Ps. Maximum 50 words per question

1. What is the scientific question you are addressing?

Does trait variability inclusion in vegetation models affect simulated responses of Amazon vegetation carbon storage in current climatic conditions and in a reduced precipitation scenario? How changes in the different components of functional diversity (richness, evenness, divergence and composition) with reduced precipitation determine Amazon carbon storage responses?

1. What is/are the key finding(s) that answers this question?

Trait variability improves representation of vegetation carbon storage by models.

Trait variability inclusion decreases vulnerability due to higher capacity of communities to functionally reorganize owing to the diversity of responses they hold.

Occupation of the functional trait space depending on trait variability affects how functional diversity components influence simulated carbon storage.

1. Why is this work important and timely?

We provide a modeling evidence that including trait variability is key to capture the vulnerability of ecosystems under climate change and how functional diversity determines ecosystem functioning. This is pivotal to achieve more accurate predictions in a time that climate change affects biodiversity at unprecedent rate and the impacts in ecosystems remain elusive.

1. Does your paper fall within the scope of GCB; what biological AND global change aspects does it address?

Biologically, our work helps in advancing the comprehension of the still uncertain effects of climate change on biodiversity (focusing on functional diversity) and how these effects impact ecosystem functioning and resilience.

Regarding global change aspects, we focused on the consequences of projected reduced precipitation in the vegetation of Amazon basin.

1. What are the three most recently published papers that are relevant to this question? This information will assist the Editors in selecting reviewers.

Schmitt, S., Maréchaux, I., Chave, J., Fischer, F., Piponiot, C., Traissac, S., & Hérault, B. (2019). Functional diversity improves tropical forest resilience: insights from a long-term virtual experiment. *Journal of Ecology*. https://doi.org/10.1111/1365-2745.13320

de Bello, F., Lavorel, S., Hallett, L. M., Valencia, E., Garnier, E., Roscher, C., … Lepš, J. (2021). Functional trait effects on ecosystem stability: assembling the jigsaw puzzle. *Trends in Ecology and Evolution*, *36*(9), 822–836. https://doi.org/10.1016/j.tree.2021.05.001

Carmona, C. P., de Bello, F., Mason, N. W. H., & Lepš, J. (2019). Trait probability density (TPD): measuring functional diversity across scales based on TPD with R. *Ecology*, *100*(12), 1–8. https://doi.org/10.1002/ecy.2876

Wieczynski, D. J., Boyle, B., Buzzard, V., Duran, S. M., Henderson, A. N., Hulshof, C. M., … Savage, V. M. (2019). Climate shapes and shifts functional biodiversity in forests worldwide. *Proceedings of the National Academy of Sciences*, *116*(15), 7591–7591. <https://doi.org/10.1073/> pnas.1904390116

6. You are required to suggest at least six reviewers which the Editor may consider. These suggestions must be without a conflict of interest with the authors including former or current coauthors (within the past 4 years), students, mentors and members of the same academic institution.

Isabelle Maréchaux: https://www.researchgate.net/profile/Isabelle-Marechaux

Sophie Fauset: https://www.researchgate.net/profile/Sophie-Fauset

Carlos Carmona : <https://www.researchgate.net/profile/Carlos-P-Carmona>

[Ceres Barros:](https://www.researchgate.net/profile/Carlos-P-Carmona) <https://www.researchgate.net/profile/Ceres-Barros>

Christine Lamana: <https://www.researchgate.net/profile/Christine-Lamanna>

Martin De Kawue: https://www.researchgate.net/profile/Martin-De-Kauwe