Supplemental Materials

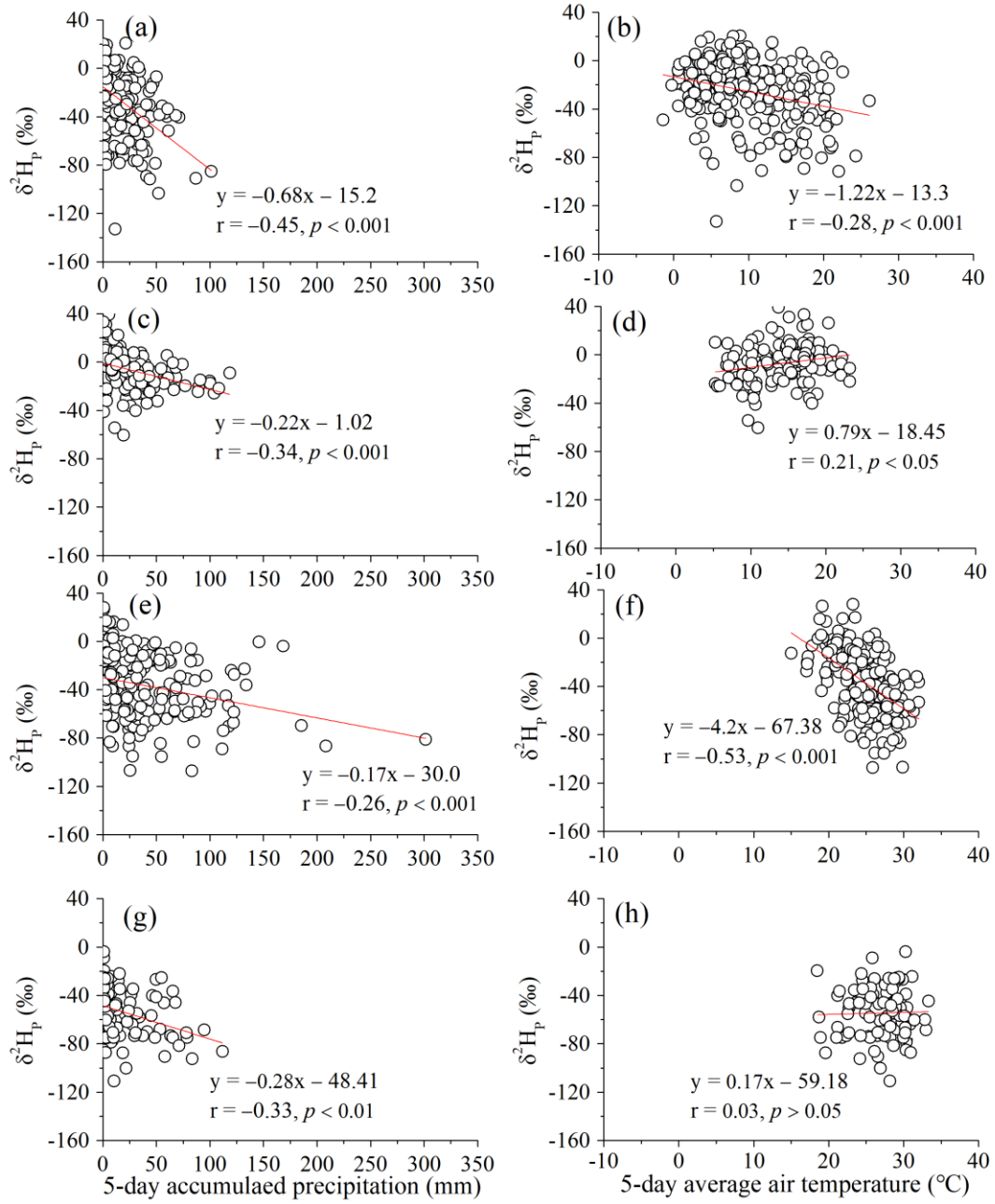

Figure S1. Relationship between the 5-day volume-weighted precipitation δ^2H (δ^2H_P) and the corresponding 5-day accumulated precipitation and 5-day average air temperature in the rainless period (a and b), spring flood period (c and d), major flood period (e and f), and summer drought period (g and h), respectively.

