Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1. Spatial distributions of r between both drought indices (SDCI and SPI) over 2018; Figure S2. Spatial distributions of r and nRMSE between satellite products and linear-fitted numerical model outputs;Figure S3 Drought conditions for SDCI on DOY 2018129 in Shandong province.

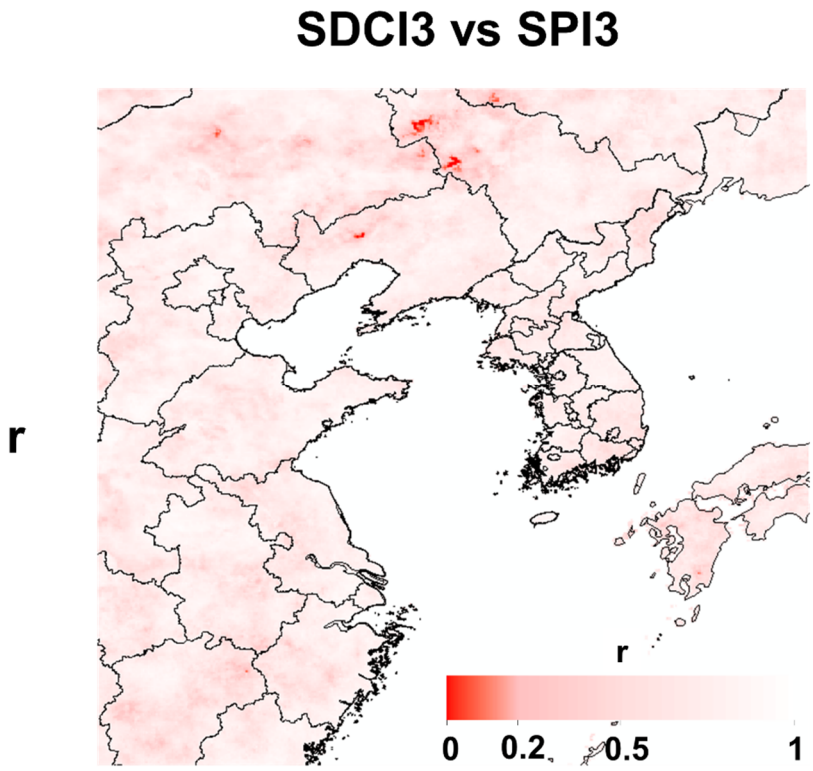

Figure S1. Spatial distributions of r between both drought indices (SDCI and SPI) over 2018. The vivid red color in four maps indicates areas of relatively high errors. The correlation coefficient ranges from 0 to 0.95 (mean of 0.7; 31 percent of the area have r values over 0.8).

