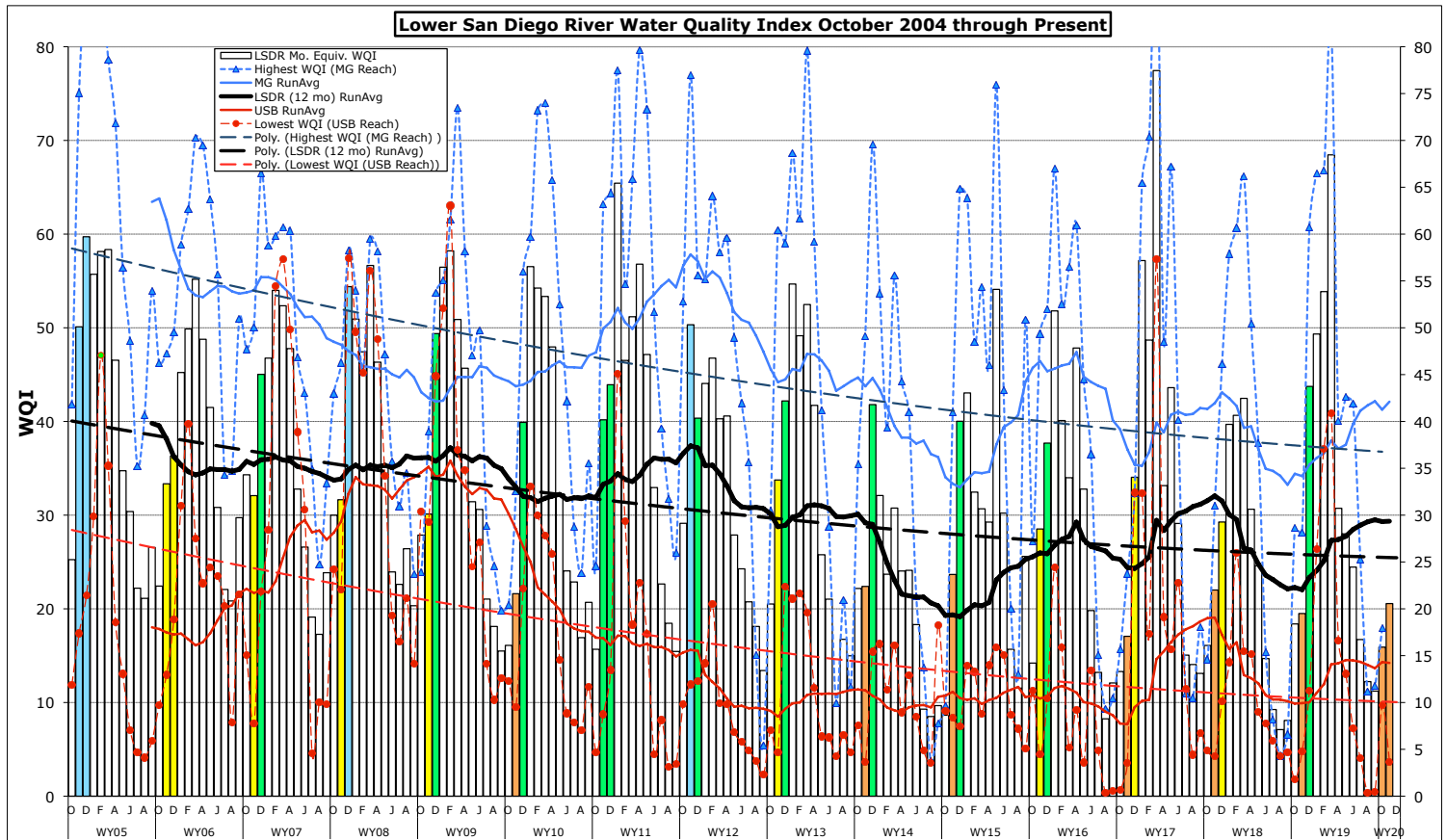


Monthly WQM Report

Lower San Diego River - November 2019



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 watershed over the past two months (Nov/Oct), constituting the two months of fall. The November index rose five points (43%) from last month to seven points below the 15-yr monthly average of 28. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) for November remained rated as E Poor.

