

*Supplementary Information*

**“Quantifying vegetation vulnerability to climate variability  
in China”**

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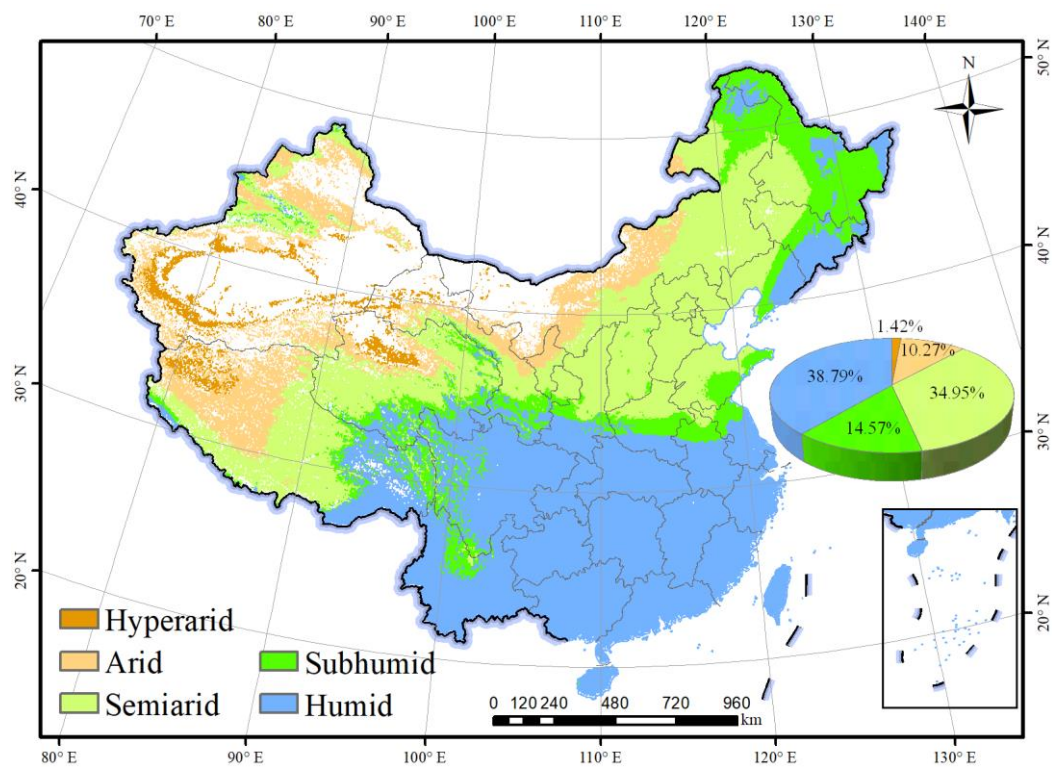
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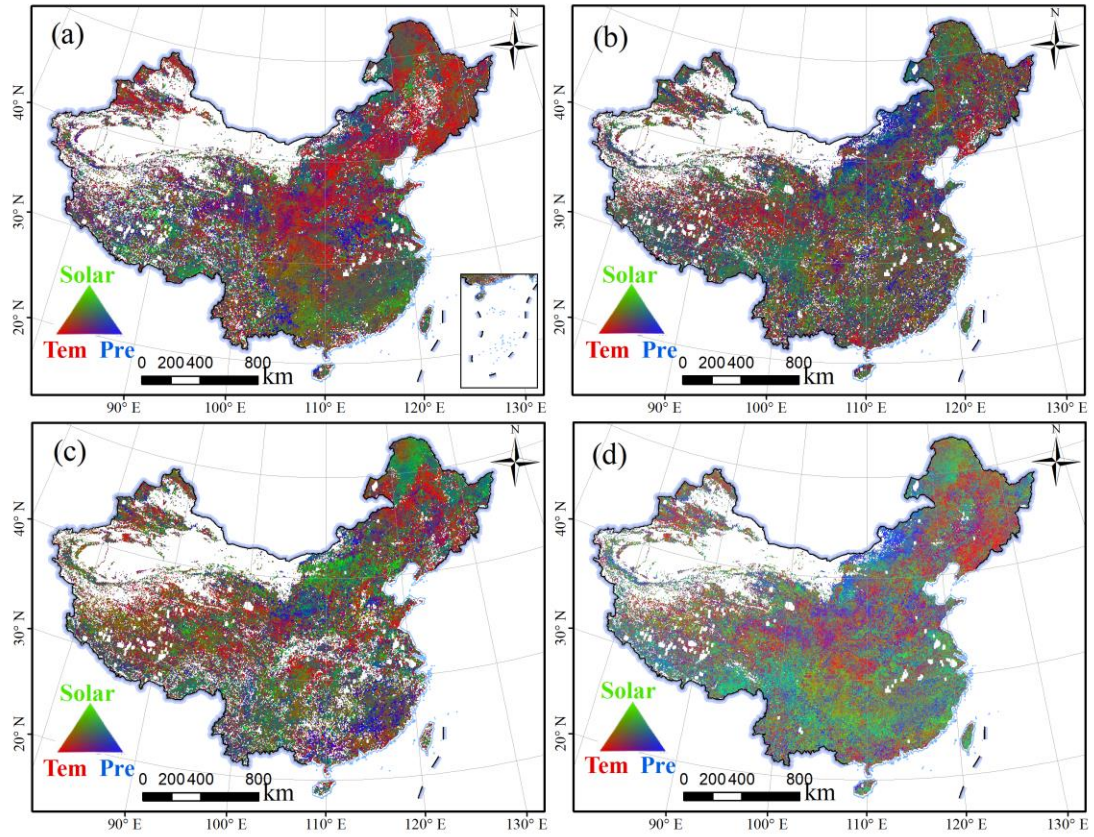
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**Table S1.** Detailed information about datasets.

