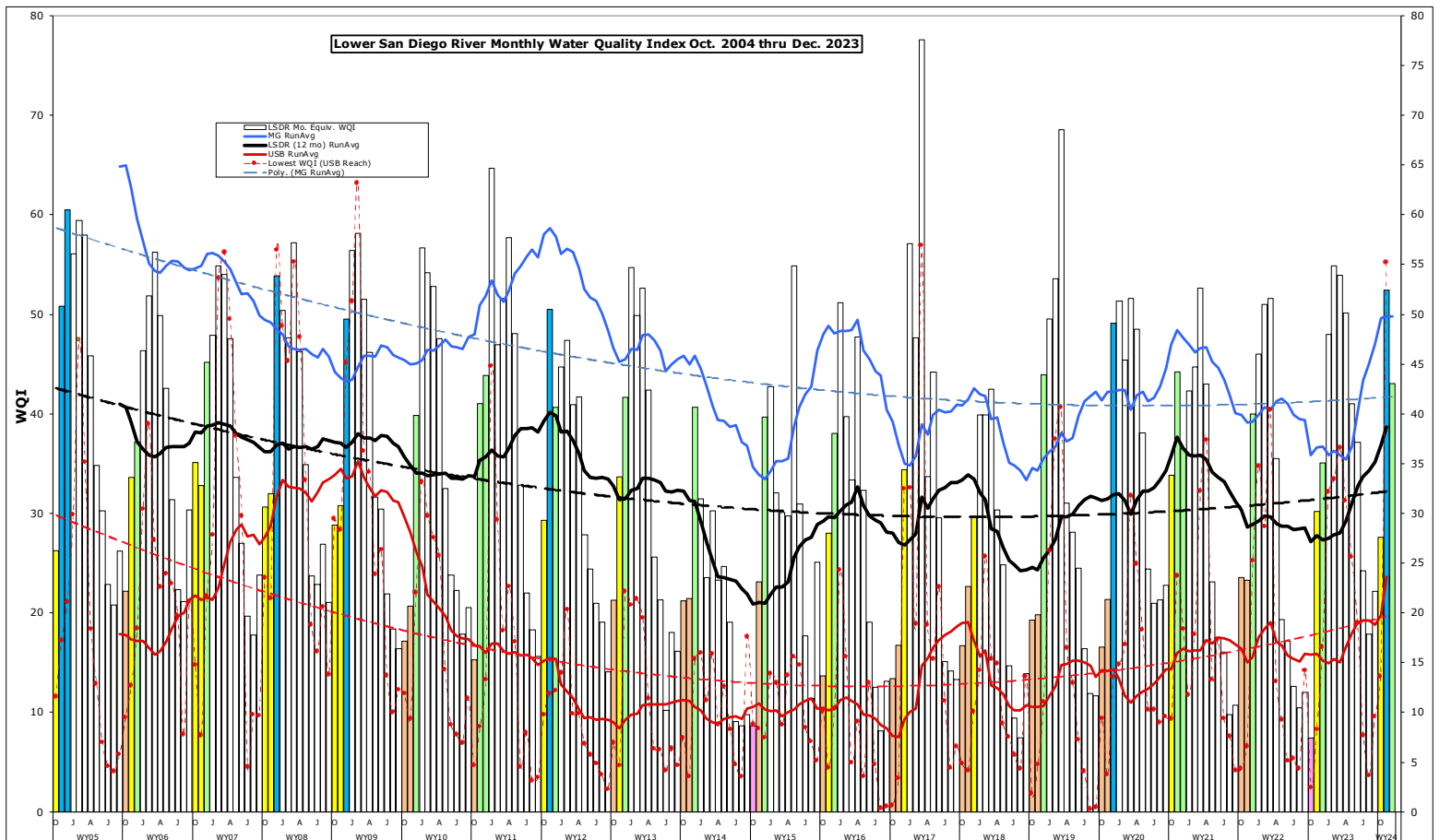


Monthly WQM Report

Lower San Diego River - December 2023



Lower SDR Water Quality Monitoring Data Summary

Table 1 presents a summary of water quality data monitored by the SDRPF RiverWatch Team within the Lower San Diego River (LSDR) watershed over the last two months (Nov/Dec) of 2023. This month's overall index is nine points below (-18%) last month but 23% above a year ago and one point above the 20-yr Dec. norm of 42.

