

## **Supplementary materials**

Figure S1. Diagram illustrating the detection of interaction. (A) changes in NDVI; (B) factor X1; (C) factor X2; and (D) interaction of factors X1 and X2 ( $X1 \cap X2$ ).

Figure S2. Inter-annual variations in the mean growing season NDVI for the Inner Mongolian grasslands from 2000–2018.

Figure S3. The  $q$ -statistics of impact factors for NDVI changes.

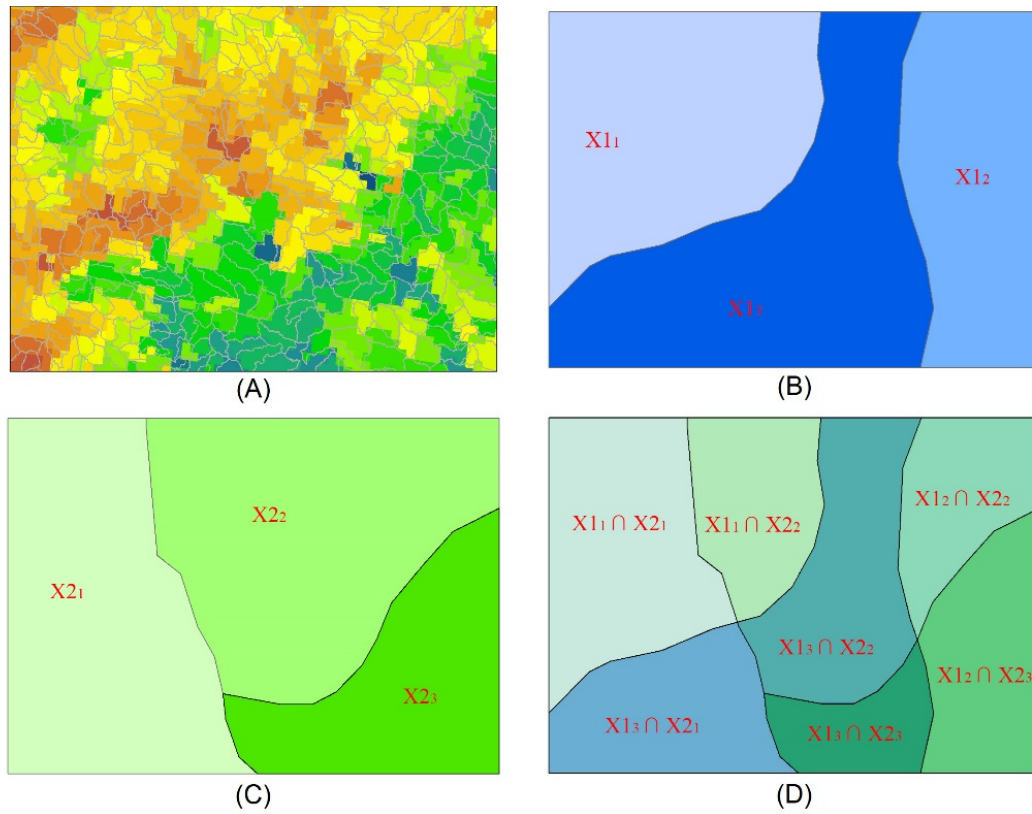


Figure S1. Diagram illustrating the detection of interaction. (A) changes in NDVI; (B) factor X1; (C) factor X2; and (D) interaction of factors X1 and X2 ( $X1 \cap X2$ ) (Wang and Xu, 2017).

