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Vegetation Index-Deduced Crop Coefficient of Wheat (Triticum aestivum) Using Remote Sensing: Case Study on Four Basins of Golestan Province, Iran

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Abstract : Crop coefficient (Kc) is an important factor contributing to estimation of evapotranspiration, and is also used to determine the irrigation schedule. This study investigated and determined the monthly Kc of winter wheat (Triticum aestivum L.) using five vegetation indices (VIs): Normalized Difference Vegetation Index (NDVI), Difference Vegetation Index (DVI), Soil Adjusted Vegetation Index (SAVI), Infrared Percentage Vegetation Index (IPVI), and Ratio Vegetation Index (RVI) of four basins in Golestan province, Iran. 14 Landsat-8 images according to crop growth stage were used to estimate monthly Kc of wheat. VIs were calculated based on infrared and near infrared bands of Landsat 8 images using Geographical Information System (GIS) software. The best VIs were chosen after establishing a regression relationship among these VIs with FAO Kc and Kc that was modified for the study area by the previous research based on R² and Root Mean Square Error (RMSE). The result showed that local modified SAVI with R²= 0.767 and RMSE= 0.174 was the best index to produce monthly wheat Kc maps.

Keywords : crop coefficient, remote sensing, vegetation indices, wheat
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