

Interactive comment on “Radiative forcing and feedback by forests in warm climates – a sensitivity study” by U. Port et al.

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Response to Referee 1

First we thank referee 1 for constructive comments and questions. Referee 1 mainly addressed two questions which we will answer below. The technical corrections suggested by referee 1 are well taken and, hence, will all be implemented in a revised version of our manuscript.

Question 1: In the simulation set-up, how did you choose the latitude marking the boundary between tropical and extra-tropical trees (Fig. 2)? In the Eocene, there is tropical vegetation well into the mid-latitudes. It looks as though the boundary is around 30 degrees. If it was done this way to facilitate comparison between the Eocene and

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pre-industrial, please state so. (This is addressed, in a way, in the last paragraph of the paper – perhaps include this sooner.)

Response: The boundary between tropical and extratropical trees was prescribed based on the climatic limits of tropical trees computed from off-line simulations using our dynamic vegetation model JSBACH and, as forcing, the climate simulations by Heinemann et al. (2009) for the Eocene climate and by Port et al. (2012) for present-day climate. This will have to be added in the revised version of our manuscript. As mentioned in our paper, the climatic limits computed for tropical trees in Eocene climate do not really match palaeobotanic evidence which indicate a more widespread distribution of tropical or tropical-like trees during the Eocene.

Question 2: The beginning of section 3, ‘Methods’, seems to indicate that these are ‘transient simulations’. . . If so, which forcing is varying in time in these simulations? I think these are not really ‘transient simulations’, rather they are ‘unequilibrated simulations’, as the approach of Gregory (2004) is applied to avoid having to run the simulations to full equilibrium. If indeed, there is a transient forcing in these experiments, this needs to be clarified (although, there doesn’t seem to be such a forcing).

Response: Referee 1 is correct in mentioning that the term ‘transient simulations’ might be misleading. Our simulations are transient in the sense that after an initial perturbation in land cover, the simulation proceeds towards a new equilibrium while the external forcing is kept unchanged. We will replace the term ‘transient simulation’ by more appropriate wording.

Interactive comment on Earth Syst. Dynam. Discuss., 6, 2577, 2015.

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