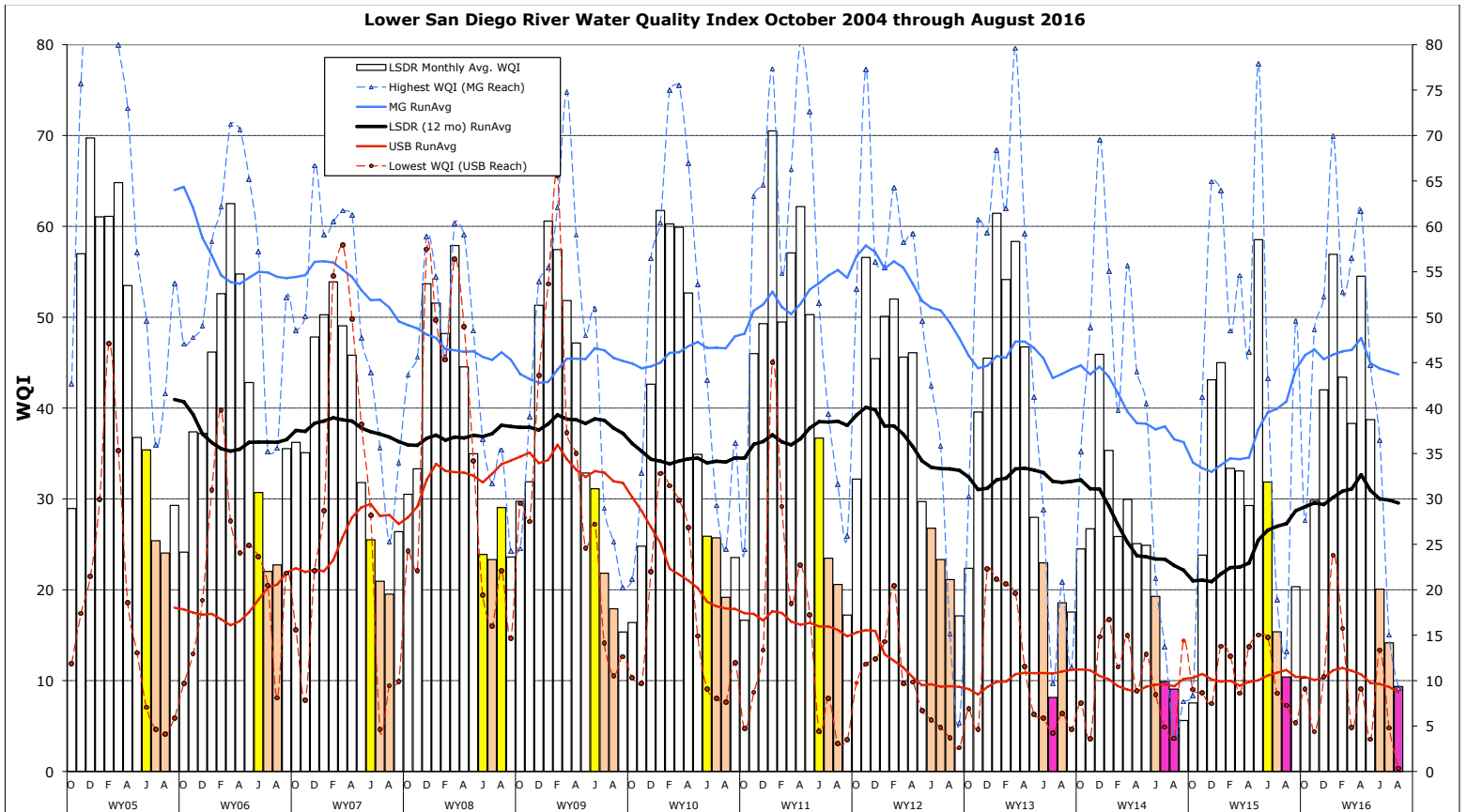


Monthly WQM Report

Lower San Diego River - August 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. July and August constitute the mid-months of summer. This month's water quality index values are down from last month, lower than last August and below the 12-yr norms for most reaches of the river. General water quality within the lower hydrologic unit (HSU 907.1) has continued to decline.

