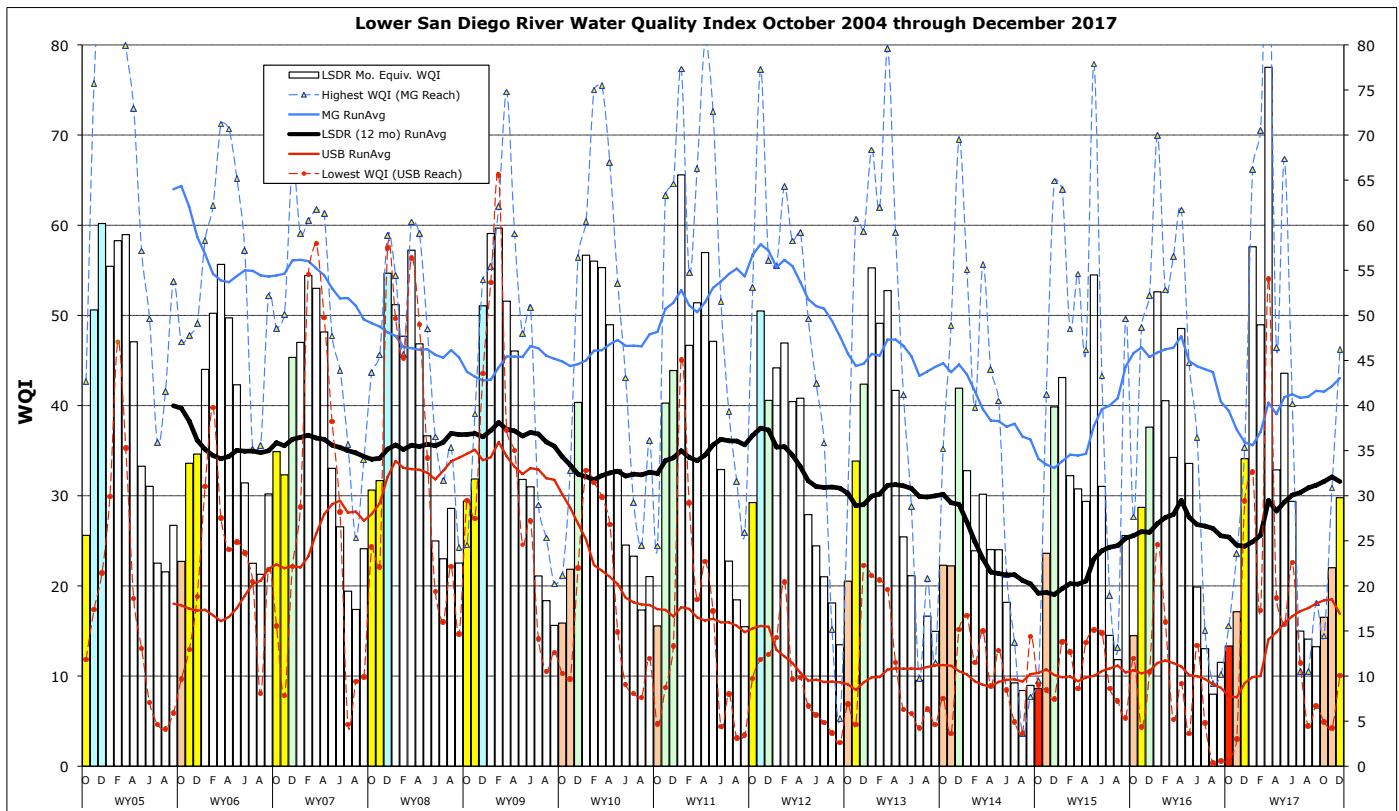


Monthly WQM Report

Lower San Diego River - December 2017



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 (November and December) that constitute the last month of fall and first month of winter. The December index rose eight points from last month, at three points below last year and 14 points below the 13-yr monthly average of 44. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded at D (Marginal).

Table 1 - Nov/Dec 2017 WQM Data Summary							
	West - MV	Mid - MG	East - SB	LSDR	Percent Variance from		
[Sites]	[1-7] Nov/Dec	[8-10] Nov/Dec	[11-15] Nov/Dec	[1-15] Nov/ Dec	Last Mo (11/'17)	Last Yr (12/'16)	13-Yr Avg (Dec.)
Temperature, oC	16.7/11.7	18.9/14.7	16.2/11.2	16.9/ 12.0	-29%	-6%	1%
Sp.Cond., mS/cm	4.64/3.68	3.11/2.60	3.25/2.42	4.01/ 3.07	-23%	110%	81%
DO, mg/L	4.47/5.83	5.73/7.78	3.16/5.31	4.16/ 5.88	30%	15%	-13%
DO, % of Sat.	46/54	58/70	33/49	43/ 54			
pH	7.87/7.91	7.89/8.30	7.82/8.14	7.84/ 8.05	3%	5%	5%
30-day ADF, cfs	1.9/1.7	1.3/2.0	1.1/2.2	1.4/ 2.0	37%	-96%	-92%
WQ Index	25/26	31/46	15/25	22/ 30	35%	-10%	-32%
Grade(Sept/Oct.)	D-/D-	D/C	E/D-	E+/ D			
November/ December 2017	Marginal Marginal	Marginal/ Fair	Poor/ Marginal	Poor/ Marginal	Index up 8 points from last month		

DO values below threshold limit of 4 mg/L and 40%Sat are listed in red.

