

Interactive comment on “Tree-ring responses to extreme climate events as benchmarks for terrestrial dynamic vegetation models” by A. Rammig et al.

Anonymous Referee #2

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The study focuses on interesting and worthwhile subject matter and it is well written. There is a strong demand to test assumptions in ecophysiological models and the extensive spatial and temporal nature of the historical tree ring dataset investigated by the authors may have potential to achieve this.

The authors conclude that “using radial tree growth is a good basis for generic model-benchmarks if the data are analyzed by scale-free measures such as coincidence analysis.” I fundamentally disagree with the statement. Studies focusing on the environmental sensitivity of tree productivity should work with the absolute growth rate of biomass. Working with standardized radial increment continues a bad precedent because (1) the age-based standardization does not adequately distinguish geometric,

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ontogenetic, and extrinsic effects on tree growth and (2) sensitivity of radial increment to extrinsic factors is not comparable with productivity, as universally defined by a flux density of mass or energy. The most likely explanation for the reported discrepancy between sensitivities of model net primary production and standardized ring width index to extreme climatic events is that the latter variable is only a subdimension of the system of interest. Expressing the results in relative terms (or scale-free terms) does not circumvent this problem and the development of new statistical methods as a means to deal with inadequacies in the type of observation being collected is not the right direction. If qualities of the cores used in this study disallow the authors from transforming ring width increment into absolute growth rate of biomass, then they will be of little value in advancing our understanding of the environmental sensitivity of tree growth.

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