

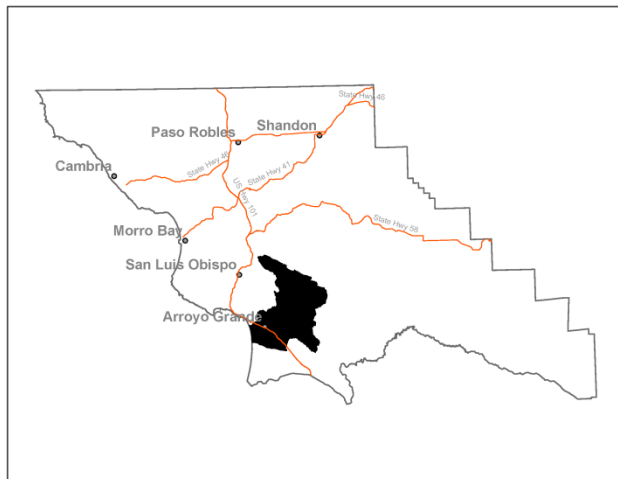
Arroyo Grande Creek Watershed

Hydrologic Unit Name	Water Planning Area	Acreage	Flows to	Groundwater Basin(s)	Jurisdictions
Estero Bay HU 10	South Coast WPA 7	95,998 acres	Pacific Ocean	Santa Maria River Valley; Arroyo Grande Creek sub-basin; Edna Valley	County of San Luis Obispo City of Arroyo Grande City of Grover Beach Community of Oceano Los Padres National Forest Pismo State Beach



Description:

The Arroyo Grande Creek Watershed is a coastal basin located in southern San Luis Obispo County. The drainage rises to a maximum elevation of approximately 3,100 feet above sea level. The watershed includes the tributaries of Tally Ho (Corbett), Tar Springs and Los Berros Creeks. Meadow Creek is a remnant marsh drainage system that enters Arroyo Grande Creek, just upstream of the confluence with the ocean. Arroyo Grande Creek empties into an estuary adjacent to the Oceano lagoon.



The watershed is dominated by agricultural land uses including vineyards, ranches and row crops. The urban core of the City of Arroyo Grande is at the confluence of Tally Ho Creek with Arroyo Grande Creek. Other land uses include Lake Lopez Reservoir and a regional airport in Oceano.

Watershed Plans:

Arroyo Grande Creek Watershed Management Plan (CCSE, 2009)

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Characteristics:

	Physical Setting	
	Rainfall	15 – 28 inches (NRCS, 2010)
	Air Temperature	<p>Summer Range (August 1981-2010): 54° - 73° F Winter Range (December 1981-2010): 39° - 63° F At Santa Maria Public Airport, CA. (NOAA National Climatic Data Center, viewed 2013)</p> <p>Limited data in watershed.</p>
	Geology Description	<p>The Arroyo Grande Creek, Carpenter Creek, Tar Springs Creek, and Vasquez Creek sub watersheds consist of steep moderately infiltrative early to mid-Tertiary headwaters – category # 8.</p> <p>The Wittenberg Creek sub watershed consists of steep pre-Quaternary, non-infiltrative headwaters with steep moderately infiltrative early to mid-Tertiary valley-category # 5.</p> <p>The Los Berros Creek sub watershed consists of steep pre-quaternary non-infiltrative headwaters with a flat highly infiltrative Quaternary valley-category # 3. (Stillwater Sciences, 2013)</p> <p>The Arroyo Grande Creek watershed lies at a structural and geomorphic transition between the north-northwest trending Coast Ranges and the west trending Transverse Ranges and has been described by Nitchman (1988) and Namson and Davis (1990) as an active fold and thrust belt. The lower watershed occurs within a geomorphic province known as the Pismo Basin that is bound on the northeast by the West Huasna Fault Zone and on the southwest by the Santa Maria River Fault Zone. The Wilmar Avenue Fault Zone also dissects the lower watershed, running parallel to the Highway 101 corridor. The lower watershed is primarily underlain by sedimentary and volcanic rocks from the Cenezoic age though portions of the watershed in the vicinity of Lopez Dam are melange and serpentine rocks from the Franciscan Formation. The sedimentary or pyroclastic nature and relatively young age of much of the underlying bedrock material results in the presence of highly erodible, friable material that is unconsolidated and easily weathered. Dune formations and extensive alluvial deposits in the valley floor of the mainstem and tributary channels also results in high erosion potentials. The alluvium primarily consist of unconsolidated, poorly bedded, poorly sorted to sorted sand, gravel, silt, and clay, with cobbles and boulders.(Swanson Hydrology &Geomorphology, 2004)</p> <p>Water supply aquifers are within Holocene alluvial deposits in Arroyo Grande Valley, which is drained by Arroyo Grande Creek. The alluvial deposits reach approximately 100 feet thick (DWR, 2002).</p>

