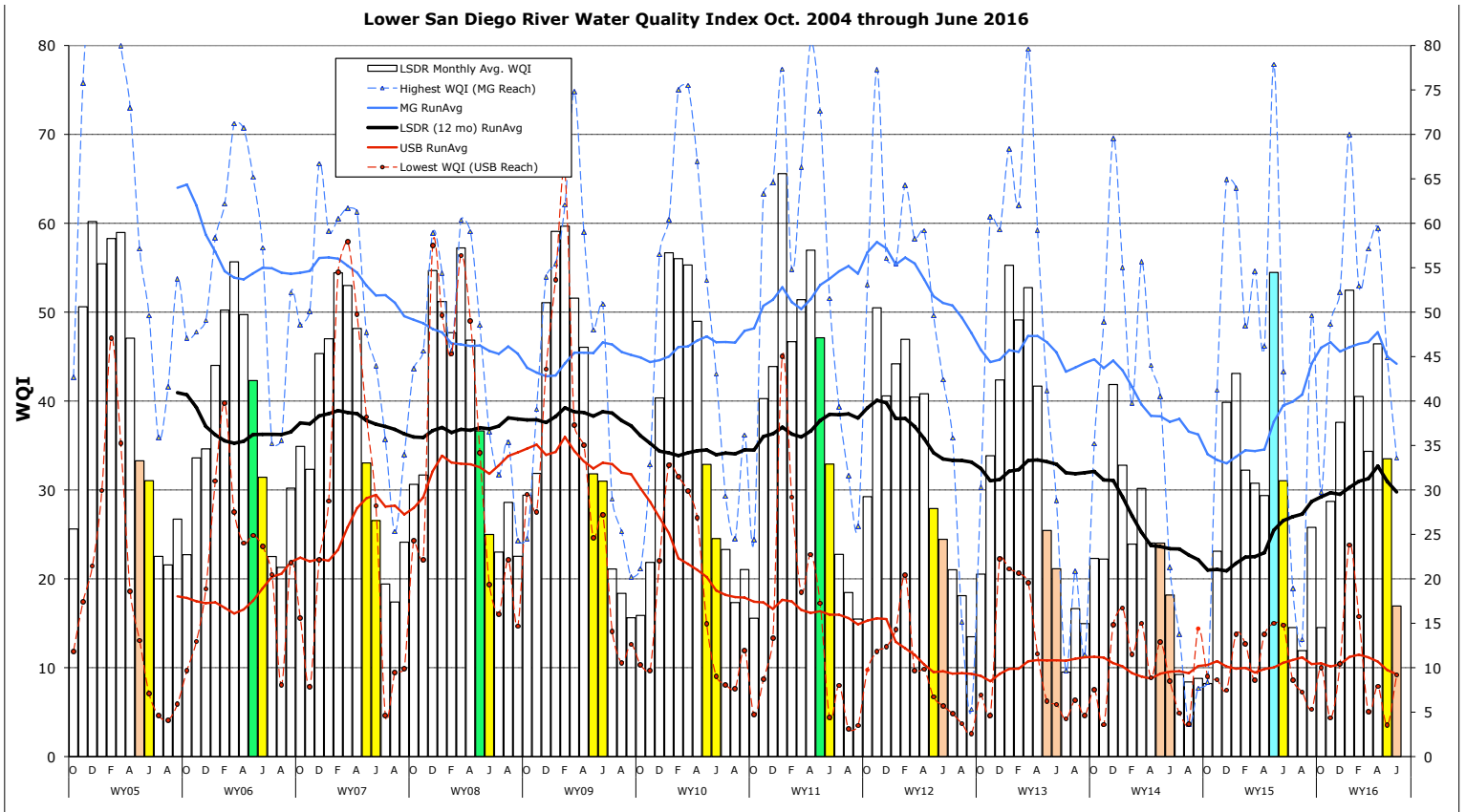


Monthly WQM Report

Lower San Diego River - June 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. May and June represent the spring to summer transition. This month's water quality index values are down from last month, lower than last June and below the 12-yr norms for all reaches of the river. Overall quality has fallen from Marginal (D) to Poor (E).

Table 1 - May/June 2016 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] May/June	[8-10] May/June	[11-15] May/June	[1-15] May/June	Last Mo (5/2016)	Last Yr (6/2015)	12-Yr Avg (June)
Temperature, oC	20.4/22.6	19.6/19.9	19.3/19.9	19.7/20.9	6%	-4%	-5%
Sp.Cond., mS/cm	2.29/3.01	1.76/2.08	1.80/2.02	2.07/2.59	25%	1%	-3%
DO, mg/L	5.54/2.67	7.34/8.01	4.52/4.03	5.31/4.04	-24%	-30%	-15%
DO, % of Sat.	63/32	80/87	50/45	59/45			
pH	7.83/7.63	7.95/7.91	7.27/7.49	7.55/7.58	0%	-6%	-2%
ADF, cfs	3/1.5	2/0.5	1/0.1	2/0.7	-75%	-60%	-85%
WQ Index	38/15	45/34	26/12	34/17	-49%	-45%	-35%
Grade(May/Jun)	C/E	C/D	D-/F+	D/E			
June Grade	Poor	Marginal	Very Poor	Poor	Down 17 pts from last mo.		

