

Rose Zheng Abramoff

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Areas of specialization

Climate Change • Terrestrial Biosphere Modeling • Ecology

Appointments held

- 2023- Research Scholar, Ronin Institute
- 2023- Project Scientist, Lawrence Berkeley National Laboratory
- 2022-2023 Associate Scientist, Oak Ridge National Laboratory
- 2018-2021 Postdoctoral Researcher, Laboratoire des Sciences du Climat et de l'Environnement
- 2015-2018 Postdoctoral Researcher, Lawrence Berkeley National Laboratory
- 2009-2015 Teaching Fellow, Boston University

Education

- 2015 PHD in Biology: Ecology, Behavior and Evolution, Boston University
- 2015 CERTIFICATE in Biogeochemistry, Boston University
- 2009 BA in Biology, Amherst College
- 2009 BA in Theater and Dance, Amherst College

Recent Grants & Fellowships

- 2023-2028 Schmidt Futures Virtual Earth System Research Institute (VESRI) Project: CALIPSO - Carbon Loss In Plants, Soils and Oceans Co-PI (\$10M across 12 institutions)
- 2023-2027 DOE Reaching A New Energy Science Workforce (RENEW) DE-FOA-0002757: Training a diverse STEM workforce to measure and model energy, water, and carbon budget Co-PI (\$800k across 2 institutions)
- 2022-2024 DOE Transformational Decarbonization Initiative LDRD: Selecting belowground processes for durable soil carbon No.11146 Co-PI (\$494k)
- 2021-2025 H2020 LC-SFS-22-2020 Forest Soils Research and Innovation Action No.101000289 Task Leader (10M€ across 20 institutions)
- 2020-2021 Marie Curie Individual Fellowship No.834169 (185k€)
- 2018-2020 [Make Our Planet Great Again](#) Fellowship (50k€)
- 2017-2018 LBNL EESA Early Career Development Grant (\$25k)

Selected Mentorship, Service & Outreach

- 2023 [Anthromes, CO₂, and Terrestrial Carbon](#) Workshop Co-Organizer
- 2022- AGU Soil Processes and the Critical Zone Technical Committee Co-Chair
- 2022-2023 American Academy of Microbiology Colloquium Steering Committee Member
- 2022- Postdoctoral co-advisor: Elisa Bruni
- 2021- AGU Soil Processes and the Critical Zone Technical Committee Member
- 2021- [Deep Soil Ecotron](#) Scientific Advisory Board Member
- 2019-2021 [Biogeo Seminar Series](#) Co-organizer
- 2019 Expert Reviewer for Working Group I IPCC Sixth Assessment Report
- 2018 ETH Zürich master's thesis reader: Valentino Weber
- 2017-2021 European Geophysical Union Member
- 2017-2018 [The Climate Music Project](#) Science Advisor
- 2014- Reviewer for 20+ journals, including: Nature Climate Change, Nature Communications, Global Change Biology, Ecology Letters, New Phytologist, Earth's Future, Soil Biology & Biochemistry, Journal of Ecology, Geoscientific Model Development, Biogeosciences, Agricultural & Forest Meteorology
- 2012- American Geophysical Union Member

