

Upper San Juan Creek Watershed

Hydrologic Unit Name	Water Planning Area	Acreage	Flows to	Groundwater Basin(s)	Jurisdictions
Estrella 17	Rafael/ Big Spring WPA 11, Salinas/ Estrella WPA 14	164,198 acres	Estrella River – to Salinas River and Pacific Ocean (Monterey Bay National Marine Sanctuary)	Paso Robles, Big Spring Area, Rafael Valley, Cuyama Valley (ptn)	County of San Luis Obispo, Los Padres National Forest



Description:

The Upper San Juan Creek Watershed is located in the eastern portion of the County directly adjacent to the Carrizo Plain. The headwaters are located in the La Panza range with the highest point at approximately 3900-feet. The confluence of San Juan Creek with the Estrella River occurs north of Creston. San Juan Creek, a permanent stream, affords recreational possibilities. The mountain slopes are excellent for hiking and riding. Wildlife is abundant, and geology and natural vegetation are of special interest. A spectacular view of the Carrizo Plain is provided from these mountains. The San Juan Creek Valley is generally used most intensively because of better soils and water availability. Irrigated production has increased during the last 10 years, particularly in vineyards and alfalfa. Dry farming and grazing operations encompass the rest of the agricultural uses.



Existing Watershed Plans:

No existing plans to date

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Characteristics

Physical Setting	
Rainfall	Average Annual: 8-23 in. (NRCS shapefile, 2010)
Air Temperature	Summer Range (August 1990-2012): 52°-95°F Winter Range (December 1990-2012): 29°-60°F (La Panza, NOAA National Climatic Data Center, viewed 2013)
Geology Description	<p>French Camp, Carnaza Creek and La Panza Ranch are composed of flat highly infiltrative Quaternary material.</p> <p>Windmill Creek, Placer Creek, Willow Canyon, Beartrap Creek, Hay Canyon, Piletas canyon and Anderson Canyon have steep pre-Quaternary non-infiltrative headwaters with steep moderately infiltrative early to mid-Tertiary valleys.</p> <p>Carissa Ranch and Wild Hog Creek sub-watersheds have moderate steep moderately infiltrative early to mid-Tertiary headwaters and are flat highly infiltrative Quaternary inland.</p> <p>La Panza Canyon, Tajea Flat and Turkey Camp Well are composed of steep moderately infiltrative early to mid-Tertiary materials.</p> <p>Barett Creek has steep moderately infiltrative early to mid-Tertiary headwaters with a flat pre-Quaternary moderately infiltrative valley.</p> <p>McGinnis Creek has steep pre-Quaternary non-infiltrative headwaters with a flat highly infiltrative Quaternary valley.</p> <p>Cedar Canyon, Rogers Creek and Rafael Creek have moderately infiltrative early to mid-Tertiary headwaters with flat Quaternary highly infiltrative valleys (Bell, pers. comm., 2013).</p> <p>Groundwater is found in Holocene age alluvium and the Pleistocene age Paso Robles Formation. Specific yield values in the Paso Robles Sub-basin range from 7 to 11 percent, with an average specific yield of 9 percent (Fugro West 2001c). DWR (1958) estimated the average specific yield for the sub-basin at 8 percent. DWR (1999) estimated the average specific yield at 15 percent for the alluvium and 9 percent for the Paso Robles Formation. Alluvium. Holocene age alluvium consists of unconsolidated, fine- to coarse-grained sand with pebbles and boulders. This alluvium provides limited amounts of groundwater and reaches 130 feet thick near the Salinas River, but is generally less than 30 feet thick in the minor stream valleys (DWR 1999). Its high permeability results in a well production capability that often exceeds 1,000 gpm (Fugro West 2001a). Groundwater in Holocene alluvium is mostly unconfined. Paso Robles Formation. Pleistocene age Paso Robles Formation, which is</p>

