



EGUsphere, referee comment RC1  
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## **Comment on egusphere-2022-417**

Xu Lian (Referee)

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Referee comment on "Global and northern-high-latitude net ecosystem production in the 21st century from CMIP6 experiments" by Han Qiu et al., EGU sphere,  
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The authors investigated the future trajectories, patterns and uncertainties of northern ecosystem carbon fluxes using an ensemble of CMIP6 climate models. They found that under future warmer climates, the CMIP6 models project an overall enhanced net carbon uptake by the ecosystems, resulted from a tradeoff between NPP and RH increases. The spread of estimates across individual models is larger than that of the global average. The paper is methodologically sound, well written, and the results are nicely presented. I have a number of line comments on the manuscript, as given below. I would like to recommend its publication with the following possible revisions or clarifications.

Line comments:

Lines 113-114: It's better to use "ten models" directly, rather than "nine models with ten datasets".

Line 123: I don't understand why land surface temperature, rather than 2-m temperature, is used in this analysis. When people say ecosystem response to temperature, they often refer to air temperature.

Line 129: Do you mean the original annual outputs from models, or the annual values aggregated from original monthly outputs?

Line 130: If the model data are resampled to 1-degree global grids, this is supposed to be 360x180? Please clarify.

Lines 145-151: The model ensemble mean of global NEP is strongly higher than the estimate by the Global Carbon Project. What's the implications for the NHL NEP and future projections of NEP changes?

Lines 167-172: It's interesting to look at how the MHL mean NEP compares with the global mean, and whether this difference is contributed more by NPP or RH.

Figure 2 and 3: Please also include the multi-model ensemble mean result.