

Yu Zhou, Ph.D.

Research Associate, Lecturer

Department of Environmental Systems Science
ETH Zürich, Switzerland

yu.zhou@usys.ethz.ch

[Google Scholar](#)

[Personal Website](#)

EDUCATION

- Ph.D. **Geography**, Clark University, Worcester, MA, USA, 2021
Dissertation: *Improving Carbon Cycle Modeling with Flux Measurements, Forest Inventories, and Satellite Observations*
- M.S. **Geographic Information System and Cartography**, with Honors, Institute of Remote Sensing and Digital Earth, Beijing, China, 2015
Thesis: *Analysis of Spatial and Temporal Patterns of Water Use Efficiency in Central Asia*
- B.E. **Remote Sensing**, with Honors, Shandong University of Science and Technology, Qingdao, China, 2012

ACADEMIC APPOINTMENTS

- 2024– **ETH Zurich**, Switzerland
Research Associate, advised by Prof. Nina Buchmann, Department of Environmental Systems Sciences
SNSF CERES: Impacts of Air Pollution and Climate Extremes on the Resilience of European Forests
COST Action CLEANFOREST: Joint effects of CLimate Extremes and Atmospheric depositioN on European FORESTs
- 2022–2024 **Cornell University**, Ithaca, NY, United States
Schmidt AI for Science Postdoctoral Fellow, advised by Prof. Yiqi Luo from College of Agriculture and Life Sciences and Prof. Carla Gomes from Institute for Computational Sustainability
Schmidt Sciences: AI for Interpreting Dryland Carbon Dynamics
- 2021–2022 **Northern Arizona University**, Flagstaff, AZ, USA
Postdoctoral Fellow, advised by Prof. Yiqi Luo, Center for Ecosystem Science and Society
DOE LTER: Trait Adaptations to Atmospheric and Soil Aridity Across Dryland Species
- 2016–2020 **Clark University**, Worcester, MA, USA
Research Assistant, advised by Prof. Christopher Williams, School of Geography
NASA EVS2 Atmospheric Carbon Transport – America: Advancing Terrestrial Carbon Cycle Models with Atmospheric Carbon Data
NASA Carbon Monitoring System: Translating Forest Change to Carbon Emissions/Removals Linking Disturbance Products, Biomass Maps, and Carbon Cycle Modeling in a Comprehensive Carbon Monitoring Framework

RESEARCH INTERESTS

Carbon cycle science, nature-based climate solution, ecosystem ecology, climate change impacts, process-based modeling, machine learning/ artificial intelligence, remote sensing.

GRANTS & AWARDS

Grants

- 2023–2024 Schmidt AI for Science Postdoctoral Fellowship at Cornell University, on "Knowledge-guided AI for process-based understanding of global dryland ecosystems", funded by Schmidt Sciences (USD 150,000)
- 2017 Sussman Research Grant, Principal Investigator, on "Fusing Aboveground Biomass Measurements with a Biogeochemical Model to Improve Site-level Forest Carbon Flux Estimates", funded by Edna-Bailey Sussman Foundation (USD 7,275)

Awards

- 2020 Group Achievement Award for ACT-America project of NASA
- 2019 Purser Dissertation Enhancement Grant, funded by Clark University (USD 2,500)
- 2017 Travel Award of Max Planck Institute, Jena, Germany (EURO 2,000)
- 2012 Excellent Thesis Award of Shandong University of Science and Technology

Scholarships

- 2016 Libbey Graduate Fellowship, funded by Clark University (USD 3,500)
- 2014 National Scholarship for Graduate Student, funded by Ministry of Education, China (RMB 20,000)
- 2008–2012 First Class Scholarship of Shandong University of Science and Technology

PUBLICATIONS

Google Scholar: <https://scholar.google.com/citations?user=LUFxjnEAAAAJ&hl=en>

(* = corresponding author; underline = mentored student; reverse-chronological)

