ALAMIN MOLLA, M.Sc.
Arizona State University || School of Geographical Sciences & Urban Planning
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Google Site, Google Scholar, ResearchGate, LinkedIn, GitHub

EDUCATION

Arizona State University, Tempe, AZ
Ph.D. in Geographic Information Science, expected Spring 2027.
Dissertation (*tentative*): Machine Learning and spatial statistical modelling for investigating air temperature variation and exposure patterns.
George Mason University, Fairfax, VA.
M.S. in Geoinformatics & Geospatial Intelligence, Spring 2023.
Project: Improved understanding of precipitation patterns over multiple urban systems.
Auburn University, Auburn, AL.
M.Sc. in Geography, Spring 2000).
Thesis: Towards Urban Sustainability: Stormwater Management and Solar Power Potential of Auburn University.
Khulna University, Khulna, Bangladesh
Bachelor of Urban and Rural Planning, December 2015.
Thesis: Urban Form Analysis of Selected Secondary Cities in Bangladesh.

RESEARCH INTEREST

Deeply committed to addressing contemporary urban challenges through data-driven modelling that produces socially embedded and contextually grounded outcomes.
Spatial Data Science: GIScience, GeoAI, Spatial Statistics, Machine Learning.
Remote Sensing: Multispectral and thermal data (e.g., Landsat, MODIS), SAR, LiDAR, UAV imagery.
Urban Environmental Science: Urban Climate Intelligence (UCInt), Urban Heat Island (UHI), Air Quality.
Social Dimensions: Environmental Justice, Environmental Epidemiology.

PUBLICATIONS

PEER-REVIEWED

1. **Molla, Alamin**, Aaron B. Flores, and David J. Sailor. 2025. "Addressing Data Gaps and Disparities in Access to Air Quality Networks: A Case Study of Maricopa County, Arizona." Population and Environment 47 (3): 27. https://doi.org/10.1007/s11111-025-00497-4.
2. **Molla, Alamin**. 2025. "Extreme Heat and Human Fertility: Amplified Challenges in the

Era of Climate Change." Journal of Thermal Biology 130 (May):104158. https://doi.org/10.1016/j.jtherbio.2025.104158.

3. **Molla, Alamin**, David J. Sailor, and Aaron B. Flores. 2025. "Exploring Air Temperature Variability and Socio-Demographic Inequalities in Heat Exposure through Machine Learning: A Case Study of Maricopa County, Arizona." Urban Climate 59 (February):102276. https://doi.org/10.1016/j.uclim.2024.102276.
4. Amaripadath, Deepak, **Alamin Molla**, Ladd Keith, and David J. Sailor. 2024. "Multi-Criteria Decision Support Framework for Outdoor Heat Stress Management in Urban Environments." Sustainable Cities and Society 114 (November):105799. https://doi.org/10.1016/j.scs.2024.105799.
5. Guo, Liying, Liping Di, Chen Zhang, Li Lin, Fei Chen, and **Alamin Molla**. 2022. "Evaluating Contributions of Urbanization and Global Climate Change to Urban Land Surface Temperature Change: A Case Study in Lagos, Nigeria." Scientific Reports 12 (1): 14168. https://doi.org/10.1038/s41598-022-18193-w.
6. Molla, Alamin, Liping Di, Liying Guo, Chen Zhang, and Fei Chen. 2022. "Spatio-Temporal Responses of Precipitation to Urbanization with Google Earth Engine: A Case Study for Lagos, Nigeria." Urban Science 6 (2): 40. https://doi.org/10.3390/urbansci6020040.
7. **Molla, Alamin**, Chandana Mitra, and Jose Vasconcelos. 2022. "Assessment of and Solutions to the Stormwater Management System of Auburn University Campus in Auburn, Alabama." Journal of Water Management Modeling, May. https://doi.org/10.14796/JWMM.C488.

IN-REVIEW

1. Abolhassani, Soroush, Safi Ullah, **Alamin Molla**, Amjad Azmeer, Deepak Amaripadath, Zheng Cong, Sami Al-Ghamdi, and David J. Sailor: Decoding the Effectiveness of Green Infrastructure Action Plans for Hot Desert Cities (*Nature Cities*).

MENTORSHIPS

- Mentored ***Aston Dolce***, High School Student from BASIS Scottsdale School, Scottsdale, Arizona on Urban Climate Research, November 01 to December 15; 2024.
- **March 15 to June 15, 2024:** Mentored ***Megan Henriksen,*** Master of Advanced Studies in GIScience (MAS-GIS) Student, Arizona State University on Capstone project on Air Temperature Variation in Arizona State through Machine Learning, March 15 to June 15; 2024.
- **February 29 to May 03, 2024:** Mentored ***Trevon Chow***, High School Student from *BASIS Ahwatukee High School*, Phoenix Arizona on Urban Heat Island (UHI) project.

AWARDS

- The Anthony Brazel Research Award **(amount:1,000 USD)**, School of Geographical

Sciences and Urban Planning (SGSUP), Arizona State University; 2025.

