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Interactive Comment

Interactive comment on "Impacts of climate change on growth period and planting boundaries of winter wheat in China under RCP4.5 scenario" *by* Z. Sun et al.

Z. Sun et al.

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Dear reviewer and editor, We really appreciate your spending precious time to provide comments for our paper. We have made following response to the comments of the second reviewer.

Reviewer: It would appear that the authors have attempted to use observational constraints to identify one single simulation from the CMIP5 multi-model. Contrary to the assertion of the authors, a very large component of uncertainty in climate projections at regional scales comes from the model response as opposed to the emissions scenario, and different GCMs can give very different regional climate responses.

Response: We know different GCMs can give very different regional climate responses. It's why we selected Multi-Model Ensemble (MME) scenario to reduce the uncertainty.

Our former studies[1,2] estimated the precision of the precipitation and temperature simulated by IPCC AR5 GCMs and MME, based on the observed data from 660 stations in China during 1996 to 2005. The process of accuracy evaluation of GCMs' simulations is shown as Fig.1. Multi-Model Ensemble (MME) takes the average of multiple Globle Climate Models (GCMs). Results show that the simulation precision of MME is better than that of any other GCMs, and the MME can reduce the uncertainty of a single GCM simulation in future scenarios. Therefore, it is more scientific and reasonable to select the scenario simulated by MME as the climate change condition, while studying subjects related to climate change. In this study, the MME is used to reduce the uncertainty of climate projections sourced from different regional climate responses between different GCMs.

Anyway, we only simulate the impact of climate change on crop growth period and boundary under the condition of GCM MME scenario within this study.

We hope that the interpretations can give a more accurate understanding.

Thank the reviewer and editors again for comments. With Kind regards, Authors

[1] Sun Z, Jia S F, Lv A F, et al. 2015. Assessment on precision of temperature simulated by the IPCC AR5 GCMs in China, 1996-2005[J]. Progress in Geography, 34(10): 1229-1240. DOI: 10.18306/dlkxjz.2015.10.003 [2] Sun Z, Jia S F, Lv A F, et al. 2016. Precision estimation of the average daily precipitation simulated by IPCC AR5 GCMs in China during 1996-2005[J]. Journal of Geo-information Science, 18(2): 227-237. DOI: 10.3724/SP.J.1047.2016.00227

Interactive comment on Earth Syst. Dynam. Discuss., 6, 2181, 2015.

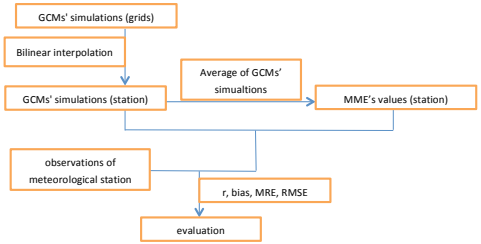

Fig. 1 The flow graph of the accuracy evaluation of GCMs' simulations

Fig. 1. accuracy assessment

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