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**CCoWS**

**Summary of Precipitation and  
Streamflow for Potrero and  
San Clemente Creeks in  
Water-Year 2013**

**Santa Lucia Preserve  
Monterey County, California**

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## Executive Summary

The purpose of this annual report is to present precipitation and streamflow summaries for the 2013 water year (October 1, 2012 to September 30, 2013). In March 2007 CSU–Monterey Bay began hydrologic monitoring of Santa Lucia Preserve for the Santa Lucia Conservancy. This project is a continuation of monitoring begun by Balance Hydrologics as part of the permit requirements for land development. Discharge, temperature, and specific conductance are reported for two creeks on the Santa Lucia Preserve, Potrero Creek and San Clemente Creek. Precipitation records are reported from two locations, the San Clemente Dam and Santa Lucia Preserve golf course.

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## 1 Introduction

This report is a hydrologic data summary for Santa Lucia Preserve for Water Year 2013 (WY-13). Balance Hydrologics installed four continuously recording streamflow gages on Santa Lucia Preserve. These gages include two on Las Garzas Creek (Moore's Lake inflow and outflow, installed in 2001), one on Potrero Creek (installed in 2002), and one on San Clemente Creek (installed in 2012). Detailed information on gage installation, operation and individual gage sites is available in Balance Hydrologics (2002).

Operation of the Potrero Creek and San Clemente Creek streamflow gages was transferred to CSUMB Watershed Institute on June 21, 2007. Data summaries are presented for streamflow on Potrero and San Clemente Creeks and for precipitation on Santa Lucia Preserve and San Clemente Dam.

## 2 Precipitation Data

Precipitation data presented from the Santa Lucia golf course is from a Rain Bird weather station operated by Santa Lucia Preserve. Precipitation data recorded by California American Water Company at nearby San Clemente Dam are included for comparison.

At San Clemente Dam the total WY-13 rainfall was 14.60 inches (Table 1 and Figure 1), which represents below average precipitation at the Dam. Based on the 91-year San Clemente Dam precipitation record, the average rainfall is 21.31 inches. Using Log-Pearson Type-III analysis, rainfall at San Clemente Dam should be less than 14.60 once every 5 years on average (Figure 2).

The recorded rainfall at the Santa Lucia Preserve Golf Course in WY-13 was 18.53 inches (Table 2 and Figure 3), which is below the 11 year average, 27.22 inches. The short duration of the record at the golf course may not be representative of actual long term precipitation patterns. The Preserve golf course received approximately 4 more inches of rain than the nearby San Clemente Dam. The available data do not show a consistent relationship between total precipitation at the San Clemente Dam and total precipitation at the golf course. During the 11 years of rain gage operation at the golf course, the golf course gage has recorded between 0.96 fewer inches and 12.10 more

inches than the Dam gage, with an average difference of 7.33 inches and a standard deviation of 4.64 inches.

### **3 Streamflow, Temperature, and Conductance Data**

The streamflow gaging station on Potrero consists of a Campbell CR10X data logger, and the stream flow gauging station on San Clemente consists of a Campbell CR1000 data logger (powered by 10 or 20 watt solar panels), two Druck pressure transducers to measure water depth, Campbell specific conductance and water temperature probe, as well as staff plates for manual readings (Balance Hydrologics 2002). Data loggers record measurements of pressure, temperature, and conductance at 15-minute intervals.

In WY-13, streamflow gage data was downloaded to a laptop computer during monthly visits, at which time manual discharge measurements were also taken using standard hydrologic practices. A FlowTracker (SonTek handheld ADV) current velocity meter was used to measure discharge. A portable Parshall flume was used to measure discharge during the latter part of the dry season when flows became too low to use the FlowTracker meter.

#### **3.1 Potrero Creek**

The current gage station on Potrero Creek was installed April 29, 2002 and is located upstream of the T-11 well. In WY-13, Potrero Creek had a mean daily flow of 0.60 cfs, a maximum daily flow of 10.8 cfs, and a minimum daily flow of 0.13 cfs; the 7-day low flow was 0.13 cfs (Table 3). Mean daily streamflow and manual discharge measurements are plotted in Figure 4. Temperature and conductance data are presented in Tables 4 through 7, and in Figure 5.

#### **3.2 San Clemente Creek**

The current gage station on San Clemente Creek was installed January 17, 2012 and is located near the Santa Lucia Preserve property boundary. In WY-13, San Clemente Creek had a mean daily flow of 0.47 cfs, a maximum daily flow of 4.6 cfs, and a minimum daily flow of 0.01 cfs; the 7-day low flow was 0.01 cfs (Table 8). Mean daily streamflow and manual discharge measurements are plotted in Figure 6. Temperature and conductance data are presented in Tables 9 through 12, and in Figure 7.

#### **4 Limitations**

Streamflow gage data are based on the stage-discharge relationship unique to each stream and gage location. This stage-discharge relationship (rating curve) for each gage has been developed over time by making manual discharge measurements at various ranges of flow and noting the water level (stage) at which a particular flow occurs. Both rating curves include historic high flow measurements. The rating curve for Potrero Creek was not adjusted this year. The rating curve for San Clemente Creek was adjusted this year to reflect to changes in the channel.

As more discharge measurements are made (particularly in the higher range of flows) the rating curves may change and it will be necessary to update the streamflow data to reflect these changes. For this reason, the streamflow data contained in this report should be considered provisional and caution should be exercised when using these data.

Discharge values were only reported through the month of January for the Potrero Creek gage due to a malfunction that began February 1, 2013.

## **5 References**

[Balance Hydrologics 2002]. Brown S, Porter S, Woyshner M, Hecht B. 2002. Hydrologic record for water year 2002: Las Garzas, Potrero, and San Clemente Creeks, Santa Lucia Preserve, Monterey County, California. 53 pp.

## **6 Tables**

Table 1. Daily precipitation record and monthly totals, water year 2013

San Clemente Dam, Monterey County, California

Record obtained from: Monterey Peninsula Water Management District

Values are inches

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1		0.04	1.80				0.30					
2			0.35									
3			1.55									
4						0.03						
5		0.01										
6			0.28			0.31						
7				0.71								
8					0.36	0.07	0.07					
9		0.25			0.01							
10	0.10	0.13		0.21								
11	0.20			0.06								
12	0.06		0.09	0.11								
13		0.02										
14												
15					0.08							
16		0.16										
17		0.30	0.10									
18			0.04									
19		0.07			0.40							
20					0.13	0.06						
21		0.04			0.02					0.01		
22	0.03		0.91							0.12		
23	0.25											
24			1.00	0.16								
25												
26			0.80	0.08								
27			0.20									
28		0.47		0.19								
29		0.10	0.55									
30		1.21										
31												
<b>Total</b>	0.64	2.77	7.70	1.52	0.90	0.46	0.48	0.00	0.00	0.00	0.00	0.13
<b>Annual Total</b>								14.60				

Table 2. Daily precipitation record and monthly totals, water year 2013  
 Santa Lucia Preserve Golf Course, Monterey County, California

Day	Record obtained from: Santa Lucia Preserve											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1		0.11	0.22					0.16				
2			2.20									
3												
4								0.10				
5		0.37	0.37					0.01				
6		0.05	0.51	0.01	0.51			0.01				
7				0.13	0.09							
8				0.27	0.03	0.12						
9			0.22	0.01								
10	0.07		0.28									
11	0.05		0.08									
12	0.01		0.08									
13												
14												
15		0.12				0.11						
16	0.31	0.01										
17	0.49	0.09										
18	0.16											
19		0.01		0.67	0.04							
20				0.01								
21		0.06			0.01					0.20		
22	0.17		1.10									
23	0.16		1.74	0.04								
24	0.01			0.17								
25		0.47	0.01									
26		0.56										
27		0.06	0.10									
28		0.66	0.01	0.02								
29		0.12	0.52									
30		4.21			0.19							
31	0.01	0.01			0.01							
<b>Total</b>	0.48	6.06	7.68	1.80	1.09	0.89	0.50	0.01	0.00	0.00	0.00	0.20
<b>Annual Total</b>			18.71									

