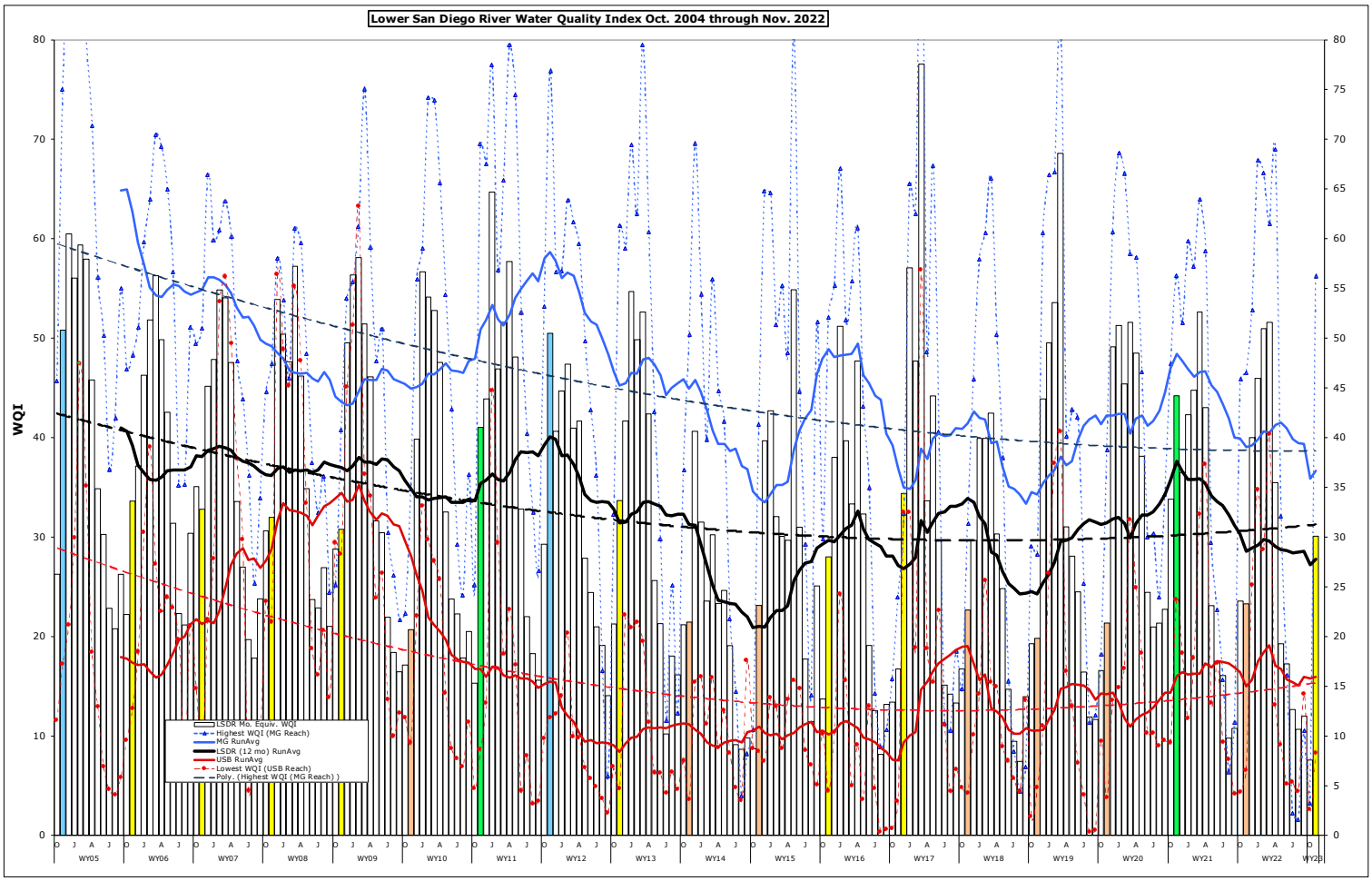
Monthly WQM Report

Lower San Diego River - November 2022



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 (Nov/Oct). This month's overall index rose 22 points (295%) from last month to within one point of the 18-yr monthly norm. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) for this month reached a grade level of D or 'mid-Marginal'.

