



Water Footprint of Urban Green Spaces

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This study presents the first estimate of the blue and green water footprint of urban greenery. The blue water scarcity is not only an emerging challenge in agriculture but also in the urban, particularly in dry regions. The necessity of improving the wellbeing of citizens by recent movements in smart green cities introduces an uneasy tension between ‘greening a city’ by creating more green spaces and the increased use of scarce blue water resources to maintain this extended greenness. We estimated the blue, green and total water footprints of a 720-hectare public parkland that consists of 29 parks in Adelaide, South Australia. The WF was estimated by measuring evapotranspiration of the urban vegetation by monitoring all inflows, outflows, and soil water storage changes considering the heterogeneity within the species, microclimates, and density of mixed plants. The annual total WF was estimated at 11,139 m³/ha of which 59% was blue and 41% was green. The highest consumption was found in summer at 42%. Our results indicated that the city of Adelaide and its largest green space were heavily reliant on the blue water resources. The dependency on blue water for maintaining the green and healthy landscape varied from 49% in October to 67% in March. Notably, there was a high demand on blue resources and consequently a high blue WF in the wet period of the year when we expected green resources readily fulfil water demands of the urban greenery. Knowing that there are not enough excess blue water resources to allocate for greening the city, we suggested and described an integrated adoptive management strategy to be taken to maintain available greenery and to expand greening the city with the minimum of extra pressure on blue resources.