Geophysical Research Abstracts,
Vol. 11, EGU2009-2644, 2009
EGU General Assembly 2009

Recent progress on land cover change and its regional climatic effects over China during historical times

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Land cover change has been demonstrated as an important forcing driver of climate change, and many studies have been conducted that simulate the climatic effects of human-induced land cover change at global and regional scales. Land cover in China has undergone large-scale modifications, mainly through deforestation and desertification, over the last several thousand years, and the extents to which these changes have influenced climate change have increasingly attracted scientists' attention. The simulations of regional climatic effects caused by land cover changes which based on different datasets–historical reconstruction and potential land cover data–show that the human-induced land cover changes over China since 1700AD have led to the enhancement on the East Asian Winter Monsoon and cooling in winter overall, with warming over most of China but cooling at somewhere (e.g. northern China or the Middle-Lower Yangtze Valley) in summer. However, the different simulations by different models show different effects on annual mean temperature, annual precipitation and East Asian Summer Monsoon. These differences among these simulations are shown to have resulted from the disparities in the classifications of land cover types among different land cover dataset used, in the extent of land cover.