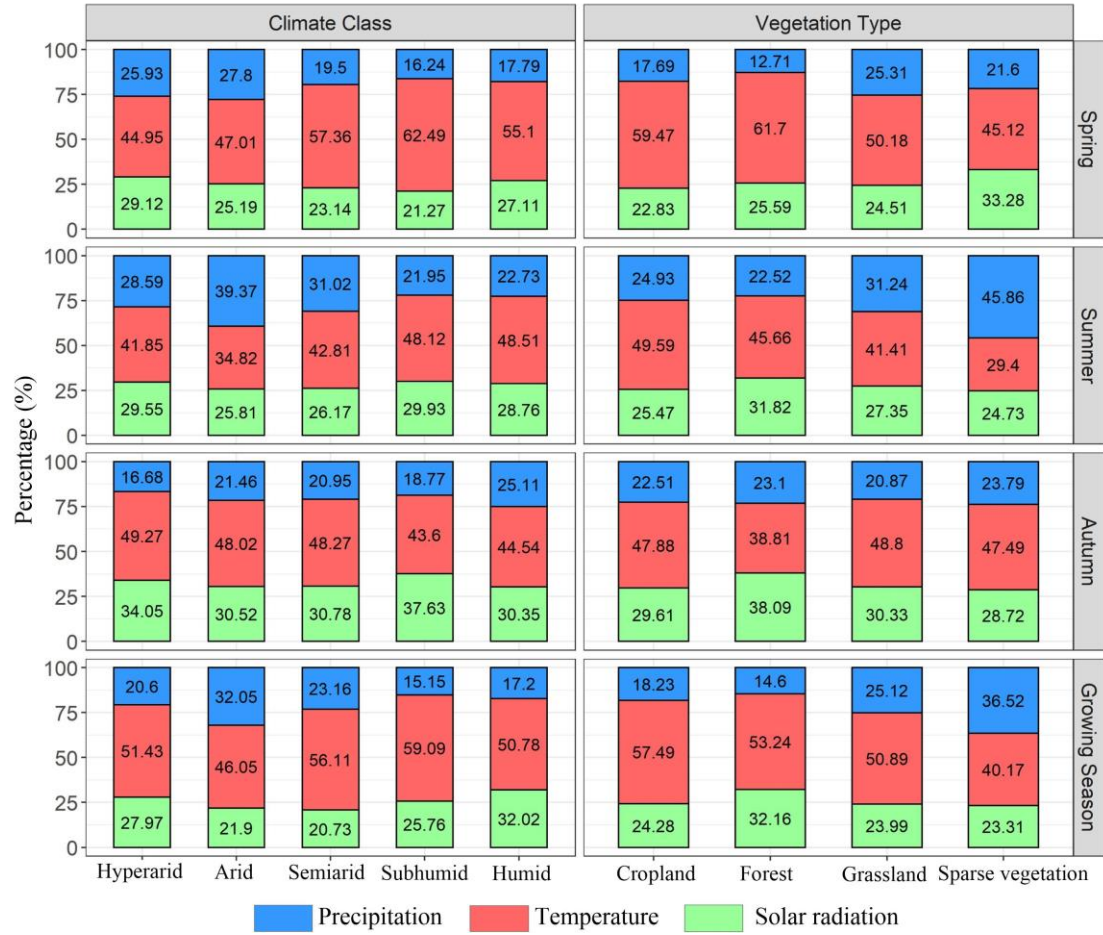
<b>Product type</b>	<b>Dataset</b>	<b>Spatial resolution</b>	<b>Temporal resolution</b>	<b>Temporal domain</b>
NDVI	AVHRR GIMMS 3g	8 km	15 days	1982-2015
Meteorological data	ERA5	10 km	monthly	1982-2015
AI	Climate Database v2	1 km	monthly	1970-2000
Land use data	Climate Change Initiative (CCI) land cover Version 2.0	300 m	yearly	2000-2015



