Chapter 3 Regional Description

3.1 Introduction

The Regional Description documents the process whereby the California Department of Water Resources (DWR) accepted the political boundaries of the County of Santa Barbara as the physical boundary of the Santa Barbara County Integrated Regional Water Management (IRWM) Region (Region). It provides details about the watersheds, water systems, water quality conditions, and common water objectives and issues within the Region. This section utilized a wide variety of background documents including the Regional Acceptance Process Application for Santa Barbara County (see Chapter 2), Urban Water Management Plans submitted to DWR in 2010, California Water Plan (including updates 2009 and 2013), California DWR Bulletin 118, and other regional and local planning documents.

3.2 Regional Overview

3.2.1 Regional Acceptance Process

On April 2009, the County successfully completed the Integrated Regional Water Management (IRWM) Regional Acceptance Process (RAP) (http://www.countyofsb.org/irwmp/irwmp.aspx?id=39048) with DWR. The RAP helped define the Santa Barbara IRWM Region (Region) and was the Region's first step in becoming eligible for Prop. 84 grant funding. The RAP identified the Santa Barbara Region's Regional Water Management Group known as the Cooperating Partners, stakeholder participation, governance structure, outreach, regional boundary, water management issues, water-related components, and relationships with adjacent Regions.

3.2.2 Internal Boundaries

The Cooperating Partners utilizes the Santa Barbara County 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). The 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. The County's upper northeastern political boundary with Kern County crosses the vast, arid Cuyama Valley.

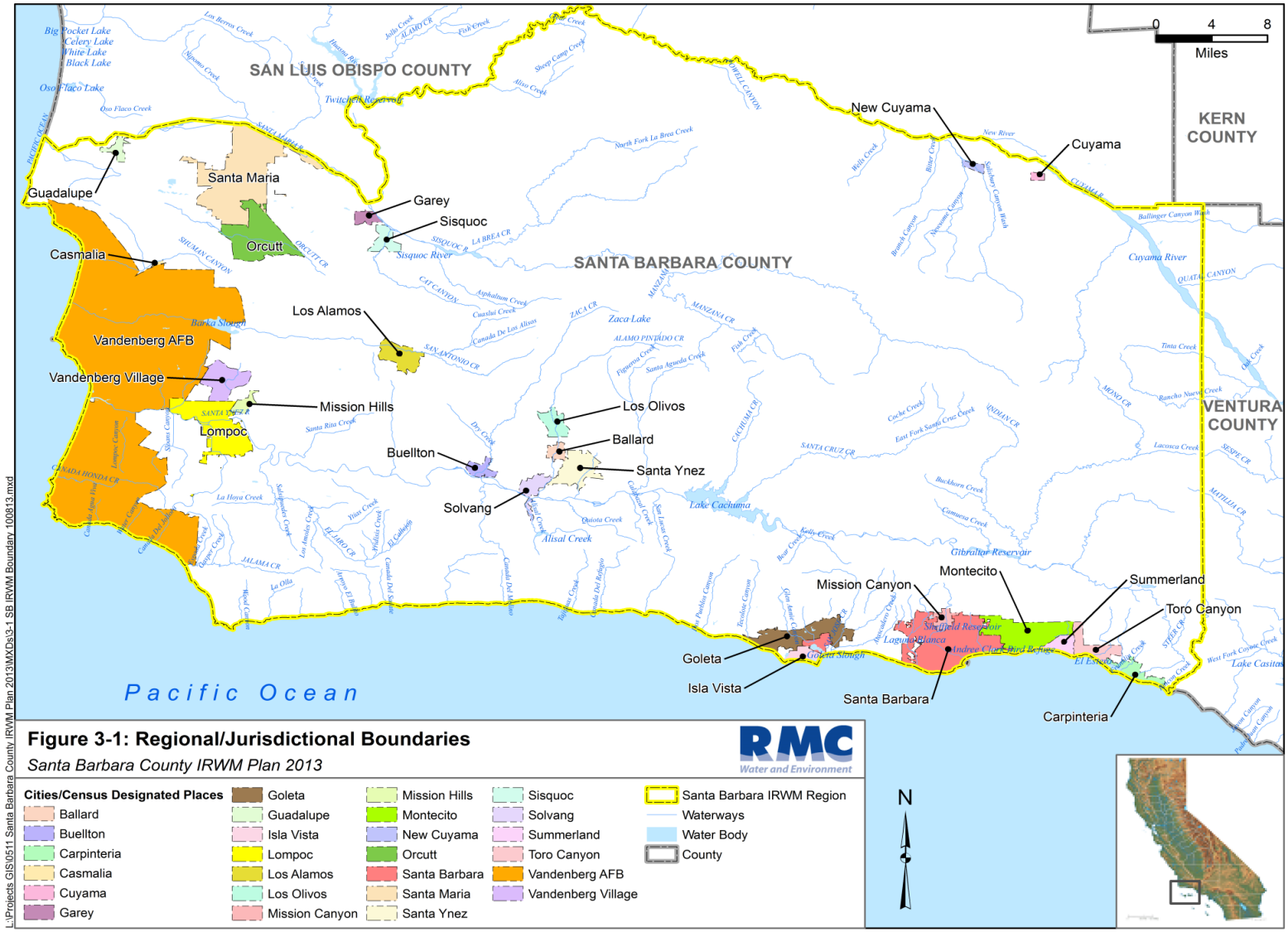
The Region encompasses the entire County (Figure 3.1). Figure 3.1 shows regional boundary and the IRWM regions adjacent to the County (San Luis Obispo and Ventura counties). The County is an appropriate region for integrated planning for several reasons:

- Different subregions within the County share water supplies and infrastructure, and water is managed as an interconnected system within the County boundaries
- Water and wastewater management entities must address issues and challenges that are specific to the Region and that would benefit from an integrated management
- From an institutional perspective, 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 IRWM Plan 2013 builds on this framework, expanding existing programs and identifying further opportunities for integration.

- 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 subordinate in size, and have no shared water infrastructure.

Figure 3.1: Santa Barbara IRWMP Regional Boundaries



3.2.3 Integrated Regional Water Resource Management in the Region

County of Santa Barbara boundary has served for several decades 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 included below.

Maximizing Opportunities for Continued Integration of Water Management

More recently, the County boundary, and also the IRWM boundary, has served the Region well as it has worked to maximize opportunities for integration of water management activities. Planning within the Region has branched out to include regional climate change analysis, treatment plant upgrades in response to ever increasing regulatory requirements, region-wide or sub-regional coordination on conservation projects such as leak assessment, recycled water development planning, and agricultural water use efficiency, and flood control projects with both sub-regional and regional benefits.

The IRWM regional boundary served the area well as coordination of salt and nutrient planning in the sub-region of Santa Maria Valley and recycled water development on the south coast were executed as part of this IRWM Plan 2013 with broad participation from stakeholders in each sub-region. Both sub-regions are well practiced at working with other stakeholders within their areas. The Santa Maria Valley has experience working on projects and issues listed below such as the Twitchell Project, groundwater planning, and interconnections between north County water districts. The stakeholders from the south coast sub-region have worked with the Santa Ynez River sub-basin stakeholders on the Cachuma Project and the State Water Project. The south coast stakeholders have worked together on the Cachuma Project, the State Water Project, the Goleta Valley water recycling project, the City of Santa Barbara desalination project, and interconnections between south County water districts. More detail on those programs and projects follows.

The IRWM boundary will continue to provide the appropriate structure for future integration opportunities. Future opportunities include salt and nutrient planning, Cachuma Project water rights issues, agricultural water use efficiency, recycled water development, urban water use efficiency, habitat restoration, groundwater conjunctive use, optimizing availability of existing local storage, infrastructure interconnections, groundwater overdraft and quality, surface water quality, low-impact development, ocean water quality, and maximizing regional water supplies.

Historic Interagency Planning and Integrated Water Supply Development

Historically, significant integrated water resource projects have been developed within the Santa Barbara County Region. Each new project in the last half century has been characterized by close cooperation among communities and their local agencies. In each case, 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 above projects.

These projects include:

- Cachuma Project (five Cachuma Member Units, Cachuma Operation and Maintenance Board, Cachuma Conservation Release Board, Reclamation, and the Santa Barbara County Water Agency)
- Twitchell Project (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)
- 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)

The delivery of Cachuma Project water is provided through close cooperation with Reclamation and an interagency agreement that established the Cachuma Operation and Maintenance Board, which operates a key distribution system. The South Coast Conduit delivers water from Lake Cachuma to the south coast. The Conduit's functionality and flexibility are essential to meeting both the 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 allowing 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, the Montecito Water District, 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 IRWMP.

The City of Santa Barbara and public agencies with interest in the operation of Gibraltar Dam have cooperated to establish the "Upper Santa Ynez River Operations Agreement." The members of the Cachuma Conservation Release Board, the Santa Ynez River Water Conservation District Improvement District No. 1, the Santa Ynez River Water Conservation District, and the City of Lompoc established the "Cachuma Project Settlement Agreement." These documents establish cooperative operation of two of the three reservoirs on the Santa Ynez River to account for:

- Loss of capacity due to siltation (Gibraltar Reservoir)
- Downstream releases consistent with the Gin Chow Judgment (Gibraltar)
- Reservoir operations to moderate peak storm flows (Cachuma)
- Reservoir releases for downstream water rights under SWRCB orders (Cachuma)
- Reservoir releases for downstream steelhead in accordance with the Cachuma Project Biological Opinion
- Conjunctive use of water rights releases and releases for the steelhead fishery

Southern California Steelhead

- Downstream water quality improvement based on mixing State Water Project 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 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 purpose of the long-term exchange of all or a portion of Cachuma Project water available to Improvement District No. 1 for an equal amount of State Water Project water available to the South Coast Cachuma Project/ State Water Project contractors. Through this mechanism, Improvement District No. 1 avoids construction, operation, and maintenance of a water treatment facility, and the South Coast Cachuma Project/ State Water Project contractors avoid certain costs of pumping and retreating the State Water Project water and construction of a separate pipeline to Cachuma through the CCWA's acquisition of the Santa Ynez pipeline.

Lake Cachuma

The Coastal Branch of the State Water Project is operated by the CCWA on behalf of 12 public agencies, the U.S. Air Force, three private interests, and San Luis Obispo County. This project and its operation integrate treated water supply operations along its 110-mile length, delivering water to 23 separate 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 upon 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 State Water Project water.

Integrated Management of Emergency Operations

Agencies preparing Urban Water Management Plans (UWMPs) include a section describing 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/or urban water shortage policies.

Emergency Response Plans include provisions for interruptions to water and wastewater services. The CCWA has prepared an Emergency Response Plan (ERP) that provides detailed instructions for catastrophic interruption of its water supply. The ERP is 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 the 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) that 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. Storm water 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."

3.3 Physical Setting

3.3.1 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 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 climate, topography, economic activities, recreational opportunities, and social/economic structure. Additionally, there are five major ecological zones and numerous subareas ranging from arid high desert Regions in the interior; mountains and foothills; and coastal plains.

3.3.2 Climate

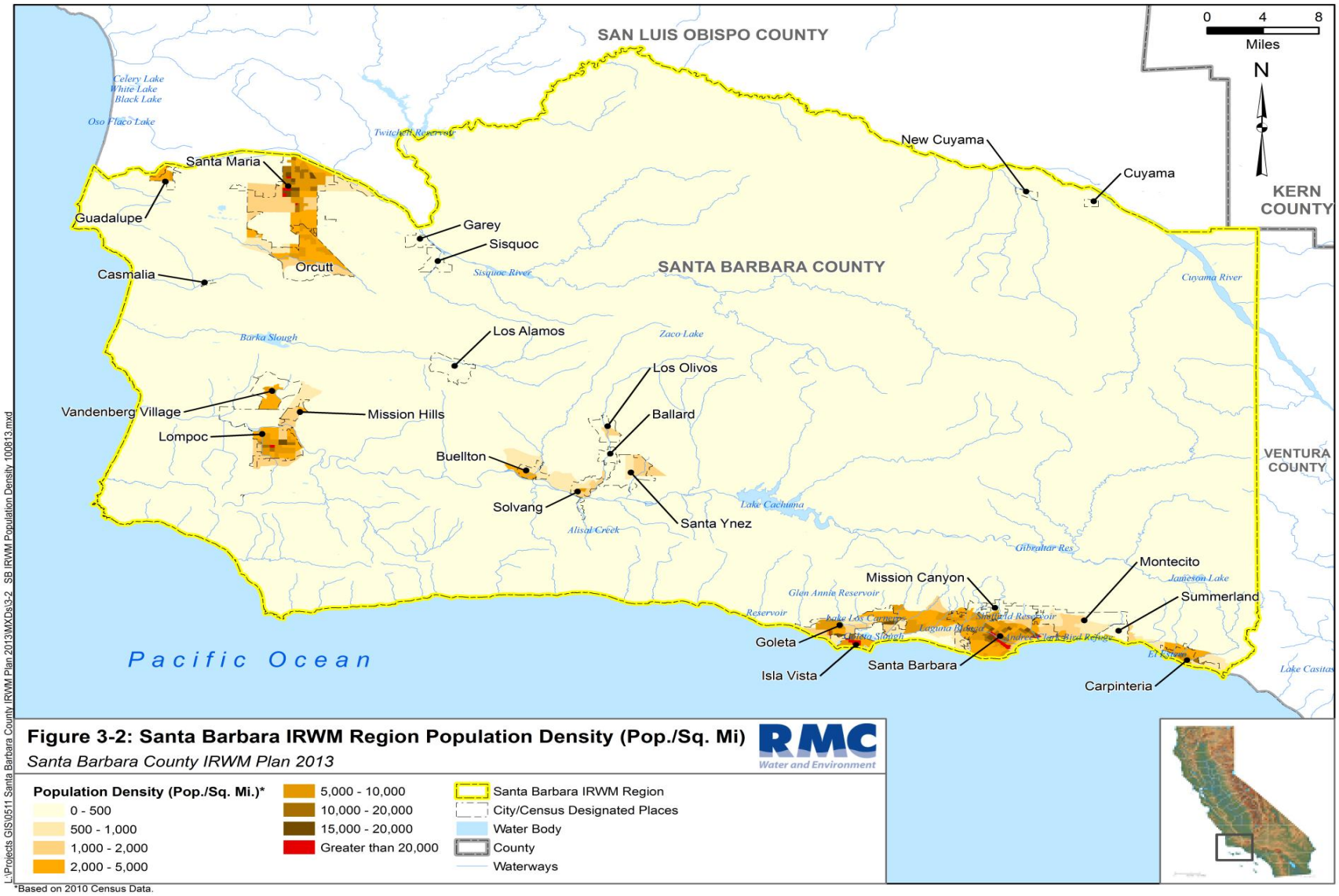
Santa Barbara County has a Mediterranean climate with several microclimatic regions. Summers are warm and dry; the winters are cool and often wet. Annual precipitation ranges from 8 inches near Cuyama Valley to a maximum of about 36 inches at the uppermost elevations of the Santa Ynez Mountains. Average rainfall in the City of Santa Barbara is approximately 18.18 inches per year. The County 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, while 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 between November and 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.

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 further 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, only light amounts of rainfall. This climatological scenario is the reason for most of California's droughts, including those occurring in 1976 to 1977 and 1986 to 1991.

3.3.3 Population

The County population is over 430,000 with most of the people living 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, 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 Chumash Indian 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.

Figure 3.2: Population Density



3.4 Land Use, Major Watersheds, and Water Systems

3.4.1 Land Use

About 65 percent of the terrain of Santa Barbara County is hilly or mountainous, and most of the remaining 35 percent 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 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 3.3 that follows and includes a breakdown of land ownership and 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 jurisdiction over nearly 46 percent 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 national forest provides a scenic backdrop to many communities within both north and south Santa Barbara County and is managed for multiple purposes, including recreation, oil development, and grazing.

Lake Cachuma

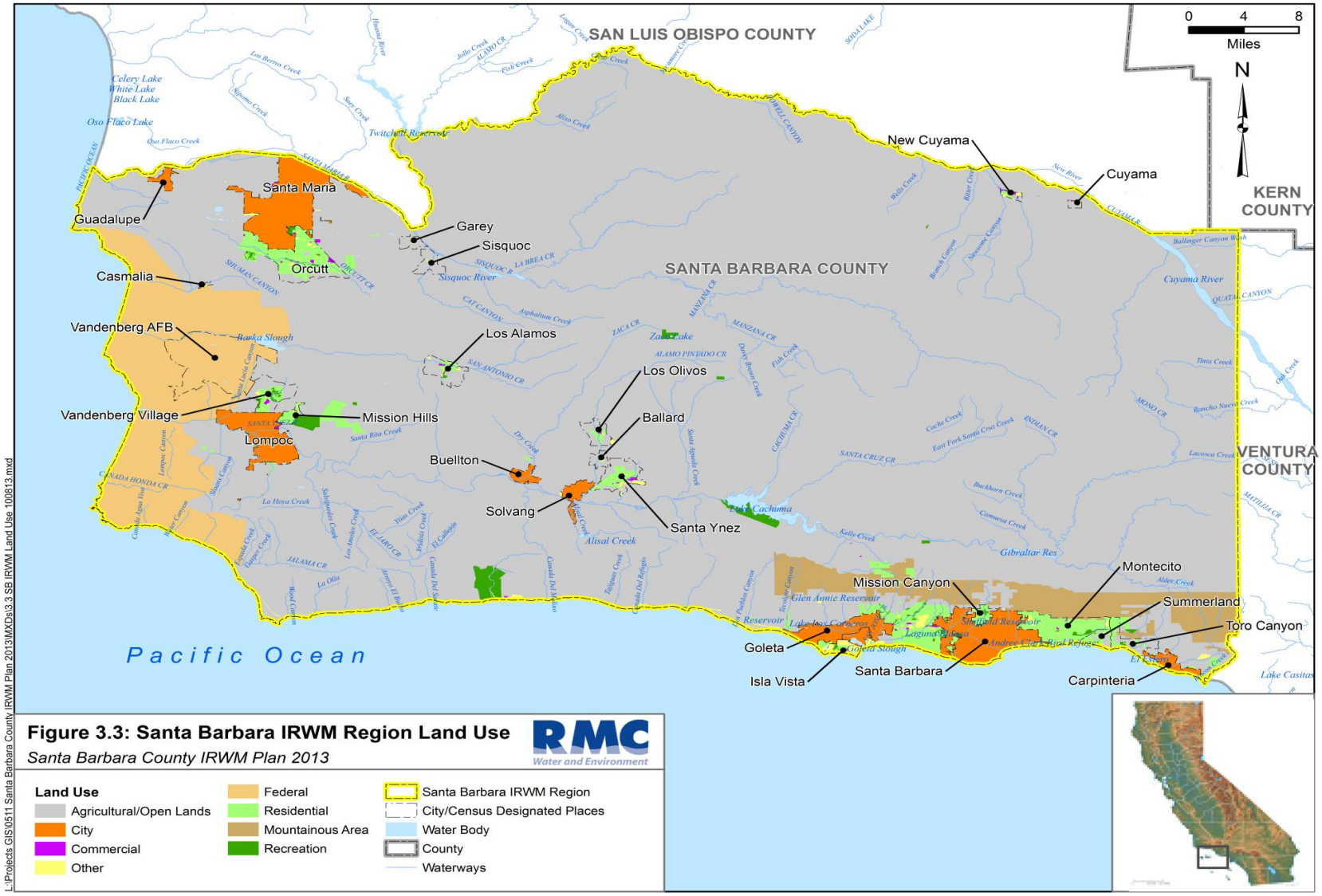
The State of California owns approximately 1 percent of County lands, or 18,000 acres. Most of this land comprises the University of California at Santa Barbara (UCSB), adjacent to the City of Goleta; the Sedgwick Reserve, which is operated by the University as part of its Natural Reserve System and 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 percent of the 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.

About thirty-four percent of the County (554,000 acres) is under Williamson Act contract, 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 figures. Thirteen percent (206,000 acres) in the County is zoned for long term agriculture (AG-II-100) for 100-acre or greater lot size, in addition to land zoned for long-term agriculture with both greater and lesser parcel sizes. Less than three percent of the County is within incorporated cities, two percent is within unincorporated urban areas, and less than one percent is zoned for hillside estate lots of 40 acres or more. Average annual precipitation ranges from a minimum of about eight inches in the Cuyama Valley to over 36 inches at the apex of the Santa Ynez Mountains. Land use in the Santa Maria Watershed is diverse and includes a wide range of recreational uses, farms, cattle ranches, urbanized areas, mines, and industrial sites. Farming is the single most important industry in the watershed relative to its effects on the economy, culture, and the environment. The vast majority of cropland is irrigated under a variety of conditions ranging from precision-leveled land with deep fertile soils and few limitations to relatively steep uplands with a limited soil base. All water in support of agriculture is pumped from groundwater resources, except for rangeland where some surface water is consumed by livestock. The San Antonio Creek watershed is located in the west-central part of Santa Barbara County about 15 miles south of Santa Maria. The drainage area is about 98,560 acres, 23,435 acres of which are located on VAFB.