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		Recharge to the sub-basin comes primarily from seepage from Arroyo Grande Creek (including Lopez Reservoir releases) and tributaries, deep percolation of precipitation, and residential/agricultural return flows. (Master Water Plan, 2012)
	Hydrology	
	Stream Gage	Yes; USGS 11141280 at Lopez Creek near Arroyo Grande (1967 - present, active) and USGS/County 11141500 Arroyo Grande Creek at the City of Arroyo Grande (1940 – 1986 by USGS 1986 - present by County, active). The County has total of 9 active stream flow gages in the watershed. There are 5 USGS stream gage stations discontinued (Stetson Engineering, 2004).
	Hydrologic Models	Yes; Swanson Hydrology & Geomorphology used a HEC-RAS to study the flood control channel in 2005. The County Public Works Department uses a model to plan.
	Peak Flow	4,620 - 5,400 cfs at USGS 11141500 (1940-1986, change in management to County) (USGS, viewed 2013). The 100 year discharge estimates are 19,500 cfs (Swanson Hydrology & Geomorphology, 2005).
	Base Flow	11 – 19 cfs at USGS 11141500 (1940 – 1986, change in management to County) (USGS viewed 2013) It is unknown whether gage was placed to capture base flows accurately. Many stream gages are installed as alert systems for peak flows.
	Flood Reports	Yes; Arroyo Grande Creek Erosion, Sedimentation and Flood Alternatives Study (Swanson Hydrology & Geomorphology, 2006); Arroyo Grande Creek Channel Waterway Management Plan (Waterways Consulting, 2010) The County manages Zone 1/1A Flood Control and Water Conservation District along the lower Arroyo Grande Creek including the channel and associated levees and flap gates for flood protection. (SLOCountyWater.org, viewed 2013)
	Biological Setting	
	Vegetation Cover	Primarily non-native annual grassland, buckbrush and chamise chaparral, and coast live oak forest. Contains some central coastal scrub, beach and coastal dune, agricultural land, and urban land. (SLO County vegetation shapefile, 1990) Dune scrub and foredune vegetation are present in coastal areas. Dune wetlands and willow woodlands are present in back dune areas. Riparian vegetation is present along Meadow Creek and Arroyo Grande Creek, primarily consisting of arroyo willow. (Althouse and Meade, Inc. 2013).

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	Limited spatial data. No alliance level vegetation mapping was available for the entire County.							
Invasive Species	<p>Largemouth bass, Black Crappie, Green Sunfish, English ivy, Cape ivy, <i>Arundo donax</i>, pampas grass, castor bean, and bullfrog. (CCSE, 2009 and Cindy Cleveland, personal communication, 2013)</p> <p>Ice plant, veldt grass, and blue gum eucalyptus are present at the coast. English ivy, Himalayan blackberry, and cotoneaster are problems in Arroyo Grande Creek near downtown Arroyo Grande (Althouse and Meade, 2013).</p> <p>Limited data and no spatial data.</p>							
Special Status Wildlife and Plants	<p>Key: FE - Federal endangered, FT - Federal threatened, SE - State endangered, ST - State threatened, SSC - State Species of Special Concern; FP- Fully Protected, SA – Special Animal, CRPR – CA rare plant rank (CNDDDB, viewed August, 2013)</p> <p>Locations listed refer to USGS 7.5' quadrangle names. Only the portion overlapping the watershed boundary was considered.</p> <p>Data is limited by the CA Natural Diversity Database.</p>							
Common Name	Status	ARROYO GRANDE NE	CALDWELL MESA	LOPEZ MTN	NIPOMO	OCEANO	SANTA MARGARITA LAKE	TAR SPRING RIDGE
Animals								
<i>arroyo chub</i>	SSC							X
California condor	FE; SE						X	X
California red-legged frog	FT	X			X	X		X
<i>coast horned lizard</i>	SSC	X						
<i>Coast Range newt</i>	SSC							X
<i>foothill yellow-legged frog</i>	SSC			X				
<i>mimic tryonia</i> (=California brackish water snail)	SA					X		
<i>monarch butterfly</i>	SA					X		
<i>Oso Flaco flightless moth</i>	SA					X		
<i>Oso Flaco robber fly</i>	SA					X		

