



ELISA BRUNI

BIOGEOCHEMICAL
MODELER

 ORCID: 0000-0001-8074-0516

 bruni@geologie.ens.fr

 Paris  elisabruni  elisabruni

WHO AM I

I hold a **PhD** in Soil Science.
I use mathematical models to understand the dynamics of **biogeochemical cycles** in terrestrial ecosystems. I am interested in **microbial controls** on soil organic matter turnover and their implications for sustainable land management and **climate mitigation**.

TECHNICAL SKILLS

Mathematical modeling of dynamical systems
Programming (R, python, Julia, Matlab, basic Fortran and Linux)

LANGUAGES

 English
 French
 Italian
 Spanish
 Portuguese



WORKING EXPERIENCE

Visiting Fellow | FairCarboN mobility grant

Max Planck Institute for Biogeochemistry | Jena, Germany
March 2025

Integrating microbial diversity into soil carbon models: a hybrid modeling approach.

Post-doc | Sharing-MED

ENS (Ecole Normale Supérieure de Paris) | France
March 2024 - present

Studying the effect of conservation agriculture on soil health in Mediterranean drylands - modeling and data management platform.
Development of a web tool to support decision-makers

Post-doc | Holisoils

ENS (Ecole Normale Supérieure de Paris) | France
April 2022 - February 2024

Multi-modeling approach to study the effect of forest management on soil organic carbon stocks and greenhouse gas emissions in Europe.
Integrating microbial diversity in soil C and N models.

Research fellowship | FAPERJ

UFRRJ (Universidade Federal Rural de Rio de Janeiro) | Brazil
April 2022 - July 2022

Modeling the evolution of soil organic carbon stocks under conservation agriculture in tropical and subtropical climates



EDUCATION AND TRAINING

PhD | CLAND

LSCE (Laboratoire des Sciences du Climat et de l'Environnement) - Ecosys (INRAe) | France
December 2018 - March 2022

Soil organic carbon modeling: estimating carbon input changes required to reach policy objectives aimed at increasing soil organic carbon stocks - a multi-modeling approach

Training Course | ECOLAB | Cornell University, USA

June 2023 New advances in Land Carbon Cycle Modeling

Summer School | DySOM | TUM Institute Germany

September 2021 Dynamics of soil organic matter

Master II | CLUES

Climate, Land-Use and Ecosystem Services - AgroParisTech | France
2017 - 2018

Master I | EEET

Environmental, Energy and Transportation Economics - Université Paris Nanterre | France
2016- 2017

Bachelor Degree

Industrial Engineering - University of Bologna | Italy |
2012 - 2016



SELECTED PUBLICATIONS

Bruni, E., Yuste, J. C., Menichetti, L., Flores, O., Guasconi, D., Guenet, B., Hereş, A.-M., Lehtonen, A., Mäkipää, R., Pallandt, M., Pérez-Izquierdo, L., Richy, E., Santonja, M., Tupek, B., and Manzoni, S.: Microbial biomass – not diversity – drives soil carbon and nitrogen mineralization in Spanish holm oak ecosystems, *Geoderma*, 460, 117408, <https://doi.org/10.1016/j.geoderma.2025.117408>, 2025.

Bruni, E., Lugato, E., Chenu, C., and Guenet, B.: European croplands under climate change: Carbon input changes required to increase projected soil organic carbon stocks, *Science of The Total Environment*, 954, 176525, <https://doi.org/10.1016/j.scitotenv.2024.176525>, 2024.

Bruni, E., Guenet, B., Clivot, H., Kätterer, T., Martin, M., Virto, I., and Chenu, C.: Defining Quantitative Targets for Topsoil Organic Carbon Stock Increase in European Croplands: Case Studies With Exogenous Organic Matter Inputs, *Front. Environ. Sci.*, 10, 824724, <https://doi.org/10.3389/fenvs.2022.824724>, 2022.

Bruni, E., Chenu, C., Abramoff, R. Z., Baldoni, G., Barkusky, D., Clivot, H., Huang, Y., Kätterer, T., Pikuła, D., Spiegel, H., Virto, I., and Guenet, B.: Multi-modelling predictions show high uncertainty of required carbon input changes to reach a 4‰ target, *European J Soil Science*, 73, <https://doi.org/10.1111/ejss.13330>, 2022.

Bruni, E., Guenet, B., Huang, Y., Clivot, H., Virto, I., Farina, R., Kätterer, T., Ciais, P., Martin, M., and Chenu, C.: Additional carbon inputs to reach a 4 per 1000 objective in Europe: feasibility and projected impacts of climate change based on Century simulations of long-term arable experiments, *Biogeosciences*, 18, 3981–4004, <https://doi.org/10.5194/bg-18-3981-2021>, **2021**.



PROJECTS

Web interface development | me4soc

May 2024 v1 release - The **me4soc** platform for decision support:

<http://me4soc.geologie.ens.fr/>



SELECTED INTERNATIONAL CONFERENCES AND INVITED TALKS

Webinar UNFCCC – April 2024 – Soil Organic Carbon to Support National GHG Inventories: <http://bit.ly/3UP0qfi>

Centennial IUSS – 19-21 May 2024 – Florence (Italy) – ORAL – Conservation agriculture increases topsoil organic carbon stocks in Brazil – A multi-modeling approach

SoilCET – 24-26 January 2024 – Rueil Malmaison (France) – ORAL – Improving the simulation of CO₂ fluxes integrating microbial biodiversity into a simple soil organic carbon model

EGU23 – 24–28 April 2023 – Vienna (Austria) – ORAL – Modelling soil organic carbon stocks and greenhouse gases in European forests with multi-model ensembles

WCSS22 (World Congress of Soil Science) – 31 July - 5 August 2022 – Glasgow (UK) – ORAL – Reaching the 4 per 1000 target in Europe: feasibility and additional carbon input required

Eurosoil – 23-27 August 2021 – Geneva (Switzerland) – ORAL – Increasing soil organic carbon storage: the 4 per 1000 objective through a modelling based approach

ISMC (International Soil Modeling Consortium) – 18-22 May 2021 – ORAL – Increasing soil organic carbon stocks in agricultural fields: a multi-modelling analysis evaluating the carbon inputs required to maintain and increase soil organic carbon stocks in Europe