SECTION 3.0 – WCVC REGION DESCRIPTION

The purpose of this section is to describe the Watersheds Coalition of Ventura County (WCVC) Integrated Regional Water Management (IRWM) Region. This includes 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**) except for the portion of Malibu Creek Watershed that lies within Ventura County which is included in the Greater Los Angeles IRWM Region. The County is an IRWM 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.

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), 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.

The County, local cities and other agencies adopted the Regional Land Use Program in 1974. 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 collaboration, exemplified by the county-wide Association of Water Agencies (AWA). The AWA includes major water districts, the cities with water-delivery responsibilities, the County, special districts, investor-owned water utilities, and mutual water companies. AWA's mission is to provide a forum for the exchange of information on local and regional water issues. Its mission statement is "*to develop and encourage cooperation among entities for the development, protection, conservation and improvement of the total water resources for Ventura County.*" AWA membership covers the range of water stakeholders including agriculture, municipalities, water districts, small systems, industrial water uses and general public.

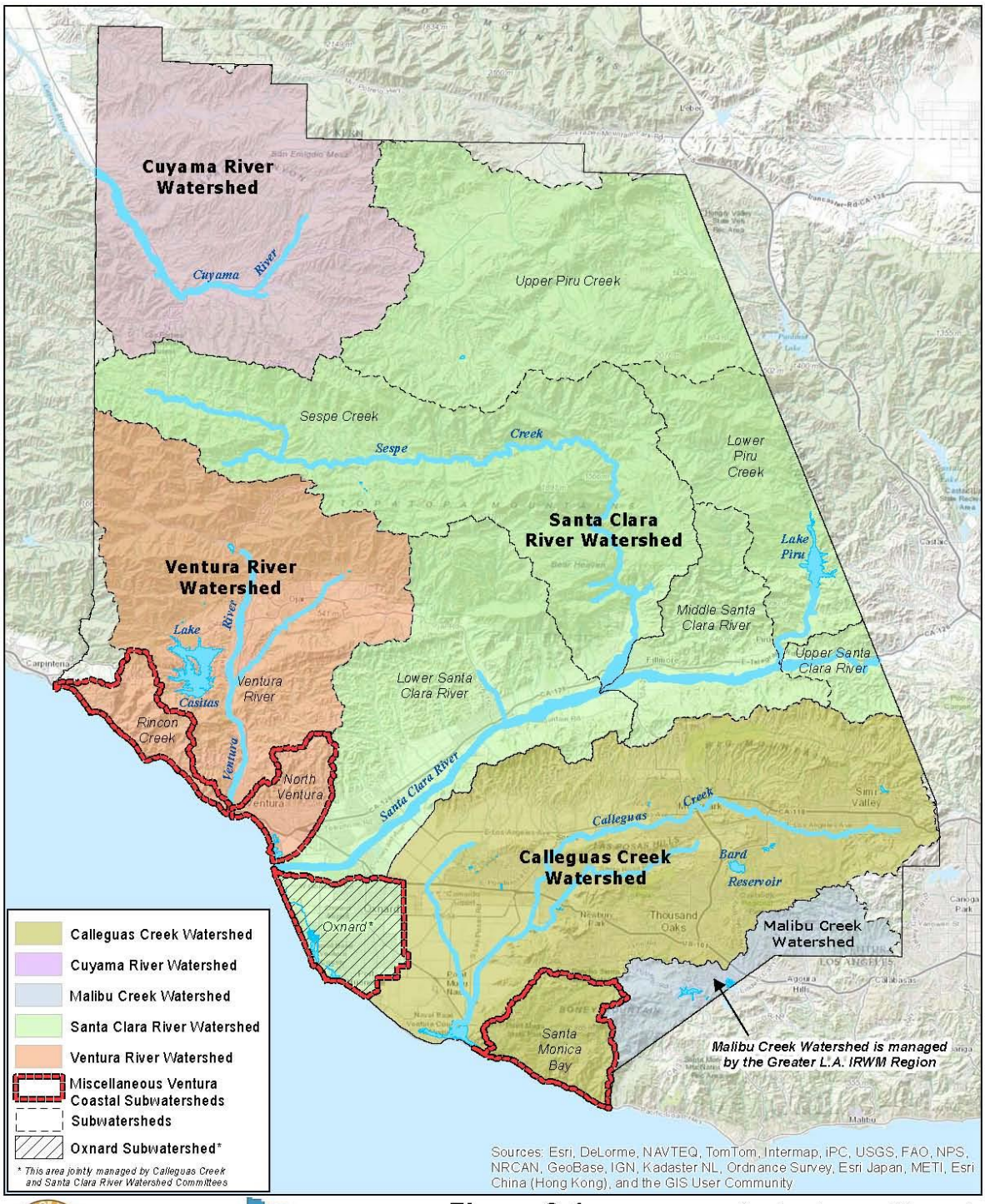


Figure 3-1
WCVC IRWM Boundaries

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. The 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 IRWM Plan process has added flood control and other important components to the integrated water management effort such as habitat protection and wetlands enhancement.

The WCVC identifies regional goals and watershed-wide objectives, determining implementation projects and programs to meet those objectives. The WCVC functions as a forum where stakeholders come together to resolve conflicts and address common issues.

3.1.2 Region Overview

Ventura County has a population of more than 854,000 people (Census Bureau 2017) 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. 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. Virtually the entire north half of the County is within the Los Padres National Forest with privately owned holdings scattered throughout. Residential, agricultural and business uses are primarily located in the southern portion of the County. This IRWM Plan focuses primarily on the southern 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;
- Coastal Strip;
- Interior valleys such as the Ojai Valley;
- Interior valleys with coastal influence such as the Santa Clara River Valley; and,
- 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 2018 Annual Crop Report, the gross agricultural value was approximately 2 billion dollars. Irrigated land in the Region has decreased approximately 6,300 acres since 1998 (John Krist, Farm Bureau of Ventura County).

Of the 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 24 Department of Water Resources (DWR)-designated groundwater basins and subbasins. There are ten incorporated cities, three wholesale water agencies, and more than 160 retail water purveyors, two groundwater management agencies and five sanitary districts. **Figure 3-2** shows the Region along with the boundaries of the major watersheds and the National Forest.

Ventura County also includes Anacapa and San Nicolas Islands. These islands are designated as 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. 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 (**Figure 3-1**). The County boundary forms 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.

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

3.2.1 Watersheds

Figure 3-1 shows the three major watersheds in Ventura County including the Santa Clara River, Ventura River and Calleguas Creek Watersheds. The Cuyama River Watershed which is partially located within the northern area of the County along with 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 the three major watersheds in the Region: the *Calleguas Creek Watershed Management Plan* (2005), the *Santa Clara River Enhancement and Management Plan* (2005) and the *Ventura River Watershed Management Plan* (2015).

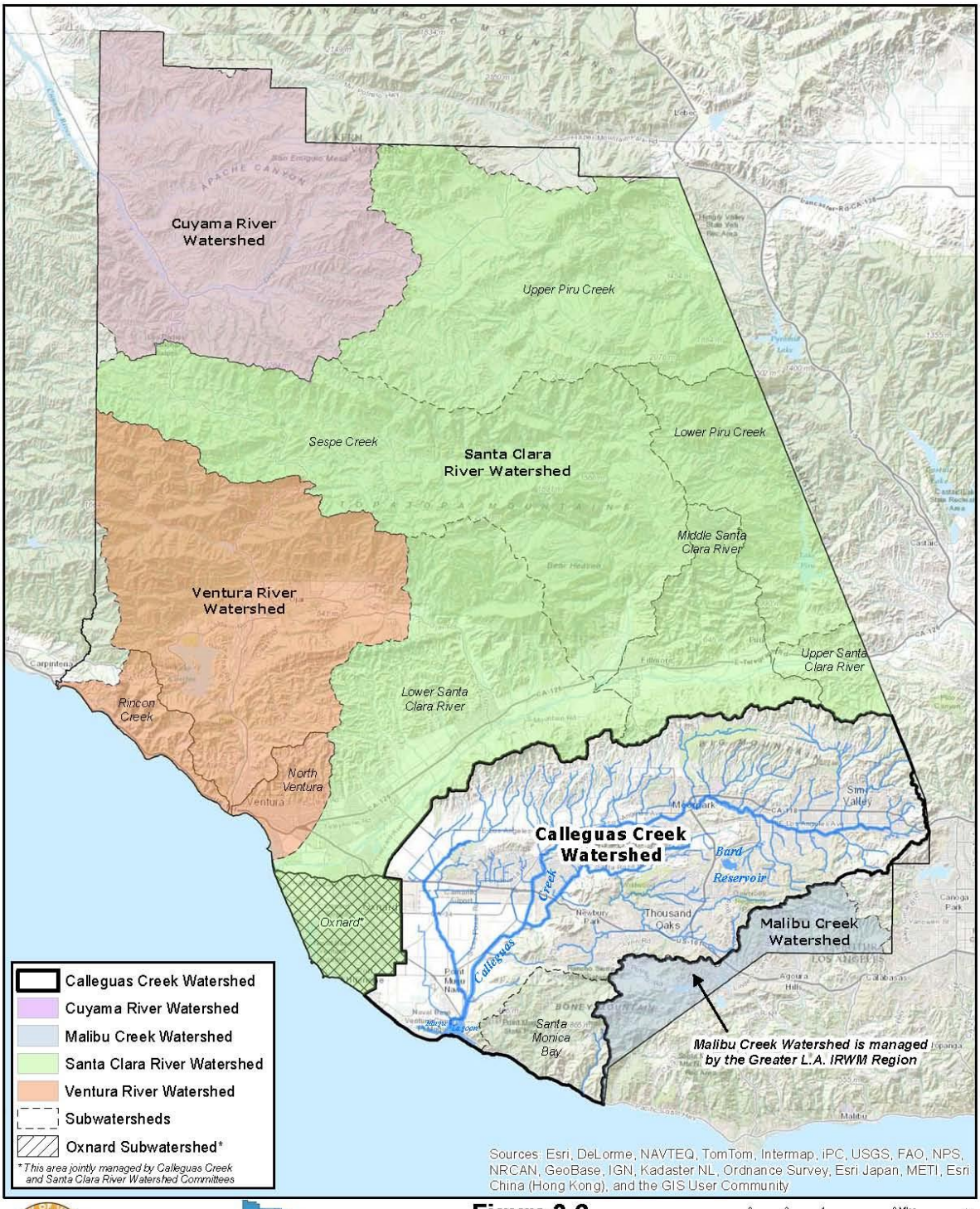


Figure 3-2
Calleguas Creek Watershed
WCVC IRWM Region

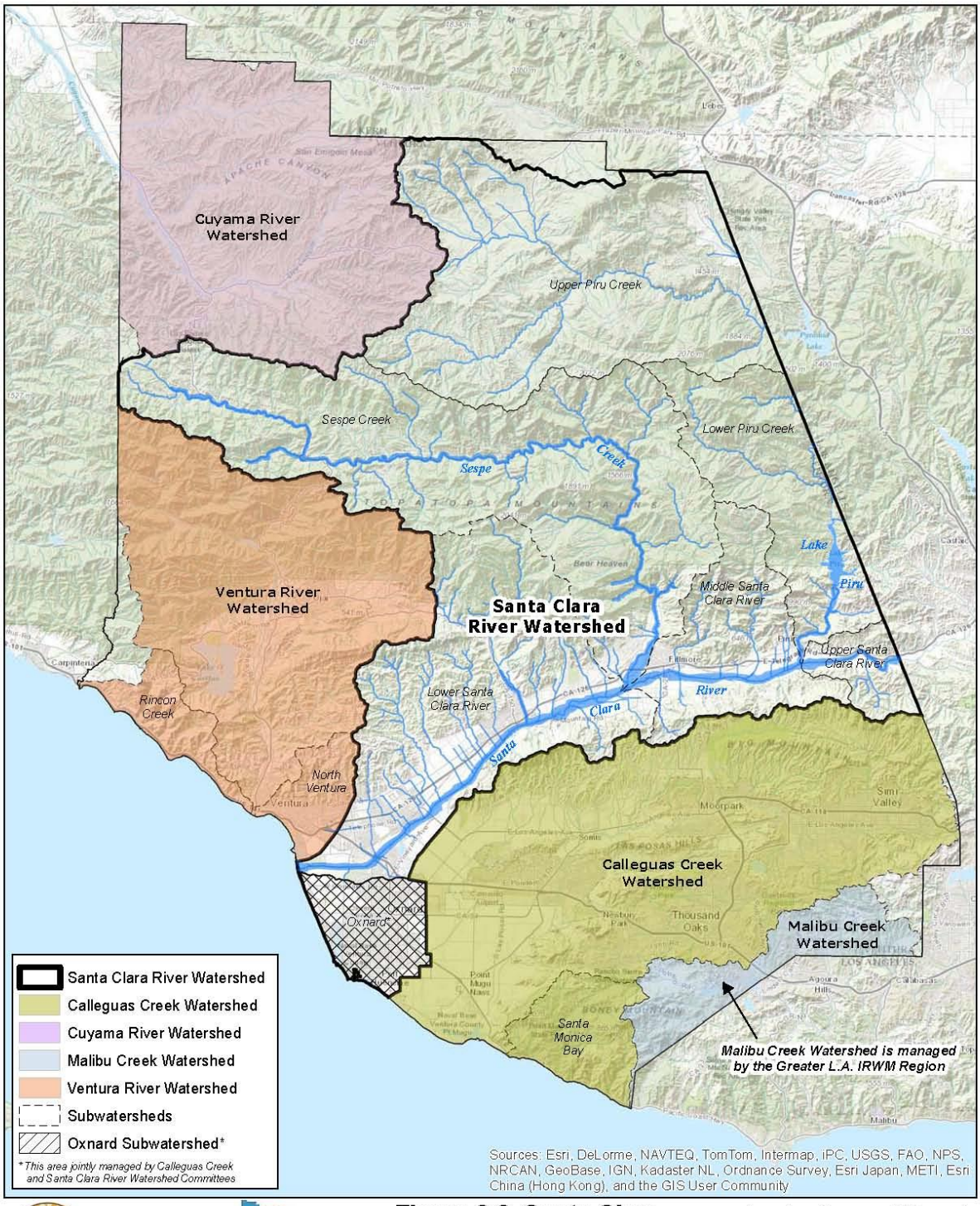


Figure 3-3 Santa Clara River Watershed WCVC IRWM Region

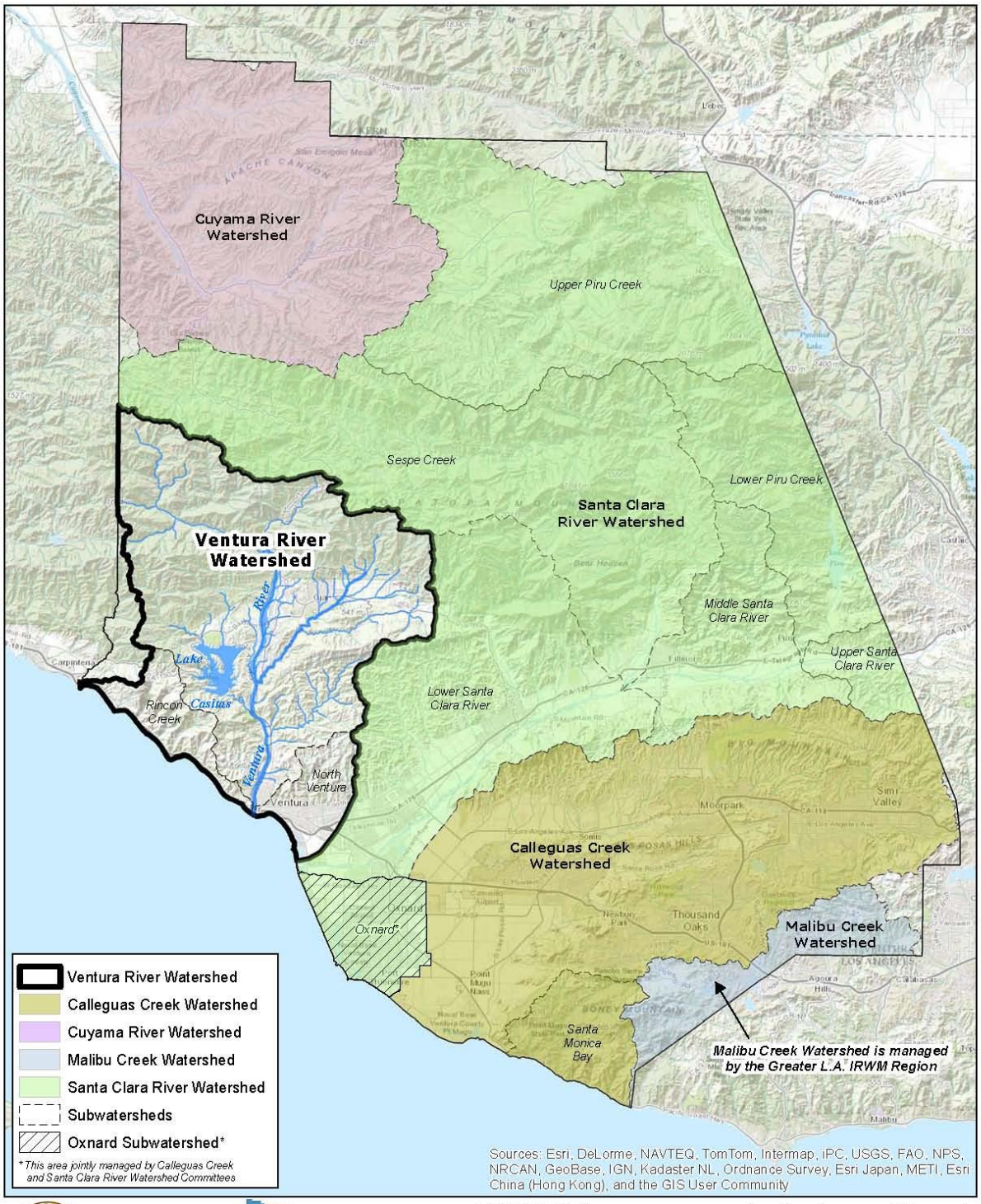


Figure 3-4
Ventura River Watershed
WCVC IRWM Region

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 the 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**. The figure 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 beneficial agency 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. These include: three water-wholesale districts and numerous other public and investor-owned water utilities and mutual water companies:

- The Calleguas Municipal Water District (CMWD) supplies water to smaller water companies, including those that serve the cities of Camarillo, Oxnard, Thousand Oaks, Simi Valley and Moorpark (**Figure 3-6**).
- The United Water Conservation District (UWCD) supplies water to smaller water companies, including those that serve the cities of Fillmore, Port Hueneme, Fillmore and Santa Paula (**Figure 3-6**).
- The Casitas Municipal Water District (Casitas) supplies water to smaller water companies, including those that serve the cities of Ventura and Ojai (**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*

