CHARLES KNOBLE, PH.D.

ENVIRONMENTAL & DATA JUSTICE RESEARCHER
GIS & DATA SCIENCE CONSULTANT

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INTERDISCIPLINARY ENVIRONMENTAL JUSTICE AND GIS SCHOLAR with progressive experience in urban planning, geospatial analysis, and big data analytics. Adept at integrating GIS, spatial statistics, and causal inference methods into research and teaching, while fostering cross-disciplinary collaboration. Proven ability to produce peer-reviewed studies and shape students into researchers, with strong research skills demonstrated through publications, conference presentations, and community building awards. Passionate about applying geospatial tools and big data to address real-world urban planning and environmental challenges, with a commitment to promoting equity and justice through both academic inquiry and practical application.

RESEARCH INTERESTS: *Critical GIS and Data Justice, Big Data Analytics, Equitable Urban Development, Environmental Justice, Public Health, Simulative Environmental/Human Dynamic Modeling*

EDUCATION:

PH.D., ENVIRONMENTAL SCIENCE AND MANAGEMENT *May 2025*
Montclair State University (MSU), *Montclair, NJ* *GPA: 3.97/4.0*
Dissertation: *Don't Let Lead Lead on Environmental Justice: A Simulative Approach to Lead Remediation in the Big Data Era*
Advisor: Dr. Danlin Yu, Professor of Environmental Science and GIS

B.A., INTERNATIONAL RELATIONS *Spring 2019*
California State University, Chico, *Chico, CA* *GPA: 3.69/4.0*
Minors: Political Science, Italian, and International Studies

RESEARCH EXPERIENCE:

GRANT, US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT *June 2023 – May 2025*
Research Assistant, *Dept. of Earth and Environmental Science, MSU*

- Developed R scripts to collect, standardize, and aggregate over 20 environmental, social, health, economic, big data, and remote sensing datasets for quantitative analysis
- Created R functions to extract and analyze temporal covariation patterns using a variety of linear transformations across datasets
- Established best practices for data collection, training a new, international student researcher in acquisition methods to ensure data validity and compliance with grant requirements
- Collaborated with an interdisciplinary team of scientists from partner universities and external advisors to support cross-sector research goals

DOCTORAL PROGRAM, ENVIRONMENTAL SCIENCE AND MANAGEMENT *Aug 2021 – May 2025*
Teaching Assistant, *Dept. of Earth and Environmental Science, MSU*

- Applied Spatial Autoregression and Ordinary Least Squares methods to analyze the relationship between social media activity, environmental justice factors, and remote sensing imagery
- Led a lab group in designing and implementing research projects focused on environmental and spatial justice for public health emergency response during the Flint Water Crisis
- Conducted research on cascading policy impacts of Pb remediation initiatives on community public health and equity using a simulative model
- Developed a system dynamics model to simulate and forecast the environmental justice impacts of elevated blood lead levels, leveraging both historical datasets and big data-driven indicators
- Synthesized findings from 50+ peer-reviewed publications (2015 onwards) in an in-depth literature review, identifying emerging trends and research gaps in environmental justice

LAND CONSERVATION AND SEA LEVEL RISE POLICIES *Jan 2019 – May 2019*
Research Internship, *California Dept. of Conservation*

- Coordinated community science outreach initiatives for neighborhoods near oil wells encountering health problems, in partnership with the Director of Outreach and Engagement

- Conducted academic and policy research on U.S. land conservation trends, synthesizing emerging developments to inform the Chief Scientist's long-term program goals
- Presented policy implications and summaries of California's emerging land conservation initiatives to internal and external stakeholders at quarterly science briefings
- Assisted in facilitating internal training sessions on Diversity, Equity, and Inclusion, and Effective Communication Strategies for department staff

UN MEMBER STATE POLICY REPORTING *Aug 2016 – April 2019*

Model United Nations Delegate and Student Teacher, *California State University, Chico*

- Analyzed policy documents for an assigned United Nations Member State, drafting formal policy responses to international environmental, cultural, and economic crises
- Delivered speeches representing the Member State's policy position, facilitating the drafting of new resolutions at national and international conferences
- Received 3 awards for writing excellence and 2 for speech delivery during these conferences
- Mentored 20+ undergraduate students in policy research, writing, and public speaking, resulting in 15 students winning awards at national and international conferences

