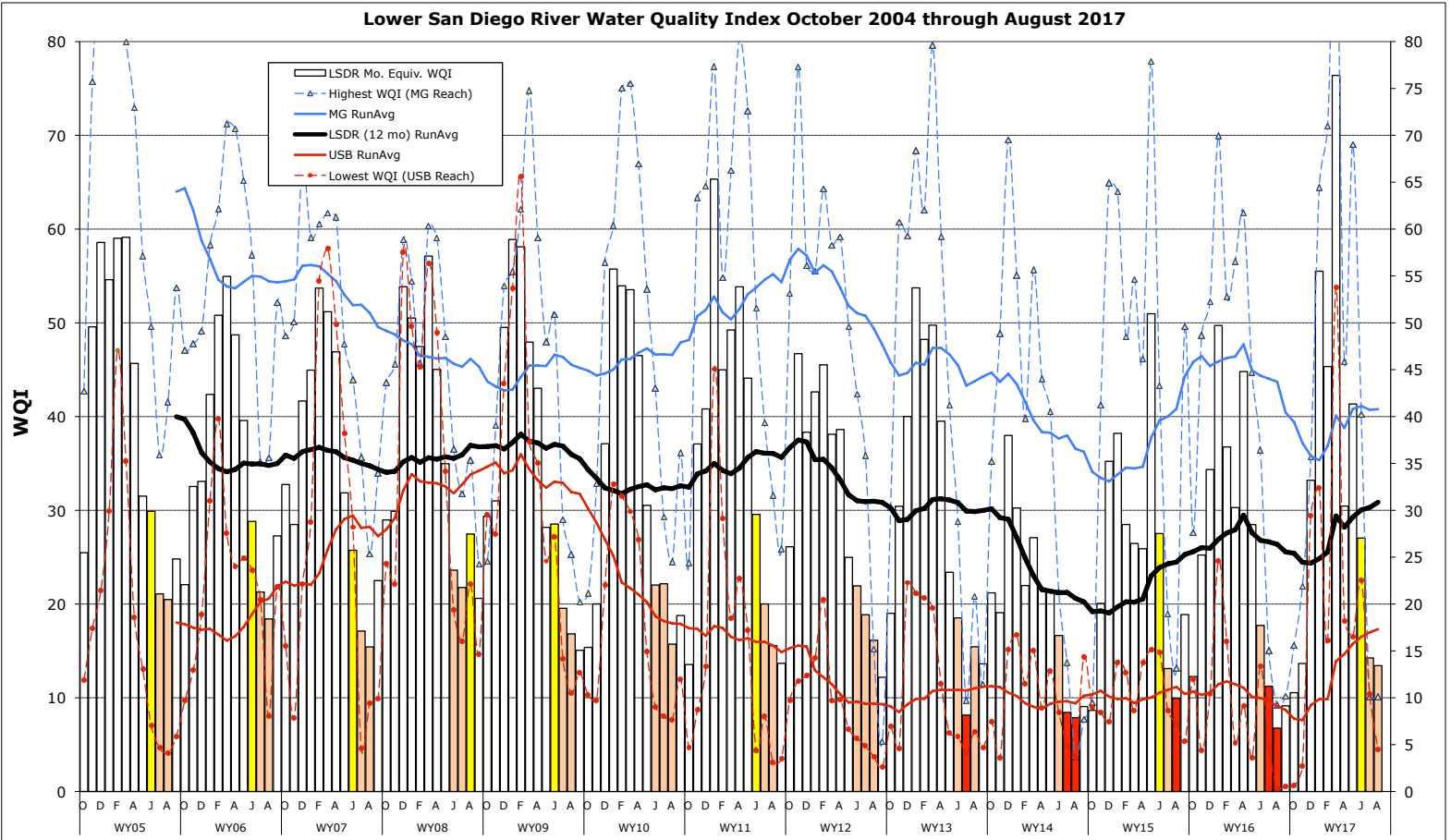


# Monthly WQM Report

## Lower San Diego River - August 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 (July and August) that constitute the middle months of summer. This year's August index is down one point from last month, at a value 6 points higher than last August (8) but 3 points under the 13-yr monthly average of 17. Overall water quality of the lower hydrologic unit (HSU 907.1) for August is rated Poor (E-), down one index point (-1%) from July, 2017 at 16% below the 13-yr monthly average.

