Dr. Zhengyu Xia (夏正宇)

Title: Associate Professor
Affiliation: School of Geographical Sciences, Northeast Normal University
Address: 5268 Renmin Avenue, Nanguan District, Changchun, Jilin, 130024, China
E-mail: xiazy008@nenu.edu.cn or zhyxia@hotmail.com
Phone: +86 135 1731 8643
Website: https://zhx215.github.io

EDUCATION

- 08/2015–05/2020 **Ph.D. in Earth and Environmental Sciences**, Lehigh University, USA
  Dissertation title: Synoptic-scale climate dynamics in southern Patagonia revealed through stable isotopes in precipitation and peat mosses
- 09/2011–06/2015 **B.S. in Geology**, China University of Geosciences (Wuhan), China

PROFESSIONAL EXPERIENCE

- 02/2022–Pres. Associate Professor, Northeast Normal University, China
- 06/2020–11/2021 Postdoctoral Research Associate, University of Massachusetts Amherst, USA
- 08/2016–05/2020 Research and Teaching Assistant, Lehigh University, USA

RESEARCH INTEREST KEYWORDS

- Peatlands, Paleoecology, Environmental Changes, Stable Isotopes, Water Cycle, Climate Dynamics

ACTIVE RESEARCH PROGRAMS

- **Isotope Hydrology**: Applying water isotope techniques to understand the water source, turnover, and flow behaviors of peatlands
- **Isotope Ecology**: Understanding plant physiological functions, ecosystem processes, and biogeochemical cycles of peatlands through the lens of plant isotopic signatures
- **Paleoecology and Global Change**: Developing paleo-records to understand peatland vulnerability, resilience, and carbon dynamics under ongoing climate change and human impact

PUBLICATIONS

- Peer-reviewed journal articles (*Corresponding author, †Equal contribution):

Stansfield, A. R.*, Booth, R. K., Loisel, J., Camill, P., Yu, Z., **Xia, Z.**, Gengaro, A., Scally, A., 2025. Recent *Sphagnum* expansion into the tundra on the North Slope of Alaska. *Ecological Monographs*, in press.

Xia, Z.*,†, Chen, F.†, Guo, M., Yu, Z.*, 2025. Ecosystem dynamics of an ice-poor permafrost peatland in eastern Eurasia: Paleoecological insights into climate sensitivity. *Biogeosciences*, 22, 5283–5308.

Xia, Z.*, Jiang, Y., Xia, Y., Wang, M., Zhang, S., Bu, Z.J., Yu, Z.*, 2025. The high sensitivity of stable carbon and oxygen isotopic compositions of peatland *Sphagnum* mosses to seasonality. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 679, 113269.

Xia, Z.*, Liu, Y., Zhang, C., Li, Y., Yu, Z., 2025. Using the spatial pattern of water isotope ratios to understand peatland hydrology: Examples from Northeast China and a model-based interpretive framework. *Mires and Peat*, 32, 10.

Xia, Y., **Xia, Z.**, Yu, Z.*, 2025. A 1700-year peatland-based hydroclimate record from the Hengduan Mountains in the southeastern Tibetan Plateau reveals changing dynamics of the summer monsoon interface. *Quaternary Science Reviews*, 366, 109501.

Li, M., **Xia, Z.***, Li, Y., Dong, Y., Yu, Z.*, 2025. Simulating carbon accumulation of rain-fed peatlands in the East Asian monsoon region using the DigiBog model: Parameter sensitivity and climate response mechanisms. *Quaternary Sciences*, 45(3), 789–805. [李萌, **夏正宇***, 李跃峰, 董彦民, 于子成*, 2025. 基于 DigiBog 模型模拟东亚季风区雨养型泥炭地碳累积过程: 参数敏感性与气候响应机制. 第四纪研究, 45(3), 789–805.]

Yang, T., Sun, J., Li, Y., Wang, M., Li, H., Wang, S., **Xia, Z.**, Yu, Z.*, 2025. Impact of climate-induced water-table drawdown on carbon and nitrogen sequestration in a *Kobresia*-dominated peatland on the central Qinghai-Tibetan Plateau. *Communications Earth & Environment*, 6, 188.