Table 3. Mean daily flow, Potrero Creek, water year 2013  
Santa Lucia Preserve, Monterey County, California

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.13	0.16	0.20	1.50								
2	0.13	0.16	0.20	1.21								
3	0.13	0.16	0.20	0.93								
4	0.13	0.16	0.20	0.73								
5	0.13	0.16	0.19	0.57								
6	0.13	0.16	0.20	0.48								
7	0.13	0.16	0.20	2.78								
8	0.13	0.16	0.19	2.12								
9	0.13	0.17	0.19	1.57								
10	0.14	0.17	0.18	1.28								
11	0.15	0.16	0.18	2.20								
12	0.15	0.16	0.18	1.97								
13	0.14	0.16	0.18	1.59								
14	0.14	0.16	0.18	1.30								
15	0.14	0.16	0.18	1.08								
16	0.14	0.17	0.18	0.92								
17	0.14	0.18	0.19	0.80								
18	0.14	0.17	0.20	0.70								
19	0.14	0.17	0.19	0.57								
20	0.15	0.18	0.20	0.47								
21	0.15	0.19	0.27	0.39								
22	0.15	0.19	0.58	0.31								
23	0.16	0.19	2.10	0.26								
24	0.15	0.20	10.78	0.22								
25	0.15	0.20	3.10	0.20								
26	0.15	0.20	3.59	0.20								
27	0.15	0.20	4.04	0.20								
28	0.15	0.20	2.55	0.20								
29	0.15	0.20	2.71	0.20								
30	0.16	0.20	1.95	0.20								
31	0.16	0.20	1.90	0.19								
<b>Mean</b>	0.14	0.18	1.21	0.88								
<b>Max Day</b>	0.16	0.20	10.78	2.78								
<b>Min Day</b>	0.13	0.16	0.18	0.19								
<b>Yield (ac-ft)</b>	8.77	10.86	74.12	54.2								

**Water Year 2011 Annual Summary**

<b>Mean Daily Flow</b>	0.60	cfs
<b>Max. Daily Flow</b>	10.8	cfs
<b>Min. Daily Flow</b>	0.13	cfs
<b>7-Day Low Flow</b>	0.13	cfs
<b>Total Yield</b>	148	ac-ft
<b>Normalized Yield</b>	0.04	ac-ft/ac

yr	day	cfs
1992	7/10	0.02
1993	7/21	0.04
1994	8/14	0.02
1995	9/19	0.02
2002	8/8	0.01
2003	8/23	0.01
2004	8/27	0.00
2005	9/30	0.05
2006	9/17	0.06
2007	9/6	<.01
2008	9/2	0.02
2009	9/3	0.13
2010	8/24	0.08
2011	9/7	0.17
2012	8/23	0.04

Approximate date and value of first minimum daily mean flow near the end of each water year.

Table 4. Mean Daily Water Temperature (°C)  
Potrero Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	12.87	10.27		6.69								
2	13.05	11.57		5.63								
3	12.73	10.93		5.25								
4	13.23	10.99	10.75	5.56								
5	12.95	11.28	11.88	6.42								
6	12.77	11.05	12.49	8.24								
7	12.22	10.67	10.46	7.23								
8	11.96	11.37	8.46	7.46								
9	11.65	10.41	8.44	7.81								
10	12.47	9.70	8.44	7.96								
11	12.67	8.78	8.25	7.73								
12	12.74	8.27	9.50	6.79								
13	11.87	8.36	7.61	5.04								
14	11.92	8.79	6.78	4.10								
15	12.27	8.88	6.93	4.13								
16	12.47	9.96	8.36	4.29								
17	12.58	10.98	10.10	4.81								
18	12.30	11.11	8.95	5.34								
19	13.34	10.02	6.43	5.37								
20	13.29	9.92	5.23	5.25								
21	11.72		5.85	5.04								
22	11.88		8.88	5.44								
23	11.56		9.22	7.24								
24	10.67		10.23	8.72								
25	11.54		8.83	9.57								
26	11.16		9.72	9.60								
27	11.14		9.37	8.81								
28	11.54		7.94	8.75								
29	11.41		8.74	8.56								
30	11.22		7.11	7.44								
31	11.66		6.22	6.92								
Mean Day	12.16	10.17	8.61	6.68								
Max Day	13.34	11.57	12.49	9.60								
Min Day	10.67	8.27	5.23	4.10								

Table 5. Maximum Daily Water Temperature (°C)  
Potrero Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	13.61	12.38		7.22								
2	13.64	12.15		6.24								
3	13.29	11.43		6.02								
4	13.57	11.64	11.41	6.46								
5	13.44	11.78	12.59	7.83								
6	13.25	11.55	12.61	8.86								
7	12.70	11.29	12.10	7.98								
8	12.45	11.55	9.36	8.34								
9	12.34	11.04	9.45	8.69								
10	12.69	9.97	9.39	8.45								
11	12.74	9.53	9.30	8.28								
12	12.98	8.78	9.98	7.96								
13	12.48	9.00	8.47	5.89								
14	12.47	9.43	7.96	4.70								
15	12.75	9.47	7.83	4.90								
16	13.05	10.59	9.18	5.03								
17	13.15	11.28	11.07	5.79								
18	13.31	11.26	10.36	6.27								
19	13.72	10.64	7.64	6.36								
20	13.65	10.35	6.02	6.28								
21	12.62		7.75	6.06								
22	12.21		9.56	6.67								
23	11.80		11.31	8.29								
24	11.18		11.36	9.43								
25	12.04		9.65	10.26								
26	11.71		9.95	10.21								
27	11.77		9.77	9.38								
28	11.95		8.77	9.42								
29	11.80		9.26	9.30								
30	11.63		8.01	8.53								
31	11.99		6.87	7.28								
<b>Mean Day</b>	12.64	10.76	9.54	7.50								
<b>Max Day</b>	13.72	12.38	12.61	10.26								
<b>Min Day</b>	11.18	8.78	6.02	4.70								

Table 6. Minimum Daily Water Temperature °C  
Potrero Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	12.18	11.95		5.91								
2	12.36	11.09		4.86								
3	12.03	10.33		4.37								
4	12.90	10.31	9.86	4.59								
5	12.54	10.73	11.32	5.12								
6	12.22	10.46	12.11	7.83								
7	11.56	10.00	9.43	6.23								
8	11.27	11.05	7.19	6.44								
9	10.91	9.98	7.34	6.89								
10	12.24	9.40	7.41	7.59								
11	12.58	8.16	6.99	7.02								
12	12.52	7.63	8.51	5.94								
13	11.20	7.72	6.66	4.25								
14	11.33	8.24	5.62	3.26								
15	11.75	8.30	5.78	3.27								
16	11.97	9.48	7.56	3.43								
17	12.05	10.59	9.18	3.83								
18	11.41	10.68	7.70	4.32								
19	13.02	9.55	5.60	4.31								
20	12.66	9.81	4.39	4.10								
21	11.19		4.29	3.84								
22	11.63		7.77	4.08								
23	11.14		7.92	6.50								
24	10.05		9.11	8.19								
25	11.15		8.11	8.96								
26	10.58		9.39	9.10								
27	10.53		8.29	8.21								
28	11.06		6.96	8.05								
29	10.95		8.08	7.82								
30	10.82		6.30	6.18								
31	11.41		5.50	6.56								
Mean Day	11.65	9.77	7.66	5.84								
Max Day	13.02	11.95	12.11	9.10								
Min Day	10.05	7.63	4.29	3.26								