Table 1 - Nov./Dec. 2023 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Site #s]	[1-7] Nov/Dec	[8-10] Nov/Dec	[11-15] Nov/Dec	[1-15] Nov/Dec	Last Mo. (11/'23)	Last Yr. (12/'22)	20-yr Avg. (Dec)
Temperature, oC	14.4/12.9	14.4/9.2	15.5/11.5	14.8/11.6	-22%	11%	-1%
Sp.Cond., mS/cm	1.27/2.02	0.74/1.10	0.92/1.46	1.00/1.68	68%	-15%	-9%
DO, mg/L	6.62/6.75	7.63/9.13	5.81/6.26	6.61/6.78	3%	20%	2%
DO, % of Sat.	65/65	74/82	59/58	65/63			
pH	7.65/-	-/-	-/-	7.65/-	0.5%	-1.3%	-0.9%
3-day ADF, cfs	52/12	50/11	49/11	50.8/11.4	-78%	-13%	-60%
WQ Index	49/45	59/53	51/36	52/43	-18%	23%	2%
Nov/Dec	C+/C	B/B	B-/D	B-/C			
Nov/Dec	Fair/ Fair	Good/ Good	Good/ Marginal	Good/ Fair	Index down 9 points from last month		

Negative variance (declines from norms) and DO depletion (DO < 5.0 mg/L or 50% of Sat) expressed in red.

LSDR **water temperatures** dropped 3.2 oC (-22%) from last month nearly matching the 20-yr norm of 11.7oC. The overall **specific conductance** of 1.68 mS/cm constitutes a 68% increase from last month reaching -9% below from the 20-yr norm of 1.84 mS/cm. The overall **dissolved oxygen** level of 6.78 mg/L (63%Sat.) is 3% higher than last month, 20% above last Dec. and 2% more than the 20-yr norm of 6.74 mg/L (62%Sat). **Streamflow** over the antecedent 3-day period of 11.4 cfs is 78% less than last month, 13% under a year ago and 60% of the Dec. norm. This month's overall LSDR **water quality index** (WQI) of 43 (C) is 18% lower than last month, 23% above a year ago and 2% above the 20-yr norm of 42 (C).

Monthly WQI values occurring over the past 25 months of record for the three main sections of the lower river system, the overall LSDR average, plus 30-day antecedent average daily streamflow (ADF) and total monthly rainfall (MRF) values, are expressed in **Table 2** on the next page.

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Dec.'21 - Dec.'23)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF,cfs	TMRF,in
Dec. '21	35 (D)	53 (B-)	38 (C-)	40 (C)	WW	21	1.10
Jan.'22	44 (C)	68 (B)	38 (C-)	46 (C)	WW	30	1.64
Feb.	55 (B)	67 (B)	38 (C-)	51 (B-)	T	7.1	0.22
March	55 (B)	61 (B)	42 (C)	52 (B-)	WW	26	1.04
April	32 (D)	69 (B)	25 (D-)	36 (D)	WW	14	1.01
May	17 (E)	32 (D)	15 (E)	19 (E)	T	4.1	0.03
June	19 (E)	16 (E)	15 (E)	17 (E)	DW	1.1	0.00
July	17 (E)	2 (F-)	12 (F+)	13 (E-)	DW	0.6	0.00
Aug.	15 (E)	2 (F-)	8 (F)	10 (F)	DW	0.4	0.00
Sept.	8 (F)	11 (F+)	16 (E)	12 (F+)	DW	2.0	0.64
Oct.	9 (F)	3 (F-)	7 (F)	7 (F)	T	0.9	0.03
Nov. '22	25 (D-)	59 (B)	24 (E+)	32 (D)	WW	17	1.16
Dec. '22	32 (D)	53 (B-)	30 (D)	35 (D)	WW	18	0.93
Jan. '23	49 (C+)	58 (B)	42 (C)	48 (C+)	WW	190	3.48
Feb.	56 (B)	71 (B)	47 (C)	55 (B)	WW	36	2.76
March	58 (B)	57 (B)	52 (B-)	55 (B)	WW	132	4.86
April	52 (B-)	65 (B)	43 (C)	50 (B-)	WW	77	0.54
May	40 (C)	47 (C+)	39 (C)	41 (C)	T	19	0.12
June	33 (D)	59 (B)	33 (D)	37 (D+)	T	18	0.03
July	19 (E)	39 (C-)	23 (E)	24 (E+)	DW	4.9	0.00
Aug	20 (E)	22 (E)	15 (E)	18 (E)	DW	3.1	0.10
Sept	17 (E)	35 (D)	22 (E)	22 (E)	T	26	1.75
Oct.	31 (D)	34 (D)	21 (E)	28 (D)	DW	4.9	0.01
Nov '23	49 (C+)	59 (B)	51 (B-)	52 (B-)	WW	32	0.15
Dec. '23	45 (C)	53 (B)	36 (D)	43 (C)	WW	16	0.13

