



## **Asian megacity heat stress under future climate scenarios: impacts of air-conditioning feedbacks**

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Future heat stress in Osaka is projected using dynamical downscaling with a regional climate model that has a coupled urban canopy. The feedbacks induced by urban warming and air-conditioning use (AC) are explored. An urban heat ‘stress’ island is projected in all six future global warming ( $\Delta T_{GW}$ ) scenarios ( $\Delta T_{GW} = +0.5$  to  $+3.0$  °C in  $0.5$  °C steps; based on IPCC RCP8.5) modelled. Under  $\Delta T_{GW} = +3.0$  °C conditions, people outdoors experience ‘extreme heat stress’ which could result in dangerously large increases in rectal temperature. The impact of AC induced feedback on heat stress increases roughly linearly with  $\Delta T_{GW}$ . The size reaches  $0.6$  °C (12% of heat stress increase), which is equivalent to current heat island mitigation techniques capabilities.