SECTION 3.0 - REGION DESCRIPTION

The purpose of this section is to describe the Watersheds Coalition of Ventura County (WCVC) IRWM Region, including the boundaries, water systems, resources, relationships with neighboring IRWM Regions, regional conflicts and objectives, and how the Region is working to reduce dependence on imported State Water.

3.1 Region Boundary and Overview

This section addresses the WCVC Region boundary and an overview of the Region.

3.1.1 Region Boundary

The Region included in this IRWM Plan is Ventura County (Figure 3-1) with the exception of the portion of Malibu Creek Watershed that lies within Ventura County – which is included in the Greater LA IRWM Region. The County is a logical integrated regional water management region due to its history of cooperative water management, the topography and geography of the Region, and the similarity of water issues facing water and land use agencies throughout the Region. The Watersheds Coalitions of Ventura County (WCVC) recognizes that watersheds are not defined by political boundaries and future efforts to protect and manage water and watersheds in the Region must include representatives of jurisdictions outside Ventura County. For example, representatives of the WCVC Region are working with stakeholders and agencies in the upper reaches of the Santa Clara River Watershed, which is located in northern Los Angeles County, to include them in collaborative efforts to manage and protect the entire Santa Clara River Watershed.

Ventura County and the ten cities within the County have collaborated in land use decision-making since 1969 when in cooperation with the Local Agency Formation Commission (LAFCO) a landmark set of county-wide policies entitled the "Guidelines For Orderly Development" were adopted. These policies clarified the relationship between the County and the cities regarding land use planning. These guidelines have resulted in confining urban development within cities' boundaries, which are much better equipped to deliver urban services.

The County, local cities and other agencies successfully collaborated again in 1974 to adopt the Regional Land Use Program. This program led to coordination among the cities and the County regarding such issues as population forecasting, transportation planning, spheres of influence planning, air quality planning, and water quality planning. Many of these early planning efforts have directly resulted in continued water management cooperative efforts.

Local water agencies have maintained this tradition of cooperation, exemplified by the county-wide Association of Water Agencies (AWA). The AWA includes major water districts, the Cities with water delivery responsibilities, the County, county water districts, investor-owned water utilities, mutual water companies, groundwater management agencies, a water treatment research center, and business members. AWA was formed in the late 1970s to provide a forum for the exchange of information on local and regional water issues, and its mission statement is "*to develop and*

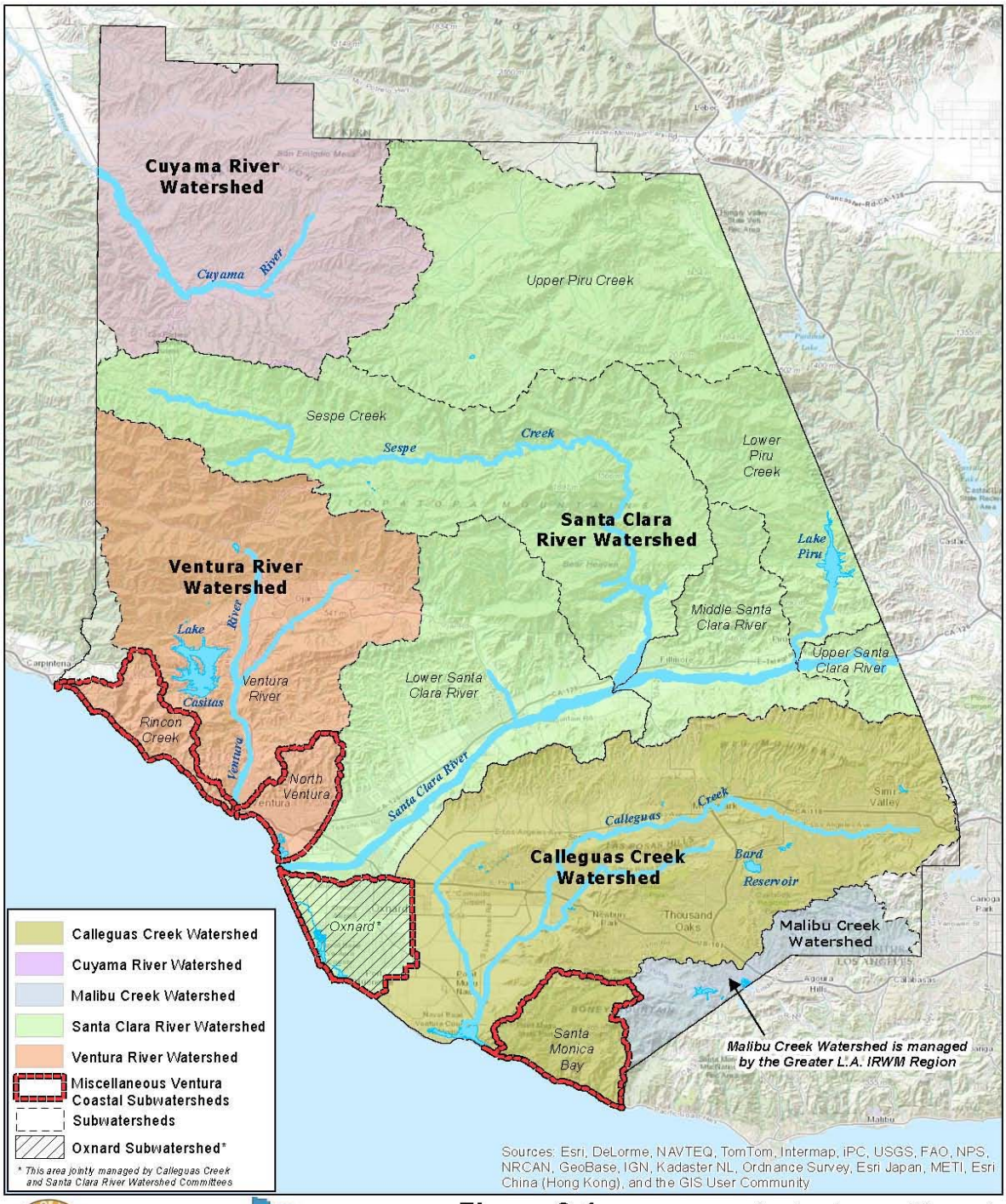


Figure 3-1
WCVC IRWM Boundaries

encourage cooperation among entities for the development, protection, conservation and improvement of the total water resources for Ventura County." The AWA membership covers the range of water stakeholders in the county: agriculture, municipalities, water districts, small systems, industrial water uses, and concerned citizens.

The Region further demonstrated its ability to cooperate on water issues with the 1980 *208 Water Quality Management Plan*, a federally mandated EPA Section 208 requirement, and the subsequent update, the *Ventura County Water Management Plan*, prepared in November 1994. These successful development and implementation of these comprehensive planning programs were the result of a coordinated effort between the County and most of the water management stakeholders in the Region, including citizen and environmental groups, water districts, and State and Federal agencies. The plans covered nearly all water management issues except for flood control. The current IRWMP process has added flood control and other important components to the integrated water management effort such as habitat protection and wetlands enhancement.

The Watersheds Coalition of Ventura County (WCVC) has made significant progress in identifying regional goals and watershed-wide objectives, determining appropriate implementation projects and programs to meet those objectives and working together on the IRWMP. As an additional benefit, the WCVC functions as a forum where stakeholders come together to resolve conflicts and work on common issues.

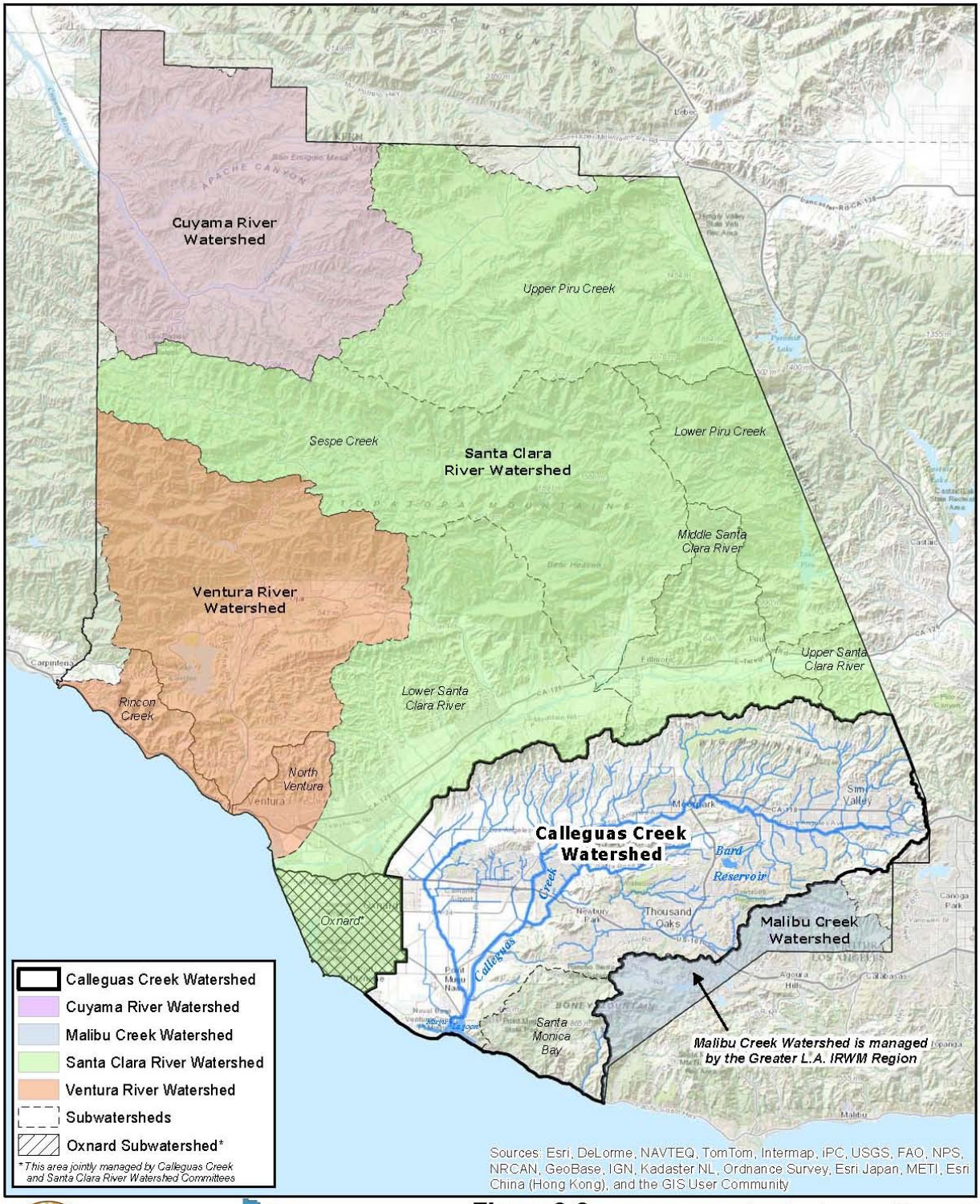
3.1.2 Region Overview

Ventura County has a population or more than 823,000 people (2010 Census) and is located north and west of Los Angeles County, east of Santa Barbara County and south of Kern County. The Pacific Ocean forms the southwestern boundary of Ventura County providing 42 miles of coastline. Virtually the entire north half of the County is within the Los Padres National Forest, although there are privately owned in-holdings scattered throughout the Forest area. Residential, agricultural and business uses are primarily located in the southern portion of the County. The County has a total area of 1,199,748 acres (1,843 square miles), of which some 550,211 acres are in the National Forest. This IRWM Plan focuses primarily on the south half of the County due to the low population and relatively small amount of water used within the northern area.

Ventura County has a Mediterranean climate, with an average July high temperature of 79 degrees, and an average January low temperature of 42 degrees. The average annual rainfall is approximately 18 inches. Ventura County has six diverse microclimates:

- Highlands and mountains of the Western Transverse Mountain Range in the northern portion of the County
- Coastal Plains, primarily located on the Oxnard Plain
- Coastal Strip
- Interior valleys such as the Ojai Valley
- Interior valleys with coastal influence such as the Santa Clara River Valley
- Interior valleys without coastal influence, such as the Conejo and Simi Valleys

Due to the favorable climate and excellent soils, Ventura County is one of the most productive agricultural regions in the country. According to the Ventura County 2012 Annual Crop Report, the gross agricultural value was approximately $1.96 billion dollars, an 18% increase from 2008. Even though irrigated land in the Region has decreased approximately 6,300 acres since 1998 (John



Ventura County
Resource Management Agency
Information Systems Department
Map created on 05/02/2014

Figure 3-2
Calleguas Creek Watershed
WCVC IRWM Region

0 2 4 8 Miles

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Krist, Farm Bureau of Ventura County), agricultural values have increased due mainly to rising values of agricultural commodities and a shift toward more valuable crops. The most significant changes over the past five years has been a nearly 130% increase in the acreage of raspberries, and an approximately 38% decrease in the acreage of nursery stock. In addition, there has been an increase in more water intensive crops like strawberries and raspberries and a slight decrease in less water intensive crops like lemons and Valencia oranges.

Of the estimated 259,000 acres of agricultural land in the Region, approximately 91,000 acres are irrigated. The number of irrigated acres has been declining since the mid-1980s. The Calleguas Creek Watershed contains the highest number of irrigated acres, followed by the Santa Clara River Watershed and Ventura River Watershed.

The Region contains three major watersheds, six smaller coastal watersheds, and twenty-six groundwater basins. There are ten incorporated cities, three wholesale water agencies and more than 160 retail water purveyors, two groundwater management agencies, and five sanitary districts. With such water resource and management diversity in the County, effective regional and integrated water management planning is crucial. Please see Figure 3-2, which depicts the Region along with the boundaries of the major watershed and the National Forest.

Ventura County also includes two offshore islands that are part of the Channel Islands: Anacapa and San Nicolas. These islands are also Areas of Special Biological Significance. Anacapa Island is entirely within the Channel Islands National Park, and San Nicolas Island is under the jurisdiction of the U. S. Navy; for these reasons, the islands are not included within the Region for the purposes of this plan.

3.2 Internal Boundaries Within the Region

The boundary for the WCVC IRWM Region is the County of Ventura boundary as described above (see Figure 3-1). The County boundaries form a logical Region for integrated regional water management due to the history of cooperative water management, shared water supply and other infrastructure, ongoing coordination among the Region's water management entities addressing critical water issues, and the topography and geography of the Region.

Numerous watershed/topography, political, and resource management-related boundaries have been established throughout the Region and are briefly described below.

3.2.1 Watersheds

As shown in Figure 3-1, there are three major watersheds in Ventura County including the Santa Clara River, Ventura River, and Calleguas Creek Watersheds. A fourth watershed, the Cuyama River Watershed, and various sub-watersheds are also shown. The major hydrologic features of the Santa Clara, Ventura, and Calleguas Watersheds are depicted in Figures 3-2, 3-3 and 3-4.

Watershed-based management plans have been prepared for two of the major watersheds in the Region: the *Calleguas Creek Watershed Management Plan* (2005) and the *Santa Clara River Enhancement and Management Plan* (2005). Development of a watershed management plan for the Ventura River Watershed is underway with expected completion in Fall of 2014.

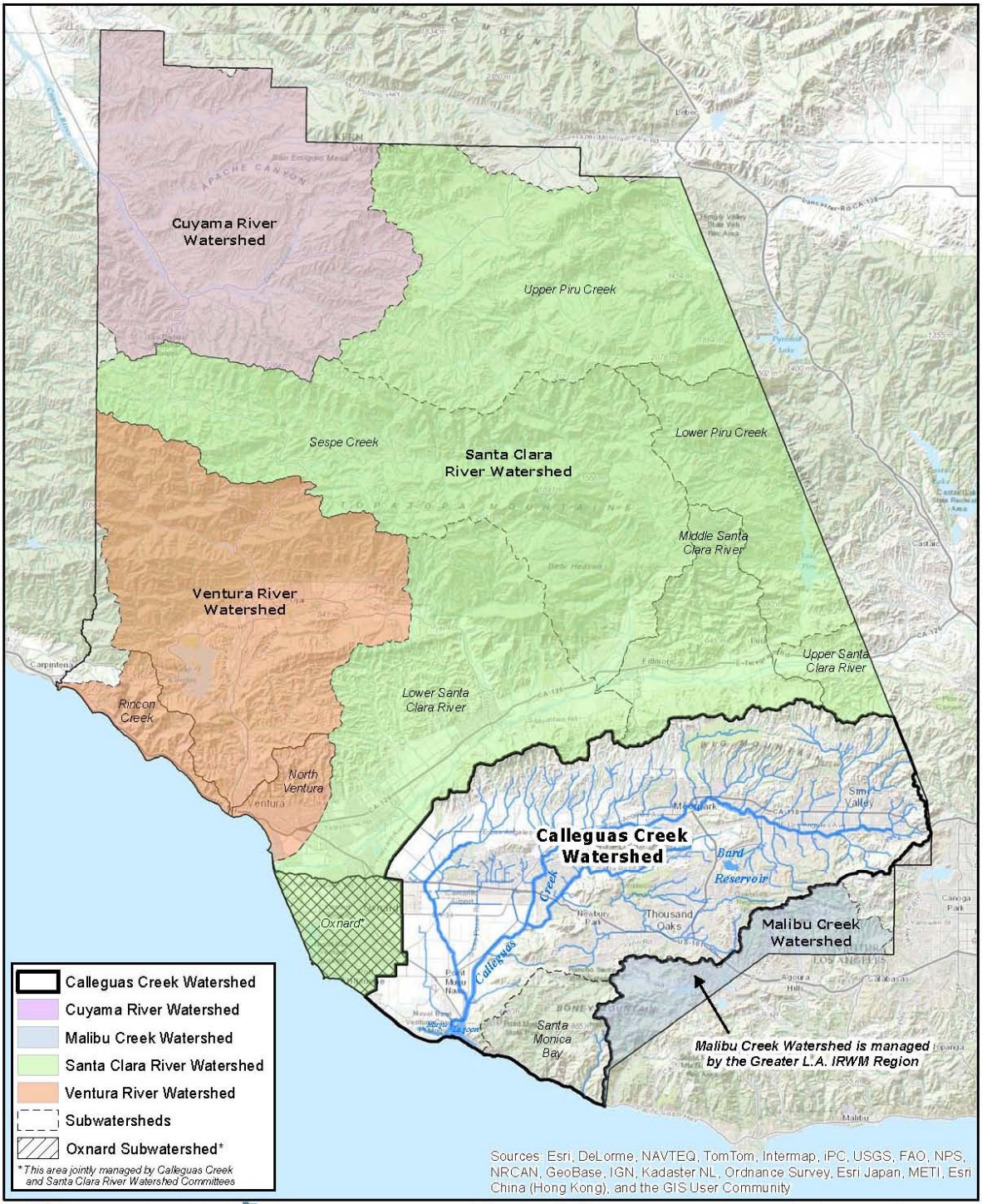


Figure 3-2
Calleguas Creek Watershed
WCVC IRWM Region

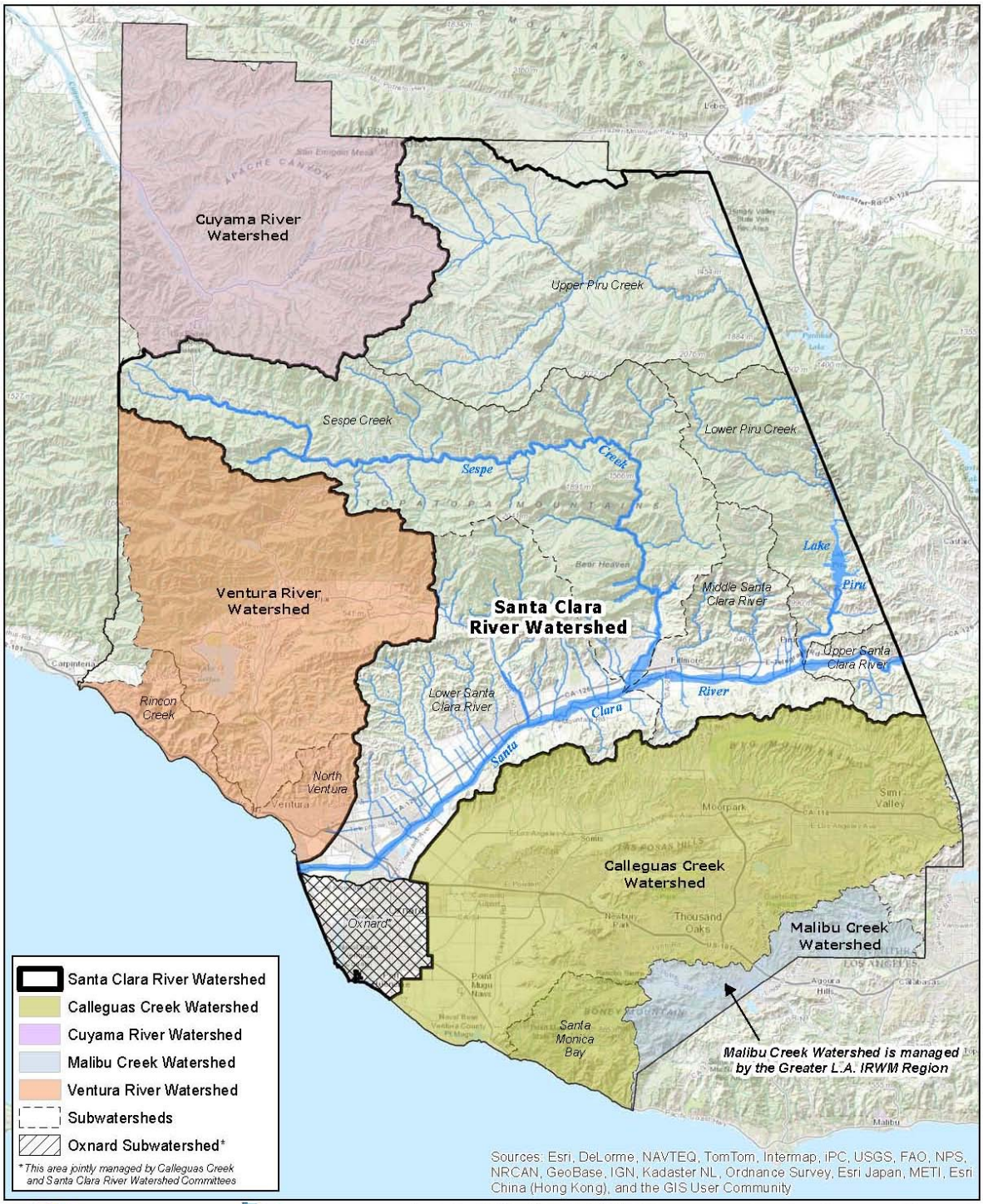


Figure 3-3 Santa Clara River Watershed WCVC IRWM Region

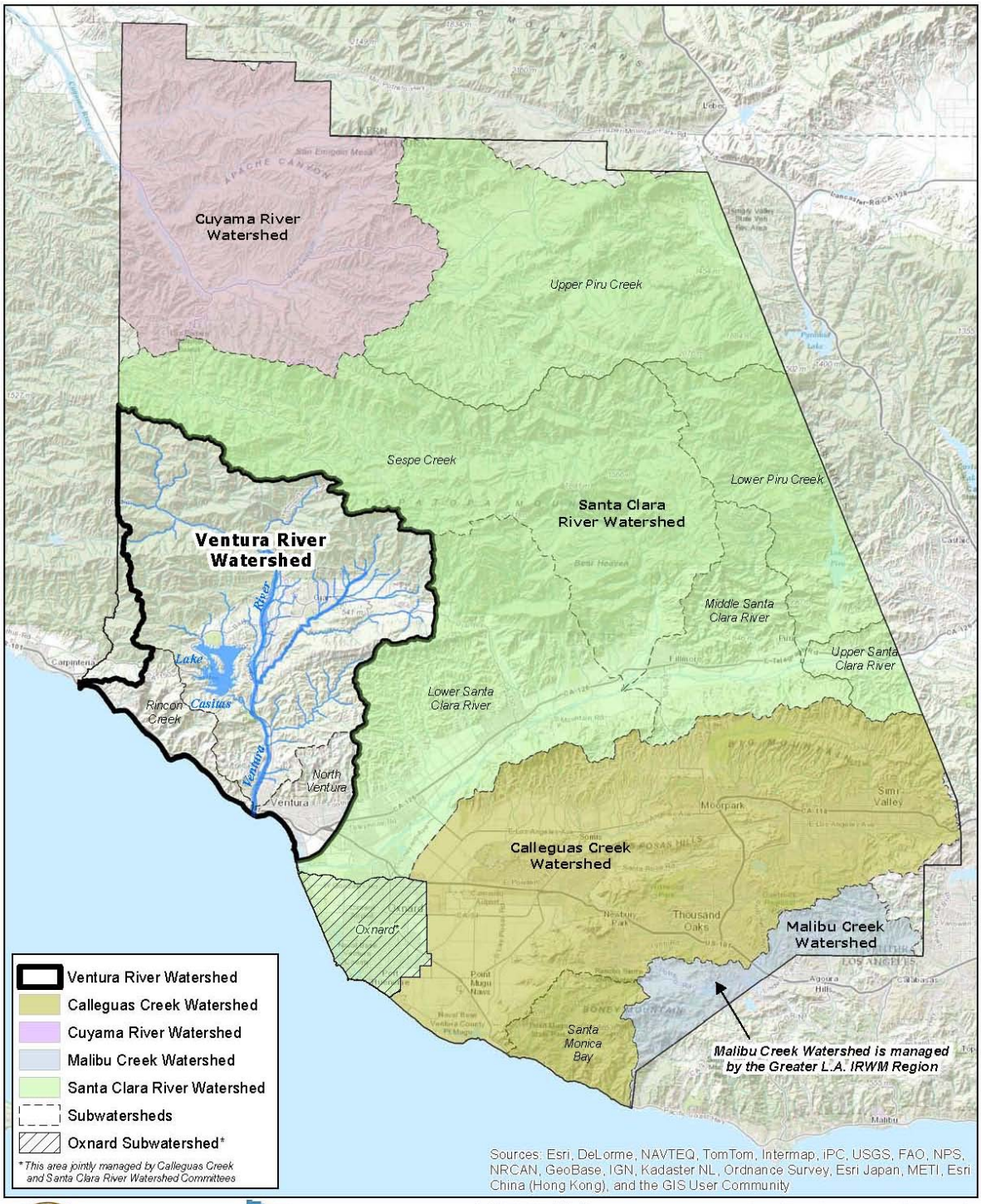


Figure 3-4
Ventura River Watershed
WCVC IRWM Region

3.2.2 Municipalities/Land Use Agencies

Each incorporated city in the Region serves as the land use agency for areas within its jurisdiction. The ten incorporated cities include San Buenaventura (Ventura) and Ojai in the Ventura River Watershed; Camarillo, Thousand Oaks, Simi Valley and Moorpark in the Calleguas Creek Watershed; and Oxnard, Port Hueneme, Santa Paula and Fillmore in the Santa Clara River Watershed. The location of each incorporated city, in the Region is shown on Figure 3-5.

The County of Ventura serves as the land use agency for unincorporated areas of the Region. The more populated unincorporated communities of Piru, Saticoy, El Rio, Oak Park, Newbury Park, Meiners Oaks, Oak View and Casitas Springs are shown on Figure 3-5, which also depicts the boundary of the Los Padres National Forest, which encompasses the northern half of Ventura County.

Another land use agency in the Region is the Local Agency Formation Commission (LAFCO). LAFCO is a State-created commission with county-wide jurisdiction responsible for working closely with citizens, the County, cities and special districts within the County on a variety of issues concerning jurisdictional boundary changes. LAFCO's statutory purposes include the discouragement of urban sprawl and the encouragement of orderly governmental boundaries based upon local circumstances and conditions.

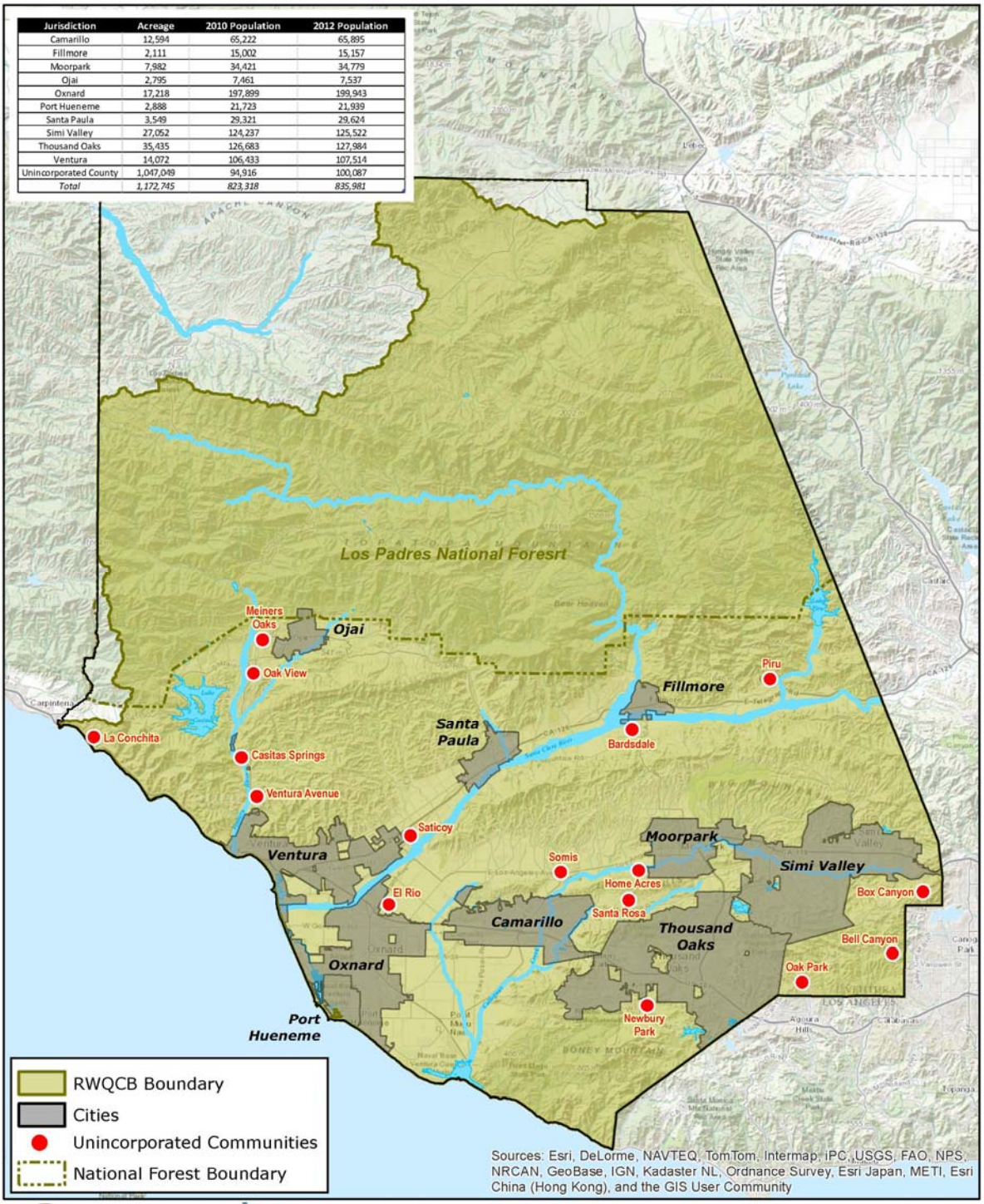
3.2.3 Water, Wastewater and Flood Control Agencies

Water Providers - There are more than 165 entities in the Region delivering water to wholesale and retail water users, including: three water wholesale districts (Calleguas Municipal Water District, Casitas Municipal Water District and United Water Conservation District), seven (7) city-owned and operated systems, 22 special water districts, 25 public water purveyors, five (5) Public Utility Commission (PUC) regulated water companies, 63 mutual water companies, and 59 other privately owned systems of varying sizes. Please see Figure 3-6 for a map depicting all the entities.

