

MARGARET A LAWRIKORE

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RESEARCH INTERESTS

My research encompasses climate change adaptation and resilience, sustainable development, and environmental justice. I apply big-data analytics, high-performance computing, and geostatistical methods to tackle complex issues. Collaborating with local communities, planning agencies, and research institutions, I seek solutions to socio-environmental issues, emphasizing clear science communication and visualization.

EDUCATION

North Carolina State University (NCSU)

Ph.D. Geospatial Analytics | GPA 4.0/4.0

Raleigh, NC

Expected August 2025

North Carolina State University (NCSU)

B.S. Environmental Sciences | GPA 4.0/4.0

Raleigh, NC

May 2020

- Concentration: Geospatial Information Science (GIS)
- Minors: Computer Programming, Bassoon Performance

PROFESSIONAL APPOINTMENTS

Graduate Research Assistant

Urban Systems Lab | Center for Geospatial Analytics | NCSU

August 2021 - Present

Raleigh, NC

Graduate Research Intern

Human Geography Group | Oak Ridge National Laboratory

June - September 2024

Oak Ridge, TN

Teaching Assistant

Fundamentals of Geospatial Information Science and Technology | NCSU

January - May 2023 and 2025

Raleigh, NC

Research Assistant

Center for Geospatial Analytics | NCSU

September 2019 - June 2021

Raleigh, NC

- Food-Energy-Water-Transportation Systems Lab | February 2021 - June 2021
- Biological Invasions Lab | May 2020 - February 2021
- Urban Systems Lab | September 2019 - May 2020

Undergraduate Research Assistant

North Carolina Institute for Climate Studies

May - August 2019

Asheville, NC

PUBLICATIONS

Peer Reviewed Articles

Sanchez, G.M., **Lawrimore, M.A.**, Petrasova, A., Vogler, J.B., Collins, E., Petras, V., Harper, T., Butzler, E., Meentemeyer, R.K. (2024). The Safe Development Paradox of the United States Regulatory Floodplain. PLoS ONE 19(12): e0311718. <https://doi.org/10.1371/journal.pone.0311718>

Lawrimore, M. A., Sanchez, G. M., Cothron, C., Tulbure, M. G., BenDor, T. K., Meentemeyer, R. K. (2024). Creating spatially complete zoning maps using machine learning. Computers, Environment and Urban Systems, 112, 102157. <https://doi.org/10.1016/j.compenvurbsys.2024.102157>

Sanchez, G.M., Petrasova, A., Skrip, M., Collins, E., **Lawrimore, M.A.**, Vogler, J.B., Terando, A., Vukomanovic, J., Mitasova, H., Meentemeyer, R.K. (2023). Spatially interactive modeling of land change identifies location-specific adaptations most likely to lower future flood risk. Sci Rep 13, 18869. <https://doi.org/10.1038/s41598-023-46195-9>

Sugg, M.M., Woolard, S., **Lawrimore, M.A.**, Micheal, K.D., Runkle, J.D. (2021). Spatial Clustering of Suicides and Neighborhood Determinants in North Carolina, 2000 to 2017. Appl. Spatial Analysis 14, 395–413. <https://doi.org/10.1007/s12061-020-09364-1>

Articles In Preparation

Lawrimore, M.A., Sanchez, G.M., BenDor, T.K., Meentemeyer, R.K. Relationships between Land-use Zoning and the Spatial Distribution of Impervious Surface in a Rapidly Growing Region. Manuscript in preparation for Landscape and Urban Planning.

DATA AND SOFTWARE RELEASES

Lawrimore, M.A., Sanchez, G.M., Cothron, C., Tulbure, M.G., BenDor, T.K., Meentemeyer, R.K. (2023). Predicted Spatially Complete Zoning Map of North Carolina. Zenodo. <https://doi.org/10.5281/zenodo.8136886>

Petrasova, A., Sanchez, G.M., Skrip, M.M., Collins, E.L., **Lawrimore, M.A.**, Vogler, J.B., Terando, A., Vukomanovic, J., Mitasova, H., and Meentemeyer, R.K. (2023). FUTURES v3: Scenarios of Future Patterns of Urbanization in Response to Sea Level Rise and Frequent Flooding Across the Southeast United States from 2020 to 2100: U.S. Geological Survey data release, <https://doi.org/10.5066/P9BD5V4B>.

Petrasova, A., Sanchez, G.M., **Lawrimore, M.A.**, Vogler, J.B., Collins, E.L., Petras, V., Harper, T., Butzler, E., and Meentemeyer, R.K. (2023). FUTURES v2: Status Quo Projections of Future Patterns of Urbanization Across the Conterminous United States from 2020 to 2100: U.S. Geological Survey data release, <https://doi.org/10.5066/P94N3ICH>.

GRANTS AND FELLOWSHIPS

PI: Sanchez, G.M.; **I: Lawrimore, M.A.** (Awarded) Amount: \$10,000. Smart Zoning for Coastal Flood Adaptation and Resilience. NC Sea Grant program. September 2022 - September 2023.