Recreation in the Santa Ynez Valley

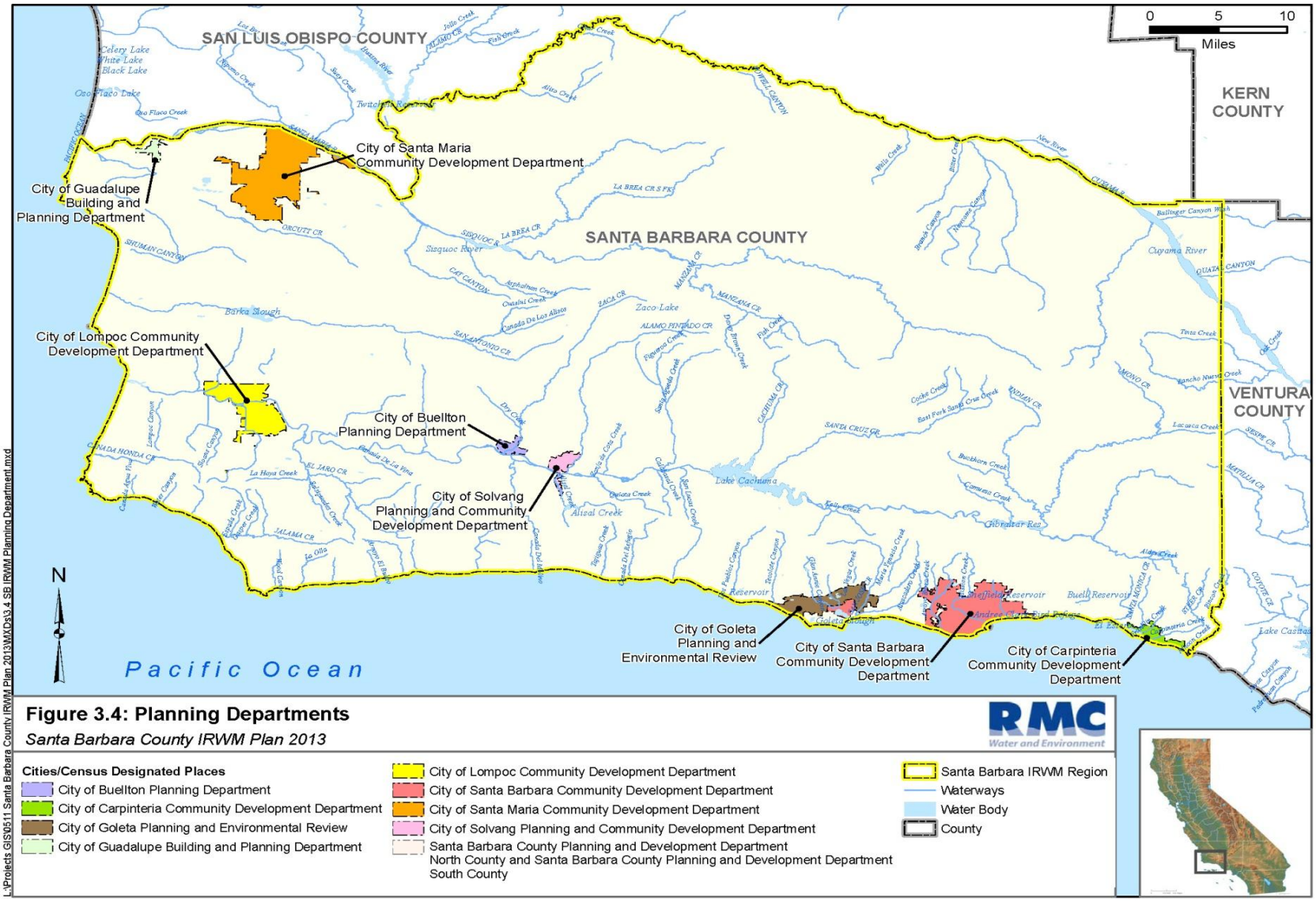
Figure 3.3: Land Use



The land use agencies in the Region are listed below and shown in Figure 3.4 Jurisdictions with Planning Departments. The Santa Barbara County Planning and Development Department jurisdictional boundary includes the unincorporated areas of the County. The city planning agencies jurisdictional boundaries include the 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

Figure 3.4: Jurisdictions with Planning Departments



3.4.2 Watersheds

The County contains four principal watersheds that are shown in Table 3.1: Santa Maria, which includes the Cuyama and Sisquoc watersheds and covers 1,845 square miles; San Antonio Creek that covers 165 square miles; Santa Ynez that covers 900 square miles; and the South Coast, which is comprised of 50 short, steep watersheds extending from the ridge of the Santa Ynez Mountains to the Pacific Ocean that covers 416 square miles. 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 3.5 shows the regional watersheds.

Table 3.1: Santa Barbara County IRWM Region Watersheds

Watershed	Square Miles
Santa Maria (Including Cuyama and Sisquoc watersheds)	1845
San Antonio Creek	165
Santa Ynez River	900
South Coast (composed of numerous smaller watersheds)	416

Sources: Tetra Tech, 2013, Public Works Department Water Resources Division Water Agency, 2011

Santa Maria Watershed

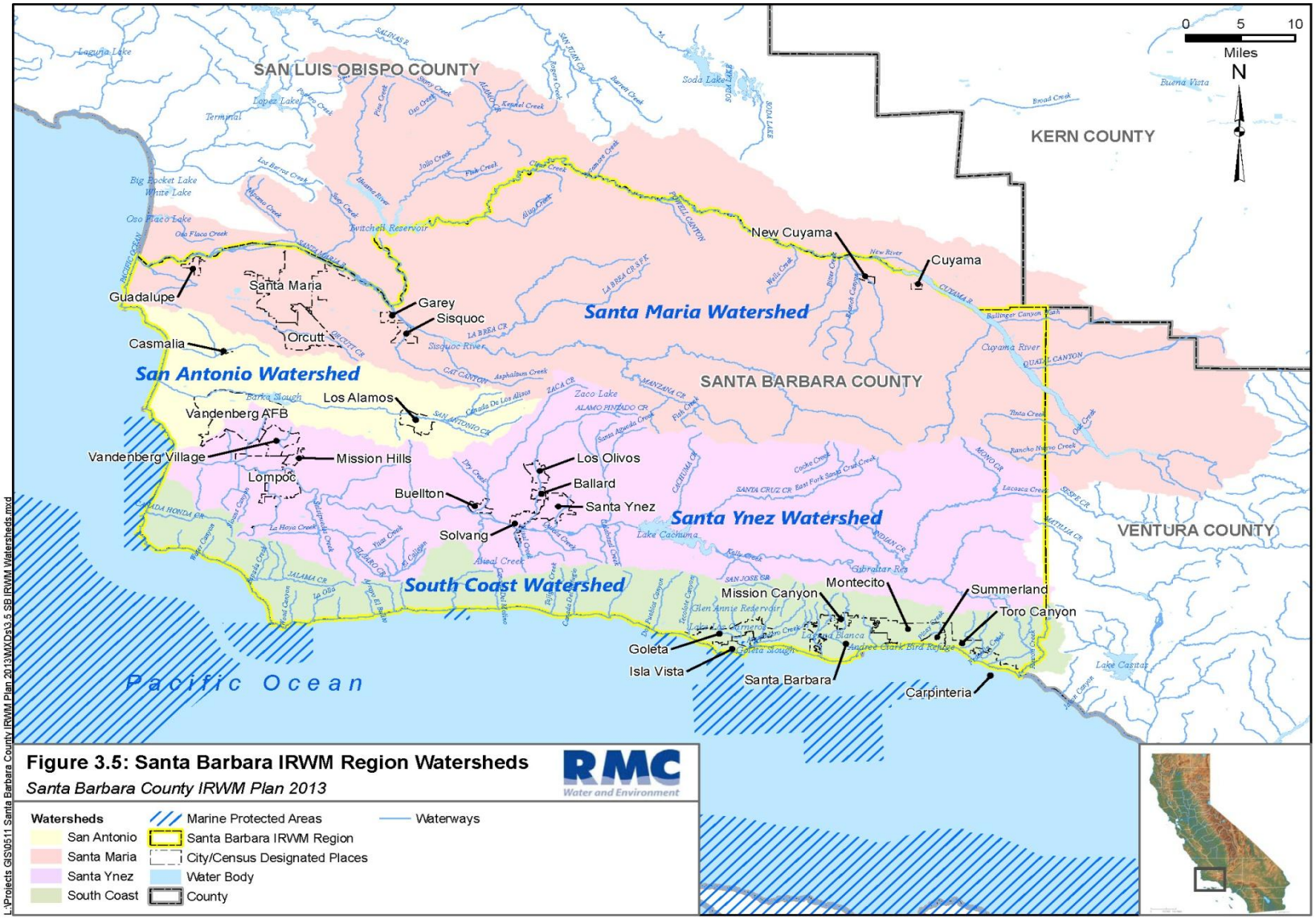
The 1,140-square-mile Santa Maria Watershed is drained by the Santa Maria River which is one of the largest rivers on the central coast of California between Point Lobos and Point Conception and is formed by the confluence of the Cuyama and Sisquoc rivers at Fugler Point, 20 miles inland from the coast. 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 Hydrogeomorphic Guidebook, 2002). Much of the watershed is a large alluvial plain that is broad and wide near the ocean that 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 unimproved. There is a natural riverbed with riparian habitat, mostly willows; where the river flows through the ubiquitous cultivated agricultural fields, there are earthen agricultural levees. Upstream from Highway 1, the river is improved with earthen and rock levees (constructed by the United States Army Corps of Engineers (USACOE) in the 1950s) 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, mock heather, coyote brush 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 are flows in the river, but these can be attributed to agricultural and urban runoff, as well as Twitchell Dam releases.

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 Bureau of Reclamation), which serves a flood protection and water conservation function. The USACE constructed levees for the Santa Maria River in the 1950's. The USACE levees extend to Fugler Point (near Garey) and terminate at the upstream side of the Highway 1 Bridge in Guadalupe (Santa Maria Estuary Enhancement Plan, 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

Figure 3.5: Santa Barbara County Watersheds



Cuyama 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. Bradley Lake and a series of small ponds commonly referred to as the Betteravia Lakes are other permanent water bodies. They are formed in part because of natural land depressions, and partly because of dams. In addition, there are numerous other constructed ponds and lakes, the largest of which is the lake formed by Twitchell Dam. The only estuary is at the mouth of the Santa Maria River.

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 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, as well as recreation.

The main groundwater basin in the Santa Maria Watershed is the Santa Maria River Valley Groundwater Basin (see Figure 6). This groundwater basin underlies the Santa Maria Valley in the coastal portion of northern Santa Barbara and southern San Luis Obispo counties. 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.

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 Groundwater Basin was conducted from 2008-2013 by the Water Agency in cooperation with the United States Geological Survey. The study is scheduled for completion and release at the end of 2013 and will include data compilation, new data acquisition, model development, analysis of water availability, and report preparation. Preliminary results from the study indicate areas of the groundwater basin are in significant decline.

Numerous sensitive species in the watershed are listed by the California Department of Fish and Wildlife. Sensitive plant species include the Beach Layia and Spectacle Pod, the Dune Larkspur, the La Graciosa Thistle, the Sand Mesa Manzanita, and the Parish's Checkerbloom. Sensitive mammals include the Giant Kangaroo Rat, the San Joaquin Kit Fox, and American Badger. Sensitive birds include the American Perigrine Falcon, the Brown Pelican, the Least Bell's Vireo, Willow Flycatcher, California Clapper Rail, and the California Least Tern. Amphibians and reptiles include the Arroyo Toad, the California Red-legged Frog, the California Tiger Salamander, and the California Horned Lizard. The Southern California Steelhead and Tidewater Goby are sensitive fish.

San Antonio Creek Watershed

The 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 seven 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.

The drainage system of the San Antonio Creek Watershed starts at a point approximately 10 miles east of Los Alamos. It traverses generally to the west through Los Alamos and Vandenberg Air Force Base to the ocean. The basin is rather narrow, averaging about eight miles in width. The lower reaches throughout Vandenberg Air Force Base 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 which are irrigated depend on groundwater resources.

Santa Ynez River Basin Watershed

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 Prisima 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 about 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 about 40 percent of the mainland part of the County. It is the primary source of water for about two-thirds of the Santa Barbara County residents, including those within the watershed as well as 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.

Approximately 260,000 acres in the Santa Ynez watershed are public land, 215,000 of which is within the Las Padres National Forest and is relatively pristine. Riparian habitat is well preserved and there has been no channelization nor are there barriers for steelhead/rainbow trout which are listed under the Endangered Species Act. The remaining public lands are, for the most part, on Vandenberg Air Force Base. 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 Vandenberg Air Force Base (CARCD, 2002).

High quality habitat also occurs on private land in the lower river and tributaries. Some habitat above steelhead barriers continues to support naturally reproducing rainbow trout population that still retain ancestral ties to the native steelhead population. This rainbow trout population may be contributing outmigration of individuals to the persistent remnant anadromous steelhead population downstream of Bradbury Dam (Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, Stoecker Ecological Consulting, 2004). Other portions of the lower river through the urban areas of Solvang and Buellton have been channelized and the aquatic habitat and vegetative habitat have been degraded or removed.

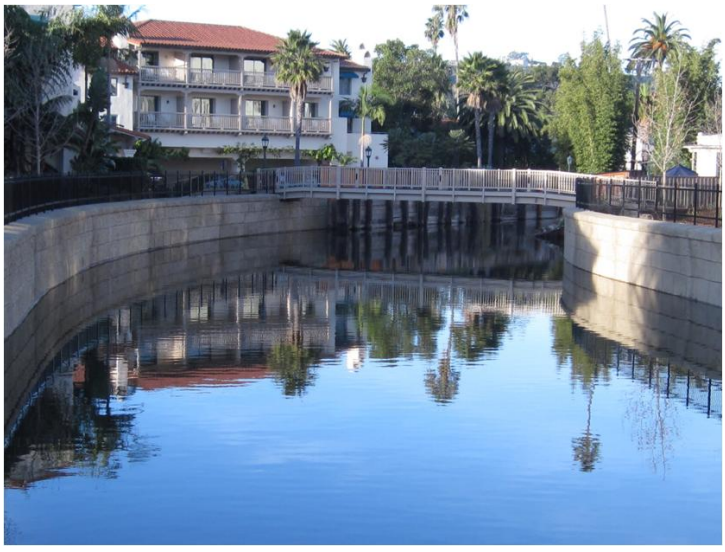
South Coast Watersheds

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 about 10 degrees higher in temperature than the current north of Point Concepcion during the winter months. The topography is precipitous, rising abruptly from sea level to over 4,300 feet in places along the crest of the Santa Ynez range. Annual rainfall varies from about 16 inches on the coast to about 30 inches along the crest. Virtually all the subtropical fruit (principally avocados) and about 75 percent of the nursery and hot-house products of the County are raised in the south coast, most of which are 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 dams; and to a lesser degree from on-farm surface entrapments.

The southeastern part 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 2013 and is comprised of 9,532 acres in the south eastern 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 the University of California, Santa Barbara.

Five of the other larger watersheds are discussed below (South Coast Watershed Characterization Study, An Assessment of Water Quality Conditions in Four South Coast Creek, August 1999, URS):

- The Goleta Slough Watershed covers approximately 45 square miles and includes seven 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 the southern face of the Santa Ynez Mountains. The Slough is an area of estuary, tidal creeks, tidal marsh, and wetlands. The slough primarily consists of the filled and unfilled remnants of the historic inner Goleta Bay about 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 on the few coastal wetlands that remain in the State and the slough is important for enhancing water quality by filtering pollutants. It provides recreational opportunities including bike paths, parks and bird watching along many of Goleta creeks and protects wildlife habitat for endangered steelhead trout, red-legged frogs and tidewater gobies. (State of California's Critical Coastal Areas. 2006).
- 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 about 7,786 acres. It extends approximately 7.5 miles from the ocean to the ridge of the Santa Ynez Mountains at 3,985 feet 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, the open space of the National Forest comprises about 47 percent of the watershed, while residential and commercial land uses contribute about 31 and 17 percent, respectively. Agriculture accounts for only two percent of the total watershed.

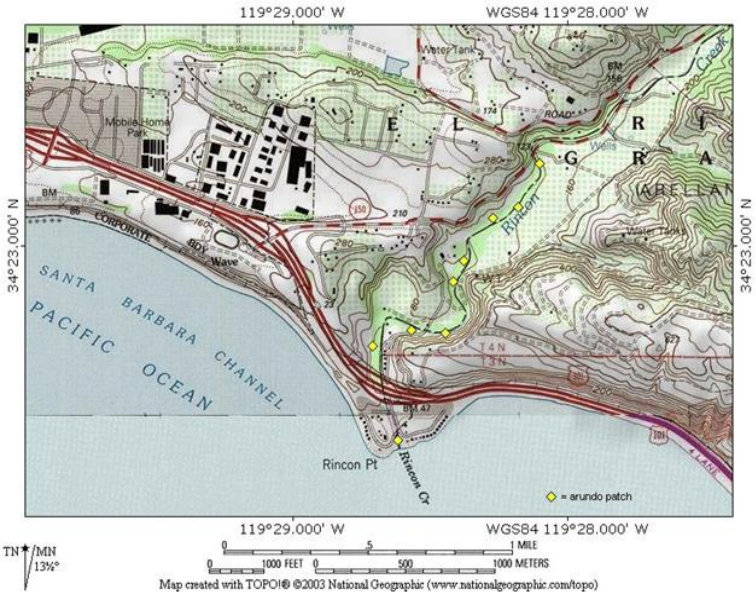


Mission Creek Looking Upstream from State St. Bridge

- 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 about 6,217 acres. It extends about seven miles from the ocean to the ridge of the Santa Ynez Mountains at 3800 feet 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 percent of the watershed with its headwaters beginning above Lauro Canyon Reservoir. Barger Creek makes up 14 percent of the watershed and begins in Barger Canyon above Foothill Road and later enters Arroyo Burro Creek.

- The Carpinteria Creek watershed is located in the southeastern portion of Santa Barbara County. The watershed encompasses 9,410 acres. It extends about seven 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. A lagoon is present at the creek mouth Carpinteria lagoon and 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 comprised of greenhouses, orchards, scattered residences, and the open space of the National Forest. The latter comprises about 79 percent of the entire watershed. Agricultural uses encompass about 17 percent, while the combined residential and commercial uses account for less than 2 percent of the entire watershed.
- The Rincon Creek watershed pictured to the right occurs within both Santa Barbara and Ventura counties. The watershed encompasses 10,219 acres. It extends about 7.5 miles from the ocean to the ridge of the Santa Ynez Mountains at a 4,800 feet elevation. Long Canyon and Casitas Creek are the two main tributaries to the mainstem 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. The open space of the Los Padres National Forest comprises about 64.5 percent of the watershed. Agricultural lands are the next dominant land use type, covering about 32 percent of the watershed. Residential land uses only account for less than two percent, while commercial development is absent. Overall, the creek maintains its natural state with exception to the lower reaches of the watershed. There are two tributaries to Rincon Creek - Long Canyon and Casitas Creek.



Rincon Creek Watershed

3.4.3 Groundwater Basins

The groundwater basins in the County have been divided into North County, Santa Ynez River and South Coast basins and are listed below in Table 3.2 and shown in Figure 3.6. The North County groundwater basins include Santa Maria, San Antonio Creek, and Cuyama. The Santa Ynez groundwater basins include Santa Ynez Uplands, Buellton Uplands, Lompoc, and Santa Ynez River Alluvial Basin. The South Coast groundwater basins (located between the Santa Ynez Mountains and the Pacific Ocean) include 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 3.2: Groundwater Basins and Land Use

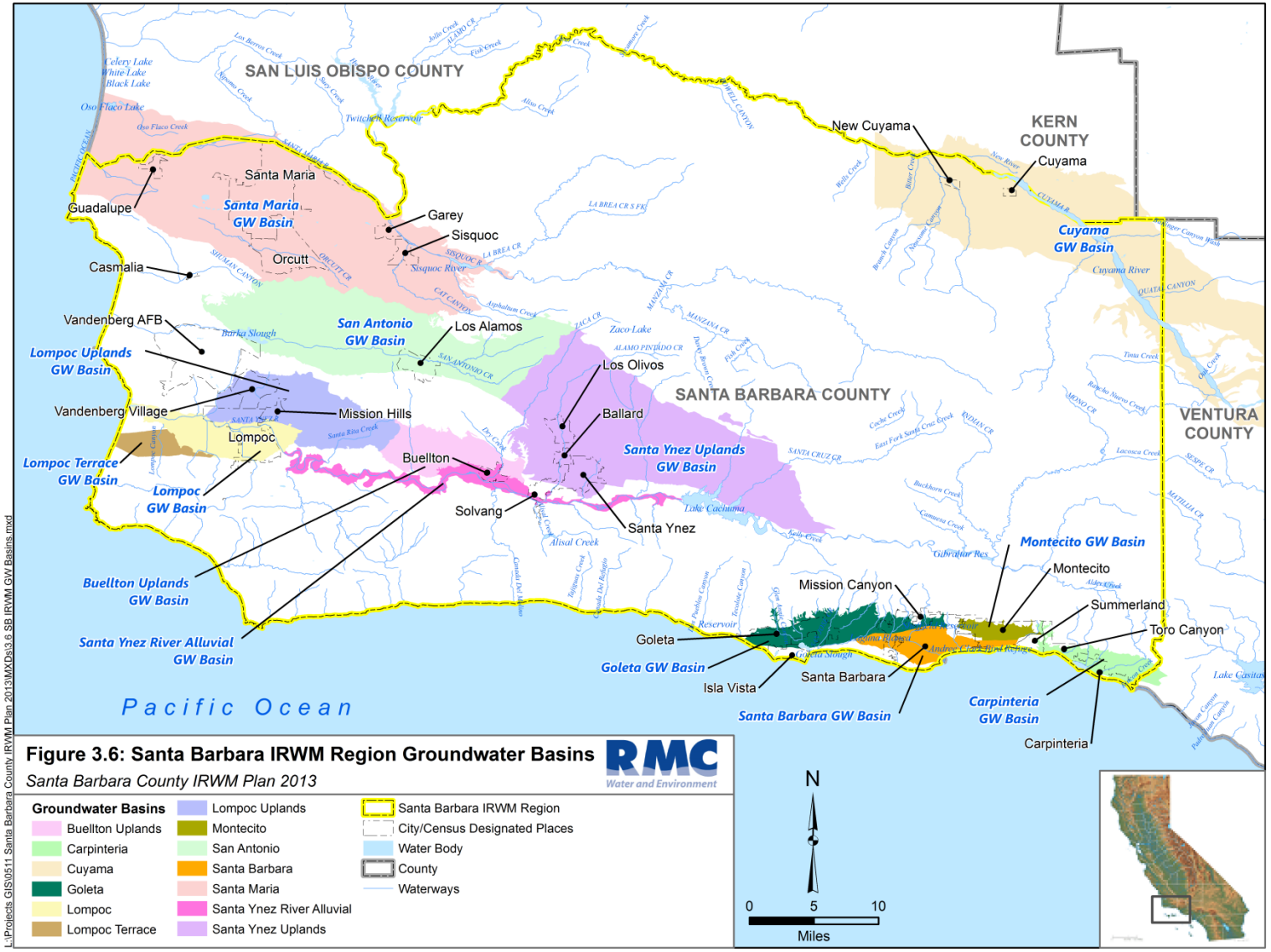
	Size (Acres)	Land Use Summary and Boundaries
North County Groundwater Basins		
Santa Maria	110,000 with 80,000 within Santa Barbara County	Land use: two cities; extensive unincorporated urban area (Santa Barbara County); extensive irrigated agriculture; petroleum production. Bordered by the Nipomo Mesa 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 is bound by Sierra Madre Mountains on the south and by the Caliente Range on the north.
Santa Ynez River Groundwater Basins		
Santa Ynez Uplands	83,200	Land use: three towns, one city and other medium-density residential; varied high-value agriculture. Underlies 130 square miles located about 25 miles east of Point Arguello and north of the Santa Ynez River.
Buellton Uplands	18,560	Land use: agriculture; one city. Encompasses about 29 square miles located about 18 miles east of the Pacific Ocean and directly north of the Santa Ynez River.