- The Calleguas Municipal Water District supplies water to 12 water companies, including those that serve the cities of Camarillo, Oxnard, Thousand Oaks, Simi Valley and Moorpark. The names and boundaries of the individual water companies served by Calleguas are also depicted on Figure 3-6.

- The United Water Conservation District supplies water to six water companies, including those that serve the cities of Fillmore, Port Hueneme, Fillmore and Santa Paula. The names and boundaries of the individual water companies served by Calleguas are also depicted on Figure 3-6.

- The Casitas Municipal Water District supplies water to six water companies, including those that serve the cities of Ventura and Ojai. The names and boundaries of the individual water companies served by Casitas are also depicted on Figure 3-6.



Jurisdiction	Acreage	2010 Population	2012 Population
Camarillo	12,594	65,222	65,895
Fillmore	2,111	15,002	15,157
Moorpark	7,982	34,421	34,779
Ojai	2,795	7,461	7,537
Oxnard	17,218	197,899	199,943
Port Hueneme	2,888	21,723	21,939
Santa Paula	3,549	29,321	29,624
Simi Valley	27,052	124,237	125,522
Thousand Oaks	35,435	126,683	127,984
Ventura	14,072	106,433	107,514
Unincorporated County	1,047,049	94,916	100,087
Total	*1,172,745*	*823,318*	*835,981*

Ventura County
Resource Management Agency
Information Systems Department
Map created on 04/07/2014

Figure 3-5 Cities and Unincorporated Communities WCVC IRWM Region

0 2 4 8 Miles

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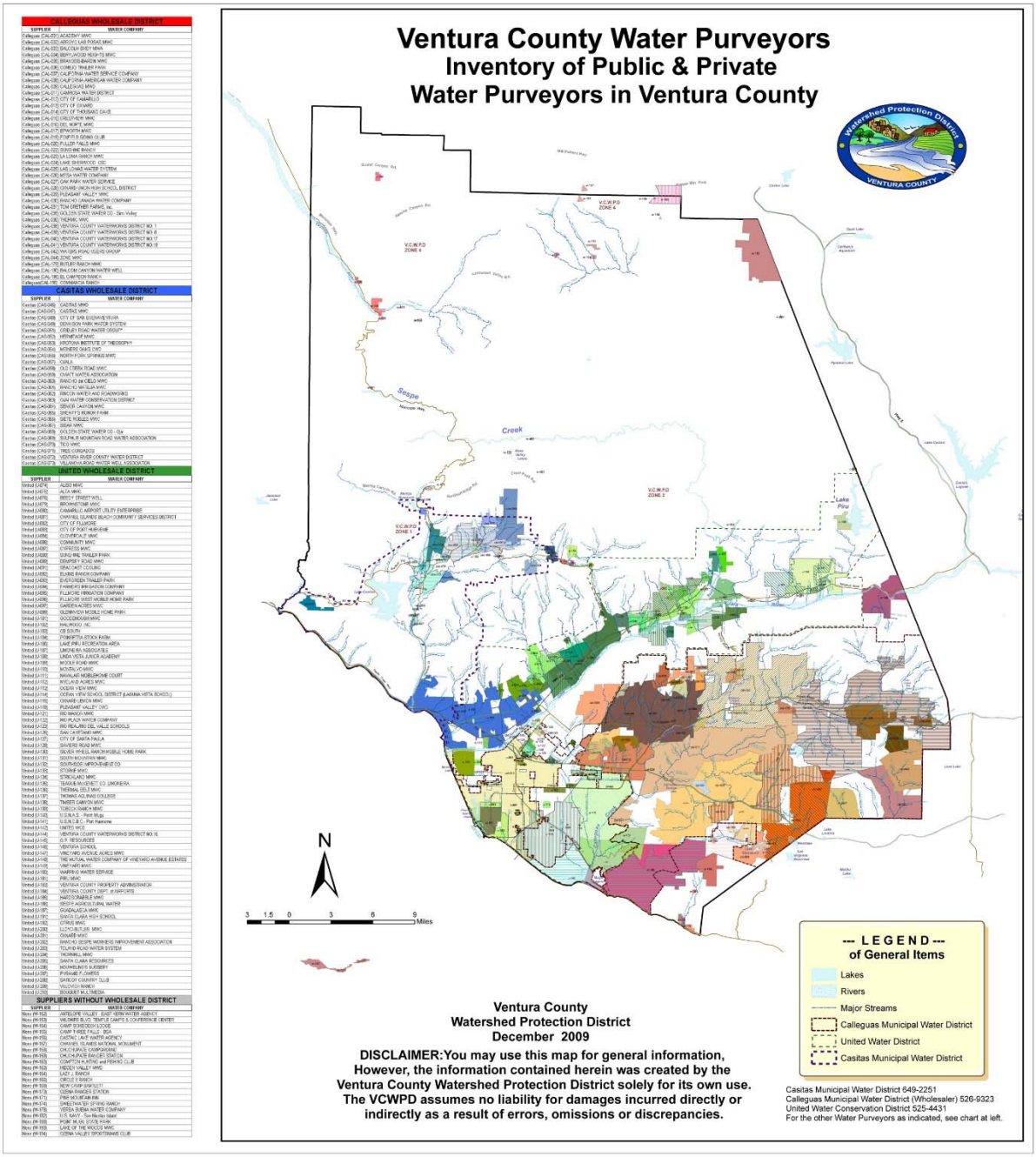


Figure 3-6

Wholesale Water Districts and Water Purveyors

WCVC IRWM Region

Wastewater Districts - Ventura County is served by 17 wastewater treatment districts. In addition to districts that serve each of the incorporated cities, seven (7) districts (Camrosa, Saticoy, Triunfo, Ventura County Service Areas 29 and 30, Piru, and the Ventura Regional Sanitation District) serve the major unincorporated areas of the County. The service area for each wastewater treatment district, and the location of wastewater treatment facilities, are depicted on Figure 3-7.

Flood Control District The Ventura County Watershed Protection District is the regional flood control agency and has the same boundaries as the County of Ventura.

3.2.4 Groundwater Basins

There are 32 groundwater basins, as defined in DWR Bulletin 118, Update 2003 – California's Groundwater, located in the Region. Of the identified basins, most (27) are located in the southern portion of the County and five (5) are located in the northern portion. The names and locations of each of the identified groundwater basins are depicted on Figure 3-8. The largest groundwater supplies in the southern portion of the County are contained within major water bearing aquifers that underlie most of the Oxnard Plain and Las Posas Valley. These basins include the Oxnard, Mugu, Hueneme, Fox Canyon, and Grimes Canyon aquifer zones. The major groundwater basins in the northern portion of the County are the Lockwood Valley and the Cuyama Valley Basins.

As depicted on Figure 3-8 the majority of the identified groundwater basins are fully contained within the Region boundaries, however, several are shared with neighboring IRWM Regions, including the Cuyama, Hungry Valley and Little Cuddy Valley Basins in the north half of the County, and Russell Valley and Las Virgenes Canyon Basins along the southern end of the County.

3.2.5 Surface Water Bodies

Surface water resources in Ventura County are divided into two major hydrologic units, the Ventura River and Santa Clara-Calleguas Unit. There are also four other smaller hydrologic units, consisting of the Rincon Creek, Cuyama, San Joaquin, and the Malibu Units. The major surface water resources in the County are provided by the Lake Casitas, Lake Piru, and Bard reservoirs. Streams in Ventura County that generally flow throughout the year include Sespe Creek, Piru Creek, Reyes Creek, Matilija Creek, the North Fork of the Ventura River, and the Ventura River below Foster Park. Major rivers and reservoirs in the Region are depicted on Figure 3-1.

3.2.6 Regional Water Quality Control Board Boundaries

The WCVC IRWM Region is part of Region 4 – Los Angeles area - of the California Regional Water Quality Control Board. Most of the County lies in Region 4 – see Figure 3-5 for the boundaries of the Ventura County portion of RWQCB Region 4.

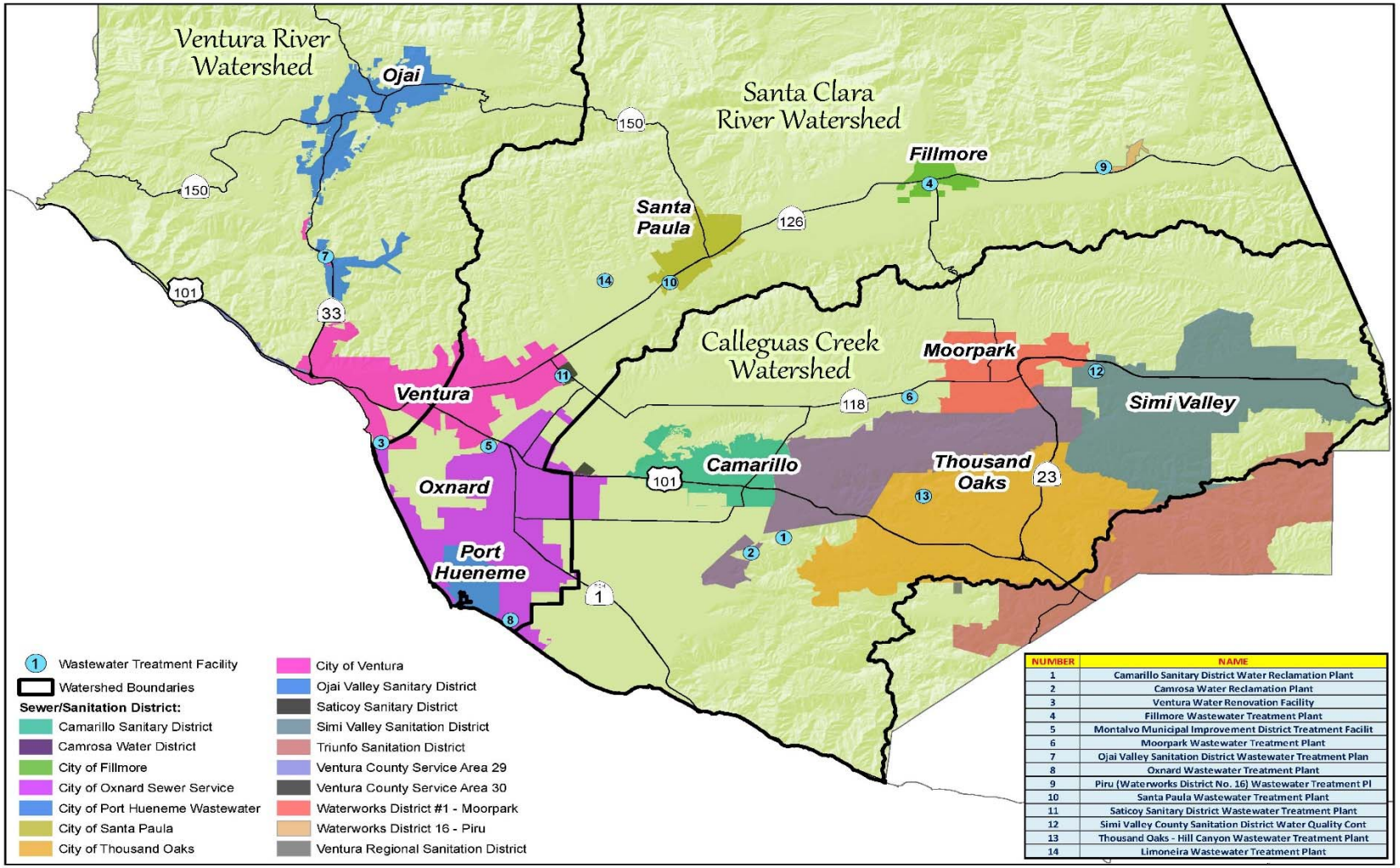


Figure 3-7
Wastewater Districts and Facilities
WCVC IRWM Region

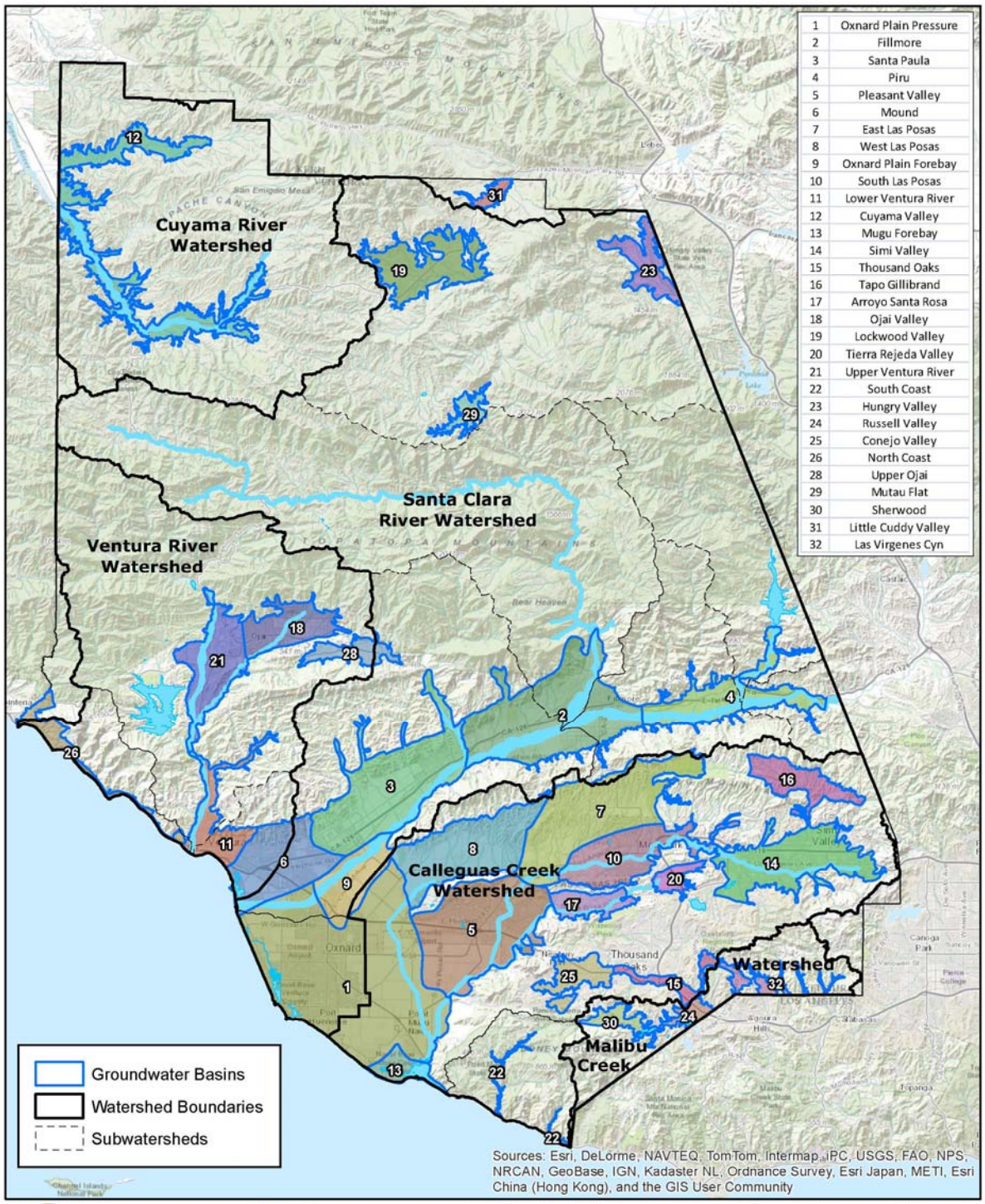


Figure 3-8
Groundwater Basins
WCVC IRWM Region

3.2.7 Floodplains

The Ventura County Watershed Protection District, which is governed by the Board of Supervisors, has the authority to maintain and construct flood control facilities on the channels shown on the District's Comprehensive Plan, and a permit from the Watershed Protection District must be obtained for most activities in, on, over, under, or across the bed, banks, and overbank areas of these channels. Outside of these limits, the prime responsibility for regulating activities in flood hazard areas lies with local governments. 100- and 500-year floodplain areas designated by the Federal Emergency Management Agency are generally depicted on Figure 3-9.

3.3 Watersheds and Water Systems in Ventura County

As previously stated there are three major watersheds and thirty two groundwater basins in the Region. Each of the major watersheds and groundwater basins are briefly described below. More detailed information regarding each of the three major watersheds are contained in Appendices A, B and C.

3.3.1 Calleguas Creek Watershed Characterization

The Calleguas Creek Watershed encompasses an area of approximately 343 square miles, predominantly in southeastern Ventura County. The major hydrologic features of the watershed include Conejo Creek, Arroyo Santa Rosa, Arroyo Simi, Arroyo Las Posas, and Calleguas Creek, as well as Revolon Slough and Mugu Lagoon. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge Mountains. The southern boundary is formed by the Simi Hills and Santa Monica Mountains. Presently 50 percent of the watershed is undeveloped open space, 25 percent is agricultural, and the remaining 25 percent is in urban land use. The watershed ultimately drains to the Pacific Ocean through Mugu Lagoon.

Prior to the 1940s, Calleguas Creek and its main tributaries provided drainage for stormwater and irrigation discharge with rare occurrences of year-round flow. However, over the past 50 years, steadily increasing wastewater discharges and urban runoff now provide portions of Calleguas Creek and its tributaries with perennial flow.

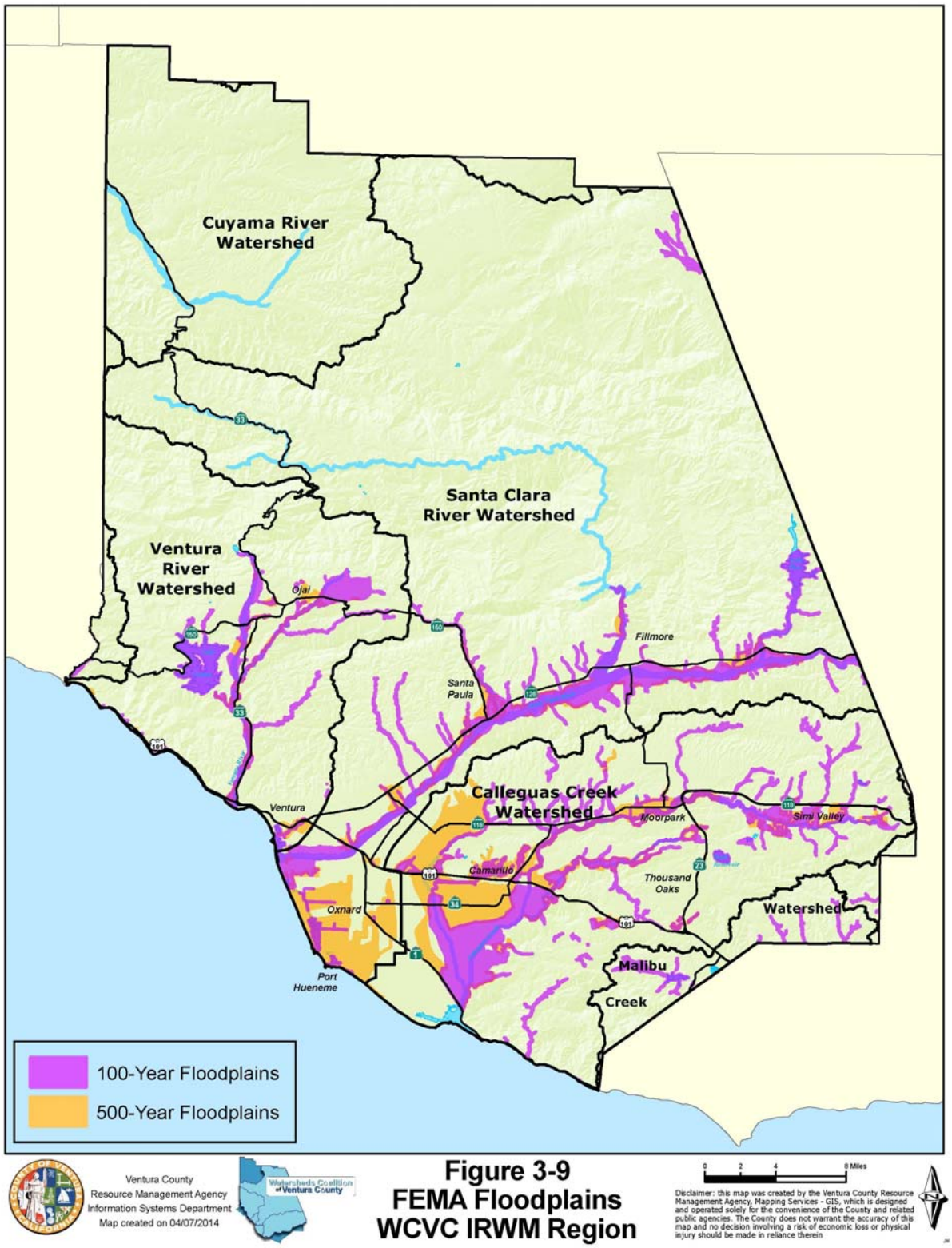


Figure 3-9
FEMA Floodplains
WCVC IRWM Region

Hydrology

Surface Water

The Calleguas Creek Watershed has three major watercourses: the Arroyo Simi/Arroyo Las Posas/Calleguas Creek system, the Arroyo Santa Rosa/Arroyo Conejo/Conejo Creek system, and the Honda Barranca/Beardsley Wash/Revolon Slough system. These watercourses drain from the Santa Susana Mountains and Santa Monica Mountains through the Oxnard Plain into the Pacific Ocean through Mugu Lagoon.

The Arroyo Simi/Arroyo Las Posas/Calleguas Creek system, the longest of the three drainage systems, drains Simi Valley, the eastern Las Posas Valley, much of Pleasant Valley, and the eastern portion of the Oxnard Plain. In addition to the natural streams, Arroyo Simi is also fed by a number of dewatering wells operated by the City of Simi Valley, as well as discharges from the Simi Valley Water Quality Control Plant and the Moorpark Wastewater Treatment Plant.

The Arroyo Santa Rosa/Arroyo Conejo/Conejo Creek system drains the Thousand Oaks area, the Tierra Rejada Valley, the Santa Rosa Valley and a portion of Pleasant Valley. The system is fed by natural tributaries as well as numerous agricultural drains. Engineered levees consisting of riprap, gunite coated riprap or concrete sidewalls have been installed along much of the natural stream channel.

The Camrosa Water District operates the Conejo Creek Diversion immediately south of U.S. Highway 101. The diversion was completed in 2002. Through a series of agreements between the City of Thousand Oaks, Calleguas Municipal Water District, the Pleasant Valley County Water District (PVCWD) and Camrosa, Camrosa purchases the recycled surface water diverted from Conejo Creek from the City of Thousand Oaks who discharges the tertiary treated water into the creek from their Hill Canyon Treatment Plant well upstream of the diversion. The diversion is governed by a SWRCB water right decision that limits the area of use to Camrosa and Pleasant Valley County Water District's service areas. Recycled surface water in excess of the District's needs is delivered to PVCWD and stored in the PVCWD reservoir located near Camarillo Airport.

The Honda Barranca/Beardsley Wash/Revolon Slough system drains the western portion of the Las Posas Valley, a portion of Pleasant Valley and a portion of the Oxnard Plain. Agricultural and stormwater account for the majority of input water into this system.

Ground Water

Recharge to the shallowest aquifers in the Calleguas Creek Watershed occurs by direct infiltration or precipitation through streambed deposits, most notably along Arroyo Las Posas downstream of the City of Moorpark. In the western portion of Simi Valley, groundwater often rises to the surface and flows as surface water. The City of Simi Valley operates a series of dewatering wells to lower groundwater levels. Groundwater is kept from rising to the surface through continuous pumping and is then discharged into a concrete-lined section of Arroyo Simi.

The Calleguas Creek Watershed includes several significant groundwater basins. Water rights have not been adjudicated in every one of these basins, so groundwater production is not comprehensively controlled or maintained.

In basins such as the Simi Valley and South Las Posas Basins, groundwater storage has increased significantly in the last several decades, necessitating dewatering operations to protect development in the western portion of the City of Simi Valley. This increase is due to a combination of an overall decrease in agricultural use of groundwater because of high total dissolved solid (TDS) levels and return flows from applied imported water supplied to Simi Valley.

Wildlife, Habitats and Vegetation

More than 50 percent of the Calleguas Creek Watershed is either agricultural or developed land. Much of the natural vegetation and habitat of the watershed is dominated by coastal sage scrub and chaparral. Coastal sage scrub is typically located on the lower elevation slopes within the western half of the watershed and covers approximately 33,100 acres. Chaparral is the most common native vegetation community within the watershed, covering approximately 38,000 acres and typically occurs on the higher elevation slopes within the Santa Monica Mountains. Other natural habitats of the watershed consist of grasslands, oak woodlands, California Walnut, riparian, salt marsh, beach/dune, disturbed riparian, and open water. (Calleguas Creek Watershed Management Plan, June 2005).

Principal wildlife supported by the habitat types in the watershed include mule deer, valley quail, mourning dove, coyote, bobcat, mountain lion, badger, spotted skunk, striped skunk, black-tailed jackrabbit, Audubon cottontail, brush rabbit and numerous species of small mammals, songbirds, shorebirds, raptors and reptiles, as well as many other bird species. The riparian habitats of the watershed support several species of amphibians including the Pacific tree frog, bullfrog, California salamander, and California newt.

The U.S. Fish and Wildlife Service has designated critical habitat areas for sensitive species in several locations in the Calleguas Creek Watershed. Critical habitat areas have been established for Braunton's milk-vetch, Lyon's pentachaeta, California red-legged frog, Riverside fairy shrimp, coastal California gnatcatcher, and western snowy plover. The location of designated critical habitat areas in the Calleguas Creek Watershed are depicted on Figure 3-13.

Issues and Needs in the Watershed

Urban development and agricultural activities within the Calleguas Creek Watershed have resulted in the degradation of water resources, loss of sensitive ecosystems, floods, and erosion and sedimentation problems. In 1996, a broad coalition of local property owners, water and wastewater agencies, environmental groups, agricultural parties, governmental agencies, and other private interests joined together to develop a management plan for the watershed. The Calleguas Creek Watershed Management Plan (CCWMP) was completed in July 2004 to address the issues impacting the watershed. The CCWMP recommended 20 action items in the areas of water resources and water quality, habitat and recreation, flood protection and sediment management, agriculture, land use, and public outreach and education.

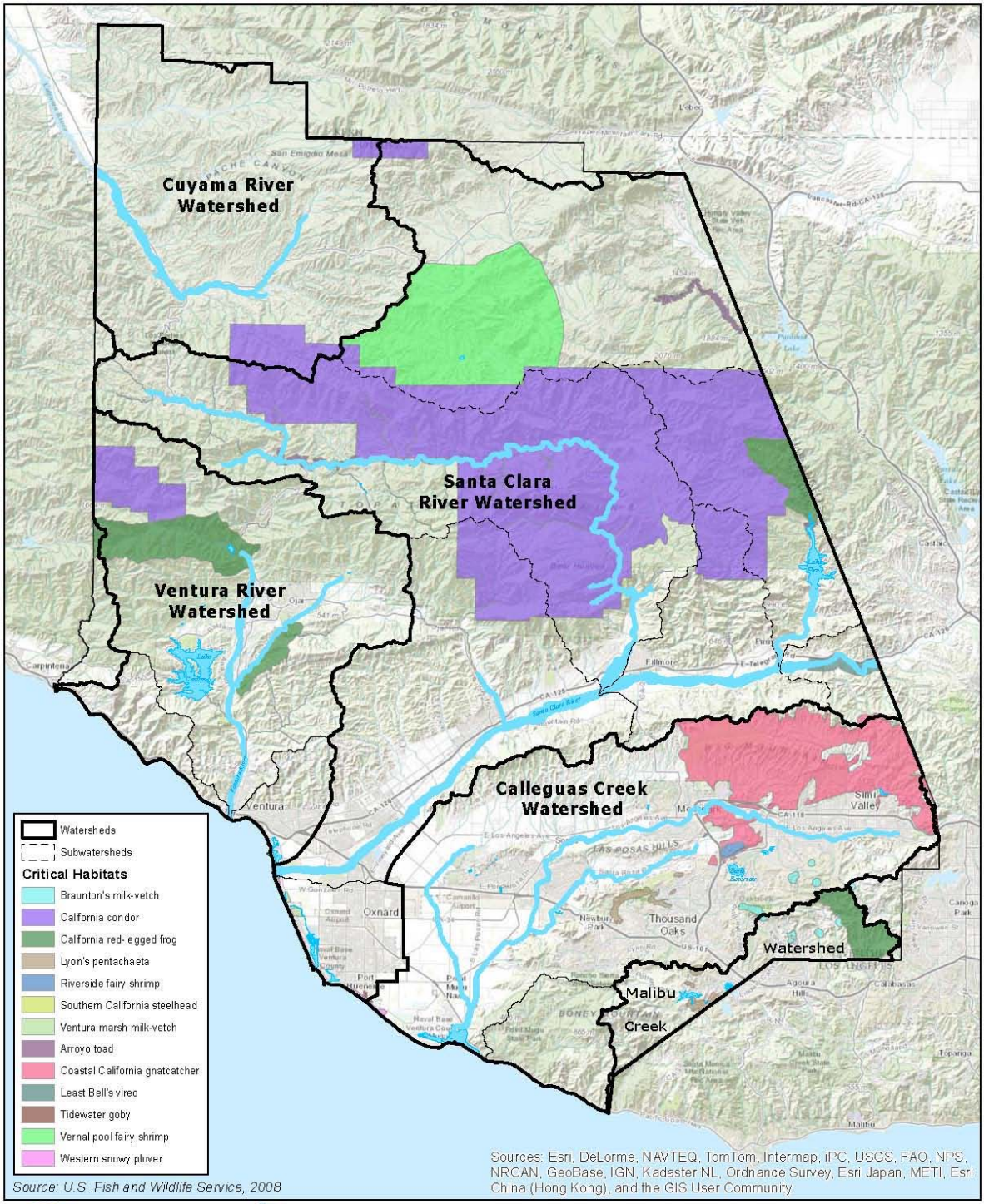


Figure 3-13
Critical Habitat Areas
WCVC IRWM Region

The following were identified as significant issues for the Calleguas Creek Watershed.

Critical Needs
- Water quality improvement
- Water supply enhancement
- Water supply reliability
- Flood control
- Habitat quality improvements

Water Quality Concerns
- Surface: TMDL – Metals, Salts, Toxicity, Bacteria, Trash, Sediment, Pesticides
- Groundwater: Salts, Iron, Manganese

Water Supply Issues
- Better groundwater quality would help reduce the amount of imported water, lessen dependence on outside water, and increase groundwater reliability
- Utilization of recycled water
- Public education towards utilization of recycled water
- Development of local supplies
- Development of a drought-proofing plan
- Public education for conservation

Water Supply Reliability – See also Water Supply
- A need for self- sufficiency

Flood Control Issues
- Building in floodplains
- Planning and land development
- Erosion control to reduce sediment
- Channel capacity – levee construction

Habitat Issues
- Mugu Lagoon – sediment quality and quantity
- Wetlands areas within the Watershed degraded

3.3.2 Santa Clara River Watershed Characterization

The Santa Clara River is the largest river system in Southern California remaining in a relatively natural state. The Santa Clara River headwater is at Pacifico Mountain in the San Gabriel Mountains and it flows in a generally western direction for approximately 84 miles through Tie Canyon, Aliso Canyon, Soledad Canyon, the Santa Clarita Valley, the Santa Clara River Valley, and the Oxnard Plain before discharging to the Pacific Ocean near the Ventura Harbor. The Santa Clara River and tributary system has a watershed area of about 1,634 square miles. Major tributaries include Castaic Creek and San Francisquito Creek in Los Angeles County, and the Sespe, Piru, and Santa Paula Creeks in Ventura County. Approximately 40 percent of the watershed is located in Los Angeles County and 60 percent is in Ventura County. Figure 3-3 provides a map depicting the Santa Clara River Watershed in Ventura County.