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<i>prairie falcon</i>	SA (Nesting)	X	X	X	X	X	X	X
Common Name	Status	ARROYO GRANDE NE	CALDWELL MESA	LOPEZ MTN	NIPOMO	OCEANO	SANTA MARGARITA LAKE	TAR SPRING RIDGE
<i>steelhead - south/central California coast DPS</i>	FT	X			X	X		X
<i>western pond turtle</i>	SSC	X				X		
<i>western snowy plover</i>	FT					X		
<i>white sand bear scarab beetle</i>	SA					X		
Plants								
<i>Blochman's leafy daisy</i>	CRPR 1B.2					X		
<i>California saw-grass</i>	CRPR 2B.2					X		
<i>coastal goosefoot</i>	CRPR 1B.2					X		
<i>crisp monardella</i>	CRPR 1B.2					X		
<i>Cuesta Ridge thistle</i>	CRPR 1B.2			X				
<i>dune larkspur</i>	CRPR 1B.2					X		
<i>Eastwood's larkspur</i>	CRPR 1B.2			X			X	X
<i>Gambel's water cress</i>	FE; ST; CRPR 1B.1					X		
<i>Hardham's evening-primrose</i>	CRPR 1B.2						X	
<i>Hoover's bent grass</i>	CRPR 1B.2	X		X		X		
<i>La Graciosa thistle</i>	FE; ST; CRPR 1B.1					X		
<i>La Panza mariposa-lily</i>	CRPR 1B.3						X	
<i>marsh sandwort</i>	FE; SE; CRPR 1B.1					X		
<i>Nipomo Mesa lupine</i>	FE; SE; CRPR 1B.1					X		
<i>Ojai fritillary</i>	CRPR 1B.2						X	
<i>Pecho manzanita</i>	CRPR 1B.2			X				

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<i>Pismo clarkia</i>	FE; SR; CRPR 1B.1	x				x		
Common Name	Status	ARROYO GRANDE NE	CALDWELL MESA	LOPEZ MTN	NIPOMO	OCEANO	SANTA MARGARITA LAKE	TAR SPRING RIDGE
<i>Robbins' nemacladus</i>	CRPR 1B.2							x
<i>San Bernardino aster</i>	CRPR 1B.2					x		
<i>San Luis mariposa-lily</i>	CRPR 1B.2	x						
<i>San Luis Obispo County lupine</i>	CRPR 1B.2				x			x
<i>San Luis Obispo monardella</i>	CRPR 1B.2					x		
<i>San Luis Obispo owl's-clover</i>	CRPR 1B.2	x						
<i>sand mesa manzanita</i>	CRPR 1B.2					x		
<i>Santa Lucia manzanita</i>	CRPR 1B.2	x		x				
<i>Santa Margarita manzanita</i>	CRPR 1B.2	x				x		x
<i>straight-awned spineflower</i>	CRPR 1B.3	x						
<i>umbrella larkspur</i>	CRPR 1B.3		x					x
Steelhead Streams	Yes; Arroyo Grande Creek. (NMFS, 2012) Los Berros (CEMAR, 2008). There are rainbow trout populations above Lopez Dam (CEMAR, 2008)							
Stream Habitat Inventory	Yes; Completed 2004 for Arroyo Grande Creek as landowner access allowed by California Conservation Corps. None completed for other tributaries. (CCSE, 2009) Data limited to mainstem.							
Fish Passage Barriers	Modify County Stream Gage at stream mile 4.98; Replace Cecchetti Road Culvert at steam mile 8, Temporary Barrier, PAD # 700030.00000; Modify Abandoned Dam at stream mile 9.5; Modify Concrete Dam at stream mile 5.82; Remove Debris at Huasna Road; Modify Los Berros Creek Gage at stream mile 5.6; Replace Los Berros							

