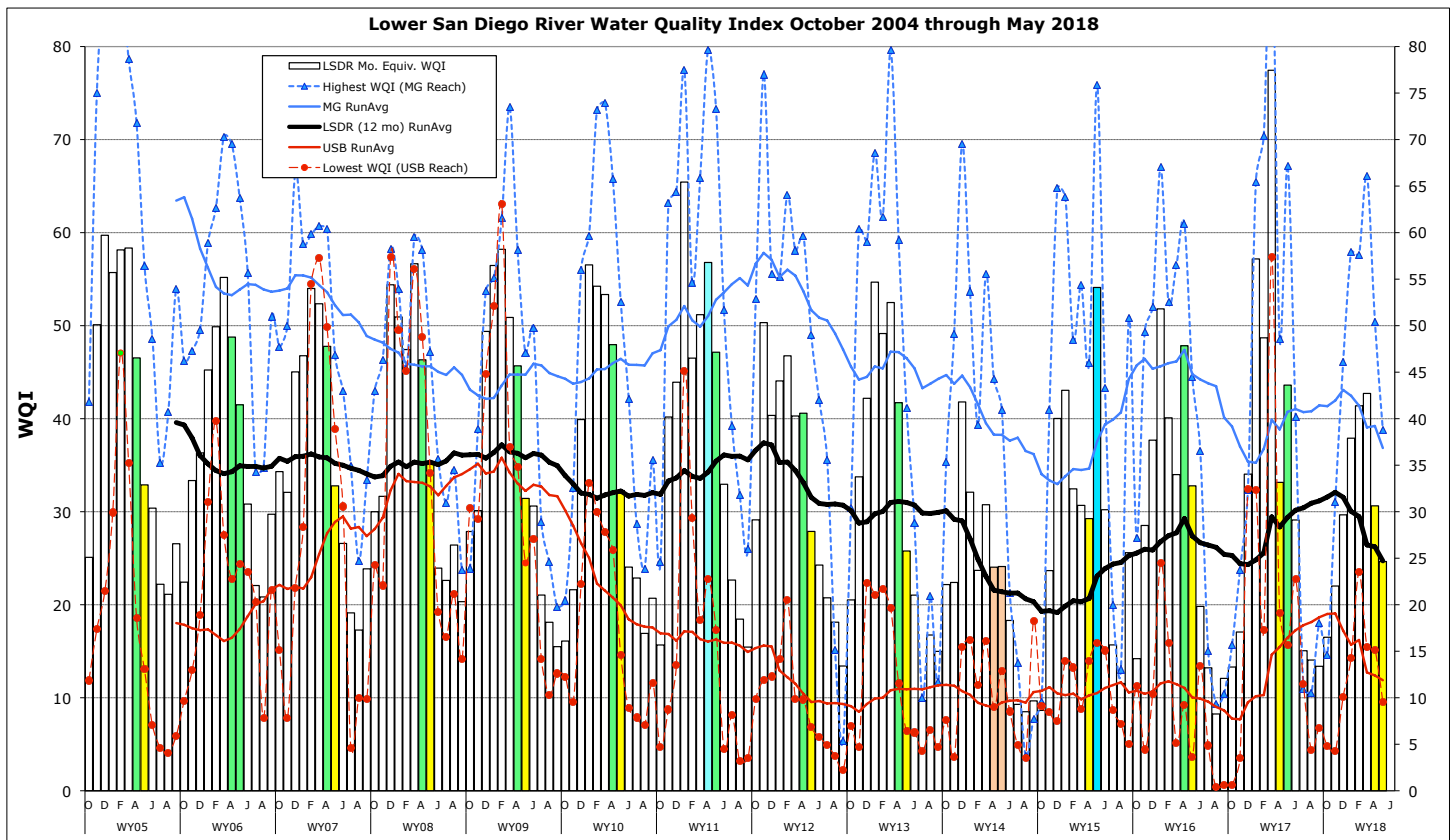


Monthly WQM Report

Lower San Diego River - May 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 April) which constitute the spring transitional period. The May index fell six points (20%) from last month to 16 points below (-39%) from last year and ten points (-31%) below the 13-yr monthly average of 35. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded as low Marginal (D-).

Table 1 - May/April 2018 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] May/April	[8-10] May/April	[11-15] May/April	[1-15] May/April	Last Mo (4/18)	Last Yr (5/17)	13-Yr Avg (May)
Temperature, oC	19.5/19.0	20.1/18.5	18.3/16.8	19.1/17.9	6%	-5%	-5%
Sp.Cond., mS/cm	3.28/2.53	2.10/1.76	2.42/1.84	2.76/2.15	28%	70%	24%
DO, mg/L	3.64/4.40	7.90/8.01	3.87/3.30	4.53/4.80	-5%	-25%	-14%
DO, % of Sat.	40/48	87/79	41/34	49/50			
pH	8.09/8.12	8.13/8.30	8.10/8.34	8.10/8.26	-2%	1%	6%
3-day ADF, cfs	1.6/1.3	1.5/2.4	1.4/2.5	1.5/2.1	-38%	-79%	-67%
WQ Index	22/31	39/50	20/22	25/31	-20%	-39%	-31%
Grade(May/Apr)	E/D	C/B	E/E	D-/D			
May 2018/ April '18	Poor/ Marginal	Fair/ Good	Poor/ Poor	Marginal/ Marginal	Index down 6 points from last month		

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

Overall, LSDR **water temperature** rose 1.2°C (6%) from last month, to a level 5% below last May and the 13-yr monthly norm of 20.2°C. **Specific conductivity** of 2.76 mS/cm climbed 28% from last month to 70% above last year's average value and 24% higher than the 13-yr monthly norm of 2.22 mS/cm. The overall **dissolved oxygen** level of 4.53 mg/L (49%Sat.) is 5% below last month, 25% below of a year ago and 14% below the 13-yr monthly norm of 5.26 mg/L (57%Sat). **Streamflow** over the antecedent 3-day period of 1.5 cfs, is down 38% from last month to 79% below a year ago and 67% less than the 13-yr norm of 4.4 cfs. This month's LSDR **water quality index** (WQI) of 25 (D-/Marginal) is 6 points (-20%) less than last month, 16 points (-39%) below a year ago and ten points (-31%) lower than the 13-yr monthly norm of 35 (D/Marginal).

