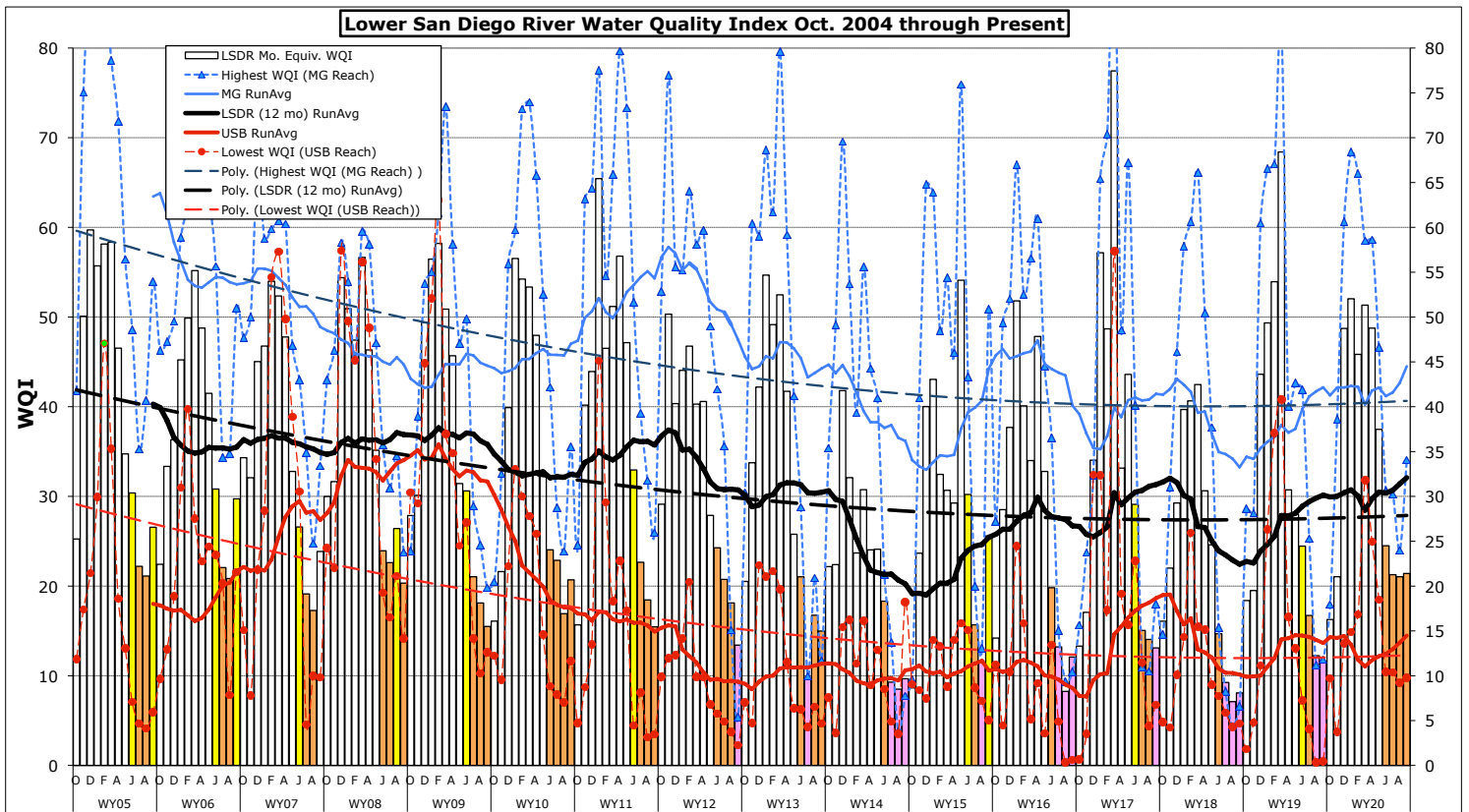


Monthly WQM Report

Lower San Diego River - September 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 (Sept/Aug). The September index is the same as August at a level seven points (30%) above the 16-yr monthly average of 16. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) remained unchanged at E (Poor).

