

Bárbara Rocha Cardeli, PhD.

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PROFILE SUMMARY

Ph.D. in Ecology, specialized in ecosystem modeling, biogeochemical cycles, and climate-vegetation interactions. My research integrates process-based models and machine learning to improve representations of biogeochemical cycles and to investigate climate change impacts on terrestrial ecosystems. I am part of the development team of CAETÊ-DVM, the first dynamic vegetation model in Latin America, within the AmazonFACE scientific program. My research interests encompass Earth system modeling, land-atmosphere interactions, climate science, environmental change, functional diversity, tropical ecosystems, and ecosystem resilience.

EXECUTIVE SUMMARY

- **CURRENT PROJECTS**

[AmazonFACE Project](#) — Assessing the effects of increased CO₂ on the resilience of the Amazon forest — Ph.D. candidate and contributor in [Ecosystem Modelling Research Area](#);

PROFESSIONAL EXPERIENCE

- **Post-doc Research** **2025 — ongoing**
Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), Earth System Modeling and Data Assimilation (ESYDA) division, Bologna, Italy.
Contributing to [CONCERTO](#), [ESA-CMUG](#), and [RESCUE](#) projects

EDUCATION

- **Doctor of Philosophy in Ecology (Ph.D.)** **2021 — 2025**
Earth System Science Lab, University of Campinas (Unicamp), Brazil
Thesis title: Functional Diversity and Provisioning Ecosystem Services: analysis of the Amazon Forest under climate change (Supervisor: Dr. David M. Lapola)
- **Research Fellow** **2024 — 2025**
Data and Modelling Department, Senckenberg Biodiversity and Climate Research Centre (SBiK-F), Frankfurt am Main, Germany.
(SGN Global Fellowship funding)

***Project:** Modelling the resilience of the alternative communities in the Amazon rainforest to climate change (Supervisor: Dr. Thomas Hickler and Dr. Mateus Dantas de Paula)*

- **Master of Science in Ecology and Biodiversity (MSc.)** **2019 – 2021**
Ecology Department, São Paulo State University (Unesp), Brazil
***Dissertation title:** Modelling of light competition and plant functional traits under CO₂ increase in Amazon rainforest (Supervisor: Dr. David M. Lapola)*
- **Bachelor in Biological Science** **2015 – 2018**
Pontifical Catholic University of Campinas (PUC-Campinas), Brazil

PUBLICATIONS

Cardeli, B. R., Dantas de Paula, M., Langan, L., Padsgurschi, M. C. G., ... , Hickler, T., & Lapola, D. M. (*manuscript in preparation*). Functional divergence and richness are key to ensuring Amazonian Ecosystem Multifunctionality under climate change.

Lapola, D.M., Blanco, C., **Cardeli B. R.**, Esquivel-Muelbert, A., Martinelli, J.V., Quesada, C.A.N., Rius, B.F., Silva-Junior, C.H.L. Not just semantics: CO₂ fertilization can be a disturbance leading to worldwide forest degradation. **Plants, People, Planet**. 2025. DOI: <https://doi.org/10.1002/ppp3.10601>.

Blanco, C. Darelha-Filho, J. P. **Cardeli, B. R.**, Rius, B. F., Hofhansl, F., ... & Lapola, D. M. A decade of trait-based vegetation modeling: lessons learned and pathways to advance our knowledge on functional ecology (*in review*). 2024.

Dantas de Paula, M., Schön, J., Wurz, A., **Cardeli, B. R.**, Homeier, J., Farwig, N. Hickler, T., Insect herbivory shapes functional diversity of trees in a tropical mountain biodiversity hotspot, Authorea (*in review*). 2024. DOI: <https://doi.org/10.22541/au.172660486.63435041/v1>.

Figueiredo, R., Llerena, J. P. P., Kiyota, E., Ferreira, S. S., **Cardeli, B. R.**, de Souza, S. C. R., ... & Mazzafera, P. The sugarcane ShMYB78 transcription factor activates suberin biosynthesis in *Nicotiana benthamiana*. **Plant Molecular Biology**, p. 1-17, 2020. DOI: <https://doi.org/10.1007/s11103-020-01048-1>.

CONFERENCES PRESENTATIONS

- **ORAL PRESENTATION**

CARDELI, B. R. et al., (2021), Modeling light competition in the Amazon forest: the effects of high CO₂ in functional diversity and biogeochemical cycle. **European Geosciences Union (EGU)**. DOI: 10.5194/egusphere-egu21-3514.

CARDELI, B. R. et al., (2023), Modeling the impacts of long La Niña's events and the reduced solar radiation on the functioning and functional diversity of a central Amazon forest. *American Geophysical Union (AGU)*.

CARDELI, B. R. et al., (2024), New modeling approach to evaluate the effects of climate change on plant functional diversity in the Amazon rainforest. *European Geosciences Union (EGU)*. DOI: 10.5194/egusphere-egu24-16900.

- **POSTER PRESENTATION**

CARDELI, B. R. et al., (2025), Functional divergence and richness are key to ensuring Amazonian ecosystem multifunctionality under climate change. **British Ecological Society (BES) Annual Meeting**.

SKILLS

- **MODELING & COMPUTATION EXPERIENCE**

Advanced experience in numerical modeling | Expertise in biogeochemical cycles modeling | Advanced programming skills (*Fortran90/95*, *Python*, *R*) | Advanced experience in GIS tools, observational and empirical datasets

- **LANGUAGES**

Brazilian Portuguese: Native | **English:** C1 (Advanced) | **Italian:** A2 (Basic) | **Spanish:** A2 (Basic)