Li Chao (Mike)

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Research Profile

Interdisciplinary scientist working at the intersection of **artificial intelligence, geoscience, and sustainability economics**. Over the past three years I have focused on two deeply complementary goals: (1) **building large-scale research data infrastructure** — a 200-million-article global news corpus, a worldwide well-being micro-database of tens of millions of respondents (Gallup, Global Flourishing Study, DHS; via collaboration with senior economists at the Asian Development Bank), a harmonized global geospatial stack (MODIS × CMIP6 × population × land-cover × pollution), and an automated Gemini-based AI Agent that now drives cross-survey data integration — and (2) entering a **sustained high-output phase** powered by that infrastructure, with **27 peer-reviewed papers (23 first-author, all JCR Q1)**, **24 additional first-author manuscripts under review or in final preparation**, **3 patents filed at the Japan Patent Office**, and a **CRAN-published R package**. I am seeking a tenure-track faculty position in which this data infrastructure and research pipeline can be transferred into a university lab to train students and generate research at scale.

Published papers	27 (23 first-author, all JCR Q1)
Under review / working	24 first-author manuscripts
Patents	3 filed at Japan Patent Office (2024)
Open software	GWPR.light — on CRAN
Data infrastructure built	Global News Corpus (~200M articles, 5-year, multilingual) · Global Well-being micro-database (Gallup + GFS + DHS, tens of millions of respondents, via ADB collaboration) · Global MODIS × CMIP6 geospatial stack · SRDB v1 (prototype) · Gemini-based AI Agent for automated data integration
Compute resources	Google Cloud Platform compute engine + in-house HPC cluster with 20 shared 4×H100 GPU nodes + dedicated PostgreSQL data server

Two Distinguishing Strengths

1. Large-Scale Research Data Infrastructure I Have Built

The scarcest resource in empirical AI / sustainability research is not models — it is high-quality, research-ready data at global scale. Over the past three years I have assembled, cleaned, and aligned the following infrastructure, which now feeds my current research pipeline and will transfer directly into a university lab:

- **Global News Corpus (GNews) — operational:** A multilingual global news database of **~200 million articles covering the last five years**. Stored on a dedicated PostgreSQL server with automated daily ingestion. This is the primary feedstock for downstream ESG-text, financial event-study, and social-risk models.
- **Global Well-being Micro-Database — under active alignment:** A harmonized individual-level panel integrating the **Gallup World Poll (2005–2024)**, the **Global Flourishing Study**, and the **DHS Program** (Demographic and Health Surveys covering many developing countries). Total: **tens of millions of**

respondents. Raw survey access is supported through collaboration with senior economists at the **Asian Development Bank (ADB)**. Cross-survey variable alignment is ongoing; this is expected to anchor a major wave of publications in 2026–2027 on global well-being, gender, rural-urban disparity, greenness, and climate-health.

- **Global High-Resolution Geospatial Stack — operational:** Harmonized MODIS + CMIP6 + population + land cover + air pollution + greenness grids, used to produce global monthly 5-km temperature forecasts for 2000–2100 and city- and grid-level demographic projections. 500-m downscaling in development for 2026.
- **SRDB – Social Risk Database (v1 prototype):** Built on top of GNews to extract corporate-level social-risk signals (labor, community, governance). A first working version has been deployed; model performance is still being improved and a v2 with stronger entity resolution and scoring is on the roadmap.
- **Automated AI Agent for Data Integration — in development:** Designing an **automated research AI Agent stack**; the first working agent — built on **Google Gemini** — is already driving the cross-survey alignment and integration pipeline of the Well-being Micro-Database, reducing what was previously months of manual harmonization to a semi-automated workflow. Additional agents for literature screening, variable mapping, and robustness checking are on the roadmap.
- **Open Software:** Authored and maintain GWPR.light on CRAN — the first R package for geographically weighted panel regression; reused across several of my own publications.
- **Compute:** A dedicated PostgreSQL data server for the research corpora, **Google Cloud Platform compute engine** for scalable training and data processing, and access to a **local HPC cluster with 20 shared 4×H100 GPU nodes** for large-model experiments.

