

Figure S1 Spatial distribution of the multiyear mean EOS in Northern China. DOY, day of the year.

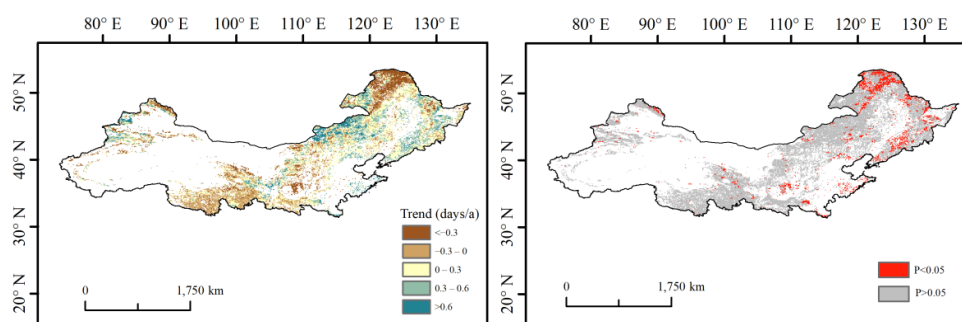


Figure S2 Spatial distribution of the trend in EOS in Northern China during 2001-2018. Pixels with significant trends ($P < 0.05$) are shown in red on the right map.

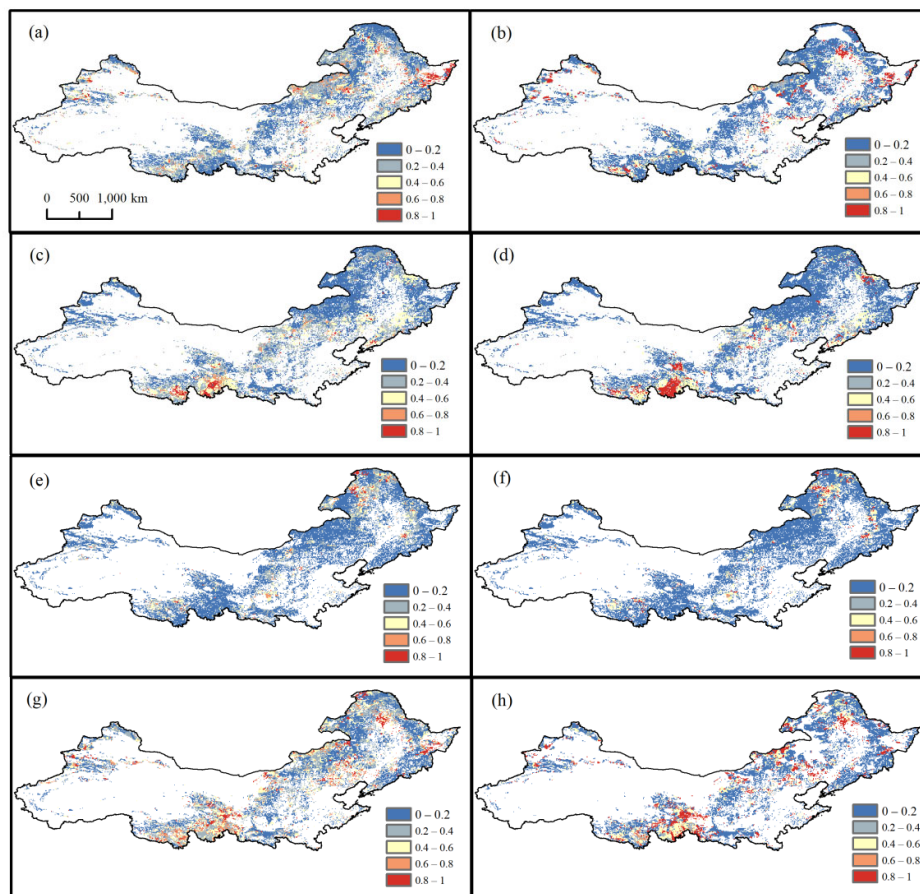


Figure S3 Spatial distribution of the CRs of negative EOS anomalies and extreme climate events based on the threshold of 1 (left) and 1.5 (right) STD. (a,b) CR for extreme hot events. (c,d) CR for extreme cold events. (e,f) CR for extreme wet events. (g,h) CR for extreme dry events.