The Santa Clara River Watershed is the largest Watershed in the County and also has the lowest percentage of development. About 90 percent of the Watershed is to the east and north of the floodplain in the mountainous terrain of the San Gabriel Mountains, the Sierra Pelona, and the Topatopa Mountains of the Sespe back-country to headwaters near Pine Mountain and Mt. Pinos, and to the south of the river including the Santa Susana Mountains, Oak Ridge, and South Mountain. Much of this area is in the Angeles National Forest and Los Padres National Forest. The remaining 10 percent of the watershed is mostly located in the relatively flat terrain of the Oxnard Plain, the Santa Clarita Valley, Castaic Valley, the Santa Clara River Valley, and the floors of the larger canyons, including the upper Soledad, and lower Sand, Mint, Bouquet, Placerita, San Francisquito, Piru, Santa Paula, and Sespe Canyons.

Hydrology

Surface Water

Historic records indicate that the climatic and basin characteristics of the Santa Clara River Watershed generally produce an intermittent flow regime in the river mainstem; however, flows can increase rapidly in response to high intensity rainfall with the potential for severe flooding. At certain times of the year, the river may have continuous surface flow to the Pacific Ocean from natural watershed discharge. Controlled releases of water from Lake Piru supplement surface flows in the river reach in Ventura County. Incidental flows are supplied from water reclamation plant discharges and imported water runoff in the middle reach from the Santa Clarita Valley area to the Los Angeles County/Ventura County line. It is important to note that the current and future amounts of effluent discharges from these facilities can fluctuate due to several factors including seasonal variations, changes in treatment requirements, population growth, and effluent reuse. These flows are not considered a component of the natural base flows for the river; however, they do constitute a component of the comprehensive hydrological regime (i.e., surface and recharge waters) and are included for planning purposes.

Lake Piru (Piru Reservoir): The United Water Conservation District (UWCD) operates and maintains Lake Piru, diversion structures on Piru Creek, and the Santa Clara River (Freeman Diversion), and the associated spreading grounds along the Santa Clara River in Piru, Saticoy and El Rio. Several water purveyors and individuals utilize water diverted from the Santa Clara River by UWCD. Lake Piru is UWCD's storage reservoir for water that is later released into spreading grounds to percolate into underground aquifers. Subsequent uses include sale of water to retail purveyors and agricultural users, and recharge. The capacity of Lake Piru, has declined to approximately 83,200 acre feet, with an annual safe yield of 15,000 acre feet per year. Approximately 10,000 to 50,000 AF of water is released from Lake Piru each year. Average releases are about 27,000 AFY.

Santa Clara River: UWCD diverts natural surface flows in the Santa Clara River to spreading basins in the Oxnard Forebay basin to replenish the aquifers beneath the Oxnard Plain. UWCD also supplies diverted surface water to agricultural users on the Oxnard Plain and Pleasant Valley area via its Pumping Trough Pipeline. Releases from Lake Piru in the later summer or fall, when

sufficient supplies are available, provide surface flows that act as groundwater recharge but also enhance agricultural deliveries at a time when the Santa Clara River is normally dry.

Ground Water

There are two groundwater basins in the Santa Clara River Watershed: the Acton Valley Basin and the Santa Clara River Valley Basin, both of which are drained by the Santa Clara River toward the Pacific Ocean. The Santa Clara River Valley Basin is subdivided into six sub-basins: Santa Clara River Valley East, Piru, Fillmore, Santa Paula, Mound, and Oxnard.

Beneath the Oxnard Plain, the gross overdraft of the Oxnard aquifer has been largely eliminated in recent years through effective management practices and constant recharge activities. However, even with targeted improvements, some areas still remain impacted by saline waters previously drawn into the aquifer. Projects such as the Pumping Trough Pipeline (1986), the Freeman Diversion (1991) and the Noble Pit spreading basin (1995), coupled with wet-to-average climatic conditions and reduced pumping, contributed to improving conditions in the upper aquifer system (UAS). Conditions in the UAS have improved partially at the expense of the lower aquifer system (LAS), which has been pumped heavily in recent years. The LAS is seriously overdrafted in the southern Oxnard Plain and Pleasant Valley basins, where the intrusion of saline water continues. The United Water Conservation District has constructed a new UAS well field near Saticoy to utilize UAS water that is more easily replenished. This allows an increase in water deliveries, while at the same time helping to alleviate the seawater intrusion problem in the overdrafted areas by providing an underutilized source of water. The Fox Canyon Groundwater Management Agency (FCGMA) has also tightened restrictions and instituted strict management procedures on all groundwater extractions and well operators located on parcels above the Fox Canyon aquifer.

Threats to water quality in the Santa Clara Watershed include increasing development in floodplain areas, which has necessitated channelization and resulted in increased runoff volumes, velocities, erosion, and loss of habitat. In many disturbed areas the exotic giant reed (*Arundo donax*) has become rampant and presents a significant threat to native habitats.

Wildlife, Habitats and Vegetation

The Santa Clara River is one of the last natural river systems in Southern California. A variety of upland, riparian, and wetland vegetation types exist within the Santa Clara River floodplain that provide habitat for a diverse assemblage of plant and animal species. The river corridor also acts as a landscape linkage providing for wildlife movement between and amongst habitat patches from the San Gabriel Mountains to the Pacific Ocean.

Extensive areas of high quality riparian habitat are present along the length of the Santa Clara River and its tributaries. The endangered unarmored stickleback and Southern California steelhead are resident in the river. One of the largest of the Santa Clara River's tributaries, Sespe Creek, is designated a wild trout stream by the State of California and supports significant spawning and rearing habitat. Sespe Creek is also designated a Wild and Scenic River. Piru and Santa Paula Creeks, which are tributaries to the Santa Clara River, also support good habitats for steelhead.

The U.S. Fish and Wildlife Service has designated critical habitat areas for sensitive species in locations throughout the Santa Clara River Watershed. Critical habitat areas have been established for the California condor, vernal pool fairy shrimp, southwestern willow flycatcher, least Bell's

vireo, arroyo toad, California red-legged frog, and tidewater goby. Figure 3-13 depicts the locations of designated critical habitat areas.

Issues and Needs in the Watershed

Some critical issues and needs identified by stakeholders in the Watershed include:

Water Supply Issues

- Groundwater and imported water supply
- Water distribution system reliability – interconnection
- Water conservation
- Water recycling – education of end users
- Enhancement of local supply – improved reliability
- Lack of public education on all of the above

Water Quality Concerns

- Seawater intrusion
- Waste water treatment plant – nitrogen and chloride
- Agricultural runoff – TMDL
- Agricultural and urban erosion – sediment loading/hydrology model
- Stormwater/urban runoff – quality and management
- Basin plan objectives
- RWQCB fines/penalties
- Permit compliance
- Impacts from remaining septic systems – nitrates and salts

Flood Management Issues

- Levee maintenance
- Floodplain development and land use planning
- Steep slopes and sensitive habitat areas
- Hydrology – peak flow
- Structures and damage
- Habitat loss

Environment/Habitat Issues

- Infrastructure
- Habitat restoration
  - Endangered species and fish
  - Invasive species
- Disadvantaged communities

3.3.3 Ventura River Watershed Characterization

The Ventura River Watershed is a coastal Watershed located in the northwestern portion of Ventura County draining an area of 228 square miles roughly half of which is on Forest Service land (USFS, 1997). The Ventura River has several major tributaries including Matilija, North Fork Matilija, San Antonio, and Canada Larga. Lake Casitas serves as the primary water supply for the area within the watershed. The Rincon and Hall/Arundell Watersheds are generally, and for the purposes of this Plan, grouped together with the Ventura River Watershed.

The Ventura River Watershed is minimally developed and compared to other watersheds of the Region has large areas with good water quality and excellent aquatic habitat. About 30 miles of the upper Fork of Matilija Creek and its tributaries are designated as Wild and Scenic Rivers.

While much of the water quality is considered good, the watershed has been degraded, particularly in the lower areas, by both nonpoint and point sources. Beach closures due to bacterial pollution are common. The major point source is the Ojai Valley Wastewater Treatment Plant which was recently upgraded and septic systems in the Ojai Valley. Nonpoint sources include urban runoff, construction, agriculture and grazing (including confined animal facilities), air deposition, and recreation. Water quantity is an important issue in this watershed. Groundwater is used for domestic and irrigation purposes and the alluvial basins must be carefully managed and recharged. Groundwater basins generally are aligned with the surface flows and are made up of alluvial material that is quickly recharged and depleted and is highly interconnected with surface flows. The Southern California steelhead and other fisheries are restricted or diminished by diversions and dams that have cut off important spawning areas by diminished flow in the main stem of the river and by poor water quality.

Hydrology

Surface Water

From the upper slopes of the mountains of the Transverse Range, the surface water system in the Ventura River Watershed generally flows southward to an estuary located at the mouth of the Ventura River. Groundwater basins composed of alluvial aquifers located along the surface water system are highly interconnected with the surface water system and are quickly recharged or depleted according to surface flow conditions. Topography in the watershed is rugged, and as a result creeks that drain the watershed have very steep gradients ranging from 40 feet per mile at the mouth to 150 feet per mile at the headwaters.

Precipitation varies widely in the Ventura River Watershed with most occurring as rainfall during just a few storms between November and March. Summer and fall months are typically dry. Although snow occurs at higher elevations, melting snowpack does not sustain significant runoff in warmer months. About 80 percent of the time, there is no significant surface flow in the Ventura

River above the confluence with San Antonio Creek. The seasonal weather pattern, coupled with the steep gradients throughout most of the watershed, result in high flow velocities with most runoff reaching the ocean.

Lake Casitas (Casitas Reservoir): Lake Casitas is the largest local reservoir with a capacity of 254,000 acre feet. The approximate safe yield is 20,000 acre feet per year without the Matilija Dam and 20,800 acre feet with the Matilija Dam. About a half of the water that fills Lake Casitas comes from diversions off of the Ventura River from the Robles Fish Passage Facility, which is located a few miles north of Lake Casitas. The water then travels through the Robles Canal to Lake Casitas. The remainder of water supply to Lake Casitas comes from the Coyote and Santa Ana Creeks that both flow into the lake. The Casitas Municipal Water District, according to the *Casitas Municipal Water District 2010 Urban Water Management Plan* serves about 68,000 people. Over 40 percent of Casitas' water goes to agricultural customers. Casitas has about 2,700 customers and is considered both a retail and wholesale water agency. Casitas operates one well, the Mira Monte well, which provides a water supply of about 300 acre feet per year. The high quality surface water from Lake Casitas is mixed with the well water to improve its water quality.

Matilija Reservoir: Due to the accumulation of silt behind the Matilija Dam, Matilija Reservoir has less than 500 acre feet of remaining storage and provides an average of approximately 800 acre feet of water per year to Lake Casitas through multiple releases during the rainy season. Matilija Reservoir will cease to exist after it has completely silted up, or after the Matilija Dam removal project has been completed.

Ventura River: Ventura River surface water is diverted by the City of Ventura for use in the City's delivery system via an in-stream underground dam and group of shallow extraction wells at Foster Park. A few individual property owners also divert some water from the Ventura River, and water is also diverted for agricultural use by private individuals along the river. Several small mutual water companies, the U.S. Forest Service, and private individuals use wells and springs associated with the river as their source of water supply.

Groundwater

The Ventura River system is composed of five major groundwater basins: the Upper Ojai, Ojai, Upper Ventura River, Lower Ventura River, and the San Antonio Creek basins. These basins fluctuate annually and seasonally with the highest groundwater levels occurring in the winter and the lowest levels occurring in the late summer and early fall. The primary source of recharge to the groundwater system is direct infiltration of precipitation.

Flood Management and Infrastructure

The Ventura River Watershed has the highest annual rainfall and rainfall intensities of the major watersheds in the County. It is also characterized by steep slopes with a relatively high percentage of slope failure areas that can contribute sediment to the streams. The high sediment loads decrease the ability of the Ventura River and its tributary streams to convey the storm flow within their channels and leads to flooding damage in developed areas. The potential flooding problem is increased by the fact that the Ojai area development is built on ancient alluvial fans that have experienced periodic significant debris flows over time. Alluvial fans are characterized by braided

stream systems that are not easily channelized into one stream, and have a tendency to form new channels during extreme storm events and debris flows.

The intense rainfall and steep slopes in the watershed yield high peak flows with large erosive potential, as can be seen by tens of feet of scour observed in channels such as San Antonio Creek. Because the rainfall events causing this scour occur relatively infrequently, channels are dry most of the year and damaging floods have occurred relatively infrequently. This has led to encroachment of development into historic floodplain areas during periods between floods and increases the potential for flood damage when storm events occur. Some homes along the lower San Antonio Creek are located very close to the stream in the 100-year floodplain. Homes located along smaller creeks such as Thacher, Canada Larga, and McNell are also subject to flooding damages during storm events. High flows have damaged creek pipeline crossings, leading to pipeline breaks and large volume sewage spills. Fossil fuel pipelines can also be threatened by the storm flow.

The Ventura River ultimately receives all of the runoff from its tributaries, and combined with imbalances in its sediment equilibrium due to Matilija Dam and other debris basins, has the potential to cause significant scour and bank erosion. Even banks that have been armored with bank protection can be damaged by floods with levee breaches occurring and threatening adjacent homes and businesses. Neighborhoods built on bluffs adjacent to the river have seen their backyards disappear due to bend scour and meandering of the river during storm events. Near the outlet of the river, the Highway 101 river crossing does not have adequate capacity and is subject to flooding and closures during fairly low flow levels. An adjacent RV park is flooded at even smaller flow levels and periodically requires evacuation.

Issues and Needs in the Watershed

Land use agencies and water districts with projects within the Ventura River Watershed provided information on the key issues of concern with respect to water supply, water quality, and environmental/habitat concerns. Primary issues of concern include:

Water Supply Management Optimization

- Water quantity
- Water distribution system reliability – interconnection
- Source protection- providing security and protection
- Additional water supplies and/or increased efficiency

Habitat Restoration

- Steelhead recovery
- Arundo removal

Water Quality

- Pollution prevention
- Stormwater/urban runoff – quality and management
- Septic system pollution

Flood Control

- Channel maintenance

- Watershed assessment of flooding

3.3.4 Major Water-Related Infrastructure

3.3.4.1 Water and Wastewater Infrastructure

Major Water Wholesale Agencies

As described earlier in this section, there are three major wholesale water agencies in the Region: Calleguas Municipal Water District, Casitas Municipal Water District and United Water Conservation District. Figure 3-6 contains a map with the boundaries of all of the major water purveyors, including the three wholesale water agencies.

Calleguas Municipal Water District:

The Calleguas Municipal Water District (Calleguas) provides imported State water (SWP) for wholesale purposes to retail water purveyors serving municipal/industrial customers in the southeastern portion of the County. The District serves an area of approximately 350 square miles, including the Cities of Camarillo, Moorpark, Oxnard, Port Hueneme, Simi Valley, and Thousand Oaks, and the unincorporated communities of Oak Park, Santa Rosa Valley, Bell Canyon, Lake Sherwood, Somis, Camarillo Estates, and Camarillo Heights. Calleguas delivers the largest volume of water to retailers. Approximately 75 percent of the population in the County receives water imported by Calleguas. Calleguas, a member agency of the Metropolitan Water District (MWD). According to the *Calleguas Municipal Water District 2010 Urban Water Management Plan*, the population served is over 632,000 and annual water delivery is typically more than 168,000 acre-feet. In 2013 Calleguas imported a total of 112,466 acre-feet of treated SWP water. Figure 3-10a depicts the location of the major water system infrastructure operated by the Calleguas Municipal Water District.

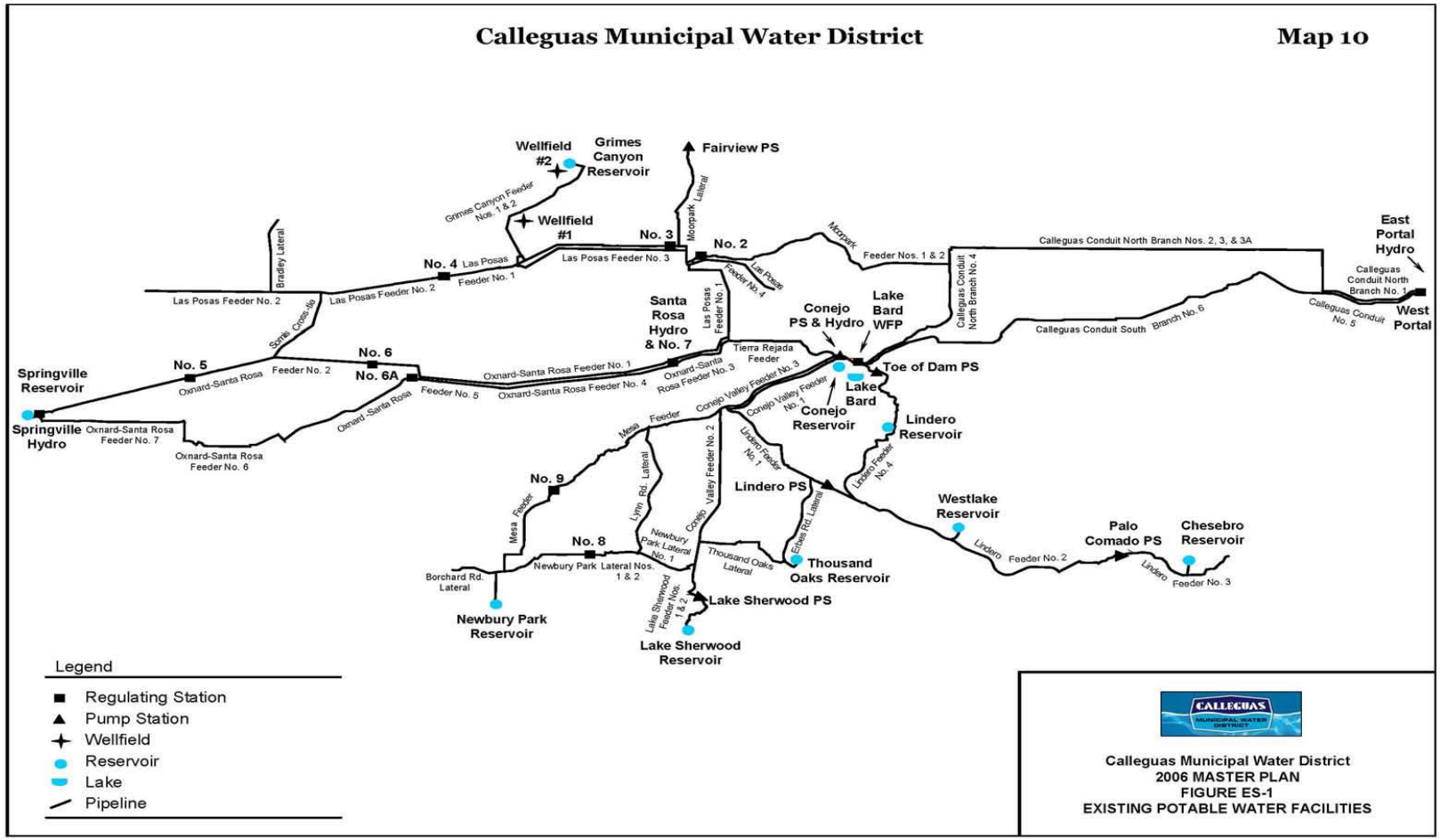


Figure 3-10a
Calleguas Municipal Water District
Major Infrastructure
WCVC IRWM Region

Casitas Municipal Water District:

The Casitas Municipal Water District (Casitas) provides wholesale and retail water distribution from Lake Casitas and has the primary responsibility for delivery of surface water from Lake Casitas. The District manages Lake Casitas has a storage capacity of 254,000 acre feet and serves approximately 65,000 people. Approximately 45 percent of the inflow to the Casitas reservoir comes from runoff in the 34-square-mile surrounding drainage area. The remaining 55 percent is diverted to Casitas from the 74-square-mile Ventura River-Matilija Creek Watershed through the Robles-Casitas Canal. Figure 3-10b depicts the major infrastructure operated by Casitas.

United Water Conservation District:

The United Water Conservation District (United) is responsible for groundwater recharge in the Ventura County portion of the Santa Clara River Valley and on the Oxnard Plain and for the wholesale distribution of water to purveyors on the Oxnard Plain. United operates Lake Piru (87,000 acre-foot capacity), and water from the lake is released to the Santa Clara River for recharge of the Piru, Fillmore, and Santa Paula basins. When possible, United imports State Project Water into Ventura County from Lake Pyramid which lies upstream of Piru. The Piru diversion on Piru Creek recharges upstream groundwater basins at recharge ponds in Piru. The Freeman Diversion in Saticoy conveys river water to spreading grounds where it recharges groundwater for subsequent use by municipal and agricultural pumpers. The Freeman Diversion has an average yield of approximately 69,000 AFY of water diverted from the Santa Clara River. The location of the Freeman Diversion and other facilities operated by the United Water Conservation District are depicted on Figure 3-10c. Total groundwater pumping within United's service area is approximately 180,000 AFY.

Other Water Purveyors in Ventura County

In addition to the major wholesalers, there are numerous public and private water retail districts that provide water to agricultural users and rural residents. Figure 3-6 shows the boundaries of these entities. Many of the cities in Ventura County operate water treatment facilities. As of year-end 2002, there were 166 licensed water purveyors in Ventura County. This includes seven (7) city-owned and operated systems, 22 special water districts, 25 public water purveyors, five (5) Public Utility Commission (PUC) regulated water companies, 63 mutual water companies, and 59 other privately owned systems of varying sizes. In 2006 the Ventura County Watershed Protection District compiled a database entitled "Inventory of Public and Private Water Purveyors in Ventura County." This database is available from the District in printed and electronic formats. The database provides information on the location and contacts, the wholesale water district area in which individual districts are located; officers, governing board; staff; website; wells; connections; and comments.

In addition to the 500 or so water wells owned or operated by the retail and wholesale water providers, it is estimated there are about 2,500 additional individual well owners within the County who obtain their water directly from groundwater sources. Of the groundwater pumped in Ventura County, less than one-third is delivered by a water district. Individual well owners do most of the groundwater pumping in Ventura County, mostly for irrigation purposes.

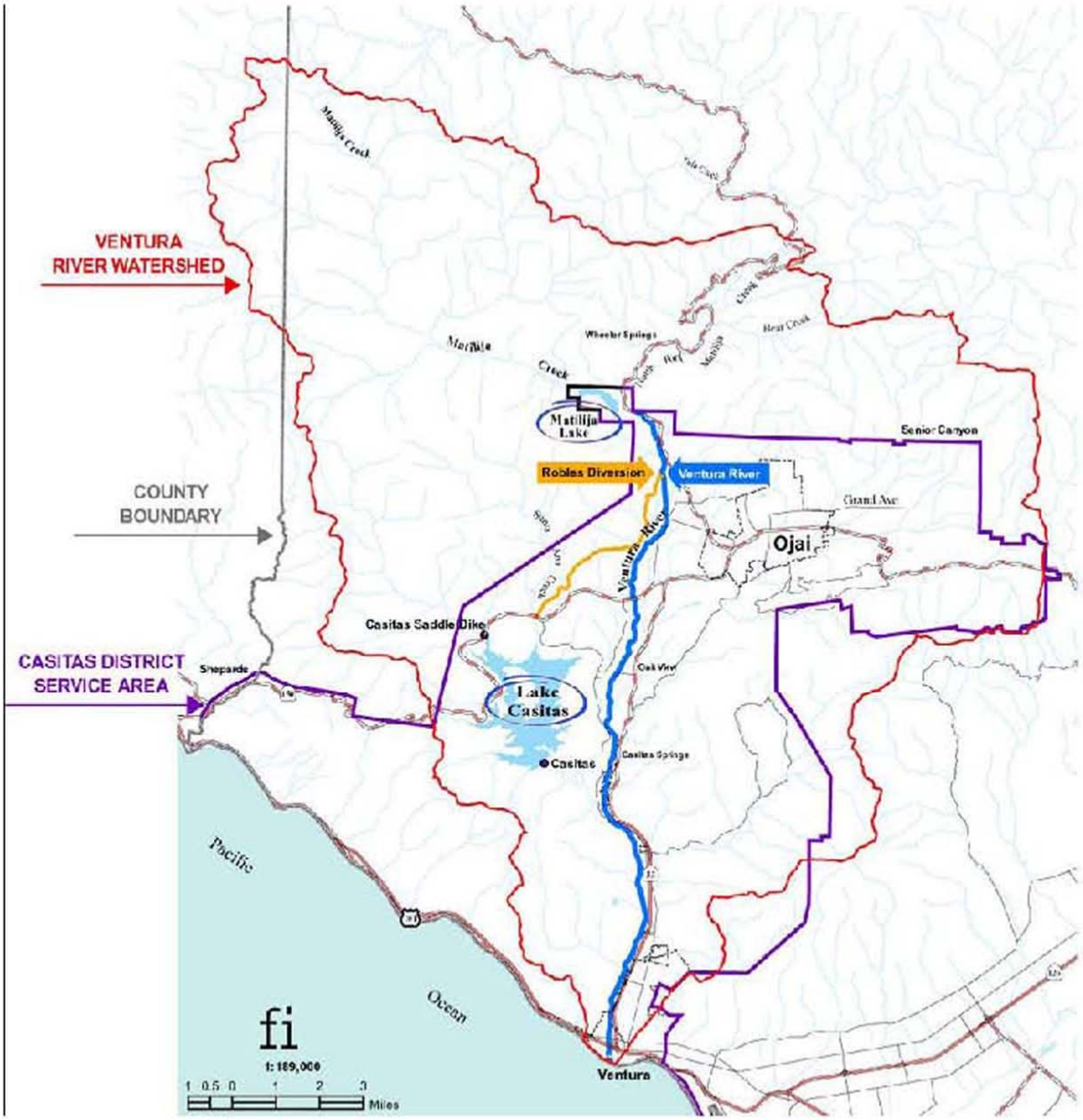


Figure 3-10b

Casitas Municipal Water District

Major Infrastructure

WCVC IRWM Region

United Water Conservation District

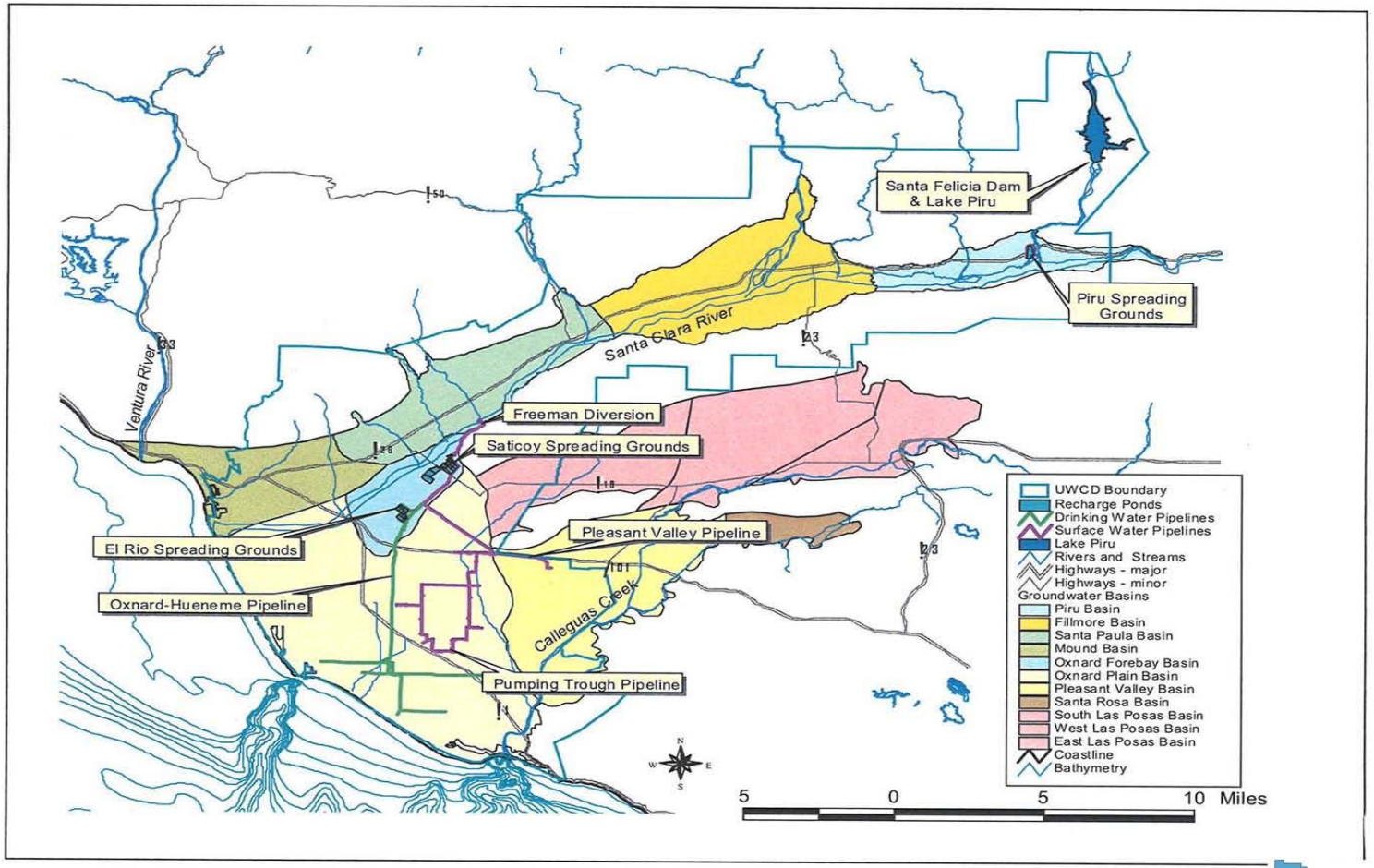


Figure 3-10c United Water Conservation District Major Infrastructure WCVC IRWM Region

3.3.4.2 Flood Improvement Infrastructure

The Ventura County Watershed Protection District is the regional flood control agency. In order to develop regional solutions to flooding, the District has devoted significant funds and staff resource in watershed-level feasibility studies on all of the major streams such as Calleguas Creek, Santa Clara River, and Ventura River (Matilija Dam Ecosystem Restoration project). The District has also developed an Integrated Watershed Protection Plan (IWPP) that identifies local and regional problems and opportunities to reduce flooding in the County and outlines funding needs over a 20-year planning horizon. Development of the IWPP documents are coordinated with local Cities and other agencies. The objectives of the county-wide IWPP are the following:

1. To provide a systematic process for the inclusion of projects into the District's Capital Improvement Plan (CIP) over its five-year planning period.

2. To improve the long-range District planning process for the 20-year period subsequent to the CIP by allocating projected revenues to identified projects.

3. To provide program goal and priority articulation.

4. To improve interagency project coordination.

5. To help identify funding opportunities.

Many of the projects included on the IWPP project list are updated in conjunction with the watershed-level feasibility studies. By comparing the total projected revenues to the total problem solution costs for the IWPP project list within a zone, an appropriate level of service for solving flooding problems is determined. The Level-of-Service evaluation assists the District, their Board of Supervisors, and stakeholder groups in identifying the need for additional funding to achieve desired flood mitigation levels.

The IWPP and Feasibility Studies provide a list of potential projects to mitigate flooding problems in Ventura County. More general strategies to address flooding concerns were developed in the "Flood Mitigation Plan for Ventura County, California (WPD, 2005)." The Flood Mitigation Plan (FMP) was written to outline the planning efforts to reduce risks associated with flooding, post-fire debris flow, dam failure, and to mitigate the losses from repetitively damaged structures in the County. The FMP gives the County the ability to apply for project grants to implement the FMP strategies.

FMP strategies to mitigate flooding damages include:

1. Build and support local capacity and commitment to become less vulnerable to flood hazards.

2. Promote public understanding, support, and demand for regional flood hazard mitigation.

3. Reduce the possibility of damage and losses to assets, particularly people, critical facilities, and District-owned facilities, due to floods.

4. Reduce the possibility of damage and losses to assets, particularly people, critical facilities, and District-owned facilities, due to dam failure.

5. Reduce the possibility of damage and losses to assets, particularly people, critical facilities, and District-owned facilities, due to post-fire debris flows.

6. Reduce the number of repetitively damaged structures and the associated claims to the National Flood Insurance Program.