Table 1 - November/October 2022 WQM Data Summary

	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Site #s]	[1-7] Nov/Oct	[8-10] Nov/Oct	[11-15] Nov/Oct	[1-15] Nov/Oct	Last Mo. (10/'22)	Last Yr. (11/'21)	18-yr Avg. (Nov.)
Temperature, oC	12.8/19.9	10.7/20.3	12.7/21.1	12.3/20.5	-40	-21%	-17%
Sp.Cond., mS/cm	/3.15	2.43/2.63	2.50/2.61	2.90/3.25	-24%	-13%	-13%
DO, mg/L	3.40/1.46	6.47/2.14	4.43/2.28	4.40/1.82	120%	10%	-20%
DO, % of Sat.	32/16	59/25	42/26	41/21			
pH	7.63/7.48	8.02/7.61	7.83/7.55	7.75/7.52	3%	0%	0%
3-day ADF, cfs	5.3/1.5	4.3/0.5	4.2/0.4	4.7/0.9	440%	93%	-12%
WQ Index	**23**/9	**56**/3	**24**/8	**30**/8	295%	29%	-1%
Nov./Oct.	**E+**/F	**B**/F	**E+**/F	**D**/F			
Nov. 22/ Oct. '22	**Poor**/ VeryPoor	**Good**/ VeryPoor	**Poor**/ Very Poor	**Marginal**/ Very Poor	**Index up 22 points from last month**		

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

LSDR **water temperatures** declined 8.2 degrees (40%) below last month, 21% less than a year ago and 17% the 18-yr Nov. norm of 15 oC. Overall **specific conductivity** of 2.90 mS/cm constitutes a 24% decrease from last month and 13% less than last year and the 18-yr monthly norm of 2.67 mS/cm. The overall **dissolved oxygen** level of 4.40 mg/L (41%Sat.) is 120% above last month and 10% more than last Nov. but remaining 20% below the 18-yr norm of 5.35 mg/L (52%Sat). **Streamflow** over the antecedent 3-day period of 4.7 cfs is over five times last month and 93% more than a year ago and only 12% below the 18-yr norm. This month's overall LSDR **water quality index** (WQI) of 30 is up 22 points from last month to 29% above last year to within one percent the 18-yr November norm.

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 (Oct.'20 - Nov.'22)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF,cfs	TMRF,in
Oct. 20	32 (D)	47 (C)	27 (D-)	34 (D)	T	2.4	0.21
Nov. '20	**45 (C)**	**56 (B)**	**37 (D+)**	**44 (C)**	**T**	**7.6**	**0.11**
Dec.	34 (D)	52 (B)	32 (D)	36 (D+)	T	2.9	0.06
Jan. '21	46 (C)	60 (B)	30 (D)	42 (C)	WW	10	1.10
Feb.	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 '21	12 (F+)	11 (F+)	10 (F)	11 (F+)	DW	0.6	0.004
Oct. 21	19 (E)	46 (C)	18 (E)	24(E+)	T	6.4	0.80
Nov. '21	**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. '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)	11 (F+)	DW	0.4	0.00
Sept '22	8 (F)	11 (F+)	16 (E)	12 (F+)	DW	2.0	0.64
Oct. '22	8 (F)	3 (F-)	8 (F)	7 (F)	DW	0.9	0.03
NOV. 22	**23 (E+)**	**56 (B)**	**24 (E+)**	**30 (D)**	**T**	**16**	**1.13**

The **cover page** of this report presents monthly WQI values and range (high/low) for the Lower San Diego River watershed over the 18 years of monitoring. November 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 (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 primarily attributed to depleted DO levels extending throughout protracted low-flow periods. The dashed lines present a negative slope of -0.6 points per annum in index value over the 18-yr 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; 15% below the 18-yr norm of 33. This month's overall index value of 30 is the 8th time the Nov. index has been in the Marginal (D) catergory.

