

Table. S1 Inventory of surface water isotopes in the Liujiaxia Reservoir from 2016 to 2017.

| Date |    |     | Lake water            |                    |          | River water           |                    |          |
|------|----|-----|-----------------------|--------------------|----------|-----------------------|--------------------|----------|
|      |    |     | $\delta^{18}\text{O}$ | $\delta^2\text{H}$ | D-excess | $\delta^{18}\text{O}$ | $\delta^2\text{H}$ | D-excess |
|      |    |     | (‰)                   | (‰)                | (‰)      | (‰)                   | (‰)                | (‰)      |
| 2016 | 18 | Jan | -10.25                | -76.42             | 5.60     | -10.22                | -73.43             | 8.29     |
|      | 2  | Feb |                       |                    |          | -10.48                | -75.37             | 8.45     |
|      | 21 | Feb |                       |                    |          | -10.49                | -75.24             | 8.70     |
|      | 5  | Mar | -10.13                | -76.36             | 4.65     | -10.51                | -75.03             | 9.09     |
|      | 19 | Mar | -10.12                | -76.73             | 4.25     | -10.55                | -75.07             | 9.31     |
|      | 10 | Apr | -9.84                 | -73.55             | 5.20     | -10.11                | -75.06             | 5.85     |
|      | 30 | Apr | -10.18                | -77.07             | 4.33     | -9.96                 | -71.52             | 8.19     |
|      | 14 | May | -10.02                | -76.03             | 4.15     | -9.79                 | -74.47             | 3.89     |
|      | 18 | May | -10.05                | -76.15             | 4.25     | -10.13                | -74.77             | 6.25     |
|      | 8  | Jun | -10.08                | -75.35             | 5.32     | -9.96                 | -72.05             | 7.63     |
|      | 11 | Jun | -10.27                | -74.81             | 7.33     | -9.66                 | -73.23             | 4.09     |
|      | 9  | Jul | -9.77                 | -71.73             | 6.42     | -9.35                 | -67.02             | 7.74     |
|      | 24 | Jul | -9.57                 | -71.38             | 5.19     | -9.96                 | -69.30             | 10.40    |
|      | 7  | Aug | -9.81                 | -74.15             | 4.37     | -9.82                 | -68.47             | 10.10    |
|      | 24 | Aug | -9.77                 | -73.57             | 4.57     | -9.42                 | -67.53             | 7.86     |
|      | 4  | Sep | -10.10                | -72.29             | 8.55     | -9.70                 | -67.46             | 10.13    |
|      | 12 | Sep | -9.80                 | -69.66             | 8.73     | -10.09                | -72.92             | 7.81     |
|      | 3  | Oct |                       |                    |          | -9.49                 | -66.31             | 9.60     |
|      | 17 | Oct | -9.76                 | -69.77             | 8.29     | -9.75                 | -65.72             | 12.28    |
|      | 13 | Nov | -9.70                 | -67.60             | 10.03    | -9.89                 | -67.68             | 11.46    |
|      | 17 | Nov | -9.49                 | -66.69             | 9.24     | -10.00                | -67.04             | 12.99    |
|      | 20 | Dec | -9.64                 | -68.61             | 8.47     | -9.82                 | -68.29             | 10.28    |
| 2017 | 4  | Jan | -10.04                | -71.50             | 8.80     | -10.11                | -70.02             | 10.87    |

|    |     |        |        |       |        |        |       |
|----|-----|--------|--------|-------|--------|--------|-------|
| 17 | Jan | -10.05 | -71.77 | 8.59  | -10.21 | -70.12 | 11.52 |
| 1  | Feb | -10.17 | -72.57 | 8.82  | -10.20 | -71.97 | 9.61  |
| 14 | Feb | -10.10 | -72.46 | 8.30  | -10.18 | -72.64 | 8.82  |
| 2  | Mar | -10.20 | -72.60 | 8.97  | -9.90  | -72.33 | 6.90  |
| 19 | Mar | -10.28 | -71.81 | 10.44 | -9.99  | -72.91 | 6.99  |
| 28 | Mar | -10.32 | -71.34 | 11.25 | -9.99  | -72.53 | 7.37  |
| 15 | Apr |        |        |       | -10.27 | -73.31 | 8.83  |
| 8  | May |        |        |       | -10.42 | -72.38 | 10.94 |
| 3  | Jun |        |        |       | -10.12 | -70.24 | 10.72 |
| 20 | Jun |        |        |       | -10.33 | -70.50 | 12.16 |
| 5  | Jul |        |        |       | -10.40 | -70.91 | 12.33 |
| 24 | Jul |        |        |       | -10.41 | -69.90 | 13.39 |
| 10 | Aug |        |        |       | -9.94  | -70.79 | 8.73  |
| 24 | Aug |        |        |       | -9.99  | -69.34 | 10.58 |

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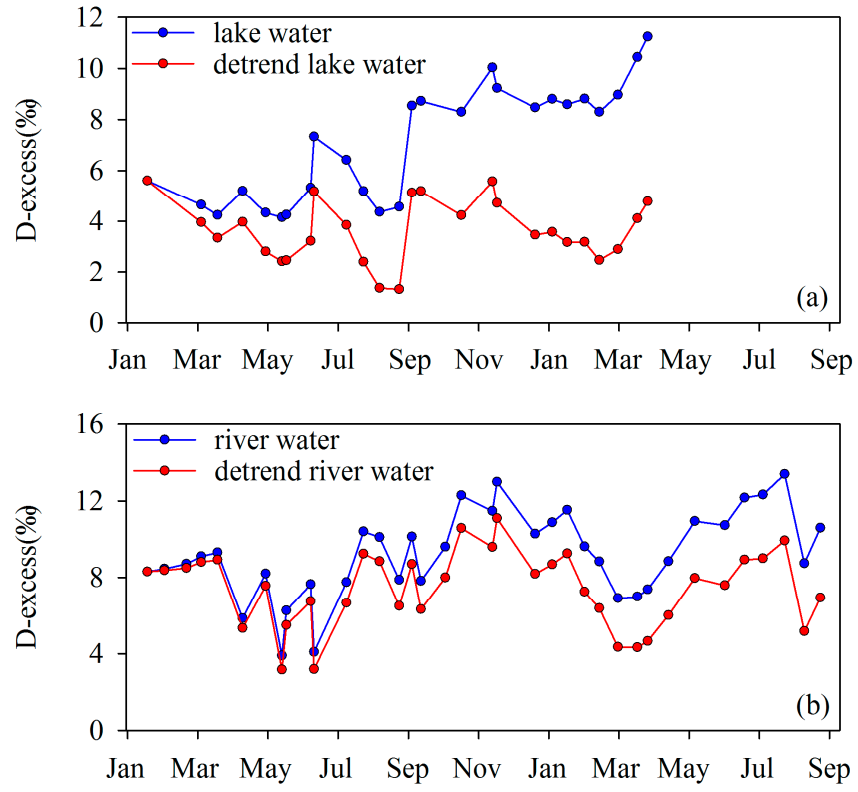


Figure S1. The variation of original and detrended D-excess in (a) the lake water and (b) the river water.