**Supplementary** **Table 1** Values of the measured bacteriological, physical and chemical water quality parameters in each sampling campaign in both rivers. Zmean: mean depth, Zmax: maximum depth, TDS: total dissolved solids, N-NH3: ammoniacal nitrogen, SRP: soluble reactive phosphorus, DO: dissolved oxygen, COD: chemical oxygen demand, CDOM ag254: chromophoric dissolved organic matter at 254 nm. MSI: chromophoric organic matter molecular size index, TC: total coliforms, FC: faecal coliforms. n=48 for physical and chemical variables and n=16 for microbiological variables in each river. nd: no data available.

|  |  |
| --- | --- |
|  | Rojas River |
| R1 | R2 | R3 | R4 |
| M | J | S | D | M | J | S | D | M | J | S | D | M | J | S | D |
| Zmean (m) | 0.94 | 0.50 | 0.43 | 0.35 | 1.41 | 0.98 | 1.17 | 0.95 | 0.90 | 1.32 | 1.43 | 1.18 | nd | 1.53 | 1.45 | 1.34 |
| Zmax(m) | 1.04 | 0.75 | 0.90 | 0.77 | 2.14 | 1.95 | 2.18 | 1.70 | 0.94 | 1.67 | 1.95 | 1.40 | nd | 1.97 | 1.88 | 1.50 |
| Temperature (°C) | 24.03±0.12 | 12.06±0 | 14.07±0.06 | 23.73±0.25 | 23.70±0 | 13.27±0.12 | 13.73±0.06 | 24.63±0.25 | 23.70±0.17 | 12.37±0.06 | 13.93±0.06 | 24.50±0.10 | 23.63±0.15 | 12.33±0.06 | 14.30±0.10 | 24.27±0.21 |
| Conductivity (μS cm-1) | 7356.67±5.77 | 5766.67±11.55 | 6653.33±25.17 | 6206.67±72.34 | 6453.33±15.28 | 5273.33±20.82 | 5866.67±15.28 | 5726.66±75.06 | 6453.33±5.77 | 5470.00±10 | 6320±10.00 | 6103.33±15.28 | 6523.33±15.28 | 5220±34.64 | 6336.67±25.17 | 5800±62.45 |
| pH | 8.65±0.02 | 8.13±0 | 8.21±0.01 | 8.31±0.02 | 8.44±0.39 | 8.12±0.01 | 8.14±0.01 | 8.30±0.03 | 8.52±0.02 | 8.17±0.01 | 8.16±0.01 | 8.22±0.02 | 8.91±0.01 | 8.11±0.01 | 8.11±0.01 | 8.32±0.03 |
| Turbidity (NTU) | 32.33±1.10 | 29.15±0.27 | 44.11±0.96 | 32.92±3.60 | 27.02±0.39 | 32.82±2.24 | 38.10±1.82 | 22.30±0.58 | 20.97±0.63 | 26.63±0.55 | 28.75±0.55 | 12.00±0.16 | 50.25±3.51 | 25.80±0.21 | 27.90±0.61 | 23.49±0.46 |
| Secchi depth (cm) | 24.00±2.64 | 26.00±0 | 18.50±0.50 | 15.00±0 | 20.00±2.00 | 29.00±0 | 21.00±0 | 21.33±2.31 | 29.67±0.58 | 28.33±0.58 | 30.50±0.50 | 25.67±1.15 | 19.67±0.58 | 25.67±0.58 | 28.00±0 | 24.50±0.50 |
| TDS (mg L-1) | 3.69±0.01 | 2.88±0.01 | 3.33±0.02 | 3.10±0.04 | 3.23±0.01 | 2.63±0.01 | 2.63±0.01 | 2.93±0.01 | 3.22±0 | 2.73±0.01 | 3.15±0.01 | 3.05±0.01 | 3.26±0.01 | 2.61±0.02 | 3.17±0.02 | 2.89±0.03 |
| N-NH3 (mg L-1) | 0.15±0.11 | 0.17±0.05 | 0.22±0.01 | 0.02±0.02 | 2.26±0.69 | 2.95±0.07 | 1.52±0.02 | 2.19±0.22 | 2.24±0.51 | 0.40±0.03 | 0.57±0.01 | 1.67±0.08 | 0.03±0.02 | 0.44±0.04 | 0.49±0.01 | 0.02±0.03 |
