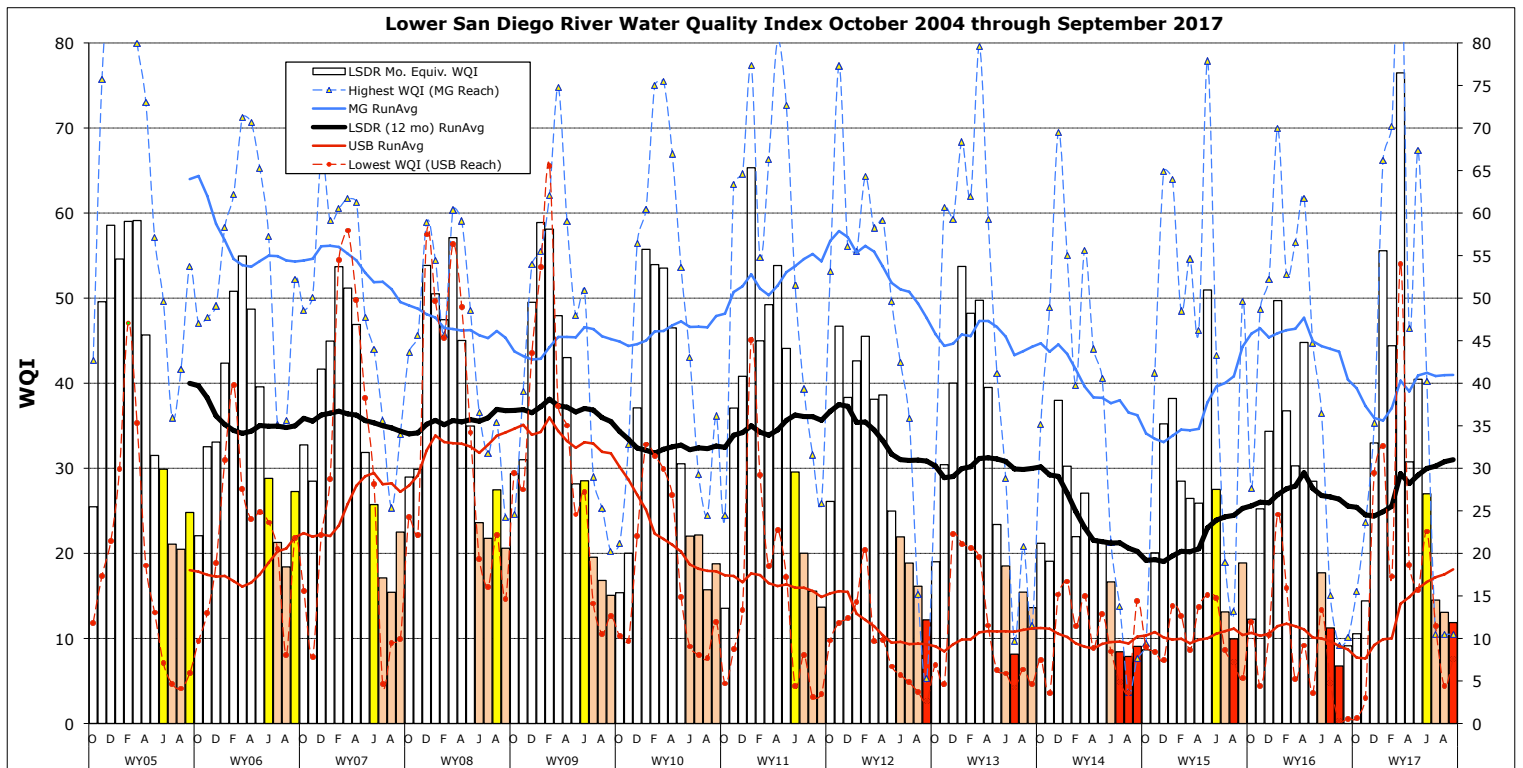


# Monthly WQM Report

## Lower San Diego River - September 2017



## Lower SDR WQ Monitoring Data Summary

**Table 1** presents a summary of water quality data monitored by SDRPF's RiverWatch Team within the Lower San Diego River watershed over the past two months (August and September) that constitute the last months of summer. The September index is down two points from August, at the same value as last Sept. that is seven points under the 12-yr monthly average of 19. Overall September water quality of the lower San Diego River hydrologic unit (HSU 907.1) is rated Very Poor (F+).

