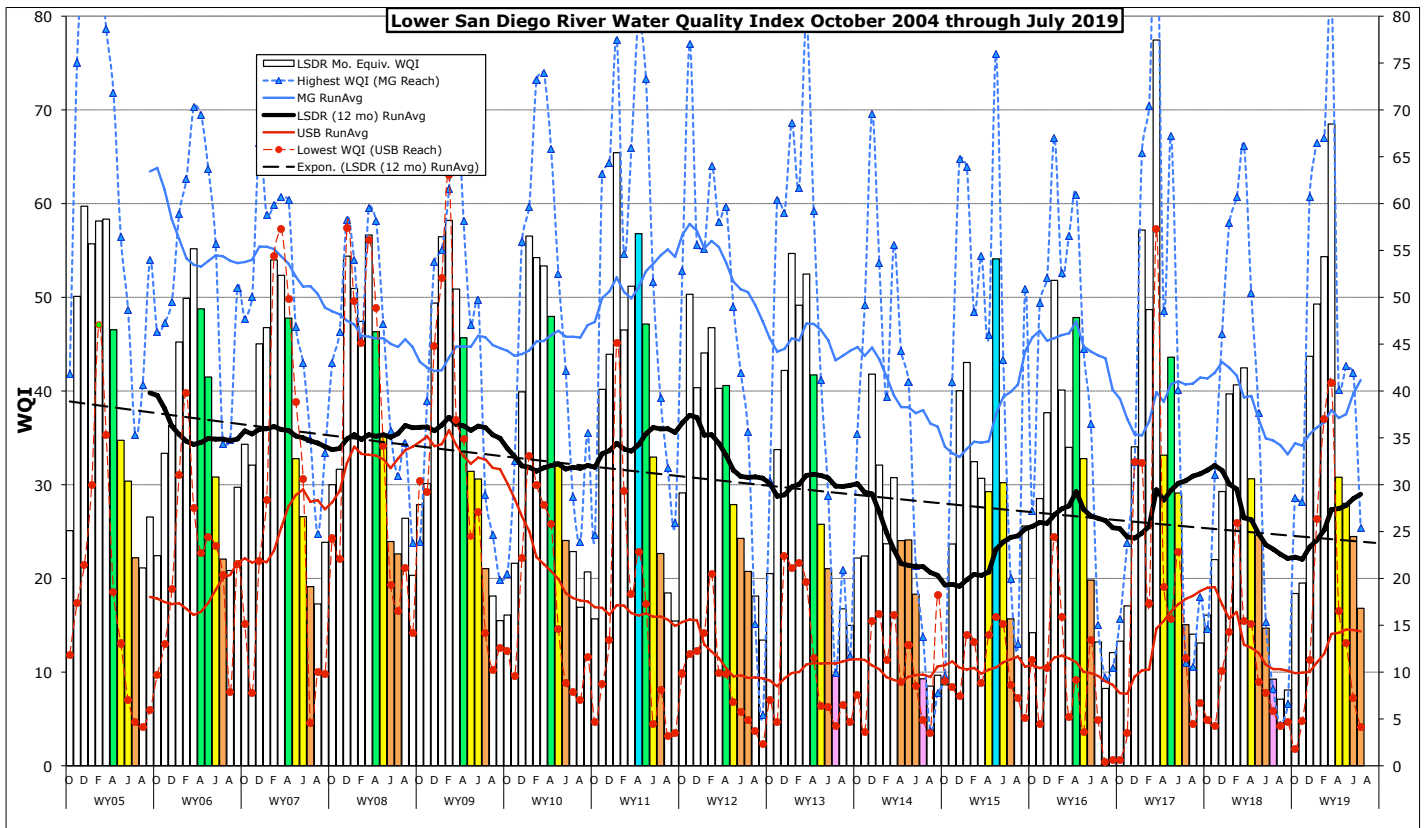


# Monthly WQM Report

## Lower San Diego River - July 2019



## Lower SDRWQ 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 last two months (July/June) that constitute the first two months of summer. The July index fell 7 points (-31%) from last month to 8 points (82%) above last July and one point above the 15-yr monthly average of 16. The overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) for the month is categorized as Poor (E).