2. Current High-Velocity Output Phase (2025–2026)

Because the infrastructure is in place, the research pipeline has shifted from data-building to paper-producing. The output profile reflects this acceleration:

- **23 first-author JCR Q1 journal articles** — 15 of which were accepted in 2024–2026, reflecting an accelerating cadence as the data stack matured.
- **24 first-author manuscripts under review or in final preparation**, spanning climate downscaling (MODIS × CMIP6), ESG text analytics, global well-being econometrics, and demographic forecasting.
- **3 invention patents** filed at the Japan Patent Office (2024) covering ESG-tendency modeling, relevance/search computation, and social-risk calculation.
- **High-impact venues in the current cycle:** Remote Sensing of Environment (IF 13.5), Sustainable Cities and Society (IF 12.0), Business Strategy and the Environment (IF 12.5), Journal of Cleaner Production (IF 10.0), Environmental Pollution (IF 8.9), Scientific Data (IF 8.5), Expert Systems with Applications (IF 7.5), Cities (IF 6.0), among others.
- **Forthcoming output:** Once the Well-being Micro-Database alignment is complete (expected 2026), a coordinated series of first-author manuscripts will follow — many are already drafted and waiting on the final data layer.

Education

Ph.D., Urban Engineering and Economics — Kyushu University, Japan	2022
M.E., Architecture — Northwestern Polytechnical University, China	2019
B.E., Urban Planning — Qinghai University, China	2016

Academic & Industry Appointments

Academic

Visiting Assistant Professor — Kyushu University 2025.04 – Present

Special Assistant Professor — Kyushu University 2023.04 – 2025.03

Researcher — Kyushu University 2022.10 – 2023.04

Industry

Head of AI Research Department — aiESG Inc. 2026.01 – Present

Chief Data Scientist & Executive Board Member — aiESG Inc. 2025.01 – Present

AI Research Manager — aiESG Inc. 2024.04 – 2026.01

Data Scientist — aiESG Inc. 2023.04 – 2024.04

Research Interests

High-resolution long-term geographic prediction · Large Language Models (design, training, fine-tuning) · Vision-Language Models · Remote sensing and big-data geoscience · AI-agent design · Vector databases and RAG systems · Human well-being and socio-environmental determinants · Air pollution, land use and land cover · Population and temperature projection · Spatial statistics and econometrics.

Technical Expertise

- **Programming:** Python, R (CRAN package author), C/C++, SQL, Linux shell, Stata, Markdown, Google Cloud Platform.
- **Deep Learning:** Transformer and Mixture-of-Experts architecture design, custom loss-function engineering, LLM/VLM pre-training and fine-tuning, RAG pipelines, vector-database construction.
- **Geospatial & Statistical:** Geographically weighted panel regression, random forest / XGBoost with geographic consideration, SHAP interpretation, spatial machine learning, remote-sensing data fusion.
- **Systems & Products:** End-to-end AI product design and deployment, GPU cluster operation, microservice and API architecture (SOCPA framework), research-to-production pipelines (MiliFrame).

Ongoing & Recently Launched Research Projects

Deep Learning for Climate Forecasting (Transformer / MoE)

- Produced global monthly temperature forecasts at 5-km resolution for 2000–2100 using MODIS and CMIP6; 500-m downscaling and vegetation-index transfer learning scheduled for 2026.
- Custom loss functions and MoE routing for scenario-aware prediction; framework named **MIKE** (manuscript under review).

Global Well-being Program — Data Alignment & Large-Scale Analysis

- Integrating the Gallup World Poll (2005–2024), the Global Flourishing Study, and the DHS Program into a unified multi-country individual-level database (tens of millions of respondents), in collaboration with senior economists at the Asian Development Bank (ADB).

- Cross-survey variable harmonization is being driven by a Gemini-based automated AI Agent, which converts what was previously months of manual work into a reproducible semi-automated pipeline.
- Ten manuscripts are already drafted / under review (gender, greenness, air pollution, loneliness, rural-urban disparity, parental relationships); a larger coordinated output is expected once alignment is complete.

