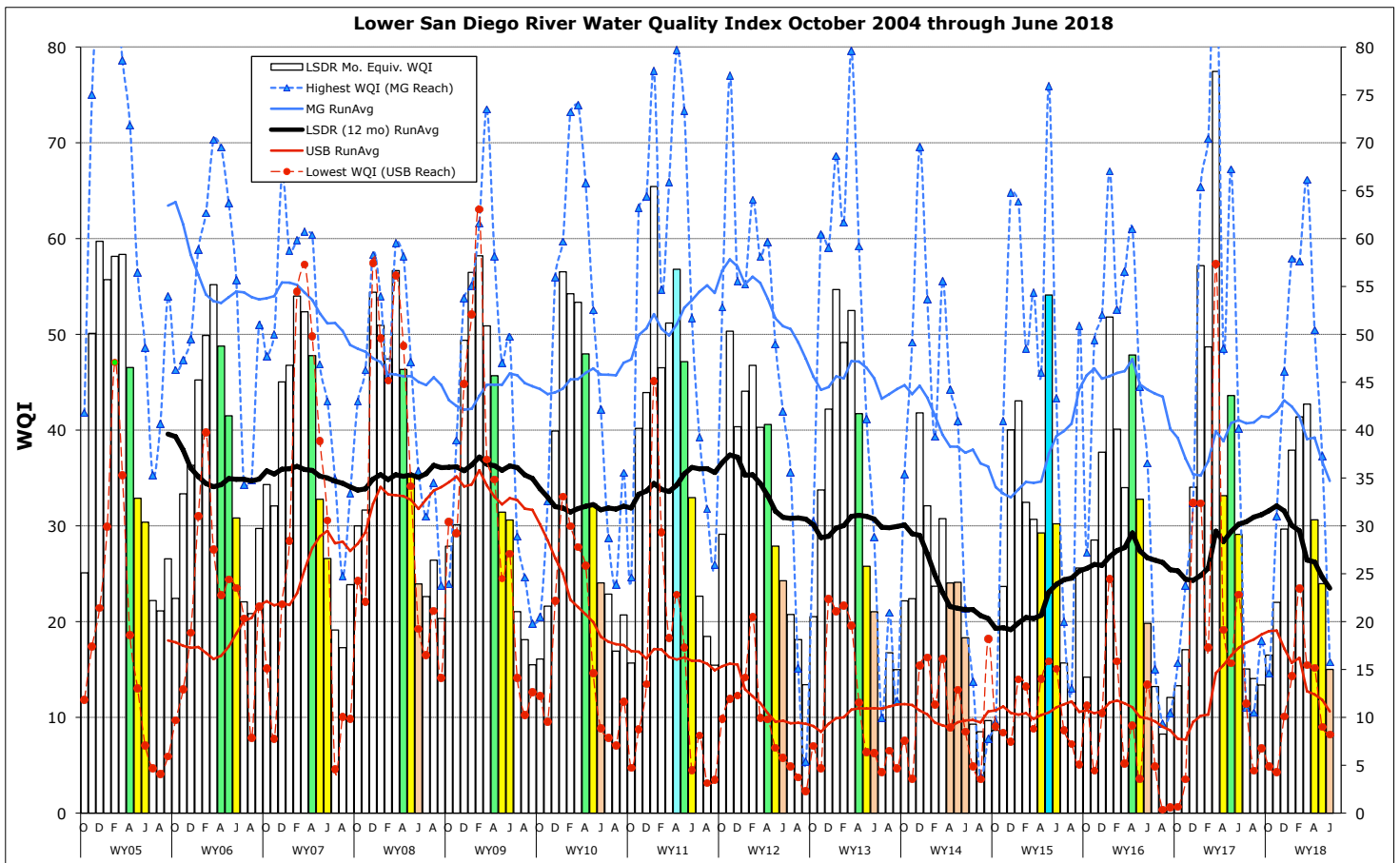


Monthly WQM Report

Lower San Diego River - June 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 (May and June) which constitute the last month of Spring and first month Summer. The June index fell nine points (-37%) from last month to 12 points below last year and 11 points (-43%) below the 13-yr monthly average of 26. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded Poor (E).