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		Creek Culvert; Modify Tar Springs Creek Road Crossing at stream mile 0.5; Replace Biddle Park Culvert at stream mile 10.9, Temporary Barrier, PAD # 707002.00000; Hwy 101 culvert at Meadow Creek, Unknown Status, PAD # 732175.00000; Little Falls Natural Falls, Total Barrier, PAD # 735375.00000; Big Falls Canyon, Total Barrier, PAD # 735376.00000; Big falls Canyon upper falls, Total Barrier, PAD # 735377.00000; Beaver Dam at Arroyo Grande Creek, Temporary Barrier, PAD # 736888.00000; Rip-Rap dam at Arroyo Grande Creek, Unknown Status, PAD # 736890.00000; Concrete dam at Arroyo Grande Creek, Partial Barrier, PAD # 736891.00000; Concrete Grade Control weir at Arroyo Grande Creek, Temporary Barrier, PAD # 736893.00000; Los Berros Creek rd. crossing/ gauging station at Los berros creek, Temporary Barrier, PAD # 736894.00000; Low Flow Concrete Structure at Branch Mil Rd. on Tar Springs Creek, Total barrier, PAD # 736895.00000; Culvert Replacement at Los Berros Creek, Partial barrier, PAD # 736896.00000; Dam at Lopez drive on Arroyo Grande Creek, Temporary Barrier, PAD # 718830; Road Crossing at Valley Road and Los Berros Creek, Partial Barrier, PAD # 712029. (CDFW Passage Assessment Database, viewed 2013 and CCSE, 2009)
	Designated Critical Habitat	Yes; South-Central California Coast Steelhead Trout , California Condor, California red-legged frog, La Grasiosa thistle, Western snowy plover (USFWS Critical Habitat Portal, viewed 2013)
	Habitat Conservation Plans	Yes; In development by County of San Luis Obispo for California red-legged frog and Steelhead trout along mainstem Arroyo Grande Creek. (USFWS Critical Habitat Portal, viewed 2013)
	Other Environmental Resources	Coastal Zone, Lopez Lake, Santa Lucia Wilderness, Los Padres National Forest, Oceano Dunes, Dunes Lakes, Meadow Creek
	Land Use	
	Jurisdictions and Local Communities	City of Arroyo Grande, City of Grover Beach, City of Pismo Beach, Town of Oceano, County of San Luis Obispo
	% Urbanized	17.6% (6.1% urban and 11.1% residential with less than 1% commercial, industrial and public facilities) (SLO County LUC).
	% Agricultural	45.6% (SLO County LUC)
	% Other	36.8% (17.91% open space, 5.02% recreation, and 13.82% rural lands) (SLO County LUC).
	Planning Areas	San Luis Bay Coastal, San Luis Bay Inland, South County Inland, Huasna-Lopez, Los Padres, San Luis Obispo
	Potential growth areas	City of Arroyo Grande, Oceano, Los Berros Village Area, Halcyon
	Facilities Present	Lopez Dam on Arroyo Grande Creek; Terminal Reservoir and Lopez Water Treatment Plant; South San Luis Obispo County Wastewater Treatment Plant with discharge to Ocean; Oceano Airport; Arroyo

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		Grande Flood Control Channel
	Commercial Uses	Cropland in Cienega Valley; Recreation and tourism at Lake Lopez, City of Arroyo Grande, State Park Beaches and the Oceano Dunes; Grieb Ranch Quarry for dimension stone, Oceano Sand Company Pit for specialty sand.(SLO County, Extractive resources shapefile)
	Demographics	
	Population	47,830 in watershed. 17,249, 36.1% in the City of Arroyo Grande. 13,156, 27.5% in the City of Grover Beach. 7,286, 15.2% in the Community of Oceano (U.S. Census Block, 2010).
	Race and Ethnicity	<p>Watershed: 70% Caucasian (33,490), 22.9% Latino (10,949) 3.2% Asian (1,517), 2.5% 2 or more races/ethnicity (1,213) and 1% Other (77). (U.S. Census Tract, 2010).</p> <p>Arroyo Grande: Caucasian, representing 76.9%. Latinos represent 15.7% of the total population in the watershed. The remaining races each represent less than 4%, including African American, American Indian, Pacific Islander, and Asian(U.S. Census, 2010).</p> <p>Grover Beach: Caucasian, representing 62.3%. Latinos represent 29.2% of the total population in Grover Beach. The remaining races each represent less than 4%, including African American, American Indian, Pacific Islander, and Asian(U.S. Census, 2010).</p> <p>Oceano: Caucasian, representing 47.4%. Latinos represent 47.8% of the total population in Oceano. The remaining races each represent less than 3%, including African American, American Indian, Pacific Islander, and Asian (U.S. Census, 2010).</p>
	Income	<p>MHI \$63,535 in watershed (U.S. Census Tracts, 2010). MHI \$64,900 in Arroyo Grande(U.S. Census, 2010) MHI \$47,708 in Grover Beach (U.S. Census, 2010) MHI \$37,219 in Oceano (U.S. Census, 2010)</p> <p>Census tract covers multiple watersheds.</p>
	Disadvantaged Communities	<p>Yes, Oceano; 5% of individuals are below poverty level in watershed (U.S. Census Tract, 2010). 7.2% of individuals are below poverty level in Arroyo Grande. 14.3% of individuals are below poverty level in Grover Beach. 14.1% of individuals are below poverty level in Oceano. (US Census, 2010)</p> <p>Census tract covers multiple watersheds.</p>
	Water Supply	
	Water Management	Zone 3 Flood Control and Water Conservation District; City of Arroyo Grande; City of Grover Beach; Oceano Community Services District;