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

Overall, LSDR **water temperatures** are up 1.2 degrees Celsius (6%) from last month, although 4% below last June and 5% lower than the 12-yr monthly norm (22° C). **Specific conductivities** have increased 25% from last month and are now 1% above last June but slightly below (-3%) the 12-yr monthly norm. **Dissolved oxygen** levels are down 24% from last month, 30% below last June and 15% below the 12-yr monthly norm of 4.7 mg/L. **Streamflow** is down by 75% from last month, more than 60% below last June and greater than 85% under the 12-yr norm. This month's LSDR **water quality index** (WQI) of 17(E) is down 17 points (49%) from last month's value of 34(D), 45% less than a year ago at -35% below the 12-yr June norm of 26(D-).

Conclusion:

The LSDR water quality index fell 17 points (nearly 50%), dropping a full letter grade from **D Marginal (34) to E Poor (17)** 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 (June 2014 - June 2016)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	TRF, in
June'14	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	38(C)	45(C)	26(D-)	33(D)		6.4	0.43
June'16	15(E)	34(D)	12(F+)	17(E)	DW	1.0	0.02

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

The **cover page** chart presents monthly WQI values and range (high-low) for the Lower San Diego River determined over the past 12 years of monitoring. The spring-summer transition (May-June) 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 well below those from May. A declining (negative) trend in values can be expected through the summer season.

Monthly WQI values extending from Oct. 2005 through June 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 **30** is 14% below the 12-yr annual norm. Although there were notable improvements in water quality for multiple reaches of the lower river watershed over the winter season, very poor water quality conditions persist in the upper (eastern) reach of the Santee Basin segment while conditions in the Mission Gorge and Mission Valley segments 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. Average daily streamflow in this reach for June is less than 20 gallons per minute (< 0.1 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 36% (5 of 14) to 79% (11 of 14) over the past month. The number of sites in the Good-to-Very Good (A-B) range has declined from three (21%) in May to none in June. Of the remaining sites in the intermediate quality range (C-D), the number of sites dropped from six (43%) to three (21%).

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 (eutrophication). Dissolved oxygen values at multiple sites are likely fall in the hypoxic zone (2-4 mg/L) during mid-day with minimal recovery after dark. Additional sites are likely, during July to become anoxic with DO levels falling below 2 mg/L.

JCK (6/19/2016)

Chart 1 - LSDR WQI Trendlines by River Reach (Sept. 2005 thru July 2016)

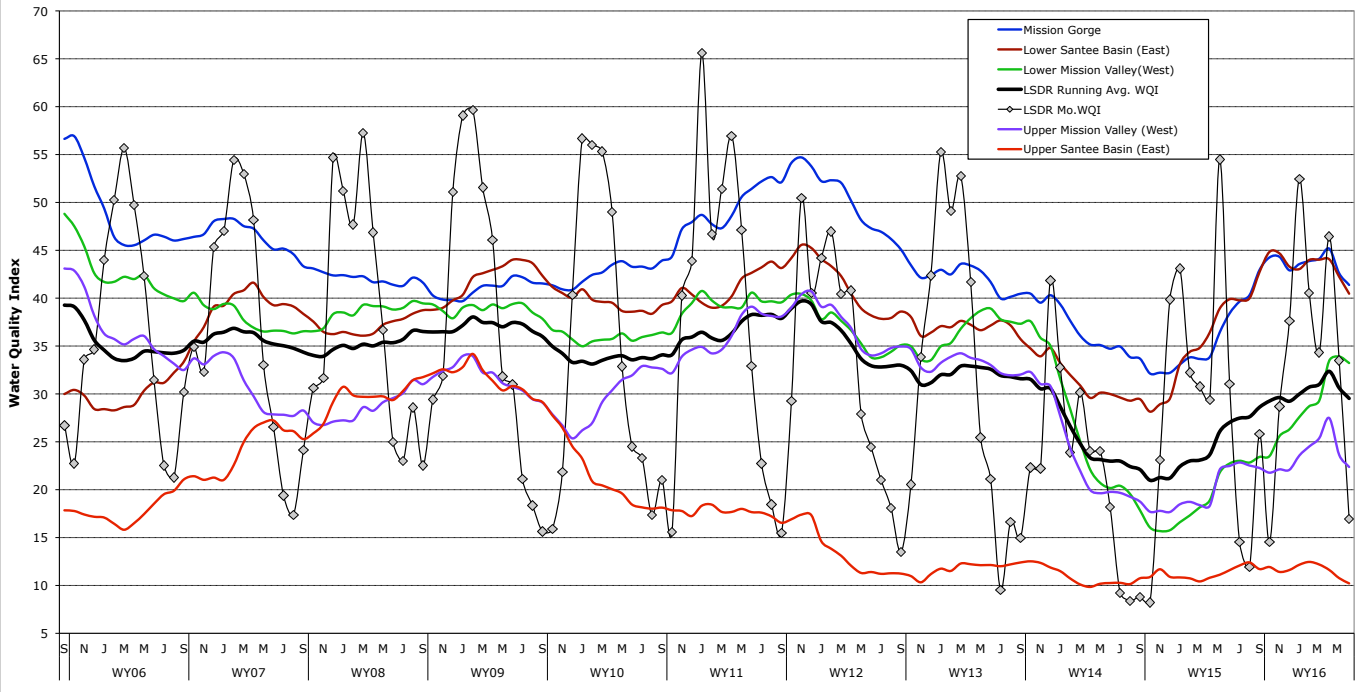


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

