

# Fangyue Zhang

Postdoctoral Research Associate

School of Natural Resources and the Environment, University of Arizona, Tucson, AZ, USA

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## PROFESSIONAL EXPERIENCE

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Postdoctoral Research Associate (with Prof. William Smith & Prof. Joel Biederman) University of Arizona, Tucson, AZ, USA	2019 – present
Graduate Research Assistant (with Prof. Shuli Niu) Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China	2015 – 2019
Graduate Research Assistant (with Prof. Qingkui Wang) Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China	2013 – 2015

## EDUCATION

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Ph.D. in Ecology Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China	2015 – 2019
M.S. in Ecology Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China	2012 – 2015
B.S. in Ecology Nanjing University of Information Science & Technology, Nanjing, China	2008 – 2012

## RESEARCH INTERESTS

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Global change ecology. Ecosystem ecology. Biogeochemistry. Biosphere-atmosphere interactions.  
Extreme event. Biodiversity. Remote sensing.

## PEER-REVIEWED PUBLICATIONS

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1. **Zhang, F.**, Biederman, J. A., Devine, C. J., Pierce, N. A., Yan, D., Javadian, M., Potts, D. L., & Smith, W. K. (2023). Using high frequency digital repeat photography to quantify the sensitivity of a semi-arid grassland ecosystem to the temporal repackaging of precipitation. *Agricultural and Forest Meteorology*, 338, 109539. <https://doi.org/10.1016/j.agrformet.2023.109539>
2. **Zhang, F.**, Biederman, J. A., Pierce, N. A., Potts, D. L., Devine, C. J., Hao, Y., & Smith, W. K. (2022). Precipitation temporal repackaging into fewer, larger storms delayed seasonal timing of peak photosynthesis in a semi-arid grassland. *Functional Ecology*, 36(3), 646–658. <https://doi.org/10.1111/1365-2435.13980>
3. **Zhang, F.**, Biederman, J. A., Dannenberg, M. P., Yan, D., Reed, S. C., & Smith, W. K. (2021). Five Decades of Observed Daily Precipitation Reveal Longer and More Variable Drought Events Across Much of the Western United States. *Geophysical Research Letters*, 48(7), e2020GL092293. <https://doi.org/10.1029/2020GL092293>