The **cover page** of this report presents monthly WQI values and range (high/low) for the Lower San Diego River watershed over the past 20 years. Each year's Oct. Nov. and Dec. values are expressed as color-shaded bars; blue (50 or >) A-B/Good, green (38-49) C/Fair, yellow (25-37) D/Marginal, brown (13-24) E/Poor, and pink (12 or <) F/Very Poor. Running average index values for the LSDR (distance weighted averages of all sites) are shown as a heavy black line. Running averages for the consistently highest (best) quality section of the river (Mission Gorge) are shown as a 'blue' line while the consistently lowest (poorest) reach (Upper Santee Basin) is shown in 'red'. The dashed lines represent overall (20-yr) trends. This month's value of 43 is the 13th time the index has been at grade level C (Fair) for December, one point above the 20-yr norm of 42.

WQI values extending from Sept.'04 thru Dec.'23 are presented in **Chart 1** (next page) together with 12-mo. running averages for each of the five reaches as well as overall (i.e., LSDR) for the lower river system. The current WQI of 39 is 20% above the 20-yr norm of 32.8. The running average low for Dec. of 21 (36% below norm) occurred in 2014. The highest running average WQI for this month of 40 (21% above the norm) occurred in 2011. The greatest improvement in water quality this month occurred on lower Forester Creek at monitoring site 15T.

Monthly and 12-mo. running average WQI values for the 'poorest' (Upper Santee Basin) and "best" (Mission Gorge) reaches of the lower watershed are presented in **Chart 2**. Although water quality has measurably improved during much of 2023, resurgent growth of invasive aquatics and subsequent decomposition with associated accrual of organics, especially in ponded portions along the river, are considered the underlying cause of subpar water quality. The greatest downward trend (red-dashed line) over time is associated with the poorest quality reach (Upper Santee Basin) encompassing Mast Park East (#13E), also referred to as 'Walmart Pond', and Magnolia Ave. (#14) sites. The Mission Gorge (blue line) section from Old Mission Dam through Mission Trails continues to demonstrate the least decline in values over the 20-yr monitoring period. The poorest quality Mission Valley site is at the outlet from Kaiser Ponds (Site 6) past San Diego Mission Rd. bridge. The poorest Santee Basin site (13E) is Mast Park East (aka, 'Walmart Ponds').

Spatial WQI values determined over the last three months, expressed in order of occurrence upstream, are shown in **Charts 3, 4 and 5** on page 6. This month's results (color bars w/values in black shown on Chart 5) are above those from last Dec. but generally below those from last month and the 20-yr norms. This month four out of 16 sites (25%) are graded B(Good), seven C(Fair), four D(Marginal) and one E(Poor). Last month only two were Marginal(D), four C(Fair) and 10 B(Good). The majority of sites were found Marginal (D) in October. Current index values for all 16 sites are within 3-4% of the 20-yr Dec. norms. The greatest decline in index values are associated with the three upper most Santee Basin sites (14, 13E & 13W).

Next month's index is expected to rise due to enhanced streamflow, low water temperatures, reduced Specific Conductance and elevated DO levels. Similarly, overall water quality is expected to continue improving in the lower river watershed throughout the first half of WY24.

