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EDUCATION

Ph.D. Global Change Ecology, University of Oklahoma, OK, Advisor: Prof. Yiqi Luo, 2015
M.Sc. Soil Science, University of Alberta, Canada, Advisor: Prof. Scott Chang, 2010
M.Sc. Ecology, Nanjing Forestry University, China, Advisor: Prof. Honghua Ruan, 2007
B.Sc. Ecology, Shandong University, China, 2004

PROFESSIONAL EXPERIENCE

Research Scientist in Modeling Institute for Environmental Genomics University of Oklahoma, Norman OK	Sep. 2021-Present
Postdoctoral Research Fellow Computational Earth Sciences Group Oak Ridge National Laboratory, Oak Ridge, TN	Sep. 2020-Sep. 2021
Postdoctoral Research Fellow <i>University of California, Irvine</i> , Irvine, CA 92697 Department of Ecology and Evolutionary Biology	June 2018-Sep 2020
Postdoctoral Research Fellow <i>University of Oklahoma</i> , Norman, OK 73069 Department of Meteorology	August 2015-May 2018
Graduate Research Assistant <i>University of Oklahoma</i> , Norman, OK 73069 Department of Microbiology and Plant Biology	August 2011-May 2015
Research Assistant <i>University of Alberta</i> , Edmonton, Canada Department of Renewable Resources	June 2010-July 2011
Graduate Research Assistant <i>University of Alberta</i> , Edmonton, Canada Department of Renewable Resources	August 2007-May 2010
Graduate Research Assistant <i>Nanjing Forestry University</i> , Nanjing, China Department of Forest Resources and Environment	August 2004-July 2007

PUBLICATIONS

2024

- [57] **Shi, Z.**, F. M. Hoffman, M. Xu, U. Mishra, S. D. Allison, J. Zhou, and J. T. Randerson. 2024. Global-Scale Convergence Obscures Inconsistencies in Soil Carbon Change Predicted by Earth System Models. *AGU Advances* 5:e2023AV001068.
- [56] Tao, F., B. Z. Houlton, S. D. Frey, J. Lehmann, S. Manzoni, Y. Huang, L. Jiang, U. Mishra, B. A. Hungate, M. W. I. Schmidt, M. Reichstein, N. Carvalhais, P. Ciais, Y.-P. Wang, B. Ahrens, G. Hugelius, T. D. Hocking, X. Lu, **Z. Shi**, K. Viatkin, R. Vargas, Y. Yigini, C. Omuto, A. A. Malik, G. Peralta, R. Cuevas-Corona, L. E. Di Paolo, I. Luotto, C. Liao, Y.-S. Liang, V. S. Saynes, X. Huang, and Y. Luo. 2024a. Reply to: Model uncertainty obscures major driver of soil carbon. *Nature* 627:E4-E6.
- [55] Tao, X., Z. Yang, J. Feng, S. Jian, Y. Yang, C. T. Bates, G. Wang, X. Guo, D. Ning, M. L. Kemper, X. J. A. Liu, Y. Ouyang, S. Han, L. Wu, Y. Zeng, J. Kuang, Y. Zhang, X. Zhou, **Z. Shi**, W. Qin, J. Wang, M. K. Firestone, J. M. Tiedje, and J. Zhou. 2024. Experimental warming accelerates positive soil priming in a temperate grassland ecosystem. *Nature Communications* 15:1178.

