Stormwater for urban forests: Is it a good fit?

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Biography:
Geoff has extensive experience in urban horticulture water management research, education and consulting.

His expertise includes planning for sustainable urban green space, water sources, passive and active irrigation and water management.

Geoff has presented and published widely.

In addition to providing advice on high profile boulevards, streetscapes and arboretums, Geoff has been providing irrigation design solutions for trees, interior and exterior, in public and commercial building developments.

He is author of key open space text; Water Use Efficiency for Irrigated Turf and Landscape, published by CSIRO, March 2013. He was the Principal Consultant for the development of Best Practice Guidelines for Functional Open Space, published by Smart Water Fund and City West Water, in 2015.

He has been a judge for the National and State (Vic) Stormwater Awards. In May 2008, he was awarded the National Irrigation Award in recognition for his contribution to irrigation in Australia.

Urban forests have the potential to deliver multiple and high value benefits. Benefits include cooling, carbon sequestration, enhanced aesthetics, increased property values and amenity.

The delivery of these services is dependent on a diverse range of tree processes including energy absorption, energy transfer, solar interception, transpiration, particulate trapping and wind retarding.

For trees to perform these various functions the tree needs to be;
a) appropriate species for the target outcomes/services and site
b) grow and develop to maturity and
c) remain healthy.

A critical factor in tree performance is water availability. Understanding tree water demand and tree/soil/root/water system is a key part of achieving sustainable and productive urban forests.

The urban environment can be very challenging for healthy tree growth. Significant site physical constraints and stressful microclimates are common. Understanding how each constraint, such as soil volume and properties, impact on the water demand and growth of the tree is important.

In addition to challenging conditions for existing trees, there is the prospect of increased demands as a result of climate change. Tree life of 50 to 100 years requires consideration of species suited to higher temperatures. Some current urban tree species are not suited to these increased temperatures (Reference D. Kendal, 2018). Increased water demand and reduced water availability, including reduced stormwater catchment yield, require consideration in the planning of urban forests.

Stormwater can generally meet much of the tree water demand, however, availability during high evaporative demand periods is an issue. Water security, with water of appropriate quality and sufficient quantity, is essential. The accumulation of potential contaminants in the soil root zones of trees, from stormwater, and the volume of water supplementary to rainfall (e.g. 5 ML/ha) required to maintain urban forests with canopy target area increases, in the range of 20% to 40%, require assessment.

This presentation will outline the water use characteristics of tree/soil systems, climate change implications, learnings from recent research and experience with the watering of urban trees and reviewing the characteristics of stormwater in terms of meeting the urban forest water demand.