Biogeosciences
Discussions

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Interactive comment on "Response of Net Primary Productivity of Zambezi teak forests to climate change along a rainfall gradient in Zambia" *by* Justine Ngoma et al.

Anonymous Referee #2

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The manuscript is straightforward and well written, and the research objectives are clearly defined, specifically projecting climate change effects on the Zambezi teak forest productivity along a rainfall gradient in southern Africa. The results are interesting; the authors projected a decrease in NPP at a drier site as a consequence of reduced rainfall with high temperature while the converse was in other two wetter sites in which the NPP is projected to be controlled by temperature and CO_2 concentration. It is noted that similar studies had been conducted at regional level, this study at the local scale is new. I found that some discussions are lacking to justify the significance of the study and I will point out some minor comments which I feel could be improved.

C1

1. The title could be improved again in my opinion; I found it a bit misleading as it sounds more like observational study than modelling study.

2. Page 3: The introduction doesn't describe much about the area of need for this study which I found it difficult to convince the readers the importance of this study. The authors state that Zambezi forests play a substantial role in mitigating climate change on line 24-25, but didn't elaborate further on this. I feel it is better to describe in details about the Zambezi forest in relation to NPP particularly the forest extent and carbon storage and also deficiency in the existing literature.

3. What are the uncertainties of projected changes in climate and NPP? I recommend to add error bars to the Figures 2, 7 and 8.

4. Page 6, line 28: LAI is a unitless measure.

5. Page 6, line 32: CAmax is not found in the listed equations.

6. Page 10, line 8-9: The authors described how much the rainfall will increase or decrease under RCP 8.5 but not for RCP 4.5. Please also provide values or statistics for RCP 4.5.

7. Page 16, line 23 to Page 17, line 7: I found these arguments or discussions are ambiguous and obscure. I don't understand what the authors mean by 'limited amount of soil water availability in LPJ-GUESS model'. Since the authors also discussed that the carry-over effects of rainfall on trees' productivity has been reported by other researchers, how does this be novel though?

8. Page 17, line 19-20: Please fix the typing error for 'As a result. . .'.

9. Page 18-19: Some acronyms are not found in Table 3 – JULES, ORCHIDEE, CEVSA, DLEM.

10. Page 19, line 3: Please fix the typing error. . . .in there physiological properties.

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