Table 7. Mean Daily Specific Conductance (umhos/cm @ 25 °C)  
Potrero Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	846.10	958.28		483.47								
2	843.28	963.80		477.98								
3	838.20	967.18		472.85								
4	837.63	970.96	694.17	465.94								
5	846.97	971.73	680.65	458.12								
6	859.07	969.95	674.59	450.45								
7	868.82	968.11	670.20	449.61								
8	878.83	968.67	670.58	445.89								
9	886.11	966.03	668.30	439.33								
10	891.97	962.55	667.21	433.98								
11	892.99	942.80	665.22	430.34								
12	893.52	865.88	657.16	425.58								
13	894.99	856.75	659.59	423.91								
14	897.95	858.45	658.94	421.38								
15	903.48	858.25	655.10	418.26								
16	910.67	854.95	649.35	413.39								
17	913.81	846.05	640.61	407.75								
18	910.44	840.06	639.93	403.01								
19	919.18	833.45	646.74	401.68								
20	926.63	825.75	649.81	402.08								
21	932.17		647.93	403.34								
22	927.03		638.21	404.03								
23	894.38		637.22	402.21								
24	857.75		610.92	402.06								
25	831.07		591.26	403.74								
26	825.23		566.17	406.75								
27	828.08		512.72	412.68								
28	829.78		493.79	418.34								
29	833.08		493.62	424.19								
30	863.31		494.01	431.60								
31	923.83		491.60	435.08								
Mean Day	877.6	912.5	622.3	428.0								
Max Day	932.2	971.7	694.2	483.5								
Min Day	825.2	825.7	491.6	401.7								

Table 8. Mean daily flow, San Clemente Creek, water year 2013  
Santa Lucia Preserve, Monterey County, California

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.06	0.07	0.47	1.97	0.96	0.74	0.64	0.31	0.24	0.08	0.02	0.01
2	0.04	0.07	2.59	1.79	0.94	0.74	0.62	0.30	0.23	0.07	0.02	0.01
3	0.04	0.07	1.91	1.63	0.93	0.73	0.60	0.31	0.23	0.06	0.02	0.01
4	0.05	0.07	0.97	1.51	0.92	0.71	0.60	0.30	0.22	0.06	0.02	0.01
5	0.05	0.07	0.86	1.45	0.90	0.71	0.59	0.29	0.22	0.06	0.02	0.02
6	0.05	0.07	0.86	2.66	0.89	1.04	0.57	0.28	0.21	0.06	0.02	0.02
7	0.05	0.07	0.69	2.01	0.89	0.87	0.57	0.29	0.20	0.05	0.02	0.02
8	0.05	0.09	0.61	1.78	1.05	0.83	0.59	0.29	0.20	0.05	0.02	0.02
9	0.05	0.08	0.54	1.70	0.91	0.77	0.55	0.30	0.18	0.05	0.02	0.02
10	0.07	0.08	0.50	2.09	0.87	0.74	0.53	0.31	0.17	0.04	0.02	0.02
11	0.07	0.06	0.49	1.80	0.84	0.74	0.54	0.32	0.17	0.04	0.02	0.02
12	0.07	0.07	0.49	1.71	0.82	0.73	0.55	0.32	0.16	0.05	0.02	0.02
13	0.06	0.07	0.47	1.58	0.82	0.71	0.51	0.32	0.15	0.05	0.02	0.02
14	0.06	0.08	0.44	1.47	0.81	0.70	0.50	0.31	0.16	0.04	0.02	0.02
15	0.06	0.09	0.42	1.41	0.79	0.69	0.53	0.29	0.15	0.04	0.02	0.02
16	0.06	0.13	0.46	1.38	0.78	0.68	0.51	0.31	0.15	0.04	0.02	0.02
17	0.06	0.14	0.44	1.35	0.77	0.67	0.48	0.29	0.15	0.04	0.02	0.02
18	0.06	0.08	0.46	1.30	0.77	0.66	0.48	0.29	0.15	0.04	0.02	0.02
19	0.06	0.07	0.40	1.25	0.99	0.65	0.47	0.30	0.14	0.04	0.02	0.02
20	0.06	0.07	0.40	1.21	1.06	0.67	0.47	0.31	0.13	0.03	0.02	0.02
21	0.05	0.06	0.41	1.17	0.90	0.68	0.46	0.30	0.13	0.03	0.02	0.02
22	0.06	0.06	1.26	1.14	0.84	0.65	0.43	0.29	0.13	0.03	0.02	0.03
23	0.06	0.05	2.86	1.12	0.83	0.63	0.41	0.30	0.13	0.03	0.02	0.02
24	0.06	0.05	4.61	1.15	0.81	0.62	0.40	0.27	0.14	0.02	0.02	0.02
25	0.07	0.05	2.71	1.15	0.79	0.62	0.39	0.26	0.12	0.02	0.02	0.02
26	0.07	0.05	3.92	1.11	0.78	0.62	0.38	0.27	0.11	0.02	0.02	0.02
27	0.08	0.05	3.21	1.10	0.75	0.61	0.37	0.28	0.09	0.02	0.02	0.01
28	0.09	0.10	2.46	1.06	0.73	0.61	0.36	0.29	0.09	0.02	0.02	0.01
29	0.08	0.08	3.24	1.03		0.60	0.37	0.23	0.09	0.02	0.02	0.01
30	0.08	1.61	2.49	1.00		0.61	0.35	0.22	0.08	0.02	0.02	0.02
31	0.07		2.17	0.98		0.66		0.23		0.02	0.01	
<b>Mean</b>	0.06	0.13	1.41	1.45	0.86	0.70	0.49	0.29	0.16	0.04	0.02	0.02
<b>Max Day</b>	0.09	1.61	4.61	2.66	1.06	1.04	0.64	0.32	0.24	0.08	0.02	0.03
<b>Min Day</b>	0.04	0.05	0.40	0.98	0.73	0.60	0.35	0.22	0.08	0.02	0.01	0.01
<b>Yield (ac-ft)</b>	3.8	7.4	86.9	89.4	47.9	43.1	29.4	17.8	9.4	2.50	1.12	1.03

#### Water Year 2013 Annual Summary

<b>Mean Daily Flow</b>	0.47	cfs
<b>Max. Daily Flow</b>	4.6	cfs
<b>Min. Daily Flow</b>	0.01	cfs
<b>7-Day Low Flow</b>	0.01	cfs
<b>Total Yield</b>	340	ac-ft
<b>Normalized Yield</b>	0.10	ac-ft/ac

#### yr day cfs

1991	9/17	0.03
1992	8/27	0.06
1993	8/27	0.10
1994	7/16	0.04
1995	9/29	0.14
2002	8/25	0.01
2003	9/14	0.03
2004	8/27	0.02
2005	9/30	0.11
2006	9/23	0.17
2007	8/4	0.03
2008	8/26	0.07
2009	9/4	0.03
2010	9/5	0.01
2011	9/23	0.17
2012	9/30	0.04

Approximate date and value  
of first minimum daily mean  
flow near the end of each  
water year.

