

Interactive comment on “Quantifying the impact of groundwater depth on evapotranspiration in a semi-arid grassland region” by M. E. Soylyu et al.

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We would like to thank Ty Ferre for his constructive review. He has pointed out two concerns, namely that:

(i) The paper is difficult to generalize, since it focuses on a specific field site. (ii) It would have been useful to show a comparison of the magnitude of errors due to the choice of model, discretization, and choice of hydraulic function.

These are both valid concerns, and our response is as follows:

(i) We used observed meteorological data as atmospheric forcing in our simulations, instead of synthetic data, in part because this is where we also have good forcing and

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validation information. Even though the observations are taken from one specific site in Nebraska, we tested the sensitivity of the models for various soil types, node spacing, and widely-used soil parameters and feel that the results are at least appropriate for other semi-arid regions. Although the comment by Ty Ferre is correct, in the sense that the results would likely vary by climate type, this is beyond the scope of our study, which is intended to be an initial assessment for future studies that could be extended to other climatic regions. Discussion is included in the conclusion section which indicates that more studies focusing on different climates and land cover types are needed, along with field validations to obtain generalizations for other climates.

(ii) Impacts of the choice of model, discretization, and hydraulic function on surface ET are illustrated in Figs. 4-6. While we appreciate the interest in quantifying these impacts more precisely (and concisely), it's clear that the range of "errors" is quite large and varies significantly with depth-to-groundwater (among other things). So attempting to quantify the magnitude of errors in a more distilled fashion than is presented in the figures could potentially be somewhat misleading, particularly given the concerns about different climate and land cover types. We do, however, include more discussion in the text that addresses the relative uncertainties in a more quantitative manner.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6887, 2010.

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