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Biogeosciences Discussions

Interactive comment on "Constraints from atmospheric CO_2 and satellite-based vegetation activity observations on current land carbon cycle trends" *by* D. Dalmonech and S. Zaehle

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Comment of the reviewer: "The only major concern I have is that I miss a discussion of the approach's limitations to some extent. Often, climate and biosphere traits are only weakly correlated, which has implications for the interpretation of results"

Common to most of the evaluation schemes, data and model errors are not considered in the metrics used for model evaluation, as these are difficult to quantify in an objective way. This is the major limit to this (and all other) approach(es) and we discuss this more explicitly in the new version of the manuscript. In our case, model and data errors are not considered because they are unknown in most cases. Furthermore, at exception of

the cost-function metric, common metrics do not take in to account biases and random errors in their mathematical formulation. The cost-function metric, however, requires the knowledge of the structure of model and data error (see i.e. review of Raupach etal.2005 GCB), which is not available. Nevertheless, in selecting the characteristic traits of the observations and suitable metrics we considered the reliability of the data streams and only tested the model's capacity to represent robustly observed patterns. With regard to the biospheric traits and their relation with climate: Weak correlations do not necessarily imply insignificant correlations. We tested the significance of each statistical relationship and took the number of independent information into account .When comparing trend, correlations, and covariation (with or without link to climate variability), we underline the tendency of the system to respond in a specific way to external forcing/climate, or to respond instantaneously or with some lag. The metric selection works in this direction: They are more sensitive to difference in sign and difference of phase detected between data and model than the absolute strength of the correlation. This is the information that we are looking at most in terms of comparison, this is more robust that any direct numerical comparison.

Interactive comment on Biogeosciences Discuss., 9, 16087, 2012.