

Interactive comment on “A simple model for predicting the global distribution of the N₂ fixing host genus *Alnus Mill.*: impact of climate change on the global distribution in 2100” by A. Sakalli

Anonymous Referee #1

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The author proposed a simplified empirical approach for estimating spatial pattern in N₂-fixing, and the approach is based on characteristics of alder group activity. To understand global nitrogen cycle and the interaction with carbon cycle and climate change, a role of N₂ fixing plants is important and the paper focusing point is interesting.

However, the paper might be not worthy of publishing to the journal, Biogeoscience. I think the paper needs two major improvements.

First, a validity of the method is suspect. The three equations are too simple comparing with other processes in general global nitrogen cycle model, and I doubt spatial-

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versatility of these equations, especially for global scale. In Fig.4, the author can't determine the validity of the method, because of too few evaluation points and just Europe. Moreover, the equations are also too simple for separating it into factors (Clim, Veg, Soil).

Second, a purpose of the model application is not clear. I understood general importance of alder, but I never find scientific knowledge provided from the author results. It means originality of the paper. I can't understand why the author estimated the model improvement using alder distribution. For example, why the author used four IPCC AR4 scenario?, why the author used several outputs of GCMs?, what the author can know by using results from simplified approach? The author needs to accumulate these discussions. Present paper is not scientific paper, similar to just report. The difference is originality. I hope the author will have more time for re-think and re-discuss.

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