	Size (Acres)	Land Use Summary and Boundaries
Lompoc	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 Uplands. Encompasses about 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 Uplands is bordered on the west by the Burton Mesa, on the north by the Purisima Hills, on the east by a topographic divide which separates it from the Buellton Uplands Basin and on the south by the Lompoc Plain Alluvial Basin and the Santa Rita Hills.
Santa Ynez River Alluvial Basins	12,000 (3 subunits)	Land use: two cities; 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 about 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 about nine 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 is 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 about eight miles long and three miles wide. It is divided into three sub-basins: the Central Sub-basin, the West Sub-basin and the North Sub-basin.

	Size (Acres)	Land Use Summary and Boundaries
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 Costal Basins	67,200	Land use: agriculture, primarily orchards and grazing; limited municipal/industrial
Gaviota to Pt. Conception Coastal Basins	23,040	Land use: agriculture, primarily grazing

Sources: (Santa Ynez River Watershed/Groundwater Basins) (City of Lompoc , 2010) (Milner-Villa Consulting, 2011) (Santa Barbara County Water Agency, 2013) (Public Works Department Water Resources Division Water Agency, 2011)

Figure 3.6 Groundwater Basins of Santa Barbara County



The following conclusions regarding groundwater basins are taken from the Santa Barbara County Groundwater Report (2011) (http://www.countyofsb.org/pwd/pwwater.aspx?id=41398&terms=groundwater%20report). References to overdraft pertain to safe yield and not perennial yield. Safe yield is defined as the maximum amount of water which 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 (2011) reflect data developed by the Water Agency and data contained in documents and reports listed under References on page 95 at the back of the report (see Appendix 3-B, Santa Barbara County Groundwater Report, 2011). In the report, the Water Agency stated that other individuals/agencies might reach different conclusions based on different sources of data or interpretations, as the report drew on the best available information, in some cases referencing conclusions from studies conducted over 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. The most recent Santa Barbara County Groundwater Report summarizes the status of groundwater basins as follows:

- An in-depth groundwater basin study now being conducted by the Santa Barbara County Water Agency in conjunction with the USGS confirms that part of the Cuyama Groundwater Basin is in a state of significant overdraft and some water quality impairments are of concern (http://ca.water.usgs.gov/projects/cuyama/). It is unclear at this time how this will affect the future economic viability of the Region and its economy.
- In the recent litigation, 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 AFY. Water levels have fallen significantly, but no regional economic or groundwater quality problem has been documented.
- The Lompoc Plain Groundwater 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.
- The Lompoc Uplands Groundwater 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 Uplands Basin.
- The Santa Rita subarea of the Lompoc Basin is in a state of overdraft of approximately 800 AFY based on a 2001 study. 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 Buellton Uplands Basin is in a state of surplus of approximately 800 AFY based on a 1995 study and generally stable water level measurements.
- The condition of the Santa Ynez Uplands Groundwater Basin has varied over time, and a 2001 study reported the basin as being in a state of overdraft of approximately 2,028 AFY at that time. The decline in water levels in this basin appears to have bottomed out in the 1987 to 1991 drought, however, and the basin currently appears be in equilibrium. Under current extraction practices, part of the basin is managed conjunctively with local and imported surface water supplies. No regional economic or water quality impacts associated with pumping have materialized.

- 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 No. 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

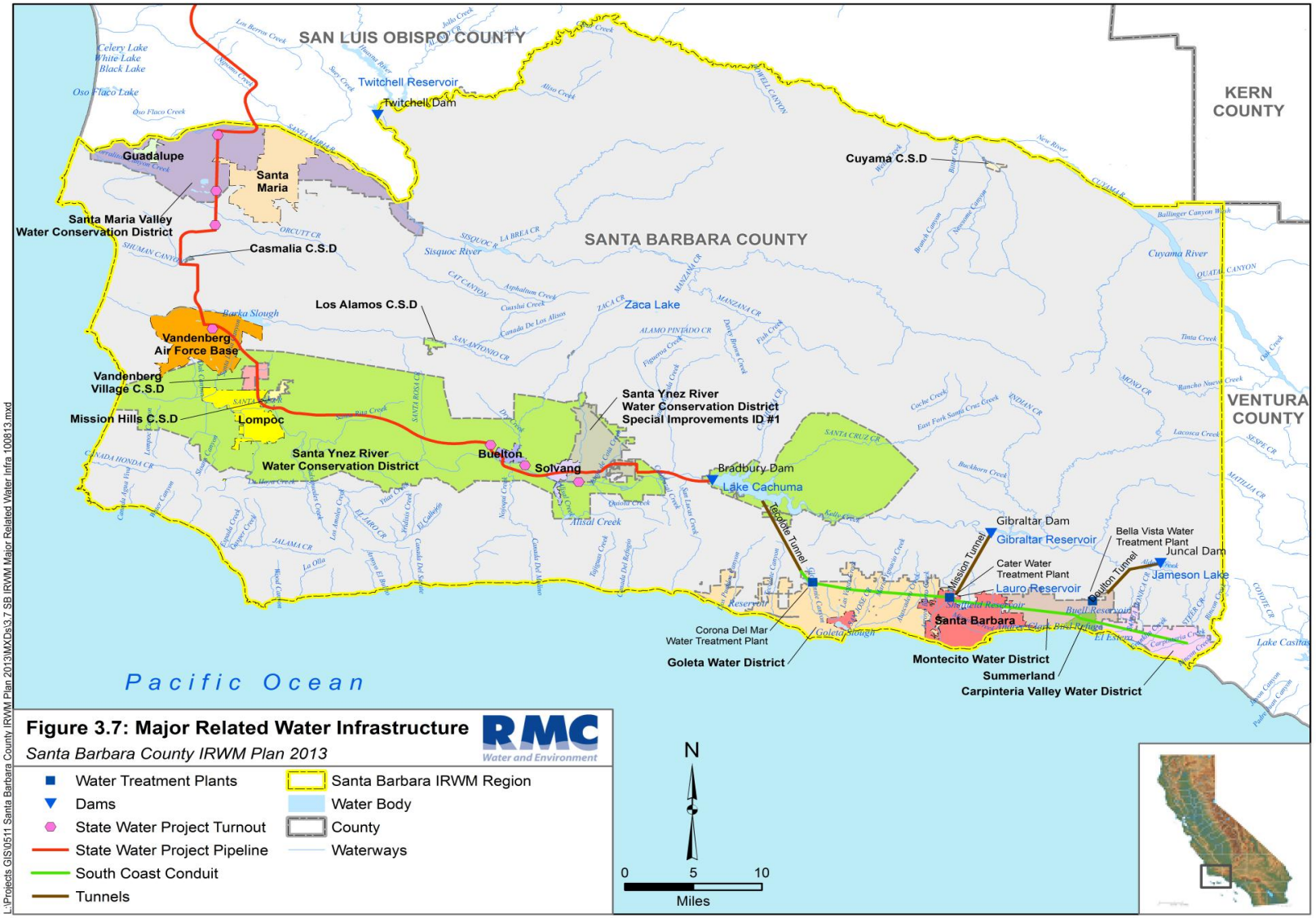
3.4.4 Major Infrastructure

This section describes major surface reservoirs, water distribution systems, desalination, and water and wastewater treatment facilities and is displayed in Figure 3.7. 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 upgraded or replaced in order to meet 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.

South Coast Conduit

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.

Figure 3.7: Major Water Related Infrastructure



Surface Storage Reservoirs and Associated Distribution Systems

The County's four major reservoirs, discussed above, 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 Water District. Lake Cachuma (pictured below), 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. 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.

Gibraltar Reservoir was completed in 1920 with a storage capacity of 14,000 AF. 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 5,303 acre-feet (AF); with an annual yield of 4,600 AF per year (Central Coast Water Authority, 2010 UWMP, page 38). The reservoir is the source of about one-third of the City of Santa Barbara's water supply. 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 Gibralter's yield and deliver it through Cachuma Reservoir.

Jameson Lake was dedicated in 1930 with a storage capacity of 7,500 AF. 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 percent of its water supply from Jameson Lake, Fox and Alder creeks via the Doulton Tunnel, so loss of storage capacity is an issue of concern.

Lake Cachuma (pictured to the right) was completed in 1956 with a storage capacity of about 205,000 AF, but its capacity has been reduced to about 195,000 acre-feet due to the accumulation of silt in the reservoir. 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 and Sheffield Tunnel. The South Coast Conduit is constricted between Tecolote Tunnel and Cater Treatment Plant due to decreased pipeline capacity since other facilities were added to that reach of the conduit.

Lake Cachuma

Additionally, the aging conduit now requires significant levels of maintenance, which could require that sections of the South Coast Conduit be taken out of service for days or weeks at a time and affect the reliability of water supply.

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 watershed (1,600 mi^2) 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 primary water supply. The aquifer provides water for the entire Santa Maria Valley, including the City of Santa Maria, Guadalupe, 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 a 32,000 acre-feet per year of water for recharge into the Santa Maria Groundwater Basin.

Since its completion, Twitchell Reservoir has been trapping sediments from the 1,140-square mile Cuyama River watershed. Original studies estimated that 40,000 AF of sediment would accumulate in the reservoir during the first 100 years of operation (Twitchell Management Authority, 2010). In 1981, a study found that the rate of sedimentation was about 70 percent greater than the original estimate. As of 2012, the accumulated sediment had reached an estimated 45,124 AF. The reservoir capacity is approximately 194,971 AF (Santa Barbara County Water Agency, 2012). Because of this, the Santa Maria Valley Water Conservation District has prepared a Twitchell Project Manual that helps to ensure the continued safe operation of the reservoir's water release works and also extend the usable life of the reservoir.

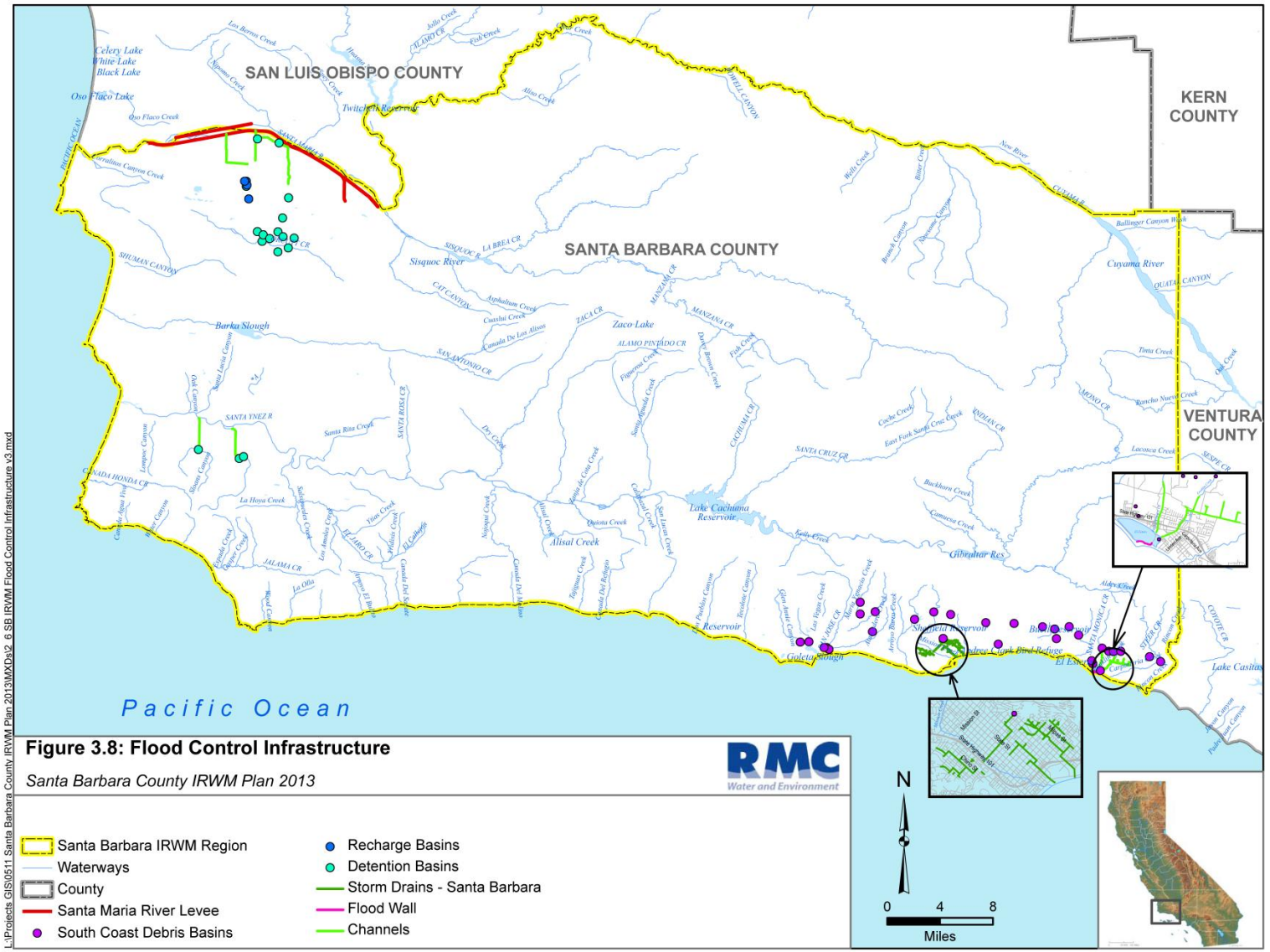
Twitchell Reservoir

Flood Control Infrastructure

Construction of the flood control facilities which make up the flood control and drainage system began in 1950 and has continued up to the present time. The District maintains a total of 288.5 miles of levees and channels and a total of 73 special facilities (see Figure 3.8). It is estimated that it would cost over $1 billion to replace this system at today's dollars. The following summary shows the major facilities which the Santa Barbara County Flood Control and Water Conservation District (District) maintains.

- 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

Figure 3.8: Flood Control Infrastructure



State Water Project Facilities

The Central Coast Water Authority (CCWA) was formed in 1991 to finance, construct, manage, and operate Santa Barbara's State Water Project facilities. Construction of the facilities to import State Water Project (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 both 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, continuing to the northerly portion of Vandenberg Air Force Base. At VAFB, the Coastal Branch connects to the 42-mile pipeline comprising the Mission Hills and the 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 Authority also constructed and operates the Polonio Pass Water Treatment Plant, located in northern San Luis Obispo County and described below. In addition, under a joint powers agreement with DWR, CCWA operates all of the Coastal Branch facilities downstream of the treatment plant.

Construction of the Coastal Branch State Water Project

Desalination

The City of Santa Barbara owns a reverse osmosis desalination plant, which is adjacent to the El Estero Wastewater Treatment Plant. This plant was constructed in 1991 to 1992 by the City of Santa Barbara, Goleta Water District, and Montecito Water District as an emergency water supply in response to the severe drought lasting from 1986 to 1991. The latter two agencies are no longer participants in the desalination plant, which is currently decommissioned to avoid high maintenance costs since other water sources are adequate. The desalination facility can be brought into operation if needed during drought or water shortage conditions (City of Santa Barbara, UWMP, 2010, Page 27.). Although, relatively elevated costs for desalination make the Desalination Plant the last supply option to be used during drought periods. New water supply guidelines identify a key goal of deferring reactivation until at least the sixth year of a critical drought period. Just over half of the prefiltration capacity and reverse osmosis treatment modules were sold, leaving sufficient capacity to meet the City's anticipated need for approximately 3,125AFY of production in future periods of shortage. This capacity is entirely dedicated to City use, though it is currently in a long-term storage mode to reduce maintenance costs and would require an estimated 18 months and $17 million to recommission. This time frame is consistent with the anticipated use of the facility during an extended drought (City of Santa Barbara, UWMP, 2010).

The Laguna County Sanitation District utilizes a reverse osmosis treatment process to treat wastewater. In addition to the brine from the reverse osmosis units, LCSD has a brine unloading station to accept concentrated brine from local water softening companies. The local water softening companies are specifically listed in the draft permit. The concentrated waste brine is then injected into a Class 1 non-hazardous injection well at a depth of approximately 4,800 feet to 5,336 feet. The well is located approximately four miles northwest of the LCSD wastewater treatment plant. The injection well was converted from a former oil well in 2002 and is permitted by EPA under an Underground Injection Control permit (CCWA, UWMP, 2010).

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, as well as those used in San Luis Obispo County to treat State Water Project water 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. Maximum Contaminant Levels (MCLs) are enforceable regulatory standards under this 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 (pictured to the right) in 1974. Due to the plant 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 about 24 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.

Corona Del Mar Water Treatment Plant

Montecito Water District

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

City of Lompoc Water Treatment Plant

The City of Lompoc operates 10 wells with a total flow of 8,940 gallons per minute (gpm). Groundwater is pumped from the wells to the water treatment plant. The plant utilizes a lime-caustic soda softening method to treat the water for hardness and to minimize total dissolved solids (TDS). Waste sludge resulting from the treatment, along with waste filter wash water, is released 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's landfill. The City of Lompoc Water Treatment Plant has a peak treatment capacity of 10 MGD with a reservoir capacity of approximately 12 million gallons of usable storage.

Lompoc Water Treatment Plant

Polonio Pass Water Treatment Plant

State Water Project 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 State Water Project 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. Lompoc

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 the 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. The water treated at the plant may be drawn directly from the South Coast Conduit or from Lauro Reservoir. 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 Gibraltar Reservoir (via the Mission Tunnel into the Penstock pipeline) and water from the South Coast Conduit. Normal operation is for Cater to draw the water from Lauro Reservoir.

A list of water service providers in the County follows in Table 3.3 and is displayed in Figure 3.9.

