Yuan Sun

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Career

2026.09 – present ◇ **Postdoctoral researcher, National University of Singapore, Singapore.**
Host: Prof. Matthias Roth

Education

2023.07 – 2026.06 ◇ **Ph.D. in Environmental Science, The University of Manchester, UK.**
Supervisors: Dr. Zhonghua Zheng, Prof. David Topping, and Prof. David Schultz
Thesis: Improving urban climate modeling within the Earth system model framework to support adaptation

2020.09 – 2023.03 ◇ **M.A. (Hons) in Architecture, Zhejiang University, China.**
First Class Honours
Supervisor: Prof. Zhu Wang

2015.09 – 2020.06 ◇ **B.A. (Hons) in Architecture, Zhejiang University, China.**
2019.01–2019.05 (Exchange) National University of Singapore, Singapore
First Class Honours

Research Interests

◇ **Urban climate: observation, modeling, impact assessment, and adaptation**
Topics:

- Urban boundary layer
- Local climate zones
- Anthropogenic heat
- Cooling effects of white roofs

◇ **Multi-scale Earth system modeling and development**
By model scale:

- Earth system model: Community Earth System Model (CESM)
- Regional climate model: Weather Research & Forecasting Model (WRF)

By model component:

- Atmosphere model: Community Atmosphere Model (CAM), CAM-Chem
- Land surface model: Community Terrestrial Systems Model (CTSM), Joint UK Land Environment Simulator (JULES)
- Urban model: Community Land Model-Urban (CLMU), Noah Single-Layer Urban Canopy Model (Noah-SLUCM), Met Office-Reading Urban Surface Exchange Scheme (MORUSES)

Selected First-Author Publications

Earth system modeling

1. **Sun, Y.**, Oleson, K. W., & Zheng, Z. (2026). Modeling urban traffic heat flux in the Community Earth System Model: Formulation and validation for two test sites. *Journal of Advances in Modeling Earth Systems*, *18*(4), e2025MS005435. https://doi.org/10.1029/2025MS005435
2. **Sun, Y.**, Oleson, K. W., Zhao, L., Mills, G., He, C., Demuzere, M., Topping, D. O., Zhang, N., & Zheng, Z. (2025). Enhancing global-scale urban land cover representation using local climate zones in the Community Earth System Model. *Journal of Advances in Modeling Earth Systems*, *17*(11), e2025MS004934. https://doi.org/10.1029/2025MS004934
3. **Sun, Y.**, Fang, B., Oleson, K. W., Zhao, L., Topping, D. O., Schultz, D. M., & Zheng, Z. (2024). Improving urban climate adaptation modeling in the Community Earth System Model (CESM) through transient urban surface albedo representation. *Journal of Advances in Modeling Earth Systems*, *16*(12), e2024MS004380. https://doi.org/10.1029/2024MS004380

Climate impact assessment

1. **Sun, Y.**, Lindley, S., & Zheng, Z. (2026). Linking urban population exposure to heatwaves with land cover change across the UK. *Sustainable Cities and Society*, *144*, 107349. https://doi.org/10.1016/j.scs.2026.107349

Built environment

1. **Sun, Y.** (2025). Mapping urban morphological prototypes: Unveiling local identity in historic water towns of the Northern Zhejiang Plain, China. *Geocarto International*, *40*(1), 2547011. https://doi.org/10.1080/10106049.2025.2547011
2. **Sun, Y.**, Wu, Y., Yu, H., & Li, Y. (2025). County-level urban forms and their correlation with local governance in Jiande, China: Evidence from historical records. *Journal of Asia Architecture and Building Engineering*, *24*(3), 1985–1998. https://doi.org/10.1080/13467581.2024.2322000
3. **Sun, Y.**, Wu, Y., Yu, H., & Li, Y. (2024). Spatiotemporal evolution of urban landscapes in Chinese historic water towns (1918-2021). *Landscape Research*, *49*(4), 568–583. https://doi.org/10.1080/01426397.2024.2322138

Awards

2026 ◇ **Third Place Best Urban Student Poster Presentation, American Meteorological Society (AMS)**, awarded for a poster presentation at the 16th Symposium on Urban Environment of the 106th AMS Annual Meeting ($50).

2024 ◇ **Best Student Poster Award, Asia Oceania Geosciences Society (AOGS)**, awarded for a poster presentation in the atmospheric sciences section.

2019 ◇ **Chu Kochen Scholarship**, awarded annually to 12 undergraduates at Zhejiang University (¥10,000).

2021, 2019, 2018, 2017, 2016 ◇ **China National Scholarship** (¥8,000).

Professional Qualifications

2025 ◇ **Associate Fellow of Advance HE (AFAHE)**, awarded by Advance HE.