

Interactive comment on “Annual evapotranspiration retrieved solely from satellites’ vegetation indices for the Eastern Mediterranean” by D. Helman et al.

Anonymous Referee #1

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This paper has marginal scientific significance and quality but has potential to have good significance with revision. Its presentation style is acceptable.

The authors present two models to estimate annual scale evapotranspiration (ET) using remotely sensed vegetation indices at 250 m resolution. The models, accurately represented as empirical, are separately formulated for annual and perennial vegetation systems and rely upon accurate ET data from 16 flux stations deployed over the 2000 to 2014 time period.

This research has a useful role highlighting the base-level capability to estimate an-

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nual ET from vegetation indices. This is not a high bar but there is value in knowing potential ET accuracy when one has little supporting data or modeling sophistication. More generally the scientific value of this work is not significant due to its statistical, locally calibrated approach. A more productive research avenue would be to develop greater, not less, modeling sophistication, and to find better ways to combine all lines of evidence into the ET estimation process. The currently available data sets, even confining oneself to remote sensing data alone, are rich; so it is hard to justify approaches that avoid using such data. While the need for simplicity can be important for common adoption of the method by others, the practitioners of ET science are a sophisticated group and can handle more complexity. Considering the ground work done with simplified approaches using vegetation indices and temperature more than 30(!) years ago by people such as Carlson, Price, Seguin, Gurney ... plus many others I don't mention.. I am wondering how proposing such a simple approach could be considered tenable. Has the world not progressed with ET research much since then? My opinion is that this work goes in the wrong direction.

If one is to nevertheless make room for a regression study of ET vs. VI data, then there are aspects of the manuscript that should be strengthened. More details are needed to show readers statistical aspects of the 15 year data set: seasonal and annual variabilities of ET at each of the flux sites would help.

What can you say about the accuracy of ET from the flux sites? How can you verify your confidence in your regression equations? How representative is 2011 for comparing your empirical ET against MODIS and MSG ET estimates. Your statistical analyses, when considered as cover classes, do not seem strong with only ~7 samples per regression. A lesser concern is your choice of R vs. R² for statistics; of course using R² values will decrease the apparent strength of your regressions. No improvement of results at annual scales using LST data is not especially significant: VI data represent the long term vegetation patterns while LST data excel in identifying shorter term water stress events.

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