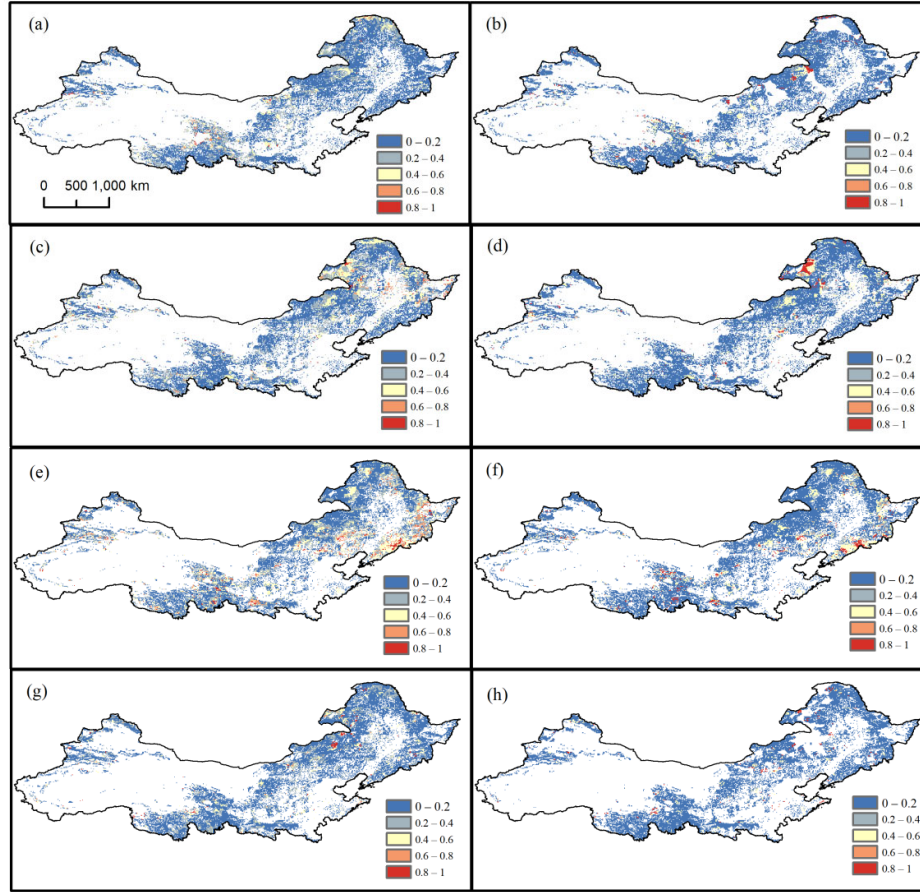


Figure S4 Spatial distribution of the CRs of positive EOS anomalies and extreme climate events based on the threshold of 1 (left) and 1.5 (right) STD. (a,b) CR for extreme hot events. (c,d) CR for extreme cold events. (e,f) CR for extreme wet events. (g,h) CR for extreme dry events.

Table S1 The correlation in the spatial pattern of CRs based on 1 and 1.5 STD

CR	Pearson's r	P value
CR _{hot_N} (1) vs. CR _{hot_N} (1.5)	0.578	<0.01
CR _{cold_N} (1) vs. CR _{cold_N} (1.5)	0.683	<0.01
CR _{wet_N} (1) vs. CR _{wet_N} (1.5)	0.652	<0.01
CR _{dry_N} (1) vs. CR _{dry_N} (1.5)	0.610	<0.01
CR _{hot_P} (1) vs. CR _{hot_P} (1.5)	0.528	<0.01
CR _{cold_P} (1) vs. CR _{cold_P} (1.5)	0.561	<0.01
CR _{wet_P} (1) vs. CR _{wet_P} (1.5)	0.607	<0.01
CR _{dry_P} (1) vs. CR _{dry_P} (1.5)	0.499	<0.01

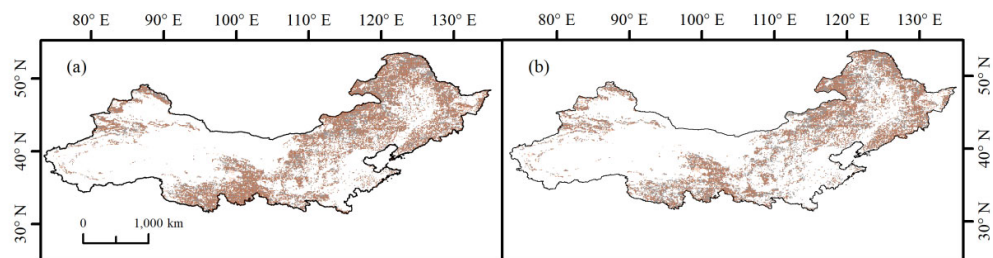


Figure S5 Spatial distributions of the significance of CRs for negative (a) and positive (b) EOS anomalies. The red dots indicate the significant CRs, i.e., the CRs that are greater than that using randomly shuffling the time series of ECEs.