Who is Hot in Cities? Assessing Socioeconomic Characteristics of Heat Intensive Areas in Glasgow

Wan-Yu Shih (1), Leslie Mabon (2), and Sohail Ahmad (3)

(1) Ming Chuan University, Urban Planning and Disaster Management, Taoyuan, Taiwan, R.O.C (shih@mail.mcu.edu.tw), (2) School of Applied Social Studies, Robert Gordon University, Aberdeen, Scotland, UK (l.j.mabon@rgu.ac.uk), (3) Urban Studies, School of Social and Political Sciences, University of Glasgow, Glasgow, UK (sohail.ahmad@glasgow.ac.uk)

This study explores socio-economic characteristics of 747 neighbourhoods to understand the characteristics of neighbourhoods associated with warmer areas during consecutive hot days in July 2014 in Glasgow City. Understanding spatial patterns of heat risk in cites has become an imperative under the trend of urbanisation and global climate change, as it provides information for decision makers to design warning systems, identify priority areas for allocating resources and provide necessary aid. The environmental and developmental context which influences greater heat intensity, and the socio-economic attributes which increase vulnerability to higher temperature, are increasingly well understood. However, how heat exposure varies in accordance with socio-economic characteristics of discrete neighbourhoods, which emerge across a city's development process, is less well understood. As heat response varies by intensity of heat exposure and socio-economic status, areas possessing specific socio-economic characteristics might be subject to greater burden, even if there is little immediate health consequence. Understanding this spatial-societal-thermal pattern will be helpful in understanding what the urban development processes and societal processes are which drive unequal exposure to heat.

Using eight thematic sets of population, income, employment, health, education-skills and-training, geographic access to services, crime, and housing (giving 32 socio-economic factors in total) from the Scottish Index of Multiple Deprivation (SIMD), this study assesses the extent to which these societal attributes are related to the location of higher land surface temperature, which was derived from LANDSAT 8 satellite image in July 2014 in Glasgow. Initial findings indicate that the most deprived areas in the city are not necessarily suffering from greater heat intensity. Neighbourhoods providing less geographical access to services tend to have lower surface temperature, whereas those with larger numbers of people living in overcrowded households tend to be subject to warmer environments. While looking into intercorrelation amongst attributes, income become an effective factor to describe the overall pattern of the social construction across cities. Furthermore, this study applies regression tree analysis to classify Glasgow City into place-specific combinations of societal characteristics by nested typology. Accordingly, we suggest spatial-specific policy interventions for improving social equality during a heatwave event in Glasgow.