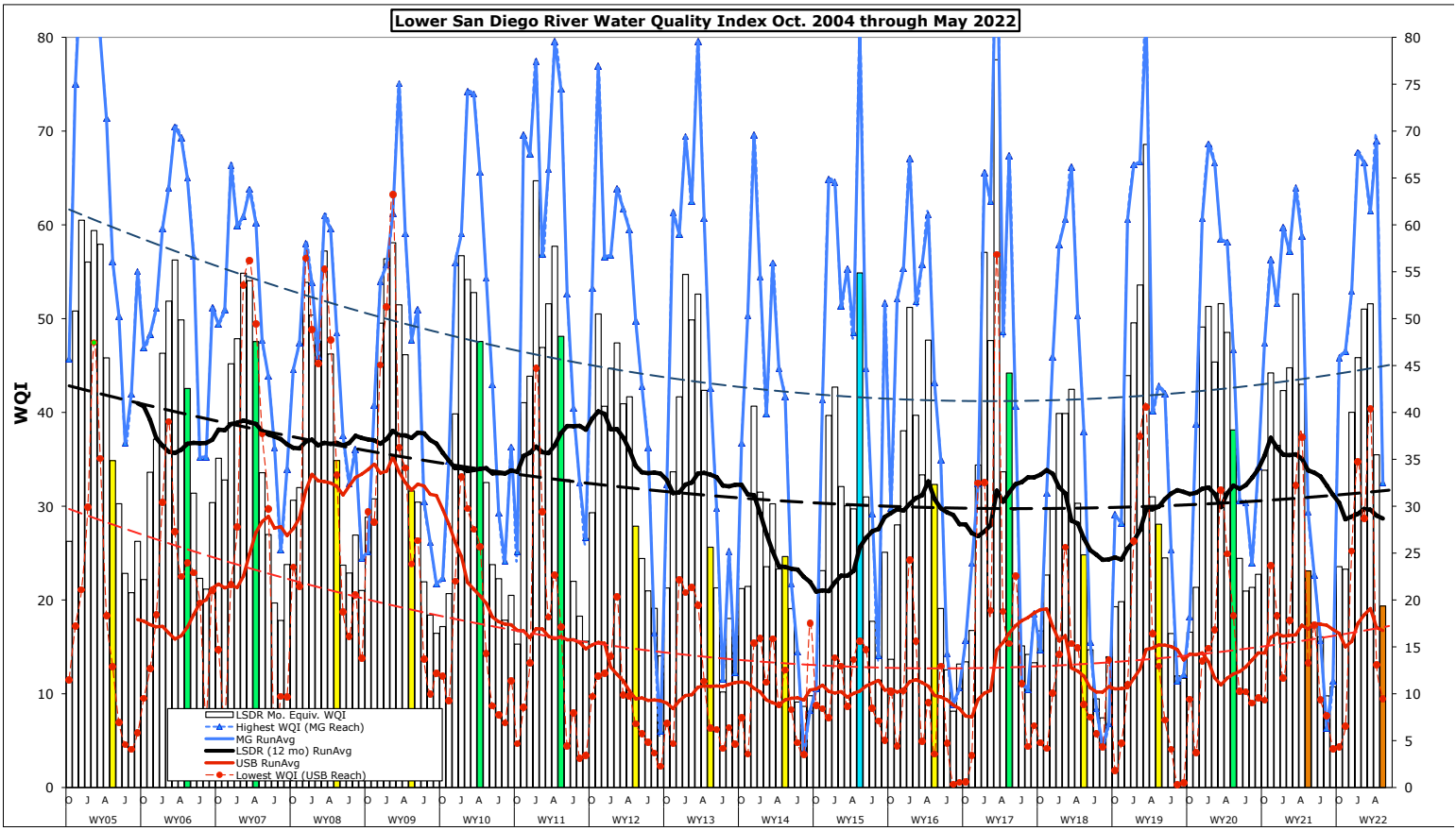
Monthly WQM Report

Lower San Diego River - May 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 subbasin over the past two months (May/April). This month's overall index declined 15 points (45%) from last month to a value 15% below last May and 41% below the 18-yr norm. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) transitioned a full grade falling from D 'Marginal' in April to E 'Poor' this month.

