

Health Impacts – Urban Heat

The West is paying for the City

Everyone who lives here knows that the Cumberland Plain is increasingly baking.

Bureau of Meteorology analysis shows that the City – where planning decisions are made – has essentially the same climate as 60 years ago, thanks to its sea breezes. However, during the same period maximum temperatures at Penrith have increased **seven degrees** (BOM 2020) and now regularly nudge 50 degrees. This is due to the replacement of rural land and bushland with dense urban estates, causing the Urban Heat Island effect. These increases are additional to just under one degree of increase to maximum temperatures due to Global Climate Change (CSIRO 2020).

Air quality & heat are leading causes of death. Nationally 2% of premature deaths are caused by air pollution (Australian Institute of Health and Welfare 2015); regional data and data for urban heat are not recorded. Western Sydney experiences among the nation's worst pollution and heat so it is possible that up to 5% of deaths are due to preventable air quality and heat impacts regionally.

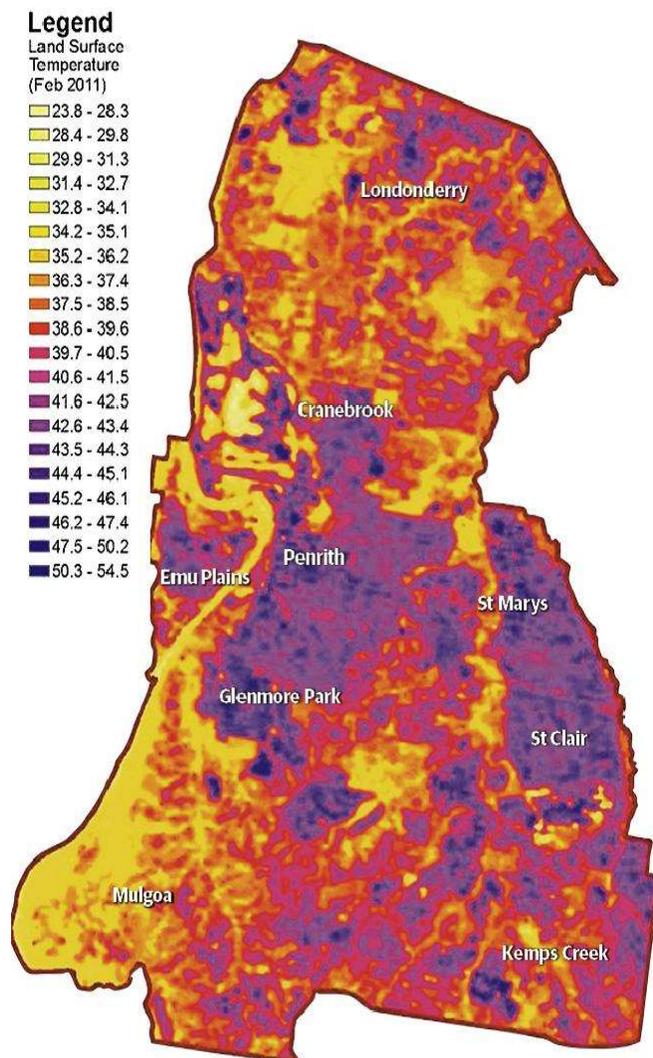
The Urban Heat Island effect can be clearly seen in this aerial heat map of Penrith (below). Glenmore Park and Jordan Springs are clearly visible with local surface temperatures >47 degrees

Impact of the CPCP developments

The developments proposed in the CPCP will substantially exacerbate these problems.

The officially recorded increase of 7 degrees at Penrith since 1960 was associated with 5,000 hectares of urban development. The CPCP proposes roughly the same scale of new urban development in the Macarthur sector alone. In broad terms we should prepare for these to cause a similar impact to that seen at Penrith, with local maximum temperatures to increase circa 5-10 degrees. This would see the current record of 45^{oC} (Appin) rise as high as 50-55^{oC}. Such conditions would result in considerable mortality to residents and wildlife.

No UHI modelling or impact assessment has been provided in the CPCP



Impacts of rising heat on biodiversity

Urban Heat Island has a devastating impact on native species. Exposure to extreme heat (now exceeding 50 degrees at Penrith) causes death in susceptible species, especially large-bodied species (Greater Glider and Koala) and those which cannot sweat (wombats). Urban Heat Island is also *drying* the Cumberland Plain Woodland through increased evaporation, equivalent to a rainfall loss of between 12-48 mm/year (Argueso *et al* 2014), increasing fire risk and further impacting our woodlands.

These impacts of Urban Heat have already had devastating, direct effects including:

- regional extinction of Greater Glider
- regional extinction of the endangered plants *Tylophora woollsii* & *Rhizanthella slateri*
- death of 71% of *Banksia aemula* trees in Agnes Banks Woodland (regional extinction anticipated)
- decline in numerous wet-adapted plants including the endangered *Pimelea spicata*
- massively reduced distribution for wildlife as they retreat to riparian corridors (Wombat)

Further impacts are not acceptable – this is already a Critically Endangered ecosystem. Significant local data are available on this issue, but it not assessed by the CPCP.

Will tree planting mitigate this effect?

The CPCP cannot realistically mitigate these impacts by tree planting.

To be effective, planting needs to be in the same areas impacted by Urban Heat Island and at a scale comparable to the threat. Planting proposed in Gulguer would have negligible impact on the temperatures in Penrith or Campbelltown. Moreover, there isn't anywhere to plant. Previous tree-planting programs have already planted-out existing public land. Indeed, they have repeatedly failed to deliver more than <40% of the trees they claim, due to the limited extent of public land available. To mitigate its Urban Heat Island Impacts the CPCP would need to create & replant new reserves upwards of 5,000 hectares in Penrith, Luddenham & Appin. This clearly is not proposed, and would cost many hundreds of Millions of dollars.

New urban areas need trees – but this would barely alter the monumental UHI impact. A 10% increase in urban greenery would decrease local temperature by <0.6°C (Sharifi & Lehmann 2015).

It would be far better to use limited budgets to protect existing, intact woodland. Even after a decade a planted Eucalyptus provides just 0.3% of the evapotranspirative cooling of a remnant Eucalyptus tree (Roberts et al 2001).

Planting a few trees simply doesn't go any distance to mitigating this issue – if more houses are built, temperatures will rise and more people and wildlife will die.

Let's take a breath

Isn't it time that the West got a break?

The community simply do not accept further exacerbation of the Urban Heat Island in the West. Western Sydney is already the largest construction project in the Southern Hemisphere, laying down an average of 8 tonnes of concrete per resident per year (Cement Concrete & Aggregates Australia 2018). We already hit 50°C last Summer. If the west is to be livable it simply cannot accommodate more houses.