Urban Applications
Met Office, Reading, UEA, Manchester, Newcastle
- **ARCC - 2050s Climate Hazard**

![Map of ARCC - 2050s Climate Hazard](image_url_1)

- **UKCP - Urban forcings**

![Map of UKCP - Urban forcings](image_url_2)

- **CMIP5 - Urban response to Radiative forcing**

![Map of CMIP5 - Urban response to Radiative forcing](image_url_3)
Impacts – Urban Heat Island
Met Office Reading Urban Surface Exchange Scheme (MORUSES)

Anthropogenic Heat Release

Canyon

Soil

Roof

Air
JIM – MORUSES
Global ancillaries

Geometry
Materials
Urban growth

Canyon
Roof
Soil
Air

Seasonal and diurnal energy use
Offline human heat balance
Varying Urban Properties

(Global urban properties courtesy of Trish Jackson and Johannes Feddema)
Energy Impacts

(Yr 2100, RCP8.5)
Avg Urban emission 28 W m$^{-2}$
Energy Impacts


IEA, 2008

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Urban inter-comparison (Maggie Hendry)

- 2TM & $M_a$ difference
  - Coupling with soil
  - Roof radiatively coupled in 2TM; uncoupled in $M_a$
Urban Climate – not just about the city centre.

From Georgescu et al. JGR – The Phoenix “Oasis”