Table 9. Mean Daily Water Temperature °C  
San Clemente Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	14.22	12.39	12.03	6.35	7.28	7.61	10.82	11.50	12.98	16.51	14.58	15.70
2	14.46	11.47	12.68	5.65	7.97	8.23	10.56	12.08	13.33	16.79	14.01	15.93
3	14.52	10.88	10.83	5.53	8.04	9.04	10.35	12.36	13.15	16.71	13.95	15.61
4	14.37	10.92	10.23	5.91	7.34	8.61	10.77	12.16	13.24	17.21	14.20	15.01
5	13.78	11.24	11.31	6.56	7.49	8.15	11.19	12.08	13.35	16.48	14.07	14.89
6	13.32	11.25	12.00	7.74	7.25	8.45	10.64	12.15	13.23	15.54	14.08	14.61
7	12.84	10.97	9.63	6.84	6.94	7.70	10.58	12.27	13.72	15.27	14.28	15.01
8	12.52	11.31	7.74	7.16	6.78	7.96	10.19	11.90	14.65	15.08	14.05	15.07
9	12.18	9.87	7.85	7.61	6.02	8.11	9.40	11.70	14.68	15.43	14.33	15.30
10	13.02	9.23	7.96	7.28	5.40	7.48	9.73	11.92	14.57	15.46	14.32	15.16
11	12.62	8.20	7.81	7.10	5.46	7.64	10.46	12.73	14.58	15.07	14.37	15.08
12	12.77	7.68	8.72	6.63	5.44	8.26	10.21	13.13	13.85	14.55	14.45	15.06
13	11.96	7.98	7.56	4.94	5.75	9.08	10.03	13.04	13.19	14.60	14.52	14.81
14	12.37	8.70	6.64	4.19	6.23	9.33	9.45	12.70	12.98	14.66	14.53	14.44
15	12.76	8.79	6.70	4.30	6.74	9.46	9.59	11.80	12.96	14.47	14.85	14.28
16	13.23	10.28	7.86	4.64	7.22	9.31	8.82	12.08	12.98	14.60	15.27	14.31
17	13.16	11.15	9.35	5.25	7.07	8.83	8.27	11.73	13.26	14.61	15.15	14.26
18	12.95	10.66	8.25	5.88	6.60	8.50	8.42	11.52	13.22	14.43	15.08	13.82
19	13.84	9.41	5.87	6.03	6.86	9.08	9.25	12.04	12.96	14.44	15.73	13.58
20	12.80	9.80	4.90	5.96	6.28	9.75	10.19	12.20	12.47	14.38	15.74	13.66
21	11.27	10.56	6.26	5.70	7.07	9.83	10.49	11.99	12.69	14.55	15.21	14.04
22	11.63	9.95	8.63	6.00	6.20	8.51	11.14	11.09	12.85	14.99	14.94	13.84
23	11.35	9.28	8.93	7.34	6.72	7.95	11.26	10.88	13.55	15.50	14.74	13.44
24	10.32	9.30	9.30	8.47	6.00	8.21	10.97	10.25	14.22	15.56	14.65	13.68
25	11.54	8.90	8.11	9.23	5.88	8.49	11.31	10.36	14.75	15.63	15.06	13.18
26	11.00	8.42	8.93	9.52	5.91	8.94	10.76	11.49	15.51	15.60	15.26	12.61
27	11.28	9.46	8.68	8.53	6.06	9.36	11.13	11.98	15.85	15.53	14.78	11.90
28	11.82	10.14	7.38	8.12	6.75	10.07	11.41	12.67	16.37	15.32	14.71	11.93
29	11.97	10.48	7.96	8.29		9.95	12.05	12.35	16.47	15.18	15.02	12.20
30	11.71	12.16	6.94	7.63		10.47	12.05	11.87	16.42	15.16	15.27	12.78
31	11.76		6.10	7.26		10.56		11.83		14.97	15.42	
<b>Mean Day</b>	12.6	10.0	8.5	6.7	6.6	8.8	10.4	11.9	13.9	15.3	14.7	14.2
<b>Max Day</b>	14.5	12.4	12.7	9.5	8.0	10.6	12.1	13.1	16.5	17.2	15.7	15.9
<b>Min Day</b>	10.3	7.7	4.9	4.2	5.4	7.5	8.3	10.2	12.5	14.4	14.0	11.9

Table 10. Maximum Daily Water Temperature °C  
San Clemente Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	15.26	12.8	12.25	12.3	7.95	8.45	11.1	12.4	14.2	17.4	15.5	16.4
2	15.46	12.2	13.93	13.9	8.55	8.96	11.1	13.1	14	17.8	15	16.5
3	15.25	11.6	11.61	11.6	8.39	9.42	11.1	13.2	14.1	17.6	14.9	16.1
4	14.80	11.8	10.80	10.8	8.1	9.05	11.4	13.1	14.1	18.2	15.1	15.5
5	14.46	12.1	12.22	12.2	7.93	8.48	11.5	12.6	14.3	17.3	15.1	15.5
6	14.00	12.12	12.30	12.30	7.93	8.75	11.10	12.38	14.23	16.42	14.96	15.40
7	13.48	11.6	11.22	11.2	7.28	8.36	11.1	12.7	14.9	16.2	15.1	15.7
8	13.15	11.6	8.43	8.43	6.96	8.22	10.8	12.5	15.7	16.1	14.9	15.7
9	13.04	10.5	8.56	8.56	6.72	8.53	10	12.5	15.4	16.5	15.2	16.1
10	13.32	9.67	8.68	8.68	5.88	8.18	10.9	12.9	15.2	16.3	15.3	15.7
11	12.88	8.95	8.70	8.70	6.02	8.57	10.86	13.76	15.32	15.96	15.27	15.58
12	13.22	8.45	8.99	8.99	6.11	9.19	11	14	14.6	15.6	15.4	15.7
13	12.75	9	8.24	8.24	6.45	9.87	10.5	13.9	14.2	15.6	15.5	15.5
14	13.27	9.69	7.44	7.44	6.97	9.99	9.96	13.4	14.2	15.7	15.5	15.1
15	13.49	9.67	7.32	7.32	7.5	10.1	9.8	12.4	13.9	15.3	15.9	14.9
16	14.11	10.83	8.69	8.69	7.88	9.87	9.21	12.77	14.09	15.43	16.26	14.87
17	13.76	11.6	9.85	9.85	7.62	9.38	9	12.4	14.2	15.6	15.6	14.6
18	14.06	11	9.51	9.51	7.04	9.36	9.45	12.3	14	15.4	15.9	14.4
19	14.39	10.1	7.04	7.04	7.08	9.79	10.4	13	13.8	15.4	16.7	14.4
20	13.76	10.5	5.38	5.38	6.85	10.1	11	13.3	13.4	15.3	16.6	14.3
21	12.06	11.02	7.95	7.95	7.33	10.09	11.47	12.69	13.79	15.56	15.94	14.42
22	12.26	10.6	9.05	9.05	6.82	9.35	12.1	11.7	14	15.8	15.7	14.2
23	11.87	10	10.40	10.4	7.24	8.82	11.9	11.4	14.1	16.1	15.5	14.1
24	11.03	10	10.28	10.3	6.65	9.07	11.5	11.2	14.7	16.5	15.4	14.1
25	12.24	9.5	9.06	9.06	6.54	9.28	11.8	11.2	15.5	16.6	15.8	13.7
26	11.83	9.12	9.10	9.10	6.59	9.61	11.53	12.41	16.40	16.55	15.91	13.02
27	12.21	9.92	8.98	8.98	6.9	9.96	12.1	12.5	16.8	16.5	15.5	12.5
28	12.54	10.8	8.13	8.13	7.62	10.7	12.3	13.4	17.4	16.3	15.5	12.7
29	12.64	11.5	8.52	8.52		10.7	13	13.2	17.5	16.1	15.7	13
30	12.27	13	7.74	7.74		10.9	12.7	12.8	17.4	16.1	16	13.3
31	12.27		6.70	6.70		10.89		13.16		15.89	15.95	
<b>Mean Day</b>	13.3	10.7	9.3	9.3	7.2	9.4	11.1	12.7	14.8	16.2	15.6	14.8
<b>Max Day</b>	15.5	13.0	13.9	13.9	8.6	10.9	13.0	14.0	17.5	18.2	16.7	16.5
<b>Min Day</b>	11.0	8.5	5.4	5.4	5.9	8.2	9.0	11.2	13.4	15.3	14.9	12.5

Table 11. Minimum Daily Water Temperature °C  
San Clemente Creek, water year 2013

