Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC1
https://doi.org/10.5194/bg-2021-206-RC1, 2021
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Comment on bg-2021-206

Anonymous Referee #1

Referee comment on "Spatially varying relevance of hydrometeorological hazards for vegetation productivity extremes" by Josephin Kroll et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-206-RC1, 2021

The study analyzed the connections between different types of hydrometeorological hazards and vegetation productivity extremes. The topic is important and worth exploring considering the scenario of more intense and frequent extreme weather events. Current work relies on limited datasets and statistical approaches, while lacking more comprehensive and in-depth analysis. My major concerns are as follows:

- Considering the uncertainties related to both SIF and re-analysis data sets, I would suggest the authors include additional data in the analysis to enhance the robustness of the work. For example, the NOAA vegetation health index (VHI) data have been widely used in monitoring global vegetation health and predicting crop yield (Kogan et al.,2004), which could be complementary to SIF in quantifying vegetation status. Similarly, the surface wetness anomalies derived from long-term satellite observations (e.g. Du et al., 2019) could serve as additional metrics to quantify extreme events.
- It would be valuable to add analysis based on plant physiology (e.g. Porporato et al., 2001; Kunert et al., 2017) for better clarification of the inner connections between vegetation growth and hydrometeorological hazards as compared to the correlation-based analysis.
- It seems to me the lagged vegetation responses to hydrometeorological hazards and the accumulated impacts from pro-longed drought/heat wave on vegetation need to be carefully addressed. Such component is currently missing in the manuscript.

References:

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