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Hydrology and Earth System Sciences
Discussions

# *Interactive comment on* "Estimation of temporal and spatial variations in groundwater recharge in unconfined sand aquifers using Scots pine inventories" *by* P. Ala-aho et al.

**Anonymous Referee #2**

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The paper entitled "Estimation of temporal and spatial variations in groundwater recharge in unconfined sand aquifers using Scots pine inventories" applies a 1-D model Richards' based to estimate groundwater recharge in a stochastic framework. I'm not an English native speaker, so I reported very few language and style corrections. However, it seems to me that the paper seems well written. Specific comments are reported as notes in the attached pdf file "hess-2014-268-supplement.pdf"

General comments:

I agree with some comments reported by the reviewer 1. So I'll not repeat them. I'll just



remark my appreciation for incorporating LAI estimates, lichens characterization and the stochastic approach. Moreover, I agree with Reviewer1 that the paper should be reduced in the text (the M&M section is rather long). Other general comments to those of the Reviewer 1:

1. There is a confusion about the use of the terms evaporation, transpiration, evapotranspiration. In my opinion evaporation is the process when water leave in gaseous form the bare soil. No plant or crop should be involved in this process. Transpiration is, obviously, the same type of process involving only crop/plant system. The process from the understorey depend if the soil is bare or covered (partially) by vegetation. If the latter applies, it is an evapotranspiration. If everywhere under the forest there are lichens, we can assume this floor as an evaporating surface, assuming no transpiration from the lichens. This is not a semantic question, because through the paper (i.e. in the M&M and Results section) it is not clear at which process the Authors refer.

2. The soils. This is a problem of the manuscript. It seems to me that the Authors mix soil with the rock/geological material underlaying the soil. The Authors tend to call "soil" all the material between surface and groundwater. This isn't correct. Moreover, just at the end of the discussion they speak about homogeneity of the simulation domain. They do not support this statement with any analysis/observation. And what about the lichens? Till which depth they occur? So, I was not able to understand the reasons and evidence of homogeneity of the simulation domain. They should better clarify this. Summarizing, the Authors should review the simulation domain, reporting a scheme of it or at least they should clearly report in the text or in a table the different depths of the simulation domain.

I propose to publish the paper after a major revision.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/11/C4766/2014/hessd-11-C4766-2014-supplement.pdf

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 7773, 2014.