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Modelling the urban heat island in Birmingham, UK at the neighbourhood scale

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Cities have higher peak temperatures compared to surrounding rural areas. The urban-rural surface air temperature difference is known as the urban heat island (UHI). As extreme heat exposure can lead to adverse health effects, information on UHI characteristics of cities is important for future urban climate planning strategies. This study applied the ADMS-Urban Temperature and Humidity model to investigate the key processes driving the UHI in Birmingham, UK, at the neighbourhood scale. This model was configured with a range of input datasets (such as meteorological data, landuse data, building data, anthropogenic heat sources etc) and run on the University of Birmingham's BlueBEAR HPC. This urban climate modelling was evaluated against the temperature measurement datasets from UK Met Office and Weather Underground. The spatiotemporal variations of surface air temperature in Birmingham, UK were captured by this model. This modelling study can be further applied to explore the impacts of local urban head island mitigation strategies.