water is transported to the South Coast through the Doulton Tunnel. Currently, it has a surface area of 138 acres when full and stores 5,291 acre-feet. The unincorporated community of Montecito receives 45% of its water supply from Jameson Lake and Fox and Alder Creeks via the Doulton Tunnel, so loss of storage capacity is an issue of concern (County of Santa Barbara 2013).

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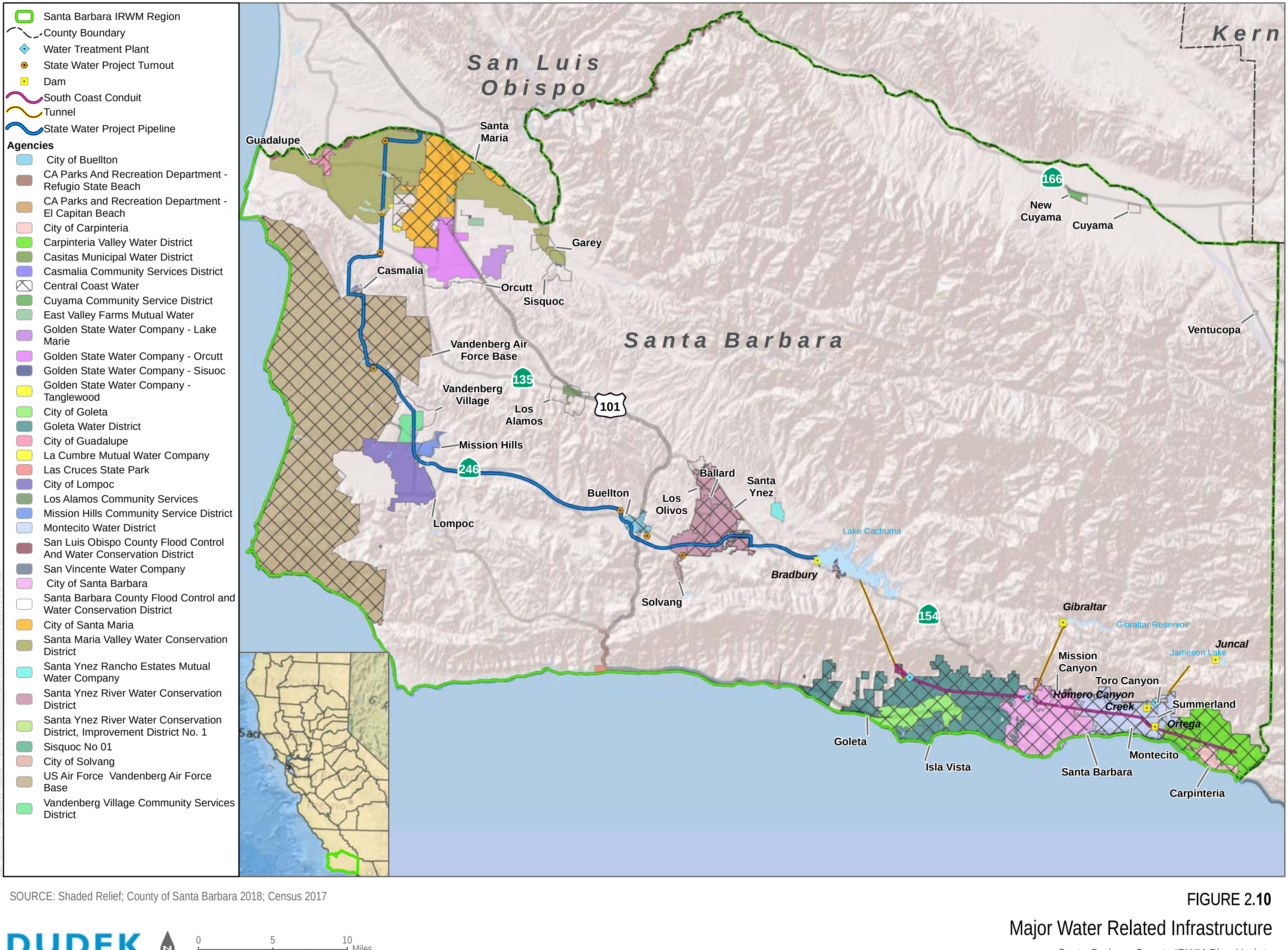

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.10

Major Water Related Infrastructure

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Lake Cachuma was completed in 1956 with a storage capacity of approximately 205,000 acre-feet, at 750 feet in elevation. The reservoir capacity at 750 feet in elevation has been reduced to approximately 184,100acre-feet due to the accumulation of silt in the reservoir. Flashboards were installed at Bradbury Dam in 2004 raising the maximum reservoir elevation by three feet which increase the capacity to 193,300 AF. The principal features of the Cachuma Project are Bradbury Dam, Lake Cachuma, Tecolote Tunnel, and the South Coast Conduit distribution systems. Included in the main conduit system are four regulating reservoirs (Glen Anne, Lauro, Ortega, and Carpinteria) and the Sheffield Tunnel. The Cachuma Project was designed as a gravity flow system. To make efficient deliveries to the South Coast, the intake tower for the Tecolote Tunnel was placed in a bay in the mid-shoreline section of the lake. Water is able to flow via gravity through Tecolote Tunnel into the South Coast Conduit all the way to Carpinteria Reservoir.[2] Sedimentation has reduced the gravity operational capacity of Lake Cachuma by blocking the lowest intake gate. If the reservoir elevation recedes below the operational gates at the intake tower, water has to be pumped from the lake into the intake tower. The supply disruptions recently have been due to drought, sedimentation, and inability to gravity flow through the system.

Twitchell Dam construction began in July 1956 and was completed in October 1958. The reservoir and dam were designed to provide the Santa Maria Valley with flood protection and water conservation. The dam catches excess rain runoff from the Cuyama River Watershed (1,140 square miles) and stores it in the reservoir, protecting the valley from winter flooding. Water is slowly released from the reservoir into the Cuyama River, which flows into the Santa Maria River, which bisects the Santa Maria Groundwater Basin. The Santa Maria River serves as the main recharge source for the local aquifer and the primary water supply. The aquifer provides water for the entire Santa Maria Valley, including the City of Santa Maria, City of Guadalupe, the unincorporated area of Santa Barbara County, and the surrounding agricultural community in northern Santa Barbara and southern San Luis Obispo County. The Twitchell Reservoir produces 32,000 AFY of water for recharge into the Santa Maria Groundwater Basin.

Since its completion, Twitchell Reservoir has been trapping sediments from the Cuyama River Watershed. Original studies estimated that 40,000 acre-feet of sediment would accumulate in the reservoir during the first 100 years of operation (Twitchell Management Authority 2010, as cited in County of Santa Barbara 2013). In 1981, a study found that the rate of sedimentation was approximately 70% greater than the original estimate. As of 2012, the accumulated sediment had reached an estimated 45,124 acre-feet. The reservoir capacity is currently approximately 194,971 acre-feet (SBCWA 2012). Because of this, the Santa Maria Valley Water Conservation District

[2] The addition of Cater Treatment Plant required booster pumps to deliver water to the South Coast Conduit.

has prepared a Twitchell Project Sediment Management Plan that helps to ensure the continued safe operation of the reservoir's water release works and extend the usable life of the reservoir.

Flood Control Infrastructure

Construction of the flood control facilities that make up the flood control and drainage system began in 1950 and has continued up to the present time. The Santa Barbara County Flood Control and Water Conservation District maintains 288.5 miles of levees and channels and 73 special facilities (see Figure 2.11, Flood Control Infrastructure). It is estimated that it would cost more than $1 billion in today's dollars to replace this system.

Following is a list the major facilities that the Santa Barbara County Flood Control and Water Conservation District maintains (SBCFCWCD, pers. comm. 2018):

- 24.5 miles of levees along the Santa Maria River
- 42 miles of closed conduits
- 22 miles of lined channels
- 50 miles of improved earth channels
- 150 miles of unimproved earth channels
- 38 retarding and recharge basins
- 25 debris basins
- 10 sediment trapping basins

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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0 5 10 Miles

FIGURE 2.11

Flood Control Infrastructure

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State Water Project Facilities

The Central Coast Water Authority (CCWA) was formed in 1991 to finance, construct, manage, and operate Santa Barbara County's SWP facilities. Construction of the facilities to import SWP water to the County began in 1994, including a 42-mile extension of the SWP water pipeline, pumping plants, and a regional treatment plant to treat the water for San Luis Obispo and Santa Barbara Counties. The Coastal Branch portion of the SWP brings water 117 miles from the California Aqueduct in Kern County, through San Luis Obispo County and the Santa Maria Valley, and continuing to the northerly portion of VAFB. At VAFB, the Coastal Branch connects to the 42-mile pipeline comprising the Mission Hills and Santa Ynez Extensions. The Santa Ynez section ends at Lake Cachuma. Water is then delivered through existing facilities to the South Coast of Santa Barbara County. The CCWA also constructed and operates the Polonio Pass Water Treatment Plant, located in northern San Luis Obispo County. In addition, under a joint powers agreement with DWR, CCWA operates all of the Coastal Branch facilities downstream of the treatment plant.

Desalination

The City of Santa Barbara constructed the Charles E. Meyer Desalination Plant, a reverse-osmosis seawater desalination facility, as an emergency water supply during the drought of 1987–1992. After that drought ended and surface water was available to meet demand, the facility was put in long-term storage mode to reduce maintenance costs. The facility has since been incorporated into the City of Santa Barbara's Long Term Water Supply Plan as a way of reducing shortages due to depleted surface supplies during drought years. On July 21, 2015, in response to exceptional drought conditions, the Santa Barbara City Council voted unanimously to reactivate the Charles E. Meyer Desalination Plant. The initial construction phase provides up to 3,125 AFY, which is approximately 30% of the City's water demand. In addition, the project included improvements that decreased energy consumption by 40% through reduction in electrical demand and the associated carbon footprint by using high-efficiency pumps, motors, and filter technology. Opportunities for the Santa Barbara facility to expand and become a regional plant exist, but agreements would need to be negotiated and additional conveyance infrastructure would need to be constructed.

In addition to treating wastewater to disinfected tertiary level, the Laguna County Sanitation District uses a reverse-osmosis treatment process to remove salts during the early morning flow hours when water softeners discharge waste brine during the regenerating process. The use of salt load water softeners is prohibited in certain areas. Water softener brine from canister exchange companies is also trucked to a brine unloading station located at the reclamation plant. Both brine waste sources are disposed of in an Environmental Protection Agency regulated class 1 non-hazardous disposal well at a depth of approximately 4,800 feet to 5,336 feet.

Water Treatment Facilities

Communities in Santa Barbara County rely on a range of water supplies; as a result, a wide variety of treatment processes are in use. Some communities receive surface water (including SWP delivery) that is treated under the Surface Water Treatment Rule. Others rely on groundwater that is treated under different regulations. Most communities receive both treated surface water and groundwater into their systems.

The following provides a description of selected treatment facilities and processes used in several communities within the County, and those used in San Luis Obispo County to treat SWP water, surface water and groundwater that is delivered to Santa Barbara County. Purveyors routinely monitor water supplies for constituents in accordance with federal and state laws. The Safe Drinking Water Act is the main federal law that ensures the quality of drinking water. Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency sets standards for drinking water quality and oversees the states, localities, and water suppliers that implement those standards. MCLs are enforceable regulatory standards under the California Safe Drinking Water Act, and must be met by all public drinking water systems to which they apply. The California Safe Drinking Water Act was passed to build on and strengthen its federal counterpart. It authorizes the State Department of Health Services to protect the public from contaminants in drinking water by establishing MCLs that are at least as stringent as those developed by the U.S. Environmental Protection Agency.

Goleta Water District

The Goleta Water District began operating the Corona Del Mar Water Treatment Plant in 1974. Due to the plant's elevation of 615 feet, water can move through the plant by gravity flow and be delivered to the vast majority of district customers without pumping. The rated nominal capacity of the plant is approximately 24 million gallons per day (mgd), with a peak capacity of 36 mgd. The "raw water" received from Lake Cachuma is directed to the plant for removal of suspended matter, such as clay particles and algae, and is further treated in order to meet state health standards (County of Santa Barbara 2013).

Montecito Water District

The Montecito Water District's Lake Cachuma water supply is treated by the City of Santa Barbara at the City of Santa Barbara's Cater Water Treatment Plant. Its Jameson Lake water supply is treated at the Montecito Water District's Bella Vista and Doulton water treatment plants. Jameson Lake is an open reservoir situated high in the Santa Ynez Mountains. With completion of the 2.2 mgd Bella Vista Treatment Plant in 1993, and its smaller 150,000-gallon-per-day (gpd) companion, Doulton Treatment Plant, the Montecito Water District has come into full compliance with the 1993 government-mandated standards (County of Santa Barbara 2013).

City of Lompoc Water Treatment Plant

The City of Lompoc operates 10 wells with a total flow of 8,195 gallons per minute or 11.84 mgd if operated simultaneously. Groundwater is pumped from the wells to the Lompoc Water Treatment Plant, located at 601 East North Avenue. The Lompoc Water Treatment Plant, which was constructed in 1963, uses a lime-caustic-soda softening method to treat the water for hardness and to reduce TDS. Waste sludge from the softening process, along with waste-filter wash water, is discharged and dried in on-site sludge lagoons or dried in centrifuges. The dried sludge is used as an alternate daily cover material at the City of Lompoc's landfill (City of Lompoc 2018)).

The Lompoc Water Treatment Plant has a peak treatment capacity of 10 mgd. From the Lompoc Water Treatment Plant, water is piped to the distribution system and to four distribution reservoirs. The four reservoirs have a total usable storage capacity of 10 to 11 million gallons. The reservoirs are located at an elevation of 320 feet above sea level. These reservoirs are connected to a gravity delivery grid, which has a single pressure zone for its service area. As of 2016, the distribution system involves approximately 135 miles of distribution lines ranging from 2 to 16 inches in diameter. The lines are located in a looping pattern, therefore maintaining pressure for fire flow requirements. Sufficient capacity and pressure are available in these distribution lines to serve existing and anticipated future development within the existing service area (City of Lompoc 2018)).

Polonio Pass Water Treatment Plant

SWP water provided to Santa Barbara County is treated at the 43 mgd Polonio Pass Water Treatment Plant in San Luis Obispo County. This treatment plant disinfects water through chloramination. Chloramines are removed from the water before it is discharged to Lake Cachuma. The treated SWP water is mixed with Cachuma Project water and delivered through Tecolote Tunnel to the contractors. Water treated at Polonio Pass is provided directly to Santa Maria; Guadalupe; Buellton; Solvang; Santa Ynez River Water Conservation District, Improvement District No. 1; and VAFB (County of Santa Barbara 2013).

City of Santa Barbara

The City of Santa Barbara constructed the William B. Cater Filtration Plant in 1964. The 1978 Joint Exercise of Powers Agreement provided for expansion and operation of the Cater Water Treatment Plant to also treat all Cachuma water delivered to the Montecito and Carpinteria Valley Water Districts. The plant was expanded to its current 37 mgd capacity in 1982. In 1997, construction was completed for facilities that connect Santa Barbara County water purveyors to the SWP. The facilities related to the SWP terminate at Lake Cachuma, and SWP water is then delivered through Cachuma Project conveyance facilities to the Cater Water Treatment Plant for treatment. Water treated at the plant may be drawn directly from the South Coast Conduit or from Lauro Reservoir, both of which are Cachuma Project facilities. The water in the South Coast Conduit comes directly from Lake Cachuma (via the Tecolote Tunnel). The water in Lauro Reservoir is a combination of water from the Gibraltar Reservoir (via the Mission Tunnel into the Penstock pipeline) and water from the South Coast Conduit. Normal operation is for the Cater Water Treatment Plant to draw water from Lauro Reservoir (County of Santa Barbara 2013).

Table 2.2 lists the water service providers in the County. Also see Figure 2.9.

Table 2.2
Water Service Providers in Santa Barbara County

Provider	Service Area and Water Source
Carpinteria Valley Water District	**Service Area:** City of Carpinteria and unincorporated areas in the Carpinteria Valley **Source:** Carpinteria Valley Groundwater Basin, Cachuma Project, and State Water Project (SWP)
Casmalia Community Services District*	**Service Area:** Unincorporated community of Casmalia **Source:** Santa Maria Groundwater Basin
City of Buellton	**Service Area:** City of Buellton **Source:** Buellton Upland and Santa Ynez Riparian Groundwater Basins and SWP
City of Guadalupe*	**Service Area:** City of Guadalupe **Source:** Santa Maria Valley Groundwater Basin and SWP
City of Lompoc	**Service Area:** City of Lompoc **Source:** Lompoc Groundwater Basin
City of Santa Barbara	**Service Area:** City of Santa Barbara **Source:** Cachuma Project, Gibraltar Reservoir, Devil's Canyon Creek, Mission Tunnel, Foothill Groundwater Basin, Santa Barbara Groundwater Basin, SWP, recycled wastewater, and desalination
City of Santa Maria*	**Service Area:** City of Santa Maria **Source:** Santa Maria Groundwater Basin, SWP, and Twitchell Reservoir recharge
City of Solvang	**Service Area:** City of Solvang and adjacent unincorporated areas **Source:** Santa Ynez Upland Groundwater Basin, Santa Ynez River Riparian Basin, SWP (acquired through contract with Santa Ynez River Water Conservation District, Improvement District No. 1)
Cuyama Community Services District*	**Service Area:** Unincorporated community of New Cuyama **Source:** Cuyama Valley Groundwater Basin
Cuyama Basin Water District	**Service Area:** Unincorporated Cuyama Valley **Source:** Cuyama Valley Groundwater Basin

Table 2.2
Water Service Providers in Santa Barbara County

Provider	Service Area and Water Source
Golden State Water Company	**Service Area:** Unincorporated communities of Orcutt, Sisquoc, Lake Marie, and Tanglewood areas **Source:** Santa Maria Groundwater Basin and SWP water
Goleta Water District	**Service Area:** City of Goleta and unincorporated areas west of the Santa Barbara City limits to El Capitan State Beach **Source:** Goleta North/Central Groundwater Basin, Cachuma Project, and SWP; Goleta Water District also distributes recycled water to various golf courses, UCSB, and other sites primarily for irrigation purposes
La Cumbre Mutual Water Company	**Service Area:** Unincorporated areas of Hope Ranch and Hope Ranch Annex **Source:** Goleta North/Central Groundwater Basin, Foothill Groundwater Basin, and SWP
Los Alamos Community Services District	**Service Area:** Unincorporated community of Los Alamos **Source:** San Antonio Groundwater Basin
Mission Hills Community Services District*	**Service Area:** Unincorporated community of Mission Hills **Source:** Lompoc Groundwater Basin
Montecito Water District	**Service Area:** Unincorporated communities of Montecito and Summerland **Source:** Montecito Groundwater Basin, the Cachuma Project, SWP, Jameson Lake, Fox and Alder Creeks, Doulton Tunnel, supplemental water purchases made through the Central Coast Water Authority and using the SWP facilities for delivery
Santa Ynez River Water Conservation District, Improvement District No. 1	**Service Area:** Unincorporated communities of Santa Ynez, the Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation, Los Olivos, and Ballard; also supplies domestic water to the City of Solvang **Source:** Cachuma Project, SWP, and Santa Ynez Upland and Santa Ynez River Riparian Basins
Vandenberg Air Force Base	**Service Area:** Vandenberg Air Force Base and Lompoc Federal Correctional Complex **Source:** San Antonio Groundwater Basin and SWP
Vandenberg Village Community Services District	**Service Area:** Unincorporated community of Vandenberg Village **Source:** Lompoc Groundwater Basin
Other Small Mutual Water Companies	Consisting of: Alegria, Bobcat Springs, Cuyama, El Capitan, Ellwood, Lincolnwood, Lingate Lane, Meadowlark Ranches, Montecito Sea Meadows, Oak Trail Ranch, Rancho Marcelino, San Augustin, San Marcos, Santa Anita, Santa Ynez Rancho Estates, Thornhill, Vieja, Vista Hills, Walking M, East Valley Farms, Foster Road, Las Positas, Mesa Hills, Oak Trail Estates, Painted Cave, Rancho Ynecita, Rolling Hills, Rosario Park, Santa Rita, Skyline Park, and Woodstock Property Owners

* Disadvantaged Community (DAC).

Wastewater Treatment

Wastewater service providers must address increasingly strict discharge limits for WWTPs, requiring increasing costs for wastewater agencies. Systems that discharge to surface water bodies (and the ocean) require National Pollutant Discharge Elimination System (NPDES) permits. Treatment systems that discharge to land or percolation ponds are regulated by waste discharge requirements. Both kinds of permits are issued and monitored by the Central Coast Regional Water Quality Control Board (RWQCB). The SWRCB General Waste Discharge Requirement for Sanitary Sewer Systems (SWRCB Order No. 2006-0003) also requires wastewater agencies to evaluate and rehabilitate sewer collection systems with a target of zero sewer overflows.

There are several steps to the wastewater treatment process. Wastewater enters sewers and is then transported to the WWTP, where it initially receives "primary treatment." This involves removing solids that settle to the bottom, as well as floating materials. Next, the water undergoes "secondary treatment," which removes organic matter and suspended solids in the water. During this treatment process, chemicals may be added to disinfect the water before it is released into the ocean, adjacent river, or stream, either directly or indirectly by percolation ponds or upland spreading areas. Most wastewater in Santa Barbara County is treated to this secondary level. Finally, some treatment plants use "tertiary treatment," which filters and disinfects the water. If treated to this advanced level, wastewater (or "effluent") can be reused for such purposes as irrigation of pasture grasses, landscaping, and even crops. Such reclaimed or recycled water is used for several purposes within the County of Santa Barbara.

Table 2.3 lists wastewater service providers; see also Figure 2.12, Wastewater Service Providers. Table 2.4 lists wastewater treatment facilities; see also Figure 2.13, Wastewater Facilities.

Table 2.3
Wastewater Service Providers

Wastewater Service Provider	Service Area
Carpinteria Sanitary District	City of Carpinteria and unincorporated areas in the Carpinteria Valley
City of Buellton	City of Buellton
City of Guadalupe*	City of Guadalupe
City of Lompoc	City of Lompoc, Vandenberg Air Force Base, Vandenberg Village Community Services District
City of Santa Barbara	City of Santa Barbara and unincorporated Mission Canyon area
City of Santa Maria	City of Santa Maria and small portion of the unincorporated community of Orcutt
County Service Area 12 (collection only)	Mission Canyon
City of Solvang	City of Solvang and portions of the Santa Ynez Valley
Cuyama Community Services District*	Unincorporated community of New Cuyama

Table 2.3
Wastewater Service Providers

Wastewater Service Provider	Service Area
Goleta Sanitary District	Unincorporated area of Goleta Valley immediately west of and adjacent to the City of Santa Barbara, a portion of the City of Goleta around and east of the Santa Barbara Municipal Airport, the Goleta West Sanitary District, University of California at Santa Barbara, Santa Barbara Municipal Airport, and certain Santa Barbara County facilities
Goleta West Sanitary District (collection only)	Western portion of Goleta Valley, Isla Vista, and Embarcadero Municipal Improvement District
Laguna County Sanitation District	Unincorporated community of Orcutt and a small area of the southern part of the City of Santa Maria
Federal Bureau of Prisons	Lompoc Federal Correctional Complex
Los Alamos Community Services District	Unincorporated community of Los Alamos
Mission Hills Community Services District	Unincorporated community of Mission Hills
Montecito Sanitary District	Unincorporated community of Montecito
Santa Barbara County Parks Department	Cachuma Lake Recreation Area
Summerland Sanitary District	Unincorporated community of Summerland
Santa Ynez Community Services District	Portions of Santa Ynez (collection and conveyance to Solvang Wastewater Treatment Plant); also manages, operates, and maintains the Chumash Wastewater Treatment Plant
Vandenberg Village Community Services District (collection only)	Unincorporated community of Vandenberg Village
Vandenberg Air Force Base	Vandenberg Air Force Base

* Disadvantaged Community (DAC).

The Lompoc Federal Correctional Complex also provides its own wastewater service. Wastewater collected from the Main Containment Area at VAFB is conveyed to the Lompoc WWTP. Other areas in the North Base and South Base are served by leach fields, septic tanks, and package treatment plants (County of Santa Barbara 2013).

Table 2.4
Wastewater Treatment Facilities

Treatment Plant	Design Capacity (mgd)	Permitted Capacity (mgd)	Permitted Secondary (mgd)	Permitted Tertiary (mgd)	Current Disposal Method (Permit)	Level of Treatment	Recycled Water Uses
Buellton WWTP	0.65	1.3	1.3	0	Percolation ponds (WDR)	Secondary	Groundwater recharge
Carpinteria Sanitary District WWTP	2.5	2.5	2.5	0	Ocean outfall (NPDES)	Secondary	Treatment plant landscape irrigation

Table 2.4
Wastewater Treatment Facilities

Treatment Plant	Design Capacity (mgd)	Permitted Capacity (mgd)	Permitted Secondary (mgd)	Permitted Tertiary (mgd)	Current Disposal Method (Permit)	Level of Treatment	Recycled Water Uses
City of Santa Maria	13.5	13.5	13.5	0	Percolation ponds (WDR)	Secondary	Groundwater recharge
Cuyama CSD WWTP	0.150	0.150	0.150	0	(NPDES)	Secondary	Groundwater recharge
City of Santa Barbara WWTP (El Estero)	11.0	11.0 for WWTP; 12.5 for desal brine	11	4.3 for recycled water system	Ocean outfall (NPDES) and provide recycled water (WDR)	Secondary and tertiary	Landscape irrigation; toilet flushing
Goleta Sanitary District and Goleta West Sanitary District	9	7.64	7.64	3.0 for recycled water system	Ocean outfall and provide recycled water (NPDES)	Secondary and tertiary	Parks, schools, golf courses, landscape irrigation, toilet flushing
Guadalupe WWTP	0.96	0.96	0.96	0	Spray field irrigation (WDR)	Secondary	Spray irrigation
Laguna County Sanitation District	3.7	3.7	—	3.7	Spray field irrigation/approved users/brine injection well (WDR)	Tertiary	Agricultural, landscaping, industrial
Lake Cachuma County Park	0.22	—	—	0	(WDR)	Secondary	None
La Purisima (La Purisima State Park)	0.40	—	—	—	(WDR)	Primary	Groundwater recharge, pasture/crop irrigation
Lompoc Regional Wastewater Reclamation Plant	5.5 mgd	5	5	5	Discharge to Miguelito Creek (tributary to Santa Ynez River) (NPDES)	Tertiary	On-site irrigation and dust control
Los Alamos	4.0	0.225	0.4	0	Percolation pond/ spray field irrigation (WDR)	—	—
Mission Hills CSD (La Purisima WWTP)	0.57	0.57	0.57	0	Percolation ponds (WDR)	Primary	Groundwater recharge

Table 2.4
Wastewater Treatment Facilities

Treatment Plant	Design Capacity (mgd)	Permitted Capacity (mgd)	Permitted Secondary (mgd)	Permitted Tertiary (mgd)	Current Disposal Method (Permit)	Level of Treatment	Recycled Water Uses
Montecito Sanitary District WWTP	1.5	1.5	1.5	0	Ocean outfall (NPDES)	Secondary	None
Santa Ynez Band of Chumash Indians	0.2	—	—	—	Discharge to Zanja de Cota Creek (NPDES)	Tertiary (off-line until upgrades completed)	Irrigation, toilet flushing, forest fire response
Solvang WWTP	1.0	1.5	1.5	0	Percolation ponds (WDR)	Secondary	Groundwater recharge
Summerland Sanitary District	0.3	0.3	—	0.3	Ocean outfall (NPDES)	Tertiary	None
US Penitentiary – Lompoc	—	—	—	—	WDR	—	—
Vandenberg AFB	—	—	—	—	Waivers of WDRs	—	—

Source: CCWA 2011, page 48.
mgd = million gallons per day; WWTP = Wastewater Treatment Plant; NPDES = National Pollutant Discharge Elimination System; WDR = waste discharge requirement; CSD = Community Services District; AFB = Air Force Base.

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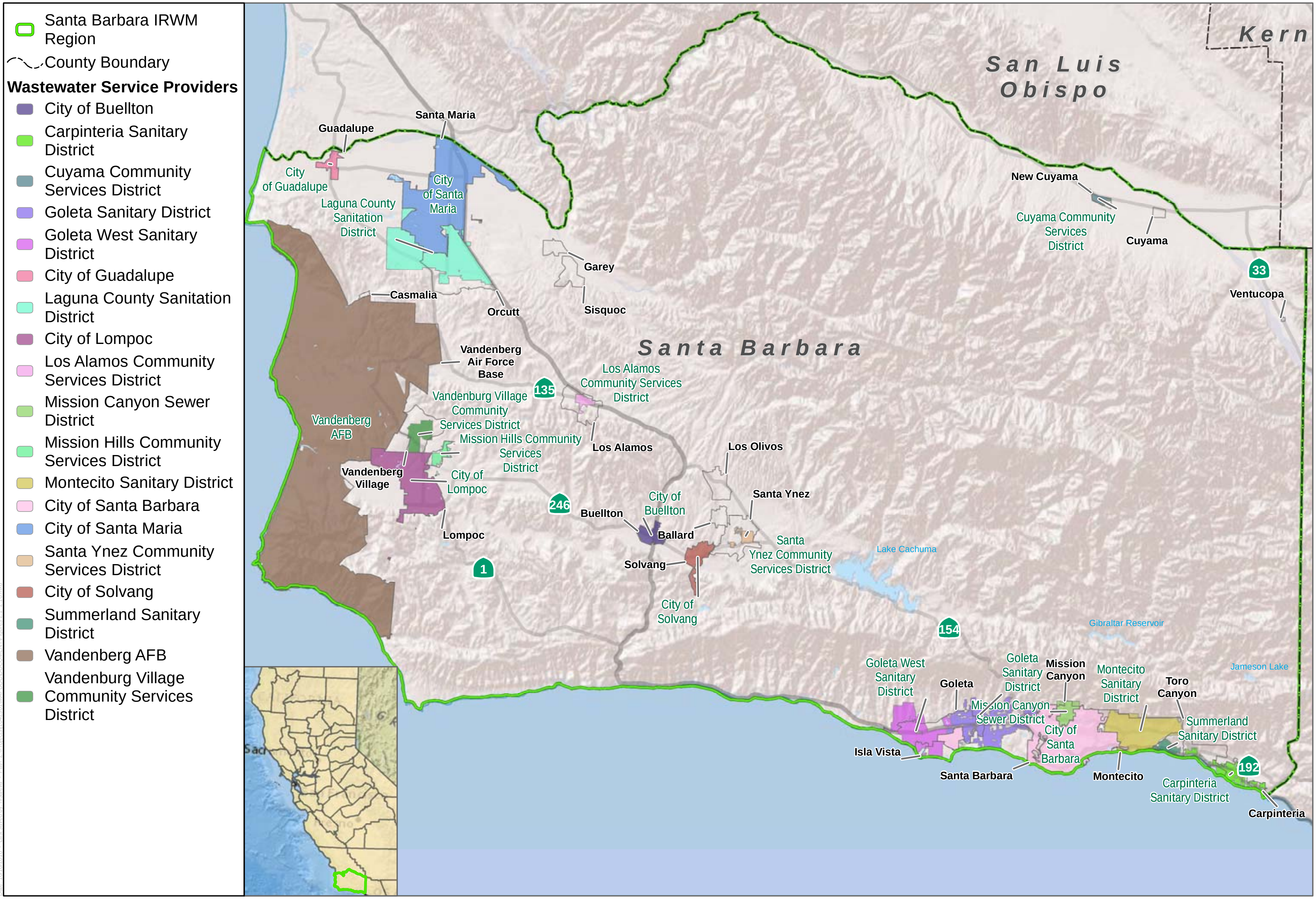

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.12

Waste Water Service Providers

Santa Barbara County IRWM Plan Update

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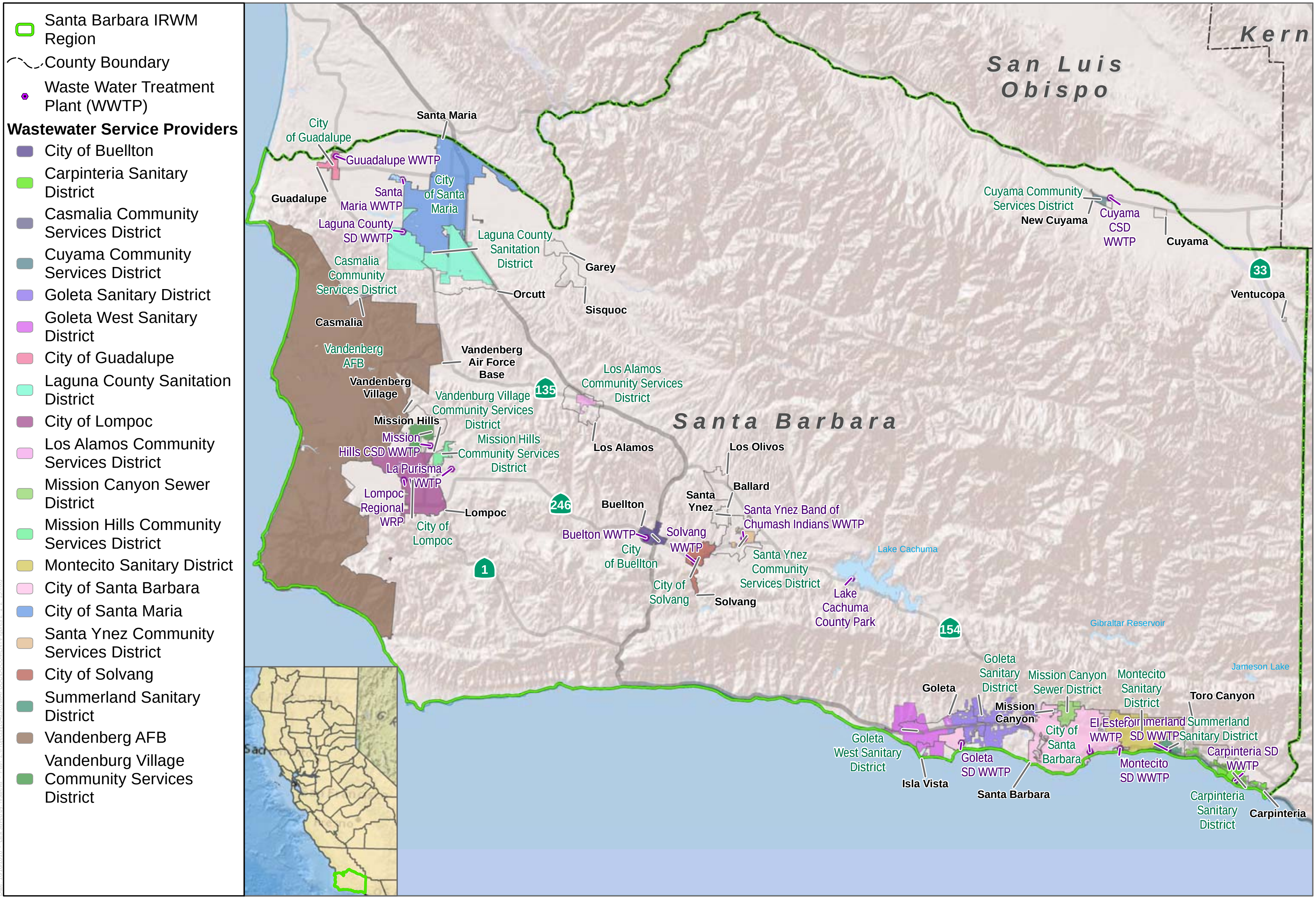

SOURCE: Shaded Relief; County of Santa Barbara 2018; Census 2017

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FIGURE 2.13

Wastewater Facilities

Santa Barbara County IRWM Plan Update

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Other Regional Water-Related Jurisdictions

Santa Barbara County Water Agency

The Santa Barbara County Water Agency (SBCWA) was established by the state legislature in 1945 to contract with the United States for the Cachuma and Santa Maria Project. The SBCWA is a dependent special district that manages a number of regional programs throughout Santa Barbara County. The Santa Barbara County Water Agency jurisdictional boundaries are the same as the County political boundaries. The Santa Barbara County Water Agency manages the following programs: implementation and partial funding of operational programs such as the cloud seeding program; implementation and administration of the Regional Water Efficiency Program; and collection of County-wide hydrologic data and development of hydrologic models. Included in these programs are technical reports and studies such as periodic reports on groundwater conditions, sediment management studies, reservoir capacity studies, technical support to other public agencies, and public information. Major water projects involving the Santa Barbara County Water Agency include the SWP (Coastal Branch Extension), Cachuma Project, and Twitchell Project. The Santa Barbara County Water Agency administers development of the IRWM Plan, supported by a number of local governments. The County Board of Supervisors adopted a Memorandum of Understanding (MOU) for IRWM planning with 28 local agencies in September 2006; the MOU was updated in 2012, and again in 2018 (see Chapter 3, Governance and Participation). Its boundaries are coterminous with the boundaries of Santa Barbara County (SBCWA 2018a).

Cachuma Operation and Maintenance Board

The Cachuma Operation and Maintenance Board is a California Joint Powers Agency (JPA) formed in 1956 pursuant to an agreement with the Bureau of Reclamation. The agreement transferred to the Cachuma Project Member Units the responsibility to operate, repair and maintain all Cachuma Project facilities, except Bradbury Dam, which the Bureau of Reclamation continues to operate. Up until 2017, the Cachuma Operation and Maintenance Board consisted of five Cachuma Project member units, including Carpinteria Valley Water District, City of Santa Barbara, Goleta Water District, Montecito Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1. After internal disagreements among the members units, the Santa Ynez River Water Conservation District, Improvement District No. 1 withdrew from the JPA. Hence, the he Cachuma Operation and Maintenance Board Cachuma member units consist of Carpinteria Valley Water District, City of Santa Barbara, Goleta Water District, and Montecito Water District. Its boundaries are coterminous with the boundaries of its constituent agencies (County of Santa Barbara 2013).

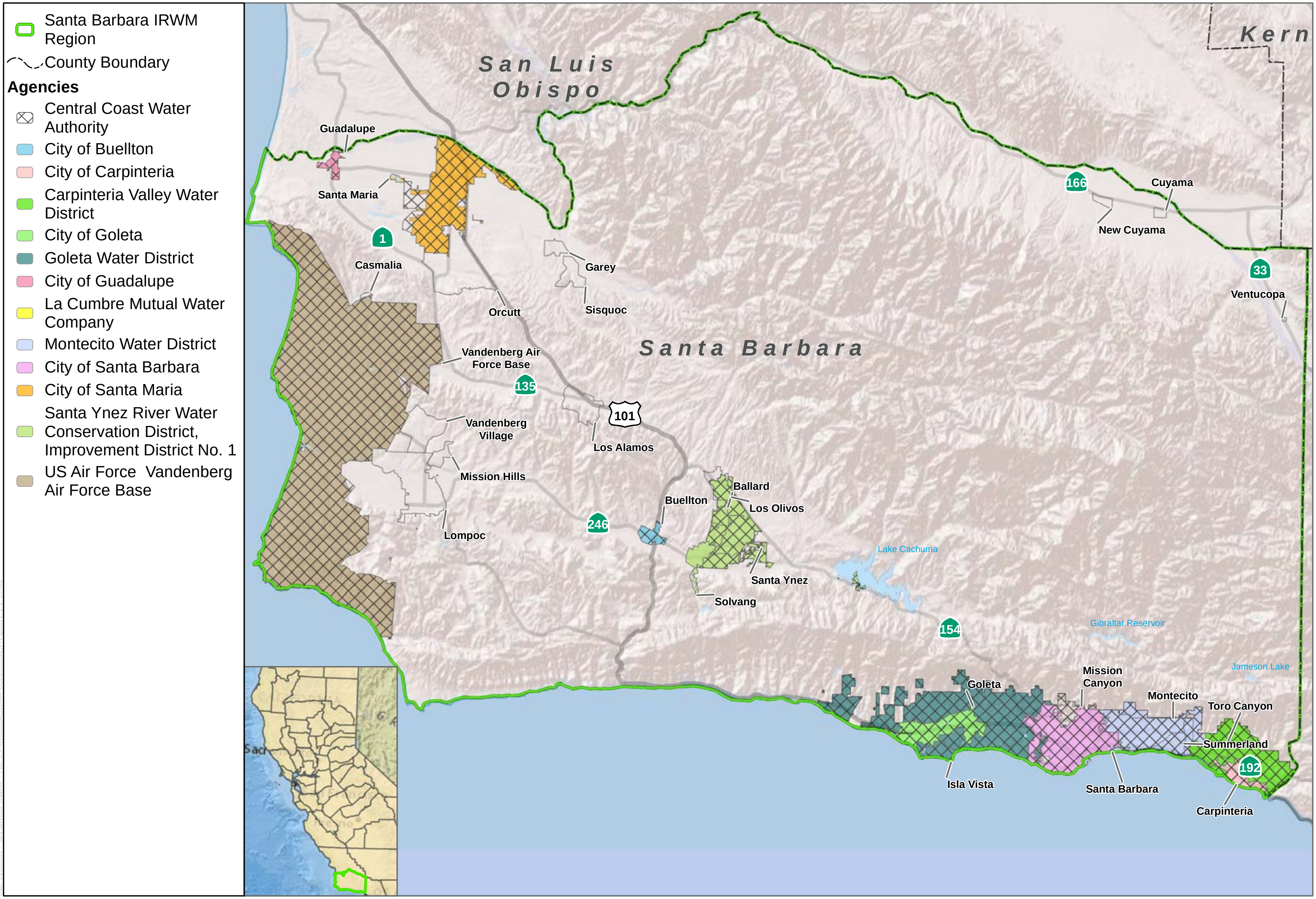
Cachuma Conservation Release Board

The Cachuma Conservation Release Board is a joint powers agency formed in January 1973 by the Carpinteria Valley Water District, Goleta Water District, the City of Santa Barbara, and Montecito Water District. In 2011, the Carpinteria Valley Water District withdrew its membership. The Cachuma Conservation Release Board was established to jointly represent the respective parties in protecting the Cachuma water rights interests of the four South Coast entities and to maximize the amount of water that they can obtain from the Cachuma Project or other sources that may be available to them. The Cachuma Conservation Release Board partnered with the Santa Ynez River Water Conservation District, Improvement District No. 1, in conducting the long-term steelhead fishery program in the Lower Santa Ynez River in accordance with an MOU with the U.S. Bureau of Reclamation and other parties until January 2011. At that time, implementation of the Lower Santa Ynez River Fish Management Plan and the 2000 Cachuma Biological Opinion was transferred to the Cachuma Operation and Maintenance Board (County of Santa Barbara 2013).

The Cachuma Conservation Release Board continues to represent its South Coast member agencies in the ongoing SWRCB's water rights proceedings. A new water rights decision for Cachuma operations is expected in 2019 or 2020. The Cachuma Conservation Release Board is also assisting the U.S. Bureau of Reclamation in developing a new biological assessment as part of a reinitiated consultation with the National Marine Fisheries Service (NMFS), which will result in a new Biological Opinion for Southern California steelhead in the Santa Ynez River (County of Santa Barbara 2013).

Central Coast Water Authority

The CCWA was formed in 1991 to construct, manage, and operate the County's 42-mile portion of the SWP and a regional water treatment plant. It later secured agreements with the DWR to operate and maintain an additional 101-mile portion of pipeline and associated facilities in Santa Barbara and San Luis Obispo Counties. It is presently composed of eight public agencies: the cities of Buellton, Guadalupe, Santa Barbara, and Santa Maria; the Carpinteria Valley Water District; the Goleta Water District; the Montecito Water District; and Santa Ynez River Water Conservation District, Improvement District No. 1. In addition, CCWA has one associate member, the La Cumbre Mutual Water Company, and two non-member, private water users, Raytheon Inc., and Morehart Land Company. Water service is also provided to Golden State Water Company and VAFB. Its boundaries are coterminous with the boundaries of its constituent agencies (County of Santa Barbara 2013) (see Figure 2.14, State Water Project Areas Serviced by Central Coast Water Authority).



SOURCE: Shaded Relief; County of Santa Barbara 2018; DWR 2017; Census 2017

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FIGURE 2.14

State Water Project Areas Serviced by Central Coast Water Authority

Santa Barbara County IRWM Plan Update

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Santa Maria Valley Water Conservation District

The Santa Maria Valley Water Conservation District operates Twitchell Dam and Reservoir, and supports water conservation projects within the Santa Maria Valley. The Santa Maria Valley Water Conservation District's boundaries were established to encompass areas that would benefit from flood protection and recharge afforded by the Santa Maria Project (comprising the Twitchell Reservoir and the Santa Maria Levee) (County of Santa Barbara 2013).

Santa Ynez River Water Conservation District

The Santa Ynez River Water Conservation District was formed in 1939 to protect the water rights and supplies of its constituents in the Santa Ynez River Watershed with respect to diversions by South Coast agencies. It also manages releases of water from Bradbury Dam to replenish the Santa Ynez River Riparian Basin and the Lompoc Groundwater Basin, and provides groundwater management planning and related activities on the upland adjacent to the river throughout the watershed. The Santa Ynez River Water Conservation District's boundaries generally encompass an area within the watershed from Lake Cachuma to the Pacific Ocean (County of Santa Barbara 2013).

2.5 Ecological Processes

Santa Barbara County is located at a point of transition between the Southern California and Northern California ecozones, and is characterized by a number of rare plant assemblages. The County has a range of climatic zones, from Mediterranean (South Coast) to Alpine (Big Pine Mountain) to high desert (Cuyama area), resulting in considerable ecological diversity. More than 1,400 plant and animal species are found in the County. Of these, 54 are federally or state-listed as threatened or endangered species (22 plant and 32 animal species), and another 60 species are considered rare or of special concern (including proposed endangered, threatened, candidate, or sensitive species) (County of Santa Barbara 2013).

2.5.1 Aquatic Sensitive Species

The listed species found in Santa Barbara County include five aquatic/stream-dependent species (tidewater goby, tiger salamander, red-legged frog, arroyo toad, and Southern California steelhead trout). The County's watersheds provide critical habitat for the anadromous steelhead trout, which is found primarily in the Santa Ynez River and its tributaries and the South Coast creeks, including Mission Creek. Steelhead populations have declined due to human activities, which have caused loss of native vegetation; influx of aggressive exotic species; increased creek/stream scouring; streamflow and groundwater diversion; increases in impervious surfaces and runoff; and degraded water quality because of thermal pollution and potential nutrient, sediment, and other polluted runoff from urban development. Dams, culverts, concrete channels, low-flow crossings, and other structures have created fish passage barriers to important upstream habitat. Southwestern pond turtle (*Actinemys [Clemmys] marmorata pallida*), a California Species of Special Concern, is also found in the County (see Appendices 2-B and 2-C, Santa Barbara Creeks Bioassessment Program Annual Reports).

2.5.2 Freshwater Habitats

Zaca Lake, located in the San Rafael Mountains north of Lake Cachuma, is the only natural lake in Santa Barbara County. It is less than 1 mile in circumference and tends to become anaerobic seasonally; therefore, the waters do not support a large or diversified biota (County of Santa Barbara 2013).

Lake Los Carneros is located on the grounds of Stow House in Goleta and is not a natural body of water; however, it does support a large and stable ecological community. It is surrounded by typical aquatic vegetation and supports diverse bird species (County of Santa Barbara 2013).

Lake Cachuma is the largest reservoir in the County. It attracts numerous migratory birds and has a rookery of great blue herons (*Ardea herodias*). The endangered southern bald eagle (*Haliaeetus leucocephalus*) may be observed at the lake. The lake supports large populations of largemouth bass (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieu*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), redear (*L. microlophus*), sunfish (Centrarchidae), channel catfish (*Ictalurus punctatus*), and rainbow trout (County of Santa Barbara 2013).

The County's four major rivers (Santa Ynez, Santa Maria, Cuyama, and Sisquoc) (shown in Figure 2.15, Major Rivers) and its many creeks and streams are characterized by riparian vegetation along their banks. This habitat can also occur along arroyos, barrancas, and other types of drainages throughout the County. Riparian vegetation supports a great diversity of aquatic and terrestrial wildlife species. Streams and pools provide habitat for aquatic and semiaquatic species such as Pacific chorus frog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), and the introduced bullfrog (*Lithobates catesbeianus*). Common reptiles include ensatina (*Ensatina eschscholtzii*), western fence lizard (*Sceloporus occidentalis*), common kingsnake (*Lampropeltis getula*), gophersnake (*Pituophis catenifer*), and common gartersnake (*Thamnophis sirtalis*). Riparian vegetation is also used by small mammals for cover, movement corridors, and foraging. Small populations of southwestern willow flycatcher and least Bell's vireo, which are federally and state-listed species, are present in the riparian areas along the Santa Ynez River, portions of which are designated as critical habitat for these species (County of Santa Barbara 2013).

SOURCE: Shaded Relief; USGS 2018

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FIGURE 2.15

Major Rivers

Santa Barbara County IRWM Plan Update

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A number of invasive weeds are present in the County's riparian areas, including Arundo donax, tamarisk (*Tamarix* spp.), pampas grass, myoporum (*Myoporum* spp.), Cape-ivy (*Delairea odorata*), and castorbean (*Ricinus communis*). Such weeds are detrimental to habitat, they are water consumptive, and they increase the risk of flooding and erosion in riparian systems. South Coast creeks discharge to the Santa Barbara Channel, and impaired creek water quality affects the water quality of the ocean in the vicinity of public beaches. Common to all urban south coastal watersheds, the natural function of local creeks has been affected by human activities and land alteration, which ultimately has altered natural hydrologic and geomorphologic processes, degraded water quality, and diminished native biological communities (County of Santa Barbara 2013).

2.5.3 Sloughs/Coastal Salt Marshes

Several salt marshes occur in the County and provide habitat for a number of estuarine invertebrates and fish, migratory birds, and rare and endangered animal species, such as Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), California brown pelican, western snowy plover, light-footed clapper rail, and tidewater goby, and plant species such as saltmarsh bird's-beak (*Chloropyron maritimum*) (County of Santa Barbara 2013).

Carpinteria Salt Marsh Reserve

Carpinteria Salt Marsh Reserve is a 230-acre estuary adjacent to the City of Carpinteria owned by the City of Carpinteria, the University of California (as part of its Natural Reserve System), and the Land Trust for Santa Barbara County. The marsh includes intertidal estuarine wetlands, adjacent palustrine wetlands, and some subtidal deepwater habitat in natural and artificial channels. The reserve offers habitat for migratory waterfowl as well as endangered plants and animals like the saltmarsh bird's-beak, light-footed clapper rail, and Belding's savannah sparrow. The marsh was one of the original California Critical Coastal Areas identified in 1995 as an impaired estuary. It is also a 303(d) listed water body (for nutrients, organic enrichment, low dissolved oxygen, and priority organics). Nurseries, greenhouses, orchards, row crops, and residential areas may contribute to nutrients in the watershed. Sedimentation is likely coming from construction, storm drains, agriculture, and natural processes. The marsh and its tributaries (Santa Monica Creek, Franklin Creek, and Arroyo Paredon) contain levels of nitrates that exceed Water Quality Control Plan (Basin Plan) objectives for municipal and domestic supply. Flood control, sediment management, and ecosystem enhancement measures recently have been implemented (University of California 2018).

Goleta Slough

Goleta Slough is located near UCSB and includes portions of the Santa Barbara Airport, which is under the jurisdiction of the City of Santa Barbara. In the slough, fresh water from seven streams mixes with salt water from the ocean, creating a range of habitats that support a unique assemblage of species, including some that are regionally rare in coastal California or locally rare in Santa Barbara County. Endangered species are known to occur in the vicinity, including California least tern, California brown pelican, light-footed clapper rail, Belding's savannah sparrow, American peregrine falcon, California red-legged frog, Southern California steelhead trout, and tidewater goby. The slough has been designated as a Globally Important Bird Area; 279 bird species have been reported there. The slough is also designated as Environmentally Sensitive Habitat in Santa Barbara City and County Local Coastal Plans, and much of it is a State Ecological Reserve (Santa Barbara ChannelKeeper 2013, as cited in County of Santa Barbara 2013).

Large volumes of sediment and debris contained in runoff from the mountains have entered the Goleta Slough ecosystem and profoundly affected the ecosystem by raising ground surface elevations and affecting patterns of flooding and the development of wetland versus upland habitats. High inputs of sediment and debris, funneled into relatively narrow areas as a result of creek channelization and development of the Goleta Valley, have diminished the capacity of creek channels to convey floodwaters through developed areas. This has necessitated regular maintenance by the Santa Barbara County Flood Control District. Goleta Slough is a 303(d) impaired water body for pathogens and priority organics, and it is considered a Critical Coastal Area (CCA). The slough is managed by the Santa Barbara Airport and the Goleta Slough Management Committee, which is composed of a variety of federal; state; and local agencies, organizations, and individuals through the Goleta Slough Ecosystem Management Plan (Goleta Slough Management Committee 2015). The importance of the slough is recognized and reflected in its designation as an Environmentally Sensitive Habitat in the Local Coastal Plans of both the City and County of Santa Barbara.

Greater Devereux Slough

The Greater Devereux Slough ecosystem is located on the west campus of UCSB, and a large portion of the area is a designated Environmentally Sensitive Habitat. The Devereux Slough ecosystem is critical to the health of the coastline and watershed, and supports an abundance and diversity of species, including several endangered birds, fish, and plants. Fish that live in the slough include the tidewater goby, California killifish (*Fundulus parvipinnis*), mosquitofish (*Gambusia affinis*), and topsmelt (*Atherinops affinis*). Invertebrates also inhabit this slough, including microscopic crustaceans, worms, and insect larvae, such as dragonfly nymphs. More than 290 species of birds are found in the Devereux Slough ecosystem. They include great egret (*Ardea alba*), snowy egret (*Egretta thula*), great blue heron, black-crowned night heron (*Nycticorax nycticorax*), avocet (*Recurvirostra* sp.), northern shoveler (*Anas clypeata*), ruddy duck (*Oxyura jamaicensis*), and least sandpiper (*Calidris minutilla*) (Goleta Slough Management Committee 2015).

The upland drainage areas of the Devereaux Slough system, commonly referred to as Santa Barbara Shores and Ellwood, are important because they are home to one of the largest monarch butterfly (*Danaus plexippus*) overwintering sites on the west coast. As part of the University of California's Natural Reserve System, the area is reserved for habitat and wildlife preservation, public education, and academic research. The slough is not listed on the 303(d) list, but sediment loading is reducing the total size of the slough. Continued residential development in the watershed may increase contamination of runoff entering the slough, and exotic plant species are displacing native plants and altering the habitats. The Santa Barbara Audubon Society began a new habitat restoration project on the north shore of Devereux Slough in September 2002, intended to restore a 1.42-acre portion of Devereux Slough seasonal wetland and upland margin, improve foraging habitat for the state-listed Belding's savannah sparrow and two species of marsh-dependent butterflies, pygmy blue (*Brephidium exilis*) and wandering skipper (*Panoquina errans*). In April 2013, UCSB, through the Trust for Public Land, acquired a 64-acre former golf course in the upper Devereux Slough for restoration to coastal wetlands and ongoing protection (Goleta Slough Management Committee 2015).

Surf/Ocean Beach Park

The surf area, including Ocean Beach Park, is located approximately 13 miles west of Lompoc at the mouth of the Santa Ynez River. The area contains a salt marsh, a small freshwater marsh, and dune habitat. Access to certain parts of the beach is restricted at times because western snowy plover nests there. Like the other marshes, this area is a stopover for birds using the Pacific Flyway, and it contains habitat suitable for a number of sensitive species, including Belding's savannah sparrow and black rail (*Laterallus jamaicensis*). Endangered plant species, such as saltmarsh bird's-beak, also may be found here. The Santa Ynez River Lagoon is found here and generally forms when flows decrease after the winter runoff period when the mouth of the river fills with sand deposited by the river and the strong longitudinal drift of sand from north to south along the shoreline. Low summer flows generally are unable to keep the outlet open (City of Lompoc Acting Wastewater Superintendent, pers. comm., City of Lompoc 2018). The lagoon represents a unique habitat characterized by saltwater/freshwater mixing (County of Santa Barbara 2013).

2.5.4 Coastal Dunes

This community occurs in several places along the coast, including on the southwestern edge of the UCSB campus (Devereux Dunes), at VAFB, north of Point Sal, between Point Sal and

Purisima Point, south of Purisima point, and around Surf/Ocean Beach Park. Of particular note is the Guadalupe-Nipomo Dunes Complex, located near the mouth of the Santa Maria River. The Guadalupe-Nipomo Dunes Complex is a National Natural Landmark comprising 18 miles and more than 22,000 acres of one of the largest coastal dune ecosystems on earth. The Dunes Complex is located in a transition zone between Northern and Southern California plant and animal communities, resulting in a high degree of habitat diversity, a large number native plants and animals, and susceptibility to disturbing delicate ecosystem balances. With more than 1,000 known species of plants and animals and some of the highest dunes on the west coast, it is a place of rare beauty and significance. Established in 2000 and encompassing 2,533 acres, the Guadalupe-Nipomo National Wildlife Refuge is located in the heart of the Dune Complex. The habitat includes coastal dune scrub, dune swales, wetlands, fore and active dune areas, and coastal strand. Sensitive species found in the refuge include western snowy plover, California red-legged frog, California least tern, and more than 16 species of rare plants. The Oso Flaco Lake Natural Area, a California State Park, also is located within the Dunes Complex (County of Santa Barbara 2013).

2.5.5 Areas of Special Biological Significance

The SWRCB designates Areas of Special Biological Significance throughout California, defined as "a non-terrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the SWRCB through its water quality control planning process" (California Public Resources Code, Section 36700[f]). In these areas, nonpoint-source pollution is to be controlled as much as possible, and point source and thermal discharges are generally not permitted. The only Area of Special Biological Significance within Santa Barbara County is the Channel Islands National Marine Sanctuary, which is managed by the National Park Service out to 6 miles from the shore (County of Santa Barbara 2013). This IRWM Plan does not include the Santa Barbara Channel Islands; thus, no Area of Special Biological Significance is located within the IRWM planning area.

2.5.6 Marine Protected Areas

California Assembly Bill 993, the Marine Life Protection Act, was passed into law on October 10, 1999. A "marine protected area" is a named, discrete geographic marine or estuarine area seaward of the high tide line or the mouth of a coastal river, including any area of intertidal or sub-tidal terrain, together with its overlying water and associated flora and fauna that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. Marine protected areas include marine life reserves and other areas that allow for specified commercial and recreational activities, including fishing for certain species but not others, fishing with certain practices but not others, and kelp harvesting, provided that these activities are consistent with the objectives of the area and the goals and guidelines of the law. Marine protected areas are primarily intended to protect or conserve marine life and habitat, and are therefore a subset of marine managed areas, which are broader groups of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities. A number of marine protected areas are present within Santa Barbara County (see Figure 2.16, Marine Protected Areas), including the following (County of Santa Barbara 2013):

- The Channel Islands
- Goleta Slough
- Refugio State Marine Conservation Area
- Vandenberg State Marine Reserve
- A 22-square-mile no-take marine reserve at Point Conception
- A 2-square-mile marine conservation area at Kashtayit (near Gaviota State Park) that allows only recreational take of finfish and invertebrates (except for rock scallops and mussels), and the harvest of giant kelp (*Macrocystis pyrifera*) by hand
- A 2.5-square-mile marine conservation area at Naples Reef (off the Gaviota Coast) that allows only spearfishing of pelagic finfish and white sea bass (*Atractoscion nobilis*), and the harvest of giant kelp
- A 10.5-square-mile marine conservation area at Campus Point in Goleta that allows only ongoing maintenance and monitoring of oil infrastructure in the area
- A 0.25-square-mile marine conservation area at Goleta Slough that allows only necessary dredging, habitat restoration, and other ongoing maintenance work

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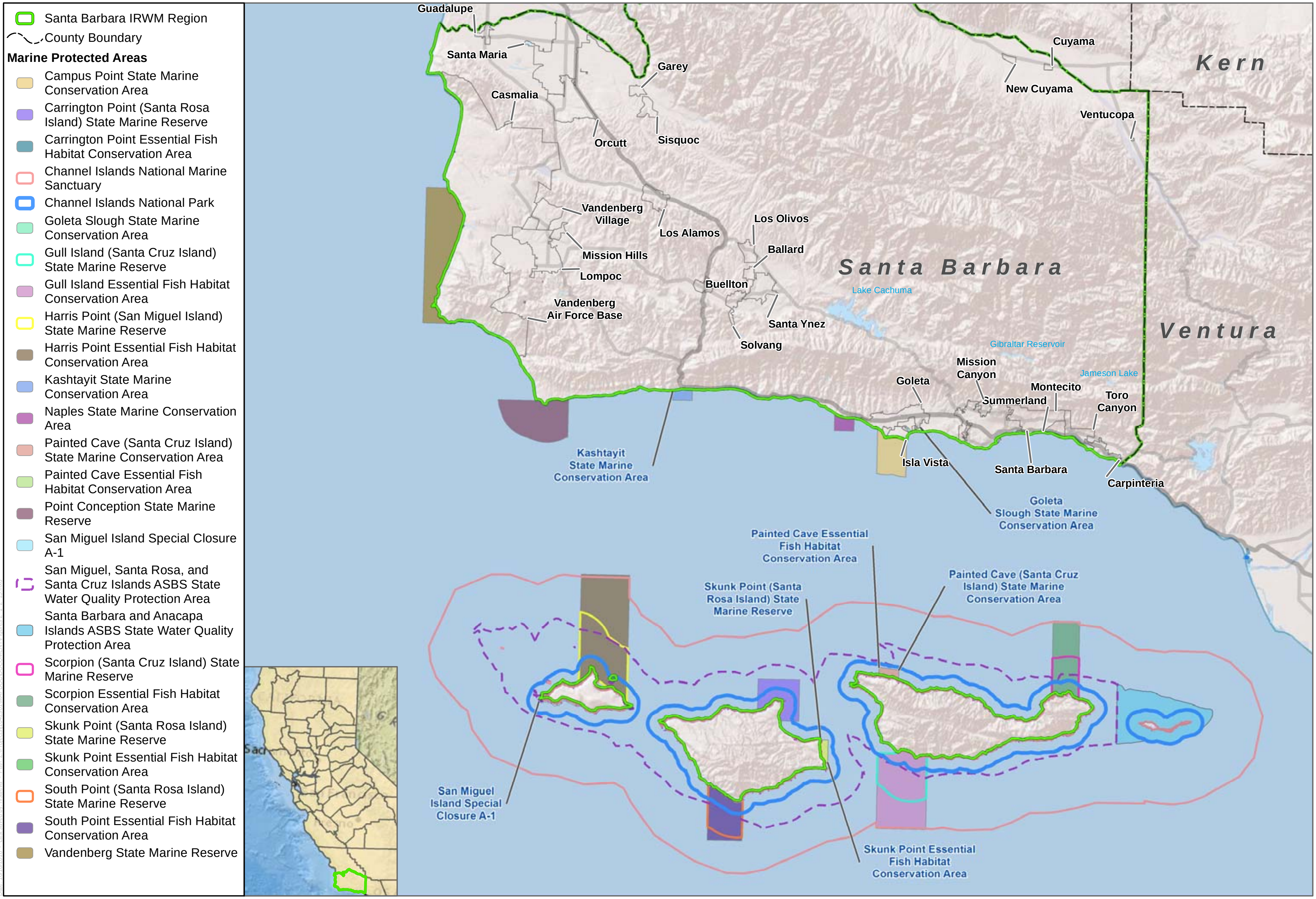

SOURCE: Shaded Relief; NOAA 2012

DUDEK

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FIGURE 2.16

Marine Protected Areas

Santa Barbara County IRWM Plan Update

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2.6 Regional Water Management History

The area that now encompasses Santa Barbara County has a long water development history, dating back to the founding of the Santa Barbara, La Purisima, and Santa Inés Missions between 1786 and 1804. Extensive water supply systems, including aqueducts, cisterns, and gravity-fed fountains, were developed to serve the earliest non-native settlements. As the area's population increased, water supplies and treatment and delivery systems were expanded to meet the growing needs in a manner that was influenced by the area's limited water supply (County of Santa Barbara 2013).