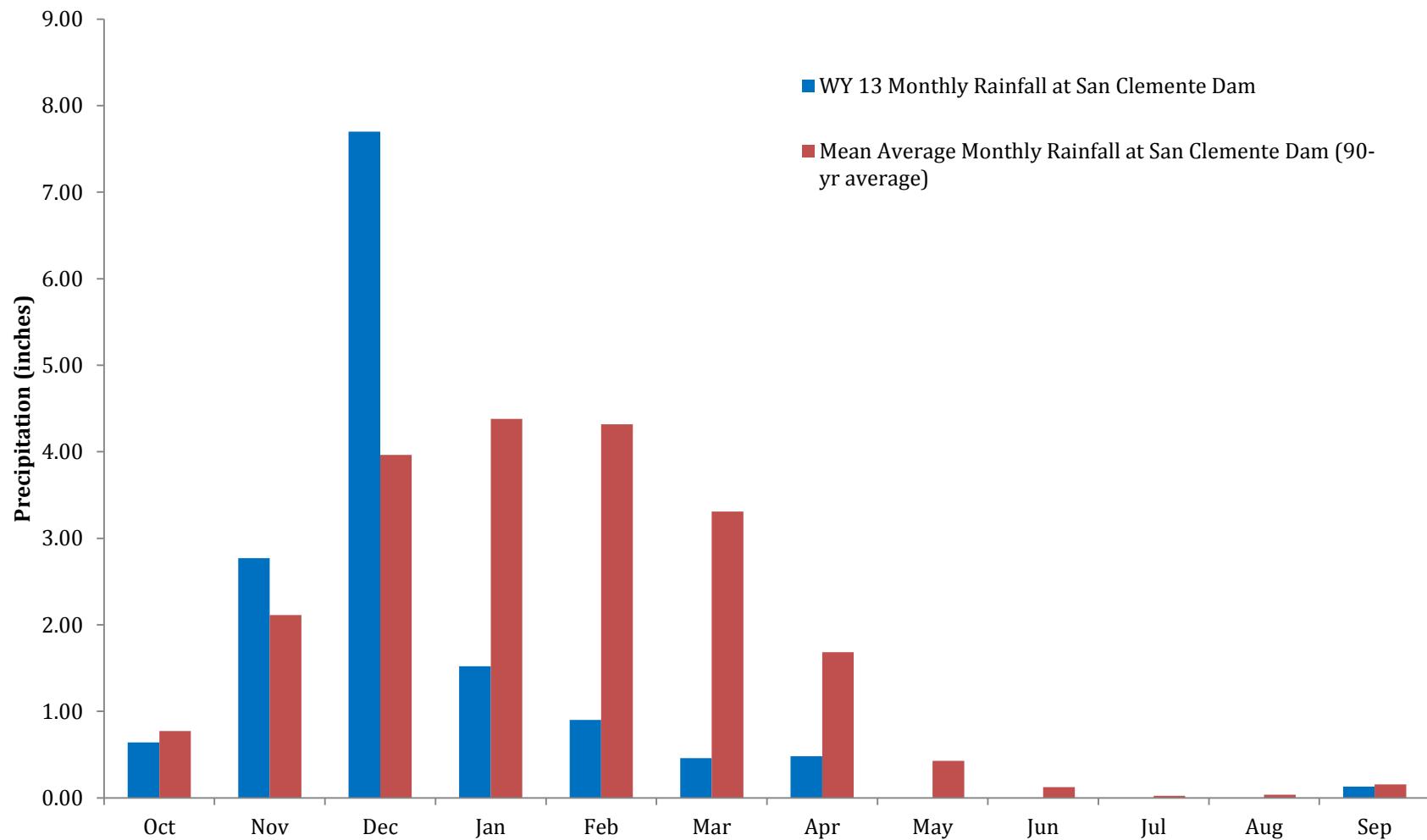
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	13.1	12.1	11.8	5.89	6.62	6.85	10.6	10.3	11.6	15.3	13.8	15.1
2	13.3	10.7	11.7	4.98	7.54	7.46	9.91	10.9	12.6	15.8	12.9	15.5
3	13.6	9.95	10.4	4.75	7.66	8.74	9.48	11.3	12.2	15.7	12.8	15.1
4	13.8	9.95	9.55	5.12	6.65	8.18	10.3	11	12.3	16.3	13.4	14.4
5	13.1	10.3	10.6	5.63	7.07	7.78	10.9	11.7	12.5	15.8	13	14.3
6	12.5	10.4	11.2	7.44	6.61	8.23	10	11.9	12.1	14.7	13.2	13.6
7	12	10.1	8.45	6.07	6.44	7.06	9.93	11.8	12.4	14.2	13.5	14.2
8	11.7	10.5	6.85	6.46	6.55	7.68	9.81	11.1	13.5	13.8	13.1	14.3
9	11.1	9.25	7.14	6.98	5.58	7.78	8.57	10.8	13.9	14.1	13.6	14.5
10	12.7	8.83	7.27	6.94	4.83	6.59	8.66	10.8	14	14.4	13.3	14.4
11	12.3	7.5	6.92	6.8	4.9	6.71	10	11.6	14	14.1	13.4	14.6
12	12.4	6.83	8.27	5.78	4.78	7.35	9.39	12	12.9	13.3	13.5	14.5
13	10.9	6.95	6.85	4.41	5.08	8.27	9.39	12	12.1	13.4	13.4	14.1
14	11.4	7.8	5.8	3.61	5.54	8.54	8.64	12	11.5	13.5	13.5	13.7
15	11.9	7.89	5.83	3.75	6.01	8.68	9.12	10.9	11.9	13.5	13.7	13.6
16	12.4	9.6	7.21	4.13	6.61	8.54	8.17	11.4	11.7	13.8	14.3	13.6
17	12.5	10.8	8.65	4.68	6.54	8.1	7.33	10.8	12.1	13.6	14.5	13.9
18	11.8	9.57	7.15	5.27	6.14	7.53	7.3	10.5	12.6	13.2	14	13.1
19	13.3	8.7	5.23	5.41	6.49	8.28	8.09	11	12.1	13.3	14.9	12.7
20	12.1	9.12	4.35	5.38	5.8	9.44	9.24	10.9	11.2	13.5	15.1	12.9
21	10.5	10.1	4.69	5.05	6.84	9.38	9.49	11.3	11.4	13.6	14.4	13.7
22	11.3	9.33	7.92	5.34	5.47	7.75	10.1	10.4	11.4	14.3	14.2	13.5
23	10.5	8.43	8	6.79	6.3	6.94	10.4	10.5	12.9	14.9	13.9	12.6
24	9.41	8.56	8.27	8.13	5.32	7.32	10.2	9.12	13.8	14.6	13.7	13.2
25	10.8	8.28	7.4	8.91	5.13	7.66	10.9	9.41	14.1	14.7	14.3	12.9
26	10.2	7.64	8.65	9.05	5.16	8.23	9.7	10.6	14.6	14.6	14.6	12.1
27	10.4	9.05	7.7	8.26	5.2	8.65	10	11.3	14.7	14.6	13.9	11.2
28	11	9.13	6.57	7.89	6	9.53	10.2	12.1	15.3	14.5	13.8	11.1
29	11.2	9.67	7.44	8.12		9.06	11	11.6	15.3	14.4	14.2	11.3
30	11	11.5	6.25	7.1		9.9	11.2	10.8	15.3	14.3	14.5	12.1
31	11.2		5.49	6.63		10		10.3		14.2	14.8	
Mean Day	11.8	9.3	7.7	6.2	6.0	8.1	9.6	11.0	12.9	14.3	13.8	13.5
Max Day	13.8	12.1	11.8	9.1	7.7	10.0	11.2	12.1	15.3	16.3	15.1	15.5
Min Day	9.4	6.8	4.3	3.6	4.8	6.6	7.3	9.1	11.2	13.2	12.8	11.1

Table 12. Mean Daily Specific Conductance (umhos/cm @ 25 °C)

