

植被覆盖状况影响中国地表气温变化的观测事实

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Observational evidence of the impact of vegetation cover on surface air temperature change in China

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摘要

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摘要

利用NOAA/AVHRR归一化植被指数(NDVI)及观测气温与再分析地表气温的差值(Observation Minus Reanalysis, OMR)研究了植被覆盖状况对中国地表气温变化的影响.结果表明,地表气温OMR趋势值与NDVI在空间上呈现出显著的负相关关系,植被覆盖差(NDVI小于0.1)的区域地表升温较为显著,气温OMR趋势值超过 $0.2^{\circ}\text{C}/10\text{a}$,而植被覆盖度高(NDVI大于0.5)的区域OMR趋势值则变化不大,甚至出现降温.气温OMR趋势值对植被的季节变化还有着敏感响应.不同区域植被覆盖状况的差别导致中国地表气温变化对全球变暖的响应不同,预测中国未来气候变化需要考虑植被覆盖状况及其动态变化的影响.

关键词: 地表气温 NDVI OMR方法 观测资料 再分析资料

Abstract:

Using NOAA/AVHRR normalized difference vegetation index (NDVI) data, the impact of vegetation cover on surface air temperature change is investigated by subtracting the reanalysis from the observation (observation minus reanalysis, OMR). The results show that the temperature OMR trend is inversely correlated to the vegetation index and the strong (weak) surface warming corresponds to the surface barrenness (greenness). Areas with NDVI less than 0.1 show a large warming trend of more than $0.2^{\circ}\text{C}/10\text{a}$, but areas with NDVI greater than 0.5 show little surface warming and even decreasing trends of temperature. Moreover, the OMR trend sensitively responds to the seasonal vegetation cover change. Atmosphere-land feedbacks over a different vegetation covers can alter the response of regional surface air temperature to global warming by the increase in anthropogenic greenhouse gases concentrations. Thus, it is suggested that projector surface climate of China should incorporate the impacts of spatio-temporal variability in vegetation cover.

Keywords: Surface air temperature NDVI OMR method Observations Reanalysis

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