<b>Table 1 - Sept/Aug 2017 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Sept/Aug	[8-10] Sept/Aug	[11-15] Sept/Aug	[1-15] <b>Sept/Aug</b>	Last Mo (8/'17)	Last Yr (9/'16)	12-Yr Avg (Sept)
Temperature, oC	22.8/23.8	22.4/22.1	21.9/22.1	<b>22.3/22.7</b>	-2%	12%	4%
Sp.Cond., mS/cm	3.49/3.50	2.41/2.35	2.48/2.23	<b>2.90/2.77</b>	5%	-13%	0%
DO, mg/L	<b>2.14/2.70</b>	7.14/3.97	<b>2.36/3.00</b>	<b>3.24/2.99</b>	8%	10%	-12%
DO, % of Sat.	<b>25/32</b>	82/44	<b>27/35</b>	<b>37/35</b>			
pH	7.68/7.68	7.93/8.11	7.67/7.68	7.67/7.67	0%	3%	0%
30-day ADF, cfs	2.1/1.9	1.1/0.8	0.7/0.5	1.3/1.1	19%	-44%	-25%
WQ Index	15/18	11/10	11/12	12/14	-13%	7%	-36%
Grade( <b>Sept/Aug</b> )	E/E	F/F	F/F+	F+/E-			
<b>September/ August 2017</b>	<b>Poor/ Poor</b>	VeryPoor/ Very Poor	VeryPoor/ VeryPoor	<b>VeryPoor /Poor</b>	<b>Index down 2 points from last month</b>		

DO values below threshold limits of 4 mg/L and 40%Sat are expressed in red.

Overall, LSDR **water temperatures** are down 0.4°C (-2%) from last month, at 2.4 degrees above last Sept. and nearly a degree above the 13-yr monthly norm of 21.4°C. **Specific conductivities** rose 5% from last month but remain 13% below last Sept. at the 12-yr monthly norm of 2.90 mS/cm. The overall **dissolved oxygen** level of 3.24 mg/L is up 8% from last month and 10% above last Sept. although remaining 12% percent below the 12-yr monthly norm of 3.74 mg/L. **Streamflow** over the antecedent 30-day period of 1.3 cfs, is slightly above last month (1.1 cfs), but is 44% less than a year ago and 25% below the 12-yr norm of 1.7 cfs. This month's LSDR **water quality index** (WQI) of 12(F+) is two points below last month's value of 14 and well below the 12-yr norm of 19.

Conclusion:

The overall LSDR water quality index is **Very Poor**, falling two points from **14 (E-) to 12 (F+)** over the past month.

A summary of monthly WQI values occurring over the past two years of record for the three sections of the lower San Diego River system as well as the overall average are listed in **Table 2** along with average daily 30-day antecedent flow (ADF) and total monthly rainfall (MRF).

