



Recent greening in the Mu Us dune field, north-central China, and influential factors

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Land desertification in arid and semi-arid environments is a severe environmental problem of fundamental importance. Better understanding of the development of desertification in the context of changing climate and human intervention is essential for policy-making on desertification control strategies and land-use management in these environmentally sensitive areas. The state, change and trend of vegetation cover and dune activity in the Mu Us dune field, a typical semi-arid dune field in north-central China, are analyzed over the years 1981-2013 by remote sensing techniques and geomorphic analysis. NDVI served as an indicator of vegetation cover, showing a significant increasing trend, while a dune mobility index indicates a reduced degree of desertification during the observation period. The transformation of dune morphologies can potentially be used to detect the long-term trend in desertification, suggesting that the dunes are being stabilized under vegetation growth. By a detailed analysis of both climatic and socioeconomic data, we found that vegetation change in the study area can be largely explained by long-term variation and short-term fluctuation of the climate, however, anthropogenic perturbations that superimposed on the natural tendency are also important at both local and regional scales. This study implies that current climatic conditions probably offer a window of opportunity for land regeneration in semi-arid northern China.