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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Groundwater Dynamics under Water Saving Irrigation and Implications for Sustainable Water Management in an Oasis: Tarim River Basin of Western China" *by* Z. Zhang et al.

Anonymous Referee #3

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The authors present an interesting case study of groundwater dynamics for the Tarim River Basin of Western China. The article is well written. The major concerns I have are that the article does not present some of the raw water balance data and reports only mean estimates of water balance terms with no uncertainty. It is difficult to trust conclusions drawn by the study without properly estimating uncertainty with the mass balance method used in the manuscript. With an inclusion of some of the raw data and basic uncertainty analysis I feel the article would be suitable for publication.

Comments:

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Discussion Paper

P1779 L22. An uncertainty of exchange flux should be reported with the mean.

P1786 L17. I am not sure what a phi20 evaporation pan is. Please explain more or provide reference.

P1786 L19. Please provide some detail about the soils? Type, %sand, %silt, %clay, bulk density, porosity, soil hydraulic parameters, etc. Difficult to assess rate of fluxes through soils without a qualitative or quantitative description.

P1787 L22. So what is the energy balance closure then, 10%? Please provide a graph documenting seasonal changes in LE, H, RN, G. Could also include monthly estimates of average diurnal cycle of energy balance terms. Hard to gain insight about how system works without seeing some basic data.

P1788 L5-10. Were the high changes in pore water conductivity due to brackish irrigation water accounted for in the estimates of volumetric water content using TDR methods? Please also present some of the raw data and report both the mean and uncertainty of the changes in water content with depth. Soil moisture is highly variable in space, how representative are the two profiles you instrumented to the larger study area? Difficult to trust EF value without first justifying changes in soil water content represent the entire field instead of 1 point in the 3.48 ha field.

P1790 L21. Porosity is not reported in manuscript, please provide with more description about the soil types.

P1793 L10. “soil water storage”.

P1799 L9. “which was common after previous flood irrigation events”.

P1800 L18. “salinization is problematic”.

Table 2. Please provide estimates of uncertainty as well.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 1777, 2014.