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 5 points below the to-date LSDR weighted average value of 33. The running average low for Nov. of 21 (36% below the current norm) occured in 2014. The highest running average WQI for Nov. of 39 (20% above norm) occured in 2005. The river system has experieced below normal rainfall and runoff over the past several years.

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 vegitation and subsequent decomposition acting in conjunction with below average streamflow and accrual of organics, especially in the deeper ponded portions, 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) encompasing 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 entire monitoring period. The poorest quality Mission Valley site is the outlet from Kaiser Ponds (Site #6) at the San Diego Mission Rd. crossing.

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. November results (color bars w/values in black shown on Chart 5) are significantly below those from last month (Chart 4) and September (Chart 3). Four out of 16 sites (25%) are graded Very Poor (F) this month while four more are Poor (E). Two sites are rated Good (B), and three are Fair (C) and three more Marginal (D). This month's values (solid colored columns) are considerably above those from last month (dashed red line) and in some instances above the 18-yr running averages (solid back line). The overall water quality index of 30 represents the eighth time over the past 18 years that the November value has been in the mid-Marginal (D) range. Further improvement is expected over the next month.

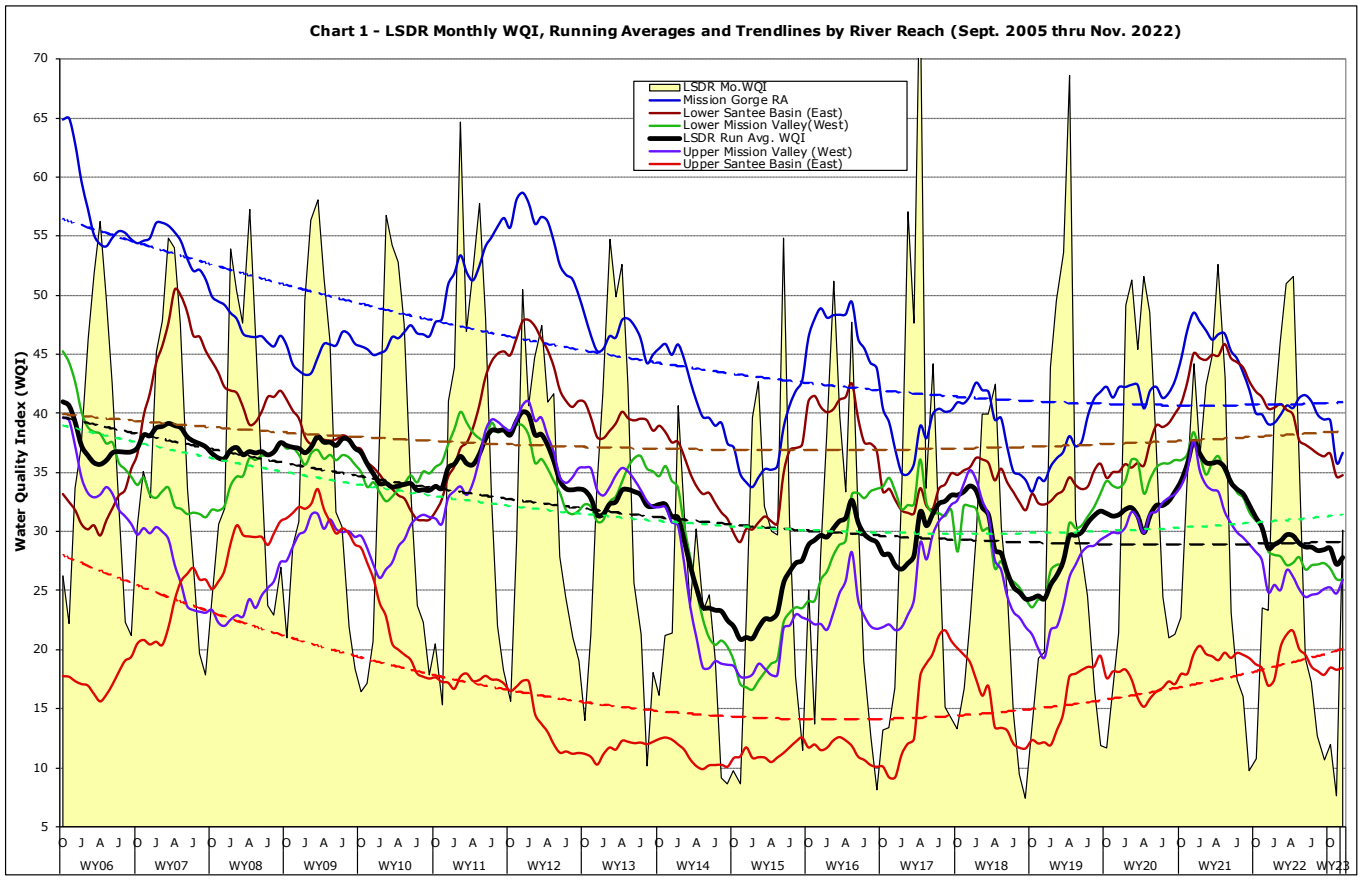


Chart 1 - LSDR Monthly WQI, Running Averages and Trendlines by River Reach (Sept. 2005 thru Nov. 2022)
LSDR Mo.WQI
Mission Gorge RA
Lower Santee Basin (East)
Lower Mission Valley(West)
LSDR Run Avg. WQI
Upper Mission Valley (West)
Upper Santee Basin (East)
Water Quality Index (WQI)
WY06
WY07
WY08
WY09
WY10
WY11
WY12
WY13
WY14
WY15
WY16
WY17
WY18
WY19
WY20
WY21
WY22
WY23

