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Interactive comment on "How can effect the synergy of climate change, soil units and vegetation groups the potential global distribution of plants up to 2300: a modelling study for prediction of potential global distribution and migration of the N_2 fixing species *Alnus* spp." *by* A. Sakalli

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I would like to thank the anonymous referee #2 very much for the very useful comments about the manuscript. Hereby I would like to reply the referee for the comments. The references at the end of this response are also added to the manuscript. For avoiding the repetition of some long names in the comments, I would like to some acronym as

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fallow;

Acronyms:

Reply to General Comment: RGC

RGC-1: Since I was looking for the prediction of distribution and migration of genus *Alnus*, an applying simple model for this aim brings plenty of advantage for coupling or implementing the models like ADM in other biogeochemical models in order to model for instance the N_2 fixation by plant groups or species (i.e. Alder spp.). Certainly, using a detailed forest dynamics model can improve the distribution prediction on species level. Since the genus *Alnus* includes about 30 species (see P818 line 23), a detailed dynamic forest model should have a bunch of parameters for the prediction of the distribution of all alder species. For instance, the dynamic vegetation model LPG-GUESS includes specific parameters which can be related to the distribution of *Alnus incana*, *A. glutinosa*, and *A. rubra* (Garreta et al., 2010).

RGC-2: Since none of the ecosystem models includes the prediction of N_2 fixation by alder on global or regional level, information about the fixation was added only species level (see P818 line 21). My future purpose is to add a methodology for prediction of the alder density in potential distribution area, and predict thus the N_2 fixation by alder spp. on global level.

RGC-3: I choosed the alder spp. instead of other N_2 fixing plants because most of the models concern the main N_2 fixing plant groups i.e. legumes for prediction the N_2 fixation on regional or global level. Although the alder can fix ca. 20-320 kg·ha^{-1}·yr^{-1} (see P818 line 21), the N_2 fixation by this group is completely missing in the modelling studies. This was the reason, why I aimed to develop the ADM for simulation of the alder distribution globally. This information can be found in the introduction part of the manuscript.

References:

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Garreta, V., Miller, A. P., Guiot, J., Hely, C., Brewer, S., Sykes, M. T., Litt, T.: A method for climate and vegetation reconstruction through the inversion of a dynamic vegetation model. Clim Dyn, 35, 371-389, 2010. DOI: 10.1007/s00382-009-0629-1

Interactive comment on Biogeosciences Discuss., 12, 815, 2015.