Overall, LSDR **water temperatures** dropped 6°C (-29%) from last month, at 0.7°C below last Dec. to within 1% of the 13-yr monthly norm of 11.9°C. **Specific conductivity** at 3.07 uS/cm fell 23% from last month but remains well above (110%) the 13-yr monthly norm of 1.69 mS/cm. The overall **dissolved oxygen** level of 5.88 mg/L up over 1.5 mg/L from last month, is 15% above a year ago, but remains 13% below the 13-yr monthly norm of 6.74 mg/L. **Streamflow** over the antecedent 30-day period of 2.0 cfs, is up from last month, but well below a year ago and the 13-yr norm of 24.5 cfs. This month's LSDR **water quality index** (WQI) of 30 (D) is 8 points higher than last month, but still 3 points below a year ago and 14 points below the 13-yr norm of 44 (C).

Conclusion:

The overall LSDR water quality index increased by 35%, rising 8 points from **22 (E+/Poor) to 30 (D/Marginal)** over the past 30 days.

A summary of monthly WQI values occurring over the past two years of RiverWatch record for the three sections of the lower San Diego River system as well as the overall average are listed in **Table 2** along with average daily 30-day antecedent flow (ADF) and total monthly rainfall (MRF).

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (Dec. 2015 - Dec. 2017)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
Dec. '15	40(C)	52(B)	29(D)	38(C-)		7.5	0.45
Jan. '16	54(B)	70(B)	42(C)	53(B)	WW	92.7	3.21
Feb.	40(C)	53(B)	35(D)	41(C)		12.3	0.05
March	32(D)	57(B)	25(D-)	34(D)		14.0	0.72
April	63(B)	62(B)	30(D)	49(C+)		11.5	0.55
May	38(C)	45(C)	26(D-)	34(D)		5.8	0.43
June	14(E-)	36(D)	18(E)	20(E)	DW	1.2	0.02
July	14(E-)	15(E)	12(F+)	13(E-)	DW	0.6	0.00
Aug	10(F)	9(F)	6(F)	8(F)	DW	0.4	0.00
Sept	12(F+)	10(F)	12(F+)	12(F+)	DW	0.4	0.32
Oct	13(E-)	16(E)	14(E-)	13(E-)	DW	1.1	0.07
Nov.	17(E)	24(E)	15(E-)	14(E)		1.3	0.61
Dec.'16	30(D)	35(D)	37(D+)	33(D)	WW	87	4.22
Jan. '17	61(B)	66(B)	49(C+)	56(B)	WW	105	3.01
Feb.	46(C)	70(B)	39(D+)	44(C)	WW	93	3.14
March	82(A)	95(A+)	64(B)	76(A-)	WW	23	0.07
April	31(D)	46(C)	29(D)	31(D)		6.3	0.02
May	43(C)	67(B)	33(D)	40(C)		6.9	0.92
June	22(E)	40(C)	31(D)	27(D-)		2.0	0.00
July	17(E)	10(F)	15(E-)	15(E-)	DW	1.0	0.00
Aug	18(E)	10(F)	12(F+)	14(E-)	DW	1.0	0.00
Sept'17	15(E)	11(F)	9(F)	12(F+)	DW	0.9	0.08
Oct. '17	20(E)	15(E)	14(E)	17(E)	DW	1.4	0.01
Nov.'17	25(D-)	31(D)	15(E)	23(E+)	DW	1.4	0.01
Dec.'17	26(D-)	46(C)	25(D-)	30(D)	DW	2.3	0.02

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River as determined over the past 13 years of RiverWatch monitoring. October, November and December values (the quarter) for each year are expressed as color-shaded bars. Running average index values for LSDR (all 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 or poorest reach (Upper Santee Basin) are shown in red. The upward trend in the index over the past year has begun now begun to decline. Base flow from groundwater return, excess irrigation and coolant system water, via tributary drains and small creek beds, that constitute the principal sources of dry-weather stream flow prevails.

Monthly WQI values extending from Oct. 2004 through Dec. 2017 are presented in **Chart 1** (next page) together with 13-month running averages (trend-lines) for each of the five principal reaches of the river and overall (i.e., for Lower SDR). The current running average WQI for the LSDR of 33 is -0.3% below the 13-yr norm. In comparison, a year ago (Dec. 2016), the running average WQI was 15% below the 13-yr norm at 28.

Monthly and 12-mo. running average WQI values for the poorest reach (Upper Santee Basin) and best Mission Gorge section are also presented in **Chart 2** on next page. Although water quality has improved to some extent in the Upper Santee Basin over the last year, resurgent growth and decay of invasive aquatic plants such as primrose-willow (*Ludwigia hexapetala*) in conjunction with low streamflow and large algal blooms are considered primary causes of poor water quality .

