

## ***Interactive comment on “Data-based modelling and environmental sensitivity of vegetation in China” by H. Wang et al.***

**Anonymous Referee #1**

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### General comments

This paper makes a solid contribution to the task of projecting and understanding the response of vegetation to climate change, through its application of empirical (statistical) approaches for predicting the distribution of vegetation types, but with predictor variables that incorporate the mechanistic controls of vegetation. This fusion of a statistical, and what might be called semi-mechanical approach (which in principle should be extendible to modeling the response of individual species), helps to satisfy the demand for making predictions about vegetation and agricultural land-use types in the interim while mechanistic or dynamic vegetation models are still evolving from the state of being able to predict only taxonomically coarse-grained descriptions of vegetation (i.e. plant functional types and biomes) to more fine-grained descriptions.

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### Specific comments

Fig. 3. It would be interesting to see a lowess curve on the figure.

Fig. 4. There are some interesting sharp edges and linear features in the background scatter of points on the figure. Presumably these are related to built-in relationships among the predictor variables?

p. 53, line 24: “hypotheses” I think the list (a)-(d) would be better referred to as “underlying assumptions” because they are only indirectly tested here (by producing the paper). It would be useful to indeed test those assumptions, both individually and jointly, but that is not the focus of this paper.

p. 58, lines 9: I don’t understand why this calibration step was necessary, i.e. why the vegetation type with the highest predicted value from the GLM models could not be assigned as the predicted vegetation type. Also, the regression described here apparently uses probabilities as the response, which, unless the data were very well behaved, would suggest using a GLM as opposed to linear regression. Then why invert the regression?

p. 62, lines 20-25: I can see why the crop vegetation types might be under predicted, inasmuch as they could be considered to be imposed on the natural vegetation, but what explains the overprediction? (Oh, karst. p. 67, line 20)

p. 64, line, 5: This estimation is just by map comparison, right?

p. 66, line 7: “The empirical model makes no prediction. . .” I first thought this meant “no prediction of change” but apparently it means “no prediction at all.” How is that represented on the maps?

### Technical corrections

p. 55, line 15: 0.1 as opposed to 0.01 degrees?

p. 55, line 18: Gallego-Sala and Prentice (2013)?

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p. 55. line 21: mGGD0 and mGGD5. Cite Prentice et al. (2012b) for this?

p. 55, line 27: precipitation timing variables – not clear (and not discussed in the cited paper)

p. 60, line 1: What does the subscript on c-sub-i index? (And for that matter, why use c to mean two different things?)

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