

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 #1

Received and published: 25 July 2014

General comments:

The method used in the paper to estimate leaf area index from forestry inventories introduces a new approach for incorporating large spatial coverage of detailed conifer canopy data into groundwater recharge estimations. The lichen layer covering the soil surface was explicitly accounted for in the simulation set-up, which is a novel modification. The paper is well written and technically sound. I like that a sensitivity analysis was performed for the model analysis.

Specific comments:

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The paper seems excessively long. I recommend reducing the text, such as in the Discussion section.

Throughout the paper, please change the word “depth” to “thickness” in reference to the thickness of the unsaturated zone. The unsaturated zone is the region between land surface and the water table and thus is not a “depth”.

Page 18: Not simulating the water table “for computational efficiency” is not a valid justification in my opinion. I recommend that the water table be included in the model to accurately simulate hydrologic processes such as ET.

Page 20, last paragraph: I don’t agree that the land surface is a reasonable representation of the water table “in the transition zone between recharge and discharge areas”. Please modify accordingly.

Page 23: In comparing the model recharge estimates to that from the baseflow method I recommend that the authors acknowledge that streamflow estimates are (at best) accurate to within 5% based on USGS data. Modify the text accordingly in relation to this qualifier.

1. Does the paper address relevant scientific questions within the scope of HESS? YES 2. Does the paper present novel concepts, ideas, tools, or data? YES 3. Are substantial conclusions reached? YES 4. Are the scientific methods and assumptions valid and clearly outlined? YES 5. Are the results sufficient to support the interpretations and conclusions? YES 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? YES 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? YES 8. Does the title clearly reflect the contents of the paper? YES 9. Does the abstract provide a concise and complete summary? YES 10. Is the overall presentation well structured and clear? YES 11. Is the language fluent and precise? YES, ALTHOUGH IN SOME CASES THE WORD “the” IS MISSING BUT NEEDED AS A FUNCTION WORD. 12. Are mathematical formulae,

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symbols, abbreviations, and units correctly defined and used? YES 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? THE PAPER IS RATHER LONG. I RECOMMEND THAT THE TEXT BE SHORTENED. 14. Are the number and quality of references appropriate? YES 15. Is the amount and quality of supplementary material appropriate? YES

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

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