Selected Publications

- 2025 **Zhou, Y.** * and Williams, C.A., 2025. Forest carbon modeling improved through hierarchical assimilation of pool-based measurements. *Journal of Advances in Modeling Earth Systems*, 17(3), p.e2024MS004622.
- 2025 Luo, Y., Wei, N., Lu, X., **Zhou, Y.**, Tao, F., Quan, Q., Liao, C., Jiang, L., Xia, J., Huang, Y. and Niu, S., 2025. Large CO₂ removal potential of woody debris preservation in managed forests. *Nature Geoscience*, pp.1-7.
- 2023 Ruehr, S., Keenan, T.F., Williams, C., **Zhou, Y.**, Lu, X., Bastos, A., Canadell, J.G., Prentice, I.C., Sitch, S. and Terrer, C., 2023. Evidence and attribution of the enhanced land carbon sink. *Nature Reviews Earth & Environment*, 4(8), pp.518-534.

- 2021 **Zhou, Y. ***, Williams, C.A., Hasler, N., Gu, H. and Kennedy, R., 2021. Beyond biomass to carbon fluxes: Application and evaluation of a comprehensive forest carbon monitoring system. *Environmental Research Letters*, 16(5), p.055026.
- 2020 **Zhou, Y.**, Williams, C.A., Lauvaux, T., Davis, K.J., Feng, S., Baker, I., Denning, S. and Wei, Y., 2020. A multiyear gridded data ensemble of surface biogenic carbon fluxes for North America: Evaluation and analysis of results. *Journal of Geophysical Research: Biogeosciences*, 125(2), p.e2019JG005314.

Work in Progress

Zhou, Y. *, Gharun, M., Xiao, J., Guerrieri, R., Li, X., & Buchmann, N. Atmospheric Deposition Outweighs Dryness in Regulating European Ecosystem Productivity. *Ready to submit.*

Zhou, Y. *, Rudgers, J., Cui, E., Quan, Q., Litvack, M., Collins, S., Pockman, W., Lehmann, J., Xia, J., Wang, R., Sun, Y., You, F, Gomes, C.P., & Luo, Y. Decoupled atmosphere and soil dryness reduces species fitness revealed by functional traits. *Ready to submit.*

Gharun, M., Migliavacca, M., Angove, C., **Zhou, Y.**, Buckeridge, K., Branquinho, C., Collalti, A., Nybakken, L., Zhiyanski, M., Sarginci, M., Macháčová, K., Guidi C., Koren, G., Ostonen, I., Sell, M., Pers-Kamczyc, E., Aslan, T., Preece, C., Prikaziuk, E., Özkan, U., Vitali, V., Havrdová, A., Grünzweig, J., Tomelleri, E., Ullah, S., Stoeva, L., Nestola, E., Vanguelova, E., & Guerrieri, R. Effect of global change drivers on carbon fluxes and resilience of European forests. *Communications Earth & Environment. Under review.*

Chandel, A., Cattray, M., **Zhou, Y.**, Duong, H., Litvak, M., Pockman, W., & Luo, Y. Hydraulic Redistribution Decreases with Precipitation Magnitude and Frequency in a Dryland Ecosystem: A Data-Model Fusion Approach. *Biogeosciences. In revision.*

Zhou, J., Quan, Q., Huang, W., Hanson, P., Ricciuto, D., Mayes, M., Griffiths, N., Salmon, V., Weber, S., Jiang, L., **Zhou, Y.**, Shi, X., Chen, W., Zhang, Y., & Luo, Y. The fate of peatland carbon interactively determined by elevated carbon dioxide and warming. *Nature. In revision.*