| SRP (mg L-1) | 0.04±0.01 | 0.50±0.03 | 0.32±0.02 | 0.13±0.02 | 0.21±0.08 | 0.65±0.01 | 0.41±0.03 | 0.41±0.01 | 0.05±0.01 | 0.44±0.01 | 0.33±0.03 | 0.36±0.02 | 0.01±0 | 0.43±0 | 0.33±0.01 | 0.19±0.02 |
| Sulphates (mg L-1) | 822.59±204.01 | 480.17±16.53 | 783.20±4.77 | 2218.83±19.27 | 778.51±184.06 | 394.77±29.02 | 631.68±67.31 | 2166.36±115.77 | 447.93±165.29 | 425.07±26.57 | 810.74±103.55 | 2209.57±65.03 | 624.24±182.82 | 375.48±31.29 | 728.10±54.19 | 2181.79±53.46 |
| Chlorides (mg L-1) | 1354.32±9.88 | 1015.43±5.76 | 1188.74±0 | 1396.59±18.83 | 1190.45±41.16 | 895.57±2.03 | 1010.07±3.06 | 1244.16±12.77 | 1142.97±3.48 | 952.42±2.69 | 1101.47±2.70 | 1372.41±2.55 | 1179.45±1.74 | 897.92±2.03 | 1100.29±3.06 | 1272.17±2.55 |
| DO (mg L-1) | 5.99±0.14 | 8.90±0.04 | 8.39±0.07 | 8.13±0.20 | 9.01±0.27 | 8.82±0.06 | 7.65±0.12 | 8.97±0.18 | 2.96±0.02 | 8.85±0.03 | 6.61±0.01 | 3.03±0.12 | 8.58±0.14 | 8.30±0.09 | 7.08±0.05 | 8.87±0.48 |
| COD (mg L-1) | 158.33±83.29 | 88.67±10.26 | 89.00±10.15 | 68.32±2.34 | 111.00±10.15 | 96.33±11.02 | 78.33±8.33 | 64.90±4.57 | 112.00±12.12 | 85.33±7.23 | 77.33±13.58 | 56.41±3.64 | 140.33±7.57 | 77.00±6.08 | 69.33±8.33 | 56.78±2.11 |
| CDOM ag254 (nm-1) | 54.32±0.45 | 97.34±2.53 | 42.53±0.27 | 57.58±0 | 55.07±0.65 | 93.74±4.80 | 45.62±0.59 | 59.62±0.80 | 54.69±0.35 | 105.02±0.40 | 42.91±0.93 | 58.11±0.53 | 60.17±0.95 | 99.96±1.52 | 42.38±0.40 | 64.71±0.69 |
| Water colour ag440 (nm-1) | 2.57±0.16 | 4.99±0.13 | 2.23±0.27 | 2.38±0.13 | 2.74±0.37 | 5.15±1.54 | 2.82±0.32 | 3.25±0.27 | 2.82±0.13 | 6.06±0.13 | 1.84±0.23 | 2.92±0.13 | 3.45±0.37 | 5.90±0.26 | 2.30±0.23 | 3.15±0.27 |
| MSI ag250/a365 | 6.20±0.10 | 5.44±0.02 | 5.60±0.21 | 6.32±0.18 | 5.99±0.23 | 5.23±0.44 | 5.33±0.20 | 5.67±0.09 | 5.77±0.10 | 5.22±0.06 | 5.83±0.21 | 5.90±0.22 | 5.78±0.25 | 5.18±0.13 | 5.77±0.03 | 6.02±0.08 |
| Chlorophyll-a (μg L-1) | 58.06±14.50 | 27.68±1.36 | 236.86±5.10 | 109.23±6.56 | 107.41±3.32 | 25.40±1.26 | 51.53±4.40 | 74.03±2.18 | 174.42±5.64 | 21.05±4.76 | 36.65±0.63 | 115.03±1.66 | 302.88±19.71 | 29.03±2.62 | 51.17±2.88 | 156.71±7.06 |
| TC (MPN/100 mL) | 40 | 1700 | 300 | 2400 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 230 | 16000 | 16000 | 2200 |
| FC (MPN/100 mL) | 0 | 80 | 40 | 220 | 1300 | 16000 | 16000 | 16000 | 60 | 9000 | 16000 | 16000 | 0 | 9000 | 3000 | 110 |
| *E. coli* (MPN/100 mL) | 0 | 40 | 40 | 60 | 170 | 70 | 800 | 60 | 60 | 170 | 340 | 30 | 0 | 60 | 340 | 90 |
