

***Interactive comment on “Ecosystem effects of
CO₂ concentration: evidence from past climates”
by I. C. Prentice and S. P. Harrison***

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Received and published: 4 June 2009

In answer to this comment, our analysis confirms that the CO₂ effects simulated by most current models (including biogeography models such as BIOME4, and dynamic global vegetation models such as LPJ, JULES and ORCHIDEE) are broadly realistic, both for plant production (the ultimate source of all stored organic carbon) and for vegetation structure. We can't at this stage go much further. The palaeodata-model comparisons that can be made at present don't help in resolving controversial quantitative issues, such as the extent to which nutrient availability constrains CO₂ effects. On the other hand, the view that nutrient availability constraints are completely (or almost completely) dominant over direct CO₂ effects in the long term is not supported by our analysis. Similarly, our analysis cannot resolve the extent to which land use

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changes are involved in contemporary "woody thickening" in tree-grass mixtures; but it does show that CO₂ effects on tree-grass competition are substantial and should not be neglected.

Interactive comment on Clim. Past Discuss., 5, 937, 2009.