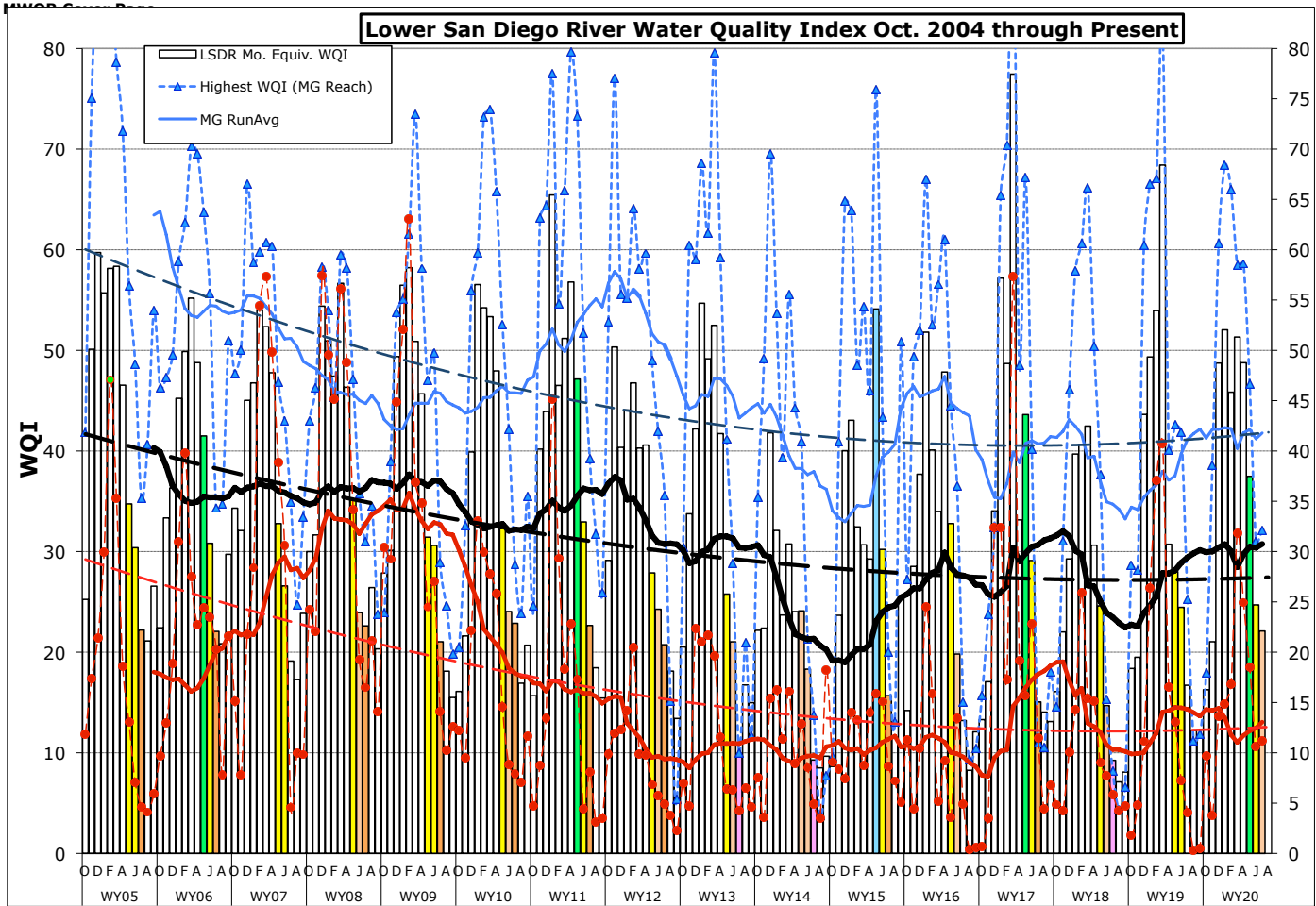


Monthly WQM Report

Lower San Diego River - July 2020



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 (July/June). The July index fell four points from June to a level four points above the 16-yr monthly average of 18. Overall water quality in the Lower San Diego River hydrologic unit (HSU 907.1) declined from low-Marginal (D-) to mid-Poor (E).

