

## ***Interactive comment on “Impact of revegetation of the Loess Plateau of China on the regional growing season water balance” by Jun Ge et al.***

**Jun Ge et al.**

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Response to Anonymous Referee #2

We thank the referee for their careful and thorough review of our manuscript. We expect to be able to revise the manuscript thoroughly to accommodate their suggestions. We provide an indication of how we will do this below.

Many of these edits will be clarification of our goals, the introduction and particularly the discussion. We do not expect our conclusions to change, but we do suspect there will be some additional caveats to ensure our conclusions cannot be misinterpreted.

Response to General comments

C1

We will modify the introduction as suggested by the reviewer to clarify our paper and add further to the discussion to clarify our new findings.

Response to Specific comments

1. We thank the reviewer for drawing our attention to some literature that we should have cited. We will modify the paper to accommodate some of these. We note some are in the Chinese literature and only available in Chinese – we will likely not incorporate these as this literature is not accessible to the readership of this journal.
2. The reviewer highlights issues with the rainfall response. We will clarify the text to resolve this comment. We agree models cannot fully explain the observed response, but equally observations are always limited in spatial and temporal extent. We will discuss this in a little more detail.
3. The data we use are based on MODIS and are therefore likely quite reliable even if they are not what we might expect.
4. This is a legitimate comment by the reviewer and we will comment on this in the revised paper.
5. We wanted to keep the same spatial resolution as WRF because we only changed the land cover in the Loess Plateau while other regions retained the default land cover. We will clarify this in the revised paper.
6. We will revise this text to clarify and ensure our conclusions are properly in context.
7. This is a demonstration that the signal, from revegetation, is small relative to the internal variability exhibited by WRF. We will clarify this in the revised paper.
8. This is a necessary caveat and could be an interesting area of future work. We can accommodate a brief discussion in the revised manuscript.
9. We will explain this in the revised manuscript as it is not straightforward. We thank the reviewer for highlighting this.

C2

10. Similar to comment #7, this is a demonstration that the signal, from revegetation, is small relative to the internal variability exhibited by WRF. We will clarify this in the revised paper.

11. Again, this is illustrating internal model variability in WRF under circumstances that the signal from the vegetation change is small. We will clarify this in the revised paper.

12. We will explore this and determine whether the additional figure adds value to our analysis and respond appropriately in the revised paper and responses to the reviewers.

13. We think this question is answered by Figures 10 and 11 but we acknowledge that the text does not fully explain this. We will clarify this in the revised paper.

14. Thank-you for drawing our attention to the Tobella et al. paper. The transferability of this paper to our study is not clear; it is an observational paper focused on Africa in a system where the forests and termites need to be considered together. However, the results of the paper do suggest a different sensitivity to those we find for the Loess Plateau and so we will try to incorporate this type of study into a brief discussion. The issue of whether there is an impact when averaged over several years positive and negative changes combine to no impact is obviously a question of timescale and the demand made on water resources. This is a legitimate comment by the reviewer and we will discuss it in the revised manuscript.

15. As with comment #9 this is not straightforward and we will revise the paper to ensure there is no confusion, and we properly discuss the implications of our results.

We thank the reviewer for the minor comments and will resolve those in the revised manuscript.

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