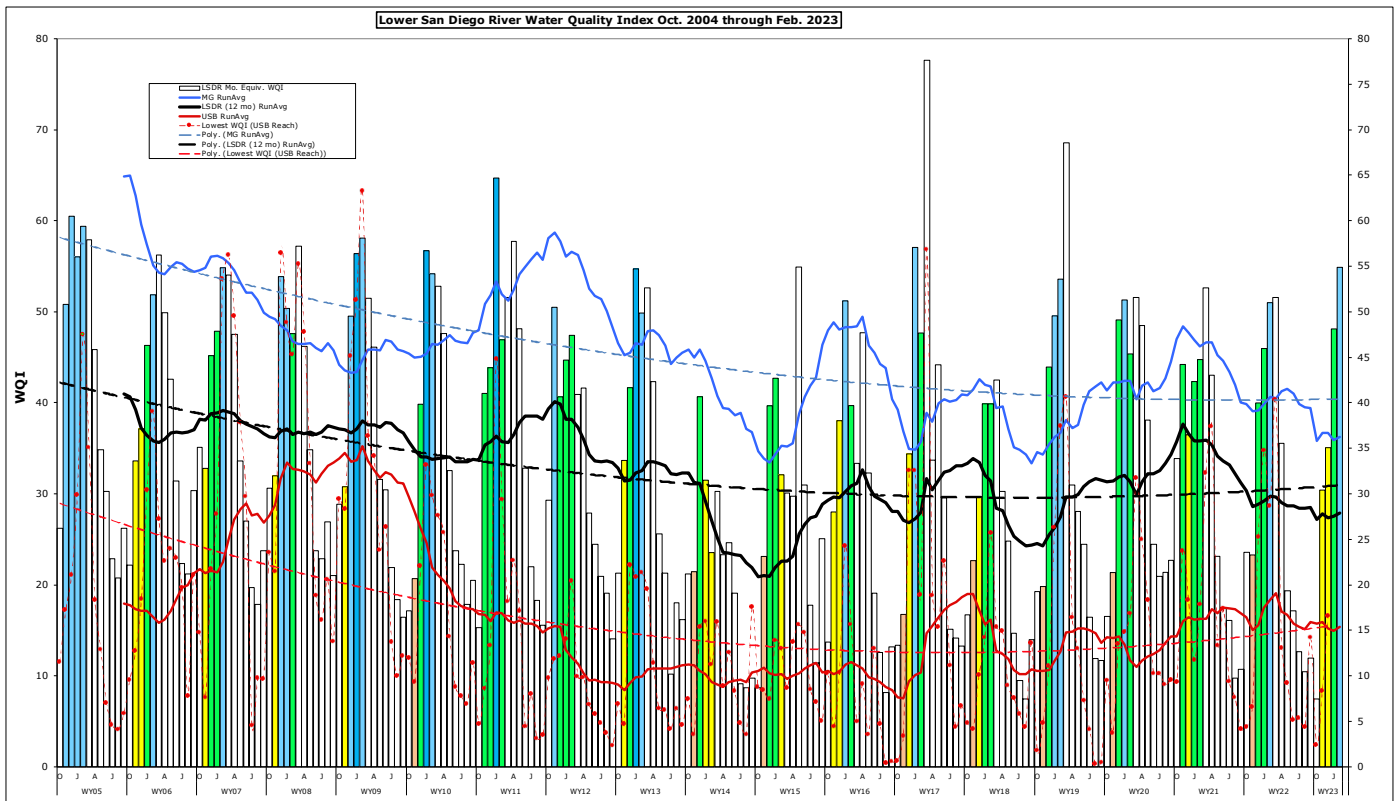


Monthly WQM Report

Lower San Diego River - February 2023



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 (Jan/Feb) of 2023. This month's overall index increased seven points (14%) from last month. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) rose from C+ Fair in January to B Good in February.

