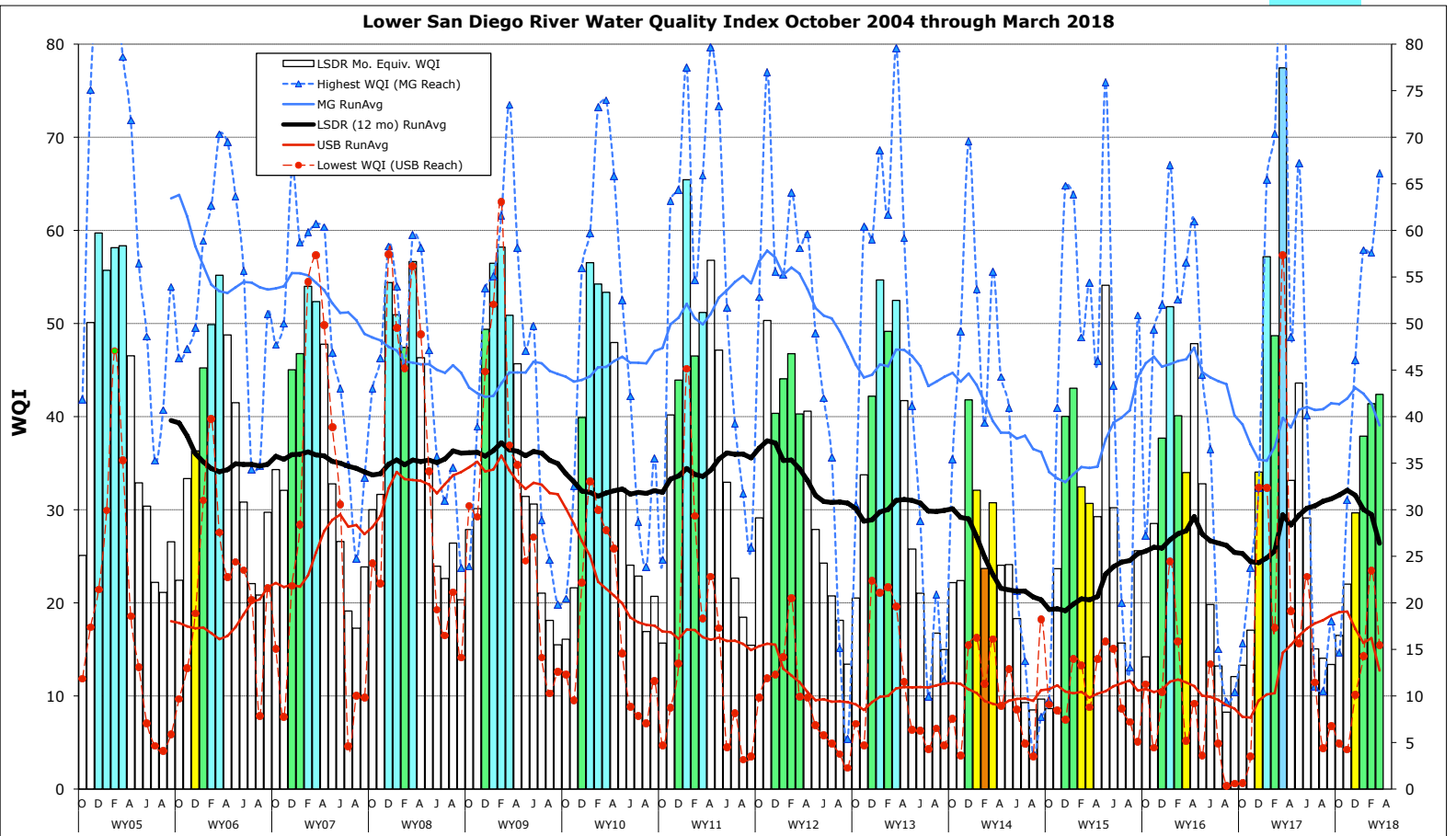


Monthly WQM Report

Lower San Diego River - March 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 (Feb. & March) that constitute the last two months of winter. The March index rose one point (2%) from last month, to a level 28 points (-45%) below last year and 8 points (-14%) below the 13-yr monthly average of 50. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) remains graded as C (Fair).