Other Peer-reviewed Journal Articles

- 2026 Rudgers, J., and **co-authors**, 2026. Precipitation variability interacts with mean precipitation to restructure a semi-arid grassland community. *Ecology*. Accepted.
- 2025 Quan, Q., Zhou, J., Hanson, P.J., Ricciuto, D., Sebestyen, S.D., Weston, D.J., Chanton, J.P., Wilson, R.M., Kostka, J.E., **Zhou, Y.**, Wei, N., Jiang, L., Mayes, M.A., Stelling, J.M., Richardson, A.D., Dusenge, M.E., Way, D., Warren, J., and Luo, Y., Drought-induced peatland carbon loss exacerbated by elevated CO₂ and warming. *Science* 390, 367-370 (2025). DOI: 10.1126/science.adv7104.
- Dong, Y., **Zhou, Y. ***, Zhang, L., Tian, F., Xie, Q., Chen, Y., Ruan, L. and Zhang, B., 2025. An Enhanced Phenology Dataset for Global Drylands from 2001 to 2019.

- Scientific Data*, 12(1), p.1167.
- 2023 Dong, Y., Zhou, Y.*, Zhang, L., Gu, Y. and Sutrisno, D., 2023. Intensive land-use is associated with development status in port cities of Southeast Asia. *Environmental Research Letters*, 18(4), p.044006.
- Hou, E., Ma, S., Huang, Y., **Zhou, Y.**, Kim, H.S., López-Blanco, E., Jiang, L., Xia, J., Tao, F., Williams, C. and Williams, M., 2023. Across-model spread and shrinking in predicting peatland carbon dynamics under global change. *Global Change Biology*, 29(10), pp.2759-2775.
- Rudgers, J.A., and **co-authors**, 2023. Infrastructure to factorially manipulate the mean and variance of precipitation in the field. *Ecosphere*, 14(7), p.e4603
- 2022 Sun, J., Wei, X., **Zhou, Y.**, Chan, C. and Diao, J., 2022. Hurricanes substantially reduce the nutrients in tropical forested watersheds in Puerto Rico. *Forests*, 13(1), p.71.
- Gourdji, S.M., Karion, A., Lopez-Coto, I., Ghosh, S., Mueller, K.L., **Zhou, Y.**, Williams, C.A., Baker, I.T., Haynes, K.D. and Whetstone, J.R., 2022. A modified Vegetation Photosynthesis and Respiration Model (VPRM) for the eastern USA and Canada, evaluated with comparison to atmospheric observations and other biospheric models. *Journal of Geophysical Research: Biogeosciences*, 127(1), p.e2021JG006290.
- 2021 Feng, S., Lauvaux, T., Williams, C.A., Davis, K.J., **Zhou, Y.**, Baker, I., Barkley, Z.R. and Wesloh, D., 2021. Joint CO₂ mole fraction and flux analysis confirms missing processes in CASA terrestrial carbon uptake over North America. *Global Biogeochemical Cycles*, 35(7), p.e2020GB006914.
- Wei, Y., and **co-authors**, 2021. Atmospheric Carbon and Transport – America (ACT – America) data sets: Description, management, and delivery. *Earth and Space Science*, 8(7), p.e2020EA001634
- 2020 Zhang, L., Xiao, J., Zheng, Y., Li, S. and **Zhou, Y.**, 2020. Increased carbon uptake and water use efficiency in global semi-arid ecosystems. *Environmental Research Letters*, 15(3), p.034022
- Gafforov, Y., Ordynets, A., Langer, E., Yarasheva, M., de Mello Gugliotta, A., Schigel, D., Pecoraro, L., **Zhou, Y.**, Cai, L. and Zhou, L.W., 2020. Species diversity with comprehensive annotations of wood-inhabiting poroid and corticioid fungi in Uzbekistan. *Frontiers in Microbiology*, 11, p.598321.
- 2019 **Zhou, Y.**, Zhang, L., Xiao, J., Williams, C.A., Vitkovskaya, I. and Bao, A., 2019. Spatiotemporal transition of institutional and socioeconomic impacts on vegetation productivity in Central Asia over last three decades. *Science of the Total Environment*, 658, pp.922-935.
- Feng, S., Lauvaux, T., Davis, K.J., Keller, K., **Zhou, Y.**, Williams, C., Schuh, A.E., Liu, J. and Baker, I., 2019. Seasonal characteristics of model uncertainties from biogenic fluxes, transport, and large-scale boundary inflow in atmospheric CO₂