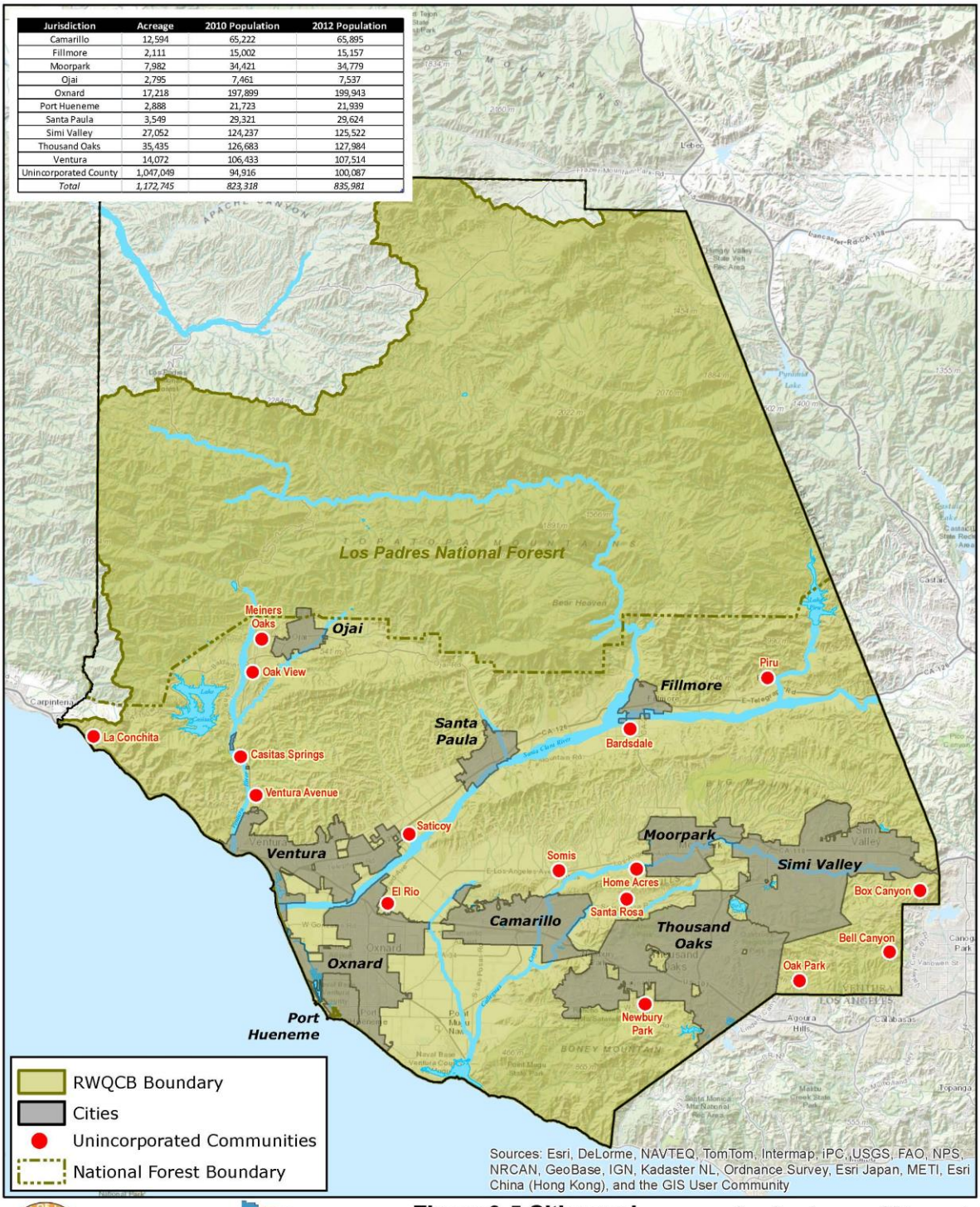


Figure 3-5 Cities and Unincorporated Communities WCVC IRWM Region

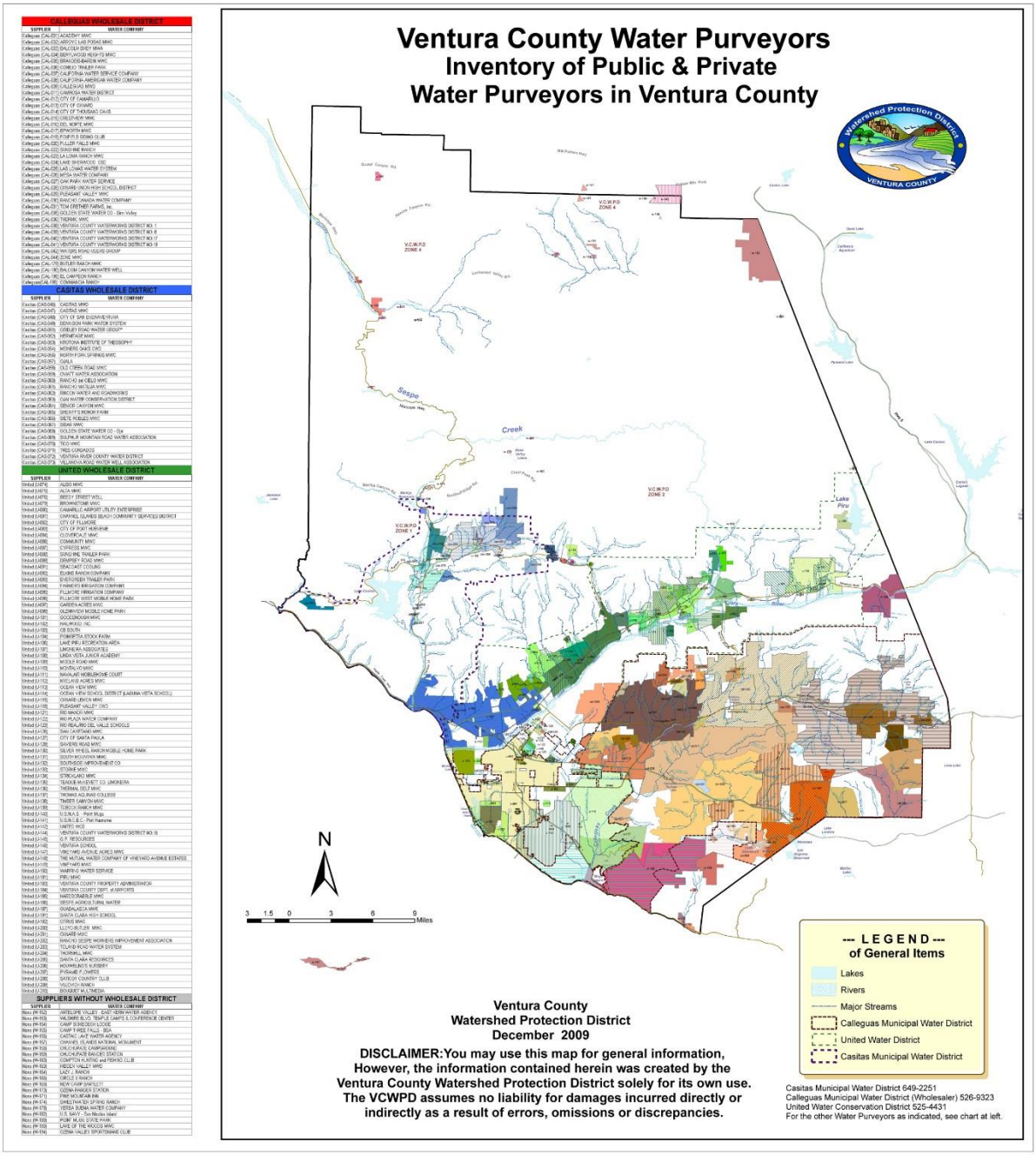


Figure 3-6

Wholesale Water Districts and Water Purveyors

WCVC IRWM Region

Wastewater Districts – The Region is served by 17 wastewater treatment districts. Each of the incorporated cities is served by a district, along with seven 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 (**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 24 groundwater basins and subbasins located in the Region, as defined in DWR Bulletin 118, February 2019 update, with four additional County-designated basins (**Figure 3-8**). The largest groundwater supplies in the southern portion of the County are contained within major water-bearing aquifers underlying most of the Oxnard Subbasin and the Las Posas Valley Basin. The basins include the Oxnard, Mugu, Hueneme, Fox Canyon and Grimes Canyon aquifers. The major groundwater basins in the northern portion of the County are the Lockwood Valley and the Cuyama Valley Basins.

Figure 3-8 shows the majority of the identified groundwater basins are fully within the Region. Several are shared with neighboring IRWM Regions including the Cuyama, Hungry Valley and Cuddy Ranch Area Basins in the northern half of the County, and the Russell Valley and Thousand Oaks Area Basins along the southern end of the County.

3.2.5 Surface Water Bodies

Surface water resources in Ventura County are divided into three major hydrologic units: the Ventura River, the Santa Clara River Valley and the Calleguas Creek Units. There are also four other smaller hydrologic subunits, consisting of the Pitas Point, 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 (**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 (RWQCB). Most of the County lies in Region 4 – see **Figure 3-5** for the boundaries of the Ventura County portion of RWQCB Region 4.

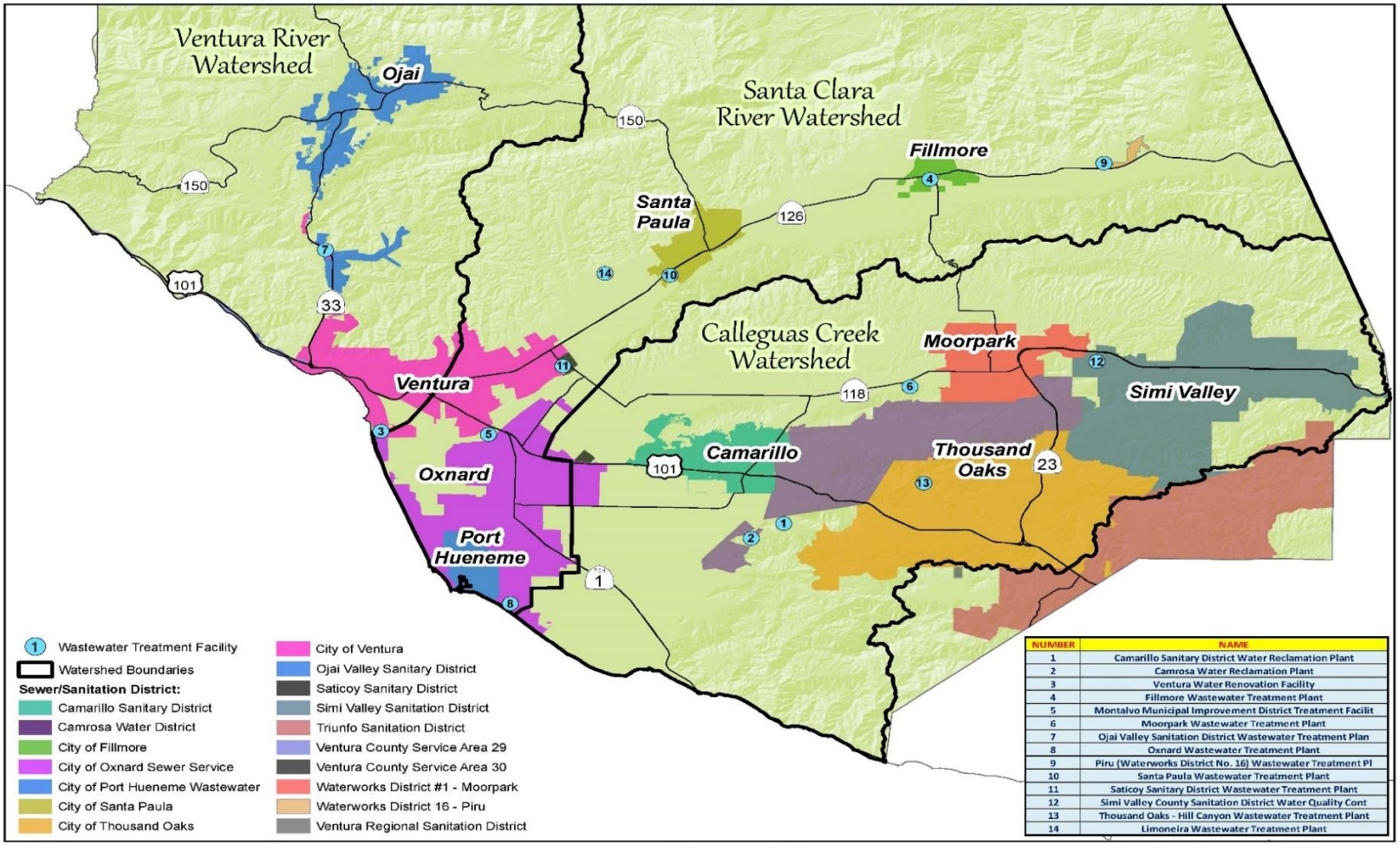


Figure 3-7
Wastewater Districts and Facilities
WCVC IRWM Region

Figure 3-8
Groundwater Basins within the County of Ventura

3.2.7 Floodplains

The Ventura County Watershed Protection District (VCWPD), which is governed by the Board of Supervisors, has the authority to maintain and construct flood-control facilities in the channels shown on the District's Comprehensive Plan. 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 (FEMA) are shown on **Figure 3-9**.

3.3 Watersheds and Water Systems in Ventura County

There are three major watersheds and 24 DWR-designated groundwater basins and subbasins in the Region. Each of the major watersheds and 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, 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. The watershed consists of undeveloped open space with agricultural and 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. Over the past 50 years, increased wastewater discharges and urban runoff provide portions of Calleguas Creek and its tributaries with perennial flow.

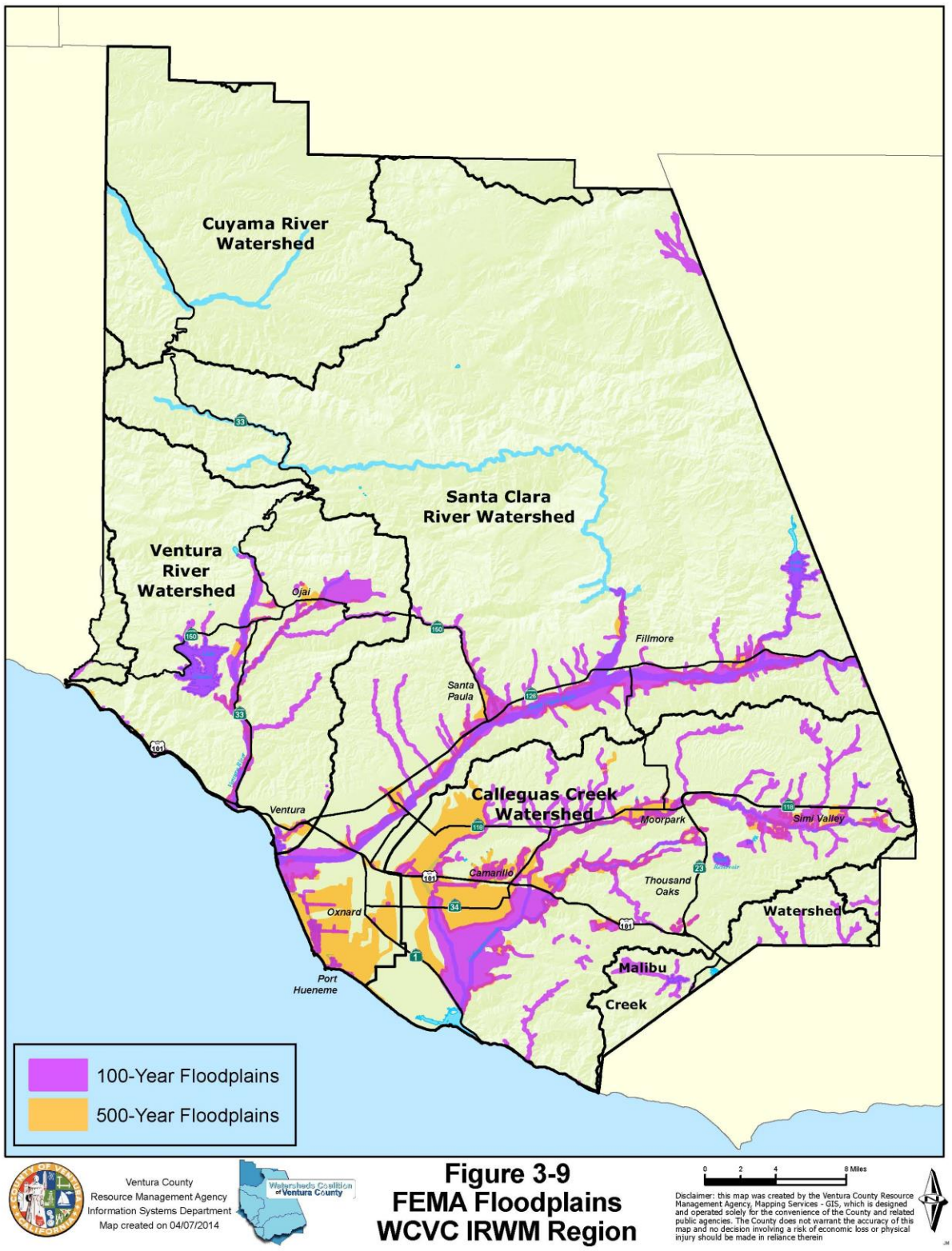


Figure 3-9
FEMA Floodplains
WCVC IRWM Region

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 drains Simi Valley, the eastern Las Posas Valley, much of Pleasant Valley and the eastern portion of the Oxnard Plain. Arroyo Simi is also fed by many 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 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 irrigation 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.

In the Simi Valley and 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 3-10**.

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, 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.

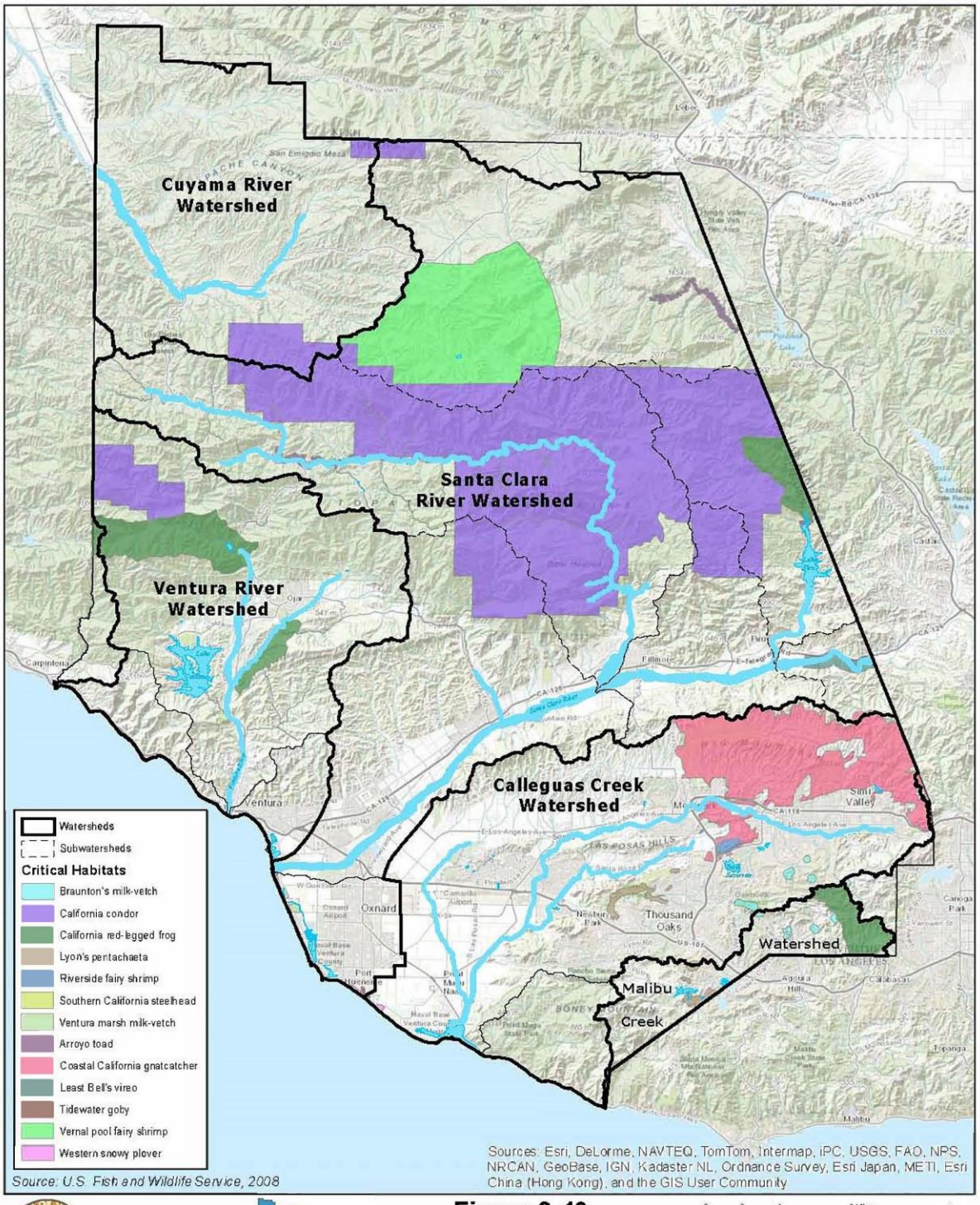


Figure 3-10
Critical Habitat Areas
WCVC IRWM Region

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
- Utilization of recycled water
- Development of local supplies
- Development of a drought-proofing plan

Water Supply Reliability – See also Water Supply

- 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 area degradation within the Watershed

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 its tributary system have 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 in Ventura County. **Figure 3-3** shows the Santa Clara River Watershed in Ventura County.