<b>Table 1 - July/Aug 2017 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] July/Aug	[8-10] July/Aug	[11-15] July/Aug	[1-15] July/ <b>Aug</b>	Last Mo (7/'17)	Last Yr (8/'16)	13-Yr Avg (Aug)
Temperature, oC	25.5/23.8	24.0/22.1	23.6/22.1	24.4/ <b>22.7</b>	-7%	-3%	-2%
Sp.Cond., mS/cm	3.31/3.50	2.20/2.35	2.29/2.23	2.73/ <b>2.77</b>	2%	-16%	-5%
DO, mg/L	<b>2.58/2.70</b>	<b>3.47/3.97</b>	<b>3.49/3.00</b>	<b>3.22/2.99</b>	-8%	24%	-18%
DO, % of Sat.	<b>32/32</b>	41/44	42/35	<b>39/35</b>			
pH	7.72/7.68	7.76/7.77	7.80/7.78	<b>7.77/7.67</b>	-1%	1%	0%
30-day ADF, cfs	2.5/2.6	1.0/0.9	0.5/0.4	1.3/ <b>1.3</b>	0%	265%	-45%
WQ Index	18/ <b>19</b>	10/ <b>10</b>	14/ <b>12</b>	15/ <b>14</b>	-1%	80%	-16%
Grade(Jly/ <b>Aug</b> )	<b>E/E</b>	<b>F/F</b>	<b>E-/F+</b>	<b>E/E-</b>			
July 2017/ <b>August 2017</b>	<b>Poor/ Poor</b>	<b>VeryPoor/ Very Poor</b>	<b>Poor/ VeryPoor</b>	<b>Poor/ Poor</b>	<b>Overall WQI down 1 point from last month</b>		

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

Overall, LSDR **water temperatures** are down 7% (1.7°C) from last month, 3% (0.8°C) below last August and 2% (0.5°C) below the 13-yr monthly norm of 23.2 °C. **Specific conductivities** rose 2% from last month but remains 16% below August of last year at 5% below the 13-yr monthly norm of 2.93 mS/cm. The overall **dissolved oxygen** level of 2.99 mg/L is down 8% from last month, considerably above (24%) last August but remaining 18% percent below the 13-yr monthly norm of 3.66 mg/L. **Streamflow** over the antecedent 30-day period of 1.3 cfs, about the same as last month (1.2 cfs), is 2.65 times greater than last August but is less than half (45%) the 13-yr norm of 2.4 cfs. This month's LSDR **water quality index** (WQI) of 14(E-) is one point below last month's value of 15 yet considerably above (6 points) a year ago August.

Conclusion:

The Lower San Diego River water quality index remains **Poor**, down one point from **15 (E) to 14 (E-)** 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 river system as well as the overall LSDR average are listed in **Table 2** along with average daily flow (ADF) and total monthly rainfall (MRF).

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Aug. 2015 - Aug. 2017)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Aug '15	8(F)	13(E-)	15(E)	12(F+)	DW	2.7	0.00
Sept	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	0.8	0.07
Nov.	16 (E)	22(E)	14(E-)	16(E)		1.2	0.61
Dec.	30(D)	36(D)	37(D+)	34(D)	WW	19.4	4.22
Jan. '17	62(B)	64(B)	49(C+)	57(B)	WW	128.2	3.01
Feb.	49(C+)	71(B)	36(D+)	48(C)	WW	122.8	3.14
March	82(A)	95(A+)	63(B)	77(A-)	WW	176.6	0.07
April	31(D)	46(C)	28(D)	32(D)		9.2	0.02
May	43(C)	69(B)	34(D)	45(C)		17.8	0.92
June	22(E)	40(C)	31(D)	29(D-)		3.2	0.00
July'17	18(E)	10(F)	14(E-)	15(E)	DW	1.3	0.00
<b>Aug'17</b>	19(E)	10(F)	12(F+)	14(E-)	DW	1.3	0.00

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, July and August (the first three months of the summer season) values 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 the advent of dry-weather, now pretty much leveled off or 'plateaued'. Surface flow is now absent at four monitoring sites; RCP/Cottonwood (14), Sycamore Ck/Santee Lakes (12), Old Mission Dam (10) and Mission Trails at Jackson (8). Base flow from groundwater return and excess irrigation water, via tributary drains and creek beds, constitute the primary sources of stream flow.

Monthly WQI values extending from Oct. 2004 through Aug. 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 (Aug 2016) the running average WQI was 26 (17% below the 12-yr norm). The elevated DO values monitored in the lower river that were associated with extended wet-weather rainfall events are now declining rapidly with return to low flow conditions.

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 consequent degradation) of invasive aquatic plants such as primrose-willow (*Ludwigia hexapetala*) and extremely low streamflow 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. August WQI values (color bars w/index values in black) have declined significantly from June and also noticeably from last month. During August of this year 92 percent (11 of 12) of the sites were in the Poor (E) or Very Poor (F) range (WQI > 24) while only one was rated Marginal (D). Last month, 12 of 14 sites monitored were Poor (8) to Very Poor (4) while only two were found Marginal. Further decline in water quality at most sites can be anticipated throughout the last month of summer assuming continued dry weather and above normal air temperature.

In summary, the overall water quality index for the lower river watershed area is expected to further decline over the next month or two at most monitoring sites based on declining dissolved oxygen levels and streamflow in conjunct with elevated specific conductivity and water temperatures. Dissolved oxygen concentrations that are currently at threshold levels are anticipated to reach hypoxic limits (<2.5 mg/L or 30% Sat) at multiple monitoring sites throughout of the lower river this coming month.

jck (8/31/2017)