Publications & talks

PEER-REVIEWED ARTICLES, BOOK CHAPTERS, AND POLICY BRIEFS

- 2023 Le Noë J, Manzoni S, **Abramoff RZ**, et al., Soil organic carbon models need independent time-series validation for reliable prediction. *Communications: Earth & Environment* 4:158, DOI:10.1038/s43247-023-00830-5 [Link to PDF](#)
- Hu J, Hartemink AE, Desai AR, Townsend PA, **Abramoff RZ**, , Zhu Z, Sihi D, Huang J, A Continental-Scale Estimate of Soil Organic Carbon Change at NEON Sites and Their Environmental and Edaphic Controls. *JGR:B Biogeosciences* 128:5, e2022JG006981, DOI:10.1029/2022JG006981 [Link to PDF](#)
- Abramoff RZ**, Ciais P, Zhu P, Hasegawa T, Wakatsuki H, Makowski D, Adaptation Strategies Strongly Reduce the Future Impacts of Climate Change on Simulated Crop Yields. *Earth's Future* 11, e2022EF003190, DOI:10.1029/2022EF003190 [Link to PDF](#)
- Lucash, MS, Marshall AM, Weiss SA, McNabb JW, Nicolsky DJ, Flerchinger GN, Link TE, Vogel JG, Scheller RM, **Abramoff RZ**, Romanovsky VE, Burning trees in frozen soil: Simulating fire, vegetation, soil, and hydrology in the boreal forests of Alaska. *Ecological Modelling* 481, 110367, DOI:10.1016/j.ecolmodel.2023.110367 [Link to PDF](#)
- Mäkipää R, **Abramoff RZ**, Adamczyk B, et al., Policy Brief 7: Forest soils can increase climate change mitigation with targeted management *European Forest Institute* DOI:10.36333/pb7 [Link to PDF](#)
- Mäkipää R, **Abramoff RZ**, Adamczyk B, et al., How does management affect soil C sequestration and greenhouse gas fluxes in boreal and temperate forests?- a review. *Forest Ecology and Management* 529, 120637, DOI:10.1016/j.foreco.2022.120637 [Link to PDF](#)
- 2022 Bruni E, Chenu C, **Abramoff RZ**, et al., Multi-modelling predictions show high uncertainty of required carbon input changes to reach a 4‰ target. *European Journal of Soil Science* 73, DOI: 10.1111/ejss.13330 [Link to PDF](#)

