

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 and June). The June index fell 16 points from last month to a level two points below the 16-yr monthly average of 23. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) declined from D+ (high Marginal) to E (Poor).

Table 1 - May/June 2020 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 (5'20)	Last Yr (6'19)	16-yr Avg (June)
Temperature, oC	21.2/23.0	18.5/21.6	18.8/22.0	19.7/22.3	13%	4%	1%
Sp.Cond., mS/cm	2.39/2.88	1.11/1.75	1.27/1.85	1.67/2.29	37%	2%	-9%
DO, mg/L	4.48/2.87	6.86/5.44	4.54/3.06	4.94/3.51	-28%	-10%	-20%
DO, % of Sat.	52/34	74/59	49/34	55/40			
pH	7.82/7.79	8.11/8.09	7.85/7.67	7.83/7.71	-2%	-5%	-1%
3-day ADF, cfs	13/5.1	10/3.7	10/3.5	11/4.1	-63%	25%	68%
WQ Index	38/22	47/25	34/19	37/21	-43%	-13%	-9%
May/June	C-/E	C/D-	D/E	D+/E			
May/ June '20	Fair/ Poor	Fair/ Marginal	Marginal/ Poor	Marginal/ Poor	Index down 16 points overall from last month		

Negative variance (declines from norms) and DO depletions (< 5.0 mg/L or 55% of Sat) expressed in red.

LSDR **water temperatures** increased 2.6 degrees (13%) from last month to 4% higher than a year ago and 1% above the 16-yr June norm of 22.1 oC. Overall **specific conductivity** of 2.29 mS/cm constitutes a 37% increase from last month, to 2% greater than last June to 9% below the 16-yr norm of 2.52 mS/cm. The overall **dissolved oxygen** level of 3.51 mg/L (40%Sat.) is 23% less than last month, 10% below last June and 20% under the 16-yr norm of 4.38 mg/L (49%Sat). **Streamflow** over the antecedent 3-day period of 4.1 cfs is down 63% from last month at 25% greater than a year ago and 68% above the 16-yr norm. This month's LSDR **water quality index** (WQI) declined 16 points (down 43%) from last month to two points below the 16-yr June norm of 23.

Monthly WQI values occurring over the past 26 months of record for the three main sections of the lower river system and the overall LSDR average, along with 30-day antecedent average flow (ADF) and monthly rainfall (MRF), are expressed in **Table 2** on the next page.

Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (5'18 - 6'20)							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	MRF, in
May	24 (E+)	37 (D+)	18 (E)	24 (E+)	t	2.3	0.12
June'18	12 (F+)	15 (E)	17 (E)	15 (E)	DW	1.3	0.00
July	12 (F+)	8 (F)	8 (F)	9 (F)	DW	0.7	0.00
Aug.	8 (F)	4 (F)	8 (F)	7 (F)	DW	0.3	0.02
Sept	9 (F)	7 (F)	8 (F)	8 (F)	DW	0.3	0.00
Oct	24 (D-)	29 (D)	9 (F)	18 (E)	t	3.2	0.57
Nov	21 (E+)	28 (D)	14 (E-)	19 (E)	t	9.6	0.81
Dec.	54 (B)	61 (B)	25 (D-)	44 (C)	WW	48	3.02
Jan.'19	47 (C)	66 (B)	43 (C)	49 (C+)	WW	39	2.80
Feb.	51 (B-)	67 (B)	51 (B-)	54 (B)	WW	179	2.98
Mar.	76 (A-)	82 (A)	55 (B)	68 (B)	WW	25	1.28
April	33 (D)	40 (C)	24 (E+)	31 (D)	t	8.6	0.46
May	28 (D)	43 (C)	21 (E)	28 (D)	t	14	0.51
June'19	21 (E)	42 (C)	20 (E)	24 (E+)	t	4.3	0.38
July	17 (E)	25 (D-)	13 (E-)	17 (E)	DW	1.2	0.01
Aug.	16 (E)	11 (F)	9 (F)	12 (F+)	DW	0.9	0.02
Sept	15 (E)	12 (F+)	8 (F)	11 (F+)	DW	1.2	0.03
Oct	18 (E)	18 (E-)	15 (E)	16 (E)	DW	0.9	0.00
Nov.	20 (E)	39 (C)	14 (E)	21 (E)	t	37	0.52
Dec.	60 (B)	61 (B)	31 (D)	49 (C+)	WW	78	3.51
Jan. '20	62 (B)	68 (B)	34 (D)	52 (B-)	WW	18	2.90
Feb.	47 (C)	66 (B)	35 (D)	46 (C)	ww	10	0.38
March	52 (B-)	58 (B)	46 (C)	51 (B-)	WW	48	1.97
April	47 (C)	59 (B)	45 (C)	49 (C+)	WW	181	3.58
May	38 (C-)	47 (C)	34 (D)	37 (D+)	t	13	0.06
June'20	22 (E)	25 (D-)	19 (E)	21 (E)	t	6.3	0.00

