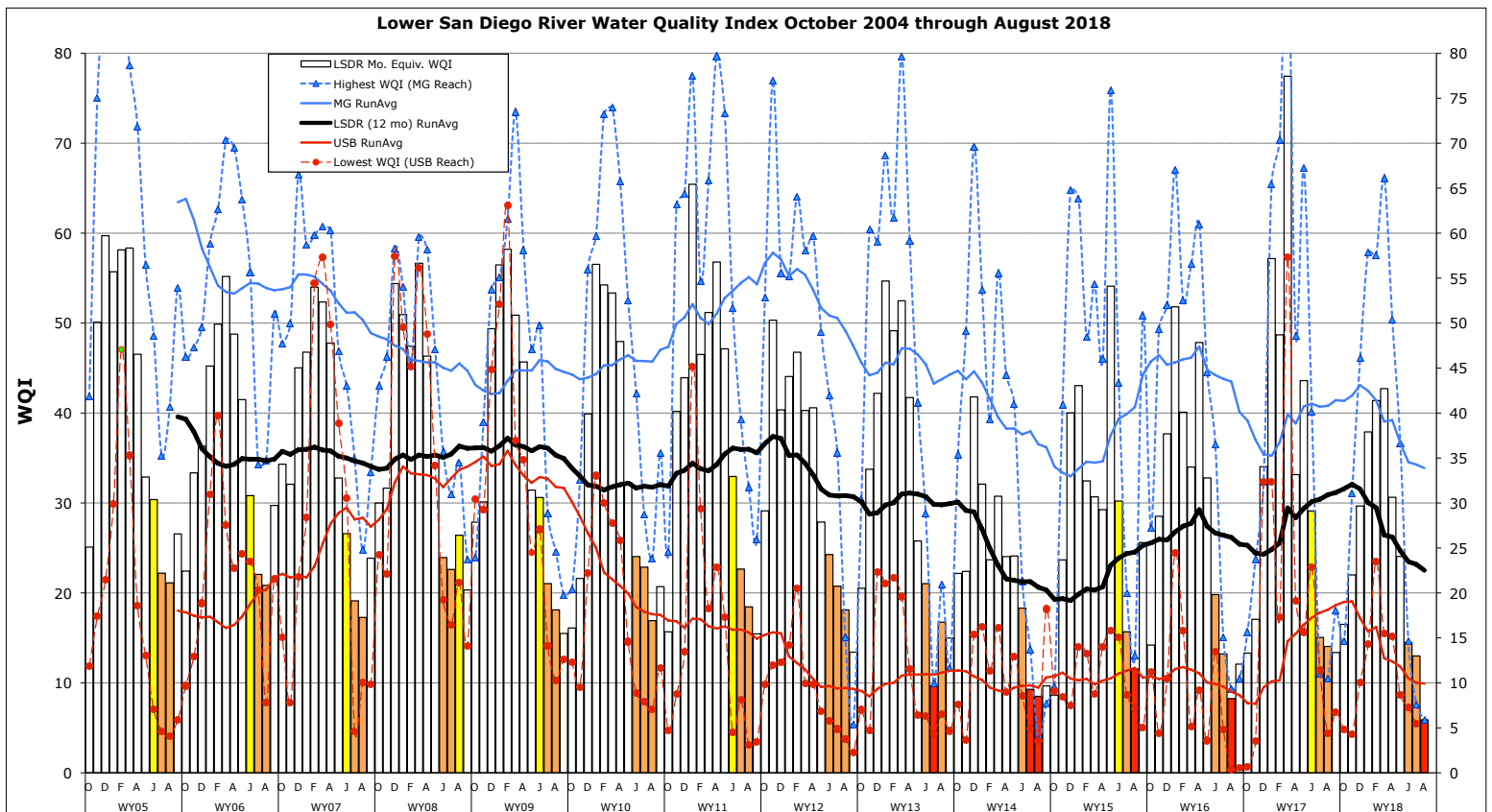


# Monthly WQM Report

## Lower San Diego River - August 2018



## 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) which constitute the middle two month of summer. The August index fell two points (15%) from last month and last year to one point (-11%) below the 13-yr monthly average of 18. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded Poor (E).

<b>Table 1 - July/Aug. 2018 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/Aug	Last Mo (7-'18)	Last Yr (8-'17)	13-Yr Avg (Aug)
Temperature, oC	24.8/25.4	23.2/23.7	23.2/24.3	23.8/24.5	3%	8%	6%
Sp.Cond., mS/cm	3.51/3.90	2.35/2.10	2.58/2.46	3.11/3.29	6%	19%	13%
DO, mg/L	2.13/2.43	3.61/3.74	2.33/3.05	2.54/2.94	18%	-2%	-15%
DO, % of Sat.	25/30	42/44	27/37	30/36			
pH	7.48/7.70	7.67/8.02	7.43/7.67	7.44/7.67	3%	0%	0%
3-day ADF, cfs	0.7/0.5	0.2/0.1	0.1/0.1	0.4/0.2	-27%	-74%	-87%
WQ Index	11/11	8/6	17/7	13/8	-15%	-11%	-8%
Grade(Jly/Aug)	F+/F+	F/F	E/F	E-/F			
July/ <b>Aug '18</b>	VaryPoor VeryPoor	VeryPoor VeryPoor	Poor/ VeryPoor	Poor/ <b>VeryPoor</b>	<b>Index down 5 points from last month</b>		

DO values below threshold limit of 4 mg/L (45 %Sat.) are expressed in red.