| *E. coli* (copy number/100 mL) | 105 | 183 | 62 | 40 | 90001 | 42824 | 12533 | 50310 | 2731 | 492 | 1052 | 1804 | 18.53 | 2200 | 3511 | nd |

|  |  |
| --- | --- |
|  | Salado River |
| S1 | S2 | S3 | S4 |
| M | J | S | D | M | J | S | D | M | J | S | D | M | J | S | D |
| Zmean (m) | 0.80 | 0.91 | 0.80 | 0.91 | 1.20 | 2.22 | 1.84 | 2.27 | 0.73 | 0.90 | 0.87 | 0.95 | 0.50 | 1.01 | nd | nd |
| Zmax(m) | 0.80 | 1.00 | 0.90 | 0.95 | 1.44 | 3.80 | 3.30 | 3.85 | 0.80 | 0.90 | 0.90 | 0.95 | 0.50 | 1.04 | nd | nd |
| Temperature (°C) | 22.47±0.23 | 8.20±0.10 | 16.97±0.06 | 22.33±0.06 | 24.77±0.21 | 10.03±0.06 | 17.17±0.06 | 24.47±0.12 | 24.80±0.17 | 9.87±0.21 | 18.97±0.32 | 24.77±0.06 | 25.47±0.51 | 7.87±0.15 | 16.30±0.10 | 23.70±0.10 |
| Conductivity (μS cm-1) | 11096.67±101.16 | 10240.67±19.00 | 9076.67±11.55 | 8740.00±10.00 | 9996.67±15.27 | 7800.00±320.47 | 8950.00±17.32 | 8553.33±41.63 | 8390.00±10.00 | 6186.67±179.26 | 8856.67±17.32 | 7736.67±40.41 | 5623.33±40.42 | 4553.33±45.09 | 8140.00±10.00 | 7156.66±49.33 |
| pH | 9.20±0.05 | 9.05±0.02 | 8.42±0.01 | 8.73±0.01 | 9.07±0.01 | 8.90±0.02 | 8.32±0 | 8.66±0.01 | 9.06±0.01 | 9.01±0.01 | 8.37±0.01 | 8.77±0.01 | 8.60±0.02 | 8.60±0.04 | 8.34±0 | 8.69±0 |
| Turbidity (NTU) | 104.67±0.58 | 242.33±4.84 | 273.22±5.42 | 170.44±2.17 | 74.55±3.50 | 100.89±4.29 | 184.22±13.41 | 160.98±3.22 | 69.89±7.88 | 112.11±1.07 | 231.78±2.37 | 142.99±18.34 | 37.32±3.72 | 51.88±1.66 | 230.78±1.02 | 121.99±9.61 |
| Secchi depth (cm) | 9.50±0.50 | 7.83±0.29 | 6.00±0 | 9.00±0 | 3.17±0.29 | 9.17±0.29 | 8.50±0.50 | 9.67±0.29 | 11.67±0.58 | 9.50±0.50 | 7.00±0 | 9.50±0 | 14.33±0.58 | 15.17±0.29 | 7.00±0 | 9.50±0 |
| TDS (mg L-1) | 5.52±0.05 | 5.11±0.02 | 4.54±0.01 | 4.37±0.01 | 5.00±0.01 | 3.90±0.17 | 4.47±0.01 | 4.28±0.02 | 4.18±0.01 | 3.09±0.09 | 4.43±0.02 | 3.86±0.02 | 2.81±0.02 | 2.27±0.02 | 4.07±0.01 | 3.58±0.07 |
| N-NH3 (mg L-1) | 0.06±0.06 | 0.14±0.08 | 0.59±0.18 | 0.26±0.03 | 0.09±0.08 | 1.70±0.45 | 0.77±0.04 | 0.25±0.09 | 0.02±0 | 1.10±0.37 | 0.81±0.54 | 2.25±1.79 | 6.84±0.34 | 6.99±0.31 | 1.93±0.19 | 1.16±0.18 |
| SRP (mg L-1) | 0.05±0.01 | 0.04±0.02 | 0.72±0.03 | 0.77±0.03 | 0.05±0.01 | 0.21±0.06 | 0.80±0.04 | 0.75±0.01 | 0.04±0.02 | 0.13±0.03 | 0.69±0.08 | 0.87±0.22 | 1.20±0.28 | 1.97±1.01 | 1.23±0.06 | 0.84±0.23 |
| Sulphates (mg L-1) | 1907.99±112.51 | 866.67±106.27 | 596.69±59.60 | 1301.85±37.04 | 1693.11±310.25 | 519.56±9.54 | 607.71±41.60 | 1264.82±37.04 | 1246.83±582.59 | 343.25±66.80 | 552.62±91.03 | 962.35±189.15 | 1009.91±335.5 | 78.79±9.54 | 508.54±74.53 | 919.14±38.55 |