FOREIGN AID – BRIDGES AND BARRIERS *Dec 2018*

Senior Capstone Study, *California State University, Chico*

- Conducted a comprehensive review of policy, news, and organizational responses to the 2010 earthquake in Haiti, with a focus on humanitarian aid and redevelopment efforts
- Synthesized peer-reviewed literature on the effectiveness of international humanitarian aid, highlighting significant gaps between intended and actual recovery efforts
- Analyzed both qualitative and quantitative data from the American Red Cross, USAID, and academic sources to assess the effectiveness of post-disaster recovery initiatives

ASSESSING IMPACTS AT THE ALCOHOL DRUG AND EDUCATION CENTER *Dec 2016*

Research Methods Project, *California State University, Chico*

- Conducted an ethnographic study assessing the effectiveness of outreach efforts at the Campus Alcohol and Drug Education Center, utilizing small group sessions and individual interviews
- Authored a comprehensive literature review on ethnographic research methods, education outreach strategies, and qualitative data collection techniques

PEER REVIEWED PUBLICATIONS:

Fabolude G., **Knoble, C.**, Vu A., Yu D. (2025). Beyond Mining: A Comprehensive Approach to Assessing Lead Exposure Risks in Nigeria. *Environmental Impact Assessment Review*, 114, 107923. https://doi.org/10.1016/j.eiar.2025.107923

Knoble, C., Fabolude, G., Vu, A., Yu, D. (2024). From crisis to prevention: mining big data for public health insights during the Flint Water Crisis. *Discover Sustainability*, 5, 289, https://doi:10.1007/s43621-024-00514-w

Chien, S. -C., & **Knoble, C.** (2024). Uneven Burdens: The Intersection of Brownfields, Pollution, and Socioeconomic Disparities in New Jersey, USA. *Sustainability*, 16(23), 10535. https://doi.org/10.3390/su162310535

Fabolude, G., **Knoble, C.**, Vu, A., Yu, D. (2024). Comprehensive lead exposure vulnerability for New Jersey: Insights from a Multi-Criteria risk assessment and community impact analysis framework. *Ecological Indicators*, 167, 112585. https://doi.org/10.1016/j.ecolind.2024.112585

Chien, S.-C., & **Knoble, C.** (2024). Research of Education for Sustainable Development: Understanding New Emerging Trends and Issues after SDG 4. *Journal of Sustainability Research*, 6(1), e240006, Article e240006. https://doi.org/10.20900/jsr20240006

Fabolude, G., **Knoble, C**., Vu, A., & Yu, D. (2024). Smart cities, smart systems: A comprehensive review of system dynamics model applications in urban studies in the big data era. *Geography and Sustainability* https://doi.org/10.1016/j.geosus.2024.10.002

Chien, S.-C., **Knoble, C.**, Krumins, J. (2024). Human population density and blue carbon stocks in mangroves soils. *Environmental Research Letters,* 19(3). https://doi.org/10.1088/1748-9326/ad13b6

Knoble, C. & Yu, D. (2023). Bridging the Gap: Analyzing the Relationship between Environmental Justice Awareness on Twitter and Socio-Environmental Factors Using Remote Sensing and Big Data. *Remote Sensing*, 15(23), 5510. https://doi.org/10.3390/rs15235510

Knoble, C. & Yu, D. (2023). Environmental justice: An evolving concept in a dynamic era. *Sustainable Development*, 31(4), 2091-2108. https://doi.org/10.1002/sd.2519

MANUSCRIPTS UNDER REVIEW

Knoble, C., Fabolude, G., Vu, A., Yu, D. (n.d.). Don't Let Lead Lead on Environmental Justice: A Simulative System Dynamics Analysis of Lead Exposure in the Big Data Era. *Science of the Total Environment*.

Knoble, C., Fabolude, G., Vu, A., Yu, D. (n.d.). Data Justice and Fast-Food Mobile Apps: Analyzing Targeted Marketing and Health Implications in Marginalized Communities. *Big Data and Society*.

Amenyo, A., **Knoble, C.**, Lal, P. (n.d.). Green Finance in the United States: Distribution of Accessibility and Interest and Implications for Environmental Justice. *Journal of Climate Finance*.

