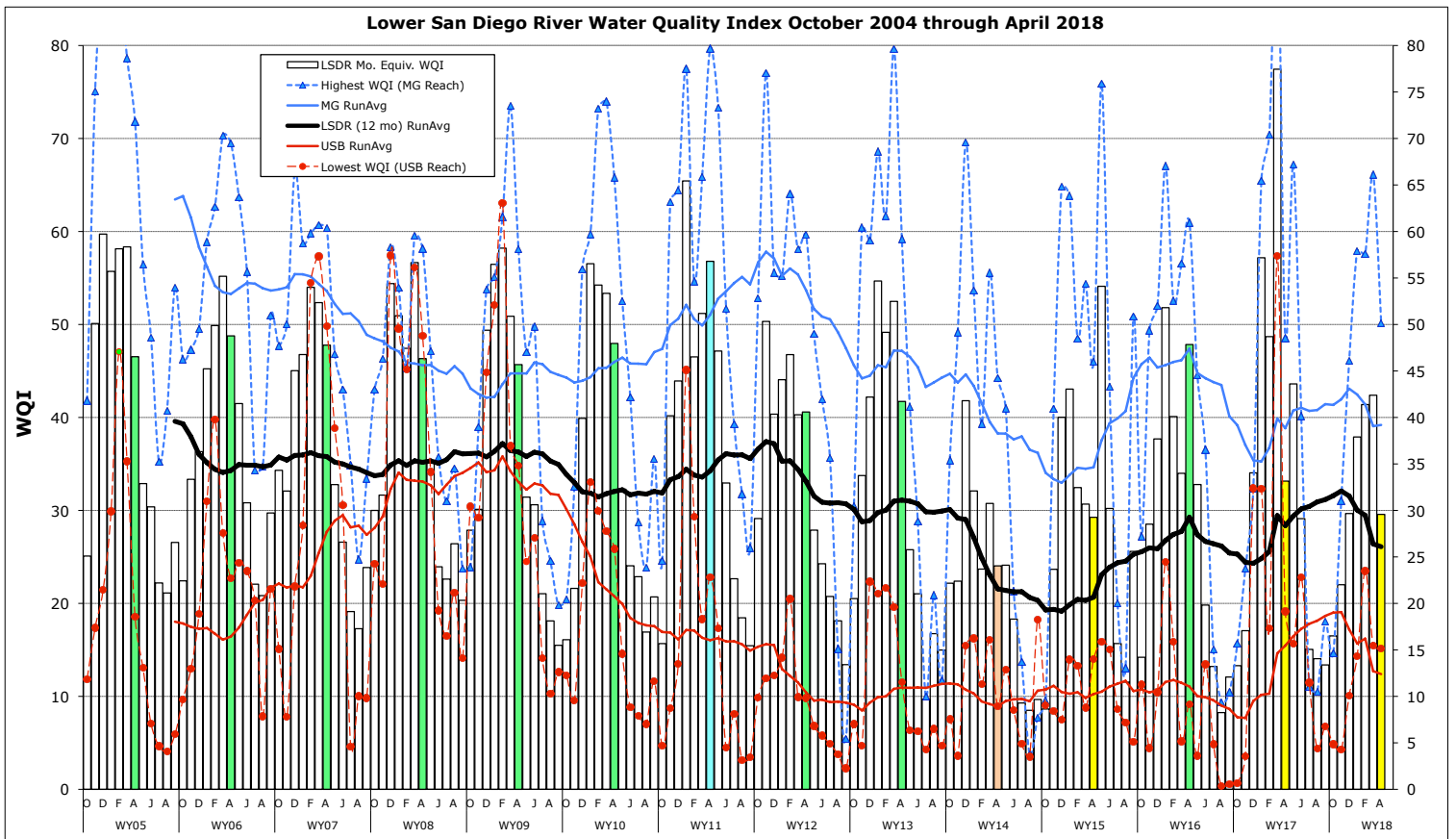


Monthly WQM Report

Lower San Diego River - April 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 (March and April) which constitute the last month of winter and first month of spring. The April index fell 11 points (28%) from last month to one point below last year and 12 points below the 13-yr monthly average of 43. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded as Marginal (D).

