



Extracting Urbanization-related Signals from Extreme Summer Warmest night Temperatures Changes in Surrounding Bohai Area

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Many studies have been focused primarily on the impacts of urbanization on China mean temperatures changes but very little on the changes in extreme temperatures. This paper examined the urbanization impact on extreme summer warmest night temperatures from 33 stations in Surrounding Bohai area during 1958-2009. We then used the Generalized Extreme Value (GEV) distribution to analyze the distribution of extreme warmest night temperatures and the long term variations of the three distributional characteristics parameters. Results suggest that among the three extreme minimum temperature distribution parameters, the position parameter is the most representative in terms of its long term change. A new classification method based on the intercommunity (factors analysis method) of the temperature change is developed to detect the urbanization effect on summer extreme warmest night temperatures in different cities. During the period of rapid urbanization (after 1980), the magnitude of variations of the three distribution parameters for the urban station group is larger than that for the reference station group, indicating a higher chance of occurrence of warmer weather and a larger fluctuation of temperatures. Among different types of cities, the three parameters of extreme warmest night temperature distribution of the urban station group are, without exception, higher than those of the reference station group. The urbanization of different types of cities all show a urban heat island effect, with an average effect about 0.3 [U+2103] [U+FF0F] 10a.