Table 1 - May/April 2022 WQM Data Summary

	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Site #s]	[1-7] **May**/Aprl	[8-10] **May**/Aprl	[11-15] **May**/Apri	[1-15] **May**/Aprl	Last Mo. (4/'22)	Last Yr. (5/'21)	18-yr Avg. (May)
Temperature, oC	**20.0**/19.6	**19.2**/18.5	**19.5**/17.9	**19.6**/18.6	5%	2%	-2%
Sp.Cond., mS/cm	**2.71**/2.07	**1.65**/1.49	**1.82**/1.83	**2.24**/1.87	20%	-9%	1%
DO, mg/L	**2.71**/3.72	**7.46**/10.23	**3.34**/4.63	**3.74**/5.11	-28%	-25%	-11%
DO, % of Sat.	**30**/41	**81**/107	**37**/50	**41**/55			
pH	**7.47**/7.48	**7.64**/8.00	**7.57**/7.74	**7.53**/7.63	-1%	-4%	-2%
3-day ADF, cfs	**2.6**/14	**1.5**/5.3	**1.3**/3.7	**1.8**/8.3	-78%	-35%	-74%
WQ Index	**18**/32	**33**/69	**15**/25	**20**/35	-45%	-15%	-41%
May/April	**E**/D	**D**/B	**E**/D-	**E**/D			
May/ April '22	**Poor**/ Marginal	**Marginal**/ Good	**Poor**/ Marginal	**Poor**/ Marginal	**Index down 15 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** rose one degee (5%) from last month to 2% below the 18-yr monthly norm of 19.9 oC. Overall **specific conductance** of 2.24 mS/cm constitutes a 20% increase from last month that is 9% less than last May but 1% above the 18-yr monthly norm of 2.21 mS/cm. The overall **dissolved oxygen** level of 3.74 mg/L (41%Sat.) is a 26% drop from last month, 6% less than last May and 25% below the 18-yr norm of 4.98 mg/L (54%Sat). **Streamflow** over the antecedent 3-day period of 1.8 cfs is 78% less than last month, 36% below a year ago and 74% below the 18-yr average of 7.1 cfs. This month's overall LSDR **water quality index** (WQI) of 20 is down 45% from last month, 15% below a year ago and 41% less than the 18-yr May average of 33.

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

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Jan. '20 - May '22)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF,cfs	TMRF,in
April '20	47 (C)	58 (B)	46 (C)	49 (C+)	WW	181	3.58
May 20	**38 (C-)**	**47 (C)**	**34 (D)**	**38 (C-)**	**T**	**13**	**0.06**
June	25 (D-)	31 (D)	21 (E)	24 (E+)	T	5.7	0.02
July	18 (E)	30 (D)	21 (E)	21 (E)	DW	2.1	0.001
Aug.	23 (E+)	24(E+)	18 (E)	21 (E)	DW	1.3	0.00
Sept	21 (E)	34 (D)	19 (E)	23 (E)	DW	1.3	0.00
Oct.	32 (D)	47 (C)	27 (D-)	34 (D)	T	2.4	0.21
Nov.	45 (C)	56 (B)	37 (D+)	44 (C)	T	7.6	0.11
Dec. '20	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 21	**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. '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-)		7.1	0.22
March	55 (B)	61 (B)	42 (C)	52 (B-)	WW	26	1.04
April	32 (D)	69 (B)	25 (D-)	35 (D)	WW	14	1.01
May '22	**18 (E)**	**33 (D)**	**15 (E)**	**20 (E)**	**T**	**4.4**	**0.03**

The **cover page** of this report presents monthly WQI values and range (high/low) for the Lower San Diego River watershed over nearly 18 years of monitoring. The May 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 LSDR (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 attributed to depleted DO levels extending throughout protracted low-flow hyrologic events combined with the fact that WY05 constituted the highest dry-weather flows on record. The dashed lines present a negative slope of -0.7 points per annum in index value over the 18 yr 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 29; 13 percent below the 18-yr norm of 33. This month's overall value of 19 is only the second time the May index has been in the Poor range since the monitoring program began.

