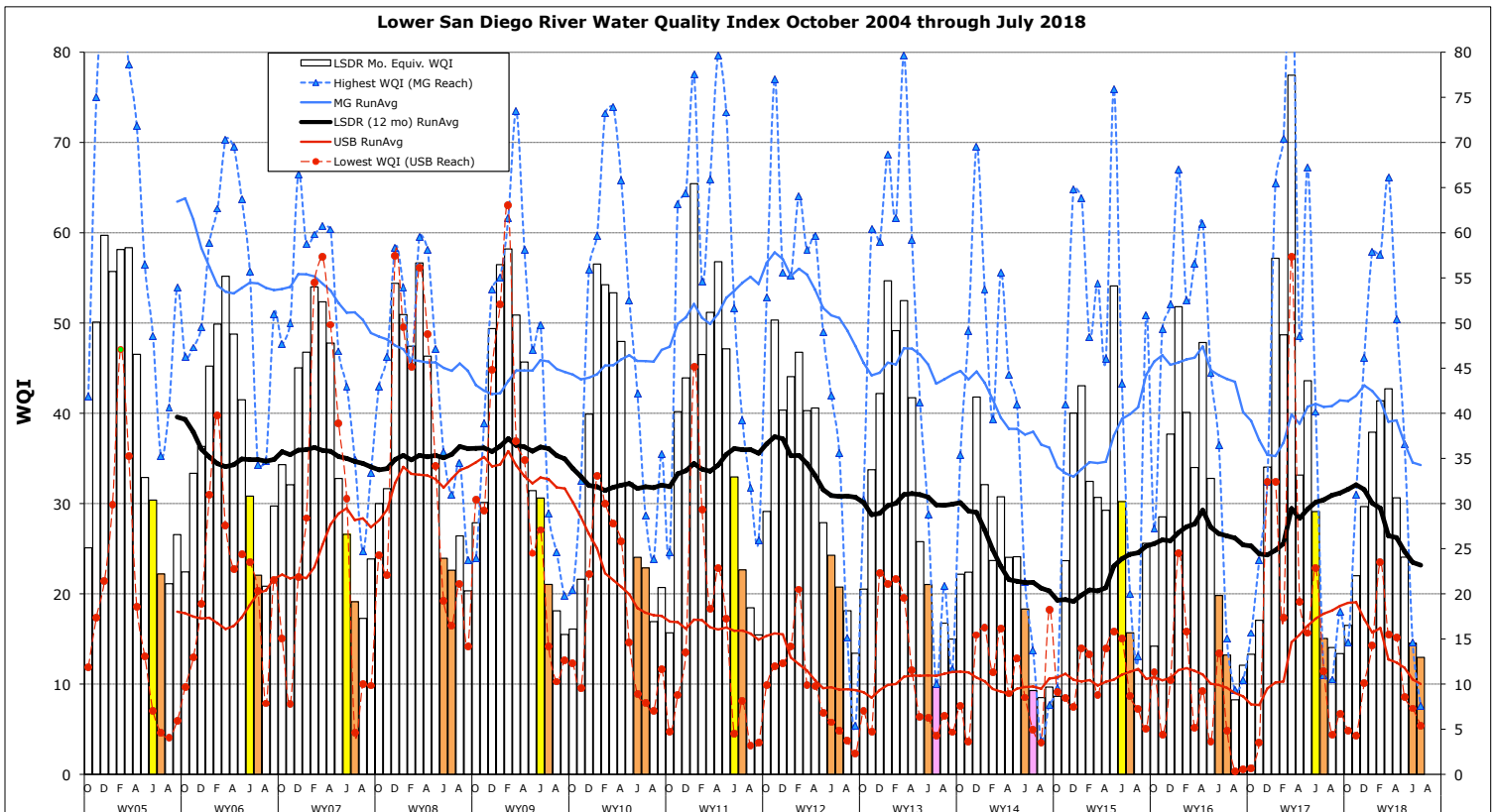


Monthly WQM Report

Lower San Diego River - July 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 (June and July) that constitute the initial months of Summer. The July index fell two points (-11%) from last month and last year to 5 points (-29%) 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-).