Table 1 - March/Feb. 2018 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Mar/Feb	[8-10] Mar/Feb	[11-15] Mar/Feb	[1-15] Mar/Feb	Last Mo (2/'18)	Last Yr (3/'17)	13-Yr Avg (March)
Temperature, oC	16.3/15.3	17.5/17.2	16.2/15.2	16.5/15.6	6%	-11%	-2%
Sp.Cond., mS/cm	1.50/2.86	1.37/1.94	1.38/1.99	1.36/2.39	-43%	-9%	-19%
DO, mg/L	5.32/5.60	9.70/9.01	3.96/4.83	5.66/6.00	-5%	-42%	-17%
DO, % of Sat.	55/57	93/87	40/48	57/60			
pH	7.99/7.97	8.37/8.22	8.12/8.25	8.06/8.13	-1%	-1%	5%
3-day ADF, cfs	51.8/5.6	22.4/3.9	19.1/3.8	31.1/4.4	603%	33%	106%
WQ Index	41/41	66/58	31/35	42/41	2%	-45%	-14%
Grade(Sept/Oct.)	C/C	B/B	D/D	C/C			
February/ March 2018	Fair/ Fair	Good/ Good	Marginal/ Marginal	Fair/ Fair	Index up 1 point from last month		

DO values below a threshold limit of 4 mg/L or 42 %Sat. are listed in red.

Overall, LSDR **water temperature** rose 1°C (6%) from last month, to a level 11% below last March and 2% below the 13-yr monthly norm of 16.9°C. **Specific conductivity** of 1.36 mS/cm declined 43% from last month to 9% below last year's value and 19% below the 13-yr monthly norm of 1.67 mS/cm. The overall **dissolved oxygen** level of 5.66 mg/L is slightly (-5%) below last month, but remains 42% less than a year ago and 17% below the 13-yr monthly norm of 6.79 mg/L. **Streamflow** over the antecedent 3-day period of 31 cfs, is up 603% from last month, at 33% higher than a year ago and 103% above the 13-yr norm of 15 cfs. This month's LSDR **water quality index** (WQI) of 42 (C/Fair) is 1 point higher than last month, but 35 points (-45%) below a year ago March and 8 points (-14%) below the 13-yr monthly norm of 50 (C/Fair).

Conclusion:

The overall LSDR water quality index rose by 2%, increasing one point from **41 (C/Fair) to 42 (C/Fair)** over the last 30 days.

A summary of monthly WQI values occurring over the past two years of RiverWatch record for the three sections of the lower San Diego River system as well as the overall average are listed 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 - Mar. 2018)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Mar.'16	32(D)	57(B)	25(D-)	34(D)		14.0	0.72
April	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	1.1	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. '17	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
Mar.'18	41(C)	66(B)	31(D)	42(C)	ww	31	0.51

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. Dec.'17 through March 2018 values (the four months of the winter season) 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 initial six months of WY18 primarily due to oxygen levels as well as streamflow remaining below seasonal averages at many sites.

Monthly WQI values extending from Oct. 2004 through March 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 Lower SDR). The current running average WQI for the LSDR of 28 is 16% below the 13-yr norm of 33. In comparison, a year ago (March 2017), the running average WQI was only 1% below the 13-yr norm. The running average low for the month of 23 (29% below the annual monthly norm) occurred in 2015. A high of 37 (12% above norm) occurred three years earlier in March 2012.

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 hextapetala*) in conjunction with low 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. February WQI values (color bars w/index values in black) have improved slightly from last month at about half the sites. In mid-December 33% (5 of 15) were in the Poor (E) or Very Poor (F) range while the remaining ten (6 Marginal and 4 Fair) were in the 'Intermediate' range. By mid-January, only 13 percent (2 of 15 sites monitored) were in the Poor (1) or Very Poor (1) range (WQI<25) while 67% (10 sites) were Marginal (5) or Fair (5) within the Intermediate range and three sites (20%) were Good. Last month two sites (13%) were in the Poor range while ten of the 15 sites (67%) remained in the Intermediate (5-Fair and 5-Marginal) range and three (20%) were Good (WQI>50). This month only one site was in the Poor range while nine (60%) were Intermediate (6-Fair & 3-Marginal) and five sites (33%) were Good (WQI>50).

In summary, the overall water quality index for the lower SDR watershed has shown slow improvement over the four winter months, a pattern that is expected to continue into the Spring. On the other hand, the water quality improvements during the winter season have not been great enough to off-set the downward trend in the 12-month running average WQI. As shown on the cover page chart, 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. Winter declines in running average WQI have occurred in but four of the past 14 years (2006, 2012, 2014 and 2018).

JCK: (3/24/18)