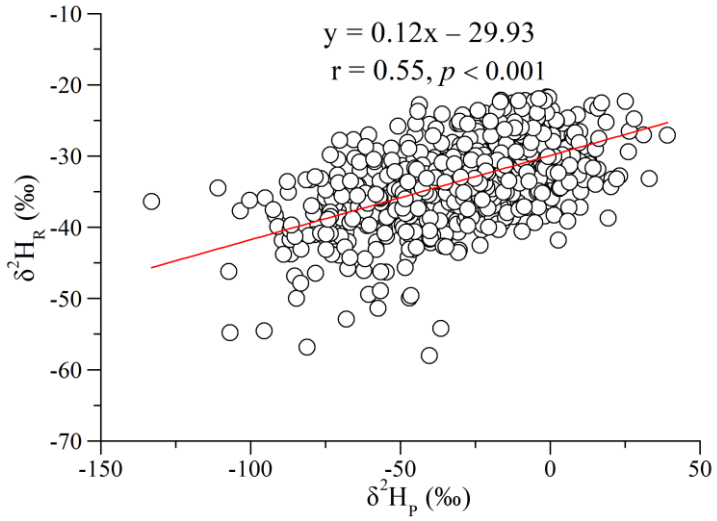

Figure S2. Relationship between the river water δ^2H (δ^2H_R) and the corresponding 5-day volume-weighted precipitation δ^2H (δ^2H_P).