Table 1 - July/August 2016 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] July/Aug	[8-10] July/Aug	[11-15] July/Aug	[1-15] July/August	Last Mo (7/2016)	Last Yr (8/2015)	12-Yr Avg (August)
Temperature, oC	24.3/24.4	23.1/23.7	22.7/22.7	23.3/23.5	1%	-1%	1%
Sp.Cond., mS/cm	3.60/3.83	2.48/2.68	2.66/2.88	3.10/3.39	9%	35%	11%
DO, mg/L	3.17/2.53	5.78/5.03	3.76/3.17	3.44/3.07	-11%	4%	-22%
DO, % of Sat.	39/31	68/59	45/38	41/36			
pH	7.59/7.82	7.61/7.72	7.31/7.39	7.45/7.57	2%	-2%	-2%
ADF, cfs	0.8/0.5	0.4/0.2	0.3/0.1	0.5/0.3	-45%	-79%	-87%
WQ Index	14/10	15/9	12/6	13/8	-39%	-33%	-53%
Grade(May/Jun)	E/F	E/F	F/F	E-/F			
August Grade	VeryPoor	Very Poor	Very Poor	Very Poor	Down 5 pts from last mo.		

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

Overall, LSDR **water temperature** is up 0.2 of a degree Celsius (1%) from last month, at 1% above last August and 1% lower than the 12-yr August norm (23.3° C). **Specific conductivities** have increased 9% from last month and are now 35% above last August and 11% higher than the 12-yr monthly norm. **Dissolved oxygen** levels are down 11% from last month, at 4% above last Aug., but 22% below the 12-yr monthly norm of 3.8 mg/L. **Streamflow** declined 45% from last month, down 79% from last August and 87% lower than the 12-yr norm of 2.2 cfs. This month's LSDR **water quality index** (WQI) of 8(F) is down 5 points (39%) from last month's value of 13(E-), 33% less than a year ago and 53% below the 12-yr August norm of 17(E).

Conclusion:

The overall Lower San Diego River water quality index declined another 5 points, dropping from **13 (E- Poor)** to **8 (F Very Poor)** 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 overall LSDR average are listed in **Table 2** along with average daily flow (ADF) and total monthly rainfall (MRF).

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Aug. 2014 - Aug. 2016)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Aug'14	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	0.00
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-)	34(D)		6.4	0.43
June	14(E)	36(D)	18(E)	20(E)	DW	1.0	0.02
July	14(E)	15(E)	12(F+)	13(E-)	DW	0.5	0.00
Aug'16	10(F)	9(F)	6(F)	8(F)	DW	0.3	0.00

WQI values are expected to remain in the Very Poor range at most monitoring sites over the next month.

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River determined over the past 12 years of RiverWatch monitoring. The first three months of summer (June/July/August) values for each of the past 12 years are expressed as color-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) are shown in red. This month's values are below those from last August and the same as the previous two years (Aug. 2014 and 2013). A declining (negative slope) trend can be expected through the remainder of this summer's season assuming continued hot, dry conditions. Summer rainstorms occurring last year (in July and September) had a positive impact on WY15 river water quality that have not transpired this year.

Monthly WQI values extending from Oct. 2005 through August 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** remains 14% below the 12-yr annual norm of 34. 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 have persisted, most notably in the upper (eastern) reach of the Santee Basin segment, while conditions in the Mission Gorge and Mission Valley segments have also been 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*) 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 poor to very poor water quality index values during the past five years. Average daily flow in the lower segment of the river is less than 50 gallons per minute (< 0.3 cfs) for August.

Spatial WQI results for the past three months of monitoring are shown in **Charts 3, 4 and 5** 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. All sites are in the Very Poor (7) or Poor (6) range this month. There is no flow at two sites (14-Cottonwood/RCP and 12T-Carlton Oaks/Santee Lakes).