Table 1 - January/February 2023 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Site #s]	[1-7] Jan/FEB	[8-10] Jan/FEB	[11-15] Jan/FEB	[1-15] Jan/FEB	Last Mo. (1/'23)	Last Yr. (2/'22)	19-yr Avg. (FEB)
Temperature, oC	11.6/12.2	12.1/9.6	11.3/10.7	11.6/11.0	-5%	-16%	-20%
Sp.Cond., mS/cm	1.59/2.94	1.54/1.21	1.33/1.84	1.43/2.23	57%	16%	32%
DO, mg/L	7.83/8.74	9.06/11.65	6.50/8.34	7.39/8.85	19%	16%	20%
DO, % of Sat.	73/82	83/104	61/76	69/81			
pH	7.65/7.72	7.96/8.14	7.50/7.74	7.56/7.73	2%	1%	-1%
3-day ADF, cfs	102/25	116/18	118/17	111/20	-82%	1%	-65%
WQ Index	48/57	58/71	42/47	48/55	14%	8%	16%
Jan/FEB	C+/B	B/B	C/C	C+/B			
Jan./FEB	Fair/Good	Good/Good	Fair/Fair	Fair/Good	Index up 7 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** declined 5% (0.6 oC) from last month to 20% below the 19-yr norm of 13.7 oC. The overall **specific conductance** of 2.23 mS/cm constitutes a 57% rise from last month; a 32% increase above the 19-yr Feb. norm of 1.69 mS/cm. The overall **dissolved oxygen** level of 8.85 mg/L (81%Sat.) is 19% above last month, 16% greater than last Feb. and 20% greater than the 19-yr norm of 7.19 mg/L (69%Sat). **Streamflow** over the antecedent 3-day period of 20 cfs is 82% below last month, the same as a year ago and 65% below the 19-yr Feb. norm. This month's overall LSDR **water quality index** (WQI) of 55 constitutes a 14% increase over last month, 8% above last year and 16% greater than the 19-yr Feb. norm of 48 (C+).

Monthly WQI values occurring over the past two years 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 (Jan.'21 - Feb.'23)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF,cfs	TMR,F,in
Jan.	46 (C)	60 (B)	30 (D)	42 (C)	WW	10	1.10
Feb. 21	52 (B-)	57 (B)	35 (D)	45 (C)	WW	35	0.50
March	55 (B)	64 (B)	45 (B)	53 (B-)	WW	28	2.32
April	29 (D)	59 (B)	50 (B-)	43 (C)	T	7.9	0.12
May	25 (D-)	29 (D)	20 (E)	23 (E+)	T	3.7	0.04
June	14 (E)	23 (E+)	19 (E)	17 (E)	DW	1.7	0.002
July	15 (E)	16 (E)	16 (E)	16 (E)	DW	0.8	0.004
Aug.	11 (F+)	6 (F)	10 (F)	10 (F)	DW	0.6	0.22
Sept.	12 (F+)	11 (F+)	10 (F)	11 (F+)	DW	0.6	0.004
Oct.	19 (E)	46 (C)	18 (E)	24(E+)	T	6.4	0.80
Nov.	16 (E)	47 (C)	22 (E)	23 (E+)	T	2.4	0.21
Dec.	35 (D)	53 (B-)	38 (C-)	40 (C)	WW	21	1.10
Jan.	44 (C)	68 (B)	38 (C-)	46 (C)	WW	30	1.64
Feb. 22	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)	11 (F+)	DW	0.4	0.00
Sept.	8 (F)	11 (F+)	16 (E)	12 (F+)	DW	2.0	0.64
Oct.	8 (F)	3 (F-)	8 (F)	7 (F)	T	0.9	0.03
Nov.	23 (E+)	57 (B)	24 (E+)	30 (D)	WW	15	1.16
Dec.	32 (D)	53 (B-)	30 (D)	35 (D)	WW	12	0.93
Jan.	48 (C+)	58 (B)	42 (C)	48 (C+)	WW	188	3.48
FEB. 23	57 (B)	71 (B)	47 (C)	55 (B)	WW	23	2.76

The **cover page** of this report presents monthly WQI values and range (high/low) for the Lower San Diego River watershed over 18 plus years of monitoring. Nov., Dec. and Jan. values for each year are expressed as color-shaded bars; blue (50 or >) 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 (reach-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 expressed in red. The generally downward slope in index values, represented by dashed trendlines, are attributable to depleted DO levels extending throughout extended low-flow periods of the year. The dashed lines present a negative slope (decline) of 0.8 points per annum in index value over the full monitoring period. The irregular solid black line (12-month running average index), generally increasing since reaching a low of 21 in late 2014, is currently at 28; 16% below the running average norm of 32.7. This month's index value of 55 is the 9th time over the past 19 years (47%) that the Feb. index has exceeded 50; reaching the grade level of Good (B).

