CRC for Water Sensitive Cities

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Project B3.1
Green Cities and microclimate

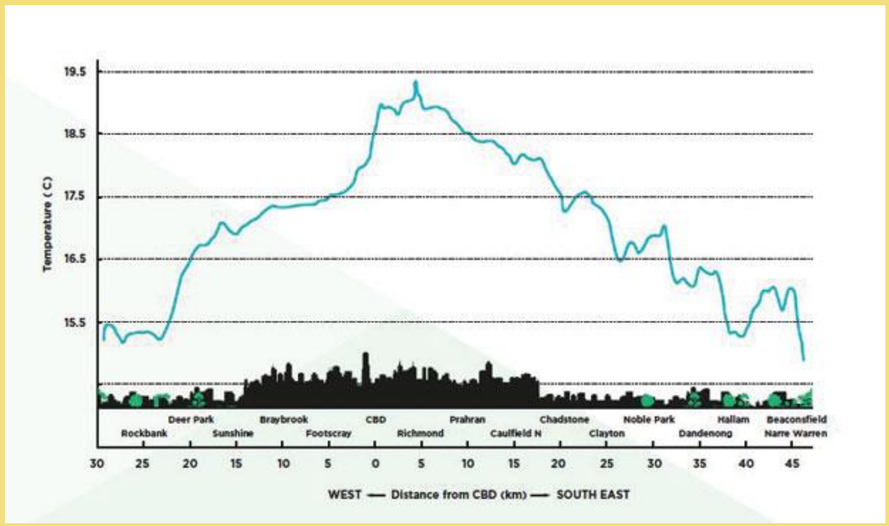
Modelling heatwaves and the urban heat island

Motivation

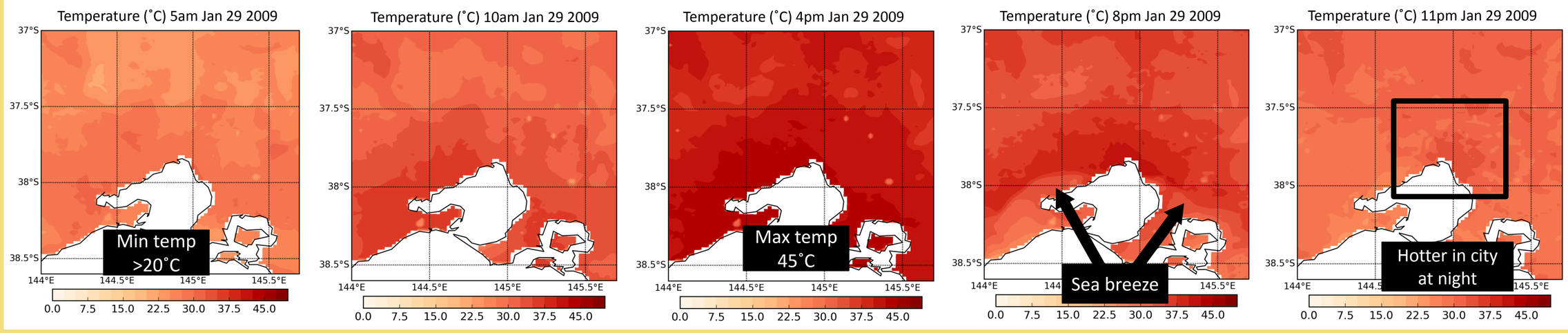
Heatwaves ➔ heat stress ➔ high *overnight* temperatures have greatest effect on human health

50% of the global population lives in cities ➔ Urban Heat Island effect ➔ cities *hotter at night* than rural areas

UHI mitigation ➔ Water sensitive urban design ➔ cooler cities ➔ cooler citizens

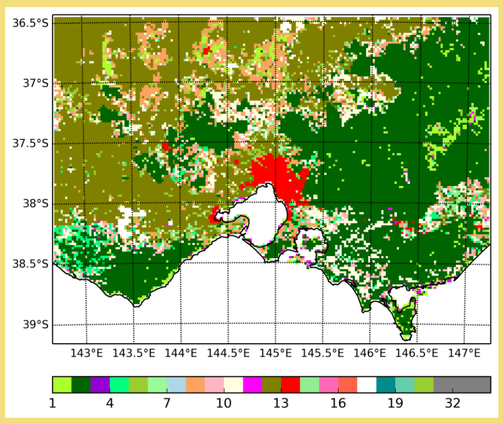


Modelling the January 2009 Melbourne heatwave



What if we removed the urban areas?

Replace land surface in model using nearest neighbour method ➔ Melbourne becomes croplands in the west (olive green) and evergreen broadleaf forest (dark green) in the east



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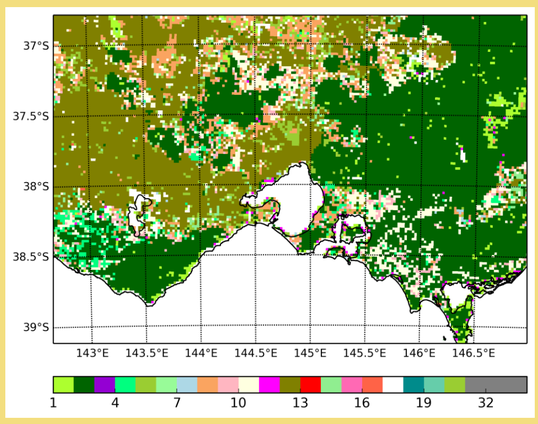
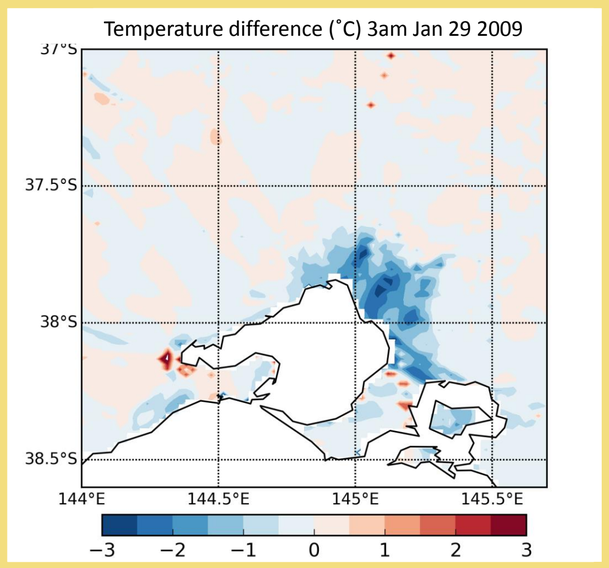


MODIS satellite land use categories (red is urban)

Land Use Category	Land Use Description
1	Evergreen Needleleaf Forest
2	Evergreen Broadleaf Forest
3	Deciduous Needleleaf Forest
4	Deciduous Broadleaf Forest
5	Mixed Forests
6	Closed Shrublands
7	Open Shrublands
8	Woody Savannas
9	Savannas
10	Grasslands
11	Permanent Wetlands
12	Croplands
13	Urban and Built-up
14	Cropland/Natural Vegetation Mosaic
15	Snow and Ice
16	Barren or Sparsely Vegetated
17	Water
18	Wooded Tundra
19	Mixed Tundra
20	Barren Tundra

Melbourne is 3˚C cooler!



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