Ahmed, A., **Knoble, C.**, Schuler, M. (n.d.). Effects of Multiple Stressors on Freshwater Quality and Nutrient Dynamics: A Review. *Environmental Pollution*.

Yu, D., **Knoble C.**, Fabolude G., Vu. A. (n.d.). Understanding Lead Exposure Through Data and Domain Expertise: Insights from New Jersey with a Geographically Weighted Regression Analysis. *Environmental Science and Pollution Research*.

Fabolude, G., **Knoble C.**, Vu, A., Yu, D. (n.d.). The Battle Against Lead Exposure: Unveiling Urban Lead Exposure Dynamics Through System Modeling. *Environmental Health Perspectives*.

Vu, A., **Knoble C.**, Fabolude, G., Yu, D (n.d.). Micromobility in New York City: Historical Development, Current Trends, and Future Directions for Sustainable Urban Transportation. *Transport Policy*.

Cade, R., Yu, D., **Knoble, C.**, Whyte, K., Lal, P., Borgerson, C. (n.d.). Environmental Justice in Indigenous Communities: The Disproportionate Effects of Environmental Contamination. *Sustainable Futures*.

IN PREPARATION

Yu, D., **Knoble, C.** (2026). Integrative Sensing Strategies for Disaster Management. *Elsevier,* Earth Observations.

TEACHING EXPERIENCE:

INTRODUCTION TO GIS AND REMOTE SENSING (EAES 210/506) *Spring 2024*
Adjunct Professor, *Dept. of Earth and Environmental Science, MSU*

- Designed the course curriculum and lab assignments, and delivered lectures for a GIS course attended by 20+ undergraduate and graduate students
- Developed a course syllabus that emphasized the intersection of environmental justice and public health, encouraged the use of multiple software platforms for real-world spatial analysis projects
- Supervised and mentored a teaching assistant, providing guidance on student support and grading

INTRODUCTION TO GIS AND REMOTE SENSING (EAES 210/506) *Spring 2022 – Fall 2023, Spring 2025*
Teaching Assistant, *Dept. of Earth and Environmental Science, MSU*

- Lead lab sections for undergraduate and graduate students, conducting hands-on activities focused on spatial data acquisition, geospatial analysis, and data management using ArcGIS Pro and QGIS
- Provide guidance for lab exercises, conceptual exams, and real-world spatial and statistical analyses while encouraging community collaboration and self-learning
- Grade assignments and exams, helping students master both theoretical and practical GIS concepts
- Awarded "Outstanding Teaching Assistant" in the first year for demonstrating enthusiasm and dedication to student success

ADVANCED GIS AND REMOTE SENSING (EAES 310/510) *Spring 2022, Spring 2023*
Teaching Assistant, *Dept. of Earth and Environmental Science, MSU*

- Guided undergraduate and graduate students through advanced geospatial analyses, spatial data acquisition, and machine learning classification techniques using ArcGIS Pro and QGIS
- Assisted students in developing individual research projects, preparing for exams, and producing static and dynamic maps using Esri software
- Graded assignments and supported students with both theoretical and practical GIS exam preparation

PLANET EARTH (EAES 101) *Fall 2022, Fall 2023*
Teaching Assistant, *Dept. of Earth and Environmental Science, MSU*

- Led lab sections for an introductory earth science course emphasizing geographic principles for 25+ interdisciplinary undergraduate students
- Facilitated lab exercises using tools like Google Earth Pro and Gigapan, contextualizing assignments with real-world events whenever possible
- Provided one-on-one tutoring and feedback on assignments, helping students build foundational earth system and geographic knowledge

METHODS IN ENVIRONMENTAL RESEARCH (EAES 390/591) *Fall 2021*
Teaching Assistant, *Dept. of Earth and Environmental Science, MSU*

- Assisted students with assignments focused on pre-processing data, verifying statistical assumptions, and conducting statistical analyses using R
- Created a supportive, inclusive learning environment through weekly drop-in hours, despite the asynchronous online format
- Graded assignments and provided individualized tutoring to help students strengthen their understanding of research methods in environmental science

MODEL UNITED NATIONS SIMULATION (POLS 340A/B) *Aug 2016 – April 2019*
Student Teacher, *California State University Chico, Political Science and Criminal Justice Department*

