

# Landon L. Rutledge

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## Profile

Recent MSc Geospatial Sciences graduate with 4+ years of combined industry and research experience in resilience engineering, geospatial science, and infrastructure analytics. Passionate about spatial risk modeling, climate impact assessment, and sustainable infrastructure planning. Bringing advanced skills in spatial data analysis, asset management, and R/Python-based modeling to contribute to reliable, data-driven solutions through technical expertise and collaborative, interdisciplinary research.

## Education

### **University College London (UCL), London, United Kingdom**

MSc Geographic Information Science and Computing, September 2024 – September 2025

Grade: Distinction

### **James Madison University, Harrisonburg, VA**

BS Geographic Science (Applied Geographic Information Science), August 2019 – May 2023

Minor: Environmental Studies

## Work Experience

### **Research Assistant in Risk and Resilience (DARe Hub) May 2025 – Present**

- Developing a GIS-based multi-hazard risk assessment toolkit to identify critical corridors and nodes across the UK's multi-modal freight network, supporting prioritization of resilience interventions for flooding, waterlogging, and landslips
- Collaborating with a team of three researchers and external stakeholders to align technical outputs with real-world transport adaptation needs
- Synthesizing research findings into clear documentation and technical summaries to support internal decision-making and ongoing tool development

### **GIS Technician I, ASRC Federal May 2023 – September 2024**

- Conducted GIS data editing, cartographic design, map composition, and spatial analysis using ESRI ArcGIS software
- Performed parcel analysis, address review, and QA/QC using ArcGIS Online WebApps
- Integrated county and locally sourced GIS datasets to review and validate parcel address accuracy

## Research Projects

### **Dissertation: *Improving the operational resilience of freight transport networks: a multi-hazard vulnerability and impact analysis***

- Conducted a GIS-based risk assessment to identify road freight corridors in England that are particularly vulnerable to flooding and landslips
- Developed a probabilistic impact model in Python to quantify disruptions to freight operations, estimating delays, rerouting distances, emissions, and vehicle operating costs
- This research project is a subset of the broader DARe Hub multi-modal freight resilience initiative, contributing a focused analysis on road freight vulnerability and continuity planning

## DARe Hub Research Assignment: *Improving the Operational Resilience of Multi-Modal Freight Networks*

- Conducting spatial and network-based risk analysis to assess multi-hazard exposure and disruption impacts across road and rail freight infrastructure using climate and infrastructure datasets
- Modeling operational and financial disruptions to both rail and road freight
- Deliverable includes a live-updating GIS-based dashboard to support multi-modal freight movement across the UK, integrating weather and traffic data to identify potential delays and optimize routing strategies

## Human Spatial Cognition and Indoor Trajectories

- Collaborated on a small-group research project analyzing real-world human movement patterns in indoor spaces
- Explored correlations between movement and sociodemographic factors
- Utilized QGIS to visualize, analyze, and interpret walking trajectories within indoor environments

## Academic Honors

- Hart Prize for Geospatial Sciences Award Winner, 2025 (UCL)
- President's List: Spring, 2023; Dean's List: Spring 2020, Spring 2022, Fall 2022
- Member & Treasurer, Gamma Theta Upsilon (Geographical Honor Society) (January 2022 – May 2023)

## Publications and Presentations

- *Improving the Operational Resilience of Multi-Modal Freight Networks*. Poster presented at:
  - Transportation Research Symposium 2025 – Rotterdam, The Netherlands
- *Multi-Modal Freight Vulnerability to Water-Related Disruptions*. Poster presented at:
  - DARe Researcher Conference 2025 – Newcastle, England

## Relevant Coursework (UCL)

### Spatial-Temporal Data Analysis and Data Mining

- Analyzed NOAA climate data across six U.S. states using ARIMA and STARIMA models in R to forecast regional temperature trends from 2000 to 2015
- Conducted data preprocessing and exploratory analysis, including autocorrelation and trend visualization, to assess model suitability and regional variation
- Evaluated and compared forecasting accuracy of temporal (ARIMA) vs. spatial-temporal models (STARIMA), highlighting the added value of spatial context in climate data modeling

### Geospatial Programming

- Designed a Python-based application for emergency flood response on the Isle of Wight
- Integrated raster data analysis, shortest-path routing, and OOP to guide users to high ground during flood events
- Applied Naismith's Rule for route cost estimation and used spatial indexing (R-Trees) to locate nearest infrastructure nodes

## Computer Skills

- **Programming Languages:** Python (Advanced), R (Advanced), SQL (Advanced), JavaScript (Intermediate)
- **Databases:** PostgreSQL (Advanced), Microsoft Access (Intermediate)
- **Software:** ESRI ArcGIS Pro (Advanced), QGIS (Advanced), Git/GitHub (Advanced), Feature Manipulation Engine – FME (Intermediate), ArcGIS Online, Adobe Acrobat, Dashboards, StoryMaps, BAO, Erdas Imagine, Microsoft Office