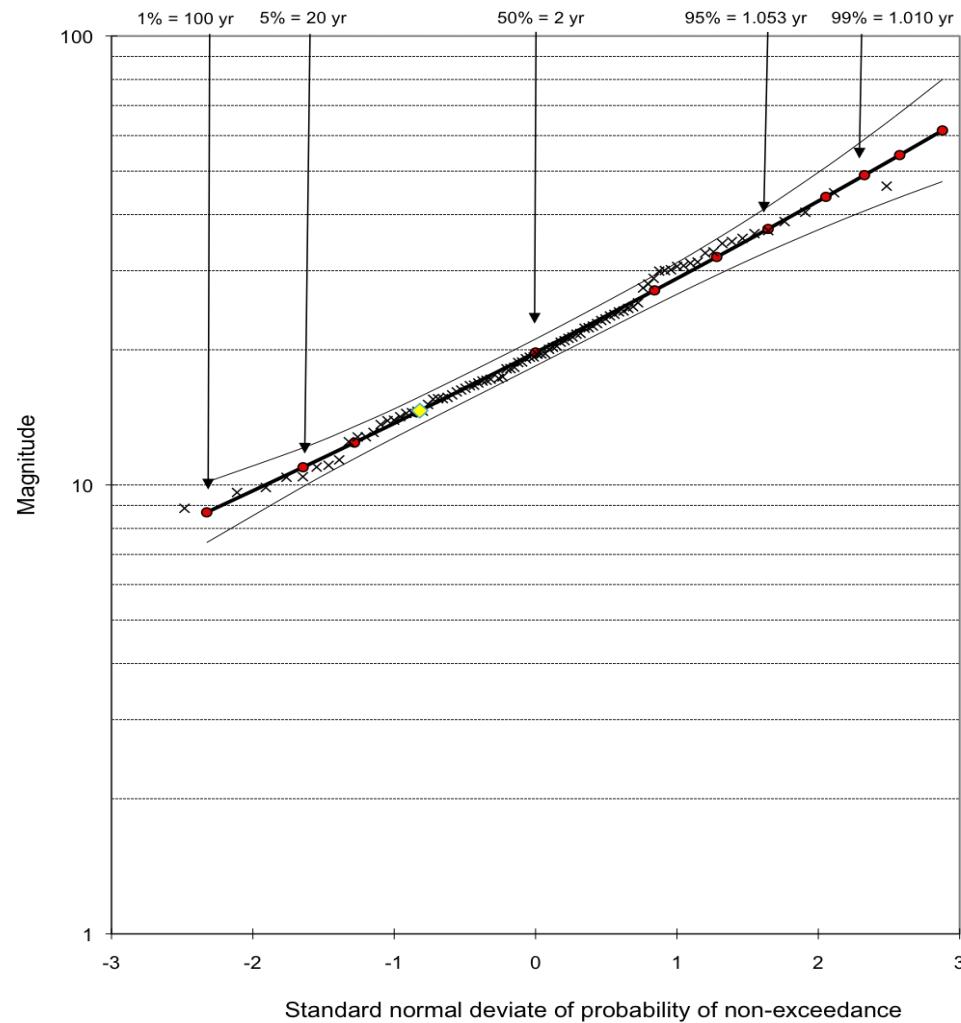
San Clemente Creek, water year 2013

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.28	0.27	0.21									
2	0.28	0.27	0.18									
3	0.28	0.28	0.15									
4	0.28	0.28	0.17									
5	0.27	0.28	0.18									
6	0.27	0.28	0.19									
7	0.26	0.28	0.19									
8	0.26	0.28	0.18									
9	0.26	0.26	0.18									
10	0.26	0.25	0.18									
11	0.26	0.24	0.18									
12	0.26	0.24	0.19									
13	0.26	0.22	0.18									
14	0.26	0.22	0.18									
15	0.27	0.23	0.18									
16	0.27	0.24	0.19									
17	0.27	0.24	0.20									
18	0.27	0.24	0.19									
19	0.27	0.23	0.18									
20	0.27	0.24	0.17									
21	0.26	0.24	0.18									
22	0.26	0.24	0.16									
23	0.26	0.24	0.14									
24	0.25	0.24	0.03									
25	0.26	0.24										
26	0.26	0.24										
27	0.26	0.25										
28	0.26	0.25										
29	0.27	0.26										
30	0.26	0.20										
31	0.25											
Mean Day	0.3	0.2	0.2									
Max Day	0.3	0.3	0.2									
Min Day	0.2	0.2	0.0									