The **cover page** chart presents monthly WQI values and their range (high-low) for the Lower San Diego River sub-basin as determined over the past 16 years of RiverWatch monitoring. This month's values (June) for each year are expressed as color-shaded bars; blue B (50 or >) Good, green C (38-49) Fair, yellow D (25-37) Marginal, brown E (13-24) Poor and pink F-(12 or <) Very Poor. Running average index values for LSDR (flow-weighted averages of all sites) are shown as the 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 generally downward slope in index over the 16-year period can be attributed to depleted dissolved oxygen levels extending throughout protracted low-flow periods of the water year. The dashed black line represents an overall downward trend of -2.5% per annum in index value since late 2004. WYO5 witnessed best overall water quality while poorest water quality was monitored during the summer months of 2014 extending through November.

Monthly WQI values from Oct. '04 through June of this year are presented in **Chart 1** (next page) together with 12-mo. running averages for each of the five principal reaches of the lower river system and overall (i.e., LSDR). The current running average WQI of 30 is seven percent below the 16-yr LSDR flow-weighted average index of 32.7 but several points above experienced a year ago. The running average June low of 21 (-37% below the norm) occurred in 2015. The highest running average WQI for June of 36 (10% above norm) occurred in 2009. The overall LSDR running average (12-month trendline shown dashed in black), has declined approximately ten index points over a span of 180 months (15.7 years).

Monthly and 12-mo. running average WQI values for the poorest reach (Upper Santee Basin) and best (Mission Gorge) are presented in **Chart 2**. Although water quality improved within the Upper Santee Basin over the past year, resurgent growth and subsequent decay of aquatic invasives plants such as floating primrose-willow (*Ludwigia peploides*) in conjunction with low-flow and increased organic detritus are primary causes of deteriorated water quality both within this reach and deeper portions in Mission Valley (e.g., Kaiser Ponds). The greatest downward trend (red-dashed line) is associated with the poorest reach (Upper Santee Basin) encompassing monitoring sites 13 (Mast Park) and 14 (Magnolia Ave/RCP).

Spatial WQI values by monitoring site over the past three months are shown in **Charts 3, 4 and 5** on page 6. Both early and late June results (color bars w/values in black) shown on Chart 5 are considerably lower than April (Chart 3) and May (Chart 4) values. One site showed Good (B) water quality in early June (none by late June) compared to three sites (20%) in May. Poor quality (E-F) sites rose from just two (13%) in May to eight (53%) in June. It is anticipated that reduced streamflow combined with higher water temperatures and elevated rates of oxygen depletion over the coming months will result in further declines in index values throughout remaining months of this water year. DO concentration values monitored in the Upper Santee Basin (Sites 13-14) have remained below chronic hypoxic levels (<2.5 mg/L) for much of the past decade. There are also several periodic hypoxic hotspots present within the upper Mission Valley river reach (Sites 5-6) observed on a regular basis throughout the dry-weather flow months of the year.

(jck 6/24/20)



