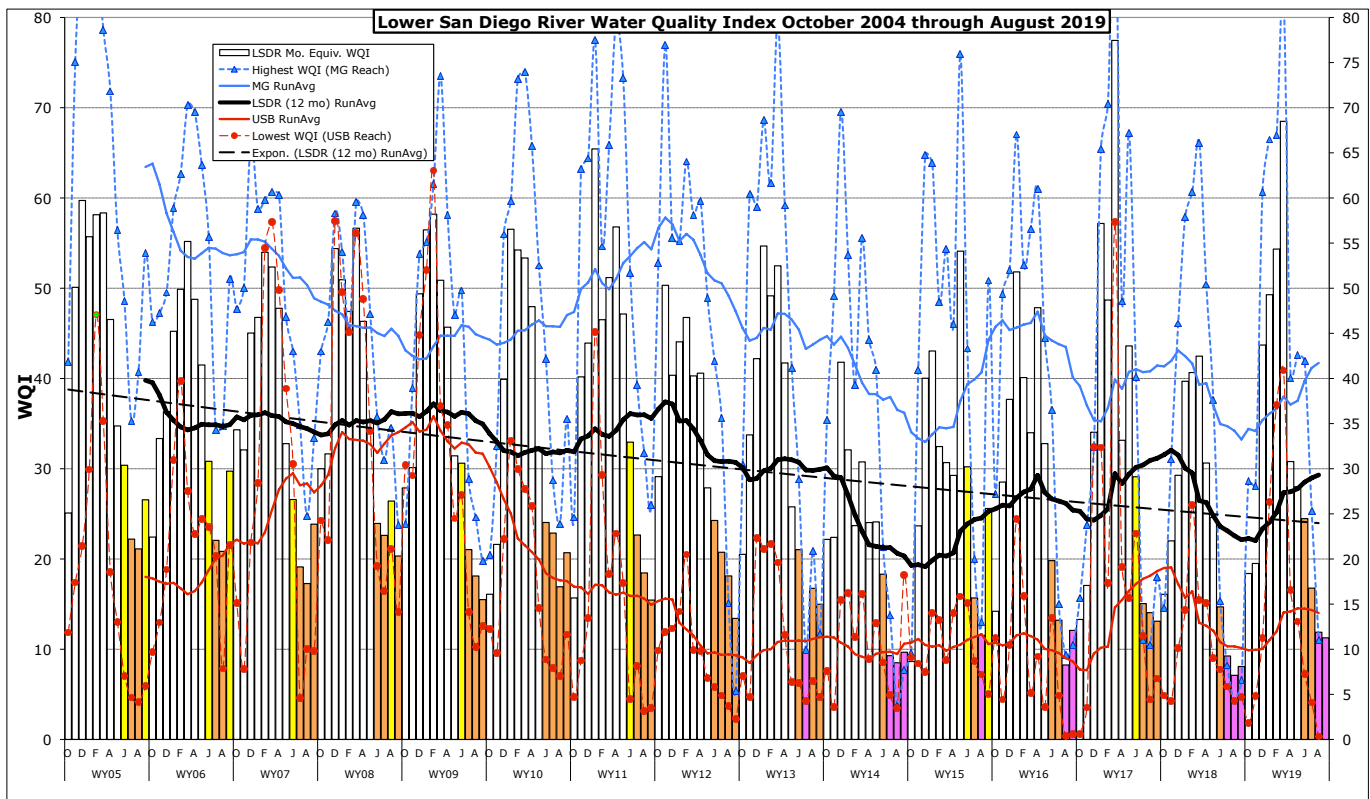


Monthly WQM Report

Lower San Diego River - September 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 (Sept/Aug) that constitute the last two months of summer. The September index fell one point (-5%) from last month to four points below the 15-yr monthly average of 16. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) for August and September has been categorized as Very Poor (F).

