Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-450-RC2, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Dew frequency across the US from a network of in situ radiometers" *by* François Ritter et al.

Anonymous Referee #2

Received and published: 5 October 2018

Ritter et al. presents new results extending the work of Jacobs et al. 2006 using IR radiometers to provide surface temperature and infer dew deposition. The authors use data from NEON sites to calculate dew deposition frequency and duration and infer characteristics of optimal dew deposition conditions. The analysis is sound and the results very interesting. The paper is well written, and I do not have any minor comments.

There is, however, one gaping hole in this paper: there is no actual dew deposition measurement presented against the model. I understand that the work presented here is based on Jacobs et al. 2006, in which the model is compared to real data, but I think the method and the instruments are uncommon enough that a second set of dew deposition data could be helpful. This could be easily achieved by temporarily placing

a leaf wetness sensor in the field at one of the NEON sites for example. The goal would be to verify that the predicted dew deposition times are correctly calculated by the model.

My second issue is with the lack of details regarding the model and its parameters. Right now, the paper refers to Jacobs et al. 2006, but since the model is really at the heart of the work presented here, I think it would be beneficial to flesh out the details of the different terms, either in the body of the paper or as an appendix. I would also like to see a more extended discussion on other types of dew formation models and how they get around the surface temperature issue. See for example Richards 2009, Maestro-Valero et al 2012, Gerlein-Safdi et al. 2018 that took different approaches to dew modeling.

Richards, K. (2009). Adaptation of a leaf wetness model to estimate dewfall amount on a roof surface. Agricultural and Forest Meteorology, 149(8), 1377–1383. http://doi.org/10.1016/j.agrformet.2009.02.014

Maestre-Valero, J. F., Ragab, R., Martínez-Alvarez, V., & Baille, A. (2012). Estimation of dew yield from radiative condensers by means of an energy balance model. Journal of Hydrology, 460-461(C), 103–109. http://doi.org/10.1016/j.jhydrol.2012.06.046

Gerlein-Safdi, C., Koohafkan, M. C., Chung, M., Rockwell, F. E., Thompson, S., & Caylor, K. K. (2018). Dew deposition suppresses transpiration and carbon uptake in leaves. Agricultural and Forest Meteorology, 259, 305–316. http://doi.org/10.1016/j.agrformet.2018.05.015

Section 3.1.2: Please include some significance test with your r^2 values. P11, L20: Why would a high vapor pressure deficit cause fog formation?

Results and Discussion: as is often the case when results and discussion are lumped together, the "discussion" part of the section ends up being short-sighted and too focused on the results, as opposed to promoting a reflection on the broader implications

of the work. What are the consequences of the results for ecosystem function and water balance? Some of this is shortly mentioned in the Conclusion but really belongs to a Discussion section. I would advise breaking down the Results and Discussion Sections and moving some of the points from the Conclusion into the Discussion, to make sure that the important takeaways from this work aren't lost in the middle of the (many) figure descriptions. . .

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-450, 2018.