Spatial WQI results by site for the past three months of monitoring are shown on **Charts 3, 4 and 5** on page 6. December WQI values (color bars w/index values in black) have improved from last month and October at most sites. In mid-October of this year 67 percent (10 of 15) of the sites were in the Poor (E) or Very Poor (F) range (WQI>24) while the remaining five sites (33%) were found Marginal (D). By mid-November 50% (7 of 14) were in the Poor (E) or Very Poor (F) while the remaining seven sites (5 Marginal and 2 Fair were rated Intermediate. This month, only 33 percent (5 of 15 sites monitored) were in the Poor (4) or Very Poor (1) range (WQI <25) while the remaining 67% (10 sites) 6 Marginal and 4 Fair in the Intermediate range. Protracted low streamflows combined with only moderate improvements in DO concentration levels over the past month are the primary causes of below normal results for December.

In summary, the overall water quality index for the lower river watershed area continues to improve if slowly and is expected to reach the Fair (C) over the next month at most monitoring sites based on enhanced streamflows improved DO and further declines in specific conductivities .

JCK: (12/18/17)

Chart 1 - LSDR WQI Trendlines by River Reach (Sept. 2005 thru Dec. 2017)

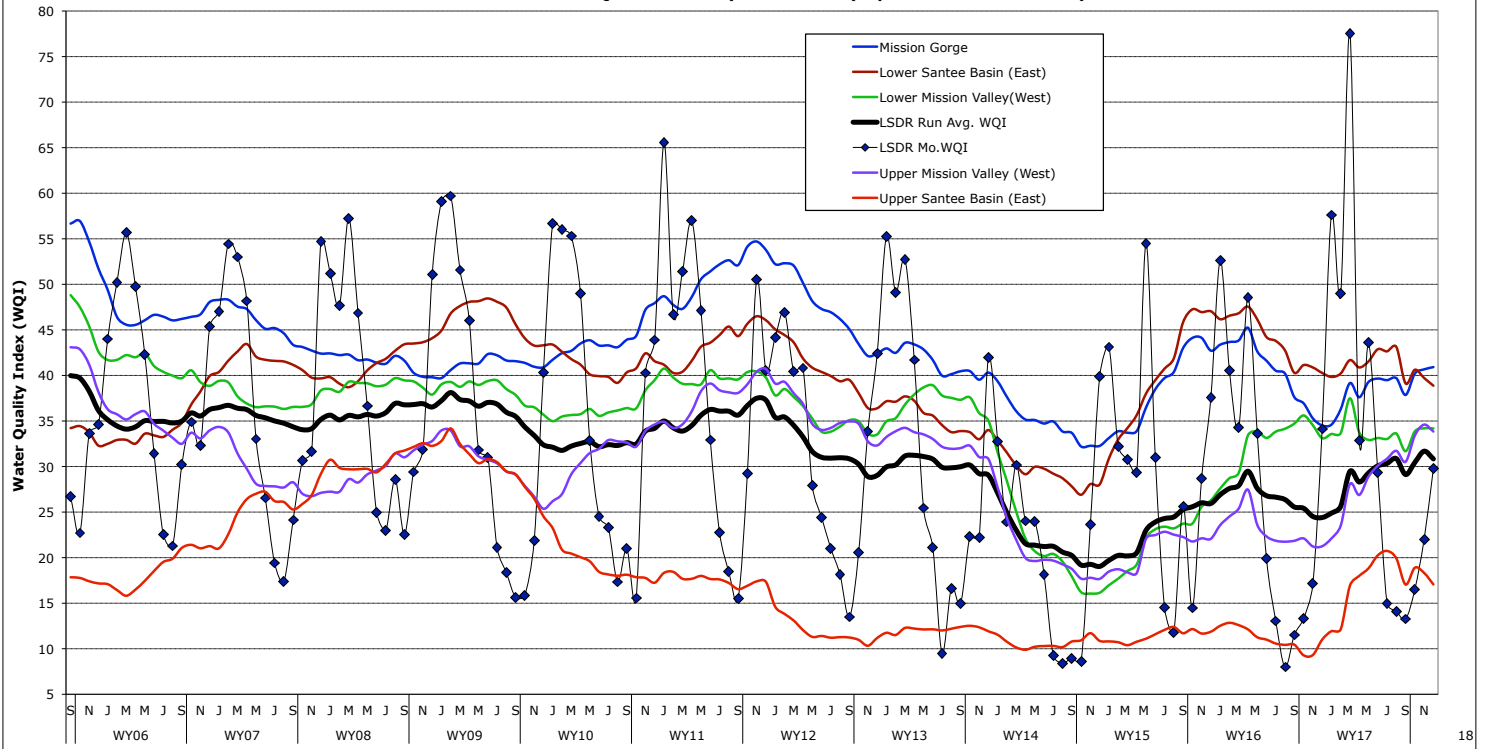


Chart 2 - Mast Park (Site 13) and Mission Gorge (Sites 8-10) Monthly and 12-mo Running Average WQI

