



Modeling and Analysis of the Potential Impacts on Regional Climate due to Vegetation Degradation over Arid and Semi-arid Area of China

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The possible regional climate effects of vegetation change in arid and semi-arid regions of China, which has experienced serious grassland degradation, were investigated in this study using the Weather Research and Forecasting (WRF) regional climate model. Two long-term simulation experiments (1979-2009), one with the land cover derived from the original United States Geological Survey's (USGS) data (denoted as CTL) and the other (denoted as SEN) with a modification of the former one by vegetation degradation in arid and semi-arid regions of China, were undertaken to investigate the influence of vegetation degradation on regional climate over arid and semi-arid regions of China, the possible mechanisms were also studied. The simulation results indicate that when compared with the observation datasets, the WRF model can well simulate the spatial pattern and change of temperature and precipitation. After vegetation degradation over the arid and semi-arid regions of China, the net radiation and evaporation were reduced mainly within the degraded areas in summer, consistent with the reduction in precipitation and the increase in surface air temperature.