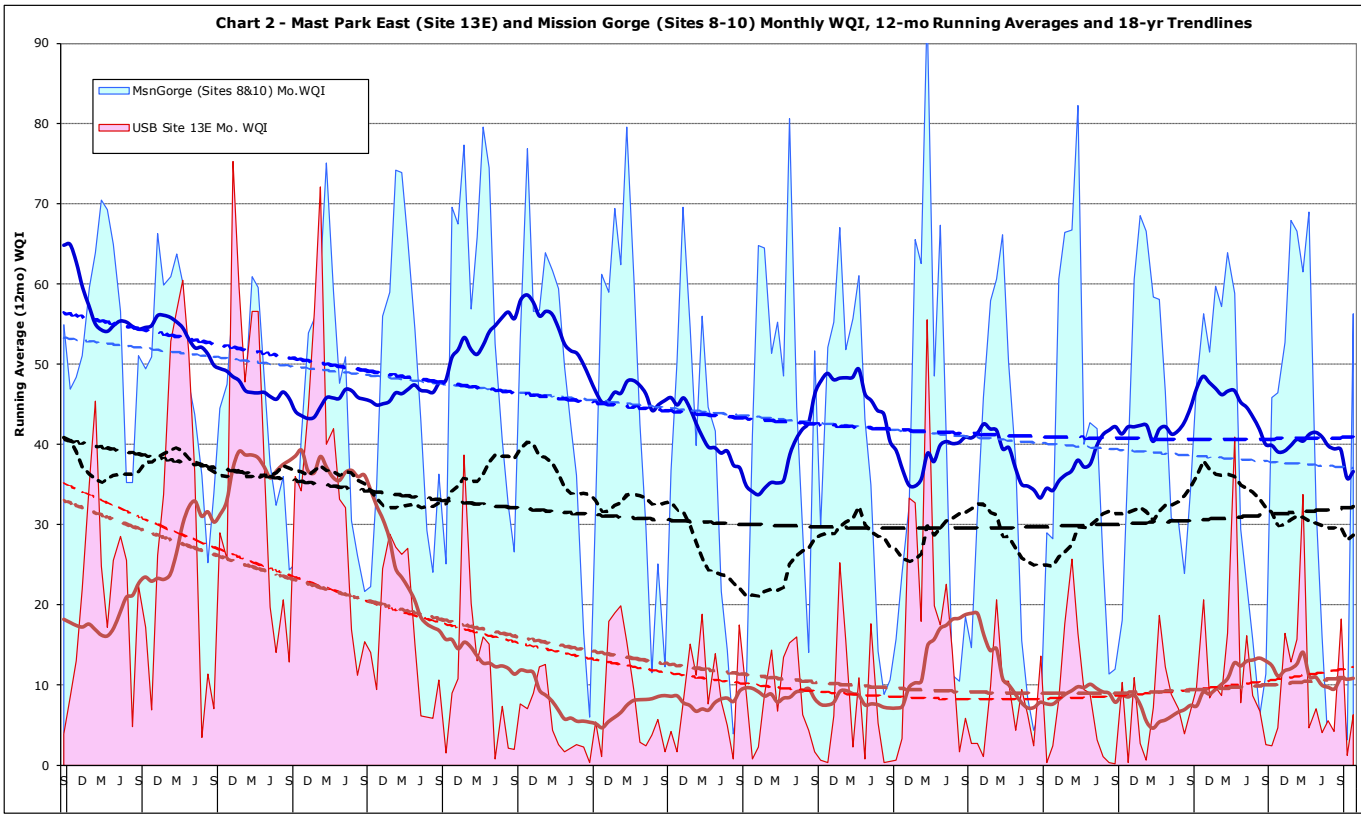


Chart 2 - Mast Park East (Site 13E) and Mission Gorge (Sites 8-10) Monthly WQI, 12-mo Running Averages and 18-yr Trendlines
MsnGorge (Sites 8&10) Mo.WQI
USB Site 13E Mo. WQI
Running Average (12mo) WQI