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	the most important source of groundwater in the sub-basin, is unconsolidated, poorly sorted, and consists of sand, silt, gravel, and clay (DWR 1979). This formation reaches a thickness of 2,000 feet and groundwater within it is generally confined (DWR 1958) (Carollo, 2012).
Hydrology	
Stream Gage	None (USGS, viewed August 2013)
Hydrology Models	Yes; SLO County Flood Control and Water Conservation District, 2008, Paso Robles Groundwater Sub-basin Water Banking Feasibility Study <i>Data general for Paso Robles Sub-basin,, not watershed specific</i>
Peak Flow	No data available (USGS, viewed August 2013)
Base Flow	No data available (USGS, viewed August 2013)
Flood Reports	No source identified
Flood Control Structures	No data available
Areas of Heightened Flood Risk	No data available
Biological Setting	
Vegetation Cover	Primarily non-native grassland; mixed chaparral consisting mainly of buckbrush and chamise; blue oak woodland with chamise-redshank chaparral consisting mainly of chamise chaparral; juniper consisting mainly of semi-desert chaparral; coastal scrub consisting mainly of diablan sage scrub; 3 blue oak-foothill pine consisting mainly of foothill pine. (SLO County vegetation shapefile, 1990) <i>Data limited by age of shapefile</i>
Invasive Species	No data available
Special Status Wildlife and Plants	Key: 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) Locations listed refer to USGS 7.5' quadrangle names. Only the portion overlapping the watershed boundary was considered. <i>Data limited to observations, not complete inventory</i>

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Species	Status	BRANCH MTN	CALIFORNIA VALLEY	CAMATTA RANCH	CHIMINEAS RANCH	HOLLAND CANYON	LA PANZA	LA PANZA NE	LA PANZA RANCH	LOS MACHOS HILLS	PACKWOOD CREEK	POZO SUMMIT	SIMMLER
Animals													
<i>American badger</i>	SSC				x	x		x	x		x		
<i>blunt-nosed leopard lizard</i>	FE; SE; FP	x			x								
<i>burrowing owl</i>	SSC (Burrow sites, some wintering sites)				x								
<i>California condor</i>	FE; SE						x						
<i>giant kangaroo rat</i>	FE; SE					x			x		x		
<i>long-eared owl</i>	SSC				x								
<i>longhorn fairy shrimp</i>	FE	x	x		x								x
<i>Nelson's antelope squirrel</i>	ST		x		x								x
<i>pallid bat</i>	SSC		x				x						
<i>prairie falcon</i>	SA-Nesting	x	x	x		x	x	x	x	x	x	x	
<i>San Joaquin kit fox</i>	FE; ST				x			x	x				
<i>San Joaquin whipsnake</i>	SSC				x								
<i>silvery legless lizard</i>	SSC	x											
<i>Tulare grasshopper mouse</i>	SSC						x						
<i>western pond turtle</i>	SSC	x			x								
<i>western spadefoot</i>	SSC				x								
Plants													
<i>California jewel-flower</i>	FE; SE						x		x				
<i>Camatta Canyon amole</i>	FT; SR			x									
<i>chaparral ragwort</i>	CRPR 2B.2			x									
<i>diamond-petaled California poppy</i>	CRPR 1B.1						x		x				
<i>dwarf calycadenia</i>	CRPR 1B.1			x			x		x				
<i>Indian Valley spineflower</i>	CRPR 1B.2							x	x				
<i>Kern mallow</i>	FE				x				x				
<i>La Panza mariposa-lily</i>	CRPR 1B.3	x			x		x						x
<i>Lemmon's jewel-flower</i>	CRPR 1B.2						x	x	x				x
<i>Munz's tidy-tips</i>	CRPR 1B.2							x					

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Species	Status	BRANCH MTN	CALIFORNIA VALLEY	CAMATTA RANCH	CHIMINEAS RANCH	HOLLAND CANYON	LA PANZA	LA PANZA NE	LA PANZA RANCH	LOS MACHOS HILLS	PACKWOOD CREEK	POZO SUMMIT	SIMILER
<i>oval-leaved snapdragon</i>	CRPR 4.2				x								
<i>pale-yellow layia</i>	CRPR 1B.1						x						
<i>Palmer's mariposa-lily</i>	CRPR 1B.2											x	
<i>Parish's checkerbloom</i>	SR						x						
<i>round-leaved filaree</i>	CRPR 1B.1				x				x				
<i>Santa Margarita manzanita</i>	CRPR 1B.2						x					x	
<i>showy golden madia</i>	CRPR 1B.1				x								
<i>straight-awned spineflower</i>	CRPR 1B.3	x											
<i>umbrella larkspur</i>	CRPR 1B.3	x											
Steelhead Streams	No (Not listed in Holland Canyon or Camatta Canyon Quads in CNDDDB Database viewed 2013)												
Stream Habitat Inventory	No source identified												
Fish Passage Barriers	None listed in PAD Database												
Designated Critical Habitat	Yes; California Condor, Purple Amole (USFWS Critical Habitat Mapper, viewed 2013)												
Habitat Conservation Plans	Yes; North San Luis Obispo County Habitat Conservation Program – multiple species, initially San Joaquin kit fox <i>HCP is general for North County, not watershed specific</i>												
Other Environmental Resources	None listed (SLO County Flood Control and Water Conservation District, 2007)												
Land Use													
Jurisdictions & Local Communities	County of San Luis Obispo												
% Urbanized	0.7% Public Facility and Residential Suburban												
% Agricultural	74.9%												
% Other	22% Open Space; 2.4% Rural Land												
Planning Areas	Shandon-Carrizo Planning Area												
Potential growth areas	None listed												