Table 1 - September/August 2020 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 (8'20)	Last Yr (9'19)	16-yr Avg (Sept.)
Temperature, oC	22.8/26.7	22.0/23.7	21.3/24.7	22.0/25.2	-13%	5%	2%
Sp.Cond., mS/cm	3.69/3.55	1.99/2.09	2.22/2.35	2.80/2.87	-2%	-11%	-5%
DO, mg/L	3.73/4.14	6.95/7.26	3.90/4.03	4.34/4.60	-10%	105%	24%
DO, % of Sat.	44/52	79/85	44/50	50/56			
pH	8.07/7.82	8.23/7.94	8.16/7.84	8.12/7.82	4%	8%	5%
3-day ADF, cfs	0.6/1.7	1.1/1.3	1.1/1.3	1.0/1.4	-33%	-6%	-35%
WQ Index	18/23	34/24	19/19	21/21	2%	85%	30%
July/Aug	E/E	D/E+	E/E	E/E			
July/ August'20	Poor/ Poor	Marginal/ Poor	Poor/ Poor	Poor/ Poor	Index unchanged overall from last month		

Negative variance (declines from norms) and DO depletions (< 5.0 mg/L or 55% of Sat) expressed in red.

LSDR **water temperatures** fell 3.2 degrees (13%) from last month to 5% greater than a year ago and 2% above the 16-yr Sept norm of 21.5 oC. Overall **specific conductivity** of 2.80 mS/cm constitutes a 2% decrease from last month, to 11% less than last Sept and 5% below the 16-yr norm of 2.96 mS/cm. The overall **dissolved oxygen** level of 4.34 mg/L (50%Sat.) is 10% below last month, but 105% above last Sept and 24% greater the 16-yr norm of 3.54 mg/L (39%Sat). **Streamflow** over the antecedent 3-day period of 1.0 cfs is down 33% from last month to 6% less than a year ago and 35% below the 16-yr norm. This month's LSDR **water quality index** (WQI) is unchanged from last month at 21 and seven points (30%) above the 16-yr September norm of 16.

Monthly WQI values occurring over the past 26 months of record for the three main sections of the lower river system and the overall LSDR average, along with 30-day antecedent average 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 (8'18 - 9'20)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Aug.	8 (F)	4 (F)	8 (F)	7 (F)	DW	0.3	0.02
Sept'18	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	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. '19	16 (E)	11 (F)	9 (F)	12 (F+)	DW	0.9	0.02
Sept'19	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	47 (C)	59 (B)	45 (C)	49 (C+)	WW	181	3.58
May	38 (C-)	47 (C)	34 (D)	37 (D+)	t	13	0.06
June	23 (E)	35 (D)	23 (E)	26 (D-)	dw	5.7	0.02
July	18 (E)	30 (D)	20 (E)	21 (E)	DW	2.1	0.00
Aug '20	23 (E)	24 (E+)	19 (E)	21 (E)	DW	1.3	0.00
Sept '20	18 (E)	34 (D)	19 (E)	21 (E)	DW	1.1	0.00

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River sub-basin as determined over the past 16 years of RiverWatch monitoring. The past four month's values (June - Sept.) for each year are expressed as color-shaded bars; blue B (50 or >) 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 the 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. The generally downward slope in index over the 16-year period can be attributed to depleted dissolved oxygen levels extending throughout protracted low-flow periods of the water 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 while poorest water quality was monitored during the summer months extending through Nov. of 2014.

Monthly WQI values from Oct. '04 through September 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 32 is three percent below the 16-yr LSDR flow-weighted average index of 32.8; well above above experienced both last Sept. (30) and two year's ago (22). The running average monthly low of 20 (38% below the current norm) occurred in 2014. The highest running average WQI for Sept. of 40 (23% above norm) occurred in 2005. The overall LSDR running average (12-month trendline shown dashed in black) has declined approximately ten index points (from 40 to 30) over the 16 year span.

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 aquatic growth and subsequent decay of invasive plants such as floating primrose-willow (*Ludwigia peploides*) in conjunction with low streamflow and increased benthos are causes of poor water quality both within this reach and the deep waters of Upper 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 East) 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. September results (color bars w/values in black) shown on Chart 5 are relatively unchanged from Aug. (Chart 4) and July (Chart 3). Poorest quality (E-F) sites have gone from nine (64%) in July down to seven (50%) in August and back up to eight (57%), while Marginal (D) and Fair (C) quality sites increased from five (36%) in July to seven (50%) in Aug. back to six (43%) this month. Water quality sites in Mission Gorge have improved while the west sites have declined. Eastern sites have remained steady. DO concentration values in the Upper Santee Basin (Sites 13-14) remain below chronic hypoxic levels (<2.5 mg/L) as for much of the past decade. There are also several hypoxic hotspots within the Mission Valley reaches (Sites 3 and 6) present during the dry-weather flow months of every year. This year's summer dissolved oxygen depletion levels have not in general been as great as during the previous four years. This month marks the end of WY20. The past two water years (WY19 & WY20) have witnessed a slow, steady rise in overall (LSDR) water quality index values.

(jck 9/22/20)