Table 1 - September/August 2019 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Sept/Aug	[8-10] Sept/Aug	[11-15] Sept/Aug	[1-15] Sept/Aug	Last Mo (8'19)	Last Yr (9'18)	15-Yr Avg (Sept)
Temperature, oC	22.5/23.6	19.1/22.0	20.4/21.8	20.9/22.5	-7%	1%	-3%
Sp.Cond., mS/cm	3.67/3.50	2.39/2.32	2.62/2.61	3.14/2.99	5%	-5%	6%
DO, mg/L	2.16/2.42	2.76/4.70	2.01/2.59	2.18/2.72	-22%	-16%	-38%
DO, % of Sat.	25/29	30/55	18/30	24/32			
pH	7.67/7.65	7.85/7.57	7.59/7.44	7.61/7.51	1%	-12%	-1%
3-day ADF, cfs	2.1/1.0	0.7/0.6	0.5/0.5	1.1/0.7	52%	1049%	-28%
WQ Index	16/16	12/11	8/9	11/12	-5%	39%	-28%
Grade Sept/Aug	E/E	F+/F	F/F	F/F+			
September/ August 2019	Poor/ Poor	VeryPoor/ VeryPoor	VeryPoor VeryPoor	VeryPoor VeryPoor	Index fell points overall from last month		

Negative variance (declines from norms) and DO deficits (< 4.0 mg/L) expressed in red.

LSDR **water temperatures** dropped one and a half degrees (-7%) from last month (1% above last Sep.) to 3% below the 15-yr norm of 21.4 oC. The overall **specific conductivity** of 3.14 mS/cm constitutes a 5% increase from last month, but 5% below a year ago at 6% above the 15-yr norm of 2.97 mS/cm. The overall **dissolved oxygen** level of 2.18 mg/L (24% Sat.) is 22 percent below last month and 28% below the 15-yr monthly norm of 3.49 mg/L (39% Sat.). **Streamflow** over the antecedent 3-day period of 1.1 cfs is up from last month at ten times a year ago but still 28% less than the 15-yr norm. This month's LSDR **water quality index** (WQI) fell one point (-5%) from last month to 3 points above last yr, remaining five points (-28%) below the 15-yr Sept. norm of 16.

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 (7/2017 - 9/2019)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRf, in
July'17	17 (E)	11 (F)	15 (E)				
Aug.	18(E)	11(F)	12 (F+)	14(E-)	DW	1.0	0.00
Sept	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)		1.4	0.01
Dec.'17	26(D-)	46 (C)	24(D-)	29 (D)		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)		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)		2.8	0.02
May	24 (E+)	37 (D+)	18 (E)	24 (E+)		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)		3.2	0.57
Nov	21 (E+)	28 (D)	14 (E-)	19 (E)		9.6	0.81
Dec.'18	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)		8.6	0.46
May	28 (D)	43 (C)	21 (E)	28 (D)		14.3	0.51
June	21 (E)	42 (C)	20 (E)	24 (E+)		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	0.8	0.02
Sept '19	16 (E)	12 (F+)	8 (F)	11 (F+)	DW	1.0	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 15 years of RiverWatch monitoring. The past four-month values (June, July, Aug. & Sept.) for each year are expressed as color-shaded bar columns; 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 generally declining oxygen levels extending throughout protracted low-flow/dry weather periods. The dashed black line represents an overall (straight-line) trend of -2.5% per annum decline in the index since late 2004. WY05 presented best overall water quality monitored during the past 15 years of monitoring while the poorest water quality was experienced during the latter months of WY14 extending into early WY15.

Monthly WQI values extending from Oct. 2004 through Sept. 2019 are presented in **Chart 1** (next page) together with 12-mo. running average trendlines for each of the five principal reaches of the river and overall (i.e., lower SDR). The current running average WQI of 30 is only 4% below the 15-yr LSDR flow-weighted average index of 31, and eight index points above a year ago. The monthly low for Sept. of 20 (34% below the norm) occurred in 2014. The highest running average WQI for Sept. of 34 (19% above norm) occurred in 2005. The overall LSDR trendline, shown dashed in black, has fallen by approximately 15 index points (25%) over the span of 15 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 invasives such as primrose-willow (*Ludwigia hexstapetala*) in conjunction with low flow and muck accural are primary causes of deteriorated water quality both within this reach and deeper portions of Mission Valley (Kaiser Ponds). The steepest 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 of Summer are shown in **Charts 3, 4 and 5** on page 6. The September results (color bars w/values in black) are lower than monitored last month and in July. In August, five out of 13 sites were Very Poor(F), whereas this month seven sites were in the same (F) category. Dissolved oxygen depletion from both algal decay and other benthic demands constitute the primary drivers of the recurrent late summer decline in water quality.

The September index continued to decline due to depleted dissolved oxygen levels monitored throughout most reaches of the river combined with minimal streamflow. This month's index suggests that the lower river system is somewhat improved from this time last year but still below the long term (15-yr) September norm.

(jck 9/22)