**Figure S1.** Distribution map of climate zones in China.

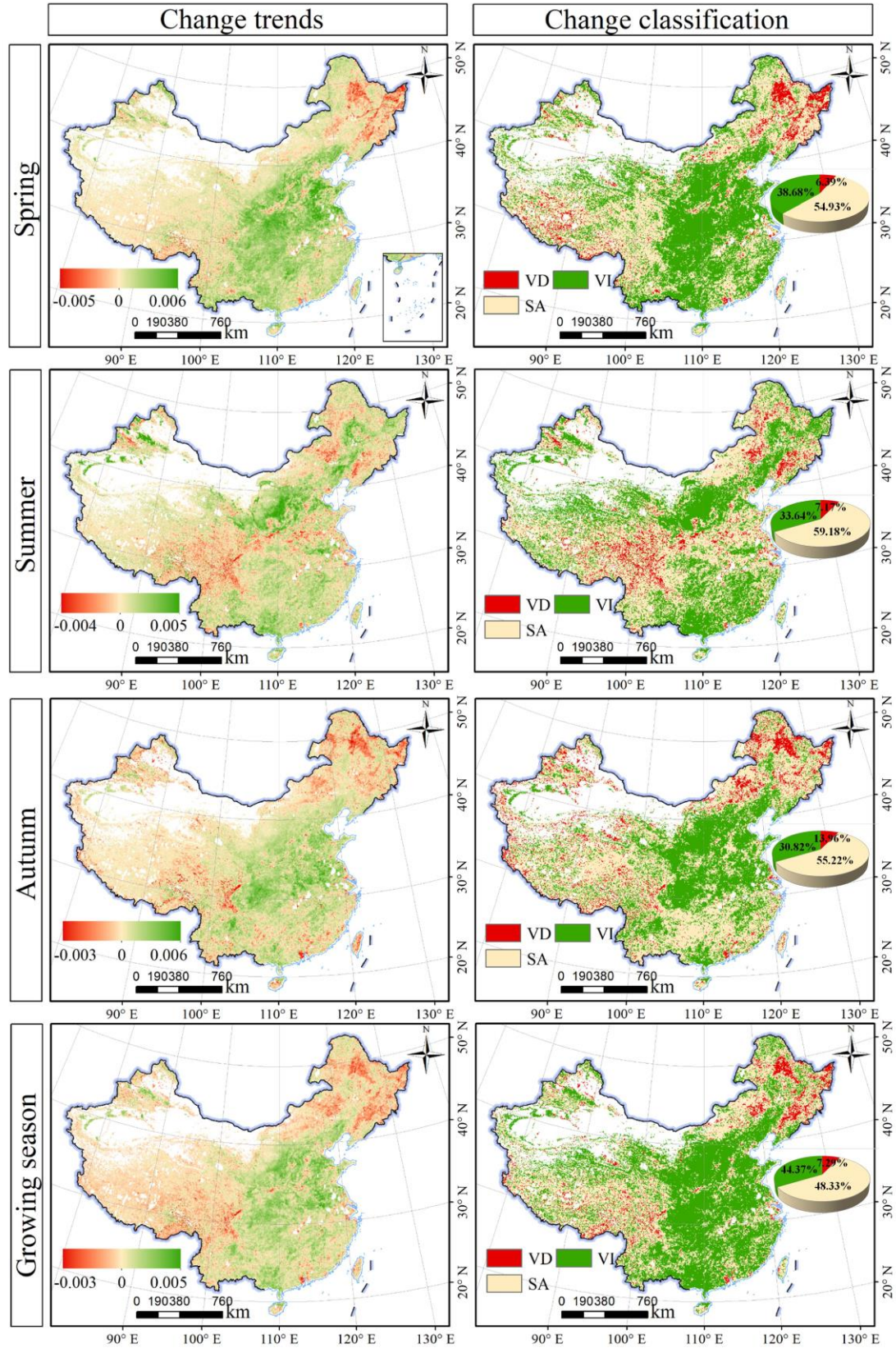


**Figure S2.** RGB composite of the climate weights for different seasons (red: temperature; green: solar radiation; blue: precipitation). (a) Spring. (b) Summer. (c) Autumn. (d) Growing season. Tem: temperature; Pre: precipitation; Solar: solar radiation. The climate weights were calculated based on an autoregressive model, which was introduced in Section 2.3.1.



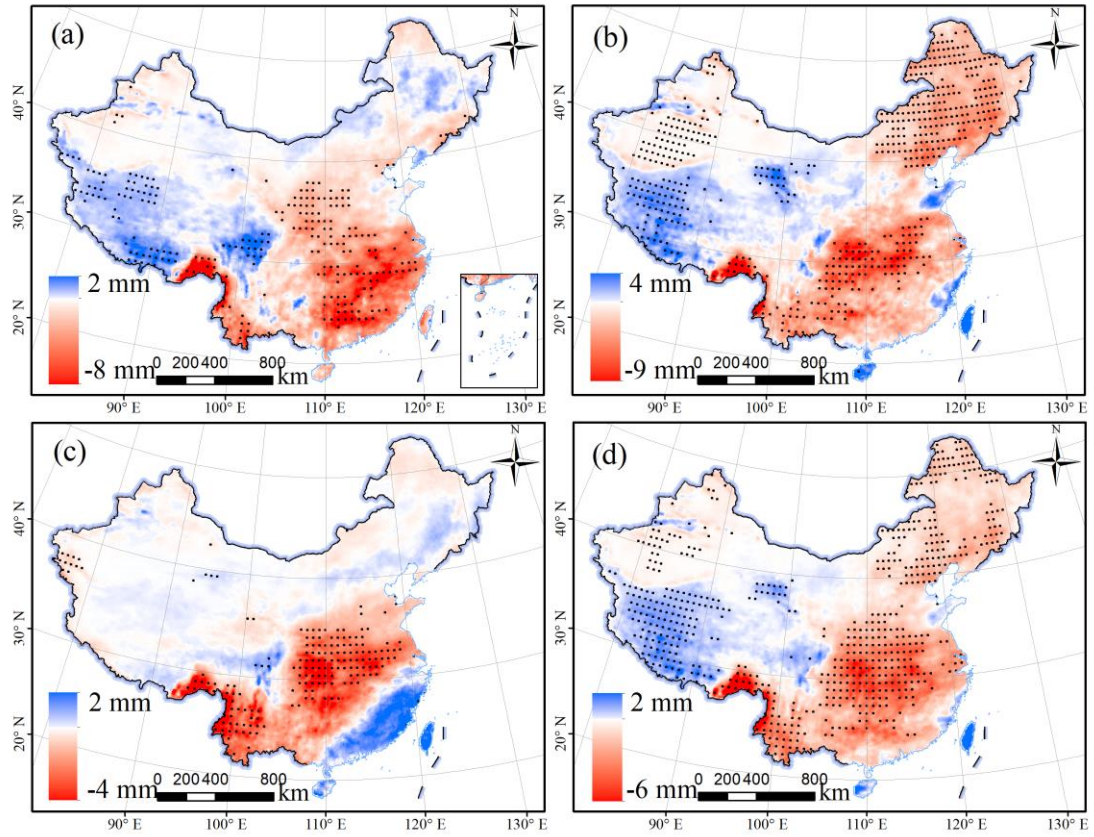
**Figure S3.** The percentages of dominant climatic factors affecting vegetation growth in different regions. The dominant climatic factors were extracted based on the weighted coefficients, which was introduced in Section 2.3.1. The relative importance of the three climatic factors was quantified by a principal components regression. The highest weighted coefficient for climatic factor in Equation 8 was considered as the dominant climatic factor.