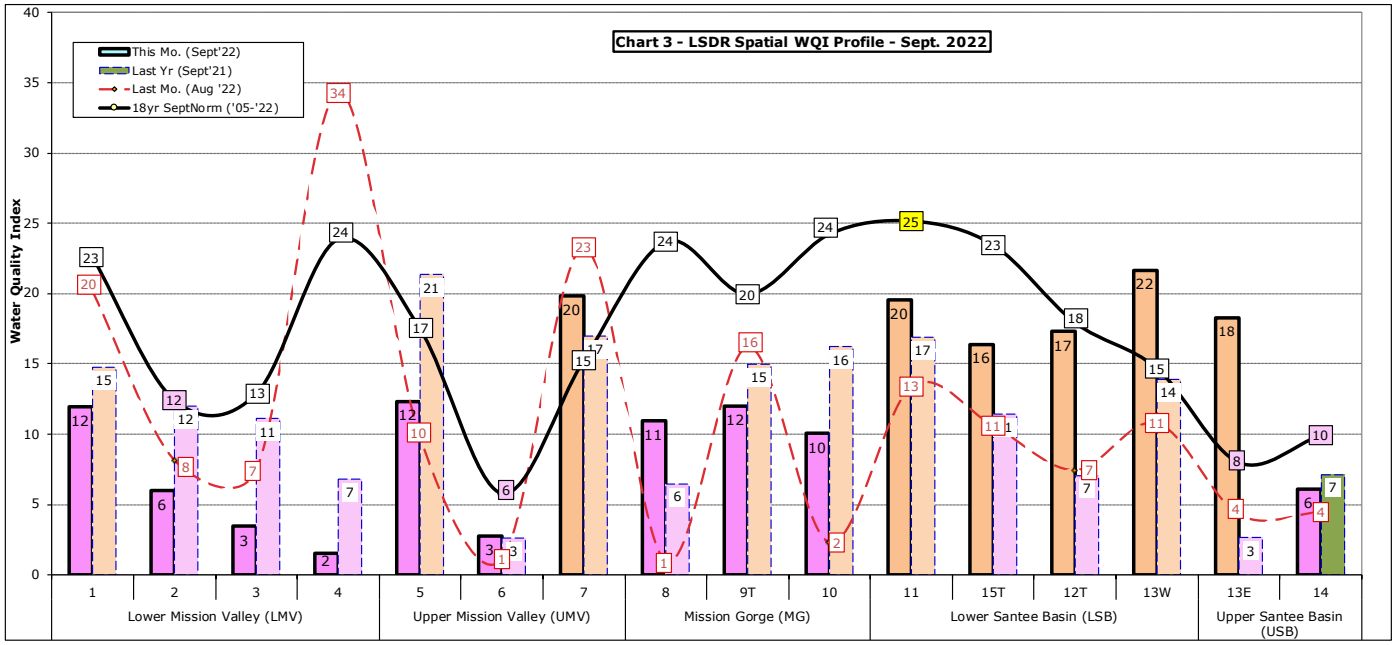


Chart 3 - LSDR Spatial WQI Profile - Sept. 2022
This Mo. (Sept'22)
Last Yr (Sept'21)
Last Mo. (Aug '22)
18yr SeptNorm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)

