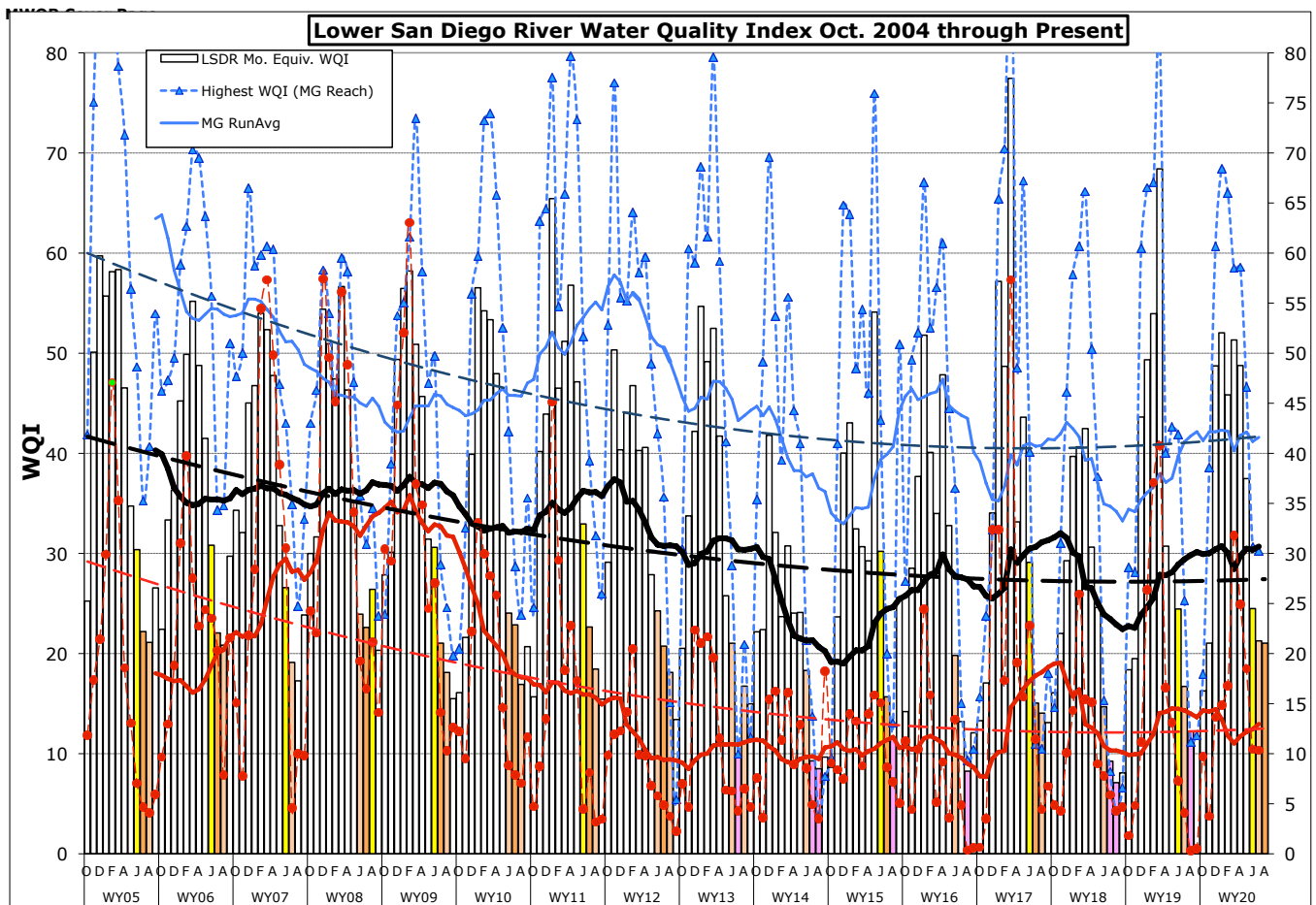


Monthly WQM Report

Lower San Diego River - August 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/Aug). The August index remained unchanged from July at 21, six points above the 16-yr monthly average of 15. Overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) held steady at Poor (E).