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 29 is three points below the 18-yr to-date LSDR weighted average value of 32.9. The running average low of 24 (28% below the current norm) occured in 2014. The highest running average WQI for May of 38 (16% above norm) occured in 2012. The river has experieced below average rainfall (and runoff) during the past few 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 improved somewhat within the upper-most reach over the last several years, resurgent invasive aquatic vegitation with subsequent decay acting in conjunction with low streamflow and accrual of organics in ponded portions are considered the principal cause of poor water quality. The greatest downward trend (red-dashed line) is associated with the poorest reach (Upper Santee Basin) incompasing 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 location is Kaiser Ponds outlet (site #6) below the San Diego Mission Rd. crossing.

Spatial WQI values determined over the last three months in order of occurance upstream are shown in **Charts 3, 4 and 5** on page 6. May results (color bars w/values in black shown on Chart 5) are significantly below those from last month (Chart 4) and March (Chart 3). Eleven out of 15 sites (73%) this month are graded Poor (E or F), while the remaining four are Marginal (D). Only three sites (20%) were graded Poor last month and one (7%) in March. The May values (solid colored columns) are both below those from a year ago (dashed columns) as well as the 18-yr running averages (solid back line). The overall water quality value of 19 represents only the second time in the past 18 years that the May index has declined into the Poor(E) range. The outlook for this summer is continued poor to very poor water quality within the Lower San Diego River system. (5/24/22 jck)

