Yi Bao

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Research Experience

Nanjing University	Assistant Professor
Institute of Space Earth Sciences	2025.12 –
Peking University	Boya Postdoctoral Fellow
Geomatics and Engineering	2023.12 – 2025.11
Supervisor: Peijun Li	

Education

Peking University	Ph.D.
Cartography and Geographic Information System	2018.09 – 2023.07
Advisor: Zhou Huang	
China University of Geosciences (Wuhan)	B.Sc.
Information Engineering	2014.09 – 2018.07

Awards

Postdoctoral Innovative Talent Support Program	2024
Outstanding Ph.D. Dissertation of Peking University	2023
Outstanding Graduate of Peking University	2023
Outstanding Research Award of Peking University	2020, 2022
Excellent Academic Paper Award of Peking University	2020, 2022
Liao Kaiyuan Scholarship of Peking University	2020
Outstanding Graduate of China University of Geosciences	2018
National Scholarship	2015, 2016
9th Li Siguang Plan of China University of Geosciences	2015

Research Projects

National Natural Science Foundation of China	2025.01 – 2027.12

Methodology and Application for Nationwide Estimation of Urban Built Environment Material Stock with Wide Range and High Resolution

Principal Investigator

Postdoctoral Innovative Talent Support Program	2024.06 – 2025.11

Spatiotemporal Evolution and Human-Land Relationship Dynamic Simulation of High-Resolution Built Environment Material Stocks Based on Deep Learning

Principal Investigator

National Key R&D Program 2023.12 − 2025.11
Key Technologies and Application Demonstration of Integrated Safety Remote Sensing Monitoring **Sub-project Leader**

Open Fund of State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University 2025.01 − 2026.12
Construction and Collaborative Analysis of Multi-modal Knowledge Graph for Disaster Monitoring and Early Warning **Principal Investigator**

77th Batch General Program of China Postdoctoral Science Foundation 2023.12 − 2025.11
Fine-grained Estimation and Pattern Evolution of Long-term Urban Material Stock Integrating MaaS and Multi-source Geographic Big Data **Principal Investigator**

International Cooperation Project of Key R&D Program 2019.08 − 2021.07
MaaS Mobility as a Service: Key Technologies and Application Demonstration of Smart Public Transport **Major Participant**

National Natural Science Foundation of China (General Program) 2022.01 − 2025.12
Multi-source Trajectory Big Data Computing Methods and Applications for Traffic Infrastructure Optimization **Major Participant**

Publications	**28 Published Papers, 13 as First/Corresponding Author**

Assessing and Mitigating the Carbon Emissions from Illegal Urban Buildings: A Spatial Lifecycle Analysis
Yi Bao, Haode Du, Zhou Huang*, Shuliang Ren, Ganmin Yin, and Ruichang Mao
Resources, Conservation and Recycling **IF=11.4**
10.1016/j.resconrec.2024.108097

Quantifying the impact of building material stock and green infrastructure on urban heat island intensity
Yi Bao, Zhou Huang, Ganmin Yin, Shuliang Ren, Xiaoqin Yan, Junnan Qi
Building and Environment **IF=7.6**
10.1016/j.buildenv.2025.113068

Dynamic graph attention network for local leisure event recommendation in event-based social networks

Xia Peng, Yazhao Wu, Zhiming Gui, Yitian Liu, Zhou Huang, **Yi Bao***

International Journal of Digital Earth **IF=4.9**

Big geodata revealed spatial patterns of built environment stocks across and within cities in China

Zhou Huang#*, **Yi Bao#**, Ruichang Mao#, Han Wang, Ganmin Yin, Lin Wan, Houji Qi, Qiaoxuan Li, Hongzhao Tang, Qiance Liu, Linna Li, Bailang Yu, Qinghua Guo, Yu Liu, Huadong Guo*, Gang Liu*

Engineering **IF=12.8**

Evaluating the human use efficiency of urban built environment and their coordinated development in a spatially refined manner

Yi Bao, Zhou Huang, Linna Li, Han Wang, Jiayuan Lin, Gang Liu

Resources, Conservation and Recycling **IF=13.7**

High-resolution mapping of material stocks in the built environment across 50 Chinese cities