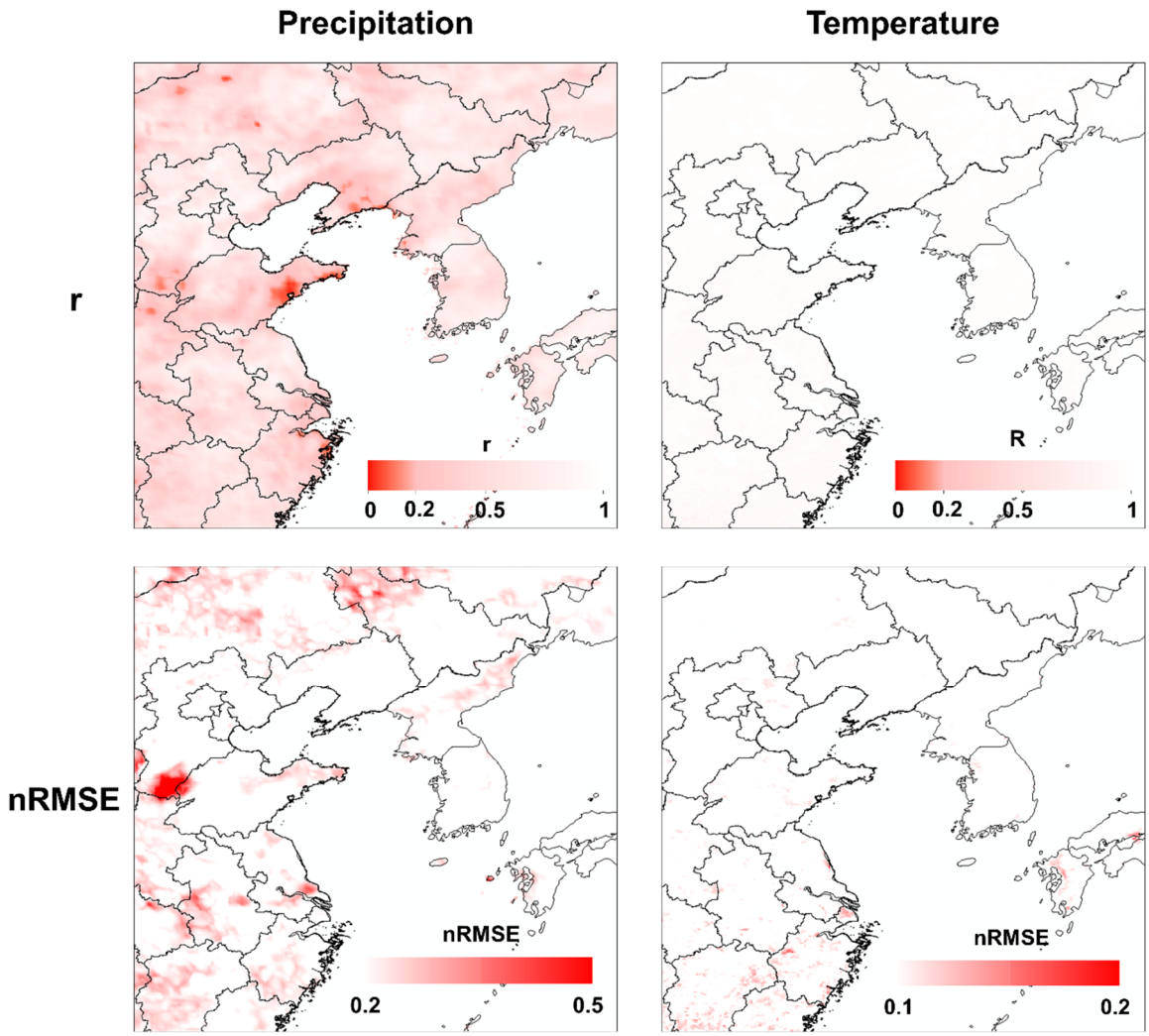

Figure S2. Spatial distributions of r and nRMSE between satellite products and linear-fitted numerical model outputs. The vivid red color in four maps indicates areas of relatively high errors.

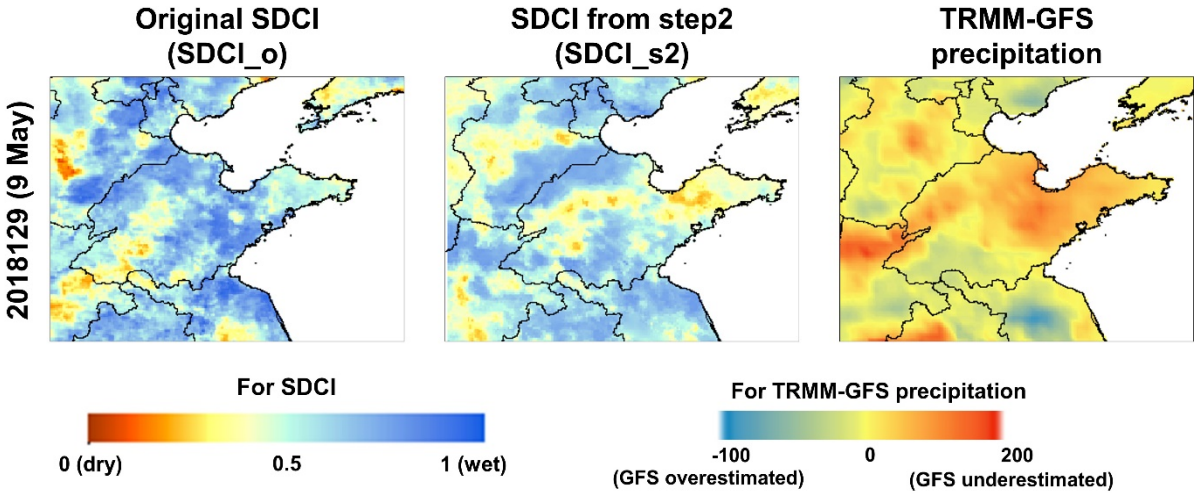

Figure S3. Drought conditions for SDCI on DOY 2018129 in Shandong province. The red(blue) color indicates underestimation(overestimation) in TRMM-GFS precipitation distribution.