This section focuses on development of the major regional water infrastructure, which led to the agreements and management practices that are in place today, as well as the importation of water from the SWP.

2.6.1 Water Supply Development – South Coast, Santa Ynez Valley, and Lompoc Valley

The Santa Barbara Mission was founded in 1786 and supported surrounding ranching and fruit-growing efforts. When water supplies became limited due to higher concentrations of people in more populated areas, plans were made to construct the South Coast's first large dam and reservoir, which was completed in 1807. After incorporation as a city in 1850, the population of Santa Barbara expanded, and the city continued to experience the pressures of limited water supplies. A report written in 1889 by the City Engineer concluded that the only feasible long-term source of water for Santa Barbara would have to come from the Santa Ynez River. He recommended land purchases for two possible dam and reservoir sites on the Santa Ynez River, but the city's initial bond proposal was defeated. Droughts in 1894 and from 1898 through 1900 re-emphasized the report's conclusions. Although the Cold Spring Tunnel (constructed in 1896) initially provided essentially a horizontal well producing approximately 290 AFY of water, its yield steadily decreased to approximately 100 AFY, and attention again turned to potential dam and reservoir sites on the Santa Ynez River (County of Santa Barbara 2013).

Mission Tunnel

A 1905 report by USGS recommended construction of a tunnel (the Mission Tunnel) from the Santa Ynez River to the coast side of the mountains, in conjunction with building a dam and reservoir at the Gibraltar site on the river (SBCWA 2000). The main obstacle to this plan was that the tunnel would have to pass through lands held by the Santa Barbara Water Company, a private firm that owned extensive tracts of land encompassing all practicable reservoir sites on the headwaters of the Santa Ynez River. The City of Santa Barbara negotiated a contract with the Santa Barbara Water Company to allow construction of the tunnel in exchange for maintenance of flows in Mission Creek. The 3.7-mile-long Mission Tunnel was completed in 1912, the same year that the City of Santa Barbara purchased the holdings of the Santa Barbara Water Company. Mission Tunnel was designed to intercept groundwater flow and to later convey water from the Gibraltar Reservoir to the City of Santa Barbara. Infiltration into Mission Tunnel varies with rainfall, but averages approximately 1,100 AFY (County of Santa Barbara 2013).

Gibraltar Dam and Reservoir

The presence of major reservoirs in Santa Barbara County began in 1920 with completion of the Gibraltar Dam and Reservoir on the Santa Ynez River. By 1945, sedimentation had reduced storage in Gibraltar Reservoir from 14,000 acre-feet to approximately 7,800 acre-feet. In 1948, the dam was raised 23 feet, and storage capacity was restored to approximately the original volume. The current storage capacity of the reservoir has been reduced to approximately 5,000 acre-feet due to siltation, with an annual yield of 4,600 AFY (County of Santa Barbara 2013).

Juncal Dam, Jameson Lake, and Doulton Tunnel

The Montecito Water District completed construction of Juncal Dam and Jameson Lake in 1930. Water is diverted from the Santa Ynez River to the Montecito area through the Doulton Tunnel. Construction of the Doulton Tunnel began in 1924 and initially penetrated only the first mile of the Santa Ynez Mountains due to substantial groundwater inflow. The tunnel was finally completed in 1928 (County of Santa Barbara 2013).

Gin Chow Judgment and Upper Santa Ynez River Operations Agreement

The storage and diversion of Santa Ynez River water by the City of Santa Barbara and Montecito Water District at Gibraltar and Juncal Dams was challenged in court by downstream interests in 1928. Gin Chow, a Lompoc farmer and local prophet, and more than 30 others filed suit against the City of Santa Barbara and Montecito Water District, claiming that they were unlawfully diverting water from the Santa Ynez River. In 1933, the California Supreme Court upheld the rights of the City of Santa Barbara and Montecito Water District, setting limits on their ability to store and divert water, and decreeing that the City of Santa Barbara must release up to 616 AFY from Gibraltar Reservoir for downstream water rights (County of Santa Barbara 2013).

In the 1980s, when the City of Santa Barbara initiated a seismic retrofit project at Gibraltar Dam, concern by downstream interests that this could lead to a second enlargement of the dam led to the Upper Santa Ynez River Operations Agreement. This agreement provides for diversions of water to the City of Santa Barbara (including a pass-through provision to protect against loss of capacity) and for downstream releases consistent with the Gin Chow judgment (County of Santa Barbara 2013).

Cachuma Project

The Cachuma Project had its beginnings in 1939 when a study referred to as the Hill Report was submitted to the County Board of Supervisors recommending further development of the Santa Ynez River. This resulted in the formation of the Santa Ynez River Water Conservation District by people who felt that the interests of the residents of the Santa Ynez River Watershed were not being adequately protected, as evidenced by the Gin Chow litigation. The Santa Ynez River Water Conservation District called for a more extensive study by an impartial government agency. The County contracted with USGS in 1940 to obtain basic data and with the U.S. Bureau of Reclamation in 1941 to prepare a County-wide water resources development plan. The Cachuma Project, among others, was recommended by the U.S. Bureau of Reclamation in 1944 (County of Santa Barbara 2013).

The Santa Barbara County Water Agency was formed in 1945 to act as a go-between, contracting with the federal government and local water purveyors (known as the Cachuma Member Units). The Cachuma Member Units were to be the City of Santa Barbara, Montecito, Carpinteria, Goleta, and Summerland County Water Districts, and the Santa Ynez River Water Conservation District. The Cachuma Project was approved by these entities in 1947 and by the Secretary of the Interior in 1948. Contract negotiations resulted in a master contract, and Cachuma Member Unit contracts were approved by all parties except for the Santa Ynez River Water Conservation District, which withheld approval pending the negotiation of a separate agreement with the U.S. Bureau of Reclamation to protect downstream water rights. The so-called “Live Stream Agreement” was subsequently agreed to, allowing elections to occur in 1949. The elections were successful and federal funding was ultimately forthcoming. Cachuma Project facilities were completed by 1956 (County of Santa Barbara 2013).

The Cachuma Project consists of the Bradbury Dam, which impounds Lake Cachuma; the Tecolote Tunnel, which diverts 90% of the Cachuma Project’s yield to the South Coast; and the South Coast Conduit conveyance facilities, which consists of a pipeline and four regulating reservoirs to transport water from Goleta to Carpinteria along the South Coast. In 1957, the Cachuma Operation and Maintenance Board, then consisting of the South Coast Member Units and the Santa Ynez River Water Conservation District, was formed to operate and maintain Tecolote Tunnel and the South Coast Conduit system. Today, the South Coast Member Units consist of the City of Santa Barbara and the Goleta, Montecito, and Carpinteria Valley Water Districts. These entities serve urban and agricultural users, and in 1973, they formed the Cachuma Conservation Release Board to represent their Cachuma Project water rights interests (County of Santa Barbara 2013).

In 1963, the Santa Ynez River Water Conservation District formed Improvement District No. 1 to serve 10% of the Cachuma Project yield to urban and agricultural users in the more urbanized areas of the Santa Ynez Valley. In 1968, a separate Improvement District No. 1 Board of Trustees was established, and in 1993, the Santa Ynez River Water Conservation District assigned its interests in the Cachuma Project to Improvement District No. 1. Today, Improvement District No. 1 and the four South Coast entities compose the Cachuma Member Units (County of Santa Barbara 2013).

Under federal law, the U.S. Bureau of Reclamation is required to comply with state water rights law. Accordingly, in 1946, the U.S. Bureau of Reclamation filed an application with the State Water Rights Board (the precursor to the SWRCB) to appropriate Santa Ynez River water. Hearings did not occur until 1957, a year after the Cachuma Project was in operation. After a contested hearing in 1958, the State Water Rights Board issued the Cachuma Permits subject to the rights of downstream water users. The State Water Rights Board retained continuing jurisdiction for 15 years to ensure that the prescribed releases were adequate (County of Santa Barbara 2013).

After prolonged and sometimes contentious negotiations between the South Coast Member Units (now represented by the Cachuma Conservation Release Board) and the Santa Ynez River Water Conservation District, the latter and the U.S. Bureau of Reclamation reached agreement on a stipulated modification of the 1958 permit conditions, with the concurrence of the Cachuma Conservation Release Board. These modifications resulted in establishing the Above and Below Narrows Accounts, and the credit water in these accounts is stored in Cachuma Reservoir. The credit water is released for the benefit of downstream water users for the area above the Lompoc Narrows and the Lompoc Plain. The SWRCB adopted these concepts in Order WR 73-37 in 1973. It again retained jurisdiction for 15 years (County of Santa Barbara 2013).

Prior to 1989, negotiations between the parties led to agreement on stipulated modifications to WR 73-37. Experience indicated that adjustments were needed because the Lompoc Valley was not receiving the recharge water to which it was entitled. These modifications were adopted by the SWRCB in WR 89-18 in 1989. The SWRCB extended its jurisdiction for another 5 years (1994), which was subsequently extended to 2000 (County of Santa Barbara 2013).

An SWRCB hearing in 2000 was adjourned and reconvened in 2003. In 2002, the Santa Ynez River Water Conservation District and other downstream interests settled many long outstanding issues with the South Coast interests in the Cachuma Project Settlement Agreement. Although operative for the most part, portions of that agreement, which are under the jurisdiction of the SWRCB, are pending a decision of the Board (County of Santa Barbara 2013).

Lower Santa Ynez River Fish Management Plan and the Cachuma Project Biological Opinion

During the Cachuma Project authorization process before Congress in the 1940s, the U.S. Fish and Wildlife Service and others suggested that instream flow should be considered for fish and wildlife needs; however, the Division of Water Resources recommended to the Secretary of the Interior that no water from Lake Cachuma be dedicated to the protection of fish because of the limited water supply available to provide for present and future needs of people. The U.S. Congress relied on this recommendation in its funding appropriation; the U.S. Bureau of Reclamation and the Member Units relied on it in the construction of the Cachuma Project; and the SWRCB relied on it to issue the Cachuma Project water rights permits. The permits eventually were challenged by fisheries interests, and in 1990, the SWRCB held hearings on fisheries and other issues relating to the Santa Ynez River system (County of Santa Barbara 2013).

As a result of the 1990 hearings, beginning in 1993, the U.S. Bureau of Reclamation and the Member Units formed a working group seeking consensus on fisheries issues and began to make water releases from Lake Cachuma to maintain fish habitat and to carry out various studies downstream of Bradbury Dam. The releases were made mandatory by the SWRCB in 1994. In 1997, Southern California steelhead was listed as an endangered species, triggering a Section 7 consultation with the NMFS. Additional studies led to the development of the Cachuma Project Biological Opinion issued by the NMFS and the Lower Santa Ynez River Fish Management Plan issued by the Santa Ynez River Technical Advisory Committee in 2000 to comply with SWRCB Order WR 94-5. These two documents mandate essentially the same operations, which include enhanced habitat flows, passage flows, and various other actions to benefit the steelhead fishery. NMFS reinitiated consultation on the Cachuma Project in 2009, and the U.S. Bureau of Reclamation developed a Draft Biological Assessment. The Draft Biological Assessment includes a detailed analysis of the current Cachuma Project operations and steelhead protection measures, as well as a set of extensive biologic and hydrologic studies. Once complete, the U.S. Bureau of Reclamation submitted the Draft Biological Assessment to NMFS for comment. Following formal comments from NMFS, the U.S. Bureau of Reclamation incorporated those comments, finalized the Biological Assessment, and resubmitted it to NMFS. This began the formal consultation process between the U.S. Bureau of Reclamation and NMFS. The Final Biological Assessment would inform development of the NMFS Draft Biological Opinion, expected approximately 90 days after submittal of the Final Biological Assessment (County of Santa Barbara 2013).

Cachuma Project Settlement Agreement

The 2002 Cachuma Project Settlement Agreement resolves various differences between the South Coast Member Units and downstream interests that existed for more than 50 years pertaining to operation of the Cachuma Project. It provides the vehicle to manage Cachuma releases conjunctively downstream of the dam. The background and provisions of the Cachuma Project Settlement Agreement are summarized below.

The parties support WR 89-18 and agree that releases pursuant to WR 89-18, as modified by the Cachuma Project Settlement Agreement, will protect downstream water rights holders and will improve the quality of water released for downstream uses. The parties agree to mutually support the NMFS Biological Opinion and the Fish Management Plan for the Cachuma Project to address public trust (steelhead) issues. The parties further agree that WR 89-18 releases will operate conjunctively with fish water releases required to meet target flows in the Biological Opinion (County of Santa Barbara 2013).

- As provided in the MOU that establishes the governance structure, in the outlet works of Bradbury Dam, maximize deliveries of SWP water (consistent with the Biological Opinion) when water rights releases are made.
- Santa Ynez River flooding issues are addressed in the Cachuma Project Settlement Agreement through winter storm operations of Bradbury Dam, including precautionary drawdowns and temporary surcharging, to reduce peak flows and provide some measure of flood control. Project water supply is protected by achieving a full reservoir following peak flow events.
- The parties have requested the SWRCB to incorporate into WR 89-18 a provision involving the exchange of the Below Narrows Account (water stored in Lake Cachuma) with the Lompoc Groundwater Basin. More water would be available for the Lompoc (Below Narrows) area in most years, although some Below Narrows Account water stored in Cachuma Reservoir would be made available to Cachuma contractors during shortage years.

Most of the provisions of the Cachuma Project Settlement Agreement were implemented in 2002. Some others are pending before the SWRCB. Approval of the remaining provisions and full implementation of the Cachuma Project Settlement Agreement would provide the basis for further water management planning by individual water purveyors downstream of the dams in accordance with the objectives, water management strategies, and regional priorities in the IRWM Plan.

Wright Suit Settlement

The 1989 Wright Suit Settlement served to adjudicate the water resources of Goleta North/Central Basin and assigned quantities of the basin’s safe yield to various parties, including the Goleta Water District and the La Cumbre Mutual Water Company. The judgment also ordered the Goleta Water District to bring the North/Central Basin into a state of hydrologic balance by 1998. The Goleta Water District has achieved compliance with this order through importation of SWP water and development of other supplemental supplies. These supplemental supplies have offset the court-mandated reduction in pumpage from the basin (County of Santa Barbara 2013). Given that the Goleta North/Central Basin has been adjudicated and pumpage is controlled by the court, overdraft is not foreseeable in the basin.

2.6.2 Water Supply Development – Santa Maria Valley

Santa Maria Project

Prior to the construction of Twitchell Reservoir, large portions of the Santa Maria Valley were subject to periodic flooding. In an effort to provide relief from flooding disasters, the U.S. Bureau of Reclamation constructed the Twitchell Dam as part of the Santa Maria Project in cooperation with USACE. The Santa Maria Project provides flood protection and recharge to the groundwater basin underlying the Santa Maria Valley. Twitchell Reservoir is operated and maintained by the Santa Maria Valley Water Conservation District, which provides water conservation, groundwater basin recharge, and flood control services. Twitchell Reservoir supplies an average of 32,000 AFY of recharge to the Santa Maria Groundwater Basin (County of Santa Barbara 2013).

The Twitchell Management Authority, formed to implement the requirements of the Settlement Agreement (Stipulation) (see "Santa Maria Groundwater Adjudication" subsection, below), is a committee that administers provisions of the Stipulation and contributes funds intended to enhance and monitor water conservation efforts of the Twitchell Reservoir and Dam. The Twitchell Management Authority published the Twitchell Project Manual in 2012, which is an integrated operations and procedures manual for Twitchell Reservoir and Dam with recommendations for capital and maintenance projects to maximize recharge of the Santa Maria Management Area (Twitchell Management Authority 2012, as cited in County of Santa Barbara 2013).

Santa Maria Groundwater Adjudication

In 1997, the Santa Maria Valley Water Conservation District filed a lawsuit challenging, among other things, the rights of Santa Maria, Guadalupe, and Golden State Water Company to import SWP water and to use its return flows (Santa Maria Valley Water Conservation District vs. City of Santa Maria, et al., commonly known as the "Santa Maria Groundwater Adjudication"). Various parties filed cross-complaints, expanding the legal issues to include an adjudication of groundwater rights, among other things. Over the next couple of years the scope of the litigation expanded to include nearly all groundwater users within the Santa Maria Valley Groundwater Basin.

In summer 2005, after three phases of trial, the majority of the parties to the lawsuit, including the original plaintiff, the Santa Maria Valley Water Conservation District, negotiated a Settlement Agreement (Stipulation) that set forth terms and conditions for a physical solution concerning the overall management of Santa Maria Valley Groundwater Basin's water resources, including rights to use groundwater, SWP water and associated return flows, and the developed groundwater yield resulting from operation of Twitchell and Lopez Reservoirs (located in San Luis Obispo County), and the ongoing monitoring and management of these resources, consistent with common law water rights priorities and Article X, Section 2 of the California Constitution.

The Stipulation also subdivides the Santa Maria Valley Groundwater Basin into three Management Areas: the Northern Cities Management Area, Nipomo Mesa Management Area, and Santa Maria Valley Management Area. The Santa Maria Valley Management Area is within the planning area for the Santa Barbara IRWM Plan. The delineation of these areas was based on historical development and use of Santa Maria Valley Groundwater Basin water resources, as further delineated in the Stipulation and the court record. As noted above, the Stipulation provides the City of Santa Maria certain rights to water in the Santa Maria Valley Groundwater Basin. These rights include a recognition of the City of Santa Maria's highest historical use of groundwater from the Santa Maria Valley Groundwater Basin, the right to recapture a preset portion of the return flows from the City of Santa Maria's use of SWP water in the Santa Maria Valley Groundwater Basin, and a 14,300 AFY share of the developed groundwater yield resulting from Twitchell Reservoir operations. In addition, the City of Santa Maria may access additional supplies through the transfer of Twitchell Reservoir yield. Also, return flows from SWP water are assignable in whole or part, subject to accounting. The Stipulation also establishes certain preset water shortage response measures in anticipation of reduced availability of groundwater.

Although the court has approved the Stipulation as between those who have signed it, not all parties to the adjudication have agreed to it. The trial proceeded in 2006 and 2007 between the public water suppliers, including the City of Santa Maria, and a small number of landowners who opposed the Stipulation. In January 2008, the court entered a Final Judgment incorporating the Stipulation as binding on the signatories to that agreement. The court also imposed a physical solution that requires all parties, including the non-stipulating parties, to comply with the monitoring provisions in the Stipulation. The court also included as part of the Final Judgment an award of prescriptive rights by the City of Santa Maria and Golden State Water Company as against the non-stipulating landowners. In addition, the court reaffirmed the City of Santa Maria's right to use its return flows as provided in the Stipulation. The Final Judgment provides that the court retains jurisdiction to enforce the judgment and to implement the physical solution as necessary.

On November 21, 2012, the Court of Appeals issued a published decision affirming the trial court's decision in nearly all respects, including the management and allocation of Twitchell Reservoir yield as provided in the Stipulation, the award of prescriptive rights to the City of Santa Maria and Golden State Water Company, and the imposition of the physical solution.

The Santa Maria Groundwater Adjudication has established the manner by which the Twitchell Reservoir and Santa Maria Valley Groundwater Basin are managed; any projects included in the

IRWM Plan that could affect the Santa Maria Valley Groundwater Basin or Twitchell Reservoir will be consistent with the terms of the adjudication.

2.6.3 State Water Project

The increasing population in the City of Santa Maria and the County's South Coast area and problems associated with rapid siltation of reservoirs, which led to diminished storage capacities, required development of additional water supplies, including SWP water. In 1963, the Santa Barbara County Flood Control and Water Conservation District contracted with DWR to deliver SWP water to Santa Barbara County. At that time, the County began payments to DWR to retain a share of the SWP yield (Table A amount)[3] for 57,700 AFY, but funds were not allocated to construct the necessary local facilities to deliver water within the County. In 1981, the original contract was amended to reduce the County's SWP Table A amount to 45,486 AFY. In 1994, this amount was further modified by the project participants of the CCWA to include 39,078 AFY of the Table A amount, 3,908 AFY of drought buffer, and 2,500 AFY of a special drought buffer for00 the Goleta Water District (County of Santa Barbara 2013).

In 1991, after 4 years of extremely dry conditions, voters in several service areas in Santa Barbara County voted to authorize the bonds needed to construct the facilities to import SWP water. This included the cities and unincorporated communities of Carpinteria, Summerland, Montecito, Santa Barbara, Hope Ranch, Goleta, Buellton, Solvang, Santa Ynez, Orcutt, and Guadalupe. The Santa Maria City Council and VAFB also decided to participate in the SWP. The communities of Lompoc, Vandenberg Village, and Mission Hills voted not to participate in the SWP. Beginning in 1997, the CCWA began to deliver SWP water to Lake Cachuma, where it is mixed with Cachuma Project water and delivered through the Tecolote Tunnel to contractors on the South Coast. South Coast Member Units also receive Cachuma Project water that was exchanged for SWP water with Santa Ynez River Water Conservation District Improvement, District No. 1. The Santa Ynez Pipeline, which delivered water to Improvement District No. 1 from Lake Cachuma, was owned by Improvement District No 1 until 1996, when it was sold to the CCWA in anticipation of SWP deliveries (County of Santa Barbara 2013).

[3] "Table A" is a term used in SWP Water Supply Contracts. The "Table A amount" is the annual maximum amount of water to which an SWP contractor has a contract right to request delivery, and is specified in Table A of each contractor's Water Supply Contract. (Prior to the Settlement Agreement arising out of a legal challenge to the Monterey Amendment to the State Water Project contracts, the Table A amount was referred to as "entitlement.") The amount of water actually available for delivery in any year may be an amount less than the contractor's Table A amount due to a number of factors, including hydrologic conditions.

2.6.4 Wastewater Management

Efforts to manage wastewater within the County have been underway for more than a century. This section describes the history of the larger wastewater providers to give an overview of how systems have evolved over time in responding to population growth and regulatory requirements.

South Coast

City of Santa Barbara

The City of Santa Barbara's first sewers were installed in the 1870s. In 1925, the City constructed a "screening plant" and ocean discharge outfall. The City's growing population and increasing environmental awareness led to construction of the El Estero WWTP in 1952. However, a majority of its current infrastructure was constructed in 1978 to comply with the 1972 Federal Water Pollution Control Act (County of Santa Barbara 2013).

In 1989, a recycled water facility was constructed at the El Estero WWTP to provide treatment and delivery of up to 1,400 AFY of reclaimed water. The recycled water facility was replaced in 2015 (County of Santa Barbara 2013).

The City continues to construct capital improvements to El Estero WWTP each year. Investment in the treatment plant ensures that it remains able to meet increasingly stringent wastewater discharge regulations. Presently, El Estero is an 8 mgd Secondary Treatment Facility, equipped with a 4.3 mgd Tertiary Treatment for recycled water (City of Santa Barbara 2018a).

Carpinteria Sanitary District

The Carpinteria Sanitary District was formed in 1928. During the 1930s and 1940s, wastewater was collected and discharged to the ocean without treatment. It was during this period that the bulk of the sewer system serving the downtown area was constructed. The Carpinteria Sanitary District's first WWTP, designed to treat 500,000 gpd, was completed and put into operation in 1951. Treated effluent was discharged directly into the Pacific Ocean via an 18-inch-diameter outfall pipe that ran along the eastern bank of Carpinteria Creek. As the community grew, so did the sewer collection system and the treatment plant. In 1961, the treatment plant was expanded and upgraded to a capacity of 2 mgd, which included a new, longer outfall pipe; primary clarification; trickling filters; final clarification; and anaerobic sludge digestion. This facility served the community for more than 30 years. In 1993, the Carpinteria Sanitary District completed another major upgrade to its WWTP that involved replacement of the majority of the process infrastructure. The current treatment plant includes preliminary screening and grit removal, primary clarification, extended aeration biological treatment, final clarification, chemical disinfection, aerobic digestion, and odor control systems. The Carpinteria Sanitary District has expanded its service areas to include the Rincon and Sandyland Cove areas through a Clean Beaches septic to sewer project (County of Santa Barbara 2013).

Goleta Sanitary District

The Goleta Sanitary District was formed in 1942 to serve the rural agricultural area of Goleta. Only 1,500 people lived within the Goleta Sanitary District at the time. In those years, sewage waste was disposed of through individual cesspools and septic tanks. With the end of World War II, the fledgling Goleta Sanitary District applied to the Navy Department to connect its sewer lines to the Marine Air Base, located on the site of today's Municipal Airport. Plans were drawn to build a sewer system and treatment plant, and the Goleta Sanitary District owns and operates the treatment facility and serves, under contract, four public agencies: Goleta West Sanitary District, City of Santa Barbara Municipal Airport, UCSB, and certain facilities of Santa Barbara County (Goleta Sanitary District 2018).

In 1988, Goleta Sanitary District enlarged and improved its treatment system to meet the discharge requirements of a 301(h) NPDES permit, whereby primary and secondary effluent is blended, disinfected, and discharged into the Pacific Ocean. The Goleta Sanitary District received a new NPDES permit in September 2010, and uses what is called a blended secondary treatment process. In 2010, the Goleta Sanitary District received funding from DWR through Proposition 84 Round 1, which, along with other funding, has enabled the Goleta Sanitary District to upgrade wastewater treatment facilities to full secondary treatment, pursuant to an RWQCB settlement agreement. The upgrade to full secondary effluent treatment was completed before 2014 (Goleta Sanitary District 2018).

In 1991, in cooperation with the Goleta Water District, a water reclamation facility was constructed to produce up to 1,500 AFY of reclaimed water. The Goleta Sanitary District produces 785 AFY of reclaimed water that is distributed throughout the community and used primarily for landscape irrigation (Goleta Sanitary District 2018).

Goleta West Sanitary District

The Goleta West Sanitary District was formed as the Isla Vista Sanitary District in 1954 to serve the needs of the growing area of Isla Vista. The organization established a five-member Board of Directors and hired a general manager. The district changed its name to Goleta West Sanitary District in January 1990 to reflect the area-wide aspects of the district's service area. In the late 1950s, more than 5 miles of sewer lines were installed in the Isla Vista area using assessment bonds. The balance of the system—force main, pump station, and trunk sewers—was financed by issuing general obligation bonds. The Goleta West Sanitary District collects but does not treat sewage. Through a joint use agreement, the Goleta West Sanitary District connected to the Goleta Sanitary District treatment plant for treatment and disposal. The Goleta West Sanitary District owned only 5% of the plant's capacity in the 1950s, but has expanded its ownership to more than 40% to meet Goleta West Sanitary District needs (County of Santa Barbara 2013).

North County

City of Santa Maria

The City of Santa Maria has treated and disposed of wastewater at the present site off Black Road since 1910. The original facilities were expanded in several phases beginning in the mid-1930s through 1962. The 1962 expansion resulted in a capacity to handle 6.5 mgd of wastewater. During peak months of 1975, flows to the treatment plant reached its capacity of 6.5 mgd. An expansion to treat present and future flow was needed. Also, much of the original plant was 40 years old and had reached its useful life. The City of Santa Maria completed a study in 1977 evaluating alternative means of increasing wastewater treatment and disposal capacity. The recommended plan consisted of expanding the existing plant with similar types of processes and equipment. Many of the existing structures were rehabilitated and incorporated into the treatment scheme to reduce construction costs. The treated effluent was applied to percolation ponds and irrigated pasture; this land application achieves additional treatment at a low cost. Construction of the recommended expansion began early in 1980 and was completed by mid-1982. The 1981 expansion increased capacity to 7.8 mgd and converted the land used for effluent land application by spray irrigation into eight percolation ponds so that all effluent is disposed into on-site percolation ponds. In 1996, another expansion increased the capacity to 9.5 mgd and expanded the percolation ponds. In 2008, the City of Santa Maria received a Proposition 50 grant from DWR to help fund expansion of the City of Santa Maria Wastewater Treatment Plan from 9.5 mgd to 13.5 mgd (County of Santa Barbara 2013).

Laguna County Sanitation District

Laguna County Sanitation District was formed by the Santa Barbara County Board of Supervisors on December 29, 1958, pursuant to the provision of the County Sanitation District Act (Health & Safety Code Section 5700 et seq.). At that time, Lompoc and Santa Maria were experiencing tremendous growth as a result of activities at Camp Cook (renamed Vandenberg Air Force Base in 1958). Housing development occurred in the areas south of the Santa Maria Public Airport District. Septic systems were proposed initially, but the soil was found to be incompatible. The original plant had a capacity of 1.6 mgd. Effluent was recycled for use in growing sugar beets that were processed at the Union Sugar (later Holly Sugar) processing plant constructed in 1898. The Laguna County Sanitation District absorbed the Orcutt Sanitary District in 1961, as well as two

County collection system districts in 1975. The WWTP capacity was increased to 2.4 mgd in 1975, to 3.2 mgd in 1987, and to 3.7 mgd in 2003. The most recent upgrade modified the plant to Class IV due to full tertiary treatment using ultrafiltration membranes and reverse osmosis for the portion of flow containing high salt levels from water softener discharge. Brine from the reverse osmosis system is disposed of in Class 1 non-hazardous disposal-wells (modified former oil production wells). The plant operates under Waste Discharge Requirements and a Master Reclamation Permit issued by the RWQCB. In 2008, the Laguna County Sanitation District received a Proposition 50 grant from DWR to convert a recycled water holding pond to a closed tank with increased capacity to provide more surge storage, require less maintenance, ensure water quality, and allow for reduction in the use of chlorine (County of Santa Barbara 2013).

Santa Ynez Community Services District

The Santa Ynez CSD provides wastewater collection for urban uses in the Santa Ynez Township and was formed in 1971. The Santa Ynez CSD owns 0.29 mgd capacity in the City of Solvang's 1.5 mgd WWTP, and the main trunk line carries an average of 175,000 gpd to Solvang's treatment plant (Santa Ynez CSD 2018).

The Santa Ynez Band of Chumash Indians have a contract for 88,000 gpd of the Santa Ynez CSD's capacity, and constructed a WWTP with a capacity of 200,000 gpd that was brought online in May 2004. This plant serves the Chumash casino, hotel, administration buildings, and approximately 350 residents on the reservation. Treatment includes head works, extended aeration, filtration, and ultraviolet disinfection prior to discharge to Zanja de Cota Creek. The discharge meets California Title 22, tertiary 2.2 standards. Some of this tertiary water is being used in irrigation throughout the reservation and for water to flush toilets. The Santa Ynez CSD is under contract to maintain the Chumash Wastewater Plant and Collection System (Santa Ynez CSD 2018).

Los Alamos Community Services District

The Los Alamos CSD was formed on October 29, 1956. Phase I of the Los Alamos Wastewater Collection and Treatment Plant was built in 1988, and Phase II was completed in 1994, increasing the capacity of the treatment facilities to allow a maximum discharge of 176,000 gpd, averaged over each month. In 2005, the Central Coast RWQCB established new waste discharge requirements for the Phase III expansion, allowing the Los Alamos CSD to discharge a maximum of 225,000 gpd, averaged over each month, and to allow for buildout of the town of Los Alamos as defined in the Community Plan. Phase III was completed in 2006 (County of Santa Barbara 2013).

City of Lompoc

The City of Lompoc owns the Lompoc Regional Wastewater Reclamation Plant. The Lompoc Regional Wastewater Reclamation Plant treats wastewater from the City of Lompoc, Vandenberg Village CSD, and VAFB. Upgrade of the Lompoc Regional Wastewater Reclamation Plant was completed in November 2009. The average dry-weather flow design capacity of the upgraded facility is 5.5 mgd, with a peak dry-weather flow of 9.5 mgd. The peak wet-weather capacity is 15 mgd. The upgraded Lompoc Regional Wastewater Reclamation Plant achieves biological nutrient (nitrogen) removal by using oxidation ditches with denitrification and nitrification treatment. The flow enters secondary clarifiers before being transferred to flow equalization basins. Equalized flow is pumped through cloth media filters to prepare it for disinfection by ultraviolet radiation. Maximum flow through the disinfection units is 5.5 mgd. A portion of the final effluent is used for plant processes, including landscape irrigation for areas inside the facility. This occurs before the remainder of the plant flow is discharged to its surface receiving water, the Santa Ynez River, via San Miguelito Creek (City of Lompoc 2015 Urban Water Management Plan).

Mission Hills Community Services District

Mission Hills CSD was formed in 1979 and provides water and wastewater services through 1,200 service connections to the community of Mission Hills. Mission Hills CSD operates a primary WWTP. Discharge from the plant is disposed of through percolation (County of Santa Barbara 2013).

Vandenberg Village Community Services District

Vandenberg Village CSD was established in 1983 and provides water and wastewater services through 2,400 service connections to the community of Vandenberg Village. Vandenberg Village CSD acquired wastewater infrastructure and a 17.8% capacity right in the Lompoc Regional Wastewater Reclamation Plant from Park Water Company. Vandenberg Village CSD received a Proposition 50 IRWM grant in 2008 that contributed to the upgrade of the Lompoc Regional Wastewater Reclamation Plant. The upgrade reduced nitrates, improved overall water quality, and protected flows into the Santa Ynez River (County of Santa Barbara 2013).

2.7 Water Supplies and Demand

2.7.1 Water Supply

Water supplies include groundwater, surface water, imported SWP water, desalinated water, and recycled water; water supplies also are enhanced by the conjunctive use of surface water and groundwater supplies and cloud seeding. The current average annual water supplies for Santa Barbara County total approximately 223,000 AFY, plus approximately 90,000 AFY in return flows to useable groundwater basins. The Long Term Supplemental Water Supply Alternatives Report written in 2015 (County of Santa Barbara 2015a) provided the most recent research overview of the County's water resources pre-drought. However, this has fluctuated throughout the past 3 to 4 years. The most recent information related to the County's water resources is summarized below.

Groundwater

Santa Barbara County and indeed, the entire central coast hydrological region (unit) is the most hydrologically independent region of the state (https://cawaterlibrary.net/hydrological-region/central-coast). Within the Santa Barbara County IRWM region, groundwater has historically accounted for the highest proportion of water use supplying approximately 75% of domestic, commercial, industrial, and agricultural water. The regional groundwater basins are described in Section 2.4.3, Groundwater Basins. In 2017, however, IRWM region wide, groundwater accounted for 34% of total water resources use, exclusive of agriculture (http://www.waterwisesb.org/where.wwsb). Use of groundwater varies by jurisdiction within the region.

In the south County, water purveyors use groundwater as a secondary source of potable water. However, the north County is largely supported by groundwater and/or shallow, riparian basin water, both of which are recharged by surface flows; precipitation; and, in the case of groundwater, percolation of treated wastewater (http://www.waterwisesb.org/where.wwsb). The areas of the IRWM region that are wholly groundwater dependent include the Cuyama Valley, the Community of Los Alamos, the community of Mission Hills, the community of Vandenberg Village and the City of Lompoc (http://www.waterwisesb.org/where.wwsb).

Surface Water

Surface water refers to water resources that flow or are stored in surface channels (streams and rivers or lakes and reservoirs). Surface water reservoirs are an important part of the regional water supply and presently account for approximately 15% of all water resources Region-wide. For this Region, the surface water found in streams and reservoirs is often a vital component to water supplies for domestic use. Development of reservoirs can reduce the threat of flooding and store stream runoff until it is needed, allowing society to use water from winter rains to meet our needs during the dry summer and fall months when streams cannot meet demand. Locally, the Jameson, Gibraltar, and Cachuma Reservoirs on the Santa Ynez River help meet the needs of communities on the South Coast and help supplement groundwater supplies in the Santa Ynez River downstream. Twitchell Reservoir on the Cuyama River helps reduce threats from floods and replenishes groundwater important to agriculture in the Santa Maria Valley (SBCWA 2017a).

Lake Cachuma is the County's largest reservoir. It was created by the construction of Bradbury Dam in 1953 and stores floodwaters of the Santa Ynez River. Water is diverted from Lake Cachuma through the Tecolote Tunnel, which extends approximately 6.4 miles through the Santa Ynez Mountains. Cachuma is a U.S. Bureau of Reclamation-funded project and is managed by the U.S. Bureau of Reclamation and the Cachuma Operation and Maintenance Board. Lake Cachuma's water resources are shared by the Cachuma Operation and Maintenance Board member units (SBCWA 2017a). During the most recent drought, Lake Cachuma was down to approximately 6% of its overall water holding capacity and although it has recovered, it is now only approximately 32% full. Moreover, over the past 11 years and through five large fires, the watershed areas surrounding Lake Cachuma have been denuded of extensive amounts of vegetation, which will result in abundant amounts of sediment and debris during stormflows, much of which will end up in Lake Cachuma. The resultant debris flows have introduced large amounts of organic material into surface waters, and possible impacts could include increased nutrient loading, dissolved organic carbon, major ions, firefighting compounds, turbidity, and general treatability challenges in the Region's largest drinking water source.

Imported Water (State Water Project)

Table 2.5 shows the amount of water to which each Santa Barbara County participant in the SWP has a contractual right, referred to as Table A amounts. Actual deliveries may be less than shown due to supply limitations and request reductions. Historically, deliveries have ranged from 30% to 90% since the Region began importing SWP water. Table 2.5 also presents a drought buffer amount of 3,908 acre-feet. The drought buffer entitlement increases the reliability of each project participant's Table A amount. This can be stored for future use and/or requested in dry years when cutbacks are expected to SWP allocations. By storing this water or increasing the water request in dry years, even after a percentage cutback by DWR, the project participants can reduce shortages in their entitlement deliveries (County of Santa Barbara 2017). The Santa Barbara County (IRWM Region) Table A amounts per participant are included in Table 2.5 (CCWA 2016).

The primary factors affecting the amount of Table A amount deliveries are the availability of SWP supplies and the SWP contractors' demands for this water. Climatic conditions and other factors can significantly alter the availability of SWP water in any year. A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies, including SWP supplies. The amount of water DWR determines is available and allocates for delivery in a given year is based on that year's hydrologic conditions, the amount of water in storage in the SWP system, current regulatory and operational constraints, and SWP contractors' requests for SWP supplies. Even in years when additional Table A amount supplies are available, the amount of water DWR allocates is limited to SWP contractors' requests (County of Santa Barbara 2017b; CCWA 2016).

SWP water has helped reduce the use of groundwater in all major basins except the Cuyama Valley Groundwater Basin, which does not have a water purveyor that receives SWP water. SWP water also has improved water quality in areas that directly receive SWP water, and has increased the overall water supply in Santa Barbara County (County of Santa Barbara 2017b).

Table 2.5
State Water Project Table A Allocations in Santa Barbara County

State Water Project Participant	Drought Buffer (AFY)[a]	Table A Amount (AFY)
Carpinteria Valley Water District	200	2,000
City of Buellton	58	578
City of Guadalupe	55	550
City of Santa Barbara	300	3,000
City of Santa Maria	1,620	16,200
Golden State Water Company (Orcutt area)	50	500
Goleta Water District	450	4,500
La Cumbre Mutual Water Company	100	1,000
Montecito Water District	300	3,000
Morehart Land Company	20	200
Raytheon Systems Co.	5	50
Santa Ynez River Water Conservation District, Improvement District No. 1	200	500
City of Solvang	0	1,500
Vandenberg Air Force Base	550	5,550
Total	**3,908**	**39,078**
Goleta Water District Additional Drought Buffer[b]	2,500	

Sources: CCWA 2011 (page 3, Table 1-2), 2013; County of Santa Barbara 2013 (page 13, Table 3-2).
Notes:
[a] The drought buffer entitlement of 3,908 acre-feet increases the reliability of each State Water Project (SWP) participant's Table A amount. This can be stored for future use and/or requested in dry years when cutbacks are expected to SWP allocations. By storing this water and/or increasing the Central Coast Water Authority's water request in dry years, even after a percentage cutback by DWR, the SWP participants can reduce shortages in their entitlement deliveries.
[b] Goleta Water District has 2,500 AFY of drought buffer in addition to its Table A amount of 450 AFY that can be taken as capacity permits.

Water Conservation

Water conservation addresses the "demand side" of water management, and thereby constitutes an important part of stretching the County's water supplies. Through water conservation programs implemented at the regional and water purveyor level, additional water supplies become available for use within the County, reducing pressure on other water resources. Water conservation activities occur County-wide through its Regional Water Efficiency Program. Water purveyors in the program work cooperatively to implement conservation through residential, commercial, agricultural, and landscape programs (County of Santa Barbara 2013). Members of the Regional Water Efficiency Program are listed in Table 2.6.

Table 2.6
Regional Water Efficiency Program Members

Program Members
Carpinteria Valley Water District
City of Buellton
City of Guadalupe
City of Lompoc
City of Santa Barbara
City of Santa Maria
City of Solvang
Cuyama CSD
Golden State Water Company (Santa Maria/Orcutt)
Goleta Water District
La Cumbre Mutual Water Company
Los Alamos CSD
Mission Hills CSD
Montecito Water District
Santa Ynez River Water Conservation District, Improvement District No. 1
Vandenberg Village CSD

CSD = Community Services District.

Additionally, regional education and public information programs help change behavior to decrease water use. Regional programs have been in place since 1990 and are staffed and funded by a multiagency team of conservation staff from the Santa Barbara County Water Agency and local water purveyors. Water purveyors also implement individual programs of particular interest within their service areas. Water savings through conservation programs are calculated on an annual basis by those agencies that are members of the California Urban Water Conservation Council. Council signatories have committed to best management practices for water conservation by signing the California Urban Water Conservation Council MOU. However, calculating water savings is challenging, since savings may be due to implementing best management practices or numerous other factors such as weather, demographic changes, or changes in the plumbing code requiring water-efficient fixtures (County of Santa Barbara 2013).

Agricultural water quality and water use efficiency services are offered by the Cachuma Resource Conservation District (CRCD). The CRCD's Mobile Irrigation Lab has been active in the County for more than 20 years and has been made available to more than 1,500 growers and other land managers such as schools and parks to identify opportunities for water use efficiency and water quality improvements (SBCWA 2017b).

The County Regional Water Efficiency Program is co-funded by the Santa Barbara County Water Agency. The regional website for the County Regional Water Efficiency Program devotes a webpage to CRCD's Mobile Irrigation Lab (SBCWA 2017b). As funding permits, CRCD also produces educational materials for different farm and ranch systems, including outreach to Spanish-speaking land managers. CRCD has been able to obtain federal and state grants to assist with water quality solutions and provide owners of evaluated properties with rebates for water-wise irrigation equipment when installed in response to recommendations from the Mobile Irrigation Lab team. At the end of each fiscal year, CRCD submits an accomplishments report to the Santa Barbara County Water Agency, which shares the information with Regional Water Efficiency Program members (SBCWA 2017b).

Recycled Water and Advance Treatment

Recycled water must meet rigorous water quality standards before it can be reused. Various treatment technologies are approved for treatment of recycled water under Title 22 of the California Code of Regulations, but generally they are all referred to as tertiary treatment. The level of treatment required depends on the type of reuse. In addition, other constituents, such as total dissolved solids (TDS), in the treated wastewater sometimes limit the use or require additional treatment for landscape irrigation and groundwater recharge with recycled water (County of Santa Barbara 2018a.

Currently, three agencies in the County treat all of their effluent to full tertiary levels. These agencies are the Laguna County Sanitation District, the City of Lompoc, and the Summerland Sanitary District. The Laguna County Sanitation District produces approximately 2,242 AFY, which is used for agricultural, landscaping, and industrial purposes, with recycling as its only discharge mechanism. Reverse osmosis is used to reduce TDS to improve water quality (County of Santa Barbara 2018b). The Summerland Sanitary District treats approximately 168 AFY, which is discharged to the Pacific Ocean (County of Santa Barbara 2018a).

Two other agencies treat some of their flow to tertiary levels for reuse as landscape irrigation: the City of Santa Barbara and the Goleta Sanitary District. The City of Santa Barbara's recycled water system has distribution capacity to deliver 1,400 AFY. However, tertiary effluent from the El Estero WWTP is currently unable to meet its permit requirements without blending with potable water because of high turbidity and TDS levels in the wastewater. With the need to reduce TDS levels in the recycled water supply and to eliminate the blending of potable water, the City of Santa Barbara began implementing process upgrades to the El Estero WWTP. The City of Santa Barbara currently provides 800 AFY of recycled water to users and 300 AFY of process water at the El Estero WWTP, and additional demands of 300 AFY are anticipated in the long term. The Goleta recycled water system is operated jointly by the Goleta Sanitary District and the Goleta Water District, which acts as the purveyor/retailer of the recycled water to its customers. The system currently serves approximately 785 AFY of recycled water, and the Goleta WWTP can treat up to 1,500 AFY of tertiary effluent (County of Santa Barbara 2018a). Through an SWRCB Planning Grant, the GWD completed a study entitled Goleta Potable Reuse Facilities Plan in July 2017 (Appendix 2-D). The study was focused on the feasibility of expanding recycled water use within the District.

The City of Lompoc's Recycled Water permit for dust control and compaction allows 62,000 gallons of Recycled water sales per day; therefore, the total maximum amount of recycled water yearly sales allowed is 69 AFY of its tertiary treated effluent for reuse. The City currently discharges approximately 2.98 MGD to the Santa Ynez River, through San Miguelito Creek. The Los Alamos CSD discharges all of its approximately 130 AFY of secondary effluent for pasture irrigation (County of Santa Barbara 2018a).

Many of these agencies, as well as others not discussed, discharge to percolation ponds, the Pacific Ocean, or other water bodies. The current demand for recycled water in the Region is 4,177 AFY (County of Santa Barbara 2013). The IRWM Plan 2013 included a target of 7,035 AFY recycled water use by 2035 (County of Santa Barbara 2013), and this continues to be the goal that the Plan and projects are aiming to achieve.

Desalted Water

The City of Santa Barbara owns a desalination facility that is discussed in more detail in Section 2.4.4, Major Infrastructure. In addition, the Venoco oil treatment facility on the Gaviota coast operates a desalination facility to meet plant needs of up to 500 gallons per minute (County of Santa Barbara 2018c).

Coordinated Use of Surface and Groundwater

Santa Barbara's water purveyors practice the conjunctive use of surface and groundwater supplies when excess water is available to recharge groundwater basins for later withdrawal when supplies are short. Some purveyors use SWP water, when available, and rely on groundwater to supplement when demand is higher. Purveyors may also purchase a "drought buffer" of additional SWP water or bank water in a groundwater basin. Similarly, some purveyors (such as the Carpinteria Valley Water District) manage, in accordance with an Assembly Bill 3030 Groundwater Management Plan, the groundwater pumped and stored in groundwater basins in order to optimize the basin's overall long-term working yield (County of Santa Barbara 2013).

The City of Santa Barbara maintains a water well system capable of extracting up to 4,500 AFY. Most of this potential supply is kept in reserve in case of drought, since a majority of the water supply is from surface water sources outside of the watershed area. During normal years, the City of Santa Barbara's groundwater basins are allowed to recharge, with groundwater extraction generally reserved for periods of drought or other supply shortages. Pumping occurs in Storage Unit 1 (downtown area) and the Foothill Basin (outer State Street area). The City of Santa Barbara conducts conjunctive use water supply management activities by injecting and storing surface water in the groundwater basins (County of Santa Barbara 2013).

The Goleta Water District continues to store groundwater pursuant to the Wright Suit Settlement. That adjudication affords the Goleta Water District the right to store water, such as excess Cachuma water, during times of abundant rainfall and extract during periods of surface water shortage (County of Santa Barbara 2013).

Cloud Seeding

The Santa Barbara County Water Agency conducts a weather modification program, known as cloudseeding, to augment rainfall and runoff in watersheds behind the major water reservoirs (i.e., Lake Cachuma and Gibraltar Dam on the Santa Ynez River and Twitchell Reservoir near Santa Maria). For the Twitchell Reservoir component of the program, only the Huasna and Alamo Watersheds are seeded, not the rain-shadowed area of the Cuyama River drainage. The operational program has been in existence since 1981 and follows research conducted between 1957 and 1974 that indicated significant increases in rainfall could be achieved by "seeding" convective bands embedded in winter storms. Sponsors of the research programs included the National Science Foundation, Naval Weapons Center China Lake, U.S. Weather Bureau, U.S. Forest Service, State of California, University of California, County of Santa Barbara, and County of Ventura. Research programs dating back to the 1950s were the result of pioneering work done in the field of weather modification in the late 1940s by Dr. Vincent Schaefer and Dr. Bernard Vonnegut (County of Santa Barbara 2018d).

Most storms that arrive in Santa Barbara County are abundant in moisture but limited in condensation nuclei. Water droplets or ice particles form on microscopic condensation nuclei, which are extremely small particles of dust or dirt in the atmosphere. Research has shown that many of these storms have embedded convective bands with super-cooled water vapor. Super-cooled water vapor is water vapor existing below the freezing point but does not freeze due to extremely low atmospheric pressure. By identifying these embedded convective bands and injecting artificial hydroscopic material into the cloud mass, cloudseeding provides a mechanism to move the moisture from the cloud mass to the surface of the earth where it is needed (County of Santa Barbara 2018d).

Seeding is accomplished from both the ground and aircraft, depending on cost-effectiveness. Currently, six land-based sites are used. From north to south, they are Mt. Lospe, Harris Grade, Sudden Peak, Refugio Pass, West Camino Cielo, and Gibraltar Road. Cloudseeding programs are conducted throughout California, and are common throughout the world. The Santa Barbara County Water Agency recognizes cloudseeding as a safe and cost-effective means of promoting adequate water supplies. DWR labels cloudseeding a "safe and effective means of augmenting local water supplies." The American Society of Civil Engineers recognizes cloudseeding and has produced an operations guidelines manual. The U.S. Bureau of Reclamation has done several studies on effects and has repeatedly found no negative impacts. The Weather Modification Association has a statement on silver toxicity that indicates no harmful effects. Santa Barbara's program is in compliance with the California Environmental Quality Act (CEQA) and conducted in accordance with all applicable laws and licensing (County of Santa Barbara 2018d).

The Santa Barbara County Water Agency splits the cost of the current cloudseeding program with local water purveyors under a matching funds program where the Santa Barbara County Water Agency matches funds provided by local water purveyors on a year-by-year basis. Design of the cloudseeding program changes year by year to reflect watershed and hydrologic conditions. For example, if wildfire affects a watershed, that watershed may not be seeded until it has recovered, as with the 2007 Zaca Fire. If reservoirs are filled, the program may be curtailed and funds carried over to the next season. Not all storms are seeded; weak storms many times do not have the super-cooled water vapor content or proper wind field to promote significant results from seeding, and very strong storms may not be seeded due to potential flooding in urban areas and perception of use of the program. No urban areas are targeted, just backcountry areas behind major reservoirs (County of Santa Barbara 2018d).

The cloudseeding program plays a valuable role in protecting groundwater resources by increasing rainfall in seeded storms by 10%–15%. Increased runoff captured by Gibraltar Dam and Lake Cachuma on the Santa Ynez River is used for a variety of purposes, including municipal and industrial, direct irrigation of agriculture, recharge to the Santa Ynez River alluvial aquifer and Lompoc groundwater basins, and supplement of freshwater habitat. Increased runoff captured by Twitchell Reservoir is released slowly in the late spring and summer months to percolate into the heavily used Santa Maria Groundwater Basin (County of Santa Barbara 2018d).

Table 2.7 presents a list of water purveyors and their water sources. This table provides a snapshot of sources for the year 2017 only. Water supplies can vary significantly from year to year. All data is listed in acre-feet.

Table 2.7
Water Sources by Water Purveyor for Santa Barbara County, 2017

Purveyor	Groundwater Wells	Cachuma Project	Other Surface	State Water Project	Desalination	Other Purchased	Recycled	Total (acre-feet)
City of Buellton	845.2	0	0	377.36	0	1,222.56	0	1,222.56
Carpinteria Valley Water District	841.5	1,164.9	0	2,030.8	0	0	0	4,037.2
Casmalia CSD	0	0	0	0	0	9.28	0	9.28
Cuyama CSD	148.84	0	0	0	0	0	0	148.84
Golden State Water Company	5,409.97	0	0	236.08	0	0	0	5,646.06
Goleta Water District	2,188	2,758	0	3,245	0	1,776	785	10,885
City of Guadalupe	496.32	0	0	605.94	0	0	0	1,102.26
La Cumbre Mutual Water Company	639	0	0	553	0	0	0	1,192
City of Lompoc	4,186.59	0	9.48	0	0	0	0	4,196.08
Los Alamos CSD	266.78	0	0	0	0	0	0	266.78
Mission Hills CSD	481.91	0	0	0	0	0	0	481.91
Montecito Water District	438	0	592	2,726	0	0	0	3,756
City of Santa Barbara	523	0	4,883	2,784	294	–225	855	9,114
City of Santa Maria	1,668	0	0	11,270	0	0	0	12,938
Santa Ynez River Water Conservation District, Improvement District No. 1	1,560	0	0	2,370	0	0	0	3,930
City of Solvang	362.47	0	0	818	0	1.75	0	1,182.22

Table 2.7
Water Sources by Water Purveyor for Santa Barbara County, 2017

Purveyor	Groundwater Wells	Cachuma Project	Other Surface	State Water Project	Desalination	Other Purchased	Recycled	Total (acre-feet)
Vandenberg Air Force Base*	0	0	0	1,729.66	0	0	0	1,729.66
Vandenberg Village CSD	1,284.46	0	0	0	0	0	0	1,284.46

Source: SBCWA 2017a.
Notes: CSD = Community Services District.
* Data from 2016.

2.7.2 Water Demand

Current agricultural, municipal, and industrial demands are discussed below, as are projected demands. Sources of demand information include the Supply and Demand Study (County of Santa Barbara 2017), urban water management plans, and water agency reports. Water use estimates from the Supply and Demand Study (County of Santa Barbara 2013) are based on actual reports of use from water suppliers and population estimates outside of service areas. Agricultural water use is estimated based on cropping information from the Santa Barbara County Agricultural Commissioner's office and crop water use factors from the University of California at Cal Poly Irrigation and Training Research Center or the Agricultural Extension Service. Demand estimates represent typical annual use, not peak annual demand.

Agricultural Demand

Agriculture has a long history in Santa Barbara County, from the Chumash to the Spanish to the Mexicans to waves of immigrants from the eastern United States and Europe. The type of agriculture has varied throughout the centuries, but agriculture has and continues to be the number one industry in the County. In 2017, agricultural products in Santa Barbara County accounted for $1,590,350,591 billion in crops, which is an increase of $163,686,522 million over 2016. Including agricultural dependent and appurtenant industries, agriculture is the largest contributor to the IRWM region's economy for a total of $2.8 billion (County of Santa Barbara 2017x). Noteworthy, however, is that drought, fires, and other natural disasters have impacted agriculture. Farmers and ranchers recovering from the 7,500-acre Sherpa Fire in 2016 reported upward of $3 million in loses (Hamm 2016). In 2017, total agricultural losses from natural disasters accounted for a $13.3 million loss region wide. Moreover, due to the deadly debris flow and Thomas Fire, 40 growers have reported estimates totaling $20 million in crop and structure losses (). This information is important because as the climate warms and wildfires become more frequent and more destructive, impacts to watersheds will be increasingly more deleterious.

Agricultural water use now accounts for approximately 75% of all water demand in the County; calculating an exact amount would require accounting for the fact that some of the water used for agricultural returns as groundwater recharge. Most agricultural water supplies are obtained from private groundwater wells, although some water purveyors provide agricultural water, as well. In recent years, improvements in agricultural technology have allowed increases in crop yield and intensification of agricultural development on an acre-by-acre basis. In some cases, water demand per acre has increased to allow for double and triple cropping and for higher-water-using (and income-producing) crops, such as strawberries, to be grown. Irrigation technologies have also improved, reducing the amount of water used by some crops. These improvements include drip irrigation, seedling propagation in controlled greenhouse environments, laser leveling of fields, irrigation based on precise crop need, and use of tailwater recovery systems in furrow-irrigated fields (SBCWA 2017c). Estimated agricultural water demand is listed in Table 2.8.

Table 2.8
Estimated Agricultural Water Demand

Source	Demand (AFY)
Carpinteria Valley Water District	2,130[a]
Goleta Water District	3,160[b]
La Cumbre Mutual Water Company	103[c]
Montecito Water District	313[d]
City of Santa Barbara	152
Santa Ynez River Water Conservation District, Improvement District No. 1	2,404[e]
Private Wells, Cuyama Valley	15,300[c]
Private Wells, San Antonio Valley	17,020[c]
Private Wells, Santa Maria Valley	117,852[c]
Private Wells, Santa Ynez Valley	59,980[c]
Total	**217,328**

Sources:
a Carpinteria Valley Water District 2015, Table 4-1.
b Goleta Water District 2015, Table 3-5.
c SBCWA 2000.
d Montecito Water District 2017, Table T5.
e SYRWD, pers. comm. 2006.

Based on DWR's Land and Water Use Program estimates for crop area and applied water, an estimated 198,085 acre-feet of water was used for agriculture in Santa Barbara County in 2010 (DWR 2018).

Urban Demand

Urban demand, known also as municipal and industrial water demand, accounts for approximately 25% of all water demand in Santa Barbara County. Table 2.9 provides the most recent (2017) demand data from Public Water System Statistics Form #38, which water purveyors submit annually to the DWR. Demand data varies from year to year; for example, total demand in 2008 was 70,422 AFY and in 2010 was 61,893 AFY (WaterWise Santa Barbara 2017).

Table 2.9
Municipal and Industrial Water Demand

Source	Demand (AFY)
City of Buellton	974
Carpinteria Valley Water District	1,980
Casmalia Water Conservation District	9
Cuyama Community Services District	149
Golden State Water Company	5,078
Goleta Water District	7,338
City of Guadalupe	986
La Cumbre Mutual Water Company	1,067
City of Lompoc	4,080
Los Alamos Water Conservation District	253
Mission Hills Water Conservation District	467
Montecito Water District	3,222
City of Santa Barbara	8,651
City of Santa Maria	11,371
Santa Ynez River Water Conservation District, Improvement District No. 1	1,751
City of Solvang	1,109
Vandenberg Air Force Base	—
Vandenberg Village Community Services District	1,152
Total	**49,637**

Sources: Data are from each water purveyor’s form DWR #38: Public Water System Statistics for CY 2017. The forms are submitted by water purveyors annually to the California Department of Water Resources.

2.8 Projected Water Supply and Demand

The County’s Long Term Supplemental Water Supply Alternatives Report (County of Santa Barbara 2015a) provides information on projected water demand and supply. The projected demand and supply for municipal and industrial users and agricultural users is summarized below. Information on the estimated water supply and demand balance is also provided for each Detailed Analysis Unit (DAU) within the County.

2.8.1 Projected Municipal Water Supply

The County's Long Term Supplemental Water Supply Alternatives Report (County of Santa Barbara 2015a) states that future water availability for some municipal suppliers will be reduced by lost reservoir capacity and reduced reliability of SWP deliveries. In addition, climate change effects such as extended periods of drought and more frequent occurrence as well as variance in the frequency and intensity of rain and storm events and the increased frequency and intensity of fires will all further limit water supplies locally and throughout the state. This reduction in supplies must be balanced by improved water efficiency and possibly increased water recycling on the South Coast. Reservoirs on the Santa Ynez River (Jameson, Gibraltar, and Cachuma) will continue to experience reduction in capacity and in water quality that has only been accelerated by recent fires. Sediment in Gibraltar Reservoir has reduced capacity such that City of Santa Barbara has begun "pass-through" operations pursuant to the 1989 Upper Santa Ynez River Operations Agreement. That agreement allows use of Cachuma Project facilities for transport of lost Gibraltar Reservoir capacity in part because silt trapped by Gibraltar Reservoir reduces the rate of sedimentation in Cachuma Lake. SWP deliveries are affected each year by weather conditions within the source areas and measures to protect habitat in key water transport facilities, particularly within the Sacramento/San Joaquin River Delta (County of Santa Barbara 2015b).

