

## ***Interactive comment on “Estimation of future groundwater recharge using climatic analogues and Hydrus-1D” by B. Leterme et al.***

**Anonymous Referee #2**

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The article is rather contrasted: one part is focussing on an interesting and difficult part, the interaction of groundwater and unsaturated zone that may lead to a change in the sign of the recharge. The other part is not convincing, with the use of contrasted meteorological data sets that are claimed to be analogues in the context of climate change.

The problem is that even the interesting part is not completely convincing, since there is no real computation of the interaction between the unsaturated and saturated zone: a constant piezometric depth is used and an empirical equation depending on this depth is used to estimate the flux between the two zones.

I understood that the piezometric head is not computed by the model, since the soil depth is fixed to only 3m depth. However, I might have missed this point, since there

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are not a lot of details given. If this is true, I will then suggest not accepting this article, since there is no new ideas nor interesting results.

If I'm wrong, and that there is really a computation of the groundwater depth and thus, of its interaction with the unsaturated zone, then, this article should be accepted after some major modifications. First, I suggest to add more results and discussions on the original part of the article, ie, on the estimation of the groundwater depth and estimation of the groundwater loss ( $q(n)$  flux). For instance how the piezometric level is computed in Hydrus-1D ? How does the  $q(n)$  flux vary ?

Then, I strongly recommend modifying the title that is confusing: “Sensitivity of groundwater recharge using climatic analogues and Hydrus-1D” is closer to the work presented.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1389, 2012.