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Hydrology and Earth System Sciences
Discussions

Interactive comment on "The effect of assimilating satellite derived soil moisture in SiBCASA on simulated carbon fluxes in Boreal Eurasia" *by* M. K. van der Molen et al.

Anonymous Referee #1

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Authors make an attempt to apply the remotely sensed soil moisture product ASCAT for observation–based adjustment of the soil moisture simulation in terrestrial biosphere model SiBCASA and compare the large scale anomalies in the observed soil moisture (METOP ASCAT) to one simulated by SiBCASA over Boreal Eurasia. The conclusion is not entirely positive. The ASCAT soil moisture product appears to agree with model simulation in the southern band, while showing less correlation in the tree-covered areas and tundra. Authors attribute the problems outside of the arid zone to the presence of snow and standing water. The study presents useful assessment of the current capability of the remotely sensed soil moisture product ASCAT for applications in the

ecohydrological modeling, thus has value for use in further developments amid hopes for practical applications of the soil moisture products. The manuscript is well written, and can be published after minor revision addressing the comments below.

General comments.

1. Authors rely heavily on SiBCASA simulation for large-scale comparison but did not mention any other model-simulated soil moisture products usable for comparison with ASCAT over Boreal Eurasia such as GLDAS (http://ldas.gsfc.nasa.gov/GLDAS/)

2. (page 9020 line 19) Authors effectively point at deficiency of the SiBCASA soil hydrology module during drought spells in Eastern Siberia. In dry Yakutsk Larix site, ample proportion of the water supply in spring and summer is provided by downward propagation of the active layer, and water is released from ice in the melting front, so water availability should be a function of the melting front propagation rather than active layer depth.

3. (page 9028 line 13) Higher correlation between SiBCASA and ASCAT is found in sparsely vegetated and steppe areas. However, there are two exceptions that deserve to be commented. As can be seen on Fig.4, correlation in August over steppe regions is good in Europe, West Siberian and deteriorates to the East. Poor correlation over Larix forest region, which is relatively sparse, also doesn't fit to the statement.

Minor corrections

p 9005 line 15. Abbreviation TER introduced without reference

p 9019 line 22. Could be "extent" in place of "extend".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 9003, 2015.