The Santa Clara River Watershed is the largest watershed in the County with 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. To the south of the river includes 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 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. The current and future quantities of effluent discharge from these facilities can fluctuate due to 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. They do constitute a component of the comprehensive hydrological regime (i.e., surface and groundwater recharge waters) and are included for planning purposes.

Lake Piru (Piru Reservoir): 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 utilize water diverted from the Santa Clara River by UWCD. Lake Piru is UWCD's storage reservoir for water that is released into spreading grounds to percolate into aquifers. Subsequent uses include sale of water to retail purveyors, agricultural use and for groundwater recharge.

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 is one groundwater basin in the Santa Clara River Watershed in the Region: the Santa Clara River Valley Basin, which is drained by the Santa Clara River toward the Pacific Ocean. The Santa Clara River Valley Basin is divided into five subbasins: (Piru, Fillmore, Santa Paula, Mound and Oxnard).

Beneath the Oxnard Subbasin, critical overdraft of the Oxnard aquifer has been largely eliminated in recent years through effective management practices and continuous recharge. 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) that are coupled with wet-to-average climatic conditions and reduced pumping have contributed to improved 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 critically-overdrafted in the southern Oxnard Subbasin and Pleasant Valley Basin where the intrusion of saline water continues. The UWCD has constructed a new UAS well field near Saticoy to utilize UAS water that is more easily replenished. This allows increased water deliveries while at the same time helping to alleviate seawater intrusion in the overdrafted areas. 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 with the implementation of Emergency Ordinance E.

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 3-10**).

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

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
- 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 the water quality is considered good, the watershed has been degraded particularly in the lower reaches by both nonpoint and point sources. Beach closures due to bacterial pollution are common. The major-point sources are the Ojai Valley Wastewater Treatment Plant and individual septic systems in the Ojai Valley. Nonpoint sources include urban runoff, construction, agriculture and keeping of animals, air deposition and recreation. Water quantity is an important issue in this

watershed. Groundwater is used for domestic and irrigation purposes and alluvial basins must be carefully managed and recharged. Groundwater basins are generally aligned and interconnected with surface flows and are made up of alluvial material that is quickly replenished and depleted. The Southern California steelhead and other fisheries are restricted or diminished by diversions and dams that have cut off spawning areas by reduced stream flow and by poor water quality.

Hydrology

Surface Water

From the upper slopes of the mountains of the Transverse Range surface waters in the Ventura River Watershed generally flow southward to an estuary located at the mouth of the Ventura River. Groundwater basins are composed of alluvial aquifers that are aligned with and interconnected with the surface waters and are recharged or depleted relative to surface flow conditions.

Precipitation varies in the Ventura River Watershed with most rainfall occurring between November and March. Summer and fall months are typically dry. Melting snowpack does not sustain significant runoff in warmer months. For a majority of the year, there is no significant surface flow in the Ventura River above the confluence with San Antonio Creek. Seasonal weather and steep gradients result in high flow velocities with most runoff reaching the ocean.

Lake Casitas (Casitas Reservoir): Lake Casitas is the largest local reservoir. Half of the water that fills Lake Casitas comes from Ventura River diversions from the Robles Fish Passage Facility via the Robles Canal, located a few miles north of Lake Casitas. Remaining supply comes from the Coyote and Santa Ana Creeks that flow into the lake. The Casitas Municipal Water District (Casitas) serves about 70,000 people, according to the *Final Urban Water Management Plan and Agricultural Water Management Plan 2016 Update*. Casitas has over 3,000 customers and is considered both a retail and wholesale water agency. They operate one well, the Mira Monte well. High-quality surface water from Lake Casitas is mixed with the well water to improve its quality.

Matilija Reservoir: Due to the accumulation of silt behind the Matilija Dam, Matilija Reservoir has 600-AF of remaining storage and provides an average of 800-AFY 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 divert water from the Ventura River for agricultural use. Several small mutual water companies, the U.S. Forest Service and individuals use wells and springs associated with the river as their source of water.

Groundwater

The Ventura River system is composed of three groundwater basins: The Upper Ojai Valley, Ojai Valley and Ventura River Valley Basin. These basins fluctuate seasonally with the highest groundwater levels in winter and the lowest levels in late summer and early fall. The primary source of recharge to groundwater is the direct infiltration of precipitation.

Flood Management and Infrastructure

The Ventura River Watershed has the highest annual precipitation and rainfall intensities of the major County watersheds. It is characterized by steep terrain and a relatively high percentage of

slope-failures contribute sediment. High-sediment loads decrease the ability to convey the stormwater flow and leads to flooding damage. Potential flooding is increased due to the Ojai area overlying ancient alluvial fans that have historically experienced significant debris flows. Alluvial fans are characterized by braided, sinuous streams that tend to form new channels during extreme storm events and debris flows.

The Watershed yields high-peak flows with large erosive potential as evidenced by channel scour. Channels are dry most of the year and damaging floods have occurred infrequently. Encroaching development into historic floodplain areas increases storm-event flood damage potential. High historic flows have damaged creek pipeline crossings causing large volume spills.

The Ventura River ultimately receives runoff from its tributaries and with sediment equilibrium imbalances from Matilija Dam and other debris basins can cause scour and bank erosion. Armored banks can be damaged by floods with breached levees that threaten homes and businesses. During storm events, bend scour and river meander have eroded adjacent bluffs. The Highway 101 river crossing near the outlet is subject to flooding and closures.

Issues and Needs in the Watershed

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

Water Supply Management Optimization

- Water quantity
- Water distribution system interconnection
- Additional water supplies and/or increased efficiency

Habitat Restoration

- Steelhead recovery
- Arundo removal

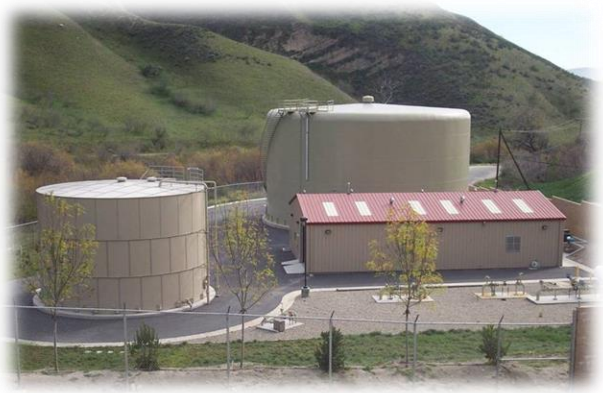
Water Quality

- 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

There are three major wholesale water agencies in the Region: Calleguas Municipal Water District (Calleguas), Casitas Municipal Water District (Casitas), and United Water Conservation District (UWCD) (**Figure 3-6**).

Calleguas Municipal Water District:

Calleguas provides imported state water from the State Water Project (SWP) for wholesale to retail water purveyors serving municipal/industrial customers in the southeastern portion of the County. Calleguas serves an area of approximately 366-square miles including the cities of Camarillo, Moorpark, Oxnard, Port Hueneme, Simi Valley and Thousand Oaks including the unincorporated communities of Oak Park, Santa Rosa Valley, Bell Canyon, Lake Sherwood, Somis, Camarillo Estates and Camarillo Heights. Calleguas delivers a large volume of water to retailers. Approximately 75 percent of the population in the County receives water imported by Calleguas. Calleguas is a member agency of the Metropolitan Water District (MWD). According to the *July 2019 Annual Water Quality Report* and *2015 Calleguas Municipal Water District Urban Water Management Plan - Final*, the population served is over 635,000, and annual water delivery was 131,466-AF. In 2015, Calleguas imported a total of 86,971-AF of SWP water. **Figure 3-11a** shows the location of the major water system infrastructure operated by Calleguas.

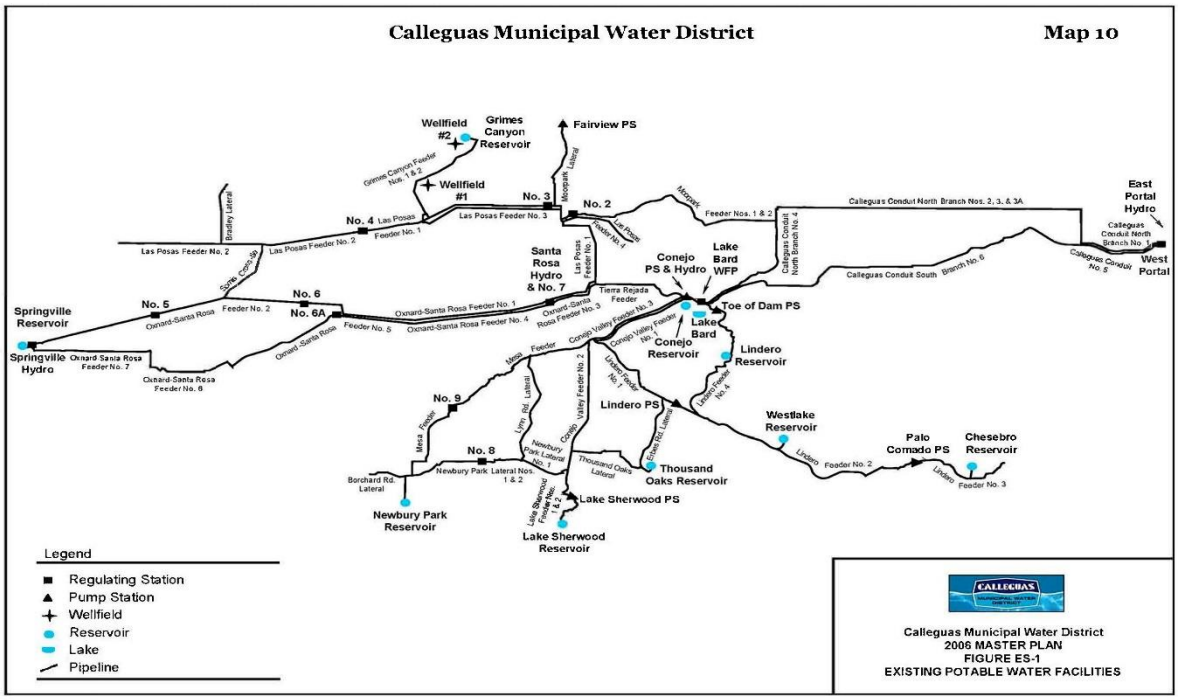


Figure 3-11a
Calleguas Municipal Water District
Major Infrastructure
WCVC IRWM Region

Casitas Municipal Water District:
Casitas provides and delivers wholesale and retail water from Lake Casitas. The District manages Lake Casitas and serves approximately 70,000 people. A portion of the inflow to the Casitas reservoir comes from runoff in the 34-square-mile surrounding drainage area. The remainder is diverted to Casitas from the 74-square-mile Ventura River-Matilija Creek Watershed through the Robles-Casitas Canal. **Figure 3-11b** shows the Casitas infrastructure.

United Water Conservation District:
UWCD is responsible for groundwater recharge in the Ventura County portion of the Santa Clara River Valley and the wholesale distribution of water to purveyors on the Oxnard Plain. UWCD operates Lake Piru. Water from the lake is released to the Santa Clara River for recharge of the Piru, Fillmore and Santa Paula Subbasins. United imports SWP water, when available, into Ventura County from Pyramid Lake 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 municipal and agricultural use. **Figure 3-11c** shows the location of the Freeman Diversion and other UWCD facilities.

Other Water Purveyors in Ventura County
In addition to major wholesalers there are numerous public and private water-retailers that provide water to agricultural and domestic users (**Figure 3-6**).

In addition to water wells owned or operated by retail and wholesale water providers, Individual well owners perform most of the pumping in chiefly for irrigation purposes.

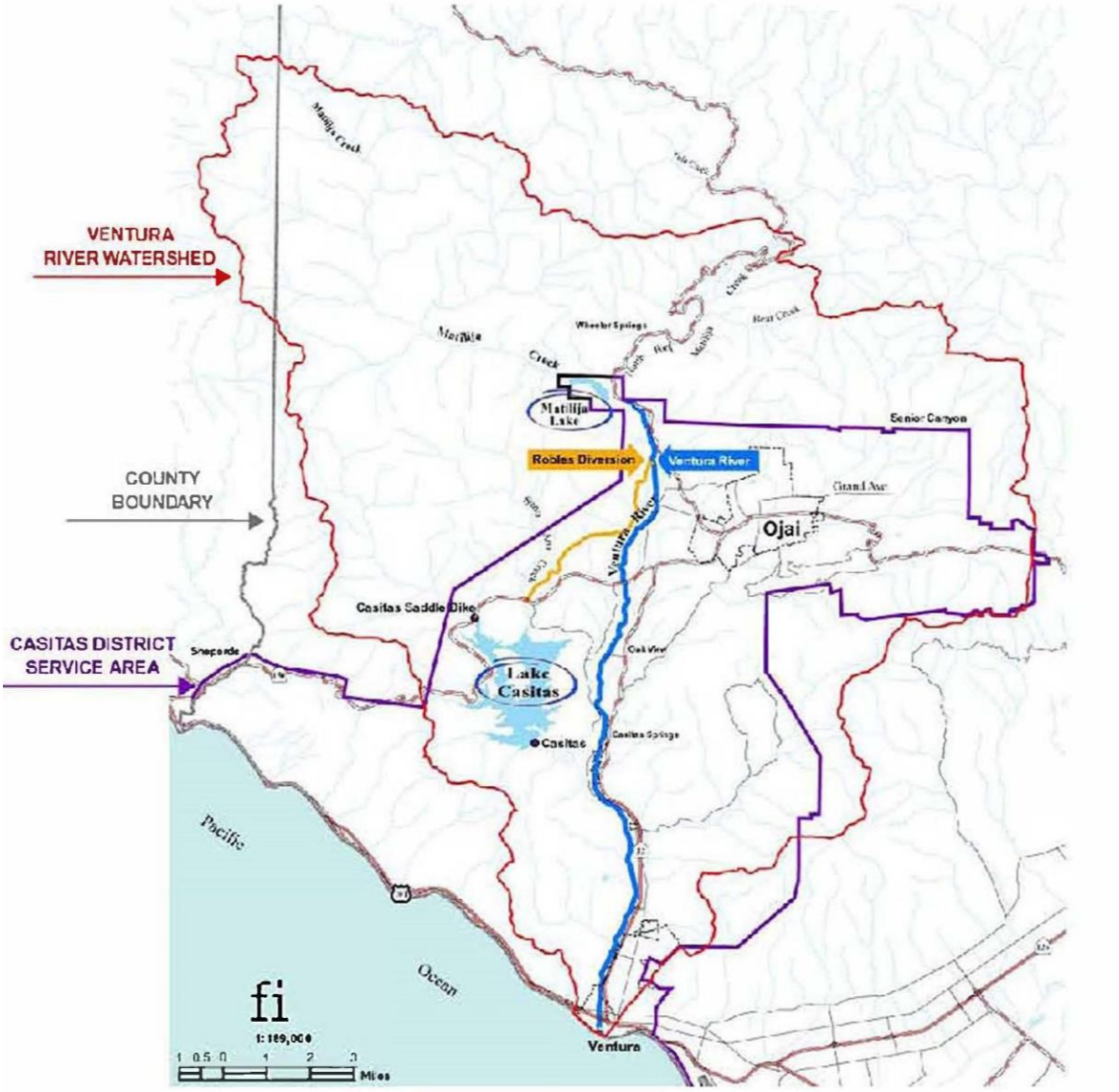


Figure 3-11b
Casitas Municipal Water District
Major Infrastructure
WCVC IRWM Region

United Water Conservation District

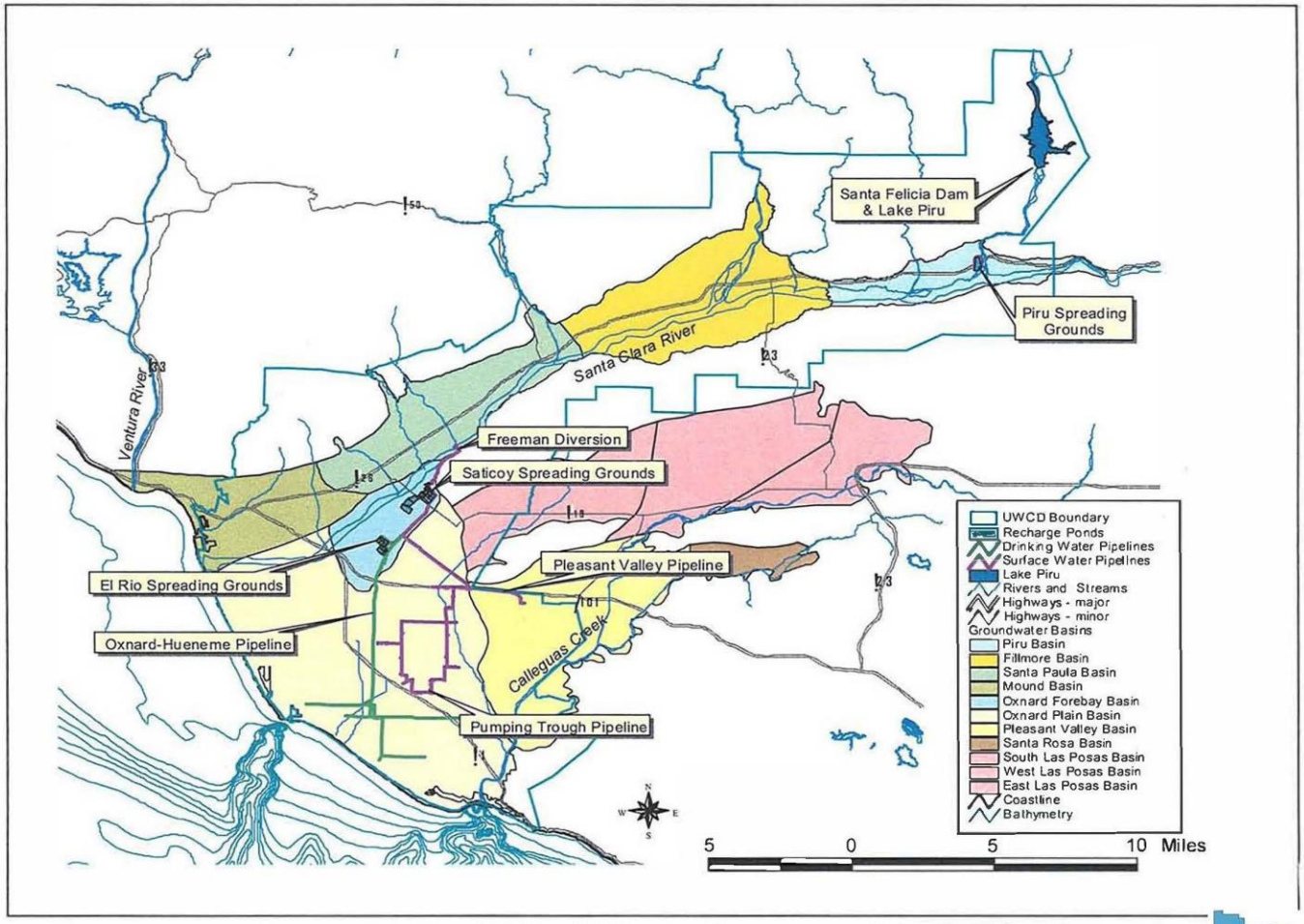


Figure 3-1 1c United Water Conservation District Major Infrastructure WCVC IRWM Region

3.3.4.2 Flood Improvement Infrastructure

The Ventura County Watershed Protection District (VCWPD) is the regional flood control agency. VCWPD developed an Integrated Watershed Protection Plan (IWPP) that identifies local and regional concerns and opportunities to reduce flooding within the County and subsequently outlines future funding needs. Development of the IWPP documents are coordinated with cities and other agencies. The IWPP objectives are as follows:

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.

Projects included in the IWPP are updated in conjunction with watershed-level feasibility studies. Total projected revenues are compared to the total problem solution costs for the IWPP project list within a zone to determine appropriate agency services. These evaluations assist the District, Board of Supervisors and stakeholder groups to identify funding needs for flood mitigation.

The IWPP and feasibility studies offer potential projects to mitigate flooding problems. 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 losses from repetitively damaged structures in the County. The FMP allows the County to apply for grants to implement the FMP strategies.

FMP strategies to mitigate flooding damages include:

1. Build and support local capacity 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, people, critical facilities, and District-owned facilities, due to floods.
4. Reduce the possibility of damage and losses to assets, 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 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 flooding concerns identified in each of the four major watersheds of Ventura County.