News-Driven Financial & ESG Time-Series Modeling

- Exploratory AI system quantifying the causal impact of individual news events on stock prices, built on the 200-million-article Global News Corpus.
- Fine-tuning experiments with open-weight LLMs (deepseek-r1, gemma3, gpt-oss families) for investor-sentiment and ESG-tone extraction; ongoing benchmarking against classical baselines.

Research Team Leadership

- Leading a 4–5 person AI research group in industry; supervising junior data scientists and research interns, and guiding the full cycle from data ingestion through model training to first-author publication.

Publications

Peer-Reviewed Journal Articles (27 total, 23 first-author, all first-author papers JCR Q1)

Author is **Li, C.** unless otherwise noted. Reverse chronological order.

2026

1. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. Beyond the heat: Nonlinear and uneven climate change impacts on mental health. Sustainable Cities and Society 141, 107273. https://doi.org/10.1016/j.scs.2026.107273 (IF 12.0).
2. **Li, C.**, Keeley, A. R., & Managi, S. A Link between ESG Topic Emphases in Security Report and Stock Price. Journal of Cleaner Production 552, 148017. https://doi.org/10.1016/j.jclepro.2026.148017 (IF 10.0).
3. Mi, J., **Li, C.**, & Rahut, D. B. Impact of climate change on farmland NPP: Evidence from multi-scenario projections in Japan. Journal of Environmental Management 398, 128452. https://doi.org/10.1016/j.jenvman.2025.128452.
4. **Li, C.**, Keeley, A. R., & Managi, S. Demographic Decline and Resurgence in the Aging Century — Grid-level Population Tendency Grasped by Artificial Intelligence. Humanities and Social Sciences Communications (forthcoming). (IF 3.7).

2025

5. **Li, C.**, Keeley, A. R., & Managi, S. Impacts of community attachment and community livability on environmental activity according to XGBoost and SHAP. Cities 156, 105559. https://doi.org/10.1016/j.cities.2024.105559 (IF 6.0).
6. **Li, C.**, Keeley, A. R., & Managi, S. Human Mobility and Environmental Factors. Journal of Industrial Ecology. https://doi.org/10.1111/jiec.70031 (IF 4.9).
7. **Li, C.**, Keeley, A. R., & Managi, S. City-level Population Prediction in Japan from 2020 to 2100 by Machine Learning. Expert Systems with Applications. https://doi.org/10.1016/j.eswa.2025.128005 (IF 7.5).

8. **Li, C.**, Mi, J., Zhang, J., Shi, B., Keeley, A. R., & Managi, S. Low Well-Being among Middle-Aged People: Inherent or External Factors. Humanities and Social Sciences Communications. https://doi.org/10.1057/s41599-025-05708-9 (IF 3.7).
9. **Li, C.**, Keeley, A. R., & Managi, S. Forecasts and Insights into Japan's Fiscal Future: Machine Learning-Based Projections of City-level Taxpayer Numbers and Total Income from 2020 to 2100. Machine Learning with Applications. https://doi.org/10.1016/j.mlwa.2025.100699 (IF 4.9).
10. **Li, C.**, Keeley, A. R., & Managi, S. ESG emphasis of top companies in East and Southeast Asian countries unveiled by deep learning. Green Technologies and Sustainability 100296. https://doi.org/10.1016/j.grets.2025.100296.
11. **Li, C.**, & Managi, S. A spatial machine learning approach to valuing development and greenness in well-being. Sustainable Cities and Society 135, 107007. https://doi.org/10.1016/j.scs.2025.107007 (IF 12.0).

2024

12. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. ESG Tendencies From News Investigated by AI Trained by Human Intelligence. Business Strategy and the Environment. https://doi.org/10.1002/bse.4089 (IF 12.5).
13. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. Investor's ESG tendency probed by pre-trained transformers. Corporate Social Responsibility and Environmental Management. https://doi.org/10.1002/csr.3055 (IF 8.3).
14. **Li, C.**, & Managi, S. Mental health and natural land cover: a global analysis based on random forest with geographical consideration. Scientific Reports 14, 2894. https://doi.org/10.1038/s41598-024-53279-7 (IF 4.6).
15. Piao, X., **Li, C.**, & Managi, S. Infrastructure distribution in cities and the improvement of the well-being of citizens in Japan. Sustainable and Resilient Infrastructure, 1–15. DOI: 10.1080/23789689.2024.2403882.