- Doetterl S, **Abramoff RZ**, Cornelis J-T, Frossard A, Fiener P, Garland G, Kaiser M, Laub M, Opfergelt S, Van de Broek M, von Fromm SF, Effects of abiotic factors affecting processes of soil organic carbon sequestration at different scales. in *Understanding and fostering soil carbon sequestration*, Ed. Cornelia Rumpel. Burleigh Dodds Science Publishing [Link to PDF](#)
- Todd-Brown KEO, **Abramoff RZ**, Beem-Miller J, Blair HK, Earl S, Frederick KJ, Fuka DR, Guevara Santamaria M, Harden JW, Heckman K, Heran LJ, Holmquist JR, Hoyt AM, Klinges DH, LeBauer DS, Malhotra A, McClelland SC, Nave LE, Rocci KS, Schaeffer SM, Stoner S, van Gestel N, von Fromm SF, Younger ML, Reviews and syntheses: The promise of big soil data, moving current practices towards future potential. *Biogeosciences* 19, 3505–3522, DOI:10.5194/bg-19-3505-2022 [Link to PDF](#)
- Georgiou K, Jackson RB, Vinduřková O, **Abramoff RZ**, Ahlstrom A, Feng W, Harden JW, Polley WH, Riley WJ, Torn MS, Global capacity and controls of mineral-associated carbon in soils. *Nature Communications* 13, DOI:10.1038/s41467-022-31540-9 [Link to PDF](#)
- Green J, Ballantyne A, **Abramoff RZ**, Gentine P, Makowski D, Ciais P. Surface temperatures reveal the patterns of vegetation water stress and their environmental drivers across the tropical Americas. *Globally Change Biology* 28:9, DOI:10.1111/gcb.16139 [Link to PDF](#)
- Riley WJ, Sierra C, Tang JY, Bouskill NJ, Zhu Q, **Abramoff RZ**, Next generation soil biogeochemistry model representations: A proposed community open source model farm (BeTR-S). in *Multi-Scale Biogeochemical Processes in Soil Ecosystems: Critical Reactions and Resilience to Climate Changes*, eds. Y. Yang, M. Keiluweit, N. Senesi and B. Xing.
- Abramoff RZ**, Guenet B, Zhang H, Georgiou K, Xu X, Viscarra-Rossel R, Yuan W, Ciais P, Improved global-scale predictions of soil carbon stocks with Millennial Version 2, *Soil Biology and Biochemistry* 164:108466, DOI:10.1016/j.soilbio.2021.108466 [Link to PDF](#)
- 2021 Saifuddin M, **Abramoff RZ**, Davidson EA, Dietze MC, Finzi AC, Identifying Data Needed to Reduce Parameter Uncertainty in a Coupled Microbial Soil C and N Decomposition Model. *JGR: Biogeosciences* 126:12, DOI:10.1029/2021JG006593 [Link to PDF](#)
- Huang Y, Ciais P, Santoro M, Makowski D, Chave J, Schepaschenko D, **Abramoff RZ**, Goll DS, Yang H, Chen Y, Wei W, Piao S, A global map of root biomass across the world's forests. *Earth System Science Data* 13:9, 4263–4274, DOI:10.5194/essd-13-4263-2021 [Link to PDF](#)
- Zhu P, **Abramoff RZ**, Makowski D, Ciais P, Uncovering the past and future climate drivers of wheat yield shocks in Europe with machine learning. *Earth's Future* 9:5, DOI:10.1029/2020EF001815 [Link to PDF](#)
- Abramoff RZ**, Georgiou K, Guenet B, Torn MS, Huang Y, Zhang H, Feng W, Jagadamma S, Kaiser K, Kothawala D, Mayes MA, Ciais P, How much carbon can be added to soil by sorption? *Biogeochemistry Letters* 152, 127–142, DOI:https://doi.org/10.1007/s10533-021-00759-x [Link to PDF](#)
- 2020 Zhang H, Goll D, Wang YP, Ciais P, Wieder W, **Abramoff RZ**, Huang Y, Guenet B, Prescher A-K, Viscarra Rossel R, Barré P, Chenu C, Zhou G, Tang X, Microbial dynamics and soil physicochemical properties explain large scale variations in soil organic carbon. *Global Change Biology* 26:4, DOI:10.1111/gcb.14994 [Link to PDF](#)
- 2019 **Abramoff RZ**, Torn MS, Georgiou K, Tang J, Riley WJ, Soil organic matter temperature sensitivity cannot be directly inferred from spatial gradients. *Global Biogeochemical Cycles* 33:6, 761–776, DOI:10.1029/2018GB006001 [Link to PDF](#)
- 2018 Contributing author to: 2nd State of the Carbon Cycle Report. Chapter 12: Soils [Link to PDF](#)
- Sulman BN, Moore JAM, **Abramoff RZ**, Averill C, Kivlin S, Georgiou K, Sridhar B, Hartman M, Wang G, Wieder WR, Bradford MA, Luo Y, Mayes MA, Morrison E, Riley WJ, Salazar A, Schimel JP, Tang J, Classen AT, Multiple models and experiments underscore large uncertainty in soil carbon

dynamics. *Biogeochemistry* 141:2, 109-123, DOI:10.1007/s10533-018-0509-z [Link to PDF](#)

Savage K, Davidson EA, **Abramoff RZ**, Finzi AC, Giasson M-A, Partitioning Soil Respiration: Quantifying the Artifacts of the Trenching Method. *Biogeochemistry* 1-11. DOI:10.1007/s10533-018-0472-8 [Link to PDF](#)

Abramoff RZ, Xu X, Hartmann M, O'Brien S, Feng W, Davidson EA, Finzi AC, Moorhead D, Schimel J, Torn MS, Mayes M (2018), The Millennial model: in search of measurable pools and exchanges in soil carbon cycling for the new century. *Biogeochemistry* 1-21, DOI:10.1007/s10533-017-0409-7 [Link to PDF](#)

2017 Georgiou K, **Abramoff RZ**, Harte J, Riley WJ, Torn MS (2017), Microbial community-level regulation explains soil carbon responses to long-term litter manipulations. *Nature Communications* 1223, 1-10, DOI: 10.1038/s41467-017-01116-z [Link to PDF](#)

Abramoff RZ, Davidson EA, Finzi AC (2017), A parsimonious modular approach to building a mechanistic belowground carbon and nitrogen model. *JGR Biogeosciences* 122, DOI:10.1002/2017JG003796 [Link to PDF](#)

