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Disaggregation of remote sensing evapotranspiration data: from low to high spatial resolution

M. Vazifedoust (1), J.C. Van Dam (2), R.A. Feddes (3), W.G.M Bastiaanssen (4)

(1) Soil physics, Ecohydrology and Groundwater Management Group, Department of Environment of Sciences, Wageningen University, The Netherlands (Majid.Vazifedoust@wur.nl)

(2) Soil physics, Ecohydrology and Groundwater Management Group, Department of Environment of Sciences, Wageningen University, The Netherlands (Jos.vanDam@wur.nl)

(3) Soil physics, Ecohydrology and Groundwater Management Group, Department of Environment of Sciences, Wageningen University, The Netherlands (Reinder.Feddes@wur.nl)

(4) WaterWatch, Generaal Foulkesweg 28A, 6703 BS, Wageningen, The Netherlands (w.bastiaanssen@WaterWatch.nl)

Remotely sensed images of the Earth's surface have the potential to provide detailed information about evapotranspiration *ET*. However, due to resolution limitations of existing remotely sensed data, these data can not be used directly for routine estimation of *ET* from individual fields. Low spatial / high temporal resolution data from the Moderate Resolution Imaging Spectroradiometer (MODIS) have been used successfully for routine *ET* estimation, but they represent *ET* over a mixture of different fields with areas of 100 ha. On the other hand, high spatial / low temporal resolution images from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER), do not come frequently enough. Therefore, disaggregation of *ET* maps derived from low spatial resolution data having a high temporal resolution into high spatial resolution is needed. In this study, a new disaggregation technique based on linear aggregation of *ET* components within each MODIS pixel is proposed and applied in both the winter and summer growing season in Iran.

The performance of the disaggregaation model showed low absolute *ET* differences

and small RMSE ($ET_{difference}$= 0.87 mm d^{-1}, RMSE = 1.1 mm d^{-1}) on a summer day (17 August 2005). For a winter day (13 May 2005), the RMSE and mean of absolute *ET* differences were slightly higher ($ET_{difference}$= 0.89 mm d^{-1}, RMSE=1.12 mm d^{-1}). The overall disaggregated *ET* and observed ET map as well as their *ET* histograms matched each other quite well.