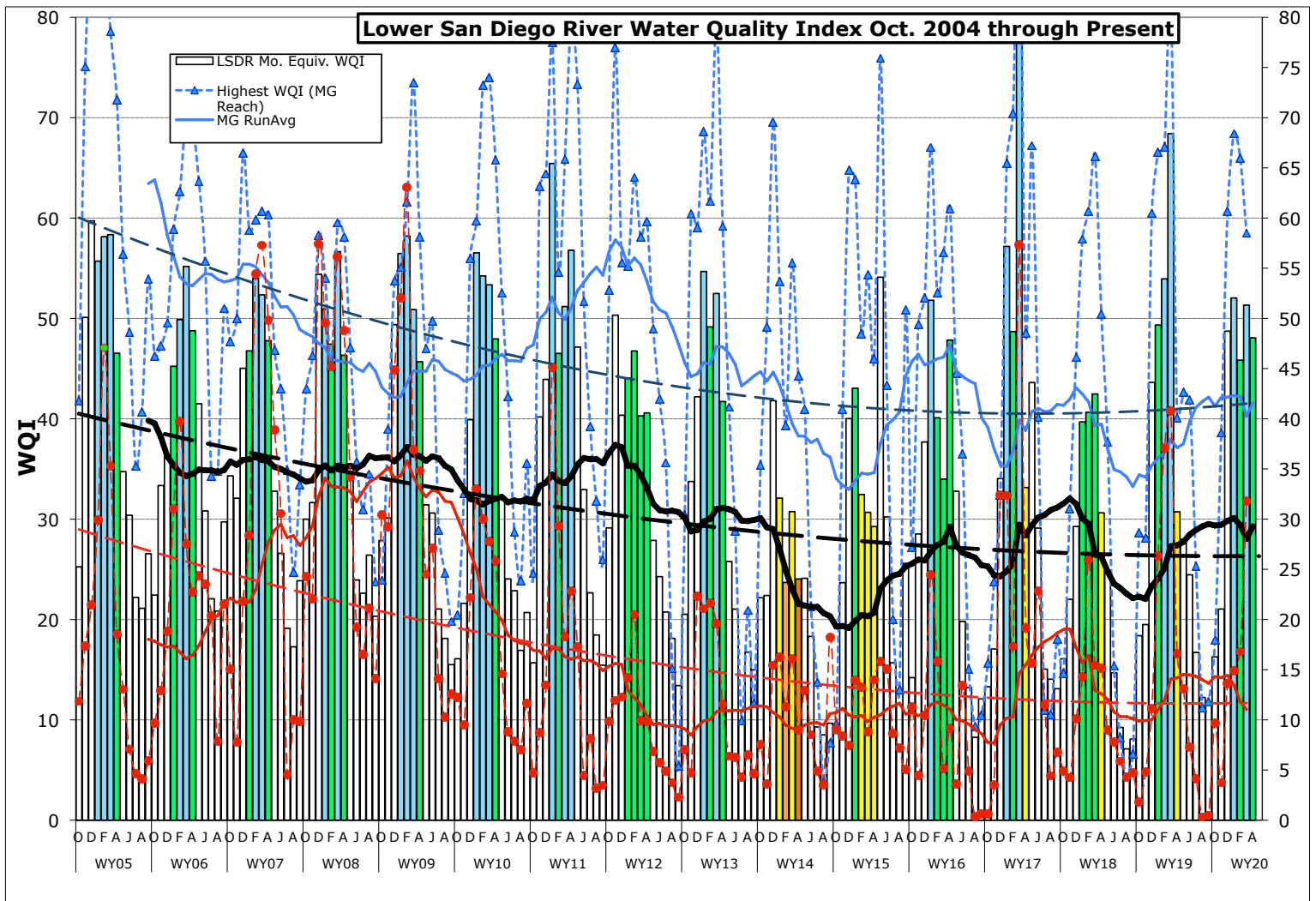


Monthly WQM Report

Lower San Diego River - April 2020



Lower SDRWQ Monitoring Data Summary

Table 1 presents a summary of water quality data monitored by the SDRPF RiverWatch Team within the Lower San Diego River subbasin over the past two months (March and April). The April index declined two points from last month to three points above the 15-yr March average of 48. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) rose 12 percent from Fair (C) to Good (B-).

