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Biogeosciences Discussions

Interactive comment on "How representative are FLUXNET measurements of surface fluxes during temperature extremes?" *by* Sophie V. J. van der Horst et al.

Anonymous Referee #3

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General comments:

The manuscript by van der Hort et al. gives a very interesting overview of global FLUXNET data availability - within an objectively pre-selected subset of FLUXNET stations - with a focus on how well temperature extremes are represented. The results are of good use for, above all, the modelling community. It might provide help for selecting suitable sites for validating models in the context of climate projections. This is what the authors propose.

I want to highlight that the results are interesting mainly because of their clear yet counter-intuitive character. For instance, the low correlation between the amount of

precipitation as well as mean temperature and the data availability are rather unexpected. Knowing that many factors other than (micro)meteorological play into the overall data availability, I think this study objectively summarizes the results using their own metric for an easy interpretation, without going into too much detail about the reasons (which is not the focus of this manuscript).

As a general comment on the used methodology I want to mention that using temperature measurements as the reference for data availability is confusing at first (as was mentioned by Referee 1). It seemes arbitrary and is clearly biased by the availability of temperature measurements. However, I understand from the author's response that they rely on actually measured data available at the respective FLUXNET site as one possible method. It would help, though, if this is expressed in more detail. After all, temperature is used as 'reference length' of time series, since the metric of measurement ratio requires the temperature to be available. This simple circumstance is not clearly described in the manuscript.

Also, a lot of possible comments related to shortcomings of the study (i.e., the qualitative character of the results) are dispersed with the caveat and comments in anticipation of criticism to certain points in the conclusion.

Minor comments:

p9 l08: It is important to always make clear whether the mean and tails refer to per-site or all sites

p3 l18: 'most observations' should be something like 'longest time series' or similar

p3 l38: A more widely used threshold is 10 Wm2, why is 1 used (instead of straightforwardly zero)? Also, how are erroneous measurements of shortwave radiation at night identified? Was this condition applied only if it seemes erroneous?

p4 l21ff: The numbers given on the following lines referring to Fig. 1, while given as approximates, are still inaccurate. E.g., the maximum ratio for Qh, Qle in 1b is clearly

rather at 30 degC than 20 degC.

p4 l23: 'affect instrumentation' is a very unprecise wording, as the measurements are affected

p4 l26: What is meant by '68 individual measurements'?

p5 l10f: This phrase seems odd and unnecessarily complicated, if meaning not representing the total amount of annual precipitation, please re-phrase.

p5 l14: from 'Qle and Qh, but for NEE, most are in cool sites...' I don't get this phrase. Should it read 'Qle and Qh but for NEE and most are in cool sites...'?

Figure 1: Please show more ticks on the y-axis.

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