WQI values extending from Oct.'04 through this month are presented in **Chart 1** (next page) together with 12-mo. running averages for each of the five reaches of the lower river system and overall (i.e., LSDR). The current running average WQI of 28 is five points below the to-date LSDR weighted average value of 33. The running average low for Feb. of 23 (33% below norm) occurred in 2015. The highest running Feb. average WQI of 39 (20% above norm) occurred in 2007.

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 improved somewhat within the upper-most reach in recent years, resurgent invasive aquatic vegetation and subsequent decomposition acting in conjunction with below average streamflow and accrual of benthic organic matter, especially in the deeper ponded portions of the river, are considered the principal causes of poor water quality. The greatest downward trend (red-dashed line) over time is associated with the poorest quality reach (Upper Santee Basin) encompassing Mast Park(#13E) and Magnolia Ave.(#14) monitoring sites. The Mission Gorge (blue line) section continues to demonstrate the least decline in index values over the monitoring period. The poorest quality Mission Valley site is the outlet from Kaiser Ponds (Site 6) at the San Diego Mission Rd. crossing. The poorest Santee Basin site is at the Mast Park East ponds (Site 13E)

Spatial WQI values determined over the last three months, shown in **Charts 3, 4 and 5** on page 6, are expressed in order of location upstream. This month's results (color bars w/values in black shown on Chart 5) are above those from last month (Chart 4) and December (Chart 3) values. Ten out of 16 sites (62%) are graded Good (B) or above while five more are Fair (C). Only one site is rated Marginal (D) and none Poor (E). With few exceptions (9T, 12T & 13E) this month's index values (solid colored columns) are above those from both last month (dashed red line) and the 19-yr running averages (solid black line). The overall water quality index of 55 represents the 9th time over the past 19 years the value has been in the Good (B) range. Further improvement in the water quality index is possible over the next month depending primarily on hydrologic conditions; e.g., rainfall and resultant streamflow. {2/20/23 jck}

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

This chart displays the monthly Water Quality Index (WQI) for various river reaches, along with running averages and trendlines. The Y-axis represents the Water Quality Index (WQI) from 5 to 70. The X-axis represents time in years, from WY06 to WY23. The chart includes the following data series:

- LSDR Mo. WQI (Yellow shaded area)
- Mission Gorge RA (Blue line)
- Lower Santee Basin (East) (Red line)
- Lower Mission Valley (West) (Green line)
- LSDR Run Avg. WQI (Black line)
- Upper Mission Valley (West) (Purple line)
- Upper Santee Basin (East) (Brown line)

The chart shows significant seasonal fluctuations in WQI, with peaks often occurring in the summer months (WY06, WY07, WY08, WY09, WY10, WY11, WY12, WY13, WY14, WY15, WY16, WY17, WY18, WY19, WY20, WY21, WY22, WY23). The WQI generally decreases over time, with the lowest values observed in WY14 and WY15. The LSDR Run Avg. WQI (black line) shows a steady decline from approximately 40 in WY06 to around 28 in WY23. The trendlines for each reach also show a general downward trend, with the Upper Santee Basin (East) (brown line) having the highest trendline and the Lower Santee Basin (East) (red line) having the lowest.

Chart 2 - Mast Park East (Site 13E) and Mission Gorge (Sites 8-10) Monthly WQI, 12-mo Running Averages and 18+yr Trendlines

The chart displays two data series: Mission Gorge (Sites 8-10) Mo. WQI (blue) and USB Site 13E Mo. WQI (red). Both series show monthly fluctuations, 12-month running averages (solid lines), and 18-year trendlines (dashed lines). The Y-axis represents the Running Average (12mo) WQI, ranging from 0 to 90. The X-axis shows months from September to December.

Legend:

- MsnGorge (Sites 8&10) Mo. WQI
- USB Site 13E Mo. WQI

