

## ***Interactive comment on “Drought-associated changes in climate and their relevance for ecosystem experiments and models” by H. J. De Boeck and H. Verbeeck***

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In their manuscript titled "Drought associated changes in climate and their relevance for ecosystem experiments and models", De Boeck and Verbeeck present interesting details on climatic conditions during drought periods which are referred from a good data basis. Furthermore, the authors demonstrate by the help of a process-based model that neglecting associated climatic shifts during drought events besides precipitation itself can produce misleading results. I am not familiar with the applied model and I am not an expert on process-based models, therefore I cannot comment on the technical aspect of the simulation study. Style, language and use of references are well done.

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I have enjoyed reading this well prepared manuscript. The topic is timely and novel, the results are very relevant both for modelling and for experimental approaches for climate and climate impact research. I see one area for further improvement of the paper: The simulation study is currently restricted to one special case, i.e. the mean drought duration of 26 days. For this special case, very interesting differences between “natural drought” and “precipitation only” occur, which furthermore differ between vegetation types. I feel that the scope should be broadened here. I suggest testing at which drought duration this difference between vegetation types starts, and when the forests also begin to show reduced productivity. This could easily be done with the model as it is parameterized currently and a gradient of drought durations.

Some minor remarks:

465 lines 27 ff: Clear and testable hypotheses are missing

470 lines 24 ff: I would welcome more discussion on the definition of drought and its implications for this topic. The authors consider consecutive days without rainfall as a drought. But total amount during the vegetation period could also be a good definition, as the often cited summer of 2003 was not extreme concerning the first definition, but concerning the second.

470 line 15: this is my major point! When will they start to be limited? You can test this.

Figure 3: Differences and similarities between sites should be discussed. E.g.: GPP in the Braaschaat grassland differs considerably from the other two grassland runs, why?

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