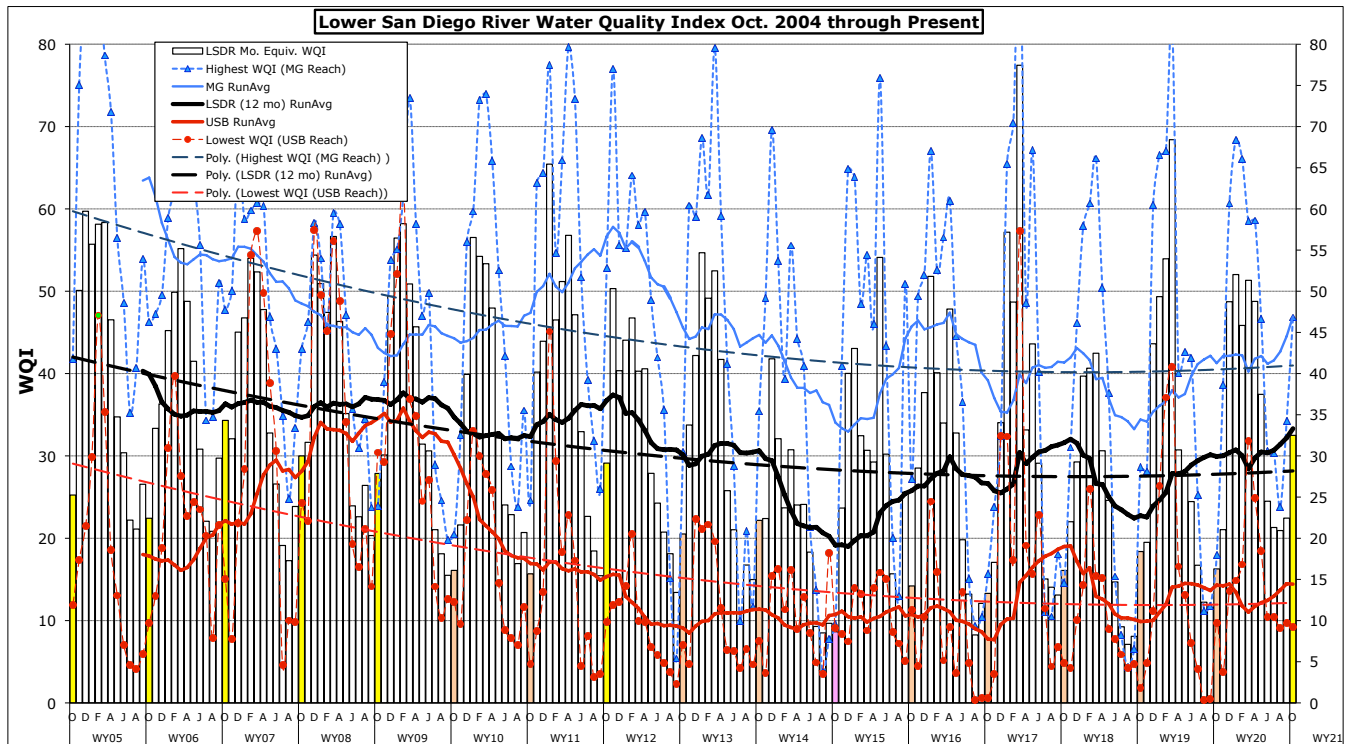


Monthly WQM Report

Lower San Diego River - October 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/Oct). This month's index of 32 is ten points (45%) above last month and 12 points higher than the 16-yr monthly average of 20. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) rose from a full grade from Poor (E) and Marginal (D).

Table 1 - September/October 2020 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Sept/Oct	[8-10] Sept/Oct	[11-15] Sept/Oct	[1-15] Sept/Oct	Last Mo (9'20)	Last Yr (10'19)	16-yr Avg (Oct.)
Temperature, oC	22.8/18.4	22.0/14.0	21.3/16.3	22.0/16.6	-24%	-11%	-11%
Sp.Cond., mS/cm	3.69/3.68	1.99/2.31	2.22/2.15	2.80/2.87	2%	-5%	1%
DO, mg/L	3.73/5.26	6.95/8.77	3.90/4.79	4.34/5.67	24%	55%	41%
DO, % of Sat.	44/56	79/84	44/48	50/57			
pH	8.07/7.78	8.23/8.23	8.16/7.85	8.12/7.62	-4%	3%	2%
3-day ADF, cfs	1.3/1.8	1.2/3.1	1.1/3.3	1.2/2.7	134%	195%	60%
WQ Index	21/32	34/47	19/26	22/32	45%	100%	64%
Sept/Oct	E/D	D/C	E/D-	E/D			
Sept/ October '20	Poor/ Marginal	Marginal/ Fair	Poor/ Marginal	Poor/ Marginal	Index up 10 points 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 5.4 degrees (24%) from last month to 11% below a year ago and the 16-yr Oct. norm of 18.7 oC. Overall **specific conductivity** of 2.87 mS/cm constitutes a 2% increase from last month, to 5% less than last Oct and 1% greater than the 16-yr norm of 2.85 mS/cm. The overall **dissolved oxygen** level of 5.67 mg/L (57%Sat.) is 24% higher than last month, 55% above last Oct and 41% greater than the 16-yr norm of 3.95 mg/L (41%Sat). **Streamflow** over the antecedent 3-day period of 2.7 cfs is up 134% from last month to 195% of a year ago and 60% above the 16-yr norm. This month's LSDR **water quality index** (WQI) is 10 points above last month, 16 points (100%) greater than a year ago and 64% more than the 16-yr October norm of 20.

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) amounts, are expressed in **Table 2** on the next page.

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (9'18 - 10'20)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRf, in
Sept'18	9 (F)	7 (F)	8 (F)	8 (F)	DW	0.3	0.00
Oct '18	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.	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 '19	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	23 (E)	24 (E+)	19 (E)	21 (E)	DW	1.3	0.00
Sept	21 (E)	34 (D)	19 (E)	22 (E)	DW	1.3	0.00
Oct '20	32 (D)	47 (C)	26 (D-)	32 (D)	DW	2.2	0.02

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 October values 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-yr 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 -0.875% 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 Oct.'20 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 33 is two percent above the 16-yr LSDR flow-weighted average index; well above experienced both last Oct. (30) and two year's ago (23). The running average Oct. low of 19 (42% below the current norm) occurred in 2014. The highest running average WQI of 40 (23% above the norm) occurred in 2004. 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 flow and increased benthos are causes of poor water quality within the upper reaches of both the Santee Basin and Mission Valley. 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. overpass).

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. October results (color bars w/values in black) shown on Chart 5 are significantly above those from September. (Chart 4) and August (Chart 3). Six of 15 sites were rated Fair(C) this month, while there was only one each of the previous months. Oct. also saw one site (Forester Ck) rated Good(B). Reduced water temperatures and greater daily flows resulted in elevated dissolved oxygen levels and declining specific conductivity values. DO concentration in the Upper Santee Basin (Sites 13-14) however remain below chronic hypoxic levels (<2.5 mg/L) as during much of the past decade. There are also several hypoxic hotspots within the Mission Valley reaches (Sites 3 and 6) present during dry-weather flow months of every year. This year's dry-weather dissolved oxygen depletion levels have not in general been as great as during the previous four years. October marks the first month of WY21 and suggests further recovery in overall (LSDR) water quality index values as noted over the past several years beginning in November 2018.

(jck 10/30/20)

