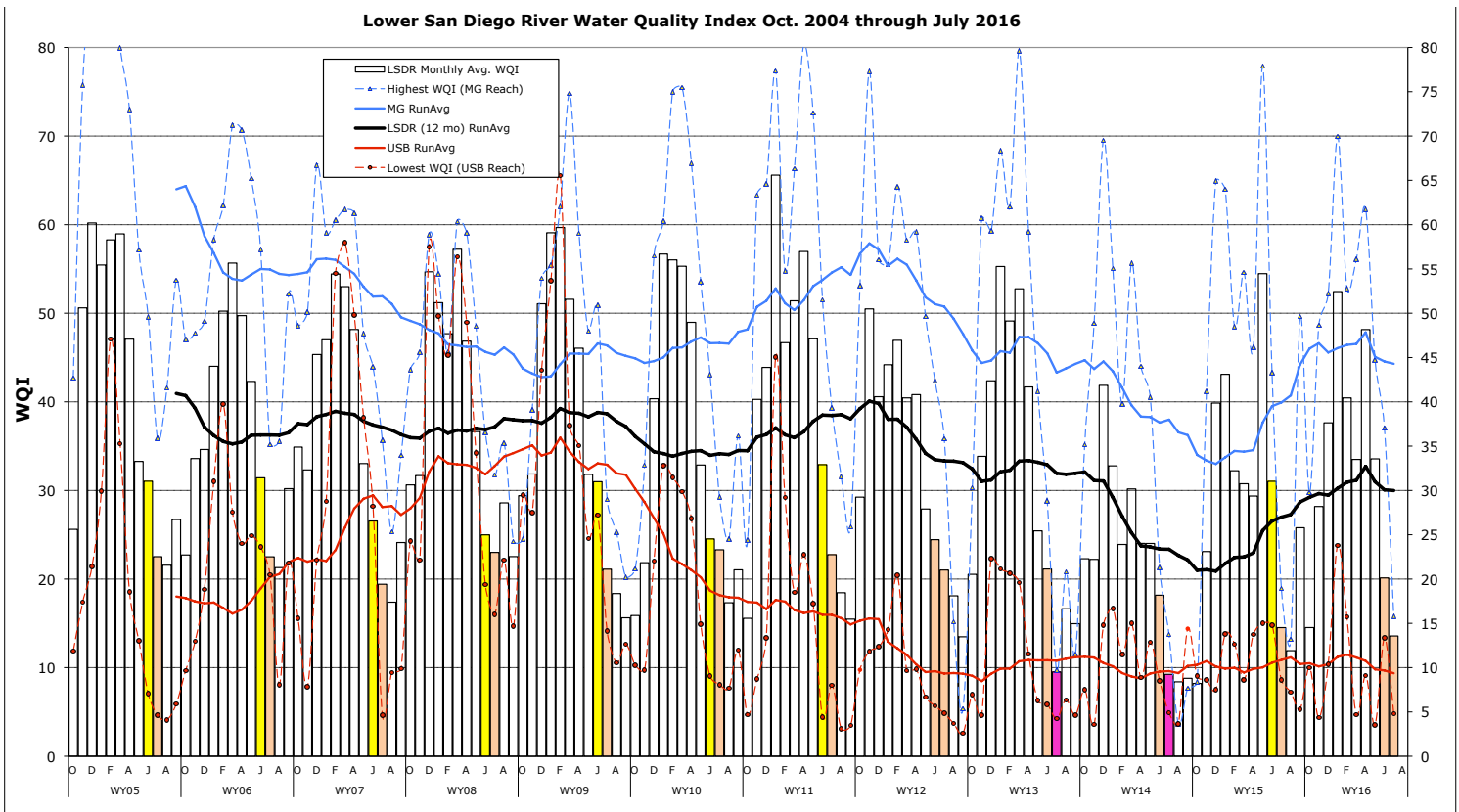


# Monthly WQM Report

## Lower San Diego River - July 2016



## 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. June and July constitute the first two months of summer. This month's water quality index values are down from last month, lower than last July and below the 12-yr norms for all reaches of the river. Overall quality has continued to decline.