Water quality index values can be expected to remain Very Poor over the next month at most monitoring sites assuming minimal streamflows, continued elevated water temperatures and further decomposition (eutrophication) of benthic biomass. Dissolved oxygen values at multiple sites are likely to fall into the anoxic zone (< 2 mg/L) during mid-day with minimal recovery after dark. Additional sites are likely to remain in the hypoxic range with DO levels between 2 and 4 mg/L.

jck (9/1/2016)

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

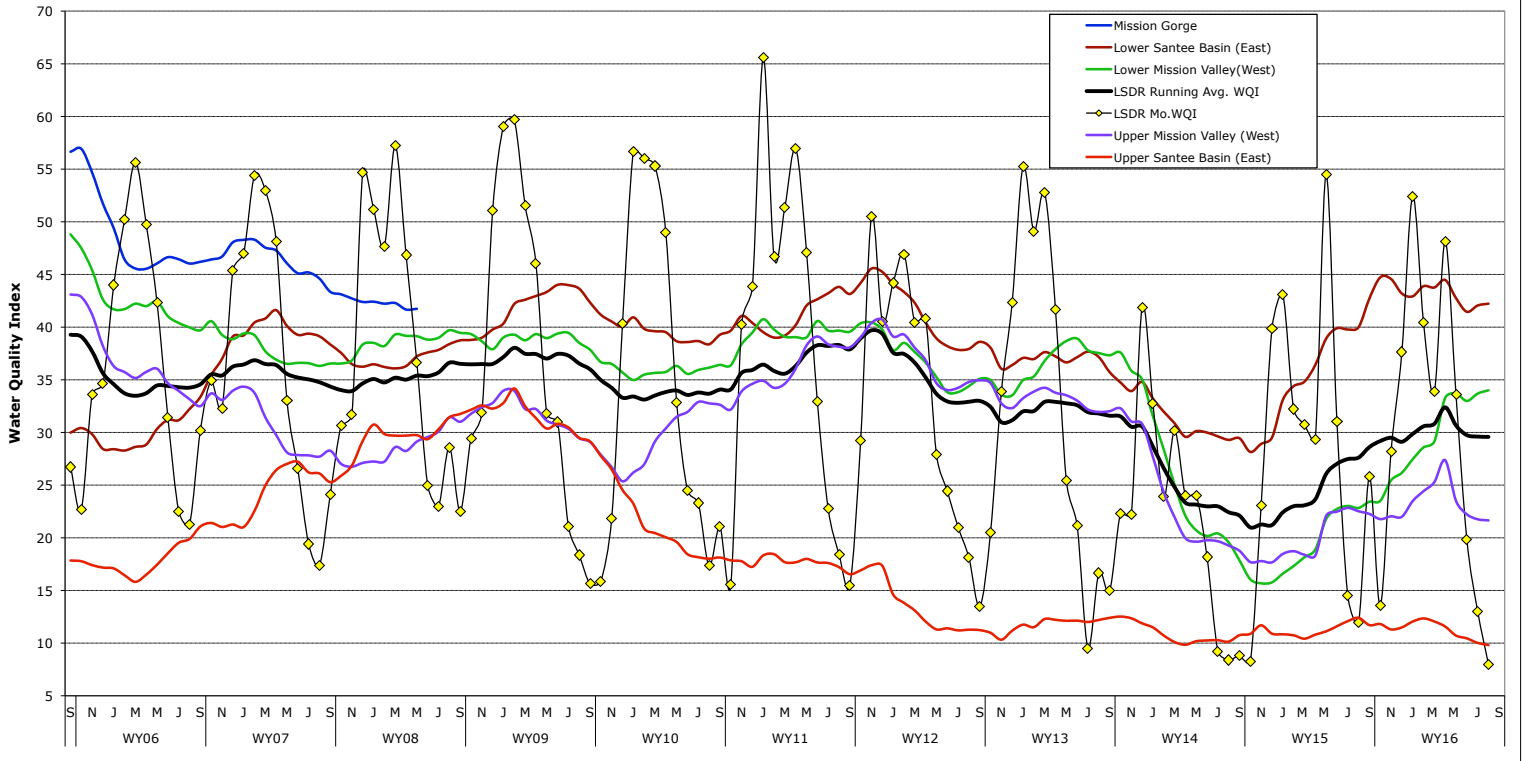


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