| Table 1 - July/August 2020 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/Aug | Last Mo (7'20) | Last Yr (8'19) | 16-yr Avg (Aug.) |
| Temperature, oC | 26.2/26.7 | 22.8/23.7 | 23.3/24.7 | 24.3/25.2 | 4% | 12% | 7% |
| Sp.Cond., mS/cm | 3.21/3.55 | 1.91/2.09 | 2.25/2.35 | 2.63/2.87 | 9% | -4% | -2% |
| DO, mg/L | 2.99/4.14 | 6.65/7.26 | 3.94/4.03 | 3.98/4.60 | 17% | 70% | 32% |
| DO, % of Sat. | 37/52 | 76/85 | 47/50 | 47/56 | | | |
| pH | 7.91/7.82 | 8.11/7.94 | 7.93/7.84 | 7.92/7.82 | -1% | 4% | 2% |
| 3-day ADF, cfs | 2.4/1.7 | 1.9/1.3 | 1.8/1.3 | 2.0/1.4 | -30% | 70% | 53% |
| WQ Index | 18/23 | 30/24 | 20/19 | 21/21 | -1% | 72% | 39% |
| July/Aug | E/E | D/E+ | E/E | E/E | | | |
| July/ August'20 | Poor/ Poor | Marginal/ Poor | Poor/ Poor | Poor/ Poor | Index unchanged 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 0.9 degrees (4%) from last month to 12% greater than a year ago and 7% above the 16-yr Aug norm of 23.5 oC. Overall **specific conductivity** of 2.87 mS/cm constitutes a 9% increase from last month, to 4% less than last Aug and 2% below the 16-yr norm of 2.94 mS/cm. The overall **dissolved oxygen** level of 4.60 mg/L (56%Sat.) is 17% above last month, 70% above last Aug and 32% greater the 16-yr norm of 3.56 mg/L (41%Sat). **Streamflow** over the antecedent 3-day period of 1.4 cfs is down 30% from last month, but 70% greater than a year ago and 53% above the 16-yr norm. This month's LSDR **water quality index** (WQI) is unchanged from last month at 21, six points (39%) above the 16-yr August norm of 15.

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 (7'18 - 8'20) | | | | | | | |
|------------------------------------------------------------------------------------|----------------|----------------|---------------|----------------|-----------|------------|-------------|
| | Mission Valley | Mission Gorge | Santee Basin | LSDR | | ADF, cfs | MRf, in |
| 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 | 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. '19 | 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 | 5.7 | 0.02 |
| July | 18 (E) | 30 (D) | 20 (E) | 21 (E) | DW | 2.1 | 0.00 |
| Aug '20 | 23 (E) | 24 (E+) | 19 (E) | 21 (E) | DW | 1.3 | 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. The past three month's values (June, July & Aug) 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. WY05 witnessed best overall water quality while poorest water quality was monitored during the summer months extending through Nov. of 2014.

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 32 is three percent below the 16-yr LSDR flow-weighted average index of 32.7; well above above experienced both last Aug (30) and two year's ago (23). The running average Aug. low of 21 (37% below the current norm) occurred in 2014. The highest running average WQI for Aug. of 38 (18% above norm) occurred in 2005. The overall LSDR running average (12-month trendline shown dashed in black) has declined approximately ten index points (from 40 to 30) over a span of 16 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 primary causes of poor water quality both within this reach and the deep waters of Upper 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. Overall August results (color bars w/values in black) shown on Chart 5 are relatively unchanged from July (Chart 4). Both months are considerably below June (Chart 3) results. Poor quality (E-F) sites have gone from nine (64%) in July to seven (50%) in August, while Marginal (D) and Fair (C) quality sites increased from five (36%) in July to seven (50%) this month. It can be expected that next month's results will be little changed from the the past two months. 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 within the Mission Valley reaches (Sites 3 and 6) commonly present during the dry-weather flow months of each year. This year summer dissolved oxygen depletion levels have not been as profound (i.e., less anoxic sites) as during the previous three to four years.

(jck 9/18/20)

