

## Supplementary Materials for

# Substantial reduction in vegetation photosynthesis capacity during compound droughts in the Three-River Headwaters Region, China

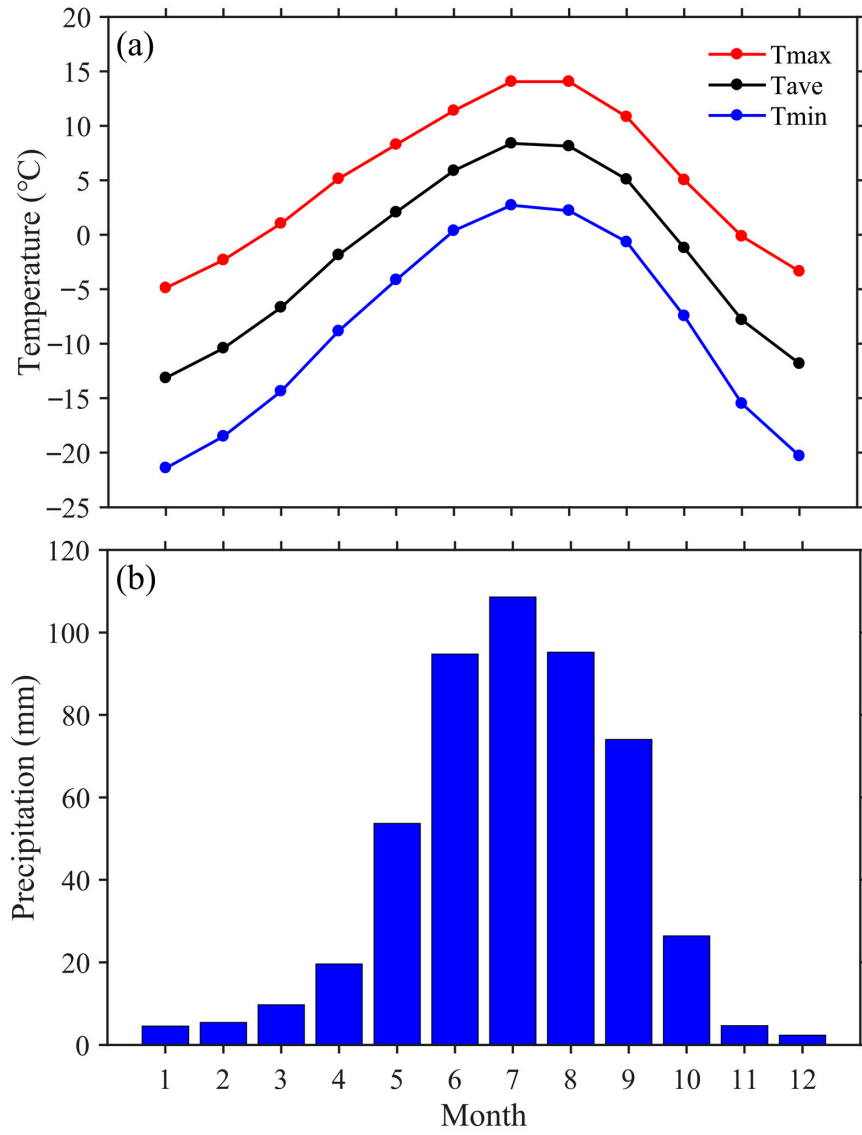
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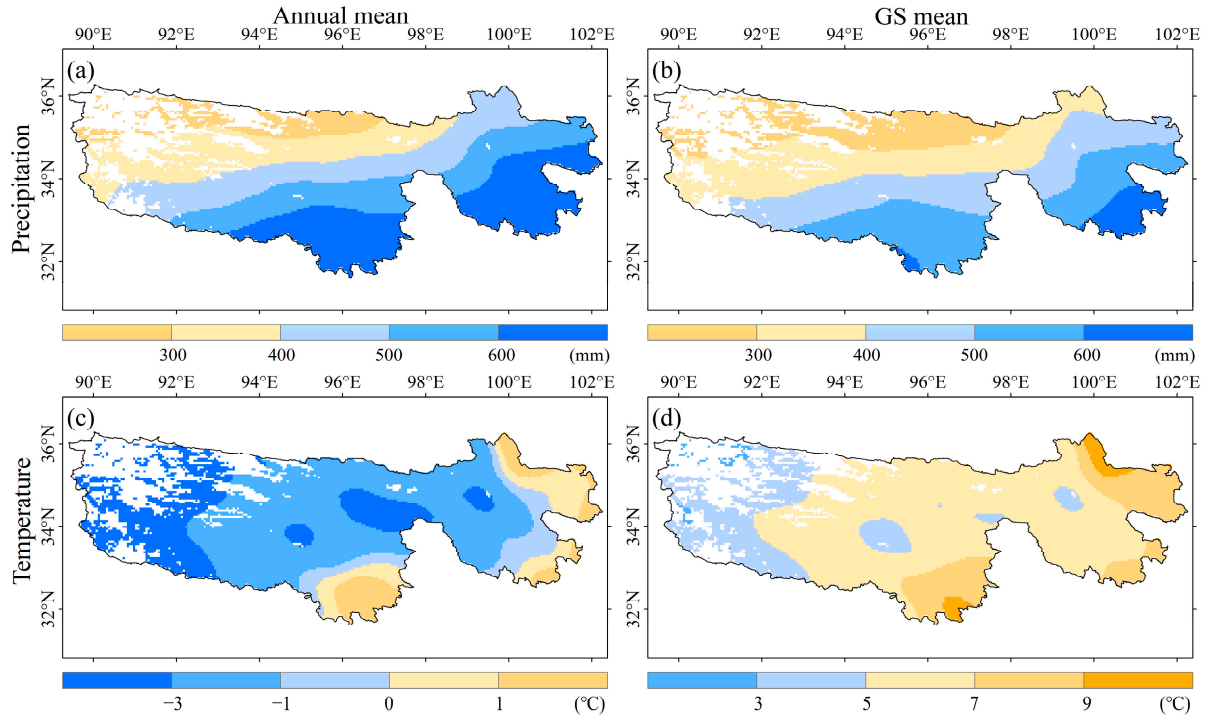