Table 1 - November/October 2019 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Nov/Oct	[8-10] Nov/Oct	[11-15] Nov/Oct	[1-15] Nov/Oct	Last Mo (10'19)	Last Yr (11'18)	15-Yr Avg (Nov.)
Temperature, oC	16.9/19.8	15.2/16.6	15.9/18.9	16.1/18.7	-14%	19%	9%
Sp.Cond., mS/cm	3.78/3.65	2.50/2.39	2.47/2.36	3.09/3.02	2%	0%	15%
DO, mg/L	2.56/2.86	5.35/4.92	3.44/3.43	3.76/3.56	4%	-26%	-30%
DO, % of Sat.	37/31	52/50	35/37	38/38			
pH	7.00/7.62	7.76/7.75	7.52/7.64	7.31/7.52	-4%	-11%	-6%
3-day ADF, cfs	1.4/1.4	0.9/0.7	0.9/0.7	1.0/0.9	13%	72%	-81%
WQ Index	19/17	38/18	14/15	21/16	43%	-13%	-19%
Grade Nov/Oct	E/E	C/E	E/E	E/E			
November/ October 2019	Poor/ Poor	Fair/ Poor	Poor/ Poor	Poor/ Poor	Index rose 5 points overall from last month		

Negative variance (declines from norms) and DO depletion (< 5.0 mg/L) expressed in red.

LSDR **water temperatures** dropped over two degrees (-14%) from last month to within 9% of the 15-yr norm (14.8 oC). The overall **specific conductivity** of 3.09 mS/cm constitutes a 2% increase from last month, same as a year ago and 16% above the 15-yr norm of 2.69 mS/cm. The overall **dissolved oxygen** level of 3.76 mg/L (38%Sat.) is only 4 percent higher than last month and 26% below than a year ago, and the 15-yr monthly norm of 5.44 mg/L (53%Sat). **Streamflow** over the antecedent 3-day period of 1.0 cfs is 13% greater than last month, 72% more than a year ago but well below the 15-yr norm. This month's LSDR **water quality index** (WQI) increased five points (29%) from last month, to two points above last yr and seven points (-27%) below the 15-yr Nov. norm of 28.

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

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (9/2017 - 11/2019)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRf, in
Sep'17	15(E)	18(E)	9 (F)	13(E-)	DW	0.9	0.08
Oct.	20(E)	15(E)	13(E-)	16(E)	DW	1.4	0.01
Nov.	25(D-)	31(D)	15(E)	22(E)	t	1.4	0.01
Dec.	26(D-)	46 (C)	24(D-)	29 (D)	t	2.3	0.02
Jan.'18	41(C)	58(B)	29(E+)	40(C)	WW	13	1.78
Feb.	41(C)	61(B)	31(D)	41(C)	t	4.4	0.36
Mar.	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.	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	14.3	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	17 (E)	18 (E-)	15 (E)	16 (E)	DW	1.0	0.00
Nov '19	19 (E)	38 (C)	14 (E)	21 (E)	DW	1.2	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 15 years of RiverWatch monitoring. The two-month values (Oct. & Nov.) for each year are expressed as color-shaded bars; yellow are D-Marginal (25-37), brown E-Poor (13-24) and pink F-Very Poor (0-12). Running average index values for LSDR (flow-weighted average 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 attributed to declining oxygen levels extending throughout protracted low-flow/dry-weather periods. The dashed black line represents an overall trend of -2.5% per annum decline in the index since late 2004. WY05 presented best overall water quality during the past 15 years while the poorest water quality was experienced during the summer months of WY14 extending through October.

Monthly WQI values extending from Oct. 2004 through Nov. 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 river and overall (i.e., lower SDR). The current running average WQI of 29 is five percent below the 15-yr LSDR flow-weighted average index of 31, remaining at seven index points above a year ago. The monthly low for Nov. of 19 (-38% below the norm) occurred in 2014. The highest running average WQI for Nov. of 38 (+24% above norm) occurred in 2006. The overall LSDR running average (12-month trendline), shown dashed in black, has declined 11 index points over the span of 14 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 such invasives as floating primrose-willow (*Ludwigia peploides*) in conjunction with low-flow and increased biomass are primary causes of deteriorated water quality both within this reach and deeper portions of Mission Valley (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/RCP).

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. The November results (color bars w/values in black) are higher than monitored both last month and September. In October, 93% of the sites (11 of 15) were Poor or Very Poor, whereas this month 7 of 15 (67%) were in those two grades. Less oxygen depletion from decomposition, lower water temperatures constitute the primary drivers of slightly improved water quality.

The overall November index shows some improvement in water quality over last month due to higher dissolved oxygen concentrations monitored in the middle and lower reaches of the river. This month's index shows that the lower river system improved little from the same time last year and remains below the 15-year Nov. average. December is typically a month of significantly greater improvement in LSDR water quality as expressed on the cover page chart.

(jck 11/18/2019)

