

P10 Energy usage in future urban climate.

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Urban Heat Islands (UHIs) have been studied extensively in the past, and have recently received greater attention due to implications for the environmental, health and energy sectors. In a recent paper by Tewari et al (2016), UHIs and their interaction with heat waves under current and future climate conditions were investigated. Salamanca et al (2014, 2015) examined the effect of air conditioning (AC) systems on air temperature and their energy consumption in a semi-arid environment. They found that explicit representation of waste heat from air conditioning systems improved the 2 m air temperature in comparison to local observations. They also found that during the night, heat emitted from AC systems increased the mean 2 m air temperature by more than 1°C for some urban locations.

The purpose of the present work is to investigate impacts of AC systems under future urban projections in a future thermal environment. The energy usage under the current climate was evaluated by conducting numerical experiments using a regional atmospheric model WRF (Weather Research and Forecasting Model) coupled with a multi-layer urban canopy model for a summer month (June 2012). For these experiments, NCEP FNL (Final Global Analysis) data are used. For the future climate, the current climate data (FNL) were perturbed using forcing data from a global climate model (CCSM4). The preliminary results from the above experiments will be presented at the workshop.