Hydrol. Earth Syst. Sci. Discuss., 7, C2822–C2823, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C2822/2010/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Quantifying the impact of groundwater depth on evapotranspiration in a semi-arid grassland region" *by* M. E. Soylu et al.

T. Ferre (Referee)

tyferre@gmail.com

Received and published: 11 October 2010

This is an interesting study comparing the effects of model complexity on estimation of flow of water from the saturated zone to the atmosphere throughh the vadose zone. Although the basic result is not surprising, that shallow water tables lead to increased flow through the vadose zone, it is worthwhile to have these fluxes and some of their sources of uncertainty documented. The limitation to the paper is that the results and discussion are focused on the examined site. While comparison with field data is a unique aspect of this study, it seems that more effort could have been made to generalize the findings in the discussion. At a minimum, this would help other researchers to identify the soil types and hydrologic/atmospheric conditions that are most likely to lead

to significant errors if this subsurface hydrologic mechanism is overlooked. For example, they note the depth of the critical zone as an important characteristic, but it would seem that this could be related to characteristics of the saturation vs pressure curve so that other researchers could make initial assessments for their conditions. Similarly, it would have been useful to attempt to compare the magnitudes of errors due to the choice of model, discretization, and choice of hydraulic function so that other researchers could prioritize their efforts Despite this shortcoming, the authors point to an important overlooked flux that could affect large scale models. In addition, like Faust et al., 2006, who showed the uncertainty of distributed model-based recharge estimates based on the selection of pedotransfer function, the authors point out how seemingly insignificant choices of supporting models can have dramatic impacts on model predictions.

Faust, A.E., T.P.A. Ferré, M.G. Schaap, and A. C. Hinnell. 2006. Can Basin-Scale Recharge Be Estimated Reasonably with Water Balance Models? Vadose Zone Journal, v. 5: 850-855.

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