DWR performs a detailed evaluation of SWP reliability every 5 years. The results from the latest analysis are reflected in the estimates of future SWP deliveries (DWR 2018b). Future average yield from groundwater supplies is not expected to change significantly through the analysis period. This is based on the existing use and condition of the groundwater resource, past development of groundwater management plans, effect of existing adjudications, and information on future groundwater use contained in Urban Water Management Plans (County of Santa Barbara 2015a).

Several environmental issues will affect water supply in the future, including the effects of climate change, control of invasive species such as Arundo donax, Santa Ynez River fish passage/habitat expansion, and Santa Maria River fish passage flows (County of Santa Barbara 2015b).

2.8.2 Projected Agricultural Supply

Agriculture in Santa Barbara County relies overwhelmingly on groundwater for its supply. Supplies of water to agriculture are expected to remain adequate based on existing adjudications, SWRCB water rights orders that establish agricultural access to groundwater supplies, the results of groundwater resource evaluations, and a limited amount of additional suitable land for irrigated agriculture. Since the passage of the Sustainable Groundwater Management Act of 2014 (SGMA), the majority of agricultural water users are now within Groundwater Sustainability Agency (GSA) jurisdictional areas and will be subject to further management once Groundwater Sustainability

Plans (GSPs) have been developed and are implemented. In basins designated as critically overdrafted, GSPs must be submitted to DWR by 2020 and in basins designated as medium and high, GSPs must be submitted to DWR by 2022. The Cuyama Valley groundwater basin is critically overdrafted and the GSP is currently being drafted. The other GSAs in the region, which govern medium- and high-priority basins are in varying stages of GSP development.

2.8.3 Projected Municipal Water Demand

In the 2013 Santa Barbara County Water Supply and Demand Study (GEI 2013a), the estimate of average municipal demands are based on projections of population increases and projected per capita use. Population data and forecasts for cities and water purveyor service areas and DAUs can be found in the Supply and Demand Study. Projections extend through 2040. To the extent available, projections were taken from Urban Water Management Plans prepared by larger suppliers in the County. For smaller service areas, the estimate of per capita use was derived from data made available by the Santa Barbara County Water Agency and population estimates developed by the Santa Barbara County Area Governments' staff (County of Santa Barbara 2013).

Based on an evaluation of the existing data in the Supply and Demand Study (GEI 2013a), per capita water use is affected by household size, lot size, and landscaping type. The projections of water use were based on the following factors (GEI 2013a):

- Population is expected to increase in virtually all areas.
- Increasing efficiency is expected to decrease per capita use.
- Increased recycling on the South Coast will divert water from ocean outfall, thus increasing supply and decreasing demand from other sources.
- Increased recycling would be less effective in reducing demand in other areas because the discharge to surface streams or infiltration facilities does not effectively capture water that would be otherwise lost to the system.
- Increased cost (energy) will drive up costs; however, historical data suggest that marginal cost increases to end-users will not reduce per capita demand.

Overall, water demand was found to increase in most areas, driven by population increase. This is consistent with past projections (Cosby and Ahlroth 1991 and 2003, as cited in GEI 2013a).

2.8.4 Municipal Conservation Estimates

Per capita water use data have been collected in several areas in Santa Barbara County since the 1990s. Appendix G of the Supply and Demand Study (GEI 2013a) presents graphs comparing per capita water use against price and against annual rainfall. An analysis of per capita water use versus price in Santa Barbara County suggests that price increases in some areas apparently cause an initial reduction in per capita use, but that per capita use tends to increase in the following years. Other studies demonstrate that increasing "block rate" pricing does have a longer-term effect on reducing per capita water use (Arbues et al. 2004, as cited in County of Santa Barbara 2013; SBCWA 2003).

Local water use data suggest a weak correlation between annual rainfall and per capita water use. This relationship, along with higher reported usage in areas of larger lot size (Montecito, La Cumbre, and Santa Ynez Improvement District No. 1), suggests the potential to reduce per capita use by focusing on improved landscaping irrigation efficiency. Work on behalf of the California Urban Water Conservation Council suggests that although higher than normal temperature and rainfall do affect per capita water use, the effects also depend on the time of year and the actual evapotranspiration rate (CUWCC 2011, as cited in County of Santa Barbara 2013). A detailed analysis of per capita water use using the 2011 California Urban Water Conservation Council methodology is beyond the scope of this IRWM Plan.

2.8.5 Projected Industrial Water Demand

Santa Barbara County's industrial base is mainly oil and gas production and processing of agricultural products. Oil and gas production, processing, and support facilities are provided water from on-site sources. The nature of existing development does not require significant fresh water supplies. Although the industry is experiencing an increase in production due to new technology and stronger prices, the actual demand for water is not expected to increase significantly. Water demand for agricultural product processing depends on the scope and nature of products produced. Since no significant change in acreage or the nature of products produced is expected, no significant change is expected in industrial water demand.

2.8.6 Projected Agricultural Water Demand

Santa Barbara County enjoys a vibrant and diverse agricultural and ranching industry. Most areas with good soils and adequate water supplies have been put into production and those areas with soils that are not as suitable for agriculture have been used for ranching. The majority of the region's land uses are agricultural and ranching. The land use plans for respective cities and the county at large do not provide for significant conversion of agriculture to urban land use. There is, however, anticipated to be land use changes and /or fallowing in relation to the development and implementation of GSPs in various areas of the region.

In the Cuyama Valley, agricultural water use is expected to be affected by increasing pumping costs that may reduce pumpage with time and with the GSP. The rate of this change is presently being evaluated by the GSA, and the results will be incorporated into the evaluations of supply and demand as well as the sustainable yield of the basin.

2.8.7 Projected Future Water Demand and Supply Balance

The Supply and Demand Study DAU analysis indicates increased water demand due to increasing population, primarily in urbanized areas served by public water suppliers, increased agricultural use in the San Antonio Valley, and continued agricultural use in the Cuyama Valley. The expected increased demand is not expected to exceed estimated future supplies in three of the five DAUs, but is expected to exceed estimated future supplies in the Cuyama and San Antonio Valleys. The Supply and Demand Study does not provide a safe yield or detailed balance calculation for groundwater basins or sub-basins within the DAUs. In the Cuyama and San Antonio Valleys, demand in excess of supply will continue to be met by over-producing in portions of relatively large groundwater basins underlying each area. The County of Santa Barbara in cooperation with USGS conducted a detailed evaluation of the Cuyama Valley Groundwater Basin (USGS 2015b) and is conducting a similar detailed evaluation for the San Antonio Groundwater Basin (USGS 2018). Detailed conservation estimates, municipal and industrial return flow estimates, and water supply estimates through 2040 are available in Appendix A, Tables A-4 through A-6, of the Supply and Demand Study (GEI 2013a).

DAU 71

Estimated projections for Santa Maria DAU 71 indicate that water supplies for this area are sufficient to meet current or projected demands within a reasonable uncertainty using the assigned values from available information in comparison to the level of accuracy required for the calculation of a safe yield. The estimated shortfall is approximately 5% of the total annual demand, which is within a reasonable range of uncertainty and does not definitively define the groundwater basin within the DAU as out of balance. This evaluation estimates that the shortfall for the DAU may continue to increase through 2040 to 7% of total demand. Importing SWP water has significantly reduced the overall DAU water supply shortfall; however, uncertainty remains on the need for additional water supplies. Notably, an annual report is submitted to the courts for each groundwater basin within the DAU, which provides a more detailed account of water supply and demand over a representative hydrologic period. The annual supply and demand varies by water year, and the balance may change from positive to negative by water year type; therefore, it is imperative to recognize the limits of this IRWM Plan and make use of the more detailed annual report.

DAU 73

Estimated projections for San Antonio DAU 73 indicate that water supplies for this area are not sufficient to meet current or projected demand. The estimated shortfall for the DAU is approximately 20,000 acre-feet per year for the entire DAU area, which includes a defined groundwater basin area and additional area in the northwest portion of the DAU. Thus, the estimate for the DAU includes a groundwater basin that has an estimated safe yield and additional area outside the defined groundwater basin. The rate of use is anticipated to continue at a similar rate over time. The agricultural land use information indicates a substantial amount of vineyard acres in the central portion of DAU 73 and a substantial amount of rotational vegetables in the northwest portion of DAU 73, adjoining DAU 71. The County of Santa Barbara is currently undertaking a more detailed study for this area. Some of the shortfall will be reduced over time due to expected water conservation efforts to reduce the per capita water demand by Los Alamos CSD, VAFB, the GSA and GSP implementation, private municipal, industrial, and agricultural water pumpers.

DAU 74

Projections for Santa Ynez DAU 74 indicate that current water supplies for this area are sufficient to meet current demand and there will be sufficient supply into the future. This condition of sufficient supply to meet demand is anticipated to remain through 2040.

DAU 75

Projections for the South Coast DAU 75 indicate that this area has sufficient water supply up to the year 2040. This is due to the variety of potential supplies available to South Coast purveyors, including SWP water; groundwater; desalinated water; recycled water; and Cachuma, Gibraltar, and Jameson Reservoirs, along with the active conservation programs conducted by these purveyors. Important spatial differences may exist in the water supply-and-demand balance within specific groundwater basins and sub-basins.

DAU 76

Water supply projections for the Cuyama Valley DAU 76 indicate that this area is already experiencing a severe water supply shortfall with respect to meeting current demands. The current shortfall is approximately 24,000 acre-feet per year or more in the Main Zone, which is expected to continue (USGS 2015a). This area will need to be updated once the final GSP is completed for the basin.

2.8.8 Effects of Climate Change on Supply

Section 2.13 includes a discussion of climate change, including impacts to water supply.

2.8.9 Uncertainty

This IRWM Plan provides a long-term forecast of the regional water supply-and-demand balance for Santa Barbara County, aggregated by DAUs. A certain amount of uncertainty exists in the estimates for current and future water supply and demand. Regarding uncertainty within the DAUs, this IRWM Plan uses available information regarding the supplies and demands of water uses within groundwater basins and sub-basins within each DAU; however, it does not compute a safe yield level of balance for each of these groundwater basins or sub-basins within each DAU. Therefore, this IRWM Plan does contain some spatial uncertainty for long-term balance within each DAU. This uncertainty is based on the difficulty of accurately predicting changes in numerous factors, including the following:

- Population growth rates
- Land use changes
- Level of participation in residential, commercial, industrial, and agricultural water efficiency programs
- Weather changes year to year and long-term trends
- Environmental regulatory changes, including requirements that reduce the assumed yield of surface water and groundwater supplies
- Groundwater basin and surface water model revisions to reflect improved geotechnical data, assumed rainfall, and other factors
- DAU boundaries containing one or more groundwater basin or sub-basin boundaries
- Changes in irrigated agricultural acreage and types of crops planted
- Indirect estimation of agricultural water use
- Estimation of return flow from irrigation applied water
- Outcome of water rights litigation
- Development of new water supplies and drought-year contingency supplies by water purveyors
- Future development and reliability of the SWP water resulting from ongoing contract renegotiations and the Bay Delta Conservation Plan

The level of uncertainty is also increased as the forecast time horizon extends from 10 years to 40 years. To minimize the uncertainty that will always exist, this IRWM Plan is based on the most recently available current and future population estimates, land use plans, water supply master plans, water models, and agricultural data. Nevertheless, significant changes may occur that cannot be anticipated at this time. Consequently, the water supply-and-demand forecasts should be considered as trends within the DAU spatial areas rather than exacting forecasts of groundwater basins. In addition, the water supply-and-demand forecasts should be reevaluated periodically to reflect new baseline conditions that arise.

2.9 Reducing Dependence on the Sacramento–San Joaquin Delta

The Santa Barbara County IRWM Region receives SWP water from the Sacramento–San Joaquin Delta (Delta). In the County, SWP participants have a contractual allocation for 39,078 AFY of Table A amount water, plus an additional 3,908 acre-feet of drought buffer for the rights holders and an additional drought buffer of 2,500 acre-feet for Goleta Water District, from the Delta through the SWP (CCWA 2016).

The IRWM Plan is focused on the development of local and reliable water supplies and will support the state's goal of reducing dependence on the Delta. The IRWM Plan uses a project selection process that evaluates and ranks the potential of projects. One of the criterion scores a project based on its ability to "reduce dependence on the Delta." Another criterion is "increases supply reliability."

The IRWM Plan aligns the goal of reducing dependence on the Delta with stakeholder-approved regional issues, objectives, and targets. The IRWM Plan's regional issues mirror the intent to protect and develop local supply sources and underscore the Region's commitment to reducing dependence on the Delta. Specifically, identified issues are as follows:

- Need to expand existing water supplies and develop new local supplies to address future water supply constraints
- Vulnerability to water supply shortages due to lack of local water supply diversification
- Variability of SWP water deliveries due to climate and regulatory constraints may reduce supply available for important beneficial uses
- Need to control stormwater to increase capture to augment supply
- Loss of storage in surface water storage
- Need for regional collaboration for conjunctive groundwater management
- Lack of redundancy and capacity in storage and aging distribution systems leaves region vulnerable to water supply shortages during times of prolonged drought and in emergency situations
- Insufficient integration of adjacent systems constrains operational flexibility

- Wildfires cause habitat damage and extreme erosion, which adversely affect reservoir storage and water quality
- Long-term sediment accumulation has reduced vital reservoir storage capacity and operations

The IRWM Plan objectives align with water management strategies for the Region (see Table 2.10). These objectives and associated strategies reflect the Region's goal of reducing dependence on the Delta.

The regional objective to "protect, conserve, and augment water supplies" emphasizes regional self-reliance to reduce the use of imported water during times of drought. Strategies include conservation, recycled water, indirect potable reuse, and stormwater capture and treatment. The objective to "protect, manage, and increase groundwater supplies" would increase regional self-reliance. The objective to "protect and improve water quality" is similar to the Delta Stewardship Council (previously the CALFED Bay-Delta Program) goal of "water quality." The objective to "improve flood management" includes strategies such as "multi-purpose and multi-benefit flood and stormwater management" that uses stormwater capture and sediment management. The objective to "improve emergency preparedness" guides the Region to prepare for emergency situations, including drought management through regional water supply self-reliance. The objective to "maintain and enhance water and wastewater infrastructure efficiency and reliability" is a high priority for the Region and has led to many projects that invest in updating obsolete infrastructure so that adequate local supply and water quality can be maintained. The "climate change" objective includes strategies that are being adopted by regions across the state to assist in reducing dependence on the Delta. Table 2.10 highlights the regional objectives mentioned in the above paragraph with examples of water management strategies from the IRWM Plan that are aligned with the state goal of reducing dependence on the Delta.

Table 2.10
IRWM Plan Objectives and Strategies to Reduce Dependence on the Delta

IRWM Plan Objective	Examples of Water Management Strategies Aligned with Reducing Dependence on the Delta
Protect, conserve, and augment water supplies	• Agricultural and urban water use efficiency • Conjunctive management and groundwater storage • Recycled municipal water • Sediment management • Develop and maintain a diversified mix of water resources
Protect, manage, and increase groundwater supplies	• Conjunctive use and groundwater management • Efficiency and conservation measures • Groundwater remediation/aquifer remediation • Prevention of salt water intrusion

Table 2.10
IRWM Plan Objectives and Strategies to Reduce Dependence on the Delta

IRWM Plan Objective	Examples of Water Management Strategies Aligned with Reducing Dependence on the Delta
	• Recharge area protection • Capture and treatment of stormwater
Protect and improve water quality	• Groundwater remediation/aquifer remediation, including shallow groundwater • Capture and treatment of stormwater • Upgrade wastewater treatment to meet current and future state and federal water quality standard
Improve emergency preparedness	• Increase back-up facilities, interconnections, redundant power sources, and treatment facilities • Plan for and address the impacts of emergency situations, such as drought and fires
Maintain and enhance water and wastewater infrastructure efficiency and reliability	• Rehabilitation and replacement of older water and wastewater delivery and treatment facilities • Renewable and energy-efficient facilities
Address climate change through adaptation and mitigation	• Energy use reduction by water and wastewater systems • Renewable energy generation and use by infrastructure • Recycled municipal water and urban water use efficiency • Protect resources and facilities by constructing seawalls or levees
Improve flood management	• Structural improvements to flood infrastructure to decrease flooding • Management of creek and river systems to reduce flood flow • Multi-purpose and multi-benefit flood and stormwater management • Sediment management

Table 2.5 shows the amount of water to which each Santa Barbara County participant in the SWP has a contractual right, referred to as the “Table A” amount. The primary factors affecting the amount of Table A deliveries are the availability of SWP supplies and the SWP contractors’ demands for this water. Climatic conditions and other factors can significantly alter the availability of SWP water in any year; a topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California’s future water supplies, including SWP supplies.

2.10 Water Quality

The following sections have been updated substantially since the IRWM Plan 2013. Changes include the addition of details on water quality, specifically nitrate, arsenic, and chromium-6, in line with Senate Bill 985 (the region does not have perchlorate water quality issues). In addition, the IRWM Plan 2013 Section 3.11.2, Urban Surface Water Quality, and Section 3.11.3, Agricultural Water Quality, have been replaced with Section 2.10.2, Surface Water Quality, which provides a comprehensive overview of the quality of regional surface water supplies and areas within the region that require targeted action to improve water quality.

On January 26, 2016, the Central Coast RWQCB adopted Resolution No. R3-2017-0004, Adopting the Human Right to Water as a Core Value and Directing Its Implementation in Central Coast Water Board Programs and Activities. The Resolution and the Workplan for Implementing the Human Right to Water (Central Coast RWQCB 2017a) includes development of region-wide GIS maps to identify areas where public and domestic drinking water wells are impacted by common pollutants, including nitrate, and the identification of areas in the Southern Central Coast region where domestic wells users are vulnerable to contamination and need assistance. These efforts will increase the accessibility of water quality data and improve the ability of the region to identify and respond to water quality issues in the future.

Nitrate Contamination in the Santa Barbara County IRWM Region

Nitrate contamination occurs in a number of areas within the Santa Barbara IRWM Region. This section provides a general overview of contamination at a regional scale, as well as a description of regional-level regulations aimed at reducing nitrate contamination. In 2014, the Central Coast RWQCB summarized groundwater basin data with respect to nitrate for the Central Coast region. For the Santa Barbara County IRWM Region, the report included data from the Division of Drinking Water for public water system drinking water supply wells and from the Central Coast Regional Water Board Agricultural Order for groundwater monitoring for on-farm domestic wells and irrigation supply wells.

Of 198 public water system supply wells sampled in Santa Barbara County, 12 wells (6.1%) were found to be equal to or above the nitrate MCL (10 milligrams per liter as nitrogen [mg/L-N]). Of 188 on-farm domestic wells sampled in Santa Barbara County, 34 wells (18.1%) were found to be equal to or above the MCL (10 mg/L-N). Of 476 agricultural supply wells in Santa Barbara County, 147 wells (30.9%) were found to be equal to or above the MCL (10 mg/L-N) (Central Coast RWQCB 2018a).

Table 2.11 lists the occurrence of nitrate concentrations equal to or above the MCL (10 mg/L-N) for groundwater basins in the Santa Barbara IRWM Region. The Santa Maria River Valley and the Cuyama Valley have significant percentages of public water system supply wells with nitrate concentrations equal to or above the MCL (10 mg/L-N) (20.2% and 33.3% respectively). In addition, a significant number of on-farm domestic wells and agricultural supply wells in the Santa Maria River Valley were found to have nitrate concentrations equal to or above the MCL (10 mg/L-N) (47.5% and 56.7% respectively) (Central Coast RWQCB 2018a).

Table 2.11
Nitrate Data (mg/L-N) by Santa Barbara County Groundwater Basin

	Santa Maria River Valley	Santa Ynez River Valley	Carpinteria	Cuyama Valley	Goleta	San Antonio Creek	Foothill	Montecito	Santa Barbara
Public Water System Supply Wells	109	70	*	3	17	*	*	*	*
Number Equal or Above MCL (10 mg/L-N)	22	1	0	1	0	0	0	0	0
Percent Equal or Above MCL (10 mg/L-N)	20.2%	1.4%	—	33.3%	—	—	—	—	—
On-Farm Domestic Wells	118	90	6	11	*	16	—	—	*
Number Equal or Above MCL (10 mg/L-N)	56	4	0	1	0	0	—	—	0
Percent Equal to or Above MCL (10 mg/L-N)	47.5%	4.4%	—	9.1%	—	—	—	—	—
Agricultural Supply Wells	323	136	53	48	*	38	—	*	*
Number Equal to or Above MCL (10 mg/L-N)	183	14	17	4	0	2	—	0	0
Percent Equal to or Above MCL (10 mg/L-N)	56.7%	10.3%	32.1%	8.3%	—	5.3%	—	—	—

Source: Central Coast RWQCB 2014a, 2014b.
Notes: mg/L-N = milligrams per liter of nitrate as nitrogen; MCL = maximum contaminant level; — = no data available.
* Data were presented in aggregate and could not be disaggregated by basin.

The Central Coast RWQCB operates the Central Coast Ambient Monitoring Program, including the Groundwater Assessment and Protection Program to monitor and assess regional water quality. The program aims to make scientific information widely available to "protect, restore, and enhance the quality of waters of central California" (Central Coast RWQCB 2018a).

RWQCB Agricultural Order

Under its Irrigated Lands Regulatory Program, the Central Coast RWQCB regulates discharges from irrigated agricultural lands to protect surface water and groundwater using a permit called a Conditional Waiver of Waste Discharge Requirements that applies to owners and operators of irrigated land used for commercial crop production. The Central Coast RWQCB is focusing on priority water quality issues, especially nitrate impacts to drinking water sources in major agricultural areas. The Conditional Waiver was first adopted in 2004 and an updated version was adopted by Agricultural Order in 2012. The 2012 Agricultural Order expired on March 14, 2017, and the Central Coast RWQCB passed an interim Agricultural Order entitled Agricultural Order 3.0 on March 9, 2017. The Central Coast RWQCB is currently working on the next iteration of the Agricultural Order entitled 4.0 (Central Coast RWQCB 2018b).

Since 2004, the Central Coast RWQCB has compiled substantial data demonstrating that water quality conditions in agricultural areas continue to be significantly impaired. The most serious degradation being caused by fertilizer and pesticide use, which results in runoff to surface waters and percolation into groundwater (Central Coast RWQCB 2018b).

The Agricultural Order regulates discharges of waste from irrigated lands to ensure that they do not contribute to the exceedance of any water quality standards. Dischargers are classified into one of three tiers based on criteria that define the risk to water quality and the level of discharge. The extent of requirements for compliance depends on the tier of the commercial grower. All tiers must enroll in the Agricultural Order, develop and implement a farm water quality management plan, implement best management practices to protect water quality, conduct surface water receiving and groundwater monitoring and reporting, and install backflow prevention devices. In addition, Tier 2 and Tier 3 must submit annual compliance forms. Tier 3 must also conduct individual discharge monitoring and reporting, and develop and implement a certified irrigation and nutrient management plan, and a water quality buffer plan (Central Coast RWQCB 2018b).

Stated goals of the Irrigated Lands Regulatory Program include that by 2025, 80% of groundwater will meet nitrate water quality objectives and 80% of surface water will meet nutrient water quality objectives, with the remaining 20% of each exhibiting positive trends (Central Coast RWQCB 2018b).

Local Agency Management Program

The California Water Quality Control Policy for Siting, Design, Operation and Maintenance of On-Site Wastewater Treatment Systems (OWTS) went into effect in May 2013, requiring counties to adopt their own Local Agency Management Program (LAMP) by 2016 or to default to the policy's restrictions. The Central Coast RWQCB approved Santa Barbara County's LAMP, developed by Environmental Health Services with local stakeholders, on November 20, 2015, and it became fully effective January 1, 2016. The LAMP outlines a customized management program to regulate septic systems within the County's jurisdiction, and requires the County to develop management plans for water bodies degraded by the use of OWTS. The goal of the LAMP is to protect surface water bodies and groundwater from negative impacts caused by the operation of OWTS. OWTS, also known as septic systems, that malfunction can release wastewater that then migrates to groundwater and surface water bodies leading to contamination with nitrates and other constituents. In areas that suffer from nitrate contamination due to poor septic system design or lack of maintenance, implementation of the LAMP management program can stop further contamination and protect groundwater quality (Central Coast RWQCB 2018c).

The LAMP includes permit, inspection, and reporting elements. It requires permitting by Environmental Health Services for the construction of new OWTS, and the repair, modification, or abandonment of existing systems. Inspection and approval of all work by Environmental Health Services is required prior to backfilling any components or putting the system into service. Once in use, OWTS require regular maintenance to ensure that they are operating properly. With the exception of those systems that require supplemental treatment, there is no mandatory maintenance requirement. However, when an OWTS is serviced, the technician providing the service is required to inspect the system and send a written report to Environmental Health Services detailing the findings of the inspection. If the inspection finds any deficiencies, the owner is sent a notice directing that they make appropriate repairs (Central Coast RWQCB 2018c).

OWTS requiring supplemental treatment—engineered designs and/or technology to further treat effluent to reduce contaminants—are required to undergo periodic inspection, maintenance, and reporting to ensure proper operation. The use of supplemental treatment is required when using shallow drip dispersal fields and, in most circumstances, when seepage pits are used. Supplemental treatment is also required in Special Problem Areas where the use of conventional on-site sewage systems poses an exceptional risk to the public health (Central Coast RWQCB 2018c).

Additional Regulations

A state regulatory initiative seeks to improve groundwater quality. The SWRCB adopted a Recycled Water Policy in February 2009. The purpose of the policy is to increase the use of recycled water in a manner that implements state and federal water quality laws. The Recycled Water Policy required that Salt and Nutrient Management Plans be completed by 2014 to facilitate basin-wide management of salts and nutrients from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health. Recycled water has the potential to contain TDS levels that, through application and infiltration to groundwater basins, may negatively impact groundwater quality. The Recycled Water Policy helps to manage that risk and protect groundwater quality while still encouraging use of recycled water. The Recycled Water Policy requires stakeholders to develop implementation plans to meet these objectives for salts and nutrients. Implementation plans are then adopted by RWQCBs as amendments to the Region's Water Quality Control Plan (Basin Plan) (Central Coast RWQCB 2017b, 2017c).

New and forthcoming regulations related to direct potable reuse and indirect potable reuse provide additional pathways for managing surface water and groundwater quality issues. Highly treated recycled water that is of higher quality than existing surface water and groundwater supplies can help improve overall water quality when mixed with these supplies. Regulations for groundwater replenishment using recycled water became effective on June 18, 2014. Final review of proposed Surface Water Augmentation using recycled water is currently underway, and the SWRCB released the draft Surface Water Augmentation regulations for public comment on July 21, 2017 (SWRCB 2017). Additionally, on December 29, 2016, the SWRCB released a report on the feasibility of developing uniform water recycling criteria for direct potable reuse. The report concluded that development and adoption of regulations for direct potable reuse is feasible, and indicated research and knowledge gaps that must be addressed prior to implementation of such regulations (SWRCB 2017).

The Sustainable Groundwater Management Act of 2014 (SGMA) provides a framework for the sustainable management of groundwater supplies by local agencies. SGMA requires the formation of local groundwater sustainability agencies (GSAs) to assess local basins and groundwater sustainability plans (GSPs). The timeline for GSA formation and adoption depends on basin priority and degree of overdraft, as determined by DWR. A number of GSAs have formed County-wide (see Figure 2.17, Groundwater Sustainability Agencies). Section 8.7.2 provides an overview of regional GSA formation, the agencies involved, and the current status of each. The SGMA provides an additional pathway for managing water quantity and quality issues of groundwater basins.

2.10.1 Groundwater Quality

Groundwater quality in the Region varies depending on the groundwater basin, basin subarea, and overlying land uses. Slight increases in TDS have been recorded in many basins in the County, but in other areas, TDS levels have remained stable and have even decreased. Efforts to increase recharge and improve irrigation efficiency have been implemented to address this problem in some areas (SBCWA 2012). In several areas in the County (Santa Barbara and near Santa Maria), geologic conditions may allow seawater intrusion. As of yet, these initial signs of intrusion do not pose a threat to drinking water supplies. Monitoring wells have been established to provide early warning of any change in water quality (SBCWA 2012).

The County contains a number of non-sewered, fairly densely populated areas that remain on septic tanks, requiring integrated action by the Local Agency Formation Commission, cities, and special districts to provide for extensions of sewer systems to serve these areas or other measures to address potential groundwater contamination (SBCWA 2012).

Groundwater Basins of the South Coast

The following describes groundwater quality in the major basins of the South Coast: Carpinteria, Montecito, Santa Barbara, Foothill, and Goleta Groundwater Basins.

Carpinteria Groundwater Basin

The Carpinteria Groundwater Basin underlies approximately 12 square miles in the Carpinteria Valley and extends east of the Santa Barbara County line into Ventura County. The basin contains two groundwater storage units: Storage Unit 1 is located north of the Rincon Creek thrust fault and Storage Unit 2 is located south of the Rincon Creek thrust fault. The fault acts as a barrier to groundwater flow between the two storage units (Geotechnical Consultants Inc. 1976, as cited in County of Santa Barbara 2013).

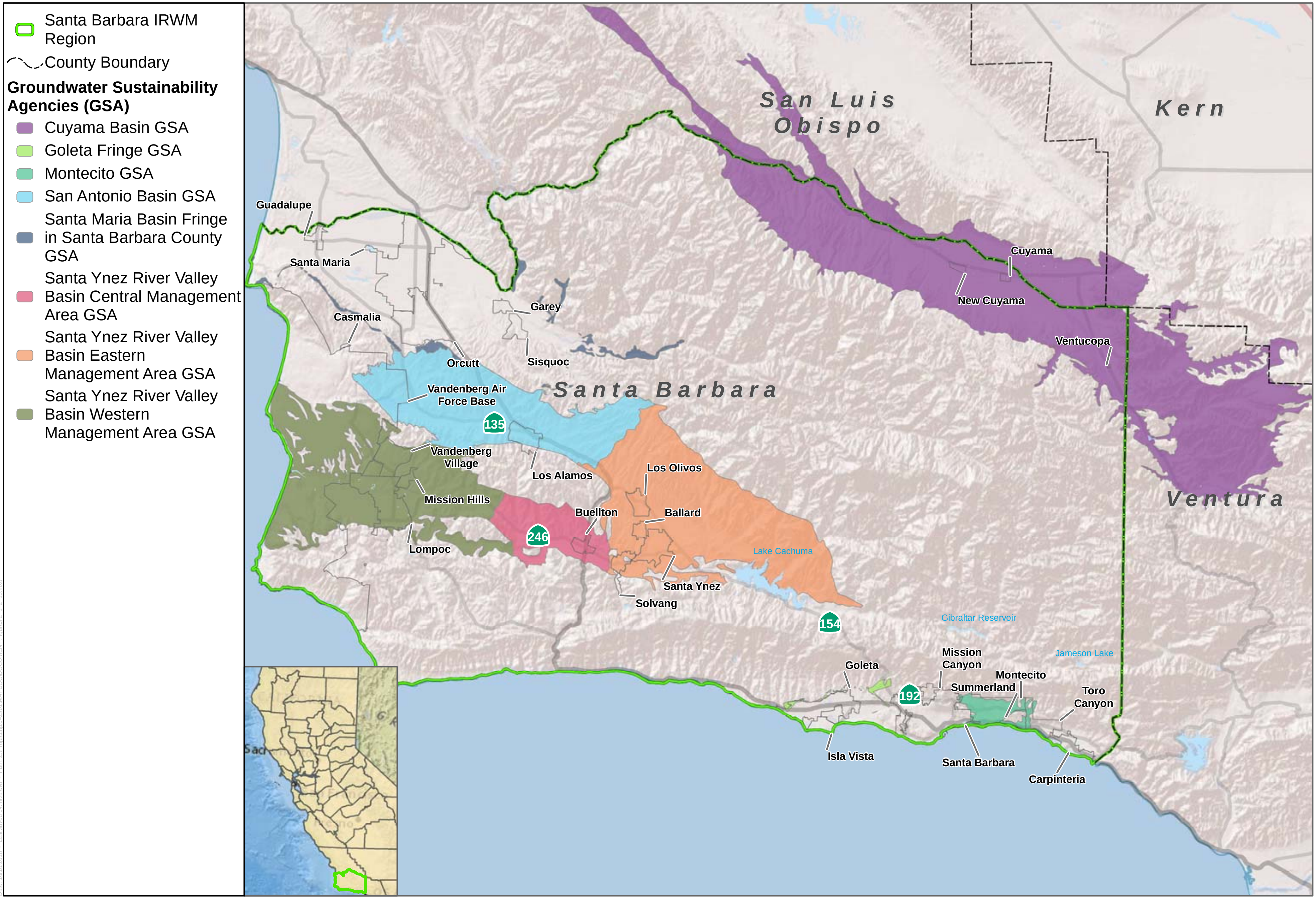
Groundwater in the basin is predominantly calcium bicarbonate with varying amounts of sodium. The TDS concentrations within the basin are stable, with recent concentrations of 800 mg/L. Groundwater analyses conducted in 2010 revealed nitrate levels below the state MCL of 45 mg/L for public water systems. No evidence of seawater intrusion has been found in the basin (Carpinteria Valley Water District 2014).

Montecito Groundwater Basin

The Montecito Groundwater Basin encompasses approximately 6.7 square miles between the Santa Ynez Mountains and the Pacific Ocean. It is separated from the Carpinteria Groundwater Basin to the east by faults and bedrock, and from the Santa Barbara Groundwater Basin to the west by a topographical divide and to the south by the Montecito Fault. Water quality in the basin is generally suitable for agricultural and domestic use. Some wells near fault zones or coastal areas yield groundwater with elevated levels of TDS and other constituents. Studies indicate that seawater intrusion is not a significant problem in the Montecito Groundwater Basin. It is thought that deeper aquifers of the basin are protected from seawater intrusion by an impermeable offshore fault. However, some encroachment of seawater might occur in shallower aquifers during periods of heavy pumping, such as occurred during the early 1960s (Montecito Water District n.d.).

Santa Barbara Groundwater Basin

The Santa Barbara Groundwater Basin underlies an area of approximately 9 square miles between the Montecito Groundwater Basin and the Foothill Groundwater Basin. The basin includes two hydrologic units: Storage Unit 1, northeast of the Mesa Fault (approximately 7 square miles), and Storage Unit 3, southwest of the Mesa Fault (approximately 2.5 square miles). TDS concentrations within the two hydrological units range from approximately 530 mg/L to more than 2,000 mg/L. Isolated wells have exhibited much higher TDS concentrations. Seawater intrusion occurred in some areas of the south basin (Storage Unit 1) where heavy pumping from municipal wells caused groundwater levels to drop as much as 100 feet in the late 1970s. Groundwater pumping within the Santa Barbara Groundwater Basin has been drastically reduced since the 1989 to 1991 period. Effective management of pumping practices and groundwater injection programs have restored the previously existing gradient, thereby reversing the trend of seawater intrusion. The basin continues to be managed such that planned pumping would minimize seawater intrusion and maintain a long-term balance of the groundwater basin (City of Santa Barbara 2018b).



SOURCE: Shaded Relief; County of Santa Barbara 2018; DWR 2018; Census 2017

DUDEK

FIGURE 2.17

Groundwater Sustainability Agencies

Santa Barbara County IRWM Plan Update

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Foothill Groundwater Basin

The Foothill Groundwater Basin is located in northwest Santa Barbara and northeast Goleta. It encompasses the hydrologic unit formerly designated Storage Unit 2 of the Santa Barbara Groundwater Basin and the former "East Subbasin" of the Goleta Groundwater Basin. The basin was later redesignated as a separate hydrologic unit after geo-hydrologic data showed that the above-mentioned faults impede groundwater exchange between the adjacent Santa Barbara and Goleta Groundwater Basins (Freckleton 1989, as cited in County of Santa Barbara 2013).

TDS concentrations range from 610 to 1,000 mg/L in seven wells sampled in the basin. Chloride concentrations in this basin are relatively low (44 to 130 mg/L) in the seven wells. An eighth well was sampled in a USGS study from which poor-quality water (TDS 1,900 mg/L, chloride 360 mg/L) was recovered. This well, however, is known to produce water from bedrock aquifers below the sediments that compose the Foothill Groundwater Basin (City of Santa Barbara 2018b).

Goleta Groundwater Basin

The Goleta Groundwater Basin lies immediately west of the Santa Barbara and Foothill Groundwater Basins. The basin is divided into three sub-basins: the Central Sub-Basin, the West Sub-Basin, and the North Sub-Basin. Although originally defined as portions of a larger basin, these three hydrologic units are distinct and have been analyzed and described in planning and legal documents as separate basins. The Central Sub-Basin, from which most water is extracted, contains the lowest TDS concentrations, averaging approximately 770 mg/L. The Central Sub-Basin also has lower amounts of chloride, averaging 65 mg/L to 80 mg/L, compared to more than 200 mg/L in the West Sub-Basin. Chloride concentrations are a particular problem in low-lying areas of the basin near tidal marshes. Although high chloride concentrations are one indication of seawater intrusion, observation wells near the Goleta Slough area also exhibited correspondingly high concentrations of sulfate, a mineral not typically found in significant quantities in seawater (SBCWA 1977, as cited in County of Santa Barbara 2013). There is currently no evidence of seawater intrusion in the basin. In addition, seawater intrusion is not likely to have occurred at any time due to the rock formations and the More Ranch Fault along the coast that act as barriers to groundwater migration. Near-surface low-permeability sediments cause the southern portion of the North, Central, and West Sub-Basins to be under confined conditions and provide a barrier to contamination from potential surface sources of water quality degradation, such as agricultural return flow and infiltration of brackish water in the overlying Goleta Slough. High TDS perched water is present in shallow aquifers above the confining layers. This water is not in general use. Water quality in the North and Central Basins is sufficient for many agricultural uses as well as for domestic uses. Water in the West Basin requires treatment for domestic use and can be used for irrigation of a limited variety of crops. The Goleta Water District has extracted water from a bedrock well on a test basis. The well pumped water from the fractures in consolidated bedrock in the foothills north of the basin, and the water was of very poor quality. The Goleta Water District has no plans to use water from this source (Goleta Water District 2018).

Groundwater Basins of the Santa Ynez River Watershed

The groundwater basins of the Santa Ynez River Watershed consist of the Santa Ynez River Alluvial Groundwater Basin; Santa Ynez Upland Groundwater Basin; Buellton Upland Groundwater Basin; and Lompoc Groundwater Basin, which is composed of the hydrologically connected Lompoc Plain, Lompoc Terrace, and Lompoc Upland Sub-Basins. The groundwater basins lie between the San Rafael Mountains to the north and east, the Purisima Hills to the northwest, and the Santa Ynez Mountains to the south.

Santa Ynez River Alluvial Groundwater Basin

The Santa Ynez River Alluvial Groundwater Basin consists of the unconsolidated sand and gravel alluvial deposits of the Santa Ynez River. These deposits are up to 150 feet thick and several hundred feet across, and extend 36 miles from Bradbury Dam to the Lompoc Plain. In the Santa Ynez River Watershed, under the Cachuma Project Settlement Agreement, SWP water is mixed with water rights releases from Bradbury Dam to lower the salt content of flows downstream. Also, since 1997, discharge of SWP water from WWTPs where this supply is used has tended to lower the TDS level of groundwater in the vicinity of these sources (SBCWA 2014b).

Santa Ynez Upland

The Santa Ynez Upland Groundwater Basin underlies 130 square miles located approximately 25 miles east of Point Arguello and north of the Santa Ynez River. Water quality within the basin is generally adequate for most agricultural and domestic purposes. Studies completed in 1970 indicate TDS concentrations ranging from 400 to 700 mg/L. Although recent water quality data are limited, samples analyzed by USGS in 1992 exhibited a TDS concentration of 507 mg/L. Nitrogen levels in the basin, in the form of nitrate, have raised since 1990 from 11 mg/L to approximately 26 mg/L in 2010. Sulfate levels have been constant, ranging from 20 to 23 mg/L (SBCWA 2012).

Occurrence of Nitrate – Los Olivos

Los Olivos, Ballard, and Janin Acres have all been designated as Special Problem Areas (per Chapter 10, Article XIII of the Santa Barbara County Code) due to historic problems with the use of on-site sewage disposal systems (County of Santa Barbara 2010). Nitrate groundwater contamination from septic systems in the area of Los Olivos has been identified as a particularly significant issue. Of 19 wells with a history of testing, 14 show a trend of increasing nitrate levels

(County of Santa Barbara 2010) (see Figure 2.18, Santa Ynez River Water Conservation District Service Area—Upland). Los Olivos has a high groundwater table in many areas, resulting in inadequate separation from the existing leach fields and dry wells. In addition, many of the septic system are old, not designed to current codes and standards, and clustered in too high a density for proper sizing and setback of leach fields. This combination of factors led to Los Olivos being identified as a high-priority area for conversion from septic to sewer.

The community of Los Olivos formed a CSD and is exploring options related to wastewater treatment and construction of a new WWTP, or construction of a joint system with Ballard. In addition, the City of Solvang is working on an Advanced Treatment Study to consider potential upgrades to its WWTP. Another option is expansion of the WWTP to accommodate wastewater from Los Olivos (Los Olivos Water Reclamation 2018).

Occurrence of Hexavalent Chromium

The Upland Basin, which is a sub-basin to the larger Santa Ynez River Groundwater Basin, is a triangular-shaped 130-square-mile area that narrows to the east (see Figure 2.8). The basin was created by faulting and uplift of the Transverse Ranges. To the south, the basin is bounded by the Santa Ynez River Fault zone. To the north, the basin is bounded by the Little Pine Fault (County of Santa Barbara 2013).

The geology of the San Rafael Mountains on the northeastern side of the Santa Ynez Valley favors chromium-6 formation in the Upland Basin. The San Rafael Mountains are part of the Transverse Ranges, an east/west-oriented mountain range that is part of the Franciscan Complex, which forms the basement rock in the Coast Range ophiolite (Wahl 1995, 1998, as cited in County of Santa Barbara 2013). The Franciscan Complex is the oldest formation in the area and is made up of a serpentine matrix known to result in oxidation of chromite to chromium-6 (Oze 2007 and Wahl 1995, as cited in County of Santa Barbara 2013). The Franciscan Complex formed as a result of Farallon–North American Plate convergence (Wahl 1998, as cited in County of Santa Barbara 2013).

Almost all water production in the Upland Basin is from the Paso Robles Formation, which is characterized by heterogeneous lenticular deposits that result in highly variable well yields. In some instances, thick beds of clay separate distinct water-producing zones. All of the Santa Ynez River Water Conservation District, Improvement District No. 1 Upland Basin wells are screened in and produce water from the Paso Robles Formation (Santa Ynez River Water Conservation District, Improvement District No. 1, pers. comm.).

The San Rafael Mountains are also part of the contributing watershed that provides recharge to the groundwater basin. The Franciscan Formation dominates the geology of these mountains, which locally include a serpentinite matrix known to contain chromite. Active geochemical processes in the environment favor the oxidation (loss of electrons) of the trivalent chromium (chromium-3) in chromite ($FeCr_2O_4$) to form chromium-6, the more soluble form of chromium. The increased solubility of oxidized chromite means that it can more easily be dissolved in groundwater. As a result, groundwater flow through the aquifer results in the presence of chromium-6 in the Santa Ynez Upland Groundwater Basin. Unlike an isolated contaminant plume of chromium-6 from an industrial source, water will continue to react with chromium-bearing deposits in the Paso Robles Formation, resulting in a continuous source of chromium-6 in the local groundwater (Santa Ynez River Water Conservation District, Improvement District No. 1, pers. comm.). Anthropogenic chromium-6 contamination of groundwater has occurred in several industrialized areas of California from the use of chromium in chrome-plating, wood preservatives, paint pigments, manufacturing of stainless steel, and other industrial processes. This contamination source does not affect the Santa Ynez Upland Groundwater Basin (Santa Ynez River Water Conservation District, Improvement District No. 1, pers. comm.).

In developing alternatives that could address the ability of the Santa Ynez River Water Conservation District, Improvement District No. 1, to comply with the new chromium-6 MCL, the Consultant Working Group focused on three primary considerations: water supply quantity, water quality reliability, and cost-effectiveness of water supply solution. The Consultant Working Group identified six alternatives that could be employed by the Santa Ynez River Water Conservation District, Improvement District No. 1, to achieve compliance with the chromium-6 MCL. The identified alternatives are considered the building blocks for a potential integrated and comprehensive solution to be implemented by the Santa Ynez River Water Conservation District, Improvement District No. 1 (SYRWD, ID#1 2018).

Each of the identified technology alternatives has the capability of addressing, in some manner, elevated chromium-6 concentrations in the Santa Ynez River Water Conservation District, Improvement District No. 1 domestic water supply. However, use of a single technology in isolation would not necessarily achieve the highest efficiency or greatest ability to meet water supply objectives. Therefore, “solutions packages” or “complete options” to combine various technology alternatives were developed. In developing solutions packages involving various combinations of the technology alternatives and designed to achieve compliance with the chromium-6 MCL, the Consultant Working Group applied a set of screening criteria (SYRWD, ID#1 2018).

Following development and analysis of the six technology alternatives, and using the screening criteria discussed above, complete options (implementing solutions packages) were developed by combining alternatives. The Consultant Working Group created 12 complete options that include the full spectrum of combined alternatives, from the No Action Alternative to “treat everything.” These complete options were presented to the Santa Ynez River Water Conservation District

Improvement, District No. 1 Board of Trustees, and it approved the most flexible and cost-effective option to include treatment, blending, and well modification (SYRWD, ID#1 2018).

The Board of Trustees also approved a 45% rate increase to its customers to continue to pay for this process. This financial impact to its domestic and agricultural customers is a significant burden (SYRWD, ID#1 2018).

The Santa Ynez River Water Conservation District, Improvement District No. 1, has made every effort to find financial assistance to complete this mandate in the time allowed, including State Proposition 1, IRWM, and State Revolving Fund funding; U.S. Department of Agriculture rural assistance funding; and bonding. A particular disappointment was that although treatment for naturally occurring chromium-6 was included in the Proposition 1 language and in the accompanying water code, the guidance documents in the applicable areas precluded the Santa Ynez River Water Conservation District, Improvement District No. 1, from any grant assistance. As a result, the Santa Ynez River Water Conservation District, Improvement District No. 1, is finding it difficult to manage huge costs while not punishing its customers and the surrounding water districts that depend on it for some or all of their supplies (SYRWD, ID#1 2018).

The SWRCB Division of Drinking Water (formerly the California Department of Public Health) finalized the MCL of 10 ppb for chromium-6 effective July 1, 2014. This meant that the Santa Ynez River Water Conservation District, Improvement District No. 1, would have to comply with this new regulation or be in violation. Violation would mean fines, public notification of the violation, providing alternative drinking water supplies to its customers, and filing a mandatory compliance schedule with the SWRCB to come into compliance. On May 31, 2017, the Superior Court of Sacramento County issued a judgment invalidating the chromium-6 MCL for drinking water. The court ordered the State Water Resources Control Board (State Water Board or Board) to take the necessary actions to delete the chromium-6 MCL from the California Code of Regulations and to file with the court by August 15 proof that it has done so (*California Manufacturers and Technology Association, et al. v. California Department of Public Health, et al.* (Super. Ct. Sacramento County, 2017. No. 34-2014-80001850).

The change became effective with the Office of Administrative Law filing the change with the Secretary of State, on September 11, 2017. Thus, as of September 11, 2017, the MCL for chromium-6 is no longer in effect (SYRWD, ID#1 2018).

The Santa Ynez River Water Conservation District, Improvement District No. 1, currently operates nine groundwater wells, maintains an additional two groundwater wells on stand-by status, and monitors one well in the Santa Ynez Upland Groundwater Basin (Upland Basin), generally located north of Santa Ynez, California, in the Alamo Pintado Creek Watershed. Of these 12 groundwater wells, 4 have historically and consistently exceeded the chromium-6 MCL of 10 ppb, and 4 additional wells are so close to the MCL that they are a reliability threat.

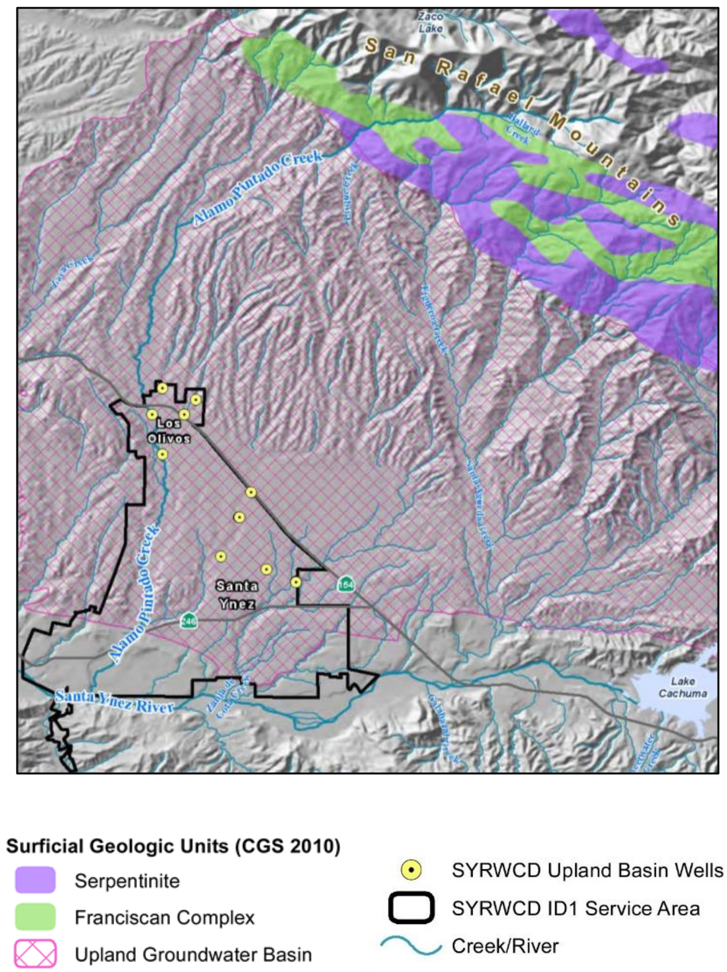

Figure 2.18. Santa Ynez River Water Conservation District Service Area – Upland

Buellton Upland Groundwater Basin

The Buellton Upland Groundwater Basin encompasses approximately 29 square miles located approximately 18 miles east of the Pacific Ocean and directly north of the Santa Ynez River. Current water quality data for the basin is limited. However, data from late 1950s and early 1960s indicate TDS concentrations between 300 and 700 mg/L for several wells within the basin (Public Works Department Water Resources Division Water Agency 2011).

Lompoc Groundwater Basins

The Lompoc Groundwater Basins consist of three hydrological sub-basins: the Lompoc Plain, Lompoc Terrace, and Lompoc Upland. Water quality in the Lompoc Plain varies significantly geographically and throughout the different zones of the upper and lower aquifer. Generally, groundwater quality decreases from east to west as the basin nears the coastline of the Pacific Ocean. The City of Lompoc is located in the Lompoc Plain. The Lompoc Plain is in equilibrium, because during periods of dry climate, water is released from Lake Cachuma to recharge groundwater levels in the eastern portion of the Lompoc Plain (County of Santa Barbara 2016; SBCWA 2012, 2014a; USGS 1992).

Areas of recharge in some portions of the eastern Lompoc Plain adjacent to the Santa Ynez River contain TDS concentrations greater than 1,000 mg/L. It is believed that leakage from the shallow zone is responsible for elevated TDS levels in the middle zone in the northeastern plain. Sulfates have generally ranged between 400 and 600 mg/L, and dissolved solids have generally ranged between 1,000 and 1,500 mg/L over the past 40 years. Point sources of sulfates and nitrates include WWTPs, industrial discharges, and agricultural return flows. Sulfates are not considered toxic to plants or animals at normal concentrations. In humans, concentrations of 500–700 mg/L cause a temporary laxative effect. Problems caused by sulfates are most related to their ability to form strong acids that can change the pH characteristics of a water body. In the middle zone, water samples taken from below agricultural areas of the northeastern plain contained TDS concentrations averaging more than 2,000 mg/L. However, some middle zone portions of the upper aquifer groundwater from the western plain exhibited TDS levels of less than 700 mg/L (County of Santa Barbara 2016; SBCWA 2012, 2014a; USGS 1992).

In the far western section of the Lompoc Plain, water quality changes dramatically. In this area near the coast, groundwater from the Main Zone exhibited TDS concentrations as high as 4,500 mg/L. Water quality in the shallow zone of the Lompoc Plain tends to be poorest near the coast and in some heavily irrigated areas of the sub-basin. Contamination of the Main Zone near the coast is thought to be due to percolation of seawater through estuary lands and upward migration of poor-quality connate waters (water trapped in the pores of the rock during formation of the rock) from the underlying rock. The presence of elevated boron, a constituent common in seawater, supports this conclusion (County of Santa Barbara 2016; SBCWA 2012, 2014a; USGS 1992).

Groundwater of the Lompoc Terrace and Lompoc Upland Sub-Basins is generally of better quality than that of the Lompoc Plain, with TDS averaging around 700 mg/L. Some of the natural seepage from these sub-basins is of excellent quality (County of Santa Barbara 2016; SBCWA 2012, 2014a; USGS 1992).

Groundwater Basins of the Santa Maria Watershed

San Antonio Groundwater Basin

The San Antonio Valley is approximately 30 miles long by 7 miles wide. It is cradled between the Solomon-Casmalia Hills to the north, the Purisima Hills to the south, the Burton Mesa to the west, and the westernmost flank of the San Rafael Mountains to the east. The watershed is approximately 130 square miles and the groundwater basin within the valley is approximately 110 square miles. Water quality studies conducted by USGS in the late 1970s indicated an average TDS concentration within the basin of 710 mg/L, with concentrations generally increasing westward. The cause of the westward water quality degradation is thought to be the accumulation of lower-quality water from agricultural return flow and the dissolution of soluble minerals. The highest TDS concentration (3,780 mg/L) was found in the extreme western end; the lowest concentration (263 mg/L) was found at the extreme eastern end. Analyses compiled for samples taken between 1958 and 1978 indicated that groundwater quality remained fairly stable during that period (USGS 2018). Analyses of water sampled in 1993 for several wells show only slight increases in TDS since the USGS study. There is evidence that poor-quality connate waters exist within fracture zones of the bedrock and that this water might be induced into overlying strata through excessive pumping. There is no evidence of seawater intrusion in the San Antonio Groundwater Basin, nor is the basin considered susceptible to seawater intrusion due to the consolidated rock that separates the basin from the Pacific Ocean (SBCWA 2012).

Santa Maria Valley Groundwater Basin

The Santa Maria Valley Groundwater Basin main unit is a 170-square-mile alluvial basin that is bordered by the Nipomo Mesa and Sierra Madre Foothills to the north, the San Rafael Mountains to the east, the Solomon–Casmalia Hills to the south, and the Pacific Ocean to the west. It is located in the northwest portion of Santa Barbara County and extends into the southwest portion of San Luis Obispo County. Groundwater quality conditions in the basin have fluctuated greatly since the 1930s, when historical water quality sampling began, with marked short- and long-term trends. The great majority of groundwater in the basin, primarily in the eastern and central portions of the Santa Maria Valley and in the Sisquoc Valley, had historically been of a calcium magnesium sulfate type originating from Cuyama River and Sisquoc River streamflows. Groundwater had historically been of better quality toward the Orcutt Upland, Nipomo Mesa, the City of Guadalupe, and coastal areas (Lippincott 1931, as cited in County of Santa Barbara 2013). Although recently general groundwater quality has been stable, nitrate concentrations in shallow groundwater have progressively increased. Deep groundwater concentrations remain markedly lower, generally less than 10 mg/L (Luhdorff and Scalmanini 2013, as cited in County of Santa Barbara 2013).

Occurrence of Nitrate – Santa Maria River Valley

A USGS report on groundwater quality in the South Coast Range–Coastal Study Unit published in 2013 found high and moderate relative concentrations of nitrate in the Santa Maria River Valley Groundwater Basin. High concentrations of nitrates (greater than 10 mg/L-N) were primarily focused in the northern part of the basin surrounding Santa Maria and Nipomo. The study found that nitrate concentrations had a positive correlation to agricultural land use and a negative correlation to natural land use and urban areas. Nitrate concentrations also correlated to the age of groundwater, with older groundwater having lower concentrations of nitrate compared to newer groundwater (USGS 2013, as cited in County of Santa Barbara 2013).

In 2013, the Santa Maria Valley Groundwater Assessment was completed by GEI Consultants for the Salt and Nutrient Planning Workgroup of the Santa Barbara County IRWM Group. The goal of the assessment was to support development of salt and nutrient management plans in the Region. The assessment found that nitrate loading to the valley decreased substantially between 1990 and 2010. Despite this decrease in loading, water quality in some areas continued to show high levels of nitrate, likely because the nitrate entering the valley continued to exceed the amounts discharged. In particular, nitrate levels have increased substantially in shallow wells, particularly in the western portion of the Santa Maria Valley (GEI 2013b).

Laguna County Sanitation District

The Laguna County Sanitation District produces recycled water at its wastewater reclamation plant that is then land-applied or used for industrial purposes. Currently, the wastewater reclamation plant is not designed for nitrogen removal, although some processes do achieve nitrogen reduction. Because water is land-applied, there are no limits set for its waste discharge requirements. Typically the crop or vegetation has a nutrient demand, and, consequently, the permit limits discharge to the agronomic and hydraulic requirements of the vegetation to which the water is applied. Therefore, land-applied water is not considered a source of nitrogen loading to the groundwater basin (County of Santa Barbara 2018b). Furthermore, in 2010, a Facilities Master Plan was completed for expanding and upgrading the wastewater reclamation plant. Upgrades are planned to begin in 2018, with completion anticipated in 2021, which will reduce the nitrogen concentration in the effluent by 30%–50%, to a total of less than 10 mg/L, which will further minimize the potential recycled water to impact nitrate levels in the valley (County of Santa Barbara 2018b).

City of Santa Maria

The City of Santa Maria is significantly affected by nitrate contamination in groundwater supplies. Nitrate concentrations in shallow groundwater in the Municipal Wellfield Area have shown an increasing trend from 50 mg/L–NO_3 a decade ago to 65 mg/L–NO_3 in 2015. To decrease nitrate concentration in the water supply to consistently meet drinking water standards, the City of Santa Maria blends groundwater with SWP water. The downside to this approach is that SWP water is considerably more expensive than groundwater, and including this source in the overall supply increases cost for the City of Santa Maria and ultimately its customers. In addition to blending, the City of Santa Maria manages groundwater nitrate concentration through direct delivery to irrigate turf in public areas.

In addition to taking steps to manage the impact of nitrate concentration to water deliveries, the City of Santa Maria is also actively working to decrease the quantity of nitrate entering groundwater. The City of Santa Maria worked in partnership with the CRCD and the agricultural community to construct a wood chip biofilter to remove nitrate from agricultural runoff before it percolates into the groundwater. The biofilter is located at Jim May Park adjacent to Santa Barbara County Flood Control District's Bradley ditch, which drains more than 5,700 acres of irrigated farmland. The goal of the project is to reduce the nitrate concentration in the water at the outlet of the filter to below the drinking water standard of 10 mg/L–N. The CRCD was instrumental in securing funding for the project through the SWRCB's Proposition 84 Agricultural Water Quality Grant Program.

Cuyama Valley Groundwater Basin

The Cuyama Valley is a rural agricultural area about 35 miles north of the City of Santa Barbara. It is bound by the Sierra Madre Mountains on the south and the Caliente Range on the north. Agricultural water use began in 1938 and has since progressively increased. The constant cycling and evaporation of irrigation water has resulted in decreasing water quality. Groundwater within the basin makes up 100% of the water supply for Cuyama Valley agriculture, petroleum operations, businesses, and homes. Agriculture accounts for more than 95% of the water use within the Cuyama Valley. Groundwater quality in the Cuyama Valley Groundwater Basin ranges from hard to very hard, and is predominantly of the calcium and magnesium-sulfate type, in great part due to the abundance of gypsum as a source material in the middle and upper parts of the watershed (Upson and Worts 1948, as cited in County of Santa Barbara 2013). TDS typically range from 1,500 mg/L to 1,800 mg/L in the main part of the Cuyama Valley Groundwater Basin. In the Cuyama Badlands on the eastern part of the basin, sub-watersheds Ballinger, Quatal, and Apache canyons have better water quality of a sodium or calcium bicarbonate type, with TDS typically ranging from 400 mg/L to 700 mg/L. Boron is generally higher in the upper part of the basin (9N/24W-33M1), and shows up more in the upland shallow (233 feet deep) well than deeper wells (depths of 1,000 feet) in the main part of the basin. Boron is not regulated but is generally accepted to be detrimental at approximately 300 micrograms per liter (µg/L) (Public Works Department Water Resources Division Water Agency 2011, as cited in County of Santa Barbara 2013). Water quantity and quality deteriorate toward the west end of the Cuyama Valley Groundwater Basin, where the basin's sediments thin. Toward the northeast end of the basin at extreme depth there exists poor-quality water, perhaps connate from rocks of marine origin. Although groundwater in the Cuyama Valley is only of fair to poor chemical quality, it has been used successfully to irrigate most crops. Presumably this has been possible because the sodium content of most of the water is relatively low and the soils are quite permeable. However, the leaching of soils carries dissolved salts from the root zone to the water table and may impact water quality over time (SBCWA 2012).

Occurrence of Arsenic – Cuyama Valley

Between 2008 and 2012, USGS and the Santa Barbara County Water Agency collected water samples to assess water resources of the Cuyama Valley Groundwater Basin. Of 33 wells sampled and analyzed for arsenic, 4 were found to contain levels greater than the MCL (10 ppb). The highest concentration of arsenic, 67.1 ppb, was measured in a well in the Southern-Main Zone of the basin. The 4 wells with the highest concentration of arsenic draw water older than 25,000 years, indicating that time to mobilize arsenic is an important component of total arsenic concentration in the Region (USGS 2017b).

