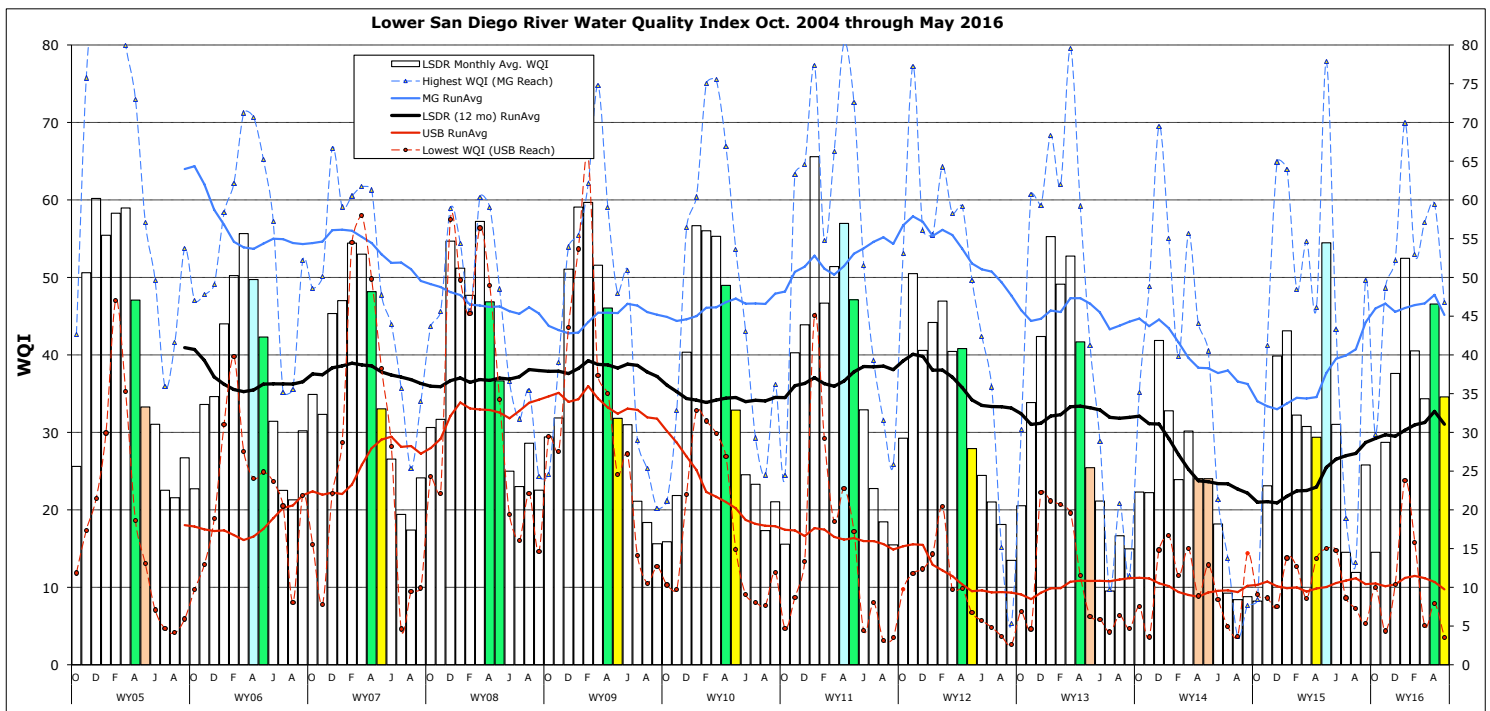


Monthly WQM Report

Lower San Diego River - May 2016



Lower SDR WQ Monitoring Data Summary

Table 1 presents a summary of water quality data monitored by SDRPF's RiverWatch Team within the Lower San Diego River watershed over the past two months. April and May represent the two months of the WY16 spring season. This month's water quality index values are down considerably from last month. May 2016 results are also lower than last May and the 12-yr average values.

Table 1 - May/April 2016 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] May/Aprl	[8-10] May/April	[11-15] May/Aprl	[1-15] May/April	Last Mo (4/2016)	Last Yr (5/2015)	12-Yr Avg (May)
Temperature, oC	20.3/19.6	19.6/17.5	19.3/18.2	19.7/18.6	6%	8%	-2%
Sp.Cond., mS/cm	2.29/1.83	1.76/1.43	1.80/1.64	2.07/1.65	26%	32%	-11%
DO, mg/L	5.54/6.42	7.34/8.82	4.46/3.86	5.30/6.92	-22%	-25%	0%
DO, % of Sat.	63/71	80/91	49/41	59/75			
pH	7.83/7.40	7.95/7.71	7.27/7.03	7.55/7.22	5%	-7%	-1%
ADF, cfs	3/10	2/8	1/7	2/8	-73%	-92%	-52%
WQ Index	38/63	45/59	26/26	33/47	-28%	-39%	-5%
Grade(Mar/Apr)	C/B	C/B	D-/D-	D/C			
May Grade	Fair	Fair	Marginal	Marginal	Down 14 pts from last mo.		

DO values in red indicate general hypoxic (DO < 4 mg/L) conditions.