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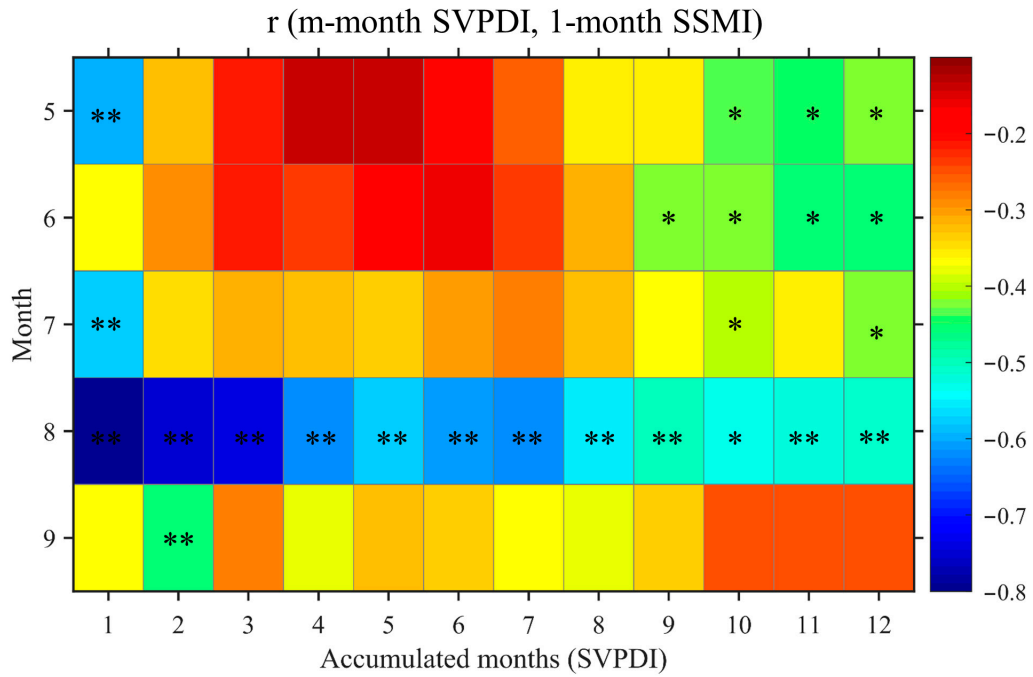
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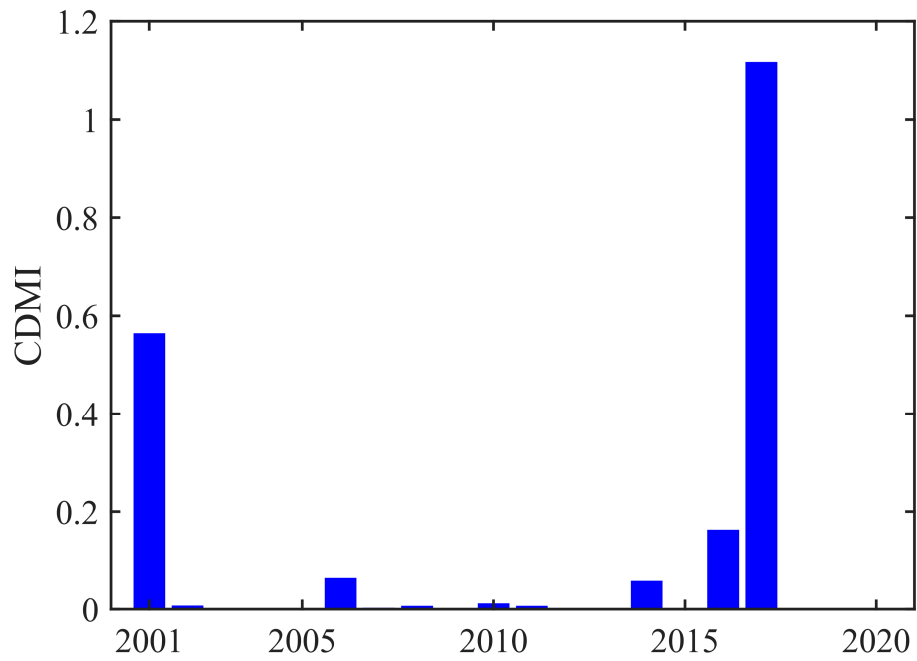
**Figure S1.** Monthly average (a) temperature and (b) precipitation during 2001–2020.



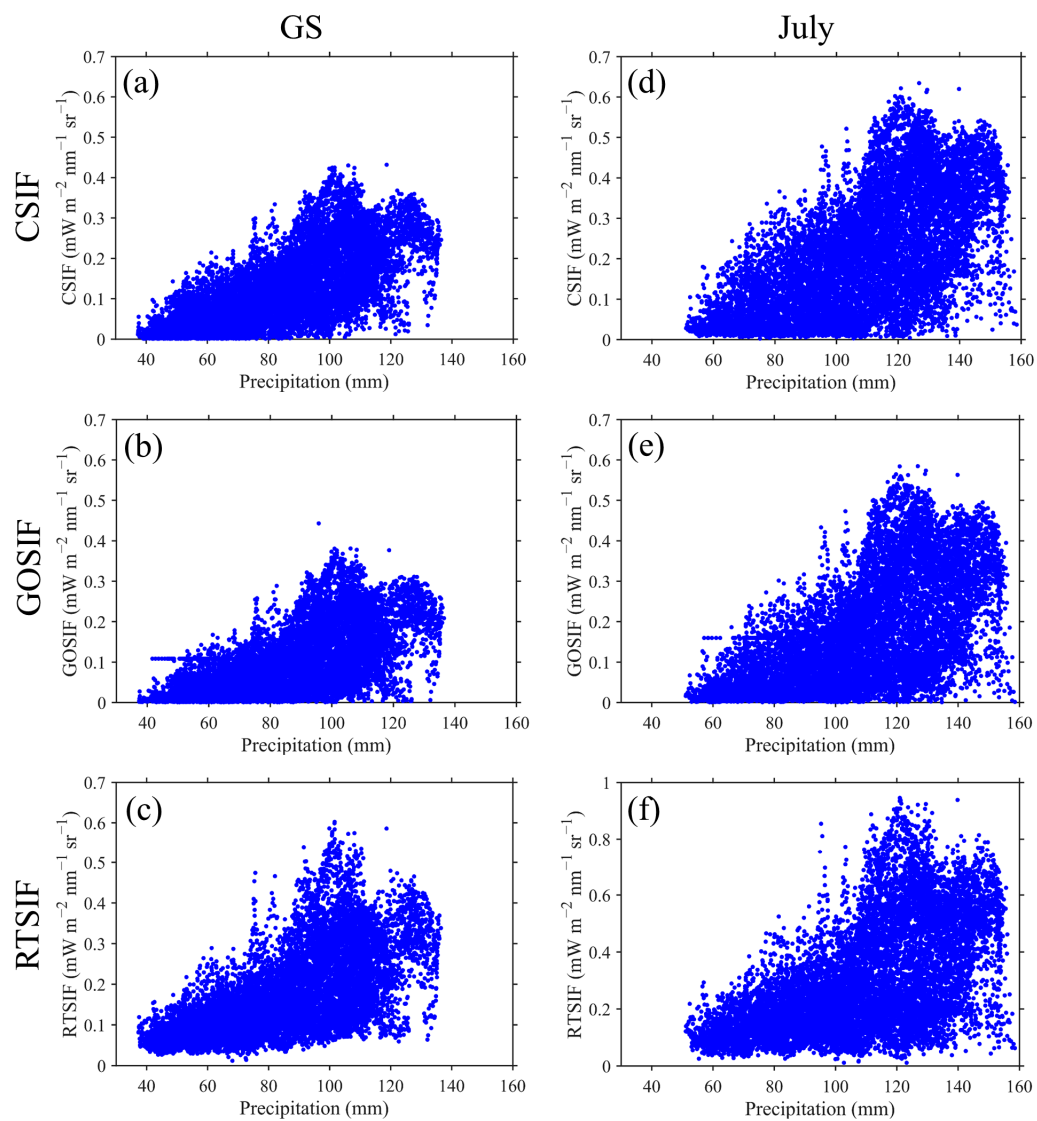
