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Biogeosciences Discussions

Interactive comment on "Thermal adaptation of net ecosystem exchange" *by* W. Yuan et al.

Anonymous Referee #1

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Yuan et al.'s "Thermal adaption of net ecosystem exchange" is a welcome contribution to the already existing body of literature on thermal adaption of carbon exchange. Yuan et al. defines two key parameters Tb and To, which is the temperature an ecosystem transitions from a carbon source to sink and the optimal carbon uptake temperature, respectively. These two temperature points are of great interest, especially when comparing many ecosystems across a broad range of latitude and mean annual temperature. With the thought that air temperature will increase over the next 50-100 years, the need to accurately model/identify the ecosystems that can and cannot adjust optimal temperature for photosynthesis (To) as well as the temperature that ecosystems begin to sequester carbon (Tb) is important, both for management and political perspectives.

Yuan et al. picked 72 different sites, which vary in species composition and environmental conditions. Yuan et al. does a fine job at highlighting important environmental and plant community features that have been shown to have important effects on NEE

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e.g. forest age structure, solar radiation and drought stress. Yuan et al. goes through each of these important features to discuss how it affected Tb and To. Overall, Yuan et al. found similar results as past studies have found. While the results are not unique, they do strengthen what we already know between plant community structure, environmental conditions and carbon balance.

Yuan et al does a good job explaining how these types of studies, across many ecosystems, can be used to help with large-scale ecosystem models, both to constrain parameters, as well as to independently test models.

After having reviewed this manuscript, I feel no major changes are needed for publication, though some small grammatical edits are needed.

Interactive comment on Biogeosciences Discuss., 8, 1109, 2011.