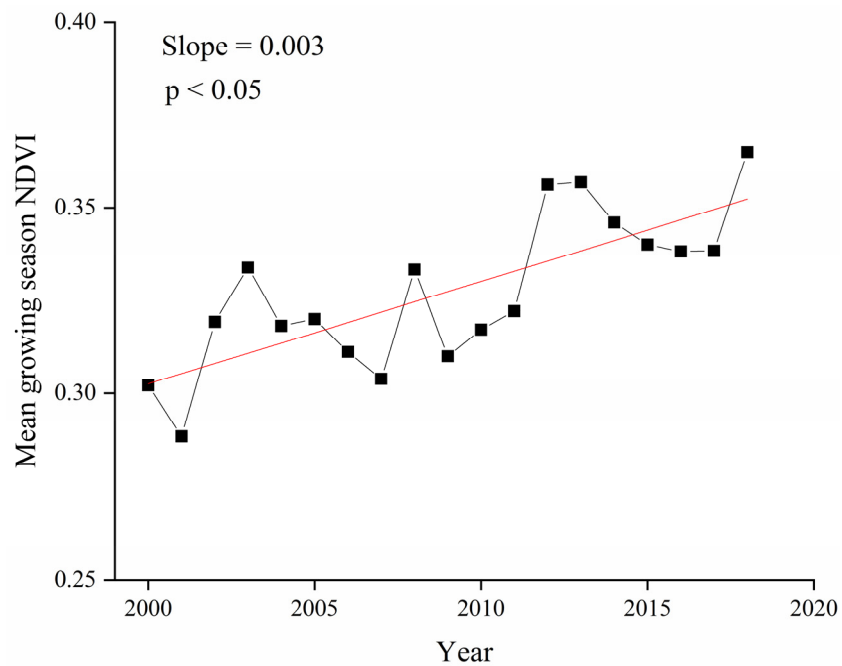


Figure S2. Inter-annual variations in the mean growing season NDVI for the Inner Mongolian grasslands from 2000–2018.

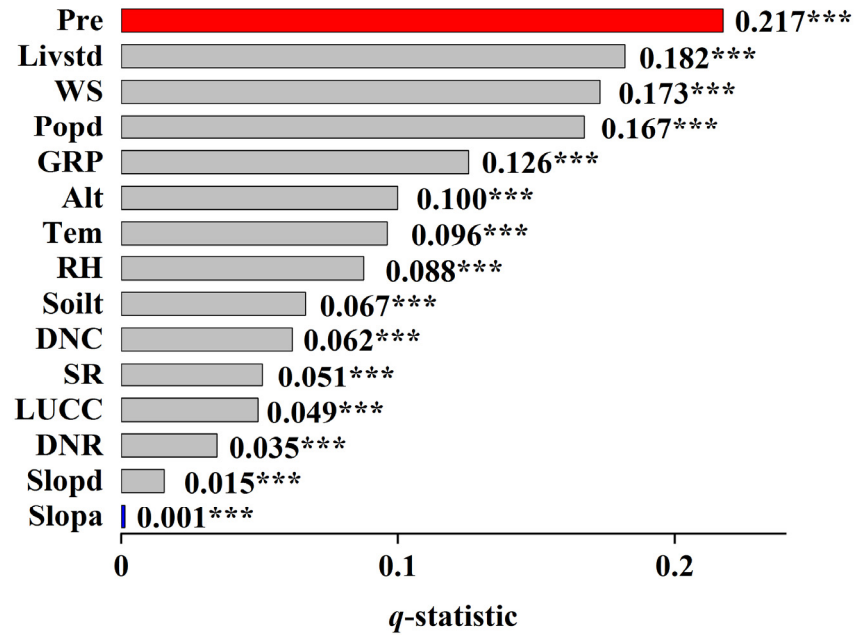


Figure S3. The  $q$ -statistics of impact factors for NDVI changes. Note: \*\*\* denotes that  $q$ -statistic is significant at the 0.001 level ( $p < 0.001$ ). Pre: precipitation; Tem: air temperature; SR: solar radiation; WS: wind speed; RH: relative humidity; Alt: altitude; Slopd: slope; Slopa: slope aspect; Soilt: soil type; DNR: distance to the nearest road; DNC: distance to the nearest county centers; Popd: population density; GRP: Per capita gross regional product; Livstd: livestock density; LUCC: land use/cover conversion type.

## References

Wang J F, Xu C D. (2017). Geodetector: Principle and prospective. *Acta Geographica Sinica*, 72 (1): 116–134.