Conclusion: The overall LSDR water quality index declined 6 points falling 20 percent from **31 (D/mid-Marginal)** to **25 (D-/low-Marginal)** 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 (May 2016 - May 2018)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
May '16	38(C)	45(C)	26(D-)	34(D)		5.8	0.43
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 '18	22 (E)	39 (C)	20 (E)	25 (D-)		1.7	0.12

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 and May values (the two months of spring) 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. An downward trend in the index during the first half of WY18 is due to below average oxygen levels in concert with below normal seasonal streamflow caused by well below average rainfall.

Monthly WQI values extending from Oct. 2004 through May 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 26 is 21% below the 13-yr norm of 33. In comparison, a year ago (May 2017), the running average WQI was only four percent below the 13-yr norm. The running average for this month reaches a low also occurring in 2015. The May high of 36 (15% above the 13-yr norm) occurred in 2006, 2008 and 2009. All indications point toward a forthcoming 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 flow and large 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. May WQI values (color bars w/index values in black) have further declined at many sites from last month. In mid-March only 7% (1 of 15) sites were in the Poor (E) or Very Poor (F) range while 60% (3 Marginal and 6 Fair) were in the 'Intermediate' range and 33% (5 of 15) were Good or better. By mid-April, 36% (5 of 14 sites monitored) were in the Poor (2) or Very Poor (3) range (WQI<25) while 57% (8 sites) were in the Intermediate range (4 Marginal and 4 Fair) with only one site observed as Good. By mid-May 50% of the sites were Poor (5) or Very Poor (2), while the other half were Marginal (6) or Fair (1). No sites were found Good or better. The lack of significant rainfall throughout the wet season has had significant impact on lower San Diego river water quality.

In summary, overall water quality index for the lower SDR watershed has further declined over the past month; a trend that is expected to continue throughout the dry season. 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. May 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 cause.

JCK: (5/21/18)

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

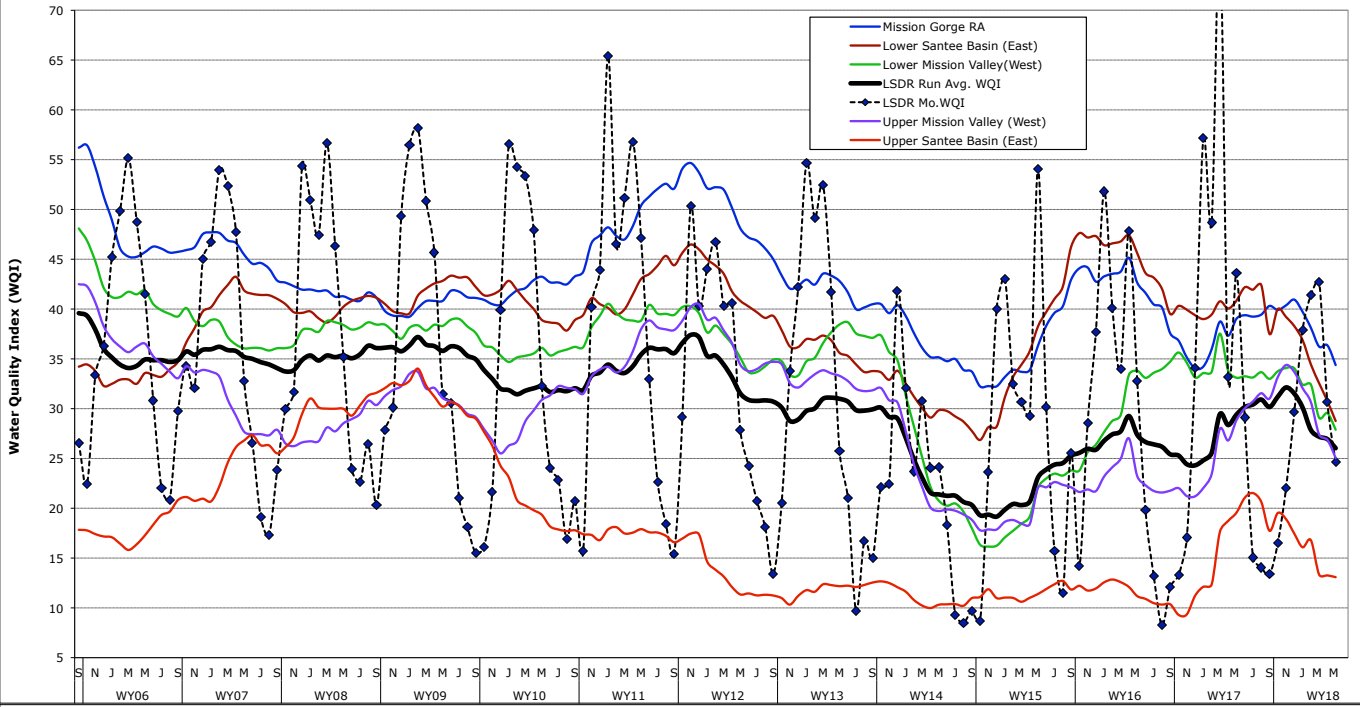


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

