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Biogeosciences Discussions

Interactive comment on "Challenges and opportunities in modelling savanna ecosystems" *by* Rhys Whitley et al.

Anonymous Referee #2

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The topic of this review is interesting and highly relevant for improving and developing new ecological models for savanna ecosystem. It gives a detailed description of the complexity of savanna ecosystem dynamics by focusing on the main drivers which play a key role in controlling carbon and water fluxes of this ecosystem. The authors give clear recommendations on how should the ecological models be improved for having a better description of the savanna. I recommend publishing this review in Biogeosciences.

My minor comments are: (1) I found the description of additional dataset (ancillary and remote sensing data) which can be used to test the ecological model a little bit unclear. However, this part can be easily improved by the authors by adding more details on the variables which can be extrapolated from these datasets at the end of the session on "Datasets to inform model development" (P 18, L583). (2) A short discussion on the

scale mismatch between these datasets (including EC) and the model grid should be added in the "Model evaluation and benchmarking".

Specific comment

P5, L139: Please substitute "ecosystem types" with "ecoclimate regions"

P7, L183: Please define the two acronyms: LSM and DGVM

P9, L252: This should be section "3" and not section "2". Please check and re-number, where needed, all sections

P9, L252: Please eliminate ":" and the end of the title

P17, L524: Please eliminate "ground-based"

P17, L531-534: This sentence is not very clear for people that don't know very well how models and the eddy covariance system work. Please rephrase

P17, L534: I would like to use "ecosystem scale" instead of "spatial scale" to better give the idea of the spatial representativeness of EC data which are limited to the footprint area

P17, L534: Please refer to Aubinet et al., 2012

Aubinet, M., Vesala, T., and Papale, D.: Eddy Covariance – A Practical Guide to Measurement and Data Analysis, Springer, ISBN: 978-94-007-2351-1, 2012

P17, L535: Please add reference: Balzarolo et al., 2014; doi:10.5194/bg-11-2661-2014

P18, L567: Please explain NATT

P18, L583: Please revise this sentence, which is not very clear

P18, L573: Are you referring to long-term temporal predictions?

P21, L680: Please refer to Fluxnet (Baldocchi et al., 2001)

Baldocchi, D. D., Falge, E., Gu, L., Olson, R., Hollinger, D., Running, S., Anthoni, P., Bernhofer, C., Davis, K., Fuentes, J., Goldstein, A., Katul, G., Law, B., Lee, X., Malhi, Y., Meyers, T., Munger, J. W., Oechel, W., Pilegaard, K., Schmid, H. P., Valentini, R., Verma, S., Vesala, T., Wilson, K., and Wofsy, S.: FLUXNET: a new tool to study the temporal and spatial variability of ecosystem-scale carbon dioxide, water vapor and energy flux densities, B. Am. Meteorol. Soc., 82, 2415–2435, 2001.

P22, L693: Please also refer to NEON (National Ecological Observatory Network)

Figures

Figure 1: please add (a) and (b) in the figure and check the appropriate units to the y-axis (mean annual rainfall is correct in mm/month?)

Figure 2: it is not very clear the use of “2012” and “2011” in the legend. Please change or explain in the caption.

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