| Chlorides (mg L-1) | 2133.13±13.35 | 2010.35±10.15 | 1723.76±4.43 | 2248.12±6.77 | 1875.54±13.43 | 1365.63±33.28 | 1689.78±5.12 | 2165.40±24.40 | 1333.39±347.72 | 1098.95±8.79 | 1649.90±19.98 | 1722.28±221.40 | 940.70±0 | 737.03±2.54 | 1508.10±9.22 | 1688.31±4.43 |
| DO (mg L-1) | 1.83±0.51 | 10.83±0.07 | 7.73±0.04 | 7.42±0.07 | 13.28±0.64 | 11.71±0.74 | 3.38±0.09 | 6.38±0.19 | 9.22±0.20 | 9.59±0.18 | 7.41±0.07 | 8.60±0.08 | 4.13±0.45 | 3.44±0.02 | 5.13±0.26 | 4.98±0.23 |
| COD (mg L-1) | 424.33±3.06 | 477.00±10.15 | 325.33±37.90 | 219.76±7.02 | 353.67±10.26 | 300.67±6.66 | 259.33±2.08 | 208.54±7.41 | 248.67±16.62 | 282.67±8.51 | 288.33±14.43 | 221.13±21.96 | 190.00±5.29 | 186.00±6.08 | 269.00±10.82 | 203.84±12.76 |
| CDOM ag254 (nm-1) | 247.62±20.96 | 213.22±17.98 | 214.10±8.60 | 228.75±5.66 | 220.60±14.03 | 175.21±8.15 | 233.20±4.87 | 222.96±11.82 | 181.84±6.05 | 146.93±5.31 | 211.65±4.92 | 197.52±18.57 | 132.77±3.08 | 110.39±2.32 | 202.08±2.38 | 191.26±7.16 |
| Water colour ag440 (nm-1) | 5.71±0.41 | 7.35±5.70 | 8.53±0.99 | 6.64±2.13 | 5.56±0.21 | 8.83±4.34 | 9.34±1.91 | 7.20±3.39 | 5.55±0.63 | 5.47±1.09 | 7.06±1.27 | 5.30±0.23 | 6.65±0.81 | 4.61±0.23 | 8.49±1.03 | 6.66±2.62 |
| MSI ag250/a365 | 11.51±0.60 | 10.88±2.50 | 8.21±0.51 | 10.20±0.84 | 11.41±0.15 | 9.55±2.09 | 8.13±0.68 | 10.04±1.50 | 10.41±0.30 | 8.49±0.62 | 8.88±0.50 | 10.22±0.32 | 7.70±0.34 | 7.59±0.02 | 8.03±0.33 | 9.41±1.14 |
| Chlorophyll-a (μg L-1) | 517.46±79.89 | 589.32±18.13 | 110.31±7.68 | 132.09±8.24 | 576.25±61.64 | 367.96±13.06 | 71.61±8.87 | 150.23±5.76 | 314.25±36.45 | 391.18±11.99 | 177.08±5.03 | 258.37±43.62 | 255.95±20.03 | 190.15±6.29 | 179.99±10.47 | 306.99±19.35 |
| TC (MPN/100 mL) | 500 | 300 | 230 | 500 | 2800 | 16000 | 9000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 | 16000 |
| FC (MPN/100 mL) | 300 | 300 | 130 | 140 | 300 | 16000 | 5000 | 3500 | 9000 | 3500 | 16000 | 900 | 16000 | 16000 | 16000 | 340 |
| *E. coli* (MPN/100 mL) | 40 | 40 | 80 | 140 | 80 | 110 | 340 | 70 | 440 | 170 | 160 | 105 | 3500 | 120 | 120 | 30 |
| *E. coli* (copy number/100 mL) | 42 | 1727 | 228 | 93 | 2291 | 6128 | 219 | 1851 | 24150 | 62780 | 12165 | 37939 | 24296 | 31422 | 8229 | 10942 |

**Supplementary Fig. 1** Workflow showing total coliforms (TC), fecal coliforms (FC), *E. coli* and the diarrhoeagenic *E. coli* (DEC) detection process.

