

Millions of city trees at risk from rising temperatures

November 14 2017



Credit: University of Melbourne

A new study has found that almost one quarter of trees in Australian cities are at risk from increasing temperatures in urban environments due to climate change and urban heat islands, posing a threat to some tree species in our cities.

Researchers from the University of Melbourne and the University of

Queensland from the Clean Air and Urban Landscapes Hub (CAUL) have found that 24 per cent of all public trees (35 per cent of species) in Australia's cities are at high [risk](#) from increased temperatures by 2070, in the business-as-usual emissions scenario. A further 29 per cent of trees are at some risk.

They found that the trees in the high-risk category will likely not be suitable for future climates, will not perform as well and will be more vulnerable to things like diseases

The study highlights that new species should to be introduced into cities now to maintain resilience and enable [urban forests](#) to adapt to a changing [climate](#).

The research was led by Dr Dave Kendal, Project Leader with the Clean Air and Urban Landscapes Hub, based in the Faculty of Science at the University of Melbourne.

"Australian cities contain 10s of millions, if not 100s of millions of trees that provide important functions such as cooling and slowing stormwater runoff, and providing habitat for birds and animals," Dr Kendal said.

"But there is growing recognition that increasing temperatures, due to urban heat and climate change, are a threat to some [tree species](#) in our cities.

"Because urban trees are important to people for different reasons, a wide range of concerns must be addressed when planning our urban forests of the future."

The study analysed the risk of [temperature](#) increases to 1.9 million trees in 29 local government authorities across Australia, from Launceston to Darwin, and Brisbane to Perth. Every tree was analysed to see how close

it was to known temperature limits in current climates, an emissions-limited climate change scenario in 2040 assuming emissions stabilisation, and a business-as-usual emissions scenario in 2070.

The study looked at 1,392 species of trees including Australian natives, European deciduous trees, as well as tropical and sub-tropical flowering trees.

The results of the emissions-limited climate change scenario showed 14 per cent of all public trees (22 per cent of species) in Australia's cities are at high risk and a further 33 per cent of trees are at some risk.

However, there is great variation in the risk to urban trees of temperature increases from [city](#) to city, and across areas within each city. Under both the business-as-usual and emissions-limited scenario, Darwin has the highest proportion of trees at risk, with 84 per cent and 85 per cent respectively, while in Ballarat only 1 per cent of trees are at risk in the emissions-limited scenario, and that jumps to 10 per cent in the business-as-usual [scenario](#).

This risks from increasing temperatures will present a major challenge to land managers across Australia.

Co-author Lyndal Plant from the University of Queensland says there are several strategies that are available for urban forest managers to adapt to the increasing temperatures.

"For important trees, a strategy of resistance can be used to improve the environmental conditions and prolong useful life, for example by providing irrigation or improved pest and disease management. Managers can also respond to change by selecting [trees](#) that are better adapted to future climates," she said.

While this report focussed on the risks of increasing temperatures, there are also many opportunities that could arise from this. The study found new tree [species](#) can be introduced to our cities to maintain resilience, and could provide a wide range of benefits.

"We have an opportunity to improve the sustainability of our cities through this renewal process," Dr Kendal said.

"Meaningful engagement with the community and industry will help create successful urban forests of the future that provide a wide range of benefits for people and wildlife in cities."

Provided by University of Melbourne

Citation: Millions of city trees at risk from rising temperatures (2017, November 14) retrieved 9 April 2024 from <https://phys.org/news/2017-11-millions-city-trees-temperatures.html>

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