- Delivered lectures on public speaking and research methods for a class of 30+ students under the supervision of the course instructor
- Developed lesson plans, assignments, exams, and lectures to prepare students for Model United Nations conferences
- Guided students in research methods, writing techniques, and public speaking skills in a United Nations environment, contributing to their preparation for competitive conferences

INDUSTRY EXPERIENCE:

STARCREST LLC & INDEPENDENT CONSULTANT, Remote *May 2022 – Present*
Geographic Information Systems (GIS) Analyst

- Assess environmental, social, and spatial equity impacts of proposed sustainability projects using curated datasets and federal mapping tools
- Conduct marine vessel emissions exposure inventories by processing and visualizing thousands of data points using automated geospatial analysis techniques in ArcGIS Pro, R, and python
- Create static and dynamic geographic visualizations to communicate environmental and social stories
- Assisted in drafting 7 emissions inventory reports on methodologies, findings, and recommendations for achieving sustainability goals for port authority clients

- Contributed to 7 (and secured 5) federal grant proposals by quantifying expected environmental justice impacts based on state and federal regulations, tools, and definitions
- Completed 400+ hours with Starcrest LLC and 400+ hours as an independent consultant

CENTER FOR SUSTAINABLE ENERGY, Oakland, CA; Remote *April 2020 – Aug 2021*
Clean Cities Coordinator; Project Manager
- Developed and implemented outreach efforts for fleet electrification by organizing webinars with industry leaders, drafting monthly email campaigns, and engaging in one-on-one consultations
- Coordinated monthly fleet electrification training sessions, environmental policy newsletter distributions, and sustainability transition resource updates for 60 partner organizations
- Planned, developed, and enacted internal assessment of outreach effectiveness through cross-department collaboration research study

PRESENTATIONS:

MAPPING YOUR LOCAL ENVIRONMENT (MYLE), Rooted Futures Lab *March 2025*
Workshops: Empowering Local Journalists with Critical GIS
Charles Knoble, Arpan Somani
- Developed and delivered workshops in Atlanta, GA and Detroit, MI empowering local journalists to acquire, assess, and visualize geospatial data using GIS software

AMERICAN ASSOCIATION OF GEOGRAPHERS, Annual Meeting 2025 *March 2025*
Big Data-Driven Detection: System Dynamics Modeling of Pb Exposure in Newark, NJ
Charles Knoble
- Delivered a paper presentation on the impacts of various policy interventions on lead exposure and social justice considerations, for the session "Hazards, Risks, and Disasters Specialty Group: Social and Environmental Justice"

GEOGRAPHIC INFORMATION SYSTEMS DAY 2024, MSU *Nov 2024*
Industry Leaders on the Future of GIS
- Organized and moderated panel of GIS professionals, job fair style tabling, and networking dinner for student and public attendees in celebration of the 25th anniversary of GIS Day

CLEAN ENERGY AND SUSTAINABILITY ANALYTICS CENTER, Annual Summit 2024 *May 2024*
Don't Let Lead Lead on Environmental Justice: Developing a Dynamic Level Injustice Detection Tool
Charles Knoble
- Presented a research poster on the development of a system-level simulative tool to forecast community elevated blood lead levels using environmental, socioeconomic, and big data sources

AMERICAN ASSOCIATION OF GEOGRAPHERS, Annual Meeting 2024 *April 2024*
A System Dynamics Simulative Approach to Lead Remediation in the Era of Big Data
Charles Knoble
- Delivered a paper presentation on the creation of a system dynamics tool for detecting lead contamination through an environmental justice lens, for the session "Responsible GeoAI II: Justice and Accuracy"

MAPTIMEDAVIS GROUP, University of California Davis *March 2024*
Workshop: Practicing Critical GIS in the Era of Big Data and AI
Charles Knoble
- Developed and led a two-hour hybrid workshop attended by 20 participants, discussing the role of Critical GIS, the rise of big data in environmental research, and the use of Google Trends in geospatial analysis

GEOGRAPHIC INFORMATION SYSTEMS DAY 2023, MSU *Nov 2023*
Professionals in GIS
Charles Knoble, Nicholas D'Ambrosio, Amy Ferdinand, Rolihlahla Ferdinand