The IWPP provides for several types of projects intended to reduce flooding in Ventura County. Projects are proposed to address the flooding concerns identified in each of four watersheds of Ventura County; Ventura River, Santa Clara River, Calleguas Creek and Malibu Creek.

Countywide flooding issues are addressed through a number of different project categories as follows: Operation and Maintenance (O&M); Structural Life; Detention/Debris Basin Retrofit and Upgrade; Flooding Mitigation; Deficiency Study; Right-of-Way/Jurisdiction; Dam Safety and Retrofit; Environmental and Aesthetic Enhancement; and Demonstration Projects.

The definition of each category is provided in the following sections. A project can sometimes fit into more than one category, so a project is generally categorized according to the most important element associated with the project. For example, a facility that requires frequent maintenance due to flooding problems, is generally included in the O&M category rather than the Flooding Mitigation category. On the other hand, facilities that are subject to extensive flooding, but do not require extensive maintenance, are included in the Flooding Mitigation category.

Operations and Maintenance Projects

The O&M projects include facilities with known historic or current problems that require repairs and remediation. The known O&M problems include channel bank erosion, excessive sediment deposition, inadequate drainage facility capacity, channel lining damage, lack of capacity due to vegetation growth, and lack of access to perform necessary maintenance activities.

Structural Life Projects

Structural Life Projects represent channel reaches that may require upgrading or replacement because they are reaching the end of their design life. For planning purposes, Watershed Protection District facilities are assumed to have a useful life of approximately 50 years. Using a 2020 planning horizon, structures built prior to 1970 that will be 50 years or older by 2020, will be candidates for replacement. Channels that are approaching their design life and also lack capacity for current design peak flow estimates are given priority for repair/replacement.

Detention/Debris Basin Retrofit and Upgrade Projects

The detention and debris basins constructed prior to 1970 were built primarily to capture debris and do not provide significant detention or attenuation of inflow peaks. These basins with storage or safety deficiencies may require operability improvements. These include the debris/detention basins in the Watershed Protection District's Debris Basin Manual (1999). However, more recently constructed basins were generally built for both runoff detention and debris capture.

Basins throughout the region have been evaluated to determine whether existing conditions warrant basin improvements or removal. The evaluation of existing conditions consisted of field reconnaissance of each basin to take photos of the basins, principal spillways, emergency spillways, riser structures, and downstream channels. The general conditions of the basins such as vegetation, rip-rap, basin side slopes, and upstream drainage area were also documented. Preliminary analyses consisted of sediment yield estimates and hydrologic/hydraulic analyses to determine if the basins could be retrofitted to improve their flood control capabilities. Several basins were identified as having inadequate operational and emergency spillways that could lead to flooding in downstream developments.

Dam Safety and Retrofit Projects

There are a number of dams with possible structural and performance problems due to design, construction, or maintenance issues which have been identified.

Right-of-Way/Jurisdiction Projects

The Right-of-Way (ROW)/Jurisdiction projects include those facilities that have access or jurisdictional issues.

Flooding Mitigation Projects

The Flooding Mitigation Projects consist of the channel reaches along District jurisdictional channels that are located within the 100-year Federal Emergency Management Agency (FEMA) floodplain boundaries. Flood damages were estimated based on FEMA 100-year floodplain information, land use data, and structural value information contained in Ventura County's parcel database. Flood mitigation project costs were estimated based on the associated damages, and detailed deficiency analyses were performed to determine the improvements to solve the flooding problem. The resultant projects are general flood mitigation projects with construction costs equal to the flooding damages.

For detailed information on the IWPP Implementation process, see the IWPP Reports at http://www.vcwatershed.org/Projects_IWPP.html.

Local cities operate local storm drain projects; many of the storm drains feeding into the WPD facilities are built by cities or developers for cities.

Also important, hydrologic design standards are used by the Ventura County Watershed Protection District (District) and other local entities (eg. cities) to evaluate the potential increase in flooding due to proposed developments. The results of the design studies are used to develop mitigation strategies for reducing developed peak flows in the channel system. The District also engages in sediment transport studies of the major streams to evaluate the effects of development on scour and deposition in the channels and their effect on flooding.

Please see Figure 3-11 for a depiction of the major local flood improvement infrastructure.

3.3.5 Major Land Use Categories in Ventura County

As previously noted, the County and the ten Cities have worked together to confine urban development within City boundaries and preserve the unincorporated area for agriculture and open space. Figure 3-12 depicts the major categories of land use as designated in local general plans.

Agricultural: The "Agricultural" designation is applied to irrigated lands which are suitable for the cultivation of crops and the raising of livestock. Because of the inherent importance of agriculture as a land use in and of itself, agriculture is not subsumed under the "Open Space" land use designation but has been assigned a separate land use designation.

Open Space: The Open Space designation encompasses land as defined under Section 65560 of the State Government Code as any parcel or area of land or water which is essentially unimproved and devoted to an open space use as defined in this section, and which is designated on a local, regional, or State open space plan as any of the following:

- Open space for the preservation of natural resources including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.

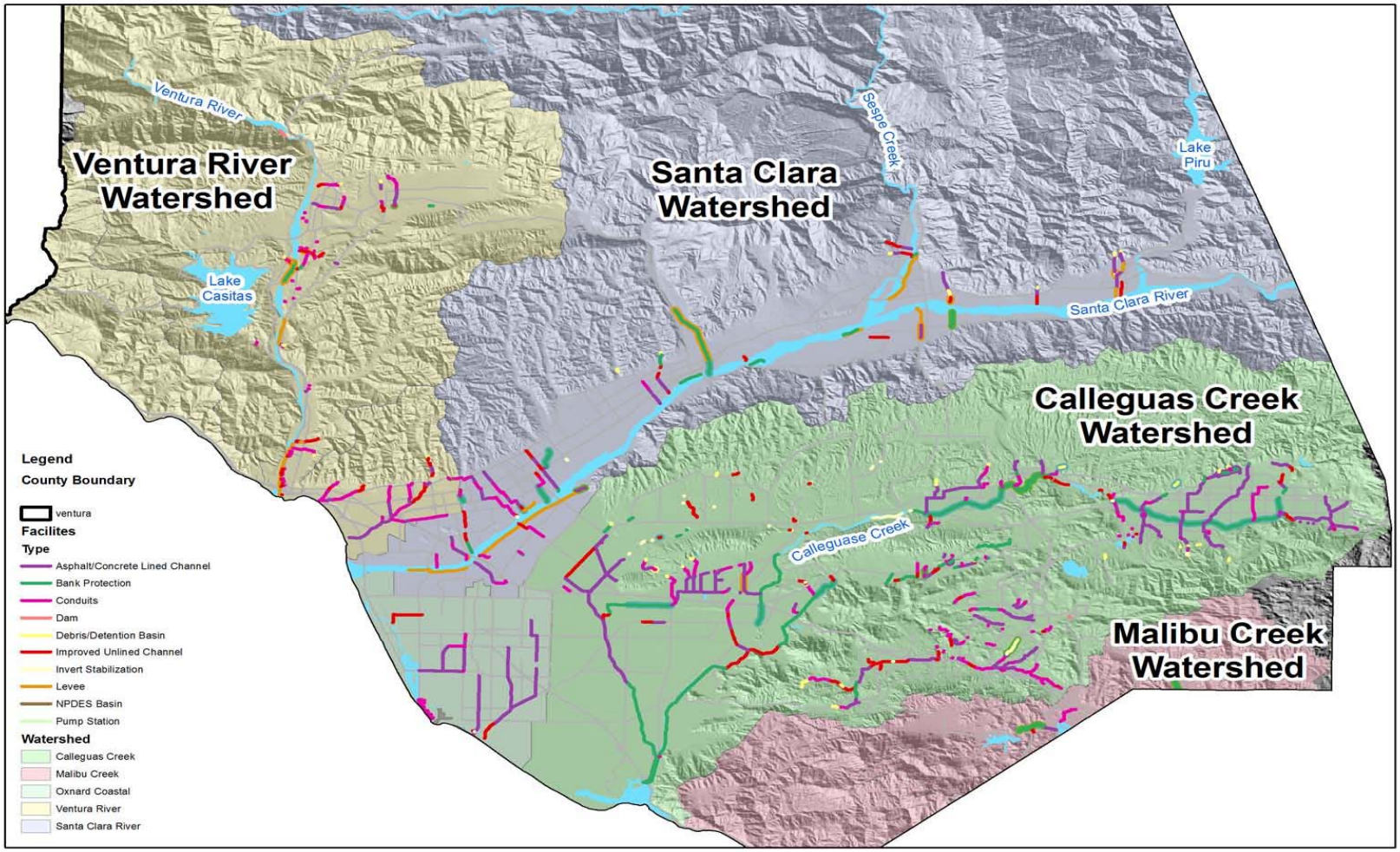


Figure 3-11
Flood Improvement Infrastructure
WCVC IRWM Region

Figure 3-12
Land Use Designations
WCVC IRWM Region

- Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands not designated agricultural; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.

- Open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.

- Open space for public health and safety, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, floodplains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs, and areas required for the protection and enhancement of air quality.

For local planning purposes, and in support of the Guidelines for Orderly Development, Ventura County's General Plan also uses "Open Space" for the following purposes:

- Open space to promote the formation and continuation of cohesive communities by defining the boundaries and by helping to prevent urban sprawl.

- Open space to promote efficient municipal services and facilities by confining urban development to defined development areas.

Rural: The "Rural" designation identifies areas suitable for low-density and low-intensity land uses such as residential estates of two acres or greater parcel size and other rural uses which are maintained in conjunction with agricultural and horticultural uses or in conjunction with the keeping of farm animals for recreational purposes.

The "Rural" designation also identifies institutional uses such as boarding and non-boarding elementary and secondary schools. Additionally, the designation is utilized for recreational uses such as retreats, camps, recreational vehicle parks and campgrounds. The designation of areas for "Rural" land uses is intended to accommodate the need for low density rural residential development, which in conjunction with the higher density development of the Urban designated land uses, will provide a full range of residential environments.

The areas considered for inclusion in the "Rural" designation are existing clusters of rural development and areas deemed appropriate for future rural residential development. This category is mainly applicable in the unincorporated County.

Existing Community: The Existing Community designation identifies existing urban residential, commercial or industrial enclaves located outside Urban designated areas. An Existing Community may include uses, densities, building intensities, and zoning designations which are normally limited to Urban designated areas but do not qualify as urban centers. This designation has been established to recognize existing land uses in unincorporated areas which have been developed with urban building intensities and urban land uses; to contain these enclaves within specific areas

so as to prevent further expansion; and to limit the building intensity and land use to previously established levels. This category is mainly applicable in the unincorporated County.

State or Federal Facility: The "State or Federal Facility" land use designation recognizes Federal or State facilities, excluding forest and park lands, over which the County or Cities have no or limited land use authority. Areas so designated include lands under Federal or State ownership on which governmental facilities are located. Major examples of these facilities are Naval Base Ventura County and the California State University at Channel Islands. This category is mainly applicable in the unincorporated County.

Urban: The "Urban" land use designation is utilized to depict existing and planned urban centers which include commercial and industrial uses as well as residential uses where the building intensity is greater than one principal dwelling unit per two acres. This designation has been applied to all incorporated lands within a City's Sphere of Influence as established by the Local Agency Formation Commission (LAFCO), and unincorporated urban centers within their own Areas of Interest which may be candidates for future incorporation.

- An Unincorporated Urban Center is an existing or planned community which is located in an Area of Interest where no City exists. The unincorporated urban center represents the focal center for community and planning activities within the Area of Interest. For example, the Community of Piru represents the focal center in the Piru Area of Interest.

- An Area of Interest is a major geographic area reflective of community and planning identity. Within each Area of Interest there should be no more than one City or Unincorporated Urban Center, but there will not necessarily be a City or Unincorporated Urban Center in each Area of Interest.

- A Sphere of Influence is an area determined by LAFCO to represent the "probable" ultimate boundary of a City.

3.3.6 Areas of Special Biological Significance and Critical Habitat Areas

There are 34 ocean areas along the California coast that have been designated as Areas of Special Biological Significance (ASBS) under the Public Resources Code 36700 (f). The water quality of these marine areas is monitored by the State Water Resources Control Board. The State Water Board's Ocean Plan prohibits waste discharges into these marine habitat areas.

Two ASBS have been established in Ventura County: ASBS 22 and ASBS 24.

ASBS 22. This area includes two Channel Islands: Anacapa and Santa Barbara Islands. Both are entirely within Channel Islands National Park, which include San Miguel, Santa Cruz, and Santa Rosa Islands. While the County works with the National Park Service on issues of mutual concern, it is unlikely that the County's water management programs and projects would significantly impact the Areas of Special Biological Significance around these islands.

ASBS 24. This area runs along Ventura County's southern coastline, from south of Mugu Lagoon past the border between Ventura and Los Angeles Counties. It extends from the beach into the Pacific Ocean for varying distances along the coast. At its northern tip, this ASBS would be affected

by runoff from the Calleguas Creek Watershed. Because there are substantial urban areas and agricultural operations within the Calleguas Creek Watershed, urban pollution sources and agricultural runoff are issues that will require consideration and have been addressed in the IRWMP. Farther south, the South Coast Watershed (the Santa Monica Mountains portion within Ventura County) drains into ASBS 24. Much of this watershed is public open space, including Point Mugu State Park and parts of the Santa Monica Mountains National Recreation Area (SMMNRA). Scattered among the SMMNRA holdings are a substantial number of privately owned properties. These properties are developed at very low intensity, with scattered houses, some livestock, and very little agriculture; however they are all on private wells, and all use individual septic system sewage disposal. Water management in this watershed must take into consideration the potential for impacts to ASBS 24.

Critical Habitat for Federally Listed Threatened and Endangered Species

The U.S. Fish and Wildlife Service has designated critical habitat for certain federally listed threatened and endangered species. Critical habitat areas for the Region are shown in Figure 3-13.

3.3.7 Marine Protected Areas

The areas around the five island Channel Islands National Park (some 12 to 15 miles offshore) are a part of a National Marine Sanctuary. In addition, there is a strip of the Pacific Ocean, at least three miles wide, extending along the County's entire coastline, which is a Marine Protected Area. The Ventura River, Santa Clara River, and Calleguas Creek Watersheds each drain into these marine areas with resulting impacts on the water. These are among the issues that must be addressed by Watershed Management Plans in the County.

3.3.8 Impaired Water Bodies

SECTION 303(D) List of Water Quality Limited Segments

Under Section 303(d) of the 1972 Clean Water Act, States, territories and authorized tribes are required to develop a list of water quality limited segments. Waters on the list do not meet water quality standards, even though the generators of point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called as Total Maximum Daily Loads (TMDL), to improve water quality.

The Section 303(d) Impaired Waterbodies in Ventura County (adopted in 2010) are listed, by watershed, in Appendix D.

Calleguas Creek Watershed

The Calleguas Creek Watershed has perhaps the most serious impairment problems of Ventura County's watersheds; as 14 separate reaches of the Calleguas Creek are listed in the EPA's 303(d) list of impaired water bodies. A variety of pollutants from agricultural and urban sources, such as pesticides and metals, have been identified as impairments to the quality of creek water.

Santa Clara River Watershed

The Santa Clara River Watershed is experiencing significant chloride levels from agricultural uses and wastewater effluent discharges into the River. TMDLs are completed for chlorides and nutrients. Impaired water bodies on the EPA 303(d) list of impaired water bodies within the watershed , include five (5) reaches of the Santa Clara River, the Santa Clara River estuary, McGrath Lake, five (5) creeks, and two (2) harbors,

Channel Islands Harbor: The Harbor was on the 2002 303(d) list for lead and zinc. The Harbor is on the 2010 303(d) list for pathogens. During the early to mid-1980s, the State Mussel Watch Program (SMWP) found low to intermediate levels of metals and organics except for one especially high accumulation of DDT. Sediment sampling for metals in 1988 revealed slightly to moderately elevated levels. Copper at one site was nearly 50 ppm and zinc was as high as 76 ppm. Arsenic was slightly elevated (4 ppm) at a sampling site located next to a drain possibly connected to a nearby agricultural field.

Port Hueneme Harbor: The Harbor is on the 2010 303(d) list for PCBs and DDT. The harbor previously was on the 2002 list for PAHs, DDT, PCBs, TBT, and zinc. The SMWP has found elevated levels of Cu, Zn, PAHs, and PCBs. Zinc was at elevated levels on the commercial side while PCBs were very high on the Navy side. Sediment core samples were collected in 1985 and 1996 as part of a proposed dredge project. Relatively low levels of metals were found and no pesticides were detected.

Ventura River Watershed

The Ventura River Watershed's impairments are due to structures such as fish barriers and pumping/water diversions, biological sources such as those from coliform, and those due to chemical sources. There are 15 water quality impaired segments listed on the EPA's 303(d) list of impaired water bodies, but no TMDLs have been completed yet.

- Ventura Keys
- Ventura Jetties
- Wheeler Canyon/Todd Barranca
- Canada Larga
- Matilija Creek (two reaches)
- Matilija Reservoir
- San Antonio Creek
- San Buenaventura Beach
- Ventura River Estuary
- Ventura River (four reaches)

3.4 Water Supply and Demand

This section includes an overview of water supplies and water demand within the WCVC IRWM Region. As described earlier in this section, there are many water districts of varying sizes and individual well owners in the Region - and no centralized water authority. Information regarding water supply and demand in the Region comes from a variety of sources, some more precise than

others. Some water use is actually measured, while other water use statistics are estimated based on a variety of assumptions (i.e. irrigation water used to grow certain crops is based on acreage and estimated crop water use factors). Urban water use (otherwise known as M&I or Municipal Industrial which includes residential, commercial, industrial, and institutional uses), for the most part, is metered and closely monitored, particularly for the larger municipal suppliers. Most of those entities are required to prepare Urban Water Management Plans every five years which contain detailed information regarding current and future water sources/supplies and water demand, groundwater management, recycled water, drought contingency planning, and water use efficiency (demand management) measures. There are a number of smaller water providers (i.e. mutual water companies) whose water use information is not as easily accessed for planning purposes.

Most agricultural use in the Region is served by local groundwater, and not all agricultural use is closely monitored due to lack of meters, and the fact that groundwater is only "managed" in a few of the basins. Detailed information about groundwater use is only available in some basins in the Region, presenting challenges to the establishment of detailed, reliable, region-wide data on water supply and demand.
The last time a comprehensive water management plan was prepared addressing all water supply and demand, and the balance between the two, in Ventura County - including current and future estimates and projections - was in 1994. The Ventura County Water Management Plan was prepared by County staff at the Direction of the Board of Supervisors in 1994. In November of 2009 a memo was prepared by County Watershed Protection District staff which included very general total water demand estimates for the County. The author of the memo stated that "limitations in the data including incomplete reporting, lack of meters, and erroneous estimates from users make it impossible to know exactly how much water is actually being used in the County."

3.4.1 Overview of Water Supplies

Ventura County has a diverse variety of water supply sources, although the mix of supplies varies greatly by watershed. The County's water supplies are primarily obtained from three major sources: groundwater (67 percent), surface water (9 percent), and imported State Water (21 percent). A small amount of recycled water (approximately 3 percent) is also used when and where it is available. Currently no desalination projects have been developed.

3.4.1.1 Groundwater

Groundwater is the largest single source of water in the Region, about 65 percent of supplies, and is pumped extensively by individual well owners and by a majority of the 166 public and private water purveyors within the County. Purveyors either wholesale water to other purveyors or make deliveries directly to individual users. Since more groundwater is used than is replaced, overall, the County's groundwater reserves are slowly decreasing. Agricultural demand accounts for most of the demand for groundwater in the County. Figure 3-8 depicts the boundaries of the 32 separate groundwater areas or recognized groundwater basins in Ventura County.

Of the total County water demand of approximately 443,400 acre feet (AF), about 253,500 AF comes from local groundwater sources. As stated above, more groundwater is extracted than can

be annually replenished resulting in overdraft. However, overdraft is not evenly distributed. While some basins experienced more replenishment than extraction, overdraft of between 25,000 to 30,000 AFY persists for the Oxnard Plain and Pleasant Valley.

Most (50-60 percent) of the groundwater supply in the County is contained within five major aquifers beneath the Oxnard Plain-Pleasant Valley area. These aquifers are, in order of increasing depth, the Oxnard, Mugu, Hueneme, Fox Canyon, and Grimes Canyon aquifer zones. Both the Oxnard aquifer in the Oxnard Plain area, and the deeper Fox Canyon aquifer, which effectively extends from the present day coastline to inland areas northeast of the City of Moorpark, were previously, or are currently, being overdrafted or "mined" of their resource. Overdraft of the local water supply has caused a number of problems, most notably seawater intrusion in the Upper Aquifer System (UAS) and Lower Aquifer System (LAS) of the Oxnard Plain. The UAS consists of the Oxnard and the Mugu aquifers. The LAS is comprised of the Hueneme, Fox Canyon, and Grimes Canyon aquifers.

Of the groundwater pumped in Ventura County, less than one-third is delivered by a water system. Individual well owners do most of the groundwater pumping in Ventura County and use it mostly for irrigation.

Many farmers obtain water from their own wells. Water demand from the agricultural sector is decreasing, primarily due to land conversion to urban uses. This trend is expected to continue though crops with higher water needs (berries and nursery crops) are replacing crops with lower water needs (lemons and avocados) in many areas. Within the boundaries of the Fox Canyon Groundwater Management Agency (FCGMA), a 25 percent reduction in groundwater extractions is being implemented for well owners as part of Emergency E adopted by the GMA board in April 2014 as a response to the drought. Historically well owners were required to reduce their extractions by 5 percent in but as a result of the drought pumping rates have risen dramatically resulting in the need for an emergency ordinance.

Data Needs

New information has been generated in the past 20 years about groundwater basin storage, yield, and well locations; however, additional information is needed. Current estimates of the safe yield of the 32 recognized groundwater basins is being evaluated since the historic information is not sufficient to perform individual basin balance equations. Although improved well production monitoring has been implemented, many private wells do not have meters, so pumping quantities must be estimated based on energy use and crop consumption factors.

There is also a need to better understand the surface and groundwater interaction throughout basins in the County. Some areas of the County have very high surface to groundwater interaction and the exact nature of that interaction is not well understood. Surface water and groundwater are regulated very differently in California, though according to comments made by State Water Resources Control Board members and staff in recent meetings, there is an attempt to improve conjunctive management of these two critical resources and provide more support to local regions.

Current and future projects proposed for funding as part of the IRWMP would help to solve the lack of data that presently exists in the areas of surface flows, return flows of applied water, natural recharge and more accurate metering of groundwater usage. Although a good baseline of data has been compiled, current data gaps should be addressed to improve resource management, conservation, and protection.

3.4.1.2 Surface Water

Surface water resources in Ventura County are divided into major hydrological units or drainage basins such as the Ventura River Watershed, Santa Clara River Watershed, and the Calleguas Creek Watershed. These main units are further subdivided into dozens of subunits.

Surface water is obtained from Lake Casitas, Lake Piru, and from diversion projects along the Santa Clara River, Ventura River, Santa Paula Creek, Piru Creek, Sespe Creek and Conejo Creek. Local surface water provides approximately 8.5 percent of the total water utilized in Ventura County.

Excluding the major diverters of surface water (Casitas MWD and United WCD), there are approximately 200 other points of diversion (springs, creeks and rivers) in Ventura County as listed in the State's online water rights management database (eWRIMS). There is little formal collection of data about the volume of water diverted at each site. Some reported diversions are only statements of diversion and use with no volume listed, while others are licensed and permitted with an annual maximum of diversion listed. An estimate of annual surface water diverted from these sites is 4,000 to 6,000 acre feet.

3.4.1.3 Imported Water

For the purposes of this Plan, imported water is considered to be water from the State Water Project (SWP), delivered to Southern California from the Bay-Delta. State Water is obtained locally by Calleguas Municipal Water District (Calleguas) from the Metropolitan Water District of Southern California (Metropolitan) for delivery to retail purveyors primarily serving the southern and eastern portions of the County, including some or all of the water needs of the Cities of Thousand Oaks, Simi Valley, Moorpark, Camarillo, Port Hueneme, and Oxnard and agricultural entities in the region. In recent years, imported water amounted to about 25 percent of the water utilized in the County. However, because water quality challenges require imported water to blend with local groundwater supplies, more than 75 percent of the County's population relies on imported water for part or all of its supply.

The United Water Conservation District (UWCD), Casitas MWD, County of Ventura, and the City of Ventura have jointly studied the feasibility of constructing conveyance facilities to import additional State Project Water, to which they collectively hold a yearly entitlement of 20,000 acre feet. Pursuing this entitlement remains a supply option for these agencies; however, analysis of the appropriate institutional and financial arrangements must take place before the participants can plan any facilities construction. The only other way that State Project Water can enter Ventura County, other than through Calleguas via Metropolitan, is from releases out of Lake Pyramid, down Piru Creek, through Lake Piru, and either overflows or planned releases from Santa Felicia Dam into the Santa Clara River. Such imports are arranged by UWCD when conditions are appropriate to facilitate storage and aid in basin management.

The Port Hueneme Water Agency (PHWA) has a long-term lease for 1,850 acre feet of UWCD's annual State Water Project entitlement of 5,000 AF. PHWA obtains this entitlement indirectly from Calleguas via the City of Oxnard. UWCD has, in recent years, been buying the remaining 3,150 AFY from the State Department of Water Resources, which delivers the water from Pyramid Lake via Piru Creek to UWCD's Lake Piru Reservoir. UWCD has, under certain hydrologic conditions, also begun to acquire a portion of the City of Ventura's unused allocation of State Water Project water.

The initial facilities of the SWP, completed in the early 1970s, were designed to meet the original needs of the SWP contractors. It was anticipated that additional SWP facilities would be built over time to meet projected increases in contractor delivery needs. However, as decisions on these additional facilities were repeatedly deferred, public attitudes and environmental regulations changed. In addition, the contracted needs for water from the SWP have increased. As a result, the SWP is not capable of delivering full contractor entitlement each and every year. In particular, statewide drought conditions often result in reduced deliveries. In early 2014 all contractors on the SWP system were notified they would receive only 5 percent of their annual water allotments.

3.4.1.4 Recycled Water

Improved waste water treatment techniques and increased waste water flows, coupled with imported water shortages, increased water demand, and over-drafted groundwater resources, contribute to making recycled water a valuable commodity that municipalities are using to supplement non-potable water needs. Approximately 14,880 acre feet of recycled water is used annually throughout the region (Ventura County Watershed Protection District, 2009). See Table 3-1 for information regarding current and future wastewater recycling in the Region.

Table 3-1
Current and Future Recycled Water Availability

Wastewater Treatment Plants Within WCVC IRWM Region			
Wastewater Treatment Facility and (Capacity)	**Treatment Level and (Disposal Method)**	**Tertiary Use and (Capacity)**	**Future Treatment Goals**
Camarillo Sanitary District (6.75 mgd**)	Tertiary with BNR* (Discharge into Conejo Creek or used for irrigation)	Irrigation (beginning in 2007) (6.75 mgd)	Increase irrigation usage of tertiary water. Cease effluent discharge into Conejo Creek by early 2008)
Camrosa Water District (1.5 mgd)	Tertiary with BNR (Leftover water discharged to Conejo Creek)	Irrigation, CSUCI campus irrigation (1.5 mgd)	Sell all tertiary effluent to customers and discharge in Conejo Creek only during peak wet season; buy additional supplies from Camarillo SD
City of Fillmore (1.8 mgd)	Tertiary with BNR (Percolation into Fillmore Basin)	Irrigation of schools, parks and green areas throughout Fillmore (2.4 mgd)	This plant was completed in 2009

City of Oxnard (31.7 mgd)	Secondary (Discharge to Ocean)	None	Provide tertiary recycled water to Oxnard and Port Hueneme Water Agency for industrial purposes, landscape irrigation, agricultural use, and groundwater injection for seawater intrusion and against salt water intrusion barrier (6.25 mgd in Phase 1; 25 mgd ultimate); receive groundwater recharge credits and build distribution system. Reduce effluent Trihalomethanes (THMs)
City of Santa Paula 4.2 mgd	Tertiary with BNR (Discharge into percolation ponds east of the facility)	Percolation (4.2 mgd)	This plant was completed in 2010
City of Simi Valley (12.5 mgd)	Tertiary with BNR (Discharge into Arroyo Simi)	Irrigation, washwater, and dust abatement (0.9 mgd)	Investment in a regional recycled water distribution system including new pipelines and 2 new reservoirs
City of Thousand Oaks -Hill Canyon WWTP (14.0 mgd)	Tertriary with BNR (Discharge into north fork of Arroyo Conejo)	Irrigation and wetlands (14.0 mgd)	
City of Ventura	Tertiary with BNR (-90% discharge into the Santa Clara River Estuary, -10% to golf course and other uses)	River discharge and irrigation of golf courses (14.0 mgd)	Full BNR, continued recycling to NPDES Permit limits

Montalvo Municipal Improvement District (1.1 mgd)	Secondary (Discharge into the Santa Clara River Estuary)	None	
Ojai Valley Sanitation District (3.0 mgd)	Tetiary with BNR (Discharge into Ventura River)	Discharged to river (3.0 mgd)	Thalium and Bis (2-ethylhexyl) phthalate reduction
Saticoy Sanitary District (0.3 mgd)	Secondary with nutrient removal (Percolation ponds)	None	
City of Moorpark WWTP Ventura County Waterworks District No. 1 (3.0 mgd)	Extended air, secondary activated sludge, filtered tertiary, with BNR (Percolation ponds or optional discharge to Arroyo Las Posas)	Irrigation of golf course (1.5 mgd)	Provide tertiary treatment for all wastewater, increase total capacity to 5.0 mgd. Expand infrastructure and provide tertiary water for agricultural and other irrigation uses in lieu of potable water
Piru -WWTP - Ventura County Waterworks District No. 16 - (0.5 mgd)	Secondary (Percolation Ponds)	None	Plant completed in 2010. Will upgrade treatment process to Tertiary by 2015
VCWWD Todd Road WWTP (0.06 mgd)	Secondary with BNR (percolation)	None	

* BNR = Biological nutrient removal
** MGD = Millions of gallons per day

Water Deliveries By Wholesale Water Districts

Of the three water wholesalers in the Region (Casitas Municipal Water District, Calleguas Municipal Water District, and United Water Conservation District), Calleguas delivers the largest volume of water to retailers. Calleguas delivered 104,104 acre feet in 2012, compared to 97,218 acre feet in 2011, and 94,864 acre feet in 2010.

The United Water Conservation District delivered 32,638 acre feet to retailers and end-users in 2012, up slightly from 31,868 acre feet in 2011. United can store up to 87,000 acre feet in Lake Piru, and at the end of 2012 there was 20,294 acre feet of storage in the lake.

The Casitas Municipal Water District delivered 15,269 acre feet in 2012, with approximately 5,000 acre feet sold to retail water purveyors. The District provides water to residential and agricultural customers and some of the 23 water purveyors in the District's boundaries.

Recent water deliveries from the three major wholesalers in the Region are summarized on Table 3-2.

Table 3-2
Wholesale Water Deliveries 2005-2012

Year	Casitas MWD (acre feet)	Calleguas MWD (acre feet)	United WCD (acre feet)	Annual Total (acre feet)
2005	16,526.50	116,431.80	30,271.46	163,229.76
2006	15,873.80	120,736.30	30,627.87	167,237.97
2007	20,080.90	131,206.10	41,387.64	192,674.64
2008	16,497.70	125,367.50	39,903.80	181,769.00
2009	15,736.10	108,726.00	41,478.00	165,940.10
2010	13,497.48	94,863.70	34,075.80	142,436.98
2011	13,439.25	97,218.00	31,868.00	142,525.25
2012	15,268.49	104,104.00	32,638.00	152,010.49
Total	**126,920.22**	**794,549.40**	**282,250.57**	**1,155,813.70**

Source: 2012 Groundwater Section Annual Report, County of Ventura Watershed Protection District

3.4.2 Water Demand

Ventura County water users consume more water than is locally available, which has resulted in an overdraft of groundwater resources and increasing dependence on imported water supplies. Countywide water demand is over 430,000 acre feet per year (AFY). Approximately 68 percent is used by agriculture, 22 percent is used by residential demands, and 10 percent is used by

commercial and industrial activities. As a result of the recent droughts, County water users have generally become more water efficient. Countywide per capita water use has fluctuated between 58,680 gallons per year (0.18 AFY) to 74,946 gallons per year (0.23 AFY). Per capita water use includes residential, commercial, industrial, and government use divided by population.