The Cuyama CSD provides water service to approximately 800 residents of New Cuyama in the Cuyama Valley. Groundwater is the sole source of supply for the water system, and arsenic levels for supply wells have historically been between 30 and 35 ppb. In 2008, California revised the arsenic MCL from 50 ppb to 10 ppb. To supply water within the 10 ppb MCL, Cuyama CSD constructed an arsenic treatment plant in 2005. Pretreatment involves the injection of sodium hypochlorite and ferric chloride into supply water that is then filtered with two pressure filters. Due to poor design, the arsenic facility ran out of room for proper disposal of waste sludge generated by the treatment process, forcing the treatment plant to cease operation on September 9, 2009. The Cuyama CSD was able to secure grant funding for construction of additional sludge drying beds and a new 300,000-gallon treated water storage tank to improve operational efficiency and reduce the production of sludge. These projects were completed by September 2014. Between the cessation of treatment in 2009 and completion of projects in 2014, water customers were provided notices of the ongoing MCL exceedances. Arsenic is a chronic contaminant (meaning it can cause health effects after continuous long-term exposure at levels above the MCL), and customers were, therefore, able to continue to drink the water despite the exceedances.

Arsenic treatment adds a significant financial burden to the Cuyama CSD, and has resulted in the need for rate increases. In addition to the added expense of arsenic treatment, Cuyama CSD has had difficulty recovering all payments due from customers. This combination of factors has led to a significant decrease in Cuyama CSD's reserves and has impacted its ability to keep its wells fully operational. Previously Cuyama CSD operated two wells; however, one of those wells suffered significant structural damage that required it to be abandoned. Cuyama CSD began the process of digging a new well and bringing it online. The Cuyama CSD is now reliant exclusively on one well, and damage to that well or related infrastructure threatens Cuyama CSD's ability to supply water to its customers. Recently the pump for the remaining well failed, leaving Cuyama CSD in an emergency situation requiring significant reductions in water use by customers until emergency funding could be secured and the pump brought back online. In addition, despite construction of new drying beds, adequate sludge disposal continues to be a concern. To remedy this, the Cuyama CSD is currently exploring options to connect the arsenic treatment plant to the sewer system for disposal.

Occurrence of Nitrate – Cuyama Valley

In 2013, USGS and the Santa Barbara County Water Agency completed a report on the Cuyama Valley Groundwater Basin, including an analysis of water quality. Water samples collected from 12 monitoring wells and 27 domestic and supply wells found concentrations of nitrate greater than the MCL (10 mg/L) in 5 of the 39 wells. Four of the wells with concentrations of nitrate in excess of the MCL occurred in the Southern-Main Zone of the basin, which has a high concentration of agricultural activities. Nitrate concentrations were found to decrease with increased depth, indicating that the nitrate source is at or near the surface. Low concentrations of nitrate in surface-water recharge, the concentration of agricultural activities in the Southern-Main Zone, and the lowest concentrations of nitrate occurring outside of agricultural zones indicate irrigation return flows as a possible source of high nitrate concentrations (USGS 2013, as cited in County of Santa Barbara 2013).

Groundwater is currently the only source of supply in the Cuyama Valley Groundwater Basin. Residents of New Cuyama are served by the Cuyama CSD, and nitrate levels in excess of the MCL have not been found in Cuyama CSD supply wells. Residents of the Cuyama Valley living outside of the Cuyama CSD service area who receive water from private wells are at comparatively higher risk of exposure due to the lack of testing and treatment requirements for these types of wells. The Proposition 1 IRWM Disadvantaged Community Involvement Grant for the Central Coast Funding Area will be used to assess water needs and challenges in the Cuyama Valley.

The Cuyama Basin Water District, in concert with the Cuyama CSD and the counties of Santa Barbara, San Luis Obispo, Ventura, and Kern, formed a GSA in 2016. The data collected for creation of the Groundwater Sustainability Plan will likely identify nitrate issues.

2.10.2 Surface Water Quality

This section replaces IRWM Plan 2013 Section 3.11.2, Urban Surface Water Quality, and Section 3.11.3, Agricultural Water Quality, providing instead a comprehensive look at efforts being undertaken to protect water quality in the Region.

The quality of surface water bodies may be impacted by a combination of factors, including sedimentation, urban and agricultural runoff containing pesticides, fertilizers, green waste, animal waste, human waste, petroleum hydrocarbons (gasoline, diesel, motor oil), trash, sediment, salts (including selenium and boron), pathogens, and heavy metals. Large catastrophic wildfires such as the Zaca Fire in 2007 and more recently the Thomas Fire in 2017 have had significant impacts on surface water quality in Jameson Reservoir, Gibraltar Reservoir, and Lake Cachuma which has reduced the reliability of surface water supplies and increased water treatment costs.

Project Clean Water, Santa Barbara County Public Works Department, works to meet Clean Water Act requirements for urban runoff and to protect the public health and enhance environmental quality in Santa Barbara County watersheds and beaches. Section 402 of the Clean Water Act established the NPDES program to regulate the discharge of waste from a point source to a receiving water body. Phase II of the NPDES program, enacted in 1999, requires preparation of Storm Water Management Plans to manage discharge of urban runoff to receiving waters. Storm Water Management Plans summarize the management plan and strategies to maintain compliance in all applicable discharge and effluent prohibitions, including control measures such as public education and outreach on stormwater impacts, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development or redevelopment, and pollution prevention “good housekeeping.”

There are a number of potential urban stormwater constituents of concern that the NPDES Phase II Storm Water Management Program aims to control on a national level and that are found in low levels in many areas throughout the County. These urban pollutants may include sediment, nutrients, bacteria and viruses, oil and grease, metals, organic compounds, pesticides, and gross pollutants such as trash. Stormwater and incidental urban runoff are two of the primary carriers of pollutants that enter the County storm drain systems and creeks. Non-storm urban runoff from commercial and residential areas, streets, parking lots, city and commercial facilities, and building construction sites, among others, can all contribute as nonpoint sources of water pollution. Santa Barbara County has led the development of an Integrated Stormwater Resources Plan (SWRP), including eight Cooperating Entities: five cities (Buellton, Carpinteria, Goleta, Guadalupe, and Solvang), two water districts (Carpinteria Valley and Montecito), and UCSB. The SWRP is a regional, watershed-based plan intended to improve the management of stormwater resources throughout Santa Barbara County by identifying water system improvements which increase user self-reliance on local water supplies. Water system improvements will be achieved through the following project types: (1) stormwater and dry-weather runoff capture projects, (2) surface water treatment facilities, and (3) green infrastructure. In addition to the aforementioned SWRP, the City of Santa Maria and the Goleta Water District have prepared SWRPs consistent with mandates of the Storm Water Resource Planning Act (SB 985), both of which have been adopted into the IRWM Plan as Appendices 2-E and 2-F. Moreover, the City of Santa Maria has a SWRCB-recognized “functionally equivalent” SWRP that has been adopted into the IRWM Plan, and the Goleta Water District prepared and received SWRCB approval of the SWRP they prepared. This, too, has been adopted by the Regional Water Management Group as Appendix 2-G to the IRWM Plan.

The Central Coast RWQCB uses Conditional Waiver of Waste Discharge Requirements, commonly known as an “Ag Order,” to control discharges from irrigated agricultural lands to protect surface water and groundwater quality. This permit applies to owners and operators of irrigated land used for commercial crop production; it is intended to control pollution from pesticides, nutrients, and sediments. Each grower in the Central Coast region must submit a Notice of Intent to comply with the Agricultural Order.

The Central Coast RWQCB approved a new Agricultural Order on March 8, 2017. The Agricultural Order includes water quality monitoring of surface water and groundwater, as well as implementing nutrient management practices pursuant to a plan developed specifically for each farming operation. Depending on the nature and size of agricultural operations, operators are required to develop farm water quality management plans and monitoring programs, and to report on total nitrogen application.

The Agricultural Order applies to all lands planted in row crops, vines, fields, or tree crops where water is applied for commercial production, commercial nurseries, nursery stock production, and greenhouse operations, and land planted in commercial crops that are not currently marketable, including vineyards and tree crops. To most effectively target efforts, the Agricultural Order program is ordered into three tiers of agriculturalists based on relative risk to water quality and discharge, with Tier 1 being the lowest risk and Tier 3 being the highest risk.

The assessment of risk includes a series of factors, including the following:

- Type of farm or ranch
- Number of acres cultivated
- Approval of a sustainable agricultural program
- Potential to discharge nitrogen to groundwater
- Distance from surface bodies and listed impaired surface bodies
- Distance to a public water system

Each tier has a set of conditions that need to be met. Also, in addition to the tier-specific requirements, there is a standard set of requirements that need to be met regardless of tier. Currently, there is a 5-year compliance calendar.

Areas Requiring Targeted Action

Occurrence of Nitrate – Santa Ynez River Watershed

The lower Santa Ynez River, downstream of the City of Lompoc, has historically been recognized as having significantly high nitrate concentrations. This portion of the river has been listed on the California Clean Water Act Section 303(d) List since 1998. The City of Lompoc has taken action to reduce loading from the Lompoc Regional Wastewater Reclamation Plant, and the Central Coast RWQCB has initiated a TMDL process to address all sources of contamination entering the river (Central Coast RWQCB 2018d).

City of Lompoc

Historically, point-source discharges of treated wastewater from the Lompoc Regional Wastewater Reclamation Plant have been recognized as a significant source of nitrate in the Santa Ynez River. In 2009, the City of Lompoc completed major upgrades to the Lompoc Regional Wastewater Reclamation Plant, leading to decreases in nitrate concentrations in effluent between 2009 and 2012. Despite historically high surface-water nitrate concentrations, supply wells for the City of Lompoc have been at non-detect levels for nitrate for many years. Occasionally, nitrate levels of up to 1 mg/L-N are detected in effluent from the water treatment plant, indicating that sometimes the treatment process introduces trace levels of nitrate, but these levels are well below the water quality standard (Central Coast RWQCB 2018e).

Santa Ynez River TMDL

Section 303(d) of the federal Clean Water Act requires every state to evaluate its water bodies and maintain a list of waters that are considered “impaired” either because the water exceeds water quality standards or does not achieve its designated use. For each water body on the Central Coast RWQCB’s 303(d) Impaired Waters List, the RWQCB must develop and implement a plan to reduce pollutants so that the water body is no longer impaired and can be de-listed. The RWQCB is the agency responsible for protecting water quality consistent with the Water Quality Control Plan for the Central Coastal Basin (Basin Plan), including developing TMDLs for water bodies identified as not meeting water quality objectives. The section of the Santa Ynez River below the City of Lompoc to the Pacific Ocean is on the 303(d) list for nitrate. The upper Santa Ynez River Basin is characterized as primarily undisturbed, and the lower basin is characterized by urbanized/developed lands and cultivated cropland, in addition to natural areas. Levels of nitrate are well in excess of natural background conditions, indicating that controllable conditions may be causing or contributing to water quality impairment (Central Coast RWQCB 2018f).

The Central Coast RWQCB has initiated a TMDL process for nutrients, specifically nitrate, in the Santa Ynez Valley to improve water quality. In April 2016, the Central Coast RWQCB produced a TMDL Scoping Report for the Santa Ynez Basin to present information in support of development of a TMDL. Based on the initial scoping report, the Central Coast RWQCB determined that a broader review of nutrient surface water quality data and a look at possible water quality improvements in the Santa Ynez River is merited. As a next step in TMDL development, Central Coast RWQCB staff anticipates conducting a watershed assessment of the river basin (Central Coast RWQCB 2018d).

City of Solvang

Pursuant to the ongoing development of TMDLs for the Santa Ynez River (of which nitrate is a top concern), the Central Coast RWQCB made the decision to include limits for nitrate in the waste discharge permit for discharge from the City of Solvang's WWTP. The City of Solvang's waste discharge permit was scheduled to be renewed in 2017. To comply with the new requirement to limit nitrate in the effluent, the City of Solvang undertook modifications to the WWTP treatment process to facilitate denitrification. Denitrification to within the limits set by the new waste discharge permit was achieved in April 2017. Modifications to the operation of the WWTP to allow for denitrification resulted in a reduction in the excess capacity of the WWTP. Prior to modification, the plant operated at approximately 60% of capacity. Following the addition of denitrification processes, the WWTP is now operating at approximately 80% capacity (Central Coast RWQCB 2018f).

Occurrence of Nitrate – Santa Maria River Watershed

The Santa Maria River and many surface water bodies in the lower watershed do not meet water quality standards for designated drinking water supply and groundwater recharge beneficial uses because of nitrate concentrations. Due to these high concentrations of nitrates, they are included on the Clean Water Act 303(d) list of impaired waters for nitrate impairment (Central Coast RWQCB 2018f).

Santa Maria River TMDL

Section 303(d) of the federal Clean Water Act requires every state to evaluate its water bodies and maintain a list of waters that are considered "impaired" either because the water exceeds water quality standards or does not achieve its designated use. For each water body on the Central Coast RWQCB's 303(d) Impaired Waters List, the RWQCB must develop and implement a plan to reduce pollutants so that the water body is no longer impaired and can be de-listed. The RWQCB is the agency responsible for protecting water quality consistent with the Basin Plan, including developing TMDLs for water bodies identified as not meeting water quality objectives. To improve water quality in the impaired water bodies in the lower Santa Maria River Watershed, the Central Coast RWQCB approved a TMDL for nutrients that went into effect on May 22, 2014. The TMDL for nitrogen compounds (nitrate and unionized ammonia) covers approximately 237 square miles of the lower watershed. RWQCB staff developed the TMDL using water quality data from the RWQCB's Central Coast Ambient Monitoring Program, the Cooperative Monitoring Program, the City of Santa Maria, and the County of Santa Barbara's Project Clean Water (Central Coast RWQCB 2018f).

The Central Coast RWQCB has identified sources that are causing or contributing to water quality impairment and their responsible parties, and has proposed pollutant allocations necessary to achieve the TMDLs. The numeric target for nitrate in all waters and reaches of the Santa Maria River upstream of Highway 1 is 10 mg/L-N, equal to the Basin Plan's numeric objective protective of drinking water beneficial uses. Downstream of Highway 1, the nitrate TMDL is 4.3 mg/L-N in the dry season and 8 mg/L-N in the wet season to achieve Basin Plan targets for biostimulatory substances. Un-ionized ammonia has a numeric target of 0.025 mg/L-N, which is equal to the Basin Plan's un-ionized ammonia numeric water quality objective against toxicity in surface water (Central Coast RWQCB 2018f).

The final concentration-based allocations are to be attained by 30 years after the TMDL went into effect. Interim allocations are also established by the TMDLs to assess progress toward achieving the final allocations. TMDL is implemented through the Conditional Waiver of Waste Discharge Requirements for Irrigated Lands.

<u>Salt and Nutrient Management Plans</u>

A broad initiative is underway to address nutrients in the Santa Maria Valley. Salt and nutrient plans are required of certain discharges by RWQCB Policy 2009-0011. To initiate development of salt and nutrient plans, WWTP operators and other stakeholders in the Santa Maria Valley conducted a focused assessment of salt and nutrients in the groundwater basin from 2012–2013. The assessment was prepared to evaluate sources, transport, and fate of "salts" and "nutrients" (nitrate and other forms of nitrogen) in surface water and groundwater within the Santa Maria Valley. The goals of the assessment were to identify regulatory requirements, gather and evaluate data, summarize key issues, and provide recommendations to support future development of salt and nutrient management plans by individual stakeholders within the Santa Maria Valley. The assessment describes this planning process and provides more detail on sources and transport of salts and nutrients in the Santa Maria Valley (GEI 2013b). WWTP operators are continuing to work on meeting SWRCB requirements.

2.10.3 Ocean Water Quality

Ocean water quality is of concern in Santa Barbara County, as it is in many places along the California coast. Scientific evidence has linked stormwater runoff with high levels of indicator bacteria in creeks and ocean water. Exposure to indicator bacteria correlates with an increased health risk to humans, requiring beach warnings. Sources of these indicator bacteria may include human and domestic and wild animal excrement, decomposing plant matter, and septic and sanitary sewer overflow. Investigations of the City of Santa Barbara sewer system, for example, have indicated that local sewer pipe leaks likely occur in some areas of the city, contributing untreated wastewater to the shallow groundwater zone that can eventually make its way to creeks and beaches. In addition, poorly placed septic systems on beaches, near creeks, in marshes, and in areas of high groundwater have leached into creeks, marshes, groundwater, and the ocean (County of Santa Barbara 2003).

Heal the Ocean, a Santa Barbara non-profit group, has been successful in facilitating and finding state funding for the conversion of 130 beach homes from septic systems to public sewer, including the world-famous Rincon surf area, and is continually seeking state funding to help upgrade sewer infrastructure and recycled water facilities, and help homeowners abandon faulty septic systems.

Santa Barbara County Environmental Health Services began conducting weekly year-round sampling of 20 beaches between Rincon and Guadalupe Dunes in 1996. This sampling was supported by a combination of State and local funding. Reductions in available funding caused a slight reduction in monitoring, Currently, Environmental Health Services tests 16 beaches between Guadalupe Dunes and Carpinteria State Beach. Santa Barbara County Environmental Health Services distributes test results in weekly press releases to media sources and interested groups and individuals. In addition, a computer database of past results is maintained to help understand trends (https://www.countyofsb.org/phd/oceanwatermonitoring/). Stormwater is a major contributor to ocean water exceedances.

2.11 Social and Cultural Makeup of Santa Barbara County

2.11.1 Economic Conditions and Trends in the Region

Santa Barbara County is economically diverse, with pronounced differences between the north and south. Agricultural activities and oil development traditionally have been the dominant economic forces north of the Santa Ynez Mountains, although in recent years, tourism has increased, oil leases have been decommissioned, and more white collar workers have been moving into the area because of the high housing prices in the south. Agriculture continues to be the County's major producing industry.

The South Coast's economy is largely based on tourism, software and other high-tech pursuits, and education-related activities, although the area continues to support oil development offshore and agricultural activities continue to occur in the Goleta and Carpinteria Valleys, particularly in the foothills. The South Coast has experienced slow economic growth in recent years, while the North County has undergone considerable economic growth. This is due in large part to the extremely high cost of housing in the South Coast, where the median price of a single-family home hovers around $1 million. As a result, the North County is undergoing significant population growth, which, in turn, is driving construction and service industry growth in the area. Economists predict that the North County region will be the main driving force in the economy for the foreseeable future because of relatively affordable housing, available work force, and a perceived business-friendly environment (UCSB 2006, as cited in County of Santa Barbara 2013).

2.11.2 Social and Cultural Makeup

San Barbara County demographic information is summarized in Table 2.12. The County is predominantly composed of white persons (46.3%), with persons of Hispanic or Latino origin (44.1%), Asian (4.9%), American Indian/Alaska Native (0.4%), Black/African American (1.7%), Native Hawaiian or other Pacific Islanders (0.1%), some other race (0.1%), and two or more races (2.2%) composing the rest of the population (U.S. Census Bureau 2017).

Most of the County's population lives in the coastal valleys and in the cities of Santa Barbara and Santa Maria. Other population centers on the South Coast include the cities of Goleta and Carpinteria, along with unincorporated areas such as Isla Vista, Hope Ranch, Mission Canyon, Montecito, and Summerland. The cities of Solvang and Buellton; the unincorporated communities of Los Olivos, Ballard, and Santa Ynez; and the Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation are located in the Santa Ynez Valley, north of the Santa Ynez Mountains. The City of Lompoc, the unincorporated communities of Vandenberg Village and Mission Hills, VAFB, and the Lompoc Federal Correctional Complex are in the Lompoc Valley, where the Santa Ynez River flows out to the Pacific Ocean. Los Alamos is the only community in the San Antonio Watershed. The cities of Santa Maria and Guadalupe, and the unincorporated towns of Orcutt, Casmalia, Betteravia, Garey, and Sisquoc are located in the northern portion of the County. The city of Santa Maria is the largest city in Santa Barbara County. Northeast of the San Rafael Mountains is dry and sparsely populated Cuyama Valley, where the communities of Cuyama and New Cuyama are located. The County population of approximately 451,688 is projected to increase to 492,495 by 2030 and to 516,163 by 2040 (California Department of Finance 2017).

Due, in part, to the high cost of housing, the population in the South County is becoming increasingly stratified. The number of middle class residents is decreasing, leaving a concentration of younger and poorer residents, and older and wealthier retirees. School enrollments have been declining in the South County because working families cannot afford housing and choose to move to less-expensive areas. The North County, on the other hand, is experiencing an influx of younger families because housing is more affordable. North County school enrollments are on the rise (UCSB 2006, as cited in County of Santa Barbara 2013).

Santa Barbara residents appreciate its mild climate, scenic beauty, beaches, mountains, recreational resources, and cultural opportunities. Those qualities that make the County a desirable destination for tourists also make it an appealing place to live.

Disadvantaged Communities

This section of the document encompass a variety of communities, including disadvantaged and severely disadvantaged communities (DACs and SDACs), economically distressed areas, and underrepresented and vulnerable communities. Some of these designations are beyond the scope of the 2016 Guidelines; however, they have been included here due to these communities' water needs and interfaces with the watersheds.

DWR defines a DAC as a community with an annual median household income (MHI) that is less than 80% of the statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the statewide annual MHI are considered SDACs. Under California Water Code (CWC) Section 79702 (K), DWR defines an economically distressed area as follows: (1) a municipality with a population of 20,000 persons or less; (2) a rural county; or (3) a reasonably isolated and divisible segment of a large municipality where the segment of the population is 20,000 persons or less and that has an annual MHI of less than 85% of the statewide MHI as well as one or more of the following conditions, as determined by DWR: (1) financial hardship; (2) unemployment rate of at least 2% higher than the statewide average; or (3) low population density (DWR 2015a).

For purposes of DWR's Disadvantaged Communities Involvement Grant (DACI) Program (DWR 2016b), underrepresented communities were categorized under the DAC umbrella. For the purposes of the Santa Barbara County IRWM region, however, underrepresented communities is defined as those communities whose voices have historically not been included or reflected in the larger societal dialogue and narrative and is not only limited to an economically derived definition. Underrepresented communities, therefore, in this context as defined by the Regional Water Management Group includes Tribal/First Nations' communities, recent immigrants, communities of color, youth, the elderly, and other populations that are traditionally underserved or underrepresented. "Vulnerabl0e communities" as defined by the Regional Water Management Group includes the temporarily unsheltered and chronically unsheltered communities.

The Santa Barbara County IRWM region includes nine DACs and SDACs: New Cuyama, Cuyama, Casmalia, Sisquoc, Isla Vista, and Garey, and the cities of Guadalupe, Lompoc, and Santa Maria, all of which are located in North County, except the City of Lompoc, which is located in mid-County, and the community of Isla Vista, which is located in South County (see Figure 2.19, Disadvantaged Communities, Severely Disadvantaged Communities, and Economically Distressed Areas). In addition, the community of Tanglewood, which is included in “A Needs Assessment for Santa Barbara County and Southern San Luis Obispo County” (Kennedy Communications 2017) has been defined as a DAC despite not meeting the income guidelines. A growing concern with the MHI criterion is the recognition that in many communities, there is more than one household residing in a single-family dwelling and that multiple families or households are actually contributing to a residence in order to be able to afford the home. Therefore, in consideration of this reality and relying on the recent work contained in the “A Needs Assessment for Santa Barbara County and Southern San Luis Obispo County” (Kennedy Communications 2017), Tanglewood requires further study and a potential income survey. Additionally, the community of Ventucopa, which is located in the northeastern portion of the Santa Barbara IRWM region, east of Cuyama and bordering Ventura and Kern Counties as well as the Los Padres Forest is home to 92 people and has one privately owned water system. This agricultural community is likely disadvantaged. The Needs Assessment efforts funded through the DACI grant is addressing this area and has surveyed the Ventucopa townsite, along with the whole Ventucopa Uplands as far as Lockwood Canyon Road.

DACs were identified by reviewing MHI data from the U.S. Census Bureau’s American Community Survey 2011–2015 data for all zip codes within Santa Barbara County and identifying those that were 80% or less of the statewide MHI of $61,818 (80% of which is $49,454). SDACs are defined as those with an MHI of less than 60% of the statewide MHI, or $37,091 (U.S. Census Bureau 2016a).

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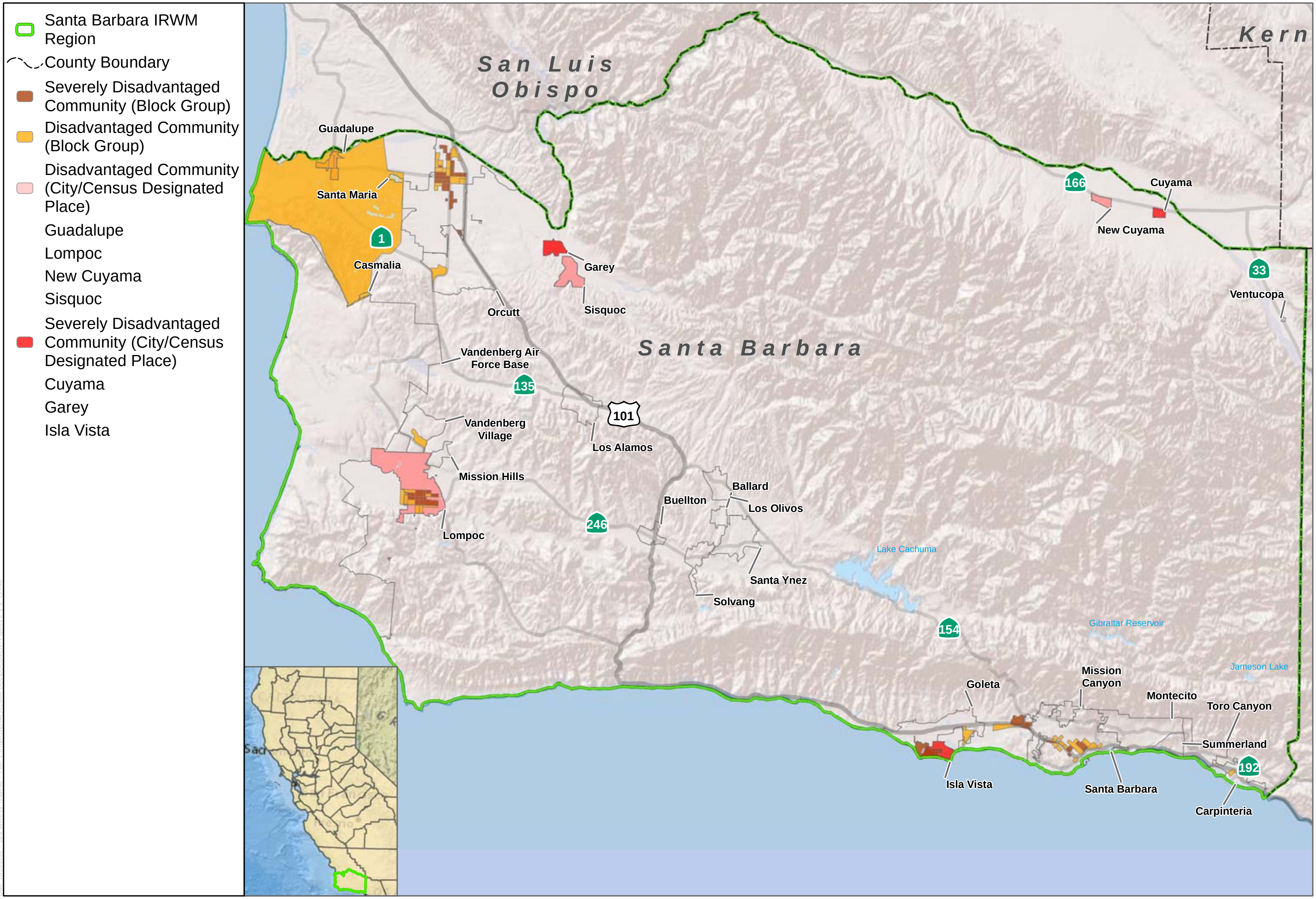

SOURCE: Shaded Relief; County of Santa Barbara 2018; US Census ACS 5-Year 2010-2014

DUDEK

FIGURE 2.19

Disadvantaged Communities, Severely Disadvantaged Communities, and Economically Distressed Areas

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MHIs for all census rated DACs and SDACs identified in the Santa Barbara IRWM Region are presented in Table 2.12 and summarized as follows: Guadalupe, $43,710; Casmalia, $46,394; New Cuyama, $40,125; Cuyama, $27,159; Isla Vista, $20,550; City of Lompoc, $44,866; Sisquoc, $44,500; and Garey (no Census MHI data available). In comparison, the MHI for all Santa Barbara County zip codes is $63,985 (U.S. Census Bureau 2016a).

Sisquoc, New Cuyama, Garey, Cuyama, and Casmalia are fairly isolated from other populated areas within the County. DACs face financial hardships that can make paying for reliable, high-quality water supplies challenging for water service providers and individuals. Water quality issues, such as arsenic contamination in the Cuyama Valley, are expensive to treat, increasing costs for service providers and rates for their customers. In an effort to ensure access to affordable supplies for customers, service providers sometimes delay rate increases. When costs increase and rates do not, service providers deplete reserve funds and can handicap their ability to respond to unforeseen challenges, such as infrastructure failures, which threaten supply reliability. Even with timely rate increases, balancing the high costs of treatment can be challenging for small service providers.

Lack of sufficient funding can also impede a supplier's ability to provide water that meets all health standards. Failures in water quality treatment infrastructure or disposal systems that cannot be quickly resolved due to lacking funds can threaten public health. In these situations, suppliers may be required to issue "boil before drinking" advisories or provide customers with alternative drinking water supplies. Preventing and responding to threats to water quality and reliability may also be thwarted by the limited capacity of small service providers. Service provider staff may lack the resources necessary to effectively manage treatment and delivery systems. This lack of capacity may further exacerbate the challenges that small, financially disadvantaged service providers face.

Residents of DACs that are not supplied water by a local service provider face additional challenges. Testing and treatment on an individual well basis is often prohibitively expensive, increasing the risk of exposure to contaminants of individuals served by these wells.

Table 2.12 summarizes regional and watershed issues and challenges faced by DACs. Those challenges include lack of affordable supply in Casmalia; Cuyama Valley Groundwater Basin overdraft that threatens water supply reliability for residents and creates water quality impairments; flooding in Cuyama where isolated thunderstorms in the summer and high winter flows can wash out and damage roads and highways; the undersized and unreliable distribution system currently serving Isla Vista.

Tribal Communities

Established in 1901, the Santa Ynez Reservation is located adjacent to the City of Santa Ynez in the Santa Ynez Valley. The residents of the Santa Ynez Reservation are members of the Santa Ynez Band of Chumash Indians, the only federally recognized Chumash tribe in the nation. There are 249 residents on the Santa Ynez Reservation and 97 homes. Other tribal members live in the surrounding towns.

In 1994, the Chumash opened a small casino, which was further developed into a 190,000-square-foot gaming facility in 2003. Revenue generated by the facility has been used to provide tribal members opportunities for education, has improved healthcare, and has created jobs for tribal members and the local community.

Table 2.12
Santa Barbara County Demographic Information Summary

Area	Population	Average House-hold Size[a]	Median Age	Median House-hold Income	Primary Language	Ethnicity: Number (Percent)
Santa Barbara County	435,850	3.1	33.6	$63,985	English: 60.4% Spanish: 32.7% Other: 6.9%	White: 201,998 (46.3%) Hispanic/Latino: 192,304 (44.1%) Black/African American: 7,421 (1.7%) American Indian/Alaska Native: 1,791 (0.4%) Asian: 21,535 (4.9%) Native Hawaiian/Other Pacific Islander: 630 (0.1%) Some other race: 398 (0.1%) Two or more races: 9,773 (2.2%)
Ballard Census Designated Place (CDP)	373	2.5	50	98,125	English: 84.6% Spanish: 10.6% Other: 4.7%	White: 300 (80.4%) Hispanic/Latino: 73 (19.6%)
Casmalia CDP	116	3.5	57.5	$46,394[b]	English: % Spanish: % Other: %	White: 48 (41.4%) Hispanic/Latino: 680 (58.6%)
City of Buellton	4,977	2.7	44.1	$71,667	English: 75% Spanish: 19.3% Other: 5.7%	White: 3,189 (64.1%) Hispanic/Latino: 1,351 (27.1%) Black/African American: 109 (2.2%) Two or more races: 156 (3.1%) Other: 172 (3.4%)

Table 2.12
Santa Barbara County Demographic Information Summary

Area	Population	Average House-hold Size[a]	Median Age	Median House-hold Income	Primary Language	Ethnicity: Number (Percent)
City of Carpinteria	13,449	2.6	44.2	$71,174	English: 60.8% Spanish: 33.5% Other: 5.7%	White: 6,671 (49.6%) Hispanic/Latino: 5,893 (43.8%) Asian: 540 (4.0%) Other: 345 (2.6%)
City of Goleta	30,541	2.8	37.1	$80,438	English: 64.3% Spanish: 26.4% Other: 9.2%	White: 15,287 (50.1%) Hispanic/Latino: 11,462 (37.5%) Asian: 2,474 (8.1%) Two or more races: 817 (2.7%) Other: 501 (1.6%)
City of Guadalupe	7,218	3.9	27.9	$43,710	English: 33.4% Spanish: 63.5% Other: 3.1%	White: 510 (7.1%) Hispanic/Latino: 6,174 (85.5%) American Indian/Alaska Native: 170 (2.4%) Asian: 190 (2.6%) Other: 64 (2.5%)
City of Lompoc	43,428	3.2	32.6	$44,866	English: 57.8% Spanish: 38.6% Other: 3.7%	White: 14,443 (33.3%) Hispanic/Latino: 23,622 (54.4%) Black/African American: 2,173 (5.0%) Asian: 1,214 (2.8%) Two or more races: 1,494 (3.4%) Other: 482 (1.1%)
City of Santa Barbara	90,401	2.6	36.7	$66,107	English: 62.5% Spanish: 30.4% Other: 7.1%	White: 48,613 (53.8%) Hispanic/Latino: 35,708 (39.5%) Asian: 2,909 (3.2%) Other: 3,171 (3.5%)
City of Santa Maria	102,618	3.7	29.4	$50,433	English: 36.1% Spanish: 58.4% Other: 5.5%	White: 21,016 (20.5%) Hispanic/Latino: 74,446 (72.5%) Asian: 5,002 (4.9%) Other: 2,154 (2.1%)
City of Solvang	5,456	2.2	49.5	$67,484	English: 75.5% Spanish: 19.3% Other: 5.1%	White: 3,870 (70.9%) Hispanic/Latino: 1,415 (25.9%) Other: 171 (3.1%)

Table 2.12
Santa Barbara County Demographic Information Summary

Area	Population	Average House-hold Size[a]	Median Age	Median House-hold Income	Primary Language	Ethnicity: Number (Percent)
Cuyama CDP	91	3.6	21.9	$27,159	English: 19.7% Spanish: 59.2% Other: 21.1%	White: 22 (24.2%) Hispanic/Latino: 66 (72.5%) Asian: 3 (3.3%)
Garey CDP	170	7.4	35.5	Not available[c]	English: 12.4% Spanish: 87.6%	White: 18 (10.6%) Hispanic/Latino: 152 (89.4%)
Isla Vista CDP	26,275	5.1	20.7	$20,550	English: 63.4% Spanish: 15.9% Other: 20.8%	White: 14,005 (53.3%) Hispanic/Latino: 5,998 (22.8%) Black/African American: 646 (2.5%) Asian: 4,486 (17.1%) Two or more races: 1,030 (3.9%) Other: 110 (0.4%)
Los Alamos CDP	1,607	3.0	38.9	$61,115	English: 68.8% Spanish: 29.2% Other: 2%	White: 965 (60.0%) Hispanic/Latino: 593 (36.9%) Other: 49 (3.0%)
Los Olivos CDP	1,007	2.5	48.4	$89,605	English: 91.6% Spanish: 8.4%	White: 808 (80.2%) Hispanic/Latino: 88 (8.7%) American Indian/Alaska Native: 11 (1.1%) Native Hawaiian/Other Pacific Islander: 39 (3.9%) Two or more races: 61 (6.1%)
Mission Canyon CDP	2,520	2.7	49.8	$129,227	English: 87.4% Spanish: 7.3% Other: 5.3%	White: 2,292 (91.0%) Hispanic/Latino: 102 (4.0%) Two or more races: 64 (2.5%) Other: 62 (2.5%)
Mission Hills CDP	3,679	3.1	42.2	$83,234	English: 69.9% Spanish: 27.8% Other: 2.2%	White: 1,816 (49.4%) Hispanic/Latino: 1,312 (35.7%) Asian: 53 (1.4%) Two or more races: 211 (5.7%) Other: 287 (8.5%)
Montecito CDP	9,471	2.9	48.5	$136,619	English: 87.5% Spanish: 6.0% Other: 6.5%	White: 8,711 (86.2%) Hispanic/Latino: 760 (8.0%) Asian: 271 (2.9%) Two or more races: 221 (2.3%) Other: 56 (0.6%)

Table 2.12
Santa Barbara County Demographic Information Summary

Area	Population	Average House-hold Size[a]	Median Age	Median House-hold Income	Primary Language	Ethnicity: Number (Percent)
New Cuyama CDP	665	3.1	26.7	$40,125	English: 35.5% Spanish: 64.0% Other: 0.5%	White: 179 (26.9%) Hispanic/Latino: 471 (70.8%) Two or more races: 15 (2.3%)
Orcutt CDP	29,908	2.8	43.1	$72,597	English: 86.6% Spanish: 8.5% Other: 4.9%	White: 20,939 (70%) Hispanic/Latino: 6,205 (20.7%) Asian: 1,182 (4.0%) Two or more races: 961 (3.2%) Other: 621 (2.0%)
Santa Ynez CDP	4,489	2.6	49.7	$100,202	English: 82.8% Spanish: 11.2% Other: 6.1%	White: 3,196 (71.2%) Hispanic/Latino: 707 (15.7%) American Indian/Alaska Native: 235 (5.2%) Asian: 127 (2.8%) Two or more races: 161 (3.6%) Other: 19 (0.4%)
Sisquoc CDP	291	3.8	25.8	$44,500	English: 62.0% Spanish: 23.0% Other: 15%	White: 128 (44%) Hispanic/Latino: 98 (33.7%) American Indian/Alaska Native: 65 (22.3%)
Summerland CDP	1,505	1.9	50.2	$76,973	English: 74.4% Spanish: 5.2% Other: 20.4%	White: 1,013 (67.3%) Hispanic/Latino: 144 (9.6%) Black/African American: 31 (2.1%) Asian: 250 (16.6%) Some other race: 34 (2.3%) Two or more races: 33 (2.2%)
Toro Canyon CDP	1,580	2.5	52.4	$120,227	English: 77.8% Spanish: 16.4% Other: 5.8%	White: 1,151 (72.8%) Hispanic/Latino: 429 (27.2%)
Vandenberg Air Force Base CDP	3,317	3.8	23.5	$58,893	English: 84.4% Spanish: 10.8% Other: 4.7%	White: 1,789 (53.9%) Hispanic/Latino: 739 (22.3%) Black/African American: 247 (7.4%) American Indian/Alaska Native: 17 (0.5%) Asian: 127 (3.8%) Two or more races: 398 (12%)

Table 2.12
Santa Barbara County Demographic Information Summary

Area	Population	Average House-hold Size[a]	Median Age	Median House-hold Income	Primary Language	Ethnicity: Number (Percent)
Vandenberg Village CDP	6,763	2.5	42.3	$73,182	English: 87.6% Spanish: 7.6% Other: 4.8%	White: 4,544 (67.2%) Hispanic/Latino: 1,372 (20.3%) Black/African American: 221 (3.3%) Asian: 171 (2.5%) Two or more races: 328 (4.8%) Other: 127 (1.9%)

Source: U.S. Census Bureau 2016b.
Notes:
a Average household size determined by dividing total population by the number of occupied housing units.
b 2011–2015 American Community Survey 5-year estimates for the Casmalia CDP report MHI as $67,679, with a margin of error of +/−39,462. Given this very large margin of error and local knowledge of economic opportunities in Casmalia, data from the 2010 Census ($42,692 +/− 6,853) was determined to be more accurate. The 2010 estimate was converted to 2015 dollars ($46,393.88) for inclusion in this table.
c Median household income data are reported by the U.S. Census Bureau's American FactFinder as "not available for this topic and the selected geography."

Vulnerable Communities

Like many places in California, the chronically unsheltered population has grown significantly over the past decade and these communities have located themselves within and adjacent to surface watercourses and channels. This poses a number of challenges for water quality and flood control in all of the rivers and creeks within the region. There are a number of projects underway through a consortium of agencies and NGOs to relocate populations out of waterways and into temporary and permanent housing.

2.12 Natural Hazards Requiring Emergency Planning

Water resources planning in Santa Barbara County must consider the potential for service disruptions due to natural hazards, such as earthquakes, fires, and floods, which can damage water and wastewater infrastructure. Additionally, the area experiences periodic droughts, which requires planning for potential shortages.

2.12.1 Severe Storms and Flooding

Santa Barbara County experiences periods of high-intensity rainfall that causes flash flooding and landslides. For example, widespread problems resulted from the December 2004–January 2005 storms, including facilities damage, road and railroad closures, mudslides, debris flows, creek blockages and overtopping, flooding, power outages, fallen trees, and beach erosion. On January 9, 2018, a high-intensity storm dropped more than 0.5 inches of rainfall in 5 minutes, meeting or exceeding the 200-year storm standard. The storm's intensity was amplified because the Thomas Fire, the largest in California history at the time, had burned much of the watershed just days before. The Thomas Fire stripped vegetation and reduced the water-absorbing properties of the soil. Under these conditions, the high-intensity storm led to mud and debris flows that coursed through Montecito neighborhoods, destroying homes and infrastructure and claiming the lives of 21 people (Santa Barbara County, 2018.

Some areas in Santa Maria experience chronic flooding in modest storm events. All areas of the County experience threat from flood damage in years of exceptional storms.

The Cuyama Valley agricultural area in proximity of the Cuyama River is highly susceptible to flooding because the river banks are shallow (less than 4 feet high) and highly erodible, so natural water containment is limited. In other areas, west of the town of New Cuyama, the river has steep and unstable cut banks. This has resulted in bank failure that has caused loss of life, loss of land, and siltation of the Twitchell Reservoir, downstream.

The Santa Maria Valley has a history of flooding that has been lessened by construction of the Twitchell Reservoir and the Santa Maria River Levee. The Twitchell Reservoir continues to provide effective flood control despite siltation of its lower portion. The Santa Maria River Levee underwent extensive restoration by the Santa Barbara County Flood Control and Water Conservation District and USACE to address concerns about its strength and stability. The project began in 2009 and was completed in 2014, strengthening more than 6 miles of the levee.

Periodic flooding also occurs on the Santa Ynez River, particularly in the City of Lompoc and on agricultural fields west of Lompoc. Flooding occurs because of the Santa Ynez River's limited flow capacity resulting from designated areas of sensitive habitat. A modified operation of Cachuma Reservoir was developed in 1998 to manage Bradbury Dam gate operations to reduce releases of floodwaters during major runoff events. Cachuma Reservoir has no flood pool and, thus, potential reductions are limited.

The South Coast area is traversed by numerous steep, flashy streams capable of high flows and transport of large amounts of debris. USACE constructed and County Flood Control maintains debris-control structures on approximately 20 streams that traverse developed areas. In addition, channel capacity has been increased in several streams, particularly in lower, flatter portions. Most recently, major improvements in channel capacity were made to lower Mission Creek and by the City of Goleta at lower San Jose Creek.

2.12.2 Earthquake

The Region, like the rest of California, is seismically active and has experienced multiple large-scale (magnitude 6.0 or greater) earthquakes over the last two centuries. The December 21, 1812, earthquake was estimated to be magnitude 7.2. Much of Santa Barbara was damaged by the magnitude 6.3 earthquake of June 29, 1925. Another strong earthquake of magnitude 6.0, which also caused damage in Santa Barbara, occurred June 30, 1941 (Harp et al. 1980). The Region contains numerous active and potentially active faults, and is also susceptible to ground shaking from regional faults, such as the San Andreas Fault, which is located approximately 7 miles from the northeast corner of the County. Earthquakes present the potential to damage water storage facilities and levees, cause landslides, and disrupt water supply and treatment capabilities in the Region for weeks or possibly months.

2.12.3 Fire

During the summer and early fall, much of Santa Barbara County is at risk from wildfires stemming from a combination of dry, windy conditions and woodlands, brushlands, chaparral, and grasslands that burn readily (see Table 2.13, Major Wildfires in Santa Barbara County, 1955–2017). Under drought conditions, the fire season can extend into the winter months. The largest fire in California history at the time, the Thomas Fire began on December 4, 2017. The County contains a number of high fire hazard areas, particularly in undeveloped and mountainous locations, and at the wildland/urban interface. Fires pose a number of challenges to water resources planners, because adequate water must be supplied at correct pressure to meet fire department requirements, particularly during major incidents. Fires also increase erosion and runoff from burned areas due to the resulting loss of vegetation and the decreased water absorption capacity of the soil. Surface water quality can be severely degraded by debris from fires, and increased sedimentation of local creeks and reservoirs degrade quality and decrease storage capacity. Fires can also damage water supply infrastructure, causing supply interruptions, loss of stored water, and impacts to water quality within the supply system.

Table 2.13
Major Wildfires in Santa Barbara County, 1955–2017

Fire	Date	Acres Burned
Refugio	September 1955	79,428
Coyote	September 1964	65,338
Romero	October 1971	14,538
Sycamore	July 1977	806
Wheeler	July 1985	119,361
Painted Cave	June 1990	4,270

Table 2.13
Major Wildfires in Santa Barbara County, 1955–2017

Fire	Date	Acres Burned
Marre	September 1993	43,822
Gaviota	July 2004	7,440
Perkins	July 2006	14,988
Zaca	July 2007	240,207
Gap	July 2008	9,443
Tea	November 2009	1,940
Jesusita	May 2009	8,733
La Brea	August 2009	91,622
Sherpa	June 2016	7,474
Rey	August 2016	32,606
Canyon	September 2016	12,742
Whittier	July 2017	18,430
Thomas	December 2017	281,893

2.12.4 Drought

Hydrologic variability and drought are basic features of the climate of Santa Barbara County and much of the American West. Historical records and paleoclimatic evidence demonstrate that California has suffered severe multi-year droughts throughout its history. There is also evidence of megadroughts lasting from multiple decades to multiple centuries (Cook et al. 2010).

Most recently, California experienced a historic drought beginning in early 2012 (County of Santa Barbara 2018e; reproduced below). The years 2012 through 2014 were the driest in 120 years of recorded history, and a survey of tree rings found that it was the most extreme drought since the year 800 (Griffin and Anchukaitis 2014). The record at Gibraltar reservoir in Santa Barbara County indicates that the driest years since record keeping began at the facility are between 2012 – 2018, (County Flood Control Hydrology). The extreme severity of the most recent drought was driven by the combined factors of low precipitation and record high temperatures. In Santa Barbara County, water year 2017 (September 1, 2016, through August 31, 2017) marked a return to wet weather, with rainfall at 136% of normal (Figure 2.20, County-Wide Percent-of-Normal Water-Year Rainfall). On April 2, 2017, Governor Brown lifted the drought emergency that he had declared on January 17, 2014, however, Santa Barbara County continues to ratify the drought emergency

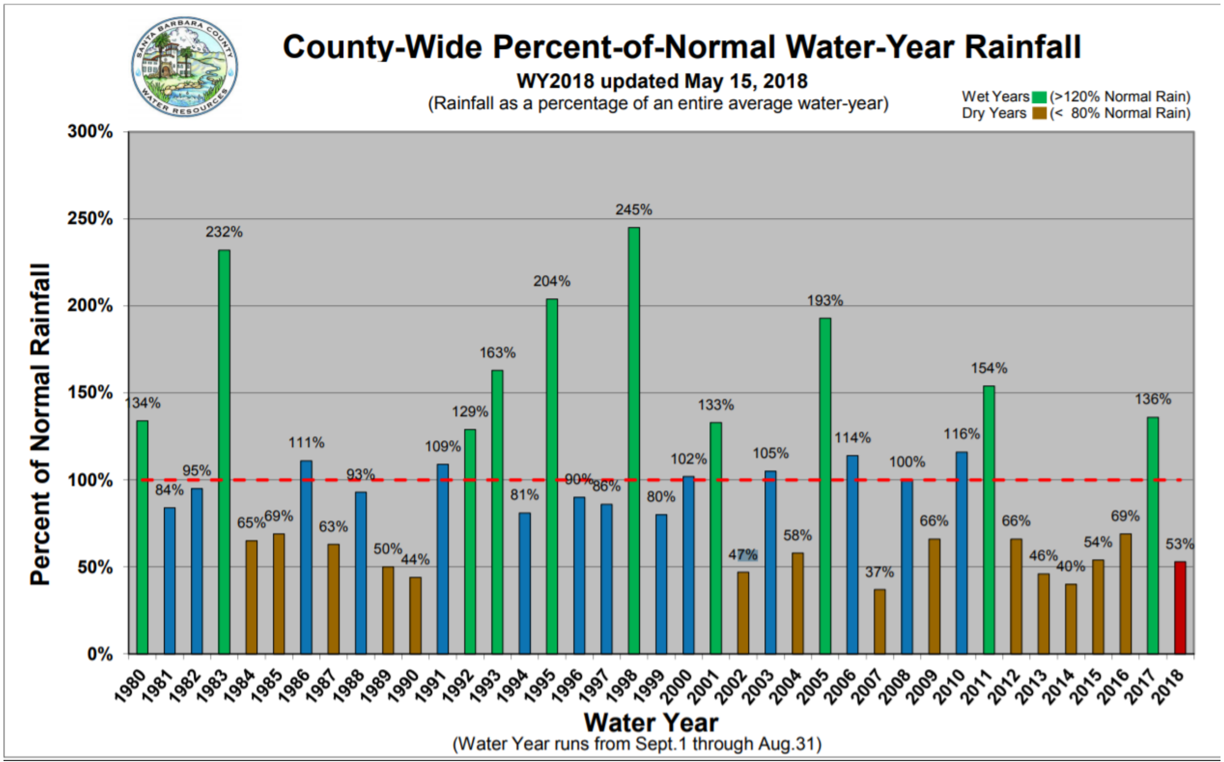

Figure 2.20. County-Wide Percent-of-Normal Water-Year Rainfall

Drought presents a number of challenges for water agencies, reducing available supplies, increasing demand due to increased evapotranspiration, and negatively impacting water quality. The most recent drought effected the availability of both local and imported water supplies. The State Water Project (SWP) allocation for 2014 was 5% of the requested amount. Locally, in 2016, Lake Cachuma fell to just 7.3% of capacity, requiring the installation of temporary emergency infrastructure to continue to move water out of Lake Cachuma (Santa Barbara County Water Agency). The severe reduction in surface water availability caused local agencies to increase the utilization of other supplies, primarily groundwater. Table 2.14, Water Production in Santa Barbara County, compares water supply sources as a percent of total supply for 2011, 2015, and 2017. In 2011, surface water data was not divided into local surface water and Lake Cachuma water, so the combined volume is reported in Table 2.14 as "Lake Cachuma," since this is the larger of the two volumes. Similarly, purchased water was not split between SWP purchased and other purchases in 2011, so both are reported as "State Water Project" in Table 2.14 (Santa Barbara County Water Agency, pers. comm. 2018).

Table 2.14
Water Production in Santa Barbara County

Supply	2011	2015	2017*
Local Surface Water	Not Available	2%	9%
Lake Cachuma	42%	9%	6%
State Water Project	28%	34%	47%
Purchased	Not Available	2%	5%
Recycled	2%	3%	3%
Groundwater	28%	50%	35%

* **Source:** County of Santa Barbara Water Agency, pers. comm. 2018.

Across the Region, water suppliers have set water conservation goals and implemented water use restrictions in response to drought. In addition, agencies are implementing a variety of programs to diversify local water supplies, including stormwater capture, potable reuse, and desalination. See Table 2.15, Water Conservation Goal by Purveyor, 2018, for the conservation goals of cities and water districts in the Region.

Table 2.15
Water Conservation Goal by Purveyor, 2018

Santa Barbara County Water Purveyor	Water Conservation Goal
Carpinteria Valley Water District	20%
City of Buellton	25% or 2 days per week irrigation limit
City of Guadalupe	25% or 2 days per week irrigation limit
City of Lompoc	12%
City of Santa Barbara	30%
City of Santa Maria	16%
City of Solvang	25% or 2 days per week irrigation limit
Cuyama Community Services District	25% or 2 days per week irrigation limit
Golden State Water Company – Orcutt	32%
Goleta Water District	35%
La Cumbre Mutual Water Company	25% or 2 days per week irrigation limit
Los Alamos Community Services District	25% or 2 days per week irrigation limit
Mission Hills Community Services District	25% or 2 days per week irrigation limit
Montecito Water District	35%
Santa Ynez River Water Conservation District, Improvement District No. 1	Voluntary 10%
Vandenberg Village Community Services District	Voluntary 25%

Source: SBCWA 2017d.

2.13 Climate Change

Climate change projections indicate that California can expect to be impacted by increased temperatures, changes in the timing and quantity of precipitation, an increased risk of wildfires and flooding, and sea-level rise. California agencies, including the Governor's Office of Planning and Research, the California Energy Commission and the California Natural Resources Agency recently released the statewide Fourth California Climate Change Assessment and the corresponding Regional Reports (http://www.climateassessment.ca.gov). The Santa Barbara County IRWM region utilized the Central Coast Summary Report, which is the Regional Report of the Fourth California Climate Change Assessment as one of the source documents in this section. The IRWM region also makes use of various tools such as Cal-Adapt, CoSMoS, HERA and others to plan for and make better policy and project decisions as it relates to change, adaptation and resilience,

Recent events in the IRWM Region, including a prolonged drought, historic wildfires, flooding, and a catastrophic debris flow, have brought projected climate change impacts into stark focus and have altered perceptions of priority climate-change vulnerabilities. Water quality for surface water and groundwater, increased erosion and sedimentation, an overall decrease in groundwater supply, and sensitivity due to higher drought potential have all been identified as very high priority climate change vulnerabilities for the Region.

2.13.1 Regional Impacts

State and local entities have been working to downscale climate models to allow for climate change planning at a level that can be useful for planning efforts. As part of the Santa Barbara Area Coastal Ecosystem Vulnerability Assessment, temperature and precipitation output from 10 Global Climate Models was downscaled to a resolution of 3.73 miles using the Localized Constructed Analogs technique for all of Santa Barbara County (Myers et al. 2017).

To incorporate climate change effects into water resources management, temperature and precipitation projections/models are input into other models, such as hydrologic models, to project impacts to water supply, water demand, snow pack, sea-level rise, and wildfires. The results of these models have been summarized in a variety of studies and planning documents at the state, regional, and local levels. As part of this IRWM Plan, several of these documents were reviewed to determine which best represent potential impacts for the Region. These documents consisted of urban water management plans, water supply management plans, groundwater management plans, supply planning studies, and California climate change studies and guidance. These documents were reviewed for climate change information relevant to the Region, including temperature changes, rainfall/snowfall changes, sea-level rise, and wildfire risk. A summary of these findings is presented in Table 2.16, Impacts of Climate Change on the Region by Mid-Century.

Table 2.16
Impacts of Climate Change on the Region by Mid-Century

Impact	Ranges*
Temperature	Winter: Projected increases of 4°F to 5°F Summer: Projected increases of 5°F to 6°F
Precipitation	5- to 7-inch decrease in average annual rainfall Increase in annual precipitation variability, fewer and more intense storms, and longer dry periods
Sea-Level Rise	4–30 centimeters (cm) by 2030 12–61 cm by 2050 42–167 cm by 2100
Supply	State Water Project delivery decrease of 7%–10% by 2050, and 21%–25% by 2100; changes to local supply not quantified
Wildfire	Low to moderate increase in projected fire risk
Flooding	Greater flood magnitudes**

Source: Information compiled by the Cooperating Partners in 2018.
* Changes to occur by 2100 unless otherwise noted.
** Greater flood magnitudes are anticipated to result from more frequent atmospheric river-storm events (Fourth California Climate Change Assessment and the corresponding Regional Reports (http://www.climateassessment.ca.gov).

Temperature Changes

The primary effect expected from climate change in the future is an increase in average global temperature. By the mid-century, temperatures in the Central Coast area are projected to increase 4°F–5°F during the winter, and increase 5°F–6°F during the summer and by the end of the century annual average temperatures are anticipated to be 7°F–8°F over the historic average (http://www.climateassessment.ca.gov/regions/docs/20180928-CentralCoast.pdf). Increases in temperature may be expected to impact water resources through changes to precipitation patterns, evapotranspiration rate increases, increased customer water use, increased wildfire potential, and faster snowmelt, which will not directly impact Santa Barbara County, but will impact the State Water Project water.

The frequency of extreme hot days was also projected to increase significantly from 3 to 4 extreme hot days in the historical period (1985–2014), 6 to 10 extreme hot days by 2030, 9 to 18 extreme hot days by 2050, and 23 to 43 extreme hot days by 2090 (also under the Representative Concentration Pathway 8.5 emissions scenario) (Myers et al. 2017).

Precipitation Changes

Changes in rainfall are projected both state wise and locally, and decreased snowfall is projected at the state level. The 10 downscaled Global Climate Models analyzed as part of the Santa Barbara Area Coastal Ecosystem Vulnerability Assessment did not exhibit consistent trends in annual precipitation for Santa Barbara County, but the majority of the results indicated an increase in annual precipitation variability, fewer and more intense storms, and longer dry periods as the wet season shortens (Myers et al. 2017).

Statewide, rainfall and snowfall are expected to change in terms of both type and timing. The state is already experiencing decreases to natural snowpack in the Sierra Nevada, which has implications for SWP deliveries. Climate change will likely cause more precipitation to fall as rain, and warmer temperatures will cause snow pack to melt 4 to 14 days earlier in the season (Cayan et al. 2008a, 2008b; Franco et al. 2008). DWR is predicting that the Sierra snowpack will experience a 25% to 40% reduction by 2050 based on historical modeling, with additional decreases caused by warmer storms due to climate change (Mirchi et al. 2015).

At the local level, changes in the timing and intensity of precipitation could negatively affect groundwater recharge, runoff flowing to rivers and reservoirs, flooding frequency, and length of the dry season and resulting increased risk of wildfires and vegetation die off.

Sea-Level Rise

Local, regional, and statewide planning studies indicate that the Region can be expected to be impacted by sea-level rise. The National Research Council predicts that sea-level rise for the coast of California will be 4–30 centimeters (approximately 1.6–12 inches) by 2030, 12–61 centimeters (approximately 5–24 inches) by 2050, and 42–167 centimeters (approximately 17–66 inches) by 2100 (National Research Council 2012). Recent CoSMoS (Coastal Storm Modeling System) modeling (https://www.usgs.gov/centers/pcmsc/science/coastal-storm-modeling-system-cosmos, 2017) demonstrated serious SLR in the Santa Barbara region over the 21st century. The most vulnerable regions for future flooding across the region include Carpinteria, Santa Barbara Harbor/East Beach neighborhood, Goleta Slough/Santa Barbara Airport, Devereux Slough, and Gaviota State Park. Many beaches will become increasingly narrow and, and up to two-thirds may be completely lost over the next century across the region (Vitousek et al. 2017). Narrowing and/or loss of future beaches will be caused by SLR combined with a lack of ample sediment in the system, which together will continue to drive the landward erosion of beaches.

Within the Region, the popularity of beachfront property has meant that a large amount of residential and commercial property can be found near sea level. The California Department of Boating and Waterways performed an assessment on several beachfront communities to assess the damage that could occur through sea-level rise, and included the City of Carpinteria as an example of the estimated economic cost to beachfront communities. The results of this study indicate that coastal development and coastal recreation are vulnerable to sea-level rise through impacts to recreational value, habitat value, spending, and tax revenue (DBW and SFSU 2011). Coastal infrastructure in the Region, including water and wastewater infrastructure, is also vulnerable to sea-level rise.

Sea-level rise has the potential to impact water supplies in Santa Barbara County through seawater intrusion into coastal aquifers, impacts to water infrastructure, and decreased deliveries from the SWP. Coastal aquifers in Santa Barbara County consist of the Carpinteria Groundwater Basin, Montecito Groundwater Basin, Santa Barbara Groundwater Basin, Lompoc Plain Groundwater Basin, San Antonio Groundwater Basin, and Santa Maria Groundwater Basin. Some of these basins have the potential to be at risk of seawater intrusion. In the late 1970s, heavy pumping in the Santa Barbara Groundwater Basin caused groundwater levels to drop as much as 100 feet and caused seawater intrusion into that basin (SBCWA 2012). Effective pumping practices and groundwater injection programs restored the previously existing groundwater gradient and reversed the trend of seawater intrusion. Seawater intrusion has not been confirmed in any other coastal aquifer.

The Sea Level Rise and Coastal Hazards Vulnerability Assessment (County of Santa Barbara 2017), developed as a component of the Santa Barbara County Coast Resiliency Project, identified vulnerabilities to water and wastewater infrastructure, discussed below.

Wastewater

Under existing conditions, miles of sewer main are potentially impacted by erosion and coastal flooding and erosion may affect more than 450 parcels on septic systems (442 with coastal armoring). All WWTPs along the Santa Barbara County coastline, including those in the cities and communities of Carpinteria, Summerland, Montecito, Santa Barbara, and Goleta, are vulnerable to inundation and flooding as it relates to storm events and sea level rise.

Water Supply

The water supply infrastructure in the County is vulnerable to the impacts of sea-level rise. Most notable are the water supply pipes susceptible to erosion, and the valves that will be flooded. These scenarios would reduce the ability to manage the system. Under existing conditions, potentially 1 mile of water supply mainline pipe is vulnerable to erosion (County of Santa Barbara 2017).

By 2100, 8.7 miles of water main, 186 hydrants, and 184 control valves are projected to be impacted, likely causing failure in the system. Under the coastal armoring scenario, Montecito Water District would have 0.4 miles of water supply mainline pipe and 23 hydrants affected by coastal flooding. With coastal armoring, no valves are expected to be damaged by flooding. Carpinteria Valley Water District anticipates 8.05 miles of water main, 46 hydrants, 630 meters, two pressure regulator stations, 252 valves, and nine private wells to be impacted by 2100 with armoring in place (County of Santa Barbara 2017).