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Facilities Present	No data available
Commercial Uses	Agriculture
Demographics	
Population	38 in watershed (US Census, 2010)
Race and Ethnicity	Watershed: 86.8% Caucasian, 5.3% Latino, 5.3% Two Plus Races, 2.6% American Indian
Income	MHI \$62,773 in watershed (US Census, 2011, based on interpolation of two census tracts covering multiple watersheds)
Disadvantaged Communities	No; 6.0% of individuals are below poverty level in watershed
Water Supply	
Water Management Entities	Uses served by individual wells
Groundwater	Yes; Paso Robles, Big Spring Area, Rafael Valley, and Cuyama Valley (ptn) Basins
Surface Water	No public reservoirs.
Imported Water	None
Recycled/Desalinated Water	None
Key infiltration zone	<p>No comprehensive study has been completed to date however the Shell Creek/Camatta Creek and Lower San Juan Creek Recharge Areas were identified by the SLO County Flood Control and Water Conservation District in 2008.</p> <p>Natural recharge in the basin is derived from infiltration of precipitation, seepage from streams, and return flow from irrigation and other uses (SLO County Flood Control and Water Conservation District, 2008)</p>
Water budget performed?	<p>Yes; Todd Engineers, 2013, for Paso Robles Groundwater Sub-basin Management Plan Update</p> <p><i>Data is general for Paso Robles Sub-basin, not watershed specific</i></p>
Water Uses	
Beneficial Uses	<p><i>San Juan Creek</i> - Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Ground Water Recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Wildlife Habitat (WILD), Warm Freshwater habitat (WARM), Threatened, or Endangered Species (RARE), and Commercial and Sport Fishing (COMM). (CCRWQCB, 2011)</p>

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Other Unique Characteristics	
Valley Sink Scrub	A unique natural community known as valley sink scrub exists in the watershed. Characterized by low, open succulent shrublands dominated by alkali tolerant plant species such as frankenia (<i>Frankenia salina</i>), spear oracle (<i>Atriplex patula</i>), wedge scale (<i>Atriplex truncata</i>), alkali weed (<i>Cressa truxillensis</i>) and saltgrass (<i>Districhlis spicata</i>). Valley scrub soils are typically dark, sticky clay soils that often have a brilliant white salty crust over them. Grazing has altered much of this community where non-native grasses now dominate much of the valley floor.
Climate Change Considerations	
	See IRWMP, 2014 Section H, Climate Change <i>Data is general for County, not watershed specific</i>

Watershed Codes

Calwater / DWR Number	HA	Hydrologic Area Name	HSA	Hydrologic Sub-Area Name	SWRCB Number	CDF Super Planning	CDF Watershed Area
3317.000101	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Carrisa Ranch
3317.000102	0	Undefined	0	Undefined	317.00		Barrett Creek
3317.000103	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Tajea Flat
3317.000104	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Wild Hog Creek
3317.000105	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Rafael Creek
3317.000106	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Rogers Creek
3317.000107	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Anderson Canyon
3317.000108	0	Undefined	0	Undefined	317.00	Headwaters San Juan Creek	Piletas Canyon
3317.000109	0	Undefined	0	Undefined	317.00	Headwaters	Turkey Camp Well