Some generalities had to be made to develop an estimate of total water demand for the County. Therefore, a "best attempt" estimate was calculated using water reporting data gathered for calendar year 2007. This data includes information gathered from groundwater management agencies, water wholesaler's, the Groundwater Section Annual Usage Statements, the Association of Water Agencies of Ventura County, and the County Agricultural Commissioner's Office Annual Crop Report. The calculated value was then compared to an overall general estimate of water demand based on population data and irrigated acreage information.

Limitations in the data including incomplete reporting, lack of meters, and erroneous estimates from users make it impossible to know exactly how much water is actually being used in the County. Therefore, the calculated value is considered only a **very general estimate** of total demand for the County.

The County has contracted with a consultant to conduct a study to provide an updated snapshot of water supply and demand statistics for the year 2013. At the time of this writing, that study was not yet available. That information will be included in future updates to the WCVC IRWM Plan.

Municipal Water Supply and Demand

There are ten Cities in Ventura County as well as a number of unincorporated communities. The Cities of Ventura and Oxnard use a blend of imported water, groundwater, and treated surface water. The City of Ventura's water supply comes from water diverted from the Ventura River, groundwater extracted by city wells, and from Lake Casitas. The City of Oxnard uses water from the United Water Conservation District, imported water from Calleguas, and groundwater produced by the City.

The Cities of Simi Valley, Moorpark, and Thousand Oaks, along with the unincorporated communities of Bell Canyon, Newbury Park, Hidden Valley, Lake Sherwood, Oak Park, and a part of Westlake Village rely mainly on water imported from Calleguas.

In the City of Simi Valley, Ventura County Water Works District 8 (VCWWD8) extracts groundwater that is used for agricultural purposes from three wells in the Tapo Canyon area. Groundwater is also extracted from several wells at the west end of the City for de-watering purposes, and that water is discharged to the Arroyo Simi. The City recently completed a one million gallon per day Tapo Canyon Water Treatment Plant that uses the three Tapo Canyon agricultural supply wells to provide water to approximately 500 homes. The Golden State Water Company (GSWC) in Simi Valley extracts groundwater from two wells and blends it with imported water from Calleguas (10 percent groundwater and 90 percent imported water). VCWWD8 provides more than23,000 acre feet of water (68 percent of the City's water demand), while GSWC provides approximately 8,500 acre feet (32 percent of the City's water demand). In 2012, Calleguas delivered 21,613 acre feet to VCWWD8 and 6,875 acre feet to GSWC.

The City of Moorpark receives water from Ventura County Water Works District No. 1. Approximately 75-80 percent of the District's water is imported from Calleguas, which delivered

8,524 acre feet to the District in 2012. The City also extracts groundwater from two wells for park irrigation.

In the City of Thousand Oaks, California Water Service, California American Water, and the City import water from Calleguas to serve the City, Newbury Park, and Westlake Village. The City supplies water to approximately 36 percent of the water users, California American Water serves 48 percent, and California Water Service serves 16 percent. The three water purveyors received 36,522 acre feet from Calleguas in 2012. The City of Thousand Oaks also extracts groundwater for the irrigation of the Hillcrest Avenue median and the Los Robles Golf Course.

Approximately 40-50 percent of the City's water supply is from groundwater produced by four wells. The City must keep its groundwater extraction below the groundwater allocation from the Fox Canyon Groundwater Management Agency. The remaining water supply is imported water provided by Calleguas, which delivered 5,463 acre feet in 2012. Water for some residents of the City is supplied by the Pleasant Valley Mutual (groundwater and imported water), Crestview Mutual (groundwater and imported water), California American Water Company (imported water), and the Camrosa Water District (groundwater and imported water).

The Port Hueneme Water Agency receives and treats water from the United Water Conservation District and blends it with water from Calleguas. The Agency provides water to the City of Port Hueneme, Channel Islands Beach Services Community District, and Naval Base Ventura County.

The City of Ojai and the unincorporated communities of Casitas Springs, Meiners Oaks, and Oak View rely on a mixture of groundwater extracted by local purveyors and wholesale water from the Casitas Municipal Water District that is delivered to local purveyors.

The City of Santa Paula relies on 5,000 to 7,000 acre feet/year of local groundwater. In addition, approximately 500 acre feet/yr of surface water is diverted from Santa Paula Creek and is sent to the Canyon Irrigation Company in exchange for extraction credits for the Santa Paula Groundwater Basin. The City of Fillmore relies solely on 2,600 to 2,800 acre feet/yr of groundwater extracted from City water wells. The community of Piru relies on groundwater delivered by local water purveyors.

Residents of the Lockwood Valley area and the Santa Monica Mountains area, as well as residents in areas not served by a water company, rely on private domestic water wells.

Table 3-3 includes information regarding urban water use derived from the most recent Urban Water Management Plans.

Table 3-3 Urban Water Use in Ventura County

Note: Reflects only those communities with an Urban Water Management Plan (which is required for all water suppliers providing water for more than 3,000 customers)

Area Served	Water Districts with UWMP	Population	Annual System Gross Water Use (Acre/Feet)	Average per Capita Water Use (Acre/feet per year)	Average gal/person/day
Camarillo	Camrosa Water District	26,931	11,721	0.44	389
Camarillo	City of Camarillo	46,694	8,585	0.18	164
Fillmore (1)	City of Fillmore	15,180	2,549	0.17	195
Moorpark	Ventura County Waterworks District #1	37,576	7,954	0.21	189
Ojai	Golden State Water Company - Ojai	7,873	2,007	0.25	228
Oxnard*	City of Oxnard	20,1432*	26,497	0.13	117
Port Hueneme*	City of Port Hueneme	21,555*	3,012	0.14	109
Santa Paula	City of Santa Paula	29,321	3,391	0.12	103
Simi Valley	Golden State Water Company - Simi Valley	38,676	6,513	0.17	150
Simi Valley*	Ventura County Waterworks District #8	90,090	21,496	0.24	213
Thousand Oaks	California American Water Company - Thousand Oaks	62,144	15,235	0.25	218
Thousand Oaks	City of Thousand Oaks	51,609	10,978	0.21	190
Ventura*	City of Ventura	112,496*	17,587	0.16	139
Ventura / Ojai*	Casitas Municipal Water District (retail customers)	9,379	2,651	0.28	243

Westlake Village**	California Water Service - Westlake Village	16,850	9,634	0.57	509
Total		417,143	147,262	**0.24**	212

(1) 2005 data

*2009 data

**2008 data

NOTE: Some communities are served by more than one water purveyor (Camarillo, Simi Valley, Thousand Oaks)

Agricultural Water Supply and Demand

The majority of agricultural demand, as stated before, is met with local water supplies, primarily groundwater. Agricultural water use patterns have shifted in recent years due to both a continued, albeit slow decline in agricultural acreage, and a shift to higher value crops which are often more water-use intensive, such as berries.

Groundwater use may increase or decrease depending on a number of factors. Factors contributing to a reduction in groundwater use would include seawater intrusion abatement programs (which are expected to limit groundwater extractions by providing replacement supplies), increases in reclaimed water availability, and a reduction in agricultural irrigation due to more efficient irrigation practices and fewer acres in agricultural irrigation (unless high-water-use crops replace lower-water-use crops).

Increases in agricultural irrigation could occur from the replacement of low-water-use crop to high-water-use crops such as strawberries, nursery crops, or turf. Even if fewer acres are farmed, if higher water use crops are grown, overall agricultural water demand could increase. In addition, a trend toward agricultural cultivation on hillside and marginal lands may contribute toward an increase in agricultural irrigation. More efficient irrigation practices by agricultural growers are likely to increase, as groundwater extraction reduction ordinances are implemented, water prices increase and water efficiency technology becomes more available and accepted by growers. Agricultural irrigation efficiency training by the University of California Cooperative Extension and the Resource Conservation District's Mobile Irrigation Management Laboratory is discussed in Section IV, Water Demand Management.

The availability and use of imported water for agriculture will depend on cost and policies of the water purveyors. Imported water is of high quality and would best be used to meet high quality water demands such as potable municipal uses.

Agricultural Water Demand by Geographical Area

The major geographical areas of the county and their agricultural water use are discussed below:

Oxnard Plain: Oxnard Plain agricultural users obtain the majority of their water from the five aquifers that underlie the Oxnard Plain. The five aquifers are, in order of increasing depth, Oxnard, Mugu, Hueneme, Fox Canyon, and Grimes Canyon. There is a County ordinance restricting drilling of any new Oxnard and Mugu Aquifer wells which could aggravate seawater intrusion. Surface water from the Santa Clara River is also used by farmers via the Freeman Diversion project to the Pleasant Valley County Water District and the Pumping Trough Pipeline. Over the long-term, agricultural water demand on the Oxnard Plain is expected to decrease due to the urbanization of agricultural land within the sphere of influence of the City of Oxnard. However, if more high-water-use crops such as berries are grown, agricultural water demand may actually increase even if fewer acres are farmed.

Considerable potential exists for use of reclaimed water on the Oxnard Plain particularly because wastewater from the Oxnard treatment plant is currently discharged to the ocean. This discharge is lost to the ocean; therefore, no recharge to groundwater basins occurs. Use of reclaimed water from the Oxnard Treatment Plant for agriculture could significantly decrease the amount of water extracted from groundwater systems beneath the Oxnard Plain. A reduction in groundwater extractions would help alleviate the existing overdraft condition. Reclaimed water is approved for all crop types, though irrigation methods are regulated.

Santa Clara River Valley: The Santa Clara River Valley's agricultural community depends primarily on groundwater for its water supply. In addition, a small amount of surface water is diverted annually from the Piru Creek, Sespe Creek, Santa Paula Creek, and Santa Clara River. It is anticipated there will be some loss of agricultural land in areas adjacent to the cities of Ventura, Santa Paula, and Fillmore due to urbanization. The major source of water for agriculture is expected to continue to be groundwater unless reclaimed water becomes available in sufficient quantities and quality. It should be noted that a large percentage of treated wastewater discharged to rivers percolates into local groundwater basins. Overall, any reduction in demand on groundwater from agriculture is expected to be offset by increased urban demand. In effect, total use of the Santa Clara River Valley's groundwater supply is expected to remain approximately constant.

Conejo-Calleguas Basin: This area includes that portion of Ventura County served by the Calleguas MWD with the exception of the City of Oxnard. In general, most of the agricultural land lies in the western portion of the Calleguas MWD service area around the Las Posas Valley, the Santa Rosa Valley, Moorpark, and adjacent areas. Agricultural water users within the Calleguas MWD depend on groundwater to meet the majority of agricultural water demands. Often it is difficult to determine how much imported water is used to meet agricultural demands because water retailers cannot guarantee the accuracy of such records. Potential demand for additional reclaimed water supplies especially in the Las Posas area is very high.

The Santa Rosa basin has experienced quality problems. Due to the locations of a clay cap and fault, nitrates that enter the basin through septic tanks and agricultural activities are not flushed out.

Ojai Valley: The major sources of water for agricultural water users in the Ojai Valley are Lake Casitas and groundwater within the Ojai basin. One or two small systems depend on naturally occurring springs. In addition to the local Ojai Valley demand on Lake Casitas supplies, agricultural users along the north coast of Ventura County also obtain water from Lake Casitas.

Casitas MWD estimates there will be an increase in agricultural water demand in the future. Should this occur, current local supplies may be insufficient to meet total demand, particularly during droughts. Importation of water would increase the ability of Casitas MWD to meet future demands. However, high quality imported water should be used to meet high quality water demand uses. Imported water could be used for potable uses while local surface and groundwater resources could be used for agricultural irrigation and/or other uses that do not require high quality water.

North Coast: The North Coast area of Ventura County has no significant local groundwater. Water is supplied by Casitas. Most of the water delivered is used by farmers who have established avocado orchards in the area.

Agricultural Water Use Summary: Currently, compared to residential, commercial and industrial water demands, countywide agricultural water demand appears to be slowly decreasing. The decline is based on an expected reduction in agricultural acreage. However, if high-water-use crops and the irrigation of turf replace low-water-use crops, agricultural water demand may increase even with fewer acres being farmed.

To the extent reclaimed water is developed for irrigation use and more farmers implement more efficient water use practices, a decrease in groundwater use may occur.

3.4.3 Impacts of Climate Change on WCVC Region

Stressors and Vulnerabilities

This section identifies the potential climate change stressors and vulnerabilities in the WCVC region. The climate change assessment was performed using the output of computer models that project future conditions from inputs of GHG emissions. These models provide potential climate scenarios that are used for planning purposes.

The primary climate stressors projected by global climate models that are important to this Region are changes in air temperature, changes in precipitation patterns (longer, more frequent droughts and more extreme flood events), and sea level rise. A stressor related to higher temperatures and changes in precipitation is more frequent and intense wildfires. The State of California 2009 Climate Change Impacts Assessment prepared by DWR (DWR 2009) provides the scientific basis for developing statewide climate change impact projections, and provides future climate projections to support water resources decision-making in California.

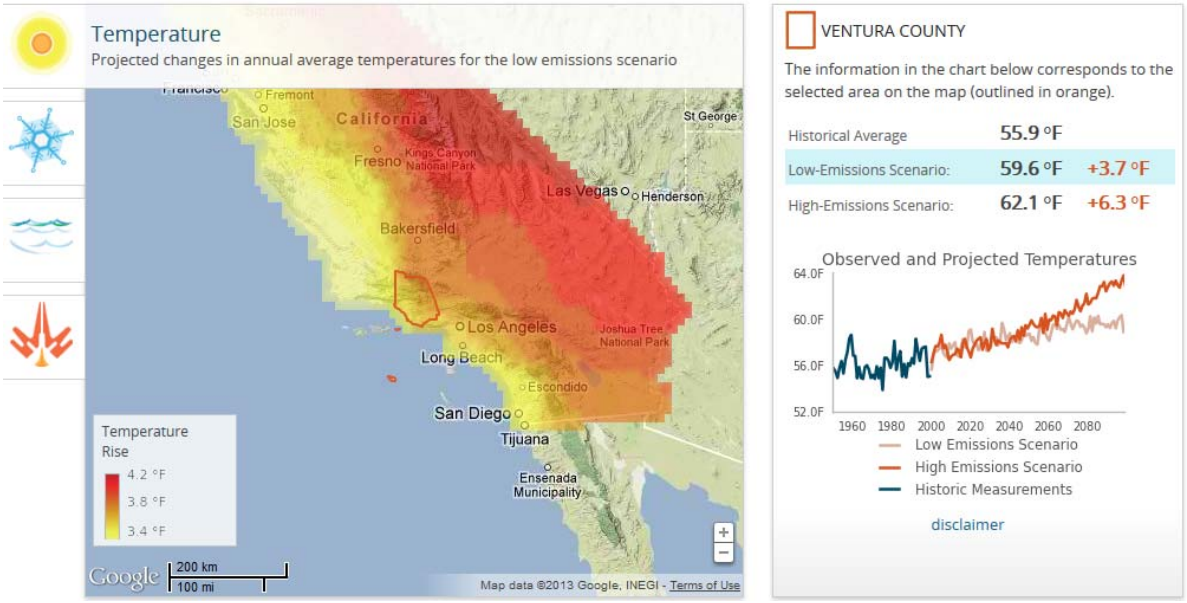
In 2012, the California Energy Commission's Public Interest Energy Research Program (PIER) established the Cal-Adapt website (http://cal-adapt.org). The website provides output from four climate models and two internationally accepted GHG emissions scenarios. Scenario A2 assumes high growth in population, higher GHG emissions and little to no global cooperation on reducing GHGs, while Scenario B1 assumes social consensus for sustainable development and lower GHG emissions. Given the inability to reach global decisions on climate change mitigation measures, and adopting a precautionary approach, this document analyzes stressors and vulnerabilities based on Scenario A2. In those cases where a comparison between the two Scenarios could assist with future decision-making, data from both is used.

Climate Stressors

Stressor: Higher Temperatures

Under Scenario B2 (high emissions scenario) overall air temperatures in Ventura County are expected to rise 6.3°F by 2100. The historical average temperature is 55.9°F. The increase in

temperatures would likely be accompanied by more frequent heat events with related ecosystem and human health impacts.



While average temperatures will increase by 6.3°F, the expected rise in minimum temperatures is 7.2°F. This means warmer nights, fewer freezing events and warmer winters, with implications for agriculture and ecosystems.

Stressor: More Frequent and Intense Wildfires

Because wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In years with wet winters, annual vegetation growth is plentiful. But accentuated dryness during summer would produce a hazardous fuel load that worsens the wildfire problem in some of Southern California wildlands. With expanding development into the urban/wildland interface, threats to human safety and property are even greater. The spread of invasive species that are more fire-prone, coupled with more frequent and prolonged periods of drought, are projected to increase the risk of fires and reduce the capacity of native species to recover. Wildfires also impact air quality, human health, and soil erosion and are an added stress on the watersheds.

The potential for more frequent wildfires, combined with changes to precipitation, mean that higher rates of soil erosion and runoff are likely in the Region's watersheds, affecting water supply and quality and reducing ecosystem services provided in these watersheds.

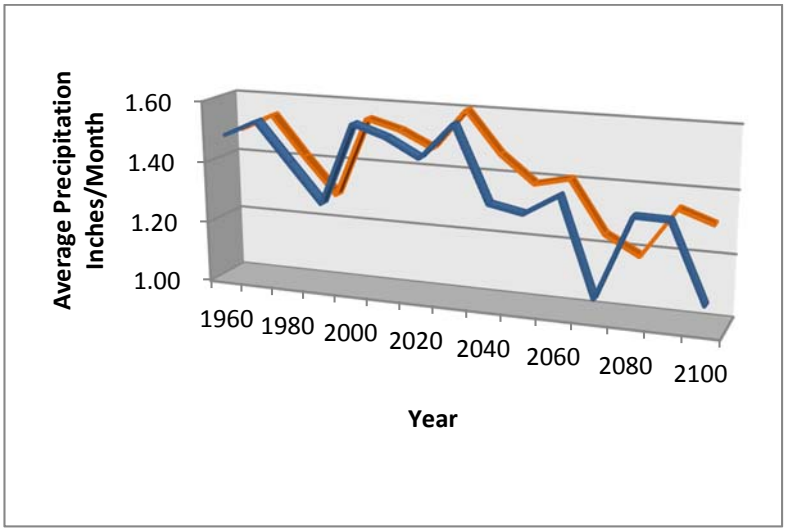
Stressor: Longer, More Frequent Droughts and More Extreme Flood Events

Global models clearly indicate reduced precipitation for California's mountains and inland valleys. Because the County depends, at least partially, on water from the State Water Project, any changes to precipitation for State sources would result in reduced availability and increased costs for that water. While global models include fluctuations, with increased rainfall predicted to occur in the

2030 decade, the general trend is towards lower monthly and annual precipitation levels. By 2100, using Scenario B1 (the higher emissions scenario), Ventura County's 2100 rainfall totals are projected to decline by 2.16 inches below rainfall levels in 1960.

It is important to note that global models also predict differences in the way precipitation occurs with more extreme weather events possible. The combination of flood events and sea level rise is particularly critical to coastal communities and ecosystems.

Average Precipitation (Inches Per Month)
1960 to 2100

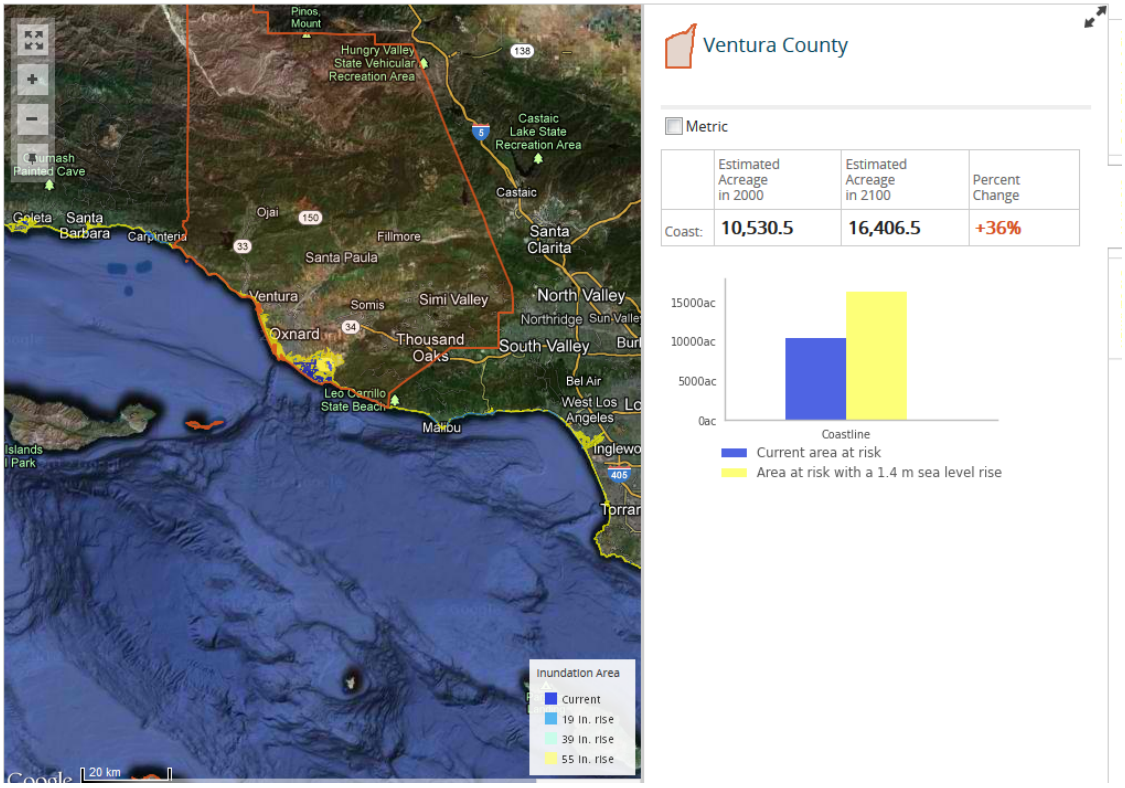


Source: Cal-Adapt

Year	Scenario A2: High Emissions	Scenario B1: Low Emissions
1960	1.49	1.49
1970	1.54	1.54
1980	1.41	1.41
1990	1.29	1.29
2000	1.55	1.55
2010	1.52	1.52
2020	1.46	1.47
2030	1.58	1.60
2040	1.34	1.47
2050	1.31	1.38
2060	1.38	1.41
2070	1.07	1.24
2080	1.34	1.18
2090	1.33	1.34
2100	1.09	1.30

Stressor: Sea Level Rise

SEA LEVEL RISE: THREATENED AREAS MAP



California's Cal-Adapt website states that "Global models indicate that California may see up to a 55 inch (1.4 meter) rise in sea level within this century given expected rise in temperatures around the world."[1] This type of sea level rise, combined with a 100 year flood event, would lead to significant inundation in the coastal regions of Ventura County.

These data were developed by scientists from the United States Geological Survey (USGS) in the Bay Area and the Pacific Institute (Coast). The darker blue areas are already threatened today, while the lighter shades are areas projected to also be threatened given the expected sea level rise.

The USGS and Scripps Institute estimate that the replacement value of buildings and contents in Ventura County vulnerable to a 100 year coastal flood with a 1.4 meter sea-level rise would be $2.2 billion.

[1] This projection is based on a paper prepared by the California Climate Change Center: The Impacts of Sea-Level Rise on the California Coast", CEC-500-2009-024-D. This is consistent with the National Research Council's conclusions, published in "Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present and Future", National Academies Press, 2012.

Climate Change Vulnerabilities

The purpose of identifying climate change vulnerabilities is to identify opportunities for making substantive changes today to enhance future resilience. This allows planners to determine the degree to which a system is susceptible to the adverse effects of climate change including climate variability and climate extremes. Through a series of workshops and meetings, WCVC stakeholders developed a detailed matrix to identify vulnerabilities related to the climate change stressors described above.

Water demands and water supply, water quality, water-related infrastructure, agriculture and human populations are the key vulnerabilities associated with climate change in the IRWMP planning area. Those vulnerabilities vary depending upon the results of climate change. Based upon the scenarios and assumptions of this Plan, the results that are most likely to impact vulnerabilities across the three watersheds in the planning area are: longer, more frequent droughts, higher temperatures, more extreme flood events, more frequent and intense wildfires and sea level rise.

Available Water Supply

With longer and more frequent droughts and higher temperatures, there would be higher water use, especially for agriculture and landscape irrigation. This would likely be exacerbated by increased evaporation and evapotranspiration. More frequent and intense wildfires would increase water demands for firefighting. Sea level rise would make coastal agricultural wells more vulnerable to salt water intrusion, increasing the demand for surface or imported water. Less predictable precipitation may result in changes to when and how much local water is available for use and recharge and how water supply is managed.

Reliability of water supply is a function of local and imported water sources being available when needed. A portion of the water supply for eastern Ventura County is imported through Metropolitan Water District. MWD's Integrated Water Resources Plan, 2010 Update describes uncertainties that create the potential for dramatic shifts in water management. With respect to imported water, the Update states: "Metropolitan's planning relies on nearly 100 years of historical data to forecast future conditions, including the frequency and abundance of rainfall. However, analysis of thousands of years of climate variability, along with models of potential future climate, indicate weather patterns may fall outside the range of the historic data used in Metropolitan's planning models. Changes in climate could significantly affect water supply reliability." (MWD Integrated Water Resources Plan, 2010 Update, Executive Summary).

The State Water Project issued its Final Delivery Reliability Report for 2011, in June 2012. The report states: "…as climate change continues to affect California, past hydrology is no longer a reliable guide to future conditions." Specific aspects related to climate change that may alter reliability are: decreased water availability with reduced snowpack, increased SWP water demands, and sea level rise in the Delta.

Water Quality

Longer, more frequent droughts and higher temperatures that result from climate change could impact water quality by increasing eutrophication and algal biomass, reducing dissolved oxygen levels and cold water pools for fish. These factors may also impact water managers' ability to meet water quality standards made worse if extreme floods, wildfires, and sea level rise occur simultaneously. Poor water quality may result from increased sedimentation and accelerated runoff from burned areas. Severe storms and floods would generally increase turbidity and deposit waste and other pollutants into local streams and rivers. Sea level rise would increase salinity in estuaries and near shore aquifers, reducing their availability for the current ecosystem and human uses.

Water-Related Infrastructure

Impacts on water-related infrastructure are direct and indirect. Direct impacts include lack of reliable power supplies when transmission lines and power plants are threatened by fires, floods, and sea level rise. Direct impacts can result from damage to water conveyance systems. Indirect impacts on water-related infrastructure include reduced access to reliable electricity for pumping and distribution when high temperatures increase summer energy demands. While the State is increasing the supply of renewable energy sources (water, solar), these sources are also vulnerable to the results of climate change. In addition to lack of reliability, damage and competitive demands for power are likely to result in increased costs for electricity used to purvey water.

Ecosystems and Habitats

Ecosystems and habitats are vulnerable to less and/or more variable in-stream water. More droughts, higher temperatures, and wildfires increase aquatic and ecosystem stress by increasing water temperatures and reducing in-stream water quality. As the climate changes, the range, composition, distribution and migrations patterns of plant and animal communities are also likely to change. With increased pests, invasive species and diseases, ecosystem services[2] would likely be reduced. They would likely be reduced further by alteration in stream channels and sediment transport due to altered precipitation patterns producing drought conditions and larger storms and increased coastal erosion and salinity in estuaries and near-shore aquifers.

Agriculture

Agriculture is an important part of the WCVC Region's economy. As noted above, agricultural uses are particularly vulnerable to water reliability. In the worst case scenario, cropland may be taken out of production due to lack of water, and agricultural land in coastal areas may become less productive as a result of sea level rise and salt water intrusion. With increased temperatures and more frequent droughts, evapotranspiration would likely increase, and soil moisture levels would likely decline increasing water demands and costs. Changes to nighttime temperatures and seasonal water supplies would likely result in shifts in crop behavior and health. Increased pests and diseases that result from heat and drought, along with other factors, would likely impact crop productivity.

[2] Ecosystem services are defined as the important benefits for human beings that arise from healthily functioning ecosystems, including but not limited to production of oxygen, soil genesis, and water detoxification.

Human Populations

The IRWMP Plan area includes a range of population distribution including cities, suburbs, and less densely populated areas. Climate change impacts on human populations occur both directly and indirectly. Humans may be directly impacted by higher temperatures, exposure to fires, and intense floods and landslides brought on by infrequent but more intense rain events. Public health officials are exploring the impacts of climate change on provision of services to the frail and elderly. From an economic perspective, because climate change may result in reduced availability of water, the impacts range from increased costs to displacement of people and businesses.

Table 3-4 below highlights the regional vulnerabilities to climate change in the Region.

Table 3-4
Regional Vulnerabilities to Climate Change
Ventura County

	Longer, More Frequent Droughts	Higher Temperatures	More Extreme Flood Events	More Frequent & Intense Wildfires	Sea Level Rise
Water Demand (demands on available supply)					
1. Higher water use, especially for agricultural and landscape irrigation	√	√			
2. Increased evaporation and evapotranspiration	√	√			
3. Higher water demands for firefighting				√	
4. Increased water demand from contaminated coastal agricultural wells					√
Water Supply (available water)					
5. Less predictable precipitation	√				
6. Less groundwater recharge	√	√			
7. Reduced water supply reliability	√	√	√		
8. Less usable water supply due to reduced water quality from increased sedimentation and accelerated runoff in burned areas			√	√	
9. Damage to reservoir operations, wells, water diversions and conveyance systems			√		
10. Near shore groundwater supplies threatened by salt water intrusions					√
Water Quality					
11. Increased eutrophication and algal biomass	√	√			
12. Reduced dissolved oxygen	√	√			
13. Reduced cold water pools for fish (e.g. California steelhead trout)	√	√			
14. Inability to meet water quality standards	√	√	√	√	√
15. Poor water quality from increased sedimentation (turbidity) and accelerated runoff in burned areas			√	√	
16. Increased turbidity, pathogens, trash and other pollutant loads from severe storms			√		
17. Increased salinity in estuaries and near shore aquifers					√
18. Reduced groundwater and lake water quality	√	√		√	√
Water Related Infrastructure					
19. Access to electricity for pumping and distribution threatened by higher summer energy demands and increased power outages	√	√			
20. Access to electricity threatened by potential fires, floods and sea level rise			√	√	√

21. Increased sediment in water systems			√	√	
22. Insufficient capacity and/or water to address firefighting needs	√	√		√	
23. Levee stress/failure			√		√
24. Impacts to wastewater treatment plants and reservoir operations within the watershed			√		√
25. Impacts to wastewater treatment plant (Ventura Water Reclamation Plant) outside the watershed (near Santa Clara River mouth) from discharges within the watershed			√		√
26. Damage to conveyance systems			√		
27. Increased sediment in water systems	√	√	√	√	
Ecosystems and Habitats					
28. Less and more variable in-stream water	√	√			
29. Increased aquatic and terrestrial ecosystem stress	√	√		√	
30. Increased water temperature and plant/animal mortality	√	√			
31. Changes to the range, composition, distribution and migration of plant/animal communities	√	√	√		√
32. Increased pests, invasive species and diseases	√	√		√	√
33. Decreased ecosystem services	√	√	√		
34. Short-term habitat loss	√	√			
35. Habitat changes from frequent fires due to loss of seedbeds/vegetative restarts				√	
36. Reduced in-stream water quality	√	√	√	√	
37. Alteration in stream channels and sediment transport			√		
38. Increased frequency of disturbance	√	√	√	√	
39. Increased salinity in estuaries and near shore aquifers		√			√
40. Increased coastal erosion			√		√
Agriculture					
41. Increased evapotranspiration and soil moisture deficits	√	√			
42. Increased water demands and costs	√	√			
43. Shifts in crop behavior (flowering/ripening)	√	√			
44. Increased pests and diseases	√	√			
45. Reduced crop productivity	√	√	√		
46. Cropland taken out of production due to lack of water	√				
47. Crop losses	√	√		√	
48. Range land losses (reduced soil moisture; fires)		√		√	
49. Increased soil erosion			√		
50. Increased salinity in near shore aquifers used by agriculture					√

51. Loss of agricultural land near coast					√
Human Populations					
52. Insufficient local water supplies	√		√		
53. Increased water costs (from increased demand)	√	√			
54. Displacement of people and services	√	√	√	√	√
55. Reduced recreational opportunities	√	√	√	√	√
56. Economic losses and potential wide scale economic losses due to lack of water	√	√	√	√	√
57. Property damage and losses			√	√	√
58. Mortality and morbidity (from heat, fires and intense flood flows and landslides)		√	√	√	
59. Increased water and sewer costs from reduced water quality and infrastructure damage	√		√		√
60. Increased energy costs		√	√		
61. Increased property insurance costs			√	√	

Section 3.5 Water Quality

Water quality can be adversely affected by point and nonpoint sources. Point sources are those from a well-defined source of origin, while nonpoint sources may be more difficult to identify and can originate from widespread sources. Point sources include wastewater treatment plants, urban stormwater runoff, and other site-specific discharges. Nonpoint source pollution issues in the Region include seawater intrusion, individual sewage disposal systems (septic tanks), abandoned water wells, agricultural runoff, aggregate resource management, and naturally occurring contaminants.