<b>Table 1 - July/June 2019 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] July/June	[8-10] July/June	[11-15] July/June	[1-15] July/June	Last Mo (6'19)	Last Yr (7'18)	15-Yr Avg (July)
Temperature, oC	24.0/21.7	22.3/20.6	22.6/21.6	23.0/21.4	7%	-3%	-1%
Sp.Cond., mS/cm	3.14/2.57	2.09/1.87	2.04/2.02	2.57/2.25	14%	-17%	-6%
DO, mg/L	2.61/2.75	6.38/6.99	2.77/3.26	3.39/3.88	-12%	33%	-2%
DO, % of Sat.	31/32	73/77	32/37	40/44			
pH	7.70/8.03	7.88/8.08	7.83/8.23	7.77/8.14	-5%	4%	2%
3-day ADF, cfs	1.2/4.0	0.9/3.0	0.9/2.8	1.0/3.3	-69%	163%	-47%
WQ Index	17/21	25/42	13/20	17/24	-31%	82%	5%
Grade <b>July/June</b>	<b>E/E</b>	<b>D-/C</b>	<b>E-/E</b>	<b>E/E+</b>			
<b>July/ June 2019</b>	<b>Poor/ Poor</b>	<b>Marginal/ Fair</b>	<b>Poor/ Poor</b>	<b>Poor/ Poor</b>	<b>Index fell 7 points overall from last month</b>		

Negative variance (declines from norms) and DO deficit threshold (< 4.0 mg/L) expressed in red.

LSDR **water temperatures** rose 1.6 degrees (7%) from last month to 3% below last July and just one percent below the 15-yr norm of 23.2oC. The overall **specific conductivity** of 2.57 mS/cm constitutes a 14% increase from last month, remaining 17% below a year ago and 6% less than the 15-yr norm of 2.73 mS/cm. The overall **dissolved oxygen** level of 3.39 mg/L (40% Sat) is 12 percent below last month, but 33% greater than last July at 2% less than the 15-yr monthly norm of 3.51 mg/L. **Streamflow** over the antecedent 3-day period of 1.0 cfs is down 69% from last month at 163% above a year ago and -47% less than the 15-yr norm. This month's LSDR **water quality index** (WQI) fell 7 points (31%) from last month to a value 82% above last July to one point (5%) above the 15-yr July norm of 16.

Conclusion: The overall LSDR water quality index declined seven points from **24(E+)** to **17(E)** over the past 30 days, remaining within the grade of Poor.

Monthly WQI values occurring over the past 24 months of record for the three main sections of the lower San Diego River system and the overall LSDR average, are expressed in **Table 2** along with average 30-day antecedent flow (ADF) and monthly rainfall (MRF).