12/17/23 (JCK)

Chart 1 - LSDR Monthly WQI, Running Averages and Trendlines by River Reach (Sept. 2005 thru Dec. 2023)

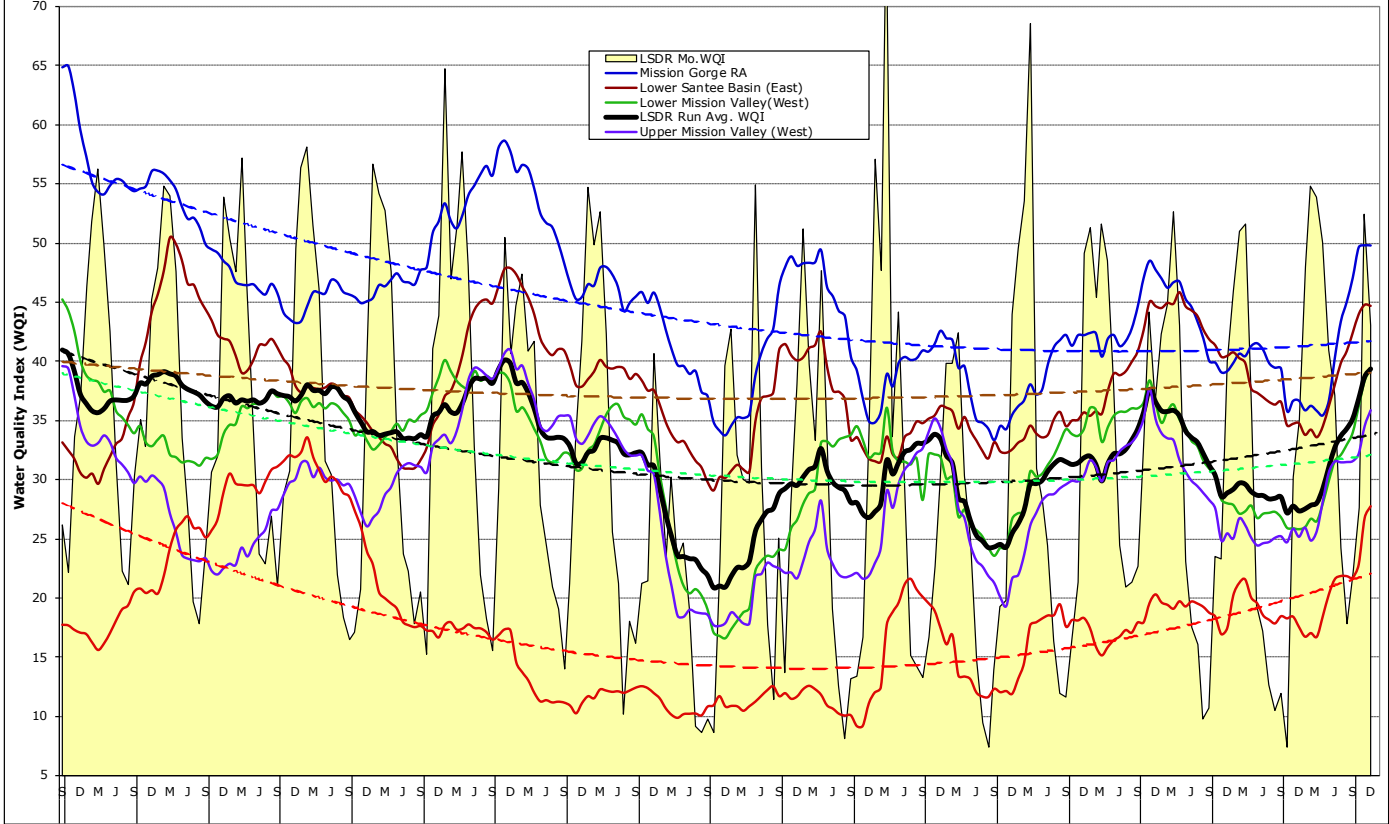


Chart 2 - Mast Park East (Site 13E) and Mission Gorge (Sites 8-10) Monthly WQI, 12-mo Running Averages and 20-yr Trendlines

