Bin Liu

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BIOGRAPHY

Bin Liu is a master's student in Landscape Ecology at the Chinese Academy of Sciences (a Double First-Class institution), supervised by Prof. Liding Chen. With an interdisciplinary background in economics, statistics, and ecology, his research focuses on sustainable urban transitions, employing spatial data science and economic policy analysis (including China's dual-carbon policies, urban planning strategies, and land-use policies). His work integrates quantitative methods to map and monitor the spatiotemporal evolution of urban landscapes, addressing key challenges such as urban sprawl, job-housing imbalance, production-living-ecological space conflicts, and energy-related carbon emissions through a policy- and data-driven "Social-Economic-Natural" nexus framework. Particularly interested in urban livability, he aims to advance sustainable urban planning and design that harmonizes human well-being, environmental balance, and economic vitality—fostering a tri-dimensional sustainable urban system.

RESEARCH INTERESTS

Landscape ecology, urban sustainability, Spatial analysis, GIS and Remote sensing applications, Geospatial big data and Mapping, Urbanization, Carbon emissions, Land use change

EDUCATION

Chinese Academy of Sciences, Research Center for Eco-Environmental Sciences, State Key Laboratory of Regional and Urban Ecology   **Beijing, China | 09/2023 - Present**
- **Master's Student in Ecology**
- **GPA:** 3.55/4.0
- **Core Courses:** Ecosystem Assessment and Management(92), Resources Recycling and Ecological Economics(92), Ecological Remote Sensing Applications(98), Modern Urban Governance(92), Human geography Model and Application(91), Remote Sensing of Ecosystems: Principles and Methods(90), Ecology of Resources(88), Ecological City and Green Building(87), GIS(85), Spatial Analysis and Modeling in Landscape, Urban Ecological Management

Northeast Forestry University   **Harbin, China | 09/2019 - 06/2023**
- **Degree:** Bachelor of Economics in Economic Statistics
- **GPA:** 88.42/100
- **Core Courses:** Statistical software(100), Forecasting and Decision of Statistics(98) Econometrics(97), Statistics(96), National Economic Accounting(96), Time Series Analysis(96), Finance(96), Probability Theory and Mathematical Statistics(94), Multivariate Statistical Analysis(92), Statistical modeling training(92), Micro(86) and macro-economics(89)

PUBLICATIONS

- **Bin Liu,** Jiehua Lv* (2024). Spatiotemporal evolution and Tapio decoupling analysis of energy-related carbon emissions using nighttime light data: A quantitative case study at the city scale in Northeast China, *Energies,* 17(19), 4795. DOI: https://doi.org/10.3390/en17194795.

- **Bin Liu,** Lei Yang, Liding Chen*, Sike Ma. An optimized approach to job-housing spaces identification in urban areas using location-based service data: A case study in Haidian District of Beijing, China. *Habitat International* **(Under Review)**

- **Bin Liu,** Liding Chen*. Spatial patterns of production-living-ecological spaces in the Beijing-Tianjin-Hebei region: applications of multi-perspective mapping. *Applied Geography* **(Under preparation)**

- **Bin Liu,** Liding Chen*****. Spatial interaction between production-living-ecological spaces and landscape patterns in Beijing, China. *Landscape and Urban Planning* **(Under preparation)**

RESEARCH EXPERIENCE

Landscape Spatial Process Evolution and Soil Environmental Benefits in Rapidly Urbanizing Regions
Key Project Funded by National Natural Science Foundation of China   **09/2023 - Present | *Research Assistant***
Advisor: *Prof. CHEN Liding (Research center of eco-environment sciences, Chinese academy of sciences)*
- Investigated the impacts of rapid urbanization on landscape patterns, spatial processes, and soil ecological security, integrating socioeconomic dynamics and geospatial big data
- Combined GIS spatial and remote sensing techniques with geographic big data for quantitative computation of the spatial dynamics of urban landscape functionalities, revealing their evolution under rapid urbanization pressures from 2016 to 2024
- Conducted 5km grid mapping of Production-Living-Ecological Spaces (PLES) in Beijing-Tianjin-Hebei (BTH) urban agglomeration using POI and land use data
- Developed an optimized method to identify urban job-housing spaces using dynamic population data
- Performed qualitative mapping of landscape functional cells across the BTH urban agglomeration and analyzed spatial response between PLES and landscape patterns at the grid scale