Table 1 - July/June 2018 WQM Data Summary							
	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-'18)	Last Yr (7-'17)	13-Yr Avg (July)
Temperature, oC	24.8/22.1	23.2/22.4	23.2/22.2	23.8/22.1	8%	-2%	3%
Sp.Cond., mS/cm	3.51/3.50	2.35/2.64	2.58/2.71	3.11/2.99	4%	14%	15%
DO, mg/L	2.13/1.75	3.61/5.40	2.35/3.61	2.54/3.36	-22%	-22%	-28%
DO, % of Sat.	25/20	42/55	27/41	30/37			
pH	7.48/7.68	7.67/7	7.21/7.76	7.31/7.73	-5%	-6%	-4%
3-day ADF, cfs	0.7/1.0	0.3/0.5	0.2/0.5	0.4/0.7	-48%	-68%	-82%
WQ Index	12/12	8/15	17/18	13/15	-11%	-14%	-29%
Grade(July/June)	F+/F+	F/E	E/E	E-/E			
July/ June '18	VeryPoor VeryPoor	VeryPoor/ Poor	Poor/ Poor	Poor/ Poor	Index down 2 points from last month		

DO values below threshold limit of 4 mg/L (42 %Sat.) are expressed in red.

Overall, LSDR **water temperature** rose 1.7°C (8%) from last month, to 2% below last July and 3% above the 13-yr monthly norm of 23.1°C. **Specific conductivity** of 3.11 mS/cm rose 4% from last month to 14% above last year's average and 15% greater than the 13-yr monthly norm of 2.71 mS/cm. The overall **dissolved oxygen** level of 2.54 mg/L (30%Sat.) is 22% below last month and a year ago and 28% below the 13-yr monthly norm of 3.59 mg/L (41%Sat). **Streamflow** over the antecedent 3-day period of 0.4 cfs, is down 48% from last month to 68% below a year ago and 82% less than the 13-yr norm of 2.0 cfs. This month's LSDR **water quality index** (WQI) of 13(E-/Poor) is 2 points (-11%) lower than last month and a year ago and 5 points (-29%) less than the 13-yr monthly norm of 18 (E/Poor).

Conclusion: The overall LSDR water quality index declined 2 points from **15 (E-/Poor)** to **13 (E-/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).

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (July 2016 - July 2018)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
July'16	14 (E)	15 (E)	12(F+)	13 (E-)	DW	0.5	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.'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	12 (F+)	8 (F)	17 (E)	13 (E-)	DW	0.4	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. May, June and July 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 or poorest reach (Upper Santee Basin) are shown in red. A downward trend in the index in WY18 can be attributed to below average oxygen levels acting in concert with below normal seasonal flow resulting from well below average annual rainfall.

Monthly WQI values extending from Oct. 2004 through July 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 26 is 25% below the 14-yr LSDR norm of 33. In comparison, a year ago (July 2017), the running average WQI was two percent above the 13-yr norm. The previous July low of 23 occurred in 2014. All indications suggest a continued 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 also presented in **Chart 2** 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.

Spatial WQI results by site for the past three months of monitoring are shown in **Charts 3, 4 and 5** on page 6. July WQI values (color bars w/index values in black) have declined at most sites from last month. In mid-June 86% of the sites were Poor (6) or Very Poor (6) while the remaining two (14%) were Marginal. This month 100% of the sites were Poor (7) or Very Poor (7). The low amount of rain throughout this year has a significant and measurable impact on lower San Diego river flow and water quality. The next several months of dry-weather monitoring can be expected to provide a clear indication as to the key cause(s) of such excursions from anticipated lows associated with common DO deficits.