Countywide flooding issues are addressed through project categories including 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.

Each category is defined in the following sections. A project can fit into more than one category and is generally categorized according to the most important element associated with the project.

Operations and Maintenance Projects
O&M projects include facilities with historic or current problems that require repairs and remediation. 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 maintenance access.

Structural Life Projects
Structural Life Projects represent channel reaches at the end of their design life that require upgrading or replacement. WPD facilities are assumed to have a useful life of 50 years. 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 lack capacity for current design peak flow estimates are given priority.

Detention/Debris Basin Retrofit and Upgrade Projects
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. Basins with storage or safety deficiencies may require operability improvements. These include debris/detention basins in the WPD's *Debris Basin Manual* (1999). Recently constructed basins were generally built for runoff detention and debris capture.

Regional basins have been evaluated to determine if existing conditions warrant basin improvements or removal. 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
Dams with potential structural and performance issues due to design, construction or maintenance 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 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. Detailed deficiency analyses were performed to determine the

improvements to solve flooding issues. 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 storm drain projects. Many of the storm drains feeding into the District facilities are built by cities or developers within cities.

Hydrologic design standards are used by the District and other local entities to evaluate potential increases 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 engages in sediment transport studies of the major streams to evaluate the effects of development on scour and deposition in the channels.

Figure 3-12 shows the major local flood improvement infrastructure.

3.3.5 Major Land Use Categories in Ventura County

The County and ten cities have worked together to confine urban development within city boundaries and preserve unincorporated areas for agriculture and open space. **Figure 3-13** shows categories of land use as designated in local general plans.

Agricultural: The "Agricultural" designation is applied to irrigated lands that are suitable for the cultivation of crops and raising of livestock. 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, 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.

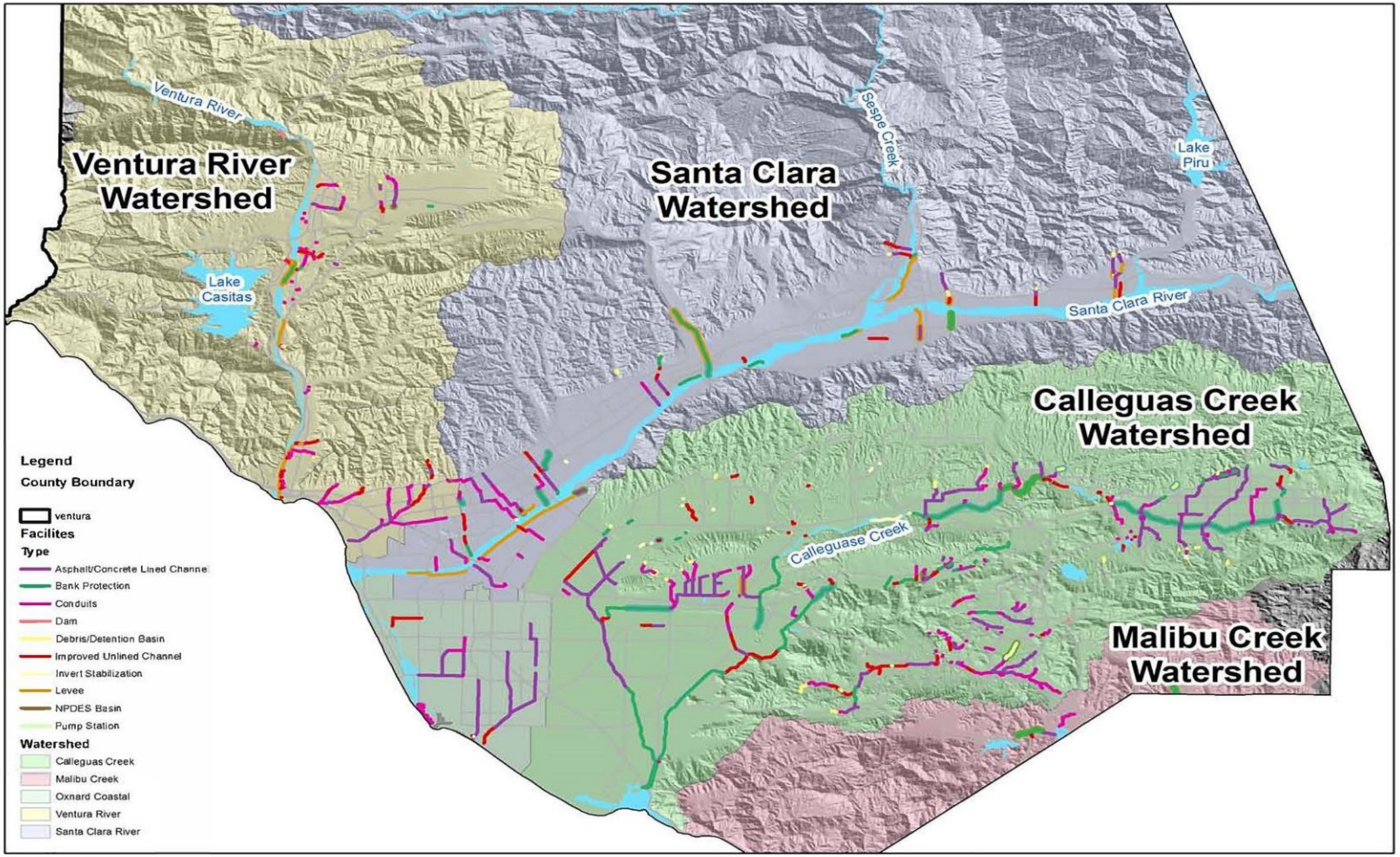


Figure 3-12
Flood Improvement Infrastructure
WCVC IRWM Region

Figure 3-13
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 that 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 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. Examples of these facilities are Naval Base Ventura County and the California State University at Channel Islands. This category is primarily applicable in the unincorporated County.

Urban: The "Urban" land use designation is utilized to depict existing and planned urban centers that 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 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 (SWRCB). The SWRCB'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 require consideration and have been addressed in the IRWM Plan. 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 utilize private wells, and onsite wastewater treatment systems (septic). 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 3-10**.

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 (TMDLs) 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 reaches of the Santa Clara River, the Santa Clara River estuary, McGrath Lake, five creeks and two 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. There are water districts of varying sizes and many individual well owners in the Region. Urban water uses includes residential, commercial, industrial and municipal uses. Most larger suppliers prepare Urban Water Management Plans every five years which detail current and future water sources and water demand, groundwater management, recycled water, drought contingency planning and water use efficiency measures.

Most agriculture in the Region is irrigated by local groundwater. The Sustainable Groundwater Management Act (SGMA) requires the formation of local groundwater sustainability agencies (GSAs) in all DWR Bulletin No. 118 basins designated as high or medium priority and critically-overdrafted. GSAs can form in low-priority basins, but the law does not require it. GSAs must assess conditions in their respective basins and adopt a groundwater sustainability plan (GSP) that ensures the basin will

be sustainably managed within 20 years with interim milestones subject to state review every five years. Critically-overdrafted basins must submit a GSP by January 31, 2020. Other high and medium priority basins must be managed under a GSP by January 31, 2022.

3.4.1 Overview of Water Supplies

The County's water supplies are primarily obtained from groundwater, surface water and imported State Water. Recycled water is 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 and is pumped by individual well owners and water purveyors within the County. Agriculture accounts for most of the groundwater demand in the County.

A large volume of groundwater supply in the County is contained within the aquifers beneath the Oxnard Plain-Pleasant Valley geographic area. These aquifers include, in order of increasing depth the Oxnard, Mugu, Hueneme, Fox Canyon and Grimes Canyon aquifer zones. Both the Oxnard aquifer in the Oxnard Plain geographic area and the deeper Fox Canyon aquifer, which extends from the coastline to inland areas northeast of the City of Moorpark are overdrafted. Overdraft has caused seawater intrusion in the Upper Aquifer System (UAS) and Lower Aquifer System (LAS) of the Oxnard Plain geographical area. The UAS consists of the Oxnard and the Mugu aquifers. The LAS is comprised of the Hueneme, Fox Canyon and Grimes Canyon aquifers.

Within the boundaries of the Fox Canyon Groundwater Management Agency (FCGMA), there is a reduction in groundwater extractions for well owners as part of Emergency Ordinance E, adopted by the FCGMA board in April 2014. Groundwater Sustainability Agencies (GSAs) for basins within the boundaries of FCGMA will be implemented starting in 2020 and will assume oversight for extractions within the boundary of each respective basin.

3.4.1.2 Surface Water

Surface water resources in Ventura County are divided into major hydrological units or drainage basins (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.

Excluding major diverters of surface water, there are numerous other points of diversion (springs, creeks and rivers) in Ventura County as listed in the state's online water rights management database (eWRIMS).

3.4.1.3 Imported Water

For the purposes of this Plan, imported water is water from the SWP, delivered to Southern California from Northern California. State Water is obtained by Calleguas from the Metropolitan Water District of Southern California (MWD) for delivery to retail purveyors serving the southern and eastern

portions of the County. This includes water needs of the Cities of Thousand Oaks, Simi Valley, Moorpark, Camarillo, Port Hueneme, and Oxnard and other 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, closer to 75 percent of the County's population relies on imported water for parts of its supply.

UWCD, Casitas, the County of Ventura, and the City of Ventura – who collectively share an entitlement to 20,000 AFY - have studied constructing conveyance facilities to import this additional State Project Water. SWP water can enter Ventura County from releases out of Lake Pyramid down Piru Creek through Lake Piru and overflows or planned releases from Santa Felicia Dam into the Santa Clara River.

3.4.1.4 Recycled Water

Improved waste-water-treatment techniques and flows, coupled with imported water shortages, increased water demand and over-drafted groundwater resources make recycled water a valuable commodity utilized by municipalities. **Table 3-1** lists 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, wash water, 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)	Tertiary 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)	Tertiary 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.
City of Simi Valley Tapo Canyon WWTP, Ventura County Waterworks District No. 8 (1.0 mgd)	Tertiary	Irrigation	
Piru -WWTP - Ventura County Waterworks District No. 16 - (0.5 mgd)	Tertiary	None	Upgraded treatment process to Tertiary in 2015.
City of Camarillo, North Pleasant Valley Desalter Project (4,500-AFY)	Tertiary	Municipal and Agricultural	Plant to be completed by Summer 2021

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
Calleguas delivers the largest volume of water to retailers with 91,340-AF in 2018. UWCD delivered 16,953-AF to retailers and end-users in 2018. UWCD can store up to 87,000-acre feet in Lake Piru, and at the end of 2018, there was 11,776-AF of stored water in the lake. Casitas delivered 12,168-AF in 2018, with approximately 3,590-AF sold to retail water purveyors. The District provides water to residential and agricultural customers and water purveyors in Casitas'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 2009-2018

Year	Casitas MWD (acre feet)	Calleguas MWD (acre feet)	United WCD (acre feet)	Annual Total (acre feet)
2009	15,736	108,726	41,478	165,940
2010	13,497	94,864	34,076	142,437
2011	13,439	97,218	31,868	142,525
2012	15,268	104,104	32,638	152,010
2013	18,270	111,283	24,358	153,911
2014	18,336	106,293	17,492	142,121
2015	16,272	89,045	16,293	121,609
2016	12,793	87,542	16,757	117,092
2017	12,166	89,666	16,613	118,445
2018	12,168	91,340	16,953	120,461
Total	**147,946**	**888,741**	**248,525**	**1,256,092**

Source: County of Ventura, Watershed Protection District

3.4.2 Water Demand

Municipal Water Supply and Demand
Of the ten incorporated cities within Ventura County, Santa Paula and Fillmore do not rely on water supplied by the major wholesale districts.

The cities of Ventura and Oxnard use a blend of imported water, groundwater and treated surface water to meet demands. Ventura's water supply comes from treated water diverted from the Ventura River, groundwater extracted from City wells and surface water from Lake Casitas delivered by

Casitas. The City of Oxnard receives water from UWCD, imported water from Calleguas and groundwater from City well fields.

In the southern half of the County, the cities of Simi Valley, Moorpark and Thousand Oaks and the communities of Bell Canyon, Newbury Park, Hidden Valley, Lake Sherwood, Oak Park and part of Westlake Village rely mainly on water imported from Calleguas.

The City of Simi Valley receives water from Ventura County Water Works District No. 8 (VCWWD8). VCWWD8 extracts groundwater from three wells in the Tapo Canyon area. Groundwater is also extracted from several dewatering wells at the west end of the city which is discharged to the Arroyo Simi. The Tapo Canyon Water Treatment Plant, a one-million gallon per day (MGD) facility, utilizes the three Tapo Canyon wells to provide water. Golden State Water Company (GSWC) in Simi Valley extracts groundwater from one well and blends it with imported water from Calleguas (10% groundwater, 90% imported water)[1]. VCWWD8 serves 68% of demand or approximately 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[2]. In 2018 Calleguas delivered 19,651 AF to VCWWD8 and 5,432 AF to GSWC.

The City of Moorpark residents receive water from Ventura County Water Works District No. 1 (VCWWD1). Approximately 75-80% of VCWWD1's water is imported from Calleguas. In 2018, Calleguas delivered 7,507 AF to VCWWD1. The City also extracts groundwater from two wells used for park irrigation.

The City of Thousand Oaks extracts groundwater for median irrigation on Hillcrest Ave. and golf course irrigation at the Los Robles Golf Course. California Water Service and California American Water along with the City of Thousand Oaks Water Department provide water imported from Calleguas in the Thousand Oaks, Newbury Park and Westlake Village area. According to the *City of Thousand Oaks 2015 Urban Water Management Plan*, the City supplies water to approximately 36% of water users, California American Water 48%, and California Water Service Company 16%. In 2018, these three water purveyors received 32,170 AF of water from Calleguas.

The City of Camarillo relies on groundwater and imported water from Calleguas. The city extracts groundwater from four wells, supplying approximately 40-50% of the city's water demand with the remaining demand supplied by imported water. The city must keep its groundwater extraction volume below the groundwater extraction allocation from the FCGMA. In 2018, Calleguas delivered 4,624 AF of water to the City of Camarillo. Water for some residents is supplied by Pleasant Valley Mutual (groundwater and imported water), Crestview Mutual (groundwater and imported water), California American Water Co. (imported water), and Camrosa Water District (groundwater and imported water).

The PHWA receives and treats water from UWCD and blends it with water from Calleguas for the City of Port Hueneme, Channel Islands Beach Services Community District and Naval Base Ventura County.

In the Ojai Valley, the City of Ojai and the communities of Casitas Springs, Meiners Oaks and Oak View rely on a mixture of locally extracted groundwater and wholesale water from Lake Casitas delivered by Casitas to local water purveyors.

[1] Golden State Water Company, 2015 Urban Water Management Plan – Simi Valley.
[2] Ventura County Waterworks District No. 8, City of Simi Valley, 2015 Urban Water Management Plan.

In the Santa Clara River Valley area, the City of Santa Paula relies on local groundwater. In addition, some surface water is diverted from Santa Paula Creek (approximately 500 AF/yr)[3] and is sent to Canyon Irrigation Company. The City of Fillmore relies solely on 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 living in areas not served by a water company rely on private domestic water wells. Water is extracted from groundwater basins, or from water-bearing units (fractured volcanic rock and bedrock) in areas outside of groundwater basins.

Agricultural Water Supply and Demand

The majority of agricultural demand is met primarily with groundwater.

- Groundwater usage depends on various factors. Reductions in groundwater use would include seawater intrusion abatement programs, increases in reclaimed water availability and reductions in agricultural irrigation.
- Increases in agricultural irrigation occur from the replacement of low-water-use crops to high-water-use crops. Agricultural cultivation on hillsides and marginal lands contribute towards an increase in irrigation. Efficient irrigation practices by growers can potentially increase as groundwater extraction reduction ordinances are implemented, water prices increase and water-efficiency technology becomes available.
- The availability and use of imported water for agriculture depends on water cost and purveyor policies. High quality imported water should be used to meet high quality water demands such as potable municipal uses.

[3] Data from City of Santa Paula 2015 Urban Water Management Plan

3.4.3 Impacts of Climate Change on WCVC Region

To better understand projected changes to the climate in the region, WCVC partnered with the Ojai Valley Land Conservancy to obtain a grant from the Resources Legacy Fund in 2018 to conduct a climate study. The purpose of the study was to evaluate historic climate patterns and variability, and review climate models in order to project climate changes out to the year 2040. This research was conducted by Dr. Nina Oakley and Dr. Ben Hatchett, with the Western Regional Climate Center located at the Desert Research Institute in Reno, Nevada. The final report from this study, *Projected Change in Ventura County Climate,* provides information to help "paint a picture" of future climate in the watersheds of Ventura County (Ventura River, Santa Clara River and Calleguas Creek) to support and inform climate change-related decision-making (**Appendix K**).

This study provided much-needed information to help the Region better assess future vulnerabilities to climate change and assess and modify the Region's mitigation and adaptation strategies, which are covered in this and other sections of the Plan. WCVC stakeholders were engaged in the process through special meetings conducted with Drs Oakley and Hatchett. These meetings included regionwide meetings with all interested stakeholders on October 16, 2018 and April 10, 2019. as well as meetings with small groups of representatives of local water districts, groundwater sustainability agencies, agricultural organizations and the VCWPD. The purpose of the meetings with representatives of specific interests was to determine their unique data and information needs regarding climate change and to help them with the process of developing strategies to adapt to those changes. The information presented at those workshops can be found at: http://wcvc.ventura.org/documents/climate_change.htm

The conclusions of this study are found on Page 53 of the June 2019 report *Projected Change in Ventura County Climate (***Appendix K**). "Analyses presented herein for the 2021–2040 period demonstrate increases in both maximum and minimum temperatures and heat extremes, more intense precipitation focused during the winter season, and increased evapotranspiration. Increased drought risk, potential for a longer wildfire season with more ignitions as population growth continues, reduced marine stratus (fog), reduction in Sierra Nevada snowpack, and longer duration and more intense atmospheric rivers are also noted as concerns for the region. This report covers the 2021–2040 period and climate projections commonly discussed in the popular media and associated with mid-to-late century change may not be represented here. There is generally an intensification/augmentation/increase in magnitude of changes across all variables in the mid-to-late century ".

These key climate change stressors and related vulnerabilities for the Region are listed below in blue. Higher priority vulnerabilities are shown in red. These are based on the analysis conducted in the two studies referenced previously in this section - *Projected Change in Ventura County Climate* and *Sea Level Rise Vulnerability Assessment* and also reflects feedback from stakeholders.

Maximum Temperatures

Daily highs; increased frequency of extreme maximum temperatures

- Impacts to agriculture (to crops and farmworker health)
- Impacts to ecosystem health and viability
- Water quality impacts
- Energy demand impacts
- Heat and community health

Minimum Temperatures

Overnight lows; increased frequency of extreme high-minimum temperatures

- Impacts to agriculture (both to crops and farmworker health)
- Water quality impacts
- Heat and community health
- Energy demand impacts Ecosystem impacts

Increased Evapotranspiration (ET_0)

- Increased water demand (agricultural and urban)
- Impacts to ecosystem health and viability
- Reservoir evaporation
- Reduction in runoff

Precipitation Changes

Increased number of dry days, more intense storms, higher sub-daily rain rates

- Reduced in-stream flows
- More annual precipitation in fewer days
- Increased flash-flood risk (high-intensity precipitation)
- Reduced snowpack in the Sierra (impacting imported State Water supplies)

Drought

Increased drought risk

- Duration of droughts
- Frequency of droughts
- Reduced snowpack in the Sierra (impacting imported State Water supplies)
- Magnitude of droughts

Wildfire

Extended season; possible greater frequency of ignitions

- Post-fire runoff: debris flows, flash flooding, water quality impacts
- Threats to life, property, and wildlife

- Smoke/air quality impacts

Sea Level Rise

- Coastal Erosion – impacts to infrastructure
- Saltwater intrusion/groundwater impacts

Section 3.5 Water Quality

Water quality can be affected by point and nonpoint sources. Point sources are those from a well-defined source while nonpoint sources may originate from multiple sources that are more difficult to identify. Point sources include wastewater treatment plants, urban stormwater runoff and other site-specific discharges. Nonpoint sources 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 RWQCB 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 US Environmental Protection Agency (USEPA), the state's official evaluation of its surface water quality is the 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 LARWQCB 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, Channelkeeper, Coastkeeper 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.

