

New method for retrieval actual evapotranspiration rate from satellite remote sensing data.

Mohd Idris Ali¹, Mazlan Hashim², Harun Shah M Zin³

¹ Civil Engineering & Earth Resources, *Universiti Malaysia Pahang*,
Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang Darul Makmur, Malaysia
Email: imamidrisali@gmail.com

² Institute of Geospatial Science & Technology (INSTeG)
Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
Email: mazlanhashim@utm.my

³ Faculty of Geoinformation and Real Estate
Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
Email: mazlanhashim@utm.my

Abstract: In many hydrological-related studies, determination of actual evapotranspiration rate (AET) is one of the determinant task. Even the availability of this information with in-situ measurement are limited points in a specific watershed. Systematically AET in a full-grid of the any specific large area watershed is only possible with the synoptic view of satellite remotely sensed data. Fully understanding of the satellite-hydrology has enable the creation of higher level products of AET with input of regional parameters covering the globe. To utilize such products at specific watershed, the validation and calibration at localized-level is very crucial. In this paper, we introduce a new approach a simple yet robust calibration of selected recent satellite high-level products of AET for deriving water-yield information, with input of widely used vegetation biophysical parameter NDVI (normalized difference vegetation index). In addition, this paper also highlights on the relationships of NDVI and AET for the period July 2000 to Jun 2005 and then independently validated for the period July 2005 to Jun 2010. Results of the study, indicated a significant correlation of NDVI with the derived-AET. The absolute analysis of satellite-derived AET and actual AET is also reported reasonably good agreement ($r^2=0.85$, $n=30$, $p<0.05$). It is concluded that AET could be estimated utilizing NDVI, as demonstrated, however the robustness to localized watershed need furthermore observation prior to the disseminating of multipliers and offset coefficients with respect to selected time be published.

Keywords: NDVI, Actual Evapotranspiration, digital image processing