Table 1 - May/June 2018 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] May/June	[8-10] May/June	[11-15] May/June	[1-15] May/June	Last Mo (5/18)	Last Yr (6/17)	13-Yr Avg (June)
Temperature, oC	19.5/22.1	20.1/22.4	18.3/22.2	19.1/22.1	16%	-5%	0%
Sp.Cond., mS/cm	3.28/3.50	2.10/2.64	2.42/2.86	2.76/3.05	10%	27%	18%
DO, mg/L	3.64/1.75	7.90/5.40	3.87/3.61	4.53/3.36	-25%	-26%	-26%
DO, % of Sat.	40/20	87/55	41/40	49/37			
pH	8.09/7.68	8.13/7.62	8.10/7.76	8.10/7.73	-5%	-	0%
3-day ADF, cfs	1.6/0.7	1.2/0.7	1.1/0.7	1.3/0.7	-46%	-64%	-65%
WQ Index	22/11	37/16	19/19	24/15	-37%	-44%	-43%
Grade(M/June)	E/F	D+/E	E/E	E+/E			
May/ June '18	Poor/ Very Poor	Marginal/ Poor	Poor/ Poor	Poor/ Poor	Index down 9 points from last month		

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

Overall, LSDR **water temperature** rose 2.6°C (16%) from last month, to 5% below last June reaching the 13-yr monthly norm of 22.1°C. **Specific conductivity** of 3.05 mS/cm rose 10% from last month to 27% above last year's average and 18% greater than the 13-yr monthly norm of 2.58 mS/cm. The overall **dissolved oxygen** level of 3.36 mg/L (37%Sat.) is 25% below last month, and 26% below of a year ago and the 13-yr monthly norm of 4.51 mg/L (51%Sat.). **Streamflow** over the antecedent 3-day period of 0.7 cfs, is down 46% from last month to 64% below a year ago and 65% less than the 13-yr norm of 2.0 cfs. This month's LSDR **water quality index** (WQI) of 15 (E/Poor) is 9 points (-37%) less than last month, 12 points (-44%) below a year ago and 11 points (-43%) lower than the 13-yr monthly norm of 26 (D-/Marginal).

Conclusion: The overall LSDR water quality index declined 9 points falling 37 percent from **24 (E+/Poor)** to **15 (E/Poor)** over the last 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 (June 2016 - June 2018)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
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	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)	DW	1.4	0.01
Dec.'17	26(D-)	46(C)	25(D-)	30(D)	DW	2.1	0.02
Jan.'18	41(C)	58(B)	24(E+)	38(C)	WW	32	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	31	1.51
April	31(D)	50(B-)	22(E)	31(D)		2.1	0.30
May	22(E)	37(D+)	19(E)	24(E+)		1.7	0.12
June '18	11(F)	16(E)	19(E)	15(E)	DW	0.8	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. April, May and June 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 during the first half of WY18 is due to below average oxygen levels acting in concert with below normal seasonal streamflow caused from well below average annual rainfall.

Monthly WQI values extending from Oct. 2004 through June 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 for the LSDR of 25 is 25% below the 13-yr norm of 33. In comparison, a year ago (June 2017), the running average WQI was one percent above the 13-yr norm. A previous monthly low of 23 occurred in June 2014. All indications point toward a summer of 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 algal blooms are considered primary causes of inferior 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. June WQI values (color bars w/index values in black) have steadily declined at all sites from last month. In mid-April only 4 sites were in the Poor (E) or Very Poor (F) range and one Good; the remaining nine being intermediate (Marginal to Fair). By mid-May 50% of the sites were Poor (5) or Very Poor (2), while the other half were Marginal (6) or Fair (1). This June 86% of the sites (12) are Poor (6) or Very Poor (6) while the remaining two are Marginal. The lack of significant rainfall throughout the wet season has significant impact on lower San Diego river flow and water quality. This month's WQ index of 15 is the lowest value for June since the RiverWatch monitoring program was initiated in September 2004. The previous low (18) for the month of June occurred in 2014.