Yi Bao, Zhou Huang*, Ruichang Mao, Gang Liu, Han Wang, Ganmin Yin

Resources, Conservation and Recycling **IF=13.7**

A BiLSTM-CNN model for predicting users' next locations based on geotagged social media

Yi Bao, Zhou Huang*, Linna Li, Yaoli Wang, Yu Liu

International Journal of Geographical Information Science **IF=5.2**

High-resolution quantification of building stock using multi-source remote sensing imagery and deep learning

Yi Bao, Zhou Huang*, Han Wang, Ganmin Yin, Xiao Zhou, Yong Gao

Journal of Industrial Ecology **IF=7.2**

Optimizing Segmented Trajectory Data Storage with HBase for Improved spatio-temporal Query Efficiency

Yi Bao, Zhou Huang*, Xuri Gong, Yuyang Zhang, Ganmin Yin, Han Wang

International Journal of Digital Earth **IF=4.6**

Spatial Blockchain: Enhancing Spatial Queries and Applications through Integrating Blockchain and Spatial Database Technologies

Yi Bao, Zhiming Gui, Zhongxiang Sun, Zhengyang An, Zhou Huang

Electronics   **IF=2.9**

10.3390/electronics12204287

Spatiotemporal Calculation of Urban Built Environment Stocks: Progress and Prospects

Yi Bao, Zhou Huang*, Qinghua Guo, Yu Liu

Journal of Remote Sensing   **IF=2.3**

10.11834/jrs.20222083

High-Resolution Mapping of the Urban Built Environment Stocks in Beijing

Ruichang Mao, **Yi Bao**, Zhou Huang*, Qiance Liu, Gang Liu*

Environmental science & technology   **IF=11.4**

10.1021/acs.est.9b07229

Perceiving Beijing's "city image" across different groups based on geotagged social media data

Xia Peng, **Yi Bao**, Zhou Huang*

IEEE Access   **IF=3.5**

10.1109/ACCESS.2020.2995066

Global urban subway development, construction material stocks, and embodied carbon emissions

Ruichang Mao, **Yi Bao**, Huabo Duan, Gang Liu

Humanities and Social Sciences Communications   **IF=2.7**

10.1057/s41599-021-00757-2

A novel carbon cycle turbulence index identifies environmental and ecological perturbations

Ziheng Li, Zhen Guo, Zhongqiang Chen*, S.W. Poulton, **Yi Bao**, Laishi Zhao, Feifei Zhang

Geochemical Perspectives Letters   **IF=5.0**

10.7185/geochemlet.2137

DouFu: A Double Fusion Joint Learning Method for Driving Trajectory Representation

Han Wang, Zhou Huang*, Xiao Zhou, Ganmin Yin, **Yi Bao**

Knowledge-Based Systems   **IF=8.14**

10.1016/j.knosys.2022.110035

Identifying spatiotemporal characteristics and driving factors for road traffic CO2 emissions

Xiao Zhou, Han Wang, Zhou Huang*, **Yi Bao**, Guoqing Zhou, Yu Liu

Science of The Total Environment **IF=10.75**

Site selection for hybrid offshore wind and wave power plants using a four-stage framework: A case study in Hainan, China

Xiao Zhou, Zhou Huang*, Han Wang, Ganmin Yin, **Yi Bao**, Quanhua Dong, Yu Liu

Ocean & Coastal Management **IF=4.30**

ConvGCN-RF: A hybrid learning model for commuting flow prediction considering geographical semantics and neighborhood effects

Ganmin Yin, Zhou Huang*, **Yi Bao**, Han Wang, Linna Li, Xiaolei Ma, Yi Zhang

GeoInformatica **IF=2.77**

Examining active travel behavior through explainable machine learning: Insights from Beijing, China

Ganmin Yin, Zhou Huang, Chen Fu, Shuliang Ren, **Yi Bao**, Xiaolei Ma

Transportation Research Part D: Transport and Environment **IF=7.6**

Matching end-of-life household vehicle generation and recycling capacity in Chinese cities: A spatio-temporal analysis for 2022−2050

Shuliang Ren, Zhou Huang, **Yi Bao**, Ganmin Yin, Jingfan Yang, Xv Shan

Science of The Total Environment **IF=9.8**

Spatially-optimized greenspace for more effective urban heat mitigation: Insights from regional cooling heterogeneity via explainable machine learning