3.5.1 Surface Water Quality

Surface water quality is regulated by several State and Federal agencies. The Federal Clean Water Act (CWA) requires the California Regional Water Quality Control Board (Regional Board) to develop water quality standards that include beneficial use designations and criteria to protect beneficial uses for each water body found within its region. The Regional Board carries out its CWA responsibilities through California's Porter-Cologne Water Quality Control Act and establishes water quality objectives designed to protect beneficial uses contained in the Water Quality Control Plan for the Los Angeles Region (Basin Plan).

As approved by USEPA, the State's official evaluation of its surface water quality is the State Water Resources Control Board's (SWRCB's) biennial water quality assessment and the Clean Water Act 303(d) List of Water Quality Limited Segments. In 2002, California listed 685 water bodies on the 303(d) list that exceed established water quality objectives. About 13 percent of the total miles of California's rivers and streams and about 15 percent of its lake acreage are now listed as limited under the 303(d). In 2002, advisories warning against fish consumption, an indirect indicator of surface water quality, were posted for 18 percent of California's lakes, while less than 1 percent of the state's rivers were similarly posted (2005 California Water Plan).

As described in the Regional Water Quality Control Board (L.A. Region) Watershed Management Initiative (WMI), current strategies by the State to improve water quality are now approached on an integrated, watershed level:

"For the initial implementation of the WMI, during the late 1990s, each Regional Board identified the watersheds in their Region, prioritized water quality issues, and developed watershed management strategies. These strategies and the State Board's overall coordinating approach to WMI are contained in the Integrated Plan for Implementation of the WMI which is updated annually. In following years, the Regional Boards have continued to build upon their early efforts to utilize this approach. The full version of our (Regional Water Quality Control Board) WMI Chapter outlines our ongoing efforts to continue implementation of the WMI."

Surface Water Quality Monitoring and Assessment

Only a small percentage of California water bodies are regularly monitored and assessed for water quality or for the appropriate contaminants of concern. Once data is collected, it is too often not assessed or evaluated. To address this need, the State Legislature created the Surface Water Ambient Monitoring Program (SWAMP) in order to integrate existing water quality monitoring activities of the State Water Resources Control Board, and Regional Water Quality Control Boards with other monitoring programs. One of SWAMP's key objectives is to create a coordinated statewide monitoring effort to assess the conditions of surface waters throughout the state of California and capture monitoring information collected under the State's TMDL, Nonpoint Source, Agricultural Waiver and Stormwater Programs.

Public health officials in coastal counties conduct weekly testing, between April 1 and October 31, at beaches visited annually by more than 50,000 people and at adjacent storm drains (including natural creeks, streams, and rivers that flow during the summer). The County of Ventura Environmental Health Division monitors numerous locations on a weekly basis from April through October, from Rincon Beach south of the creek (near the Santa Barbara County line) to Staircase Beach, located at the north end of Leo Carrillo State Beach. In addition, samples are collected by the City of Oxnard, Channelkeepers. and others.

Overall water quality at Ventura County beaches is excellent though there are sometimes beach closures in any given year. Of the water quality monitoring locations during summer dry weather, 98 percent of the locations received good-to-excellent water quality marks. The only Ventura County beach to receive a summer dry weather grade lower than a B was San Buenaventura Beach south of the drain at San Jon Road. For the second year in a row, the Hobie/Kiddie Beach monitoring locations in Channel Islands Harbor have seen improved water quality. There were no known sewage spills that led to beach closures in Ventura County in recent years.

Please see the information below regarding the status of TMDLs in the Region.

Status of TMDLs in Ventura County

There are numerous TMDLs in Ventura County, some of which are already adopted and approved, currently under development, or scheduled for development. The list below outlines the current status of TMDLs in Ventura County.

Watershed	Constituent Listing	Status as of March 2014
Ventura Coastal Beaches (Hobie/Kidde Beaches)	Bacteria	Effective (December 2008)
Ventura River	Trash	Effective (March 2008)
	Algae	Effective (June 2013)
Santa Clara River	Bacteria	Effective (March 2012)
Oxnard Drain #3	Pesticides, PCBs, and Sediment Toxicity	Approved by U.S. EPA in October 2011
Calleguas Creek	Nutrients	Effective (July 2003) Revised WLA's Oct 15 2009
	Chloropyrifos and Diazinon	Effective (March 2006)
	OC Pesticides and PCBs	Effective (March 2006)
	Metals (Cr, Ni, Ag, Zn, Cd)	Effective (March 2007)
	Boron, Chloride, Sulfate, TSS, Salts	Effective (December 2008)
	Trash (Revolon/Beardsely Wash)	Effective (March 2008)
Malibu Creek and Santa Monica Bay	SMB Marine Debris	Effective (March 2012)
	Bacteria (shellfish/swimming restrictions)	Effective (January 2006)
	Nutrients (Phase I)/ Ammonia/pH/ Algae/ Eutrophication	Approved by U.S. EPA in March 2003
	Benthic-Macroinvertebrates and Sedimentation	Approved by U.S. EPA in July 2013
	Trash	Effective (July 2009)
	Lake Sherwood Mercury	Approved by U.S. EPA in March 2012

Ventura Countywide Stormwater Quality Management Program

The Ventura Countywide Stormwater Quality Management Program (Program) is made up of the ten cities of Ventura County, the County and the Watershed Protection District, collectively referred to as the Permittees. They joined together in 1994 to meet the Clean Water Act requirements for municipal separate storm sewer systems (MS4) and are currently under their third MS4 Permit from the State. The Permittees continue to work together to implement the Stormwater Program and improve water quality in Ventura County. Elements of the Program include public outreach, business and construction site inspections, illicit discharge enforcement, land development requirements, and monitoring.

Under the new Permit, development and redevelopment projects are subject to new criteria that focus on Low Impact Development (LID) strategies and are required to effectively limit impervious areas to only five percent. That means that stormwater from only five percent of the hardened surfaces (e.g. concrete or rooftops) is allowed to runoff. The remainder will need to be captured to

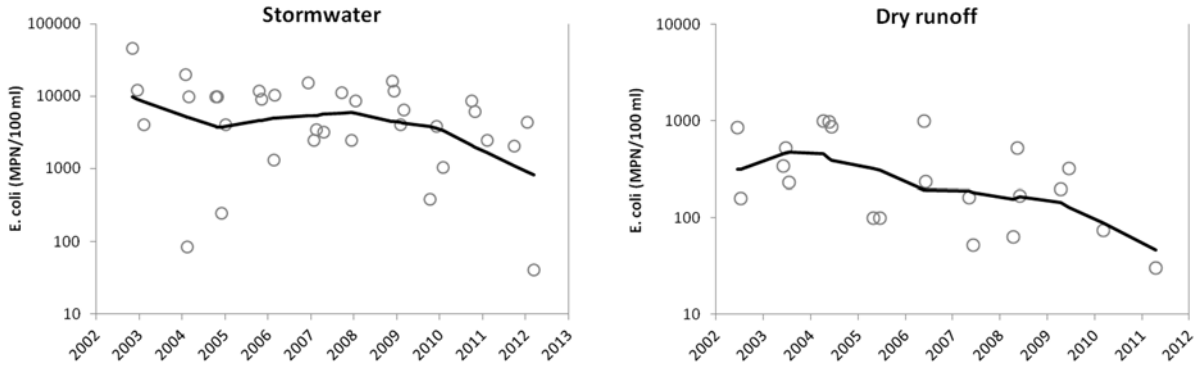
soak into the soil and benefit groundwater or be held in a cistern and used later to water landscaping.

Applicable projects must reduce Effective Impervious Area (EIA) to five percent of the total project area unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using Retention BMPs (infiltration or storage). Biofiltration BMPs may be used to achieve the 5 percent EIA standard if Retention BMPs are technically infeasible. If the 5 percent EIA is technically infeasible onsite a project may make up the remaining volume offsite. To assist developers and designers the Program updated the existing *Technical Guidance Manual for New and Redevelopment* (TGM) to reflect the new requirements. The TGM covers Site Design Principles, Source Control Measures, Retention BMPs, Biofiltration BMPs, and Treatment Control Measures needed for a project to be in compliance with the new requirements.

The Program monitors water chemistry, toxicity, and biologic function of creeks, rivers, and channels within Ventura County. Locations for water chemistry and toxicity include receiving water stations and major outfall stations. Receiving water stations are located in the lower reaches of the three major watersheds in Ventura County (Ventura River, Santa Clara River, and Calleguas Creek). Major outfall stations, a component of the Stormwater Monitoring Program since 2009, are located in watersheds representative of each Permittee's contribution to downstream waters. Water chemistry and toxicity samples are taken for three storm events and a dry period each year. Bioassessment sampling is performed at fifteen random [probabilistic (P)] and three targeted [trend (T)] sites throughout Ventura County divided among each of the three major watersheds (six P and one T in the Ventura River and Calleguas Creek Watershed, and three P and one T in the Santa Clara River Watershed). This multi-parameter monitoring helps assess the overall health of the waterbody.

Ventura County Surface Water Quality Trends

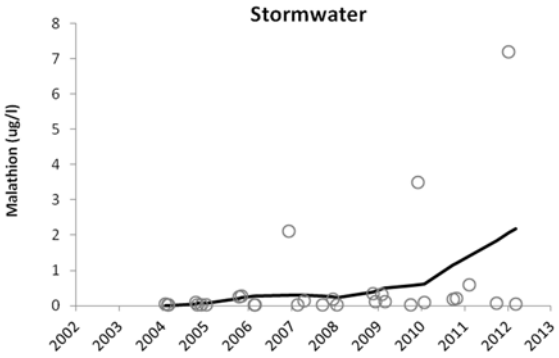
The Program has been monitoring three mass emission stations, one in each watershed, since 2001. These mass emission stations are on the main stem, in the lower reaches of the Ventura River, Santa Clara River and Calleguas Creek. More than 200 constituents are routinely monitored during dry weather and storm events. A large fraction of the monitored organic chemicals, and some metals, have been fairly consistently below the detection limit since 2001. Examples include aroclor PCBs, pesticides such as aldrin, atrazine, lindane, and other chlorinated organic and aromatic compounds. Comprehensive statistical analysis indicated that the majority of routinely detected constituents did not show any significant trend in time. Still, a number of significant, mostly decreasing trends, were observed in each watershed. For example, concentrations of the fecal indicator bacteria *E. coli* and Enterococcus have decreased significantly since 2002 at ME-CC, the Calleguas Creek watershed mass emission station. Both stormwater and dry weather runoff concentrations decreased about five-to tenfold on average see figure below. While the exact causes for the observed decrease are under investigation, they may be related to implementation of the bacteria TMDL in the Calleguas Creek Watershed.



***E. coli* concentration trends at ME-CC**

Concentrations of various metals also decreased in all three watersheds during dry weather and storm events, although in some cases the decreasing trends in stormwater were attributed to the smaller storm sizes in recent years. Decreasing trends were also observed for Total Kjeldalh Nitrogen (all watersheds) and the organophosphate pesticide diazinon (Calleguas Creek Watershed).

Increasing concentrations trends were observed in some cases for mercury, phthalate compounds, and malathion. For example, malathion stormwater concentrations have increased at ME-CC and exceed aquatic life criteria in some cases – see figure below. Increasing mercury concentrations were found during dry weather only, but concentrations remain below current water quality objectives. These constituents with increasing concentrations trends were identified as high priorities for continued monitoring.



Malathion stormwater concentration trends at ME-CC

3.5.2 Groundwater Quality

Approximately 65 percent of the water needs in Ventura County are supplied by groundwater resources. The quality and protection of this vital resource is of considerable interest, attention, and concern. Most groundwater in the Region is pumped from 10 major groundwater basins and seven (7) minor groundwater basins. There are 15 additional areas in the County where groundwater is considered to exist in recoverable quantities.

Groundwater Quality Records and Sampling

The Groundwater Resources Section of the Ventura County Watershed Protection District (VCWPD) obtains and coordinates analysis of groundwater samples from selected areas.

To date, tens of thousands of individual water quality records have been entered into the County's database. Records predating 1970 are contained within paper copy format. These water quality records reflect general mineral constituents found in most groundwater basins within the County.

In 2012, VCWPD conducted groundwater sampling at 168 locations throughout the County. Samples were analyzed for general minerals (calcium, magnesium, potassium, sodium, carbonate, bicarbonate, sulfate, chloride, nitrate, phosphate, fluoride, boron, copper, iron, manganese, zinc) pH, lab electroconductivity, and SAR along with some specialized tests for heavy metals or radio chemistry (gross alpha, and uranium count). Some samples were also analyzed for Title 22 metals. Additional groundwater quality data is also available from sources such as water districts and agencies that collect and analyze groundwater samples for their own use.

The Regional Water Quality Control Board's (Regional Board) Geotracker website for environmental cleanup sites is overseen by the SRWQCB and the County of Ventura Environmental Health Division.

Water Quality Problems and Issues

Overall, water quality within the Calleguas Creek Watershed is impaired and it appears that a principle source of these pollutants is agricultural activities such as the continued disturbance and erosion of historically contaminated soils. Agricultural soils cover approximately 25 percent of the watershed along the inland valleys and coastal plain. Activities at the nearby naval facility have also been a contributor to water quality impairments. Other nonpoint sources include residential and urban activities, which are present in over 25 percent of the watershed.

One of the most significant water quality challenges in the watershed is the presence of salts. Although there is plenty of salty groundwater in some parts of the County, there is no place to discharge concentrate from groundwater desalters.

Mugu Lagoon is located at the mouth of the Calleguas Creek Watershed and is one of the few remaining significant saltwater wetland habitats in Southern California. The Lagoon borders an Area of Special Biological Significance (ASBS) and supports a great diversity of wildlife including several endangered birds and one endangered plant species. Except for the adjacent Naval Base Ventura County, the lagoon area is relatively undeveloped. Aquatic life in both Mugu Lagoon and the inland streams of Calleguas Creek Watershed have been impacted by pollutants from nonpoint sources. DDT, PCBs, other pesticides, and some metals have been detected in both sediment and biota collected from surface waterbodies of the watershed. Additionally, ambient toxicity has been revealed in several periodic toxicity testing studies conducted in the watershed (ammonia from POTWs and pesticides such as diazinon and chlorpyrifos have been identified). Fish collected from Calleguas Creek and Revolon Slough exhibit skin lesions and have been found to have other histopathologic abnormalities. High levels of minerals and nitrates are common in the water column as well as in the groundwater. Sediment toxicity is also elevated in some parts of the lagoon.

Primary issues related to POTW discharges include ammonia toxicity; and high mineral content (i.e., salinity), which in part, is due to imported water supplies. Discharges are fairly evenly spread around the watershed.

Of the 73 dischargers enrolled under the general industrial stormwater permit in the Calleguas Creek Watershed, the largest numbers are located in the cities of Simi Valley and Camarillo. There is a diverse mix of industries represented including auto wrecking, sand and gravel operations, production of electronics, transit, and trucking.

The Oxnard Forebay is a vital part to the County's water resources and prime groundwater recharge area that is impacted by nitrogen discharges, mainly from densely populated communities using septic systems and agricultural areas. Approximately 250,000 people obtain at least a portion of their water supplies from water originating in the Forebay. The County of Ventura and the Regional Water Quality Control Board undertook a study of septic systems in the area and in August 1999 the Regional Board adopted a Basin Plan amendment to prohibit septic systems in the unincorporated areas of El Rio. The amendment prohibits the installation of new septic systems or the expansion of existing septic systems on lot sizes of less than five acres. Discharges from septic systems on lot sizes of less than five acres were required to cease by January 1, 2008. This prohibition affected approximately 3,000 septic systems and 10,000 to 15,000 people. Septic systems in the Forebay were removed in 2009 and residents were connected to the nearby sewer system, in part with funding from the State Water Resources Control Board through a Proposition 50 Implementation Grant.

Groundwater Quality by Basin

West Las Posas Basin

The water quality of the West Las Posas Basin currently meets standards for irrigation and drinking water use. Within the pumping depression in the far eastern portion of the Basin, samples from two wells have had increased chloride concentration. It is not clear if this is the beginning of a trend or if these chlorides were transported into the Basin from the shallow aquifer generally located along Arroyo Las Posas in the East Las Posas Basin.

East Las Posas Basin

High chloride levels in the portion of the Basin along the Arroyo Las Posas continue to be a problem in the East Las Posas Basin. These high chloride concentrations are associated with historically high groundwater levels that apparently leach salts from previously unsaturated sediments in the shallow aquifer along the Arroyo.

The groundwater that contains these chloride-rich salts recharges the Lower Aquifer System by moving downward from the shallow aquifer into the lower aquifer, then northward into the Basin. This recharge has formed a chloride-rich recharge mound beneath the Arroyo Las Posas.

South Las Posas Basin

Water quality in the South Las Posas Basin is dominated by the movement of salts from the East Las Posas Basin. The progressive filling of the shallow aquifer of the South Las Posas Basin progresses from the upstream to the downstream portions. Two wells completed in the shallow aquifer beneath the Arroyo that have had elevated salts for 20 years have shown a lessening of salinity in the past two years.

Primarily agricultural in land use, the South Las Posas Basin has generally good groundwater quality. TDS typically ranges between 600 and 1400 mg/l depending upon well depth and location, with the average for all samples on file at 709 mg/l. The deeper Fox Canyon and Grimes Canyon aquifer waters yield the best groundwater quality in the 600-700 mg/l TDS range, with shallow river alluvium producing the less desirable water.

Pleasant Valley Basin
Saline intrusion from surrounding sediments and salinity associated with high groundwater levels are the primary water quality concern in the Pleasant Valley Basin. The potential for saline intrusion continues in the depressed groundwater elevations in the Lower Aquifer System of the Pleasant Valley Basin.

Average TDS values in groundwater cover a broad range and are generally found to be 700-1,250 mg/l in most samples. During drought years however, TDS levels in some wells can range up to 2000 mg/l, and values as high as 3500 mg/l have even been recorded. The average TDS value for all samples on file equals 1110 mg/l.

Thousand Oaks Basin
The Thousand Oaks Groundwater Basin consists of a shallow, linear, alluvial fill accumulation located mainly along the U.S. Highway 101 freeway corridor. Like Simi Valley, this area was once agriculturally based with many small farms and ranches. Shallow domestic wells were very common in the Basin often heavily clustered and competing for limited groundwater supplies. Data collection over the last 15-20 years has been limited since most of these old wells have been destroyed to make room for new development.

Arroyo Santa Rosa Basin
The Arroyo Santa Rosa Basin receives most of its water replenishment from Conejo Valley and Thousand Oaks Basin surface runoff, including discharges from the Thousand Oaks Hill Canyon Wastewater Treatment Plant. Iron, nitrate and sulfate levels are usually high, and TDS concentrations typically range from 750-1000 mg/l with 817 mg/l the overall average.

Because of the high number of individual septic disposal systems (the area is not served by sewers), and the widespread use of agricultural fertilizers, groundwater nitrate (NO3) levels are usually high, and many exceed the MCL for drinking water of 45 mg/l. Of the five wells sampled in Arroyo Santa Rosa Basin in 2005, four showed nitrate concentrations of over 45 mg/l, and one had TDS concentration greater than the MCL. High pH, with values in the 8.2-8.6 range are commonly detected in area groundwater.

Tierra Rejada Basin
Groundwater recharge is slow here due to fine-grained silt and clay dominated surface soils, a shallow alluvium, and minimal fractures in the relatively hard underlying volcanic basalts. Average TDS in the Basin is 674 mg/l, with a range of 330-930 mg/l. Naturally occurring iron and nitrates are current threats to continued better-than-average groundwater quality.

Conejo Valley Basin
The Conejo Valley Basin is comprised of shallow fine-grained alluvium (50-100 feet thick) overlying fractured volcanic basalts. TDS values range from 405 to 1620 mg/l in all wells tested with a 790 mg/l average. Iron and calcium carbonate levels often approach the limit for drinking water standards.

Gillibrand or Tapo Canyon Basin
Primarily a sand and gravel mining area, the Gillibrand or Tapo Basin's TDS concentration in groundwater average 693 mg/l for all samples on file.

Piru Basin
Similar to the Fillmore Basin directly downgradient, the Piru Basin contains groundwater with TDS values averaging 1,435 mg/l. Sulfate often exceeds the maximum contaminant level (MCL) for drinking water but is tolerated by the primarily agricultural groundwater uses (citrus irrigation). 2013 water samples from fourteen wells have sulfate (SO4-2) concentrations greater than the secondary MCL for drinking water and four have manganese (Mn) concentrations greater than the secondary MCL. Three wells in the Piru Basin located south of Highway 126 have consistently been found to have selenium levels that exceed the primary MCL for drinking water of 0.05 mg/l (50 µg/l). Elevated selenium concentrations occur in those wells perforated in the interval between approximately 125 to 250 feet below ground surface. A well located north of Highway 126 and perforated at a similar elevation does not have high selenium.
For more information on groundwater quality, see the Ventura County Watershed Protection District Water and Environmental Resources Division 2013 Groundwater Section Annual Report: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Groundwater_Resources/

Fillmore Basin

The Fillmore Basin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in some places. Despite the depth of the basin, County records indicate that water wells are generally no deeper than approximately 950 feet. Water quality can vary greatly depending on depth of the well. Shallow groundwater is generally younger and recharged by river flows with varying chemistry. Deeper groundwater is older and has acquired its chemistry through dissolution of constituents from the surrounding sediments. There are approximately 706 water supply wells in the Fillmore Basin; 450 are active. Historically, nitrate (NO3-) concentrations have been elevated because of extensive use of fertilizers and septic system discharges, but of the ten wells sampled recently only two showed elevated NO3- concentration relative to the primary MCL for drinking water. Groundwater samples from all ten wells were above the secondary MCL for drinking water for sulfate (SO42-). TDS ranges from 1040 mg/l to 3190 with an average for the wells sampled recently of 1645 mg/l, well above the secondary MCL for drinking water.

For more information on groundwater quality, see the Ventura County Watershed Protection District Water and Environmental Resources Division 2013 Groundwater Section Annual Report: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Groundwater_Resources/

Santa Paula Basin

The Santa Paula Basin is a court adjudicated groundwater basin. In an effort to prevent overdraft, a June 1991 judgment ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Basin. The judgment stipulated an allotment of 27,000 acre-feet per year could be pumped from the basin. Water quality in the basin has not changed substantially since 2007. The depth to the water bearing material is 65 to 160 feet. There are approximately 364 water supply wells in the Santa Paula Basin; 164 are active. TDS concentrations for water in the four wells sampled in 2013 vary from 1050 to 2740 mg/l, with an average value of 2063 mg/l for wells sampled this season; all above the current secondary MCL for drinking water. Water samples from all the wells have concentrations above the secondary MCL for sulfate and manganese and three have concentrations above the secondary MCL for iron.

For more information on groundwater quality, see the Ventura County Watershed Protection District Water and Environmental Resources Division 2013 Groundwater Section Annual Report: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Groundwater_Resources/

Mound Basin

The Mound Basin is generally divided into the Upper Zone (from ground surface to 300 feet) and the Lower Zone (from 450 to over 1000 feet below grade). Most active water wells (regardless of use) are perforated in deep (Lower) water bearing zones.

The average TDS concentration for the five wells sampled in 2013 is 1626 mg/l. Sulfate concentration was greater than the secondary MCL for drinking water in all five wells sampled, iron is above the secondary MCL in one well, and manganese was above the secondary MCL in four of the wells sampled. A water sample from one well was analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were below the primary MCL for drinking water. Water quality of the wells sampled in the Mound Basin is similar to that in the Santa Paula Basin.

For more information on groundwater quality, see the Ventura County Watershed Protection District Water and Environmental Resources Division 2013 Groundwater Section Annual Report: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Groundwater_Resources/

Oxnard Forebay Basin

The Oxnard Plain Forebay Basin is the principal recharge area for the Upper and Lower Aquifer Systems of the Oxnard Plain Pressure Basin. Approximate depth to the water bearing unit is 25 to 50 feet. There are approximately 367 wells in the Oxnard Plain Forebay Basin; 54 are active water supply wells. The Oxnard Plain Forebay generally has acceptable water quality except for the southern portion where high nitrate concentrations are common. The area to the north is predominantly agricultural with a few residential areas that still rely on individual septic systems. All three wells sampled in 2013 had TDS and sulfate concentrations above the secondary MCL for drinking water. Two wells had nitrate concentrations above the MCL for drinking water.

For more information on groundwater quality, see the Ventura County Watershed Protection District Water and Environmental Resources Division 2013 Groundwater Section Annual Report: http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Groundwater_Resources/

Water Quality in the Fox Canyon Groundwater Management Agency (FCGMA) Area:

The following information has been excerpted from the Draft FCGMA Groundwater Management Plan Update (October 2006). For more information the document can be found on the GMA website at:
http://publicworks.countyofventura.org/fcgma/index.htm

Seawater intrusion has long been the primary water concern within the FCGMA and was the problem for which the FCGMA was originally formulated to help fix. The intrusion occurs exclusively along the coastline in the Oxnard Plain basin. The U.S. Geological Survey also identified another type of saline intrusion on the Oxnard Plain – salts moving from the surrounding marine clays and older geologic units as pressure in the aquifers is reduced from overpumping. This type of intrusion may also be occurring on a minor scale in the Pleasant Valley basin. Chloride has also become a problem along Arroyo Las Posas where groundwater from an area in the East and South Las Posas basins must be blended with lower-chloride water to meet irrigation suitability. This problem appears to have migrated downstream with some of the City of Camarillo's wells now affected.

Chloride is also a problem in the Piru basin near the Los Angeles County line where high chlorides from discharge of wastewater treatment plants along the Santa Clara River have degraded the recharge water for the basin. This chloride problem is currently isolated to the Piru basin, although long-term recharge of poorer quality water could eventually move through the groundwater basins along the Santa Clara River and reach the Freeman Diversion.

High nitrate concentrations in groundwater are a localized problem in the Oxnard Plain Forebay and Santa Rosa basins. In, and adjacent to, the Forebay, nitrates affect drinking water wells of UWCD's Oxnard-Hueneme wellfield, mutual water companies, and the City of Oxnard particularly during and following dry periods.

Seawater Intrusion on the Oxnard Plain

The significant water quality issue on the Oxnard Plain basin is saline intrusion from both seawater and from surrounding marine sediments. See Figure 3-14 for a depiction of current seawater intruded areas.

High chloride levels were first detected on the Oxnard Plain in the vicinity of the Hueneme and Mugu submarine canyons in the early 1930s (California Department of Water Resources, 1954, 1971) and became a serious concern in the 1950s. Early monitoring programs used only existing production wells and abandoned wells as monitoring points; sampling of these wells indicated a widespread area of elevated chloride concentration in the Hueneme to Mugu areas. Current efforts to reduce groundwater extractions and replace previous water demands with diverted surface water or imported water have significantly improved the situation in the Oxnard and Mugu aquifers.

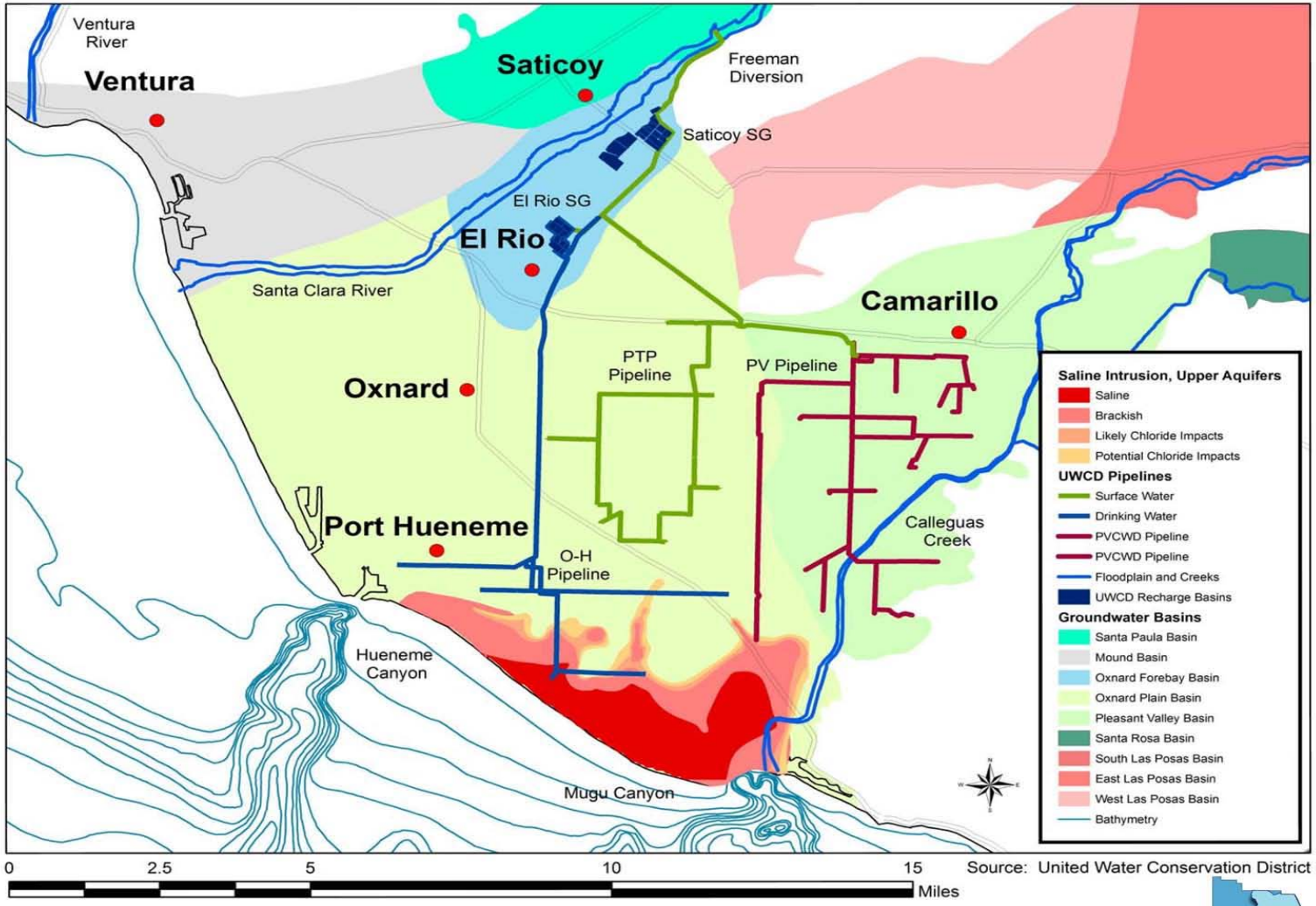


Figure 3-14 Seawater Intrusion Levels WCVC IRWM Region

Cuyama Valley Basin

Sparsely settled, the southern end of the Cuyama River Valley lies within Ventura County. The rock types surrounding the Cuyama Basin are high in evaporate minerals such as calcium carbonate, boron, silica, and various salts. These bedrock formations have a direct influence with average TDS of 1660 mg/l and unsuitable for most potable and agricultural needs.

