

Should we all escape to the country during a heatwave?

July 2 2015, by Faye Jackson

A University of Birmingham research project has highlighted the potential health impacts of heatwaves in urbanised areas. By modelling the 2003 heatwave the researchers were able to identify areas where city centres were up to 7°C hotter than the surrounding countryside in the West Midlands.

Heatwaves pose an increased health risk to vulnerable populations, such as the elderly or those suffering from cardiovascular diseases. The August 2003 heatwave saw many European countries experience their highest temperatures on record and contributed to an estimated 2,000 deaths in England.

The study, published in the *Quarterly Journal of the Royal Meteorological Society*, details how a novel, dynamic way of mapping temperature across urban [areas](#) can help researchers to better understand how local authorities can plan to cope with the effects of a sudden rise in temperature.

Taking data from 1 kilometre squared areas across Birmingham and the West Midlands, the researchers were able to stimulate high-resolution temperatures during the 2003 heatwave. This modelling method improves our ability to understand what people living in different areas are exposed to and can identify areas most at risk during sustained periods of high temperatures.

Using this dataset the researchers were able to identify the fluctuations

on a regional scale. For example, during the August 2003 heatwave, temperatures inside Birmingham city centre were up to 7°C hotter than the surrounding rural areas.

The research shows that the key to regional variation within the West Midlands is the effect of the Urban Heat Island.

Urban Heat Islands occur in built-up areas in which large quantities of concrete from buildings absorb sunlight and store energy. At night, the energy re-radiates out and warms the surrounding areas, resulting in warmer inner-city temperatures.

The extra warmth is often added to by the effect of polluted air, which traps heat in an area, particularly during periods of extreme temperature.

Lead researcher Dr Clare Heaviside, Honorary Research Fellow at the University of Birmingham's School of Geography, Earth and Environmental Sciences, explained: "This modelled dataset is on a much finer scale than we've been able to use before. At the moment, global climate models do not go into such detail, and regional variations can be overlooked. We are currently working on how we can use this model to investigate the potential combined impacts of climate change and Urban Heat Islands on health and help us to plan for the future."

It is hoped that this data will highlight areas that will be more susceptible to the worst effects of heatwaves and allow public health care providers to better prepare for heat-related health effects and mortality during periods of higher-than-average temperatures.

However, far from being a call for people to leave the cities, the team are keen to point out that the Urban Heat Island could be an aid to vulnerable populations during the colder winter months.

Dr Xiaoming Cai, Senior Lecturer at the University of Birmingham's School of Geography, Earth and Environmental Sciences, said: "While Urban Heat Islands negatively affect people in summer, they could have a potential protective effect in winter months. We often find that the same people who are most vulnerable to heat are also vulnerable to cold."

Provided by University of Birmingham

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