Policy Implications on Matching and Equilibrium of Greenhouse Gas Emissions and Forest Carbon Sink
Funded by National Social Science Foundation of China   **09/2021 - 06/2023 | *Research Assistant***
Advisor: *Prof. LV Jiehua (College of economics and management, Northeast Forestry University)*
- Investigated the drivers of GHG emission reduction (e.g., environmental regulations, energy structure, innovation) and inter-provincial spillovers, alongside a parallel assessment of forestry carbon sinks' sequestration potential, providing actionable policy insights to advance China's dual-carbon agenda, energy security, and sustainable urbanization
- Conducted provincial-level statistical accounting and city-level spatiotemporal analysis of carbon emissions derived from eight energy sources across Northeast China (2005-2019)
- Designed an interdisciplinary method by integrating statistical accounting, GIS spatial analysis, nighttime light data, and landscape ecology's 'scaling' concept to model city-scale energy carbon emissions, visualizing spatiotemporal dynamics and decoupling trends between emissions and economic growth
- Awarded the Outstanding Thesis designation with the highest academic score, published a paper as first author in *Energies*

Chinese Forestry and Grassland Spirit and Its Connotation and Contemporary Value
Funded by China Forestry Policy and Research Association   **07/2021 - 03/2022 | *Member***
Advisor: *Prof. CHEN Wenbin (Northeast Forestry University)*
- Investigated the spiritual connotation of China's forestry-grassland sector from practitioners' perspective under the Ecological Civilization framework
- Led a nationwide perceptual evaluation study by surveying 3,000+ forestry/grassland practitioners across seven state-owned forest regions
- Employed classical statistical methods (PCA, contingency analysis, and factor analysis) to identify and quantify core dimensions of the forestry-grassland spirit
- Awarded First Prize by the China Forestry Policy and Research Association for outstanding research

ACTIVITIES

The 4th Heilongjiang Provincial Survey on Ecological Civilization Progress, *Heilongjiang Provincial Think Tank for Ecological Civilization and Green Development*
    Harbin & Yichun, China | 07/2021 - 08/2021 | *Team Leader*
- Led team to conduct comprehensive field surveys in Yichun, Heilongjiang province, a national key forest region, with a focus on eco-economic industries (e.g., forest health) and forestry workers' livelihoods
- Awarded *the First Prize for Outstanding Survey Report* and *the Second Prize for Outstanding Survey Team*

China Foundation for Poverty Alleviation Program (CFPA): "Kindness 100" Charity Fundraising Campaign
    Harbin, China | 10/2019 - 12/2019 & 11/2020 - 12/2020 | *Member*

- Participated in local communities via street fundraising and social media on poverty-related challenges
- Awarded the *Pioneer Challenger and Tier 1 Volunteer* of Kindness 100 by CFPA

AWARDS & COMPETITIONS

National-level：
- **National Encouragement Scholarship**   **Thrice, 2020 & 2021 & 2022**
- **National Third Prize,** National University Student Competition on Energy Conservation, Emission Reduction, and Social Practice **(Team Leader)**   **08/2022**
- **National Third Prize,** National University Student Market Research and Analysis Competition **(Member; Team Leader)**   **Twice, 2021 & 2022**
- **First Prize for Outstanding Research Achievement,** China Forestry Workers' Ideological and Political Research Association (National) **(Member)**   **03/2022**
- **Honorable Mention,** Mathematical Contest in Modeling **(Team Leader)**   **2022**

Provincial-level：
- **Bronze,** "Internet+" National College Student Innovation and Entrepreneurship Competition (Provincial Level) **(Member)**   **Twice, 2021 & 2022**
- **Silver Award,** Challenge Cup National College Student Innovation Plan Competition (Provincial Level) **(Member)**   **08/2022**
- **First Prize,** National University Student E-Commerce Challenge (Provincial Level) **(Member)**   **08/2022**

University-level:
- **Second-Class Scholarship,** Research Center for Eco-Environmental Sciences, CAS   **01/2025**
- **Distinguished Graduate,** Northeast Forestry University   **06/2023**
- **Outstanding Undergraduate Thesis designation,** Northeast Forestry University   **06/2023**
- **Merit Student,** Northeast Forestry University   **12/2022**
- **University First-Class Scholarship,** Northeast Forestry University   **04/2022**
- **Social Practice Activist** (Awarded for Community Engagement and Fieldwork Leadership)   **11/2021**

Peer Review Experience

- *Frontiers in Sustainable Cities* (ESCI Q2), Reviewer for 1 manuscript, 2025

Membership

- Ecological Society of China (ESC), student member
- The Geographical Society of China (GSC), student member
- Chinese Society of Landscape Architecture (CHSLA), student member

SKILLS

- **Language:** Chinese (*Native*), English (*Fluent*)
- **Programming:** RStudio (*Proficient*), Python (*Familiar*)
- **GIS & RS:** ArcGIS (*Proficient*), Google Earth Engine (*Familiar*)
- **Others:** Adobe Illustrator (*Proficient*), Microsoft (*Word, PowerPoint, Excel*) (*Proficient*), SPSS (*Proficient*), Eviews (*Proficient*), Origin (*Proficient*), Fragstats (*Proficient*)