



# ELISA BRUNI

SOIL ORGANIC  
CARBON  
MODELER

Paris @ebruni93 @elisabruni

## WHO AM I

I hold a PhD in Soil Science. My work focuses on the simulation of the soil organic carbon cycle with a multi-modeling approach. I use calibration methods that enable the upscaling of model simulations from site to larger scales.

## TECHNICAL SKILLS

Mathematical modeling of dynamic systems  
Programming (R, python, Matlab, basic Fortran and Linux)  
Climate data analysis (CDO, NCO, Ferret)  
Spatial data analysis (GIS)  
Basic web design (HTML, CSS)

## LANGUAGES

English  
French  
Italian  
Spanish  
Portuguese



## WORKING EXPERIENCE

### 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

### 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. Development of a web tool to support decision-makers

### Visiting 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

New advances in Land Carbon Cycle Modeling | Cornell Univ  
June 2023

### Summer School | DySOM

Dynamics of soil organic matter - TUM Institute  
September 2021

### Master | CLUES

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

### Master | EEET

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

### Bachelor Degree

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



## RELATED ACTIVITIES

### Web interface development | me4soc

May 2024 v1 release - The **me4soc** platform for decision support: <http://me4soc.geologie.ens.fr/>

### Webinar | UNFCCC

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



## SCIENTIFIC PUBLICATIONS

**Bruni**, Elisa, Claire Chenu, Rose Z. Abramoff, Guido Baldoni, Dietmar Barkusky, Hugues Clivot, Yuanyuan Huang, et al. "Multi-modelling Predictions Show High Uncertainty of Required Carbon Input Changes to Reach a 4 % Target." *European Journal of Soil Science* 73, no. 6 (November 2022): e13330. <https://doi.org/10.1111/ejss.13330>.

**Bruni**, Elisa, Bertrand Guenet, Hugues Clivot, Thomas Kätterer, Manuel Martin, Iñigo Virto, and Claire Chenu. "Defining Quantitative Targets for Topsoil Organic Carbon Stock Increase in European Croplands: Case Studies with Exogenous Organic Matter Inputs." *Frontiers in Environmental Science* 10 (2022): 824724.

**Bruni**, Elisa, Bertrand Guenet, Yuanyuan Huang, Hugues Clivot, Iñigo Virto, Roberta Farina, Thomas Kätterer, Philippe Ciais, Manuel Martin, and Claire Chenu. "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, no. 13 (2021): 3981–4004.

Guenet, Bertrand, Benoit Gabrielle, Claire Chenu, Dominique Arrouays, Jérôme Balesdent, Martial Bernoux, Elisa **Bruni**, et al. "Can N<sub>2</sub>O Emissions Offset the Benefits from Soil Organic Carbon Storage?" *Global Change Biology* 27, no. 2 (January 2021): 237–56. <https://doi.org/10.1111/gcb.15342>.

Khurana, Swamini, Rose Abramoff, Elisa **Bruni**, Marta Dondini, Boris Tupek, Bertrand Guenet, Aleksi Lehtonen, and Stefano Manzoni. "Interactive Effects of Microbial Functional Diversity and Carbon Availability on Decomposition—A Theoretical Exploration." *Ecological Modelling* 486 (2023): 110507.

Le Noë, Julia, Stefano Manzoni, Rose Abramoff, Tobias Bölscher, Elisa **Bruni**, Rémi Cardinael, Philippe Ciais, Claire Chenu, Hugues Clivot, and Delphine Derrien. "Soil Organic Carbon Models Need Independent Time-Series Validation for Reliable Prediction." *Communications Earth & Environment* 4, no. 1 (2023): 158.

Simões-Mota, A., P. Barré, F. Baudin, Rosa M. Poch, E. **Bruni**, R. Anton, A. Enrique, and I. Virto. "Effects of Long-Term Sewage Sludge Addition to a Calcareous Soil on Soil Organic C Fractions and Soil Functions." *Geoderma* 445 (2024): 116868.

Ťupek, Boris, Aleksi Lehtonen, Alla Yurova, Rose Abramoff, Stefano Manzoni, Bertrand Guenet, Elisa **Bruni**, Samuli Launiainen, Mikko Peltoniemi, and Shoji Hashimoto. "Modeling Boreal Forest's Mineral Soil and Peat C Stock Dynamics with Yasso07 Model Coupled with Updated Moisture Modifier." *EGUsphere* 2023 (2023): 1–34.



## SELECTED INTERNATIONAL CONFERENCES

**EGU21** – 19-30 April 2021 – Vienna (Austria) – PICO - How much should we increase carbon inputs to the soil to reach a 4per1000 objective of soil organic carbon storage in European agricultural sites: a multi-modelling approach

**ISMIC** (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

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

**Young Soil Researchers Forum** – 21 October 2021 – JRC – ORAL - Assessing the feasibility of soil organic carbon stock increase in Europe with a multi-modelling ensemble

**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

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

**SoilCET** – 24-26 January 2024 – Rueil Malmaison (France) - ORAL - Improving the simulation of CO<sub>2</sub> fluxes integrating microbial biodiversity into a simple soil organic carbon model

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



## TEACHING ACTIVITIES

June 2024 | Introduction to process-based Modeling | SAFEST Summer School - UniPisa (Italy)

April 2024 | Soil Organic Carbon to Support National GHG Inventories | UNFCCC webinar

2022-2023 | Modeling soil organic carbon | Departamento do solo UFRRJ (Brazil)

2020-2014 | Soil organic matter modeling | M2 CLUES Module «Understanding and managing soil organic matter for ecosystem services delivery» AgroParisTech (France)

2020-2024 | Numerical Modeling | M2 CLUES Module «Numerical modelling» AgroParisTech (France)

2021- 2022 | Modeling | M2 GSSE «Gestion des sols et services écosystémiques» AgroParisTech (France)

2020-2021 | Internship Tools | M2 CLUES Module «Conseils et outils pour un bon stage» AgroParisTech (France)

2020 | Bioclimatology | 1A Module «Ecosystèmes continentaux» AgroParisTech (France)

2019-2020 | Industrial Ecology | 1A Module «Sciences de la production et la transformation» AgroParisTech (France)