

On the urban heat island effect dependence on temperature trends. 1997.

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ABSTRACT

For American, Argentine and Australian cities, yearly mean urban to rural temperature differences (ΔT_{u-r}) and rural temperatures (T_r) are negatively correlated in almost every case, suggesting that urban heat island intensity depends, among other parameters on the temperature itself. This negative correlation is related to the fact that interannual variability of temperature is generally lower in urban environments than in rural areas. This seems to hold true at low frequencies leading to opposite trends in the two variables. Hence, urban stations are prone to have lower trends in absolute value than rural ones.

Therefore, regional data sets including records from urban locations, in addition to urban growth bias may have a second type of urban bias associated with temperature trends. A bulk estimate of this second urban bias trend for the contiguous United States during 1901-84 indicates that it could be of the same order as the urban growth bias and of opposite sign.

If these results could be extended to global data, it could be expected that the spurious influence of urban growth on global temperature trends during warming periods will be offset by the diminishing of the urban heat island intensity.