Table 1 - March/April 2020 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Mar/Aprl	[8-10] Mar/Aprl	[11-15] Mar/Aprl	[1-15] Mar/Aprl	Last Mo (3'20)	Last Yr (4'19)	15-Yr Avg (April)
Temperature, oC	17.4/17.4	16.7/17.9	16.2/17.1	16.8/17.4	3%	-10%	-5%
Sp.Cond., mS/cm	1.09/0.93	1.07/0.63	1.03/0.97	1.10/0.94	-14%	-51%	-51%
DO, mg/L	6.62/6.41	8.54/7.64	6.58/5.69	6.64/6.23	-5%	28%	8%
DO, % of Sat.	68/68	86/78	67/59	68/65			
pH	7.78/7.71	8.23/8.22	7.82/7.81	7.80/7.77	0%	8%	1%
3-day ADF, cfs	57/147	24/67	20/58	34/91	170%	1160%	712%
WQ Index	52/ 47	58/ 58	46/ 45	51/ 49	-5%	59%	25%
March/ April	B-/C	B/B	C/C	B-/C+			
March/ April '20	Good/ Fair	Good/ Good	Fair/ Fair	Good/ Fair	Index fell 2 points overall from last month		

Negative variance (declines from norms) and DO depletions (< 5.0 mg/L or 45%Sat) expressed in red.

LSDR **water temperatures** increased 0.6 degrees (3%) from last month to 5% below the 15-yr April norm of 18.2 oC. Overall **specific conductivity** of 0.94 mS/cm constitutes a 41% decline from last month, 51% less than last April and the 15-yr norm of 1.94 mS/cm. The overall **dissolved oxygen** level of 6.23 mg/L (65%Sat.) is 5% less than last month but 28% more than last April and 8% more than the 15-yr norm of 5.57 mg/L (60%Sat). **Streamflow** over the antecedent 3-day period of 91 cfs is up 170% from last month to three times a year ago and eight times the 15-yr norm. This month's LSDR **water quality index** (WQI) declines two points (-5%) from last month to a level ten points above the 15-yr April norm of 39.

Monthly WQI values occurring over the past 26 months of record for the three sections of the lower river system and the overall LSDR average, along with average 30-day antecedent flow (ADF) and rainfall (MRF), are expressed in **Table 2** on the next page.

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (2'18 - 4'20)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Feb.	41(C)	61(B)	31(D)	41(C)	ww	4.4	0.36
Mar. '18	42(C)	66(B)	31(D)	42(C)	WW	22	0.95
April	31 (D)	50 (B-)	22 (E)	31 (D)	t	2.8	0.02
May	24 (E+)	37 (D+)	18 (E)	24 (E+)	t	2.3	0.12
June	12 (F+)	15 (E)	17 (E)	15 (E)	DW	1.3	0.00
July	12 (F+)	8 (F)	8 (F)	9 (F)	DW	0.7	0.00
Aug.	8 (F)	4 (F)	8 (F)	7 (F)	DW	0.3	0.02
Sept	9 (F)	7 (F)	8 (F)	8 (F)	DW	0.3	0.00
Oct	24 (D-)	29 (D)	9 (F)	18 (E)	t	3.2	0.57
Nov	21 (E+)	28 (D)	14 (E-)	19 (E)	t	9.6	0.81
Dec.	54 (B)	61 (B)	25 (D-)	44 (C)	WW	48	3.02
Jan.'19	47 (C)	66 (B)	43 (C)	49 (C+)	WW	39	2.80
Feb.	51 (B-)	67 (B)	51 (B-)	54 (B)	WW	179	2.98
Mar. 19	76 (A-)	82 (A)	55 (B)	68 (B)	WW	25	1.28
April	33 (D)	40 (C)	24 (E+)	31 (D)	t	8.6	0.46
May	28 (D)	43 (C)	21 (E)	28 (D)	t	14	0.51
June	21 (E)	42 (C)	20 (E)	24 (E+)	t	4.3	0.38
July	17 (E)	25 (D-)	13 (E-)	17 (E)	DW	1.2	0.01
Aug.	16 (E)	11 (F)	9 (F)	12 (F+)	DW	0.9	0.02
Sept	15 (E)	12 (F+)	8 (F)	11 (F+)	DW	1.2	0.03
Oct	18 (E)	18 (E-)	15 (E)	16 (E)	DW	0.9	0.00
Nov.	20 (E)	39 (C)	14 (E)	21 (E)	t	37	0.52
Dec.	60 (B)	61 (B)	31 (D)	49 (C+)	WW	78	3.51
Jan. '20	62 (B)	68 (B)	34 (D)	52 (B-)	WW	18	2.90
Feb.	47 (C)	66 (B)	35 (D)	46 (C)	ww	10	0.38
March	52 (B-)	58 (B)	46 (C)	51 (B-)	WW	48	1.97
April'20	47 (C)	58 (B)	45 (C)	49 (C)	WW	285	3.58