2023

16. **Li, C.**, & Managi, S. Gridded Datasets for Japan: Total, Male, and Female Populations from 2001–2020. Scientific Data 10. https://doi.org/10.1038/s41597-023-01989-4 (IF 8.5).
17. **Li, C.**, & Managi, S. Natural land cover positively correlates with COVID-19 health outcomes. BMC Public Health 23(1). https://dx.doi.org/10.1186/s12889-023-15484-3 (IF 4.5).
18. **Li, C.**, & Managi, S. Income raises human well-being indefinitely, but age consistently slashes it. Scientific Reports 13(1). https://dx.doi.org/10.1038/s41598-023-33235-7 (IF 4.6).
19. **Li, C.**, & Managi, S. Inappropriate nighttime light reduces living comfort. Environmental Pollution 334, 122173. https://doi.org/10.1016/j.envpol.2023.122173 (IF 8.9).

2022 and earlier

20. **Li, C.**, & Managi, S. Impacts of air pollution on COVID-19 case fatality rate: a global analysis. Environmental Science and Pollution Research. https://doi.org/10.1007/s11356-021-18442-x (IF 5.8).
21. **Li, C.**, & Managi, S. Estimating monthly global ground-level NO_2 concentrations using geographically weighted panel regression. Remote Sensing of Environment 280, 113152. https://doi.org/10.1016/j.rse.2022.113152 (IF 13.5).
22. **Li, C.**, & Managi, S. Global malaria infection risk from climate change. Environmental Research 214, 114028. https://doi.org/10.1016/j.envres.2022.114028 (IF 8.3).

23. Keeley, A. R., **Li, C.**, Takeda, S., Gloria, T., & Managi, S. The Ultimate Owner of Environmental, Social, and Governance Investment. Frontiers in Sustainability 3. https://doi.org/10.3389/frsus.2022.909239.
24. Song, X., Lu, Y., **Li, C.**, Wang, F., & Zhao, X. Enhancing the mechanical stability of composite electrodes by regulating the volume of active material using a prelithiation strategy. Journal of Energy Storage 51, 104390. https://doi.org/10.1016/j.est.2022.104390.
25. **Li, C.**, & Managi, S. Land cover matters to human well-being. Scientific Reports 11. https://doi.org/10.1038/s41598-021-95351-6 (IF 4.6).
26. **Li, C.**, & Managi, S. Spatial Variability of the Relationship between Air Pollution and Well-being. Sustainable Cities and Society 103447. https://doi.org/10.1016/j.scs.2021.103447 (IF 11.7).
27. **Li, C.**, & Managi, S. Contribution of on-road transportation to PM2.5. Scientific Reports 11, 21320. https://doi.org/10.1038/s41598-021-00862-x (IF 4.6).

Manuscripts Under Review / In Final Preparation (24)

All first-author unless noted. This list reflects the current high-output phase.

1. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. **MIKE**: A Deep Learning Framework for High-Resolution, Scenario-Aware Temperature Prediction Using MODIS and CMIP6 Data.
2. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. Systematic Inconsistencies Between CMIP6 Simulations and MODIS Observations Across Historical and Scenario Periods.
3. **Li, C.**, Keeley, A. R., & Managi, S. Grid-level Land Cover Forecast during Long-Term Aging Society Powered by Deep Learning.
4. **Li, C.**, Keeley, A. R., & Managi, S. Long-term Forecasting of the City-level Economy and Workforce in an Aging Society via Machine Learning.
5. **Li, C.**, Keeley, A. R., & Managi, S. How Will the Households with Different Employment Status Distribute in Japan during the Depopulation Century.
6. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. Do Companies Walk the Talk about Greenhouse Gas Emissions? A Big Data Textual Analysis with Classification Pretrained Transformer.
7. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. ESG Topics Relatedness from News and Stock Market Price Indicators.
8. **Li, C.**, Keeley, A. R., & Managi, S. ESG Risk Database Powered by Artificial Intelligence.
9. **Li, C.**, Keeley, A. R., & Managi, S. AI-Powered ESG Text Analysis: Corporate Reporting Tendency Pattern and Variation in East and Southern Asia.
10. **Li, C.**, Keeley, A. R., & Managi, S. Environmental Disclosure Dimensions and Japanese Firm Valuation: Volume, Sentiment, and Market Heterogeneity.
11. **Li, C.**, Keeley, A. R., & Managi, S. Disaggregating Social Disclosure: Volume, Sentiment, and Topic-Specific Tone's Association with Market Capitalization in Japan.
12. **Li, C.**, Keeley, A. R., & Managi, S. Corporate Governance Disclosure Volume, Sentiment, and Topic Tone: Heterogeneous Associations with Firm Valuation.
13. **Li, C.**, & Managi, S. Reality Contradicts Maslow's Hierarchy of Needs.
14. **Li, C.**, & Managi, S. GWPR.light: An R Package for Geographically Weighted Panel Regression.