Overall, LSDR **water temperature** rose 0.7°C (3%) from last month, to 8% above last August and 6% above the 14-yr monthly norm of 23.2°C. **Specific conductivity** of 3.29 mS/cm rose 6% from last month to 19% above last year's monthly average and 13% greater than the 14-yr monthly norm of 2.91 mS/cm. The overall **dissolved oxygen** level of 2.94 mg/L (36%Sat.) is 18% above last month, 2% below a year ago and 15% below the 14-yr monthly norm of 3.59 mg/L (41%Sat.). **Streamflow** over the antecedent 3-day period of 0.2 cfs, is down 27% from last month to 74% below a year ago and 87% less than the 14-yr norm of 1.8 cfs. This month's LSDR **water quality index** (WQI) of 8(F/Very Poor) is five points (15%) lower than last month, 11% below a year ago and 8 points less than the 14-yr monthly norm of 16 (E/Poor).

Conclusion: The overall LSDR water quality index declined 5 points from **13 (E-/Poor)** to **8 (F/Very Poor)** over the past 30 days.

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 and the overall average, are expressed 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 (Aug. 2016 - Aug. 2018)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Aug '16	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.'16	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	1.0	0.00
Sept	15(E)	11(F)	9(F)	12(F+)	DW	0.9	0.08
Oct.	20(E)	15(E)	14(E)	17(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)	25(D-)	30 (D)		2.3	0.02
Jan.'18	41(C)	58(B)	24(E+)	38(C)	WW	13	1.74
Feb.	41(C)	58(B)	35(D)	41(C)		4.4	0.02
March	42(C)	66(B)	31(D)	43(C)	WW	26	1.51
April	31 (D)	50 (B-)	22 (E)	31 (D)		2.4	0.30
May	24 (E+)	37 (D+)	18 (E)	24 (E+)		1.4	0.12
June	12 (F+)	15 (E)	18 (E)	15 (E)	DW	0.7	0.00
July	11 (F)	8 (F)	17 (E)	13 (E-)	DW	0.4	0.00
Aug '18	11 (F)	6 (F)	7 (F)	8 (F)	DW	0.3	0.02

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River as determined over the past 14 years of RiverWatch monitoring. June, July and Aug. values (initial three months of summer) 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 or poorest reach (Upper Santee Basin) are shown in red. A downward trend in the index in WY18 can be attributed to low oxygen levels working in concert with below normal seasonal flow caused by well below average annual rainfall.

Monthly WQI values extending from Oct. 2004 through Aug. 2018 are presented in **Chart 1** (next page) together with 12-mo. running averages (trend lines) for each of the five principal reaches of the river and overall (i.e., for the lower SDR). The current running average WQI of 24 is 28% below the 14-yr LSDR norm of 33. In comparison, a year ago (Aug. 2017), the running average WQI was 34 (2%) above the norm. The previous August low of 22 occurred in 2014. All indications point toward a 2018 summer of Poor-to-Very Poor river water quality.

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 the next page. Although water quality improved to an extent in the Upper Santee Basin over the past year, resurgent growth and subsequent decay of invasive aquatic vegetation such as primrose-willow (*Ludwigia hexapetala*) in conjunction with low flows and large algal blooms are considered primary causes of deteriorated water quality both in the upper portion of the Santee Basin and the upper reach of Mission Valley.

Spatial WQI results by site for the past three months of monitoring are shown in **Charts 3, 4 and 5** on page 6. August WQI values (color bars w/index values in black) have declined at some sites from last month but improved at others. In mid-June 86% of the sites were Poor (6) or Very Poor (6) while the remaining two (14%) were Marginal. Last month 100% were Poor (7) or Very Poor (7). This month eight sites (57%) are Very Poor and six sites (43%) are Poor. Well below average rainfall throughout this water year has had a measurable impact on Lower San Diego River flow and resultant water quality.

In summary, the overall water quality index for the lower river watershed has continued in decline over the past month presenting a slow downward trend expected to persist through the rest of the dry-weather season. As shown on the cover page chart and in Charts 1 and 2, the running average WQI has declined since last November in all three sections of the lower river: Santee Basin, Mission Gorge and Mission Valley. The August index has been in the Very Poor (<12) realm four out of 14 years since monitoring was established in 2004. The index for August has been in the Poor (13-24) range a total of nine times and in the Fair range (25-37) only once (WY08). So far, this year's dry-weather season, although Poor overall, is not quite as bad as general water quality conditions experienced at many lower river monitoring sites several years ago. The September index is often a few points higher than the August index due to declining water temperatures and slightly higher dissolved oxygen levels.

JCK (8/31/18)