In summary, the overall water quality index for the lower river watershed has been reasonably steady over the past month but continues a slow downward trend expected to persist through 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 July index has been in the Poor (13 to 24) realm 12 out of 14 years since monitoring was established in 2004; the other two years (WY13 and 14) were in the Very Poor range (0-12). It is beginning to look like this summer's season, although Poor overall, will not be quite as extreme as experienced at most monitoring sites during the peak of the last drought.

JCK (7/30/18)

Chart 1 - LSDR WQI Trendlines by River Reach (Sept. 2005 thru July 2018)

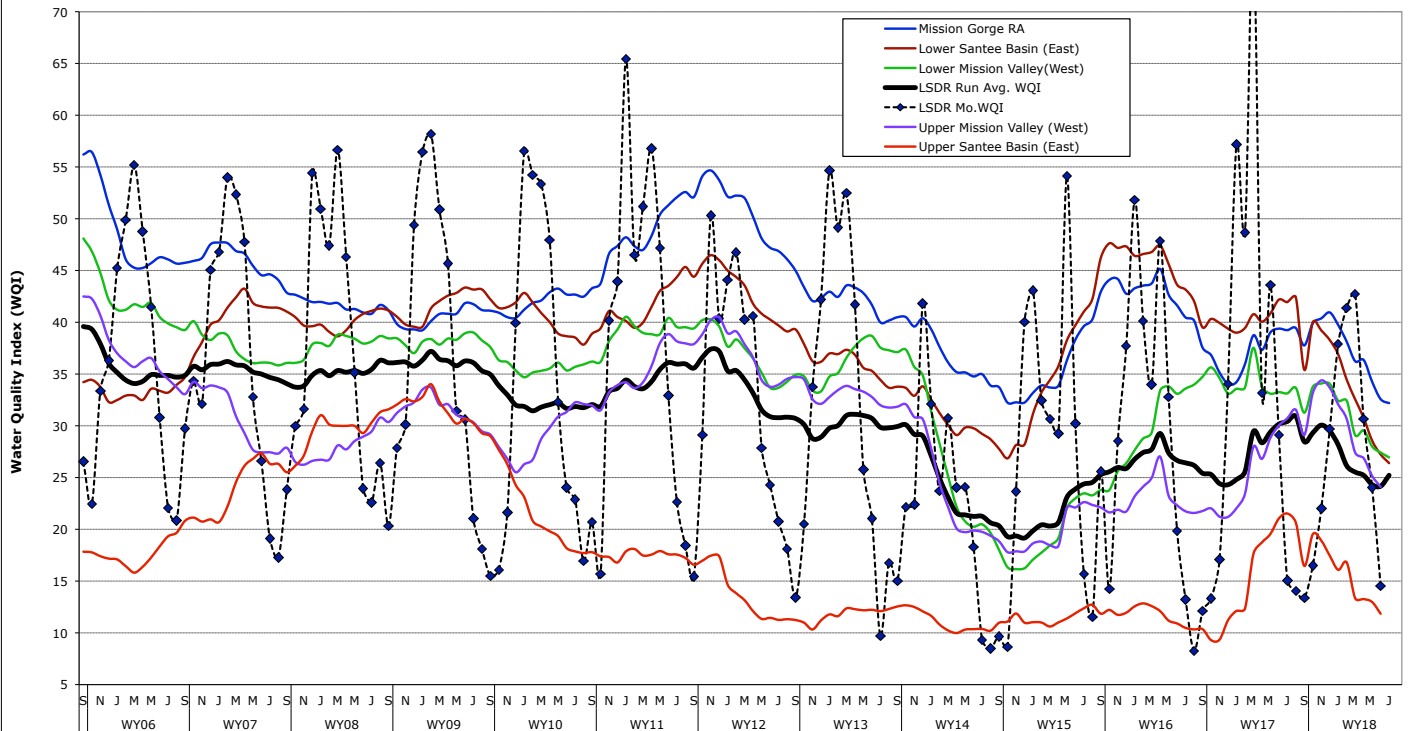


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