4. **Zhang, F.**, Quan, Q., Ma, F., Tian, D., Hoover, D. L., Zhou, Q., & Niu, S. (2019). When does extreme drought elicit extreme ecological responses? *Journal of Ecology*, *107*(6), 2553–2563. <https://doi.org/10.1111/1365-2745.13226>
5. **Zhang, F.**, Quan, Q., Ma, F., Tian, D., Zhou, Q., & Niu, S. (2019). Differential responses of ecosystem carbon flux components to experimental precipitation gradient in an alpine meadow. *Functional Ecology*, *33*(5), 889–900. <https://doi.org/10.1111/1365-2435.13300>
6. **Zhang, F.**, Quan, Q., Ma, F., Zhou, Q., & Niu, S. (2019). Clipping increases ecosystem carbon sequestration and its sensitivity to precipitation change in an alpine meadow. *Plant and Soil*. <https://doi.org/10.1007/s11104-019-04278-5>
7. **Zhang, F.**, Quan, Q., Song, B., Sun, J., Chen, Y., Zhou, Q., & Niu, S. (2017). Net primary productivity and its partitioning in response to precipitation gradient in an alpine meadow. *Scientific Reports*, *7*(1), 15193. <https://doi.org/10.1038/s41598-017-15580-6>
8. Javadian, M., Scott, R. L., Biederman, J. A., **Zhang, F.**, Fisher, J. B., Reed, S. C., Potts, D. L., Villarreal, M. L., Feldman, A. F., & Smith, W. K. (2023). Thermography captures the differential sensitivity of dryland functional types to changes in rainfall event timing and magnitude. *New Phytologist*, *n/a*(n/a). <https://doi.org/10.1111/nph.19127>
9. He, Y. L., Wang, J. S., Tian, D. S., Quan, Q., Jiang, L., Ma, F. F., Yang, L., **Zhang, F. Y.**, Zhou, Q. P., & Niu, S. L. (2022). Long-term drought aggravates instability of alpine grassland productivity to extreme climatic event. *Ecology*, *n/a*(n/a), e3792. <https://doi.org/10.1002/ecy.3792>
10. Quan, Q., **Zhang, F.**, Jiang, L., Chen, H. Y. H., Wang, J., Ma, F., Song, B., & Niu, S. (2021). High-level rather than low-level warming destabilizes plant community biomass production. *Journal of Ecology*, *109*(4), 1607–1617. <https://doi.org/10.1111/1365-2745.13583>
11. Wang, J., Song, B., Ma, F., Tian, D., Li, Y., Yan, T., Quan, Q., **Zhang, F.**, Li, Z., Wang, B., Gao, Q., Chen, W., & Niu, S. (2019). Nitrogen addition reduces soil respiration but increases the relative contribution of heterotrophic component in an alpine meadow. *Functional Ecology*, *33*(11), 2239–2253. <https://doi.org/10.1111/1365-2435.13433>
12. Chen, W., Wang, B., **Zhang, F.**, Li, Z., Wang, J., Yu, G., Wen, X., & Niu, S. (2020). Hysteretic relationship between plant productivity and methane uptake in an alpine meadow. *Agricultural and Forest Meteorology*, *288–289*, 107982. <https://doi.org/10.1016/j.agrformet.2020.107982>
13. Ma, F., Song, B., Quan, Q., **Zhang, F.**, Wang, J., Zhou, Q., & Niu, S. (2020). Light Competition and Biodiversity Loss Cause Saturation Response of Aboveground Net Primary Productivity to Nitrogen Enrichment. *Journal of Geophysical Research: Biogeosciences*, *125*(3), e2019JG005556. <https://doi.org/10.1029/2019JG005556>
14. Ma, F., **Zhang, F.**, Quan, Q., Song, B., Wang, J., Zhou, Q., & Niu, S. (2020). Common Species Stability and Species Asynchrony Rather than Richness Determine Ecosystem Stability Under Nitrogen Enrichment. *Ecosystems*. <https://doi.org/10.1007/s10021-020-00543-2>
15. Quan, Q., **Zhang, F.**, Meng, C., Ma, F., Zhou, Q., Sun, F., & Niu, S. (2020). Shifting biomass allocation determines community water use efficiency under climate warming. *Environmental Research Letters*, *15*(9), 094041. <https://doi.org/10.1088/1748-9326/aba472>

16. Chen, W., **Zhang, F.**, Wang, B., Wang, J., Tian, D., Han, G., Wen, X., Yu, G., & Niu, S. (2019). Diel and Seasonal Dynamics of Ecosystem-Scale Methane Flux and Their Determinants in an Alpine Meadow. *Journal of Geophysical Research: Biogeosciences*, 124(6), 1731–1745.  
<https://doi.org/10.1029/2019JG005011>
17. Quan, Q., Tian, D., Luo, Y., **Zhang, F.**, Crowther, T. W., Zhu, K., Chen, H. Y. H., Zhou, Q., & Niu, S. (2019). Water scaling of ecosystem carbon cycle feedback to climate warming. *Science Advances*, 5(8).  
<https://doi.org/10.1126/sciadv.aav1131>
18. Ma, F., Song, B., **Zhang, F.**, Quan, Q., Zhou, Q., & Niu, S. (2018). Ecosystem Carbon Use Efficiency Is Insensitive to Nitrogen Addition in an Alpine Meadow. *Journal of Geophysical Research: Biogeosciences*, 123(8), 2388–2398. <https://doi.org/10.1029/2018JG004530>
19. Quan, Q., **Zhang, F.**, Tian, D., Zhou, Q., Wang, L., & Niu, S. (2018). Transpiration Dominates Ecosystem Water-Use Efficiency in Response to Warming in an Alpine Meadow. *Journal of Geophysical Research: Biogeosciences*, 123(2), 453–462. <https://doi.org/10.1002/2017JG004362>
20. He, T., Wang, Q., Wang, S., & **Zhang, F.** (2016). Nitrogen Addition Altered the Effect of Belowground C Allocation on Soil Respiration in a Subtropical Forest. *PLOS ONE*, 11(5), e0155881.  
<https://doi.org/10.1371/journal.pone.0155881>
21. Wang, Q., Xiao, F., **Zhang, F.**, & Wang, S. (2013). Labile soil organic carbon and microbial activity in three subtropical plantations. *Forestry: An International Journal of Forest Research*, 86(5), 569–574.  
<https://doi.org/10.1093/forestry/cpt024>