| Table 1 - July/June 2020 WQM Data Summary | | | | | | | |
|--|-----------------------|-------------------------------|-----------------------|---------------------------|--|-------------------|---------------------|
| | West - MV | Mid - MG | East - SB | LSDR | Percent Variance from | | |
| [Sites] | [1-7] July/June | [8-10] July/June | [11-15] July/June | [1-15] July/June | Last Mo (6'20) | Last Yr (7'19) | 16-yr Avg (July) |
| Temperature, oC | 26.2/23.0 | 22.8/21.6 | 23.3/22.0 | 24.3/21.7 | 12% | 6% | 4% |
| Sp.Cond., mS/cm | 3.21/2.88 | 1.91/1.75 | 2.25/1.85 | 2.63/2.15 | 22% | -3% | -3% |
| DO, mg/L | 2.99/2.82 | 6.65/5.44 | 3.94/3.31 | 3.98/3.87 | 5% | 18% | 14% |
| DO, % of Sat. | 37/34 | 76/59 | 47/37 | 47/47 | | | |
| pH | 7.71/7.79 | 8.11/8.09 | 7.93/7.67 | 7.92/7.77 | 2% | 2% | 3% |
| 3-day ADF, cfs | 2.2/5.1 | 2.6/3.7 | 2.6/3.5 | 2.5/4.0 | -60% | 145% | -50% |
| WQ Index | 18/22 | 32/31 | 22/20 | 22/26 | -43% | -13% | -9% |
| July/June | E/E | D/D- | E/E | E/D- | | | |
| mid July/ June '20 | Poor/ Poor | Marginal/ Marginal | Poor/ Poor | Poor/ Marginal | Index down 4 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 (12%) from last month to 6% greater than a year ago and 4% above the 16-yr July norm of 23.3 oC. Overall **specific conductivity** of 2.63 mS/cm constitutes a 22% increase from last month, to 3% less than last July and 3% below the 16-yr norm of 2.72 mS/cm. The overall **dissolved oxygen** level of 3.98 mg/L (47%Sat.) is 5% more than last month, 18% above last July and 14% greater the 16-yr norm of 4.54 mg/L (41%Sat). **Streamflow** over the antecedent 3-day period of 2.5 cfs is down 60% from last month, 145% greater than a year ago and 50% less than the 16-yr norm. This month's LSDR **water quality index** (WQI) declined 4 points (down 14%) from last month to 5 points above the 16-yr July norm of 17.

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 (6'18 - 7'20) | | | | | | | |
|--|----------------|----------------|----------------|---------------|-----------|------------|-------------|
| | Mission Valley | Mission Gorge | Santee Basin | LSDR | | ADF, cfs | MRF, in |
| June'18 | 12 (F+) | 15 (E) | 17 (E) | 15 (E) | DW | 1.3 | 0.00 |
| July '18 | 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 '19 | 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 | 23 (E) | 35 (D) | 23 (E) | 26 (D-) | DW | 6.3 | 0.02 |
| July '20 | 18 (E) | 32 (D) | 22 (E) | 22 (E) | DW | 3.0 | 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 months 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 July 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 31 is five percent below the 16-yr LSDR flow-weighted average index of 32.7 but several points above experienced a year ago. The running average July low of 21 (35% below the norm) occurred in 2014. The highest running average WQI for July of 37 (12% above norm) occurred in 2011. The overall LSDR running average (12-month trendline shown dashed in black), has declined approximately ten index points over a span of 180 months (15.8 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 aquatic growth and subsequent decay of invasive plants such as floating primrose-willow (*Ludwigia peploides*) in conjunction with low streamflow and increased benthos are key causes of poor water quality both within this reach and the deep ponds within 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 East) 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. Mid-July results (color bars w/values in black) shown on Chart 5 are significantly lower than in May (Chart 3) and early June (Chart 4). Poor quality (E-F) sites rose from two (13%) in May to five (33%) in June to eight (57%) in July. Good (B) quality sites dropped from three (20%) in May to one (7%) last month to none this month. It can be expected that further reduced streamflow combined with higher water temperatures and elevated rates of dissolved oxygen depletion over the remaining months of summer will result in further decline in index values throughout the entire lower river system. 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 hypoxic hotspots evident within the Mission Valley reaches (Sites 3 and 6) observed seasonally during the dry-weather flow months of each year.

(jck 7/17/20)