Table 3.3: Water Service Providers in Santa Barbara County

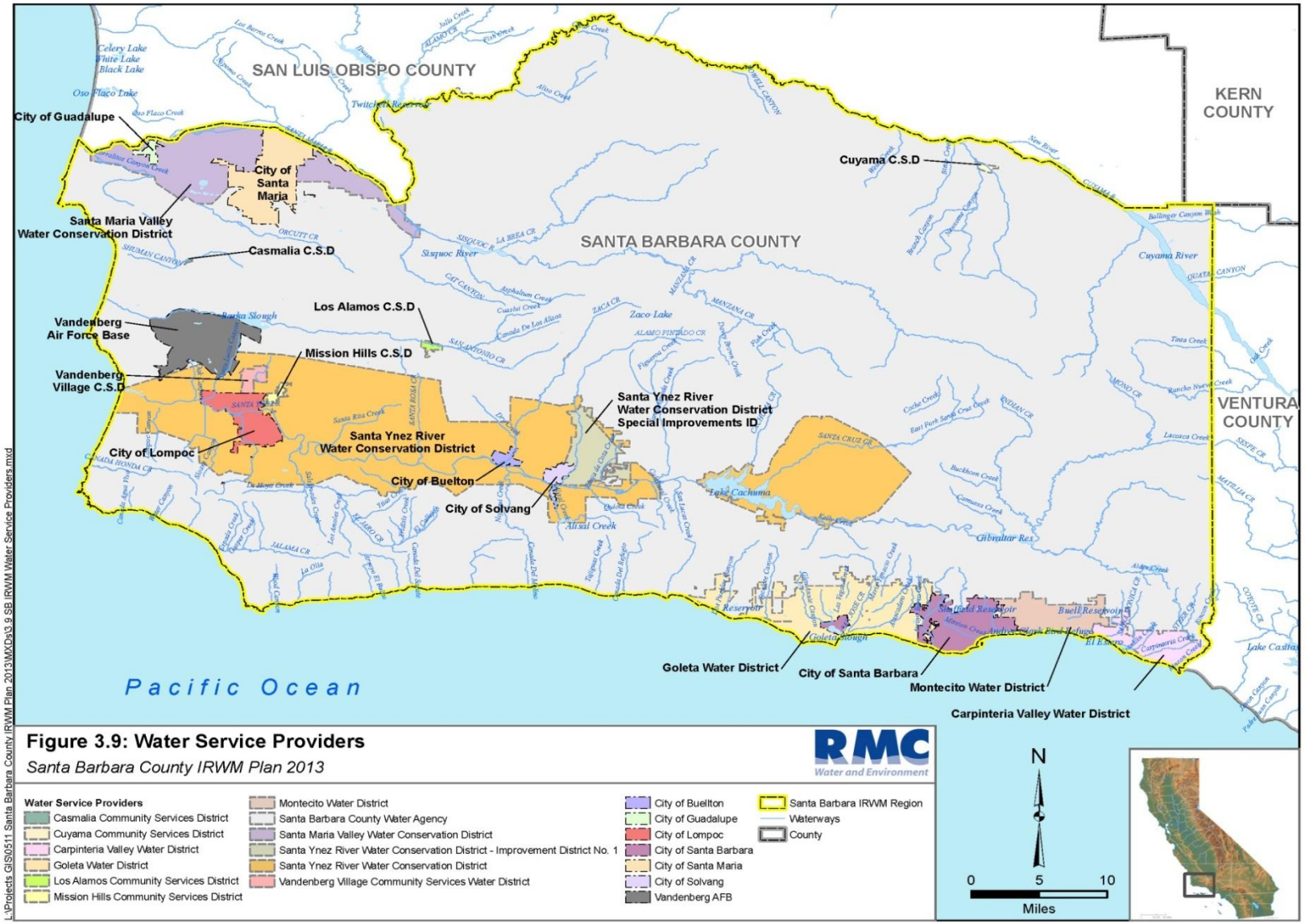
Provider	Service Area and Water Source
Carpinteria Valley Water District	**Service Area**: City of Carpinteria and unincorporated areas in the Carpinteria Valley **Source**: Carpinteria Valley Groundwater Basin, Cachuma Project, and State Water Project
Casmalia Community Services District[a]	**Service Area**: Unincorporated community of Casmalia **Source**: Santa Maria Groundwater Basin
City of Buellton	**Service Area**: City of Buellton **Source**: Buellton Uplands and Santa Ynez Riparian Groundwater Basins and State Water Project
City of Guadalupe[a]	**Service Area**: City of Guadalupe **Source**: Santa Maria Valley Groundwater Basin and State Water Project
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, State Water Project, Recycled Wastewater, and Desalination (during droughts and emergencies)
City of Santa Maria[a]	**Service Area**: City of Santa Maria **Source**: Santa Maria Groundwater Basin, State Water Project, and Twitchell Reservoir recharge
City of Solvang	**Service Area**: City of Solvang and adjacent unincorporated Areas **Source**: Santa Ynez Uplands Groundwater Basin, Santa Ynez River Riparian Basin, State Water Project (acquired through contract with Santa Ynez River Water Conservation District Improvement District No. 1)
Cuyama Community Services District[a]	**Service Area**: Unincorporated community of New Cuyama **Source**: Cuyama Groundwater Basin
Golden State Water Company	**Service Area**: Unincorporated communities of Orcutt, Sisquoc, Lake Marie, and Tanglewood areas **Source**: Santa Maria Groundwater Basin and State Water Project Water

Provider	Service Area and Water Source
Goleta Water District	**Service Area**: City of Goleta, as well as unincorporated areas west of the Santa Barbara City limits to El Capitan State Beach **Source**: Goleta North/Central Groundwater Basin, Cachuma Project, and State Water Project. The 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 State Water Project
Los Alamos Community Services District	**Service Area**: Unincorporated community of Los Alamos **Source**: San Antonio Groundwater Basin
Mission Hills Community Services District[a]	**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, State Water Project, Jameson Lake, Fox and Alder Creeks, and Doulton Tunnel
Santa Ynez River Water Conservation District Improvement District No. 1	**Service Area**: Unincorporated communities of Santa Ynez, Chumash Indian's Santa Ynez Reservation, Los Olivos, and Ballard; also supplies domestic water to the City of Solvang **Source**: Cachuma Project, State Water Project, Santa Ynez Upland and Santa Ynez River Riparian Basins
Vandenberg Air Force Base	**Service Area**: Air Force Base and Lompoc Federal Correctional Complex **Source**: San Antonio Groundwater Basin and State Water Project
Vandenberg Village Community Services District	**Service Area**: Unincorporated community of Vandenberg Village **Source**: Lompoc Groundwater Basin

Provider	Service Area and Water Source
Other Small Mutual Water Companies	Including: 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.

[a]Disadvantaged community (DAC)

Figure 3.9: Water Service Providers



Wastewater Treatment

Wastewater service providers must address increasingly strict discharge limits for wastewater treatment plants requiring increasing costs for wastewater agencies. Systems that discharge to surface water bodies (and the ocean) require NPDES permits. Treatment systems that discharge to land or percolation ponds are regulated by Waste Discharge Requirements (WDRs). Both kinds of permits are issued and monitored by the Central Coast Regional Water Quality Control Board. 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 wastewater treatment plant, 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, or 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.

A list of wastewater service providers follows in Table 3.4 and is displayed in Figure 3.10. A list of wastewater treatment facilities can be found in Table 3.5 and is displayed in Figure 3.11.

Table 3.4: 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[a]	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
County Service Area (CSA) 12 (collection only)	Mission Canyon
City of Solvang	City of Solvang and portions of the Santa Ynez Valley
Cuyama Community Services District[a]	Unincorporated community of New Cuyama

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 El Embarcadero MID)
Laguna County Sanitation District	Unincorporated community of Orcutt and portions of Southern 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

[a]Disadvantaged community (DAC)

The Lompoc Federal Correctional Complex also provides its own wastewater service. Wastewater collected from the Main Containment Area at Vandenberg Air Force Base is conveyed to the Lompoc Wastewater Treatment Plant. Other areas in the North Base and South Base are served by leach fields, septic tanks, and package treatment plants.

Figure 3.10: Wastewater Service Providers

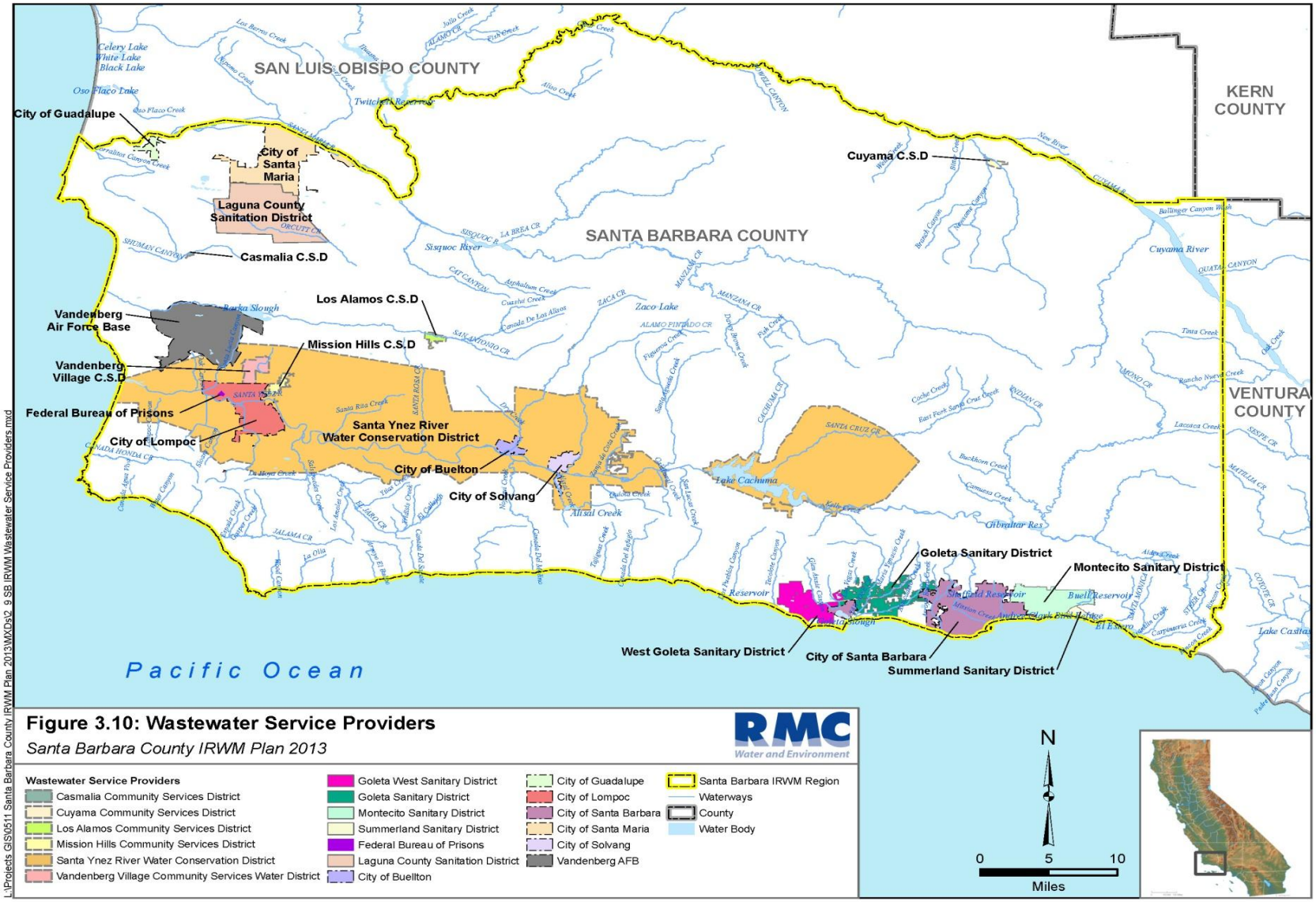


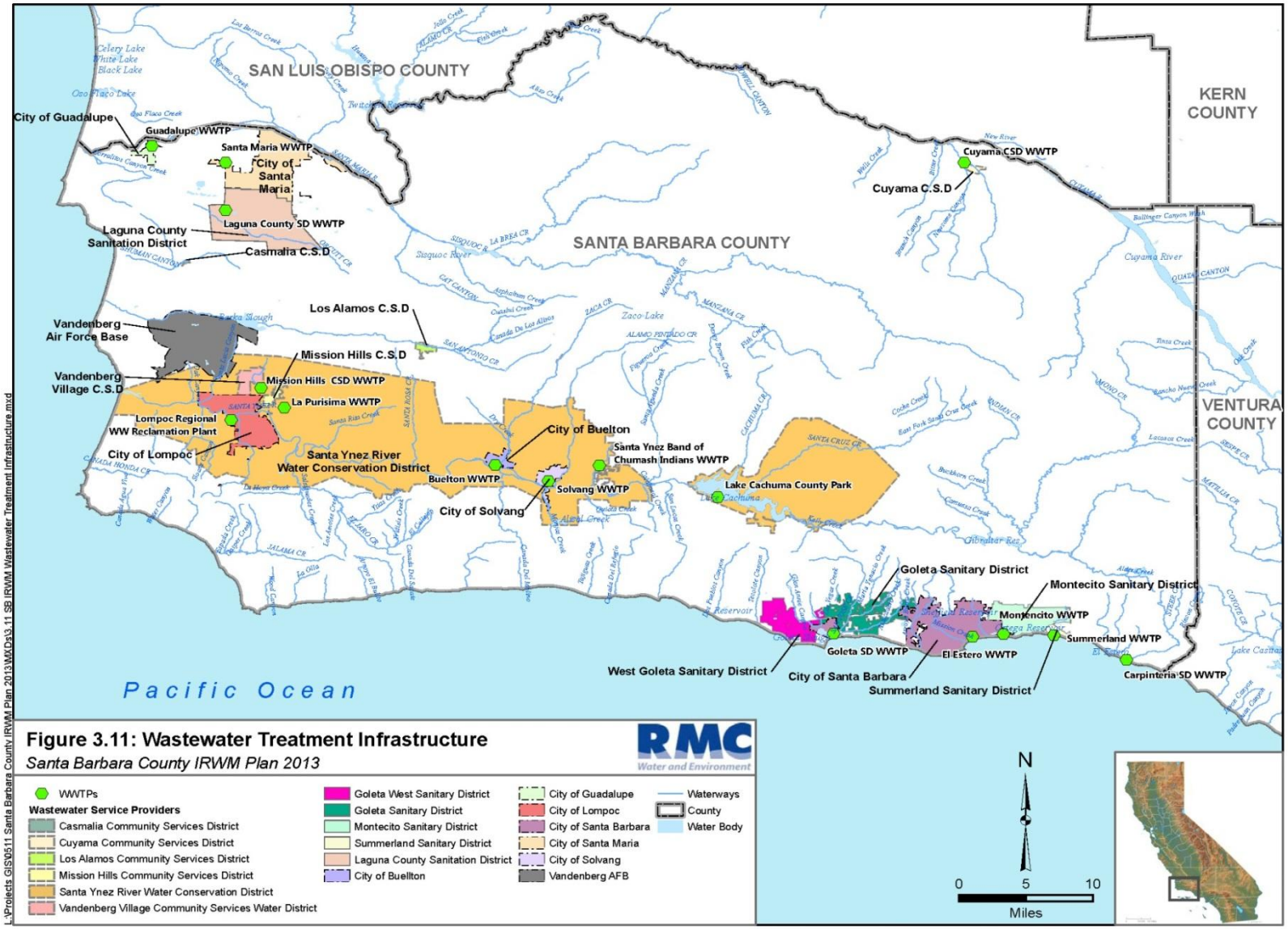
Table 3.5: Wastewater Treatment Facilities within Santa Barbara County

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
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 (WRD)	Secondary and tertiary (off-line until upgrades completed)	Landscape irrigation; toilet flushing
Goleta Sanitary District and Goleta West Sanitary District	9	7.64	7.64	3.0 for recycle Water System	Ocean Outfall and Provide Recycle 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				Need Info (WDR)	Secondary	None
La Purisima (La Purisima State Park)	0.40				(WDR)	Primary	Groundwater recharge, pasture/crop irrigation

Treatment Plant	Design Capacity (MGD)	Permitted Capacity (MGD)	Permitted Secondary (MGD)	Permitted Tertiary (MGD)	Current Disposal Method (Permit)	Level of Treatment	Recycled Water Uses
Lompoc Regional Wastewater Reclamation Plant	5.5 mgd	5	5	5	Discharge to Migeulito 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
Montecito Sanitary District WWTP	1.5	1.5	1.5	0	Ocean Outfall (NPDES)	Secondary	None
Santa Ynez Band of Chumash Indians	0.2				(NPDES)	Tertiary	None
Solvang Wastewater Treatment Plant	1.0	1.5	1.5	0	Percolation Ponds (WDR)	Secondary	groundwater recharge
Summerland Sanitary District	0.30	0.3		0.3	Ocean Outfall (NPDES)	Tertiary	None
US Penitentiary - Lompoc					WDR		
Vandenberg AFB					Waivers of WDRs		

Source: Central Coast Water Authority 2010 UWMP, page 48

Figure 3.11: Wastewater Facilities



Other Regional Water-Related Jurisdictions

Santa Barbara County Water Agency

The Santa Barbara County Water Agency (Water Agency) is a dependent special district that manages a number of regional programs throughout Santa Barbara County. The Water Agency jurisdictional boundaries are the same as the County political boundaries. The programs that the Water Agency manages include: 1) implementation and partial funding of operational programs such as the cloud seeding program; 2) implementation of the Regional Water Efficiency Program, 3) development of countywide hydrologic data and development of hydrologic models, and 4) management of Project Clean Water which works to meet Clean Water Act requirements for urban runoff and to protect the public health and enhance environmental quality in County watershed and beaches. Included in these programs are the compilation and publication of annual tri-annual report on groundwater conditions, sediment management studies, technical support to other public agencies, and public information. Major water projects involving the Water Agency include the State Water Project (Coastal Branch Extension), Cachuma Project, and the Twitchell Project. The Water Agency administers development of the IRWM Plan 2013 supported by a number of local governments. The County Board of Supervisors adopted a Memorandum of Understanding for IRWM planning with 28 local agencies in September 2006; the MOU was updated in 2012 (see Chapter 2). Its boundaries are coterminous with the boundaries of the County of Santa Barbara.

Cachuma Operation and Maintenance Board

The Cachuma Operation and Maintenance Board (COMB) is a joint powers agency that includes the five Cachuma Project Member Units. The COMB Cachuma Member Units include Carpinteria Valley Water District, City of Santa Barbara, Goleta Water District, Montecito Water District, and Santa Ynez River Water Conservation District, ID No. 1. Although Reclamation owns Bradbury Dam, the Tecolote Tunnel, and the South Coast Conduit and its four regulating reservoirs, the COMB has operated and maintained the Cachuma Project facilities, other than Bradbury Dam, since 1957 when it was formed to take over these responsibilities from Reclamation. Its boundaries are coterminous with the boundaries of its constituent agencies.

Cachuma Conservation Release Board

The Cachuma Conservation Release Board (CCRB) 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. However, in 2011, Carpinteria withdrew its membership. The 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 amounts of water that they can obtain from the Cachuma Project or other sources that may be available to them. CCRB 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 a Memorandum of Understanding with the U.S. Bureau of Reclamation (Reclamation) and other parties until January 2011. At that time, implementation of the Lower Santa Ynez River Fish

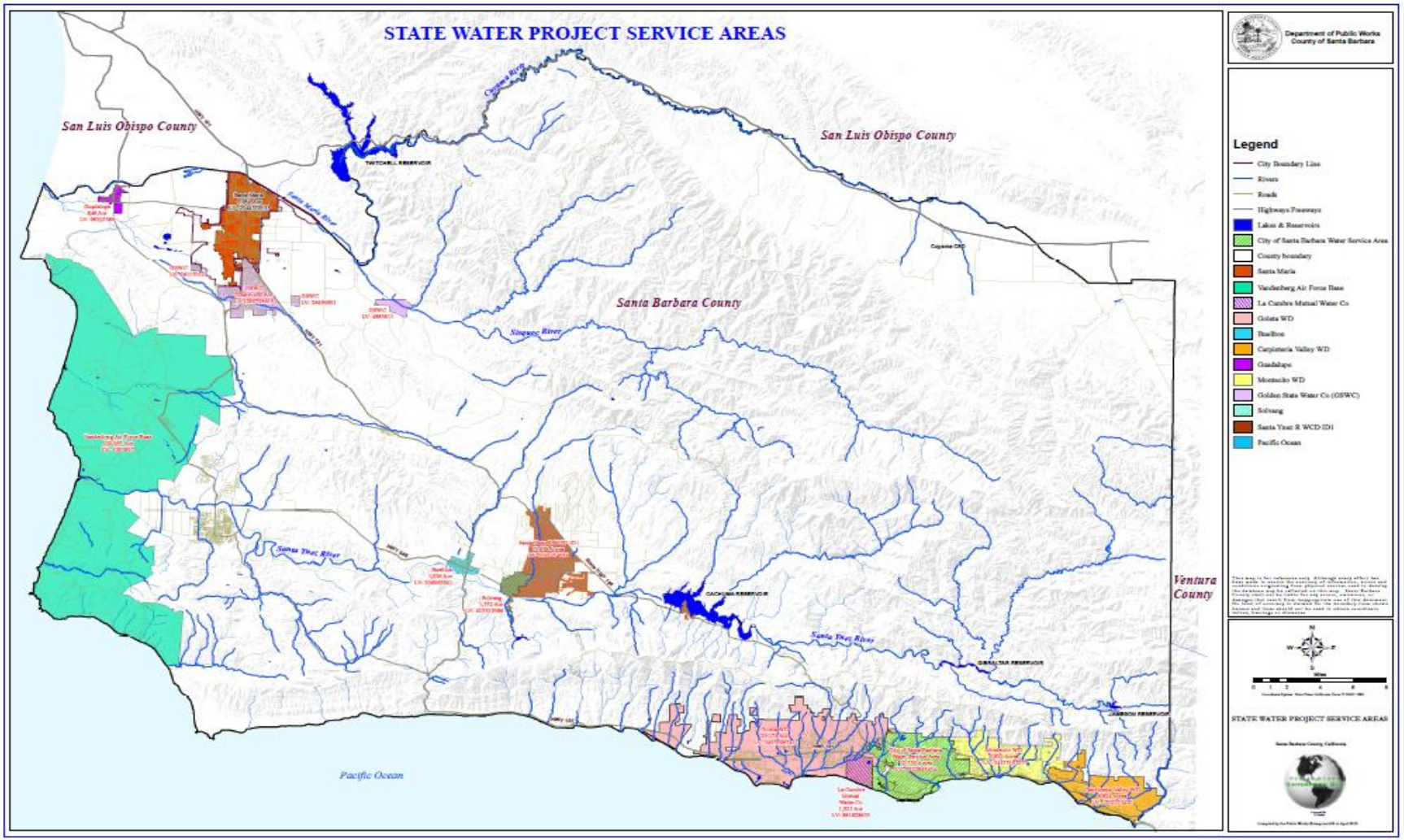
Management Plan and the 2000 Cachuma Biological Opinion was transferred to the Cachuma Operation and Maintenance Board.

CCRB continues to represent its South coast member agencies in the ongoing State Water Resources Control Board's water rights proceedings. A new water rights decision for Cachuma operations is expected in early 2014. CCRB is also assisting Reclamation in developing a new Biological Assessment as part of a reinitiated consultation with the NMFS which will result in a new Biological Opinion for Southern California steelhead in the Santa Ynez River.

Central Coast Water Authority

The CCWA was formed in 1991 to construct, manage, and operate Santa Barbara County's 42-mile portion of the State Water Project and a regional water treatment plant. It later secured agreements with the State of California Department of Water Resources (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, Carpinteria Valley Water District, Goleta Water District, 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 Vandenberg Air Force Base. Its boundaries are coterminous with the boundaries of its constituent agencies. Figure 3.12 displays State Water Project Areas Serviced by CCWA.

Figure 3.12 State Water Project Areas Serviced by Central Coast Water Authority



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 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.)

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 uplands adjacent to the river throughout the watershed. The District's boundaries generally encompass an area within the watershed from Lake Cachuma to the Pacific Ocean.

3.5 Ecological Processes

Santa Barbara County is located at a point of transition between the Southern California and Northern California eco-zones and is characterized by a number of rare plant assemblages. The County has a range of climatic zones, from Mediterranean climate (south coast) to Alpine (Big Pine Mountain) to high desert (Cuyama area), resulting in considerable ecological diversity. Over 1,400 plant and animal species are found in the County. Of these, 54 are federally or state-listed 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, and sensitive species).