Lower Ventura River Basin

The Lower Ventura River Basin is at the downstream end of several significant surface and groundwater drainage areas and as such is subject to variable water quality inputs. Some of this input water is of very poor quality due to human activity and land use (livestock ranches, oil fields, urban runoff, etc.), but some quality problems can be attributed to surrounding natural rock types and soil constituents. Despite the various inputs, groundwater TDS quality remains relatively acceptable at 900 mg/l throughout most of the year. TDS values can range between 1100 and 3000 mg/l during extended dry spells.

Upper Ventura River Basin

The Upper Ventura River Basin is characterized by thin alluvial deposits with the Ventura River as the dominant recharge source and contributions from San Antonio Creek (which drains the Ojai Valley), Lion Canyon Creek (which drains the Upper Ojai Valley), and Matilija Creek (which drains the mountain areas to the north). Groundwater TDS average 680 mg/l. Groundwater quality does vary however, with elevated nitrate from ranching operations common along San Antonio Creek and occasional high fluoride, iron, potassium, and manganese concentrations in other portions of the Basin.

Ojai Basin

Groundwater is the dominant supply source in the unconfined eastern three-quarters of the valley and around the valley perimeter. Overall water quality is considered good for most intended uses with typical TDS values ranging between 500 and 800 mg/l with average TDS for all wells tested in 2005 equaling 691 mg/l. Past sampling results indicate medium to high nitrate concentrations in many areas but with low boron, manganese, and iron. One tributary canyon north of the valley has shown elevated fluoride levels from groundwater extraction wells located there.

In 1991, the Ojai Basin was placed under the jurisdiction of the Ojai Valley Basin Groundwater Management Agency (OVBGMA) by the California Legislative.

Upper Ojai Basin

The Upper Ojai Basin is a small linear valley located southeast of, and at a higher elevation than, the larger Ojai Valley Groundwater Basin directly adjacent to the northwest. The total range for TDS in all samples taken is 250-1425 mg/l, with average TDS for all samples on file at 549 mg/l.

Average thickness of water-bearing deposits is approximately 60 feet, and the total groundwater-in-storage is estimated at less than 5000 acre feet most years. Elevated levels of nitrate, iron, or chloride can also occur in Upper Ojai Basin wells, making this an impaired groundwater Basin.

Lockwood Valley Basin

The Lockwood Valley Basin is really a collection of several small stream channels with shallow sedimentary fill and a couple of small, flat "valley" floors created by alluvial fans from the surrounding foothills. TDS averages 821 mg/l for all wells tested to date with individual sites ranging from 350 mg/l to over 1900 mg/l. Some wells in the north half of the county show high fluoride concentrations. High gross alpha counts have been detected in at least four wells in the area west of Lockwood Valley Road. Analytical testing laboratories have determined that the radioactivity source is uranium. High pH is common in the samples on file, many in the 7.9-9.2 range.

Nitrates in Groundwater

Historically, the primary sources of nitrate are septic systems (especially if they are poorly maintained or being used above design capacity) and agricultural fertilizer.

The Oxnard Forebay is a prime groundwater recharge area that is impacted by nitrogen discharges, mainly from densely populated communities (some still using septic systems), and agricultural areas. The Forebay is a vital part to the County's water resources. Approximately 250,000 people obtain at least a portion of their water supplies from water originating in the Forebay. The County of Ventura and Regional Board undertook a study of septic systems in the area and in August 1999 the Regional Board adopted a Basin Plan amendment to prohibit septic systems in the unincorporated areas of El Rio. Subsequently septic systems in El Rio and Oxnard were removed and residents were connected to the nearby sewer system.

Department of Defense Cleanup Program/Naval Base Ventura County

The Regional Board is working with the Department of Toxic Substances Control (DTSC) to investigate soil and groundwater quality at Naval Base Ventura County from past practices. Sites currently under assessment/remediation at the Naval Base include Mugu Lagoon, a former landfill, the Navy Exchange gas station, numerous underground storage tank sites, and the former oxidation sewage ponds.

Underground Storage Tank Program

The Leaking Underground Fuel Tanks (LUFT) Program is the local oversight program and lead agency that regulates soil and groundwater cases within Ventura County involving releases from underground storage tanks (UST's) that contain gasoline, diesel, waste oil, and other petroleum hydrocarbons. The County of Ventura has entered into a contract with the State Water Resources Control Board to be the lead agency that regulates cleanup of unauthorized releases from UST's within Ventura County.

Section 3.6 Social and Cultural Make-Up of Regional Community

The County's social and cultural values are as varied as its population and economy. However, as noted above, the County's residents are united in their determination to minimize the pace of urban

growth and to preserve the County's agricultural and open space resources. Of the County's ten Cities, eight (Camarillo, Fillmore, Moorpark, Oxnard, Santa Paula, Simi Valley, Thousand Oaks, and Ventura) have approved Save Our Open Space and Agricultural Resources (SOAR) measures which define and limit where growth can occur and require voter approval of any development outside those areas. There are two Cities which do not have these measures. Port Hueneme is completely surrounded by the City of Oxnard and the Pacific Ocean, and therefore cannot expand. The City of Ojai is known for its determined no-growth sentiment and limits growth through its General Plan and zoning approval process. Finally, County residents adopted a Countywide SOAR measure which effectively limits urban development on Open Space and Agricultural areas.

3.6.1 Demographics and Population

Based on 2010 Census information, Ventura County had a total population of approximately 823,000 people, of whom about 728,000 or 89 percent live within the incorporated cities. Approximately 47 percent are non-Hispanic white, while Hispanics represent the largest minority community with 42 percent of the population total. Asians represent the second largest minority community with seven (7) percent of the population, followed by non-Hispanic blacks at 1.5 percent. According to the 2010 census, median household income was $76,728 Countywide and ranges from a low of $53,359 in Santa Paula to $100,373 in Thousand Oaks.

The U.S. Department of Housing and Urban Development (HUD) reported that the 2010 median household (four persons) income for the County of Ventura was $75,300. In comparison, HUD estimated that the overall County median income in 1979 was $21,243, and in 1987 was $36,700. According to the 2000 Census, the median income level in the County was $59,666 per year.

According to the Regional Transportation Plan/Sustainable Communities Strategy Growth Forecast 2012, Ventura County is projected to have approximately 954,000 people by 2035, which is an increase of about 131,000 people during the forecast period. The annual population growth rate is a little less than one percent. Following the Southern California trend, Ventura County is projected to be more racially and ethnically diverse by 2035 than it is today, with a dramatic increases in the Hispanic population, as is the case for the entire state.

Population Forecast (2035)

The Southern California Association of Government (SCAG) developed population forecasts in 2011. The population and population per dwelling unit forecasts for unincorporated Ventura County and the incorporated cities in the County are shown in Table 3-5. According to SCAG, the 2000-2035 Population Forecast (Table 3-5) was largely derived from Department of Finance (DOF) population and employment forecasts and modified by regional demographic and modeling efforts by SCAG. As shown in the Tables, the population for unincorporated Ventura County is expected to increase 6 percent between 2010 and 2020, which is less than the expected increase of 8 percent per year for all of Ventura County during that same period.

Table 3-5
Population Forecast

Jurisdiction	Census 2000	Census 2010	DOF 2011	Forecast 2020	Forecast 2035
Camarillo	57,077	65,201	65,830	72,200	76,700
Fillmore	13,643	15,002	15,120	18,000	20,800
Moorpark	31,415	34,421	34,710	39,300	41,500
Ojai	7,862	7,461	7,511	8,400	9,400
Oxnard	170,358	197,899	199,722	216,700	244,500
Port Hueneme	21,845	21,723	21,477	22,100	22,500
San Buenaventura	100,916	106,433	107,124	116,900	128,800
Santa Paula	28,598	29,321	29,531	35,400	38,800
Simi Valley	111,351	124,237	125,026	129,700	133,200
Thousand Oaks	117,005	126,683	127,557	129,700	130,900
Unincorporated Total	93,127	94,937	94,775	100,500	107,200
Countywide Total	753,197	823,318	828,383	888,900	954,300

Source: 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy Growth Forecast (Adopted by SCAG Regional Council on April 4, 2012), Modified by County 2012. Source tables were modified to reflect the SCAG Regional Transportation Plan/Sustainable Communities Strategy Growth Forecast. The data only includes information for the incorporated Cities and the unincorporated portion of Ventura County, not the entire SCAG region.

3.6.1.1 Native American Tribes

There are several Native American tribes represented in Ventura County including the Chumash, Barbareno and Ventureno Indians. There has been ongoing outreach to tribal interests throughout the IRWM planning process beginning in 2005. The Native American Heritage Commission was contacted to confirm the appropriate contacts for further outreach. Local tribal interests are loosely organized and consist primarily of individuals. These individuals are included in the outreach e-mails and periodically attend meetings. WCVC staff have met with these individuals to determine their primary interests and cultural values and preferences. In particular, they strongly value preservation of the ecosystems and species (i.e., California Steelhead trout populations) which sustained indigenous tribes for centuries. Other stakeholders share this value which has been reflected in the habitat goal as well as a variety of restoration projects proposed and/or implemented in the Region. Figure 3-15 includes statistics regarding Native Americans residing in the County (2010 Census).

3.6.2 Economic Factors

Ventura County's economic base is as diverse as its population. Leading economic sectors in the County include agriculture, oil development, tourism, high tech and manufacturing, education, and Naval Base Ventura County.

Ventura County's mild Mediterranean climate combined with the prime agricultural soil of its river valleys create optimum farming conditions, and the agricultural sector forms a key part of the County's economy. According to the Ventura County 2012 Annual Crop Report, agricultural production generated $1.96 billion in gross sales in 2012, placing the County 9th in a statewide ranking of California's 58 counties, and 10th in a nationwide ranking of all U.S. counties. Table 3-6 includes the list of the top ten leading agricultural commodities based on value. Other high value crops (more than $10 million in value) include kale, greens, Valencia oranges, cabbage, lettuce, blueberries, vegetable transplants, spinach, and mandarin oranges. Figure 3-16 includes a map depicting the location of major crop types in the Region.

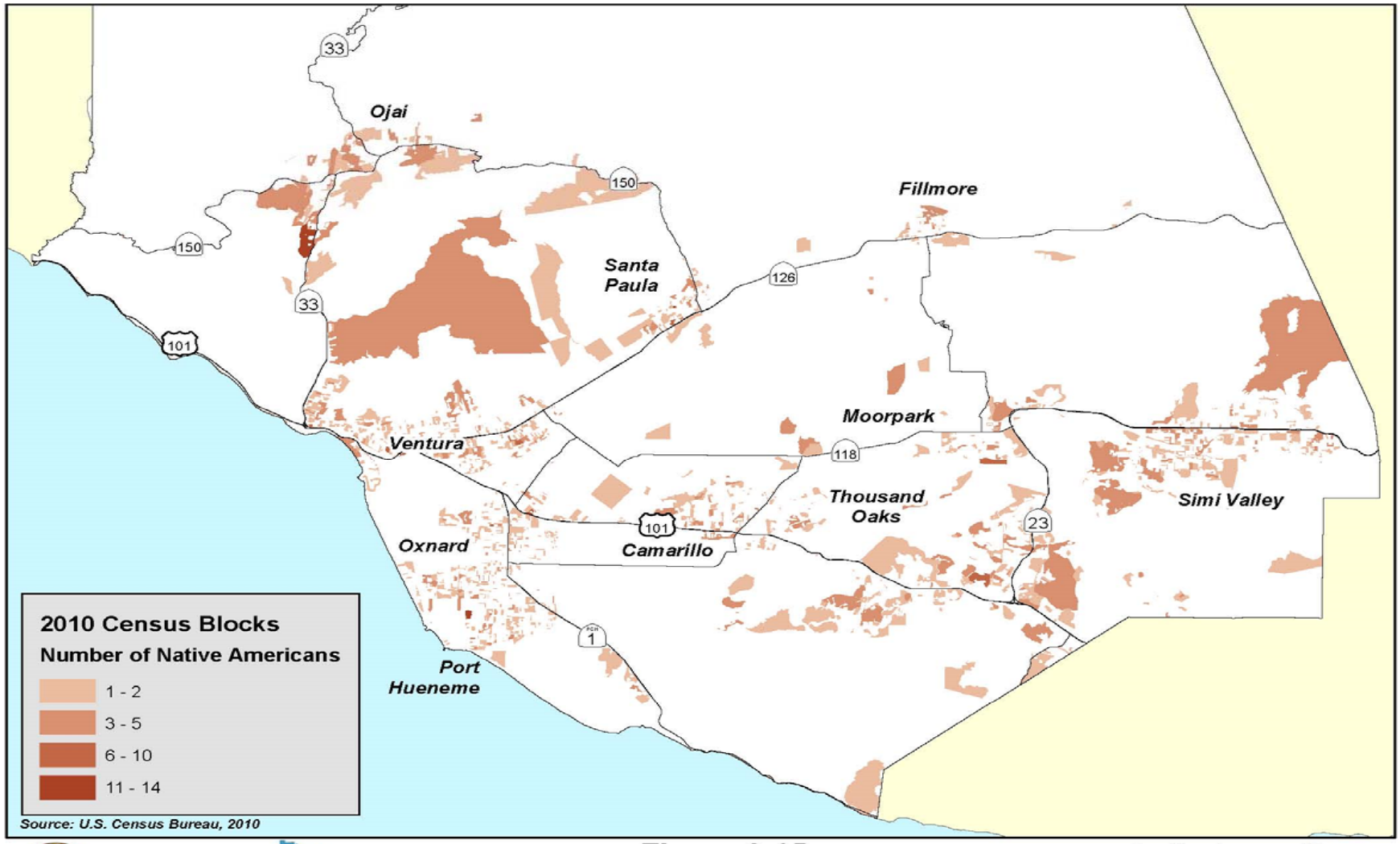


Figure 3-15
Native American Population
WCVC IRWM Region

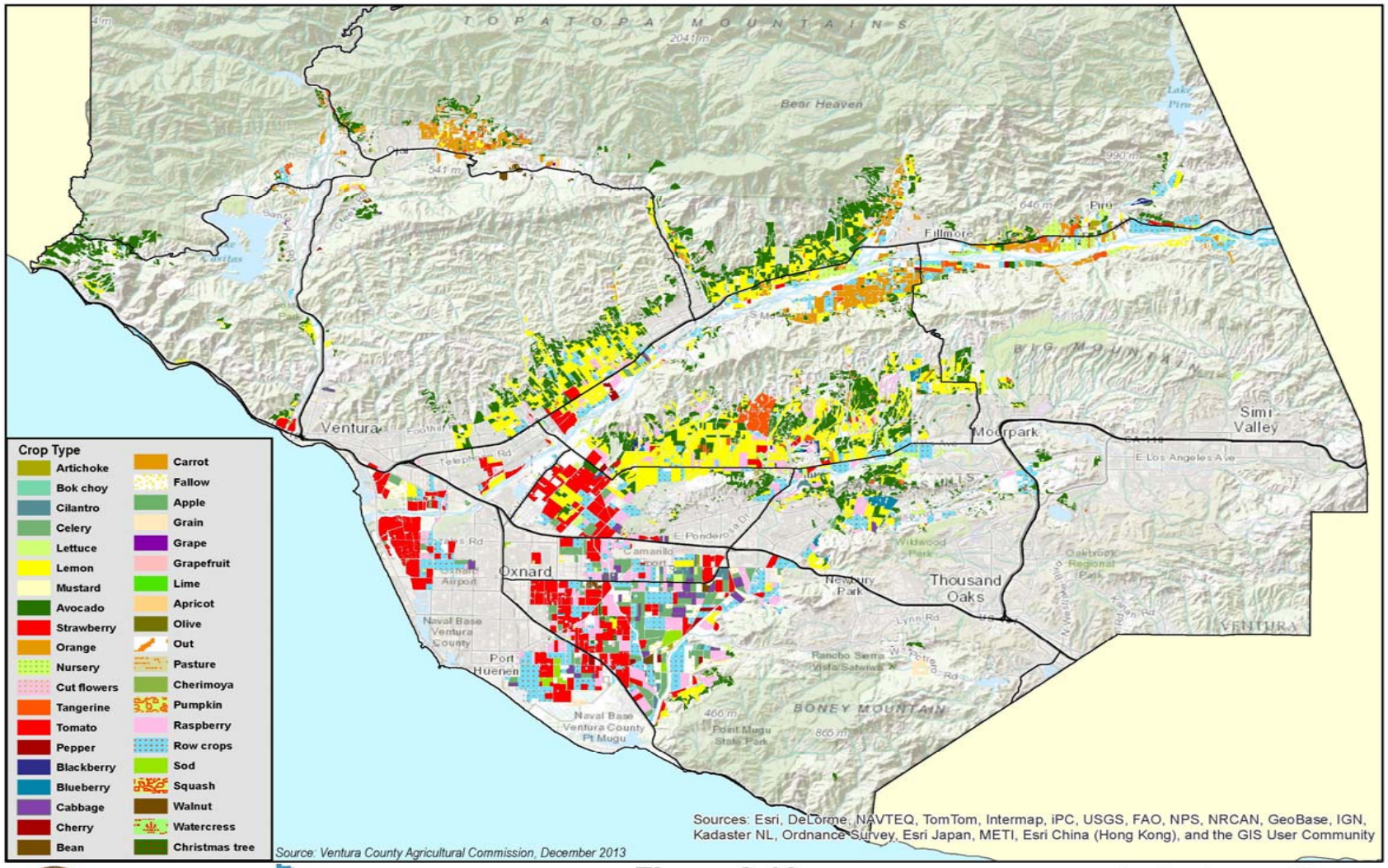


Figure 3-16
Primary Crop Types
WCVC IRWM Region

Table 3-6

Ventura County's Leading Agricultural Commodities – 2012

Commodity Gross Value	($)
1. Strawberries	691,303,000
2. Lemons	201,820,000
3. Raspberries	187,277,000
4. Nursery Stock	186,351,000
5. Celery	134,258,000
6. Avocados	113,315,000
7. Tomatoes	75,819,000
8. Peppers	48,395,000
9. Cut Flowers	46,829,000
10. Cilantro	23,438,000

Source: Ventura County's Crop and Livestock Report, County Agricultural Commission, July 2013

In addition to generating significant economic benefits, agricultural lands in Ventura County also provide habitat for various species, provide buffers between urban areas and natural habitats, and are part of the cultural landscape. Preservation of agricultural land uses in the County is therefore recognized as an important tool to contribute to water quality management and open space protection.

Other major employment sectors in the County include medical research, development and facilities; banking; schools and universities; and oil production and support. Military bases contribute significantly to the local economy, through Naval Base Ventura County and the California Air National Guard Base. The civilian portion of Port Hueneme Harbor, a deep-water facility, accommodates a growing volume of sea traffic and commercial commodities. Technology and manufacturing companies such as Amgen and Proctor and Gamble provide a highly educated workforce with well-paying jobs.

The mild climate, proximity to Los Angeles, and spectacular natural resources, such as the Channel Islands National Park and Los Padres National Forest, attract significant numbers of tourists.

A key economic issue for County residents, as elsewhere in Southern California, is the high price of housing, with a median home price of over $515,000 in 2011. (American Community Housing Survey)

3.6.2.1 Disadvantaged Communities

As defined by the Proposition 84 IRWM Grant Guidelines, a disadvantaged community (DAC) is one with an annual median household income that is less than 80 percent of the statewide annual median household income, which is $61,632 (as of 2013).

A recent study funded by DWR and conducted by the Council for Watershed Health in Los Angeles representing the Greater LA IRWM Region, evaluated disadvantaged community outreach and made the following observations:

- "US Census tracts commonly used to designate the boundaries of DAC, are very poor at properly describing communities"
- "The use of median-household income statistics has utility, but is not sufficient when developing an engagement strategy that relies on awareness of a community's individuality"

In the 2006 WCVC IRWM Plan, very few areas meeting the DAC criterion were identified in the Region. Due to changing economic conditions, many Ventura County residents, as in other regions of California, have experienced either unemployment or a drop in income. Based on the most recent American Community Survey 5-Year Estimate (2007-11), there are more census tracts in Ventura County that have a concentration of residents with income levels below the threshold of 80 percent of the median household income ($49,305) than there were a few years ago. These areas now qualify as DACs. Residents in some of these areas are served by small, rural water companies (mutual water companies) that lack the staff and resources to address some of the needs of these areas (i.e. adequate fire flow capacity). The WCVC and individual water agencies have reached out to representatives of the small water companies and residents in DAC areas to discuss water supply, quality and sanitation issues, and identify potential sources of assistance.

Though Ventura County is relatively affluent in terms of income levels, as with other coastal areas in Southern California, the cost of housing and other "living expenses" is relatively high when compared to other parts of the state. In other words, the disparity between income levels and housing costs is relatively greater than in other areas.

DAC Outreach and Assistance:

For the purposes of the IRWM Plan, DACs have been identified in two ways. The first is through the American Community Survey, a part of the U.S. Census designed to provide more current demographic data and estimates throughout the decade. Surveys are conducted every year and cover one, three, and five-year periods. In 2006, only one community in the Region was qualified as disadvantaged. As depicted on Figure 3-17, the most recent five year survey identified several disadvantaged communities in Ventura County. This increase in the number of DAC areas using income level data may be a function of the economic downturn in 2008-09 which resulted in declining or stagnant wages and higher unemployment.

The second method used in the WCVC IRWM Region to identify DACs, also based on income data, has been through income surveys. As a result of income surveys conducted by the County Waterworks Districts serving the communities of Piru and El Rio, these two communities were determined to be DACs. Each community has received targeted DAC IRWM Implementation Grant funding in Propositions 50 and 84 respectively to address critical water quality and water supply needs.

During development of the IRWM Plan, a variety of entities serving DACs were contacted to engage them in Plan development. This occurred primarily at the watershed level and included neighborhood councils and municipal advisory committees, mutual water companies, sanitary districts, and the County Planning and Environmental Health departments which serve pockets of DACs within the County.

Most DACs are located within water agency service areas, therefore their drinking water quality or supply issues are being met; they receive safe drinking water through their water agency. Water resources needs are generally centered around community development and surface water quality issues rather than drinking water quality or drinking water supply issues. Often DWR's definition of a critical water supply or water quality need of a DAC fails to encompass what these DACs (and their relevant planning agencies) consider a critical water supply or water quality need.

The WCVC worked directly with local water supply and quality entities to identify unmet needs of the identified DAC areas within the Region. This outreach primarily included the Cities of Oxnard and Ventura, the County Resource Management Agency, Planning Division (Saticoy Community Plan), Planning Division and the County Waterworks Districts serving the communities of El Rio and Piru, mutual water companies in small, rural DAC areas, as well as the municipal advisory committees and neighborhood councils serving low income communities. As a result, several DAC projects were identified and implemented including a septic tank removal and sewer connection project in the community of El Rio (County Service Area 34) and a tertiary treatment upgrade to the wastewater treatment plant in Piru (County Waterworks District 16).

The County Waterworks District staff worked with the neighborhood councils and mutual water companies in the areas served by the two DAC projects implemented to date. Waterworks staff regularly attend meetings to provide updates and discuss items of mutual concern and determine needs in the community. These discussions let to development of the two projects. Waterworks staff worked closely with these entities during the time the two projects were being proposed to assure they understood the value of the projects to the community and to gain support.

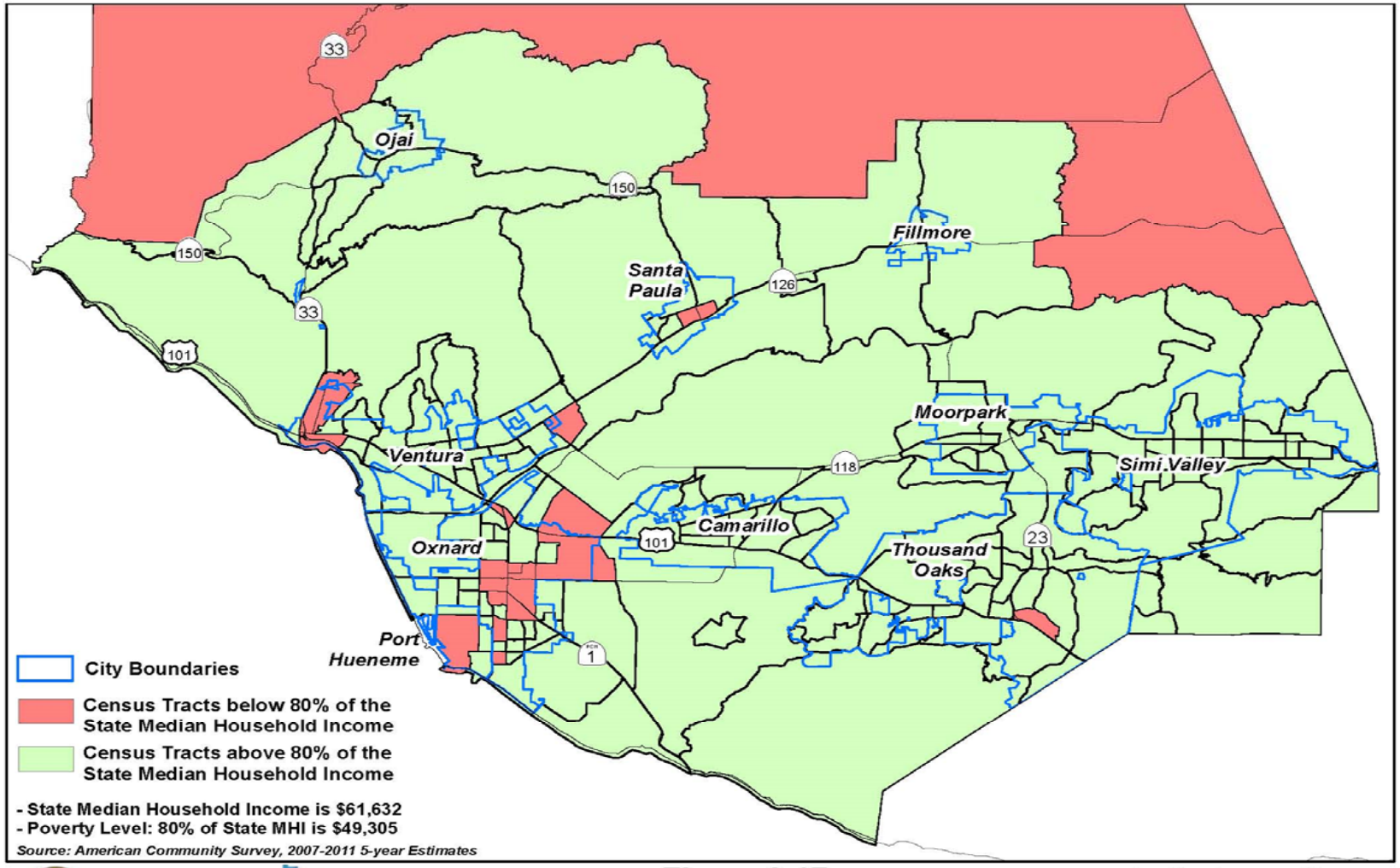


Figure 3-17
Disadvantaged Communities
WCVC IRWM Region

3.7 Goals and Conflicts

A variety of regional challenges and conflicts have faced the Region over the past 40 plus years, first identified and described in the 1980 Water Quality Management Plan for Ventura County. These have been the driving force behind regional water management ever since. This section contains an updated description of the major issues and problems, regional goals and how conflicts have been resolved.

3.7.1 Major Water Issues and Problems

The following list of issues and problems was developed by the WCVC stakeholders and acknowledges the challenges that have been recognized by local water agencies and others since the early 1970s. These issues are separate from the IRWM Plan's goals, which are described below in Section 3.7.2.

•Quantity of water available locally not adequate to meet local water needs.
•Agricultural and urban runoff (point and nonpoint sources) have degraded some local water bodies and groundwater basins thereby reducing the potential uses of these water sources – including septic tank leaching, runoff from agricultural areas, stormwater runoff. These problems are most pronounced on the Oxnard Plain but are also present in the Ojai Valley area of the Ventura River Watershed.
•Localized problems with high TDS, chlorides, and TMDLs.
•Seawater has intruded into a critical aquifer on the Oxnard Plain
• Periodic flooding events threaten or destroy property and habitats.
•Wetlands and habitats (including fisheries) have been lost or degraded due to reduced flows/pollution.
•Lack of comprehensive studies in some watershed areas – supply, demand, flows.
•Untapped opportunities to maximize use of treated effluent from local wastewater treatment plants (some of which runs into the ocean and is not captured for beneficial use) and increased water use efficiency through implementation of statewide standardized best management practices.

3.7.2 IRWM Plan Goals:

1. Reduce dependence on imported water and protect, conserve and augment water supplies.

2. Protect and improve water quality.

3. Protect people, property and the environment from adverse flooding impacts.

4. Protect and restore habitat and ecosystems in watersheds.

5. Provide water-related recreational, public access, stewardship, engagement and educational opportunities.

6. Prepare for and adapt to climate change.

3.7.3 Managing Regional Issues and Conflicts

Below are a few examples of how a few local conflicts have been addressed by wholesale water agencies in the WCVC IRWM Region.

Calleguas Municipal Water District

Of the three major watersheds in the Watersheds Coalition of Ventura County, the Calleguas Creek Watershed has the most limited local water supply. The introduction of imported water facilitated development of the Watershed, which is now the most developed of the watersheds in the Region. Demands for imported water grew from 9000 acre feet in 1964 to 110,000 acre feet in 2002, a twelve-fold increase in 38 years. Regional water management issues and conflicts in this Watershed may be generally characterized as the interaction of the evolving effects of rapid development played out against a mixed water supply of local and imported water sources. The following case studies illustrate how conflict has been managed in the Calleguas Creek Watershed.

Calleguas Creek Watershed Case Study No. 1: The City of Thousand Oaks Water Right and the Conejo Creek Project

In 1989, the City of Thousand Oaks filed a water right application to appropriate the imported water discharged from its treatment plant, which was met with strong opposition by farmers who believed their riparian water rights would be harmed. At the same time, the Camrosa Water District was having difficulty meeting potable water demands due to a drought.

After the public voted to recall the five members of the Camrosa Water District board, the District entered into negotiations with the City of Thousand Oaks, the County of Ventura, the Pleasant Valley County Water District, and Calleguas Municipal Water District regarding the proposed reclamation project.

Camrosa offered to buy all the water released from the City of Thousand Oaks. Camrosa, in conjunction with Calleguas Municipal Water District, offered to finance the cost of the project facilities. Camrosa offered to negotiate long-term sales contracts to the riparian users guaranteeing them continued availability of water at a favorable rate in return for resolving the water right protests. Camrosa offered to build, own, and operate the diversion and pumping facilities. And finally, Camrosa offered to provide to Pleasant Valley County Water District any water that could not be used in the Camrosa Water District. In October 1993, all the parties entered into a Memorandum of Understanding that provided a framework to proceed.

Calleguas Creek Watershed Case Study No. 2: Watershed Planning and TMDLs

On December 12th, 2001, the Los Angeles Regional Water Quality Control Board staff released a tentative TMDL for Chloride on the Calleguas Creek Watershed. However, due to extensive comments and opposition from The Calleguas Creek Watershed Water Quality/Water Resources subcommittee, the Regional Board postponed its consideration of the Chloride TMDL and was forced to adopt the EPA's TMDL for Chloride on the Calleguas Creek Watershed. Both the Regional Board and the local agencies found that the U.S. EPA was not prepared to allow the lack of consensus among State and local agencies to prevent it from meeting its court-ordered time schedule to develop TMDLs. Without State and local cooperation, the time schedule threatened to

create a cascade of individual TMDLs that, while meeting every regulatory and procedural requirement, would only by chance translate into an integrated approach to deliver local watershed benefits. At worst, it threatened to create a thicket of regulations that would complicate local solutions to the unique water resource management challenges of the Watershed.