**Figure S2.** Spatial characteristics of annual mean (a,b) temperature and (c,d) precipitation during 2001–2020.



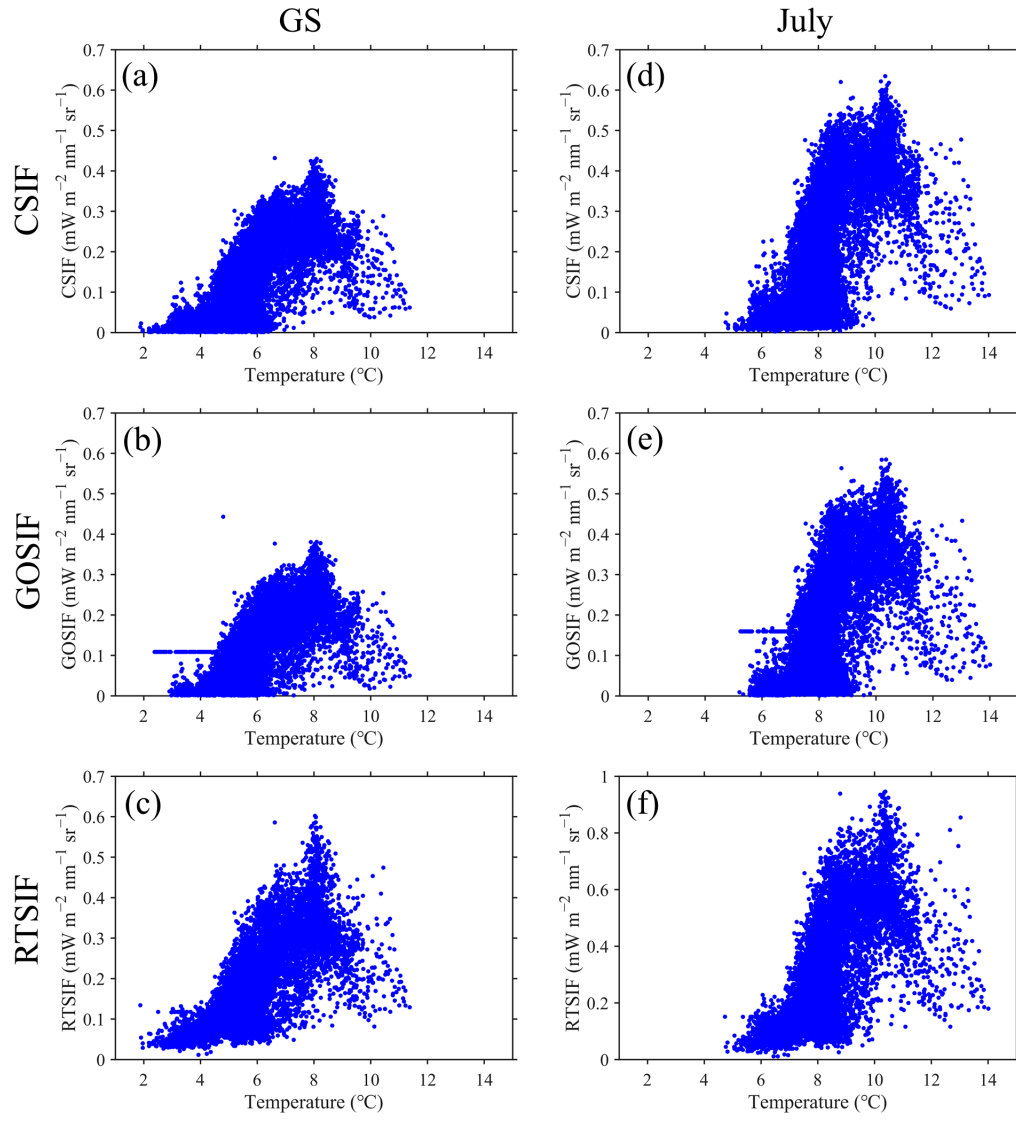
**Figure S3.** Correlation coefficients of 1-month SSMI and different cumulative time scales of SVPDI throughout GS. Note: “\*” and “\*\*\*” indicate coefficients passing 0.1 and 0.05 significance levels, respectively.



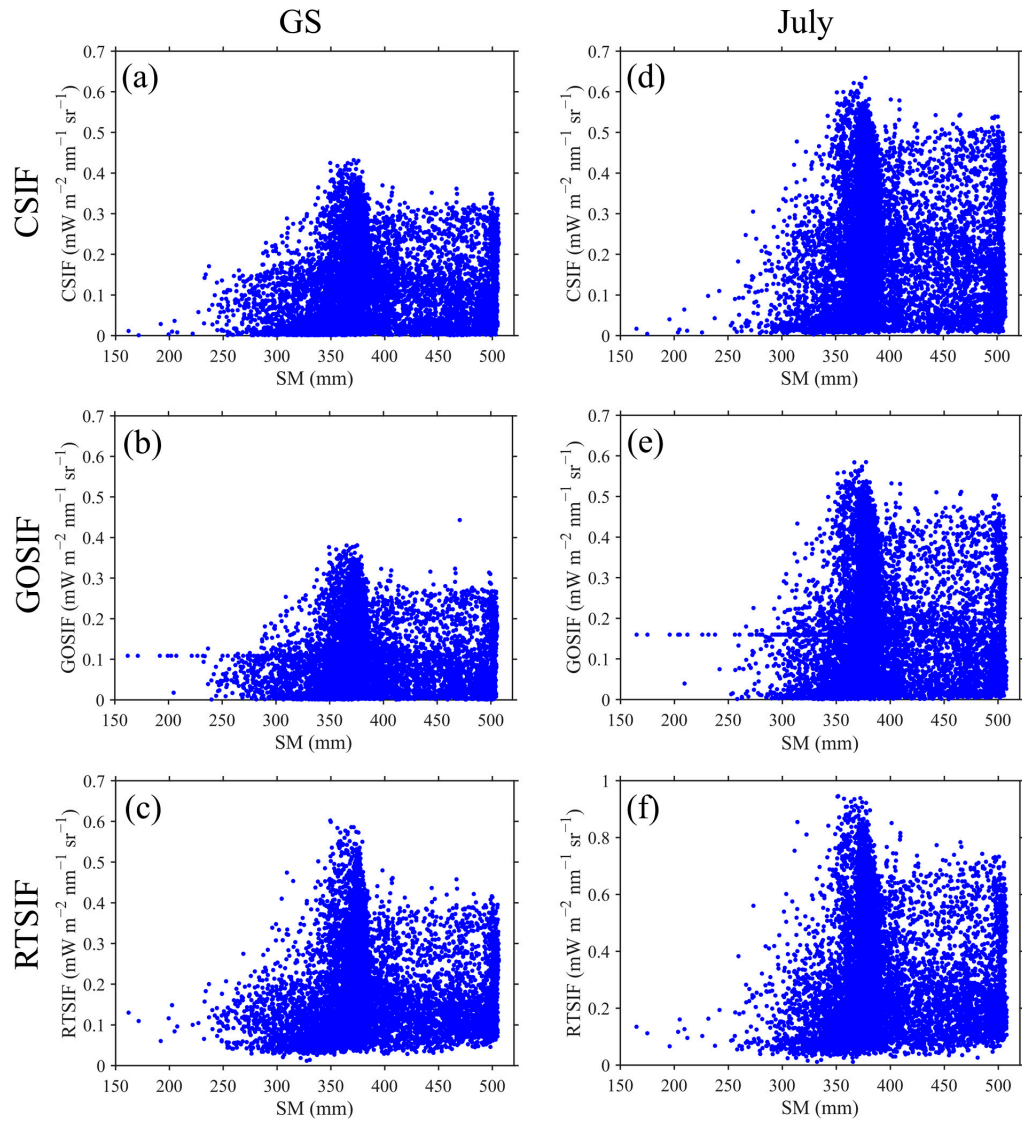
**Figure S4.** Compound drought magnitude index (CDMI) for July during 2001–2020 in the Yellow River source region. CDMI is expressed as the absolute value of the