
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

S. H. Wu and P.-E. Jansson

Thanks for your review and suggestions to improve the manuscript.

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.

AC

Yes we understand this and have added a connection to previous study on the temperature response on photosynthesis and transpiration.

RC

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.

AC

We have added some additional information about the site conditions also requested by second reviewer. In addition we adopted to the useful suggestions on the heading.

RC

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?

AC

We did not fully understand the question. The model consist of temperature response functions and the important role of the paper was that we could describe to which extent we could support the parameters in the equations based on the measurements available from the specific site. The paper includes all the important equations that are used to identify this. Additional information and background are in the references.

*Technical Comments

RC

P6423 L18 & 20: I assume you here mean high temporal resolution and low temporal resolution data.

AC Yes but we have changed this to be more clear in new formulation

P6427 L26-P6428 L5: This section goes better under Results and discussion.

AC

We do not agree this is the criteria used to constrain the model. However since they are based on the performance obtained we understand your point.

P6428, L4: delete period after Ts.

AC

Yes

RC

P6428, L17: Is the growing season threshold a momentaneous threshold or a criterion that needs to be met for a certain length of time?

AC

See comments also to second reviewer. The vegetation period and the temperature sum have roles in the regulation of the photosynthesis and also the transpiration. However there is a transition for the photosynthesis based on paramters. For the water uptake and transpiration there is a step change from one stomatal conductance to another. However, the regulation of the water uptake is made but the correspondence soil temperature.