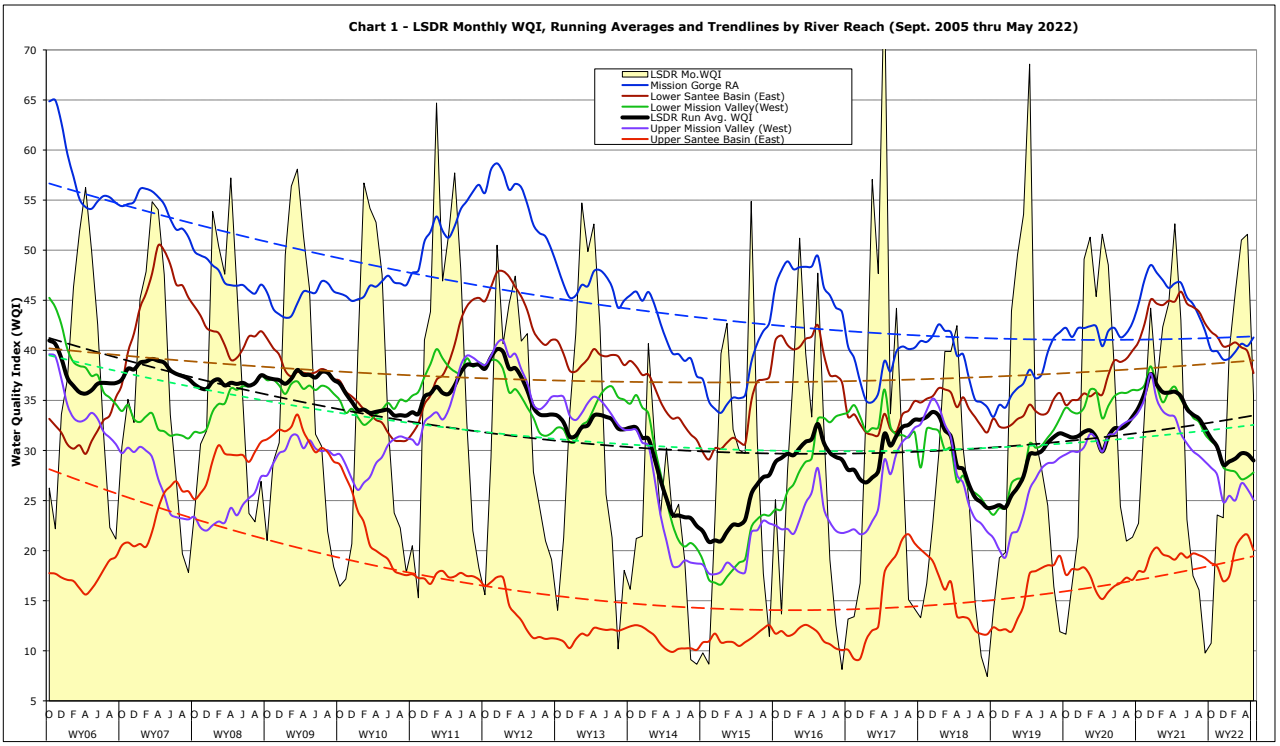


Chart 1 - LSDR Monthly WQI, Running Averages and Trendlines by River Reach (Sept. 2005 thru May 2022)
Water Quality Index (WQI)
LSDR Mo.WQI
Mission Gorge RA
Lower Santee Basin (East)
Lower Mission Valley(West)
LSDR Run Avg. WQI
Upper Mission Valley (West)
Upper Santee Basin (East)
WY06
WY07
WY08
WY09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

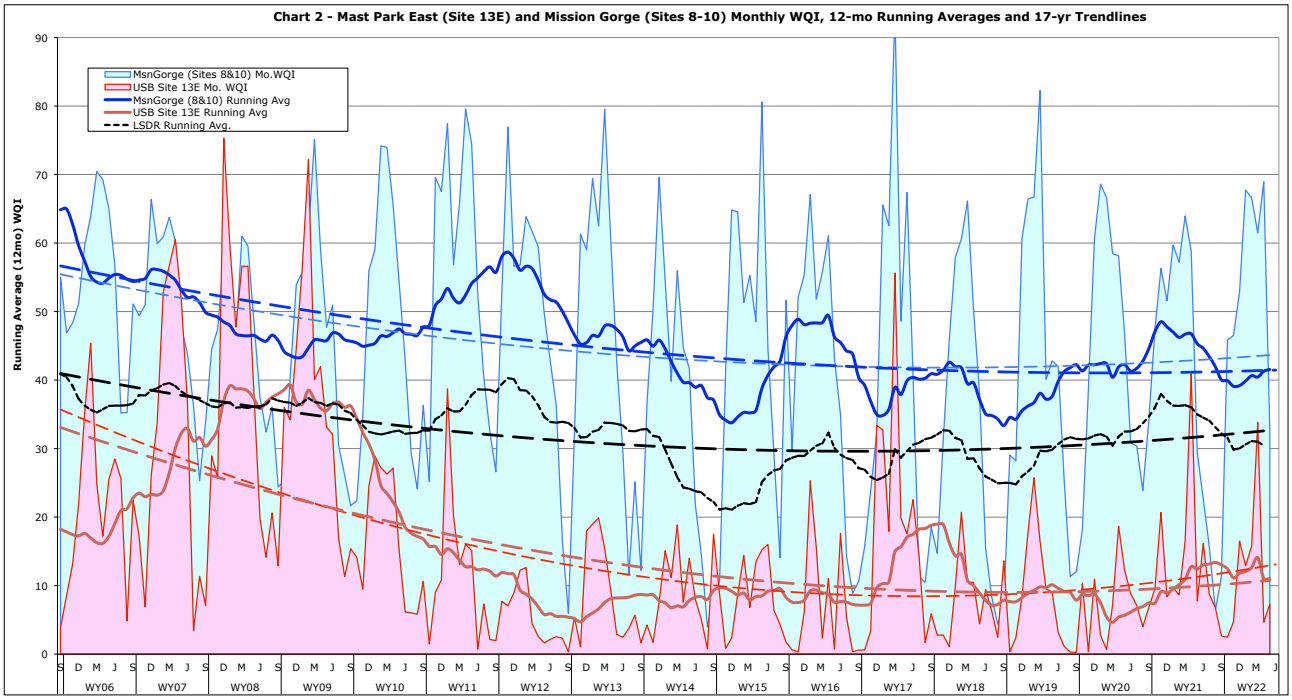


Chart 2 - Mast Park East (Site 13E) and Mission Gorge (Sites 8-10) Monthly WQI, 12-mo Running Averages and 17-yr Trendlines
Running Average (12mo) WQI
MsnGorge (Sites 8&10) Mo.WQI
USB Site 13E Mo. WQI
MsnGorge (8&10) Running Avg
USB Site 13E Running Avg
LSDR Running Avg.
WY06
WY07
WY08
WY09
WY10
WY11
WY12
WY13
WY14
WY15
WY16
WY17
WY18
WY19
WY20
WY21
WY22

