

Interactive comment on “Modelling soil temperature and moisture and corresponding seasonality of photosynthesis and transpiration in a boreal spruce ecosystem” by S. H. Wu and P.-E. Jansson

Anonymous Referee #2

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***General Comments**

The manuscript “Modelling soil temperature and moisture and corresponding seasonality of photosynthesis and transpiration in a boreal spruce ecosystem” by Wu and Jansson presents a model study on the extent to which air temperature and soil temperature influence seasonality of photosynthesis and transpiration of a boreal spruce ecosystem in Sweden.

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The paper covers an interesting topic for a broad group of readers and highlights the importance in including the combined effect of soil and air temperature into forest ecosystem modeling. There is useful information on factors on which transpiration and photosynthesis responds to in a complex environment (seasonal snow and forests), thus contributing to extend the knowledge on a system that there is yet so much to learn about. Nevertheless, to me the novelty of the study is a bit worn out by being yet another study on model performance. It could be brought a step ahead by discussing potential implications of the results and relate to findings from similar studies (of which there are a few).

The manuscript is well written and literature is correctly used. Overall, the paper is good and presents methods and results in a clear and concise form, and following a logical approach.

***Specific Comments**

The paper is full of jargon making it a difficult paper to follow and this will potentially loose readers.

It would be interesting to relate the findings of the model output to findings from previous studies brought up in the Introduction. To me there is only a vague link between the Introduction and the Results and discussion.

It would be good with more study site description rather than references to this .

I find the long and precise subheadings (even in 3rd order) a bit awkward. For example, “3.3 Validity and seasonal patterns of simulated variables based on four model assumptions, 3.3.1 General ability of four model assumptions to simulate eddy covariance, soil temperature and soil moisture data”. These could be shortened.

Temperature response functions seem to play a big role in the study. Does the model already include empirical temperature response functions or are theses developed? If already included are there any references? If developed, how was that done?

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*Technical Comments

P6423 L18 & 20: I assume you here mean high temporal resolution and low temporal resolution data. P6427 L26-P6428 L5: This section goes better under Results and discussion. P6428, L4: delete period after Ts. P6428, L17: Is the growing season threshold a momentaneous threshold or a criterion that needs to be met for a certain length of time?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 6419, 2012.