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River subbasin as determined over the past 15 and a half years of RiverWatch monitoring. The last four-month values (Jan.-April) for each year are expressed as color-shaded bars; blue B (50 or >) is Good, green C (38-49) Fair, yellow D (25-37) Marginal, brown E (13-24) Poor and pink F-(12 or <) Very Poor. Running average index values for LSDR (flow-weighted averages of 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/poorest reach (Upper Santee Basin) are shown in red. The generally downward slope in index over the 15-year period is primarily attributed to declining dissolved oxygen levels extending throughout protracted low-flow (dry-weather) periods of each year. The dashed black line represents an overall downward trend of -2.5% per annum in index value since late 2004. WY05 witnessed best overall water quality during the past 15+ years while poorest water quality was experienced during the summer months of 2014 extending through November.

Monthly WQI values extending from Oct. '04 through April of this year are presented in **Chart 1** (next page) together with 12-mo. running averages for each of the five principal reaches of the lower river system and overall (i.e., LSDR). The current running average WQI of 29 is ten percent below the 15-yr LSDR flow-weighted average index of 32.7, and two index points above a year ago. The running average April low of 21 (-37% below the norm) occurred in 2015. The highest running average WQI for April of 36 (10% above norm) occurred in 2009. The overall LSDR running average (12-month trendline shown dashed in black), has declined approximately ten index points over the span of 15 and one-half years.

Monthly and 12-mo. running average WQI values for the poorest reach (Upper Santee Basin) and best (Mission Gorge) are presented in **Chart 2**. Although water quality improved within the Upper Santee Basin over the past year, resurgent growth and subsequent decay of aquatic invasives such as floating primrose-willow (*Ludwigia peploides*) in conjunction with low-flow and increased organic detritus (benthic biomass) are primary causes of deteriorated water quality both within this reach and deep channel portions of Mission Valley (e.g., Kaiser Ponds). The greatest downward trend (red-dashed line) is associated with the poorest reach (Upper Santee Basin) encompassing monitoring sites 13 (Mast Park) and 14 (Magnolia Ave/RCP).

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. This month's results (color bars w/values in black) are slightly lower than last month at the same as monitored in February. Both this month and in Feb., six of 15 sites (40%) were Good or Very Good (blue bars) while eight (57%) were Fair (green bars). Mast Park (#13) remains the lowest index site with DO values recorded well below hypoxic levels. It is anticipated that reduced streamflows combined with increasing temperatures and elevated rates of eutrophication over the coming months in this reach of the river are likely to result in perpetuation of Very Poor (WQI < 12) water quality throughout the second half of this year. DO concentration values monitored at this site have remained below chronic hypoxic levels for nearly all months of the year over the past decade (since 2010).

(JCK 4/20/20)