Shuliang Ren, Zhou Huang*, Ganmin Yin, Xiaoqin Yan, Quanhua Dong, Junnan Qi, Jiangpeng Zheng, **Yi Bao**, Shiyi Zhang

Landscape and Urban Planning **IF=7.9**

Traffic prediction and road space optimization for the integration of dockless bike-sharing and subway

Ganmin Yin, Chen Fu, Shuliang Ren, Xiaoqin Yan, Junnan Qi, **Yi Bao**, Zhou Huang*

Sustainable Cities and Society **IF=12.0**

Multi-level Priors-Guided Diffusion-based Remote Sensing Image Super-Resolution
Lijing Lu, Zhou Huang, **Yi Bao**, Lin Wan, Zhihang Li
ISPRS Journal of Photogrammetry and Remote Sensing   **IF=12.2**

Background environment mitigate heat islands from inadequate urban green coverage while amplifying socioeconomic thermal inequities
Shuliang Ren, Xiaoqin Yan, Ganmin Yin, Jiangpeng Zheng, Junnan Qi, Hanyu Zhang, Xiaowei Li, **Yi Bao**
Sustainable Cities and Society   **IF=12.0**

Assessing carbon sink potentials in the built environment: A study of 40 Chinese cities using a bottom-up high-resolution approach
Xiao Zhou, Ting Wang, Xinmin Zhang, **Yi Bao**, Jie Wu, Xinzhou Chen, Yanling Lu, Guoqing Zhou
Journal of Cleaner Production   **IF=10.0**

Unveiling the overestimated carbon reductions of dockless bike-sharing: A data-driven analysis
Ganmin Yin, Zhou Huang, Xiaoyu Wang, Mengfan Tang, Shuliang Ren, **Yi Bao**
Transportation Research Part D: Transport and Environment   **IF=7.6**

Research Interests

Urban Spatiotemporal Big Data Mining and Sustainable Development: By mining urban spatiotemporal big data, reveal the patterns and trends of urban development, and provide scientific basis for urban planning and decision-making. Based on data analysis results, formulate reasonable land use planning, transportation planning, and public facility layout to achieve sustainable and intelligent urban development.

High-resolution Urban Built Environment Studies: Combining machine learning with geographic big data to calculate high-resolution urban built environment (buildings, infrastructure, etc.) material stocks, distribution patterns, and to evaluate urban mineral potential, urban evolution direction, and sustainable urban development models.

Exploring the Interaction Mechanism between Built Environment and Human Activities, Socioeconomic Attributes: Analyzing the relationship between built environment and human activities, socioeconomic attributes to explore the impact and interaction mechanism of urban built environment on human activities and socioeconomic attributes, and providing scientific basis for sustainable urban development by improving resource use efficiency.

Research Honors	First author paper "A BiLSTM-CNN model for predicting users' next locations based on geotagged social media" selected as one of the Top 20 most cited papers in the International Journal of Geographical Information Science in the last 3 years.

First author paper "High-resolution quantification of building stock using multi-source remote sensing imagery and deep learning" selected as Editor's Pick highlighted paper in the Journal of Industrial Ecology.

First author paper "Big geodata revealed spatial patterns of built environment stocks across and within cities in China" published in Engineering, the journal of the Chinese Academy of Engineering, was reported by Xinhua News Agency under the title **"Research results on spatial patterns and evolution models of built environment material stocks in major cities in China released"**, stating **"This research result will provide important references for global sustainable urban development and help achieve SDG 11.3"**. The article received widespread attention, with over 1.15 million views across the internet.

Peer Review	- Humanities & Social Sciences Communications

- Resources, Conservation and Recycling
- Transportation
- Cities
- Journal of Big Data
- Journal of Selected Topics in Applied Earth Observations and Remote Sensing
- Journal of Industrial Ecology
- Geo-spatial Information Science
- IEEE Access
- International Journal of Applied Earth Observation and Geoinformation
- Transactions on Geoscience and Remote Sensing
- Urban Informatics
- Sustainable Cities and Society
- Landscape and Urban Planning
- Applied Geography
- Earth's Future
- Journal of Asian Architecture and Building Engineering