



High resolution identification of local vulnerabilities to urban heatwaves

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Climate change models outcomes are often too coarse for urban scale prediction. A recently developed method in statistical downscaling of CMIP5 is LOCA (Localized Constructed Analogs). This technique provides community-scale historical and projected weather data across the USA at 1/16-degree resolution and includes daily maximum and minimum data for 1950 to 2100.

We define a heatwave as a period in which minimum and maximum daily temperatures in at least two consecutive days exceed the 95th percentile of the historical records and utilized the LOCA downscaled data set to find the neighbors with the most frequent and severe heatwave occurrences in nine cities across the USA. This definition helps capturing events that account for high night time temperature, as those have more physiological impact on vulnerable urban populations.

Our findings indicate that the results of a small-scale heatwave study using LOCA is consistent with land-based observations. The suggested method is based on publicly available data and presents a simple procedure for initial estimation of vulnerable populations during heatwaves. The results are useful for local government to plan heatwave strategies, such as cool centers and reliable water distribution networks and electrical energy delivery during heatwaves.