2016 **Abramoff RZ**, Finzi AC (2016), Seasonality and partitioning of root allocation to rhizosphere soils in a midlatitude forest. *Ecosphere* 7.11, e01547, DOI:10.1002/ecs2.1547 [Link to PDF](#)

2015 Finzi AC, **Abramoff RZ**, Darby BA, Spiller KS, Brzostek ER, Phillips RP (2015), Rhizosphere processes are quantitatively important components of terrestrial carbon and nutrient cycles. *Global Change Biology* 21.5, 2082-2094, DOI: 10.1111/gcb.12816 [Link to PDF](#)

Abramoff RZ, Finzi AC (2015), Are above-and below-ground phenology in sync? *New Phytologist* 205.3, 1054-1061, DOI: 10.1111/nph.13111 [Link to PDF](#)

DATASETS & CODE RELEASES

2023 **Abramoff RZ**, Ciais P, Zhu P, Hasegawa T, Wakatsuki H, Makowski D, rabramoff/ProjectYield: First release of crop yield analysis. *Zenodo release of Github repository* DOI:10.5281/zenodo.7670875 [Link to Repository](#)

2022 **Abramoff RZ** rabramoff/Millennialv2: First release of Millennial. *Zenodo release of Github repository* DOI:10.5281/zenodo.6353519 [Link to Repository](#)

2021 **Abramoff RZ** rabramoff/DAMM-MCNPvo: First release of DAMM-MCNP. *Zenodo release of Github repository* DOI:10.5281/zenodo.5608424 [Link to Repository](#)

2017 Vaughn L, Zhu B, Bimueller C, Porras R, Curtis B, Chafe O, **Abramoff RZ**, Bill M, Torn MS, Soil Mesocosm CO₂ Emissions after ¹³C-glucose Addition, Soil Physical and Chemical Characteristics, and Microbial Biomass, Barrow, Alaska, 2014-2016. *Next Generation Ecosystems Experiment-Arctic, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (US)* DOI: 10.5440/1364061

2016 **Abramoff RZ**, Finzi AC (2016), Phenology and Carbon Allocation of Roots at Harvard Forest 2011-2013. *Long Term Ecological Research Network, Dataset*. DOI:10.6073/pasta/b2fe6d68f23ad815f62a022826028328

SELECTED INVITED ORAL PRESENTATIONS

2022 **Abramoff RZ**, Integrating empirical understanding of anthropogenic effects into soil models. ASA - CSSA - SSSA International Annual Meeting. November 2022.

Abramoff RZ, The hidden half and the hidden whole: belowground processes and human effects on biogeochemistry. BU Biogeoscience Symposium Keynote. May 2022.

Abramoff RZ, Leveraging measurements to constrain models of soil carbon cycling. UW Madison Soil Science Department Webinar. April 2022.

2021 **Abramoff RZ**, Guenet B, Zhang H, Georgiou K, Xu X, Viscarra-Rossel RA, Yuan W, Ciais P. Improved global-scale predictions of soil carbon stocks with Millennial Version 2. *American Geo-*

physical Union. December 2021.

Abramoff RZ, Ciais P, Zhu P, Hasegawa T, Wakatsuki H, Makowski D. Partitioning climate change impacts on yield variation due to temperature, CO₂ increase, and adaptation. ITES Soil Science Seminar. ETH Zurich. November 2021.

2020 **Abramoff RZ**, Microbes, minerals, and math: Mechanisms of soil C sequestration, the models used to make predictions, and their role in understanding global climate change. *Williams College Colloquium*, Williamstown

2019 **Abramoff RZ**, Georgiou K, Guenet B, Huang Y, Zhang H, Feng W, Jagadamma S, Kaiser K, Kothawala D, Mayes M, Camino-Serrano M, Ciais P, Maximum capacity of mineral-sorbed organic matter. *Soil process seminar*, LUKE, Helsinki

Programming Skills

R, Fortran, Python, Matlab, High Performance Computing