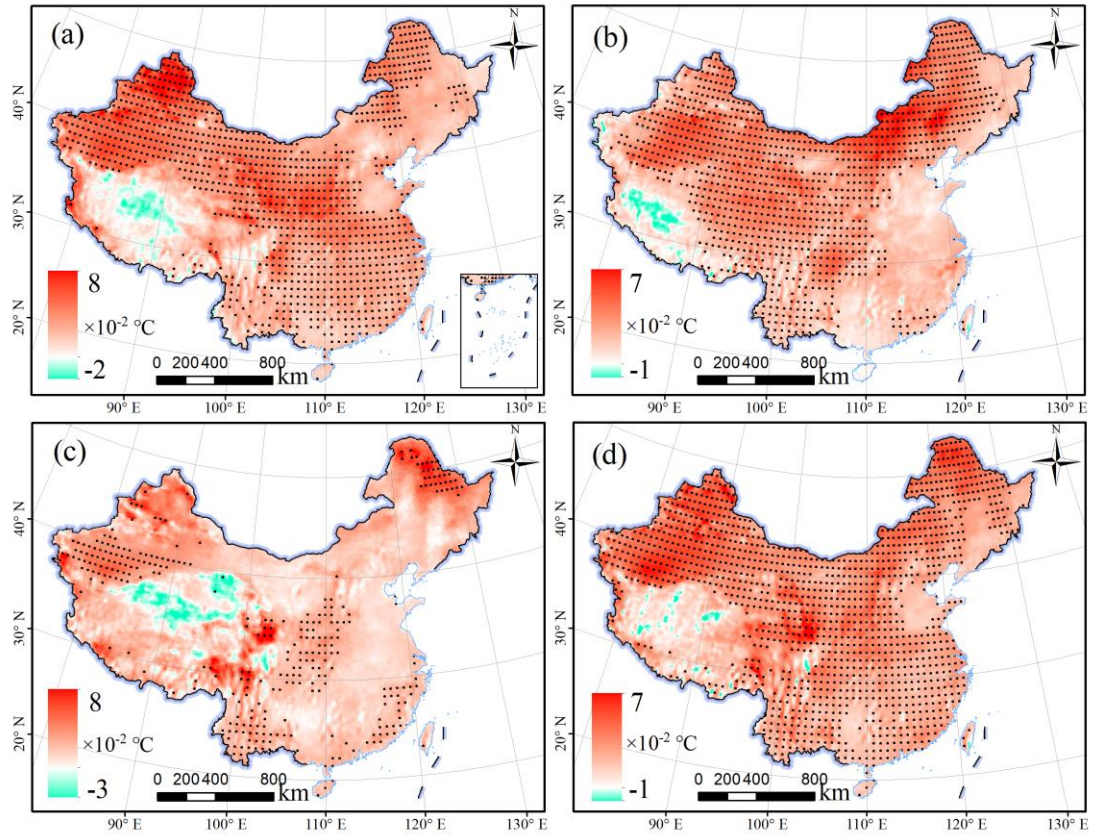
**Figure S4.** Spatial distribution of the change trend in NDVI and change classification in vegetation for different seasons. The change trend in NDVI can be reclassified into three classes (vegetation degradation, vegetation improvement and stable area) according to the Mann-Kendall test. Significant changes ( $|ZS| \geq 1.96$ ) were categorized as vegetation degradation or vegetation improvement, while

