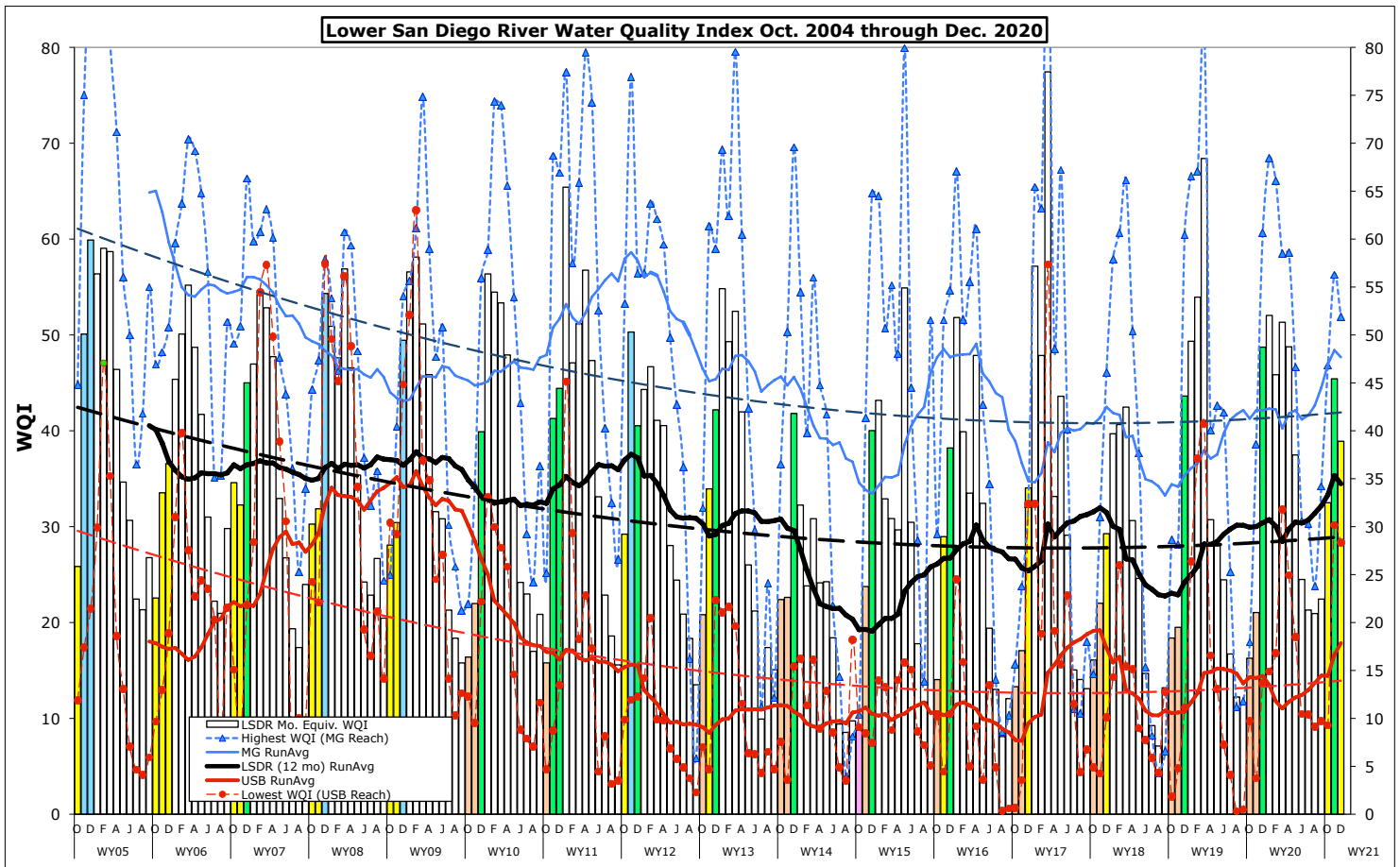


# Monthly WQM Report

## Lower San Diego River - December 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 (Nov/Dec). This month's overall index of 39 is six points (-14%) below last month and 2 points less than the 16-yr monthly average of 41. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) declined slightly but remained in the range of Fair (C) over the last 30 days.

<b>Table 1 - November/December 2020 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Nov/Dec	[8-10] Nov/Dec	[11-15] Nov/Dec	[1-15] Nov/Dec	Last Mo (11'20)	Last Yr (12'19)	17-yr Avg (Dec.)
Temperature, oC	16.6/12.0	12.6/8.4	14.5/10.3	15.0/10.6	-29%	-3%	-11%
Sp.Cond., mS/cm	2.57/3.42	2.05/2.00	2.15/2.07	2.41/2.55	6%	36%	42%
DO, mg/L	6.82/6.54	9.66/9.60	7.24/7.62	7.48/7.46	-3%	-4%	10%
DO, % of Sat.	70/61	91/87	68/69	73/68			
pH	7.97/8.08	8.29/8.30	8.05/8.25	8.02/8.18	2%	6%	6%
3-day ADF, cfs	4.5/2.4	4.4/4.2	4.3/4.4	4.4/3.6	17%	-67%	-86%
WQ Index	46/35	56/52	40/37	45/39	-14%	-20%	-5%
Nov/Dec Grade	C/D	B/B-	C/D+	C/C-			
Nov/ Dec	Fair/ Marginal	Good/ Good	Fair/ Marginal	Fair/ Fair	<b>Index down 6 points overall from last month</b>		