3.5.1 Aquatic Sensitive Species

The listed species found in Santa Barbara County include five aquatic/stream dependent species (tidewater goby [*Eucycloglobius newberryi*], tiger salamander [*Ambystoma californiense*], red-legged frog [*Rana aurora draytonii*], arroyo toad [*Bufo californicus*], and Southern California steelhead trout [*Oncorhynchus mykiss*]). The County's watersheds provide critical habitat for the anadromous steelhead trout, which are 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 activity impacts, such as 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, or other structures have created fish passage barriers to important upstream habitat. The southwestern pond turtle (*Clemmys marmorata pallida*), a California Species of Special Concern, also is found in the County. (See Appendix 3-C and 3-D).

3.5.2 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.

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

Lake Cachuma is the largest reservoir in the County. It attracts numerous migratory birds and has a rookery of great blue herons. The endangered southern bald eagle (*Haliaeetus* leucocephalus) may be observed at the lake. The lake supports large populations of largemouth and smallmouth bass, crappie, bluegill, redear, sunfish, channel catfish, and rainbow trout.

The County's four major rivers (Santa Ynez, Santa Maria, Cuyama, and Sisquoc shown in Figure 3-1) 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, western toad, Pacific tree frog, and the introduced bullfrog. Common reptiles include the ensatina, western fence lizard, common king snake, gopher snake, and common garter snake. Riparian vegetation is also used by small mammals for cover, movement corridors, and foraging. Small populations of the southwestern willow flycatcher (*Empidonax trailii extimus*), least Bell's vireo (*Vireo bellii pusillus*), 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.

A number of invasive weeds are present in the County's riparian areas, including arundo, tamarisk, Pampas grass, myoporum, cape ivy, and castor bean. Such weeds are detrimental to habitat and water conservation, 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 over time by human activities and land alteration, which ultimately has altered natural hydrologic and geomorphologic processes, degraded water quality, and diminished native biological communities.

3.5.3 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 sanwichensis beldingi*), California brown pelican (*Pelicanus occidentalis californicus*), western snowy plover (*Charadrius alexandrinas*), light-footed clapper rail (*Rallus longirostris levipes*), and tidewater goby; and plant species such as salt marsh bird's beak (*Cordylanthus maritimus*).

Carpinteria Salt Marsh

Carpinteria Salt Marsh is a 230-acre estuary adjacent to the City of Carpinteria and is 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 deep water habitat in natural and artificial channels (Carpinteria Salt Marsh Reserve)(http://nrs.ucop.edu/reserves/carpinteria/carpinteria.htm). The reserve offers habitat for migratory waterfowl as well as endangered plants and animals like the salt marsh 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

Carpinteria Salt Marsh

may contribute to nutrients in the watershed. Sedimentation is likely coming from construction, storm drains, and agriculture. The marsh and its tributaries (Santa Monica Creek, Franklin Creek, and Arroyo Paredon) contain levels of nitrates that exceed Basin Plan objectives for municipal and domestic supply. Flood control, sediment management, and ecosystem enhancement measures recently have been implemented.

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 (Santa Barbara ChannelKeeper, 2013). 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 the 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.

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, which require 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 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. 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 the watershed and supports a large abundance and diversity of species including several endangered birds, fish, and plants. Fish that live in the slough include the Tidewater Goby, California Killifish, Mosquitofish, and Topsmelt. Invertebrates also inhabit this slough including microscopic crustaceans, worms, and insect larvae like Dragonfly nymphs. Over 290 species of birds are found in the Devereux Slough ecosytem. They include Great and Snowy Egrets, Great Blue Herons, Black-crowned Night Herons, Avocet, Northern Shovelers, Ruddy Ducks, and Least Sand pipers.

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 overwintering sites on the West Coast. As a 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 and wandering skipper. 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 on-going protection.

Surf/Ocean Beach Park

The Surf area, including Ocean Beach Park, is located about 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 the 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 the black rail. Endangered plant species, such as salt marsh bird's beak also may be found here. The Santa Ynez River Lagoon also 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 both the river and by 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 Wastewater Superintendent). The lagoon represents a unique habitat characterized by saltwater/freshwater mixing.

3.5.4 Coastal Dunes

This community occurs in several places along the coast, including on the southwestern edge of the University of California, Santa Barbara, campus (Devereux Dunes), at Vandenberg Air Force Base, 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 birds, 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 the western snowy plover, California red-legged frog, California least tern and over 16 species of rare plants. The Oso Flaco Lake Natural Area, a California State Park, also is located within the Dune Complex.

Guadalupe-Nipomo Dunes Complex

3.5.5 Areas of Special Biological Significance

The SWRCB designates Areas of Special Biological Significance (ASBS) throughout the State of 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 (PRC Section 36700[f]). In these areas, non-point source pollution is to be controlled as much as possible, and point source and thermal discharges are generally not permitted. The only ASBS within Santa Barbara County is the Channel Islands National Marine Sanctuary, which is managed by the National Park Service out to 6 miles from shore. This IRWM Plan does not include the Santa Barbara Channel Islands thus no ABS is located within the IRWM Planning area.

3.5.6 Marine Protected Areas

California Assembly Bill (AB 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 3.5), including:

- The Channel Islands
- Goleta Slough
- Refugio State Marine Conservation Area
- Vandenberg State Marine Reserve
- A 22-square mile no-take marine reserve at Pt. 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 by hand
- A 2.5-square mile marine conservation area at Naples Reef (off the Gaviota Coast) that allows only spear-fishing of pelagic finfish and white sea bass 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, and
- A 0.25-square mile marine conservation area at Goleta Slough that allows only necessary dredging, habitat restoration and other ongoing maintenance work.

3.6 Climate Change

Climate change projections have shown that California can expect to be impacted by changes to temperature and precipitation in the future. The Region may already be experiencing climate change impacts. Regional water resource planners face challenges interpreting new climate change information and discerning which response methods and approaches will be most appropriate for planning needs.

3.6.1 Regional Impacts

Estimating the impacts of climate change at a regional level is challenging due to the coarse spatial scale of models that project climate change impacts of temperature and rainfall, and due to the long time scale evaluated in many models (to the year 2100). Recently, 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. The timescale used for these models has also been downscaled to provide outputs for the year 2050, and though this is still a longer timescale than is used in IRWM planning, it is still useful for assessing climate change.

To incorporate climate change into water resources management, downscaled temperature and precipitation projections 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 Plan, several of these documents were reviewed to determine which best represented the impacts for the Region. These documents include:

- Urban Water Management Plans
- Water Supply Management Plans
- Groundwater Management Plans
- Supply Planning Studies
- 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, as shown in Table 3.6. These effects were reviewed and vetted by the Region's Climate Change Workgroup, which was comprised of various water resources and planning representatives that have experience in climate change planning within the Region.

Table 3.6: Impacts of Climate Change on the Region by 2100 (unless otherwise noted)

Impact to	Ranges
Temperature change	Winter: Projected increases of 4 to 5°F Summer: Projected increases of 5 to 6°F
Precipitation	5 to 7 inch decrease in average annual rainfall
Sea Level Rise	4 – 30 cm by 2030 12 - 61 cm by 2050 42 - 167 cm by 2100
Supply	SWP delivery decrease of 7%-10% by 2050, and 21%-25% by 2100 Changes to local supply not quantified
Wildfire Risk	Low to moderate increase in projected fire risk

Temperature Changes

The primary effect expected from climate change in the future is an increase in average global temperature. By 2100, temperatures in the central coast area are projected to increase between 4 and 5°F during the winter, and increase between 5 and 6°F during the summer (CA Emergency Management Agency & CA Natural Resources Agency, 2013). 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.

Precipitation Changes

Changes in rainfall and snowfall are expected to affect the Region both locally and at the state level. In Santa Barbara County, by 2100 rainfall is expected to decrease 5- to 7-inches at the coast, and decrease by 4- to 5-inches further inland. Generally, the Region may receive more extreme weather events including more frequent droughts and more precipitation during storm events.

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 Mountains, which has implications for State Water Project deliveries. Climate change will likely cause more precipitation to fall as rain, while warmer temperatures will cause snow pack to melt 4 to 14 days earlier in the season (Cayan, 2007). DWR is predicting that Sierra snowpack will experience a 25 to 40 percent reduction by 2050 based on historical modeling, with additional decreases caused by warmer storms due to climate change.

Sea Level Rise

Local and statewide planning studies indicate 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 cm by 2030, 12 – 61 cm by 2050, and 42 – 167 cm by 2100.

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 study performed an assessment on several beach-front 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 beach-front 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 (California Department of Boating and Waterways and San Francisco State University, 2011). Coastal infrastructure in the Region, including water and wastewater infrastructure, is also vulnerable to sea level rise.

Supply

Imported water supply from the State Water Project deliveries are projected to decrease between 7% - 10% by 2050, and 21% - 25% by 2100. (California Climate Change Center, 2009) At this time, the Region has not projected the effects of climate change on local supplies. However, changes in precipitation may be expected to cause variations in the amount of local supply available.

Wildfire Risk

A significant portion of Santa Barbara County is occupied by forest land, and wildfire is already a common occurrence in the Region due primarily to the warm, dry summer climate. Earlier onset of summer dryness that lasts longer and becomes more intense is likely to result in a low to moderate increase in fire risk (California Emergency Management Agency and California Natural Resources Agency, 2012). An increase in the frequency of wildfires could threaten downstream water quality and lead to the loss of reservoir storage capacity due to sedimentation.

3.6.2 Identification of Vulnerabilities

A climate change vulnerability assessment helps a Region to assess its 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 has identified a series of questions to help regions identify key indicators of potential vulnerability, including (DWR, 2011):

- Currently observable climate change impacts (climate sensitivity)
- Presence of particularly climate sensitive features, such as specific habitats and flood control infrastructure (internal exposure)

- Resiliency of a region's resources (adaptive capacity)

The Region's Climate Change Workgroup, which was comprised of 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 by asking a series of questions suggested by DWR in its 2011 *Climate Change Handbook for Regional Water Planning.* Table 3.7 summarizes the analysis, which includes:

- Vulnerability Question: Taken from Box 4-1 of DWR's Climate Change Handbook
- Answer: Provided at June 12, 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?

Table 3.7: 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
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 which 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

Vulnerability Question	Answer	Justification	Vulnerability Issue
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 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. Though 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
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 dorax 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

Vulnerability Question	Answer	Justification	Vulnerability Issue
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
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/ 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 tide gauge near the City of Santa Barbara has shown a 1.25 mm/yr increase in sea level rise over the last 15 years.	

Vulnerability Question	Answer	Justification	Vulnerability Issue
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/habitats
Is there land subsidence in the coastal areas of your region?	N	There is no evidence of land subsidence.	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 flood plains.	Increases in inland flooding
Does aging critical flood protection infrastructure exist in your region?	Y	Areas such as Santa Maria and Guadalupe have aging 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.	Increases 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
Ecosystem and Habitat			
Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Y	Aquatic habitats existing 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.	

Vulnerability Question	Answer	Justification	Vulnerability Issue
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.	
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.	Decrease in available, necessary habitat
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.	
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 the 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.	

3.6.3 Prioritized Vulnerabilities

Once the Workgroup identified the Region's areas of concern in terms of climate change issues, it was able to begin examining the adaptability of its water resources to climate change by prioritizing the vulnerability issues. In prioritizing the vulnerability issues, the Workgroup identified those water resources that are of highest concern to the Region in terms of the significance of the impact of climate change and therefore the level of adaptation that will be needed.

The vulnerabilities identified were then prioritized during an exercise conducted with the Working group. Through discussion, the members gave each vulnerability a ranking of 1, 2 or 3, where 1 is a low concern and 3 is a high concern, and some vulnerabilities received a range of scores (e.g. 2-3, and 1-2). The vulnerability issues were then grouped into three priority levels ranging from high to low according to the ranking: high (scores of 2-3 and 3), medium (scores of 1-2 and 2), and low (scores of 1).

At a subsequent meeting held on November 13, 2012, the Workgroup reviewed the results and made suggestions for refinements that could be made to better align the prioritization with the vulnerabilities identified in planning documents, including using only two levels of prioritization: high and low. These suggestions were incorporated into the prioritized vulnerability issues which are shown below.

Table 3.8: Vulnerability Issues

Prioritization	Vulnerability Issue
High	**Water Demand:** Habitat demand would be impacted **Water Demand:** Limited ability to conserve further **Water Demand:** Lack of groundwater storage to buffer drought **Water Demand:** Meeting demand in peak seasons would be more difficult **Water Supply:** Decrease in imported supply **Water Supply:** Decrease in groundwater supply **Water Quality:** Increased constituent concentrations **Water Quality:** Poor water quality in surface waters **Water Quality:** Decrease in recreational opportunity – **Water Quality:** Increase in treatment needs and costs **Water Quality:** Increased erosion and sedimentation **Sea Level Rise:** Decrease in land **Sea Level Rise:** Damage to coastal infrastructure/recreation/tourism **Sea Level Rise:** Damage to ecosystem/habitat **Ecosystem and Habitat**: Increased impacts to coastal species
Low	**Water Demand:** Crop demand would increase **Water Demand:** Industrial demand would increase **Water Supply:** Sensitivity due to higher drought potential **Water Supply:** Decrease in seasonal reliability **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

3.6.4 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 this Section 8.2. Section 8.2 states that the Steering Committee (representing the Cooperating Partners) and the Lead Agency will be responsible for evaluating and monitoring the implementation the IRWM Plan 2013 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 – the biennial review. The biennial 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 biennial review and modified appropriately." Section 8.3.7 (Review and Updates of the IRWM Plan 2010 Biennial Review, 2) –states that "IRWM issues and conflicts,

objectives, water management strategies, and targets will be evaluated during the Biennial 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. If there is funding available for a full update of the IRWM Plan 2013, the Region will be able to fully reassess the prioritized vulnerabilities.

3.7 Regional Water Management History

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 County's population increased, water supplies and treatment and delivery systems were expanded to meet the growing needs in a manner that was accounted for by the County's limited water supply. This section focuses on the 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 State Water Project.

3.7.1 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 coasts' 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. While the Cold Spring Tunnel (constructed in 1896) initially provided essentially a horizontal well producing approximately 290 acre-feet of water per year (AFY), its yield steadily decreased to about 100 AFY, and attention again turned to potential dam and reservoir sites on the Santa Ynez River.

Mission Tunnel

A 1905 report by the United States Geological Survey recommended the 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 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 purchased the holdings of the Santa Barbara Water Company. Mission Tunnel was designed to intercept groundwater flow and to later convey water from Gibraltar Reservoir to the City of Santa Barbara. Infiltration into Mission Tunnel varies with rainfall, but averages approximately 1,100 AFY.

Gibraltar Dam and Reservoir

The presence of major reservoirs in Santa Barbara County began in 1920 with the completion of Gibraltar Dam and Reservoir on the Santa Ynez River. By 1945, sedimentation had reduced storage in Gibraltar Reservoir from 14,000 acre-feet (AF) to approximately 7,800 AF. 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 (AF) due to siltation; with an annual yield of 4,600 AF per year.

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 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.

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, respectively, was challenged in court by downstream interests in 1928. Gin Chow, a Lompoc farmer and local prophet, and over 30 others filed suit against Santa Barbara and Montecito, claiming that they were unlawfully diverting water from the Santa Ynez River. In 1933, the California Supreme Court upheld the rights of Santa Barbara and Montecito, setting limits on their ability to store and divert water, and decreeing that the City must release up to 616 AF of water per year from Gibraltar Reservoir for downstream water rights.

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 (see "Gibraltar" above) 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.

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 by individual water users, as evidenced by the Gin Chow litigation. The District called for a more extensive study by an impartial government agency. The County contracted with the U.S. Geological Survey (USGS) in 1940 to obtain basic data and with the U.S. Bureau of Reclamation (Reclamation) in 1941 to prepare a countywide water resources development plan. The Cachuma Project, among others, was recommended by Reclamation in 1944.

The Santa Barbara County Water Agency was formed in 1945 to act as a go-between, contracting with both 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 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 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, federal funding was ultimately forthcoming, and the Cachuma Project facilities were completed by 1956.

The Cachuma Project consists of the Bradbury Dam, which impounds Lake Cachuma; the Tecolote Tunnel, which diverts 90 percent of the 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 both urban and agricultural users, and

in 1973, they formed the Cachuma Conservation Release Board to represent their Cachuma Project water rights interests.

In 1963, the Santa Ynez River Water Conservation District formed Improvement District No. 1 to serve 10 percent 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 comprise the Cachuma Member Units.

Under federal law, Reclamation is required to comply with State water rights law. Accordingly, Reclamation filed an application with the State Water Rights Board (precursor to the SWRCB) to appropriate Santa Ynez River water in 1946. Hearings did not occur until 1957, a year after the 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 Board retained continuing jurisdiction for 15 years to ensure that the prescribed releases were adequate.

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 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 WR Order 73-37 in 1973. It again retained jurisdiction for 15 years.

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 Board extended its jurisdiction for another 5 years (1994), which was subsequently extended to 2000.

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.

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; 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.

As a result of the 1990 hearings, beginning in 1993, 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 the Southern California Steelhead was listed as an endangered species, triggering a Section 7 consultation with the National Marine Fisheries Service (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 (to comply with SWRCB Order WR 94-5) in 2000. These two documents contain 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. USBR is currently developing a Draft Biological Assessment (BA). The Draft BA includes a detailed analysis of the current project operations and steelhead protection measures as well as a set of extensive biologic and hydrologic studies. Once complete, USBR will submit the Draft BA to NMFS for comment. Following formal comments from NMFS, USBR will incorporate those comments, finalize the BA, and resubmit to NMFS. This begins the formal consultation process between USBR and NMFS. The Final BA will inform development of the NMFS Draft Biological Opinion, expected approximately 90 days after the submittal of the Final BA.

Cachuma Project Settlement Agreement

The 2002 "Cachuma Project Settlement Agreement" resolves various differences between the South Coast Member Units and downstream interests pertaining to the operation of the Cachuma Project that existed for over 50 years. 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 Agreement, will protect downstream water rights holders and will improve 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.

- As provided in the MOU that establishes the governance structure, in the outlet works of Bradbury Dam by maximizing deliveries of State Water Project water (consistent with the Biological Opinion) when water rights releases are made.
- Santa Ynez River flooding issues are addressed in the Agreement through winter storm operations of Bradbury Dam, including precautionary drawdowns and temporary surcharging, in order to reduce peak flows and provide some measure of flood control. Project water supply is protected by achieving a full reservoir following the 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 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 2013.

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 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.

3.7.2 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, Reclamation constructed the Twitchell Dam as part of the Santa Maria Project in cooperation with the USACOE. The project provides recharge to the groundwater basin underlying the Santa Maria Valley and provides for flood protection. Twitchell Reservoir is operated and maintained by the Santa Maria Valley Water Conservation District that provides water conservation, groundwater basin recharge, and flood control services. The Reservoir supplies an average 32,000 AFY of recharge to the Santa Maria Groundwater Basin. The Twitchell Management Authority, formed to implement the requirements of the Settlement Agreement (Stipulation), is a committee that administers provisions of the Stipulation (see Santa Maria Groundwater Adjudication section below) 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.

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 GSWC to import State Water Project ("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 Basin.

In the summer of 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 Basin water resources, including rights to use groundwater, State Water Project water and associated return flows, the developed groundwater yield resulting from the 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 Basin into three Management Areas: the Northern Cities Management Area, Nipomo Mesa Management Area, and the 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 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 Basin. These rights include: a recognition of the City's highest historical use of groundwater from the Basin; the right to recapture a preset portion of the return flows from the City's use of State Water Project in the Basin; and a 14,300 AFY share of the developed groundwater yield resulting from Twitchell Reservoir operations. In addition, the City may access additional supplies through the transfer of Twitchell Yield. Also, return flows from State Water Project 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 as between the public water suppliers, including the City, 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 (GSWC) as against the non-stipulating landowners. In addition, the court reaffirmed Santa Maria's right to utilize its return flows as provided in the Stipulation. The 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 Appeal issued a published decision affirming the trial court's decision in nearly all respects, including the management and allocation of Twitchell Yield as provided in the Stipulation, the award of prescriptive rights to the City and GSWC, and the imposition of the physical solution.

The Santa Maria Groundwater Adjudication has established the manner by which Twitchell Reservoir and the Basin are managed; any projects included in the IRWMP that could affect the Santa Maria Valley Groundwater Basin or Twitchell Reservoir will be consistent with the terms of the adjudication.

3.7.3 State Water Project

The increasing population in the cities of Santa Maria and the County's south coast area, as well as problems associated with rapid siltation of reservoirs, which led to diminished storage capacities, required the development of additional water supplies, including State Water Project water. In 1963, the Santa Barbara County Flood Control and Water Conservation District contracted with the State of California Department of Water Resources (DWR) to deliver State Water Project water to Santa Barbara County. At that time, the County began payments to DWR to retain a share of the State Water Project yield ("Table A Amount[2]") 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 State Water 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 Table A Amount; 3,908 AFY of drought buffer; and 2,500 AFY of a special drought buffer for the Goleta Water District.

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 State Water Project water. This included the communities of Carpinteria, Summerland, Montecito, Santa Barbara, Hope Ranch, Goleta, Buellton, Solvang, Santa Ynez, Orcutt, and Guadalupe. The Santa Maria City Council and Vandenberg Air Force Base also decided to participate in the State Water Project. The communities of Lompoc, Vandenberg Village, and Mission Hills voted not to participate in the State Water Project. Beginning in 1997, the CCWA began to deliver State Water Project water to Lake Cachuma, where it is mixed with Cachuma Project water and delivered through Tecolote Tunnel to the contractors on the south coast. South Coast Member Units also receive Cachuma water that was exchanged for State Water Project 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 the District until 1996, when it was sold to the CCWA in anticipation of State Water Project deliveries.

3.7.4 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 in order to give an overview of how systems have evolved over time in responding to population growth and regulatory requirements.

