

Interactive comment on “Large-scale biospheric drought response intensifies linearly with drought duration” by René Orth et al.

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Received and published: 6 March 2020

The paper investigates responses of a variety of vegetation characteristics to soil droughts. The authors found the integrated vegetation response may have a linear relationship with drought duration, depending on the background aridity conditions. They further explain such a phenomenon from a water- or energy-limited regime of ecosystems. In general, the paper is well written and organized and I only have a few comments. Therefore, I recommend a minor revision to be warranted.

B1: We thank the reviewer for these positive comments.

The following lists my concerns or comments: 1) As the authors stated, there is no significant linear correlation between vegetation response and drought duration in wet

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areas (aridity index < 1), where ecosystems are energy-limited. Meanwhile, across regions of different aridity regimes, the vegetation response to drought duration is not linear as the slope (maybe we can call it intensity of vegetation response) increases towards wet regions. Thus, I suggest that the title may need revision or more accurate delimitation because its current form is somewhat misleading.

B2: We agree with the reviewer, and have added ‘in arid regions’ to the title.

2) Line 95: since all anomalies are scaled by standard deviation, how could they be still expressed as inter-annual standard deviations? It seems the authors are actually using z-score. Moreover, could the authors add some formulas for their computation? It will be helpful for readers to understand the data processing.

B3: The reviewer is correct, and we have clarified this point in lines 92-97:

“To enable direct comparison of anomalies across variables, and across observations and models, we compute z-scores. This is done by standardizing all anomaly values by dividing them with a characteristic variability value. This value is computed for each variable and each grid cell as the standard deviation across all half-monthly growing-season values. This way, all anomalies discussed and illustrated in this study are scaled by inter-annual standard deviations to be expressed as z-scores.”

3) Lines 116-118: references are required.

B4: We have added a reference to this statement in line 119.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-442>, 2019.

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