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						San Juan Creek	
3317.000201	0	Undefined	0	Undefined	317.00	Sixteen Spring	Beartrap Creek
3317.000202	0	Undefined	0	Undefined	317.00	Sixteen Spring	Hay Canyon
3317.000203	0	Undefined	0	Undefined	317.00	Sixteen Spring	Willow Canyon
3317.000204	0	Undefined	0	Undefined	317.00	Sixteen Spring	Placer Creek
3317.000205	0	Undefined	0	Undefined	317.00	Sixteen Spring	La Panza Canyon
3317.000206	0	Undefined	0	Undefined	317.00	Sixteen Spring	La Panza Ranch
3317.000207	0	Undefined	0	Undefined	317.00	Sixteen Spring	Carnaza Creek
3317.000208	0	Undefined	0	Undefined	317.00	Sixteen Spring	Cedar Canyon
3317.000301	0	Undefined	0	Undefined	317.00	Navajo Creek	Windmill Creek
3317.000302	0	Undefined	0	Undefined	317.00	Navajo Creek	French Camp
3317.000303	0	Undefined	0	Undefined	317.00	Navajo Creek	McGinnis Creek
3317.000401	0	Undefined		Undefined	317.00	San Juan Valley	Bellyache Spring
3317.000410		Undefined		Undefined	317.00	San Juan Valley	Sandy Canyon
Source: Excerpt from California Interagency Watershed Map of 1999, Calwater 2.2.1 (CA Resource Agency, 2004 Update)							

Major Changes in the Watershed

The San Juan is the southern branch of the Estrella River, albeit the summer season finds only occasional pools in its broad, sandy channel. The rains convert this into a veritable river, fifty to 100 yards wide, running through small valleys and hills softly rounded, clothed in a luxuriant growth of alfilaria?, wild oats, bunch-grass and flowering shrubs (Storke, 1891).

This section is a paradise to the stockman, being devoted almost entirely to pasturage. Nevertheless, its resources would suffice for varied industries. There is here much oak timber, the soil is very fertile, there are mineral springs, ore-bearing rocks, and diverse elements to support a large population. This valley may be considered as including the following tracts: That section between the San Jose Range and the Carriso Plain; the ranches Las Chimeneas and Avenales in the southern part; La Panza and the mining district in the central part; and La Cometa or Comate, California, and San Juan Capistrano in the north (Storke, 1891).

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Among the old settlers were: John Gilkey, on the Comate, murdered in 1858; Baratie and Borel, on the San Juan Capistrano, murdered in 1858; Philip Biddle, Robert G. Flint, James Mitchell, Joseph Zumwalt, D. W. James and John D. Thompson, all of whom located there twenty to thirty-five years since (Storke, 1891).

Watershed Health by Major Tributary

Tributary Name	Ephemeral / Perennial	303d Listed/ TMDLs	Pollution Sources NP (non-point) MP (Major Point)	Environmental Flows
Anderson Canyon	Undetermined	Not assessed	Undetermined	Not assessed
Barett Creek	Undetermined	Not assessed	Undetermined	Not assessed
Beartrap Creek	Undetermined	Not assessed	Undetermined	Not assessed
Camaza Creek	Undetermined	Not assessed	Undetermined	Not assessed
Carissa Ranch	Undetermined	Not assessed	Undetermined	Not assessed
Cedar Canyon	Undetermined	Not assessed	Undetermined	Not assessed
French Camp	Undetermined	Not assessed	Undetermined	Not assessed
Hay Canyon	Undetermined	Not assessed	Undetermined	Not assessed
La Panza Canyon	Undetermined	Not assessed	Undetermined	Not assessed
La Panza Ranch	Undetermined	Not assessed	Undetermined	Not assessed
McGinnis Creek	Undetermined	Not assessed	Undetermined	Not assessed
Piletas Canyon	Undetermined	Not assessed	Undetermined	Not assessed
Placer Creek	Undetermined	Not assessed	Undetermined	Not assessed
Rafael Creek	Undetermined	Not assessed	Undetermined	Not assessed
Rogers Creek	Undetermined	Not assessed	Undetermined	Not assessed
Tajea Flat	Undetermined	Not assessed	Undetermined	Not assessed
Turkey Camp Well	Undetermined	Not assessed	Undetermined	Not assessed
Wild Hog Creek	Undetermined	Not assessed	Undetermined	Not assessed

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Watershed Health by Major Groundwater Basin