2 "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.

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 the construction of the first treatment plant in 1951. The El Estero Treatment Plant as it exists today was built to comply with the 1972 Federal Water Pollution Control Act. In 1991 the plan was upgraded to provide treatment and delivery of up to 1,400 AFY of reclaimed water. The City continues to update and upgrade the treatment facility each year. Investment in the treatment plant ensures it remains able to meet increasingly stringent wastewater discharge regulations.

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 the benefit of treatment. It was during this period that the bulk of the sewer system serving the downtown area was constructed. The District's first wastewater treatment plant, designed to treat 500,000 gallons per day (gpd), was completed and put into operation in 1951. Treated effluent was discharged directly into the Pacific Ocean via an 18-inch 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 2.0 million gallons per day (mgd) which included a new, longer outfall pipe, primary clarification, trickling filters, final clarification, and anaerobic sludge digestion. This facility served the community for over 30 years. In 1993, the District completed another major upgrade to its wastewater treatment plant 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 District has recently expanded its service areas to include the Rincon and Sandyland cove areas.

Goleta Sanitary District

The Goleta Sanitary District was formed in 1942 to serve the rural agricultural area called Goleta. Only 1,500 people lived within the District. In those years, sewage wastes were disposed of through individual cesspools and septic tanks. With the end of World War II, the fledgling 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. 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, University of California at Santa Barbara (UCSB), and certain facilities of Santa Barbara County.

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

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 District produces 785 AFY of reclaimed water that is distributed throughout the community and used as landscape irrigation.

Goleta West Sanitary District

The Goleta West Sanitary District (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, over 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 District collects but does not treat sewage. Through a joint use agreement the District connected to the Goleta Sanitary District treatment plant for treatment and disposal. The District owned only 5 percent of the plant capacity in the 1950s, but has expanded its ownership to over 40 percent to meet District needs.

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 5 mgd of wastewater. During peak months of 1975, flows to the treatment plant reached its capacity of 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 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 to be rehabilitated and incorporated into the treatment scheme to reduce construction costs. The treated effluent was to be 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. In 2008, the City of Santa Maria received a Proposition 50 grant from DWR to help fund the expansion of the City of Santa Maria Wastewater Treatment Plan to 13.5 mgd from 8.5 mgd.

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 district absorbed the Orcutt Sanitary District (formed in 1926) in 1961, as well as two County collection system districts in 1975. The wastewater treatment plant 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 membranes including reverse osmosis for the portion of flow containing high salt levels from water softener discharge. Brine from the reverse osmosis system is disposed of through injection of deep wells (modified former oil production wells). In 2008, the District received a Proposition 50 grant from DWR to convert a holding pond to a closed tank with increased capacity that provides more surge storage, requires less maintenance, ensures water quality, and allows for the reduction in the use of chlorine.

Santa Ynez Community Services District

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

The Chumash Indians have a contract for 88,000 gpd of the District's capacity and constructed a wastewater treatment plant 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 utilized in the irrigation throughout the reservation and for water to flush the toilets. The Santa Ynez Community Services District is under contract to maintain the Chumash wastewater plant and collection system.

Los Alamos Community Services District

The Los Alamos Community Services District 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 District to discharge a maximum of 225,000 gpd, averaged over each month and to allow for build out of the town as defined in the Community Plan. Phase III was completed in 2006.

City of Lompoc

The City of Lompoc owns the Lompoc Regional Wastewater Treatment Plant. In 1974, the City of Lompoc entered into long-term agreements with Vandenberg Air Force Base and Park Water Company (a private water company that served Vandenberg Village) to construct the Lompoc Regional Wastewater Reclamation Plant. The plant was built from 1975 – 1977, and utilized secondary treatment technology. The City of Lompoc, Vandenberg Village CSD, and Vandenberg Air Force Base contribute flows to the plant. From 2007-2010, a significant upgrade to the plant took place, implementing tertiary treatment technology. The treatment process converts ammonia to nitrate, then denitrifies the wastewater so that nitrogen compounds in the wastewater are largely depleted, reducing nutrient load and toxicity to aquatic life. Ultraviolet light disinfection replaced chlorination in the upgraded plant, eliminating the need for any chemical additions at the Lompoc facility. The upgraded plant has an average dry weather flow design capacity of 5.5 mgd, and a peak wet weather flow design capacity of 9.5 mgd. The plant is currently permitted to discharge 5.0 mgd average dry weather flow.

Mission Hills Community Services Distric*t*

Mission Hills Community Services District was formed in 1979 and provides water and wastewater services through 1,200 service connections to the community of Mission Hills. The District operates a primary wastewater treatment plant. Discharge from the plant is disposed of through percolation.

Vandenberg Village Community Services District

Vandenberg Village Community Services District was established in 1983 and provides water and wastewater services though 2,400 service connections to the community of Vandenberg Village. The District acquired wastewater infrastructure and a 17.8 percent capacity right in the Lompoc Regional Wastewater Reclamation Plant from Park Water Company. The District 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.

3.7.5 Current Regional IRWM Issues/Conflicts and Objectives

The preceding history of regional water infrastructure development provides the backdrop for the issues/conflicts and objectives that were identified by regional stakeholders during the IRWM Plan 2013 planning process. Some of the issues and challenges of the past still remain issues and conflicts today. Chapter 4 (Section 4.2.3 and Table 4.2) details issues and conflicts for each of the four sub-regional watersheds - Santa Maria, San Antonio, Santa Ynez, and south coast. The key regional issues and challenges are as follows:

Table 3.9: Key Regional Issues and Conflicts

Key Regional Issues and Conflicts
Regional Water Management System
• 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 • Variability of rainfall challenges water supply planning and delivery • Variability of State Water Project 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 storage and distribution systems leaves 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 non-point 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 case redundant, regulations challenge water users and dischargers ability to comply • Reduced access to State and federal grant funding for water resource projects

Key Regional Issues and Conflicts
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 shortages
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 droughts

Regional Objectives

The regional objectives in the IRWM Plan 2013 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.

3.8 Water Supplies and Demand

3.8.1 Water Supply

Water supplies include groundwater, surface water, imported State Water Project (SWP) water, and recycled water; water supplies also are enhanced by the conjunctive use of surface and groundwater supplies and cloud seeding. The

current average annual water supplies for Santa Barbara County total about 223,000 AFY, plus about 90,000 AFY in return flows to useable groundwater basins. The Supply and Demand (2013) (http://www.countyofsb.org/pwd/pwwater.aspx?id=41398) provides the most recent supply and demand evaluation from the Water Agency. It is briefly summarized below.

Groundwater

Groundwater basins are the major source of water in the County, supplying about 77 percent of Santa Barbara County's domestic, commercial, industrial, and agricultural water. The regional groundwater basins are described in Section 3.4.3. 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.

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. Under normal conditions, Gibraltar Reservoir is the source of about one-third of the City of Santa Barbara's water supply. However, the reservoir has annually lost 332 AFY since construction in 1953. The maximum storage has been reduced to 5,290 acre-feet from 8,277 acre-feet. The unincorporated community of Montecito receives 45 percent of its water supply from Jameson Lake, Fox and Alder creeks via the Doulton Tunnel. Maximum storage in Jameson Reservoir is estimated to be 5,290 acre-feet.

On an average annual basis, Lake Cachuma provides approximately 65 percent of the south coast's water supply. A survey in 2008 showed storage capacity at 186,636 acre-feet; an updated capacity survey will be completed in early 2014. Twitchell Reservoir is important to both the water supply and the flood protection of the Santa Maria Valley. The reservoir supplies about 32,000 AF of recharge to the Santa Maria Groundwater Basin on an average annual basis. It is estimated by the Santa Maria Valley Water Conservation District that the reservoir has 26% less capacity than when completed in 1958. Due to the Regions reliance on surface impoundments, any loss of storage capacity in these reservoirs is of significant concern. Maximum storage in Twitchell Reservoir is estimated to be 194,971 AF. To date no effective measures have been developed to reduce the rate of sedimentation or to pass significant volumes of accumulated sediment through the reservoirs. Sediment removal projects from the dams are under evaluation.

Imported Water (State Water Project)

Table 3.10 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 both supply limitations and request reductions. Historically, deliveries have ranged from 90 percent to 30 percent since the Region began importing SWP water. Table 3.10 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 and/or increasing the CCWA's water request in dry years, even after a percentage cutback by DWR, the project participants can reduce shortages in their entitlement deliveries.

The primary factors affecting the amount of Table A deliveries are the availability of SWP supplies and the SWP Contractors' (Contractors) demands for this water. Climatic conditions and other factors can significantly alter the availability of State Water Project water in any year; a topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies, including State Water Project 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 State Water Project system, current regulatory and operational constraints, and Contractors' requests for State Water Project supplies. Even in years

when additional Table A supplies are available, the amount of water DWR allocates is limited to Contractors' requests.

State Water Project water has helped reduce the use of groundwater in all major basins, except the Cuyama Basin, which does not have a water purveyor that receives State Water Project water. It also has improved water quality in areas that directly receive State Water Project water and has increased the overall water supply in Santa Barbara County.

Table 3.10: 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 (includes Summerland)	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	

[a]The drought buffer entitlement of 3,908 AF 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 State Water Project 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 project participants can reduce shortages in their entitlement deliveries.

[b]Goleta has 2,500 AFY of drought buffer in addition to its Table A 450 AFY that can be taken as capacity permits.

Sources:
Central Coast Water Authority, 2010 Urban Water Management Plan. (Page 3, Table 1-2)
Central Coast Water Authority Water Delivery Status Report, October 31, 2013.
Santa Barbara County Water Supply and Demand Study, 2013 (Page 13, Table 3-2).

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 pressures on other water resources. Water conservation activities occur countywide through the Regional Water Efficiency Program (RWEP), in which water purveyors work cooperatively to implement conservation in the areas of residential, commercial, agricultural, and landscape programs. Members of the RWEP are found in Table 3.10 below.

Table 3.11: Regional Water Efficiency Program Members

Regional Water Efficiency Program Members	
Carpinteria Valley Water District	Golden State Water Company (Santa Maria/Orcutt)
City of Buellton	Goleta Water District
City of Guadalupe	La Cumbre Mutual Water Company
City of Lompoc	Los Alamos CSD
City of Santa Barbara	Mission Hills CSD
City of Santa Maria	Montecito Water District
City of Solvang	Santa Ynez River WCD ID#1
Cuyama CSD	Vandenberg Village CSD

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 who are members of the California Urban Water Conservation Council. Council signatories have committed to best management practices (BMPs) for water conservation by signing the Council Memorandum of Understanding. However, calculating water savings is challenging as savings may be due to implementing BMPs or numerous other factors such as weather conditions, demographic changes, or changes in the plumbing code requiring water efficient fixtures.

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

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.

The water use efficiency program is co-funded by the County Water Agency. The regional website for the County RWEP devotes a webpage to the CRCD's Mobile Irrigation Lab under the "Large Landscapes" icon at http://www.waterwisesb.org/landscape/. As funding permits, CRCD also produces educational materials for different farm and ranch systems, including outreach to Spanish-speaking land managers. In recent years, the CRCD has been able to obtain over 2.5 million dollars in 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 Lab team. At the end of each fiscal year, CRCD submits an accomplishments report to the County Water Agency, which shares the information with RWEP members.

Recycled Water

Recycled water must meet rigorous water quality standards before it can be reused. Various different treatment technologies are approved for treatment of recycled water under Title 22 of the CCR, but generally they are 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.

Presently, two agencies in the County treat all of their effluent to full tertiary levels. These agencies are the Laguna County Sanitation District 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. The Summerland Sanitary District treats approximately 168 AFY, which is discharged to the Pacific Ocean.

Two other agencies treat some of their flow to tertiary levels for reuse landscape irrigation. These include 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 EEWTP is currently unable to meet its permit requirements without blending with potable water because of high turbidity and TDS level 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 has recently begun implementing process upgrades to the EEWTP. The City currently provides 800 AFY of recycled water to users and 300 AFY of process water at the EEWTP, 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 about 785 AFY of recycled water and the Goleta WWTP can treat up to 1,500 AFY of tertiary effluent.

The City of Lompoc utilizes approximately 5 AFY of its tertiary treated effluent for reuse and discharges to the Santa Ynez River. The Los Alamos Community Services District discharges all of its approximately 130 AFY of secondary effluent for pasture irrigation. 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. This IRWM Plan 2013 includes a target of 7,035 AFY recycled water use by 2035.

Desalted Water

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. The City of Santa Barbara's desalination plant is discussed in more detail in Section 3.4.4, Major Infrastructure. In addition, the Veneco oil treatment facility on the Gaviota coast operates a desalination facility to meet plant needs of up to 500 gpm.

Conjunctive Use

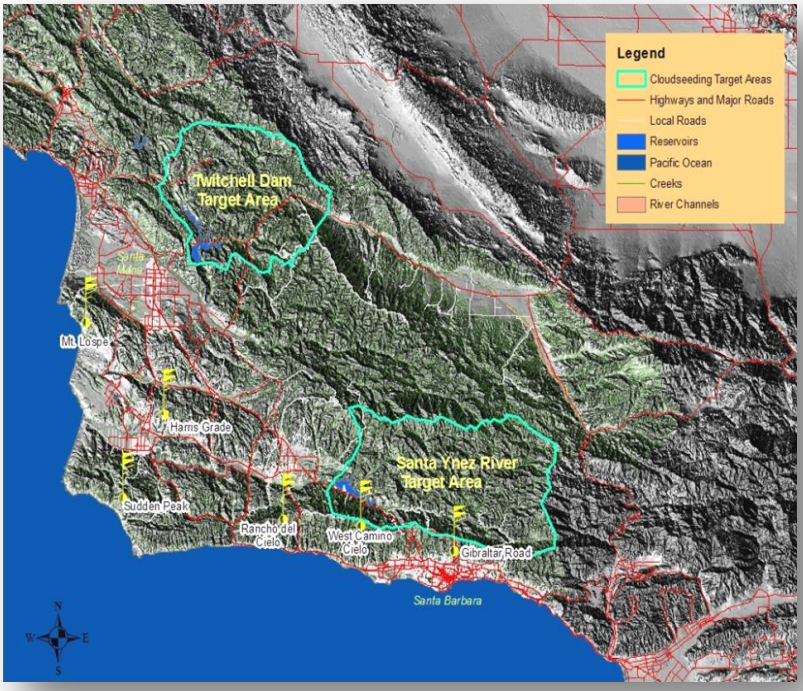
Santa Barbara's water purveyors practice the conjunctive use of surface and groundwater supplies when excess water is available to recharge groundwater basins for later withdrawal when supplies are short. Some purveyors use State Water Project water, when available, and rely on groundwater to supplement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

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 its water supply is from surface water sources outside of the watershed area. During normal years, the City'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 No. 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 basins.

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.

Cloud Seeding

The 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. 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 that move through the area. 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, Santa Barbara County and Ventura County. Research programs dating back to the 1950s were the result of pioneering work



Santa Barbara County Cloud Seeding Target Areas

done in the field of weather modification in the late 1940s by Dr. Vincent Schaefer and Dr. Bernard Vonnegut. The following map (Figure 3.13) from the Water Agency depicts Santa Barbara County terrain as well as the Cloudseeding Target Areas and ground sites from which cloudseeding operations are conducted.

The SBCWA splits the cost of the current operational program with local water purveyors under a matching funds program where the Water Agency matches funds provided by local water purveyors on a year by year basis. The design of the 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 in 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.

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, 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.

Seeding is accomplished by both ground and aircraft. In some instances it is more cost effective to seed from the ground and in others with aircraft. Currently six land based sites are utilized, 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 Water Agency recognizes cloudseeding as a very safe and cost effective means of promoting adequate water supplies. The California Department of Water Resources 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 Bureau of Reclamation has done several studies on effects and repeatedly found no negative impacts. The Weather Modification Association has a statement on silver toxicity which indicates no harmful effects. Santa Barbara's program is in compliance with the California Environmental Quality Act and conducted in accordance with all applicable laws and licensing.

The cloudseeding program plays a valuable role in protecting groundwater resources by increasing rainfall in seeded storms by 10 – 15 percent. The percent increase does not directly translate into increased rainfall due to antecedent conditions, location, and other factors. 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 in order to percolate into the heavily utilized Santa Maria Groundwater Basin.

Table 3.12 below presents a list of water purveyors and their water sources. This table provides a snapshot of sources for the year 2012 only. Water supplies from various sources can vary significantly from year to year. All data is listed in acre-feet.

Table 3.12: Water Sources by Water Purveyor for Santa Barbara County, 2012

Purveyor	Groundwater	Local Surface Water	Cachuma Project	State Water Project	Recycled	TOTAL (AF)
City of Buellton	695			527		1,222
Carpinteria Valley Water District	1,192		2,923	433		4,548
Casmalia CSD	11					11
Cuyama CSD	171					171
Golden State Water Co.	7,981			330		8,311
Goleta Water District	306		10,984	972	907	13,169
City of Guadalupe	521			403		924
La Cumbre Mutual Water Company	1,364			361		1,725
City of Lompoc	4,695					4,695
Los Alamos CSD	317					317
Mission Hills CSD	657					657
Montecito Water District	253	2,150	3,230	647		6,280
City of Santa Barbara	1,157	3,623	7,859	647	819	14,105
City of Santa Maria	1,787			11,410		13,197
Santa Ynez River WCD, ID #1	2,310		2,771	420		5,501
City of Solvang	287			1,146		1,433
Vandenberg AFB						
Vandenberg Village CSD	1,547					1,547
Total	**25,245**	**5,783**	**27,767**	**17,296**	**1,726**	**77,817**

All data listed in Acre Feet
Table compiled by Santa Barbara County Water Agency
All data provided by water purveyors and where appropriate, reflects specific water sources
State Water Shown is amount before exchange
For the City of Lompoc, local surface water is outside of City limits.
Complete data for Vandenberg AFB is not available.

3.8.2 Water Demand

Current agricultural and municipal and industrial (M & I) demands are discussed below, as are projected demands. Sources of demand information include the Supply and Demand Study (2013), urban water management plans, and water agency reports. Water use estimates from the Supply and Demand Study (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 types of agriculture have varied throughout the centuries, but one thing has not changed, agriculture has and continues to be the number one industry in the County. In 2012, agricultural products in Santa Barbara County accounted for $1.29 billion in crops, which is an 8.1%

increase over 2011. Agricultural water use now accounts for approximately 75 percent 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 (using CIMIS data), and use of tailwater recovery systems in furrow-irrigated fields. Estimated agricultural water demand for each source is listed below in Table 3.13.

Table 3.13: Estimated Agricultural Water Demand

Source	Demand (AFY)
Carpinteria Valley Water District	1,582[a]
Goleta Water District	2,387[b]
La Cumbre Mutual Water Company	103[c]
Montecito Water District	550[d]
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, UWMP, 2010 , Table 3-2, page 18. Central Coast Water Authority Water Delivery Status Report, October 31, 2013.
[b]Goleta Water District, UWMP, 2011a, Table 2-4, page 2-3
[c]Santa Barbara County Water Agency, 2000
[d]Montecito Water District, 2005, Table 5D
[e]Santa Ynez River Water Conservation District Improvement District No. 1, 2006

Urban Demand

Urban demand, known also as Municipal and Industrial water demand, accounts for approximately 25 percent of all water demand in Santa Barbara County.. Table 3.14 provides the most recent (2012) demand data provided to Santa Barbara County from Public Water System Statistics Form #38, which water purveyors submit annually to the California Department of Water Resources. Demand data varies from year to year. Total demand in 2008 was 70,422 AFY, in 2009 was 66,860 AFY, in 2010 was 61,893 AFY, and in 2011 was 60,838 AF (Public Water System Statistics Form #38).

Table 3.14: Municipal and Industrial Water Demand

Source	Demand (AFY)
City of Buellton	1,221
Carpinteria Valley Water District	2,093
Casmalia Water Conservation District	11
Cuyama Community Services District	171
Golden State Water Company	7,517
Goleta Water District	10,362
City of Guadalupe	977
La Cumbre Mutual Water Company	1,493
City of Lompoc	4,608
Los Alamos Water Conservation District	289
Mission Hills Water Conservation District	631
Montecito Water District	5,191
City of Santa Barbara	12,431
City of Santa Maria	12,382
Santa Ynez River Water Conservation District ID#1	2,602
City of Solvang	1,385
Vandenberg Air Force Base	-
Vandenberg Village Community Services District	1,371
Total	**64,735**

Sources: All 2012 demand data was provided to Santa Barbara County from Public Water System Statistics Form #38. The forms are submitted by water purveyors annually to the California Department of Water Resources.

3.9 Projected Water Supply and Demand

The Water Agency recently conducted Supply and Demand Study (2013) 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 of the Detailed Analysis Unit (DAU) within the County.

3.9.1 Projected Municipal Water Supply

The Supply and Demand Study (2013) states that future water availability for some municipal suppliers will be reduced by lost reservoir capacity and reduced reliability of SWP deliveries. This reduction in supplies will likely be balanced by improved water efficiency and possibly increased water recycling on the south coast. Reservoirs on the Santa Ynez River (Gibraltar and Cachuma) will continue to experience reduction in capacity. Sediment in Gibraltar 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 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. The Department of Water Resources performs a detailed evaluation of SWP reliability every five years. The results from the latest (2007) analysis are reflected in the estimates of future SWP deliveries. Future average yield from groundwater supplies are 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.

Several environmental issues may affect water supply in the future including the following: control of invasive species such as Arundo donax; Santa Ynez River fish passage/habitat expansion; and Santa Maria River fish passage flows.

3.9.2 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.

In the Cuyama Valley, long-term monitoring and the recent study by the County Water Agency and USGS suggest that continued water level decline will occur in areas relying on groundwater for irrigated crops. Agricultural water use could be affected by increasing pumping costs if water levels drop in the future. Increased pumping costs could cause a reduction in pumping. Supplies for irrigated agriculture in the San Antonio Valley are currently adequate, but the basin appears to be in overdraft. However, insufficient information is available to estimate the effect on irrigated agriculture.

