

Interactive comment on “Aboveground biomass in Inner Mongolian temperate grasslands decreases under climate warming” by Guocheng Wang et al.

Anonymous Referee #2

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The authors compiled in situ measurements and long-term experimental data to estimate changes in aboveground biomass over Inner Mongolia at a spatial resolution of 1 km. Moreover, the machine-learning model which was constructed using historical observations is applied to estimate aboveground biomass changes under future climate scenarios. Without implicitly considering the following two major comments, I would not recommend this paper to be published. In a warmer future, the rising CO₂ effect on aboveground grassland productivity was not considered. It is well established that the fertilization effect of rising CO₂ would greatly offset the warming-induced productivity loss in grasslands. Without considering the CO₂ effect, projections of aboveground biomass would be greatly biased in a warmer world. Note that the temporal dynamics was deduced from the analysis of climate drivers of spatial gradient in aboveground

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biomass. This space-for-time method was generally challenged by the fact that the climatic controls in space and time would be different. The authors have six long-term experimental sites, but unfortunately these valuable data set especially for evaluating the inferred long-term trend has not been explored. The authors should add new analyses and figures to evaluate the model-derived productivity changes in terms of mean, inter-annual variation and trend using these data. Minor comments: 1. Change the error of AGB unit “ka ha⁻¹” in Abstract Line 17. 2. A table showing the details of environmental drivers might be helpful. 3. In the future projection, current grazing intensity was kept stable, while it would not be consistent with RCP simulations under RCP4.5 and RCP8.5. Some hypothetical scenarios are necessary

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