Groundwater Basin	Estimated Safe Yield	Water Availability Constraints	Drinking Water Standard Exceedance	Water Quality Objective Exceedance
Paso Robles	97,700 AF (SLO County RCS, 2011).	Physical limitations, water rights and water quality issues (Carollo, 2012).	Yes; see description below.	None (CCRWQCB, 2011)
Big Spring Area	None (Carollo, 2012)	None (Carollo, 2012)	None (Carollo, 2012)	None (CCRWQCB, 2011)
Rafael Valley	None (Carollo, 2012)	None (Carollo, 2012)	None (Carollo, 2012)	None (CCRWQCB, 2011)
Cuyama Valley (ptn)	None (Carollo, 2012)	None (Carollo, 2012)	None (Carollo, 2012)	None (CCRWQCB, 2011)

Groundwater Quality Description: The predominant cations are calcium and sodium and the predominant anion is bicarbonate (DWR 1981; Fugro West, 2001b). Analysis of 48 public supply wells in the sub-basin show an average Total Dissolved Solid (TDS) content of 614 ppm and a range of 346 to 1,670 ppm.

In one study, (Fugro West 2001b), 23 of 74 samples collected exceeded one or more drinking water standards. The maximum contaminant level (MCL) for nitrate was exceeded in 4 samples (Fugro West, 2001b). Water quality trends indicate an increasing concentration of TDS and chloride in the deep, historically artesian aquifer northeast of Creston (Carollo, 2012).

Another major problem is the unpredictable occurrence of hydrogen sulfide in the ground water (DWR, 1981)

Primary Issues

Issue	Potential Causes	Referenced from
Significant water level declines	Range of groundwater uses in close proximity, including agricultural irrigation, municipal supply wells, golf course irrigation, and a relatively dense aggregation of rural “ranchette” users	Carollo, 2012
Groundwater Quality	High concentrations of TDS, chlorides, sulfates, and boron	Carollo, 2012

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Groundwater: Paso Robles Groundwater Basin

According to multiple studies of this basin, annual basin pumping is now at or near the basin's perennial yield (Paso Robles Groundwater Management Plan, 2011). From 1997–2009, water levels declined on average of 2–6 feet per year, depending on the location. A Todd Engineering monitoring report (2007) indicated that the Basin was not approaching the safe yield level and some areas were experiencing significant declines in groundwater elevations. A later study completed in 2009 suggested groundwater pumping was approaching the safe yield level of the Basin. The 2010 Resource Capacity Study prepared by the San Luis Obispo County Planning Department stated that the Basin is now near or at perennial yield levels. The County Board of Supervisors certified a Level of Severity III for the Paso Robles Basin in October, 2012, due to declining water levels. In August 2013, the County Board of Supervisors adopted an urgency ordinance to limit new draws from the Paso Robles Groundwater basin.

The Paso Robles Groundwater Basin encompasses an area of approximately 790 square miles and is the primary, and in many places the only, source of water available to property owners throughout Northern San Luis Obispo County. The basin extends from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon. The basin supplies water for 29% of SLO County's population and an estimated 40% of the agricultural production of the County (Paso Robles Groundwater Basin Blue Ribbon Committee, 2013).

Paso Robles, Atascadero, and Templeton draw their water from the groundwater basin (primarily the Atascadero sub-basin), the underflow of the Salinas River and from the Nacimiento Pipeline Project. The remaining communities (Shandon, San Miguel, Creston, Bradley, Camp Roberts, Whitley Gardens, and Garden Farms) are entirely dependent on the groundwater basin for their water supply.

An established bi-annual well monitoring program overseen by the SLO County Flood Control and Water Conservation District reported these water declines in groundwater dependent communities (Through April, 2013):

- a. Shandon: Water levels have dropped approximately 17 feet from 2011 to 2013.
- b. Creston: Water levels have dropped approximately 25 feet from 2011 to 2013.
- c. Estrella: Water levels have dropped approximately 25 feet from 2011 to 2013.
- d. San Juan: Water levels have dropped approximately 5 feet from 2012 to 2013.

Bibliography

Technical Reports

Bell, Ethan. (2013). Personal Communication.

CAL FIRE/San Luis Obispo County Fire. (2013). Unit Strategic Fire Plan.