3.9.3 Projected Municipal Water Demand

In the Supply and Demand Study (2013), the estimate of average municipal demands are based on projections of population increases/projected per capita use. Population data and forecasts for cities and water purveyor service areas and DAUs can be found in Appendix 3-A, Supply and Demand Study (2013), Study Appendix A, tables A-1 and A-2. 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 area, other areas estimate of per capita use were derived from data made available by the County Water Agency and population estimates developed by the Santa Barbara County Area Governments' staff.

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

- Population is expected to increase in virtually all areas.
- Increasing efficiency decreases per capita use.
- Increased recycling on the south coast would divert water from ocean outfall, thus effectively 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 (Supply and Demand Study, 2013, Appendix 3-A).

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

3.9.4 Municipal Conservation Estimates

Per-capita water use data have been collected in several areas in Santa Barbara County since the 1990's. The Supply and Demand Study (2013), Study Appendix G 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).

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 ID #1 suggests the potential to reduce per capita by focusing on improved landscaping irrigation efficiency. Work on behalf of the CUWCC suggests that while 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). A detailed analysis of per-capita water use using the CUWAA 2011 methodology was beyond the scope of this study.

3.9.5 Projected Industrial Water Demand

Santa Barbara County's industrial base is mainly oil/gas production and processing of agricultural products. Currently oil and gas production, processing and support facilities are provided water from onsite 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 is expected (Supply and Demand Study, 2013).

3.9.6 Projected Agricultural Water Demand

Santa Barbara County enjoys a well-developed and valuable agricultural industry. Most areas with good soils and adequate water supplies have been put into production. During preparation of this report, no plans for significant conversion of agriculture to urban land use were provided by the land use agencies for the cities or the County. In addition, conversion of agricultural areas to urban land uses is otherwise controlled by land use policies. Therefore limited changes in acreage or in cropping patterns are expected except in the Cuyama Valley. Thus, average annual water demand for agriculture is not expected to change in the future except in the Cuyama Valley.

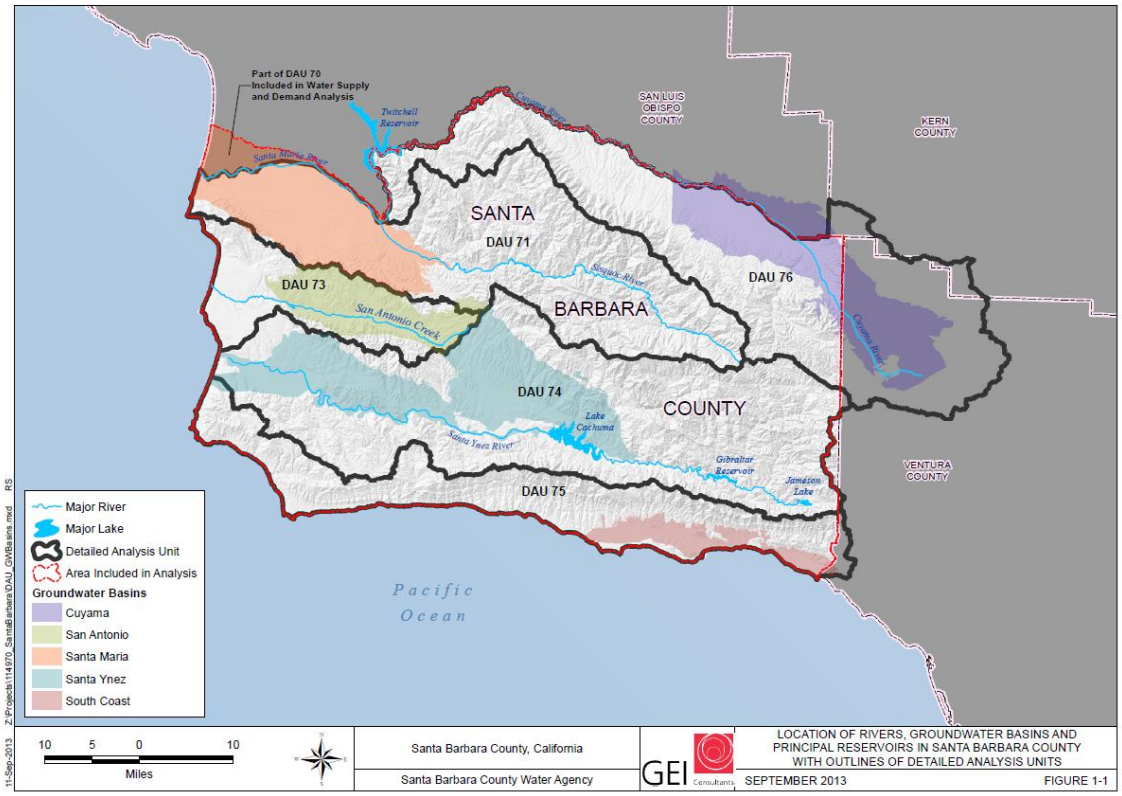
In the Cuyama Valley agricultural water use is expected to be affected by increasing pumping costs that may reduce pumpage with time. The rate of this change is presently being evaluated by the County and other agencies through their ongoing evaluation. The results of that study may be incorporated into future evaluations of supply and demand. For the purposes of this evaluation an assumption of a 10 percent reduction in agricultural demand per decade was assumed for the Cuyama Valley (Supply and Demand Study, 2013).

3.9.7 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 DAU areas but is expected to exceed estimated future supplies in the Cuyama and San Antonio valleys. The 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, it is noted that 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 the USGS conducted a detailed evaluation of the Cuyama Valley Groundwater Basin and is considering a similar detailed evaluation for the San Antonio Groundwater Basin. The Cuyama evaluation should be available in early 2014 and draft reports can be found on the USGS website (http://ca.water.usgs.gov/projects/cuyama/). The location of the DAUs follows in Figure 3.13. Detailed conservation estimates, M & I return flow estimates, and water supply estimates through 2040 are available in the Supply and Demand Study (2013), Study Appendix A, tables A-4 through A-6 included in Appendix 3-A of this document.

Figure 3.13: Santa Barbara County Detailed Analysis Units



DAU 71

Santa Maria: Estimated projections for Santa Maria DAU 71, based on the available information used in this report, 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 five percent of the total annual demand, which is within a reasonable range of uncertainty and does not definitively define the groundwater basin within the DAU out of balance. This evaluation estimated the shortfall for the DAU may continue to increase through 2040 to seven percent of total demand. Importing State Water Project water has significantly reduced the overall DAU water supply shortfall; however, uncertainty remains on the need for additional water supplies. Notably, the groundwater basin within the DAU submits an annual report to the courts each year that provides a more detailed water supply and demands evaluation over a representative hydrologic period; the annual supply and demand does vary by water year type and the balance may change from positive to negative by water year type, therefore, it is imperative to recognize the limits of this study and make use of the more detailed annual report.

DAU 73

San Antonio: 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 stated in this report is approximately 20,000 acre-feet per year is 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 define groundwater basin. The rate of use is anticipated to continue at the similar rate over time. The agricultural land use information provided for this report indicates a substantial amount of vineyard acres in the central portion of DAU 73 and a substantial amount of rotational vegetables in the in northwest portion of DAU 73, adjoining DAU 71. Importing State Water Project water has significantly reduced the overall DAU water supply shortfall; however, additional water supplies are still needed. The County of Santa Barbara is considering 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, Vandenberg AFB and the private M&I and agricultural water pumpers.

DAU 74

Santa Ynez: Projections for Santa Ynez DAU 74 indicate that the 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

South Coast: Projections for the South Coast DAU 75 indicate that this area has sufficient water supplies up to the year 2040. This is due to the variety of potential supplies available to south coast purveyors including State Water Project water, groundwater, desalination, 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 subbasins.

DAU 76

Cuyama Valley: 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 23,000 acre-feet per year or more and is expected to continue.

3.9.8 Effects of Climate Change

According to the California Climate Action Adoption Strategy, 2009, climate change impacts are already affecting the State and will continue to do so into the future. Given the complexity of the factors affecting climate conducting a detailed quantitative assessment of impacts a local scale is difficult. However, much of the climate change projection work produced to date for California cites some likely impacts. Impacts that are particularly relevant to Santa Barbara County include higher temperatures, more extreme storm events, longer and more frequent droughts, sea level rise and increased incidence of wildfires (California Climate Adaptation Strategy, 2009).

The long term qualitative effects of such impacts can be considered relative to the County's geography, water supply sources, infrastructure and economy. For example, more extreme storms events could result in more frequent and destructive flooding. As a result of this flooding, water quality may be degraded due to higher levels of sediment being washed into waterways. Depending on the timing and distribution of such storms, greater recharge of groundwater and increased surface water storage may also result.

Higher temperatures and more frequent droughts could increase water demand and increase the incidence of wildfire. Increases in the incidence of wildfires could increase sedimentation rates in reservoirs resulting in reduced water storage capacities and decrease water quality. Longer and more frequent droughts could also

threaten the reliability of surface and groundwater supplies by reducing surface water supply available for direct use and recharge, and in turn impact agricultural production and the regional economy. Sea level rise could place water infrastructure at risk and cause salt water intrusion of coastal groundwater basins.

The State government has enacted legislation which sets goals for the reduction of greenhouse gas emissions (Executive Order S-3-05), details and codifies mid-term GHG reduction tarts (Assembly Bill 32), defines CEQA Guideline amendments for the analysis of climate change in CEQA documents (Senate Bill 97), and directs the preparation of various climate change studies (Executive Order S-13-08). Numerous State and local programs are targeted to monitor climate change effects and prepare for its impacts. The Santa Barbara County Planning and Development Department has completed a Climate Action Study (September, 2011) and this document includes a section discussing the vulnerabilities and adaptation strategies unique to Santa Barbara County's water resources (see Chapter 3.6).

Given the difficulty of quantifying the extent and timing of short- and long-term climate change impacts, quantitative climate change calculations in regards to water supply and demand have not been included in this report. If such calculations are feasible in the future, this supply- demand report will be updated to account for those impacts. It is recommended that climate change legislation and data relating to Santa Barbara County be monitored and evaluated as they progress.

3.9.9 Uncertainty

This report 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 report utilizes 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, the report 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 and groundwater water supplies;
- Groundwater basin and surface water model revisions to reflect improved geotechnical data, assumed rainfall or 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, and
- Future development and reliability of the SWP water resulting from ongoing contract renegotiations and the Bay Delta Conservation Plan.

Furthermore, the level of uncertainty is compounded as the forecast time horizon extends from 10 years to 40. To minimize the uncertainty that will always exist, this report 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 exacting forecasts of groundwater basins. In addition, the water supply and demand forecasts should be reevaluated periodically to reflect new baseline conditions that arise.

3.10 Reducing Dependence on the Sacramento-San Joaquin Delta

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

The IRWM Plan 2013 will help reduce dependence on the Delta in multiple ways. The IRWM Plan 2013 utilized a project selection process that evaluated and ranked the potential of projects. One of the criteria scored a project based on its ability to "reduce dependence on the Delta". Another criterion was "increases supply reliability."

The IRWM Plan 2013 aligns the goal of reducing dependence on the Delta with stakeholder approved regional issues, objectives, and targets. The plan's regional issues mirror the Region's intent to protect and develop local supply sources and underscore the Region's commitment to reducing dependence on the Delta. Specifically, identified issues include:

- 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 State Water Project 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;
- Regional collaboration needed for conjunctive groundwater management;
- Lack of redundancy and capacity in storage and 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 affects reservoir storage and water quality, and
- Long-term sediment accumulation has reduced vital reservoir storage capacity and operations.

The IRWM Plan 2013 Objectives aligned with water management strategies the Region has selected and are presented in Table 3.15. These objectives and associated strategies reflect the Region's goal of reducing dependence on the Delta.

The regional objective "protect, conserve, and augment water supplies" emphasizes regional self-reliance which will reduce the use of imported water during times of drought. The associated strategies include conservation, recycled water, indirect potable reuse, and stormwater capture and treatment. The objectives include "protect, manage, and increase groundwater supplies" which increases regional self-reliance. The objectives include "protect and improve water quality" – similar to the CALFED Bay-Delta Program goal of "water quality." The objective of "improve flood management" includes strategies such as "multi-purpose and multi-benefit flood and stormwater management" that utilizes stormwater capture and sediment management. The objective of "improve emergency preparedness" guides the Region to prepare for emergency situations including drought management through regional water supply self-

reliance. The objective of "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 the dependence on the Delta.

Table 3.15 highlights the regional objectives mentioned in the above paragraph with examples of water management strategies from the updated Plan – IRWM Plan 2013 – that are aligned with the State goal of reducing dependence on the Delta.

Table 3.15: IRWM Plan 2013 Objectives and Strategies that Reduce Dependence on the Delta

IRWM Plan 2013 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 & 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 • Recharge Area Protection
Protect and improve water quality	• Groundwater Remediation/Aquifer Remediation including Shallow • Capture and treatment of stormwater • Upgrade Wastewater Treatment to meet Current and Future State and Federal Water Quality Standards
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.
Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability	• Rehabilitation and Replacement of Aging Water and Wastewater Delivery and Treatment Facilities • Renewable and Efficient Energy 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 3.10 shows the amount of water to which each Santa Barbara County participant in the SWP has a contractual right, referred to as 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.

3.11 Water Quality

3.11.1 Groundwater Quality

Groundwater quality in the Region varies depending upon the groundwater basin, basin sub-area and overlying land uses. Slight increases in TDS have been recorded in many basins in the County; yet in other areas, TDS levels have remained stable and even decreased. Efforts to increase recharge and improve irrigation efficiency have been implemented to address this problem in some areas (Public Works Department Water Resources Division Water Agency, 2011) 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.

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. State maximum contaminant levels (MCLs) for nitrates have been exceeded in some areas (Regional Water Quality Control Board, Central Coast Region, 2011).

A State regulatory initiative seeks to improve ground-water 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 requires that Salt and Nutrient Management Plans are 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. The Recycled Water Policy requires stakeholders to develop implementation plans to meet these objectives for salts and nutrients. The implementation plans will then be adopted by Regional Boards as amendments to the region's Basin Plan.

Groundwater Basins of the South Coast

The following describes groundwater quality in the major basins (Santa Barbara County Water Agency. The Carpinteria, Montecito, Santa Barbara, Foothill and Goleta Basins constitute the South Coast 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 (Geotechnical Consultants, Inc., 1976) Storage Unit No. 1 is located north of the Rincon Creek thrust fault and Storage Unit No. 2 is located south of the Rincon Creek thrust fault. The fault acts as a barrier to groundwater flow between the two storage units.

Groundwater in the basin is predominantly calcium bicarbonate in character, with varying amounts of sodium. The TDS concentrations within the basin are stable with recent concentrations of 800 milligrams per liter (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.

Montecito Groundwater Basin
The Montecito Groundwater Basin encompasses about 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 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 during the early 1960s.

Santa Barbara Groundwater Basin
The Santa Barbara Groundwater Basin underlies an area of about nine 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 #111 southwest of the Mesa Fault (approximately 2.5 square miles). TDS concentrations within the two hydrological units range from about 530 mg/L to over 2,000 mg/L. Isolated wells have exhibited much higher TDS concentrations. Seawater intrusion occurred in some areas of the south basin (Storage Unit No. 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, together with groundwater injection programs, has restored the previously existing gradient thereby reversing the trend of seawater intrusion.

Foothill Groundwater Basin
The Foothill Groundwater Basin is located in the northwest Santa Barbara and northeast Goleta areas. It encompasses the hydrologic unit formerly designated Storage Unit #11 of the Santa Barbara Basin and the former "East Sub-basin" of the Goleta Groundwater Basin (Freckleton, 1989). The basin was later re-designated 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.

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 the 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 comprise the Foothill Basin.

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 about 770 mg/l. The Central Sub-basin also has lower amounts of chloride averaging 65 mg/l to 80 mg/l as compared to over 200 mg/l in the West Sub-basin. Chloride concentrations are a particular problem in low lying areas of the basin near tidal marshes. While 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 normally found in significant quantities in seawater (SBCWA, 1977).

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 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 or 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-Central Basin is sufficient for many agricultural uses but might require treatment 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 bedrock well on a test basis. The well pumped water from the fractures in consolidated bedrock in the foothills north of the basin and was of very poor quality. The District has no plans to utilize water from this source.

Groundwater Basins of the Santa Ynez River Watershed

The groundwater basins of the Santa Ynez River Watershed include the Santa Ynez River Alluvial Groundwater Basin, Santa Ynez Uplands Basin, Buellton Uplands Groundwater Basin, and Lompoc groundwater basins, which are comprised of the hydrologically connected Lompoc Plain, Lompoc Terrace and Lompoc Uplands 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, State Water Project water is mixed with water rights releases from Bradbury Dam to lower the salt content of flows downstream. Also since 1997, discharge of State Water Project water from wastewater treatment plants where this supply is used has tended to lower the total dissolved solids (TDS) of groundwater in the vicinity of these sources.

Santa Ynez Uplands

The Santa Ynez Uplands Groundwater Basin underlies 130 square miles located about 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 the USGS in 1992 exhibited a TDS concentration of 507 mg/L. Nitrogen levels in the basin, in form of Nitrate have raised since 1990 from 11 mg/L to approximately 26 mg/L. Sulfate levels have been constant, ranging from 20 to 23 mg/L (Public Works Department Water Resources Division Water Agency, 2011)

Buellton Uplands Groundwater Basin

The Buellton Uplands Groundwater Basin encompasses about 29 square miles located about 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 the Lompoc Uplands. Water quality in the Lompoc Plain varies significantly both 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. 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 Plain.

Areas of recharge in some portions of the eastern Lompoc Plain adjacent to the Santa Ynez River contain total dissolved solids (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 1000 and 1500 mg/L over the past 40 years.

In the middle zone, water samples taken from below agricultural areas of the northeastern plain contained TDS concentrations averaging over 2,000 mg/l. However, some middle zone portions of the upper aquifer groundwater from the western plain exhibited TDS levels below 700 mg/l. In the far western section of the Lompoc Plain water near the coast groundwater from the main Zone, 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. TDS concentrations of up to 8,000 mg/l near the coast were measured in the late 1980s. 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 from the underlying rock. The presence of elevated boron, a constituent common in seawater supports this conclusion. Groundwater of the Lompoc Terrace and Lompoc Upland Sub-basins is generally of better quality than that of the plain, with TDS averaging around 700 mg/l. Some of the natural seepage from these Sub-basins is of excellent quality.

Groundwater Basins of the Santa Maria Watershed

San Antonio Groundwater Basin

The San Antonio Valley is approximately 30 miles long by seven 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 about 110 square miles.

Water quality studies conducted by the 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 indicate that groundwater quality remained fairly stable during that period. Analyses of water sampled in 1993 for several wells show only slight increases in TDS since the previous 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 basin, nor is the basin considered susceptible to seawater intrusion due to the consolidated rock that separates the basin from the ocean (Public Works Department Water Resources Division Water Agency, 2011).

Santa Maria Valley Groundwater Basin

The Santa Maria 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 1930's, 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 the Cuyama 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, J.B., 1931). While 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).

The Central Coast Regional Water Quality Control Board (RWQCB) has begun regulatory initiatives to establish TMDLs (Total Maximum Daily Load) for pollutants of concern in surface water bodies. TMDLs are strategies/plans to restore clean water. 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 Water Board'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.

In May 2013, the RWQCB amended the Basin Plan by adopting a TMDL for nitrogen compounds (nitrate and unionized ammonia) and orthophosphate for streams within the lower Santa Maria River watershed and tributaries to Oso Flaco Lake. The geographic scope of the TMDL encompasses approximately 237 square miles of the lower Santa Maria River watershed. RWQCB staff developed the TMDL using water quality data from the Water Board's Central Coast Ambient Monitoring Program (CCAMP), the Cooperative Monitoring Program (CMP), City of Santa Maria, and County of Santa Barbara's Project Clean Water. The TMDL represents the loading capacity of a water body—the amount of a pollutant that the water body can assimilate and still support beneficial uses. The TMDL is the sum of allocations for nonpoint and point sources and any allocations for a margin of safety. Owners and operators of irrigated lands, municipal storm water entities, natural sources, and owners/operators of livestock and domestic animals are assigned unionized ammonia, nitrate, and orthophosphate load allocations equal to the TMDL and numeric targets.

Two broad initiatives are underway to address nutrients in the Santa Maria Valley: the Agricultural Regulatory Program and requirements on other dischargers to develop salt and nutrient plans. Through the Agricultural Regulatory Program, the 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. On March 15, 2012, the RWQCB adopted an updated Conditional Waiver of Waste Discharge Requirements (Ag Order). Provisions of the RWQCB Ag Order were stayed in the fall of 2012 by the SWRCB with the outcome of a SWRCB review pending.

Salt and nutrient plans are required of certain discharges by Water Resources Control Board Policy 2009-0011. To initiate development of salt and nutrient plans, the wastewater treatment plant 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 a salt and nutrient management plans by individual stakeholders within the Santa Maria Valley. The assessment can be found at http://www.countyofsb.org/irwmp/irwmp.aspx?id=42008 and describes this planning process and provides more detail on sources and transport of salts and nutrient in the Santa Maria Valley. Treatment plant operators are continuing to work on meeting SWRCB requirements.

Cuyama Groundwater Basin

The Cuyama Valley is a rural agricultural area about 35 miles north of the City of Santa Barbara and is bound by Sierra Madre Mountains on the south and by 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 percent of the water supply for Cuyama Valley

agriculture, petroleum operations, businesses and homes. Agriculture accounts for over 95 percent of the water use within the valley.

Ground water quality in the Cuyama 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). Total dissolved solids typically range from 1,500 mg/l to 1,800 mg/l in the main part of the 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 total dissolved solids 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 uplands shallow (233 feet deep) well than deeper wells (depths of 1000 feet) in the main part of the basin. Boron is not regulated but is generally accepted to be detrimental at about 300 ug/l (Public Works Department Water Resources Division Water Agency, 2011).

