Maisunath Maliha Amin

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Research Area

Data analytics and GIS researcher focused on energy accessibility and energy insecurity, using spatial and statistical methods to analyze environmental justice and social vulnerability

Education

Georgia State University, Andrew Young School of Policy Studies — Atlanta, GA
Master's in Interdisciplinary Studies (Urban Studies) — *April 2024*

BRAC University — Dhaka, Bangladesh
Bachelor of Social Science in Economics — *November 2018*

Work Experience

National Aeronautics and Space Administration (NASA), NASA DEVELOP Program

DEVELOP Research Intern — *January 2025 – April 2025*

Climate Change, Data Collection, Environmental, Remote Sensing, Project Management

- Conducted wetland classification and spatial data processing using Landsat, Lidar, and ArcGIS.
- Applied the Random Forest model to improve wetland classification accuracy.
- Collaborated with the South Carolina Coastal Conservation League to analyze and map freshwater wetlands near underserved communities in the coastal South Carolina region.
- Supported conservation efforts by providing wetlands data critical for ecosystem preservation and climate resilience.

Atlanta Regional Commission — Atlanta, Georgia
Community Development Program Assistant — *August 2023 – January 2025*

Climate Change, Data Collection, Environmental, and Socioeconomic Data Analysis, Project Management

- Led a project on urban heat island (UHI) effects for the Metro Atlanta Region using Remote Sensing (Google Earth Engine), examining heat impact on populations, and interventions from various US cities and international projects for heat vulnerability and risk mitigation.
- Identified heat-vulnerable and energy-burdened areas using the EPA Environmental Justice Index tool and the American Community Survey's heat-related socio-economic parameters for the Metro Atlanta Climate Action Plan.
- Examined the energy consumption of the existing and the proposed new data centers and their implications from an environmental justice perspective.
- Independently developed GHG emission reduction policy inventory for the Climate Pollution Reduction Grant (CPRG) project of the EPA for 29 counties in Georgia.

- Collaborated with the cross-functional team in the "climate change vulnerability assessment" project for agenda development and documenting environmental planning agenda for policy brief meetings.

Andrew Young School of Policy Studies, Georgia State University Atlanta, Georgia
Graduate Research Assistant *August 2022 – April 2024*

Large Dataset Analysis, Risk and Vulnerability Assessment

- Conducted quantitative analysis using Python and SPSS using large datasets of ACS, EPA, General Social Survey, and flood insurance data.
- Utilized statistical analysis such as ANOVA, Multivariate, and Principal Component Analysis for Social Vulnerability Assessment for multi-hazard-prone areas with Python and visualized the analysis with maps with GeoPandas in Python.
- Extracted socio-economic API data for population forecasting for Georgia.

PARAA, Bangladesh Dhaka, Bangladesh
Research Assistant *January 2020 – June 2020*

Data Collection, Field Research, Data Analysis, Participatory Planning and Quantitative Analysis, FGD

- Led on-site surveys for participatory planning in Dhaka City's slum areas to gather primary data on the socioeconomic condition of the slum population and assist in identifying suitable areas for slum agriculture in a FAO-funded project.
- Interacted with local government officials and stakeholders, facilitating focus group discussions (FGDs) to allocate specific locations for slum agriculture practice.
- Visualized flood-prone areas using hydrological data with GIS and conducted suitability analysis, interpreted data, and summarized technical reports to collaborate with a cross-functional team to formulate policy proposals and maps for Dhaka City Corporation.

Research Experience

Andrew Young School of Policy Studies, Georgia State University Atlanta, Georgia
Research Project *September 2021 – April 2024*

Evaluating District-level Social Vulnerability to Multi-Hazards in Dhaka Division, Bangladesh: A Comparative Analysis of Multi-Hazard Intensity Scores and Social Vulnerability Index Scores (2024)

- Developed Social Vulnerability Index (SoVI) and calculated the SoVI score with SPSS for each district of Dhaka Division using Principal Component Analysis, ranked them based on the vulnerability score, and compared the ranking score with the hazard intensity score of each district to find out the most vulnerable areas based on the hazard intensity, conducted multivariate analysis to determine the impact of each socio-economic factors on hazard intensity.

Unveiling Georgia's Carbon Footprint at the Census Tract Level: Sectoral Dynamics, Spatial Patterns, and Socioeconomic Drivers of CO_2 Emissions (2024)

- Processed socioeconomic API data from ACS, categorized sector-wise carbon emission data by year from Drawdown Georgia, spatially joined sector-wise carbon emission data and socioeconomic data, conducted Spearman's Correlation Coefficient to analyze the association, and OLS regression to analyze

the impact of the socioeconomic factors on GHG emission with Python and ran Cluster and Outlier analysis with ArcGIS Pro.

Socioeconomic Disparities in Air Pollution Exposure: A Comprehensive Analysis of Fulton and Dekalb Counties (2023)

- Processed socioeconomic API data and demographic data from ACS, and EPA, developed environmental justice tool index, conducted bivariate and multivariate analysis to analyze the social disparities, and visualized the vulnerable areas with ArcGIS.

Development of Heat Vulnerability Index for Four Counties in Georgia State (2023)

- Processed and cleaned socio-economic and demographic data from ACS using Excel, acquired boundary data from GDCA, conducted weightage calculation with AHP, converted vectors to raster data, and created overall vulnerability maps based on the vulnerability equation of the 5th assessment report of IPCC.

Interactive Dashboard for Analyzing Crash Data in the City of Tempe (2023)

- Utilized City of Tempe Open Data Portal to create an interactive dashboard analyzing crash data; implemented an interactive map feature to investigate traffic accidents by day/time and collision types by ambient conditions; enabled data filtering to assess the impact of variables such as injury severity by travel conditions and driver characteristics; demonstrated proficiency in R programming for data manipulation, analysis, and visualization to create user-friendly data exploration tools.

Blogpost Authoring

Atlanta Regional Commission, 33n Atlanta, Georgia
Published: September 2024

- Georgia's Emission Culprits: What's Really Fueling CO_2 in the Peach State?
- Extreme Heat and Energy: Inventory of Issues

Reports

NASA Technical Reports
Published: September 2025

- Ferus, J. A., Amin, M. M., Cho, Y., & Eigeman, S. (2025). *Coastal South Carolina water resources: Isolated wetlands risk assessment using NASA Earth observations to support further wetland protections in coastal South Carolina* (NASA DEVELOP Technical Report). NASA. https://ntrs.nasa.gov/citations/2025000512