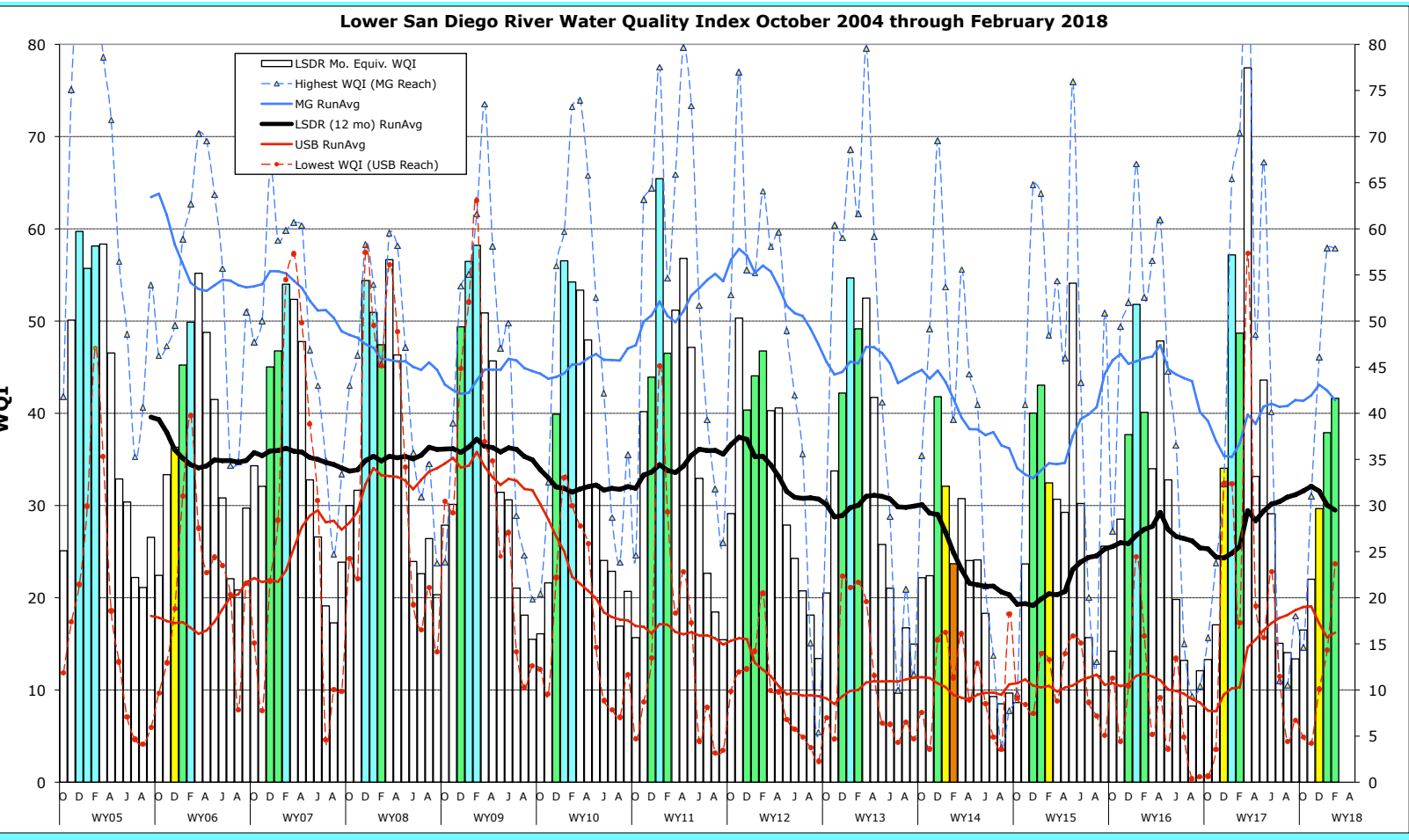


Monthly WQM Report

Lower San Diego River - February 2018



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 (Jan. & Feb.) that constitute the mid-months of winter. The February index rose three points from last month, to a level four points below last year and six points below the 13-yr monthly average of 47. This month's overall water quality in the lower San Diego River hydrologic unit (HSU 907.1) is graded as C (Fair).