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	Entities	Northern Cities Management Area participants including City of Pismo Beach, City of Arroyo Grande, City of Grover Beach, Oceano Community Services District, small public water systems, and residential and agricultural overlying users.
	Groundwater	Yes; alluvial, Arroyo Grande Valley and Santa Maria Valley Basins (SLO County, 2012)
	Surface Water	Yes; Lake Lopez is operated for municipal water supply storing 49,400 acre-feet and downstream irrigation water supply. Average annual diversion in 1969 through 1996 was about 4,630 acre-feet (Stetson Engineering, 2004).
	Imported Water	Yes; State Water enters the watershed and serves the Oceano Community Services District which has considered selling its surplus (in surplus years) to surrounding cities.
	Recycled/ Desalinated Water	No source identified. South San Luis Obispo County Sanitation District may look into the feasibility of recycled water.
	Infiltration Zones	Arroyo Grande Creek by releases from Lake Lopez. Other areas undetermined. Limited data.
	Water Budget	None to date for entire watershed. A water budget is available for the Northern Cities Management Area (NCMA TG, 2012)
	Water Uses	
	Beneficial Uses	<p><i>Arroyo Grande Creek</i> – Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Ground Water Recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Commercial and Sport Fishing (COMM), Warm Fresh Water Habitat (WARM), Cold Fresh Water Habitat (COLD) , Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN).</p> <p><i>Arroyo Grande Estuary</i> – Ground Water Recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Commercial and Sport Fishing (COMM), Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), Rare, Threatened, or Endangered Species (RARE), Migration of Aquatic Organisms (MIGR), Shellfish Harvesting (SHELL) (RWQCB, 2011)</p> <p><i>Dunes Lakes</i> – Ground Water Recharge (GWR), Freshwater Replenishment (FRSH), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Commercial and Sport Fishing (COMM), Warm Fresh Water Habitat (WARM), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Spawning, Reproduction, and/or Early Development (SPWN).</p>

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	Other Unique Characteristics	
	Historic Resources	The City of Arroyo Grande has a building on the National Register of Historic Places.
	Archeological Resources	There were Chumash towns called Chimoli, Chiliqin, and Stemeqtatimi at the time of European settlement (SB Museum of Natural History, viewed 2013). Limited data and low priority for this effort.
	Los Padres National Forest	The Los Padres National Forest, Santa Lucia District in the watershed includes one campground, portions of the Santa Lucia Wilderness and general recreation.
	Climate Change Considerations	
		State climate change maps show sea level affecting the City of Grover Beach and town of Oceano with inundation areas along Meadow Creek and the historic Los Berros Creek (USGS, Cal-Adapt, viewed 2013). See IRWMP, 2014 Section H. Climate Change Limited data and not local.