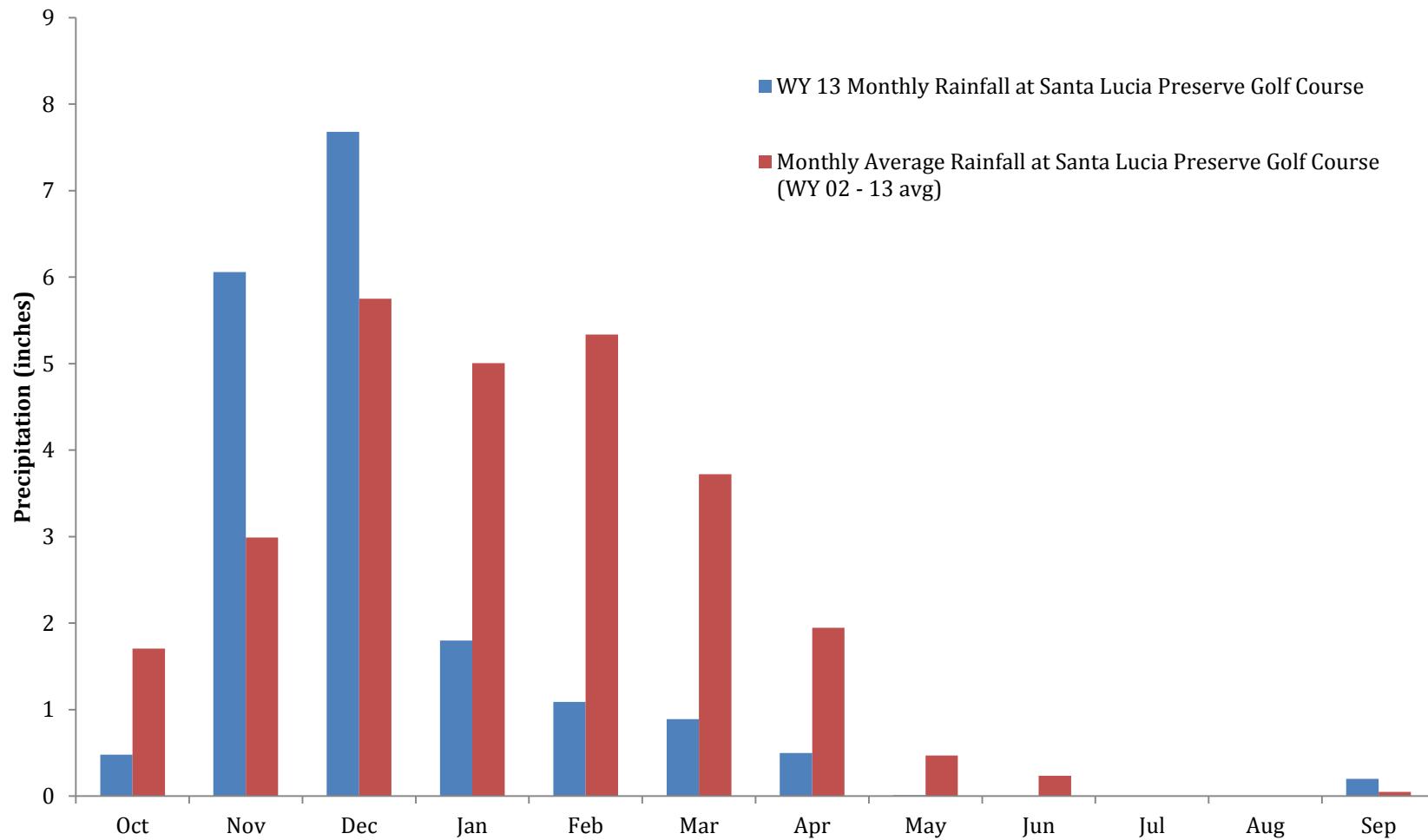
## **7 Figures**



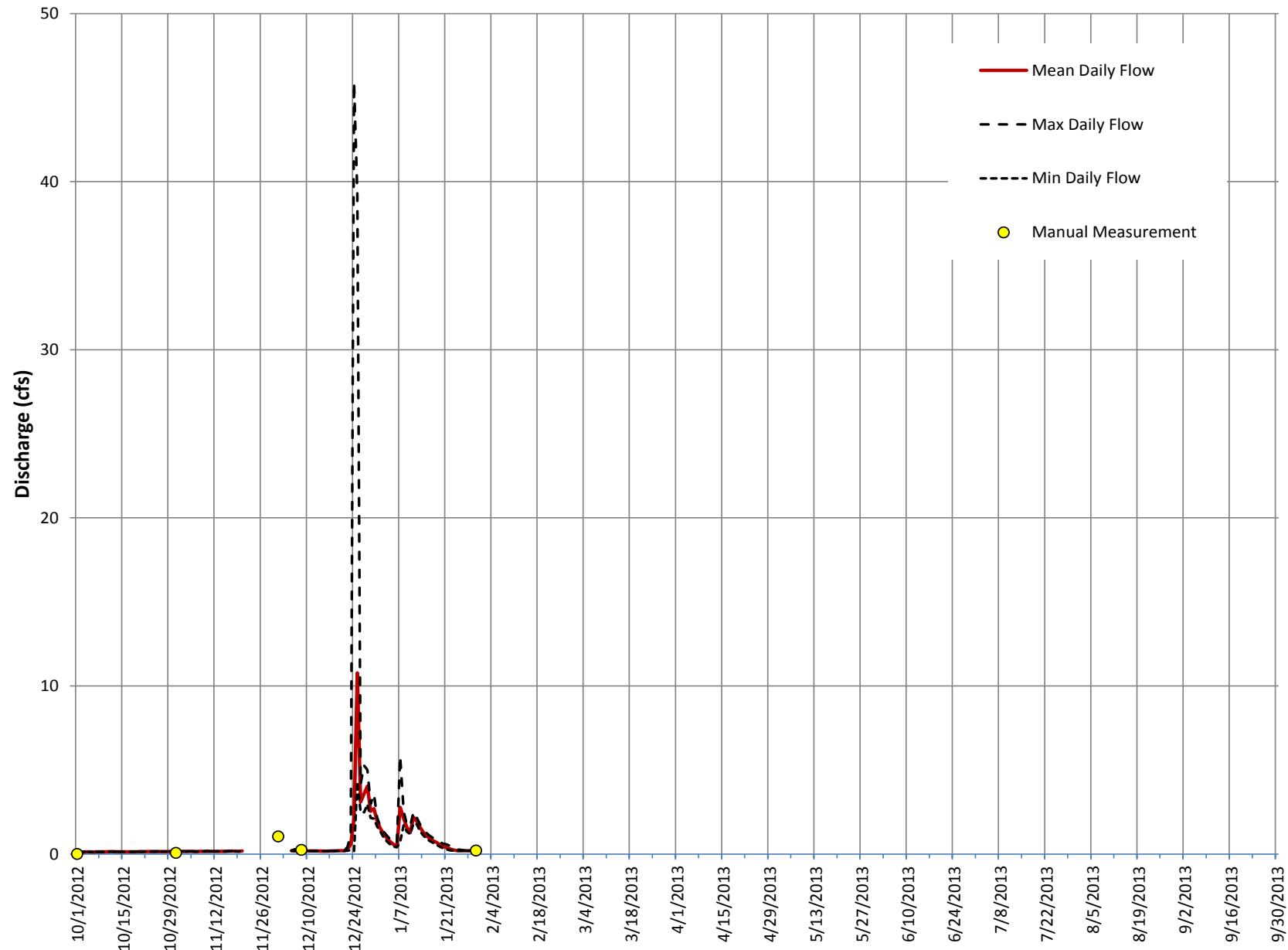
**Figure 1. Monthly precipitation at San Clemente Dam for Water Year 2013.** WY 2013 precipitation was below average. Total precipitation in WY 2013 at the dam was 14.60 inches compared to the average total precipitation at the dam, 21.31 inches. Mean monthly data is based on Water Years 1922 – 2013. Precipitation data are from the Monterey Peninsula Water Management District (2013).



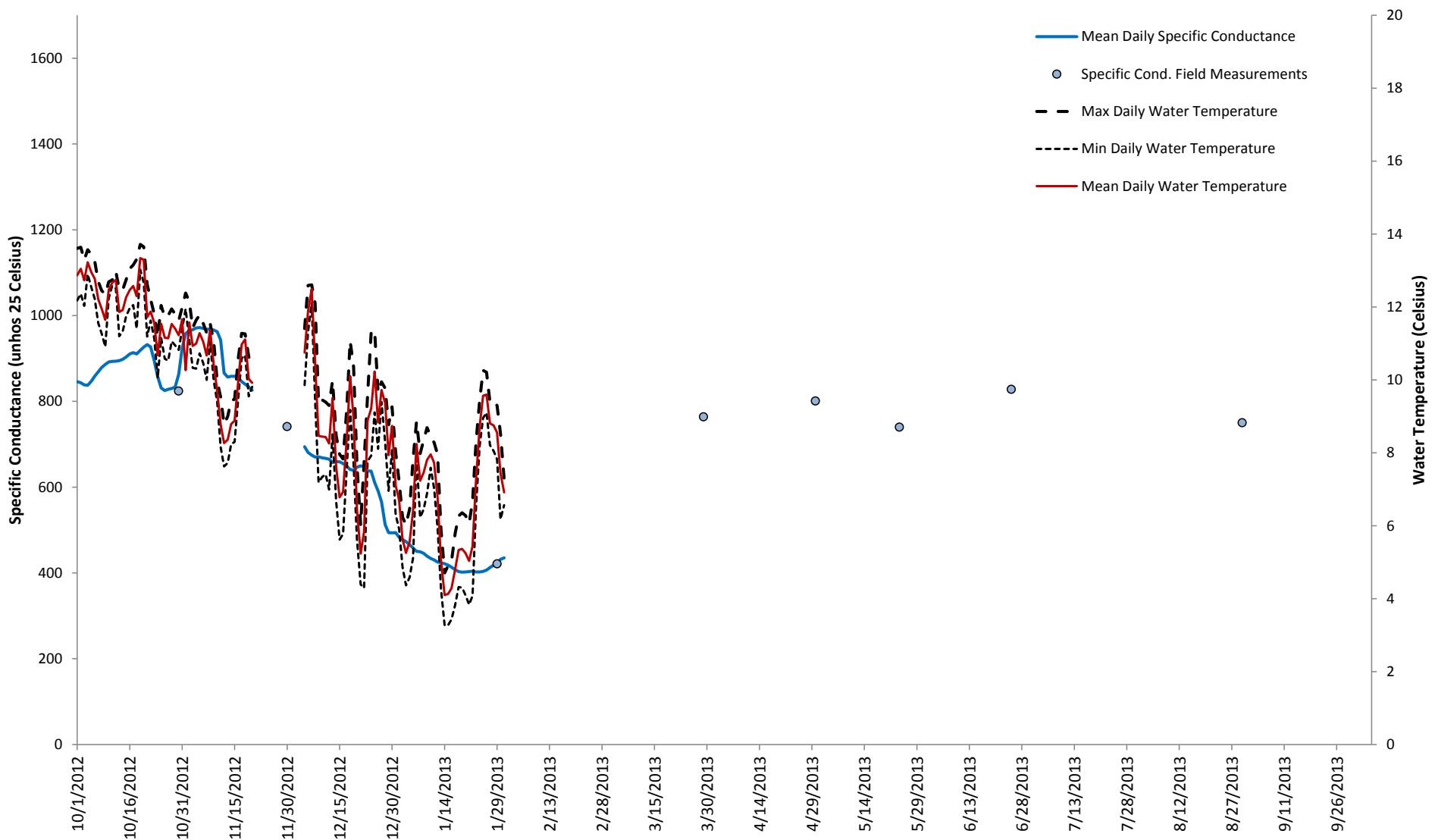
**Figure 2. Log-Pearson Type-III statistical analysis of historic precipitation data from San Clemente Dam.** Thin curved lines represent upper and lower 95% confidence bounds for precipitation and non-exceedance probability. The yellow diamond symbol marks the 14.60 inch precipitation of the 2013 water year.



**Figure 3. Monthly Precipitation at Santa Lucia Preserve Golf course for Water Year 2013.** WY 2013 precipitation was below average at the golf course. Precipitation was 18.71 inches in Water Year 2013 compared to the 11 year annual average of 27.22 inches. Mean monthly average is based only on Water Years 2002 – 2013 and is probably not an accurate characterization of actual long-term patterns (precipitation data from Santa Lucia Preserve, 2013).

