Geophysical Research Abstracts
Vol. 21, EGU2019-5478, 2019
EGU General Assembly 2019

Interaction between Biological soil crust and climate variability based on multi-datasets

Yifan Li, Mark Reyers, and Yaping Shao
University of Cologne, Institute of Geophysics and Meteorology, Germany (yifan.li@uni-koeln.de)

Biogenic Soil Crusts (BSCs) are critical components of desert ecosystems, significantly modifying the surfaces they occupy. Climate variability has significant effects on desert ecosystems, but little is known about the effects of climate variability on BSCs. In addition, BSCs' effects are absent in most Earth system model. Thus, studying BSCs interactions with climate variability and including the effect of BSCs in climate models is important.
This study consist of two elements. First, we detect and map BSCs on the Gurbantunggut Desert in China. The satellite remote sensing data can be used. We get merged surface reflectance data from Landsat and MODIS. BSC Index (BSCI) is then calculated using the retrieved surface reflectance. Based on a BSC model, the range of BSCI is determined for the study area. Information of the typical spectral reflectance of BSCs is taken from literature. The BSCI is calculated for a 10 year period (2008-2017). The spatial-temporal variability of BSC on different time scales, including intra-annual, inter-annual and inter-decadal, is analyzed. Second, to explore how climate affects BSCs community distribution, we consider the effects of environmental climate conditions using ERA5 datasets. We bring together the spatial-temporal distribution of climate variables (e.g. temperature, total precipitation) and BSCs to analyze the response of BSCs to climate variability.