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

LSDR **water temperatures** fell 4.4 degrees (-29%) from last month to 3% below a year ago and -11% less than the 16-yr Dec. norm of 12 oC. Overall **specific conductivity** of 2.56 mS/cm constitutes a 6% increase from last month to 36% more than last Dec. and 42% above the 16-yr monthly norm of 1.80 mS/cm. The overall **dissolved oxygen** level of 7.46 mg/L (68%Sat.) is 3% below last month, 4% less than a year ago but still 10% above the 16-yr Dec. norm of 6.72 mg/L (62%Sat). **Streamflow** over the antecedent 3-day period of 3.6 cfs is down 17% from last month to 67% of a year ago and 86% less than the 17-yr norm. This month's LSDR **water quality index** (WQI) is six points less than last month, ten points (-20%) below a year ago and two points (-5%) under the 17-yr Dec. norm of 41.

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 streamflow (ADF) and rainfall (MRF) values, are expressed in **Table 2** on the next page.

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Nov'18 - Dec'20)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Nov.'18	21 (E+)	28 (D)	14 (E-)	19 (E)	t	9.6	0.81
<b>Dec.</b>	<b>54 (B)</b>	<b>61 (B)</b>	<b>25 (D-)</b>	<b>44 (C)</b>	<b>WW</b>	<b>48</b>	<b>3.02</b>
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	18 (E)	18 (E)	15 (E)	16 (E)	DW	0.9	0.00
Nov.'19	20 (E)	39 (C)	14 (E)	21 (E)	t	37	0.52
<b>Dec.</b>	<b>60 (B)</b>	<b>61 (B)</b>	<b>31 (D)</b>	<b>49 (C+)</b>	<b>WW</b>	<b>78</b>	<b>3.51</b>
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	32 (D)	47 (C)	26 (D-)	32 (D)	t	2.3	0.21
Nov.'20	46 (C)	57 (B)	40 (C)	46 (C)	t	7.2	0.17
<b>Dec.</b>	<b>35 (D)</b>	<b>52 (B)</b>	<b>37 (D+)</b>	<b>39 (C-)</b>	<b>t</b>	<b>3.3</b>	<b>0.08</b>

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River watershed as determined over the past 16+ years of monitoring. The first quarter of the water year values (Oct., Nov. and Dec.) 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 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/or poorest reach (Upper Santee Basin) are shown in red. The downward slope in index, represented by the smooth dashed black line, from WY05 through WY17 can be attributed to depleted dissolved oxygen levels extending throughout protracted low-flow periods of the water year. The dashed line represents an overall negative slope of -0.625% per annum in index value over the 16+ years of monitoring. The irregular solid black line (12-month running average index value), generally rising since reaching a low of 19 in Oct. 2014, is currently at 35. This month's index of 39 (green column) is the 11th time in 17 years that the Dec. value has been in the C (Fair) range.

Monthly WQI values from Oct. '04 through Dec.'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 35 is 10% above the 16+ yr LSDR flow-weighted average index; running at a level last experienced in late 2011. The running average Dec. low of 19 (39% below the current norm) occurred in 2014. The highest running average WQI of 39 (23% above the norm) occurred in 2004. The fact that the river has not yet experienced significant rainfall and stormflow during the first three months of the water year suggests that WY21 may result in slightly above average running average water quality index values.

Monthly and 12-mo. running average WQI values for the "poorest" (Upper Santee Basin) and "best" (Mission Gorge) reaches of the lower river are presented in **Chart 2**. Although water quality improved within the Upper Santee Basin over the past 12 months, resurgent aquatic growth and subsequent decay of invasive plants such as floating primrose-willow (*Ludwigia peploides*) in conjunction with below average dry weather flow and increased benthos are primary causes of sustained poor water quality within the upper portions of both the Santee Basin and Mission Valley sections of the river. 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.). Mission Gorge (blue line) present the least decline over time in water quality index values.

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. December results (color bars w/values in black) shown on Chart 5 are below those from last month (Chart 4) and Oct. (Chart 3). Six of 15 sites were rated Good (B) and six Fair (C) last month (Nov.), whereas this month, only two sites were rated Good and four Fair. Two sites were found to be Poor (E) this month the same as in Oct. There were none last month. As shown in Chart 5, this month's index values (solid colored columns) are in general below a year ago (Dec. 2019, dashed colored columns), last month (dashed red line) and the 17-yr Dec. norms (solid back line). The overall rating of 39 (C-) constitutes a borderline Fair-to-Marginal result that is two points below the 17-year norm for the last month of the calendar year. (jck 12/20/20)

