CRC for Water Sensitive Cities

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Project B3.2 The design of the public realm to enhance urban micro-climates

Cooling Effect of Irrigation and Tree Shading in Urban Green Space

Introduction

Irrigation and shading are known to create cooling benefits. However, we know little about their cooling effect during heatwave in Australian cities.

Why is this issue important? Our research shows that it is worth spending money on irrigation and urban greening, as it improves people's comfort level during heatwaves.

How much cooling does shading and irrigation provide during heatwave?

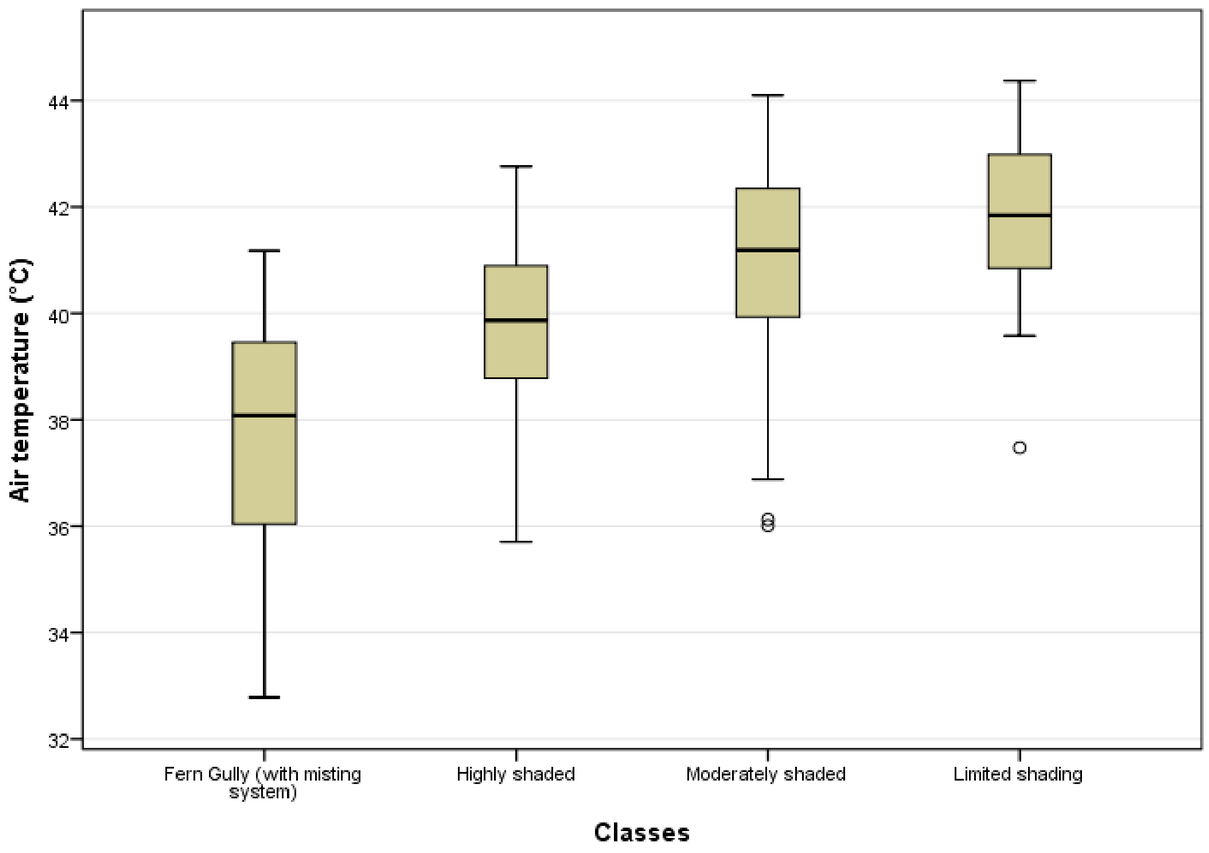

Figure 1 Mean temperature differences between areas with various shading, 12-4pm, 14 – 17 January, 2014, Royal Botanic Garden Melbourne

Methods

We set up automatic weather stations in Royal Botanic Garden Melbourne from December 2013 to March 2014. Here we present data from the heatwave from 14-17 January, 2014. We also took fisheye photos for calculating sky view factor (an indicator for shading). In addition, we compared areas with different irrigation priority in the garden.