Table 1 - March/April 2018 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Mar/April	[8-10] Mar/April	[11-15] Mar/April	[1-15] Mar/April	Last Mo (3/18)	Last Yr (4/17)	13-Yr Avg (April)
Temperature, oC	16.3/19.0	17.5/18.5	16.2/16.8	16.5/17.9	9%	-10%	0%
Sp.Cond., mS/cm	1.50/2.53	1.37/1.76	1.38/1.84	1.36/2.15	58%	6%	11%
DO, mg/L	5.32/4.40	9.70/8.01	3.96/3.30	5.66/4.80	-13%	-1%	-20%
DO, % of Sat.	55/48	93/79	40/34	57/50			
pH	7.99/8.12	8.37/8.30	8.12/8.34	8.06/8.26	2%	3%	7%
3-day ADF, cfs	51.8/2.2	22.4/2.5	19.1/2.5	31.1/2.4	-90%	-62%	-80%
WQ Index	41/31	66/50	31/22	42/31	-28%	-1%	-28%
Grade(Mar/Aprl)	C/D	B/B	D/E	C/D			
March/ April 2018	Fair/ Marginal	Good/ Good	Marginal/ Poor	Fair/ Marginal	Index down 11 points from last month		

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

Overall, LSDR **water temperature** rose 1.4°C (9%) from last month, to a level 10% below last April to nearly the 13-yr monthly norm of 18°C. **Specific conductivity** of 2.15 mS/cm climbed 58% from last month to 6% above last year's average value and 11% higher than the 13-yr monthly norm of 1.94 mS/cm. The overall **dissolved oxygen** level of 4.80 mg/L (50% of Sat.) is 13% below last month, that is within one percent of a year ago and 20% below the 13-yr monthly norm of 5.92 mg/L (60% of Sat). **Streamflow** over the antecedent 3-day period of 2.4 cfs, is down 90% from last month at 62% below a year ago and 80% under the 13-yr norm of 12.4 cfs. This month's LSDR **water quality index** (WQI) of 31 (D/Marginal) is 11 points (-28%) less than last month, one point below a year ago and 12 points lower than the 13-yr monthly norm of 43 (C/Fair).

Conclusion: The overall LSDR water quality index declined 11 points, falling 28 percent from **42 (C/Fair)** to **31 (D/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 (Mar. 2016 - April 2018)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
April '16	63(B)	62(B)	30(D)	49(C+)		11.5	0.55
May	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	1.3	0.07
Nov.	17(E)	24(E)	15(E-)	14(E)		6.5	0.61
Dec.'16	30(D)	35(D)	37(D+)	33(D)	WW	48	4.22
Jan. '17	61(B)	66(B)	49(C+)	56(B)	WW	169	3.01
Feb.	46(C)	70(B)	39(D+)	44(C)	WW	182	3.14
March	82(A)	95(A+)	64(B)	76(A-)	WW	42	0.07
April	31(D)	46(C)	29(D)	31(D)		7.6	0.02
May	43(C)	67(B)	33(D)	40(C)		16.7	0.92
June	22(E)	40(C)	31(D)	27(D-)		2.8	0.00
July	17(E)	10(F)	15(E-)	15(E-)	DW	1.2	0.00
Aug	18(E)	10(F)	12(F+)	14(E-)	DW	1.1	0.00
Sept	15(E)	11(F)	9(F)	12(F+)	DW	1.1	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	0.02
Dec.'17	26(D-)	46 (C)	25(D-)	30 (D)	DW	2.1	0.03
Jan.'18	41(C)	58(B)	24(E+)	38(C)	WW	32	1.83
Feb.	41(C)	58(B)	35(D)	41(C)		9.9	0.01
March	41(C)	66(B)	31(D)	42(C)	WW	16.3	1.35
April '18	31 (D)	50 (B-)	22 (E)	31 (D)		3.2	0.03

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 values (the first month 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 upward trend in the index during the past year has been declining during the first half of WY18 primarily due to lower oxygen levels at many sites as well as streamflows running considerably below seasonal averages.

Monthly WQI values extending from Oct. 2004 through April 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 27 is 13% below the 13-yr norm of 31. In comparison, a year ago (April 2017), the running average WQI was only one percent below the 13-yr norm. The running average low for the month of April of 21 (34% below the annual monthly norm) occurred in both 2014 and 2015. An April high of 36 (15% above the 13-yr norm) occurred in 2006, 2008 and 2009.

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 decay of invasive aquatic vegetation such as primrose-willow (*Ludwigia hexapetala*) in conjunction with minimal streamflow and algal blooms are considered primary causes of continued poor 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. April WQI values (color bars w/index values in black) have 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, 29% (4 of 14 sites monitored) were in the Poor (2) or Very Poor (2) range (WQI<25) while 64% (9 sites) were in the Intermediate range (5 Marginal and 4 Fair) with only one site observed as Good. The lack of wet season rainfall has had a significant effect on lower San Diego river water quality.

In summary, the overall water quality index for the lower SDR watershed has shown a significant decline over the past month, a pattern 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. April declines in running average WQI has occurred four times in the past 13 years (2006, 2012, 2014 and 2018). The April WQI is commonly in the 40's (C Fair). The April index reached a high of 57 (B Good) in 2011 and a low of 24 (E Poor) in 2014. It has been in the D Marginal range three times since monitoring was established in 2005; 2015, 2017 and 2018. This April is the third lowest WQI (31) recorded of the past 13 years. Well below average rainfall and resulting streamflow over the past six months constitute the primary causes.

JCK: (4/25/18)

