

Biogeosciences Discuss., author comment AC2
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Reply on RC2

Haiyang Shi et al.

Author comment on "Variability and uncertainty in flux-site-scale net ecosystem exchange simulations based on machine learning and remote sensing: a systematic evaluation" by Haiyang Shi et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-46-AC2>, 2022

Response to referee comments

Referee #2

This study implemented a meta-analysis of current NEE prediction studies. Overall, the topic is interesting and the methodology is innovative, as few researchers in past studies have used R² or other accuracy metrics to compare models of different studies. Although the number of available models is not large, some of the findings of this study have adding-values and implications at the cross-study (different focus, data, models) level. This manuscript is of interest to BG readers (especially researchers using machine learning to predict NEE). The following issues should be clarified before acceptance.

Response: We would like to thank the reviewer for the positive comments and the time invested to review our manuscript. The revised manuscript will follow the reviewer's recommendations.

Main comments:

The authors have already mentioned the inconsistency between the area of the flux footprint and the area extracted from remote sensing data (e.g. 2x2 km). So, could the authors extract this information from the literature and further analyze this effect? I believe this analysis will be interesting.

Response: Thank you for the insightful comments. Indeed the scale of the explanatory variables affects how well they match the scale of the flux observations. We will consider discussing this issue more in-depth or extracting this information from the literature and further evaluate this effect in various PFTs.

The discussion section is not in-depth enough. The authors should adequately compare the differences between some conclusions in previous studies and the findings of this manuscript.

Response: Thank you for the insightful comments. We will further improve the discussion section of this manuscript by incorporating/comparing findings from previous literature (e.g., the study of uncertainty in modeling practices in some local studies).

Other comments:

In Table 1, GPP is also used as a keyword in the literature collection? Clarify.

Response: Our inclusion of the keyword GPP was to ensure that as much of the literature as possible was included because NEE was predicted along with GPP in some literature.

In Table 2, evapotranspiration (ET) is also used as a predictor. Is ET here the latent heat observed by the flux station? Clarify.

Response: We would modify it to 'evapotranspiration (ET) as the latent heat observed by the flux station'.

In Figure 8, the categories should be reordered.

Response: We will modify the order.

The area observed by the flux station should be larger than 100 x 100 m (usually a few hundred meters).

Response: We will modify it to 'a few hundred meters'. The observation extent of the flux footprint is influenced by many factors such as wind speed and therefore varies within a few hundred meters.