The local agencies learned that if they were going to have a meaningful role in helping to develop TMDLs that made sense on a local level they would have to both be willing to fund the necessary analysis and learn to translate their approach into what was to local stakeholders an arcane language of regulatory administrative procedure and rulemaking. Over time, this approach has resulted in adopted TMDLs for nitrogen, toxicity, historical pesticides, siltation, organochlorine pesticides, salts, and metals

Calleguas Creek Watershed Case Study No. 3: Implementation of the Conditional Waiver for Irrigated Lands

On Nov. 3, 2005, the Los Angeles Regional Water Quality Control Board adopted a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region (Order No. R4-2005-0080) in order to assess the effects of and control discharges from irrigated agricultural lands in Los Angeles and Ventura Counties. Individual landowners and growers would be able to comply with its provisions by working collectively as a Discharger Group. The grower's reaction to the waiver adoption and to the proposed compliance strategy was initially skeptical. After months of outreach, however, landowners were convinced that group membership would provide important advantages.

As of April 2009, 92 percent of the irrigated acreage in the county is enrolled in the program. In the first four years of the program, VCAILG members have been billed a cumulative $1.9 million for Conditional Waiver program costs.

Casitas Municipal Water District

The Casitas Municipal Water District (MWD) has led a number of efforts to manage regional issues and conflicts in the Ventura River Watershed. To protect endangered species, Casitas MWD led a multi-agency effort to build a fish passage facility at the Robles Diversion Facility to assist endangered steelhead to travel further upstream in the Ventura River. Casitas MWD sought and received grant assistance from State and Federal agencies to help cover the $8 million cost of the fish passage facility so that Casitas' water customers would not bear the total costs.

The Casitas MWD also implemented the Steelhead Enhancement Project to help with the endangered steelhead population recovery. This project positively benefits neighboring watersheds by increasing steelhead populations in the Ventura River and potentially in other rivers and streams up and down the Southern California coast.

Local Water Supplies: All of the water in the Ventura River Watershed comes from local rainfall. Urban and agricultural interests rely on local surface and groundwater supplies. Surface water includes the Ventura River, several smaller creeks, and the Matilija and Casitas Reservoirs. The Casitas Reservoir is a large storage facility that is the primary backup water supply for the Watershed. The local groundwater basins run dry for many purveyors, agricultural customers, residents, businesses, and institutional customers during drought conditions spanning one to three

years, which causes them to depend on the local surface storage. Demand on Casitas MWD water supplies can increase by more than 60 percent during drought years.

Physical infrastructure: Population increases through the 1930s and 1940s resulted in the construction of Matilija Dam, a 190-foot concrete arch dam, in the upper Ventura River Watershed on Matilija Creek, in 1948. The Matilija Dam almost immediately became obsolete in meeting all of the water needs of the community due to faulty aggregate used to build it and because significant amounts of sediment carried down the Matilija Creek began to fill the reservoir. The reservoir originally held 7,000 acre feet and now averages a net water supply measuring less than 500 acre feet due to that sediment buildup.

Drought continued to plague the community in the early 1950s creating water shortages for local residents and farmers. During this time, the Ventura River Municipal Water District was formed, which sought assistance from the Bureau of Reclamation to develop a project to solve the lack of water supply reliability. Voters approved a project that included the Casitas Dam and Reservoir, a diversion canal, and a diversion facility on the Ventura River. The project, completed in 1958, included a main conveyance system with 33 miles of pipeline. Today, there are over 91 miles of pipeline within the Casitas' system. Casitas distribution infrastructure includes a treatment plant, 10 pump plants, and 13 covered steel tank reservoirs. The Casitas Reservoir holds 254,000 acre-feet at spill level. Electronic and telemetering signals are used to monitor and control the operation of the water supply and distribution system.

Future Concerns:

In 2004, Casitas MWD completed a water supply and demand study that indicated Casitas would be short of water by an average of 360 acre feet per year. This study was based on demand during a historical 21-year drought period. Casitas MWD has implemented a variety of water conservation programs and other water supply management efforts to address this shortage.

United Water Conservation District

The United Water Conservation District has led efforts to address conflicts in the Santa Clara River Watershed. Some of these conflicts include balancing water supply needs with protection of biological resources and addressing water quality problems that limit the beneficial use of water in some areas of the Watershed.

Early settlers along the Santa Clara River and on the Oxnard Plain diverted water from local streams to supply water to farms and towns. Since the area was blessed with abundant groundwater, wells provided additional water supplies once electric power became available. Local residents joined together in the 1920s to block the export of local water to the City of Los Angeles, which was then looking for outside water supplies under the direction of William Mulholland. That process of working together culminated in the creation of Santa Clara Water Conservation District (SCWCD), which diverted water for farms and for groundwater recharge in the region. The District began a systematic program of groundwater recharge through constructing and operating diversions and spreading grounds in Saticoy, Santa Paula, and Piru.

The confluence of Piru Creek and the Santa Clara River, located within Ventura County near the boundary with Los Angeles County, creates a natural boundary for management of water resources

within Ventura County. Above that point, the Santa Clara River is a sandy wash with water flowing above ground only a few days a year. The upper end of the Piru groundwater basin forms a "sink" that percolates most of the flow in the Santa Clara River arriving from Los Angeles County.

By the 1950s, seawater had begun intruding into aquifers near the coast. Wells near the coast were abandoned. The Piru groundwater basin had fallen to critically low levels. The Cities and farmers worked together and "united" to create United Water Conservation District (United Water), replacing SCWCD. Voters approved bonds, and large construction projects were built to manage local water resources: Santa Felicia Dam, which impounds 88,000 acre feet Lake Piru; an enlarged Saticoy diversion; spreading ponds in El Rio; the Oxnard Hueneme potable water system to supply the cities of Oxnard and Port Hueneme, Naval Base Ventura County, and several mutual water companies. Since that time, additional facilities were constructed including the Freeman Diversion on the Santa Clara River, a hydroplant, the Pumping Trough Pipeline agricultural irrigation system, the Saticoy Wellfield, and upgrades to the potable water facilities.

In the 1970s, United Water became a contractor for the State Water Project with 5,000 acre-feet a year of allocation out of Ventura County's total 20,000 acre feet. United Water receives its State water in most years via releases from Pyramid Lake, which flow down Piru Creek into United Water's Lake Piru where it blends with local stormwater. Water stored in Lake Piru in the winter is released downstream in the late summer and fall for groundwater recharge and direct agricultural use.

Other issues are affecting the supply of water in our Region. Endangered steelhead trout require more water releases to support their migration, reducing local supplies. Endangered toads in Piru Creek limit the use of State water. The future availability of State water itself may become limited by the water needs of numerous endangered species in the Delta.

Despite 80 years of effort, much remains to be done. An extensive monitoring program and state-of-the-art modeling demonstrates that overdraft continues in the coastal aquifers. Seawater intrusion is getting worse. A buried earthquake fault hinders the movement of recharged groundwater toward the eastern part of the Oxnard Plain. High nitrates due to fertilizer use and septic systems have contaminated some areas. Reclaimed water produced by Oxnard and Ventura are available to supplement local water supplies. More projects are needed to bring water supply and demand into a long-term balance, creating a sustainable water supply into the future.

3.8 Relationship and Coordination with Neighboring IRWM regions

The boundaries for the WCVC IRWM Region are for the most part the boundaries of Ventura County with the exception of the portion of the Malibu Creek Watershed that lies within Ventura County. There are three primary adjacent IRWM Regions, as depicted in Figure 3-18; Santa Barbara County IRWM Region, Upper Santa Clara IRWM Region, and the Greater Los Angeles IRWM Region. Though the boundaries of the San Luis Obispo and Kern County IRWM Regions lie close to, or adjacent to, the WCVC Region – there are no significant shared resources or development along those boundaries.

There are no uncovered or void areas, and there is no overlap with any other IRWM Region. There are a few watersheds and groundwater basins shared with neighboring regions. Stakeholders in the Region recognize that effective and comprehensive integrated water management cannot be

confined within arbitrary or political boundaries particularly when natural resource areas are not neatly contained within those boundaries.

WCVC stakeholders have been working with neighboring Regions since before the passage of Proposition 50, and that collaboration has increased in recent years. Through ongoing communication and regular meetings, the Regions address issues and priorities of mutual interest and benefit.

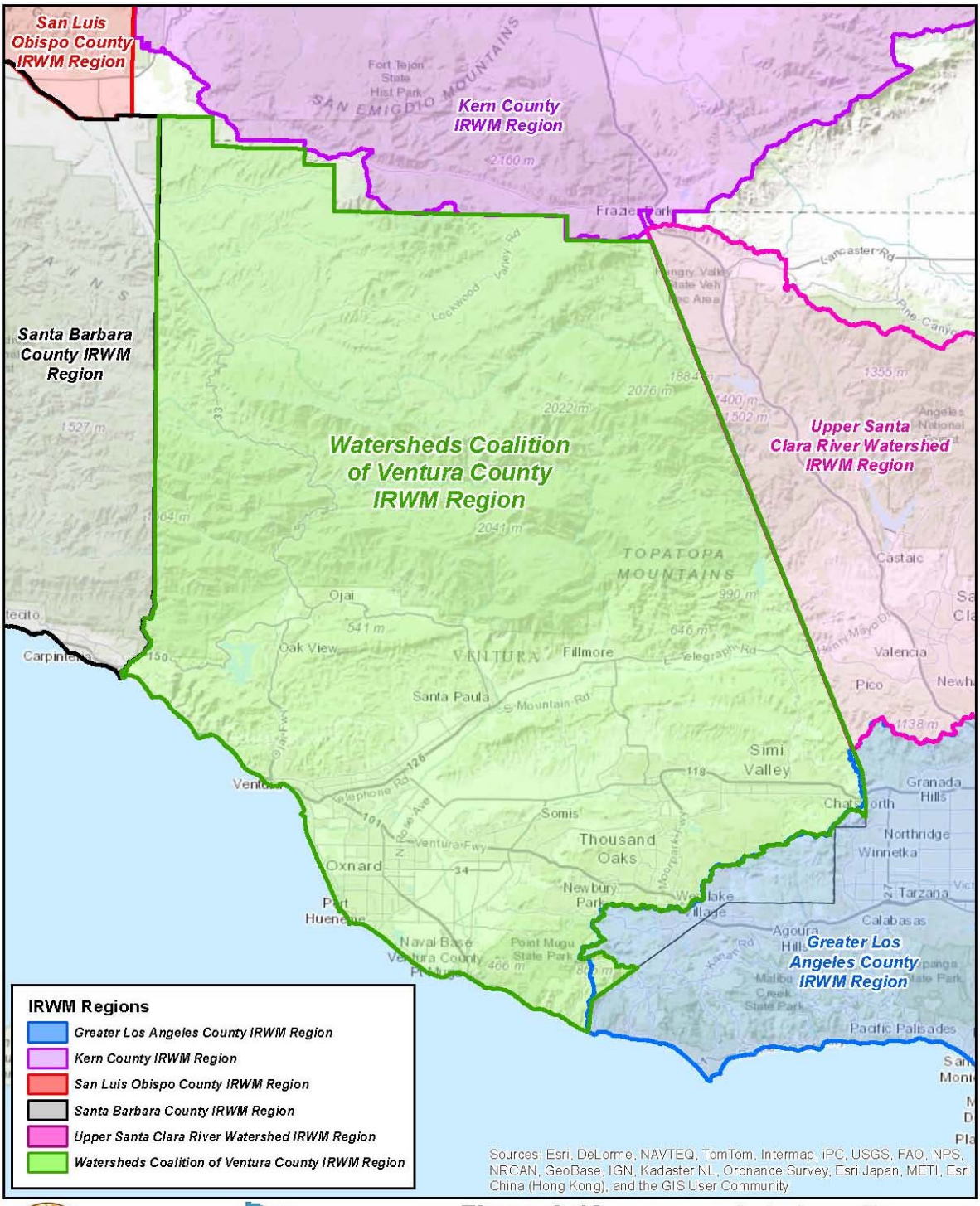


Figure 3-18
Adjacent IRWM Regions
WCVC IRWM Region

The IRWM regions sharing boundaries with WCVC include:

- Santa Barbara IRWM Region to the west
- Upper Santa Clara IRWM Region to the north and east
- Greater LA IRWM Region, specifically the North Santa Monica Bay Subregion to the south
- Kern IRWM Region to the north

Coordination among these neighboring Regions includes:

- Attending regional water management group meetings in neighboring regions
- Including representatives from the other groups on our IRWM email distribution lists – and vice versa
- Including links from our website to their websites
- Conducting meetings to discuss further ways to coordinate and discuss current and future joint projects

The Santa Barbara IRWM Region

Santa Barbara County lies to the west of Ventura County. When Proposition 50 was initiated in 2002, agencies in Santa Barbara and Ventura County met a number of times with agencies in other counties to discuss how to collaborate in the formation of IRWM Regions and the development of projects. Subsequently, Santa Barbara and Ventura Counties each formed their own IRWM Region. In 2005 Ventura, Santa Barbara, and San Luis Obispo Counties held a joint workshop to address IRWM issues and explore ways to collaborate.

In terms of shared resources, a small portion of the Rincon Creek Watershed and a larger portion of the Cuyama River Watershed and Groundwater Basin lie within both regions. These areas are sparsely populated, and there is no shared infrastructure. In 2007 a watershed management plan for the Rincon Creek Watershed was adopted. Ventura County representatives reviewed the plan, which largely addressed actions to be taken within Santa Barbara County. Representatives from both Ventura and Santa Barbara Counties plan to discuss additional opportunities to collaborate along this watershed in the future.

The Cuyama Groundwater Basin is in a state of overdraft and the USGS and the County of Santa Barbara are currently conducting a study of the Basin. Ventura County has been participating in this study by providing well records, land use information, and other data for wells in the Basin within Ventura County. Approximately 300 people live in the Ventura County portion of the Cuyama Basin. Most of the water used in the area is for agricultural irrigation.

A portion of the area along the shared boundary is part of the Los Padres National Forest and is managed by the U.S. Forest Service.

In the past, the two Counties worked together on several projects, including the emergency water supply project bringing water to Santa Barbara County through Ventura County during the last prolonged drought (1986-91). There has also been coordination among staff conducting water use efficiency and drought response programs, and joint meetings of the respective water use efficiency committees are planned.

Representatives of the two Regions have been collaborating through meetings and regular communication focused on additional ways to work together on projects that would provide mutual benefit.

Upper Santa Clara River Watershed IRWM Region

The Santa Clara River Watershed, one of the last remaining natural rivers in Southern California, is the largest watershed in Ventura County. The 1600 square mile Watershed spans two Counties - Los Angeles and Ventura – and efforts are underway between the two Counties to work collaboratively to address issues of mutual concern and benefit, such as water quality improvement. The portion of the watershed located in Los Angeles County is typically referred to as the Upper Santa Clara River Watershed, while the portion in Ventura County is referred to as the Lower Santa Clara River Watershed.

The Upper Santa Clara River Watershed IRWM Region formed in 2007 and has been coordinating closely with the WCVC IRWM Region. Prior to the formation of IRWM Regions, there have been a variety of collaborative efforts that have included both the Upper and Lower Santa Clara River areas. A few of these are listed below.

- Alternative Water Resource Management Project – Led by Los Angeles County Sanitation Districts with participation in both counties – currently underway
- Watershed U – Collaboration throughout the watershed led by U.C. Cooperative Extension with participation in both counties - 2005
- Memorandum of Understanding between United Water Conservation District and water agencies in the Upper Santa Clara River Watershed regarding groundwater modeling, water rights, quality, and quantity
- Upper and Lower Santa Clara River Conservation Plans prepared by The Nature Conservancy – with participation in both counties
- Natural Floodplain Management efforts – including land acquisition for easements in the flood plain, led by The Nature Conservancy with participation in both counties
- Santa Clara River Parkway Project – led by California Coastal Conservancy – with participation in both counties – currently underway
- Santa Clara River Enhancement and Management Plan – joint planning effort with entities in both counties and the Army Corps of Engineers - Completed in 2005
- Army Corps Feasibility Study – geomorphology assessment – joint effort with both counties and the Army Corps of Engineers – currently underway
- Land use planning – ongoing discussions between Ventura and Los Angeles County planning agencies regarding land development projects in the Upper Santa Clara River Watershed
- Ongoing efforts to improve habitat and provide stewardship for resources in the entire watershed – some local environmental groups cover the entire watershed working in both counties to coordinate efforts
- Ongoing coordination between Los Angeles and Ventura County regarding flood control

The two groups have coordinated through the respective stakeholder processes, planning efforts, and project selection processes to ensure that the entire watershed is protected and managed despite the county lines. Joint meetings between the two IRWM Groups are held periodically. The two regions are also in the same funding area under Proposition 84, so ongoing coordination is particularly important.

The two Regions continue to strive for comprehensive management of the entire watershed and to address common needs and concerns. While the two Regions function well separately, close coordination is beneficial to both.

Greater Los Angeles IRWM Region – North Santa Monica Bay Sub-region

The WCVC IRWM Region shares its southern boundary with the North Santa Monica Bay Sub-region of the Greater LA IRWM Region. Along portions of this boundary lies the Malibu Creek Watershed. This watershed is included in the Greater LA IRWM Region's planning effort. As described above with other neighboring regions, representatives of each group attend the other group meetings when possible and have coordinated on water quality issues which are of particular concern in this watershed. In particular the two Regions have collaborated on a water recycling project in the Oak Park and Lake Sherwood areas and will continue to pursue joint projects and coordinate our IRWM efforts in the future. The entities in Ventura County working most closely with the North Santa Monica Bay Sub-region participants are the Triunfo Sanitary District, the City of Thousand Oaks, and the Ventura County Watershed Protection District. This coordination has focused primarily on TMDL issues.

Kern County IRWM

Kern County lies to the north of Ventura County. The area along the shared boundary is U.S. Forest Service land and is sparsely populated. Any watershed planning and related efforts in that area are managed by the Forest Service. There is no shared water-related infrastructure with Kern County.

3.9 Reducing Dependence on Water from the Sacramento-San Joaquin Delta

The Watersheds Coalition of Ventura County (WCVC), as part of the development and implementation of its Integrated Regional Water Management (IRWM) Plan, has clearly demonstrated a strong commitment to implement projects that help reduce local dependence on imported water from the Sacramento - San Joaquin Delta (Delta). The following discussion:

- Provides an introduction and overview to WCVC, describing local and imported water demands within Ventura County.
- Describes water and resource management strategies and specific WCVC projects to reduce imported water demands.
- Describes future IRWM Plan efforts to continue to reduce dependence on imported water.

Water Demand and Imported Water Needs in WCVC

While about 65 percent of the total County water demand is supplied from local groundwater sources, imported water makes up about 25 percent of the water utilized in the County. This imported water and is currently exclusively State Water Project (SWP) water from the Delta though Colorado River water may be imported in the future. The balance of the water is from local surface water and recycled water. Conservation efforts and development of alternative water supplies have reduced imported water demand from a high of about 130,000 AFY in 2007 to approximately 104,103 AFY in 2012. However, in many locations, it is necessary to blend imported water with

local groundwater supplies to meet water quality standards, and more than 75 percent of the County's population continues to rely on imported water for all or part of its supply.

SWP water used in the Calleguas Creek Watershed and the lower parts of the Santa Clara Watershed is obtained locally by Calleguas Municipal Water District (Calleguas) from the Metropolitan Water District of Southern California (Metropolitan) for delivery to retailers serving the southern and eastern portions of the County, including the Cities of Thousand Oaks, Simi Valley, Moorpark, Camarillo, Port Hueneme, Oxnard, and agricultural entities in the Region.

Many retail purveyors in the Calleguas Creek Watershed have no source of potable water other than Calleguas, while others use both imported water and local groundwater. The projects in the IRWM Plan and this Proposal will help the Calleguas Creek Watershed to reduce its dependence on SWP water.

The Santa Clara River Watershed is partially dependent upon imported water from the SWP from Calleguas. The Cities of Oxnard and Port Hueneme receive about 50 percent of their water from Calleguas with local groundwater making up the remainder. Additionally, the United Water Conservation District has been using up to 5,000 AFY of SWP water (obtained directly from the SWP) to recharge groundwater within the Santa Clara River Watershed.

The Ventura River Watershed does not currently receive any SWP water. However, several agencies hold an entitlement for 15,000 AFY of SWP water that they are not currently utilizing. The projects in the IRWM Plan and this Proposal will help prevent agencies in the Ventura River Watershed that are not currently using SWP from calling upon their entitlement.

With current and future projects in the WCVC Region, agencies in Ventura County may be able to reduce current SWP usage and decrease future demand for imported water in the Calleguas Creek and Santa Clara Watersheds. By decreasing SWP demand, the water quality, ecosystem quality, and water supply of the Delta can be maintained and improved and adverse impacts prevented.

WCVC IRWM Plan Goal Addressing Reducing Dependence on Imported State Water

The first of the WCVC IRWM Plan's six goals aims to reduce dependence on imported water:

Goal #1 - Reduce dependence on imported water and protect, conserve, and augment water supplies.

This goal is foundational to the WCVC's IRWM Plan because:

- Local water agencies, especially those served by Calleguas, understand that expanding their water portfolios with local water supply options will increase water supply reliability. Reliable water is a basic need.
- The 2011 SWP Delivery Reliability Report indicates that environmental water needs and climate change will result in decreases in SWP deliveries from 9 percent to 70 percent of the maximum contract amount over an 82-year simulation period under current conditions.

Deliveries are expected to average 61 percent of maximum contract amount under current conditions, but decrease to approximately 35 percent of maximum contract amount over multiple dry years. Anticipated deliveries under future conditions are similar. Therefore, SWP contractors such as Metropolitan cannot rely on the SWP for delivery of maximum contract amounts now or in the future compelling agencies to pursue and expand local water supply projects.

- Metropolitan's water rates continue to rise. In 2006 the Tier 1 water rate was $453/AF; in 2013 the Tier 1 water rate is $847/AF, an increase of 87 percent. Metropolitan is projecting an average rate increase of 5 to 6 percent per year for the next ten years. Development of local water supplies will result in lower costs for ratepayers as compared to Metropolitan's water rates for imported water.

WCVC Strategies to Reduce Dependence on Imported Water

Resource Management Strategies are being implemented in the Region that reduce dependence on, or maintain independence from, imported water, including: water quality improvement, water use efficiency, desalination, water recycling, and conjunctive use.

As specified in the IRWM Plan Standards in the Proposition 84 IRWM Grant Program Guidelines, IRWM Regions must consider implementing Resource Management Strategies (RMS) which are included in Volume 3 of the California Water Plan, Update 2009. In order to improve water supply reliability, water agencies are working to diversify the water resources mix to reduce dependence on a single source of supply with the recognition that enhancing local water supplies is essential for a more reliable water portfolio.

With the variability of surface water and groundwater supplies and potential uncertainty about the availability and cost of imported water, managing the quantity of water in Ventura County is critical. By increasing use of local supplies and reducing dependence on imported water, water supply reliability can be enhanced.

As a result, most projects included in the IRWMP that contribute to increasing supply reliability, including those listed in Table 3-7 share a common focus on local supply enhancement.

TABLE 3-7
SELECT WCVC PROJECTS THAT REDUCE DEPENDENCE ON IMPORTED WATER

Project Type	Partial List of Projects	Applicable Resource Management Strategies that Reduce Dependence on Imported Water
Water Use Efficiency	• City of Port Hueneme – Meter Retrofit Program • Ventura County Farm Bureau Agricultural Water Efficiency Surveys – BMP Implementation • Ventura County Regional Urban Landscape Efficiency (VC-RULE)	• Urban water use efficiency • Agricultural water use efficiency
Salinity Management/Desalination	• Calleguas Regional Salinity Management Pipeline • Camrosa Round Mountain Desalter • Lower Santa Clara River Basins Salt and Nutrient Management Plan • North Pleasant Valley, South Las Posas, Somis, and West Simi Desalters • Renewable Water Resource Management Program for the Southern Reaches of Calleguas Creek Watershed	• Desalination – Brackish and Seawater • Salt and salinity management • Groundwater management • Conjunctive Management
Recycled Water	• CamSan/Camrosa Recycled Water Interconnection • Camrosa Expansion of Non-Potable Water System • Fillmore Integrated Water Recycling Project • Camrosa Expansion of Non-Potable Water System • Piru Treatment Plant Tertiary Upgrade	• Recycled municipal wastewater • Groundwater management and aquifer remediation • Matching water quality to use

	• Simi Valley Regional Recycled Water System • Waterworks District 1 Recycled Water System - Moorpark	
Groundwater Management/Conjunctive Use	• El Rio Forebay Groundwater Contaminant Elimination Project • Las Posas Basin Conjunctive Use Study and ASR Project • Oxnard Forebay Groundwater Contaminant Elimination Project • El Rio Forebay and Piru Spreading Grounds	• Conjunctive use and groundwater management • Groundwater/ aquifer remediation
Stormwater Capture and Management	• Multiple retention and spreading grounds projects • Low impact development standards • On-site rainwater capture devices and storage facilities • Best management practices from MS4 permit - for new construction to reduce runoff	• Matching water quality to use • Pollution prevention • Urban runoff management • Relation to land use planning

Note: These are only a few examples of projects being implemented in the Region

Water Use Efficiency (WUE)

Water use efficiency is an important means to improve reliability. Water agencies in Ventura County have a long history of promoting WUE. As discussed in Sections 6.3.1-2 of this IRWM Plan, local efforts to maximize water use efficiency, including the Ventura County Regional Urban Landscape Efficiency (VC-RULE) program, started with the drought of 1976-1977. The first county-wide WUE program began in 1982 to address both urban and agricultural efficiency.

Since then, most of the urban water suppliers in Ventura County have signed the California Urban Water Conservation Council Memorandum of Understanding to implement WUE Best Management Practices. Since these urban water suppliers deliver water to approximately 90 percent of the urbanized users in the County, efficient water use is foundational to reducing the Region's dependence on imported water use. Efforts across the Region to improve agricultural WUE include the Ventura County Resource Conservation District Mobile Irrigation Efficiency Lab, which provides free irrigation evaluations and recommendations for water and nutrient Best Management Practices.

Desalination

Brackish water desalination is considered essential to increasing local supply reliability and reducing dependence on imported water. "Brackish water desalination solves both reliability and quality goals in the Region. By desalting ground and surface water, salinity is reduced in the watershed for the benefit of all users. At the same time those impaired water resources, once treated, augment local supplies and further insulate the Region from threats to imported water."

Much of the local groundwater, especially in the Calleguas Creek and Santa Clara River watersheds, has total dissolved solids levels that limit its use for municipal or agricultural supply without treatment.

One of the integrated, long-range, regional solutions developed for the Calleguas Creek Watershed is construction of the approximately 35-mile Regional Salinity Management Pipeline (SMP), which will provide brine disposal from brackish groundwater treatment facilities. This project is essential to expanding use of local groundwater supplies, thereby reducing dependence on imported water. It is estimated that the pipeline will enable development of up to 40,000 AFY of new local water supplies. This proposal includes a brackish groundwater treatment facility that will utilize the SMP and further the IRWM goal to reduce dependence on imported water. A priority of the Calleguas Municipal Water District is to minimize capital facilities projects related to importation of State Water in favor of local reliability projects (i.e. brackish groundwater treatment, recycling, conservation, etc.)

Wastewater Recycling

Recycled wastewater provides a valuable source of supplemental local water to reduce dependence on Delta water supplies and is recognized in the IRWM Plan as an essential element of a balanced water supply portfolio. Recycled water in Ventura County holds great potential as an alternative water source and a means to improve water supply reliability.

By making recycled water available for non-potable uses, another drought-proof and constant source of water is created for some users. In addition, other potable supplies are made available for potable purposes. The result is improved use of local supply, increasing water supply reliability and reducing dependence on imported SWP water.

Many wastewater treatment plants in the County recycle a portion of their effluent. Several others are planning or implementing projects to initiate or expand recycled water, such as the projects funded in Round One. Table 3-1 includes information about recycling efforts. These projects help reduce the Region's dependence on imported water. The County of Ventura, along with several partner agencies, is currently preparing a Salt and Nutrient Management Plan in order to move forward with developing additional recycled water projects.

Conjunctive Management and Groundwater

There are extensive conjunctive use facilities in Ventura County, allowing the Region to maximize utility of available water resources. Efforts were initiated in response to the serious concern of

seawater intrusion in the 1950s. Currently conjunctive use is implemented through stormwater recharge, in-lieu deliveries of recycled water, and inter-basin transfers.

The Freeman Diversion on the Santa Clara River uses storm flows to recharge the groundwater of the Oxnard Plain. Santa Felicia Dam at Lake Piru stores surface water for later release into the Santa Clara River contributing to improved storage and basin management. In addition, the Conejo Creek diversion provides in-lieu surface waters to meet irrigation demands within the areas of severe groundwater overdraft.

Groundwater management is critical for ensuring the long-term sustainability of the County's largest local water resource. Most groundwater basins in the Region either have an existing groundwater management institution or are in the process of developing a groundwater management plan. The Fox Canyon Groundwater Management Agency (FCGMA) and Ojai Basin Groundwater Management Agency (OBGMA) are special act districts with the authority to manage groundwater. The FCGMA manages the coastal basins of the Santa Clara River and Calleguas Watersheds, while the OBGMA manages the Ojai Basin located in the Ventura River Watershed. Collectively, the FCGMA and OBGMA manage more than half of the groundwater used in the Region. Outside of the areas managed by the special act districts, local agencies and stakeholders are developing AB 3030 groundwater management plans to ensure sustainable use of the other primary groundwater basins within the Region. Lastly, the Santa Paula Basin, located in the Santa Clara River Watershed, is adjudicated and is managed by a local advisory committee that reports to a judge in accordance with a 1996 judgment.

Stormwater Capture and Management

Stormwater can function as a resource when properly managed and protect local water quality so that it can be put to beneficial use as well as reducing flooding. The County of Ventura, Watershed Protection District, has worked collaboratively with local municipalities since 1992 to meet clean water regulations and manage the Stormwater Quality Management Program. These partners work together to improve stormwater quality, monitor the health of local watersheds, and meet the compliance regulations of the Ventura Countywide National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit as adopted by the State under the Clean Water Act. The County's Stormwater Quality Management Program has been a model of success as local Cities and communities have supported clean water and safe beaches. The mission statement for the program is to: Enhance, protect, and preserve water quality in Ventura County water bodies using proactive and innovative ideas for preservation of biodiversity, ecological viability, and human health. The Program's goal is to work as a countywide team with public agencies, private enterprise, the environmental community and the general public to locally implement Clean Water Act requirements, balancing the actions taken with social and economic constraints.

In addition to the benefits of improved water quality, stormwater can be made available for local beneficial uses through recharge, direct capture, treatment, and subsequent storage. Stormwater

can be captured on site through rain catchment devices and either used directly or stored for future use for landscape irrigation or other uses.

Enhancing local water supplies, and reducing dependence on SWP water through increased retention, treatment, and storage of stormwater holds great potential for the Region. This will be accomplished through implementation of best management practices associated with the Region's MS4 Permit and integrated projects developed through the IRWM planning effort.

Future IRWM Plan Efforts to Continue to Reduce Dependence on Imported Water

The goal to reduce demand will continue to be central to the WCVC's IRWM efforts given the Region's ongoing need for imported water, the increasing cost of that water, and its increasingly uncertain reliability. Water use efficiency, desalination, recycled water, conjunctive use, groundwater management, and stormwater capture and treatment will continue to be critical strategies in the Region for increasing local water supply reliability and reducing dependence on imported water. Urban water suppliers in the Region will continue water use efficiency efforts to, in part, meet new per capita demand reduction targets set forth in the water code. The continued progress of the regional Salinity Management Pipeline will allow the Region to greatly expand groundwater desalination and increase use of local resources. The proposed North Pleasant Valley Groundwater Desalter demonstrates the continued implementation of this strategy. Efforts to expand water recycling are ongoing, including implementation of projects recently funded with IRWM Implementation Grant funds.