insignificant changes ( $|ZS| < 1.96$ ) were reclassified as stable areas. VD: significant vegetation decrease; VI: significant vegetation increase; SA: stable area.

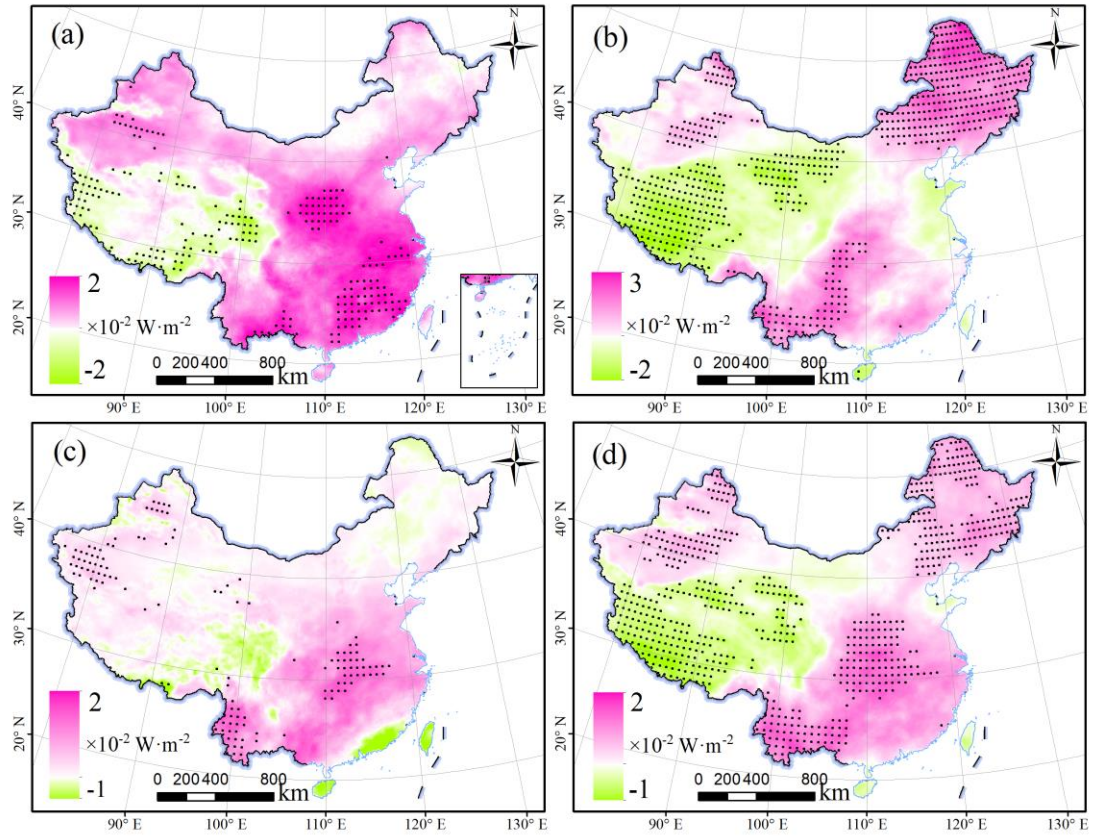


**Figure S5.** Spatial distribution of the change trend in precipitation for different seasons. The black spots represent significant changes in precipitation.





**Figure S6.** Spatial distribution of the change trend in temperature for different seasons. The black spots represent significant changes in temperature.



**Figure S7.** Spatial distribution of the change trend in solar radiation for different seasons. The black spots represent significant changes in solar radiation.