No groundwater wells reported by water districts were found to be vulnerable to existing or future coastal hazards (County of Santa Barbara 2017).

The Coastal Branch of the SWP delivers water originating in Northern California to water agencies in Santa Barbara County. The Sacramento–San Joaquin River Delta (Delta) is the central hub of the SWP. Potential impacts to the Delta resulting from climate change include increased risk of levee failure, reduced water quality, and reduced water supply, all of which could significantly impact SWP operations and the supply of water delivered to the IWRM Region. Sea-level rise threatens to disrupt deliveries from the SWP if saltwater advances into the Delta and increased quantities of fresh water would need to be released to protect water quality. Santa Barbara County water agencies should consider adapting to reduced deliveries from the SWP as a component of climate change adaptation (County of Santa Barbara 2017).

Supply

Imported water supply from the SWP is projected to decrease by 7% to 10% by 2050, and 21% to 25% by 2100 (DWR 2015b; CCCC 2009). The long-term average reliability of the SWP was estimated and is provided in Table 2.17, Long-Term Average Water Delivery Estimate.

Table 2.17
Long-Term Average Water Delivery Estimate (AFY)

Participant	Table A Allocation*	Drought Buffer	Total Table A	2010	2015	2020	2025	2030	2035
				Actual	*Estimated*				
Buellton	578	58	636	402	398	394	390	386	382
Carpinteria	2,000	200	2,200	1,389	1,376	1,362	1,348	1,335	1,321
Golden State Water Co	500	50	550	347	344	341	337	334	330
Goleta	4,500	2,950	7,450	4,705	4,659	4,612	4,566	4,520	4,473
Guadalupe	550	55	605	382	378	375	371	367	363
La Cumbre	1,000	100	1,100	695	688	681	674	667	661
Montecito	3,000	300	3,300	2,084	2,064	2,043	2,023	2,002	1,982
Morehart	200	20	220	139	138	136	135	133	132
Raytheon	50	5	55	35	34	34	34	33	33
Santa Barbara	3,000	300	3,300	2,084	2,064	2,043	2,023	2,002	1,982
Santa Maria	16,200	1,620	17,820	11,254	11,143	11,032	10,922	10,811	10,700
Santa Ynez ID1	500	200	700	1,389	1,376	1,362	1,348	1,335	1,321
Vandenberg	5,500	550	6,050	3,821	3,783	3,746	3,708	3,670	3,633

Source: CCWA 2016.
Notes: AFY = acre-feet per year; est. = estimated.
* "Table A" refers to the SWP allocation.

Seawater inundation in coastal aquifers; increased evapotranspiration rates due to increased temperatures; changes in the amount, timing, and quality of runoff and recharge as precipitation patterns change; increased sedimentation to reservoirs due to increased wildfires; more extreme storm events; longer and more frequent droughts; and damage to infrastructure due to increased flooding and sea-level rise all present significant risk to local water supply. Although these risks have not been quantified, they are widely recognized.

Wildfire Risk

A significant portion of the County is occupied by forest land, and wildfire is already a common occurrence in the Region due primarily to the warm, dry climate. Earlier onset of dryness that lasts longer and becomes more intense is likely to result in a low to moderate increase in fire risk (CalEMA and CNRA 2012).

According to Cal-Adapt, developed by UC Berkeley's Geospatial Innovation Facility with the California Energy Commission's Public Interest Energy Research Program, the annual area burned by fire in Santa Barbara County is projected to increase under climate change, as shown in Table 2.18, Projected Annual Mean Hectares Burned in Santa Barbara County Due to Wildfire (UC Berkeley 2018).

An increase in the average annual area burned by wildfires would result in increased sedimentation to reservoirs, negatively impacting water quality, reducing storage capacity, and potentially reducing deliveries due to operational impacts.

Table 2.18
Projected Annual Mean Hectares Burned in Santa Barbara County Due to Wildfire

Period	Annual Mean Hectares Burned In Santa Barbara County	Percent Increase from Historical Period
Historical Period 1961–1990	7,223.8	—
2025–2035	9,065.3	25.5%
2045–2055	9,905.5	37.1%
2089–2099*	9,675.4	33.9%

Source: UC Berkeley 2018.
Notes: Results are based on emissions scenario Representative Concentration Pathway 8.5 (emissions continue to rise strongly through 2050 and plateau around 2100), central growth projections (as opposed to low or high), and averaging across the four downscaled Global Climate Models included in the website (CanESM2, CNRM-CM5, HadGEM2-ES, and MIROC5).
* The last 10 years of modeling.

Flooding

Greater flood magnitudes are anticipated to result from more frequent atmospheric river-storm events (Fourth California Climate Change Assessment and the corresponding Regional Reports (http://www.climateassessment.ca.gov).

2.13.2 Identification of Vulnerabilities

A climate change vulnerability assessment helps to assess water resource sensitivity to climate change, prioritize climate change vulnerabilities, and ultimately guides decisions as to what strategies and projects would most effectively adapt to and mitigate against climate change. DWR identified a series of questions to help regions identify key indicators of potential vulnerability, including the following EPA, and DWR's Climate Change Handbook for Regional Water Planning, DWR's 2016 Guidelines and consistent with the Climate Change Handbook for Regional Water Planning, Section 4 and Appendix B).

The Region's original Climate Change Workgroup comprised various water resources and planning representatives who have experience in climate change planning within the Region, developed an analysis of the Region's vulnerabilities to climate change at the June 26, 2012, Climate Change Workshop. During the 2018 IRWM Plan Update, a subcommittee was convened, meetings were held, and a survey was conducted to identify and prioritize vulnerabilities. The meeting were open to the public and the survey was circulated to the Cooperating Partners, stakeholders, and public. Table 2.19, Climate Change Vulnerability Indicator Questions, summarizes the analyses conducted for the previous and current Plan Updates.

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Water Demand			
Are there major industries that require cooling/process water in your planning region?	Y	The University of California, Santa Barbara has cooling water needs, as does Vandenberg Air Force Base and produce coolers in North County.	Industrial demand would increase
Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?	Y	Climate-sensitive crops such as fruits and flowers are grown in the Region.	Crop demand would increase

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Do groundwater supplies in your region lack resiliency after drought events?	Y	The small size of the groundwater basins in the southern part of the Region tends to decrease resiliency.	Lack of significant regional groundwater storage to buffer drought
Are water use curtailment measures effective in your region?	Y	The Region already has water use efficiency measures in place that are effective. Putting additional measures into place are expected to be more difficult.	Limited ability to conserve further
Does water use vary by more than 50% seasonally in parts of your region?	Y	There is higher demand in the summer due to agricultural irrigation and outdoor residential uses.	Meeting demand in peak seasons would be more difficult
Are some in-stream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?	Y	The Region's streams are typically seasonal, with little to no flow during the summers. Further reductions in flows due to climate change may have a large impact on low flows and the habitats they support.	Habitat demand would be impacted
Water Supply			
Does a portion of the water supply in your region come from snowmelt?	Y	The Region is dependent on imported supply as a part of its supply portfolio, which comes partially from snowmelt.	Decrease in imported supply
Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?	Y	The Region is dependent on imported supply as a part of its supply portfolio.	Decrease in imported supply
Would your region have difficulty in storing carryover supply surpluses from year to year?	Y	The Region has only four main surface reservoirs, limiting the Region's ability to store water in surplus years.	Decrease in seasonal reliability
Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?	Y	A number of the Region's groundwater supplies are coastal aquifers. Although there isn't a salt intrusion issue at present, there have been infrequent signs of seawater intrusion in Guadalupe. Sea-level rise may cause a problem in the future.	Decrease in groundwater supply in some areas of the Region

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Has your region faced a drought in the past during which it failed to meet local water demands?	Y	Drought management plans have had to be put into effect in the past.	Sensitivity due to higher drought potential
Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?	Y	Invasive species such as Arundo donax and tamarisk are present in the Region, and can impact facilities and reduce the local supply available through their high water use. In additional, quagga mussels may impact imported water supplies.	Invasive species can reduce supply available
Water Quality			
Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?	Y	Wildfires are common in the Region, and have caused issues with erosion in the past.	Increased erosion and sedimentation impacting reservoirs
Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?	Y	A number of water bodies in the Region are 303(d) listed as water quality impaired for issues related to eutrophication, such as low dissolved oxygen, nitrate, and ammonia	Increased eutrophication
Are seasonal low flows decreasing for some water bodies in your region? If so, are the reduced low flows limiting the water bodies' assimilative capacity?	Y	The Region's streams are typically seasonal, with little to no flow during the summers. Further reductions in flows due to climate change may reduce the assimilative capacity of the water bodies.	Increased constituent concentration
Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?	Y	Beach closures have occurred in the Region in the past, which indicates that coastal areas are susceptible to water quality issues.	Decrease in recreational opportunity
Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?	Y	Bacteria and sedimentation have increased during storm events in the Region's receiving waters.	Increase in treatment needs and cost
Sea-Level Rise			
Has coastal erosion already been observed in your region?	Y	Erosion has occurred in coastal bluffs.	Decrease in land due to erosion

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Are there coastal structures, such as levees or breakwaters, in your region?	Y	A breakwater is in place in the Santa Barbara harbor.	Damage to coastal infrastructure, recreation, and tourism
Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?	Y	Many communities in the Region have structures along the coast, and recreation and tourism along the coast is quite common.	
Are there areas in your region that currently flood during extreme high tides or storm surges?	Y	There have been localized instances of flooding near the coast during storms.	Threat of sea-level rise would be high
Do tidal gauges along the coastal parts of your region show an increase over the past several decades?	Y	A tidal gauge near the City of Santa Barbara has shown a 1.25-millimeter-per-year increase in sea-level rise over the last 15 years.	
Are there climate-sensitive low-lying coastal habitats in your region?	Y	Climate-sensitive low-lying coastal habitats exist in the Region, such as Goleta Slough, Carpinteria Salt Marsh, and Devereux Slough.	Damage to ecosystems and habitats
Is there land subsidence in the coastal areas of your region?	N	There is no evidence of land subsidence in coastal areas.	Not applicable
Flooding			
Does critical infrastructure in your region lie within the 200-year floodplain?	Y	Water and wastewater infrastructure can be found in the area's floodplains.	Increase in inland flooding
Does aging critical flood protection infrastructure exist in your region?	Y	Areas such as Santa Maria and Guadalupe have older flood protection infrastructure.	
Have flood control facilities (such as impoundment structures) been insufficient in the past?	N	There are no known issues with current flood facilities being insufficient.	
Are wildfires a concern in parts of your region?	Y	Wildfires are common in the Region.	Increase in flash flooding
Does part of your region lie within the Sacramento-San Joaquin Drainage District?	N	The Region is outside the Sacramento–San Joaquin Drainage District.	Not applicable

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Ecosystem and Habitat			
Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Y	Aquatic habitats exist both inland and along the coast throughout the Region. These habitats are all subject to erosion and sedimentation due to the geology and land uses in the area.	Increased impacts to coastal species
Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?	Y	The Region's sloughs are dependent on freshwater flow patterns.	
Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?	Y	The Region's long coastline has estuaries, coastal dunes, wetlands, marshes, and exposed beaches, all of which are subject to coastal storms.	
Do climate-sensitive fauna or flora populations live in your region?	Y	The Mediterranean climate of the Region supports a number of climate-sensitive species.	
Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?	Y	Numerous endangered and threatened species exist in the Region, such as the western snowy plover, least Bell's vireo, tiger salamanders, California red-legged frogs, and steelhead trout. The critical habitat of these species has already been impacted by urbanization.	Decrease in available, necessary habitat
Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?	Y	A number of water bodies have competing uses, particularly habitat and recreation.	Decrease in available, necessary habitat
Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?	Y	Urbanization in the Region has reduced habitat and impacted migration corridors.	
Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?	N	The Region is not included in the Endangered Species Coalition's Top 10 habitats.	

Table 2.19
Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?	Y	Some rivers in the Region have environmental flow requirements to maintain species such as Southern California steelhead.	Decrease in environmental flows
Hydropower			
Is hydropower a source of electricity in your region?	Y	Hydropower is a source of electricity within the Region.	Decrease in hydropower potential
Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?	Y	Installation of additional hydropower facilities in the Region is a possibility, with at least one facility already in the planning stages.	

Source: Information compiled at the Climate Change Workshop in June 2012.
Notes:
Vulnerability Question: Taken from Box 4-1 of DWR's Climate Change Handbook (EPA and DWR 2011).
Answer: Provided at June 2012 workshop.
Justification: Why Y (yes) or N (no) was selected.
Vulnerability Issue: What is the climate change vulnerability issue that is identified by asking the question?

2.13.3 Prioritized Vulnerabilities

The prioritized climate change vulnerabilities for the Region are listed in Table 2.20 as very high, high, medium, and low and are the result of the survey conducted and focused discussions of the climate change subcommittee and Cooperating Partners during the Plan Update process. All of the very high and high priority projects can directly be addressed by IRWM Projects, and all projects considered for adoption into the Plan must address one or more of the vulnerability issues. In order for a project to be considered for funding through the IRWM, it must address two or more of the Very High or High Vulnerability Issues for the Region as summarized below.

Table 2.20
Climate Change Vulnerability Issues for the Region

Prioritization	Vulnerability Issue
Very High	**Water Supply**: Decrease in groundwater supply **Water Demand**: Lack of groundwater storage to buffer drought **Water Quality**: Poor water quality in surface waters **Water Quality**: Increased constituent concentrations **Water Quality**: Increase in treatment needs and costs **Water Quality**: Poor water quality in groundwater **Water Quality**: Increased constituent concentrations

Table 2.20
Climate Change Vulnerability Issues for the Region

Prioritization	Vulnerability Issue
	Water Quality: Increase in treatment needs and costs **Water Quality**: Increased erosion and sedimentation **Water Supply**: Sensitivity due to higher drought potential
High	**Water Demand:** Habitat demand would be impacted **Water Demand:** Limited ability to conserve further **Water Demand:** Meeting demand in peak seasons would be more difficult **Water Supply:** Decrease in imported supply **Sea-Level Rise:** Decrease in land **Sea-Level Rise:** Damage to coastal infrastructure, recreation, and tourism **Sea-Level Rise:** Damage to ecosystems and habitat **Ecosystem and Habitat:** Increased impacts to coastal species
Medium	**Water Quality**: Decrease in recreational opportunity **Water Demand**: Crop demand would increase **Water Supply**: Decrease in seasonal reliability
Low	**Water Demand:** Industrial demand would increase **Water Supply:** Invasive species can reduce supply available **Ecosystem and Habitat:** Decrease in environmental flows **Ecosystem and Habitat:** Decrease in available necessary habitat **Ecosystem and Habitat:** Decrease in habitat protection against coastal storms **Flooding:** Increases in inland flooding **Flooding:** Increases in flash flooding **Hydropower:** Decrease in hydropower potential

Regional Climate Change Planning

The Region has undertaken public processes and completed documents as well as implemented various projects to prepare for and adapt to climate change. The following is a short list of planning work related to climate change vulnerabilities and sea level rise completed between 2013 and 2018 in the IRWM region:

- City of Santa Barbara Climate Action Plan
- 2015 Goleta Slough Sea Level Rise & Management Plan
- Santa Barbara Area Coastal Ecosystem Vulnerability Assessment
- Santa Barbara County Coastal Resiliency Project
- The Nature Conservancy Coastal Resilience Project – Santa Barbara County
- Santa Barbara County 2016 Multi-Jurisdictional Hazard Mitigation Plan

- City of Santa Barbara Sea Level Rise Vulnerability Study
- Goleta Coastal Hazards Vulnerability and Fiscal Impact Report
- Santa Barbara County – Sea Level Rise and Coastal Hazards Vulnerability Assessment

Santa Barbara Area Coastal Ecosystem Vulnerability Assessment

The Santa Barbara Area Coastal Ecosystem Vulnerability Assessment is a multidisciplinary research project that investigates future changes to southern Santa Barbara County climate, beaches, watersheds, wetland habitats, and beach ecosystems. The target audience is local land use planners and decision makers. The main objective is to provide information that assists the Cities of Santa Barbara, Carpinteria, and Goleta; the County of Santa Barbara; and UCSB in climate adaptation planning, with a clear focus on coastal ecosystems (Myers et al. 2017).

Led by California Sea Grant, the Santa Barbara Area Coastal Ecosystem Vulnerability Assessment was developed from the work of some of the state's leading ecological and climatological research programs: UCSB's Santa Barbara Coastal Long-Term Ecological Research Program, the UC San Diego Scripps Institution of Oceanography and its activities within the California and Nevada Applications Program Regional Integrated Science and Assessment, the California 4th Climate Assessment and the Southwest Climate Science Center Program, and the USGS Coastal Storm Modeling System and accompanying coastal change monitoring program. Watershed models were developed by researchers at Northeastern University in collaboration with the Santa Barbara Coastal Long-Term Ecological Research Program (Myers et al. 2017).

Santa Barbara County Coastal Resiliency Project

The Santa Barbara County Coastal Resiliency Project is a grant-funded effort to evaluate the impacts of sea-level rise and related coastal hazards along the County's entire 110-mile-long coastline. The Coastal Resiliency Project involves four steps, each described in more detail below: (1) modeling and mapping coastal hazards and assets, (2) developing a vulnerability assessment, (3) identifying adaptation measures, and (4) amending the County's Local Coastal Program.

1. **Modeling and mapping coastal hazards and assets.** All modeling used the best available science on sea-level rise and included three sea-level rise scenarios (low, medium, and high) and three planning timescales (2030, 2060, and 2100). The sea-level rise projections were derived from the National Research Council's 2012 publication Sea Level Rise for the Coasts of California, Oregon, and Washington (National Research Council 2012).

   The entire County coastline has been modeled. The resulting hazard zone maps are on The Nature Conservancy's Coastal Resilience online map viewer (The Nature Conservancy 2018).

2. **Developing a vulnerability assessment.** Results from the sea-level rise and coastal hazards modeling, along with stakeholder engagement, were used to create the vulnerability assessment and enabled staff to analyze impacts to the County's coastal zone under different climate scenarios. Important assets and resources were identified along the unincorporated County coastline. Then, County staff determined the risk and exposure to coastal erosion, coastal flooding, and tidal inundation of those assets. The resulting Sea Level Rise & Coastal Hazards Vulnerability Assessment was completed in July 2017 (County of Santa Barbara 2017).
3. **Identifying adaptation measures.** An Adaptation Plan is not funded at this time, but adaptation measures were identified during the vulnerability assessment (County of Santa Barbara 2017) and stakeholder engagement processes. Adaptation measures are intended to manage impacts to vulnerable assets, such as existing coastal development, roads, parks, and important public facilities. These qualitative adaptation strategies and management options will inform development of new or enhanced existing Local Coastal Program policies and implementing ordinances.
4. **Amending the County's Local Coastal Program.** County staff will engage stakeholders and work collaboratively with staff from the California Coastal Commission to develop new and enhanced Local Coastal Program policies. Additionally, the County's Coastal Zoning Ordinance will be updated to provide development standards aimed at moderating coastal hazard risks and protecting existing development.

Santa Barbara County Climate Action Strategy

The County of Santa Barbara has developed a Climate Action Strategy to reduce GHG emissions pursuant to the Board of Supervisors' March 2009 direction (BOS Resolution 09-059) "to take immediate, cost effective, and coordinated steps to reduce the County's collective GHG emissions." The Climate Action Strategy followed a two-phase structure intended to promote an informed public dialogue prior to County commitment to concrete actions to reduce emissions, as follows:

Phase 1: Climate Action Study. This phase includes a GHG inventory and forecast for the unincorporated County, a discussion of GHG emissions reduction target options that the County could pursue, a list of current County activities designed to reduce GHG emissions, evaluation of potential additional emissions reduction measures the County could implement, and recommendations for implementation of the Climate Action Study through a Climate Action Plan.

Phase 2: Energy and Climate Action Plan. The Energy and Climate Action Plan identifies numerous ways the County can reduce GHG emissions and implement energy-saving measures in support of a thriving, well-balanced, and sustainable community. The Energy and Climate Action

Plan was prepared to assist the County with reducing its GHG emissions consistent with State Assembly Bill 32 (County of Santa Barbara 2015b).

The GHG emissions reduction measures within the Energy and Climate Action Plan were developed to successfully achieve a GHG reduction target of 15% below the 2007 baseline emissions inventory by 2020, and to implement further reductions by 2035.

The Board of Supervisors adopted the Energy and Climate Action Plan on Tuesday, May 19, 2015. The Board Letter, Final Energy and Climate Action Plan, Final EIR, and related documents from this hearing are available online (https://santabarbara.legistar.com/LegislationDetail.aspx?ID=2274337&GUID=E2575D87-FC34-4F18-8249-C41488F2F126&Options=&Search=).

General Plan Updates

Under Senate Bill 1000 (California Government Code, Section 65302[h][2]), as of January 1, 2018, all cities, charter cities, and counties within the state (more simply stated, any entity required to prepare and adopt a general plan) must adopt an Environmental Justice Element into its General Plan or integrate Environmental Justice policies and goals into the elements of its general plan upon the adoption or next revision of two or more elements concurrently. This requirement is applicable to any jurisdiction with identified DACs and necessitates that jurisdictions "[i]dentify objectives and policies to reduce the unique or compounded health risks in disadvantaged communities by means that include, but are not limited to, the reduction of pollution exposure, including the improvement of air quality, and the promotion of public facilities, food access, safe and sanitary homes, and physical activity." The element also requires jurisdictions to develop policies that promote participation in public decision-making and to prioritize programs that address the needs of disadvantaged communities (California Government Code, Section 65302[h][1][A],[B],[C]). Therefore, there is a greater opportunity for IRWM policies and goals to be included and a mandate to address wastewater-related concerns, and issue are addressed in a more comprehensive manner. The Cooperating Partners will stay abreast of updates and actively engage as these processes unfold to ensure IRWM and general plan synergy and consistency.

Sustainable Groundwater Management

The Sustainable Groundwater Management Act (SGMA) requires the development and implementation of Groundwater Sustainability Plans (GSPs) in groundwater basins designated by DWR as medium and high for the management and use of groundwater. Each GSP must consider the following sustainability indicators: groundwater-level declines, land subsidence, seawater intrusion, groundwater-storage reductions, interconnected surface-water depletions, and water-quality degradation. Within 20 years of the creation of a GSP, sustainability, based on the listed indicators, must be achieved in the basin. For sustainability to be achieved, climate change must be accounted for. Section 8.7.2, Sustainable Groundwater Management Act, provides detail on GSP development within the IRWM Region.

Mitigation and Adaptation

One of the key IRWM Objectives is to address climate change through adaptation and mitigation (see Chapter 4, Objectives, Priorities, and Targets). Mitigation strategies include reducing energy consumption and GHG emissions, carbon sequestration, and using renewable energy.

As discussed above, the County developed the Energy and Climate Action Plan (County of Santa Barbara 2015b) to identify methods to significantly reduce energy consumption and GHG emissions. The GHG emissions reduction measures within the Energy and Climate Action Plan were developed to achieve a GHG reduction target of 15% below the 2007 baseline emissions inventory by 2020, and implement further reductions by 2035.

The IRWM Plan also recognizes the strategies contained in California's 2017 Climate Change Scoping Plan prepared by the California Air Resources Board (CARB) and the range of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure that are required in order to meet the 2030 GHG emissions reduction target of 40% below 1990 levels. The IRWM region and Cooperating Partners have included discussion of and inclusion (to the extent feasible) of strategies adopted by CARB in the 2017 Scoping Plan into IRWM projects.

The first carbon sequestration project in the IRWM Region is being undertaken at the Ted Chamberlin Ranch in the Santa Ynez Valley. The project is a carbon farming demonstration project managed in collaboration with the California Department of Food Agriculture's Healthy Soils Program. The project is one of a dozen sites from around the state selected to demonstrate that simple land management tools can yield a wide range of soil and water benefits. On March 16, 2018, the public was invited to visit the demonstration site. The Plan currently contains a number of carbon sequestration projects on the project list that can be implemented Region-wide in conjunction with the CRCD.

Laguna County Sanitation District purchased and installed a 4,032-panel solar array on a 4-acre site that came online in March 2012. The Laguna Plant requires approximately 3 million kilowatt hours per year, costing approximately $360,000 per year. The solar system is designed to supply 60% of the Laguna Plant's power and offset 80% of costs. It is anticipated to generate $14 million savings over 30 years.

Changes in precipitation, including total quantity, length of the rainy season, and number of precipitation events will cause changes in the amount, intensity, timing, quality, and variability of water runoff and recharge. Adapting to these changes is of fundamental importance to maintain the reliability of regional water supplies under climate change. Methods for adapting to these changes include the following:

- Diversify water supply portfolios.
- Increase and shift water supplies to more drought-resilient supplies.
- Evaluate long-term water supply availability and management informed by accurate data.
- Promote projects that can be effective in a variety of conditions and/or have built-in alternatives for when there is change.
- Improve stormwater recharge.
- Capture stormwater for groundwater infiltration.
- Increase stormwater capture, treatment, and distribution.
- Practice conjunctive use of water supply sources.
- Implement groundwater banking for storage to increase room for flood capture. For surface reservoirs, namely Lake Cachuma, adaptability is limited by competing priorities, regulatory constraints, and funding availability.
- Practice on-farm flooding during wet periods to improve recharge and overcome lack of storage and spreading area.
- Recharge groundwater basins with alternative supplies (e.g., injection of advanced treated recycled water).
- Expand water reuse, including recycled water and potable reuse.
- Daylight flood-control channels.
- Increase seawater desalination.
- Increase imported water, including purchasing supplemental water from other areas in the state, as needed.
- Create a water quality and availability monitoring plan that would specify trigger points at which certain actions would be taken.
- Implement water quality projects to address increasing water quality problems in reservoirs.
- Construct catchment basins, structures, and other tools that reduce or prevent runoff, or address the quality of runoff flowing into reservoirs.

- Encourage and incentivize customers to change water use habits to reduce demand, including using water-efficient fixtures indoors and reducing or eliminating outdoor watering through climate-appropriate landscape design.
- Implement permanent water conservation requirements.

Water Supply and Sea Level Rise Nexus in the IRWM Region

Climate-change-induced sea-level rise threatens to impact water supplies locally and to reduce supply availability in the Sacramento–San Joaquin Delta, decreasing imported supplies. Section 3.10 describes methods for reducing dependence on water supplies from the Delta. The following adaptation strategies are designed to respond to the impact of sea-level rise on water supplies:

- Diversify water supply sources
- Conduct vulnerability assessments to better understand risks and appropriate adaptation measures
- Inject coastal aquifers, including with reclaimed water
- Continue groundwater monitoring programs
- Perform studies on saltwater intrusion (occurrence and potential), and make them available to the public
- Abandon aquifers when water quality becomes too poor/saline
- Protect water supply infrastructure and facilities
- Manage aquifers to keep water levels above sea level most of the time; keep aquifers full to limit seawater intrusion
- Treat groundwater affected by salt water intrusion

Sedimentation in the IRWM Region

Recent wildfires stripped hillsides of vegetation and significantly increased sediment and debris flows into waterways and reservoirs. The Zaca, Whittier, and Thomas Fires have all increased the movement of sediment within the Santa Ynez River Watershed into Jameson, Gibraltar, and Cachuma Reservoirs. Adapting to climate change in Santa Barbara County includes a particular focus on adapting to increased rates of sedimentation as wildfires become more prevalent. Drought and stormwater runoff from wildfire burn areas have and will continue to result in increased levels of organic material and sedimentation to reservoirs.

Sedimentation alters the flow of the Santa Ynez River and impacts reservoirs in the following ways:

1. Sedimentation reduces overall storage capacity. For example, at Lake Cachuma, the regional South Coast water supply reservoir, more than 20,000 acre-feet of reservoir capacity has been lost since Bradbury Dam was constructed. The capacity of Lake Cachuma was designed for 205,000 acre-feet of storage at an elevation of 750 (NGVD) in 1953 (normal water level) (SBCWA 2014b). The current capacity at elevation 750 (NGVD 29) is 184,121 acre-feet, resulting in a reduction of storage capacity of 11.3% compared to the original design capacity. Several wildfires in the past 10+ years have led to Gibraltar Reservoir losing thousands of acre-feet of capacity. In addition, the cost to remove sediment accumulation has been prohibitive. Sedimentation also affects the storage capacity of Twitchell Dam. The releases from the dam are used for groundwater recharge of the Santa Maria Groundwater Basin. Loss of storage capacity means decreased supplies and reduced ability to capture storm flows. The Montecito Water District is also studying the capacity of the Jameson reservoir.
2. Sedimentation can impact diversions from reservoirs. For example, at the North Portal Intake Tower at Lake Cachuma, the lowest gate of the tower, Gate 5, was buried with sediment and required dredging in 2014.
3. Sedimentation also impacts water quality. High turbidity and organic carbon increases water treatment costs for South Coast communities.

Sedimentation is also an area of concern for farmers and ranchers who depend on surface water as their water supply. In addition, sedimentation can impact well sources due to high mineral content in the water supply.

See Section 8 (Table 8.3, Partial Listing of Foundational Plans and Other Documents), for studies that have been undertaken in the region to implement the adaptation strategies listed above.

2.13.4 Methodology for Further Data Gathering and Analysis of Prioritized Vulnerabilities

This entire plan, including data gathering and analysis of prioritized climate change vulnerability, will be updated through the adaptive management process explained in Section 8.2. Section 8.2 states that the Cooperating Partners will be responsible for evaluating and monitoring the implementation of the IRWM Plan Update 2018 and the progress towards meeting objectives and advancing projects listed in Chapter 4. The regional climate change objective—address climate change through adaptation and mitigation—will evolve and be adjusted as new information regarding climate change becomes available.

The Region is committed to a periodic update process, which will occur annually. The review includes adaptive management processes for updating plans in response to changing conditions. The adaptive management approach identified in the regional MOU (see Chapter 2) states that the "IRWM Plan objectives, priorities, and water management strategies will be evaluated during the annual review and modified appropriately." Section 8.3.7 (Review and Updates of the IRWM Plan 2010 Review, 2) states that "IRWM issues and conflicts, objectives, water management strategies, and targets will be evaluated during the Annual Review and modified appropriately. New data and information will be access and used to update issues, objectives, and targets." The Regional database will be used to gather new information.

3 GOVERNANCE AND PARTICIPATION

3.1 Introduction

The Santa Barbara County IRWM Region includes a population of more than 446,000 residents as of July 1, 2016 (U.S. Census Bureau 2016b). The Region spans 2,745 square miles and includes eight incorporated cities: Carpinteria, Santa Barbara, Goleta, Lompoc, Buellton, Solvang, Guadalupe, and Santa Maria. Combined, these cities occupy approximately 70 square miles. In addition to the incorporated areas, the Santa Barbara IRWM Region has 21 different and distinct unincorporated communities and tremendous geographical diversity. The Region has five major watersheds and 100 miles of coastline. Elevations range from sea level to the highest peak of Big Pine Mountain at 6,828 feet, and there are 215,000 acres of Los Padres National Forest.

The IRWM Region uses the County jurisdictional boundary to define its boundary. The governance structure of the IRWM Region was established in 2006 with an MOU. The governance structure consists of the Cooperating Partners (i.e., the Regional Water Management Group) and the lead agency, which is the Santa Barbara County Water Agency. Stakeholder outreach and participation has been the hallmark of the regional IRWM planning effort since its inception. A list of the Cooperating Partners can be found at the beginning of this document. Although at time of print the Chumash Indians of the Santa Ynez Reservation are not official Cooperating Partners, there are ongoing conversations with tribal leadership for formal inclusion as a Cooperating Partner. Since 2008, representatives of the Chumash Indians of the Santa Ynez Reservation have been included on all correspondence distributed to the Cooperating Partners, whereas prior to that date, the tribal representatives were just included as stakeholders. Representatives of the Chumash Indians of the Santa Ynez Reservation have been engaged in the IRWM and with Cooperating Partners since 2008. Tribal representatives have been active on subcommittees, at Cooperating Partners meetings, and have provided meaningful content and discussion throughout the 2019 Plan Update process. The Chumash Indians of the Santa Ynez Reservation were added as a Cooperating Partner in early 2019.

3.2 Governance Structure

The Regional Water Management Group, referred to as the Cooperating Partners, has used a series of MOUs as the mechanism of governance. The most recent MOU was signed by all members of the Cooperating Partners in May 2018. The Cooperating Partners (see Table 3.1) are made up of water and sanitation/sanitary districts, community service districts, city departments, County divisions, and a NGO, and is the entity responsible for updating the IRWM Plan. Sub-committees of the Cooperating Partners have convened to provide input and develop sections of the IRWM Plan Update. The governance structure under the leadership of the Cooperating Partners supports a public involvement process; collaborative decision making; broad access and opportunity for participation; effective communication (both internal and external); long-term implementation of IRWM planning; coordination with neighboring IRWM efforts, state agencies, and federal agencies; processes to establish objectives; and updates and changes to the IRWM Plan.

The governance structure under the Cooperating Partners has ensured that the IRWM Plan is consistent with Sections 10530–10546 of the Water Code. The Water Code states that preparation of an IRWM Plan must be guided by a regional water management group composed of three or more local public agencies, at least two of which have statutory authority over water supply, formed by means of a joint powers agreement, MOU, or other written agreement that is approved by the governing bodies of the local public agencies.

The Santa Barbara IRWM Region's governance structure maintains an open and flexible framework that provides for consistency, continuity, and leadership, while also being able to adapt to changes in a responsive and timely way. The structure of governance outlined in the MOU provides for the transfer of lead agency status and responsibilities through different cycles of the program. The Santa Barbara County Water Agency has been the lead agency since 2005. The provisions that enable smooth transitions are clearly outlined and must be agreed upon by a majority of the Cooperating Partners of the Region. In addition, the MOU discusses a number of adaptive management strategies to deal with changes within the Region or IRWM Plan, whether they are related to regulations or changes in government, the IRWM Plan, or projects. For example, an adaptive management strategy for incorporating new projects into the IRWM Plan is the ongoing review of project and adoption of projects into the Plan. Acknowledging that the IRWM is a living document, the Regional Water Management Group has a practice of ensuring that the project list is as up to date as possible by having a process whereby Cooperating Partners and Stakeholders whose projects adhere to the standards, goals and aims of IRWM can have their projects adopted into the Plan after project review and approval by the majority of the Cooperating Partners (Regional Water Management Group). This process makes it possible to add new projects without having to do a wholesale update to the IRWM Plan. Specifically, the 2007 IRWM Plan describes implementation of the adaptive management framework as follows (County of Santa Barbara 2007):

> The IRWMP's overall adaptive management framework will be implemented in the following manner in accordance with the established governance practices described in Section 1:
>
> 1. IRWMP managers will conduct an annual Review and produce a report summarizing progress made in achieving IRWMP goals, including the tracking of funded projects, modifications to projects, and development of new projects as a result of the plan. The results of the Review and the report

will be posted on the IRWMP Web site (http://www.countyofsb.org/pwd/water/irwmp.htm). The performance of implemented projects will be compared to original project objectives to ensure objectives were met.

2. IRWMP objectives, priorities, and water management strategies will be evaluated during the Review and modified appropriately. The need to develop different projects to better meet the plan objectives and regional issues will be considered, as will the need to modify existing projects. Projects that may be deleted (for example, because their purpose has been met through another project or because conditions have changed) also will be considered at this time.

3. Minor adjustments to planning assumptions, operations, or actions will be adopted as necessary. If significant changes to the approved IRWMP are found to be required in the Review or the IRWMP report, the plan will be revised and submitted for approval by Cooperating Partners as necessary.

At regular intervals, typically every other year, the Cooperating Partners evaluate the Santa Barbara IRWM Plan's elements, such as objectives, priorities, and water management strategies as conditions in the Region change. The Cooperating Partners review and approve revisions to the Plan elements and update based upon a simple majority vote. The IRWM Plan project list is updated in an on-going manner. Projects can be entered into the Plan after being review by the Cooperating Partners and a determination must be made that the proposed project or projects are aligned with the objectives, priorities and water management strategies included in the Plan. Once a determination has been made as to the suitability of a project/projects to be included, a vote is taken and a simple majority rules. The overall adaptive management framework is implemented in the following manner in accordance with the established governance practices

- IRWM Plan managers will conduct a Plan Review summarizing progress made in achieving goals and development of new projects as a result of the plan. The results of the Plan Review will be posted on the IRWM Plan website (http://www.countyofsb.org/pwd/water/irwmp.sbc).
- IRWM Plan regional issues, objectives, water management strategies, and targets will be evaluated during the Plan Review and modified appropriately. The need to develop different projects to better meet the plan objectives and regional issues will be considered, as will the need to modify existing projects. Projects that may be deleted (for example, because their purpose has been met through another project or because conditions have changed) also will be reconsidered at this time.

- Minor adjustments to planning assumptions, operations, or actions will be adopted as necessary. If significant changes to the approved IRWM Plan are found to be required in the annual Review, the plan will be revised and submitted for approval by Cooperating Partners as necessary.

3.2.1 Cooperating Partners

The Cooperating Partners are made up of a broad Region-wide group that includes water and wastewater districts, CSDs, city departments, county departments, and an NGO. As indicated, all of the Cooperating Partners have signed an MOU as required for participation in the IRWM program and process. The MOU commits most of the Cooperating Partners to a financial contribution for supporting the IRWM program costs, which includes staff, consultants, materials, data management, and other costs, but does not include the cost of regional grant applications or grant administration. Under some circumstances, financial contribution can be waived and replaced with in-lieu contributions upon request to and approval of the Cooperating Partners. Table 3.1 provides a list of the Cooperating Partners and those entities' key water management issues.

Table 3.1
Cooperating Partners Key Water Management Issues

Cooperating Partner	Key Water Management Issues
Cities and County Entities	
City of Buellton	Water supply, water treatment, sewer and wastewater treatment, stormwater management, water quality, flood control, water use efficiency, water conservation
City of Carpinteria	Stormwater management ,water quality, flood control
City of Guadalupe	Water supply, water treatment, sewer and wastewater treatment, stormwater management water quality, flood control, water use efficiency, water conservation, salt and nutrient management
City of Goleta	Stormwater management, water quality, flood control
City of Lompoc	Water supply, water treatment, sewer and wastewater treatment, stormwater management treatment and infiltration, water use efficiency, water conservation, flood control
City of Santa Barbara	Water supply, water treatment, sewer and wastewater treatment, stormwater management, water quality, water use efficiency, water conservation, flood control
City of Santa Maria	Water supply, water treatment, sewer and wastewater treatment, stormwater management, water quality, water use efficiency, water conservation, flood control, salt and nutrient management
City of Solvang	Water supply, water treatment, sewer and wastewater treatment, stormwater management, flood control, water use efficiency, water conservation, water quality

Table 3.1
Cooperating Partners Key Water Management Issues

Cooperating Partner	Key Water Management Issues
County of Santa Barbara – Agricultural Commissioner's Office	Agricultural water use, water quality
County of Santa Barbara – Parks Department	Recreational water, water quality
Joint Powers Agencies	
Cachuma Operation and Maintenance Board	Water supply
Non-Governmental Organization	
Heal the Ocean	Water quality
Community Services Districts	
Casmalia Community Services District	Water supply
Cuyama Community Services District	Water supply, water treatment, sewer and wastewater treatment, water quality
Vandenberg Village Community Services District	Water supply, water treatment, sewer and wastewater treatment, water quality, water use efficiency, water conservation, salt and nutrient management
Santa Ynez Community Services District	Wastewater treatment, water quality
Sanitary Districts	
Carpinteria Sanitary District	Wastewater treatment, water quality
Goleta Sanitary District	Wastewater treatment, water quality
Goleta West Sanitary District	Wastewater treatment, water quality
Special Districts (Independent and Dependent)	
Cachuma Resource Conservation District (Independent)	Agricultural water use and quality, water use efficiency, salt and nutrient management
Laguna County Sanitation District (Dependent)	Wastewater treatment, water quality, salt and nutrient management, discharge capacity
Santa Barbara County Water Agency (Dependent)	Regional water use efficiency and conservation, County-wide hydrologic data and development of hydrologic models, County-wide groundwater conditions, stormwater, administration of regional water supply projects
Santa Barbara County Flood Control District (Dependent)	Flood control and stormwater
Water Districts	
Carpinteria Valley Water District	Water supply, water treatment, water quality, water use efficiency, water conservation
Goleta Water District	Water supply, water treatment, water quality, water use efficiency, water conservation
Santa Maria Valley Water Conservation District	Water supply, water treatment, water quality, water use efficiency, water conservation
Santa Ynez River Water Conservation District	Water supply, water treatment, water quality, water use efficiency, water conservation
Montecito Water District	Water supply, water treatment, water quality, water use efficiency, water conservation, water reuse, water supply reliability

Table 3.1
Cooperating Partners Key Water Management Issues

Cooperating Partner	Key Water Management Issues
La Cumbre Mutual Water Company	Water supply, water treatment, water quality, water use efficiency, water conservation
Tribes	
Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation	Water supply, water treatment, water quality, water use efficiency, water conservation

3.2.2 Decision Making

The MOU is a binding document that provides guidance for the Cooperating Partners and the IRWM program. The MOU outlines the purpose of the program; guiding principles for IRWM planning; and the roles and responsibilities of the lead agency, Cooperating Partners, project proponents, subcommittees, workgroups, and stakeholders. All signatories must read and sign the principles contained in the MOU. The principles are a set of mutually agreed upon statements that serve as the foundation of the governance and affirmation of the overall IRWM program objectives. The Cooperating Partners have endorsed the following principles for IRWM planning, which ensures the Region's and the Cooperating Partners' accountability. The regional program must do the following:

1. Be consistent with the state's standards for IRWM Plans, as specified in Division 43 of the California Public Resources Code and related guidelines, and meet or exceed the expected scoring criteria used by the state in its IRWM Plan approval process.
2. Establish a process for ongoing decision making among Cooperating Partners, with inclusive and participatory public involvement to ensure meaningful input.
3. Share the costs of IRWM planning, analysis, coordination, and product development through both monetary contributions and staff time/in-kind services. NGOs, as specified herein, meeting certain time commitment requests, will be exempted from the monetary contributions afforded all other members of the Cooperating Partners.
4. Adopt a regional approach that coordinates water planning across jurisdictional boundaries in Santa Barbara County, sets priorities on an IRWM regional basis, and considers issues common to regionally shared watersheds.
5. Adopt an integrated approach to address the complex inter-relationships across strategies for water supply, demand management, water quality, source water protection, droughtmanagement, flood control, and other water management issues, as well as sensitivityto water provision and resources in the context of global climate change.

6. Consider the state's "program preferences" (as specified in the California Water Code and implementing legislation) as well as "statewide priorities" (as specified in the IRWM Guidelines) during the IRWM planning process.
7. Incorporate an appropriate level of scientific watershed assessment information.
8. Modify the plan to continue as an informational "roadmap" toward meeting objectives, but not as a regulatory or enforceable mandate.
9. Recognize the need for a long-term perspective, which includes monitoring of project and plan implementation.
10. Provide for adaptive management for future revisions to the Plan. Provide for coordination with other IRWM Planning efforts in the Central Coast Hydrologic Region.
11. Provide an inclusive process that seeks involvement from, and opportunities to collaborate with, a wide range of interests including the general public, agriculture, environmental groups, watershed groups, wetlands groups, academic institutions, adjacent region representatives, and NGOs.

The lead agency is the single point of contact for the IRWM program and is liaison between all entities involved in the program. The lead agency must be a Cooperating Partner and can rotate based on need (e.g., the Santa Barbara County Water Agency has typically been the lead agency, but in Round 2 of the Proposition 84 Implementation grant application, the Cachuma Resource Conservation District took over the role of lead agency). The lead agency keeps the Cooperating Partners apprised of the principles and makes recommendations to ensure adherence to the principles. The lead agency also ensures that the public outreach and opportunities to participate in IRWM Plan development and implementation are adequately supported and addressed. This is accomplished through management of the program through regular emails, phone calls, website updates, and meetings. Public notices are made in major County-wide publications at least 2 weeks in advance of large public meetings. All Cooperating Partners' meetings are open to the public.

The Cooperating Partners, synonymous with the Regional Water Management Group, is the main decision-making body in the IRWM structure, and acts as an open forum for the proposal and vetting of ideas. The Cooperating Partners' responsibilities include the IRWM Plan Update, specifically, development of revised IRWM Plan objectives and criteria for ranking projects. Cooperating Partners participate in regular meetings and take part in decisions pertaining to the IRWM planning process, project finances, consultant selection, revision of the IRWM Plan, approval of IRWM Plan sections, and approval of projects contained in project grant applications.

A subcommittee or workgroup may be formed or dissolved at the discretion of the Cooperating Partners, as activities dictate. The subcommittee consists of selected Cooperating Partners and regional stakeholders, and meets periodically to evaluate input from the subcommittees and formulate recommendations for the Cooperating Partners' consideration, as appropriate, to verify direction or resolve disputes. Subcommittees may also be formed to perform specific functions, conduct research, or make recommendations to the Cooperating Partners. Any Cooperating Partner or stakeholder may join a subcommittee or workgroup by volunteering to do so. Such subcommittees provide an open forum for the proposal and vetting of ideas. Subcommittee members are expected to exercise a high degree of leadership, which may include leading workshops or developing documents. Subcommittees may recommend or propose actions to the Cooperating Partners, the meetings of which are the forum to obtain consensus. Decisions within subcommittees are based on consensus whenever possible, or by a vote of a simple majority of all members participating in the meeting. Final decisions on all funding and project selection issues are decided by majority vote of the Cooperating Partners.

3.3 Balanced Access and Opportunity for Participation in the IRWM Process

Each entity discussed above has the ability to attend IRWM meetings and make comments on the IRWM Plan and sections, as well as projects and the project selection process. All meeting notes and materials are available on the IRWM website (http://www.countyofsb.org/pwd/irwmp.sbc). All Cooperating Partners meetings and workgroup meetings are open to the public, providing any public stakeholder an opportunity to participate in development of the IRWM Plan and implementation of the IRWM Plan. A forum for public comment is provided at each Cooperating Partners' meeting.

Stakeholders are defined as all interested parties in the Region who are not directly participating in the IRWM process as a Cooperating Partner. Broad outreach has been conducted to diversify stakeholder participation. Outreach has been initiated to the following stakeholder categories: wholesale and retail water purveyors, including a local agency, mutual water company, or a water corporation as defined in Section 241 of the Public Utilities Code; wastewater agencies; flood control agencies; municipal and county governments and special districts; electrical corporations, as defined in Section 218 of the Public Utilities Code; Native American tribes that have lands within the Region; self-supplied water users, including agricultural, industrial, residential, park districts, school districts, colleges and universities, and others; environmental stewardship organizations, including watershed groups, fishing groups, land conservancies, and environmental groups; community organizations, including landowner organizations, taxpayer groups, and recreational interests; industry organizations representing agriculture, developers, and other industries appropriate to the Region; state, federal, and regional agencies or universities with specific responsibilities or knowledge within the Region; DAC members and representatives, including environmental justice organizations, neighborhood councils, and social justice organizations; and any other interested groups appropriate to the Region.

3.3.1 Stakeholder Outreach and Inter-Regional Coordination

Stakeholder outreach builds sustainable Region-wide capacity for carrying out the goals of the state IRWM program throughout future years to achieve all IRWM Plan objectives and DWR requirements. It is the aim of the Region to form a core group of active, engaged regional and sub-regional representatives who are motivated and equipped to meet the formidable challenges involved in planning for increased water reliability, water sustainability, flood management, water quality, water supply, and environmental benefits, among other goals within the context of a changing climate, increased political pressure, and diminishing resources.

Apart from building relationships and capacity, robust stakeholder outreach and engagement facilitates overall assimilation onto a larger water-aware culture that moves beyond traditional alliances to a more comprehensive relation to the relevant watersheds and water resources. As of the last U.S. Census count, Santa Barbara County has roughly 453,000 inhabitants (California Department of Finance 2017), just less than 0.5 million, all of whom consume water and all of whom are stakeholders. While it is unrealistic to think that the IRWM process could reach all of them, IRWM planning takes into account each of these people in its encompassing planning process.

Prior to 2009, those entities that made up the Cooperating Partners only included the statutory agencies required by proposition language. However, to provide for more transparency and a greater breadth of participation, the Santa Barbara County 2010 MOU added language that was much more inclusive in the allowance of other entities to become members of the Cooperating Partners and the governance of the Region. As a result, one of the NGOs, Heal the Ocean, has joined the Cooperating Partners and is an active member of the governance body.

Outreach methods include emails; phone calls; publicly noticed meetings; frequent updates to the website; and presentations about the IRWM at various venues, including water commissions, planning associations, environmental groups, and industry organizations, among others. IRWM regional representatives also meet with many organizations and their representatives face-to-face to educate them and engage them in IRWM process.

Stakeholder categories are as follows:

- Adjacent IRWM regions not within the Central Coast IRWM Funding Area and other IRWM regions in the Central Coast IRWM Funding Area
- Appropriate State Assembly and Senate members and their staff

- City Council members and their staff
- Board of Supervisor members and their staff
- Political organizations and groups
- U.S. Congressional members and office staff
- Chambers of Commerce
- Planning associations
- Utilities and electrical corporations
- Los Padres National Forest staff
- Private technological innovation companies interested in water resources
- Wholesale and retail water purveyors, mutual water companies, and water corporations
- Wastewater agencies, municipal county governments, and special districts
- Native American tribes
- Self-supplied water users, including residents, park districts, school districts, colleges, universities, and others
- Environmental stewardship organizations, including watershed groups, fishing groups, and conservancies and environmental groups
- Community organizations, including landowner organizations, taxpayer groups, and recreation interests
- Industry organizations representing agriculture, developers, and other industries in the Region
- State, federal, regional agencies, or universities with specific responsibilities or knowledge within the Region
- DAC members and representatives, including environmental justice organizations, neighborhood council and social justice organizations

3.3.2 Disadvantaged Community Outreach and Involvement

The Santa Barbara IRWM Region includes a number of DACs, as discussed in Section 2.11.2, Social and Cultural Makeup. There has been significant outreach to DACs, with the goal of identifying previously untapped communities and stakeholders and weaving them into the IRWM program process. The goal is to increase engagement by DACs in the IRWM process, including identifying issues, setting priorities, and developing objectives and management strategies for the

Region. In addition, the IRWM program offers resources for capacity development and access to funding to support DACs in addressing local issues and challenges (see below).

Disadvantaged Community Involvement

The Disadvantaged Community Involvement Program is being implemented by DWR through funding made available by Proposition 1, the IRWM Disadvantaged Community Involvement Grant for the Central Coast Funding Area. The program is intended to ensure the involvement of DACs, economically distressed areas, and underrepresented communities (collectively referred to as DACs) in IRWM planning efforts. The DAC Involvement Program has made funding available for cooperative activities at the Funding Area level. The Central Coast Funding Area has been allocated $4.3 million in minimum available funds for implementing a Funding Area-wide DAC Involvement Program. The DAC Involvement Program required submittal of a single proposal from the Funding Areas to collaboratively perform activities that involve DACs in IRWM planning efforts, including helping define, understand, and address DAC water management needs.

Following the issuance of the January 2016 draft Request for Proposals for the DAC Involvement Program, representatives of the six IRWM regions in the Central Coast Funding Area participated in regular (approximately monthly) conference calls to coordinate proposal development.

DAC Involvement Program implementation in the Santa Barbara IRWM Region will involve a needs assessment, community outreach, IRWM engagement efforts, and project development activities. The following are the DAC Involvement Program activities included in the Funding Area-wide proposal specific to the Santa Barbara IRWM Region:

- A needs assessment conducted to identify DACs not previously identified in the Region's outreach and engagement program, including "hidden" DACs and under-represented communities and economically distressed areas within the larger, isolated geographic area of the Cuyama Valley.
- Educational activities focused on assisting the Cuyama CSD, which has very limited means to inform and educate the community regarding issues facing the Cuyama CSD and the overall Cuyama Valley.
- Community outreach efforts focused on engaging residents of the Cuyama Valley through an annual Town Hall forum and a professionally produced bilingual website.
- Project development activities, including creation of a Cuyama and New Cuyama Facilities Optimization Master Plan, and water distribution, sewer collection, and wastewater treatment system improvements for the City of Guadalupe.

The needs assessment will be conducted by UCSB for the Cuyama Valley. The needs assessment will seek to identify economically distressed areas, DACs, and SDACs in geographically isolated areas of the Cuyama Valley, and to characterize the water management needs and resources of these populations.

The Cuyama CSD will engage in community outreach as part of the DAC Involvement Program effort. The Cuyama CSD will work with the Cuyama Joint Unified School District to provide education about the IRWM, water supply and use, water quality, water conservation, and other water resource issues. The Cuyama CSD will produce and disseminate a printed bilingual annual report to ratepayers and the public regarding Cuyama CSD activities. The Cuyama CSD will initiate an annual Town Hall forum to be held in conjunction with the Cuyama Valley Community Association. The Cuyama CSD will use the Town Hall meeting to review all aspects of the Cuyama CSD annual report with ratepayers, and will provide information about the IRWM program. Additionally, as needed, the Cuyama CSD will hold Town Hall meetings to present information to the public, for example, on how to conserve water during a drought. The Cuyama CSD will also initiate regular public communication via a professionally produced bilingual website that will be updated quarterly, and a bilingual email newsletter.

IRWM engagement efforts will be focused on increasing participation in the Cuyama Valley in the IRWM process. Although the Cooperating Partners do conduct regular meetings and regular visits to Cuyama Valley, more coordination is needed to actively engage participants from the Cuyama CSD and the Cuyama Valley. Increased access to the IRWM process will help the Cuyama CSD board and management make more informed decisions, and help the board and staff prioritize and plan for better representation in the IRWM program and within the newly formed GSA, which will be mutually reinforcing.

Project development activities for the Santa Barbara Region will focus on projects in the Cuyama Valley and the City of Guadalupe. The Cuyama CSD proposes to prepare a Facilities Optimization Master Plan that will assess the current water and wastewater facilities and systems, and will provide a comprehensive evaluation of the programs and infrastructure processes and procedures that are required to meet Cuyama CSD's mission of providing safe and reliable drinking water and reliable and cost-efficient wastewater treatment and services to its ratepayers. The Facilities Optimization Master Plan will include recommendations for facilities' efficiency, increased cost efficacy, new infrastructure, and systems optimization over a 10-year planning horizon. Another goal of the Facilities Optimization Master Plan is to provide for thorough and comprehensible operational manuals for water and wastewater facilities so that any operator is able to competently operate the facilities. The Facilities Optimization Master Plan will also include an educational and public outreach component, and public workshops.

The City of Guadalupe is proposing project development and construction activities for improvements to its water distribution, sewer collection, and wastewater treatment system, as described below.

Water Distribution Improvements: As part of the 2014 Water Master Plan update, the City of Guadalupe performed a review of the water distribution system and its ability to provide sufficient operational, emergency, and fire service to the community under existing and future conditions. The update included development and evaluation of a hydraulic model of the City of Guadalupe's distribution system. The fire flow assessment indicated that the distribution system is unable to provide the minimum required flow and residual pressure to schools and industrial zones, as set forth by the City of Guadalupe Fire Chief. A project is proposed to implement the water distribution system upgrades recommended to meet fire flow requirements under existing and future conditions.

Sewer Collection System Improvements: As part of the 2014 Wastewater Collection and Treatment Master Plan, the City of Guadalupe performed a review of the sewer collection and wastewater treatment system and its ability to serve the City of Guadalupe under existing and future conditions. The review included development and evaluation of a hydraulic model of the City of Guadalupe's collection system, along with a comprehensive review of the City of Guadalupe's WWTP capacity and operations. The assessment indicated that the collection and treatment systems have significant deficiencies under existing and future conditions, and recommended various upgrades to address the deficiencies.

Wastewater Treatment System Improvements: In 2012, the City of Guadalupe completed WWTP improvements for effluent quality and to meet permit requirements. The project was the first phase of a larger improvement plan recommended to meet permit conditions and improve operability over a 30-year design life. The project scope was reduced to meet available grant funding while performing the minimal improvements necessary to ensure compliance with the existing Waste Discharge Requirements.

County-Wide Needs Assessment

The Central Coast RWQCB contracted with Maria Elena Kennedy of Kennedy Communications to conduct a needs assessment for Santa Barbara County and southern San Luis Obispo County. The assessment included a Small Community Outreach and Needs Assessment; a Domestic Well Outreach and Needs Assessment; and Tribal Traditional and Cultural, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses.

The Small Community Needs Assessment found that small community water systems throughout the Region face numerous problems, including older infrastructure, deficiencies in supply reliability, lack of technical knowledge, and lack of information on how to obtain assistance. In addition, small systems were often found to lack sufficient revenue streams to fund needed system updates. Also, U.S. Census Bureau data as a basis for DAC determination was found to be limited in its ability to successfully define DACs in the Region. Some potential DACs, such as Tanglewood, outside the City of Santa Maria, are not Census Designated Places and are therefore not included in Census efforts.

The Domestic Well Outreach and Needs Assessment found that there is strong evidence that mobile home parks that house farm workers are supplied by individual wells and that those wells can be classified as community water systems. There is generally a lack of information about these water supply systems, including information on ownership and water quality.

The Tribal Traditional and Cultural, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses task found that most subsistence fishing in the region is done by Latinos and Pacific Islanders. Piers in particular were identified as important subsidence fishing locations, since fishing from a pier does not require a fishing license. In addition, the report indicates the need to increase outreach related to contamination concerns in fish, particularly in the Santa Maria River and along the coast at Guadalupe Dunes.

In addition to strategic DAC outreach efforts, additional DAC needs have been identified in the IRWM process. The community of Isla Vista in particular has been identified as having implementable projects that will improve overall water quality, water pressure, and water system reliability. The community is served by water system that was designed for a much smaller population, and today includes undersized waterlines and dead-end waterlines. Projects are proposed to loop the Isla Vista water system, thereby eliminating dead-ends, and to replace undersized lines with new larger lines.

Unhoused Populations in the Region

Santa Barbara County has a significant population of people who are unhoused. The 2017 Report of Homelessness in Santa Barbara County reported 1,489 people without homes in the County. The report is based on the 2017 Point-in-Time Count mandated by the United States Department of Housing and Urban Development and conducted by 136 volunteers on January 26, 2017. The count included sheltered and unsheltered homeless people and did not include people in jail, treatment facilities, or hospitals. The overall number of homeless people has remained very consistent over the past 6 years (1,536 in 2011, 47 more than were counted in 2017). However, the locations where populations of unhoused people are concentrated has shifted. The largest increases in homeless populations were reported in Lompoc, Goleta, and Isla Vista (see Table 3.2). The report indicated that the observed changes may be due to better survey methods, trusted volunteers, the migration of homeless people, or some other unknown factor.

Table 3.2
2017 Report of Homelessness in Santa Barbara County

Location	Total Homeless People	Change from 2015	Change from 2011
Santa Maria	338	+4%	+39%
Lompoc	219	+89%	+99%
Santa Ynez Valley	1	–75%	–83%
Isla Vista	26	+100%	N/A
Goleta	99	+15%	+21%
Santa Barbara	790	–12%	–24%
Carpinteria	16	–11%	+7%

N/A = not available

People who are homeless are particularly at risk during events such as fires, heavy rainfall, and flooding. During the Thomas Fire, homeless populations were at increased risk of air quality concerns due to inability to leave the area, lack of shelter, and lack of masks. Subsistence activities, including fishing, are also impacted by extreme weather events.

3.3.3 Tribal Communities

The Santa Ynez Band of Chumash Indians receives all communications regarding IRWM meetings, project opportunities, and IRWM Plan updates, and participates in IRWM meetings. The Santa Ynez Chumash Environmental Office has stated that it is particularly interested in topics related to the Santa Ynez River Watershed, since the Zanja de Cota Creek, a tributary to the Santa Ynez River, runs through the Santa Ynez Reservation. The Santa Ynez Chumash Environmental Office has ongoing projects working on riparian efforts to remove invasive species and protect wetlands.

3.4 Long-Term Implementation of the IRWM Plan

It is the overall intent of the governance and management of the IRWM program to provide for the long-term sustainability of the program and implementation of the IRWM Plan. By creating a water-aware Region and demonstrating the value of IRWM planning and projects through education and outreach, the intent is for long-term support by all interested Cooperating Partners and the public. Sustained ongoing outreach creates a greater social infrastructure for the long-term implementation of the IRWM Plan, goals, and objectives.

The Santa Barbra Region has also made a concerted effort to reach out to organizations that are prominent in the community and have a vested interest in water, including agricultural interests and the Cachuma Resource Conservation District. In addition, the Santa Barbara Region collaborates with neighboring IRWM regions to create a network of support, knowledge, and resource sharing.

From a formal standpoint, the Santa Barbara Region's MOU commits the signatories to participate in, and make a financial and/or service-oriented contribution toward, the ongoing process established pursuant to the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Act (California Public Resources Code, Sections 75001–75009), also known as Proposition 84, as well as future planning and funding opportunities consistent with the Integrated Regional Water Management Act (California Water Code, Section 10530 et seq.).

Participation of public stakeholders in the IRWM process will be essential to address regional issues and implement all elements of the IRWM Plan, including plan objectives, resource management strategies, and projects. Participants understand and are committed to a sustained and robust effort by the Cooperating Partners to engage and reengage a wide variety of stakeholders. The IRWM process provides an essential forum for regional discussions on key issues. A commitment to a plan review will rely on stakeholders to reexamine and update key elements of the IRWM Plan, including objectives, resource management strategies, and projects.

3.5 Coordination with Neighboring IRWM Efforts and State and Federal Agencies

Inter-regional coordination occurred as early as 2005 within the funding area and included inter-regional conference calls and meetings to discuss water issues on a large hydrological scale, and programmatic concerns and water issues. In 2010, the Santa Barbara Region organized a Funding Area meeting that included all regions in the Central Coast IRWM Funding Area plus DWR. All the IRWM regional representatives attended and discussed funding for Proposition 84 Round 1 and potential projects that regions had. Funding Area representatives had conference calls at semi-regular intervals to discuss IRWM program developments and project progress, and to share ideas on collaboration.