Zhong, H., Zhang, C.*, Sun, J., **Xia, Z.**, Yu, Z.*, Zhao, C.*, 2025. Mid-to-late Holocene temperature variability in southwestern China. *Quaternary Science Reviews*, 353, 109231.

Liu, B., Liu, H.*, Wang, Y., Yu, Z., Fu, Y., **Xia, Z.**, Miao, C., Jia, J.*, 2025. A millennium of cold and humid climate decreased carbon accumulation in the subtropical monsoon peatland. *Communications Earth & Environment*, 6, 12.

Xia, Z.*, Yang, W., Yu, Z.*, 2024. Major moisture shifts in inland Northeast Asia during the last millennium. *Environmental Research Letters*, 19, 124005.

Cleary, K. G.†, **Xia, Z.***,†, Yu, Z.*, 2024. The growth and carbon sink of tundra peat patches in Arctic Alaska. *Journal of Geophysical Research: Biogeosciences*, 129, e2023JG007890.

Xia, Y., Yang, Z., Sun, J., **Xia, Z.**, Yu, Z.*, 2024. Late-Holocene ecosystem dynamics and

climate sensitivity of a permafrost peatland in Northeast China. *Quaternary Science Reviews*, 324, 108466.

Xia, Z.*, Surma, J., Winnick, M. J., 2023. The response and sensitivity of deuterium and ^{17}O excess parameters in precipitation to hydroclimate processes. *Earth-Science Reviews*, 242, 104432.

Kukla, T.*, Winnick, M. J., Laguë, M. M., **Xia, Z.**, 2023. The zonal patterns in late Quaternary tropical South American precipitation. *Paleoceanography and Paleoclimatology*, 38(4), e2022PA004498.

Xia, Z.*, 2023. Quantifying the fingerprint of oceanic moisture source conditions in deuterium and ^{17}O excess parameters of precipitation. *Geophysical Research Letters*, 50, e2022GL101901.

Groff, D. V.*, Beilman, D. W., Yu, Z., Ford, D., **Xia, Z.**, 2023. Kill dates from re-exposed black mosses constrain past glacier advances in the northern Antarctic Peninsula. *Geology*, 51(3), 257–261.

Loisel, J.*, Sarna, K., **Xia, Z.**, Huang, Y., Yu, Z., 2023. Concordant changes in late Holocene hydroclimate across southern Patagonia modulated by westerly winds and the El Niño–Southern Oscillation. *Geology*, 51(3), 247–251.

Xia, Z.*, Welker, J. M., Winnick, M. J., 2022. The seasonality of deuterium excess in non-polar precipitation. *Global Biogeochemical Cycles*, 36, e2021GB007245. [Wiley Top Cited Article 2022–2023]

Xia, Z.*, Winnick, M. J., 2021. The competing effects of terrestrial evapotranspiration and raindrop re-evaporation on the deuterium excess of continental precipitation. *Earth and Planetary Science Letters*, 572, 117120.

Xia, Z.*, Oppedal, L. T., Van der Putten, N., Bakke, J., Yu, Z., 2020. Ecological response of a glacier-fed peatland to late Holocene climate and glacier changes on subantarctic South Georgia. *Quaternary Science Reviews*, 250, 106679.

Xia, Z.*, Yu, Z., 2020. Temperature-dependent oxygen isotope fractionation in plant cellulose biosynthesis revealed by a global dataset of peat mosses. *Frontiers in Earth Science*, 8, 307.

Xia, Z.*, Butorovic, N., Yu, Z., 2020. The influence of synoptic weather types and moisture transport pathways on precipitation isotopes in southern Patagonia. *Atmosphere*, 11(5), 514.

Xia, Z.*, Zheng, Y., Stelling, J. M., Loisel, J., Huang, Y.*, Yu, Z.*, 2020. Environmental controls on the carbon and water (H and O) isotopes in peatland *Sphagnum* mosses. *Geochimica et Cosmochimica Acta*, 277, 265–284.

