

Question 1 What is the dust data from Namhem? How can this be associated with vegetation and precipitation? The process is not clear.

Answer 1:

The “NAMHEM” is a part of the World Meteorological Organization (WMO) and it has 130 weather stations in the Mongolia. Dust storm data that we used is the number of dust storm occurrences in each day. However, we can use only this data observed at Sainshand station. RC1’s Professor suggested that we should add more results of correlation analysis using dust storm data observed at another station. So we changed the data that we use from NAMHEM to the WMO SYNOP surface weather data. This data was used as the number of dust storm days. This data is daily data and recorded as 1 when dust storms are observed visually in a day. We can use SYNOP data observed at 8 stations including Sainshand city in this study area.

We used this data for single regression analysis to confirm the relationship between vegetation in GS season and number of days in which dust storms occurred in the following spring at each 8 stations. And we also confirmed the relationship between precipitation in same period as vegetation and number of dust storm days. We added the results from these analyses to our paper.

Question 2 Possible implications – dust, desertification, difference between Mongolia and China, possible climate change (please document) etc can go in a discussion. Factors that may affect vegetation, dust and desertification should also be mentioned. Is the implication that mining, herders, roads or agricultural is affecting land cover?

Answer 2:

Previous studies suggested that the factors of desertification are almost same between Mongolia and China. Both of them are affected by climate factors and anthropogenic factors. However, socioeconomic factors were the dominant factor that affected desertification. For example, the cultivation, grazing, destruction or harvesting of herbaceous vegetation, and logging forests to produce firewood and rural construction materials in China (Feng et al., 2015). Furthermore, previous study showed that in addition to desertification, physical geographic conditions also influenced the frequency of dust occurrence (Wu et al., 2012). And also most of grassland are affected by human activity such as mining, road and especially grazing in Mongolia (Batjargal, 1997).

Desertification is a kind of environment regime shift. However, the environment regime shifting was not found in this Mongolian sites (such as our study area) and it found in this Chinese sites (Sofue et al, 2017, Fig.1).

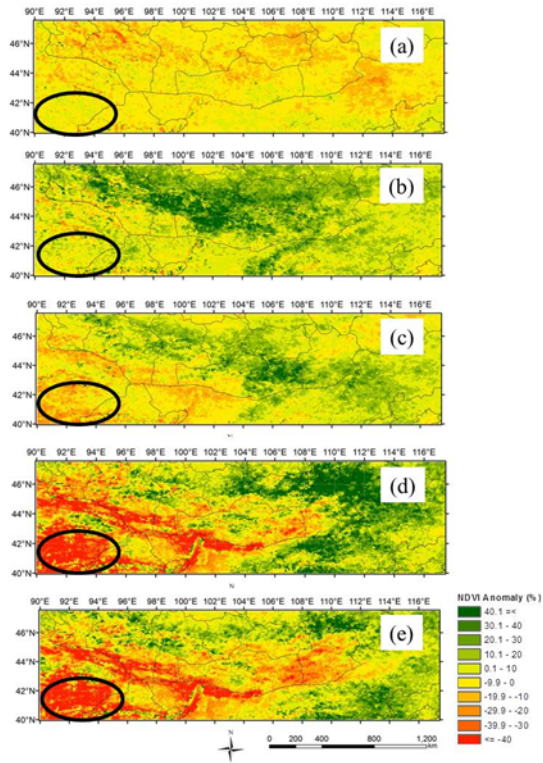


Fig.1 The anomaly NDVI of vegetation growing period in (a): 1989; (b): 1994; (c): 2003; (d) 2012 and (e): 2013 (Sofue et al., 2017).