- Presented a slideshow featuring GIS professionals from public, private, and academic sectors, introducing students and the general public to the basics of GIS and the significance of practicing Critical GIS

COLLEGE OF SCIENCE AND MATHEMATICS RESEARCH SYMPOSIUM, MSU *April 2023*
Environmental Justice in New Jersey: An Exploration of Twitter as an Early Detection Tool
Charles Knoble

- Presented a research poster on integrating big data into environmental injustice detection tools, analyzing the use of Twitter data and identifying risks and biases associated with machine learning in these applications

AMERICAN ASSOCIATION OF GEOGRAPHERS, Annual Meeting 2023 *March 2023*
A Big Data Exploration of Injustice: Twitter Data and Environmental Justice in New Jersey
Charles Knoble

- Delivered a paper presentation on the integration of social media and remote sensing big data for environmental injustice detection in New Jersey, for the session "Symposium on Harnessing the Geospatial Data Revolution for Sustainability Solutions: Data-intensive and Computational Geography"

SIGMA XI STUDENT RESEARCH SYMPOSIUM, MSU *May 2022*
Trends in Modern Environmental Justice Studies: A Review of Techniques, Methodologies, and Findings
Charles Knoble

- Presented a discussion on recent trends in environmental justice research, summarizing key techniques, methodologies, and findings, while identifying opportunities and research gaps

AWARDS AND HONORS:

LEARNING THE EARTH WITH ARTIFICIAL INTELLIGENCE & PHYSICS (LEAP) BOOTCAMP *Jan 2025*
Science and Technology Center, *National Science Foundation*

SUMMER SCHOOL FOR ENVIRONMENTAL GOVERNANCE *July 2024*
Rutgers University

OUTSTANDING TEACHING ASSISTANT, Academic Year 2021-2022 *May 2022*
Dept. of Earth and Environmental Studies, *MSU*

GRADUATION WITH HIGHEST DISTINCTION IN THE MAJOR *May 2019*
Political Science and Criminal Justice Department, *California State University, Chico*

POLICY POSITION PAPER AWARD *April 2017, April 2019*
National Model United Nations Conference, *New York, NY*

OUTSTANDING DELEGATE AWARD *October 2018*
National Model United Nations Conference, *Washington D.C.*

POLICY POSITION PAPER AWARD *October 2017, October 2018*
National Model United Nations Conference, *Washington D.C.*

COMMUNITY DEVELOPMENT AWARD *May 2017*
University Housing, *California State University, Chico*

OUTSTANDING DELEGATE AWARD *November 2016*
Northwestern Model United Nations Conference, *Seattle, WA*

POLICY POSITION PAPER AWARD *November 2016*
Northwestern Model United Nations Conference, *Seattle, WA*

PROFESSIONAL ASSOCIATIONS AND VOLUNTEER WORK:

Volunteer Researcher, Environmental Data Governance Initiative *2024*
Member, Gamma Theta Upsilon – International Geographic Honor Society *2023*
Member, Work On Climate *2023*
Member, Jersey Water Works *2023*

Member, American Association of Geographers *2022*
Member, American Geophysical Union *2022*

PROFESSIONAL DEVELOPMENT:

SPATIAL DATA SCIENCE BOOTCAMP *Feb 2024*
Carto: Location Intelligence Platform for Spatial Analytics
- Invited to an intensive course for Data Science and Analytics professionals to deepen knowledge in spatial data science trends, Python for geographic analysis, and big data management methods

SUMMER 2023 GRADUATE STUDENT TEACHING WORKSHOP *July 2023*
Office of Faculty Excellence, *MSU*
- Attended a two-day workshop on course design and methods of instruction for maintaining student engagement throughout the semester

THE SECOND NATIONAL CONFERENCE: JUSTICE IN GEOSCIENCE *Aug 2022*
Chapman Conference: Justice in Geoscience, *American Geophysical Union*
- Participated in a four-day conference centered on enhancing diversity, equity, and inclusion in geoscience, contributing to the creation of the 2072 strategic roadmap for advancing diversity, equity, and inclusion in geoscience

SUMMER 2022 GRADUATE STUDENT TEACHING WORKSHOP *May 2022*
Office of Faculty Excellence, *MSU*
- Attended a two-day workshop on course design, focusing on backward design principles, diversity in pedagogical practices, and active learning strategies