Treat, C. C.*, Kleinen, T., Broothaerts, N., Dalton, A. S., Dommain, R., Douglas, T. A.,

Drexler, J., Finkelstein, S. A., Grosse, G., Hope, G., Hutchings, J., Jones, M. C., Kuhry, P., Lacourse, T., Lähteenoja, O., Loisel, J., Notebaert, B., Payne, R., Peteet, D., Sannel, A. B. K., Stelling, J. M., Strauss, J., Swindles, G. T., Talbot, J., Tarnocai, C., Verstraeten, G., Williams, C. J., **Xia, Z.**, Yu, Z., Väliranta, M., Hättestrand, M., Alexanderson, H., Brovkin, V., 2019. Widespread global peatland establishment and persistence over the last 130,000 y. *Proceedings of the National Academy of Sciences*, 116(11), 4822–4827.

Xia, Z.*, Yu, Z., Loisel, J., 2018. Centennial-scale dynamics of the Southern Hemisphere Westerly Winds across the Drake Passage over the past two millennia. *Geology*, 46(10), 855–858.

- Peer-reviewed book chapters:

Xia, Z., Yu, Z. Applications of stable isotopes to studies of paleohydrology and Paleoclimatology. *Encyclopedia of Water: Science, Technology and Society*, Ed. P. A. Maurice, Wiley. doi: 10.1002/9781119300762.wsts0042

EXTERNAL RESEARCH GRANTS

- NSFC General Program: The optimal moisture range and driving mechanisms of carbon accumulation in rain-fed peatlands of Northeast China—A quantitative study based on *Sphagnum* isotope records, 460,000 RMB (direct funding), 2026–2029, PI.
- NSFC Major Program: Formation processes and driving mechanisms of carbon pool in typical peatlands. 3,000,000 RMB (direct funding), 2025–2029, co-PI.
- Natural Science Foundation of Jilin Province General Program: Measuring *Sphagnum* growth rates using high-resolution isotope analysis of stem and leaf micro-sections. 100,000 RMB (total funding), 2023–2025, PI.
- NSFC Young Scientists Fund: The effect of snow meltwater on *Sphagnum* cellulose carbon/oxygen isotopes as paleoenvironmental proxies in ombrotrophic peatlands: A modern process study. 300,000 RMB (total funding), 2023–2025, PI.
- Ministry of Ecology and Environment Key Laboratory of Wetland Ecology and Vegetation Restoration Open Fund. Using water isotopes to study evapotranspiration partitioning in typical peatlands of Northeast China. 40,000 RMB (total funding), 2022, co-PI.

HONORS AND AWARDS

E-Class High-Level Talent Program, Jilin Province (2023)

Lehigh University EES Graduate Symposium best talk winner (2018, 2020)

Lehigh University Williams-Upton Summer Fellowship (2019)

The University of Utah SPATIAL short course participant support award (2019)

Lehigh University College of Arts and Sciences Summer Research Fellowship (2018)

Lehigh University Presidential Fellowship (2015)

CUG-Wuhan Presidential Scholarship (2013)

SERVICES

- Academic Editor for *Advances in Meteorology*
- Editorial Board for *Geographical Science* (地理科学)
- Reviewer for academic theses under the Ministry of Education (教育部学位论文)
- Reviewer for academic journals: *Global Change Biology*, *Geophysical Research Letters*, *Water Resources Research*, *Journal of Geophysical Research: Biogeosciences*, *Ecological Applications*, *Earth System Science Data*, *Climate of the Past*, *npj Climate and Atmospheric Science*, *The Holocene*, *Organic Geochemistry*, *Progress in Physical Geography*, *Scientific Reports*
- Reviewer for research funding agencies: US National Science Foundation, Czech Science Foundation

TEACHING AND SUPERVISION

- Undergraduate course (co-)instructor: ABC of Astronomy, General Introduction to the Earth (including lab), Theory and Practice of Ecological Civilization, Global Change Ecology, Global Environmental Change, Biogeochemistry, Field Practice in Geology
- Graduate course (co-)instructor: Biogeochemical Cycles, Fundamental Theory of Wetland Sciences, Research Methods in Mire Ecology, Peatland Sciences
- Graduate student (co-)advisor: Yueyan Jiang (MS, 2023), Wei Yang (MS, 2024), Fengtong Chen (MS, 2024), Meng Li (MS, 2025), Yuexin Liu (MS), Qianqian Wang (MS), Yu Pan (MS), Xingping Xue (MS), Mengyang Guo (MS), Tianqi Wei (MS), Jia Li (MS)
- Undergraduate student research advisor: Jiarui Yu (BS, 2025), Sijia Jiang (BS)