Fern Gully

Highly shaded

Moderately shaded

Limited shading

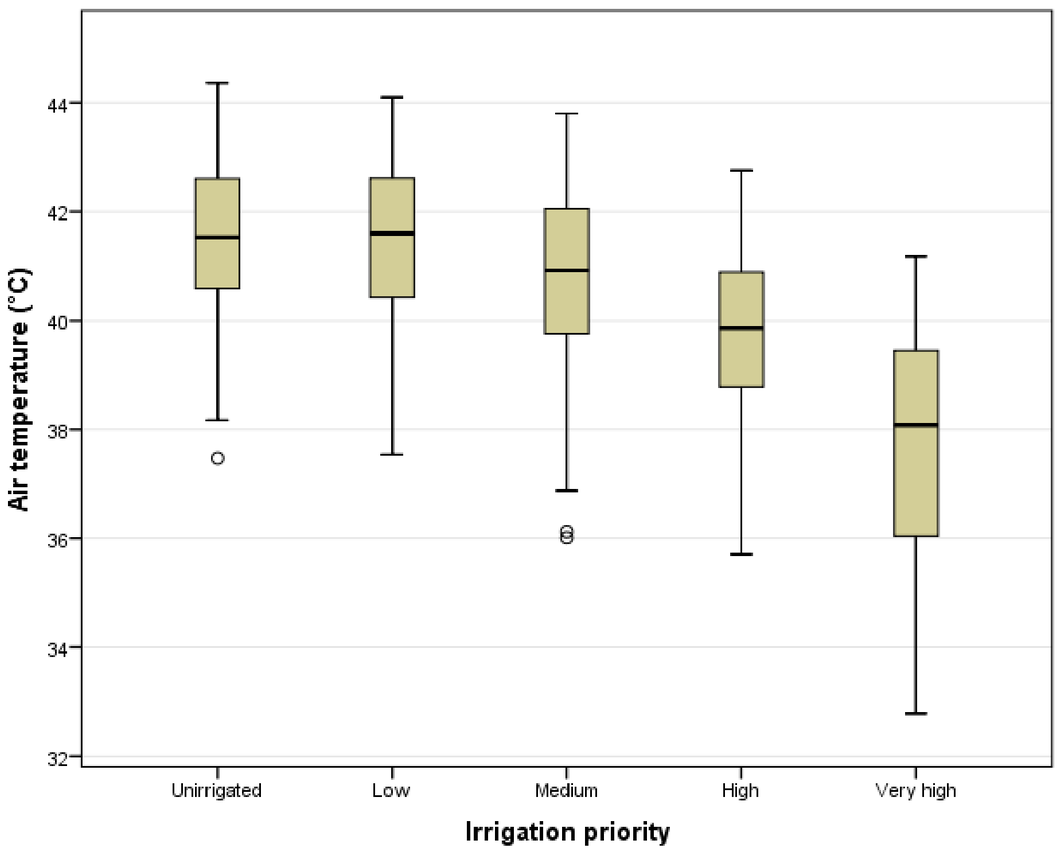

Figure 2 Mean temperature differences between areas with various irrigation priority, 12-4pm, 14 – 17 January, 2014, Royal Botanic Garden Melbourne

Main findings

Highly shaded areas were 2 °C cooler than areas with limited shading. Fern Gully was 4 °C cooler than areas with limited shading, due to its misting system (evaporative cooling) and high amount of shading. Furthermore, areas with high irrigation priority were 1.7 °C cooler than areas of low irrigation priority or unirrigated areas. Our results have implication for heat-health and people's comfort level in summer. Reducing temperature by 1-2 °C can save lives during heatwave.

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