[http://www.calfireslo.org/Documents/Plans/UnitFirePlan/SLU_Unit_Fire_Plan_v13_1_\(Complete\).pdf](http://www.calfireslo.org/Documents/Plans/UnitFirePlan/SLU_Unit_Fire_Plan_v13_1_(Complete).pdf)

Upper San Juan Creek Watershed

- California Department of Water Resources. (2003). California's Groundwater Bulletin 118 Update 2003. http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater_bulletin_118_-_update_2003/_bulletin118_entire.pdf
- Carollo. (2012). San Luis Obispo County Master Water Report. <http://www.slocountywater.org/site/Frequent%20Downloads/Master%20Water%20Plan>
- Chipping, D. H. (1987). The Geology of San Luis Obispo County: A Brief Description and Guide. Cal Poly Press. San Luis Obispo, CA.
- Fugro West, Inc. (2010). Paso Robles Groundwater Basin Water Balance Review and Update. <http://www.slocountywater.org/site/Water%20Resources/Reports/pdf/Paso%20Robles%20Groundwater%20Basin%20Water%20Balance%20Review%20and%20Update.pdf>
- Paso Robles Groundwater Basin – Groundwater Advisory Committee. (2011). Paso Robles Basin Groundwater Management Plan. <http://www.slocounty.ca.gov/Assets/PL/PR+Groundwater/gwp.pdf>
- Regional Water Quality Control Board Central Coast Region 3. (2002). Watershed management Initiative. http://www.waterboards.ca.gov/centralcoast/water_issues/programs/wmi/docs/wmi2002_final_document_revised_1_22_02.pdf
- San Luis Obispo County Flood Control and Water Conservation District. (2005). Water Years 2001-02 and 2002-03 Hydrologic Report. <http://www.slocountywater.org/site/Water%20Resources/Reports/pdf/Hydrologic%20Report%202002.pdf>
- San Luis Obispo County General Plan. (2011). http://www.slocounty.ca.gov/planning/General_Plan_Ordinances_and_Elements.htm
- San Luis Obispo County. (2013). North County Area Plan. <http://www.slocounty.ca.gov/Assets/PL/Draft+Plans/North.pdf>
- Stillwater Sciences. (2011). Development and Implementation of Hydromodification Control Methodology. Watershed Characterization Part 1: Watershed Characterization Part 1. Precipitation and Landscape. http://www.waterboards.ca.gov/rwqcb3/water_issues/programs/stormwater/docs/lid/hydromod_lid_docs/watershed_character_part_1.pdf
- Storke, Y.A. (1891). A Memorial and Biographical History of the Counties of Santa Barbara, San Luis Obispo, and Ventura, California. <http://www.rootsweb.ancestry.com/~cagha/history/sanluisobispo/creeks.txt>
- U. S. Department of Transportation. (2006). Route 46 Corridor Improvement Project, San Luis Obispo County, CA. http://safer46.dot.ca.gov/pdf/FEIRVol1_web.pdf

Upper San Juan Creek Watershed

U. S. Environmental Protection Agency. (2011). Climate Change Handbook for Regional Water Planning. <http://www.water.ca.gov/climatechange/CCHandbook.cfm>

GIS Layers

Aerial Information Systems. (2008). San Luis Obispo County Vegetation Polygons.

National Hydrography Dataset. (2013). San Luis Obispo County Streams.

San Luis Obispo County Environmental Division. (2013). San Luis Obispo County Mines.

San Luis Obispo County Planning and Building Geographic Technology and Design. (2013). Various GIS shapefiles and layers.

State Water Resources Control Board. (2013). Water Rights/Fully Appropriated Streams.

United States Census Bureau Master Address File/Topologically Integrated Geographic Encoding and Referencing Database. (2013). 2010 Census Tracts.

United States Department of Agriculture. (2013). Soil Survey Geographic Database

Databases

Department of Fish and Game. (2013). California Natural Diversity Database. <http://www.dfg.ca.gov/biogeodata/cnddb/>

National Atlas of the United States. (2013). Streamer. <http://www.nationalatlas.gov/streamer>

National Oceanic and Atmospheric Administration. (2013). National Climatic Data Center. <http://www.ncdc.noaa.gov/>

Surface Water Ambient Monitoring Program. (2013). CalWater 2.2.1 <http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/database-management-systems/swamp-25-database/templates-25/gis-shapefile-layers>

U. S. Fish and Wildlife Service. (2013). Critical Habitat Portal. <http://criticalhabitat.fws.gov/crithab>.

U. S. Fish and Wildlife Service. (2013). National Wetlands Inventory. <http://www.fws.gov/wetlands/>

U.S. Geological Survey. (2013). California Water Sciences Center. <http://ca.water.usgs.gov/>

U.S. Geological Survey. (2013). Protected Areas Database. <http://gapanalysis.usgs.gov/padus/>

Significant Studies in Progress: