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An urban climate service to manage heat risks in UK and Chinese cities

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Recent extreme heat events in the UK are likely to become more frequent over the 21st Century and exacerbated in cities due to the urban heat island effect. Due to high population densities and a concentration of assets, urban areas are more vulnerable to climatic extremes with impacts that traverse health, infrastructure, built environment and economic activity. Risks to health, well-being and productivity from high temperatures is one of six priority areas from in UK Climate Change Risk Assessment (2017) where more action is needed to manage risks, prompting local authorities to understand heat risks within their city.
City based climate services are needed for day-to-day operations in cities, emergency response and to inform urban design and development. Recent advances in high resolution modelling enable better representation of urban processes and provide greater understanding of extreme events. By exploiting such advances in underpinning science, the Met Office is generating urban climate services for city stakeholders to plan for and manage heat stress in their city.
The Met Office has been engaging with local authorities and city stakeholders in the UK and China to co-produce a prototype, two tier, urban heat climate service to enhance the resilience of urban environments to extreme heat events. The prototype is based on a strong requirement from several cities to develop an evidence base of the heat hazard and understand current and future hot spots vulnerable to extremes of heat within the city. Tier 1 uses observations and high-resolution climate data to provide city specific information of the heat hazard in a graphical factsheet format. This includes information on future changes in temperature, extreme heat indicators, frequency and duration of heatwave events, and spatial distribution of heat across the city. Tier 2 involves working closely with city stakeholders to combine the hazard information with data on health, built environment and socio-economics, to provide tailored information on heat exposure and vulnerability. This will allow users to identify highly vulnerable parts of the city network and neighbourhoods for priority action. This two-tier service can provide an evidence base to inform urban policy, design and adaptation strategies, and prepare authorities and city stakeholders for future demand on city services.