

Applying Desertification Monitoring Method to Mu Us Desert Considering Seasonal Changes

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Desertification is one of the biggest environmental issues that we face today. There have been significant efforts to reduce the impacts of desertification and restore ecosystems affected by it, being reforestation the most common mitigation measure applied. In order to maximize these efforts, it is necessary to monitor the desertification of those regions. As remote sensing technique is suitable to detect environmental changes in large area, it has long been used for monitoring desertification. Most of previous studies focuses on calculating vegetation index (e.g. NDVI) or classifying land cover from satellite images of specific period in a year. In those studies, however, only satellite images of summer are used for monitoring. As the distribution of vegetation varies over seasons or months, using only satellite images of a specific period like summer has a limitation in analyzing overall desertification tendency. Therefore, this study focuses on detecting band radiance changes of each pixel over the time, and designs Time Dependent Desertification Index (TDDI). Landsat satellite images of Mu Us desert, Inner Mongolia, in various seasons from 2007 to 2016 are used to analyze the desertification index. The TDDI value map of the Mu Us desert area is produced and it is expected to help identify overall tendency of desertification considering seasonal factors. Furthermore, this new method can be applied to other environmental fields where seasonal changes need to be considered.

Keywords: monitoring, desertification, remote sensing, Mu Us desert