Since the passage of Proposition 1, the six (6) Central Coast Funding Area (CCFA) IRWM Regions have had regular meetings and conference calls to discussion funding area wide priorities, goals and challenges. In 2017, the CCFA received an award from DWR for Proposition 1 Round 1 DACI funds. The IRWM regional members will continue to collaborate and coordinate on projects and inter-regional IRWM planning issues.

As it relates to federal agencies, the Ventura County IRWM Region and the Santa Barbara IRWM Region have significant portions of the watersheds that are owned by the U.S. Forest Service. As such, the two regions held a meeting with a Los Padres National Forest representative, with many follow-up conference calls with the Los Padres National Forest representative and other Cooperating Partners for project development discussions throughout the Proposition 84 project development and IRWM planning processes.

The Region has also coordinated with state agencies, including DWR (with both Sacramento staff and Southern California regional office representatives) regarding development of the IRWM Plan, IRWM strategic planning, implementation and planning grant applications, and overall participation in the IRWM process, and the Central Coast RWQCB regarding developing and coordinating projects with the regional Basin Plan, the development of TMDLs, development of the Santa Maria Valley Groundwater Assessment. A representative from the RWQCB participated in stakeholder meetings to develop the Santa Maria Valley Groundwater Assessment.

Beginning in earnest in 2009, a series of meetings and conference calls occurred between adjacent IRWM regions, consisting of the Kern County IRWM Region, San Luis Obispo County IRWM Region, and Ventura County IRWM Region. The purpose of these meetings was to discuss the successes and challenges regions were having, to share resources, and to talk about collaboration on potential projects in shared watersheds and groundwater basins.

San Luis Obispo, Santa Barbara, and Ventura IRWM Regions are presently coordinating on the nexus between IRWM and water planning and land use issues. The three regions made an interregional presentation to the Channel Counties Association of Environmental Planners Board on May 28, 2013.

The three regions also followed up with a Letter of Intent that was submitted to DWR and stated a commitment to ongoing collaboration and dialogue. Moreover, the regions held a half-day workshop with the Association of Environmental Professionals (AEP) and the Central Coast Chapter of the American Planning Association (APA) on specific planning issue areas where the IRWM is applicable, and on ways in which the IRWM can be an operationalized and informing document in moving forward with many planning efforts. In addition, the Ventura Region and the Santa Barbara Region collaborated on a half-day workshop about climate change and water resources in the context of the IRWM in 2011.

3.6 Neighboring IRWM Efforts

The Region shares a boundary with the San Luis Obispo County IRWM Region to the north, the Kern County IRWM Region to the northeast (not in the Central Coast Funding Area), and the Ventura County IRWM Region to the south (not in the Central Coast Funding Area). Neighboring IRWM efforts commenced in 2005 with an IRWM Summit that included Santa Barbara, Ventura, and Greater Los Angeles Counties. Collaboration has continued to the present. Collaborative efforts beginning in 2009 included various meetings and conference calls between San Luis Obispo IRWM, Kern County IRWM, and Ventura County IRWM regarding shared watershed issues, potential projects, and collaboration. The four regions share information and have frequent dialogue, and each of the IRWM main contacts for the respective regions are on each other’s stakeholder lists. In addition, in 2009, the regions of San Luis Obispo, Santa Barbara, and Ventura adopted a Letter of Intent to Coordinate across IRWM Regions that was agreed on and signed, and then submitted to DWR. Subsequently, the three regions had quarterly conference calls regarding the IRWM process until mid-2010. In 2010, all the IRWM regions in the Central Coast Funding Area held a meeting to discuss Round 1 Planning and Implementation Grants and the potential to cross-coordinate and share funding. Subsequently, various members of the regional water management groups of all the IRWM regions in the Central Coast have had follow-up conference calls to discuss ongoing efforts and share projects and IRWM Plan information.

Throughout 2010 and 2011 the Santa Barbara and Ventura IRWM Regions were in regular and close communication about projects and IRWM Plan updates. In 2011, the Santa Barbara and Ventura IRWM Regions collaborated on a Climate Change Workshop for all interested neighboring regions and agencies. The workshop was well attended and had speakers from state agencies and involved regions. During the 2018 Plan Update, conversations between the San Luis Obispo, Santa Barbara, and Ventura IRWM regions entailed collaboration of climate change issues and the sharing of regional information and data.

The San Luis Obispo, Santa Barbara, and Ventura Regions have continued their cross-jurisdictional coordination. In May 2013, the three regions presented to the Board of the Central Coast Chapter of the AEP. The three regions have collaborated on addressing coordination between water and land use planners, including the Central Coast Chapter of the AEP and the Central Coast Section of the California Chapter of the APA. The Central Coast Funding Area is in close communication related to the generation of and implementation of the DACI grant. The CCFA has regular calls and discusses regional issues related to projects and strategies.

3.7 Effective Communication, both Internal and External, throughout the IRWM Region

Open, ongoing communication among and between project management, Cooperating Partners, and actively engaging stakeholders is critical to the success of the IRWM program. In general, there are two types of communication processes—informal and formal, discussed below.

1. Informal communications consist of emails, conversations, and phone calls, and serve to supplement and enhance formal communications.
2. There are various types of formal communications. The types and purposes are described below:
    a. Public Notices – Public Notices have been posted in County-wide publications to advertise public meetings and workshops in relation to the IRWM Plan and to advertise the release of the Public Draft of the IRWM Plan for public review and comment.

b. Cooperating Partners, Workshop, Sub-committee Meeting Notices – Notices are generated and sent out by email to the respective groups in advance of the actual meeting. Meeting agendas, minutes, and materials are posted on the IRWM website (http://www.countyofsb.org/pwd/water/irwmp.sbc) for public access.

Notice of Intent –The final formal "Notice of Intent to Adopt the IRWM Plan 2018" in a public meeting is included in Appendix 3-A.

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4 OBJECTIVES, PRIORITIES, AND TARGETS

4.1 Introduction

This chapter describes the process that was used to establish regional objectives and planning targets for a 25-year planning horizon. The IRWM Plan's objectives were determined after identification of key regional and sub-regional issues and challenges. In establishing regional objectives and targets, the Cooperating Partners considered the overarching goals of the Central Coast Regional Water Quality Control Board Basin Plan Objectives (see Appendix 4-A), the 20×2020 water efficiency goals, and the requirements of California Water Code, Section 10540, and the strategies adopted by CARB in its AB 32 Scoping Plan, *Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target*. The following are relevant to the requirements of California Water Code, Section 10540(c):

- Protection and improvement of water supply reliability, including identification of feasible agricultural and urban water use efficiency strategies
- Identification and consideration of the drinking water quality of communities within the area of the IRWM Plan
- Protection and improvement of water quality within the area of the IRWM Plan consistent with the relevant basin plan
- Identification of any significant threats to groundwater resources from overdrafting
- Protection, restoration, and improvement of stewardship of aquatic, riparian, and watershed resources within the Region
- Protection of groundwater resources from contamination
- Identification and consideration of water-related needs of DACs in the area within the boundaries of the IRWM Plan

4.2 Objectives

4.2.1 Groups and Stakeholders Involved in the Process

To develop the regional objectives, the Cooperating Partners established the Objectives, Targets, and Projects Workgroup (Objectives Workgroup) for the previous Plan Update. The Objectives Workgroup met to identify regional issues, challenges, and objectives, and to consider appropriate targets for each objective. Objectives Workgroup participants included representatives from water districts, joint powers agencies, cities, the County of Santa Barbara, non-profits, and an agricultural association representative. During the 2013 Plan Update process, the Objectives Workgroup met on 11 occasions during 2012. Each of the Objectives Workgroup participants received technical assistance from their respective organizations and project consultants tasked with the update of the regional IRWM Plan 2013. The Cooperating Partners were consulted at three watershed meetings, each of the three meetings comprised Cooperating Partners, but focused on one of the three main watershed groupings within the IRWM region and they were also consulted as a whole group at a general Cooperating Partners meeting.

For the IRWM Plan Update 2018 process, discussion of objectives were discussed at general Cooperating Partners' meetings and at all subcommittee meetings that occurred throughout 2017 and 2018. At each of the watershed meetings, general meetings, and subcommittee meetings, the Objectives were brought forward, discussed, and debated and either were affirmed as being consistent with the issues that still persist and require the same level of attention and regional focus or updated to reflect current trends and concerns.

4.2.2 Process for Developing the Objectives

During the previous Plan Update in 2013, the Objectives Workgroup initially met to review the group's and individual responsibilities, which included identifying and refining regional and watershed issues and challenges, recommending metrics to be used to measure objectives, prioritizing objectives, developing measurable targets for each objective, and providing stakeholder outreach regarding IRWM Plan development. The following DWR requirements guided the selection of objectives:

- Objectives must address issues, including flood management
- Objectives must be precise enough to be measurable
- Projects will be determined by issues and objectives

The Region has opted to not create a "goal" layer above "objectives." Because of the complexity of water management issues in the Region, multiple objectives serve to better characterize the Region. Regional objectives characterize what the Region hopes to accomplish. The regional targets convey the various quantifiable and non-quantifiable measures that each of the objectives hopes to accomplish.

As discussed above, the Cooperating Partners built on the Objectives developed in 2013 and revisited the validity and relevance of the Objectives in light of the challenges faced in the intervening years. The 2013 Objectives were affirmed and therefore continue to be identified in the 2018 Plan.

4.2.3 Regional Issues and Challenges

Initially, the Objectives Workgroup reviewed the regional issues identified in the 2007 IRWM Plan and 2010 Review. The issues from the 2010 Review were based on the DWR objectives and regional objectives. These issues and challenges can be found in Appendix 1-A of the 2013 IRWM Plan (the 2007 IRWM Plan, Section 7.1). These have also been reassessed and evaluated in conjunction with the IRWM Plan Update 2018 process and are summarized as follows:

- Replacement, rehabilitation, or upgrades of infrastructure
- Health problems due to inadequate drinking water and wastewater pollution
- Water supply reliability
- Operation and maintenance of water and wastewater systems to minimize impacts on habitat and to comply with regulations
- Groundwater overdraft in North County
- Water quality impairments of groundwater and surface water bodies
- Harm to people and property from flooding
- Emergency planning needs

Once the Objectives Workgroup reviewed earlier versions of the issues and challenges, those issues were updated for both the Region as a whole and for the four major watersheds in the Region: Santa Maria River, San Antonio Creek, Santa Ynez River, and South Coast. The Objectives Workgroup also reviewed planning documents and identified key regional issues. These are discussed below and were affirmed by the Cooperating Partners as valid and relevant.

4.2.4 Key Regional Issues and Challenges

The key regional issues and challenges (see Table 4.1) are consistent with the initiatives for ensuring reliable water supplies identified in DWR's California Water Plan Update 2018, which is implementing integrated regional water management and improving area-wide water management systems.

Table 4.1
IRWM Plan Key Regional Issues and Challenges

Regional Water Management Systems
• Vulnerability to water supply shortages due to lack of local water supply diversification. • Water use efficiency measures need to continue to be adopted and implemented to further develop regional self-sufficiency.

Table 4.1
IRWM Plan Key Regional Issues and Challenges

Regional Water Management Systems
• Variability of rainfall challenges water supply planning and delivery. • Variability of State Water Project (SWP) water deliveries due to climate and regulatory constraints may reduce supply available for important beneficial uses. • Lack of storage capacity on South Coast. • Infrastructure that serves the general population and disadvantaged communities needs to be replaced, rehabilitated, or upgraded. • Lack of redundancy and capacity in supply and distribution systems leaves the Region vulnerable to water supply shortages during times of drought and emergencies. • Loss of storage in surface water storage facilities. • Regional collaboration needed for conjunctive groundwater management. • Need to control stormwater to increase stormwater capture augmenting supply. • Pollution from nonpoint sources adversely affects creek habitat and water quality. • Groundwater quality should be optimized through control and treatment of salts, nutrients, and industrial contaminants. • Poor quality stormwater runoff, contamination from septic systems, ocean acidification, and temperature changes impact ocean water quality. • Water supply constraints hinder habitat and ecosystem restoration. • Wildfires cause habitat damage and extreme erosion, which adversely affects reservoir storage and water quality. • Need for emergency planning and preparation to address potential impacts to water and wastewater facilities from floods, earthquakes, fires, and periodic droughts. • Reduced stream flow is leading to beach sand depletion. • Increased, and in some cases redundant, regulations challenge water users' and dischargers' abilities to comply. • Reduced access to state and federal grant funding for water resource projects.
Water Quality
• Runoff adversely affects creek habitat and water quality. • Efforts to control stormwater can be augmented to protect public health. • Groundwater quality should be optimized through control and treatment of salts, nutrients, and industrial contaminants. • Poor-quality stormwater runoff, contamination from septic systems, ocean acidification, and temperature changes impact ocean water quality. • Aquifer zones in the Santa Barbara area may be susceptible to seawater intrusion during periods of surface water shortage. • Pollution of creeks and coastal waters could result from nonpoint sources and point-source runoff during rain events, particularly in 303d listed water bodies.
Habitat Protection
• Water supply constraints hinder habitat and ecosystem restoration. • Wildfires cause habitat damage and extreme erosion, which adversely affects reservoir storage and water quality. • Reduced stream flow is leading to beach sand depletion.
Emergency Response and Planning
• Need for emergency planning and preparation to address potential impacts to water and wastewater facilities from floods, earthquakes, fires, and periodic drought.

4.2.5 Watershed Issues and Conflicts

On a watershed-specific basis, water issues evident in one location may be similar or even identical to issues in another area, but the most pressing water-related problems vary considerably from watershed to watershed within the IRWM Region. Issues that are currently of importance to the state as a whole are issues facing DACs, public safety impacts from flooding, surface water (including ocean water) and groundwater quality impacts from point sources and nonpoint sources, natural habitat protection, water rights and water supplies, the need to comply with regulatory requirements, and water supply reliability.

The issues identified for each of the watersheds are presented in Table 4.2.

Table 4.2
Regional Water Issues by Watershed

Santa Maria River Watershed (Including Cuyama River Watershed)
• Sediment accumulation in Twitchell Reservoir reduces storage capacity and threatens operability of release works. • Loss of storage in surface water reservoirs. • State Water Project (SWP) water deliveries fluctuate due to annual variations in climate, hydrology, and regulatory constraints. • Potential releases from Twitchell Reservoir for fish migration may reduce available water supply for groundwater recharge. • Continued groundwater monitoring and management is needed to ensure adequate supply and water quality for all users. • Regional collaboration needed for conjunctive groundwater management. • Urban and agricultural users rely on the same limited groundwater resources. • Current monitoring may not be adequate to characterize effectiveness of salt and nutrient management. • Lack of an affordable water supply in Casmalia (a Disadvantaged Community [DAC]). • Harm from flooding is a risk in some areas. • Cuyama Valley (a DAC) Groundwater Basin overdraft is causing increased pumping lift and costs for agricultural users and threatens water supply reliability for residents. • Cuyama Valley (a DAC) Groundwater Basin is in a state of critical overdraft, and some water quality impairments are of concern. • Cuyama Valley Groundwater Basin has naturally occurring arsenic problems, which are treated by the Cuyama Community Services District (CSD). • Wildfire danger could increase sediment accumulation in dams, rivers, and streams, and therefore increase the risk of flooding. • Changes in clean water standards may require modification of stormwater and water quality management. • Pollution of creeks and coastal waters could result from nonpoint sources and point-source runoff during rain events, particularly in 303d listed water bodies. • Need to control stormwater to protect ocean water quality and public health, and increase capture to augment supply. • Flooding is a risk in Cuyama where isolated thunderstorms in the summer and high winter flows can wash out and damage roads and highways.

Table 4.2
Regional Water Issues by Watershed

Mid-County IRWM Sub-Region (Santa Ynez River Watershed and San Antonio Creek Watershed)
• San Antonio Groundwater Basin may be in overdraft, which may cause increased pumping lift costs. • Changes in clean water standards may require modification of stormwater and water quality management. • Water quality exceeds certain enforceable maximum contaminant levels (MCLs) in shallow groundwater in the Santa Ynez Upland, especially Los Olivos and Ballard, and portions of Santa Ynez. • Nitrate groundwater contamination from septic systems in Los Olivos. • Continued need to manage impaired water bodies. • Scour from gravel mining in Solvang may cause problems for infrastructure such as bridges and other facilities. • Challenges of complying with existing and emerging wastewater discharge standards. • Wildfires cause habitat damage and extreme erosion, which adversely affects reservoir storage and water quality at Cachuma and Gibraltar Reservoirs. • Flood risk in the lower portion of the watershed. • Habitat management is problematic due to diverse multiple demands on water uses (e.g., water supply, protected species). • Despite the adoption of flood operations protocol at Cachuma Reservoir, large and localized events can result in large releases from the reservoir that can cause flooding of farm land and cities along the lower Santa Ynez River. • Need to control invasive species, such as quagga mussels, pampas grass, Japanese dodder, and Arundo donax. • A State Water Resources Control Board (SWRCB) decision is needed on the Cachuma Project water rights permits that support those elements of the Cachuma Project Settlement Agreement under its jurisdiction to facilitate integration of water supply, downstream water rights, and public trust resources. • Limited diversity of water supply in the City of Solvang. • Total maximum daily loads (TMDLs) in development for chloride, E coli, fecal coliform, nitrate, salinity, total dissolved solids (TDS), chlorides, sedimentation, and siltation may require changes in water use and water management. • Loss of surface water storage. • Regional collaboration needed for conjunctive groundwater management. • Miguelito Creek is the City of Lompoc's primary receiving water and is 303(d) listed, with standards.
South Coast Watershed
• Current inability to capture untapped sources of renewable energy that could be made available through the redesign of the water system. • Lack of redundancy and capacity in supply and distribution systems leaves the watershed vulnerable to water supply shortages during times of prolonged drought and in emergency situations. • Aquifer zones in the Santa Barbara area may be susceptible to seawater intrusion during periods of surface water shortages. • Older infrastructure constrains system operability. • Insufficient integration of adjacent systems constrains operational flexibility. • Flooding causes public health and safety risks. • Shallow groundwater contamination issues at orphaned sites. • Contaminated soils at former industrial and commercial areas may result in polluted runoff. • Continued conjunctive use is essential to ensure reliability of supplies. • Pollution of creeks and coastal waters could result from nonpoint sources and point-source runoff during rain events, particularly in 303d listed water bodies. • Wildfires cause habitat damage and extreme erosion, which adversely affects reservoir storage and water quality. • Long-term sediment accumulation has reduced vital reservoir storage capacity and operations.

Table 4.2
Regional Water Issues by Watershed

- Groundwater and surface water contamination from septic systems.
- Containment of contaminants from former disposal sites.
- Anthropogenic (constructed) barriers such as lined flood control channels and bridges impede steelhead trout migration.
- Need to expand existing water supplies and develop new local supplies to address future water supply constraints and reduce dependence on the Delta.
- Need to control stormwater to protect ocean water quality and public health, and increase capture to augment supply.
- Low-lying coastal wastewater treatment plants, City of Santa Barbara's El Estero Wastewater Treatment Plant, and Goleta Sanitary District's treatment plant are vulnerable to flooding due to sea-level rise.
- Upstream sources of contaminants may be compromising water quality where Jalama Creek joins Jalama Beach.
- Reduced stream flow is leading to beach sand depletion from the Jalama Watershed.
- Loss of surface water storage.
- Regional collaboration needed for conjunctive groundwater management.
- Older infrastructure and undersized mainlines threaten reliability in Isla Vista, a Disadvantaged Community.

4.2.6 Establishing Objectives

Information Considered in Establishing Objectives

The information that was considered during the process of establishing the objectives included regional issues and challenges, Santa Barbara County-wide IRWM Plan (May 2007), the 2010 Santa Barbara County IRWM Review, DWR 2012 Guidelines (including Proposition 84 Program Preferences and Statewide Priorities), climate change documents, the South Coast Recycled Water Development Plan, Santa Barbara IRWM Plan 2013, the Santa Barbara County Water Supply and Demand Current Uses and Future Estimates (2013), agency/city UWMPs, groundwater reports, water quality plans, watershed plans, and environmental compliance documents. These documents are available on the County of Santa Barbara Water Resources Division website (http://www.countyofsb.org/pwd/irwmp.sbc).

Developing and Accepting Objectives

Having identified the issues and challenges and referencing pertinent official documents, the Cooperating Partners studied the objectives from the IRWM Plan 2013 and heeded new Integrated Regional Water Management Grant Program Guidelines (DWR Guidelines) by including flood management and climate change as objectives (DWR 2016c). The objectives from 2013 were reviewed and then updated to be more relevant to current circumstances. The objectives were created in draft form. After discussion at two separate meetings with the Cooperating Partners, there was unanimity in upholding the Objectives and incorporating the Statewide Priorities as outlined in the 2016 and 2018 IRWM Guidelines.

Prioritizing Objectives

In the 2013 Plan Update, the Objectives Workgroup and Steering Committee choose not to prioritize the regional objectives or targets. Likewise, in the IRWM Plan Update 2018, the Cooperating Partners reviewed and discussed the need for prioritization. There was unanimity among the Cooperating Partners during IRWM Plan Update 2018 meetings that prioritization was not desired. Regional leadership believes that each objective is equally important relative to the others, and that prioritizing objectives is not practical given the diversity of stakeholders involved in the process and the Region, the range of priorities of various stakeholders, and the diversity of regional needs. There was also concern that prioritized objectives could reduce interest and participation in the IRWM planning process and project selection process, and could discourage development of projects that did not lead with a top objective. The Cooperating Partners wanted to retain flexibility in the project selection process and believed that a "de facto" prioritization occurs in the project prioritization and project selection processes. Finally, regional leadership did not want to confer a potential disadvantage to any projects that were not characterized by a top-priority objective when seeking funding through non-IRWM sources.

IRWM Plan objectives are listed and described in Table 4.3.

Table 4.3
IRWM Plan Objectives

Objective	Description
Protect, conserve, and augment water supplies	Increase water supply reliability by developing new water sources; maximizing the efficient use of existing sources, including recycled water used for landscaping, irrigation, and industrial and commercial purposes; increasing urban and agricultural conservation; maximizing storage capacity of existing surface reservoirs; maximizing groundwater conjunctive use; and strategically restoring or replacing water infrastructure.
Protect, manage, and increase groundwater supplies	Develop programs and policies to increase groundwater recharge or decrease groundwater use, especially in over-drafted groundwater basins; implement regional and/or interagency conjunctive use and groundwater banking programs where supported by legal decisions and landowners; and identify and address significant threats to groundwater resources from overdrafting.
Practice balanced natural resource stewardship	Protect, restore, and enhance ecological processes in watersheds, riparian areas, and aquatic areas through water quality improvements; public education; restoration efforts, including removal of invasive species; and improved steelhead passage on strategic creeks. Strategically restore and replace wastewater infrastructure to limit the potential for adverse impacts to sensitive environmental areas through accidental releases.
Protect and improve water quality	Improve surface and ocean water quality and reduce beach closures by replacing septic systems with sanitary sewer connections, ensuring the integrity of wastewater collection systems near the ocean and surface water bodies, improving the quality of urban runoff, reducing the amount of urban runoff that enters the ocean and surface water bodies, and developing public education programs to increase awareness of the measures individuals can take to improve water quality. Protect and improve water quality in accordance with the

Table 4.3
IRWM Plan Objectives

Objective	Description
	Water Quality Control Plan (Basin Plan). In addition, further define sources of groundwater contamination, develop strategies to prevent groundwater contamination, and improve groundwater quality in areas with known contamination. Identify and address drinking water quality problems within the Region.
Improve flood management	Protect public safety by reducing the potential for flooding in strategic areas through infrastructure improvements such as levee reinforcements, channel modifications, floodplain restoration, and increased reservoir storage capacity through sedimentation removal.
Improve emergency preparedness	Need for emergency planning and preparation to address potential impacts to water and wastewater facilities from floods, earthquakes, fires, and periodic droughts.
Maintain and enhance water and wastewater infrastructure efficiency and reliability	Replace, rehabilitate, and upgrade infrastructure that serves the general population and disadvantaged community needs. Increase redundancy and capacity in storage and distribution systems to prepare the Region for water supply shortages during times of drought and emergencies. Remove sedimentation is surface water reservoirs to increase storage capacity.
Address climate change through adaptation and mitigation	Encourage development of cost-effective carbon and other greenhouse gas–efficient strategies for water management projects consistent with the strategies adopted CARB's AB 32 *Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target*. Incorporate adaptation and mitigation strategies to respond to sea-level rise, rainfall variability, and temperature variability in planning for water and wastewater management.
Ensure equitable distribution of benefits	Continue outreach to and support of disadvantaged communities to ensure an equitable distribution of benefits. Continue efforts to engage Native American tribes in the regional IRWM process.

4.3 Planning Targets

Planning targets were developed in 2013 to provide a metric by which the Objectives Workgroup could determine if the regional objectives are being met. The Cooperating Partners discussed the planning targets during three meetings in the IRWM Plan Update 2018 process and agreed that the objectives and targets are realized through regional projects. Some of the regional objectives are measured with targets that are quantitative and others are qualitative.

4.3.1 Selecting Metrics

The Objectives Workgroup during the 2013 Update is no longer functional and the Cooperating Partners Group as a whole discussed metrics during the IRWM Plan Update 2018. The group approached the task of setting targets by first identifying potential metrics that could be appropriate for objectives. Potential metrics were discussed and prompted a robust discussion of appropriate, realistic, and applicable targets. The following is the list of potential metrics that were considered in the process of setting targets.

Protect, conserve, and augment water supplies

- Volume of new water (acre-feet or gallons per capita per day)
- Volume of water conserved (acre-feet)
- Amount of sediment removed (acre-feet)
- Miles of pipeline (miles)
- Number of interconnects/tie-ins (number)

Protect, manage, and increase groundwater supplies

- Volume of new water (acre-feet)
- Amount of contaminants removed (load reduction)

Practice balanced natural resource stewardship

- Presence of indicator, listed, endangered, and threatened species
- Number of new species
- Volume of augmented in-stream flow/timing of flow
- Acres restored (new) and preserved (existing)
- Number of stream miles or linear feet improved
- Tons of soil
- Number of people expected to benefit
- Yield per pound
- Number of invasive species

Protect and improve water quality

- Amount of contaminants removed
- Amount of contaminants prevented
- Reduction of wastewater loads (acre-feet)

Improve flood management

- Area (acres) protected by flood control features

- Damage prevented
- Risk reduced
- Miles or linear feet of new levee
- Value of the structures protected
- Amount of sediment removed (acre-feet)
- Volume of stormwater captured (acre-feet)
- Improvement in storm return period (level of protection)

Improve emergency preparedness

- Amount of area treated (acres) (e.g., brush clearing, mulch, seeding)
- Number of training sessions
- Amount of storage added (acre-feet) or months of supply

Maintain and enhance water and wastewater infrastructure efficiency and reliability

- Percentage of system delivery out in event of interruption
- Number of new lines, routes
- Volume of storage (acre-feet)
- Kilowatt hours of energy
- Linear feet (sewer or waterline replaced or rehabilitated)

Address climate change through adaptation and mitigation

- Percentage reduction of carbon dioxide (CO_2) equivalent (greenhouse gas [GHG]) emissions pursuant to the strategies adopted by CARB in its AB 32 Scoping Plan, Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target
- Miles or feet of shoreline protected from sea-level rise
- Value of resources protected from sea-level rise
- Kilowatt hours of energy per million gallons of water (reduction in consumption)
- Volume of new water (acre-feet)
- Volume of water recharged (acre-feet)

- Quality of water recharged
- Volume of water saved (acre-feet)
- Number of intakes or outfalls relocated
- Reduction of wastewater loads (acre-feet)

Equitable distribution of benefits

- Number of new DAC projects in Implementation Grant Application or Regional Program
- Percentage of total projects in Implementation Grant Application or Regional Program
- Volume of new water (acre-feet)
- Volume of water saved (acre-feet)
- Amount of contaminants removed (load reduction)
- Amount of contaminants prevented
- Area (acres) protected by flood control features
- Damage prevented
- Risk reduced
- Percentage of system delivery out in event of interruption
- Number of new lines, routes
- Volume of storage (acre-feet)

4.3.2 Setting Targets

The planning targets were set to provide a measurable means to gage the Region's progress toward meeting the regional objectives for a 25-year time horizon (2010 through 2035). The 2013 Objectives Workgroup, the Steering Committee, and the lead agency vetted the targets and metrics through multiple reviews. For the IRWM Plan Update 2018, the planning targets were reviewed by the Cooperating Partners at two meetings and agreed upon using the collective knowledge of regional conditions, sub-regional and regional policy, historical information, and planning documents to set final targets. The targets are summarized in Table 4.4. The targets guided the Region during the selection and prioritization of projects to implement the IRWM Plan.

Table 4.4
Planning Targets

Objective	Description
Protect, conserve, and augment water supplies	• Restore 200 acre-feet of surface storage capacity • Recycle and reuse 6,714 acre-feet per year (AFY) (4,742 AFY in Laguna; 849 AFY in Goleta Water District; 1,123 AFY in City of Santa Barbara) (current is 4,127 AFY) • Create 50 facilities that will augment and expand water supply • Conserve 5,000 AFY of water by 2035 through water use efficiency measures
Protect, manage, and increase groundwater supplies	• Increase sustainable groundwater storage by 2,500 AFY
Practice balanced natural resource stewardship	• Conserve, preserve, protect, and restore 1,000 acres of natural habitat, rangeland, and production agriculture • Protect and restore 30 linear miles of habitat (includes removing barriers to fish migration)
Protect and improve water quality	• Meet water quality objectives in current Water Quality Control Plan (Basin Plan) • Comply with TMDL requirements • Achieve salt and nutrient goals as adopted through future Basin Plan amendments
Improve flood management	• Increase land protected from flooding by 200 acres
Improve emergency preparedness	• Increase area protected from fire and flooding by 1,000 acres • Implement emergency plans, where feasible
Maintain and enhance water and wastewater infrastructure efficiency and reliability	• Implement reliability improvements to 30% of customers within water and wastewater agency service areas
Address climate change through adaptation and mitigation	• Achieve targets for water supply, resource stewardship, water quality, and infrastructure objectives • Develop cost-effective carbon dioxide and other greenhouse gas reduction strategies • Incorporate adaptation and mitigation strategies into plans and projects to respond to climate change conditions, including sea-level rise
Ensure equitable distribution of benefits	• Continue outreach to and support of grants that benefit DACs

Santa Ynez River Watershed and San Antonio Creek Watershed

Regulatory Requirements Impacting Objectives, Priorities, and Targets

Within the Santa Ynez River Watershed, the primary issues of concern are nitrates and chromium-6.

<u>Regulatory Requirements for Chromium-6</u>

In 2001, the California state legislature mandated under Senate Bill 351 that a state regulation be established to limit the concentration of chromium-6 in drinking water. This launched several years of study into the appropriate MCL to protect public health, sampling to measure the occurrence of chromium-6 and total chromium in drinking water systems, and testing of treatment technologies for chromium-6 removal. A substantial factor in the timing of the release of the Final Chromium-6 MCL was the litigation promulgated by the Natural Resources Defense Council, Environmental Working Group, and Clean Water Action. These groups commented on the Draft MCL (10 ppb), stating that it failed to meet the California Department of Health (CDPH) statutory obligations to set the level as close as possible to the California Office of Environmental Health Hazard Assessment's public health goal, and to place primary emphasis on public health. CDPH accelerated the release of the MCL in response to the litigation, but retained the draft MCL level of 10 ppb.

CDPH was transferred to the State Water Resources Control Board, Division of Drinking Water (DDW), effective July 1, 2014, and immediately finalized the MCL of 10 parts ppb for chromium-6. The total chromium (total Cr) MCL remains at 50 ppb. Initial compliance sampling results had to be submitted to DDW before January 1, 2015. If the running annual average of any four consecutive quarterly reports indicates chromium-6 concentrations exceeding the MCL, a public water system is deemed to be out of compliance. Notification of violation must be given to customers at that point, and a compliance performance schedule must be negotiated between the water district and DDW. Also, at any point where quarterly sampling results indicate a concentration so excessive that the annual average chromium-6 MCL will be exceeded, notification must be provided to customers and a compliance performance schedule negotiated with DDW.

The regulations did not allow a waiver or exemption for small public water systems, nor were there provisions providing relief in cases of financial hardship relative to the cost of necessary system improvements to address elevated chromium-6 concentrations in public water supplies. Subsequent legislation established a grace period and a negotiated plan to bring water systems into compliance without fear of violation or legal action.

5 RESOURCE MANAGEMENT STRATEGIES

5.1 Introduction

A resource management strategy (RMS) is a project, program, or policy that helps local agencies and governments manage their water and related resources. The Santa Barbara County IRWM Cooperating Partners views the RMSs identified in Table 5.1 as tools that complement operation of the Region's existing water system, help guide development and operation of systems, and will be implemented to achieve IRWM Plan objectives.

5.2 California Water Plan Resource Management Strategies

The DWR Guidelines direct IRWM regions to consider and address the RMSs identified in the most recent California Water Plan Update (DWR 2016d). RMSs are listed in the left column of Table 5.1, along with a DWR description of the RMS in the middle column, and a description of whether or not the RMS was selected in the right column. The California Water Plan RMSs are grouped into seven broad management objectives and an "other" category. Table 5.2 lists RMSs that were identified for the Region, in addition to those included in the California Water Plan. Table 5.3 indicates the connection between the selected RMSs and the IRWM Objectives. Table 5.4 includes the very high priority climate change vulnerabilities identified for the Region and the RMSs that will help address those vulnerabilities.

The inclusion of a resource management strategy related to Water and Culture was developed after a subcommittee of the Cooperating Partners was convened and determined to be relevant and salient for the IRWM Region. In addition, the IRWM Region and the Cooperating Partners have an increased sense of urgency and a renewed approach to climate change as it relates to strategies and project elements directly related to climate adaptation and resilience.

Water and Culture

Within the framework of the California Water Plan and DWR's Water and Culture: A Resource Management Strategy of the California Water Plan (July 29, 2016), the Cooperating Partners and a Water and Culture subcommittee reviewed and evaluated the need to address and incorporate the cultural water needs of tribal/Native American peoples within the Santa Barbara County IRWM Region. The Chumash Indians of the Santa Ynez Reservation—the only federally recognized Chumash tribe—are working with the Cooperating Partners in the IRWM Region. In May 2014, the Santa Ynez Band of Chumash Indians passed Resolution #944 supporting AB 685, commonly called "The Human Right to Water," in which the Santa Ynez Band of Chumash Indians stated their support of the beneficial use definitions for cultural and subsistence use. The Cooperating Partners and the IRWM Region fully recognizes Resolution #944, which was certified by a unanimous vote of the Tribal Business Committee of the Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation, and has incorporated it by reference into the IRWM Plan. Further, as an outcome of the Water and Culture subcommittee, both the subcommittee and the Cooperating Partners recognize the sacred use of water as a life force, as well as the sacred sites and Tribal Chumash shrines as having inextricable value to the Chumash culture, identify, and way of life from gathering, hunting, and fishing to ceremonial and other sacred uses and places. The IRWM Region supports the value of Water and Culture; it gives preferences of the tribe—namely those of the Santa Ynez Band of Chumash Indians of the Santa Ynez Reservation—the same level of consideration as all Resource Management Strategies in the Region.

Climate Change

The impacts and understanding of climate change within the IRWM Region has increased since the 2013 Plan Update, with the aid and work of institutions, reports, studies, dialogues, modeling, and local, state, and national agencies. In short, the Region's need to more accurately and straightforwardly address climate change is clear, and there are more strategies and planning processes in place to ensure adaptation and resilience are inherent in decision-making associated with project development and implementation.

Evaluation of the Ability of the Plan to Minimize the Impacts of Climate Change through Resource Management Strategies

While the IRWM Plan is not a regulatory document and does not supersede land use authorities, water use authorities, or any other agency's statutory authority over resources with the IRWM Region, the majority of those entities that have statutory authority of water and land use within the Region are Cooperating Partners. Moreover, the IRWM Plan and process does have autonomy over the projects the group develops and selects for funding. The IRWM does recognize the urgency associated with climate change and has prioritized projects that are climate adaptive and climate resilient. The project selection process will ensure funding to projects that minimize the impacts of climate change through RMSs included in Table 5.1, as well as other potential RMSs that may be developed. The IRWM Plan will evaluate the differences between "status quo" projects and projects that incorporate RMSs to minimize impacts of climate change. This evaluation will be conducted qualitatively and quantitatively and is part of the discussion in Section 8.

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
Reduce Water Demand		
Agricultural Water Use Efficiency	Increasing water use efficiency and achieving reductions in the amount of water used for agricultural irrigation. Includes incentives, public education, and other efficiency-enhancing programs.	Agricultural water use efficiency was selected as a resource management strategy (RMS). The largest water users in the Region are agriculture water users. In Santa Barbara County, most agricultural water supplies are obtained from private groundwater wells. Some farmers on the South Coast buy some or all of their water from a water purveyor. Agricultural water use efficiency is practiced by private agricultural businesses and by local water agencies. Water costs represent a significant portion of the overall operating costs for many growers, and economic factors have led to significant improvements in agricultural water use efficiency within the Region during the past 30 years.
Urban Water Use Efficiency	Increasing water use efficiency by achieving reductions in the amount of water used for municipal, commercial, industrial, irrigation, and aesthetic purposes. Includes incentives, public education, and other efficiency-enhancing programs.	Urban water use efficiency has been practiced in the County for more than two decades. As the Region is highly dependent on local water resources (i.e., groundwater and surface water), water conservation programs are highly developed and have been effective in reducing per-capita water use. The County Water Agency implements a Water Efficiency Program to implement demand reduction on a regional basis. The County urges responsible design of landscapes and appropriate choices of appliances, irrigation equipment, and the other water-using devices to enhance the wise use of water. Municipalities also implement water conversation programs. In recent years, laws have been passed that require efficient plumbing devices, appliances, and landscape designs. Most agencies in the Region provide rebates to customers as an incentive to conserve.
Improve Operational Efficiency and Transfers		
Conveyance – Delta	Maintaining, optimizing use of, and increasing the reliability of regional treated and untreated water conveyance facilities. Included within this strategy is maintaining the ability to obtain and convey imported water supplies into the Region.	Conveyance – Delta was selected as an RMS for the IRWM Region. The Region imports Delta water through infrastructure maintained by the Central Coast Water Authority (CCWA). The CCWA is a joint power authority composed of eight member agencies, with each agency dedicated to maintaining, optimizing the use of, and increasing the reliability of water conveyance facilities. Those facilities include 130 miles of pipeline, a water treatment plant, storage facilities, and other systems. This strategy was selected by the IRWM

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
		Region as an appropriate RMS, since State Water Project (SWP) water is highly valued and important.
Conveyance – Regional/Local	Strategies include improved conveyance systems, upgrading older distribution systems, promoting development of more extensive interconnections among water resources systems, establishing performance metrics for quantitative and qualitative indicators, and ensuring adequate resources to maintain the condition and capacity of existing constructed and natural conveyance facilities.	Conveyance – Regional/Local was selected as an RMS for the IRWM Region. This is an important RMS for the Region, with a distinct IRWM objective to maintain and enhance water and wastewater infrastructure efficiency and reliability. A key regional issue is the lack of redundancy and capacity in storage and distribution systems, which leave the Region vulnerable to water supply shortages during times of drought and emergencies. The Region has added another regionally oriented RMS, which is to increase back-up facilities, interconnections, redundant power sources, and treatment facilities to secure water supplies.
System Reoperation	Managing surface storage facilities to optimize the availability and quality of stored water supplies and to protect/enhance beneficial uses. Includes balancing supply and delivery forecasts, coordinating and interconnecting reservoir storage, and optimizing depth and timing of withdrawals.	System Reoperation was selected as an RMS for the IRWM Region. Managing the regional infrastructure to optimize the availability and quality of water supplies is essential to maximizing water supplies. It is a regional goal to increase the redundancy and capacity in storage and distribution systems.
Water Transfers	Contracting to provide additional outside sources of imported water to the Region over and above contracted State Water Project (SWP) and Colorado River supplies.	This RMS was selected for the Region since water transfers, although not widely used at this time, could play a more important role in the future. This RMS provides a means to import water in addition to SWP water.
Increase Water Supply		
Conjunctive Management and Groundwater Storage	Using and managing groundwater supplies to ensure sustainable groundwater yields while maintaining groundwater-dependent beneficial uses, including coordinating management of groundwater and surface water supplies (conjunctive use).	Conjunctive Management and Groundwater Storage was selected as an RMS for the IRWM Region. The Region is reliant on groundwater as a major source of water supply. The City of Santa Maria uses treated wastewater to help recharge groundwater supplies. The Region selected several groundwater management strategies that collectively will increase the supply of groundwater. Those strategies include conjunctive use and groundwater management, efficiency and conservation measures, groundwater remediation/aquifer

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
		remediation, prevention of contamination and saltwater intrusion, and recharge area protection.
Desalination	Developing potable water supplies through desalination of seawater. Includes disposal of waste brine.	Desalination was selected as an RMS for the IRWM Region. The City of Santa Barbara owns a desalination facility that can be brought into operation if needed during severe drought or water shortage conditions; relatively elevated costs for desalination make the desalination plant the last supply option to be used during drought periods.
Precipitation Enhancement	Increasing precipitation yields through cloud seeding or other precipitation-enhancing measures.	Precipitation Enhancement was selected as an RMS for the IRWM Region. The County Water Agency conducts a weather modification program, better known as “cloudseeding,” to augment rainfall and runoff in watersheds behind the major water reservoirs: Lake Cachuma and Gibraltar Dam on the Santa Ynez River and Twitchell Reservoir near Santa Maria. The operational program has been in existence since 1981 and follows research that indicates significant increases in rainfall could be achieved by “seeding” winter storms that move through the area (County of Santa Barbara 2018a).
Recycled Municipal Water	Developing usable water supplies from treated municipal wastewater. Includes recycled water treatment, distribution, storage, and retrofitting of existing uses.	Recycled Municipal Water was selected as an RMS for the IRWM Region. The Region currently produces 4,177 acre-feet per year of recycled water and plans on expanding production to 7,035 acre-feet per year by 2035. Recycled water is distributed by Goleta Water District, the City of Santa Barbara, and the Laguna County Sanitation District. Other tertiary treatment plants in the County include the City of Lompoc Regional Reclamation Plant and the Summerland Sanitary District, which do not reuse the final effluent. The use of recycled water also has the added benefit of reducing wastewater discharge into the ocean, which is a highly valued outcome in the Region.
Matching Water Quality to Use	Optimizing existing resources by matching the quality of water supplies to the required quality associated with use.	Matching Water Quality to Use was selected as an RMS for the IRWM Region. Several water agencies have adopted regulations requiring the use of recycled water in place of potable supplies for certain non-potable irrigation uses. Additionally, untreated water is being used in the Santa Maria Valley for landscape irrigation.

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
Surface Storage – CALFED	Developing additional CALFED storage capacity or more efficiently using existing CALFED storage capacity.	Surface Storage – CALFED was not selected as an RMS for the IRWM Region because the Region is not located in the Bay–Delta area, which is the focus of the CALFED Program.
Surface Storage – Regional/Local	Developing additional yield through construction or modification (enlargement) of local or regional surface reservoirs or developing surface storage capabilities out of Region.	Surface Storage – Regional/Local was selected as an RMS for the IRWM Region. The Region has four major reservoirs that are managed for various uses. The Region seeks to augment regional storage through the removal of sediment. It is a regional goal to increase local storage capacity for the South Coast Sub-Region.
Improve Water Quality		
Drinking Water Treatment and Distribution	Includes improving the quality of the potable supply delivered to potable water customers by increasing the degree of potable water treatment. Strategy also may include conveyance system improvements that improve the quality of supply delivered to treatment facilities.	Drinking Water Treatment and Distribution was selected as an RMS for the IRWM Region, and Utilization of New or Additional Technologies for Water and Wastewater Treatment that are Economical and Environmentally Sustainable was also added. The use of new or additional technology is seen as an opportunity to improve treatment in an economical and environmentally sustainable manner. The Region is continuously implementing projects and programs to comply with increasingly stringent federal and state drinking water standards, and new technology plays a potential role in this compliance.
Groundwater and Aquifer Remediation	Includes strategies that remove pollutants from contaminated groundwater aquifers through pumping and treatment, in situ treatment, or other means.	Groundwater and Aquifer Remediation was selected as an RMS for the IRWM Region. The Region has an identified need to improve groundwater quality through the control and treatment of salts, nutrients, and industrial contaminants. For example, the Santa Maria Valley Groundwater Assessment (Appendix 2-A), conducted as part of the IRWM Plan 2013, examined the transport and fate of salts and nutrients in surface water and groundwater in the valley. Attention is being focused on providing extensions of sewer systems to serve densely populated areas that remain on septic systems and on providing remediation of groundwater contamination at orphaned sites. The Santa Barbara County Water Agency is conducting in-depth groundwater basin studies to determine the location and trends of groundwater quality impairments.

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
Matching Water Quality to Use	Optimizing existing resources by matching the quality of water supplies to the required quality associated with use.	Matching Water Quality to Use was selected as an RMS for the IRWM Region. Several water agencies have adopted regulations requiring the use of recycled water in place of potable supplies for certain non-potable irrigation uses. Additionally, untreated water is being used in the Santa Maria Valley for landscape irrigation.
Pollution Prevention	Strategies that prevent pollution, including public education, efforts to identify and control pollutant contributing activities, and regulation of pollution-causing activities. Includes identifying, reducing, controlling, and managing pollutant loads from nonpoint sources.	Pollution Prevention was selected as an RMS for the IRWM Region. Regional entities work with the State Water Resources Control Board (SWRCB) and Central Coast Regional Water Quality Control Board (RWQCB) to comply with the following: water quality planning programs (adoption, review, and amendment of statewide and basin water quality control plans and policies), including development and adoption of total maximum daily loads (TMDLs) and implementation plans; regulatory programs, including the permitting and control of discharges through the National Pollutant Discharge Elimination System (NPDES) and waste discharge requirement (WDR) permits, discharge to land, and stormwater and storage tank programs; monitoring and quality assurance programs; and nonpoint-source management programs (e.g., Watershed Management Initiative). The Region established a complementary RMS, Prevention of Contamination and Salt Water Intrusion, because certain coastal areas of the Region are vulnerable to seawater intrusion during times of drought.
Salt and Salinity Management	Recommendations that encourage stakeholders to proactively seek to identify sources, quantify the threat, prioritize necessary mitigation action, and work collaboratively with entities with the authority to take appropriate actions.	Salt and Salinity Management was selected as an RMS for the IRWM Region. Stakeholders in the Santa Maria Valley proactively conducted the Santa Maria Valley Groundwater Assessment to support development of a Salt and Nutrient Management Plan pursuant to SWRCB Policy 2009-0011. There are denitrification projects in progress in areas that overlie the Santa Maria Groundwater Basin. Other sub-regions are pursuing compliance with SWRCB water quality management programs.
Urban Runoff Management	Includes strategies for managing or controlling urban runoff, including intercepting, diverting, controlling, or managing stormwater runoff or dry-season runoff.	Urban Runoff Management was selected as an RMS for the IRWM Region. Various entities in the Region are focusing their efforts on poor surface water quality in creeks, rivers, and oceans due to polluted stormwater and urban

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
		runoff discharges. Strategies are being implemented in the Region for managing and controlling urban runoff to comply with SWRCB and Central Coast RWQCB regulatory programs, including the Watershed Management Initiative.
Water and Culture	Includes strategies that encourage stakeholders to more actively consult with and formally consider tribal and cultural uses of water.	Water and Culture was selected as a RMS for this IRWM Region in recognition of the fact that water quality on tribal lands requires the same degree of consideration as all portions of the IRWM Region, however, more proactive outreach is required by the IRWM Cooperating Partners to ensure complete understanding of the issues and inclusion of Tribal voices.
Practice Resources Stewardship		
Agricultural Lands Stewardship	Includes strategies for promoting continued agricultural use of lands (e.g., agricultural preserves), strategies to reduce pollutants from agricultural lands, and strategies to maintain and create wetlands and wildlife habitat within agricultural lands. Stewardship strategies for agricultural lands include wetlands creation, land preserves, erosion reduction measures, invasive species removal, conservation tillage, riparian buffers, and tailwater management.	Land preservation represents a key agricultural land stewardship activity implemented within the Region and was selected as an appropriate RMS. The County of Santa Barbara's Agricultural Preserve Program (Agricultural Commissioner's Office) works toward long-term conservation of agricultural and open space lands. The program enrolls land in Williamson Act or Farmland Security Zone contracts whereby the land is enforceably restricted to agricultural, open space, or recreational uses in exchange for reduced property tax assessments. Land stewardship practices that are implemented by private landowners include erosion control, habitat conservation, pollution-reduction, creek restoration projects, steelhead enhancement projects, fuels management projects, water quality testing projects, invasive species removal projects, and watershed management projects. Agricultural and grazing lands are also responsible for carbon sequestration projects. The RWQCB is also involved in regulating (e.g., discharge permits or conditional waivers) agricultural land stewardship, including regulation of animal confinement, agricultural operations, and nursery operations.
Ecosystem Restoration	Strategies that restore impacted or impaired ecosystems, and may include invasive species removal, land acquisition, water quality protection, revegetation, wetlands creation and enhancement,	Ecosystem Restoration was selected as an RMS for the IRWM Region. Ongoing efforts within the Region include habitat restoration in floodplains, land conservation, invasive species control, rehabilitation and revegetation, wetlands preservation, debris clearance from South Coast creeks, restoration of habitat

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
	habitat protection and improvement, habitat management, and species monitoring.	damaged by wildfires, nonpoint source pollution control, addressing flow hydraulics, and preserving natural flow hydrology.
Forest Management	Strategies that promote forest management, including long-term monitoring; multi-party coordination; improvement in communications between downstream water users and communities and upstream forest managers, residents, and workers; and revisions of water-quality management plans between the SWRCB and forest management agencies to address concerns with impaired water bodies.	Forest Management was selected as an RMS for the IRWM Region. Approximately one-third of the land area within Santa Barbara County is located within the Los Padres National Forest, which includes two wilderness areas: the San Rafael Wilderness and the Dick Smith Wilderness. The Los Padres National Forest includes portions of watersheds that provide an important water source for coastal populations, as well as important habitat for several threatened, endangered, proposed, candidate, and sensitive species. Regional management has had several meetings regarding project development with the Los Padres National Forest representative. The Los Padres National Forest has been collaboratively involved in the IRWM. This strategy has been expanded for the Region to the following: Forest Management, including Control of Fuel Loads. The control of fuel loads is undertaken by the U.S. Forest Service and collaborative projects to this end are under consideration.
Land Use Planning and Management	Includes land use controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater and surface water, natural resources, and endangered and threatened species.	Land Use Planning and Management was selected as an RMS for improved coordination in the Region between land use planning and water resource planning. Regional entities pursue increased land and water land use coordination with the Los Padres National Forest, Vandenberg Air Force Base, State Parks, private lands including agricultural lands, the Santa Barbara County Planning and Development Department, and all community and municipal developments and planning departments. The Santa Barbara County Water Agency is working collaboratively with the County Planning and Development Department and the Agricultural Commissioner's Office on a groundwater project for one of the County's main groundwater basins.
Recharge Area Protection	Includes land use planning, land conservation, and physical strategies to protect areas that are important sources of groundwater recharge.	Recharge Area Protection was selected as an RMS for the IRWM Region. Protecting recharge areas is important for the Region. An example is in the Santa Maria Watershed where Twitchell Reservoir delays a portion of intercepted storm flow from the Sisquoc and Cuyama Rivers for later release and percolation to the Santa Maria Groundwater Basin.

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
Watershed Management	Comprehensive management, protection, and enhancement of groundwater and surface waters, natural resources, and habitat.	Watershed Management was selected as an RMS for the IRWM Region. Creating and implementing water resource plans, programs, projects, and activities are approached on both watershed and local levels. Watershed management has proven effective in managing, coordinating, and integrating physical, chemical, and biological processes that make up the river based sub-regions of the regional systems, including the Santa Maria Valley, San Antonio Creek, Santa Ynez River, and South Coast. The following RMS has been added for the Region to underscore the importance of mitigating the impact of wildfire using a watershed approach: Watershed Management (including Controlled Burns) to Mitigate the Impact of Wildfire and Associated Erosion. Erosion control is emphasized to preserve water storage capacity.
Sediment Management	The management of sediment in river basins and waterways is important for water benefits, environmental health, economic stability, and coastal safety. Sediment accumulation behind dams can lead to decreased storage capacity of reservoirs.	Sediment Management is an important RMS in the IRWM Region, particularly in light of recent wildfires and floods that occurred throughout the Santa Ynez River Watershed. Sediment decreases the storage capacity of the Region's reservoirs, impacts reservoir operations, impacts South Coast Conduit crossings of creek channels, negatively affects water quality, and decreases surface water supply for urban and agricultural users. Sediment management is discussed throughout this IRWM Plan as it is applicable to all watersheds and an interest of all Cooperating Partners. There is, however, a more consolidated discussion in Section 2.13.3, Prioritized Vulnerabilities, as it relates to the need for sediment management.
Improve Flood Management		
Flood Risk Management	Strategies that decrease the potential for flood-related damage to property or life, including control or management of floodplain lands or physical projects to control runoff.	Flood Risk Management was selected as an RMS for the IRWM Region. Flood risk management includes projects and programs that assist individuals and communities in managing flood flows and preparing for, responding to, and recovering from a flood. The Region has an extensive flood control system that includes 24 miles of levees along the Santa Maria River, and other flood control features that include closed conduits, lined channels, earth channels, retarding and recharge basins, debris basins, and sediment trapping basins. The Region also has a County-wide real-time hydrologic monitoring system to assist with

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
		flood prevention and response. Regional management chose to add additional definition to this state RMS by including the following three regional RMSs: • Structural Improvements to Flood Infrastructure to Decrease Flooding • Management of Creek and River Systems to Reduce Flood Flow • Multi-Purpose and Multi-Benefit Flood and Stormwater Management
People and Water		
Economic Incentives	Includes economic incentives (e.g., loans, grants, water pricing) to promote resource preservation and enhancement.	Economic Incentives was selected as an RMS for the IRWM Region. Several water agencies maintain economic incentives to encourage water conservation, including rebate programs and tiered water rates. The region actively seeks state and federal grants to promote resource conservation.
Outreach and Engagement	Outreach and engagement for water management in California is the use of tools and practices by water agencies to facilitate contributions by public individuals and groups toward good water management outcomes.	Outreach and engagement have been critical during droughts, and water agencies throughout the IRWM Region have been able to significantly reduce demand to stretch limited supplies when necessary. The water supply portfolio of the IRWM Region is diverse and complicated. It is important for the public to understand where their water comes from and the potential limitations on those sources so that good policies and water management strategies can be implemented. Outreach and engagement is also important for public support of capital improvement projects and is critical with all policy issues, particularly if stakeholders have competing priorities. Outreach and engagement is cited in various sections throughout the IRWM Plan, as it is foundational to the IRWM process. All meeting and workshops are open to the public, and are shared with the public and stakeholders. All materials are available online. Targeted and strategic outreach and engagement is also conducted to various communities, including but not limited to DACs, SDACs, the agricultural community, the environmental community, among others.
Water and Culture	Increasing the awareness of how cultural values, uses, and practices are affected by water management, as well as how they affect water management, will help inform policies and decisions.	The cultural value of water in this Region is strong. The Santa Ynez Band of Chumash Indians considers water as sacred and finds that "Water supplies, and water quality are indistinguishably linked to California Native American Tribe's

Table 5.1
California Water Plan Resource Management Strategies Considered and Selected for the Region

California Water Plan Resource Management Strategy	Resource Management Strategy Overview	Resource Management Strategies Selected or Not Selected for the Region
		spiritual, cultural, subsistence, and traditional life ways and practices". The introduction to Section 5 provides additional discussion.
Water-Dependent Recreation	Enhancing and protecting water-dependent recreational opportunities and public access to recreational lands	This RMS was selected and expanded to include an emphasis on adding educational opportunities to water-dependent recreation by relabeling the RMS as "Incorporation of Educational Opportunities in Water-Related Projects." This RMS is appropriate for the Region since there are many water-dependent recreational opportunities on lakes, rivers, streams, and in the Pacific Ocean. Some of the recreational opportunities include fishing, swimming, waterfowl hunting and birding, picnicking, camping, hiking, biking, boating, canoeing, and kayaking.
Other		
Crop Idling for Water Transfers	Crop idling is the cessation of irrigation on irrigated lands for a period of time for the purpose of transferring the water that would have been used for irrigation to another use. Crop idling includes the intention to return that land to irrigation at a later time.	This RMS is not relevant for the Region. Crops grown in the Region, including almonds, avocados, citrus, and grapes, are not candidates for idling because of the long-term nature of the investment in these crops. In addition, some crops, such as strawberries, have a very high crop value, and because of this, are not likely to be idled.
Irrigated Land Retirement	Irrigated land retirement is the removal of farmland from irrigated agriculture. This is considered a permanent cessation of irrigation.	This RMS is not relevant for the Region. It is unlikely that farmers would voluntarily retire farmland on a large enough scale for this to be a worthwhile RMS.

Table 5.2
Other Resource Management Strategies Considered and Included for the Region

Other Resource Management Strategies	Resource Management Strategy Description
Dewvaporation/Atmospheric Pressure Desalination	This Resource Management Strategy (RMS) was selected as one tool to potentially use in the future. Dewvaporation/Atmospheric Pressure is defined in the California Water Plan Update 2009 as follows: Dewvaporation is a specific process of humidification-dehumidification desalination. Brackish water is evaporated by heated air, which deposits fresh water as dew on the opposite side of a heat transfer wall. The energy needed for evaporation is supplied by the energy released from dew formation. Heat sources can be combustible fuel, solar or waste heat. The tower unit is built of thin plastic films to avoid corrosion and to minimize equipment costs. Towers are relatively inexpensive since they operate at atmospheric pressure.
Develop and Maintain a Diversified Mix of Water Resources	Develop and Maintain a Diversified Mix of Water Resources is included because the development and maintenance of a diversified mix of water resources is essential to regional water supply self-sufficiency. Challenges such as loss of storage capacity in reservoirs due to sedimentation, the fluctuations in deliveries of SWP water, and the need for additional storage capacity on the South Coast have been identified for the Region. These challenges underscore the need for this RMS and implementation of projects such as stormwater capture, distribution system connections, and groundwater cleanup.
Rainfed Agriculture	Rainfed Agriculture was selected as an RMS for the IRWM Region. Rainfed agriculture is encouraged and increasingly incorporated into crop operations where and when appropriate.
Emergency Response	The Region is increasingly vulnerable to emergency occurrences such as drought, earthquakes, flooding, fires, potential terrorism, and vandalism. Planning for and responding to emergencies is a priority for the Region, thus, the three RMSs were added: • Plan for and Address the Impacts of Emergency Situations Such as Drought, Earthquakes, Flooding, Fires, Terrorism, and Vandalism to Ensure Water Quality, Water Supply, and Ecosystem Health • Develop Inter- and Intra-Regional Emergency Response and Mutual Aid Plans • Ensure Fire Protection Capacity through Water Storage, Delivery Systems, and Power Facilities
Rehabilitation and Replacement of Aging Water and Wastewater Delivery and Treatment Facilities	The Region places a high priority on rehabilitating and replacing older water and wastewater delivery and treatment facilities. Recent projects include bringing the Goleta Sanitary District to full secondary treatment, updating the Lompoc Regional Wastewater Reclamation Plant, and updating the El Estero Recycled Water Treatment Facility to full capacity.
Renewable and Efficient Energy Facilities	RMSs aimed at dealing with the impacts of and adapting to climate change have been adopted for the Region. Future updates to and new infrastructure will incorporate, when feasible, renewable and efficient energy facilities in conformance with the adopted strategies as outlined by CARB in its AB 32 Scoping Plan, *Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target*. The climate change-related RMSs are as follows: • Energy Use Reduction by Water and Wastewater Systems • Renewable Energy Generation and Use by Infrastructure • Greenhouse Gas Emissions Reduction

Table 5.2
Other Resource Management Strategies Considered and Included for the Region

Other Resource Management Strategies	Resource Management Strategy Description
Support Projects in Disadvantaged Communities	This regional RMS points out the importance of supporting disadvantaged communities (DACs) in the Region. A regional target has been set of directing 10% of all grant funding to projects for DACs. The IRWM governance structure includes several DACs, and the Region has included several DAC projects in Proposition 50 and Proposition 84 grant applications.
Consultation, Collaboration, and Assistance to Better Sustain Tribal Water and Natural Resources	This RMS points to the regional stakeholder outreach efforts that have worked to improve consultation, collaboration, and assistance, where needed and requested, to tribal interests in the Region.

5.3 IRWM Plan Resource Management Strategies

The following diversified set of RMSs (Table 5.3) was selected for the Region as most appropriate to implement the regional objectives. They are organized according to the regional objective they strategically support and implement.