There are numerous TMDLs in Ventura County, some of which are already adopted and approved, currently under development, or scheduled for development. **Table 3-3** includes the status of TMDLs in Ventura County as of 2019.

Table 3-3

Status of TMDLs in Ventura County

Watershed	Constituent Listing	2019 Status
Ventura Coastal Beaches	Bacteria	Effective (12/2008)
Ventura River	Trash	Effective (03/2008)
	Algae	Effective (06/2013)
Santa Clara River	Bacteria	Effective (03/2012)
Oxnard Drain #3	Pesticides, PCBs, and Sediment Toxicity	Approved by USEPA (10/2011)
Calleguas Creek	Nutrients	Effective (07/2003)
	Chlorpyrifos and Diazinon	Effective (03/2006)
	OC Pesticides and PCBs	Effective (03/2006)
	Metals (Cr, Ni, Ag, Zn, Cd, Se)	Effective (03/2007)
	Boron, Chloride, Sulfate, TSS, Salts	Effective (12/2008)
	Trash (Revolon/ Beardsley Wash)	Effective (03/2008)
Malibu Creek and Santa Monica Bay	SMB Marine Debris	Effective (03/2012)
	Bacteria	Effective (01/2006)
	Nutrients (Phase I)/ Ammonia/pH/ Algae/ Eutrophication	Approved by USEPA (03/2003)
	Sedimentation & Benthic-Macroinvertebrates	Effective (05/2017)
	Trash	Effective (07/2009)
	Lake Sherwood Mercury	Approved by USEPA (03/2012)

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 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 run off. 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.

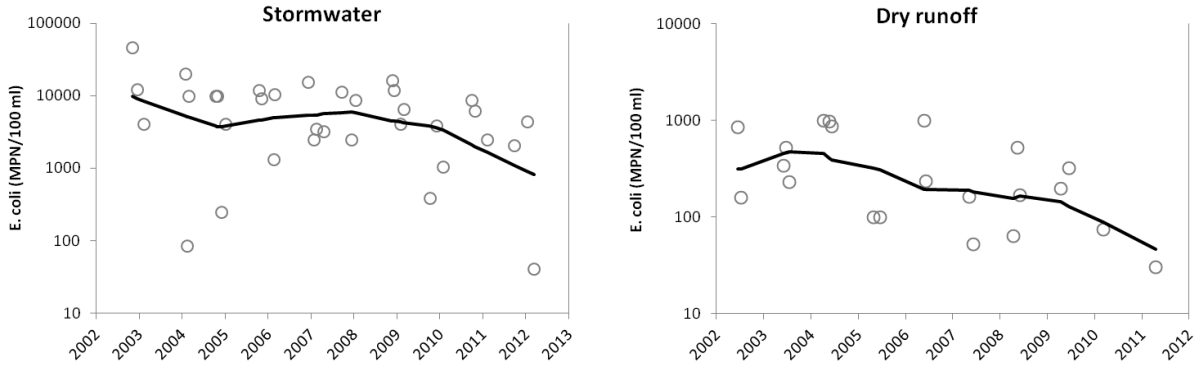
Applicable projects must reduce Effective Impervious Area (EIA) to five percent of the total project area unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using Retention BMPs (infiltration or storage). Biofiltration BMPs may be used to achieve the five percent EIA standard if Retention BMPs are technically infeasible. If the five 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 15 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.

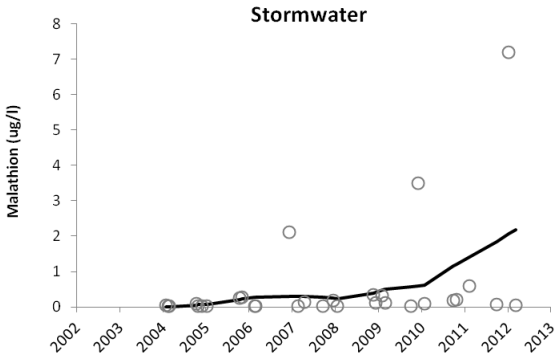
Comprehensive statistical analysis indicated that the majority of routinely detected constituents did not show any significant trend in time. Still, a number of significant, mostly decreasing trends, were observed in each watershed. For example, concentrations of the fecal indicator bacteria *E. coli* 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 concentration 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

Groundwater has been the primary source of water in Ventura County for over 100-years. The majority of accessible groundwater is found in 24 DWR-designated groundwater basins and subbasins. Groundwater basins in the northern half of the County are isolated from other basins, while some groundwater basins in the southern half of the County are hydrologically continuous on the surface and in the subsurface.

The VCWPD Groundwater Resources Section samples and reviews groundwater quality data to obtain the general groundwater characteristics within Ventura County groundwater basins. Groundwater Resources staff obtains and shares groundwater quality data with other organizations and agencies in the County to maintain consistency in the county-wide groundwater quality monitoring program. The data is also used by stakeholders, consultants and other professionals. Water quality data is publicly available upon request.

The County does not own or operate wells sampled except for a few exceptions. Consistency efforts are made to sample the same wells each year and additional wells. Some wells in the sampling program are large capacity and sampled strictly when in operation. Some may not be available for sampling due to unforeseen circumstances (I.e. pump maintenance, repairs, pump inactivity due to precipitation, lock changes on gate, etc.). When wells cannot be sampled, alternate and similarly-constructed wells are identified.

Groundwater staff sampled a total of 93 groundwater wells throughout the County in 2018 and 165 wells in 2019. Well owners are provided a copy of the laboratory analytical report and notified if any of the constituents analyzed exceed the State and Federal established Maximum Contaminant Levels (MCLs) for drinking water.

Water Quality Problems and Issues

AB 1249 – Contamination Due to Nitrate, Arsenic, Perchlorate and/or Hexavalent Chromium

AB 1249 requires IRWM Plans to identify areas within the Plan boundary with impacts due to nitrate, arsenic, perchlorate and/or hexavalent chromium contamination. There are no known areas impacted by hexavalent chromium; however, nitrate exists in several groundwater basins, elevated arsenic concentrations occur in one remote groundwater basin, and perchlorate is a potential concern in one basin. The affected basins and detected concentrations in groundwater samples collected from irrigation and domestic wells over a five-year period from 2013 through 2017 are shown on **Figures 3-14 and 3-15** and discussed in the following sections.

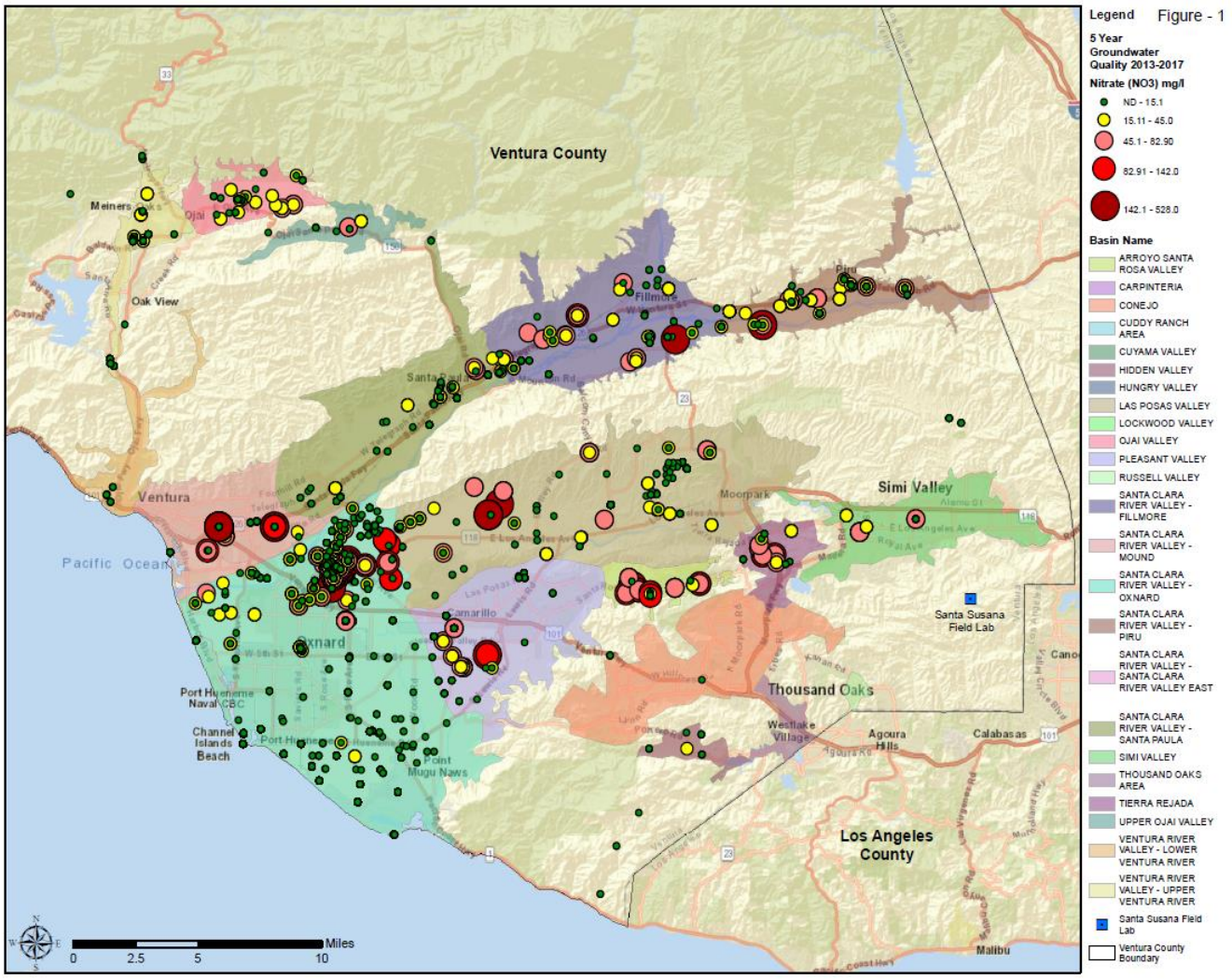


Figure 3-14

Affected Basins and Detected Concentrations – South Half of Ventura County

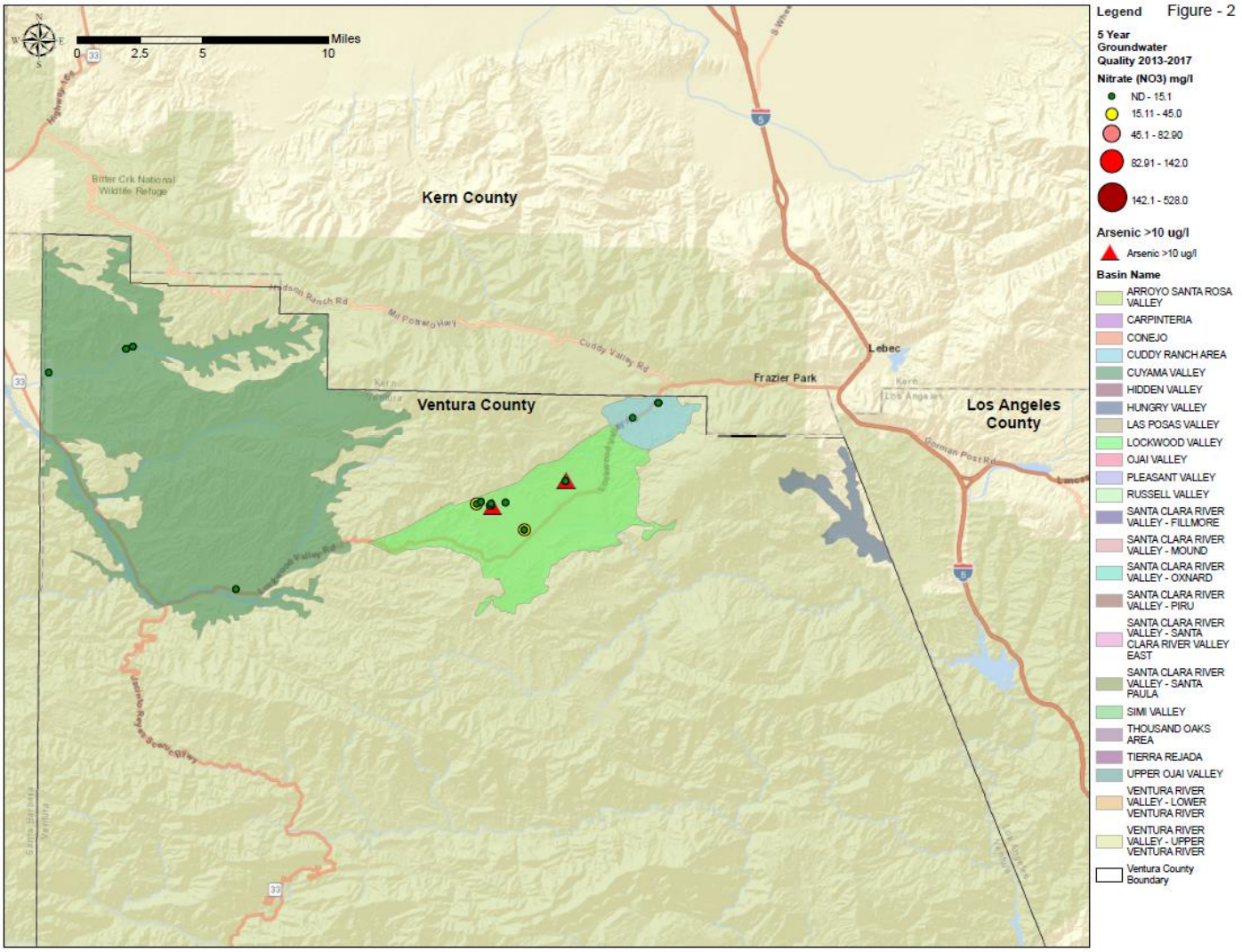


Figure 3-15

Affected Basins and Detected Concentrations – North Half of Ventura County

Arroyo Santa Rosa Valley Basin (DWR Basin No. 4-007)
The Arroyo Santa Rosa Valley is within the unincorporated area of Ventura County. Land use in the area overlying the basin consists principally of agriculture and rural residential development on large lots. Much, if not all, of the area overlying this basin is unsewered with a high number of individual septic systems. Sources of nitrate to groundwater include septic systems, agricultural fertilization, and horse boarding.

Nitrate concentrations above the drinking water MCL of 45 milligrams per Liter (mg/L) occur throughout the basin and averaged 68 mg/L up to 151 mg/L in groundwater samples collected 2013 through 2017 (**Figure 3-14**).

Camrosa provides potable water within the Arroyo Santa Rosa Valley Basin. Camrosa blends well water pumped from the basin with imported water to reduce nitrate concentrations below the MCL.

Zoning restrictions have been implemented for the Arroyo Santa Rosa Valley Basin in the Ventura County Non-Coastal Zoning Ordinance (NCZO) to mitigate nitrate impacts by limiting the number of large animals kept on individual parcels and restricting minimum parcel size for new residential development utilizing on-site septic systems.

Tierra Rejada Basin (DWR Basin No. 4-015)
Most of the Tierra Rejada Basin is within the unincorporated area of Ventura County, however a small corner of the basin is within the City of Thousand Oaks. Land area overlying the Tierra Rejada Basin principally consists of agricultural and residential use.

Nitrate concentrations above the drinking water MCL occur in the central and western portions of the basin and averaged 33 mg/L ranging up to 92 mg/L in groundwater samples collected in 2013 through 2017 (**Figure 3-14**). Subsurface groundwater flows from the Tierra Rejada Basin to the Arroyo Santa Rosa Valley Basin.

Zoning restrictions have been implemented for the Tierra Rejada Basin in the Ventura County NCZO to mitigate nitrate impacts by limiting the number of large animals kept on individual parcels and restricting minimum parcel size for new residential development utilizing on-site septic systems.

Las Posas Valley Basin (DWR Basin No. 4-008)
The Las Posas Valley Basin (LPVB) is divided into the East and West Las Posas Management Areas by the Somis Fault, which is a hydrogeologic boundary between the subbasins. Most of the land area overlying the LPVB is within unincorporated Ventura County; the eastern portion of the basin is within the City of Moorpark. Other than within Moorpark, land use is principally agricultural and rural residential.

The LPVB is not considered a nitrate-impacted basin; however, there are localized nitrate concentrations above the drinking water MCL in the western portion of the basin and within several individual locations in the central and northeastern areas of the basin (**Figure 3-14**). The average nitrate concentration in the West Las Posas Management Areawas 35 mg/L ranging up to 252 mg/L, and the average nitrate concentration in the East Las Posas Management Area was 22 mg/L ranging up to 79 mg/L in groundwater samples collected in 2013 through 2017)

Santa Clara River Valley Basin
Piru Subbasin (DWR Basin No. 4-004.06)
The Piru Subbasin is within unincorporated Ventura County and land use is principally agricultural with some rural residential use. The Piru Subbasin is not considered nitrate impacted, but there have been localized detections of nitrate above the drinking water MCL (**Figure 3-14**). Nitrate concentrations averaged 25 mg/L and ranged up to 244 mg/L in groundwater samples collected from 2013 through 2017.

Fillmore Subbasin (DWR Basin No. 4-004.05)
Land overlying the Fillmore Subbasin is within unincorporated Ventura County and the City of Fillmore. Land use outside of the city is principally agricultural. Historically, nitrate concentrations have been elevated.

The Fillmore Subbasin is not considered nitrate impacted, but localized nitrate concentrations above the drinking water MCL have been detected primarily in the west-central and southeastern portions

of the basin (**Figure 3-14**). Nitrate concentrations averaged 2.6 mg/L and ranged up to 251 mg/L in groundwater samples collected from 2013 through 2017.

Prior to 2009, the City of Fillmore's treated effluent was discharged to the Santa Clara River and may have been a source of nitrate to groundwater. Agricultural return flows may also contribute nitrate to groundwater. Since 2009, the City of Fillmore's wastewater has been treated at the city's Water Recycling Plant and is no longer discharged to the river.

Mound Subbasin (DWR Basin No. 4-004.03)

The majority of the Mound Subbasin is within the City of Ventura. Areas outside of the city consist of agricultural and residential use. The Mound Subbasin is not considered nitrate impacted, but localized detections of nitrate concentrations above the drinking water MCL occur in the subbasin (**Figure 3-14**). Nitrate concentrations averaged 36 mg/l and ranged up to 275 mg/L in groundwater samples collected from 2013 through 2017. Most residences in the Subbasin are now serviced by sewer systems.

Oxnard Subbasin (DWR Basin No. 4-004.02)

The Oxnard Subbasin is a large groundwater basin overlain by both cities and large areas of agricultural production. Nitrate concentrations are generally not a concern throughout most of the Subbasin; however, significant legacy nitrate contamination exists in the northeastern part of the Subbasin known as the Oxnard Forebay (**Figure 3-14**). Here, there are extensive clays that confine aquifers across most of the Subbasin that have been eroded away, and the aquifers are in direct hydraulic connection with the surface. UWCD diverts surface flows from the Santa Clara River to its recharge basins in the Forebay.

Nitrate concentrations averaged 33.5 mg/l and ranged up to 251 mg/L in groundwater samples collected from 2013 through 2017.

Septic systems in the unincorporated community of El Rio were determined to be a significant source of nitrate contamination to the Forebay. In 1999, the Los Angeles Regional Water Quality Control Board prohibited installation of new septic tanks in the Oxnard Forebay and discharge of septic effluent for lots less than five acres by January 1, 2008. Ventura County implemented a sewer conversion project in 2005, funded largely through federal and state grants and completed transition from septic to sewer in the El Rio area in 2011.

While nitrate contamination in the Forebay is considered largely a legacy issue, the elevated concentrations in groundwater pose challenges for delivery of potable water below the MCL, particularly in times of drought when groundwater levels are low. UWCD diverts Santa Clara River water to its recharge basins in the Forebay when available to keep nitrate levels below the MCL in its wells serving its wholesale municipal and industrial customers on its Oxnard-Hueneme Pipeline.

Recently, a small mutual water company made an emergency connection to UWCD when nitrate in its wells exceeded the MCL.