Watershed Codes

CalWater / DWR Number	HA	Hydrologic Area Name	HSA	Hydrologic Sub-area Name	SWRCB Number	CDF Super Planning	CDF Watershed Name
3310.310101	3	Arroyo Grande	1	Oceano	310.31	Lopez Lake	Vasquez Creek
3310.310102	3	Arroyo Grande	1	Oceano	310.31	Lopez Lake	Wittenberg Creek
3310.310103	3	Arroyo Grande	1	Oceano	310.31	Lopez Lake	Arroyo Grande Creek
3310.310104	3	Arroyo Grande	1	Oceano	310.31	Lopez Lake	Clapboard Canyon
3310.310105	3	Arroyo Grande	1	Oceano	310.31	Lopez Lake	Big Falls Canyon
3310.310206	3	Arroyo Grande	1	Oceano	310.31	Grover City	Guaya Canyon
3310.310204	3	Arroyo Grande	1	Oceano	310.31	Grover City	Carpenter Canyon

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CalWater / DWR Number	HA	Hydrologic Area Name	HSA	Hydrologic Sub-area Name	SWRCB Number	CDF Super Planning	CDF Watershed Name
3310.310201	3	Arroyo Grande	1	Oceano	310.31	Grover City	Tarspring Creek
3310.310205	3	Arroyo Grande	1	Oceano	310.31	Grover City	Cienega Valley
3310.310203	3	Arroyo Grande	1	Oceano	310.31	Grover City	Los Berros Creek
3310.310202	3	Arroyo Grande	1	Oceano	310.31	Grover City	Los Berros Canyon

Source: Excerpt from California Interagency Watershed Map of 1999, Calwater 2.2.1 (CA Resource Agency, 2004 Update)

Major Changes in the Watershed

- Chumash Indians are thought to have lived in the Lopez Valley as long ago as 2000 years. Four major villages were within the Lopez Valley, including the Chmoli and Chojuale villages.
- In 1772, Mission San Luis Obispo was established. Canada del Trigo, now Lopez Canyon, supplied wheat to Mission San Luis Obispo. Soon after the mission's founding, the padres established a garden and plantation on the plain of Arroyo Grande Creek where they raised corn, beans, potatoes and other vegetables.
- In the early 1800's, the first white settlers move to the valley and begin a dairy and prune orchard at the junction of Arroyo Grande and Lopez Creeks.
- Around 1899, over fourteen oil companies bored for oil in areas including Bore Porter Huasna Ranch, Phoenix Canyon, Records Ranch, Rosa Porter Ranch, Mrs. Flora Harloe Huasna Ranch, the upper valleys and in the town of Arroyo Grande.
- Between 1862 - 2000 there were approximately numerous flood years (Honeycutt, 2000)
- In 1929, fire season burned thousands of acres of AG watershed in Lopez, Clapboard, Tar Springs, and Phoenix canyons.
- In 1930, Plowed Hillside Farms washed out with every heavy rain; Corralitas, Corbett, Carpenter, and Oak Park Canyons. Oak Park Canyon pea farmers have to build brush and straw dykes at the head of the slopes. Civilian Conservation Corps (CCC) build drainage ditches and terraces to control runoff near Noyes Road and east of Printz Road. CCC stabilized hills in Carpenter Canyon-Poorman Canyon. (Honeycutt, 2000)
- In 1957, US Forest Service Intensifies fire prevention steps in Los Padres National Service. (Honeycutt)
- Early 1960s, Oceano wastewater treatment plant is constructed.
- In 1961, construction of the flood control channel was finished.
- In 1968, Lopez Dam completed; Dam filled to capacity and spills April 1969.
- In 2001, Flood Zone 1/1A Advisory Committee convenes following March 2001 levee breaches.

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Watershed Health by Major Tributary

Tributary Name	Ephemeral / Perennial	303d Listed/ TMDLs	Pollution Sources NP (non-point) MP (Major Point)	Environmental Flows
Arroyo Grande	Perennial (ptn)	Yes; E coli., Fecal coliform TMDL estimated date of completion 2021.	Agriculture, grazing related sources, urban runoff/storm sewers	See Table 3 of Instream Flow Assessment (Stillwater Sciences, 2013)
Los Berros	Ephemeral	Yes; Chloride, Nitrate, Sodium TMDL estimated date of completion 2021. (SWRCB, 2010)	Agriculture, grazing related sources, source unknown	See Table 3 of Instream Flow Assessment (Stillwater Sciences, 2013)
Tar Springs	Undetermined	Not assessed.	Undetermined.	See Table 3 of Instream Flow Assessment (Stillwater Sciences, 2013)
Corbett Creek	Undetermined	Not assessed.	Undetermined.	No source identified.