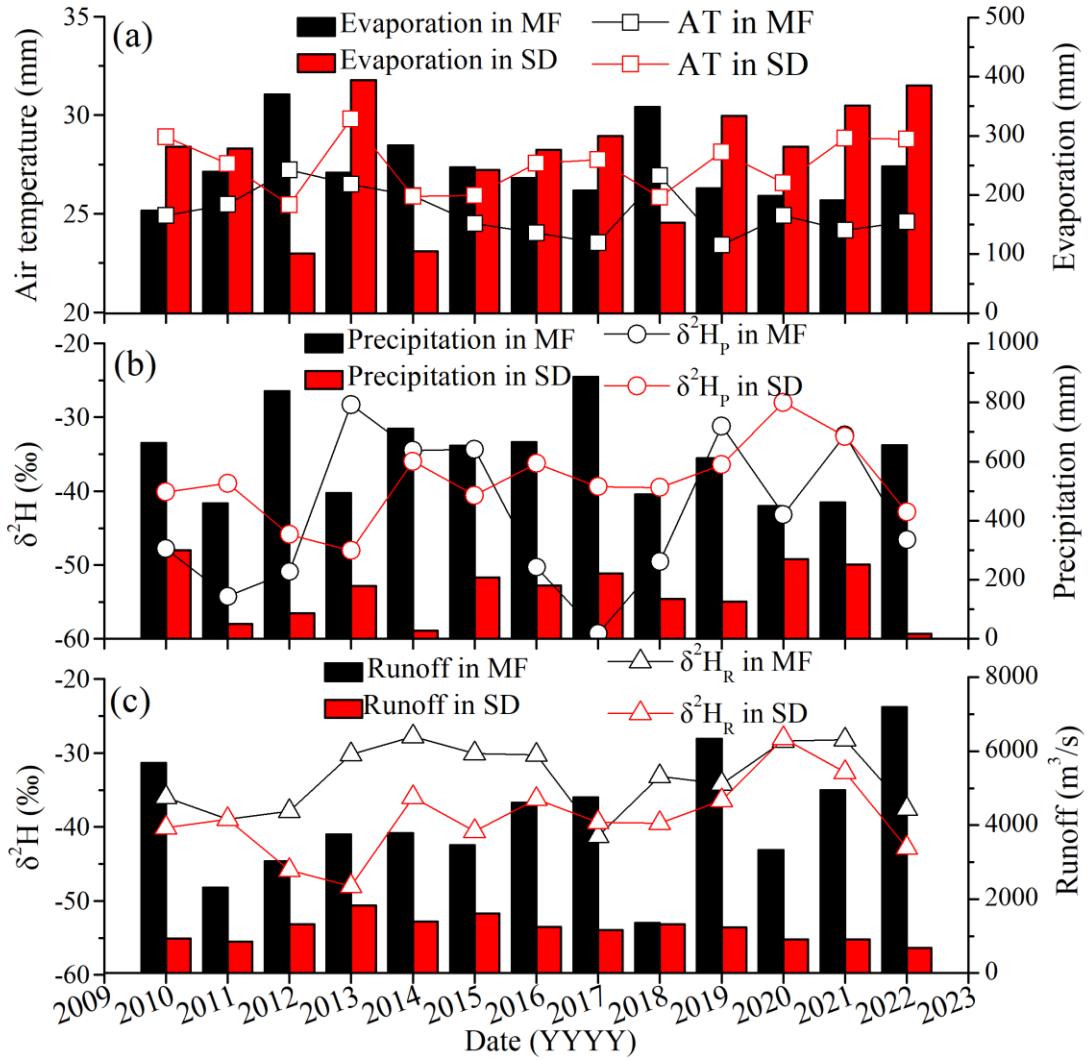

Figure S3. Inter-annual variation of the average air temperature and accumulated evaporation (a), accumulated precipitation and volume-weighted precipitation δ^2H (δ^2H_P) (b), and average runoff discharge and volume-weighted river water δ^2H (δ^2H_R) (c) in major flood period (MF) and summer drought period (SD), respectively.