Pleasant Valley Basin (DWR Basin No. 4-006)

The City of Camarillo overlies the Pleasant Valley Basin with the remainder of the overlying land in rural residential and agricultural use. While groundwater quality varies considerably across the basin, it is generally not considered nitrate impacted, although localized elevated concentrations

occur (**Figure 3-14**). Nitrate concentrations averaged 17 mg/l and ranged up to 171 mg/L in groundwater samples collected from 2013 through 2017.

Simi Valley Basin (DWR Basin No. 4-009)
The majority of the Simi Valley Basin is within the City of Simi Valley. Groundwater within the basin is typically of poor quality with elevated salt concentrations. The basin is generally not considered to be impacted by nitrates, but localized concentrations above the MCL do occur (**Figure 3-14**). Nitrate concentrations averaged 35 mg/l and ranged up to 61.5 mg/L in groundwater samples collected from 2013 through 2017. Potable water within the Simi Valley Basin is mostly supplied by imported water.

Perchlorate is a contaminant of concern associated with the development and production of solid-fuel rocket engines, road flares, and fireworks. The former Santa Susana Field Laboratory (SSFL), located above groundwater recharge areas of the southeastern end of the Simi Valley Basin, has been historically identified as a potential source of perchlorate detected in trace quantities (less than 20 micrograms per Liter (µg/L) in shallow, non-drinking groundwater dewatering wells in the western area of the basin. Higher perchlorate concentrations have been detected in wells closer to the SSFL site in the Simi Hills. Long-term efforts are being evaluated by the California Department of Toxic Substance Control to remediate on-site contaminants at the SSFL and mitigate the spread of potential groundwater plumes off-site. The County of Ventura requires all discretionary projects proposing the use of groundwater in any capacity that are located within two miles of the boundary of the SSFL site to test for perchlorate.

Upper Ojai Basin (DWR Basin No. 4-001)
The land overlying the Upper Ojai Basin is in agricultural and rural residential use in unincorporated Ventura County. The Upper Ojai Basin is not considered to be impacted by nitrates, but a nitrate concentration of 46.5 mg/L, just above the MCL, was detected in one sample (**Figure 3-14**). Nitrate concentrations averaged 10 mg/l in groundwater samples collected from 2013 through 2017.

Ojai Basin (DWR Basin No. 4-002)
The City of Ojai overlies the western portion of the Ojai Basin, with the eastern portion of the basin largely in agricultural and rural residential use. While elevated nitrate concentrations are a concern in surface water in the basin, nitrate concentrations are generally below the MCL for drinking water in groundwater. Nitrate concentrations slightly exceeded the MCL in samples collected from two wells and averaged 17.5 mg/l and ranged up to 46.6 mg/L in groundwater samples collected from 2013 through 2017 (**Figure 3-14**).

Lockwood Valley Basin (DWR Basin No. 4-017)
The Lockwood Valley Basin is in the northern, mountainous, part of unincorporated Ventura County. Groundwater varies from good to poor quality and depth-to-water bearing material ranges from 55- to 60-feet below ground surface. Land overlying the Lockwood Valley Basin is rural and used for ranching operations.

Elevated arsenic concentrations are a concern in this basin. Arsenic concentrations above the drinking water MCL of 0.01 mg/L are localized in several areas of the northern portion of the basin (**Figure 3-15**). Arsenic concentrations in groundwater samples averaged 0.014 mg/L ranging up to 0.76 mg/L.

Groundwater Quality by Basin

Arroyo Santa Rosa Basin (DWR Basin No. 4-007)

The water-bearing units of the Arroyo Santa Rosa Basin occupy almost the entire area beneath the Santa Rosa Valley. The area west of the Bailey Fault is generally considered hydrologically separate from the area east of the fault, although some leakage across the fault does occur (Camrosa, 2013). The location of the fault is inferred primarily from water well data (Camrosa, 2013). Depth to water-bearing material is approximately 50 feet bgs. The water-bearing units west of the fault are confined and those located east of the fault are unconfined. The degree of groundwater movement across the fault is not clearly understood. The main water-bearing units in the basin consist of alluvium and parts of the San Pedro Formation, which can reach a thickness of up to 700 feet in the eastern portion of the basin. The major hydrologic features are the Conejo Creek and its tributary, Arroyo Santa Rosa, which drain surface waters westward toward the Pacific Ocean.

The basin is dominated by an east-trending syncline that folds the San Pedro and Santa Barbara Formations, directing water into the more permeable San Pedro Formation. The Santa Rosa fault zone places the less permeable Sespe and Topanga Formation against the San Pedro Formation, creating a barrier to groundwater flow into the basin from the north and is likely responsible for the difference in water levels in the western part of the basin (CSWRB, 1956).

Land use in the area overlying the basin consists principally of agriculture and rural residential development on large lots. Much, if not all, of the area overlying this basin is unsewered with a high number of individual septic systems. Sources of nitrate to groundwater include septic systems, agricultural fertilization, and horse boarding. A large portion of recharge to the basin is discharge from the Thousand Oaks Hill Canyon Wastewater Treatment Plant.

There are 77 water supply wells in the Arroyo Santa Rosa Basin of which 38 are active. The Basin showed low variation in water quality of wells sampled by the VCWPD in 2018. There is no dominant cation, but the samples plot closely to the magnesium cation type. Bicarbonate is the dominant anion for one of the samples and there is no dominant anion for the remainder. The water samples are magnesium bicarbonate type.

Water from four of the five wells sampled have nitrate concentrations higher than the primary drinking water MCL as established by the EPA. All five wells have TDS concentrations above the secondary MCL, ranging from 710 to 990 mg/L. Chloride concentrations in four wells are above the level that can impair agricultural beneficial uses for sensitive plants. However, they are not above the primary MCL. One sample was analyzed for Title 22 metals. None were above the primary MCL. Groundwater chemistry was compared between the Tierra Rejada Basin and the Arroyo Santa Rosa Basin. The water chemistry is similar but with more variation in the Tierra Rejada Basin.

Carpinteria Basin (DWR Basin No. 3-018)

The County has historically used the North Coast Basin boundary (a County-defined area) for wells in the very western extent of the County. The California DWR Bulletin 118 designates this part of the County as the Carpinteria Basin. The Ventura County portion of the basin consists of narrow, thin strips of permeable sediments and marine terrace deposits along the coastline from Rincon Creek to just northwest of the Ventura River. The Ventura County portion of the basin does not have well-defined boundaries or areas of recharge and discharge. There are 18 water supply wells in the

Ventura County portion of the basin, of which only 5 are active and primarily located in the northwestern area along Rincon Creek. Water samples were collected from two wells at the northwestern end of the Ventura County portion of the basin. The basin shows little variation in the water quality of wells sampled in 2018. Calcium is the dominant cation in one sample with no dominant cations in the other. Bicarbonate is the dominant anion in one sample with no dominant anions in the other sample but is close to sulfate. The water in one sample is calcium sulfate type and the other is calcium bicarbonate.

Both samples have TDS and one has sulfate concentrations above the secondary drinking water MCLs.

Conejo Basin (DWR Basin No. 4-010)

The Conejo Basin has few active water wells available for sampling. The depth to groundwater averages about 50 feet bgs. The water-bearing units in the basin are Quaternary alluvium and the Modelo, Topanga and Conejo Formations. The quaternary alluvium is generally only a few feet thick except near Newbury Park and Thousand Oaks where it can reach up to 60 feet in thickness; however, the alluvium is not the main water-bearing unit in the basin. The Miocene age Topanga and Conejo Formations are coeval and intercalated, or the same age and interbedded. Within the Conejo Basin area, the Topanga formation contains sandstone, conglomerate and shale. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits that reach 13,000 feet thick. The high porosity of the fractured basaltic flows allows production from these units. There are approximately 429 wells in the Conejo Basin of which 60 are active water supply wells. No wells were sampled by VCWPD in this basin in 2018.

Cuddy Ranch Area Basin (DWR Basin No. 5-083)

The Cuddy Ranch Area Basin is in the northeastern part of Ventura County near the boundary of Kern County. Two faults contribute to the formation of the basin. The east-west trending San Andreas fault zone and Tecuya Mountain bound the north portion. The southwest trending Big Pine Fault and associated splays bound and underlie the southern portion of the basin. The portion of the basin adjacent to the Big Pine Fault zone is locally known as Little Cuddy Valley. Groundwater sampling has been limited to the Little Cuddy Valley portion of the basin. Water-bearing units consist of recent alluvial sand and gravel overlying shallow bedrock, permeable sands and gravels in the Quaternary and Tertiary sandstones, and highly fractured igneous or metamorphic rocks. Depth to water-bearing material is approximately 20 to 30 feet.

Historically, groundwater quality has been considered very good. There are approximately 25 water supply wells in the Little Cuddy Valley Basin of which 21 are active. No wells were sampled by VCWPD in this basin in 2018.

Cuyama Valley Basin (DWR Basin No. 3-013)

The Cuyama Valley Basin is in a remote area in a portion of northwestern Ventura County. There are approximately 134 water supply wells in the Basin, of which 100 are active. Depth to the main water-bearing unit varies between 40 to 170 feet bgs. No wells were sampled in this basin in 2018.

Fillmore Subbasin (DWR Basin No. 4-004.05)

The Fillmore Subbasin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in various locations. Despite the depth of the Subbasin, County records indicate that water wells are generally no deeper than 950 feet. Water quality can vary greatly depending on the depth of a well. Shallow groundwater is generally younger and recharged by river flows. Deeper groundwater is older and has acquired its aqueous chemistry through dissolution of constituents from the surrounding lithology.

There are approximately 596 water supply wells in the Fillmore Subbasin, of which 444 are active. Historically, nitrate concentrations have been elevated, but none of the nine wells sampled by VCWPD in 2018 showed elevated nitrate concentrations relative to the primary MCL. The dominant cation in two samples is calcium with no dominant cation for the remainder of the samples. The analytical data is closest to a calcium cation type. Sulfate is the dominant anion for all nine samples. The water is calcium sulfate type. TDS concentrations of water from the nine wells range from 980 to 2,410 mg/L and exceed the secondary MCL. All samples exceed the sulfate secondary MCL and water from two wells exceeds the manganese secondary MCL. Water samples from two wells were analyzed for Title 22 metals. All Title 22 metals concentrations were below the MCL except selenium, which was above the primary MCL in one sample. Water quality tends to degrade in the southeastern portion of the Subbasin in the vicinity of the Oak Ridge fault. The water in the Fillmore Subbasin is calcium sulfate type.

Las Posas Valley Basin (DWR Basin No. 4-008)

The Las Posas Valley area was previously divided into three basins (east, west and south) using boundaries delineated by the County of Ventura. The California DWR Bulletin 118 basin boundaries designate one basin boundary for the whole valley. The geology of the basin causes differences in water levels and water quality between the east and the west areas of the basin. Because of this and other sustainable management factors, two management areas have been defined in the GSP for the Fox Canyon Groundwater Management Agency (FCGMA). The West Management Area (WMA) encompasses what was formerly the West Las Posas Basin area and the East Management Area (EMA) encompasses the area that was formerly the East Las Posas Basin and the South Las Posas Basin. The management area boundaries are defined in the GSP for the FCGMA.

Las Posas Valley Basin – East Management Area

Water-bearing units of the EMA consist of Quaternary and Pleistocene alluvial deposits of varying thickness. Water-bearing deposits consist primarily of sand or a mixture of sand and gravel identified as the Fox Canyon Aquifer and is the basal member of the San Pedro Formation (Stokes, 1971). The Fox Canyon Aquifer is generally considered to be confined in the EMA. Data indicates the Fox Canyon Aquifer receives recharge from leakage from overlying aquifers (FCGMA 2007 Basin Management Plan) and the exact hydrogeologic continuity is not well understood. The Somis fault acts as a hydrogeologic boundary between the East and West Subbasins. Depth to the upper water-bearing unit is approximately 120 to 150 feet bgs and 530 to 580 feet bgs to the lower water-bearing unit. There are approximately 457 water supply wells in the East Las Posas Basin, of which 167 are active wells.

There is moderate variability in water quality between ten wells sampled by VCWPD in 2018. Calcium is the dominant cation in five samples and there are no dominant cations in the other samples. Sulfate

is the dominant anion in three samples, bicarbonate is the dominant anion in three samples and the four remaining samples have no dominant anion. The water in three wells is calcium bicarbonate type and the water in the remaining wells is calcium sulfate type. Of the ten wells sampled in the EMA, two wells located in the southwestern area near the Arroyo Las Posas have different water chemistry. TDS and sulfate are above the secondary MCL in the southwestern-most wells. Chloride levels for the two southwestern wells do not exceed the primary MCL but are above the level that could can cause impairment of agricultural beneficial uses for sensitive plants. The remainder have good water quality with TDS ranging between 310 and 1,580 mg/L.

There is moderate variability in the water quality of the combined areas of the EMA and WMA water chemistry. Water samples from both management areas are in two main groups: those with sulfate as the dominant anion and are a calcium sulfate type, and those with no dominant anion but are near the bicarbonate type and calcium bicarbonate type. The water chemistry of both management areas is fairly similar, although based on the sharp change in water level between the EMA and WMA, the degree of hydrogeologic connection appears to be limited.

Las Posas Valley Basin – West Management Area

There are approximately 192 water supply wells in the WMA of the Las Posas Valley Basin, of which 91 are active. Eleven wells within the WMA were sampled by VCWPD in 2018. There is moderate variability in water quality. Calcium is the dominant cation in two samples, sodium is the dominant cation in one sample and there is no dominant cation in the remaining samples. Bicarbonate is the dominant anion in four samples, and sulfate is the dominant anion in six samples. There is no dominant anion in the remaining sample, but it is close to the sulfate anion type. The water in three wells is calcium bicarbonate type, one is sodium bicarbonate type and the remainder are calcium sulfate type.

TDS is above the secondary MCL in ten wells, ranging from 480 to 1,310 mg/L. Water from one well has a nitrate concentration above the primary MCL. Six samples have sulfate concentrations above the secondary MCL and six samples have manganese concentrations above the MCL. Water from four wells was analyzed for Title 22 metals and all constituents were below the MCLs.

Lockwood Valley Basin (DWR Basin No. 4-017)

The Lockwood Valley Basin groundwater quality ranges from good to poor. The Basin covers a geographic area of 34.1-square miles. Water-bearing units consist of Quaternary alluvium, Tertiary sedimentary rocks and Quaternary stream channel alluvium. The Tertiary sedimentary rocks have high silt and clay content, resulting in low permeability. The alluvial material consists primarily of silty and clayey sands, gravels and boulders and has a much higher permeability than the underlying Tertiary sedimentary rocks. The Quaternary stream channel alluvium, prevalent near existing stream channels, contain a smaller percentage of clays and silts and wells penetrating this material tend to be higher yielding producers. Depth to water-bearing units range from 55 to 60 feet. There are approximately 289 water supply wells in the Lockwood Valley Basin, of which 247 are active. No wells were sampled by VCWPD in the basin in 2018.

Ojai Valley Basin (DWR Basin No. 4-002)

The Ojai Valley Basin aquifer system is considered unconfined except in the western end of the basin where a semi-confining to confining clay layer is present. Water quality in the basin is considered

good. There are approximately 330 water supply wells in the basin, of which 189 are active. Depth to water-bearing units is generally 25 to 30 feet bgs. There is low variation of the water quality for five wells sampled by VCWPD in 2018. Calcium is the dominant cation in all the samples. Sulfate is the dominant anion in one sample, bicarbonate in one sample, and no dominant anion in the remaining three samples. The water in one well is calcium bicarbonate type and the remaining four are calcium sulfate type.

Water from all five wells has TDS concentrations above the secondary MCL. TDS concentrations range from 630 to 820 mg/L. The Sulfate concentration in one well and the manganese concentration in one well exceed the secondary MCL. Water samples from two wells were analyzed for Title 22 metals. None of the constituents were above the primary MCL.

Oxnard Subbasin (DWR Basin No. 4-004.02)

The Oxnard Subbasin was previously divided into two separate basins by the County of Ventura. The Oxnard Plain Forebay and the Oxnard Plain Pressure Basin. DWR Bulletin 118 groundwater basin boundaries are now utilized and the Forebay is included within the boundary of the Oxnard Subbasin. Because of the difference in Upper Aquifer System geology between the Oxnard Plain Forebay and the Oxnard Plain Pressure Basin, and other management factors, the Forebay will be treated as a separate management area within the Oxnard Subbasin. The Oxnard Subbasin is the largest and most complex of the groundwater basins in Ventura County and consists of two major aquifer systems, the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). There are approximately 1,180 water supply wells in the Oxnard Subbasin, of which 469 are active.

From shallowest to deepest, the Upper Aquifer System (UAS) consists of the Perched/Semi Perched, Oxnard and Mugu aquifers. Only the Oxnard and Mugu Aquifers are sampled in the UAS. The Lower Aquifer System (LAS) consists, from shallowest to deepest, of the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are no wells perforated solely in the Grimes Canyon aquifer, therefore it cannot be sampled exclusively.

Forebay Management Area

The Forebay Management Area is the principal recharge area for the UAS and LAS of the Oxnard Subbasin. Depth to water-bearing units is generally 25 to 50 feet. There are approximately 283 water supply wells in the Forebay Management Area, of which 101 are activ. The Forebay Management Area generally has acceptable water quality except in the southern area where high nitrate concentrations are common. The northern area is predominantly agricultural with a few residential areas that still rely on individual septic systems. No wells were sampled by VCWPD in 2018.

Upper Aquifer System (UAS)

Oxnard Aquifer

The Oxnard Aquifer is the shallowest of the confined aquifers and the most developed, based on the number of wells. Average depth to the main water-bearing unit is 80 feet bgs, making it the easiest and least expensive aquifer in which to construct a water supply well.

Water from two wells has manganese concentrations above the secondary MCL. Water samples taken by VCWPD in 2018 from all three wells have TDS and sulfate concentrations above the secondary

MCL. Sulfate concentrations range from 423 to 733 mg/L. TDS concentrations range from 1,000 to 1,680 mg/L. Water from one well has a nitrate concentration above the primary MCL. None of the samples were analyzed for Title 22 metals. Groundwater plumes with elevated nitrate concentrations are common in the northern portion of the Basin. Sources of nitrate include nitrogen-based fertilizers in agricultural areas and septic systems in residential areas.

Mugu Aquifer

The Mugu Aquifer is the lowest layer of the UAS and has similar physical and chemical characteristics to the Oxnard Aquifer, but possesses slightly better water quality, due to increasing depths where contaminants are less likely to infiltrate. Average depth to the main water-bearing unit is 200 feet. One well perforated solely in the Mugu Aquifer was sampled by VCWPD in 2018. The water from the well has sulfate and TDS concentrations above the primary MCL. The sample was not analyzed for Title 22 metals. There is no dominant cation, though the data is closest to a calcium cation type. Four samples have no dominant anion but three are closer to the sulfate type and one is closer to the chloride type. Sulfate is the dominant anion for the remaining samples. The water in the UAS is best classified as a calcium sulfate type.

Lower Aquifer System (LAS)

Hueneme Aquifer

The Hueneme Aquifer is the shallowest of the LAS aquifers with the depth to the main water-bearing unit at approximately 375 feet. Few wells are perforated exclusively in the Hueneme Aquifer making water quality determination for the Aquifer difficult. One well screened solely in the Hueneme Aquifer was sampled by VCWPD in 2018. It has TDS, sulfate and manganese concentrations above the secondary MCL. The sample was not analyzed for Title 22 metals

Fox Canyon Aquifer

The Fox Canyon Aquifer is the second most-developed production zone in the Oxnard Subbasin, based on the number of wells and depth of perforations. One well perforated solely in the Fox Canyon Aquifer was sampled by VCWPD in 2018. Depth to the main water-bearing unit is approximately 580 feet. The Fox Canyon Aquifer generally has excellent water quality and high yield rates but is subject to seawater intrusion near Point Mugu and the Hueneme Submarine Canyon. Extractions are monitored and allocated by the FCGMA in order to mitigate aquifer overdraft and reduce the intrusion of seawater.

TDS is the only constituent that exceeded the secondary MCL. The sample was not analyzed for Title 22 metals.

Hueneme & Fox Canyon Aquifers

Four Oxnard Subbasin wells that were sampled by VCWPD in 2018 are perforated across both the Hueneme and Fox Canyon Aquifers and will be referred to as LAS wells. Secondary MCL concentrations were exceeded in three samples for manganese and two samples for sulfate. All four have TDS concentrations above the secondary MCL. TDS concentrations vary between 590 and 1,520 mg/L. Water samples from two Hueneme/Fox Canyon wells were analyzed for Title 22 metals and all constituents were below the primary MCL.