Water quantity and quality deteriorate toward the west end of the basin, where the basin 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 (Public Works Department Water Resources Division Water Agency, 2011).

3.11.2 Urban Surface Water Quality

Various entities in the IRWM Plan 2013 planning Region are focusing their efforts on poor surface water quality in creeks, rivers, and oceans due to polluted storm water and urban runoff discharges. Runoff pollutants can include pesticides, fertilizers, green waste, animal waste, human waste, petroleum hydrocarbons (gasoline, motor oil), trash, and other constituents. 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 National Pollutant Discharge Elimination System (NPDES) 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 (SWMP) to manage discharge of urban runoff to receiving waters. These plans summarize the management plans and strategies to maintain compliance in all applicable discharge and effluent prohibitions, including control measures such as public education and outreach on storm water impacts, public involvement/participation, illicit discharge detection and elimination, construction site storm water runoff control, post-construction storm water management in new development or redevelopment, and pollution prevention ”good housekeeping.”

There are a number of potential urban storm water 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. Storm water 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 and parking lots, city and commercial facilities, and building construction sites, among others, can all contribute as non-point sources of water pollution.

3.11.3 Agricultural Water Quality

Agricultural sources may contribute to water quality impairments through irrigation return flow, flows from tile drains, and storm water runoff. These discharges can affect water quality by transporting pollutants including pesticides, sediment, nutrients, salts (including selenium and boron), pathogens, and heavy metals from cultivated

fields into surface waters. Some surface water bodies are classified as impaired, at least in part, because of pollutants from agricultural sources.

The Central Coast Regional Water Quality Control Board (Central Coast Board) uses Conditional Waiver of Waste Discharge requirements, commonly known as an Ag Order, 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 Ag Order.

On March 15, 2012, the Central Coast Board adopted an updated Ag Order. The Ag Order expands the ongoing monitoring and reporting program and places farms in one of three tiers based on risk to water quality. Specifically, the Ag Order includes water quality monitoring of surface 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 will be required to develop farm plans and monitoring programs. At this time and during the writing of this report, full implementation of the Ag Order is pending legal challenges.

As stated by the Central Coast Board, their concerns are:

- Irrigation and stormwater runoff;
- Drainage water that percolates to groundwater;
- Operational spills;
- Pesticides;
- Nutrients;
- Salt;
- Soil, silt and sediment, and
- Trash.

The Agricultural Order applies to all lands planted in row crops, vines, field or tree crops where water is applied for commercial production specific commercial nurseries, nursery stock production and greenhouse operations; and land planted in commercial crops that are not currently marketable, including vineyards and tree crops. In order to most effectively target efforts, the Agricultural Order program has been ordered into three tiers of which agriculturalists can fall into based upon 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, such as:

- 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 as well as listed impaired surface bodies; and
- Distance to a public water system.

Based upon the answers, each tier has a set of conditions that need to be met; however, in addition to the tier specific requirements, there is a standard set of requirements that need to be met regardless of tier. Presently, there is a 5-year compliance calendar.

3.11.4 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 storm water 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 to the beaches. In addition, poorly placed septic systems on beaches, near creeks, marshes and in areas of high groundwater have leached into creeks, marshes, groundwater, and the ocean (Santa Barbara County Septic System Sanitary Survey March 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 to public sewer, including the world-famous Rincon surf area, and is continually seeking State funding to not only help upgrade sewer infrastructure and recycled water facilities, but to help homeowners abandon faulty septic systems.

Table 3.16 below summarizes the exceedance percentages (the number of samples exceeding one or more standards/total number of samples taken from the site) for the beaches monitored by the Santa Barbara County Environmental Health Services Department from 2003 - 2010.

Table 3.16: Percentage Exceedance for Indicator Bacteria by Year

Beaches	Exceedance Percentage							
	2003	2004	2005	2006	2007	2008	2009	2010
Arroyo Burro	17	13	26	46	14	33	17	35
Butterfly Beach	12	4	6	12	2	3	4	12
Carpinteria City Beach	4	2	10	8	6	5	-	-
Carpinteria State Beach	6	4	18	16	14	8	4	6
East Beach at Mission Creek	15	25	38	40	20	15	12	18
East Beach at Sycamore Creek	13	10	12	16	0	8	8	12

Beaches	Exceedance Percentage							
	2003	2004	2005	2006	2007	2008	2009	2010
El Capitan State Beach	6	2	8	8	2	3	8	12
Gaviota State Beach	12	10	4	14	0	0	12	6
Goleta Beach	13	6	18	10	8	23	12	24
Guadalupe Dunes State Beach	2	4	2	4	6	13	8	6
Hammond's Beach	10	6	14	10	4	3	8	18
Haskell's Beach	13	6	16	16	2	5	-	-
Hope Ranch Beach	10	6	8	18	6	10	8	18
Jalama Beach	10	6	22	12	4	5	12	6
Leadbetter Beach	12	6	14	16	10	13	12	12
Ocean/Surf Beach	2	6	8	4	0	8	-	-
Refugio State Beach	6	4	18	18	4	5	4	18
Rincon at Bates Beach	2	0	6	4	0	3	-	-
Sands at Coal Oil Point	4	4	4	2	2	5	0	18
Summerland Beach	-	-	-	9	6	8	4	6
Average Percentage	**9**	**6**	**14**	**14**	**14**	**33**	**17**	**35**

Sources: County of Santa Barbara Public Health Department, 2013. Year-round sampling at locations above was discontinued after 2007 however sampling was conducted from 24 – 46 weeks out of the year.

3.12 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 periodic shortages.

3.12.1 Severe Storms and Flooding

Santa Barbara County experiences periods of high intensity rainfall, which cause 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. Some areas in Santa Maria experience chronic flooding in modest storm events because existing floodwater routing systems and basins lack adequate conveyance and storage capacity required to meet the increased runoff due to both agricultural and urban growth. Each area in the County experiences threat from flood damage in years of exceptional storms.

The Cuyama Valley agricultural area in the 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 the natural ability to contain the river is limited. In the other areas west of the town of New Cuyama, the river has steep and unstable cut banks. This has resulted in bank failure which has caused loss of life, loss of land, and siltation of Twitchell Reservoir downstream.

The Santa Maria Valley has a history of flooding that has been lessened by construction of Twitchell Reservoir and the Santa Maria River Levee prior to 1960. The Reservoir continues to provide effective flood control despite siltation of the lower portion (used for conservation of water). The levee is undergoing extensive restoration by the Santa Barbara County Flood Control and Water Conservation District and the U. S. Army Corps of Engineers (ACOE) to address concerns about the levee strength and stability. The project is expected to be completed by the end of 2014.

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 River's limited flow capacity resulting from designated areas of sensitive habitat in-growth. A modified operation of Cachuma Reservoir was developed in 1998 to manage Bradbury Dam gate operations to reduce releases of flood waters during major runoff events. The 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. The ACOE has constructed and County Flood Control maintains debris control structures on about 20 streams which 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 are being made to lower Mission Creek and by the City of Goleta at lower San Jose Creek.

3.12.2 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 (Harp, 1980). 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. 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.

3.12.3 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. The County contains a number of high fire hazard areas, particularly in undeveloped and mountainous locations, although fires may occur in urban areas, as well. 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, and portions of the County have deficient fire flows. Fires also can result in erosion and runoff from burned areas, which can affect surface water quality and increase sedimentation of local creeks, and reservoirs.

3.12.4 Drought

Historical records show that local drought periods of several years or more are cyclical. Tree ring studies covering time periods of several centuries reveal apparent droughts lasting as long as 16 years or more. The most recent drought occurred from 1986 until 1991 and included some of the driest years on record. Evidence from tree ring analysis indicates that severe droughts occurred as far back as 1544. Droughts in Santa Barbara County have lasted an average of 5 years with a maximum of 9 years. Local water purveyors implement water conservation programs to extend local surface water and conserve groundwater. They also import supplemental water supplies to cope with drought.

3.13 Social and Cultural Makeup

3.13.1 Economic Conditions and Trends in the Region

Santa Barbara County is economically diverse with pronounced differences between the north and the 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 in to 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 or 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).

3.13.2 Social and Cultural Make-up

Santa Barbara County is socially and culturally diverse. County demographic information is summarized in Table 3.17. The County is predominantly composed of white persons (47.2 percent) with persons of Hispanic or Latino origin (approximately 43 percent), Asians (5.5 percent), Native American (2.2 percent) and African Americans (2.4 percent), Native Hawaiian or other Pacific Islanders (0.3 percent) (US Census Bureau, 2013) comprising the rest of the population. The County includes five disadvantaged communities (DAC) - the community of New Cuyama, the cities of Guadalupe, Lompoc and Santa Maria, and the community of Casmalia— four of which are located in north County and the City of Lompoc which is located in mid-County[3]. Cuyama and Casmalia are fairly isolated from other populated areas within the County. These communities face financial hardships and health risks related to the condition of their respective water supply systems and potential threats to the quality of their drinking water. Table 4.2 summarizes regional and watershed issues and challenges faced by DACs. Those challenges include: lack of affordable supply in Casmalia; Cuyama Groundwater Basin overdraft that threatens water supply reliability for residents and creates water quality impairments; flooding in Cuyama where isolated thunder storms in the summer and high winter flows can wash out and damage roads and highways; and the need for regional collaboration to deal with groundwater overdraft and water quality issues.

Most of the County 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 Chumash Indian 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 sea. 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 community of Cuyama is located. The County population of approximately 427,267 is projected to increase to 469,070 by 2030 and to 485,777 by 2040 (California Department of Finance, 2012)

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, as well as

3 DACs were identified by reviewing median household income (MHI) data from the 2000 US Census for all zip codes within Santa Barbara County and identifying those that were 80 percent or less of the statewide MHI based on the 2000 Census ($37,994). MHIs are as follows: Guadalupe, $30,864; Casmalia, $37,574; and New Cuyama, $36,500. In comparison, the MHI for all Santa Barbara County zip codes is $49,027.

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).

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. The County is home to a long-standing environmental movement, stemming in part from the large oil spill that affected 35 miles of coastline in 1969. Environmental activists are, however, sometimes at odds with other interests regarding the most

Table 3.17: County Demographic Information Summary

Area	Population (2010)	Average House-hold Size	Median Age	Median House-hold Income	Primary Languages	Ethnicity
Cuyama CSD	517	3.51	35.1	$45,313	English 53% Spanish 47%	White: 268 (52%) Hispanic/Latino: 234 (45%) Other: 15 (3%)
City of Santa Maria*	99,747	3.57	29.0	$51,450	English 37% Spanish 58% Other 5%	White: 21,596 (22%) Hispanic/Latino: 70,409 (70%) Black: 2001 (2%) Asian: 4,946 (5%) Other: 795 (1%)
City of Guadalupe*	7,080	3.75	28.2	$42,978	English 26% Spanish 71% Other 3%	White: 626 (9%) Hispanic/Latino: 6,103 (86%) Other: 351 (5%)
Orcutt (GSWC)	28,905	2.65	42.3	$64,328	English 86% Spanish 9% Other 5%	White: 19,667 (68%) Hispanic/Latino: 6,870 (24%) Black: 375 (1%) Asian: 1,012 (4%) Other: 981 (3%)
Casmalia CSD*	138	1.4	43.0	$42,692	English 4% Spanish 96%	White: 74 (54%) Hispanic/Latino: 58 (42%) Other: 6 (4%)
Los Alamos CSD	1,890	4.2	38.2	$56,645	English 55% Spanish 42% Other 3%	White: 1,057 (56%) Hispanic/Latino: 773 (41%) Other: 60 (3%)
Vandenberg AFB	3,338	3.7	22.5	$51,439	English 91% Spanish 7% Other 2%	White: 2,005 (60%) Hispanic/Latino: 616 (18%) Black: 285 (9%) Asian: 197 (6%) Other: 235 (7%)

Area	Population (2010)	Average House-hold Size	Median Age	Median House-hold Income	Primary Languages	Ethnicity
Vandenberg Village CSD	6,497	2.5	45	$77,121	English 87% Spanish 10% Other 3%	White: 4,385 (67%) Hispanic/Latino: 1,216 (19%) Black: 261 (4%) Asian: 304 (5%) Other: 331 (5%)
Mission Hills CSD	3,576	3.2	40.0	$68,448	English 69% Spanish 28% Other 3%	White: 2,089 (59%) Hispanic/Latino: 1,137 (32%) Asian: 120 (3%) Other: 230 (6%)
City of Lompoc*	42,434	3.2	33.9	$47,466	English 58% Spanish 37% Other 5%	White: 15,424 (36%) Hispanic/Latino: 21,557 (51%) Black: 2,204 (5%) Asian: 1,505 (4%) Other: 1,744 (4%)
City of Buellton	4,828	3.2	39.1	$63,988	English 60% Spanish 35% Other 5%	White: 3,034 (63%) Hispanic/Latino: 1,451 (30%) Asian: 132 (3%) Other: 211 (4%)
City of Solvang	5,245	2.5	45.0	$61,289	English 74% Spanish 20% Other 6%	White: 3,597 (67%) Hispanic/Latino: 1,530 (29%) Other: 208 (4%)
SYRWCD ID#1	6,017	2.5	---	----	English 88% Spanish 10% Other 2%	White: 4,847 (82%) Hispanic/Latino: 810 (13%) Other: 31 (5%)
Los Olivos	1,132	2.7	48.0	$81,964		
Ballard	467	2.6	45.7	$98,889		
Santa Ynez	4,418	2.5	47.8	$98,015		
Goleta Water District	86,946	3.1	36.5 (14)	$66,921 (14)	English 68% Spanish 20% Other 12%	White: 51,558 (59%) Hispanic/Latino:23,278 (27%) Black: 1,306 (2%) Asian: 7,796 (9%) Other: 3,008 (3%)

Area	Population (2010)	Average House-hold Size	Median Age	Median House-hold Income	Primary Languages	Ethnicity
Hope Ranch	3,653	2.5	53.1	$118,750	English 92% Spanish 3% Other 5%	White: 3,167 (87%) Hispanic/Latino: 310 (29%) Other: 176 (4%)
City of Santa Barbara	88,410	2.7	36.8	$61,937	English 62% Spanish 30% Other 8%	White: 48,417 (55%) Hispanic/Latino: 33,591 (38%) Asian: 2,927 (3%) Other: 3,475 (4%)
Montecito WD	10,413	2.6	---	---	English 91% Spanish 4% Other 5%	White: 9,061 (87%) Hispanic/Latino: 797 (8%) Other: 555 (5%)
Montecito	8,965	2.6	50	$110,375		
Summerland	1,448	2.4	49.2	$63,654		
Carpinteria Valley WD	13,040	2.6	39.5	$63,834	English 60% Spanish 36% Other 4%	White: 6,081 (47%) Hispanic/Latino: 6,351 (49%) Other: 608 (4%)

*Disadvantaged Communities
Source: Santa Barbara County Supply Demand Study, Santa Barbara County Water Agency, 2013

3.14 DAC and Tribal Outreach

3.14.1 Disadvantaged Communities

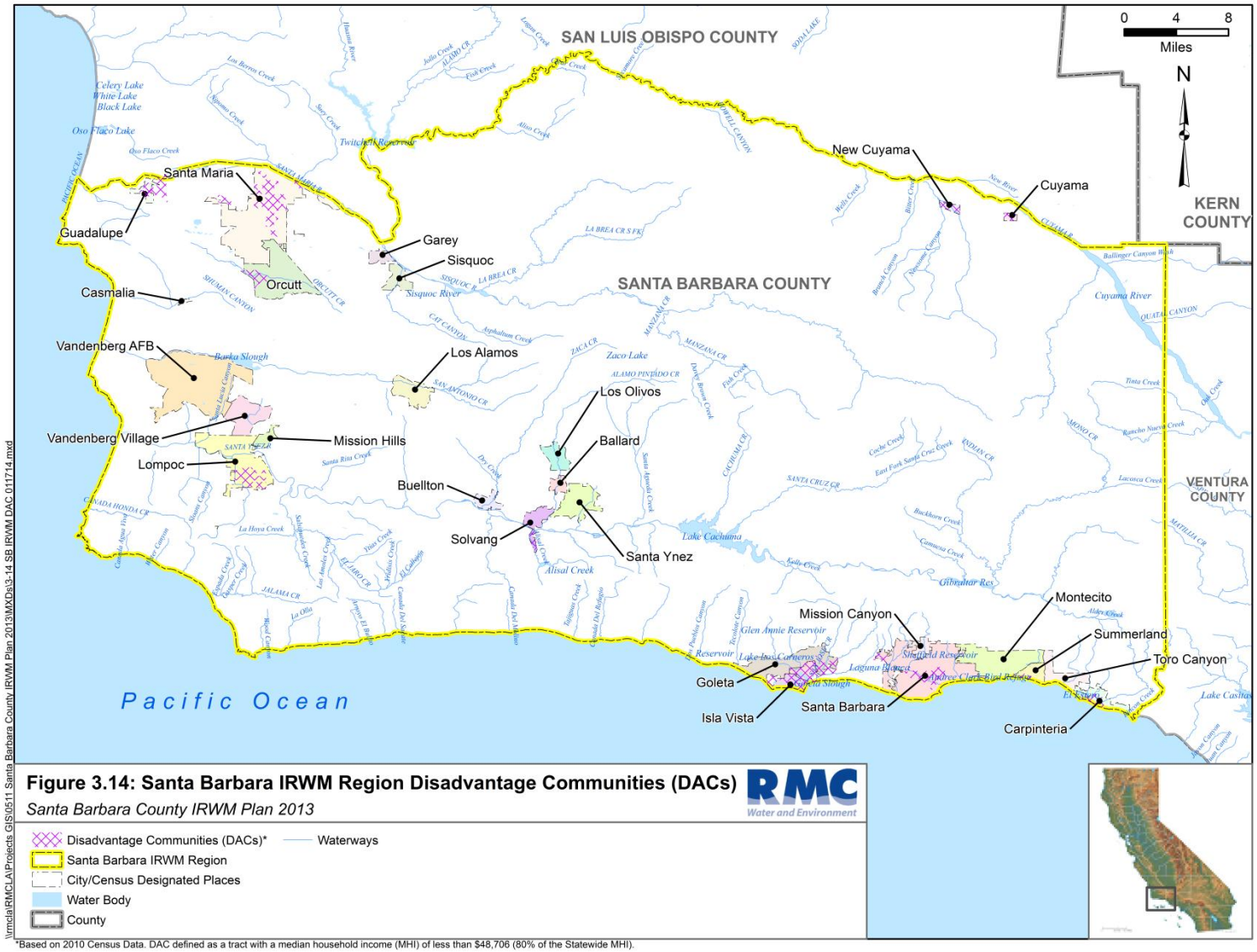
As there already was an established IRWM organizational structure that dates back to 2006 and that was updated in 2010, the IRWM Plan 2013 process utilized the Santa Barbara County Water Agency, the Cooperating Partners and the Steering Committee as the central organizational arms. In addition, there has also been significant outreach to other stakeholders, including disadvantaged communities (DAC) (see Figure 3.14) who have not previously been as activate in the stakeholder process. The goal of the targeted outreach, particularly to DACs, was not only to effectively identify and outreach to previously untapped communities/other stakeholders, but to also weave them into the IRWM fabric, assist them in developing their own capacities and engage them in an on-going water dialogue regarding their water experiences, challenges, concerns and ideas for solutions to the obstacles facing the region and the State and build significant capacity for carrying the IRWM process forward. Another goal is for the stakeholders to assist the Region in the formative process of priority setting, identification of issues and regional objectives for watershed, sub-region and regional collaboration on projects and to address the issues of water quality, water reliability, efficient water use, environmental stewardship and restoration and climate change.

The methods of outreach included emails, phone calls, publically notice 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 met with many originations and their representatives face-to-face in order to educate them and engage them in IRWM Plan 2013.

Individual DACs were visited by IRWM Regional Representatives to discuss project development options on continued participation in the IRWM program. These communities included:

- Community of New Cuyama - two projects were identified in the community of New Cuyama. While not ready for the Round 2 Implementation Grant Application, they are potential candidates for a potential Round 3 application. The Cuyama Community Services District is still involved in the IRWM process.
- City of Guadalupe - the City of Guadalupe joined the Steering Committee and participated in the development of a Groundwater Assessment for the Santa Maria Groundwater Basin, Santa Barbara County IRWM Plan 2013.

Figure 3.14 Disadvantaged Communities



3.14.2 Tribal Communities

Targeted outreach was undertaken with the Santa Ynez Band of Chumash Indians. This was accomplished by phone calls and personal meetings. The Region's representatives made several (four) calls to the Santa Ynez Band of Chumash Indians to set up focused meetings to discuss the update to the Plan and potential projects. While efforts have been focused and consistent and while the Santa Ynez Band of Chumash Indians and other tribal groups receive all communications about the meetings, project opportunities, and Plan update, there is not a significant participation or presence from this community. The Region will continue communications with tribal entities and work to support and encourage their future participation.

3.15 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 County. Collaboration has continued to the present. Recent collaborative efforts beginning in 2009 include 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 emails, information, 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 upon and signed as well as 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 potentials to cross coordinate and share funding. Subsequently, various members of the RWMGs of all the IRWM regions in the Central Coast have had follow-up conference calls to discuss on-going efforts and share projects and Plan information.

Throughout 2010 and 2011, the Santa Barbara and Ventura IRWM regions were in regular and close communication about projects and 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 with speakers from state agencies and involved regions.

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 Association of Environmental Professionals. The three regions have collaborated on addressing coordination between water and land use planners with the Central Coast Chapter of the Association of Environmental Professionals (AEP) as well as the Central Coast Section of the California Chapter of the American Planning Association (APA). It is anticipated that there will be other future opportunities to collaborate on IRWM shared watershed issues, concerns and projects.