

Hamideh Nouri

Postdoctoral research associate, University of South Australia

Topic: Optimizing Irrigation of the Adelaide Parklands Using Field-based and Remote Sensing-based Approaches

Abstract: This study aimed to tackle some of the complex challenges associated with improving water use efficiency, implementing irrigation best practice and management of nutrient loadings resulted by recycled wastewater irrigation in urban green spaces. Evapotranspiration (ET) estimation, the key indicator of plants water need and irrigation requirements, has benefitted from recent advances in remote sensing and GIS techniques particularly in agricultural applications rather than urban environments. This study examines whether remote sensed data could be used to model ET in heterogeneous urban vegetation. The relationship between urban vegetation ET and vegetation indices derived from newly-developed high spatial resolution WorldView-2 imagery was explored. Normalized Difference Vegetation Index (NDVI) values were derived for each category of urban landscape cover, namely trees, shrubs, turf grasses, impervious pavements, and water bodies. Urban landscape ET rates were estimated through field monitoring using observational-based landscape coefficients. The significant positive correlation between remote sensing-based ET and field-based ET demonstrates the performance and validity of a remotely-sensed ET estimation approach using high resolution images for the mixed urban vegetation. Also, ET estimation using coarse resolution MODIS imagery strongly supported the capability and feasibility of predicting and monitoring ET rates from unstressed mixed urban landscape plantings.