difference between SVPDI and the atmospheric drought threshold (0.5) in July multiplied by the absolute value of the difference between SSMI and the soil drought threshold (−0.5).



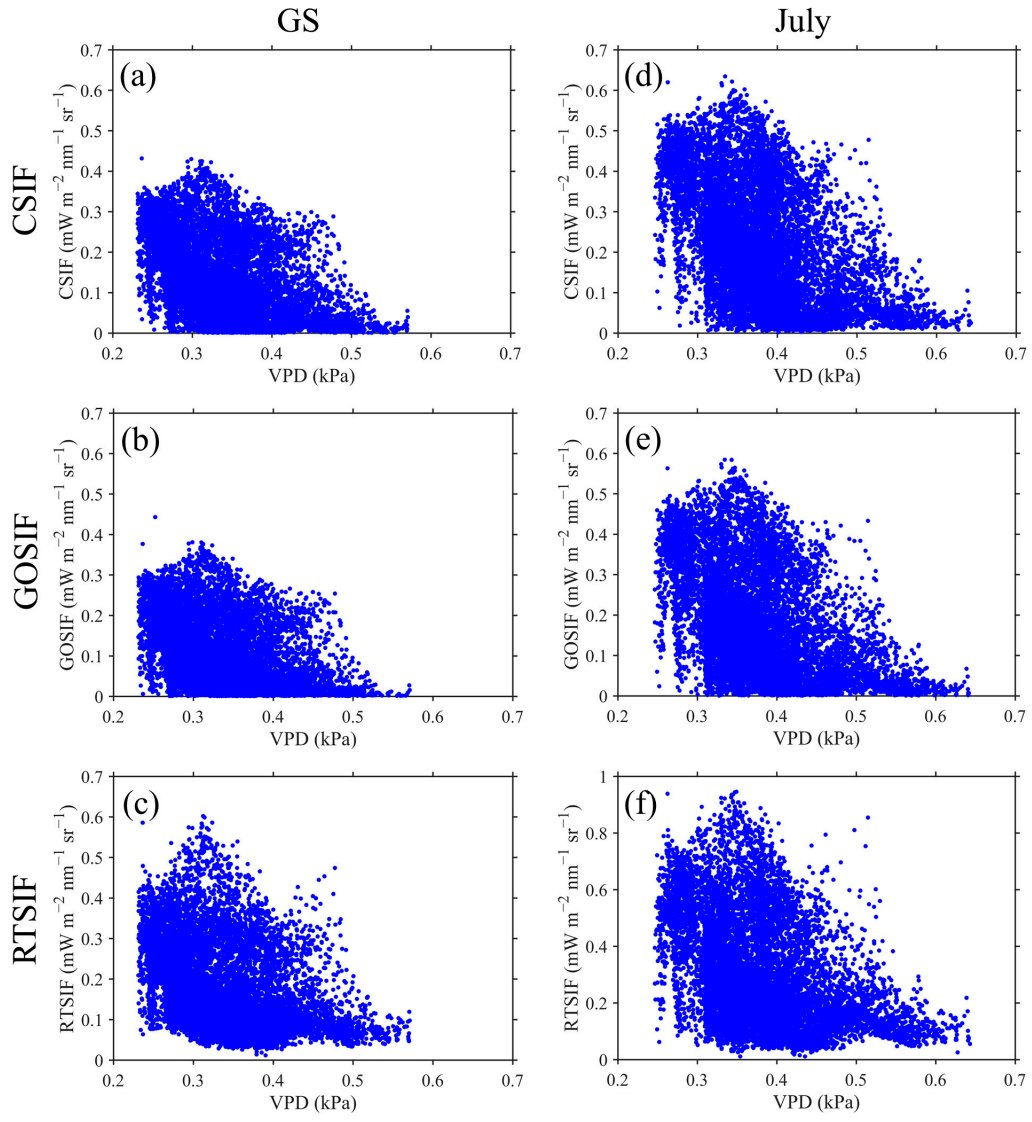
**Figure S5.** Average precipitation versus average SIF at each grid in the