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Changes in the water footprint of urban green spaces over time

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The concept of a sustainable green city based on Sustainable Development Goals (SDGs)–Goal 11 - sustainable cities and communities – may not be narrowed down to solely intensifying urban green spaces. Sustainability could include urban water management to alleviate possible conflict among “water saving” and “greening cities” strategies. Water consumption by urban greenery has a major role in urban water management, particularly in water-scarce regions where green covers are most affected by drought and aridity. More green and blue water resources are required to maintain and expand urban green spaces. Quantifying the water footprint of urban greenery helps to balance greening cities while water saving from both green and blue water resources. We employed remote sensing and artificial intelligence techniques to assess the water consumption and water footprint of a 780 ha public green space, the Adelaide Parklands in Australia. We estimated the green and blue water footprint of this green space (containing 29 parks) during 2010-2018 on a monthly basis. Our results showed that the mean total water footprint of the Adelaide Parklands was about 7.75 ggaliter per annum over 2010-2018; it varied from 7.19 ggaliter/year in 2018 to 8.45 ggaliter/year in 2012. The blue water footprint was consistently higher than the green water footprint even in wet time of the year. We suggest implementing sponge city and water sensitive urban design (WSUD) techniques to help greening cities while reducing the water footprint of urban green spaces. These approaches have the potential to lessen the pressure on blue water resources and optimise the consumption of green water resources.