

Interactive comment on “Environmental change impacts on the C- and N-cycle of European forests: a model comparison study” by D. R. Cameron et al.

Anonymous Referee #1

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Cameron and co-authors compared the performance of four biogeochemical models in their capacity to estimate the CO₂ and N₂O balance of pine and beech over Europe. In addition to species differences, decadal differences, spatial patterns and model differences were studied. The presentation of the models and results is systematic. This, however, resulted in a wordy presentation that is extremely hard to digest. The manuscript would gain a lot by preparing a table that describes the main characteristics of the four models and at the same time presents the relevant processes that were not included in the models i.e. reduction of heterotrophic respiration under enhanced N deposition (Janssens et al 2010, Nature Geoscience). This table should also include information on initial model conditions. So basically the table should summarize the

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entire section 2 and subsequently the text of section 2 should be substantially reduced (avoid repetition between the table and the text). Such a table would help the readers to understand the differences and similarities between the models at a glance.

The result section is well structured but there is simply too much information to be digested. Again table(s) comparing the results for the four models would be useful and allow to reduce the text substantially. The current results section is a complete listing of the observations with little differentiation between minor and major results. The table(s) could contain all results the authors would like to share but the text should only contain the major findings that will be discussed in the discussion section. Figures 3, 4, 6, 7, 8 and 9 can now be classified as ‘color pattern comparison’. Most of these maps bear little information as most of the patterns seems reasonable. These data should be post-processed to the point that they support the objectives of the paper: comparing four models. The authors could consider to prepare summary graphs i.e. rather than showing four maps (one for each model), show a similarity map for all four models. Such a map will support the text better than the current series of maps.

Minor comments:

-Use the same units for C and N. C is now expressed per m², N per ha. This obscures the claim that the C flux is larger than the N flux.

-EU25+5 is not an official terminology. One can check which countries are part of the EU25 but the +5 is untraceable.

-Fig1, the claim that all the models have larger N₂O emissions for beech than pine is not clear from the figure. Use different scales for C and N.

- It is often stated that ‘the model is in closer balance in XX than in YY’ (i.e. p 11062, lines 4-5) it is not clear what is in balance and what is expected to be in balance and whether this balance is a numerical or ecological prerequisite.

-Several paragraphs start with none informative sentences such as ‘Before looking at

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how ...' or 'Before moving on ...'. If the text is well structured you can delete these sentences they don't add anything to the manuscript.

- Page 11076, line 24 e.f. Have a look at for example Dieleman et al 2010, Cell, Plant and Environment for a recent meta-analysis on the topic.

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