

INTERANNUAL CHANGE DETECTION OF BLACK SOIL COVERED AREAS IN NORTHEASTERN CHINA BASED ON REMOTE SENSING DATA

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1. INTRODUCTION

Land degradation has been an important environmental issue recently. Areas covered by black soil in Northeastern China are facing the problem of land degradation. The growth of population in China and the Globe causes the rising demand of cropland. Some forests and grass lands distributed over the black-soil areas were changed to croplands and urban areas. The present study focuses on inter-annual variations of land cover/use classes using remotely sensed data, such as AVHRR, MODIS, TM, or SPOT imagery [1-5]. The AVHRR imagery has also applied in drought monitoring [6, 7]. In this study, spatial-temporal variations of landscape change will be detected and quantified in the black soil areas using geographic information system techniques. We try to use satellite imagery to find out the relationships between land use/cover types and satellite spectral indices. The imagery from Moderate Resolution Imaging Spectroradiometer (MODIS) will be applied in regional to execute the comparisons of satellite spectral indices. Landscape dynamics can be assessed by remote sensing of the normalized difference vegetation index (NDVI).

2. MATERIALS AND METHODS

This study attempted to assess vegetation dynamics of black soil covered areas in Northeastern China using MODIS data on the TERRA satellite. Normalized difference vegetation index (NDVI) data (2001-2008 used as the base period) used in this study were bi-weekly composites of the study area, excluding cloud pixels. NDVI presents the vegetation condition through the ratio of spectral reflectance in near infrared and red bands of MODIS of TERRA. The NDVI is given as:

$$NDVI_{ijk} = \frac{NIR_{ijk} - RED_{ijk}}{NIR_{ijk} + RED_{ijk}} \quad (1)$$

where, NIR_{ijk} and RED_{ijk} is the reflectance values at the near infrared and red wavelengths of MODIS on the TERRA satellite, respectively, for pixel i during season j for year k .

Furthermore, the land cover/use map classified by MODIS land science team with IGBP classes were used to analyze the inter-annual change of vegetation phenology.

3. RESULTS AND CONCLUSIONS

The analytical results will be useful for land use/cover classifications and land degradation assessment in the study area. Moreover, spatial patterns and temporal trends of landscape change across black soil areas in Northeastern China were analyzed using MODIS derived images.

4. REFERENCES

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