Table 5.3
Resource Management Strategies Implementing Objectives

IRWM Plan Objective	Resource Management Strategy
Protect, Conserve, and Augment Water Supplies	• Agricultural Water Use Through Efficiency and Conservation Measures • Urban Water Use Through Efficiency and Conservation Measures • Rainfed Agriculture • Conjunctive Management and Groundwater Storage • Desalination • Precipitation Enhancement • Recycled Municipal Water • Surface Storage – Regional/Local • Sediment Management • Dewvaporation or Atmospheric Pressure Desalination • Use of Lower Quality Water or Recycled Water for Landscaping and Other Non-Potable Uses • Develop and Maintain a Diversified Mix of Water Resources • Pollution Prevention • Capture and Treat Stormwater • Watershed Management (including Controlled Burns) to Mitigate the Impact of Wildfire and Associated Erosion • Water Transfers • Outreach and Engagement • Water and Culture

Table 5.3
Resource Management Strategies Implementing Objectives

IRWM Plan Objective	Resource Management Strategy
Protect, Manage, and Increase Groundwater Supplies	• Conjunctive Use and Groundwater Management • Efficiency and Conservation Measures • Groundwater Remediation/Aquifer Remediation • Prevention of Contamination and Salt Water Intrusion • Recharge Area Protection • Outreach and Engagement • Water and Culture
Practice Balanced Natural Resource Stewardship	• Agricultural Lands Stewardship • Economic Incentives – Loans, Grants, and Water Pricing • Restoration and Protection of Ecosystems, Wildlife Habitat, Sensitive Species, and Fisheries • Forest Management, including Control of Fuel Loads • Recharge Area Protection • Management of Water-Dependent Recreation • Watershed Management • Incorporation of Educational Opportunities in Water-Related Projects • Utilization of New or Additional Technologies for Water and Wastewater Treatment that are Economical and Environmentally Sustainable
Protect and Improve Water Quality	• Drinking Water Treatment and Distribution • Groundwater Remediation/Aquifer Remediation, including Shallow • Groundwater Contamination at Orphaned Sites • Salt and Nutrient Management • Desalination • Urban Runoff Management • Reduction of Wastewater Discharge into the Ocean through Use of Recycled Water • Prevention of Point and Nonpoint Sources of Pollution • Capture and Treatment of Stormwater • Upgrade Wastewater Treatment to Meet Current and Future State and Federal Water Quality Standards • Utilization of New or Additional Technologies for Water and Wastewater Treatment that are Economical and Environmentally Sustainable • Sediment Management • Water and Culture
Improve Flood Management	• Flood Risk Management • Structural Improvements to Flood Infrastructure to Decrease Flooding • Management of Creek and River Systems to Reduce Flood Flow • Multi-Purpose and Multi-Benefit Flood and Stormwater Management • Sediment Management
Improve Emergency Preparedness	• Conveyance – Regional/Local • Increase Back-Up Facilities, Interconnections, Redundant Power Sources, and Treatment Facilities to Secure Water Supplies

Table 5.3
Resource Management Strategies Implementing Objectives

IRWM Plan Objective	Resource Management Strategy
	• Plan for and Address the Impacts of Emergency Situations Such as Drought, Earthquakes, Flooding, Fires, Terrorism, and Vandalism to Ensure Water Quality, Water Supply, and Ecosystem Health • Develop Inter- and Intra-Regional Emergency Response and Mutual Aid Plans
Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability	• Conveyance – Regional/Local • Rehabilitation and Replacement of Aging Water and Wastewater Delivery and Treatment Facilities • System Reoperation • Renewable and Efficient Energy Facilities • Ensure Fire Protection Capacity through Water Storage, Delivery Systems, and Power Facilities
Address Climate Change	• System Reoperation • Energy Use Reduction by Water and Wastewater Systems • Renewable Energy Generation and Use by Infrastructure • Recycled Municipal Water • Urban Water Use Efficiency • Agricultural Water Use Efficiency • Enhance Natural Functions of Watersheds including Carbon Sequestration • Greenhouse Gas Emissions Reduction • Plan and Prepare for Weather Variability • Sediment Management • Outreach and Engagement • Water and Culture
Ensure Equitable Distribution of Benefits	• Support Projects in Disadvantaged Communities • Consultation, Collaboration, and Assistance to Better Sustain Tribal Water and Natural Resources
Evaluate Projects Consistent with the Most Current Climate Science Data	• Coordinate and Ensure That IRWM Projects Are Carbon Neutral or the Least GHG Intensive Alternative Project to Attain the Goal • Ensure That Projects That Address the Santa Barbara Region's Vulnerabilities Advance to Funding

5.4 Regional Resource Management Strategies that Address Climate Change High-Priority Vulnerability Issues

Table 5.4 identifies regional RMSs that address high-priority climate change vulnerability issues. These climate change vulnerabilities are described in more detail in the Natural Hazards and Climate Change Section.

Table 5.4
Regional Resource Management Strategies that Address Climate Change and Very High Priority Vulnerability Issues

High Priority Vulnerability	Description of Impact of Very High Priority Vulnerabilities	Resource Management Strategy Addressing Climate Change
Water Demand	• Lack of groundwater storage to buffer drought	• Urban Water Use Efficiency • Agricultural Water Use Efficiency • Plan and Prepare for Weather Variability • Recycled Municipal Water • Outreach and Education
Water Supply	• Decrease in groundwater supply • Sensitivity due to drought potential	• System Reoperation • Recycled Municipal Water • Urban Water Use Efficiency • Agricultural Water Use Efficiency • Plan and Prepare for Weather Variability • Water Transfers • Conjunctive Management and Groundwater Storage • Desalination • Precipitation Enhancement • Surface Storage – Regional/Local • Groundwater and Aquifer Remediation • Matching Water Quality to Use • Salt and Salinity Management • Recharge Area Protection • Develop and Maintain a Diversified Mix of Water Resources • Protect Reservoirs from and Remove Sedimentation • Rehabilitation and Replacement of Aging Water and Wastewater Delivery and Treatment Facilities • Sediment Management • Water and Culture
Water Quality	• Poor water quality in surface waters and groundwater, including increased constituent concerns and increased treatment needs • Increased erosion and sedimentation in surface waters	• Recycled Municipal Water • Plan and Prepare for Weather Variability • Desalination • Groundwater and Aquifer Remediation • Pollution Prevention • Salt and Salinity Management • Urban Runoff Management • Agricultural Lands Stewardship • Forest Management • Recharge Area Protection • Sediment Management • Water and Culture • Outreach and Education

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6 INTEGRATION AND THE PROJECT REVIEW PROCESS

6.1 Introduction

This chapter describes the system in place to ensure stakeholder, institutional, resource, and project integration. It also describes the process employed to submit, review, select, and prioritize projects for inclusion in the IRWM Plan. The integration section demonstrates that the IRWM Plan coordinates and integrates separate efforts to function in a unified fashion. Section 6.3, Project Review and Selection Process, demonstrates that the IRWM Plan will be implemented through specific actions, plans, and projects. A wide range of project types are considered in the IRWM Plan, including urban and agricultural water use efficiency, infrastructure, water supply, drinking water treatment, wastewater treatment, recycled water, water storage, habitat restoration, flood control and management, groundwater conjunctive use, groundwater quality, and energy efficiency. This chapter demonstrates that the projects selected are appropriate for funding through DWR's IRWM Grant program (Public Resources Code Section 75028 [a]) and other grant programs.

6.2 Integration

Development and implementation of the IRWM Plan by the Cooperating Partners demonstrates that the Region is integrating separate efforts that will function as one united regional water management planning effort. The regional IRWM planning process has intentionally organized separate functions to integrate processes, structures, and procedures. Integration can occur on many levels, including integration of stakeholders, resources, and projects. The IRWM Plan strategically integrated projects on the basis of merit, as defined by the 2016 Guidelines. In the process of the IRWM Plan's integration, project review, and selection and implementation, the project rubric assesses a project's intentionality with respect to the following: qualitatively and quantitatively implementing the plan's goals and objectives; providing multi-benefits to the area of immediate impact and region; ensuring projects have a regional benefit and address resource equity; ensuring projects adapt to climate change, provide for climate resiliency, and reduce climate change impacts; and have stakeholder support. Projects that attain a high level of alignment, or individual projects that have high levels of alignment but could be combined to achieve greater benefit, will be candidates for project merging and combination, redevelopment, or other strategies.

6.2.1 Stakeholder and Institutional Integration

The Region's governance structure (see Chapter 3, Governance and Participation) and processes enable diverse groups of stakeholders to participate on all levels of the IRWM planning effort. The Cooperating Partners' MOU enables stakeholders to participate in the process regardless of financial contribution.

6.2.2 Resource Integration

The Region uses several processes to encourage the combining of information, expertise, knowledge, or personnel assistance to leverage resources of all regional stakeholders involved in the IRWM process. The governance structure comprising the Cooperating Partners brings together multiple cities, agencies, and organizations in regular meetings. These meetings are critical for the identification of resource integration opportunities and the facilitation of their implementation. In addition, integration of infrastructure resources is emphasized, including built (e.g., distribution systems) and natural (e.g., habitat) water resources, both of which are instrumental to integrating water management at a regional level.

6.2.3 Project Implementation Integration

Project integration is encouraged at multiple stages of the project development process. During Cooperating Partner meetings, time is dedicated to the discussion of projects in development by individual entities, with the intention of encouraging identification of complementary projects that could be combined to leverage the resources of multiple agencies and achieve multiple benefits. In addition, during the project review process, the Subcommittee on Integration and Alternative Approaches looks to gain economies-of-scale from using and combining resources such as personnel, funding, and equipment from small projects in the same sub-region into a larger project for the sub-region. The subcommittee reviews project objectives and seeks to develop new or expanded solutions or projects to meet local needs.

Regional objectives include the following:

- Protect, conserve, and augment water supplies
- Protect, increase, and manage groundwater supplies
- Practice balanced natural resource stewardship
- Protect and improve water quality
- Improve flood management
- Improve emergency preparedness
- Maintain and enhance water and wastewater infrastructure efficiency and reliability
- Address climate change through adaptation and mitigation
- Ensure equitable distribution of benefits

The regional IRWM data management system (DMS) provides the Cooperating Partners with an important integration tool to geo-code potential project locations and then identify objectives and potential opportunities to integrate regional needs and projects. Project proponents are encouraged to consider alternate approaches and to combine efforts with other like projects as follows:

- Combine projects with similar objectives
- Use resources such as personnel, funding capacity, and equipment
- Consider different, expanded, or new solutions to meet multiple regional needs

6.3 Project Review and Selection Process

The Cooperating Partners set up the web-based, GIS-enabled Santa Barbara County IRWM Project Data Management System (IRWM DMS; County of Santa Barbara 2018d) to collect, store, and disseminate data to provide relevant project information to IRWM participants, stakeholders, the public, and the state.

6.3.1 Procedures for Submitting a Project

The project submittal process is ongoing throughout the year, however, there are occasions when a deadline for project submittal is set to solicit projects for inclusion in a grant application or other purpose. As a regular policy, newly submitted projects are available for review on the IRWM DMS.

The process for submitting projects to the IRWM DMS and project submittal training opportunities were publicized throughout the Region and within the Cooperating Partners. The Santa Barbara County Water Agency can be contacted at any time to answer any questions related to the DMS or resolve any difficulty with the data.

How to Submit and Update a Project into the Project Database

The IRWM DMS is open to anyone interested in joining the Santa Barbara County IRWM planning community. Public stakeholders can view projects and IRWM Plan information.

Once a project is submitted, it is reviewed by a project administrator to make sure that it satisfies the two basic criteria: the project is a water-related project, and the project will achieve one or more regional IRWM objectives. The Santa Barbara County Water Agency assists all project proponents, including DACs, who do not have the resources to access or enter information into the web-based project submittal system.

Types of Projects

The Cooperating Partners encourage the submittal of a wide range of projects, from conceptual to fully developed implementation projects. All projects entered into the IRWM DMS indicate the primary objective of the project. The different types of projects include urban and agricultural water use efficiency, infrastructure, water storage, wastewater treatment, flood control and management, habitat restoration, energy efficiency, drinking water treatment, recycled water, groundwater conjunctive use, and groundwater quality projects.

Projects that take actions that accomplish the Santa Barbara County IRWM regional objectives, as listed in Section 6.2.3, Project Implementation Integration, are encouraged.

Project Information Requested

Project submittal through the IRWM DMS seeks standardized information, including the following:

- General information (project name, sponsor and cosponsor, contact)
- Project location (latitude/longitude)
- Project description (watershed, project description, primary objective)
- Project cost and funding, including total project cost, capital costs, annual operation and maintenance costs, lifetime replacement costs, amount of grant funding requested, project status, identification of funding sources, and completed feasibility studies
- Regional objectives met by the project (including primary objective met)
- Performance measures used
- Monitoring and assessment system used
- How project incorporates adaptation and mitigation to potential effects of climate change
- Project benefits
- Project qualifications:
    - Project status (when ready for implementation)
    - Project included in approved plan
    - Current status of CEQA process
    - Current status of design
    - Current status of permitting

- Matching funds (what percent from agency, are matching funds committed)
- Benefits
  - Reduction in water demand (acre-feet per year)
  - Reduction in demand for Delta supplies
  - Increased water supplies for beneficial use (acre-feet per year) (local supplies)
  - Improved water supply reliability (diversifies supply)
  - Water quality
  - Resource stewardship
  - Improved flood management (number of people affected by improvement multiplied by the return period)
  - Benefits to DACs or tribal communities
  - Integration between multiple organizations (number of organizations)
  - Climate change (reduce greenhouse gas [GHG] emissions)
  - Beneficial impacts to other regions

6.3.2 Procedures for Review of Projects

The goal of the project review process is to identify projects that address regional water issues and challenges, help achieve regional objectives, and assist in implementing the IRWM Plan. Projects will continue to be approved for inclusion in the database on an ongoing basis (at least annually), as relevant projects are developed.

Project Review Factors

Projects undergo preliminary screening to be included into the IRWM Plan. A submitted project is required to be included in an approved plan and to meet one or more regional objectives, and the project sponsor has to have adopted the most recent IRWM Plan (the complete list of Cooperating Partners that have adopted the Plan in included in Appendix 8, List of Cooperating Partners that adopted the Plan and Agency Resolutions, along with copies of each agency's resolution). In addition, projects (as discussed above) are strategically adopted and integrated on the basis of merit, as defined by the 2016 Guidelines. Once a project had passed this initial screening, the factors listed below were used to further prioritize projects that meet important criteria, including meeting multiple objectives. The review factors do not contain any specific grant-related requirements.

- Does not disproportionately affect disadvantaged populations or impede environmental justice.

- Meets multiple regional objectives (see Section 6.2.3).
- Achieves multiple benefits.
- Uses regional resource management strategies.
- Identifies project costs (supported by conceptual plan or feasibility study) and funding sources (how the project will be funded, percent matching funds anticipated, matching funds are committed and identified).
- Addresses economic feasibility.
- Lists project status (design status).
- Supports technical feasibility (supporting documentation was requested [e.g., feasibility studies, modeling results, survey results]).
- Provides specific benefits to a DAC or Native American tribal community.
- Provides integration between multiple organizations (e.g., agencies, NGOs).
- Reduces dependence on the Delta water.
- Addresses adaptation and mitigation to the potential effects of climate change.
- Combats climate change by reducing GHG emissions.
- Includes strategies adopted by CARB in its AB 32 Scoping Plan 1, as feasible.

Project Review Steps

The following steps are a general guideline for the project review process.

Step 1: Call for Projects. A call for projects is issued in anticipation of funding rounds to facilitate submittal of projects into the IRWM DMS for review, further development, and prioritization.

Step 2: Strategic Integration Workshop. A Strategic Integration Workshop is held to facilitate stakeholder, resource, and project integration.

Step 3: Project Ranking and Review. Projects are reviewed and scored based on scoring criteria developed.

***Step 4: Project List and Scoring Reviewed by Cooperating Partners*.** The prioritized project list and scoring are distributed to all Cooperating Partners for review and comment. Adjustments are made to the list, if necessary, and agreed to by the Cooperating Partners.

Step 5: Projects Arranged into Tiers According to Score. Each project is first scored by the project consultant and then reviewed and rescored, if necessary, by a subcommittee formed at the direction of the Cooperating Partners. Projects are then arranged into three scoring tiers.

Step 6: Additional Information. For those projects in Tier 1, additional information on project readiness, technical feasibility, and cost benefits (to determine economic feasibility) are gathered from project proponents to have the most complete and up-to-date information in the IRWM Plan.

Step 7: Appeal of Scoring. Project proponents are allowed to request a rescoring of projects. Based on feedback from proponents, IRWM Plan consultants can adjust project scores where it is justified based on more accurate information. The scores of the rescored projects are then reviewed and approved or not approved by the Subcommittee and the Cooperating Partners.

Step 8: Review of Top Projects for Integration and Accuracy. This review is conducted by the Subcommittee. Projects are reviewed by subcommittee members who have experience with the specific type of project. Each member of the subcommittee is assigned several projects to review. A Rescoring Comment Matrix is completed on each project to guide the consideration of all project selection criteria.

Step 9: Economic Feasibility Evaluation. The Subcommittee conducts an evaluation of each top-tier project's economic feasibility (benefits and costs) with assistance from an economic consultant. A benefit-cost score is determined based on the total number of objectives achieved divided by the cost score.

Benefit Score – The benefit score is based on the number of objectives achieved, with four to five objectives achieved receiving a "high" score, two to three objectives achieved receiving a "medium" score, and one objective achieved receiving a "low" score. The number of objectives achieved is counted, with a maximum score of five benefits. Although the magnitude of the benefit from the objectives is not calculated, a general idea of the level of benefit is gained. This approach is consistent with the DWR Guidelines (DWR 2016c), and has the advantage of being applicable to multiple types of projects.

Cost Score – The cost score is based on the present value cost of the project. Present value calculations use capital cost and project life in years. To determine project life in years, the Subcommittee Workgroup will use the most recent tools available through the EPA.

Step 10: Final Scoring. Final scores are determined for each top-tier project, and then the project list and ranking is posted on the IRWM website. A public meeting is then held by the Cooperating Partners to review public comments and to receive presentations by the project proponents. Scoring is again adjusted, if necessary. Public stakeholders have multiple opportunities to track and participate in the project prioritization process, including Cooperating

Partners meetings, Project Workshops, and public meetings.

6.3.3 Procedures for Communicating the List of Selected Projects

The project list is continually being updated so that the projects reflect current issues and challenges in the Region. Stakeholders are notified that the regional project list has been updated through email blasts sent out to the Cooperating Partners and stakeholders, and on the IRWM website, sponsored by the Santa Barbara County Water Agency.

The list also includes geo-referencing each project, which allows stakeholders and project reviewers to visually see the regional distribution and types of projects within the whole Region or within their local area.

Technical issues and questions regarding the IRWM DMS can be submitted though the “Contact Us” tab on the IRWM website.

7 BENEFITS AND IMPACTS

7.1 Introduction

This chapter documents the potential impacts and benefits associated with implementation of the IRWM Plan, and provides a high-level analysis of the projects included in the IRWM Plan. This analysis is generally intended to serve as the foundation for evaluating IRWM Plan performance and understanding the potential impacts and benefits of implementing the IRWM Plan. Projects and associated benefits and impacts may change over time as the IRWM Plan is implemented, reflecting the adaptive management approach embodied in this document and discussed in detail in Chapter 8, Plan Implementation.

Benefits and impacts are evaluated at two levels: The first level is a general evaluation of the IRWM Plan and the second level is a more project-specific discussion of the IRWM Plan. The discussion of the benefits and impacts of stakeholder-identified projects is at a level of detail appropriate for the level of development at the time IRWM Plan was prepared. Implementation of the IRWM Plan is discussed at a regional level and in a flexible context appropriate for adaptive management. Benefits and impacts are organized by regional objectives and focus on planning targets.

7.2 Review and Update of Benefits and Impacts

7.2.1 Project-Specific Review

A more detailed, project-specific impacts and benefits analyses occurs as part of the project selection process in preparation for submittal of implementation grant applications. The most recent review of project benefits and impacts took place in 2018 as part of the IRWM Plan Update 2018. In addition, the project review process that took place in 2012 and also in 2014 is described in Chapter 6, Integration and the Project Review Process. Chapter 6 goes into detail about the expected impacts and benefits of IRWM Plan objectives and targets. A project-specific review also occurs on an ongoing basis. As new projects are submitted to IRWM staff, they are reviewed and, if they qualify, are uploaded to the IRWM project website two to four times a year.

7.2.2 Update of Impacts and Benefits Section of the IRWM Plan

The IRWM Plan is routinely updated, including project impacts and benefits, as a normal part of IRWM management activities. The project list is updated on a regular basis, typically quarterly. Projects can be entered into the project database at any time, and project-related discussions are on the agenda at every meeting. As projects are updated, the benefits and impacts of the projects are also updated.

7.2.3 Impacts and Benefits to DACs/Environmental Justice Concerns and Native American Tribal Communities

Multiple benefits will be received by DACs with associated environmental justice benefits through implementation of the IRWM Plan. The issues challenging DACs and associated environmental justice concerns were identified early in the IRWM process. Projects that address DAC needs are given high priority through the project review process described in Chapter 6. The Region has consistently provided in-kind support to DACs (the cities of Guadalupe and Lompoc, areas of Santa Maria, and communities of New Cuyama, Cuyama, Casmalia, Sisquoc, Isla Vista, and Garey) for project development, and DAC projects have been included in every IRWM grant application since the beginning of the IRWM program.

Section 7.3, Benefits and Impacts of IRWM Plan Implementation, describes the benefits to DACs and Native American tribal communities by achieving IRWM Plan targets and objectives. Although local Native American interests have chosen not to actively participate in the Santa Barbara County IRWM process, the Region continues to actively encourage and solicit their participation (see Section 2.11.2, Social and Cultural Makeup, for more detailed information about DACs). Nonetheless, IRWM Plan delivers benefits to DACs and Native American tribal communities. A discussion on how the IRWM Plan benefits these communities by achieving regional targets can be found in Section 7.3. Following are some examples:

- Implementing projects that help meet the target of “restore 200 acre-feet of surface storage capacity” would benefit the DAC cities of Santa Maria and Guadalupe by increasing groundwater recharge and therefore the ability to offset expensive imported water with cheaper groundwater, thereby decreasing the overall cost of the water supply.
- Achieving the target of “recycle and reuse 6,714 AFY” (Section 7.3.1) could decrease the amount of imported water needed for the DAC cities of Santa Maria, Guadalupe, and Isla Vista.
- “Increasing sustainable groundwater storage by 2,500 AFY” (Section 7.3.1) would directly benefit DACs by lowering water supply costs through decreased dependence on imported water, and by increasing supply reliability.
- “Implementing emergency plans, where feasible” (Section 7.3.5) would result in better emergency response, and lower costs would directly benefit the DACs (and SDACs) of Guadalupe, Cuyama, New Cuyama, Ventucopa, Isla Vista, and Lompoc, as well as portions of the Cities of Santa Maria, Santa Barbara, Goleta, and Carpinteria.
- “Ensure that 10% of the total future funding received from IRWM grants benefit DACs” (Section 7.3.9) will mean that more DAC projects receive funding.

7.2.4 Inter-Regional Benefits and Impacts

Inter-regional coordination has been ongoing with Ventura County; San Luis Obispo County; and, to a lesser extent, Kern County, since 2005. Coordination has occurred through conference calls and meetings where programmatic concerns and issues have been discussed. A main goal of the meetings has been to augment benefits through multi-regional projects. For example, both Ventura and Santa Barbara Counties have portions of the Los Padres National Forest within their regions. Stakeholders from both regions have met with a representative from Los Padres National Forest and had many follow-up conference calls to discuss project development. See Section 3.6, Neighboring IRWM Efforts, for more detailed information on this topic.

This chapter focuses on benefits and impacts to neighboring regions. The section organizes planning targets according to their relevant regional objectives and lists the inter-regional and regional benefits and impacts that will result from implementing projects that achieve their targets.

7.3 Benefits and Impacts of IRWM Plan Implementation

Consistent with discussions in other chapters, benefits of the IRWM Plan are organized by regional objectives. These benefits are measured, as appropriate, during implementation of the IRWM Plan, as discussed in Chapter 8. Pursuant to DWR Guidelines (DWR 2016c), the discussion of benefits includes consideration of benefits to other regions, to DACs, to Native American communities, and of environmental justice concerns. In addition, the potential to reduce GHG emissions and adaptations to the effects of climate change are discussed. The following discussion evaluates the benefits and impacts of the targets associated with each objective.

7.3.1 Protect, Conserve, and Augment Water Supplies

To protect, conserve, and augment water supplies, the following planning targets were incorporated into the IRWM Plan:

- Restore 200 acre-feet of surface storage capacity
- Recycle and reuse 6,714 AFY (4,742 AFY Laguna; 849 AFY Goleta Water District; 1,123 AFY City of Santa Barbara) (current is 4,127 AFY)
- Create 50 facilities that will augment and expand water supply
- Conserve 5,000 AFY of water by 2035 through water use efficiency measures
- Protect, manage, and increase groundwater supplies by 2,500 AFY

The benefits of each target are outlined below.

Restore 200 Acre-Feet of Surface Storage Capacity

The yield of local surface reservoirs has declined and will continue to decline in large part due to accumulation of silt and resulting reduction of storage. Removing accumulated silt would restore storage and thus yield. Limited silt removal has historically been practiced in Twitchell Reservoir and Gibraltar Reservoir. Silt may be removed by mechanical means or (in the case of Twitchell Reservoir) by "flushing" or making releases through the lowermost release works at relatively high rates.–Dredging and dry desilting at Lake Cachuma and dredging and flushing at Jameson Reservoir have been previously considered and should be reassessed for feasibility (Long Term Supplemental Water Supply Alternatives Report).

The benefits of increased local reservoir storage would be increased local supply and related decreased need for imported water. Since local supplies are less costly than imported water, a secondary benefit would be lower water costs. Releases from Twitchell Reservoir provide an important source of flow for the Santa Maria River, which is the main source of recharge for the Santa Maria Groundwater Basin. As a result of upstream fires, a clay sediment layer formed along the river bed, which limited infiltration. In an effort to improve and restore groundwater recharge of the Santa Maria Groundwater Basin, the Santa Maria Valley Water Conservation District conducted a hydraulic and infiltration analysis of the use of disking to break up the confining layer. The analysis was completed in February 2016, and areas where disking should be avoided due to concerns regarding endangered species were identified through a companion biological resource assessment, also completed in February 2016.

Currently, Twitchell Reservoir produces 32,000 AFY of water for recharge into the Santa Maria Groundwater Basin. Both the cities of Santa Maria and Guadalupe rely on a combination of groundwater and SWP water. Restoration of the storage capacity of Twitchell Reservoir and the resulting increased volume of groundwater recharge available to the Basin may allow the cities of Santa Maria and Guadalupe to offset expensive imported water supplies with relatively cheap groundwater supplies, thereby decreasing their overall cost of supply. Decreased reliance on imported supplies would also make additional water available to other regions, including the adjacent regions of San Luis Obispo and Ventura.

The actual water supply benefits of increased capacity depend on which reservoir and to what level within the reservoir the storage capacity is increased. Thus, the water supply benefit cannot be estimated without a specific project description.

Recycle and Reuse 6,714 Acre-Feet per Year

Recycling and reusing local wastewater would allow replacement of potable water supplies for landscape irrigation, dust control, and certain industrial and agricultural purposes. This would have the same effect as a new supply. Any new supply would serve to meet future demand growth, increase reliability of local sources, and decrease the need for imported water supplies. Since the source of water for recycling is generally sewage effluent, the source would be available during drought conditions, helping to increase reliability of supply.

Indirect benefits would include decreased need for (and associated cost of) imported water. This would directly benefit the DAC cities of Santa Maria and Guadalupe by potentially decreasing dependence on relatively more expensive imported water, thereby reducing the overall cost of the water supply. In addition, the supply would be available during drought conditions, and would allow continued irrigation of landscaping. Protecting landscaping would preserve property values and, thus, have a secondary economic benefit. Reducing importation of water would lower energy use and associated emissions. In addition, decreased reliance on imported supplies would make additional water available to other regions, including adjacent regions of San Luis Obispo and Ventura. An additional benefit of water recycling is reduced ocean discharges from WWTPs.

Create 50 Facilities that will Augment and Expand Water Supply

The creation of 50 facilities to augment and/or expand water supply would substantially diversify existing sources of water in the Region. Facilities would be of varying size and type, and would include the restoration, replacement, or expansion of elements of existing facilities or building new facilities. Additional facilities to augment and expand supplies would increase reliability of local supplies because redundant sources and facilities can offer flexibility during drought or other emergency situations. New facilities that expand local supplies would help meet any increased future demand and would decrease the need for imported water. Decreased importation would reduce energy consumption and potentially increase availability to adjacent regions. In addition, increased local supplies would improve reliability in the case of disruption of the system that delivers imported supplies.

Increased supply reliability through diversification and facility upgrades would provide substantial benefit to DACs that often struggle to provide reliable, high-quality water supplies. In addition, if new and upgraded facilities provide additional local supplies that can offset the need to import relatively expensive SWP water, then DACs could benefit from an overall reduction in the cost of supply.

Conserve 5,000 AFY of Water by 2035 through Water Use Efficiency Measures

Conservation of 5,000 AFY of existing supplies would have the practical effect of reducing demand on local and imported sources. Reduced demand on existing sources would lessen the need to develop new sources; new sources generally have higher initial cost and higher operating cost. Thus, water conservation would reduce future water costs. In addition, lower water use would reduce the demand for imported water, thus lowering operational costs and reducing energy use. Reduced energy use would lower GHG emissions. Finally, reduced demand for imported water would free up supplies of imported water for use in the adjacent regions of San Luis Obispo and Ventura Counties.

Conservation can be particularly beneficial for DACs by decreasing costs for water providers and individual customers in those areas. Increased efficiency can be used to offset the need to purchase relatively expensive imported water to satisfy demand. It may also help increase reliability by allocating savings in unused supplies for future use. Efficiency measures can help decrease water use and the associated costs for individual customers in DACs, thereby decreasing the burden of paying water bills.

Increase Sustainable Groundwater Storage by 2,500 Acre-Feet per Year

Increasing sustainable groundwater storage would expand opportunities for conjunctive use and groundwater banking. Expanded conjunctive use would increase availability of local supplies by allowing storage of surplus surface water for use during periods of low rainfall. Increased availability of local supplies would reduce the need to import water to the Region. This would directly benefit the cities of Santa Maria and Guadalupe by potentially lowering the total cost of water supplies by decreasing dependence on imported water; both cities are DACs. Reducing the amount of imported water would reduce energy use and GHG emissions, and would also make more water available for use in the Delta. In addition, increased groundwater supplies can help improve the reliability of water supplies for DACs. Overdraft of a groundwater basin can be a significant hurdle for DACs, which lack the resources to dig deeper wells, attain alternative supplies, or significantly contribute to increasing groundwater levels. Increasing groundwater supplies at the regional level can help decrease the likelihood of overdraft and the resulting challenges to DACs.

Groundwater banking could allow storage of water from outside a basin for eventual pumping and use, thus increasing the reliability of supply. The benefits to the existing users of the groundwater basin include improved water quality and higher groundwater levels (for lower pumping costs), and may include some form of financial consideration.

7.3.2 Protect, Manage, and Increase Groundwater Supplies

To protect, manage, and increase groundwater supplies, the regional target set in the IRWM Plan is to increase sustainable groundwater storage by 2,500 AFY. As explained in Section 7.3.1, achieving this target will be accomplished through increased conjunctive use and groundwater banking. Increasing sustainable groundwater storage by 2,500 AFY would directly benefit DACs by lowering water supply costs through decreased dependence on imported water, and by increasing supply reliability. Improved water quality will be an additional benefit, since additional water will likely increase water quality through dilution. With increased groundwater, the Region can move toward drought-proofing its water supplies and reducing the need for water imported from the Delta during times of drought. In turn, reduced imported water will reduce energy use and therefore GHG emissions.

The SGMA required the formation of Groundwater Sustainability Agencies in all basins designated as high and medium priority by June 30, 2017. These GSAs are responsible for the creation of GSPs by January 31, 2022, for designated high- and medium-priority basins, and by January 31, 2020, for basins in critical overdraft. Basin prioritization is based on a number of criteria: population; number of public and private wells; irrigated acreage; reliance on groundwater as a primary source; and groundwater impacts including overdraft, land subsidence, and water quality degradation. The goal of GSPs is to ensure that basins are managed within sustainable yields without causing undesirable results. A GSP must achieve sustainability goals for the basin in 20 years. For a complete description of GSA formation in Santa Barbara County, see Section 8.7.2, Sustainable Groundwater Management Act.

The Cuyama Valley Groundwater Basin has been designated as a high-priority basin and is critically overdrafted. In addition, the basin includes the SDACs of Cuyama and New Cuyama, suffers from arsenic contamination issues, supports rapidly expanding agriculture, is the only water source for the Cuyama Valley, and underlies four counties: Santa Barbara, Ventura, Kern, and San Luis Obispo. Each of these components adds to the complexity of managing the groundwater basin. Successful management of the Cuyama Valley Groundwater Basin through the IRWM and SGMA processes will directly benefit the DACs that rely on the basin for their water supply.

7.3.3 Practice Balanced Natural Resources Stewardship

Balanced resources stewardship is necessary to protect and enhance the overall quality of life in the Region, including the local environment and adequate water supplies. To achieve this balance, the IRWM Plan incorporates the following planning targets:

- Conserve, preserve, protect, and restore 1,000 acres of natural habitat, rangeland, and production agriculture
- Protect and restore 30 linear miles of habitat (includes removing barriers to fish migration)

The potential benefits of these planning targets are discussed below.

Conserve, Preserve, Protect, and Restore Natural Habitat, Rangeland, and Production Agriculture

Depending on the condition of the land under management, activities to conserve, preserve, protect, and restore natural habitat, rangeland, and production agriculture could have a wide range of benefits. Reduction or elimination of invasive species (such as Arundo donax) can restore or enhance stream flow and restore critical habitat for rare or endangered species. Conservation of natural habitat and rangeland can improve receiving-water quality and protect and augment stream flow. Agricultural and range lands serve as areas for carbon sequestration and are critical to providing "ecosystem service" benefits. Ecosystem services are those benefits that arise from healthy functioning ecosystems, most notably production of oxygen, soil genesis, and water detoxification. Control or elimination of invasive species can also protect or improve riparian corridors and stream flow capacity, thus improving habitat corridors and flood management.

At an interregional level, protection of habitat such as stream corridors and upland areas will benefit migratory species such as birds and insects. In addition, restoration of stream habitat will broaden interregional opportunities for anadromous fish, reducing their susceptibility to disruptions of habitat at a watershed scale.

As various stewardship activities occur, each may serve as an educational opportunity for the public and for local schools. Expanded educational opportunities can help to broaden understanding of the importance of habitat protection.

Protect and Restore Linear Habitat

Restoration and protection of linear habitat corridors would focus on stream courses and associated riparian zones. Activities could include improved quality of stormwater runoff, control or elimination of invasive species, and removing barriers to fish migration. Depending of the specific activities, benefits could include improved instream water quality and enhanced or expanded habitat of rare or endangered species. In addition, improved water quality and habitat could increase opportunities for passive recreation. Improved or expanded instream and riparian habitat could support healthy populations of migratory or anadromous species at an interregional level. Expanding interregional opportunities for anadromous fish would reduce their susceptibility to disruptions of habitat at a watershed scale.

7.3.4 Protect and Improve Water Quality

Protecting, and in some areas, improving water quality is an important regional objective and is the focus of planning activities and specific projects. To protect and improve water quality, the IRWM Plan identifies the following planning targets:

- Meet water quality objectives of the current Basin Plan
- Comply with TMDL requirements
- Achieve salt and nutrient goals as adopted through future Basin Plan amendments

Since substantial water quality regulation is underway, this IRWM Plan incorporates state and federal regulatory requirements as its planning targets. Achieving each of the three planning targets (above) would have the same benefits:

- Protect beneficial uses
- Protect habitat
- Enhance recreational opportunities

Since the Basin Plan establishes beneficial uses and water quality objectives for all surface waters in the Region, protecting beneficial uses would, by definition, meet the Basin Plan water quality objectives. In addition, meeting water quality objectives and TMDL requirements would ensure that beneficial uses, including habitat protection, are protected long term. Salt and nutrient objectives are intended to ensure long-term viability of groundwater and surface water resources. Plans to manage salts and nutrients could be formally incorporated into the Central Coast Basin Plan, tying them formally to the protection of beneficial uses.

Water quality contamination issues, particularly related to nitrate, arsenic, and chromium-6, have been detailed as part of this IRWM Plan. Contamination issues in the groundwater basins in the Santa Ynez River Watershed include chromium-6 contamination in the Santa Ynez Upland Groundwater Basin and nitrate in the Santa Ynez Upland Groundwater Basin particularly focused in the Los Olivos area. In the Santa Maria Watershed, nitrate contamination issues have been documented in the Santa Maria River Valley Groundwater Basin and Cuyama Valley Groundwater Basin, and arsenic contamination is an ongoing issue in the Cuyama Valley Groundwater Basin. In addition, both the Santa Ynez River and Santa Maria River suffer from nitrate contamination issues. Section 2.10, Water Quality, provides a discussion of water quality issues throughout the Santa Barbara IRWM Region, the effects of those issues of local populations, and efforts being undertaken to address contamination.

7.3.5 Improve Flood Management

Improving flood protection is the primary responsibility of the Santa Barbara County Flood Control and Water Conservation District. The planning target to increase land protected from flooding by 200 acres would be met through Santa Barbara County Flood Control and Water Conservation District programs. Programs include maintenance of existing facilities and development of new facilities.

Increase Land Protected from Flooding by 200 Acres

The Santa Barbara County Flood Control and Water Conservation District has an ongoing program to maintain and expand flood protection within the Region. Individual projects protect new areas or provide increased protection from larger, but less probable, floods. The projects result in lower flood insurance costs based on meeting Federal Emergency Management Agency rating criteria.

Flood protection projects within the Santa Barbara County Flood Control and Water Conservation District are designed to meet as many objectives as possible given the location, funding sources, and nature of the project. Specific benefits of increasing land protected depends of the specific project, but would, at a minimum, reduce risk to life and property. Depending on location, the design of new or modified projects is typically integrated into existing and potential future projects. Given the nature of typical flood control projects, water quality and water supply enhancements occur due to retention of flood peaks and design that enhances infiltration.

Some flood control projects may enhance stream habitat by removing fish migration barriers and ongoing control of invasive species. Where feasible, these features are included as explicit elements of project design. In some cases, flood control projects may enhance recreation, for example by providing dry-weather playing fields in retention basins or recreational trails along levees.

Flooding presents a risk in Cuyama, a DAC, where isolated thunderstorms in the summer and high winter flows can wash out and damage roads and highways. Focusing on improving flood management in Cuyama would reduce maintenance costs for infrastructure affected by flooding, directly benefiting the DAC.

7.3.6 Emergency Preparedness

Risk reduction and emergency response are key responsibilities of public agencies, including water management and supply agencies. To enhance emergency preparedness, the IRWM Plan incorporates the following planning targets:

- Increase area protected from fire and flooding by 1,000 acres
- Implement emergency plans, where feasible

Although not all emergency situations can be anticipated, continued collaboration through the IRWM and other local forums supports ongoing efforts to reduce risk and improve emergency response.

Increase Area Protected from Fire and Flooding by 1,000 Acres

Protecting additional areas from flood and fire impacts would have a number of benefits. By expanding the areas protected, the public would directly benefit by reduced changes of personal harm or damage to property. In addition, risk to property is a key determinant of the need for or cost of fire and flood insurance, so reducing risk may reduce insurance costs. Often measures to protect from fire or flood may be coordinated with existing or other future projects to enhance protection provided by any single project. Fire management may benefit habitat and water supply by encouraging more frequent, less destructive fires and creating a mosaic of habitat of different ages. Habitat mosaic is more productive habitat and helps to avoid widespread fires. In addition, more frequent fires helps to avoid impacts to soil and vegetation that can increase erosion. Avoiding large-scale and intense fires protects downstream water quality by minimizing erosion and sedimentation.

Implement Emergency Plans, Where Feasible

Development and implementation of effective emergency response plans will provide more immediate aid to the public through better initial reaction by public and private responders. Better response will protect human health and safety while reducing damage to property and the environment. Elements of response plans may include mutual aid agreements and other provisions to identify and share resources. Sharing capacity and resources increases emergency response capability, reduces redundant facilities, avoids unneeded capacity, and reduces costs. Better emergency response and lower costs would directly benefit the DACs of Guadalupe, Lompoc, and Santa Maria. The City of Lompoc is a member of the California Utilities Emergency Association and the Public Works Mutual Aid Agreement. Lompoc's membership in the California Utilities Emergency Association provides a network of California water utilities that can offer assistance to Lompoc in an emergency. Lompoc is also a member of the Public Works Mutual Aid Agreement, which provides for borrowing personnel and equipment from member agencies in Santa Barbara County and Southern California.

7.3.7 Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability

Efficient and reliable water and sewer systems depend on competent design, operation, and maintenance. With existing systems, ongoing maintenance, system upgrades, and operational changes lead to more efficient and reliable operation.

Implement Reliability Improvement within Water and Wastewater Agency Service Areas

Continuing improvement of existing water and wastewater systems will have a number of benefits. Regular maintenance and operational improvements lead to fewer service interruptions and increased system reliability. Close monitoring of system condition and operation can identify system losses or problems, and allow repairs to improve operational efficiency and lower long-term costs.

DACs would benefit from increased reliability and efficiency due to maintenance and operation improvements. Financial and capacity constraints often limit the ability of water and wastewater agencies in DACs to identify and respond to infrastructure needs. Implementation of reliability improvements through the IRWM program would help compensate for this and better position agencies to provide reliable services.

7.3.8 Address Climate Change through Adaptation and Mitigation

Planning that relates to climate change generally focuses on adaptation to limit adverse impacts and reduce GHGs. To plan for and adapt to climate change, the IRWM Plan identifies the following planning targets:

- Achieve targets for water supply, resource stewardship, water quality, and infrastructure objectives
- Implement “no regret” adaptation strategies
- Implement mitigation strategies that decrease emissions of GHGs and include strategies adopted by CARB in its AB 32 Scoping Plan, Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target

The first two planning targets focus on meeting the ongoing need for water supplies. The third aims to reduce one of the leading causes of climate change. The benefits of each are discussed below.

Achieve Targets for Water Supply, Resource Stewardship, Water Quality, and Infrastructure Objectives

A key benefit to achieving targets for water supply, water quality, and capacity of infrastructure is having some spare capacity with which to respond to unanticipated changes. In particular, achieving targets that exceed the most basic requirements provides time to plan and implement changes driven by climate changes or other factors. In addition, having the capability to plan for long-term changes allows protection of natural resources, such as sensitive habitats, to be a key consideration.

Implement "No Regret" Adaptation Strategies

"No regret" adaptation strategies, such as increased supply and improved operational flexibility, help protect against other sources of supply or treatment system disruption. These measures would have been implemented as a matter of astute response to future customer demands. They have the benefit of providing increased reliability in the face of a wide range of challenges, not just climate change.

Implement Mitigation Strategies that Decrease Emissions of Greenhouse Gases

Strategies that reduce energy consumption will reduce emissions of GHGs and other pollutants. Reducing energy consumption will also reduce operational costs. Other strategies to reduce GHG emissions may have other direct benefits, such as the collection and use of methane from sewage treatment systems. Such collection and reuse reduces release of methane directly into the atmosphere, and also reduces the need to purchase energy from outside sources. The Cooperating Partners will evaluate and incorporate strategies adopted by CARB in its AB 32 Scoping Plan, *Final 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target*.

7.3.9 Ensure Equitable Distribution of Benefits

The Santa Barbara Region IRWM process has consistently focused on the needs of DACs. The initial IRWM Plan included project development for water and sewage system upgrades in two DACs. The IRWM process will continue to identify DAC needs. In this regard, implementation of the DAC Involvement Proposal will consist of completing a needs assessments, providing educational activities and community outreach efforts, and providing project development for DACs in the IRWM Region.

Ensure that 10% of the Total Future Funding Received from IRWM Grants Benefit DACs

DAC projects will have a direct benefit to the health of DAC residents. Because public health issues can directly and indirectly affect all residents of the Region, continuing this commitment to meeting DAC needs will improve the public health for all sectors of the Region. The creation of a target percentage of total future IRWM grant funding for DACs will help ensure that the benefits of IRWM planning and projects are equitably distributed. DACs generally lack the resources necessary to identify and propose projects at the same rate as non-DACs. Setting this target for grant funding will help alleviate that imbalance and ensure equitable access to funding resources and the benefits made possible by those resources. Funding for DACs can help improve supply reliability, ensure consistent attainment of water quality objectives important to public health, and keep water rates affordable, among other benefits.

7.4 Potential Adverse Impacts of IRWM Plan Implementation

The discussion below provides a general evaluation of potential adverse impacts due to implementation of the IRWM Plan. More detailed discussion of potential adverse impacts depends on the specific measures taken to meet each planning target. For any projects undertaken, review that may be required pursuant to CEQA would disclose any significant environmental impacts and potential mitigation to reduce those impacts. CEQA review would be the responsibility of the agency taking the lead on any given project. Any fiscal impacts would be considered during funding of a project or program by the agency undertaking the project or program. The discussion below is organized around regional objectives and focuses on planning targets.

7.4.1 Protect, Conserve, and Augment Water Supplies

A wide range of projects may be undertaken to protect, conserve, or augment water supplies. A number of management measures are already employed within the Region. This discussion focuses on those measures that would be the result of new or significantly expanded programs or projects.

Restore Lost Surface Water Storage

Surface water storage capacity has been lost within the Region due to siltation of surface reservoirs. To restore up to 200 acre-feet of lost storage capacity, two approaches are possible:

- Removing silt from the active storage of the reservoir
- Raising the maximum level of storage within the reservoir

There have been past proposals in the Region to raise Gibraltar Dam and Bradbury Dam (Cachuma Lake). However, it was found that additional raising of the level of a surface reservoir to increase capacity by 200 acre-feet would face significant permitting hurdles and would be economically infeasible.

Removal of silt has also been evaluated for Gibraltar and Twitchell Reservoirs, and limited silt removal activities have occurred at each. From this experience, the following impacts are likely to be associated with efforts to restore storage capacity through silt removal:

- Increased suspended sediment within the reservoir

- Air quality emissions associated with sediment removal
- Air quality emissions, noise, and traffic associated with off-site sediment transport (if performed)

In addition to environmental effects, the cost of silt disposal is relatively high due to the volume of material involved (1,613 cubic yards per acre-foot).

Other Supply Augmentation

Water supply augmentation may include new wells, new surface storage, desalination, and increased importation from outside the Region. In each case, construction of new facilities would be required. For any new facilities, short term constructed-related impacts would include air quality emissions, noise, and increased traffic. Any new water supply facilities would have operational impacts associated with treatment and distribution. These impacts would include increased energy use and GHG emissions. New facilities would have additional capital costs associated with them.

Increased Conservation

Increased conservation would result in less water distributed in a particular area. Depending on the nature of capturing water supply costs, less water delivered may result in a decrease in finances otherwise used for existing supply operations and infrastructure operation costs. In addition, more efficient use of imported water may result in less recharge to local groundwater or surface water systems.

7.4.2 Protect, Manage, and Increase Groundwater Supplies

No potential adverse impacts were identified as a result of measures to protect, manage, and increase groundwater supplies.

7.4.3 Practice Balanced Resources Stewardship

Resources stewardship may include preserving existing restore values and restoring previously degraded resources. Increased short-term construction and site-specific impacts may occur if degraded resources are restored, particularly if large-scale restoration employs mechanized equipment. Impacts could include temporary disturbance of existing habitat, equipment emissions, and local sedimentation. Preservation of resources may include development controls that limit land uses. This could lead to loss of potential areas for future urban land uses and associated local revenue sources.

7.4.4 Protect and Improve Water Quality

No environmental impacts associated with improving water quality have been identified. Compliance with water quality regulations may result in costs associated with changes in operations, purchasing pollution abatement equipment, and providing for monitoring and reporting.

7.4.5 Improve Flood Management

Depending of the specific projects implemented, increased short-term construction and site-specific impacts may occur when flood management projects are constructed. Impacts could include temporary disturbance of existing habitat, equipment emissions, and local sedimentation.

7.4.6 Emergency Preparedness

No environmental impacts associated with improving emergency preparedness have been identified. Some emergency preparedness activities (such as drills or development of mutual aid agreements) may have minor costs associated with them.

7.4.7 Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability

Improved infrastructure efficiency can occur from changes in operations and from physical modifications. Operational improvements may require system optimization studies and extensive modification of operational procedures. Both of these steps would have a cost associated with them, which may be recovered through lower operating costs.

If operational improvements required physical modifications, short-term construction-related impacts could occur. Depending on the nature of the facility, short-term constructed-related impacts would include air quality emissions, noise, and increased traffic.

7.4.8 Plan for and Adapt to Climate Change

No environmental impacts associated with adapting to climate change have been identified. Climate change adaptation studies may result in costs associated the studies themselves and with any necessary change in operations.

7.4.9 Ensure Equitable Distribution of Benefits

No environmental impacts or significant costs associated with ensuring equitable benefits have been identified.

7.5 Project Benefits and Impacts

Since the list of implementation projects changes as the IRWM planning effort continues, it is not practical to provide an extensive analysis of impacts and benefits within the IRWM Plan. Instead, the project map found online and the project list, which is an appendix lists the benefits of each of the projects adopted into the Plan. Additional and more detailed evaluations of impacts, benefits, and costs would occur during project development and selection. More detailed environmental analysis would be required pursuant to state (e.g., CEQA) and federal law, as well as assessments of a project's GHG would be performed as part of the evaluation conducted by the Cooperating Partners for project inclusion into the Plan and the subcommittee evaluating IRWM projects for competitive applications. All of these steps are chronicled in the materials the Cooperating Partners generates and the public process, workshops and materials associated with project selection. Key criteria for projects to be included in the Plan include and selected for implementation include, but are not limited to: 1) regional, inter-regional and sub-regional equity; 2) regional, inter-regional and sub-regional benefits; 3) positive impact to or benefit to a DAC/SDAC/EDA; 4) statement about the impact/benefit of a project to EJ communities; 5) the project's nexus or proponent's cooperation with Native American tribes; 6) the project's benefits to the ecosystem; 7) the elements of the project of the project's adaptation to climate change; 8) quantification or description of how the project is meeting the objectives, targets or goals of the IRWM; and 9) listing of the RMS's being employed by the project.

The criteria, process and outcomes of the project selection process utilized by the Cooperating Partner's subcommittee, will be located on the Santa Barbara County IRWM website (http://www.countyofsb.org/pwd/water.sbc) 2 to 3 months prior to a funding application and are part of the annual review process.

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8 PLAN IMPLEMENTATION

8.1 Introduction

The Santa Barbara County IRWM Plan 2018 updates the IRWM Plan 2013 and is the main IRWM planning document for the Region. Chapter 8 discusses how the Region will implement the IRWM Plan using its governance structure (discussed in Chapter 3, Governance and Participation) and regional approaches to water management (described in Chapter 5, Resource Management Strategies). The IRWM Plan is intended to be a living document, and, as such, implementation will focus more generally on the IRWM Plan, rather than specifically on this IRWM Plan 2018.

Specifically, the following is discussed in this chapter:

- The framework that will be used to implement the IRWM Plan
- Implementation of IRWM Plan performance and monitoring that will be used to measure success
- Collection and technical analysis of data used to measure IRWM Plan success
- Flexible implementation of the IRWM Plan to address changing circumstances (adaptive management)
- Management of data relevant to the IRWM Plan
- Financing options for long-term implementation of the IRWM Plan
- Coordination among water-related planning and regulatory programs
- Compliance with CEQA

This IRWM Plan implementation chapter addresses DWR's guidance in implementing the IRWM Plan, and explicitly in meeting the Plan Performance and Monitoring Standard (see Sections 8.2 and 8.3), the Data Management Standard (see Section 8.4), the Finance Standard (see Section 8.5), the Technical Analyses Standard (see Section 8.6), the Relationship to Local Water Planning and Local Land Use Standards (see Sections 8.7 and 8.8), and the Coordination Standard (see Section 8.9).

8.2 Framework for Evaluating and Monitoring Plan Implementation

This section discusses the framework for evaluating and monitoring implementation of the Santa Barbara County IRWM Plan. The Cooperating Partners intend the IRWM Plan to be implemented over a 25-year period. The Cooperating Partners will be responsible for evaluating and monitoring implementation the IRWM Plan and the progress toward meeting the objectives listed in Chapter 4, Objectives, Priorities, and Targets.

The Cooperating Partners, with the leadership of the lead agency, will continue regular meetings to guide implementation and address issues such as ongoing stakeholder support for the IRWM program, outside funding opportunities, new project information from the IRWM DMS, interagency coordination, monitoring and reporting, and updates. The Cooperating Partners' success in meeting objectives and implementing projects will be evaluated and summarized during the reviews that take place every 6 months for IRWM Plan implementation, and every year for project monitoring.

8.2.1 Implementation of Regional Objectives

Actions to implement the IRWM Plan are focused on addressing the Region's objectives. They are based on an analysis of regional issues, supply and demand, and planning targets performed by the Cooperating Partners. The regional objectives are as follows:

- Protect, conserve, and augment water supplies
- Protect, manage, and increase groundwater supplies
- Practice balanced natural resource stewardship
- Protect and improve water quality
- Improve flood management
- Improve emergency preparedness
- Maintain and enhance water and wastewater infrastructure efficiency and reliability
- Address climate change through adaptation and mitigation
- Ensure equitable distribution of benefits

These objectives are based on and are consistent with a large number of planning and reporting documents developed by the Central Coast RWQCB, County agencies, and various cities and water districts. The planning documents include the following:

- Water Quality Control Plan for the Central Coastal Basin (2017)
- Flood control maintenance plans
- 2015 Urban Water Management Plans
- Watershed plans for streams on the South Coast
- Water supply plans and water supply management plans
- Reports prepared pursuant to court orders

Regional objectives address the issues and challenges identified in Section 4.2, Objectives. The objectives will be addressed through implementation of the plans listed above and regional projects. The responsibility for implementing the individual plans listed above rests with the agency required by law to develop and implement the plan. Each plan has specific requirements to report implementation and progress, as summarized in Table 8.1. The Cooperating Partners will compile and evaluate these reports, as discussed in Section 8.4, Data Management.

Progress in addressing objectives will be measured against the planning targets summarized in Table 4.4, Planning Targets. The processes for identifying projects is discussed in Chapter 6, Integration and the Project Review Process. The Cooperating Partners anticipates that as projects are implemented that successfully address short-term priorities, other projects will be developed and implemented to further address regional objectives. Regular evaluation of regional objectives will occur during the IRWM Plan review process that is discussed in Section 8.3, Plan Performance and Monitoring.

8.2.2 Relationship of IRWM Plan to Existing Water-Related Planning

The plans and other documents used to develop the IRWM Plan are noted in the text of various chapters or included as appendices herein. During development, the Cooperating Partner agencies responsible for water-related and climate change adaptation plans were asked to review relevant sections of IRWM Plan for consistency with their existing plans and policies. On the basis of their review, any recommended changes were incorporated into the IRWM Plan. Since all of the agencies responsible for these plans are Cooperating Partners and were involved in development and updates to the IRWM Plan, the IRWM Plan is assumed to be consistent with local water-related plans and policies. Table 8.1 provides a summary of existing water-related policy tools and their criteria. The IRWM process involves monitoring ongoing implementation of these policy tools as part of evaluation of IRWM Plan performance and to ensure that objectives are being met.

Any new information generated during implementation or updating of these plans will be reviewed as part of the regular review, and, as appropriate, incorporated into the IRWM Data Management System discussion in Section 8.4. This information will contribute to measuring how the IRWM Plan is meeting its objectives and contribute to the “lessons learned” element of adaptive management, discussed in Section 8.3.8.

Table 8.1
Management Tools and Criteria Employed within the Santa Barbara Region

Plans/Policies	Agencies	Adequacy of Supply	Protection of Water Quality	Emergency Preparedness	Climate Change Adaptation
General Plans	Cities and the County of Santa Barbara (County)	Evaluation of projected demand	Evaluation of projected impacts	Adequacy of public safety	Adaptation to sea-level rise, including impacts to wastewater treatment plant infrastructure and pipelines and evaluation of flood infrastructure
Urban Water Management Plans	Larger suppliers	Match projected demand with future supplies	Effective water use efficiency and matching water quality to water use	Drought response	Adequacy of supply during severe drought, demonstration of adequacy of local supply with reduction in imported availability
Groundwater Management Plans	Lompoc Basin (within city boundaries), Carpinteria Valley Water District, Buellton Groundwater Basin, and Goleta Water District for the Goleta Groundwater Basin	Do not exceed perennial yield	Protect source area water quality	Adequacy of supplies during drought	Response of groundwater basins to severe drought and sea water intrusion
Watershed Management Plans	South Coast area	Protect sources of recharge	Protect source area water quality	Habitat restoration	Establish baseline conditions for quality, habitat, and flows
Adjudication	Santa Maria Basin Goleta and Goleta West	Protect perennial yield	Protect water quality	Increase infiltration rates	Increase infiltration rates
Drought Response Plans	Large and medium sized suppliers	Provide for adequacy of supply during multi-year drought	Effective water use efficiency and matching water quality to water use	Provide for adequacy of supply during multi-year drought	Adequacy of supply during severe drought
Landscape Ordinances	Cities and the County	Establish water conservation and xeriscape standards	Establish programs for capture of urban runoff and low-impact development	Increase opportunities for infiltration	Drought –tolerant landscaping

Table 8.1
Management Tools and Criteria Employed within the Santa Barbara Region

Plans/Policies	Agencies	Adequacy of Supply	Protection of Water Quality	Emergency Preparedness	Climate Change Adaptation
Storm Water Management Plans	Cities and the County	Low-impact development, stormwater capture, conservation, education	Provide for low-impact development	Include flood management to provide public safety	Increased infiltration, LID
Stormwater Resource Plan	Entities seeking grant funding for stormwater-related projects	Water supply augmentation	Reduce stormwater discharges through municipal storm drains	Water supply augmentation	Ecological enhancement and water supply augmentation

8.2.3 Implementation Issues

Projects in the IRWM Plan have been vetted and prioritized through the process identified in Chapter 6. A number of issues may affect implementation of priority projects. Issues relating to implementation may include technical feasibility (will the project accomplish its goals), economic feasibility (can the proponents afford to pay for the project), political acceptability (will the voters, their representatives, and outside funding agencies support the project), and minimization of climate change impacts. In more specific terms, implementation factors include the following:

- Ability to achieve multiple objectives and provide multiple benefits
- Status and availability of outside sources of funding
- Status of design
- Availability of matching funds to support grant applications
- Benefits to DACs or tribal community or addressing EJ concerns and issues
- Degree of integration between/among multiple organizations
- Adaptation to potential effects of climate change, as well as the ability to minimize impacts, adapt, and provide resiliency
- Level of GHG emissions or reduction of GHG emissions
- Benefit-cost analysis
- Sub-regional support

These and other issues were evaluated by the Steering Committee in 2013 and by the Cooperating Partners in the IRWM Plan Update 2018 through the project vetting process, discussed in Chapter 6. One purpose of this process is to identify projects with few challenges to implementation. In particular, each project undergoes sufficient design development and environmental review so that technical and permitting issues are understood and the project is feasible. In some cases, project funding is an issue, and the lead agency will need support from grants or other supplemental sources to move forward. The nature of benefits and level of sub-regional support are also key factors, but are less likely to directly affect the feasibility of implementation.

8.2.4 Possible Obstacles to Implementation

Implementation of the IRWM Plan is a broader issue than implementation of individual projects. Public agencies focus on the purpose for which they were formed and legal mandates that apply to their functioning. Participation in the IRWM process is not mandated by law. Therefore, agencies involved in the IRWM process must justify allocation of resources to the IRWM process to their ratepayers and other sources of funding. During development of the IRWM Plan, a number of obstacles to long-term implementation of the IRWM Plan were identified by the Steering Committee in 2013 and re-evaluated by the Cooperating Partners during the IRWM Plan Update 2018. The following obstacles were identified:

- Lack of a single agency with direct statutory responsibility for the IRWM program
- Lack of readily available funding sources
- Challenge of maintaining a high level of public interest and involvement
- Lack of permanent funding for projects at the state and federal levels
- Localized nature of in-County water resources and flood issues
- Nature of shared water planning issues with adjacent regions

The sources of these obstacles are outlined in Table 8.2. Physical and hydrologic factors underlying the obstacles are discussed in Chapter 2, Regional Description. Challenges to governance and the Region’s stakeholder process are discussed in more detail in Chapter 3, Governance and Participation.

Table 8.2
Obstacles to IRWM Plan Implementation

Obstacle	Source of Obstacle	Approach
Lack of a single agency with direct statutory responsibility for the IRWM program	Propositions 50 and 84 and enabling legislation do not mandate a specific lead agency responsible for IRWM implementation	Cooperating Partners to identify agency willing and able to assume IRWM lead
Lack of readily available funding sources	Propositions established competitive grants to fund relatively short-term activities but no long-term funding is provided and not included in Prop 68	Cooperating Partners to evaluate funding options (see Section 8.5, Finance)
Challenge of maintaining a high level of public interest and involvement	The IRWM process is long term and deliberative and seeks progress through consensus and is therefore not attractive to high-visibility media or public interest	Cooperating Partners to develop strategy to include individual decision-making body briefings and participation in public events
Lack of permanent funding for projects at the state and federal levels	Propositions 50 and 84 establish competitive grants to fund projects with defined financial resources; federal funding depends on Congressional action and varies annually in amount and intent	Cooperating Partners to evaluate funding options (see Section 8.5)
Localized nature of in-County water resources and flood issues	Santa Barbara County has geographically distinct sub-regions that each have unique and separate water resources and flood control issues	Regional agencies (CCWA, Resource Conservation District, FCD) to promote Region-wide discussions and activities (such as advisory panels)
Nature of shared water planning issues with adjacent regions	The Region shares limited water resources with two of the three adjacent regions; the Santa Maria Groundwater Basin is shared with the San Luis Obispo region and is managed under court order	Region-wide agencies to explore areas of similar concerns (climate change) as opportunities for shared efforts

The Cooperating Partners have devised and implemented strategies to address these issues, as discussed in Chapter 3 and Section 8.5, Finance.

8.3 Plan Performance and Monitoring

To ensure progress toward IRWM Plan objectives, the Cooperating Partners will guide implementation of the IRWM Plan. Performance and monitoring will be addressed every 6 months in a Cooperating Partners meeting held specifically for the purpose of evaluating progress toward IRWM Plan objectives and performance on a regional level. The meeting will include review of IRWM Plan objectives and discussion of projects and programs implemented during the previous 6 months that make significant progress toward those objectives.

