Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-450-AC1, 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.

François Ritter et al.

ritter.francois@gmail.com

Received and published: 15 December 2018

Dear anonymous referee 1,

First, thank you for your constructive comments and your interest in our study. We share the same disappointment concerning the absence of available flux measurements on the NEON sites, but this lack of data is temporary as NEON has planned to progressively update the database for the next years. This study is the first attempt of a continental dew analysis based on in-situ radiometric temperatures. It does not have the ambition to precisely constrain the nocturnal energy budget because too many parameters are unknown: density and emissivity of the canopy, cloud cover, ground

Printer-friendly version

Discussion paper

heat flux and independent latent and sensible flux estimations. Our conclusion now contains a stronger disclaimer on the goal and limitations of the study.

We have corrected all the minor comments you mentioned: The Bosveld et al. (1999) paper is now referenced, information on the IR-radiometers have been updated (angle, positioning), estimated uncertainties for the different measurements (RH included) have been added and a clarification has been brought to the close neighbors graph and the Fig. 6, the Energy balance. A couple of your comments required more attention:
"P5L29: The uncertainty of +/*0.5C in the Apogee sensor might as well by systematic between calibration events. Thus a simple sqrt(N) reduction of errors might be too optimistic, please comment. P6L6: Due to the dew process a moisture gradient between RH observation level and the surface will occur. Please discuss the possible sensitivity of you duration estimates."
- In this study, the possible statistical bias introduced by either the uncertainty on the radiometric surface temperature or the difference in RH between the sensor location and the boundary layer of the leaf is analyzed Section 3.4. The Monte-Carlo simulation allows to see how the frequency of the dew events is shifted for a given dispersion around the mean surface temperature value. This shift is estimated to be 5% for a sigma of 0.2 Celcius.
- Our dew yield estimation based on the MO-theory is identical to previous direct dew measurements: 0.14+/-0.12 mm/night versus 0.13+/-0.10 mm/night (Tomaszkiewicz et al., 2015). This gives a good confidence in our statistics.

Please let us know if you have additional comments,

Best regards,

Printer-friendly version

Discussion paper

François Ritter

Bosveld, F. C., Holtslag, A., and Van Den Hurk, B.: Nighttime convection in the interior of a dense Douglas fir forest, Boundary-Layer Meteorology, 93, 171–195, 1999.

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

Printer-friendly version

Discussion paper