- simulations over North America. *Journal of Geophysical Research: Atmospheres*, 124(24), pp.14325-14346.
- Gu, H., Williams, C.A., Hasler, N. and **Zhou, Y.**, 2019. The carbon balance of the southeastern US forest sector as driven by recent disturbance trends. *Journal of Geophysical Research: Biogeosciences*, 124(9), pp.2786-2803.
- Yan, M., Li, Z., Tian, X., Zhang, L. and **Zhou, Y.**, 2019. Improved simulation of carbon and water fluxes by assimilating multi-layer soil temperature and moisture into process-based biogeochemical models. *Forest Ecosystems*, 6(1), p.12.
- 2017 **Zhou, Y.**, Zhang, L., **Zhou, Y.** and Zhang, B., 2017. Vegetation change and its driving factors in global drylands during the period of 1982–2012. *Arid Zone Research*, 34(1), pp.59-66.
- Feng, Q., Zhou, L., Chen, E., Liang, X., Zhao, L. and **Zhou, Y.**, 2017. The performance of airborne C-band PolInSAR data on forest growth stage types classification. *Remote Sensing*, 9(9), p.955.
- 2016 Zhang, L., Xiao, J., **Zhou, Y.**, Zheng, Y., Li, J. and Xiao, H., 2016. Drought events and their effects on vegetation productivity in China. *Ecosphere*, 7(12), p.e01591.
- 2015 **Zhou, Y.**, Zhang, L., Fensholt, R., Wang, K., Vitkovskaya, I. and Tian, F., 2015. Climate contributions to vegetation variations in central Asian drylands: Pre-and post-USSR collapse. *Remote Sensing*, 7(3), pp.2449-2470.
- Xiao, J., **Zhou, Y.** and Zhang, L., 2015. Contributions of natural and human factors to increases in vegetation productivity in China. *Ecosphere*, 6(11), pp.1-20.
- 2014 **Zhou, Y.**, Zhang, L., Xiao, J., Chen, S., Kato, T. and Zhou, G., 2014. A comparison of satellite-derived vegetation indices for approximating gross primary productivity of grasslands. *Rangeland Ecology & Management*, 67(1), pp.9-18.
- Zhang, B., Zhang, L., Guo, H., Leinenkugel, P., **Zhou, Y.**, Li, L. and Shen, Q., 2014. Drought impact on vegetation productivity in the Lower Mekong Basin. *International Journal of Remote Sensing*, 35(8), pp.2835-2856.

BOOK CHAPTER

- 2024 **Zhou, Y.**, 2024. Hybrid Modeling in Earth System Science. In Y. Luo & B. Smith (Eds.), *Land Carbon Cycle Modeling Matrix Approach, Data Assimilation, Ecological Forecasting, and Machine Learning*. CRC Press. Taylor and Francis.

DATASETS

- 2024 Dong, Y., **Zhou, Y.**, Zhang, L., Tian, F., Xie, Q., Chen, Y., Ruan, L. and Zhang, B., 2024. Global dryland phenology dataset (GDPD), *figshare*. DOI: 10.6084/m9.figshare.27160602.v2.
- 2020 **Zhou, Y.**, Williams, C.A., Lauvaux, T., Feng, S., Baker, I.T., Wei, Y., Denning, A.S., Keller, K. and Davis, K.J., 2019. ACT-America: Gridded Ensembles of Surface

Biogenic Carbon Fluxes, 2003-2019. *ORNL DAAC*, Oak Ridge, Tennessee, USA.

- 2019 Williams, C.A., Hasler, N., Gu, H. and **Zhou, Y.**, 2020. Forest Carbon Stocks and Fluxes from the NFCMS, Conterminous USA, 1990-2010. *ORNL DAAC*, Oak Ridge, Tennessee, USA.