2023

- [54] Elias C Massoud, Forrest Hoffman, **Zheng Shi**, Jinyun Tang, Elie Alhajjar, Mallory Barnes, Renato K Braghiere, Zoe Cardon, Nathan Collier, Octavia Crompton, P James Denny-Frank, Sagar Gautam, Miquel A Gonzalez-Meler, Julia K Green, Charles Koven, Paul Levine, Natasha MacBean, Jiafu Mao, Richard Tran Mills, Umakant Mishra, Maruti Mudunuru, Alexandre A Renchon, Sarah Scott, Erica R Siirila-Woodburn, Matthias Sprenger, Christina Tague, Yaoping Wang, Chonggang Xu, Claire Zarakas. 2023. Perspectives on Artificial Intelligence for Predictions in Ecohydrology. *Artificial Intelligence for the Earth Systems*. <https://doi.org/10.1175/AIES-D-23-0005.1>, in press.
- [53] Chai, X., Li, G., **Shi, Z.** Ruan, H. Soil radiocarbon abundance in global forest ecosystems controlled by climate and soil properties. 2023. *Plant Soil* **489**, 125–137.
- [52] Li G, Chai X, **Shi Z**, Ruan H. Interactive Effects Determine Radiocarbon Abundance in Soil Fractions of Global Biomes. 2023. *Land*. 12(5):1072. <https://doi.org/10.3390/land12051072>
- [51] **Zheng Shi**, Forrest M. Hoffman, Min Xu, Umakant Mishra, Steven D. Allison, Jizhong Zhou, James T. Randerson. 2023. Uncertain predictions of soil carbon change during the 21st century. *Research Square*. preprint. <https://doi.org/10.21203/rs.3.rs-2973284/v1>
- [50] Zhang, Y., D. Ning, L. Wu, M. M. Yuan, X. Zhou, X. Guo, Y. Hu, S. Jian, Z. Yang, S. Han, J. Feng, J. Kuang, C. R. Cornell, C. T. Bates, Y. Fan, J. P. Michael, Y. Ouyang, J. Guo, Z. Gao, **Z. Shi**, N. Xiao, Y. Fu, A. Zhou, L. Wu, X. Liu, Y. Yang, J. M. Tiedje, and J. Zhou. 2023. Experimental warming leads to convergent succession of grassland archaeal community. *Nature Climate Change* **13**:561-569.
- [49] Tao, F., Y. Huang, B. A. Hungate, S. Manzoni, S. D. Frey, M. W. I. Schmidt, M. Reichstein, N. Carvalhais, P. Ciais, L. Jiang, J. Lehmann, Y.-P. Wang, B. Z. Houlton, B. Ahrens, U. Mishra, G. Hugelius, T. D. Hocking, X. Lu, **Z. Shi**, K. Viatkin, R. Vargas, Y. Yigini, C. Omuto, A. A. Malik, G. Peralta, R. Cuevas-Corona, L. E. Di Paolo, I. Luotto, C. Liao, Y.-S. Liang, V. S. Saynes, X. Huang, and Y. Luo. 2023. Microbial carbon use efficiency promotes global soil carbon storage. *Nature*. 10.1038/s41586-023-06042-3
- [48] Ma, S., L. Jiang, R. M. Wilson, J. Chanton, S. Niu, C. M. Iversen, A. Malhotra, J. Jiang, Y. Huang, X. Lu, **Z. Shi**, F. Tao, J. Liang, D. Ricciuto, P. J. Hanson, and Y. Luo. 2023.

Thermal acclimation of plant photosynthesis and autotrophic respiration in a northern peatland. *Environmental Research Letters*. Climate: **2**:025003.

2022

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2020

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2019

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2018

- [38] Li, Z., J. Xia, A. Ahlström, A. Rinke, C. Koven, D. J. Hayes, D. Ji, G. Zhang, G. Krinner, G. Chen, W. Cheng, J. Dong, J. Liang, J. C. Moore, L. Jiang, L. Yan, P. Ciais, S. Peng, Y.-

- P. Wang, X. Xiao, **Z. Shi**, A. D. McGuire, and Y. Luo. 2018. Non-uniform seasonal warming regulates vegetation greening and atmospheric CO₂ amplification over northern lands. *Environmental Research Letters* **13**:124008.
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2017