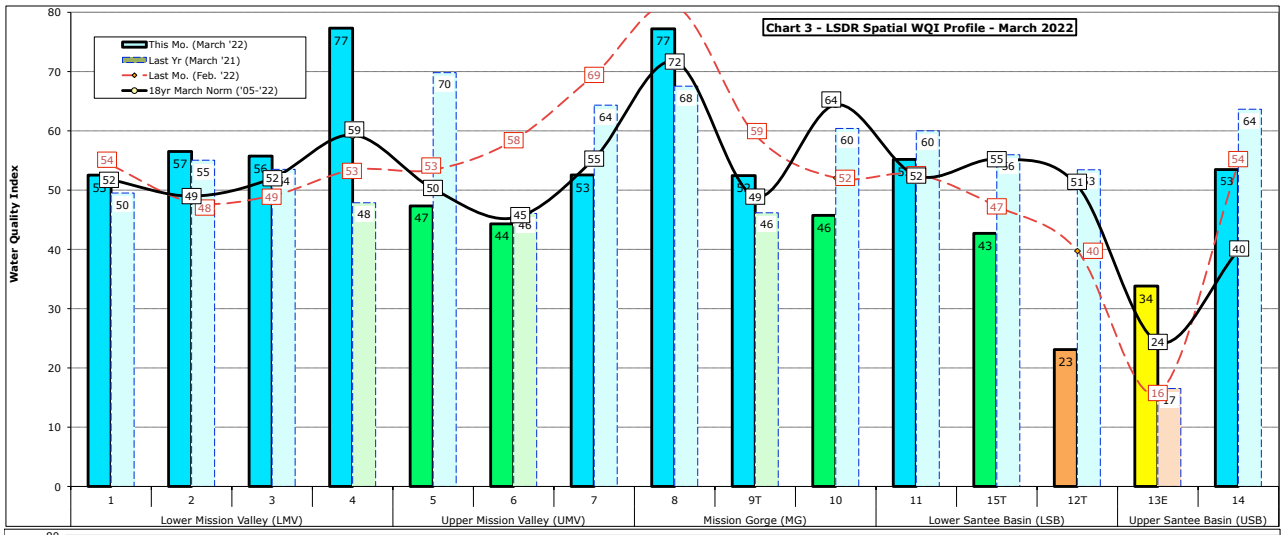


Chart 3 - LSDR Spatial WQI Profile - March 2022
This Mo. (March '22)
Last Yr (March '21)
Last Mo. (Feb. '22)
18yr March Norm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)

