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The Influence of Urbanization on Air Temperature in Nagqu County, Tibetan Plateau

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Abstract: According to meteorological data obtained at Nagqu meteorological station, which is in the Nagqu County (NQ) and at site BJ of Nagqu Station of Plateau Climate and Environment (BJ), which is outside Nagqu County, the differences in air temperature (Ta) variations at NQ and BJ from 2001 to 2014 were compared and analyzed with respect of urbanization. Both the natural processes and human activities that could lead to the differences in Ta between NQ and BJ were studied in this study. Natural processes are characterized by meteorological variables such as wind, precipitation, sunshine hours, vapor pressure and the human activities are characterized by urbanization index. The results show that the annual mean temperature (Ta_mean) and annual mean minimum temperature (Ta_min) at NQ are higher than those at BJ from 2001 to 2014. But the annual mean maximum temperature (Ta_max) at NQ is smaller than that at BJ. The urbanization of Nagqu County has increased in the past fifteen years and reached to 27.24% in 2014. There are good agreements between Ta_max and natural factors including sunshine hours and water vapor pressure at NQ and BJ. And Ta_min has a positive relationship with human activities such as the GDP and population of Nagqu County. But the relationship between Ta_min with human activities at NQ is stronger than that at BJ. This is because BJ is a field site and the strength of human activity is weak. The Natural processes has a stronger influence on the variation of Ta_min at BJ than human activities do.