

Interactive comment on “The influence of vegetation dynamics on anthropogenic climate change” by U. Port et al.

Anonymous Referee #2

Received and published: 6 August 2012

General: This paper is not worth publishing as written and needs a major revision. To make worth publishing, the new science should be highlighted and the rest shortened.

Specific: 1) Please make it clearer whether land use coexists in the gridcell with natural vegetation in these simulations. I think you just say that "vegetation cover shifts due to land-use are neglected."

2) You say "Analyzing the impact of veg. dynamics on climate change on a time scale of several centuries is unique" BUT all the feedbacks that you describe are well known. So I recommend focusing on the new findings and, thus, shortening the manuscript significantly.

3) Relevant reference missing: Mathews et al. (2004)

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- 4) You say "vertical levels" but the correct terminology is "levels in the vertical"
- 5) p. 490 line 28 I think you need to add "further" between "and differences"
- 6) p. 492 line 19 I think you mean "northwestern South America" no? Also when you say "parts of western North America" do you mean "Alaska and eastern North America"
- 7) You seem to have skipped reference to Fig. 7 here. Figure references must ascend by one each time.
- 8) p. 493 line 9 I think you mean "a few gridcells of the Amazon region"
- 9) p. 494 line 26: why does tree cover continue to increase? And... p. 496 lines 11-16: Similar question about stronger water stress and weaker CO₂ fertilization. Are these stronger and weaker at any point in DYN relative to the control? Why are trees less sensitive than grasses? Are grasses C4? How come trees survive drought better than shrubs? Is this a model bug or feature that you need to address?
- 10) p. 496 line 20: you say "higher" but seems lower to me.
- 11) p. 497 line 7: do you mean to say Figure 12?
- 12) p. 497 line 17: You need to explain better. I see cooling in Nov, Dec.
- 13) p. 497 line 25: Does your model simulate trunks, branches, and twigs explicitly?
- 14) Up to here, I have a minor comment: Something about the organization and presentation feels more complicated and hard to follow than necessary. May help to insert subsections (to the existing or some alternate structure) associated with processes.
- ...and a major comment related to the minor one: The little new science that you present seems lost in all the old science. Please simplify and shorten the paper and focus on the few new things so that these may stand out easily.
- 15) p. 498 line 13, you say "the smaller cloud cover leads to a cooling since the loss

of thermal radiation is larger" and I wonder if this means that you are dealing with nighttime clouds here. Otherwise wouldn't you get an increase in incoming solar?

16) p. 499 line 5: Why are there no diffs in land, ocean, and atm. C storage between DYN and STAT before the emissions cease but there ARE diffs after the emissions cease?

17) p. 500 line 3: What simulation could you do to get this number without extrapolating?

18) The Conclusions section is more like a summary and could represent what the manuscript should look like after you shorten it, except in the sections where you will focus on new science.

Other than summarizing the results, please come up with some conclusions from this work.

20) At some point in the manuscript you distinguish biogeographical from biogeophysical and biogeochemical. Are you consistent in your usage of these terms throughout? Also would it be clearer to present "total biogeophysical" and "total biogeochemical" and "biogeophysical due to biogeographical" and biogeochemical due to biogeographical"?

21) Table 1: Forest is a biome. Do you mean trees?

Language issues: Not serious for the most part but should correct various mistakes.

Interactive comment on Earth Syst. Dynam. Discuss., 3, 485, 2012.

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