TRHR during 2001–2020. Left column represents the GS mean and the right column represents the July mean.



**Figure S6.** The same as Figure S5, but for temperature.

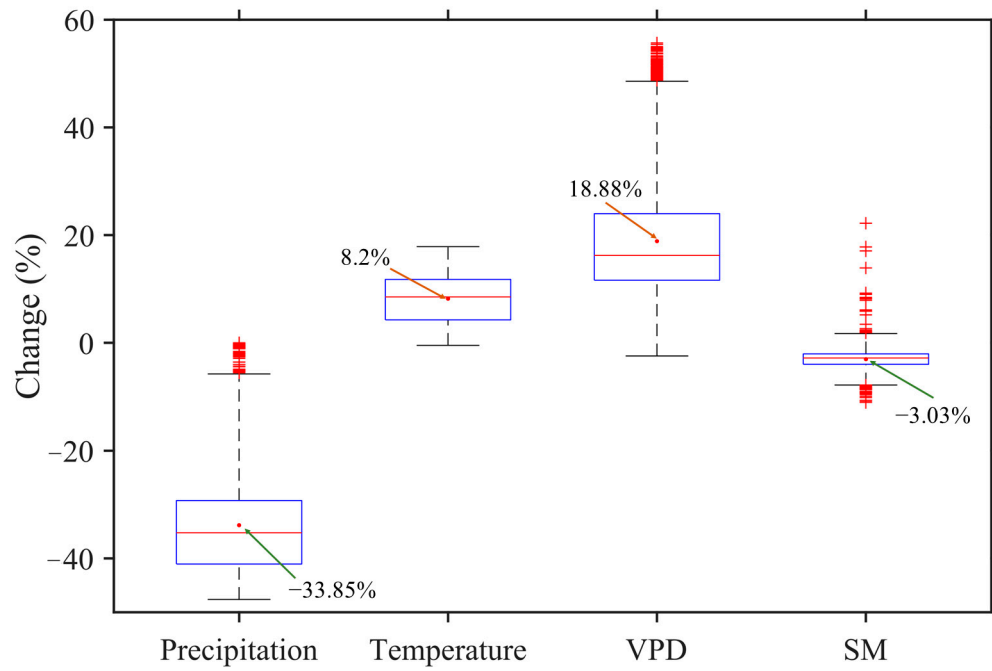


**Figure S7.** The same as Figure S5, but for SM.



**Figure S8.** The same as Figure S5, but for VPD.





**Figure S9.** Box-and-whisker plot of precipitation, temperature, VPD, and SM anomalies during July 2017 compound drought in the Yellow River source area. Top and bottom of the box indicate 75th and 25th percentiles. Red lines and dots indicate median and mean values, respectively.