Fox Canyon & Grimes Aquifers

Two Oxnard Subbasin wells sampled by VCWPD in 2018 are perforated in the Fox Canyon and the Grimes Canyon Aquifers. They are also referred to as LAS wells. Sodium is the dominant cation and there is no dominant anion. Both water samples are sodium sulfate type. Water from one well exceeded the drinking water secondary MCL concentration for manganese. Both samples have sulfate and TDS concentrations above the secondary MCL.

Hueneme, Fox Canyon & Grimes Aquifers

Four Oxnard Subbasin wells sampled by VCWPD in 2018 are perforated across the Hueneme, Fox Canyon and Grimes Canyon Aquifers. They are also referred to as LAS wells. There is moderate variability in water quality. Calcium is the dominant cation in one sample with no dominant cation in the remaining three samples but are close to the calcium type. Sulfate is the dominant anion in all samples. The water is calcium sulfate type.

Samples from three wells have manganese concentrations and all four have sulfate and TDS concentrations above the secondary MCL. TDS concentrations from these wells varies between 760 and 1,390 mg/L. Water samples from three Fox/Hueneme/Grimes wells were analyzed for Title 22 metals with all constituents below the primary MCL.

There is moderate variability in water quality of all wells sampled by VCWPD in the LAS. Sodium is the dominant cation in three samples and the remainder have no dominant cation but about half are closer to the sodium type and half closer to the calcium type. Four samples have no dominant anion but sulfate is the dominant anion for the remainder. Three water samples are sodium sulfate type and the remainder are calcium sulfate type.

There is moderate variation between all wells sampled in the Oxnard Subbasin. Three wells have sodium as the dominant cation and the remainder have no dominant cation. Eleven samples have no dominant anion and sulfate is the dominant anion in the remainder. Three samples are sodium sulfate type and the remainder are calcium sulfate type.

Piru Subbasin (DWR Basin No. 4-004.06)

The Piru Subbasin groundwater recharge is principally from precipitation, water releases from Lake Piru by UWCD, and the Santa Clara River. Flow from the Santa Clara River enters the basin from the east and carries discharges from wastewater treatment plants and urban and stormwater runoff from Los Angeles County. There are approximately 152 water supply wells in the Piru Subbasin, of which 121 are active. Depth to the main water-bearing unit is approximately 30 to 90 feet. On April 6, 2010, the LARWQCB adopted a Basin Plan Amendment that includes a Total Maximum Daily Load (TMDL) of 117 mg/L for chloride in surface water and 150 mg/L in groundwater for the stretch of the Santa Clara River in Ventura County east of Piru Creek.

Five wells were sampled by VCWPD in the Piru Subbasin in 2018. None of the groundwater sampled has a chloride concentration above the TMDL. There is low variability in water quality. There is no dominant cation for any samples but the data is closer to the calcium cation type. Sulfate is the dominant anion for all samples and the water is calcium sulfate type. The TDS concentrations exceed the secondary MCL in all samples and vary from 1,020 to 2,360 mg/L. Two samples have TDS

concentrations above 1,500 mg/L. Sulfate concentrations exceed the secondary MCL in all samples. Two samples have manganese concentrations greater than the secondary MCL and two samples have nitrate concentrations greater than the primary MCL.

A water sample from one well was analyzed for Title 22 metals. The well has a selenium concentration over nine times the primary MCL. The concentrations for the remaining constituents were well below the primary MCL.

Pleasant Valley Basin (DWR Basin No. 4-006)

Pleasant Valley Basin groundwater quality can vary greatly throughout the basin. The upper-most water-bearing unit at 35 to 60 feet is not used due to very poor water quality. Permeable lenses of alluvial sands, gravels, silts and clays of recent to Upper Pleistocene age that vary in thickness from a few feet to several hundred feet are equivalent to but not connected with the Oxnard Aquifer and are referred to as the Upper Zone. Depth to the main water-bearing unit is approximately 400 to 500 feet. This deeper zone is referred to as the Lower Zone. It is made up of marine sands and gravels of the lower-most member of the early Pleistocene San Pedro Formation and is known as the Fox Canyon Aquifer. The Grimes Canyon Aquifer underlies the Fox Canyon Aquifer at depths below 1,000 feet and is perforated by only the deepest wells. There are approximately 341 water supply wells in the Pleasant Valley Basin, of which 86 are active. Thirteen wells were sampled by VCWPD in 2018, with three perforated in the Upper Zone and 10 perforated in the Lower Zone.

Wells perforated in the Upper Zone tend to have higher concentrations of sulfate than those in the Lower Zone but in general the Upper and Lower aquifer systems show similar water quality. There is moderate variability in water quality. For wells in the Upper Zone, calcium is the dominant cation in one sample, sodium is the dominant cation in one sample and the remaining two samples have no dominant cation but are closer to the calcium type. For wells in the Lower Zone, sulfate is the dominant anion in nine samples with no dominant anion for the remaining sample. The data is closer to the sulfate type. The water in one sample is sodium sulfate type and the remainder are calcium sulfate type.

TDS concentrations in all water samples (Upper and Lower Zones) vary from 710 to 4,650 mg/L. All thirteen wells sampled have TDS concentrations above the secondary MCL. Twelve wells have sulfate concentrations above the secondary MCL. One sample has an iron concentration above the secondary MCL and seven have manganese concentrations above the secondary MCL. Chloride concentrations are above the secondary MCL in one well and nine are above a concentration that can impair agricultural beneficial uses. Four water samples were analyzed for Title 22 metals. None of the analyses were above the primary MCL.

Santa Paula Subbasin (DWR Basin No. 4-004.04)

The Santa Paula Subbasin is a court adjudicated groundwater basin. To mitigate overdraft, a June 1991 judgement ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Subbasin. The judgement stipulated an allotment of 27,000-AFY could be pumped from the Subbasin. Water quality in the Subbasin has not changed substantially since 2007. The depth to the water-bearing unit is 65 to 160 feet. There are approximately 330 water supply wells in the Santa Paula Subbasin, of which 179 are active. Water from one well was analyzed. There is no significant change in the water quality since previous sampling by VCWPD. Calcium is the dominant cation in one sample and the remaining four have no

dominant cation. Sulfate is the dominant anion and the water is calcium sulfate type. TDS concentration is above the secondary MCL. The sample has concentrations above the secondary MCL for sulfate, iron and manganese. The sample was not analyzed for Title 22 metals. There is low variability among the samples and they are all calcium sulfate water types.

Hidden Valley Basin (DWR Basin No. 4-016)

The Hidden Valley Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply throughout the basin because much of the water is stored in fractures. The water quality varies because of the heterogeneous nature of the aquifer. There are approximately 149 water supply wells in the Hidden Valley Basin, of which 98 are active. No wells were sampled by VCWPD in the basin in 2018.

Simi Valley Basin (DWR Basin No. 4-009)

The Simi Valley Basin drains to the west and historically, water quality becomes more enriched in salts and thus, of poorer quality further west in the basin. The three wells sampled by VCWPD in 2018 are in the western end of the valley. There are approximately 182 water supply wells in the Simi Valley Basin, of which 40 are active wells. Depth to the water-bearing unit is approximately 5 to 25 feet bgs. The City of Simi Valley has a high water-table at the western end of the valley and several dewatering wells have been installed to reduce the water table. There is low variability in water quality. There is no dominant cation, but the samples are closer to the calcium type. Sulfate is the dominant anion in all three samples. and the water is calcium sulfate type. TDS and sulfate concentrations in all three wells are above the secondary MCL. One well has nitrate and one well has manganese above the MCL. Three samples have chloride concentrations that could cause impairment of agricultural beneficial uses for sensitive plants but are not above the primary MCL. One water sample was analyzed for Title 22 metals and all constituents are below the MCL.

Thousand Oaks Area Basin (DWR No. 4-019)

The Thousand Oaks Area Basin has very few active water wells available for sampling. The depth to the water-bearing unit is approximately 25 to 30 feet bgs. The groundwater basin underlies a small valley between Lake Sherwood and the City of Thousand Oaks, just east of Highway 23. Water-bearing formations are mainly alluvium and fractured Conejo Volcanics There are approximately 119 water supply wells in the basin, of which 13 are active. No wells were sampled in this basin in 2018.

Tierra Rejada Valley Basin (DWR Basin No. 4-015)

Depth to water-bearing materials varies between 20 to 80 feet bgs. There are approximately 58 water supply wells in the Tierra Rejada Valley Basin, of which 37 are active. Seven wells were sampled by VCWPD in 2018. There is some variation in water quality. The dominant cation for one sample is magnesium and the remainder have no dominant cation but are close to the magnesium type. The dominant anion for one sample is bicarbonate and the remainder have no dominant anion. One well is magnesium bicarbonate type and the remaining six are magnesium sulfate type. One well has a nitrate concentration above the primary MCL. Water from all seven wells has TDS concentrations above the secondary MCL, ranging from 630 to 1,180 mg/L. One sample has manganese and one has sulfate above the secondary MCL. Two wells in the basin were analyzed for Title 22 metals and all constituents were below the primary MCL.

A comparison of water chemistry between Tierra Rejada and Arroyo Santa Rosa Basins shows chemistry in the two basins is similar but there is more variation in Tierra Rejada with slightly higher magnesium, bicarbonate and sulfate.

Upper Ojai Valley Basin (DWR Basin No. 4-001)

The Upper Ojai Valley Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. The average thickness of water-bearing deposits is approximately 60 feet and is encountered approximately 45 to 60 feet bgs. Groundwater quality is considered good but varies seasonally and usually has better quality during winter months. There are approximately 167 water supply wells in the Upper Ojai Valley Basin, of which 126 are active wells. Three wells were sampled by VCWPD in 2018. There is little variation in the water quality of wells. Calcium is the dominant cation in two samples and there is no dominant cation in the remaining sample but are closer to the calcium cation type. Bicarbonate is the dominant anion and the water is calcium bicarbonate type in all three samples.

TDS is above the secondary MCL in one sample and manganese is above the secondary MCL in two samples. One sample has a nitrate concentration above the primary MCL. Two water samples were analyzed for Title 22 metals and all constituents were below the primary MCL.

Ventura River Valley – Lower Ventura River Subbasin (DWR Basin No. 4-003.02)

The Lower Ventura River Subbasin is commonly defined at a point coinciding with the City of Ventura's submerged dam at Foster Park and extending to the Pacific Ocean. The Subbasin shares a common boundary with the Mound Subbasin at its lower reach. Canada Larga and several smaller tributary canyons are also part of the Subbasin. The water-bearing unit consists of alluvial sand and gravel with abundant cobbles and ranges in thickness from 60 to 200 feet and perhaps up to 300 feet at the mouth of the Ventura River. The Subbasin has few remaining active wells available for sampling. Depth to the water-bearing unit is 3 to 13 feet bgs in the floodplain and deeper as the ground surface elevation increases towards the edges of the Subbasin. There are approximately 33 wells in the Lower Ventura River Basin, of which 20 are active. One well was sampled by VCWPD in 2018. The water sample has TDS and sulfate concentration that exceeds the secondary MCL. The water was not analyzed for Title 22 metals. The water is calcium sulfate type.

Ventura River Valley – Upper Ventura River Subbasin (DWR Basin No. 4-003.01)

The Upper Ventura River Subbasin is mainly composed of thin alluvial deposits. There are approximately 202 water supply wells in the Upper Ventura River Subbasin, of which 121 are active. There is low variation in water quality among the samples collected by VCWPD in 2018. The dominant cation in the Upper Ventura River Subbasin is calcium with no dominant anion. The water is calcium sulfate type.

One well was sampled. The water sample has as TDS concentration that exceeds the secondary MCL. The sample was not analyzed for Title 22 metals. Calcium is the dominant cation and there is no dominant anion in the sample. The water is calcium sulfate type.

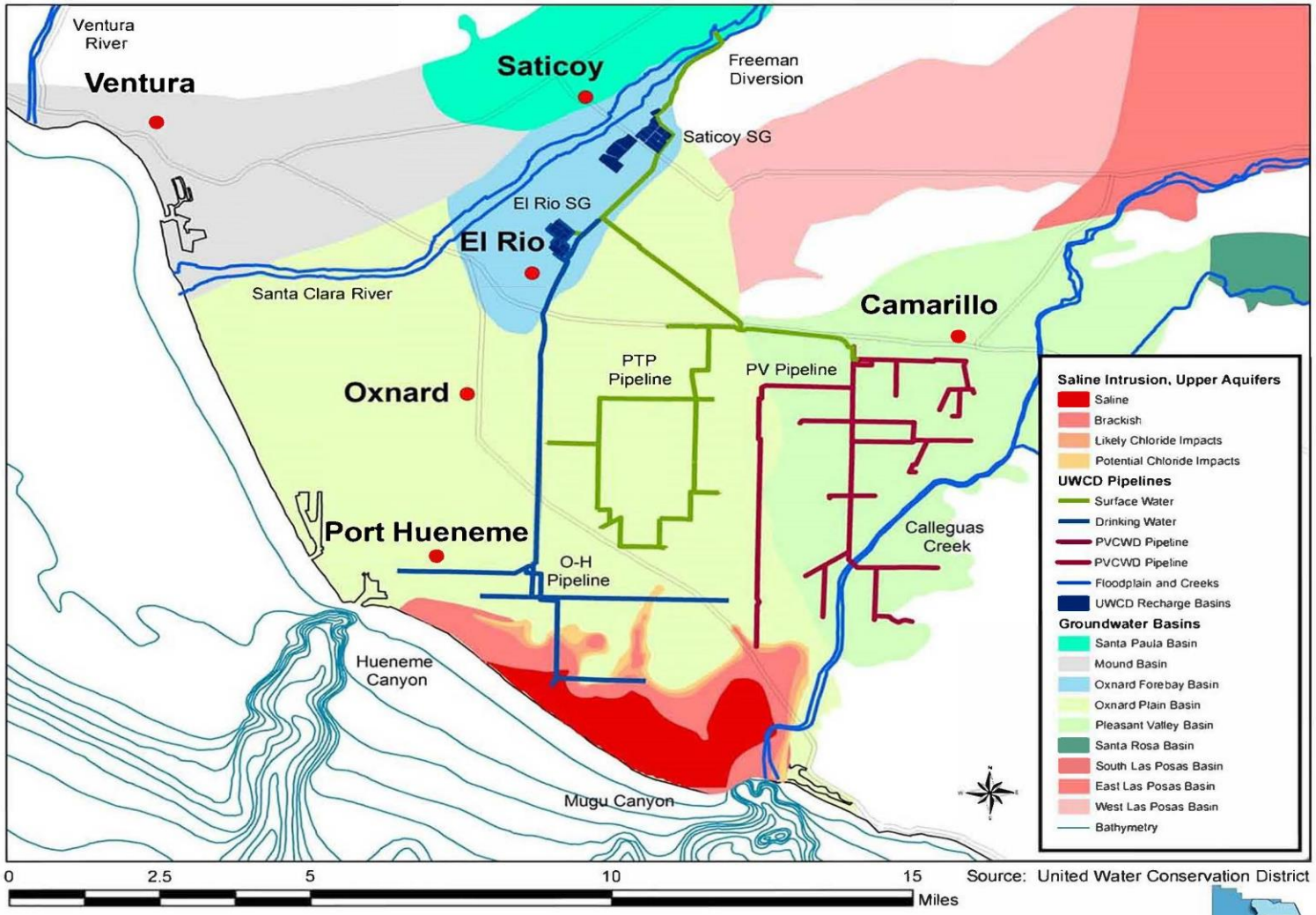


Figure 3-16 Seawater Intrusion Levels WCVC IRWM Region

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 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-**4. According to SCAG, the 2000-2035 Population Forecast (**Table 3-**4) 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 3-4
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 3-17** includes statistics regarding Native Americans residing in the County (2010 Census).

3.6.2 Economic Factors

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 2018 Annual Crop Report, agricultural production generated $2.1 billion in gross sales in 2018, 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-**5 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 3-18** includes a map depicting the location of major crop types in the Region.