Existing reports and studies listed in Table 8.3, Partial Listing of Foundational Plans and Other Documents, and new information from programs that monitor and report on water resources directly, will be stored in the IRWM information site and used as a foundation for assessing progress toward meeting IRWM Plan objectives. The planning targets and metrics discussed in Section 4.3, Planning Targets, will be used to measure and track progress toward the objectives. In addition, during the IRWM Plan performance evaluation process, objectives that are not supported by current efforts will be identified and methods for addressing those objectives will be discussed. The Cooperating Partners will assess whether funding opportunities are available to support IRWM Plan objectives, and strategize on how to best make use of available funds, including review of proposed projects and potential development of new projects that better address IRWM Plan objectives.

Evaluation of IRWM Plan implementation and progress toward objectives will continue to evolve as more effects of climate change manifest, new tools are developed, and new information becomes available. For this IRWM Plan Update, identification and prioritization of climate change vulnerabilities were updated based on recent events and improved understanding of climate-driven impacts on water resources, including prolonged drought, wildfires, and flooding. Future updates to the IRWM Plan will be similarly responsive to changing conditions and information. It is the policy of the Cooperating Partners that projects and programs implemented through the IRWM program consider and be responsive to climate change impacts. IRWM Plan performance evaluations will consider how climate change may be impacting progress toward the objectives, whether new objectives should be adopted, and if new projects and programs should be developed in response to climate change impacts.

Table 8.3
Partial Listing of Foundational Plans and Other Documents

Regional
Santa Barbara County Water Supply and Demand Current Uses and Future Estimates (2013)
Water Quality Control Plan for the Central Coastal Basin (2011)
Cachuma Resources Conservation District Final Mitigated Negative Declaration SCH#2008101027 (2008)
Santa Maria Valley Management Area 2011 Annual Report of Hydrogeologic Conditions, Water Requirements, Supplies and Disposition
Santa Barbara County 2011 Groundwater Report (2012)
Cachuma 2014 Drought Contingency Plan (2014)
Cachuma Operation and Maintenance Board Habitat Improvement Plan (Fiscal Years 2018–2022)
Watershed
Carpinteria Creek Watershed Plan (2005)

Table 8.3
Partial Listing of Foundational Plans and Other Documents

Rincon Creek Watershed Plan (2007)
San Jose Creek Watershed Plan (2003)
City/District 2015 Urban Water Management Plans
Carpinteria Valley Water District
Central Coast Water Authority
City of Lompoc
City of Santa Barbara
City of Santa Maria
Goleta Water District
Montecito Water District
Golden State Water Company, Orcutt
Groundwater Management Plans
Groundwater Management Plan Buellton Groundwater Basin (1995)
Groundwater Management Plan Goleta Groundwater Basin (2016)
Groundwater Management Plan Carpinteria Groundwater Basin (2008)
Groundwater Management Plan Lompoc Groundwater Basin (2013)
Stormwater Management Plans
Santa Barbara County
City of Buellton
City of Carpinteria
City of Goleta
City of Lompoc
City of Santa Barbara
City of Santa Maria
City of Solvang
Other Water-Related Plans
Santa Maria Valley Watershed Characterization for Hydromodification Management Within the City of Santa Maria (2010)
Twitchell Operations Manual and Capital Improvement Program
City of Santa Barbara Water Supply Planning Study (2009)
City of Santa Barbara Long-Term Water Supply Plan (2011)
Goleta Water District Water Supply Management Plan (2017)
Goleta Water District Potable Reuse Facilities Plan (2017)
Santa Barbara County Sanitary Survey, Questa Engineers (2003)
Tertiary Upgrade Report, Heal the Ocean, Metcalf & Eddy (2001)
Ocean Outfall Survey, Heal the Ocean
Carpinteria Valley Recycled Water Facilities Plan (2016)
City of Santa Barbara Potable Reuse Study, Carollo Engineers (2017)
Santa Barbara and Foothill Groundwater Basins Geohydrology and Optimal Water Resources Management: USGS Scientific Investigations Report 2018-5059, Nishikawa, Tracy (2018)

Table 8.3
Partial Listing of Foundational Plans and Other Documents

Stormwater Resource Plans
Santa Maria Integrated Plan (2016)
Goleta Water District Stormwater Resource Plan (2017)
Santa Barbara County-Wide Integrated Stormwater Resources Plan (2018)

8.3.1 Group within the Regional Water Management Group Responsible for IRMW Implementation Evaluation

Currently, the Santa Barbara County Water Agency is the lead agency for implementation of the IRWM Plan on behalf of the Cooperating Partners. Since 2006, the Santa Barbara County Water Agency has led IRWM program management and administration, hired contractors to develop the IRWM Plan, and managed IRWM implementation and planning grant contracts with DWR. Although discussion has occurred regarding the Santa Barbara County Water Agency's continuing role, any change in future role and responsibility would require concurrence and support of the Cooperating Partners. Under the direction of the Cooperating Partners, the Santa Barbara County Water Agency or another agreed-upon Cooperating Partner member will be responsible for developing evaluations and reports that track IRWM implementation grant projects and the Cooperating Partners' success at meeting objectives.

The Santa Barbara County Water Agency, or other agreed-upon Cooperating Partners member, will rely on individual agencies that are responsible for specific programs or actions to provide information used to evaluate implementation. Information may be obtained from the following:

- Specific projects reported by the lead agency responsible for implementing the project
- Monitoring by regional agencies (water quality, delivery of water to Region, groundwater and surface water monitoring) as reported by agencies implementing these programs
- Specific plans and monitoring (e.g., UWMPs, Storm Water Management Plans, waste discharge requirements) as reported by the lead agency responsible for developing each plan

8.3.2 Evaluating Project Implementation

The Cooperating Partners will evaluate implementation of projects within the Region during an annual project review process. Once a year, the Cooperating Partners will complete a review of all projects currently being implemented, including how the projects are being monitored, whether they are achieving stated goals, and where improvement is needed.

Projects that receive funding through the IRWM program are required to conduct monitoring and complete regular reports to document project progress. Typically monitoring plans include a number of protocols, including the following:

- Observational methodology
- Location and frequency
- Reporting and data management
- Evaluation and dissemination of the data

In addition, each project is monitored to comply with all applicable rules, laws, and permit requirements. Project evaluation will use these reports to determine how well the projects are progressing and whether they are making a significant contribution toward IRWM Plan objectives. Part of this analysis will be to identify areas that require improvement and to guide selection of future projects for funding.

8.4 Data Management

The IRWM Plan has a data management system (IRWM DMS) that collects, stores, and disseminates data to provide relevant regional information to IRWM participants and stakeholders, the public, and the state. A broad set of data has been collected that includes IRWM project information, reports, and documents, including designs and feasibility studies; UWMPs; regional plans and studies; and agency documents. The Cooperating Partners recognize the importance of AB 1755, The Open and Transparent Water Data Act, and although this legislation is not applicable to the IRWM DMS, the IRWM DMS will link to all available relevant data and information provided by state agencies in conformance with the legislation.

The Santa Barbara County IRWM DMS stores data electronically in one primary location. The IRWM program site on the County of Santa Barbara Water Resources Division website (http://www.countyofsb.org/pwd/water.sbc) provides a forum for sharing reports, public meeting dates, agendas, meeting minutes, annual reports, and a GIS-enabled project database.

Between 2013 and 2015 data was also stored on the Santa Barbara County IRWM GIS-enabled project website named OPTI (Online Project Tracking and Integration). Use of this site was abandoned in 2015 due to the difficulty in updating projects, high cost, and ability of Santa Barbara County staff to create a similar platform that is easier to use and cheaper to maintain.

8.4.1 Data Needs

The data needs within the Santa Barbara County IRWM Region include those dealing with water resource management, land use management, climate change, and other topics related to water management planning and projects. The IRWM website serves as a hub for all information related to the IRWM program and contains new and archived Plans, meeting materials and information, notifications, links to Cooperating Partners' IRWM sites, and project databases.

8.4.2 Existing Data and Documents

Following is a partial listing of the types of regional documents available on the County of Santa Barbara Water Resources Division website:

- Santa Barbara Countywide Integrated Regional Water Management Plan, May 2007 (County of Santa Barbara 2007) and the Santa Barbara County Integrated Regional Water Management Plan 2013 (County of Santa Barbara 2013)
- The Draft IRWM Plan Update 2018
- Cooperating Partner documents such as the MOU
- Proposition 50 documents
- Proposition 84 documents such as DWR Guidelines, presentations, solicitation packages, comment letters, and tri-county correspondences
- Planning documents such as the Santa Barbara County Water Supply and Demand Current Uses and Future Estimates (2013); Santa Maria Valley Groundwater Assessment, April 18, 2013; agency/city 2015 UWMPs; groundwater reports; water quality plans; watershed plans; and environmental compliance documents
- Climate change documents
- Recycled water documents, including the regional South Coast Recycled Water Development Plan, Metcalf & Eddy's Cost of Tertiary Wastewater Treatment for Southern Santa Barbara County, and local agency planning documents

8.4.3 Data Collection Techniques

The following section details data collection techniques. Specifically, the following subtopics are addressed: the criteria and approach for developing the database, the attributes of the database, the future needs and maintenance of the database, and the approach to resolving data management issues.

Criteria and Approach for Development of the Web-Based Project Database

The web-based GIS-enabled IRWM project database system was developed to collect, store, and disseminate project data to monitor progress toward addressing IRWM Plan regional objectives and targets.

Previously, the OPTI DMS was selected by the Data Management Workgroup. However, after limited use, it was determined that the tool was too cumbersome and expensive for ongoing use. The new integrated database was designed to streamline the Santa Barbara IRWM Region's ability to inventory, review, and integrate projects. The interface allows for a streamlined project selection process, improving the project review, prioritization, and selection process.

Criteria for Development of Project Database

The following criteria were used to develop the IRWM Plan database:

- A geo-referencing feature for stakeholders to visually see the regional distribution and types of projects within the Santa Barbara IRWM Region
- Ability to view projects based on proponent
- Ability to access project type and location information to facilitate collaboration, integration, and identification of multiple benefits
- Database that allows for version control and consistent understanding of current project or project list status by all stakeholders
- Dynamic interface that can be modified to meet the Santa Barbara IRWM Region's data management needs
- Web-based database to allow easy access by all stakeholders
- Ease of use by participating agencies and stakeholders

8.4.4 Future Needs and Maintenance of the DMS

The previous OPTI database was maintained by the consulting company RMC Water and Environment and its information technology (IT) consultant team, which designed the system for the Region. The new database is maintained by County of Santa Barbara staff. Updates to projects are made by sending changes to the County, whose IT department uploads the changes to the DMS. Before projects are added to the system, they are first voted on by the Cooperating Partners. This occurs two to three times a year, and those projects that pass the vote are then uploaded to the website. The process is the same for Public and Stakeholders. If projects are in the DMS, they are contacted at least annually and are requested to provide an update on the status of projects.

8.4.5 Resolving Data Management Issues

The IRWM program website and DMS are currently maintained by Santa Barbara County Public Works staff who are responsible for resolving data management issues. The County staff have quarterly meetings on the DMS.

8.4.6 How Stakeholders Contribute Data to the DMS

The DMS is open to anyone interested in the Santa Barbara County IRWM. Public stakeholders can view projects and IRWM Plan information, but participants who wish to input or share project data on the DMS, they must first submit that information to the Santa Barbara County Water Agency. Technical issues and questions regarding the DMS can be submitted to the contacts listed on the "Contact Us" tab of the Santa Barbara IRWM Plan site. Once project data is submitted to the Santa Barbara County Water Agency, it is voted on by the Cooperating Partners. All projects must be water related, meet at least one regional objective, and have no negative impact on a DAC. Once projects are approved by the Cooperating Partners, they are uploaded to the DMS and the public has an opportunity to view project data.

Use of the DMS was facilitated by two training sessions conducted using a web conferencing system in 2012. Both training sessions were publicized to all stakeholders in the Region. A consultant conducted several individual training sessions, with assistance available upon request. The training and one-on-one assistance ensured that all interested stakeholders could submit and have access to database information.

Stakeholders may contribute data to the IRWM program website sponsored by the County of Santa Barbara Water Resources Division by contacting the Santa Barbara County Water Agency Manager listed on the "Contact Us" tab on the website (http://www.countyofsb.org/pwd/contacts.sbc). The website provides a forum for sharing reports, public meeting dates, agendas, meeting minutes, and annual reports.

8.4.7 Procedure for Accessing DMS

Stakeholders and other participants can access the DMS via the Santa Barbara County Water Agency IRWM Plan website (http://www.countyofsb.org/pwd/water/irwmp.sbc). Information related to access has been shared at public meetings and workshops, via email and at Cooperating Partners' meetings. Any Cooperating Partner, stakeholder of member of the public may call or email the County at any time to receive information.

8.4.8 Stakeholder Communication

Stakeholder communication is accomplished through email blasts sent out to the Cooperating Partners and stakeholder groups. The IRWM Plan public stakeholder meetings, Cooperating Partner meetings, and workgroup meetings serve as the venues for information sharing, along with regular communication between these groups regarding the IRWM Plan, funding opportunities available through DWR and other funding agencies, and event and educational opportunities and forums. Other settings where information is shared include project progress meetings, public workshops, email subscription lists, and email newsletters. All of these forums serve to facilitate ongoing data and information sharing between stakeholders.

8.4.9 DMS Data Gathering

Project information is submitted to the Santa Barbara County Water Agency to be voted on and included in the DMS. To have a project considered for inclusion in the IRWM Plan, the following data/information needs to be submitted:

- General information (contact information for project sponsor)
- Project location
- Project description
- Project funding
- Regional objectives met by the project
- Project benefits
- Project qualifications:
    - Project status
    - Matching funds
    - Reduction in water demand
    - Increase water supplies for beneficial use
    - Improve water supply reliability
    - Water quality
    - Resource stewardship
    - Improved flood management
    - Benefits to DACs or tribal communities

- Integration between multiple organizations
- Address climate change through adaptation and mitigation
- Beneficial impacts to other regions

Various data/information fields are denoted as requirements before submitting project information to ensure that project proponents provide the required data for those interested in pursuing grant funding. Once project data is submitted, approved, and uploaded to the DMS, anyone can view project information.

8.4.10 DMS Reporting

The Data Management System is open for public view and can be easily interfaced with. The information on the DMS system is compatible with other state and local platforms and information is easily shared. Cooperating Partners, stakeholders and the Public are regularly requested to update their information and share information that is relevant. The County Water Agency staff vets, refreshes and uploads information.

8.4.11 Maintaining the DMS

The DMS is managed by the Cooperating Partners, with the Santa Barbara County Water Agency acting as the lead agency. The lead agency is responsible for maintenance and day-to-day operations of the DMS. The Santa Barbara County Water Agency is responsible for programming and maintaining the website, managing data, resolving technical issues, and assisting and interfacing with users. Cooperating Partners periodically review the DMS maintenance policy, including the costs, upkeep, and appropriate use of the DMS.

8.4.12 Quality Assurance and Control Measures to Validate Data Entered into the DMS

The IRWM DMS collects, stores, and disseminates data to provide relevant regional information to IRWM participants, stakeholders, the public, and the state. A broad set of data has been collected that includes IRWM project information, reports and documents, UWMPs, regional plans and studies, agency documents, and project documents including designs, feasibility studies, and reports. The quality of this data is controlled by checking the source of the information, which typically includes documents from state, regional, or local agencies or organizations. The Water Agency staff contacts the purveyors of information and ensures the information is accurate and recent.

8.4.13 Process for Data Sharing with Stakeholders in the Region

The DMS was developed to help participating agencies and stakeholders locate, connect, share, and integrate IRWM Plan projects and project data within the Santa Barbara IRWM community, with other regions, and with all governmental agencies. The database is open to anyone interested in the Santa Barbara County IRWM planning community, and data sharing is easy. Public stakeholders can view project and IRWM plan information on the DMS. The DMS was designed to facilitate regional and interregional project coordination and development.

8.4.14 Process for Sharing Data with State and Federal Agencies

The database has an easy-to-use map feature that uses GIS to pinpoint project locations. Geo-referencing projects allows the state and all stakeholders to visually see the regional distribution and types of projects within the Region or within their local area. A project summary or detailed information can be accessed by clicking on the project area or location on the map.

8.4.15 Compatibility with and Distribution to State Databases

The data saved in the DMS is not measurement or monitoring data like that found in the state databases, including the Surface Water Ambient Monitoring Program, Water Data Library, Groundwater Ambient Monitoring and Assessment Program, California Environmental Information Catalog (CEIC), and the California Environmental Resources Evaluation System (CERES). Because DMS data is not the same type as stored in the aforementioned databases, it cannot be easily stored or integrated into state databases. Should state funding become available, the Region will evaluate the advisability of sponsoring a project dedicated to planning and implementing the adaptation of specific regional data to state databases.

Project design and implementation includes the accumulation of measurement and monitoring data. Data management components of individual project designs includes an evaluation of the types of data that are accumulated for project implementation and identification of statewide databases where project data will be submitted. Once the relevant database is identified, project data will be collected in a compatible format. Relevant state databases include the California Environmental Data Exchange Network (CEDEN), Water Data Library, California Statewide Groundwater Elevation Monitoring (CASGEM), CEIC, and CERES.

CEDEN is the State Water Board’s system for integration and data sharing of information on surface water quality in California. It lists water bodies, streams, lakes, rivers, and the ocean. Regional data centers manage and facilitate information sharing. The Santa Barbara IRWM Region is covered by the Southern California Regional Data Center hosted by the Southern California

Coastal Water Research Project. Excel-based data templates and submission guidance for different data types are available on the CEDEN website (http://www.ceden.org).

The Water Data Library is maintained by DWR, which stores data from various monitoring stations, including groundwater level wells, water quality stations, surface water stage and flow sites, rainfall/climate observers, and well logs. Information regarding the Water Data Library is available online (http://wdl.water.ca.gov/).

The CASGEM program establishes a groundwater monitoring and reporting system for groundwater elevation data across the state. The purpose of the CASGEM database is to maintain the collected elevation data in a readily and widely available public database. Local entities such as counties or agencies implementing an IRWM Plan must agree to conduct groundwater monitoring to be eligible to receive water grants and loans from the state. Information on the CASGEM program is available online (http://www.water.ca.gov/ groundwater/casgem/).

CERES has the primary goal of cataloging and making available data and information about California's natural environment generated by public and private organizations. CERES accomplished this through CEIC, which uses national and international standards for data. CEIC is California's primary National Spatial Data Infrastructure node.

8.5 Finance

The Cooperating Partners have considered options for developing, maintaining, and implementing financing for implementation of the IRWM Plan at a programmatic level. The Region understands that DWR expects the majority of the cost of developing, maintaining, and implementing the IRWM Plan to be borne by local entities, with state and federal money augmenting to a smaller degree, and the region has actively sought and successfully obtained funding for projects that benefit IRWM objectives from other state and federal funding sources. The IRWM Cooperating Partners regularly receive information about local, state, and federal funding programs and discuss the various programs at regular Cooperating Partners meetings and other forums. The Region has demonstrated a history of effective management to promote regional IRWM program goals. The Region, in partnership with the state and IRWM program, is committed to providing resources to further support the operations and maintenance of IRWM-supported projects and programs. Operations and maintenance costs for projects are assumed by the project sponsors that commit to supporting operations and maintenance costs in an IRWM grant application and as a member of the Cooperating Partners.

To meet the resource needs of the IRWM Plan, funding needs to be secured from local, state, and federal sources and local in-kind services. This section documents the various funding sources and approaches that were reviewed by the Cooperating Partners and how those sources may fit together. Sources of funding for the IRWM program are first considered, and then sources of funding for IRWM projects.

Although committed to maintaining and implementing the IRWM Plan, there is a high level of uncertainty regarding whether all sources, when combined, will be adequate to carry out planning needs. A recent study by the Public Policy Institute of California noted that financing options beyond state General Obligation bonds (such as Propositions 50 and 84) are limited. The study notes that the "California infrastructure finance system is hamstrung by strict supermajority voter approval requirements (two-thirds) on local revenue measures, a decline in user fees, and insufficient ability to engage in public-private partnerships. Indeed, in these key areas of local funding, user fees, and partnerships with the private sector, California appears to be backsliding" (PPIC 2009). The Cooperating Partners have donated in-kind time to update the IRWM Plan to comply with new guidelines detailed in this IRWM Plan. This has provided an important first step toward project funding, since an approved IRWM Plan is required to be eligible for project funding from Proposition 84, other state and federal funding sources, and future General Obligation water bonds. In addition, the Cooperating Partners have been active in all stages of the IRWM process, beginning with Proposition 50, the Regional Acceptance Process, and the 2006 Propositions 1E and 84. This has resulted in funding to the Region from the program of close to $30 million. The DACI grant award to the Santa Barbara County IRWM has resulted in $865,207 in Proposition 1 funding to date.

8.5.1 Sources for IRWM Program Funding

Potential funding sources considered by the Cooperating Partners are summarized in Table 8.4.

Table 8.4
Potential Sources of Funding Identified for the IRWM Program

	Sources	Expected Contribution – Stability and Longevity	Targeted Beneficiaries
Local	• In-kind or cash donations • Cooperating Partner fees • User fees (for operation and maintenance costs) • Impact fees • Bonds and property tax for projects, and parcel tax (for operation and maintenance costs) • Benefit Assessment District • Water Enterprise Fund • Utility fees (to be used for operation and maintenance costs)	Moderate	Region's residents, environment, and economy

Table 8.4
Potential Sources of Funding Identified for the IRWM Program

	Sources	Expected Contribution – Stability and Longevity	Targeted Beneficiaries
State	• Competitive grants • Appropriations/General Fund • Statewide assessments • State mitigation funds	Moderate	Statewide environment and economy
Federal	• Appropriations • Competitive grants	Moderate	Areas of national environmental or economic significance
Others	• Individual and corporate donors • Foundations and other nonprofit organizations	Low	Particular communities or targeted interests in the Region

Recent decisions and actions by the Cooperating Partners have showed that the governing body is resilient and well able to adapt to changing circumstances. The Cooperating Partners have been open to considering the rotation or change of the lead agency (project manager) role regarding the management of grant applications and the administration of the IRWM program. Various members of the Cooperating Partners have stepped forward to contribute to projects through cash donations or through the in-kind donation of time to serve on various workgroups or subcommittees. In addition, there is a high level of participation from all agencies throughout the Region.

The Cooperating Partners considered reorganizing its governance structure as a 501(c)(3) or joint powers authority. However, after a thorough discussion, it was determined that organizing around an MOU, as is now in place, was the simplest and most effective governance mechanism available to the Region.

The Cooperating Partners will continue to conduct collaborative activities coupled with efforts to secure regional funding. Those activities include the following:

- Identify new stakeholders and work with identified stakeholders to build broad support for the IRWM program
- Conduct outreach activities to educate the public about the program, the IRWM objectives and targets, the need for infrastructure improvements to achieve targets, and the need for local revenue to fund infrastructure needs
- Continue to sponsor DAC IRWM participation and provide funding for technical expertise, studies, and support of DACs

- Continue to foster development of integrated regional projects that can facilitate partnerships and better leverage existing funding
- Continue to conduct annual reviews to stay in compliance with IRWM Plan commitments
- Continue to maintain and operate the DMS project database

8.5.2 Funding to Implement Regional Projects

In-Kind or Cash Donations

Members of the Cooperating Partners are responsible for providing the majority of the regionally based funding. This funding may be donated in the form of cash or in-kind services to be delivered by the staff of the Region's participating agencies, cities, and organizations. The Region's participants have a history of providing both forms of contributions. For example, in the process of writing this IRWM Plan, one Cooperating Partner donated cash toward a sub-regional assessment and other Cooperating Partners donated staff time. Staff time was spent by serving on the Cooperating Partners, workgroups, or subcommittees; as project proponents; and/or in an administrative role. Project sponsors will be responsible for the costs of operation and maintenance of individual projects; the certainty of this funding is very high, barring unforeseen circumstances.

Other Funding Mechanisms

There are existing funding mechanisms that will continue to be used for development and conservation of water supply, upgrade of wastewater facilities, and implementation of other regional priorities, but these mechanisms may not be adequate to achieve many regional IRWM objectives and meet regional IRWM targets. California already relies heavily on local and regional agencies to manage infrastructure. According to the Public Policy Institute, California has "some of the strictest rules in the nation for raising local revenues. Proposition 13, passed in 1978, limited property assessments and mandated supermajority voter approval for the passage of special taxes. California is also one of only eight states with supermajority requirements on the passage of local General Obligation bonds. In 1996, voters passed Proposition 218, a constitutional amendment that reduced the revenue-raising authority of locally elected governing boards by mandating majority votes for general taxes, assessments, and 'property-related' fees. Subsequently, in 2006, the California Supreme Court extended the reach of Proposition 218's restrictions to water and wastewater utilities. They are now barred from raising fees that exceed the 'proportional cost' of providing service to the parcel—a potential obstacle to financing new facilities" (PPIC 2009).

Potential funding source alternatives include local corporation and foundations including the Fund for Santa Barbara, the Santa Barbara Foundation, SAGE Publications, the Social Justice Foundation, and others.

8.5.3 State Funding Strategy

California voters have passed a number of statewide water and watershed funding measures in the past several years, including Propositions 12, 13, 40, 50, 84, Proposition 68 and there is another proposition, Proposition 3, on the November 2018 ballot. As in years past, the Cooperating Partners will stay abreast of all related funding opportunities through the SWRCB, DWR, California Department of Fish and Wildlife, and others.

8.5.4 Federal Funding Strategy

Regional agencies seeking federal funding opportunities and federal agencies may collaborate to provide opportunities to fund IRWM Plan projects. There may be new limited opportunities to collaborate with the U.S. Forest Service and VAFB, with both having large land and water assets and access to federal funding for mutually beneficial local projects. The Cooperating Partners will research and pursue future federal opportunities. Although no definitive funding plan has been developed to date, a list of potential federal funding sources for implementation of IRWM Plan projects is identified in Table 8.6.

Table 8.6
Federal Funding Options

Funding Type	Description
Loans and Grants	Federal sources include Water Recycling Grants, WaterSMART (Energy Efficiency, System Optimization, Advanced Water Treatment, Climate Change), Water and Wastewater Revolving Funds, and Title XVI
Budget	Sources include programs in the Environmental Protection Agency, Office of the Interior, and USACE budgets; the Water Resources Development Act; future economic stimulus funding

8.6 Technical Analysis

The technical analyses used to develop the IRWM Plan were based on the studies provided in Appendix 2 and noted in the text of Chapter 2. These analyses were incorporated into Chapter 2, Regional Description, and used as a basis for identifying regional objectives and planning targets (Chapter 4). The text of the original Regional Description from IRWM Plan 2013 was updated using more recent studies, plans, and other documents (see partial list in Table 8.3). The IRWM Plan used the following planning documents: UWMPs, 2011 Santa Barbara County Groundwater Report (SBCWA 2012), flood control plans, court ordered reports, agency capital improvement plans, groundwater management plans, and engineering reports. Other technical analysis was used to update issues such as water quality regulatory compliance, water rights status, groundwater supply and quality, urban and agricultural water use efficiency, salt and nutrient planning, TMDL processes, recycled water, water supply and demand, ocean water quality reporting, Central Coast RWQCB and local agency monitoring reports, water and wastewater treatment requirements and plant updates, watershed management, low-impact-development projects, septic-to-sewer conversions, and water storage facility augmentation.

Other technical analysis for ongoing IRWM Plan implementation will rely, in part, on reporting associated with ongoing monitoring programs. Several of these programs already provide data to the state through the Surface Water Ambient Monitoring Program and Groundwater Ambient Monitoring and Assessment Program. Existing programs also include the following:

- Local agency cooperative monitoring plans (surface water and groundwater) implemented through contract with the USGS
- Monitoring performed by Water Quality Inc. in collaboration with the Central Coast RWQCB
- Monitoring performed pursuant to NPDES discharge permits and waste discharge requirements reported to the Central Coast RWQCB
- Monitoring performed to satisfy public health requirements for drinking water supplies
- Ocean water quality monitoring at public beaches

Monitoring of other elements of the IRWM Plan will occur though implementation of other existing programs, as discussed in Section 8.5, Finance. Reports prepared pursuant to these other programs will be reviewed as part of the ongoing IRWM monitoring. Data relevant to implementation of the IRWM Plan from these reports will be incorporated into the IRWM DMS, as discussed in Section 8.4, Data Management.

8.7 Integration with Local Water Planning

The plans and reporting documents relevant to developing this IRWM Plan Update are provided in Appendix 2 and discussed in Chapter 2. In particular, the 2010 and 2015 UWMPs, the tri-annual County Groundwater Report (SBCWA 2012), and the 2013 Santa Barbara County Supply and Demand Report (GEI 2013a) provided important data and planning context during the IRWM process. The document types are listed in Table 8.7. As discussed in other sections of this Plan, all work related to climate adaption and resilience, including GSPs, General Plans and any document that addresses local water use planning will be consulted and will continue to be merged into project development, selection, integration, and metrics.

Table 8.7
Relationship Between Local Planning Documents and IRWM Plan Objectives

Planning Document	Augment Supplies	Increase Conservation	Infrastructure Reliability	Salt and Nutrient Planning	Recycling	Emergency Preparedness	Climate Change Adaptation	GHG Control	Water Quality
Urban Water Management Plans	X	X	X	X	X	X	X	X	X
County Groundwater Report			X	X					X
Flood Control Plan			X			X	X		
Court Ordered Reports	X		X	X					X
Agency Capital Improvement Plans	X		X	X	X	X	X	X	X
Ground Water Management Plans	X		X		X		X		X
Engineering Reports	X		X	X	X		X	X	X
Groundwater Sustainability Plans	X			X	X	X	X		X
Stormwater Resource Plans	X					X	X		X
County of Santa Barbara Energy and Climate Action Plan							X	X	

During development of the IRWM Plan, the agencies responsible for water-related and climate change adaptation plans were asked to review relevant sections of the IRWM Plan for consistency with their existing plans and policies. In addition, a survey was distributed, a Cooperating Partners meeting held, and a Climate Change Subcommittee meeting convened targeted to include regionally appropriate climate change adaptation and mitigation strategies into the IRWM Plan. The results of the survey and meetings were informed by issues and strategies identified in various local plans and policies. On the basis of Climate Change Subcommittee review, any recommended changes and updated data were incorporated into IRWM Plan. This review ensured that the IRWM Plan is consistent with the planning documents provided in Appendix 2. Documents provided in Appendix 2, plus any newly available planning documents, will be consulted for any future IRWM Plan updates.

Table 8.8 provides a summary of existing water-related policy tools and their criteria. The IRWM process will involve monitoring ongoing implementation of these policy tools as part of the evaluation of IRWM Plan performance.

Table 8.8
Management Tools and Criteria Employed within the Santa Barbara Region

Policy Tools	Agencies	Adequacy of Water Supply	Protection of Water Quality	Emergency Preparedness	Climate Change Adaptation
General Plans	Cities and County	Evaluation of project demand and conservation	Evaluation of project impacts	Adequacy of public safety	Sea-level rise, wastewater treatment plant infrastructure
Urban Water Management Plans	Larger suppliers	Match project demand with future supplies	Demonstrate adequacy of supply	Drought response	Source adequacy, demand management measures
Groundwater Management Plans	Certain overlying user agencies	Cannot exceed perennial yield		Adequacy of supplies during drought	Groundwater levels and management
Watershed Management Plans	South Coast area	Protect sources of recharge	Protect source area water quality	Forest management	Establish baseline conditions
Adjudication	Santa Maria Basin	Protect perennial yield, conservation	Water quality standards	Adequacy of supplies during drought	Groundwater level monitoring, conjunctive use, conservation
Drought Response Plans	Large and medium sized suppliers	Provide for adequacy of supply during multi-year drought		Provide for adequacy of supply during multi-year drought	Adequate supply during drought using conservation and water recycling
Landscape Ordinances	Cities and County	Mandate water conservation and xeriscape	Capture of urban runoff and low-impact development	N/A	Drought-tolerant planting requirements
Storm Water Management Plans	Cities and County	Low-impact development, stormwater capture, conservation, education	Low-impact development	Flood management	Low-impact development, stormwater capture, conservation, education
Stormwater Resource Plans	Entities seeking grant funding for stormwater-related projects	Water supply augmentation	Reduce stormwater discharges through municipal storm drains	Water supply augmentation	Ecological enhancement and water supply augmentation
Groundwater Sustainability Plans	Groundwater Sustainability Agencies	Determination of sustainability and management of resources, including project implementation to avoid "undesirable	Determination of sustainability and management of resources, including project implementation to avoid "undesirable	Determination of sustainability and management of resources, including project implementation to avoid "undesirable	Determination of sustainability and management of resources, including project implementation to avoid "undesirable

Table 8.8
Management Tools and Criteria Employed within the Santa Barbara Region

Policy Tools	Agencies	Adequacy of Water Supply	Protection of Water Quality	Emergency Preparedness	Climate Change Adaptation
		results" as defined under SGMA	results" as defined under SGMA	results" as defined under SGMA	results" as defined under SGMA

8.7.1 Stormwater Resource Plans

Senate Bill 985 as approved by the governor on September 25, 2014, modified the Water Code (Section 10563[c][1]) to require development of a stormwater resource plan as a condition to receiving funds for stormwater and dry-weather runoff capture projects from any bond approved by voters after January 2014, including Proposition 1. Upon development of stormwater resource plans, it is required that they be incorporated into the IRWM Plan.

City of Santa Maria

The City of Santa Maria has completed a functionally equivalent Integrated Stormwater Resource Plan. The Santa Maria Integrated Plan was released in draft form in April 2016 (City of Santa Maria 2016). The plan has been incorporated into the IRWM Plan by reference and is available on the Santa Barbara County IRWM Program website (http://www.countyofsb.org/pwd/water/irwmp/map.sbc) and has been added to the DMS. A crosswalk of Santa Maria Integrated Plan sections to Stormwater Resource Plan requirements is included in Appendix A of the Santa Maria Integrated Plan.

County of Santa Barbara

The County of Santa Barbara developed the Santa Barbara County-Wide Integrated Stormwater Resource Plan (SWRP) (Santa Barbara County Cooperating Entities 2018) in collaboration with the cities of Buellton, Carpinteria, Guadalupe, Goleta, and Solvang; the Carpinteria Valley Water District; the Montecito Water District; and UCSB. The SWRP was approved by the County Board of Supervisors in November 2018 and submitted to the SWRCB for approval.

Goleta Water District

The Goleta Water District completed a Stormwater Resource Plan in November 2017 and received SWRCB approval of the plan in April 2018. The Goleta Water District prepared the Stormwater Resource Plan to identify large, centralized stormwater capture opportunities that could augment water supply, thereby offsetting potable water demand, increasing local groundwater reserves, and enhancing the reliability of the Goleta Water District's overall water supply portfolio. The Goleta Water District identified multiple benefits associated with each project, including enhanced flood control, water quality improvements, and environmental benefits (Goleta Water District 2017).

In preparation of the Stormwater Resource Plan, the Goleta Water District conducted an extensive parcel screening analysis based on industry-standard screening practices to find the most feasible parcels for stormwater capture in the Goleta Water District service area that would meet all regulatory standards. This analysis included review of land use, geophysical properties, infiltrative soil types, and other hydrologic factors (Goleta Water District 2017).

The Stormwater Resource Plan identifies 12 potentially feasible projects that present opportunities to capture runoff during modeled storm events. Each project design involves either recharging the Goleta Groundwater Basin or offsetting potable water use through capture and reuse. The three types of projects are infiltration projects, dry well projects, and capture and reuse projects, described below (Goleta Water District 2017):

- Infiltration basin projects divert flow from nearby creeks to areas with available land and optimal soil type. The Goleta Water District selected infiltration basin sites that overlie the Central sub-basin, for the most productive use of infiltrated water.
- Dry well projects are designed using gravity-fed excavated pits lined with perforated casing and backfilled with gravel or stone, allowing water to penetrate layers of soil with poor infiltration.
- Capture and reuse projects, also known as "rainwater harvesting," use a subsurface storage tank to capture flow from nearby creeks and storm drain systems to use for irrigation on site or at feasible locations nearby.

Process for Stormwater Resource Plan Incorporation

As additional Stormwater Resource Plans are developed within the Santa Barbara IRWM Region, they will be reviewed for compliance with the SWRCB's Storm Water Resource Plan Guidelines (SWRCB 2015). Those plans that meet the guidelines will be incorporated into this IRWM Plan. Incorporation will be achieved through the addition of the plans as appendices and inclusion in the IRWM DMS.

8.7.2 Sustainable Groundwater Management Act

The SGMA, passed in 2014, required the formation of GSAs in all basins designated by DWR as high and medium priority by June 30, 2017. These GSAs are responsible for the creation of GSPs by January 31, 2020, for critically overdrafted basins, and by January 31, 2022, for all other basins.

The goal of GSPs is to ensure that basins are managed within sustainable yields without causing undesirable results. A GSP must achieve sustainability goals for the basin within 20 years.

Both the IRWM program and SGMA strive to achieve improved water management on a regional level, requiring collaboration among a diverse set of stakeholders to identify and work toward targets. The Sustainable Groundwater Planning Grant Program provides funding for SGMA-related projects and the creation of GSPs. The program gives priority to SGMA-related grant proposals that implement an adopted IRWM Plan, and provides advance payment for projects that meet specific requirements, including presence of the project in an IRWM Plan.

GSA formation has occurred in the following basins:

- Santa Ynez River Valley Groundwater Basin
- San Antonio Creek Valley Groundwater Basin
- Cuyama Valley Groundwater Basin
- Montecito Groundwater Basin
- Santa Maria Valley Groundwater Basin Fringe Areas

Santa Ynez River Valley Groundwater Basin

The Santa Ynez River Valley Groundwater Basin is bound to the northwest by the Purisima Hills, to the northeast by the San Rafael Mountains, to the south by the Santa Ynez Mountains, to the west by the Pacific Ocean, and to the east by nonwater-bearing rocks. The Santa Ynez River Valley Groundwater Basin has been designated as a medium-priority basin by DWR and will be managed by three GSAs covering the eastern, western, and central portions, as designated in DWR Bulletin 118. All areas of the Santa Ynez River Valley Groundwater Basin are included in one of the three GSAs. The three GSAs will be managed by an Intra-Basin Coordination Agreement, with the Santa Ynez River Water Conservation District as the point of contact with DWR. The Santa Ynez River Water Conservation District will ensure that metrics and milestones employed across all three GSAs are the same to facilitate ongoing collaboration.

Western Management Area

The Western Management Area (WMA) of the Santa Ynez River Valley Groundwater Basin consists of the Lompoc Plain, Lompoc Terrace, and Lompoc Upland. The Santa Ynez River Water Conservation District, the City of Lompoc, the Mission Hills CSD, the Vandenberg Village CSD, and the Santa Barbara County Water Agency formed the WMA GSA. These are the only public agencies eligible to form a GSA as designated by the SGMA.

The Santa Ynez River Water Conservation District covers approximately 64% of the WMA. This area includes the City of Lompoc, the communities of Vandenberg Village and Mission Hills, the Lompoc Federal Correctional Complex, and portions of VAFB. VAFB covers the majority of the remaining WMA outside the Santa Ynez River Water Conservation District (approximately the remaining 35% of the WMA). As federal entities, VAFB and Lompoc Federal Correctional Complex are not required to be subject to the SGMA and, therefore, do not participate in the GSA. The Santa Barbara County Water Agency covers approximately 1% of the WMA not within the Santa Ynez River Water Conservation District, VAFB, or Lompoc Federal Correctional Complex. Areas within the WMA represented by the Santa Barbara County Water Agency have “de minimis” groundwater production and constitute a trivial percentage of the total WMA. Therefore, the Santa Barbara County Water Agency is not a voting member of the WMA GSA Committee.

Central Management Area

The Central Management Area (CMA) includes the Buellton Upland and covers the entire central portion of the Santa Ynez River Valley Groundwater Basin, as defined by DWR Bulletin 118. The CMA GSA includes the Santa Ynez River Water Conservation District, the City of Buellton, and the Santa Barbara County Water Agency.

The Santa Ynez River Water Conservation District covers approximately 99.95% of the CMA, including the City of Buellton and the Bobcat Springs Mutual Water Company. The Santa Barbara County Water Agency covers the remaining 0.05% of the CMA that is not within the Santa Ynez River Water Conservation District. The City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency represent all of the public agencies (as defined by the SGMA) that are eligible to form a GSA in the CMA. Areas of the CMA represented by the Santa Barbara County Water Agency have “de minimis” groundwater production, and represent less than 0.05% of the total CMA. Therefore, the Santa Barbara County Water Agency is not a voting committee member of the CMA GSA.

Eastern Management Area

The Eastern Management Area of the Santa Ynez River Valley Basin covers the Santa Ynez Upland. The Santa Ynez River Water Conservation District, the Santa Ynez River Water Conservation District Improvement District Improvement District No. 1, the City of Solvang, and the Santa Barbara County Water Agency represent of all the agencies (as defined by the SGMA) that are eligible to form a GSA in the Eastern Management Area.

The Santa Ynez River Water Conservation District covers approximately 35% of the land area in the Eastern Management Area, including the City of Solvang; the communities of Santa Ynez, Los Olivos, and Ballard; many ranchettes (parcels 5 to 20 acres); and larger agricultural parcels. These communities are provided water by the Santa Ynez River Water Conservation District, Improvement District No. 1; the City of Solvang; mutual water companies; and private wells. The Santa Barbara County Water Agency covers the remaining 65% of the Eastern Management Area's land area, including ranchettes and agricultural lands where water is provided by mutual water companies and private wells. The Santa Ynez River Water Conservation District, Improvement District No. 1; the City of Solvang; and the Santa Barbara County Water Agency agreed to form the GSA for the Eastern Management Area under a Memorandum of Agreement dated April 27, 2017.

San Antonio Creek Valley Groundwater Basin

The San Antonio Creek Valley Groundwater Basin is bounded on the north by the Solomon-Casmalia Hills and the Santa Maria Valley groundwater adjudication boundary, on the east by the San Rafael Mountains, on the south by the Purisima Hills, and on the west by the Barka Slough. The San Antonio Creek Valley Groundwater Basin has been designated as a medium-priority basin by DWR.

Currently, the CRCD and Los Alamos CSD form the GSA. A local agricultural water district is also in the process of being formed in the area with the intention of joining the GSA as a replacement for the CRCD. A joint effort by the Santa Barbara County Water Agency, VAFB, and USGS is currently underway to study groundwater in the San Antonio Creek Valley Groundwater Basin. This study will help inform the creation of the San Antonio Creek Valley Groundwater Basin GSP.

Cuyama Valley Groundwater Basin

The Cuyama Valley Groundwater Basin is bounded on the north by the Caliente Range and on the southwest by the Sierra Madre Mountains. The Cuyama Valley Groundwater Basin includes portions of Santa Barbara, Ventura, Kern, and San Luis Obispo Counties. The Cuyama Valley Groundwater Basin has been designated as a high-priority basin in a state of critical overdraft. Agencies eligible for GSA formation include the San Luis Obispo County Department of Public Works, Ventura County Department of Water Resources, Kern County Water Agency, Santa Barbara County Water Agency, Cuyama CSD, and Cuyama Basin Water District.

Montecito Groundwater Basin

The Montecito Groundwater Basin is bounded on the north by the Santa Ynez Mountains and the Arroyo Parida Fault, on the east by consolidated rocks, on the southeast by the Fernald Fault, and on the northeast by a surface drainage divide that separates the Montecito and Carpinteria Groundwater Basins. The offshore Rincon Creek Fault and the Pacific Ocean bound the basin on the south, and an administrative boundary with Santa Barbara Groundwater Basin bounds the basin on the west. The Montecito Groundwater Basin has been designated as a medium-priority basin by DWR and a GSA was formed in June 2018.

The Montecito Water District relies on groundwater for 10% to 15% of its water supply. Additionally, the current number of private wells and the volume of water pumped through private wells is unknown.

Santa Maria River Valley Groundwater Basin

The Santa Maria River Valley Groundwater Basin is bounded on the north by the San Luis and Santa Lucia Ranges, on the east by the San Rafael Mountains, on the south by the Solomon Hills and the San Antonio Creek Valley Groundwater Basin, on the southwest by the Casmalia Hills, and on the west by the Pacific Ocean.

The Santa Maria River Valley Groundwater Basin has been designated as a high-priority basin. However, the Santa Maria River Valley Groundwater Basin is mostly adjudicated, with only small fringe areas not covered by the adjudication. The Santa Barbara County Water Agency filed as the sole GSA, and is filing for a basin boundary modification to exclude the need for a GSA to manage the fringe areas of the basin.

Goleta Groundwater Basin

The Goleta Groundwater Basin is bounded on the west by a topographic divide east of the Ellwood Canyon; on the southeast by the Modoc Fault; and on the north, northeast, and south by consolidated rock. The Goleta Groundwater Basin was originally designated as a medium-priority basin, but was subsequently reprioritized as a very low priority by DWR.

The Goleta Groundwater Basin is divided into three sub-basins: the north, central, and west sub-basins. Most of the north and central sub-basins are adjudicated. Adjudicated areas are only required by the SGMA to comply with additional reporting requirements. The Santa Barbara County Water Agency formed a GSA over the non-adjudicated fringe areas. However, as a result of the DWR reprioritization to very low priority, the GSA will likely be dissolved.

8.8 Relation to Local Land Use Planning

8.8.1 Introduction

This section discusses the processes and procedures that foster communication between land use managers and the Cooperating Partners (the Regional Water Management Group) with the intent of effectively integrating water management and land use planning. It documents the historic, existing, and planned relationships between local land use planning, regional water issues, and water management objectives.

8.8.2 Existing and Historical Relationships between Local Land Use Planning Entities and Water Management Entities

Relationships between local land use planning entities and water management entities in the Santa Barbara Region are well established and most pre-date the IRWM program. These relationships were borne out of the fact that water in the Santa Barbara area has long been a defining characteristic, and at most times the determining factor, in overall land use and the type of land uses in the County. Communication about and the relationships between land use planning and water use planning have been shaped by the following forces:

- Reliance of the Region on groundwater resources
- Coastal and climate adaptation and resiliency planning
- Federal and state regulations
- Public input and civil society

These forces converge and at times produce a synergistic and positive outcome for water resources, and at times contravene one another. Nonetheless, they are all integral and necessary parts in planning for a sustainable water future. Over the past 4 years, IRWM practitioners have been more successful in working with land use agencies at the city and county level by directly engaging city and county planning staff for individuals meetings on the IRWM process and the intersection of IRWM and land use policies. The stakeholder list includes current planning staff from all cities and county staff. City and County planning staff have attended meetings and workshops, and negotiations are underway to have the Santa Barbara County Long Range Planning Division join the Cooperating Partners.

8.8.3 Reliance on Groundwater Resources

The Santa Barbara IRWM Region's primary water source is groundwater, which includes water for residential, commercial, industrial, and agricultural uses. This is not a unique set of circumstance in the Central Coast hydrological region, which is the most groundwater dependent region in the state, but it is unique in the context of the state. Although this dependence on groundwater resources provides great water independence and local benefit, it also presents a set of challenges and requires a great degree of coordination and collaboration with all County-wide water supply entities to ensure the judicious and fair use of the finite water resources the Region has. To accomplish this, each water supplier (i.e., water districts, water companies, CSDs, and jurisdictions) must monitor water use and recharge carefully to avoid situations of overdraft. As such, throughout the decades, the Santa Barbara Region has developed and institutionalized a coordinated system of information sharing, documentation, and water and land use planning that is ingrained in and practiced by water and land use management authorities, including locally elected officials.

There is, however, an outlier to the system. Although there is a significant amount of monitoring going on within the Region and information sharing between and among water use managers and land use managers, there is a whole segment of agricultural users and private well owners who are not subject to these monitoring requirements or water use reporting given California's water rights laws. This has presented a large impediment to local agencies and jurisdictions in the Region when it comes to accuracy of groundwater figures, and has undermined the ability of local land and water use managers to exercise protective measures over groundwater resources.

The SGMA created a mechanism for addressing groundwater sustainability at the basin level by including public agencies and private users in the process. The SGMA requires the formation of Groundwater Sustainability Agencies and the development of Groundwater Sustainability Plans for designated basins. Implementation of the SGMA in the IRWM Region provides significant potential for improving the holistic management of groundwater resources. Additional discussion on the SGMA and how it is being implemented in the IRWM Region is provided in Section 8.7.2, Sustainable Groundwater Management Act.

Coastal and Climate Adaptation and Resiliency Planning

The increased need for and focus on Region-wide climate adaptation, climate resilience, and coastal climate resilience and climate ready policies and planning intersects with IRWM planning and the Plan's objectives, targets, goals, and resource management strategies within the region. In working more closely with city and county land use planners decision-makers such as planning commissions and the Board of Supervisors, the IRWM program and land use planning departments have become more aligned. As a result, projects that are mutually beneficial are discussed and included in the Plan. Land use and water use are inexorably linked, and within the context of climate change, the need to work in tandem with land use planners has never been more important.

8.8.4 Federal and State Regulations

Beginning in the latter half of the 1970s with a host of environmental protections passed at the federal level by the Environmental Protection Agency, including Sections 208 and 201 (Clean Water Act), there has been recognition of the importance of the marriage between land use and water resources and the mutually reinforcing roles they play. This legislation forced the hands of water management entities, land use management entities, and elected officials to communicate and be responsive to various pressures placed on natural resources (i.e., land and water) by human populations and their needs (e.g., residential, industrial, commercial, conservation). Regulations demanded that local agencies and resource agencies (e.g., U.S. Forest Service, USACE, California Department of Fish and Wildlife, RWQCBs) work to provide balanced solutions to these intersecting and competing interests.

Statewide, legislation (beginning in the 1970s and continuing to the present), including CEQA, California's general plan requirements, and the Urban Water Management Planning Act, provides other points of intersection between the spheres of land and water use. Although CEQA is an overarching assessment of all resources, water and land use included, it is applicable to each land use project that is proposed to be implemented and provides for controlling land uses based on water use measures. It can also lead to stopping a project moving forward based on significant impacts on one or both of these resource areas, or the complete re-contouring of a project to comply with federal, state, or local land and water use regulations. CEQA legislation uses a broad approach to decision making in that it includes all members of formalized decision-making structures as well as the public. CEQA compliance is a requirement of all projects included in or funded by DWR through the IRWM Plan.

Local land and water use controls are general plans, policies, development standards, and ordinances, all of which allow for great latitude over the regulation of resource areas within jurisdictions provided they comply with state law. General plans and policies, coupled with development standards and ordinance documents, guide and direct all land and water use decisions in a particular jurisdiction. Managing entities and decision-makers employ local tools for the judicious use and conservation of resources. Local agencies, water districts, CSDs, and others enact ordinances regulating resources, such as land and water uses based on local conditions, the need for protection, and other conditions that may occur. Some examples of these types of ordinances are summarized in Table 8.9. Conservation measures, particularly related to irrigation, figure prominently into the types of controls applied.

Table 8.9
Examples of Local Controls that Regulate Water Uses and Land Uses in the Region

Controlling Entity	Local Control Tool	Purpose
Montecito Water District	Ordinance 89 and Ordinance 90	Limit in water usage per acre enacted as a result of high water consumption rates primarily due to landscape irrigation. Enacted in 2007 and still in effect.
City of Santa Barbara	Santa Barbara Municipal Code Section 14.23.009 and Chapter 22.80	Requires drought-tolerant landscaping for water conservation on projects that require design review. Enacted as an update to the existing code in 2008 and still in effect.

Table 8.9
Examples of Local Controls that Regulate Water Uses and Land Uses in the Region

Controlling Entity	Local Control Tool	Purpose
City of Santa Barbara	Santa Barbara Municipal Code Chapter 14.20	Defines unlawful water use and regulations during water shortage conditions.
City of Santa Barbara	Santa Barbara Municipal Code Sections 14.32.040 and 14.32.115	Prohibits construction of private wells on properties served by the City of Santa Barbara's water supply system.
County of Santa Barbara	Floodplain Management Ordinance – Ordinance 5058	Promotes the public health, safety, and general welfare, and minimizes public and private losses due to flood conditions since flood hazard areas of Santa Barbara County are subject to periodic inundation that results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base. Enabling legislation, Government Code Sections 65302, 65560, and 65800 confer on local government units authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry.
City of Lompoc	Chapter 15.52 Lompoc Municipal Code	Updated in 2016, this ordinance amended existing municipal code language relating to water-efficient landscaping and irrigation standards, and employed a landscape water budget to regulate landscape irrigation.

8.8.5 Urban Water Management Plans

Passed in the early 1980s, the California Urban Water Management Planning Act (Water Code Sections 10610 et seq.) mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare a UWMP, at least once every 5 years. These plans are intended to support long-term resource planning and to ensure that adequate water supplies are available to meet existing and future water demands over a 20-year planning horizon. In the Santa Barbara Region, UWMPs provide a nexus between water planning and land use planning, and are often foundational documents that direct or shape new land use policies and controls, water use programs, incentives, or regulations on a local level. UWMPs also play a role in informing discussion and the formulation of regional and sub-regional goals, objectives, and targets in the IRWM Plan.

In the Region, the UWMPs are fundamental to providing an inventory of water resources and a blueprint for water planning, needs changes, and system-wide adjustments.

8.8.6 National Pollutant Discharge Elimination System Permits

Authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes and constructed ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to water quality.

In California, the Municipal Storm Water Permitting Program regulates stormwater discharges from municipal separate storm sewer systems (MS4s). Permitting for MS4s was introduced in two phases. Santa Barbara County does not have any Phase I enrollees. On April 30, 2003, as part of Phase II, the SWRCB issued a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities (populations of less than 100,000), including non-traditional Small MS4s, which are facilities such as military bases, public campuses, and prison and hospital complexes. The Phase II Small MS4 General Permit covers Phase II permittees statewide. On February 5, 2013, the Phase II Small MS4 General Permit was adopted, and these became effective on July 1, 2013. Pursuant to these regulations, local land use and water use entities collaborate and coordinate through the permit process to ensure that these federal and state regulations are met.

Municipal and urban areas commonly include large impervious surfaces that contribute to increased runoff flow, velocity, and volume. As a result, creeks and streams are hydrologically impacted through streambed and channel scouring, instream sedimentation, and loss of aquatic and riparian habitat. In addition to hydrological impacts, large impervious surfaces contribute to greater pollutant loading, resulting in turbid water, nutrient enrichment, bacterial contamination, and increased temperature and trash. These types of impacts are currently being mitigated through implementation of low-impact development measures, which are widely embraced and deployed by land use entities throughout the County. There are high levels of collaboration between land use and water use entities on this topic and these measures.

In addition, the public and local NGOs have a large role to play in local jurisdictions’ formulation and implementation of best management practices for MS4 permits and stormwater pollution prevention plans. In addition, water quality needs and deficiencies are often brought into the IRWM process and inform the discussions and formulations of regional and sub-regional goals, objectives, and targets in the IRWM Plan.

8.8.7 Public and Civil Society

Coupled with the Region's dependence on groundwater and the compulsory federal and state regulations, there has historically been and continues to be a vocal and engaged community of citizens and NGOs that have taken an active role in water and land use planning. These entities and individuals regularly monitor all types of land and water uses County-wide, and regularly provide comment letters to applicable jurisdictions and decision makers. As a result, there is a climate of generally water- and land use–savvy individuals who are involved in planning issues in the Region.

8.8.8 Relationships between Local Land Use Planning Entities and Water Management Entities in the Context of the IRWM Plan

The Cooperating Partners of the IRWM represent different water and land use management authorities. As such, they bring a range of public sentiment over land and water use issues, water supply in the Region, and the regulatory requirements to bear in the IRWM process and ultimately the IRWM Plan. The overarching issues and challenges in each of the sub-regions and the overall Region combine to form the targets, objectives, goals, and resource management strategies that are borne out of the various issues and concerns. The IRWM process and IRWM Plan, therefore, provide a forum to collectively and creatively problem-solve to create a more holistic water and land use paradigm for near- and long-term sustainability of the Region's resources, chief among them water and water-dependent resources (e.g., riparian habitats, wetlands, native fauna).

Since it was first initiated, the IRWM program and process has become more inclusive, interactive, and engaged in stakeholder outreach to local and regional planning bodies, both formal (APA, AEP) and informal, through presentations, provision of information, provision of educational opportunities, and communication. Members of the IRWM stakeholder group include all relevant planning managers and directors of County and jurisdictional planning and community development departments, as well as planning associations, planning advocacy groups, individuals, environmental advocacy groups, NGOs, and land trust entities.

The Cooperating Partners and their authorized representatives have consistently presented at various public forums and conducted information meetings and workshops. There is been outreach, engagement, and presentations to various land use entities, including the following:

- Various presentations on the water and land use nexus to the Citizen's Planning Association of Santa Barbara County (http://www.citizensplanning.org/). The Citizen's Planning Association was established in 1960 as a 501(c)(3) non-profit organization to educate the public in Santa Barbara County on the environmental and planning issues paramount to communities and neighborhoods, and to encourage both the County and City of Santa Barbara to develop and adopt general plans to protect Santa Barbara County's quality of life. The Citizen's Planning Association is a stakeholder in the IRWM process and is a frequent commenter on County-wide land use issues at meetings of City Planning Commissions, City Councils, the County Planning Commission, and the Board of Supervisors.

- Presentation to Beach Erosion Authority for Clean Oceans and Nourishment (BEACON) staff and a presentation at a BEACON Public Board Meeting. BEACON is a California joint powers agency established in 1992 to address coastal erosion, beach nourishment, and clean oceans within the central California coast from Point Conception to Point Mugu. The member agencies of BEACON include the Counties of Santa Barbara and Ventura, and the coastal cities of Santa Barbara, Goleta, Carpinteria, Ventura, Oxnard, and Port Hueneme. The BEACON Board is made up of two supervisors from each county and one council member from each coastal city, for a total of 10. BEACON is involved in an array of coastal studies and projects within its jurisdiction, and works in coordination with the parks, planning, and public works departments of BEACON's member agencies. BEACON is staffed by a combination of specialist consultants and has participation from member agency staff. Funding for BEACON comes through annual agency membership dues and grant funding from state and federal agencies. Specific costal studies and project development activities are contracted by BEACON to other agencies and consultants.
- Various presentations to the County's Agricultural Advisory Committee on the Land Use and Water Use Nexus and a presentation on the Groundwater Basin Assessment being prepared as an Attachment to the IRWM for the Santa Maria Groundwater Basin.
- Meetings with the Santa Barbara County Farm Bureau to discuss the IRWM program and collaboration opportunities as well as the type, extent and need for of water projects on privately held agricultural lands in the region.
- A meeting and presentation to the Channel Counties Chapter of the AEP Board, whose membership spans the counties of San Luis Obispo, Santa Barbara and Ventura. The presentation was given by the IRWM representatives from each of the three regions and facilitated a discussion on both land, use and water use issues and well as collaborative inter-regional communication.
- Four presentation and meetings with the Goleta Slough Management Committee established in 1991. The Committee's purpose is to work cooperatively with regulatory agencies, property owners and public interest groups to provide for a healthy Goleta Slough considering the Slough's ecosystem and recognizing a mixture of land uses. The Committee Members include the City of Santa Barbara, the Santa Barbara Airport, the City of Goleta, the Goleta Sanitary District, UCSB, and the Coastal Conservancy. The

Committee has an ongoing dialogue with the IRWM and an IRWM representative attends Committee meetings.

- A Region-wide Land Use/Water Use Planning Workshop discussing the IRWM planning process in the Region and current opportunities for increased collaboration and enhanced communication.
- Presentation on the IRWM program in the Santa Barbara region at the California Association of Resource Conversation Districts Annual Conference.
- Presentations to the Santa Barbara County Funder's Collaborative on the nexus between homelessness and water quality and flood control.

The IRWM Region coordinates with the Ventura IRWM and the other Central Coast Funding Area Partners.

Finally, as discussed in Chapter 3, Governance and Participation, the lead agency launched a targeted efforts to include members of the agricultural community, a large segment of the population that has been historically disenfranchised and absent from the IRWM process. This has been a multi-year process. Notably, agriculture is the primary industry in the Region and accounts from the majority of water use in the County and bringing this industry and predominant land use to the IRWM table allows for a more realistic and accurate picture of water use, land use and issues to emerge. Bringing daylight to the needs, challenges and opportunities of all land uses in each of the watersheds strengthens the IRWM Plan, adds greater credibility and will result in better projects that propel the region towards a more complete and sustainable water future. There are presently efforts to include more projects related to carbon sequestration into the Plan and the region is actively discussing projects with the Cachuma Resource Conservation District in partnership with the Community Environmental Council (CEC).

8.8.9 Upcoming Issues and Relationships between Local Land Use Planning Entities and Water Management Entities in the Context of the IRWM Plan

There are a number of areas in which greater collaboration and proactive communication between water and land use planning entities can be facilitated through the established IRWM process. Since there are a vast number of overlapping organizations and stakeholders that are currently engaged in the IRWM program and process, leveraging this extensive network and the information prepared in various IRWM plans and applications will create a more holistic and accurate picture of water and land in the Region.

The IRWM has a role to play not only by providing a forum for dialogue, but also for solutions that are collectively oriented and beneficial for a range of agencies and stakeholders. IRWM plans, in and of themselves, are tools that can be consulted for educational purposes and implemented to ameliorate challenges concerning land and water use issues. It is, therefore, the intent of the IRWM Region to be more proactive with the Region-wide land use planning agencies and water use agencies to annually revisit the state of the land use/water use nexus and to document the progress made toward the land use/water use goals of strengthening relationships between land use and water use entities by regularly discussing the nexus between land use and water use and engaging with land use authorities within the region. Because the obstacles that these organizations face in California are interdependent and interwoven, the solutions to challenges need to be interwoven and collaborative. In addition, a main goal for the Region is to increase land use manager and agent participation among stakeholders and within the Cooperating Partners. By communicating more frequently with the land use and water use managers Region-wide, better and potentially more sustainable solutions can be developed and implemented to reach the Region's IRWM Water Management Objectives.

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