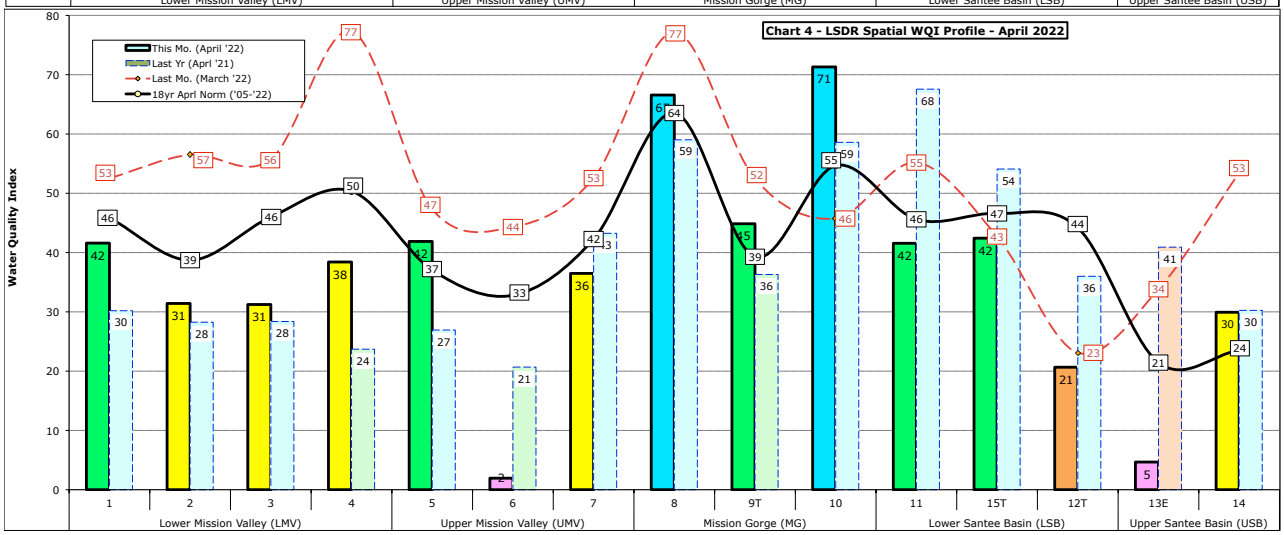


Chart 4 - LSDR Spatial WQI Profile - April 2022
This Mo. (April '22)
Last Yr (Aprl '21)
Last Mo. (March '22)
18yr Aprl Norm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)

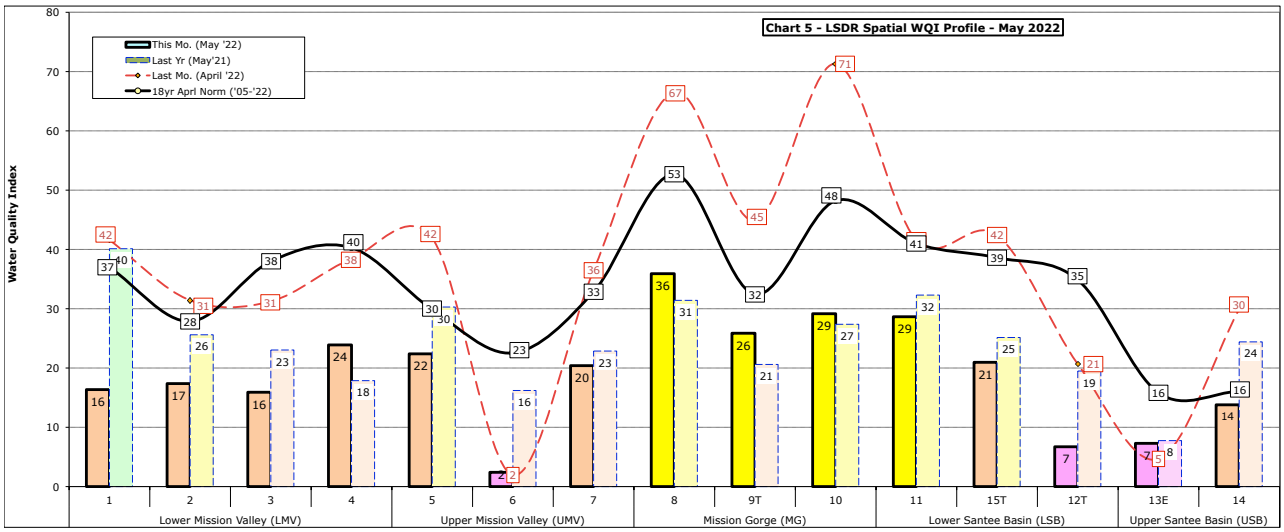


Chart 5 - LSDR Spatial WQI Profile - May 2022
This Mo. (May '22)
Last Yr (May'21)
Last Mo. (April '22)
18yr Aprl Norm ('05-'22)
Water Quality Index
Lower Mission Valley (LMV)
Upper Mission Valley (UMV)
Mission Gorge (MG)
Lower Santee Basin (LSB)
Upper Santee Basin (USB)