<b>Table 1 - July/June 2016 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	<b>LSDR</b>	Percent Variance from		
[Sites]	[1-7] July/June	[8-10] July/June	[11-15] July/June	<b>[1-15] July/June</b>	Last Mo (6/2016)	Last Yr (7/2015)	12-Yr Avg (July)
Temperature, oC	24.3/22.6	23.1/19.9	22.7/19.9	<b>23.3/20.9</b>	12%	3%	2%
Sp.Cond., mS/cm	3.60/3.01	2.48/2.08	2.27/2.02	<b>3.01/2.59</b>	16%	45%	8%
DO, mg/L	<b>3.17/2.67</b>	5.78/8.01	<b>3.76/4.09</b>	<b>3.44/4.06</b>	-12%	3%	-8%
DO, % of Sat.	<b>39/32</b>	68/87	<b>45/46</b>	<b>41/46</b>			
pH	7.59/7.63	7.61/7.91	7.31/7.49	<b>7.45/7.58</b>	-2%	-6%	-3%
ADF, cfs	01.1/1.6	0.5/0.8	0.3/0.5	<b>0.6/1.0</b>	-36%	-99%	-70%
WQ Index	15/15	16/37	12/18	<b>14/20</b>	-33%	-7%	-27%
Grade(May/June)	E/E	E/D	F/E	<b>E-/E</b>			
<b>June Grade</b>	Poor	Poor	Very Poor	<b>Poor</b>	<b>Down 6 pts from last mo.</b>		

DO values in red indicate general hypoxic (DO < 4 mg/L) conditions.

Overall, LSDR **water temperature** is up 2.4 degrees Celsius (12%) from last month, at 3% above last July and 2% higher than the 12-yr monthly norm (22.9° C). **Specific conductivities** have increased 16% from last month and are now 45% above last July and 8% higher than the 12-yr monthly norm. **Dissolved oxygen** levels are down 12% from last month, at 3% above last July but 8% below the 12-yr monthly norm of 3.8 mg/L. **Streamflows** declined 36% from last month, nearly 100% below last July and 70% lower than the 12-yr norm of 1.5 cfs. This month's LSDR **water quality index** (WQI) of 14(E-) is down 6 points (33%) from last month's value of 20(E), 7% less than a year ago and 27% below the 12-yr July norm of 19(E).

Conclusion:

The LSDR water quality index fell another 6 points,  
dropping from **20 (E) to 14 (E-)** over the last 30 days.

A summary of WQI values occurring over the past two years of record for the three main sections of the lower river system as well as the LSDR overall average are listed in **Table 2** along with average daily flow (ADF) and total monthly rainfall (TRF).