PRESENTATIONS (selected)

- 2026 **Zhou, Y.**, Gharun, M., Xiao, J., Guerrieri, R., Li, X., & Buchmann, N. Atmospheric Deposition Outweighs Dryness in Regulating European Ecosystem Productivity. Swiss Forest Lab Science Day, Bern, Switzerland.
- 2025 **Zhou, Y.**, Gharun, M., & Buchmann, N. Interactive Effect of Nitrogen Deposition and Drought on Forest Carbon Sequestration. eLTER meeting, Tampere, Finland.
[Invited] **Zhou, Y.** Improved estimation of forest carbon dynamics via model-data fusion. Grassland Seminar, ETH Zurich, Switzerland.
- 2024 **Zhou, Y.**, Litvak, M.E., Fan, J., Guo, W., Duman, T., Gomes, C., & Luo, Y. AI-powered interpretation of dryland carbon dynamics, AGU Fall Meeting, Washington DC, USA.
- 2023 **Zhou, Y.**, Rudgers, J., Cui, E., Lehmann, J., Quan, Q., Xia, J., Wang, R., Sun, Y., Gomes, C., You, F., & Luo, Y. Convergent Pattern of Plant Strategies in Varied Dryness Conditions, AGU Fall Meeting, San Francisco, USA.
- 2022 **Zhou, Y.**, Hou, E., Litvak, M.E., Rudgers, J., Collins, S.L., Pockman, W., & Luo, Y. Improved Estimates of Carbon and Water Dynamics by TECO-Dryland and Data Assimilation, AGU Fall Meeting, Chicago, USA.
- 2019 **Zhou, Y.**, Williams, C.A., Kulakowski, D., & Rogan, J. Linking Biomass Data with Carbon Cycle Modeling, AGU Fall Meeting, San Francisco, USA.
- 2018 **Zhou, Y.**, Williams, C.A., Lauvaux, T., Feng, S., Keller, K., & Davis, K.J. A multi-year gridded data product of surface biogenic carbon fluxes for North America: Evaluation and analysis of results, AGU fall meeting, Washington DC, USA.
Zhou, Y. & Williams, C.A. Improving the Predictive Ability of the Global Carbon Cycle Models, Ecological Society of America annual meeting, New Orleans, USA.

SERVICES

Teaching

- 2025– Global Change Biology, ETH Zurich, as co-Lecturer with Drs Buchmann, Kukka-Maaria, and Flavian
- 2021–2024 New Advances in Land Carbon Cycle Modeling (two-week training course), Cornell University, as Lecturer and Instructor
- 2016 IDCE 310: Introduction to GIS, Clark University, as teaching assistant
- 2015 EOG102: Weather and Climate, Clark University, as teaching assistant

Mentorship

- 2025– Sofia Ferdini, PhD student at AgroParisTech/Paris-Saclay and Universität Hohenheim, Individual Monitoring Committee member on process-based and data-driven modeling
- 2022–2027 Yuqi Dong, PhD candidate at Chinese Academy of Sciences, Co-Supervisor with Dr. Zhang, on phenology and productivity in global drylands
- 2022 Manfred Lim, High School student at Jericho Senior High School (now undergraduate at Columbia University), as science mentor on developing a machine learning model to predict soil respiration using satellite imagery and geospatial data

Academic Journal Peer Review

Nature; One Earth; Global Change Biology; Remote Sensing of Environment; Communications Earth & Environment; Journal of Advances in Modeling Earth Systems; Agricultural and Forest Meteorology; Biogeosciences; International Journal of Digital Earth; Ecohydrology; Frontiers in Environmental Science; Land Degradation & Development; Mathematical and Computational Applications; Plant and Soil; Water.

Conference Sessions

Co-convener and co-chair, AGU2023 Session GC063: Leveraging Multifaceted Approaches to Carbon Dioxide Removal for Effective Climate Change Mitigation.

ADDITIONAL INFORMATION

Languages Mandarin (Native), English (Proficient), German (Beginner).

Programming Proficient at MATLAB, R and Python. Familiar with FORTRAN.