Overall, LSDR **water temperatures** are up 1 degree Celsius (6%) from last month and 8% above last May at close to (-2%) the 12-yr monthly norm (20° C). **Specific conductivities** are up (26%) from last month at 32% above last May but still slightly below (-11%) the 12-yr monthly norm. **Dissolved oxygen** levels are down 22% from last month and 25% below last May at the 12-yr monthly norm value (5.3 mg/L). **Streamflow** is down by over 70% from last month that is more than 90% below last May and greater than 50% under the 12-yr norm. This month's LSDR **water quality index** (WQI) of 33(D) is down 14 points (28%) from last month's value of 47(C) and 39% under a year ago May at -5% below the 12-yr norm of 35.

Conclusion:

The LSDR water quality index fell 14 points (28%), dropping a letter grade from **C Fair (47) to D Marginal (33)** over the last 30 days.

A summary of WQI values occurring over the past two years of record for the three main sections of the lower river system as well as the LSDR overall average are listed in **Table 2** along with average daily flow (ADF) and total monthly rainfall (TRF).

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (May 2014 - May 2016)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	TRF, in
May '14	16(E)	41(C)	24(E+)	24(E+)	DW	1.3	0.01
June	17(E)	21(E)	18(E)	18(E)	DW	0.7	0.0
July	8(F)	14(E)	8(F)	9(F)	DW	0.6	0.0
Aug	11(F)	4(F)	8(F)	8(F)	DW	0.7	0.01
Sept	5(F)	8(F)	13(E-)	9(F)	DW	1.2	0.05
Oct	7(F)	8(F)	9(F)	8(F)	DW	0.4	0.01
Nov	12(F+)	41(C)	24(E+)	23(E)		3.1	0.37
Dec	35(D)	65(B)	32(D)	40(C)	WW	35.6	4.5
Jan.'15	37(D+)	64(B)	39(C-)	43(C)		10.3	0.38
Feb.	28(D)	48(C+)	29(D)	32(D)		6.1	0.18
March	24(E+)	55(B)	26(D-)	31(D)		14.6	0.93
April	24(E+)	46(C)	27(D-)	29(D)	DW	2.2	0.02
May	55(B)	78(A-)	41(C)	54(B)		13.3	2.4
June	26(D-)	43(C)	31(D)	31(D)	DW	2.1	0.01
July	12(F)	19(E)	15(E)	15(E)		14.9	1.71
Aug	8(F)	13(E-)	15(E)	12(F+)	DW	1.4	0.0
Sept	8(F)	50(B-)	32(D)	26(D-)		6.0	1.25
Oct	5(F)	30(D)	17(E)	15(E)		4.3	0.42
Nov	28(D)	49(C+)	20(E)	29(D)		9.9	1.53
Dec.	40(C)	52(B)	29(D)	38(C-)		14.0	0.45
Jan.'16	54(B)	70(B)	42(C)	53(B)	WW	91.7	3.21
Feb.	40(C)	53(B)	35(D)	41(C)		9.6	0.05
March	32(D)	57(B)	25(D-)	34(D)		14.4	0.72
April	63(B)	59(B)	26(D-)	47(C)		9.9	0.55
May '16	38(C)	45(C)	26(D-)	33(D)		6.4	0.43

WQI values are expected to continue a decline at most monitoring sites over the next 30 days.

The **cover page** chart presents monthly WQI values and range (high-low) for the Lower San Diego River determined over the past 140 months of monitoring. The spring transition (April-May) values for each of the past 12 years are shown as colored-shaded bars. Running average index values for LSDR (flow-weighted for all 15 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/poorest reach (Upper Santee Basin) is shown in red. This month's values are down from April. A declining trend in values can be expected through the summer season.

Monthly WQI values extending from Oct. 2005 through May 2016 are presented in **Chart 1** (next page) together with 12-month running averages (trend-lines) for each of the five individual reaches and overall (i.e., for LSDR). The current overall running average WQI for the LSDR of **31** is 11% below the 12-yr annual norm. Although there have been notable improvements in water quality for some reaches of the lower river watershed over the past 5-6 months, very poor water quality conditions persist in the upper (eastern) reach of the Santee Basin segment while conditions in the upper Mission Valley segment are rapidly declining.

Monthly and 12-mo. running average WQI values for the poorest site (13-Mast Park) and best Mission Gorge reach (Sites 8-10) are presented in **Chart 2** (also on next page). Water quality at Sites 13 and 14 remain Very Poor (F-). Excessive growth of the invasive non-native aquatic plant, floating primrose-willow (*Ludwigia hexapetala*/L. *peplodes*) observed throughout much of the slower-moving reaches of the river, are considered a major contributor of recurrent dissolved oxygen deficits (DO < 4.0 mg/L) and resultant low water quality index values over the past five years of drought. Average daily streamflow in this reach for May is estimated to be less than 0.3 cfs.

Spatial WQI results for the past two months of monitoring are shown in **Charts 3 and 4** on page 6. WQI values (color bars w/index values in black) have changed most noticeably in the upper Mission Valley and Mission Gorge reaches. The percentage of sites in the Poor-to-Very Poor range (E-F) increased from 13% (2 of 15) to 36% (5 of 14) over the past month. The number of sites in the Good-to-Very Good (A-B) range has declined from seven (47%) in April to three (21%) in May. Of the remaining sites in the intermediate quality range (C-D), the number of sites remained the same at six.

Water quality index values can be expected to continue in decline over the next month at most monitoring sites assuming less streamflow, elevated water temperatures, greater biomass and accelerated decomposition. Dissolved oxygen values at multiple sites are likely fall in the hypoxic zone (2-4 mg/L) during mid-day with less recovery after dark. Additional sites may during June become anoxic with DO levels falling below 2 mg/L.

JCK (5/27/2016)