In summary, overall water quality index for the lower SDR watershed has further deteriorated over the past month; a trend that is expected to continue throughout the summer. As shown on the cover page chart and in Charts 1 and 2, the running average WQI has been declining since last November in all three sections of the lower river: Santee Basin, Mission Gorge and Mission Valley. June declines in running average WQI has occurred four times in the past 13 years (2006, 2012, 2014 and 2018). The index has been in the Marginal range three times since monitoring was established in 2005; 2015, 2017 and 2018. Well below average rainfall and resultant streamflow over the past six months constitute the primary causes.

JCK: (6/18/18)

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

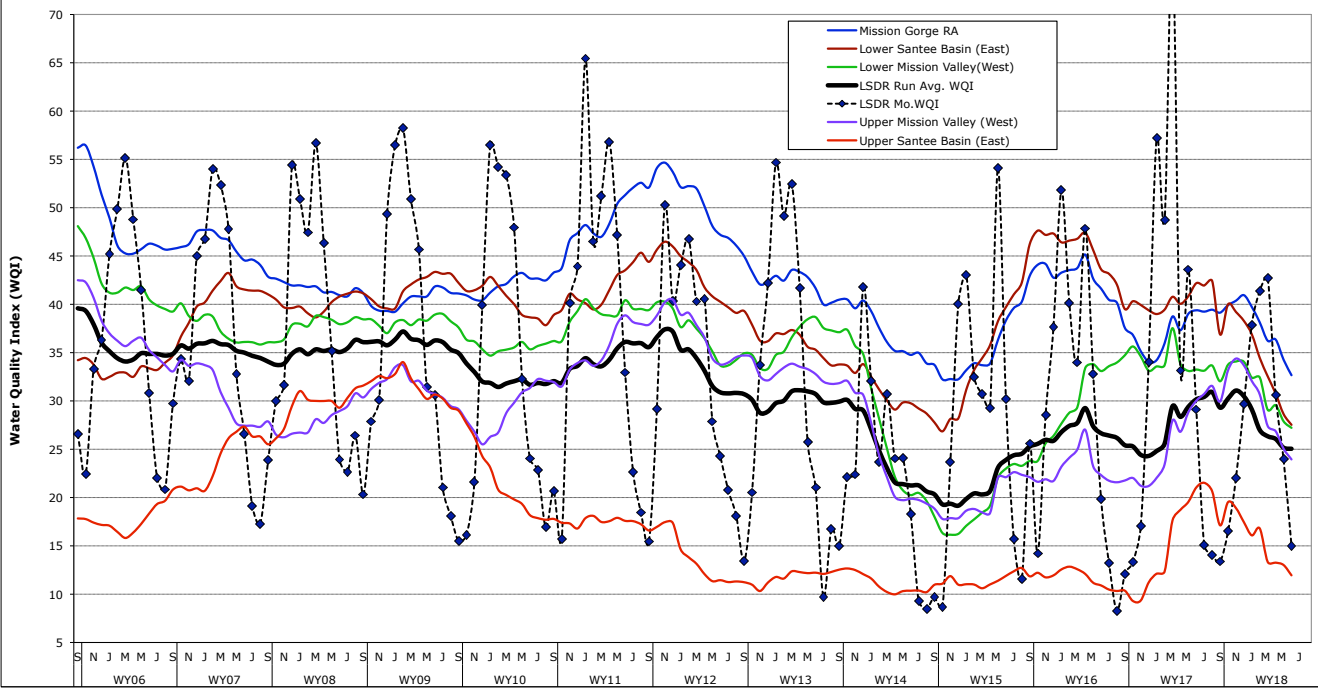


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