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (July 2014 - July 2016)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	TRF, in
July'14	8(F)	14(E)	8(F)	9(F)	DW	0.6	0.0
Aug	11(F)	4(F)	8(F)	8(F)	DW	0.7	0.01
Sept	5(F)	8(F)	13(E-)	9(F)	DW	1.2	0.05
Oct	7(F)	8(F)	9(F)	8(F)	DW	0.4	0.01
Nov	12(F+)	41(C)	24(E+)	23(E)		3.1	0.37
Dec	35(D)	65(B)	32(D)	40(C)	WW	35.6	4.5
Jan.'15	37(D+)	64(B)	39(C-)	43(C)		10.3	0.38
Feb.	28(D)	48(C+)	29(D)	32(D)		6.1	0.18
March	24(E+)	55(B)	26(D-)	31(D)		14.6	0.93
April	24(E+)	46(C)	27(D-)	29(D)	DW	2.2	0.02
May	55(B)	78(A-)	41(C)	54(B)		13.3	2.4
June	26(D-)	43(C)	31(D)	31(D)	DW	2.1	0.01
July	12(F)	19(E)	15(E)	15(E)		14.9	1.71
Aug	8(F)	13(E-)	15(E)	12(F+)	DW	1.4	0.0
Sept	8(F)	50(B-)	32(D)	26(D-)		6.0	1.25
Oct	5(F)	30(D)	17(E)	15(E)		4.3	0.42
Nov	28(D)	49(C+)	20(E)	29(D)		9.9	1.53
Dec.	40(C)	52(B)	29(D)	38(C-)		14.0	0.45
Jan.'16	54(B)	70(B)	42(C)	53(B)	WW	91.7	3.21
Feb.	40(C)	53(B)	35(D)	41(C)		9.6	0.05
March	32(D)	57(B)	25(D-)	34(D)		14.4	0.72
April	63(B)	59(B)	26(D-)	47(C)		9.9	0.55
May	38(C)	45(C)	26(D-)	34(D)		6.4	0.43
June	15(E)	37(D)	18(E)	20(E)	DW	1.1	0.02
July'16	15(E)	16(E)	12(F+)	14(E-)	DW	0.7	0.00

WQI values are expected to continue in decline at most monitoring sites over the next month.

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River determined over the past 12 years of RiverWatch monitoring. The first two months of summer (June/July) values for each of the past 12 years are expressed as colored-shaded bars. Running average index values for LSDR (flow-weighted for all 15 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. This month's values are below those from last July but slightly above the two previous years (July 2014 and 2013). A declining (negative slope) trend can be expected through the remainder of this summer's season assuming continued hot, dry conditions. Summer rainstorms occurring last year (in July and September) had a positive impact on WY15 river water quality.

Monthly WQI values extending from Oct. 2005 through July 2016 are presented in **Chart 1** (next page) together with 12-month running averages (trend-lines) for each of the five individual reaches and overall (i.e., for LSDR). The current overall running average WQI for the LSDR of **30** remains 13% below the 12-yr annual norm of 34. Although there were notable improvements in water quality for multiple reaches of the lower river watershed over the winter season, very poor water quality conditions have persisted most notably in the upper (eastern) reach of the Santee Basin segment while conditions in the Mission Gorge and Mission Valley segments have been rapidly declining.

Monthly and 12-mo. running average WQI values for the poorest site (13-Mast Park) and best Mission Gorge reach (Sites 8-10) are presented in **Chart 2** (also on next page). Water quality at Sites 13 and 14 remain Very Poor (F-). Excessive growth of the invasive non-native aquatic plant, floating primrose-willow (*Ludwigia hexapetala*/L. *peplodes*) observed throughout much of the slower-moving reaches of the river, are considered a major contributor of recurrent dissolved oxygen deficits ( $DO < 4.0$  mg/L) and resultant poor to very poor water quality index values during the past five years. Average daily flow in the upper segment of the river is less than 50 gallons per minute ( $< 0.3$  cfs) for July.

Spatial WQI results for the past three months of monitoring are shown in **Charts 3, 4 and 5** on page 6. WQI values (color bars w/index values in black) have changed most noticeably in the upper Mission Valley and Mission Gorge reaches. The number of sites in the Very Poor range (F) has increased from four to seven over the past month. Four sites are in the Poor range. Only three sites are in the intermediate quality range (C-D). The declines from May values monitored at all sites are also notable.

Water quality index values can be expected to continue in general decline over the next month at most monitoring sites assuming less streamflow, continued elevated water temperatures, greater biomass and further decomposition (eutrophication). Dissolved oxygen values at multiple sites are likely to fall in the anoxic zone ( $< 2$  mg/L) during mid-day with minimal recovery after dark. Additional sites are likely to remain in the hypoxic range with DO levels between 2 and 4 mg/L.

jck (7/18/2016)