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## SELECTED PRESENTATION

Zhang F, Biederman JA, Pierce NA, Potts DL, Smith WK. Direct and legacy effects of dry winter on photosynthesis in a semi-arid grassland. *Annual Meeting of the Ecological Society of America*. August 2023.

Zhang, F., Smith, W.K., Pierce, N.A., Potts, D.L., Biederman, J.A. Precipitation temporal repackaging in a semi-arid grassland shifted peak photosynthesis timing but maintained its magnitude. *Annual Meeting of the Ecological Society of America*. August 2021.

Zhang, F., Biederman, J.A., Schlaepfer, D., Bradford, J.B., Smith, W.K. Longer intervals between rainfall and increasing interannual variability compound soil moisture drought across the western United States. *American Geophysical Union Fall Meeting*. December 2020

Zhang, F., Dannenberg, M.P., Yan, D., Smith, W.K., Biederman, J.A. 40 years of daily precipitation data show climatic drying is amplified by longer dry intervals and growing interannual variability across the western US. *Annual Meeting of the Ecological Society of America*. August 2020.

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## TEACHING ASSISTANT

Plant-Soil Interactions (graduate)

2015 Fall

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## RESEARCH GRANTS

2021: NASA Carbon Cycle Science program (Participant)

2019: National Natural Science Foundation of China (Participant)

2018: Chinese Academy of Science Project (Participant)

2016: The Chinese Academy of Science Strategic Priority Research Program (Participant)

## **HONORS AND AWARDS**

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2019: Outstanding Graduate Student Award, Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences

2018: President Award, IGSNRR, Chinese Academy of Sciences

2016: Outstanding Student Award, University of Chinese Academy of Sciences

## **OUTREACH AND MAJOR NEWS MEDIA COVERAGE**

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Regarding Zhang, Biederman et al., 2021 GRL Paper: Radio and television interviews for NPR Morning Edition, Colorado Public Radio, USDA Radio, California Capitol Radio, KNX-Los Angeles, Wyoming Public Radio and Fox10-Phoenix. Press interviews/coverage by the Associated Press, Western Livestock Journal, Arizona Daily Star, Arizona Republic, and 200 other news outlets.

## **PROFESSIONAL REVIEWS**

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Global Change Biology. Functional Ecology. Science of the Total Environment. Agricultural and Forest Meteorology. Climatic Change. Journal of Hydrology. Journal of Geophysical Research: Biogeosciences. Remote Sensing. Global Ecology and Conservation.

## **SKILLS**

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**Field Work:** Ecosystem-scale assays of carbon/water fluxes and community structure. Plant functional traits including leaf area, leaf photosynthesis, and root growth and distribution. Soil biogeochemistry. Li-Cor 6800/8100/7500. Campbell dataloggers and programs.

**Laboratory:** Biophysical characterization of soils and water. Biomass and composition of microbial communities in soils. Chemical assays of leaves and roots.

**Analysis:** Spatial analysis, Bayesian statistics.

**Academic Skills:** R Statistics, Python, ArcGIS, JavaScript.