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (7/2017 - 7/2019)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
July'17	17(E)	11(F)	15(E-)	15(E)	DW	1.0	0.00
Aug	18(E)	11(F)	12(F+)	14(E-)	DW	1.0	0.00
Sept	15(E)	18(E)	9(F)	13(E-)	DW	0.9	0.08
Oct.	20(E)	15(E)	13(E-)	16(E)	DW	1.4	0.01
Nov.	25(D-)	31(D)	15(E)	22(E)		1.4	0.01
Dec.'17	26(D-)	46(C)	24(D-)	29(D)		2.3	0.02
Jan.'18	41(C)	58(B)	29(E+)	40(C)	WW	13	1.78
Feb.	41(C)	61(B)	31(D)	41(C)		4.4	0.36
Mar.	42(C)	66(B)	31(D)	42(C)	WW	22	0.95
April	31(D)	50(B-)	22(E)	31(D)		2.8	0.02
May	24(E+)	37(D+)	18(E)	24(E+)		2.3	0.12
June	12(F+)	15(E)	17(E)	15(E)	DW	1.3	0.00
July '18	12(F+)	8(F)	8(F)	9(F)	DW	0.7	0.00
Aug	8(F)	4(F)	8(F)	7(F)	DW	0.3	0.02
Sept	9(F)	7(F)	8(F)	8(F)	DW	0.3	0.00
Oct	24(D-)	29(D)	9(F)	18(E)		3.2	0.57
Nov	21(E+)	28(D)	14(E-)	19(E)		9.6	0.81
Dec.'18	54(B)	61(B)	25(D-)	44(C)	WW	48	3.02
Jan.'19	47(C)	66(B)	43(C)	49(C+)	WW	39	2.80
Feb.'	51(B)	67(B)	51(B-)	54(B)	WW	179	2.98
Mar.	76(A-)	82(A)	55(B)	68(B)	WW	25	1.28
April	33(D)	40(C)	24(E+)	31(D)		8.6	0.46
May	28(D)	43(C)	21(E)	28(D)		14.3	0.51
June	21(E)	42(C)	20(E)	24(E+)		4.3	0.38
July'19	17(E)	25(D-)	13(E-)	17(E)	DW	1.4	0.01

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River as determined over the past 15 years of RiverWatch monitoring. The April, May and June values (Spring and first month of Summer) for each year are expressed as color-shaded columns. Blue bars are B/Good (WQI>50), Green-C/Fair (38-49), Yellow-D/Marginal (25-37) and Brown-E with monthly values between 13 and 24. Running average index values for LSDR (average all sites) are shown as the 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 generally downward slope in index over the 15 year period can be attributed to below normal oxygen levels extending throughout protracted periods of low flow. The dashed black line represents an overall (straight-line) trend of -2.5% per annum decline in the index since late 2004. WY05 presented best overall water quality monitored during the past 15 years of monitoring. Poorest water quality was experienced during WY14 extending into early WY15.

Monthly WQI values extending from Oct. 2004 through July 2019 are presented in **Chart 1** (next page) together with 12-mo. running average trendlines for each of the five principal reaches of the river and overall (i.e., lower SDR). The current running average WQI of 29 is 6% below the 15-yr LSDR flow weighted average of 31 and six index points higher than a year ago July. The monthly low for July of 21 (31% below the norm) occurred in 2014. The highest running average WQI for July of 37 (19% above the monthly norm) occurred in 2011. The overall LSDR trendline, shown dashed in black, has fallen by approximately 15 index points (25%) over the span of 15 years. As in previous water years, monthly WQI values have decreased during the second half of the year.

Monthly and 12-mo. running average WQI values for the poorest reach (Upper Santee Basin) and best (Mission Gorge) are presented in **Chart 2**. Although water quality improved within the Upper Santee Basin over the past year, resurgent growth and subsequent decay of invasives such as primrose-willow (*Ludwigia hexapetala*) in conjunction with low flow and sediment accural (muck) are primary causes of deteriorated water quality both within this reach and the deeper portions of Mission Valley (Kaiser Ponds). The steepest downward trend (red dashed line) is associated with the poorest reach (Upper Santee Basin) encompassing monitoring sites 13 (Mast Park) and 14 (Magnolia/RCP).

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. The July results (color bars w/values in black) are lower than monitored in June and May. Last month, eight out of 15 sites (53% of total) were in the Fair(C) or Marginal(D) range while the remaining seven (47%) were Poor(E) or Very Poor(F). This month 11 out of 14 sites (79%) are Poor or Very Poor while the remaining three (11%) are Marginal. Dissolved oxygen depletion from algal and benthic demands constitute the primary drivers of the seasonal decline in water quality.

The July index is lower than last month due to depleted dissolved oxygen levels monitored throughout the upper and lower reaches of the river and continued reduction in streamflow. This month's index indicates the lower river system is likely to experience at or below normal dry-weather water quality in most reaches over the next several months. (7/22)