- [28] Wilcox, K. R*., **Z. Shi***, L. A. Gherardi, N. P. Lemoine, S. E. Koerner, D. L. Hoover, E. Bork, K. M. Byrne, J. Cahill, S. L. Collins, S. Evans, A. K. Gilgen, P. Holub, L. Jiang, A. K. Knapp, D. LeCain, J. Liang, P. Garcia-Palacios, J. Peñuelas, W. T. Pockman, M. D. Smith, S. Sun, S. R. White, L. Yahdjian, K. Zhu, and Y. Luo. 2017. Asymmetric responses of primary productivity to precipitation extremes: A synthesis of grassland precipitation manipulation experiments. *Global Change Biology* **23**:4376-4385. (*: Equal Contribution)

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- [25] Lu, X., Y.-P. Wang, I. J. Wright, P. B. Reich, **Z. Shi**, and Y. Dai. 2017. Incorporation of plant traits in a land surface model helps explain the global biogeographical distribution of major forest functional types. *Global Ecology and Biogeography* **26**:304-317.
- [24] Ren, C., F. Zhao, **Z. Shi**, J. Chen, X. Han, G. Yang, Y. Feng, and G. Ren. 2017. Differential responses of soil microbial biomass and carbon-degrading enzyme activities to altered precipitation. *Soil Biology and Biochemistry* **115**:1-10.
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2016

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2015

- [13] **Shi, Z.**, R. Sherry, X. Xu, O. Hararuk, L. Souza, L. Jiang, J. Xia, J. Liang, and Y. Luo. 2015. Evidence for long-term shift in plant community composition under decadal experimental warming. *Journal of Ecology* **103**:1131-1140.
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2014

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Before 2014

- [2] Teklay, T., **Z. Shi**, B. Attaeian, and S. X. Chang. 2010. Temperature and substrate effects on C & N mineralization and microbial community function of soils from a hybrid poplar chronosequence. *Applied Soil Ecology* **46**:413-421.
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FUNDING

Experimental-data-informed, machine-learning-enabled benchmarking and development of land carbon cycle in Earth system models. Department of Energy Research on Earth System Model Development and Analysis. \$630,000. Principal Investigator.

TEACHING EXPERIENCE

Soil carbon modeling – MEND model as an example. Spring 2023. Invited lecture.
Soil carbon and nitrogen modeling. Fall semester 2022. Seminar series.
Soil carbon and nitrogen modeling. Spring semester 2022. Seminar series.
Terrestrial ecosystem modeling. Spring semester 2021. Online class.

SELECTED TALKS

Shi Z. et al. 2021. Predicted soil carbon gain in Earth system models during the 21st century. American Geophysical Union. San Francisco, California, USA.

Shi Z. et al. 2019. The age distribution of global soil carbon inferred from radiocarbon measurements. American Geophysical Union. San Francisco, California, USA.

Shi Z. et al. 2018. Model structures amplify uncertainty in predicted soil carbon responses to climate change. Mini-symposium and short training course on new advances in land carbon cycle modeling. Flagstaff, Arizona, USA.

Shi Z. et al. 2017. Uncertainty in ecosystem carbon cycle under climate change: perspectives from long-term experiments and modeling. In Nanjing Forestry University, Nanjing, China.

Shi Z. et al. 2015. Application of data assimilation in ecosystem carbon modeling. Soil carbon workshop in Flagstaff, Arizona, USA.

Shi Z. et al. 2014. Differential effects of extreme drought on production and respiration: synthesis and modeling analysis. 99th ESA Annual Meeting, Sacramento, California, USA.

PROFESSIONAL SERVICE AND MEMBERSHIP

Reviewer for *Nature Ecology and Evolution*, *Science Advances*, *Ecology Letters*, *Global Change Biology*, *Journal of Ecology*, *Functional Ecology*, *Ecosystems*, *Journal of Geophysical Research: Biogeosciences*, *Science of The Total Environment*, *Ecological Modeling*, *Ecosphere*, *Oecologia*, *Agricultural and Forest Meteorology*, *Journal of Plant Ecology*, *Geoderma*, *Plant and Soil*