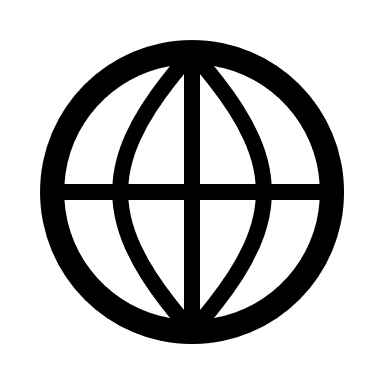
**Charles Knoble, Ph.D.** [cjknoble@gmail.com](mailto:cjknoble@gmail.com)

**Geospatial Data Scientist** [linkedin.com/in/charles-knoble](https://www.linkedin.com/in/charles-knoble/)

**Environmental & Social Big Data Researcher** [cjknoble.github.io/](https://cjknoble.github.io/GIS_portfolio.html)

Applied geospatial scientist with advanced training in machine learning, remote sensing, and spatial statistics. Proven success designing and deploying spatial modeling pipelines that support public and environmental health objectives. Adept at building production-ready tools in Python, R, and ArcGIS Enterprise environments to support decision-making and business outcomes. Deep experience integrating messy, high-volume spatial datasets and applying clustering, regression, and optimization techniques to derive actionable insights. Passionate about using spatial data science to promote resilient, data-informed operations and equitable outcomes.

**Education**

**Ph.D.**, Environmental Science and Management *May 2025*

Montclair State University*, Montclair, NJ* GPA 3.97

* Dissertation: Don’t Let Lead Lead on Environmental Justice: A Simulative Approach to Lead Remediation in the Big Data Era
* Methods: Geospatial statistics, spatial econometrics, machine learning, time-series simulations, big data analyses, social media analytics

**Technical Skills**

**Machine Learning & Modeling**: Random forest, regression, clustering, CNNs, optimization  
**Geospatial Platforms**: ArcGIS Pro, ArcGIS Enterprise, QGIS, Google Earth Engine  
**Programming & Scripting**: Python (Pandas, Geopandas, Rasterio), R (sf, spdep), SQL  
**Remote Sensing**: Landsat, Sentinel-2, SWIR/NIR indices, wildfire extent mapping  
**Deployment & Data Ops**: Esri ModelBuilder, dashboard development, scalable workflow design

**Experience**

**GIS & Data Science Consultant**, New York, NY *May 2022 – Present*

Starcrest LLC (*500+ hours*), Independent Consultant (*400+ hours*)

* Delivered deployable geospatial products via ArcGIS Enterprise, R, and Python to support public infrastructure, emissions, and health-sector clients
* Designed optimization and clustering models to support site location, population vulnerability, and routing tasks in urban environments
* Developed ArcGIS dashboards and Esri ModelBuilder workflows for client-specific business intelligence applications
* Translated stakeholder requirements into custom GIS solutions; regularly advised clients on metadata standards and spatial data quality
* Supported long-term robustness of client GIS stacks through user training, code refactoring, and tool troubleshooting

**Geospatial and ML Research Assistant**, Montclair, NJ *August 2023 – Present*

Montclair State University

* Led spatial modeling projects using random forests and unsupervised clustering for urban-rural change detection
* Integrated Sentinel-2, Landsat, and socio-environmental data to produce land cover change maps for hazard exposure monitoring
* Built reproducible, production-ready workflows for multi-source data ingestion and spatial QA/QC
* Applied spatial interpolation and regression to assess impacts of wildfire, flood, and lead contamination

**Environmental Science Ph.D. Candidate**, Montclair, NJ *August 2021 – May 2025*

Montclair State University

* Developed time-series simulations and predictive models of environmental risk using clustering and geospatial regression
* Created and documented scalable wildfire detection workflows using remote sensing, spectral indices, and ArcGIS
* Maintained metadata-rich spatial datasets for large-scale social sensing studies, ensuring reproducibility and public reuse
* Published 10 peer-reviewed papers focused on social-environmental sensing and geospatial model development

**NSF Science + Technology Center AI Bootcamp**, New York, NY *Jan* *2025*

Learning the Earth with Artificial Intelligence and Physics (LEAP)

* Trained and evaluated CNNs and RNNs for global climate modeling using TensorFlow
* Assessed and mitigated biases in AI-driven environmental prediction models

**Projects & Publications**

**Select Academic Publications** |*3 First-Author, 8 Second-Author* *April 2023 – Present*

* Bridging the Gap: Analyzing the Relationship between Environmental Justice Awareness on Twitter and Socio-Environmental Factors Using Remote Sensing and Big Data (Knoble, C. & Yu, D., 2023). *Remote Sensing*, 15(23), 5510. <https://doi.org/10.3390/rs15235510>
* From crisis to prevention: mining big data for public health insights during the Flint Water Crisis (Knoble, C., Fabolude, G., Vu, A., Yu, D., 2024). *Discover Sustainability* 5, 289. <https://doi.org/10.1007/s43621-024-00514-w>

**Wildfire Perimeter Mapping** |*R, ArcGIS Pro, Model Builder October 2023 – December 2023*

* Automated detection of wildfire extent and burn area using SWIR indices and supervised classification
* Built ArcGIS ModelBuilder tools and accompanying R-based statistical QA modules

**Geospatial Emissions Inventories** |*Python, ArcGIS Pro**August 2022 – Present*

* Scaled up resolution of national emissions datasets using automated geospatial data pipelines
* Developed custom Python tools for spatial aggregation and temporal analysis

**Awards and Honors**

* NSF-Funded AI & Climate Boot Camp Participant *2025*
* Rutgers Summer School for Environmental Governance Participant *2024*