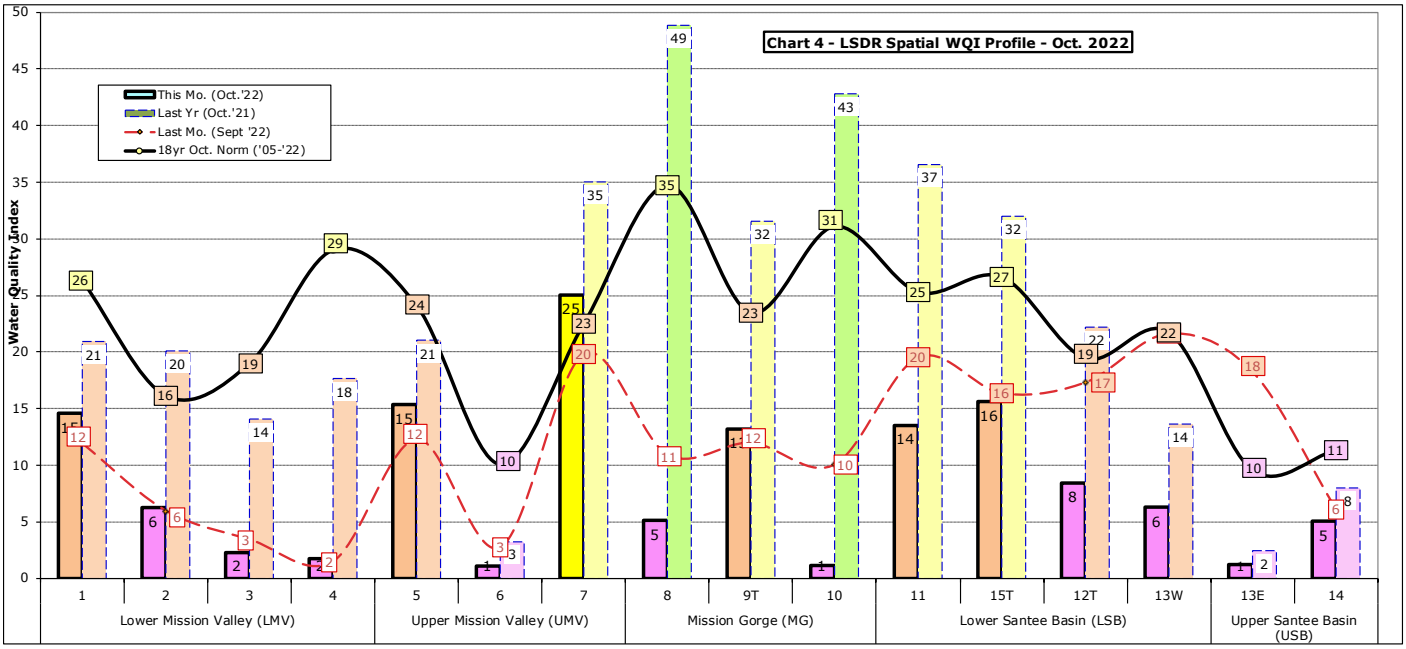


Chart 4 - LSDR Spatial WQI Profile - Oct. 2022
This Mo. (Oct.'22)
Last Yr (Oct.'21)
Last Mo. (Sept '22)
18yr Oct. Norm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)