Lawrimore, M.A. (Awarded) Amount: \$4,000. University Graduate Fellowship (2021-2022). North Carolina State University.

PRESENTATIONS

Invited Talks

Lawrimore, M.A., et al. (April 2025). When Flood Management Policies Miss the Mark: Unintended Consequences of the 100-Year Floodplain. Leveraging Geospatial Tools for Effective Environmental Planning Webinar, Southeast Climate Adaptation Science Center. Virtual. Oral presentation.

Lawrimore, M.A., et al. (September 2024). Leveraging Machine Learning to Fill Zoning Data Gaps. Smart Cities Consortium. University of Texas at Austin. Oral presentation.

Lawrimore, M.A., et al. (February 2024). Creating Spatially Complete Zoning Maps Using Machine Learning. NCSU Geospatial Forum. Raleigh, NC. Oral presentation.

Conference Presentations

Lawrimore, M.A., et al. (April 2025). Relationships between Land-use Zoning and the Spatial Distribution of Impervious Surface in a Rapidly Growing Region. International Association for Landscape Ecology - North America. Raleigh, NC. Oral presentation.

Lawrimore, M.A., et al. (December 2024). How Zoning Affects the Spatial Distribution of Human Population. American Geophysical Union - AGU24. Washington, D.C. Poster presentation.

Lawrimore, M.A., et al. (April 2024). Creating Spatially Complete Zoning Maps Using Machine Learning. International Association for Landscape Ecology - North America. Oklahoma City, OK. Oral presentation.

Lawrimore, M.A., et al. (December 2023). Spatially Interactive Modeling of Urban Growth and Human Migration Driven by Future Flood Hazard Conditions. American Geophysical Union - AGU23. San Fransico, CA. Oral presentation.

Lawrimore, M.A., et al. (October 2023). Forecasting Human Mobility and Development Patterns Driven by Future

Flood Hazard Conditions. Envisioning Urban Futures Symposium. NCSU, Raleigh, NC. Poster presentation.

Lawrimore, M.A., et al. (March 2023). Creating Spatially Continuous Zoning Maps Using Machine Learning. CNR Graduate Research Symposium. NCSU, Raleigh, NC. Poster presentation.

Lawrimore, M.A., et al. (November 2022). Smart Zoning for Coastal Flood Adaptation and Resilience. North Carolina Coastal Conference. Raleigh, NC. Poster presentation.

Lawrimore, M.A., et al. (September 2022). Forecasting Scenarios of Human Mobility and Shifts in Development Patterns Driven by Future Flood Hazard Conditions. 2022 Southeast Climate Adaptation Science Symposium. Gulf Shores, AL. Poster presentation.

RESEARCH ENGAGEMENT

Research Partnership and Collaboration

Understanding Zoning’s Influence on Human Population	June 2024 - Present
<ul style="list-style-type: none">• Partner: Human Geography Group Oak Ridge National Laboratory• Goal: Assess the influence of zoning regulations on human land use and population dynamics	
Smart Zoning for Coastal Flood Adaptation and Resilience	September 2022-September 2023
<ul style="list-style-type: none">• Stakeholder: Town of Leland, NC, Economic and Community Development Department• Partner: North Carolina Sea Grant• Goal: Assess zoning regulations, flood exposure, and future development to identify areas for strategic interventions• Summary Report: Lawrimore, M.A., Sanchez, G.M. (2023). Smart zoning for coastal flood resilience and adaptation. Submitted to the Community Development Planning Department at the Town of Leland, NC.	

Civic Technology Volunteer

Civic Hacking for Affordable Housing	March 2023 - January 2025
<ul style="list-style-type: none">• Organizations: Code with the Carolinas and the National Zoning Atlas• Co-lead bi-weekly meetings to introduce volunteers to civic-technology volunteering• Assist the organization in gathering zoning data for North and South Carolina and contribute to the National Zoning Atlas	

AWARDS

IALE-NA Student Travel Award (Spring 2024) Amount: \$500.

NCSU Center for Geospatial Analytics Travel Award (Spring 2025: \$400 & Fall 2024: \$1000 & Fall 2023: \$800.

First Prize. Predicting Municipal Zoning in Wake County, NC. 2022. NCSU Graduate Student Infographic Contest.

Honorable mention. Flood-prone Development in Charleston, SC. 2022. NCSU Research Image Contest.

Work showcased across University promotional materials, websites, and social media 15+times from 2022-2025.

LEADERSHIP

Co-President	May 2023 - May 2024
Geospatial Graduate Student Organization NCSU	Elected March 2023
<ul style="list-style-type: none">• Organize and lead events, organization spokesperson, student advocate, student-administration liaison	
Mentorship	August 2021 - May 2022
Center for Geospatial Analytics NCSU	
<ul style="list-style-type: none">• Mentored undergraduate research assistant on lab protocols, data and time management, trasitioning into workforce	

TECHNICAL SKILLS

- **Programming Languages:**
Proficiency: Python, R
Experience: C++, C, Bash, HTML
- **Geographic Information Systems (GIS):**
GRASS GIS, QGIS, ArcGIS Pro, ArcMap
 - **Co-production:** Git, GitHub