

Interactive comment on “Water requirements of the oasis in the middle Heihe River Basin, China: Trends and causes” by Xingran Liu and Yanjun Shen

Anonymous Referee #2

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This paper provides an assessment of the desert oasis water requirements during the past 3 decades in the middle Heihe River Basin. By using a GIS-based method, the proposed question of how and why the water requirement has changed during the period is answered. The regional water requirement is determined to be increased from 10.7×10^8 m³ in 1986 to 18.8×10^8 m³ in 2013. The extended planting area and the changes in land structure are confirmed to be the most important reasons for the increased water requirement, and climate changes does not significantly contribute to the trends. In general, the paper is clearly written, and the figures are informative and well presented. I have several minor comments for the authors to consider when revising the manuscript for publication (listed below line by line).

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Detailed comments:

1. Part 1, Introduction: In this part, the author failed to review the existing literature thoroughly, and thus cannot naturally leads to a judgment whether the work is novel and significant when compared with previous published reports.
2. Line 197-203, Upon the Kc values, how did you dealing with the differences in Kc among different crop species? In my opinion, this value could be very different even in different varieties of the same crop types, especially when considering the species evolution in history.
3. Line 162-170, the validating data you used for comparison is also a GIS-base one, which were produced by using almost the same method and the same procedure. I guess a ground-based observation dataset may be more reasonable for the validating purpose in this paper.
4. Line 210-212, how do you treat the groundwater-dependent forest in the ecotone of desert-oasis system and the irrigation-based forest grids in agricultural land system?
5. Line 353, more details about ETMonitor model are needed here.
6. Line 440-444, I believe there are more than one field station in this region and meteorological observation and flux measurements were performed regularly over there.
7. Line 450-454, You mentioned the uncertainty brought into the calculation by crop coefficient, but how much this uncertainty it could be? Is that small enough to let you get sound conclusion?

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