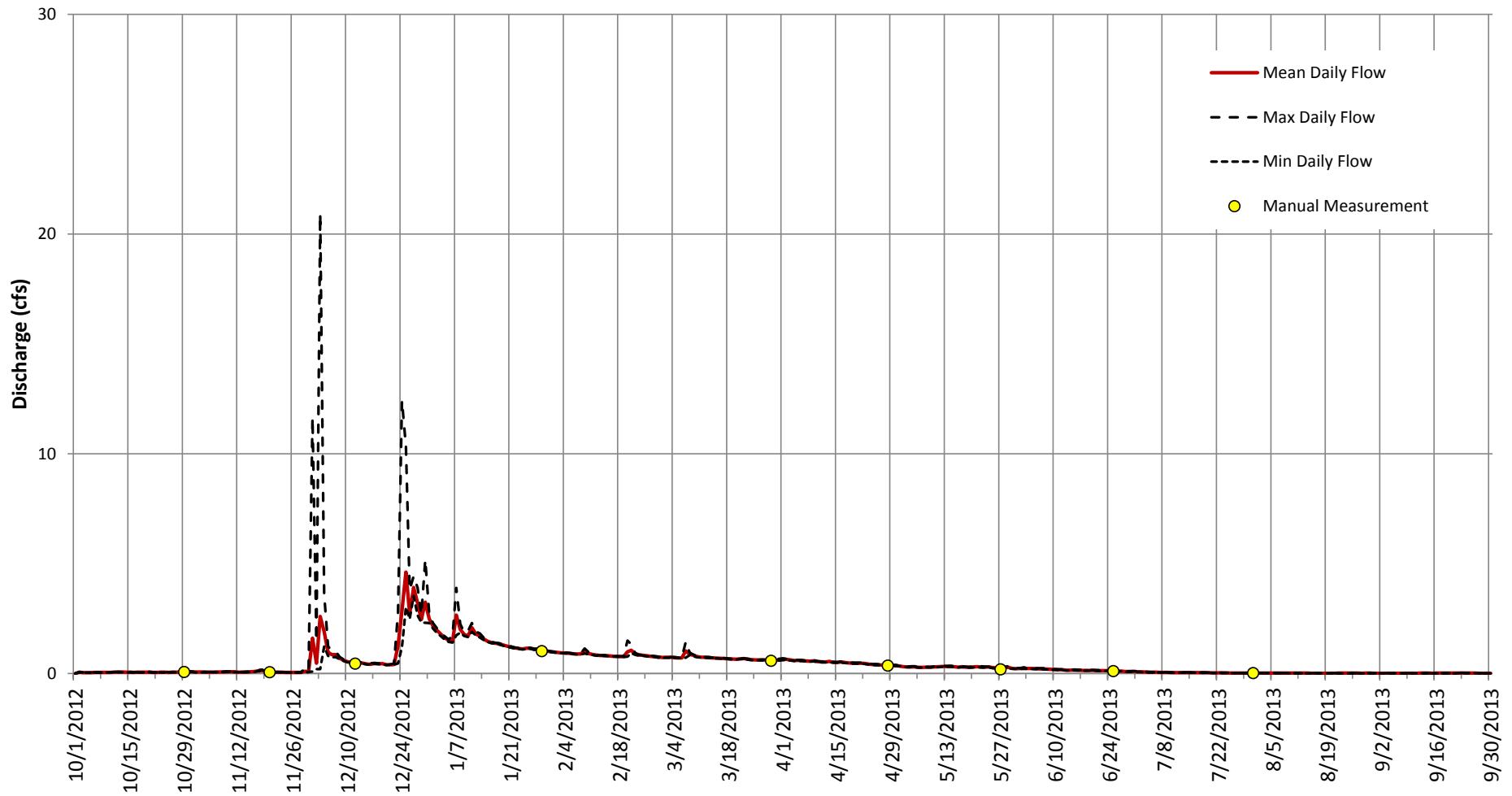


**Figure 4. Mean Daily Streamflow at Potrero Creek gage for Water Year 2013.** Red line is mean daily streamflow. Minimum and maximum daily flows are also shown. Yellow points represent manual discharge measurements.

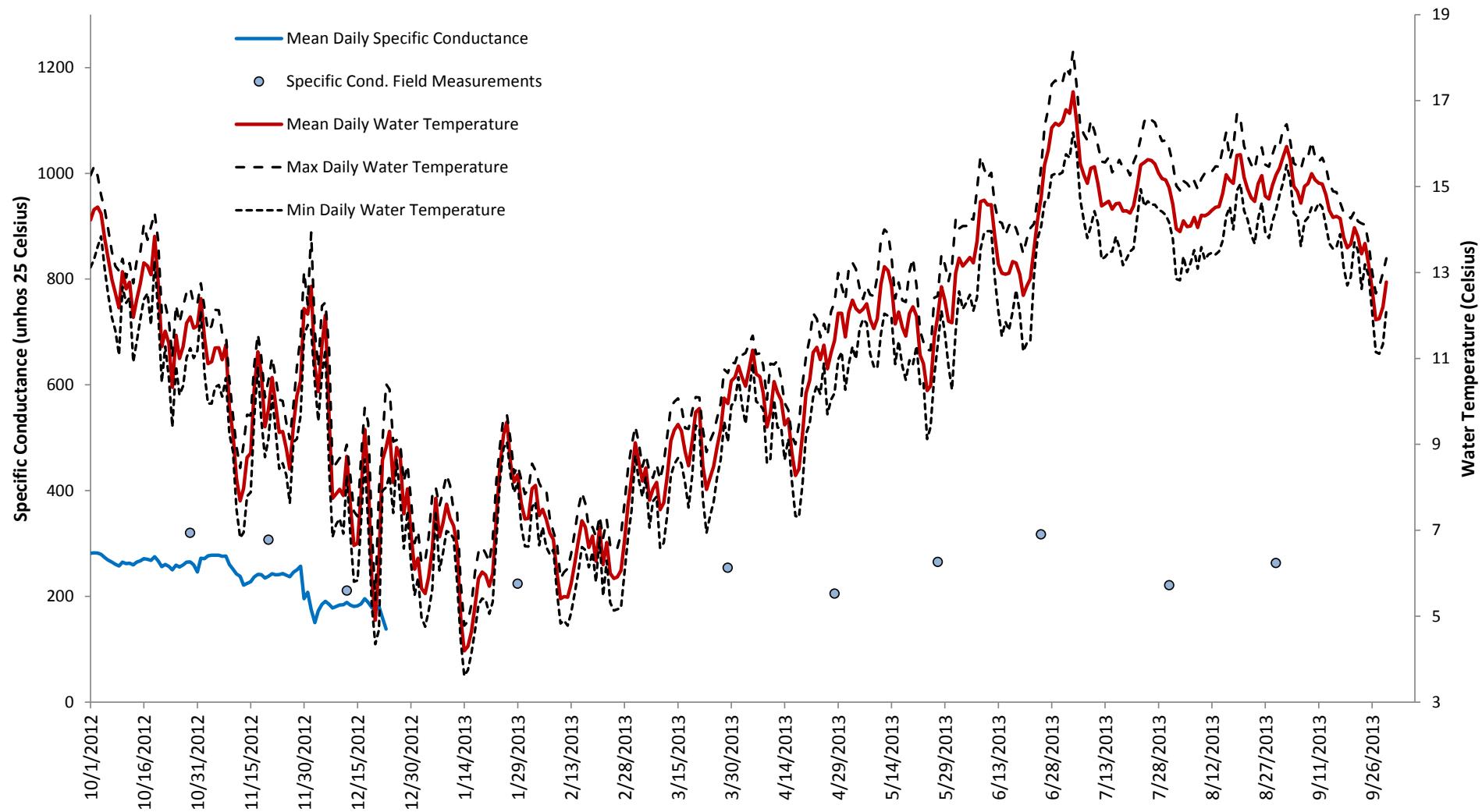


**Figure 5. Daily Specific Conductance Water Temperature data at Potrero Creek gage for Water Year 2013.**

Blue line is mean daily specific conductance; red line is mean daily water temperature; dotted lines represent minimum and maximum daily water temperature values.



**Figure 6. Mean Daily Streamflow at San Clemente Creek gage for Water Year 2013.** Red line is mean daily streamflow. Minimum and maximum daily flows are also shown. Yellow points represent manual discharge measurements.



**Figure 7. Daily Specific Conductance and Water Temperature data at San Clemente Creek gage for Water Year 2013.** Blue line is mean daily specific conductance; red line is mean daily water temperature; dotted lines represent minimum and maximum daily water temperature values.