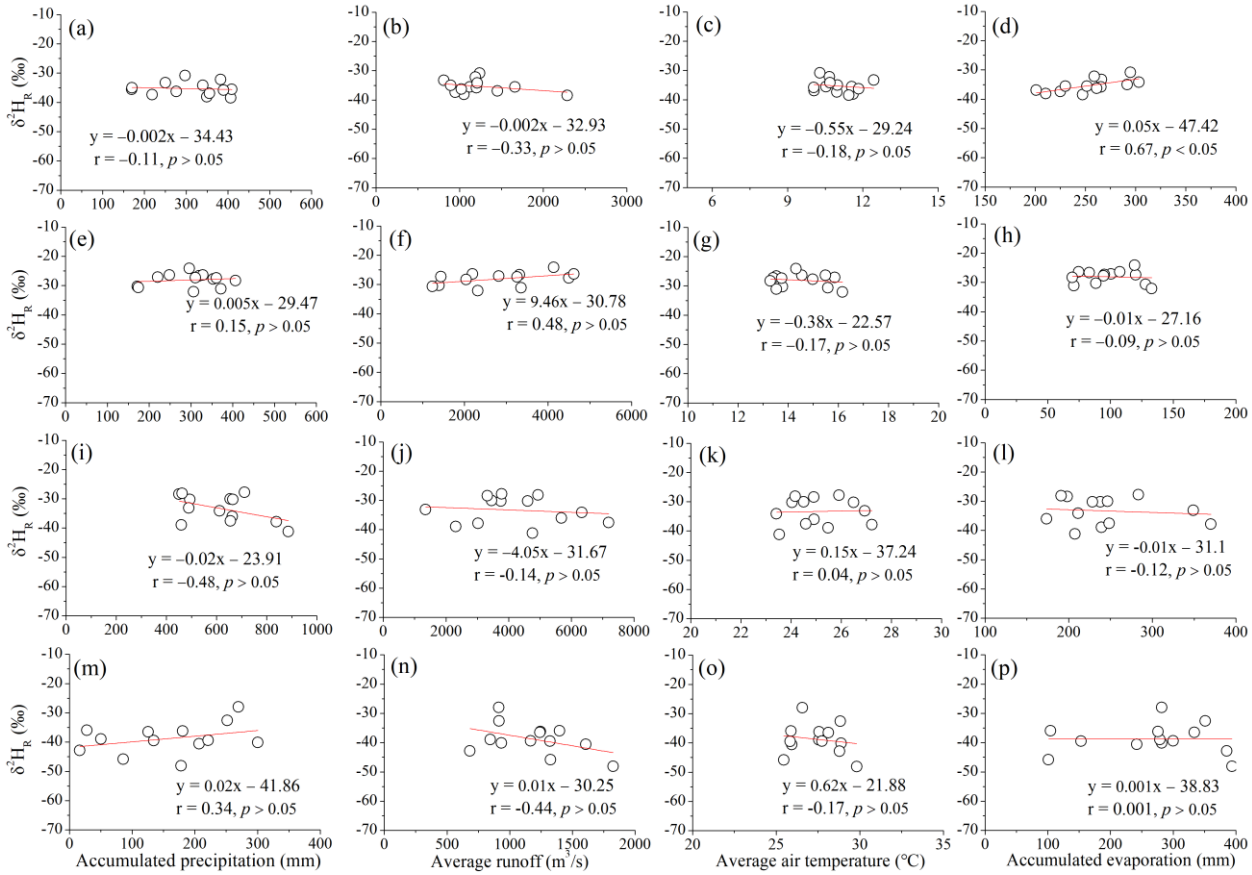

Figure S4. Relationships between the annual volume-weighted river water δ^2H (δ^2H_R) and the corresponding accumulated precipitation (the first column), average runoff discharge (the second column), average air temperature (the third column), and accumulated evaporation (the forth column) in different runoff periods, and the first raw (a, b, c, and d), the second raw (e, f, g, and g), the third raw (i, j, k, and l), and the forth raw (m, n, o, and p) represent the rainless period, spring flood period, major flood period, and summer drought period, respectively.

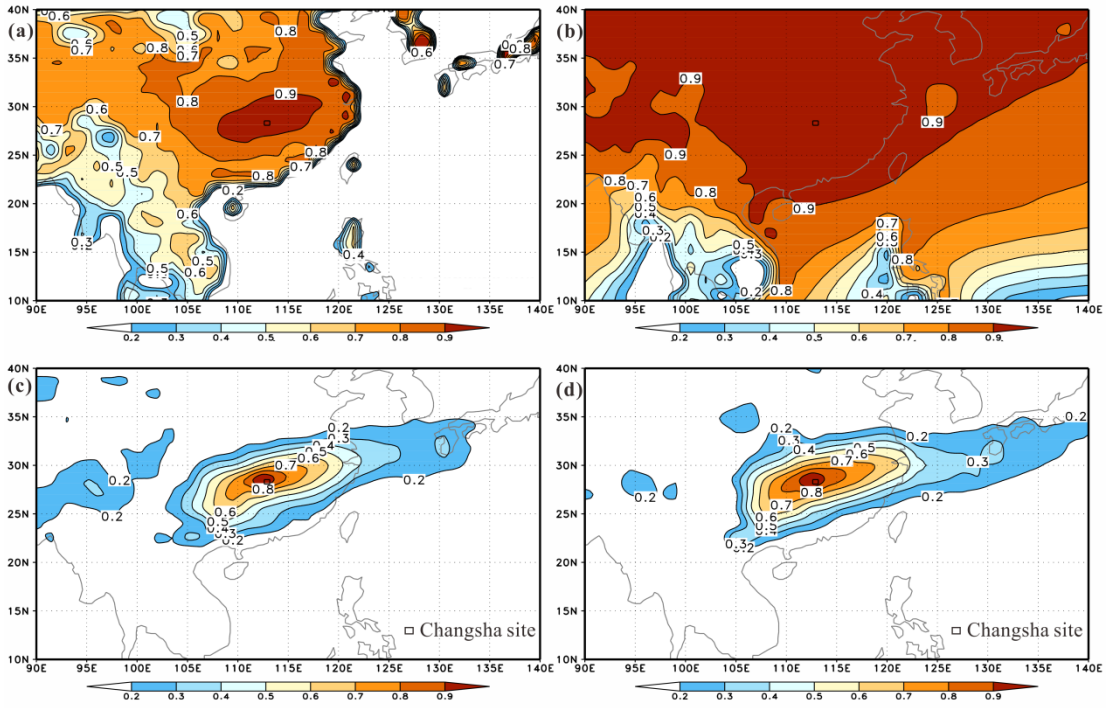

Figure S5. Spatial correlation analysis of the air temperature (a), evaporation (b), precipitation amount (c), and precipitation isotope (d) between the Changsha (CS) site and the surrounding regions at 5 days interval, this analysis employed the simulated precipitation isotope data generated by the isotopic Atmospheric Water Balance Model (iAWBM) (Zhang et al., 2015) and the air temperature, evaporation, and precipitation amount data from the ERA5 reanalysis dataset.