# Spatiotemporal Characteristics of Drought and Driving Factors Based on the GRACE-derived Total Storage Deficit Index: A Case Study in Southwest China

**Tingtao Wu** [1,2,†], **Wei Zheng** [1,2,3,4,5,*,†], **Wenjie Yin** [2,†], **Hanwei Zhang** [1]

[1] School of Surveying and Landing Information Engineering, Henan Polytechnic University, Henan 454000, China; wutingtao2008@home.hpu.edu.cn (T.W.); hwzhang@hpu.edu.cn (H.Z.)
[2] Qian Xuesen Laboratory of Space Technology, China Academy of Space Technology, Beijing 100094, China; yinwenjie@qxslab.cn
[3] School of Geomatics, Liaoning Technical University, Liaoning 123000, China
[4] School of Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China
[5] School of Aerospace Science and Technology, Xidian University, Xian 710126, China
[*] Correspondence: zhengwei1@qxslab.cn
[†] Those authors contributed equally to this paper.

Table S1. The correlation between original/STL decomposition climate factors and TSDI.
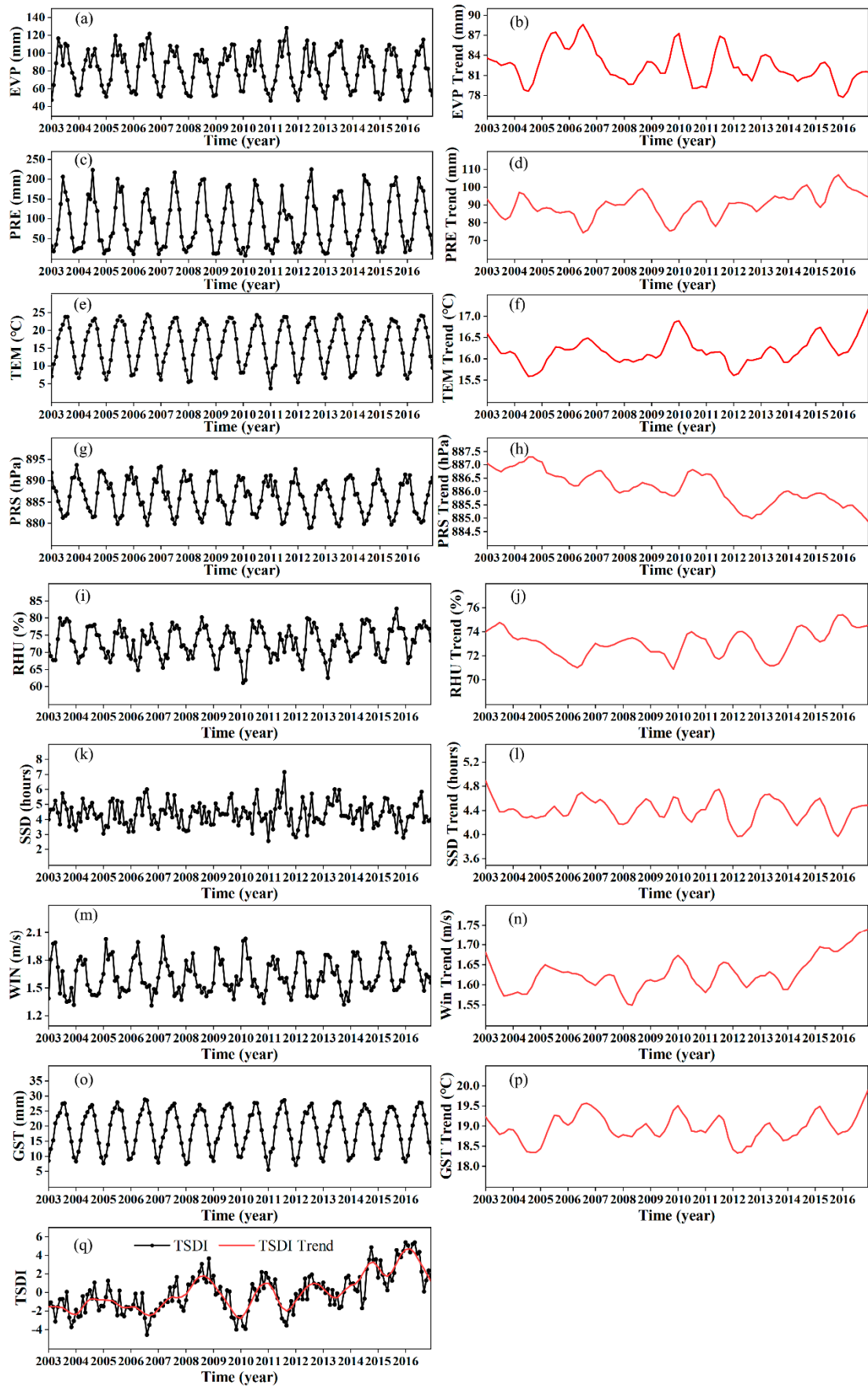
Correlation Coefficient		EVP	PRE	TEM	PRS	RHU	SSD	WIN	GST
TSDI	**Original data**	−0.15	0.11	−0.01	−0.04	0.22	−0.13	0.03	−0.03
	STL decomposition	−0.64	0.78	0.05	−0.54	0.58	−0.32	0.42	−0.08
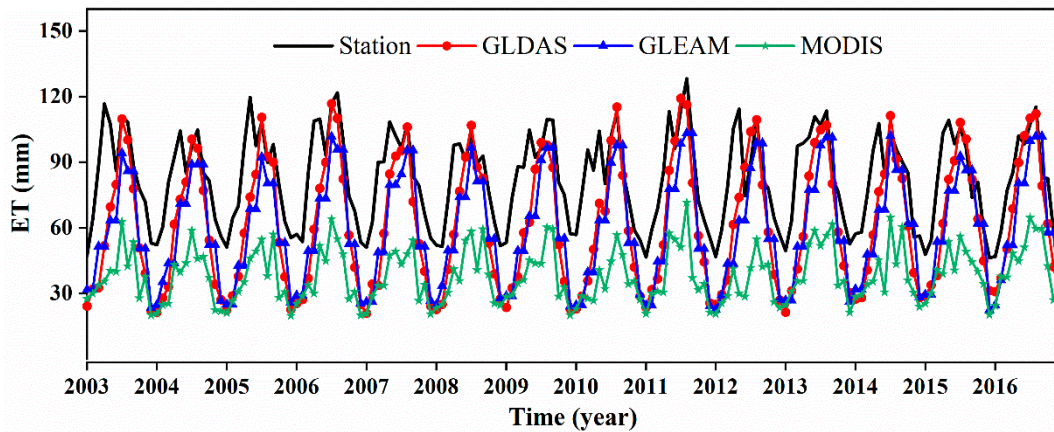
Figure S1. The comparison results of evapotranspiration data from different sources in Southwest China.
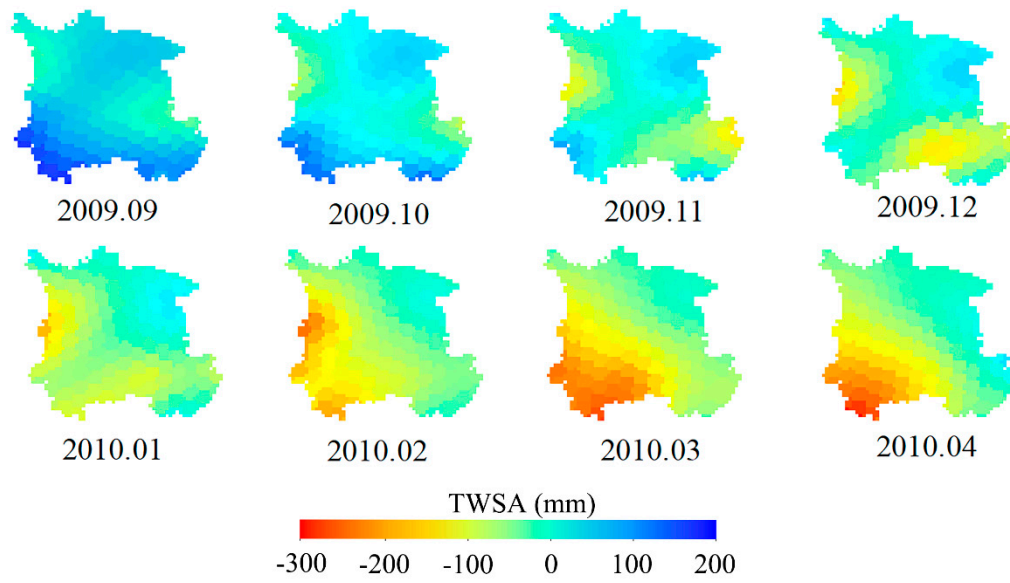
Figure S2. Spatial patterns of the GRACE-derived TWSA during 2009.09–2010.04 in Southwest China.

Figure S3. The comparison between the original data and annual trend of climatic factors obtained by STL decomposition. (a-p) the original data of EVP, PRE, TEM, PRS, RHU, SSD, WIN, and GST and the annual trend after STL decomposition; (q) the original data of GRACE-based TSDI and the annual trend after STL decomposition.