

Biogeosciences Discuss., referee comment RC2
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Comment on bg-2021-314

Anonymous Referee #2

Referee comment on "Technical note: A view from space on global flux towers by MODIS and Landsat: the FluxnetEO data set" by Sophia Walther et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-314-RC2>, 2022

In the technical note "A view from space on global flux towers by MODIS and Landsat: The FluxnetEO dataset", Walther et al. presents a standardized procedure to extract, gap-fill and quality control remote sensing observations around >300 flux sites. This contribution is critical to the reliable integration of remote sensing and eddy covariance measurements for understanding ecosystem functions and changes. I am in support of its publication, and my comments are meant to help improve the note and make it more clear to the audience.

L34: As gap-fill is a key step in producing the dataset, perhaps it would be helpful to further clarify the general assumptions under these categories of methods. Other than the realistic considerations (i.e., generalizable, no need to use ancillary data) to do gap-fill only based on the remote sensing time series themselves, are there studies that suggest this method produce comparable results to complicated ones (i.e., the one that use ancillary meteo data).

L38: "contribution" means "study"?

L51: reference for "view zenith angles".

L136-137: I have some difficulties in understanding "The idea was to....instead of....". I feel the authors are arguing that their method is appropriate for the study though I cannot understand the second part of the sentence. "Valid data" means ancillary data or just the good quality data of the time series.

L154: it is not easy to understand the scaling method without carefully looking into some

equations in ANN C. Perhaps it is helpful to insert some equations here, such as $y = ax + b$, where x means MSC while y is the non-gap filled time series. Then we can get a and b from the equation for each time window, and then apply a and b back to MSC for gap filled y .

L175. Out of curiosity why do not use quality flag of MODIS here, any issue with the flag? By using statistical method only to remove the so-called outliers, are we risking removing some true extreme values?

L210. See my comment above regarding the description of the scaling method.

L336. From Fig. 6a it is not accurate to say LST is consistently 30% higher, it is only the slope that is around 1.3.

L338. Do we really see the "slope decreases markedly for the highest temperature"? The figure only shows that slope increases a bit with the height.

L389. For those sites with footprint less than 1km (which I think many sites are), how to define this aggregated snow flag. Are they either 0 or 1?

L401 – 404. I am also wondering the rationale for choosing mean seasonal cycle and median seasonal cycle in different datasets. I also have to say in FLUXCOM mean seasonal cycle of remote sensing data was used but here the use of median seasonal cycle seems to be prevailing.

L418. Valid snow cover < 60 days = snow does not occur at the site? I have a feeling the threshold is a bit large, e.g., a site with almost two months of valid snow cover might be considered to have no snow by this filter.

L450. To double check, do you mean for each time window we get a m and n ?

L455. There is a redundant "[]" in the equation. Perhaps also would be helpful to explain the terms in the equations.