| Table 1 - Jan./Feb. 2018 WQM Data Summary | | | | | | | |
|--|-----------------------|-----------------------|--------------------------|-----------------------|--|--------------------|---------------------|
| | West - MV | Mid - MG | East - SB | LSDR | Percent Variance from | | |
| [Sites] | [1-7] Jan/Feb | [8-10] Jan/Feb | [11-15] Jan/Feb | [1-15] Jan/Feb | Last Mo (1/'18) | Last Yr (2/'17) | 13-Yr Avg (Feb.) |
| Temperature, oC | 13.8/15.3 | 17.4/17.2 | 14.4/15.2 | 14.7/15.6 | 6% | 4% | 13% |
| Sp.Cond., mS/cm | 1.68/2.86 | 1.44/1.94 | 1.75/1.99 | 1.80/2.39 | 33% | 96% | 42% |
| DO, mg/L | 5.69/5.60 | 8.86/9.01 | 4.23/4.83 | 5.72/6.00 | 6% | -14% | -14% |
| DO, % of Sat. | 55/57 | 82/87 | 41/48 | 55/60 | | | |
| pH | 7.58/7.97 | 7.91/8.22 | 7.92/8.25 | 7.78/8.13 | 5% | 6% | 4% |
| 3-day ADF, cfs | 13.8/6.0 | 12.2/4.1 | 12.0/3.9 | 12.7/4.7 | -63% | -94% | -90% |
| WQ Index | 41/41 | 58/58 | 24/35 | 38/41 | 9% | -8% | -11% |
| Grade(Sept/Oct.) | C/C | B/B | E+/C | C/C | | | |
| January/ February 2018 | Fair/ Fair | Good/ Good | Poor/ Marginal | Fair/ Fair | Index up 4 points from last month | | |

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

Overall, LSDR **water temperature** rose 0.9°C (6%) from last month, to 4% above last Feb. and 13% above the 13-yr monthly norm of 13.8°C. **Specific conductivity** of 2.39 uS/cm rose 33% from last month to nearly double (96%) last year's Feb. low of 1.20 uS/cm and 30% below the 13-yr monthly norm of 1.69 mS/cm. The overall **dissolved oxygen** level of 6.00 mg/L is slightly (5%) above last month, but remains 14% less than a year ago and the 13-yr monthly norm of 7.13 mg/L. **Streamflow** over the antecedent 3-day period of 4.7 cfs, is down 63% from last month, remaining 94% below a year ago and 90% below the 13-yr norm of 46 cfs. This month's LSDR **water quality index** (WQI) of 41 (C/Fair) is 3 points higher than last month, but remains 4 points (-8%) below a year ago and 6 points (-11%) below the 13-yr norm of 47 (C/Fair).

Conclusion:

The overall LSDR water quality index rose by 9%, increasing three points from **38 (C/Fair)** to **41 (C/Fair)** over the last 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 (Feb. 2016 - Feb. 2018) | | | | | | | |
|--|----------------|---------------|--------------|--------|----|----------|---------|
| | Mission Valley | Mission Gorge | Santee Basin | LSDR | | ADF, cfs | MRF, in |
| Feb. '16 | 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. '17 | 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 | 15(E) | 11(F) | 9(F) | 12(F+) | DW | 0.9 | 0.08 |
| Oct. | 20(E) | 15(E) | 14(E) | 17(E) | DW | 1.4 | 0.01 |
| Nov. | 25(D-) | 31(D) | 15(E) | 22(E) | DW | 1.4 | 0.01 |
| Dec.'17 | 26(D-) | 46 (C) | 25(D-) | 30 (D) | DW | 2.1 | 0.02 |
| Jan.'18 | 41(C) | 58(B) | 24(E+) | 38(C) | ww | 32 | 1.74 |
| Feb. '18 | 41(C) | 58(B) | 35(D) | 41(C) | | 5.7 | 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. Dec.'17 through Feb. 2018 values (first three months of the winter season) 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. An upward trend in the index over the past year has been in slight decline during the initial five months of WY18 primarily because oxygen levels as well as streamflow have remained below seasonal averages at many sites.

Monthly WQI values extending from Oct. 2004 through Feb. 2018 are presented in **Chart 1** (next page) together with 12-mo. 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 31 is only 7% below the 13-yr norm. In comparison, a year ago (Feb. 2017), the running average WQI was 12% below the 13-yr norm at 29. The running average low for Feb. of 23 (33% below the annual norm) occurred in 2015. The Feb. high of 38 (15% above norm) occurred three years earlier in 2012.

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 improved to an extent in the Upper Santee Basin over the past year, resurgent growth and decay of invasive aquatic vegetation such as primrose-willow (*Ludwigia hexapetala*) in conjunction with low streamflow and pervasive algal blooms are considered primary causes of continued poor water quality.

Spatial WQI results by site for the past three months of monitoring are shown in **Charts 3, 4 and 5** on page 6. February WQI values (color bars w/index values in black) have improved slightly from last month at about half the sites. In mid-December 33% (5 of 15) were in the Poor (E) or Very Poor (F) range while the remaining ten (6 Marginal and 4 Fair) were in the 'Intermediate' range. Last month, only 13 percent (2 of 15 sites monitored) were in the Poor (1) or Very Poor (1) range (WQI<25) while 67% (10 sites) were Marginal (5) or Fair (5) within the Intermediate range and three sites (20%) were Good. This month two sites (13%) are in the Poor range while ten of the 15 sites (67%) remain in the Intermediate (5-Fair and 5-Marginal) range and three (20%) remain Good (WQI>50).

In summary, the overall water quality index for the lower SDR watershed shows slow improvement over the past three months, a pattern that is expected to continue for several more, during wet weather conditions involving enhanced streamflow and improved dissolved oxygen levels.

JCK: (2/19/18)