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Sept. 2015 - Sept. 2017)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Sept.'15	8(F)	50(B-)	32(D)	26(D-)		5.5	1.25
Oct	5(F)	28(D)	17(E)	14(E-)		4.9	0.42
Nov	28(D)	49(C+)	20(E)	29(D)		7.8	1.53
Dec.	40(C)	52(B)	29(D)	38(C-)		7.5	0.45
Jan.'16	54(B)	70(B)	42(C)	53(B)	WW	92.7	3.21
Feb.	40(C)	53(B)	35(D)	41(C)		12.3	0.05
March	32(D)	57(B)	25(D-)	34(D)		14.0	0.72
April	63(B)	62(B)	30(D)	49(C+)		11.5	0.55
May	38(C)	45(C)	26(D-)	34(D)		5.8	0.43
June	14(E-)	36(D)	18(E)	20(E)	DW	1.2	0.02
July	14(E-)	15(E)	12(F+)	13(E-)	DW	0.6	0.00
Aug	10(F)	9(F)	6(F)	8(F)	DW	0.4	0.00
Sept	12(F+)	10(F)	12(F+)	12(F+)	DW	0.4	0.32
Oct	13(E-)	16(E)	14(E-)	13(E-)	DW	1.1	0.07
Nov.	17(E)	24(E)	15(E-)	14(E)		1.3	0.61
Dec.	30(D)	35(D)	37(D+)	33(D)	WW	87	4.22
Jan. '17	61(B)	66(B)	49(C+)	56(B)	WW	105	3.01
Feb.	46(C)	70(B)	39(D+)	44(C)	WW	93	3.14
March	82(A)	95(A+)	64(B)	76(A-)	WW	23	0.07
April	31(D)	46(C)	29(D)	31(D)		6.3	0.02
May	43(C)	67(B)	33(D)	40(C)		6.9	0.92
June	22(E)	40(C)	31(D)	27(D-)		2.0	0.00
July	17(E)	10(F)	15(E-)	15(E-)	DW	1.0	0.00
Aug	18(E)	10(F)	12(F+)	14(E-)	DW	1.1	0.00
<b>Sept'17</b>	<b>15(E)</b>	<b>11(F)</b>	<b>11(F)</b>	<b>12(F+)</b>	DW	1.1	0.08

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River as determined over the past 13 years of RiverWatch monitoring. June through September values (the summer months) for each year are expressed as color-shaded bars. Running average index values for LSDR (all sites) are shown as a heavy black line. Monthly values for the consistently highest/best quality reach (Mission Gorge) are shown as a blue line while the consistently lowest/poorest reach (Upper Santee Basin) are shown in red. The overall upward trend in the index over the first half of the water year has, with dry-weather, pretty much leveled off or 'plateaued'. Surface flow is absent at four monitoring sites; RCP/Cottonwood (14), Sycamore Ck/Santee Lakes (12), Mission Trails at Jackson (8) and Admiral Baker Field (?). Base flow from groundwater return, excess irrigation and coolant system water, via tributary drains and small creek beds, constitute the primary sources of dry-weather stream flow.

Monthly WQI values extending from Oct. 2004 through Sept. 2017 are presented in **Chart 1** (next page) together with 12-month running averages (trend-lines) for each of the five principal reaches of the river and overall (i.e., for Lower SDR). The current running average WQI for the LSDR of 33 is only 3% below the 13-yr norm. In comparison, a year ago (Sept. 2016) the running average WQI was 28 (16% below the 12-yr norm). The elevated DO values monitored in the lower river associated with extended wet-weather rainfall events through May have declined to typical low flow levels.

Monthly and 12-mo. running average WQI values for the poorest reach (Upper Santee Basin) and best Mission Gorge section are presented in **Chart 2** also on next page. Although water quality improved to some extent in the Upper Santee Basin over the first six months of this year, resurgent growth and decay of invasive aquatic plants such as primrose-willow (*Ludwigia hexapetala*) in conjunction with very low streamflows are considered primary causes of deterioration in current river water quality.

Spatial WQI results by site for the past three months of monitoring are shown on **Charts 3, 4 and 5** on page 6. September WQI values (color bars w/index values in black) declined considerably from July and also slightly from last month. During September of this year 86 percent (12 of 14) of the sites are in the Poor (E) or Very Poor (F) range (WQI>24) while only two sites were rated Marginal (D). Last month, 11 of 12 sites monitored were Poor (?) to Very Poor (4) while only one was found Marginal.

In summary, the overall water quality index for the lower river watershed area is expected to remain in the Poor to Very Poor range over the next month at most monitoring sites based on low dissolved oxygen levels and streamflow in conjunction with elevated specific conductivities and water temperatures. Dissolved oxygen concentrations are currently below threshold hypoxic levels (<2.5 mg/L or 30% Sat) at 50 percent (? out of 14) of the monitoring sites. Last year 60 percent (8 out of 13) of the sites were below hypoxic threshold levels. Some improvement in water quality is anticipated in October with increased streamflow, declining water temperatures and specific conductivity levels and rising dissolved oxygen concentrations.

jck (9/18/2017)

