

Interactive comment on “Role of vegetation change in future climate under the A1B scenario and a climate stabilisation scenario, using the HadCM3C earth system model” by P. Falloon et al.

P. Falloon et al.

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We thank reviewer#2 for their constructive and thoughtful comments. In response (in capitals):

Major comments: The main deficiency of this study is that the authors totally elude the question of model evaluation and do not discuss the possible limitations of their modeling approach.

WE AGREE THAT THIS WOULD BE A USEFUL ADDITION TO THE PAPER. A REVISED MANUSCRIPT WOULD THEREFORE INCLUDE A DISCUSSION OF MODEL VALIDATION, COVERING CLIMATE ASPECTS BRIEFLY, AND VEGETATION DYNAMICS IN MORE DETAIL, BOTH REFERRING TO EXISTING STUDIES WHERE RELEVANT.

Overall the paper is very lengthy and it is relatively hard to follow because there is not clear thread throughout the text.

THANKYOU FOR THIS SUGGESTION, WHICH AGREES WITH REFEREE#1'S COMMENTS. AS NOTED IN OUR RESPONSE TO REVIEWER#1, IN A REVISED MANUSCRIPT WE WOULD THEREFORE SHORTEN THE MANUSCRIPT BY A) SHORTENING THE INTRODUCTION, B) REDUCING THE RESULTS SECTION AND ALSO C) REVISING SECTIONS 1.1-1.3 AS SUGGESTED, PLUS D) CONDENSING INFORMATION IN TABLES AND BAR PLOT FIGURES ETC. THE MAPS WILL BE MAINLY KEPT IN THE APPENDIX, BUT IT WOULD BE USEFUL TO KEEP SOME OF THESE (ALBEDO, TEMPERATURE?) TO BETTER ILLUSTRATE THE REGIONAL PATTERNS.

Specific Comments: How are vegetation distribution and carbon pools initialized in 1860 (in A1B-INTVEG. Can it affect the results?)

THIS IS FROM A LONG SPINUP SIMULATION TO ACHIEVE EQUILIBRIUM. WE WILL ADD DETAILS TO A REVISED MANUSCRIPT ON THIS, AND YES IT CAN AFFECT RESULTS IF THESE TWO ASPECTS ARE NOT IN EQUILIBRIUM, FOR EXAMPLE.

Why does figure 1 show the RCP scenarios? Is it useful for the discussion? If not it should be removed.

THIS IS TO MAINTAIN RELEVANCE TO THE FORTHCOMING IPCC REPORTS, WHICH FOCUS MAINLY ON RCP SCENARIOS, NOT SRES. THIS IS A USEFUL ADDITION AND SHOULD BE KEPT.

Why does the discussion start with a comparison between ECHAM5-MPI-OM and the IPCC models? Is it really the main point here?

THIS IS BECAUSE THE 2C20 SCENARIO DISCUSSED IN THIS PAPER HAS TO OUR KNOWLEDGE ONLY BEEN PERFORMED WITH ONE OTHER MODEL, ECHAM5-MIP-OM. HENCE DIFFERENCES FROM THE ORIGINAL ECHAM SIMULATION ARE HIGHLY RELEVANT TO THE DISCUSSION.

Are you sure that the radiative forcing for a doubling of CO₂ is the most relevant parameter to compare? Isn't Climate sensitivity a more relevant parameter (and more variable across models)?

WE CAN ADD A DISCUSSION OF CLIMATE SENSITIVITY IN ADDITION TO THE EXISTING DISCUSSION ON RADIATIVE FORCING FOR 2X CO₂.

Interactive comment on Biogeosciences Discuss., 9, 7601, 2012.