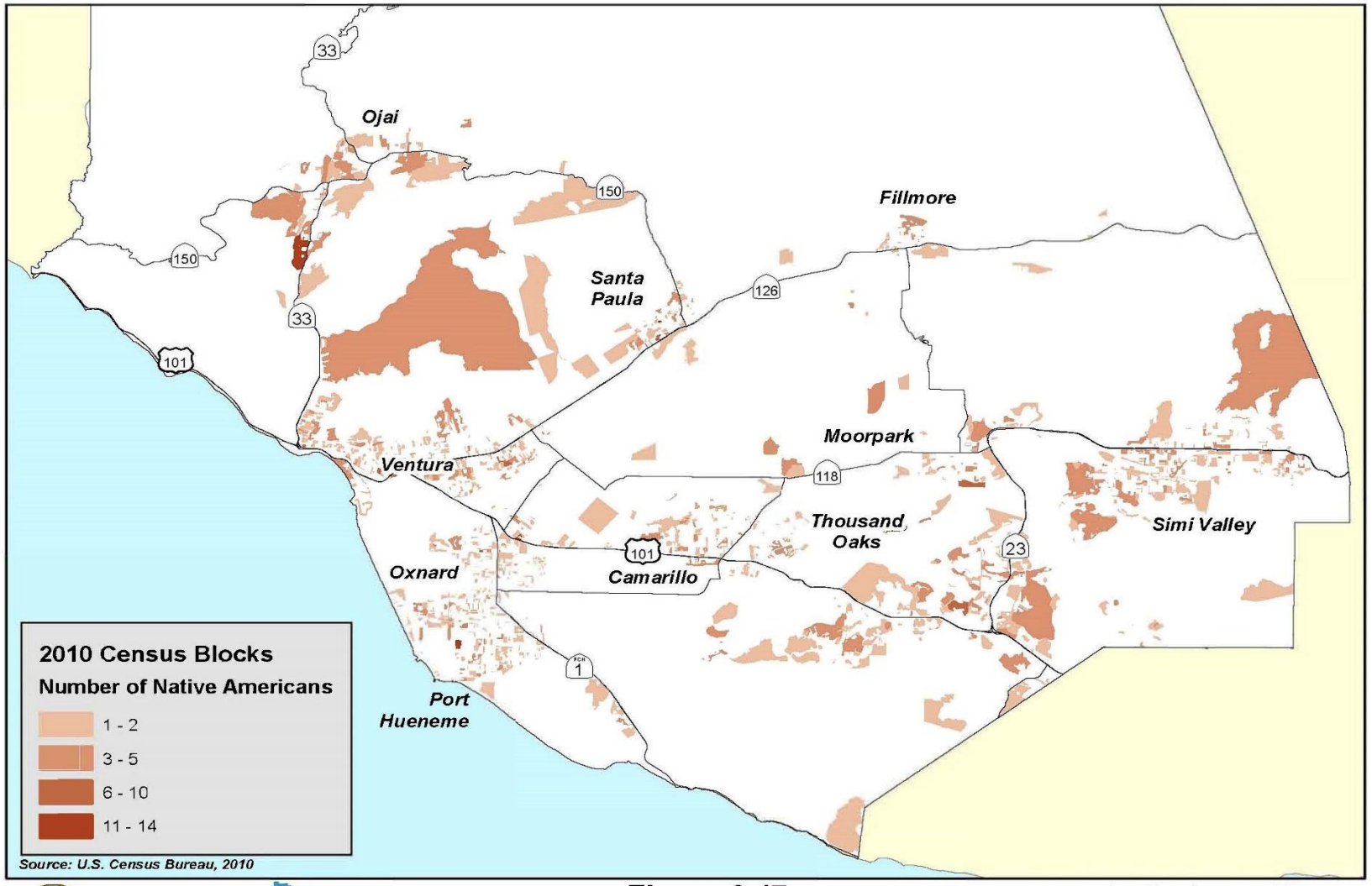


Figure 3-17
Native American Population
WCVC IRWM Region

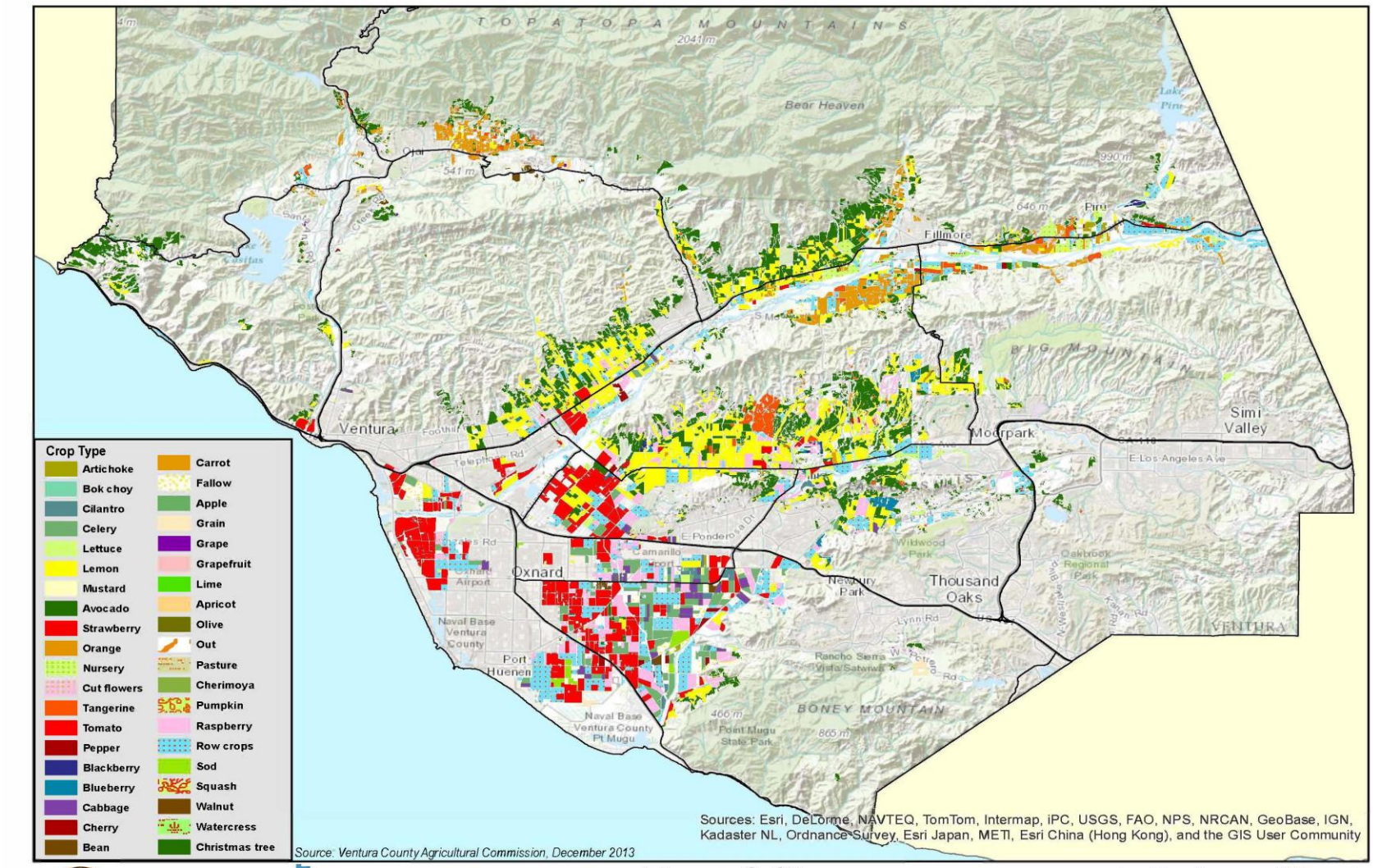


Figure 3-18
Primary Crop Types
WCVC IRWM Region

Table 3-5

Ventura County's Leading Agricultural Commodities – 2018

RANK	CROP	VALUE
1st	Strawberries	$670,716,000
2nd	Lemons	$244,173,000
3rd	Celery	$198,680,000
4th	Nursery Stock	$194,495,000
5th	Raspberries	$181,730,000
6th	Avocados	$103,252,000
7th	Tomatoes	$48,932,000
8th	Cut Flowers	$48,442,000
9th	Peppers	$43,519,000
10th	Cabbage	$36,972,000

Source: Ventura County's Crop and Livestock Report, County Agricultural Commission, July 2019

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 or ACHS)

3.6.2.1 Disadvantaged Communities

As defined by the Proposition 1 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 in 2017 was $ 71,805. To be considered a DAC, the annual median household income had to be at, or below $57,444. In Ventura County, the annual median household income in 2016 was $ 77,335 according to ACHS data. Severely disadvantaged communities (SDAC) are defined by the state as those communities with a median household income of less than 60% of the statewide median household income which in 2017 would have been $48,083.

In a study funded by DWR and conducted by the Council for Watershed Health in Los Angeles (representing the Greater LA IRWM Region disadvantaged community outreach programs were evaluated, leading to 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."

DWR maintains a Disadvantaged Community Mapping Tool where regions can determine the location of DACs and SDACs using Census data at the Place, Tract, and Block Group level. See **Figure 3-19** for a map highlighting DAC and SDAC areas in the Region, using Tract and Block Group data from 2016.

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 water-related needs of these areas (i.e. adequate fire flow capacity). WCVC and individual water and sanitation 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 ratio of the cost of housing and other living expenses to income is relatively high when compared to other parts of the state.

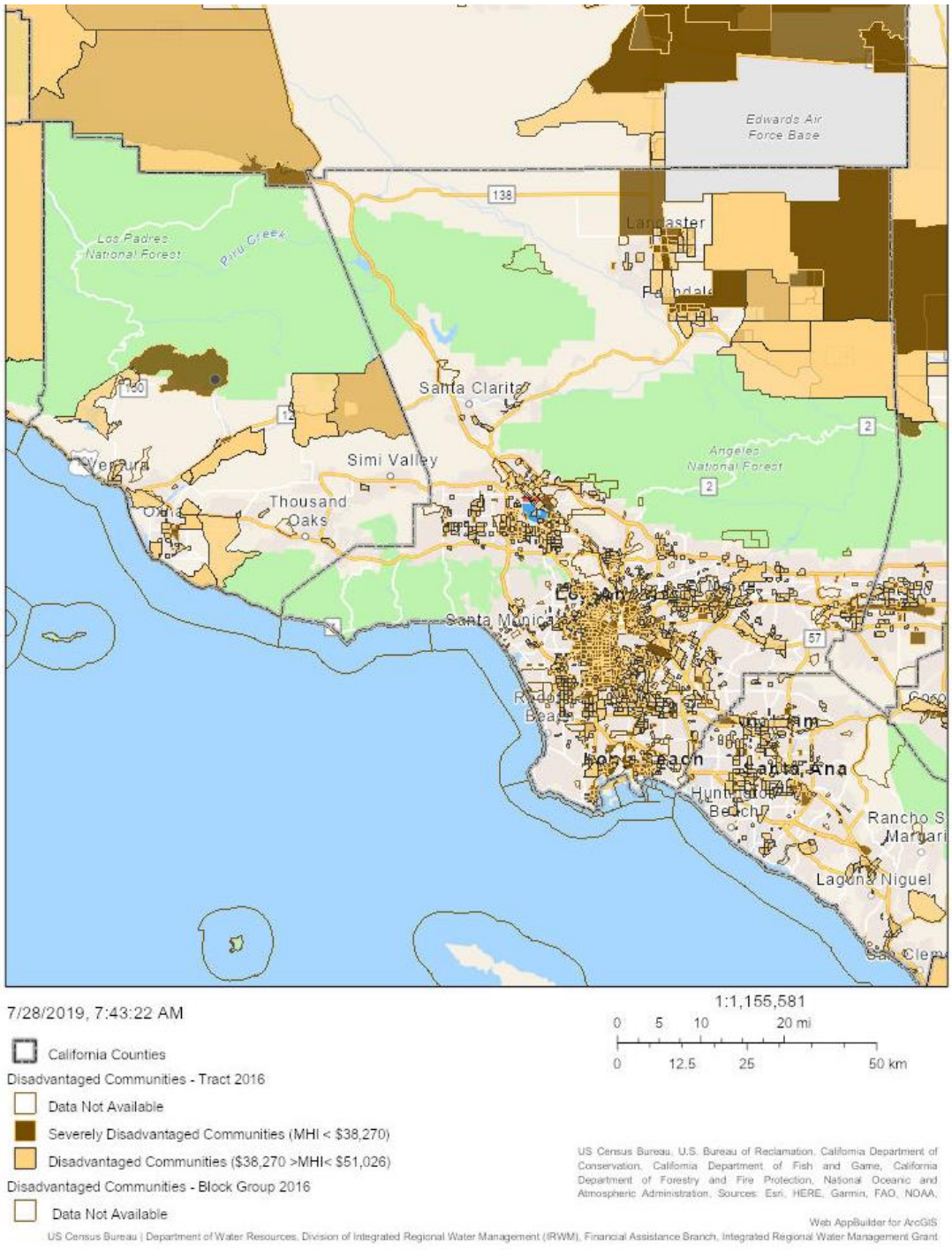


Figure 3-19

Disadvantaged Communities in Ventura County – ARC GIS Map

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.

DAC Outreach and Engagement:
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 people in DAC areas 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.

In developing the 2014 IRWM Plan, 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 led 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.

Through Proposition 1 (2014) there are funds available for Disadvantaged Community Involvement (DACI) which is 10% of the total amount of funding available in the Prop. 1 IRWM Grant program. An additional 10% is available to fund implementation projects benefiting DAC areas. The funds for DACI are distributed to each of the 12 Funding Areas in the state to manage collaboratively with all IRWM Regions within those boundaries. WCVC is part of the LA-Ventura Funding Area and has been working with the Greater Los Angeles and Upper Santa Clara River IRWM Regions to conduct activities related to the DACI program. These activities include conducting needs assessments, developing outreach, education, and engagement events, engaging DACs in development of IRWM plans, conducting site assessments, providing technical assistance and assisting with project development, improving governance structures and DAC elements in IRWM planning efforts and providing facilitation services.

The LA-Ventura Funding Area received a grant for $ 9.8 million for the DACI Program, which is being managed by the LA County Flood Control District on behalf of all three IRWM Regions. Grant funded activities are underway and scheduled to be completed in 2021.

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 faced the Region for decades.

- Inadequate quantity of locally available water.
- Agricultural and urban runoff (point and nonpoint sources) degradation of local water bodies and groundwater basins; reduction of the potential uses of these water sources – including septic tank leaching, runoff from agricultural areas, stormwater runoff.
- Localized high TDS, chlorides and TMDLs.
- Seawater intrusion into a critical aquifer of the Oxnard Plain.
- Destruction from periodic flooding events.
- Wetlands and habitats loss or degradation due to reduced flows/pollution.
- Lack of data in some watershed areas – supply, demand, flows.
- Underutilization of treated effluent from local wastewater treatment plants.

3.7.2 IRWM Plan Goals:

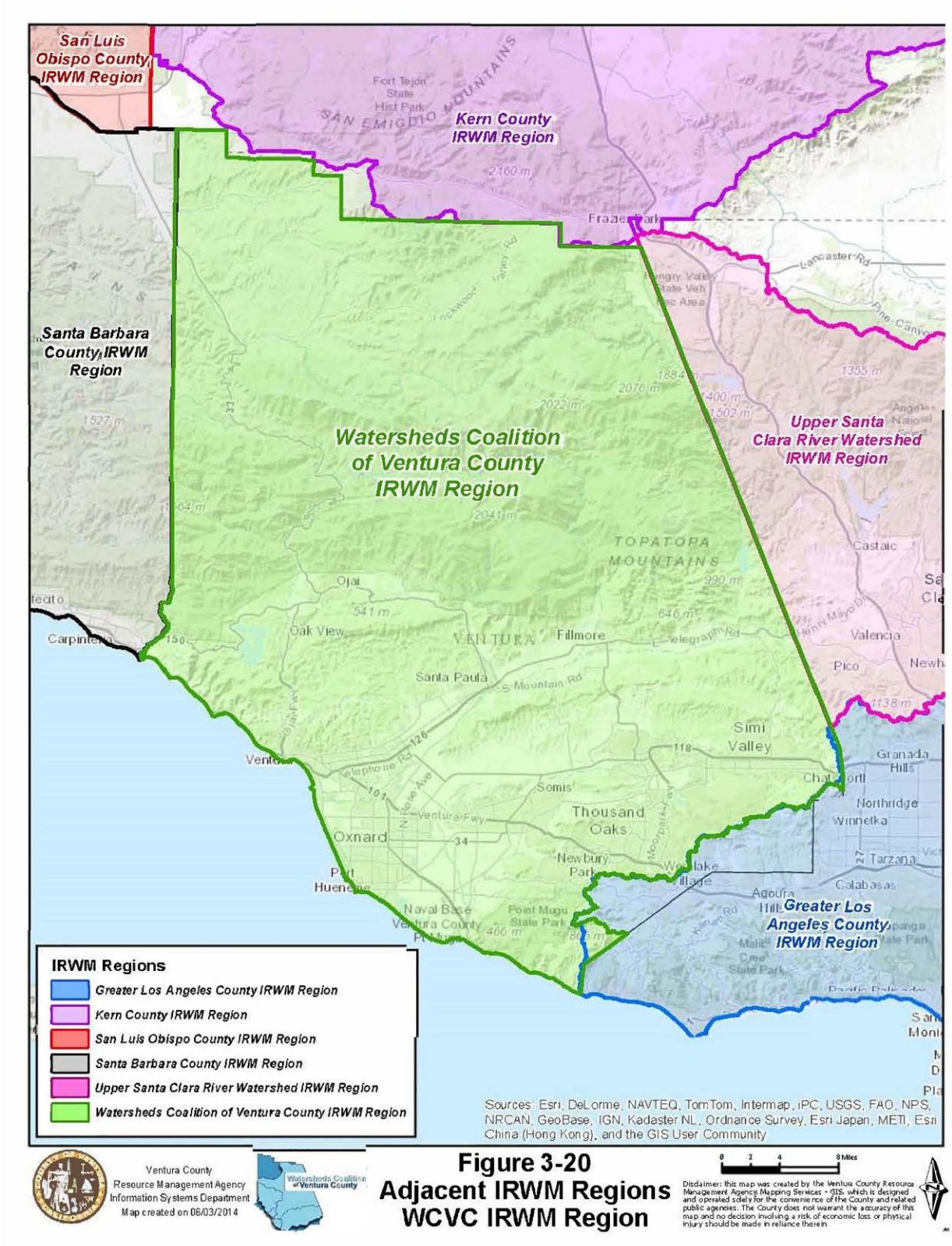
1. Protect, conserve, and augment local water supply portfolio to increase local water resilience.
2. Protect and improve water quality.
3. Protect people, property and the environment from adverse flooding impacts.
4. Protect and restore habitat and ecosystems in watersheds.
5. Provide water-related recreational, public access, stewardship, engagement and educational opportunities.
6. Prepare for and adapt to climate change.

3.8 Relationship and Coordination with Neighboring IRWM regions

The boundaries for the WCVC IRWM Region are for the most part the boundaries of Ventura County except for the portion of the Malibu Creek Watershed that lies within Ventura County. There are three primary, adjacent IRWM Regions as depicted in **Figure 3-20**: 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 in close proximity the WCVC Region there are no significant shared resources or development along those boundaries.

There are no uncovered or void areas and 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.


San Luis Obispo County IRWM Region
Kern County IRWM Region
Santa Barbara County IRWM Region
Watersheds Coalition of Ventura County IRWM Region
Upper Santa Clara River Watershed IRWM Region
Greater Los Angeles County IRWM Region
IRWM Regions
Greater Los Angeles County IRWM Region
Kern County IRWM Region
San Luis Obispo County IRWM Region
Santa Barbara County IRWM Region
Upper Santa Clara River Watershed IRWM Region
Watersheds Coalition of Ventura County IRWM Region
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community
Ventura County Resource Management Agency Information Systems Department
Map created on 06/03/2014
Figure 3-20
Adjacent IRWM Regions
WCVC IRWM Region
0 2 4 8 Miles
Disclaimer: this map was created by the Ventura County Resource Management Agency Mapping Services - GIS, which is designed and operated solely for the convenience of the County and related public agencies. The County does not warrant the accuracy of this map and no decision involving a risk of economic loss or physical injury should be made in reliance therein.

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; and,
- Kern IRWM Region to the north.

Coordination among these neighboring Regions includes:

- Attending regional water management group meetings;
- Including representatives from the other groups on IRWM email distribution lists;
- Including links from our website to their websites; and,
- 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 critical-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. 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. Prior to the formation of IRWM Regions, there have been collaborative efforts that have included both the Upper and Lower Santa Clara River areas, including:

- 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 floodplain, 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.
- Ongoing efforts to improve habitat and provide stewardship for resources in the entire watershed

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 continue to strive for comprehensive management of the entire watershed and to address common needs and concerns.

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. 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) through the development and implementation of its Integrated Regional Water Management (IRWM) Plan is committed 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; and,
- Describes future IRWM Plan efforts to continue to reduce dependence on imported water.

Water Demand and Imported Water Needs in WCVC Region
While a large quantity of the total County water demand is supplied from local groundwater sources, imported water makes up a portion of the water utilized in the County. Imported water is SWP water from the Delta. 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. However, in many locations, it is necessary to blend imported water with 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 parts of its supply.

SWP water used in the Calleguas Creek Watershed and the lower parts of the Santa Clara Watershed is obtained by Calleguas from the MWD 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 a large percentage of their water from Calleguas with local groundwater making up the remainder. Additionally, the UWCD has been using SWP water to recharge groundwater within the Santa Clara River Watershed.

The Ventura River Watershed does not currently receive any SWP water.

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 with adverse impacts prevented.

WCVC IRWM Justification for Reducing Dependence on Imported State Water

- Local water agencies understand that expanding their water portfolios with local water supply options will increase water supply reliability.
- The 2011 SWP Delivery Reliability Report indicated that environmental water demand 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 MWD 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.
- MWD's water rates continue to rise. In 2019, the Tier 1 water rate was $1,050/AF. The proposed Tier 1 water rate for 2020 is $1,078/AF, an increase of 2.7 percent. Development of local water supplies will result in lower costs for ratepayers as compared to MWD's water rates for imported water.

WCVC Strategies to Reduce Dependence on Imported Water

The WCVC Region imports approximately 25% of its water supplies from the SWP. As specified in the IRWM Plan Standards in the Proposition 1 IRWM Grant Program Guidelines, IRWM Regions must consider implementing Resource Management Strategies which are included in Volume 3 of the California Water Plan, Update 2013. In order to improve water supply reliability, water agencies work to diversify the water resources 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, management 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 IRWM Plan that contribute to increasing supply reliability, including those listed in **Table 3-6** share a common emphasis on local supply enhancement.

TABLE 3-6
WCVC Projects that Reduce Dependence on Imported Water

Project Type	Partial List of Projects
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) • AMI Metering Program – Fox Canyon GMA • Regional Turf Replacement Project

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 Moorpark Desalters • Renewable Water Resource Management Program for the Southern Reaches of Calleguas Creek Watershed
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 • 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
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

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.

In the 1990s 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.

As a result of two extended, extreme droughts (1986-92 and 2012-19) water users in the Region significantly reduced water demand and new urban and agricultural programs, projects, regulations and devices were put in place to improve WUE.

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 the approximately 35-mile Regional Salinity Management Pipeline (SMP), which provides brine disposal from brackish groundwater treatment facilities. This project is essential to expanding use of local groundwater supplies, thereby reducing dependence on imported water.

This pipeline provides capacity for development of up to 40,000-AFY of new local water supplies over the next 20 years. This proposal includes a brackish groundwater treatment facility that will utilize the SMP and further 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. As described in detail in other sections of this plan, the establishment of the Sustainable Groundwater Management Act in 2014 has resulted in a new, long-term approach to managing groundwater resources. Development of groundwater sustainability plans for basins which are designated by the state as medium or high priority due to overdraft and/or water quality degradation, will include strategies to bring the basins into balance through such means as conjunctive use, recharge, and pumping restrictions.

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 WCVC 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 supplemental water supplies, the increasing cost of water, and concerns about supply 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. Continued progress on the regional Salinity Management Pipeline will allow the Region to greatly expand groundwater desalination and increase use of local resources. Expansion of water recycling for non-potable use, and studies of the potential for potable reuse currently underway, will also enhance water supply reliability.