

## ***Interactive comment on “Implications of incorporating N cycling and N limitations on primary production in an individual-based dynamic vegetation model” by B. Smith et al.***

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Response to anonymous referee #2

We thank the referee for constructive feedback and respond to the specific comments below.

“Similar to reviewer #1 I too have problems with the algorithm employed for the biological nitrogen fixation, but I also think that the authors reasonably discuss these limitations - this clearly is an issue to work on for future versions of the model”

Author response: We fully agree that the parameterisation of biological N fixation rep-

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resents an important uncertainty in our model, and global C-N models in general. We discuss these limitations in some detail on p18638,L26-p18639,L16 and understand both referees to be satisfied with our treatment of the question there.

“p. 18617, l. 12: the distinction between a plant canopy and ground-layer vegetation will only hold for forest ecosystems – maybe find a more general formulation?”

Author response: we have added that this applies not only to forests but other vegetation types having a woody element, such as shrublands and savannahs. We admit that the representation of size structure and demographics may not be critical for modelling dynamics of purely herbaceous vegetation such as grasslands.

“p. 18626, l. 17-22: it is not clear to me – is the Cleveland et al. or the LPJ-Guess ET compared to observational studies?”

Author response: It is the ET values used in the Cleveland et al. study that are referred to. We have attempted to clarify this.

“Might be worth adding ET to Table 1?”

Author response: We prefer not to extend the scope of the table to water fluxes, but now cite the global ET simulated by LPJ-GUESS for 1961-1990 in conjunction with the above statement on p18626.

“p. 18627, l. 11: a more quantitative statement would be warranted here”

Author response: We now provide the respective global GPP estimates.

“Fig. 4: is unfortunate in my view as much of the information is hidden – I suggest to redraw in a more conservative fashion without the 3D effect”

Author response: We chose the three dimensional format to emphasise the main information we are trying to convey, namely the degree of qualitative agreement between the chronosequence data and the model in terms of the relative size structure of shade-intolerant pioneer and shade-tolerant late successional tree species during suc-

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cessional development. In our opinion, a more traditional figure with 8 panels would tend to overload the viewer with information adding little to the overall “message”. We therefore prefer to retain the 3D format if this is acceptable to the editor.

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