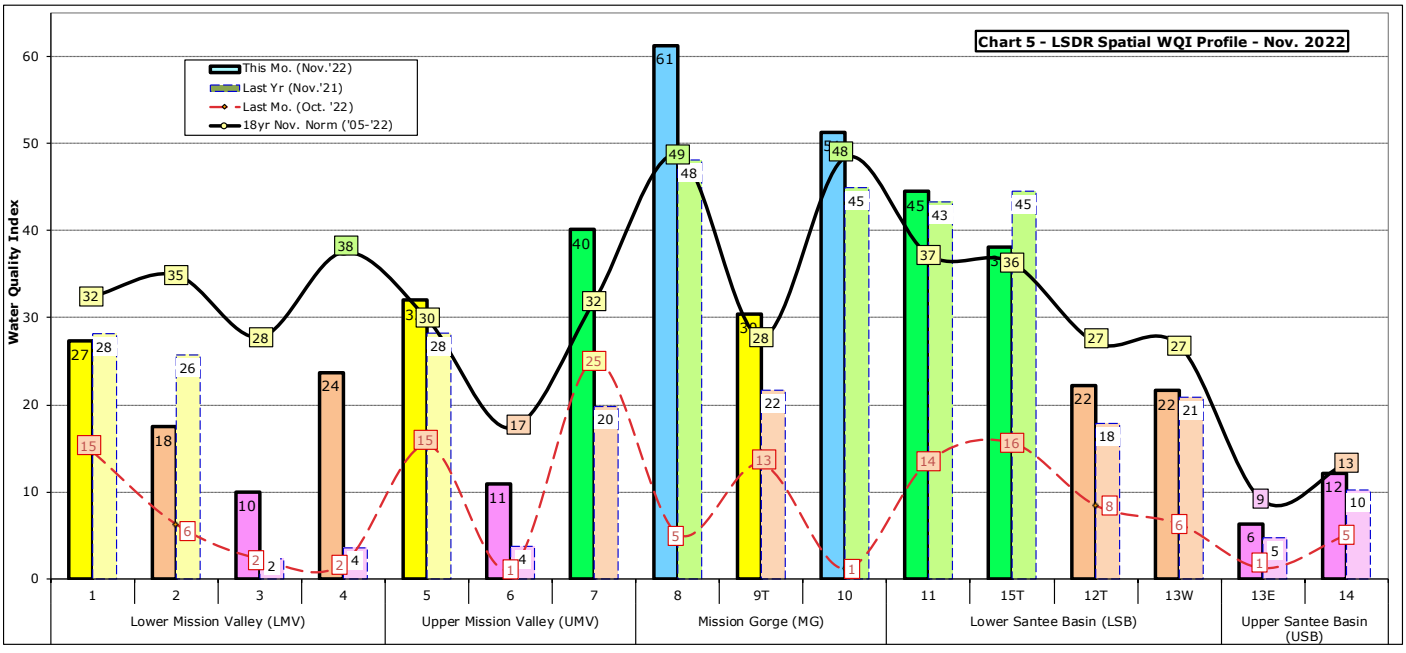


Chart 5 - LSDR Spatial WQI Profile - Nov. 2022
This Mo. (Nov.'22)
Last Yr (Nov.'21)
Last Mo. (Oct. '22)
18yr Nov. Norm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)