Watershed Health by Major Groundwater Basin

Groundwater Basin	Estimated Safe Yield	Water Availability Constraints	Drinking Water Standard Exceedance	Water Quality Objective Exceedance
Arroyo Grande Valley Sub-basin of the Santa Maria Basin	No estimated safe yield value reported. (San Luis Obispo County, Master Water Report, 2012)	water quality issues, environmental demand, and water rights The shallow alluvial deposits are typically more susceptible to drought impacts. (San Luis Obispo County, Master Water Report,	Yes; see description below. (San Luis Obispo County, Master Water Report, 2012)	No. No objective for sub-basin. (RWQCB, Basin Plan, Table 3-8, 2011)

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Groundwater Basin	Estimated Safe Yield	Water Availability Constraints	Drinking Water Standard Exceedance	Water Quality Objective Exceedance
Northern Cities Management Area of Santa Maria Valley Basin	9,500 AFY (San Luis Obispo County, Master Water Report, 2012)	2012) Water quality, environmental demand and water rights. (San Luis Obispo County, Master Water Report, 2012)	Yes; see description below. (San Luis Obispo County, Master Water Report, 2012)	No. No objective for sub-basin. (RWQCB, Basin Plan, Table 3-8, 2011)

*Note: The Santa Maria Valley groundwater basin has been adjudicated. In 2005, the Superior Court of California entered a Stipulated Judgment for a basin-wide groundwater litigation case that defined three basin management areas encompassing approximately 256 square miles. These management areas are the Northern Cities Management Area, the Nipomo Mesa management Area, and the Santa Maria Management Area, which are used herein for planning by the County of San Luis Obispo. The Stipulated Judgment was adopted, with a declaratory judgment and physical solution adjudged and decreed in the Judgment after Trial, dated January 25, 2008. The three DWR sub-basins included herein as separate basin components are outside of the adjudicated area.

Groundwater Quality Description: Historical groundwater quality in the Arroyo Grande Valley Sub-basin, based on samples collected in the 1980’s, shows a progressive deterioration in a downstream direction. The general mineral character of groundwater in the valley was calcium-magnesium bicarbonate upstream of the Tar Springs Creek confluence and calcium-magnesium sulfate downstream of the confluence. The downstream section overlies a zone of multiple faults that may contribute highly mineralized water, along with irrigation water returns. With one exception, TDS, sulfate, and chloride concentrations in groundwater samples from wells in the upstream section met drinking water standards and the water was classified as suitable for agricultural irrigation. In the downstream section, TDS from wells typically exceeded 1,500 mg/l (the short term maximum drinking water standard), with sulfate concentrations exceeding the 500 mg/l upper limit for drinking water. The water was also classified as marginal to unsuitable for agricultural irrigation (DWR, 2002).

Northern Cities Management Area: Six of 35 wells tested exceeded the State drinking water standard for nitrate, which has been a concern in the area. In the Arroyo Grande Plain, historical data between 1950 and 1987 indicate that the chemical character was typically either calcium magnesium sulfate or calcium magnesium sulfate-bicarbonate. Approximately three-quarters of the wells sampled on the Arroyo Grande Plain had TDS values between 500-1,500 mg/l, with half the wells reporting sulfate concentrations greater than 250 mg/l (DWR, 2002).

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Primary Issues

Issue	Potential Causes	Referenced from
Surface Water Quality - Temperature	Lack of riparian canopy	CCSE, 2009
Surface Water Quality - Nutrients and Dissolved Oxygen	Increase in urban land use	CCSE, 2009
Surface flow Quantity	Natural, groundwater diversions, impoundment	CCSE, 2009
Fish Passage Barriers	Road crossings, culverts, dams and other structures	CCSE, 2009
Erosion and Sedimentation	Natural, "hungry water" from dam release, lowering base flow level of mainstem, increased impervious areas, unvegetated roads and fields	CCSE, 2009
Flood Management	Loss of floodplain and encroachment of development, sedimentation in the flood control channel results in reduced capacity	CCSE, 2009 and Swanson Hydrologic, 2006

The issues described above are in no way an exhaustive list but were identified by entities working in the watershed. Additional research would be needed to flush out all the issues facing the watershed. Issues were vetted by the community to various degrees based on the individual document. There was no countywide vetting process to identify the relative priority of each issue.

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