15. Mi, J.[+], **Li, C.[+]**, Zhang, J., Shi, B., Keeley, A. R., Takeda, S., Seki, D., & Managi, S. Exploring Gender Disparities in Subjective Well-Being: The Impacts of Inherent and External Factors Across Global Contexts. ([+]co-first author)
16. **Li, C.**, Mi, J., Keeley, A. R., & Managi, S. Religious Social Engagement as a Social-Structural Mediator of Rural-Urban Well-being Disparities.
17. **Li, C.**, Mi, J., Keeley, A. R., & Managi, S. Rural-Urban Disparities in Loneliness: A Global Study on the Mediating Role of Social Support.
18. **Li, C.**, Mi, J., Keeley, A. R., & Managi, S. The Rural Happiness Paradox: Economic Insecurity and Social Support as Mediators of Global Rural-Urban Well-being Disparities.
19. **Li, C.**, Mi, J., Keeley, A. R., & Managi, S. Perceived Childhood Father and Mother Relationship Quality and Adult Life Satisfaction: Global Evidence and Cross-National Heterogeneity.
20. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. Behavioral Mediation of Air Pollution Impacts on Global Physical Health Using a Spatial Machine Learning Framework.
21. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. Where Do Gender Differences in Mental Health Come From? A Global Decomposition Analysis.
22. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. Greenness, Emotion, and Mental Health Across the World.
23. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. The Emotional Value of Air Pollution: Global Evidence from Machine Learning and Climate Projections.
24. **Li, C.**, Zhang, J., Keeley, A. R., & Managi, S. The Quantity of Leaves and the Quality of Life: Global Evidence on Leaf Area Index and Life Satisfaction.

Open-Source Software

- **GWPR.light —** an R package for geographically weighted panel regression; published on CRAN. CRAN link

Invention Patents (Japan Patent Office)

1. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. ESG Tendency CPT (ESG tendency analysis model). Filed March 7, 2024.
2. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. Related degree calculation device, search device, method, and program. Filed November 1, 2024.
3. **Li, C.**, Keeley, A. R., Takeda, S., Seki, D., & Managi, S. Social risk calculation device, social risk calculation method, and computer program. Filed December 10, 2024.

Teaching & Academic Service

Lecturer — Data Science (Bachelor level), Kyushu University	2023.10 – 2023.12
Applied Geography course, Engineering Department, Kyushu University	2022.10 – 2023.03
Master-level Urban Engineering, Kyushu University	2022.10 – 2023.03
Research Assistant, Department of Urban Engineering and Economics	2021.10 – 2022.09

Peer-Review Service

Journal reviewer for: Journal of Cleaner Production · Scientific Reports · BMC Public Health · BMC Health Services Research · International Journal for Equity in Health · Environmental Earth Sciences · Carbon Balance and Management, among others.

Honors & Awards

First Prize, Academic Scholarship — Northwestern Polytechnical University	2016–2017
National Scholarship — Ministry of Education of P. R. China	2014–2015
National Encouragement Scholarship — Ministry of Education of P. R. China	2013–2014

Languages

- **Chinese:** Native.
- **English:** Bilingual proficiency.
- **Japanese:** Limited working proficiency.