Hydrol. Earth Syst. Sci. Discuss., 10, C2992–C2994, 2013
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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Satellite based analysis of recent trends in the ecohydrology of a semi-arid region" *by* M. Gokmen et al.

Anonymous Referee #2

Received and published: 3 July 2013

This study analyzes the trends in the actual and potential evapotranspiration (ET), precipitation and a vegetation index (NDVI) in an endorheic basin (Konya) in central Turkey for the eleven-year period between 2000 and 2010. The study utilizes data from different sources including satellite-based products, surface meteorological observations and reanalysis data. Although the data have different resolutions, they were interpolated to a common resolution of 1 km, a relatively high resolution amongst such studies. The major findings of the study are that both ET and NDVI increase over the croplands while they decrease over the wetlands during the period, and that these changes occur in spite of the fact that neither precipitation nor potential ET changes over the same period.

The manuscript is well written, and the topic is interesting and a worthwhile contribution

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to the field, therefore I recommend the publication of the paper. Nevertheless, I would like the authors to address the following points, which, I think, may help improve the paper a bit further.

1. The period is relatively short for a trend analysis, especially when the climate parameters are considered. The reason for this (satellite data availability) has been mentioned in the paper. Also mentioned is the fact that there are other studies that considered short periods in their trend analysis. These are fine. I just wonder, though, how the temporal change of some parameters look for the significant change areas. Is it possible to make a plot that shows the temporal change in the parameters for irrigated crop and wetlands, for instance? The climate events such as drought may have a significant impact on the trends when relatively short periods are considered (see for instance, Voss, K. A., J. S. Famiglietti, M. Lo, C. de Linage, M. Rodell, and S. C. Swenson (2013), Groundwater depletion in the Middle East from GRACE with implications for transboundary water management in the Tigris-Euphrates-Western Iran region, Water Resour. Res., 49, doi:10.1002/wrcr.20078). 2. I am not quite sure whether the following sentence in the abstract (and other sections) is justified by the findings of this study, given the fact that the study does not involve a complete water budget calculation for the basin: "...which in turn caused drying out of the some of the wetlands and the natural vegetation which mostly depend on the groundwater, the main source of irrigation water as well." The link is through groundwater, and the study is not quantitative in that regard. The sketch in Figure 13 is good but it is subjective. 3. I think it would be better to give more information (more than citing a reference) about the model evaluation because this study depends heavily on model estimated ET, and the reader readily needs to know more on the model performance. 4. One of the shortcomings of this study is that it depends on LCLU map that represents the 2006 conditions. We don't know how the LCLU and/or crop pattern changed in the basin over the period. Did you attempt to obtain/produce LCLU maps from satellite observations? 5. How do you explain ET becoming smaller over Lake Beysehir?

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 6193, 2013.

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