- Research Travel Grant **(amount: 950 USD)**, Graduate Student Government (GSG, former Graduate and Professional Student Association - GPSA), Arizona State University; 2025.
- Research Travel Award **(amount: 500 USD)**, School of Geographical Sciences and Urban Planning (SGSUP), Arizona State University; 2025.
- Professional Development Award **(amount: 660.25 USD)**, School of Geographical Sciences and Urban Planning (SGSUP), Arizona State University; 2024.
- Research Travel Award **(amount: 500 USD)**, School of Geographical Sciences and Urban Planning (SGSUP), Arizona State University; 2024.
- Research Travel Award **(amount: 300 USD)**, Graduate College, Arizona State University; 2024.
- Research Travel Grant **(amount: 950 USD)**, Graduate Student Government (GSG), Arizona State University; 2024.
- Research Travel Award **(amount: 500 USD)**, Geosciences Advisory Board (GAB), Auburn University; 2019.
- Bangladesh-Sweden Trust Fund **(amount: 50,000 BDT),** Economic Relations Division, Government of People's Republic of Bangladesh; 2019.
- Annual Merit-based Scholarship **(amount:10,000 BDT per year)**, Khulna University, Bangladesh; 2015 to 2015.

ORAL PRESENTATIONS

- **Molla, Alamin**, Aaron B. Flores, and David Sailor (2024): Assessing Disparities in Access to Air Quality Information in Maricopa County, Arizona. AAG Annual Conference, Honolulu, Hawaii, April 16 to April 20; 2024.
- **Molla, Alamin**, Chandana Mitra, and Jose G. Vasconcelos (2019): Sustainable Stormwater Management for Auburn University Campus, AL. AAG Annual Conference, Washington, DC, April 03 to April 07; 2019.

WEBINARS

- **Moderator**: **Molla, Alamin**, Dimitrios K. Fytanidis (2025): Urban Air Quality: Challenges and Insights across Urban Integrated Field Laboratories (UIFLs). UIFL Discussions on Emerging Approaches and Synergies Webinar Series, April 2025.
- **Presenter**: **Molla, Alamin** (2025): Inter- and Intra-Urban Neighbourhood Air Temperature Variation and How It Relates to Surface Temperature: A Case Study of Maricopa County, Arizona. UIFL Discussions on Emerging Approaches and Synergies Webinar Series, February 2025.
- **Presenter**: Sailor J., David, and **Alamin Molla** (2024): Using vehicle-based traverse measurements to Explore Temperature Variations Across Phoenix, AZ. UIFL webinar series, August 2024.

POSTER PRESENTATIONS

- **Molla, Alamin**, Aaron B. Flores, and David J. Sailor. (2025): Mitigating Data Gaps and Disparities in Access to Air Quality Information: A Case Study of Maricopa County, Arizona. Institute of Social Science Research (ISSR) Spring 2025 Poster Competition, Arizona State University; April 2025.
- **Molla, Alamin**, David J. Sailor, and Aaron B. Flores: Exploring air Temperature Variability and Socio-Demographic Inequalities in Heat Exposure Through Machine Learning: A Case Study of Maricopa County, Arizona. Urban Climate Research Center (UCRC) Annual Anthony Brazel Lecture Series, Arizona State University; February 2025.
- **Molla, Alamin**, David J. Sailor, and Aaron B. Flores: A Machine Learning Approach to Predict Census Block Group Level Air Temperature and Explore Inequalities in Exposure: A Case Study of Maricopa County, Arizona. Graduate Student Government (GSG) Organized 3 Minutes (3MT) Thesis Presentation, Arizona State University; April 2024.
- **Molla, Alamin**, Aaron B. Flores, and David J. Sailor: Mitigating Data Gaps and Disparities in Access to Air Quality Information: A Case Study of Maricopa County, Arizona. UCRC Annual Anthony Brazel Lecture Series, Arizona State University; March 2024.
- **Molla, Alamin**, Aaron B. Flores, and David J. Sailor: Disparities in Access to Air Quality Information at Maricopa County, Arizona. Department of Energy, Office of Science Team Visit, Arizona State University; February 2024.
- **Molla, Alamin**, Chandana Mitra, and Jose G. Vasconcelos: Stormwater Management and Solar Power Potential of Auburn University Campus, AL. Graduate Student Research Symposium, Auburn University; April 2019.

RESEARCH EXPERIENC

- Professors **David J. Sailor** and **Aaron B. Flores**, Arizona State University, Tempe; AZ
  Research Assistant at Urban Climate Research Center, **July 2023 to Present**
  - Working on **U.S. Department of Energy (DOE)** Funded Project Southwest Urban Corridor Integrated Field Laboratory (SW-IFL).
  - Conducting research on urban heat measurement, modelling, and mitigation.
  - Applying cutting-edge GIScience, Geospatial Artificial Intelligence (GeoAI), and Spatial Statistical methods and techniques.
  - Blending data from diverse sources such as in-situ monitors/sensors, mobile traverse, satellite & Unmanned Aerial Vehicle (UAV) remote sensing, and socio-demographic census data for improved urban sensing.
- Professor **Liping Di**, George Mason University, Fairfax; VA
  Research Assistant at Center for Spatial Information Science and Systems (CSISS), **August 2020 to June 2023**
  - Worked on a National Aeronautics and Space Administration (**NASA**) funded project.
  - Leveraged Google Earth Engine (GEE) to perform planetary scale spatial analysis.

- Professor **Chandana Mitra**, Auburn University, Auburn; AL
  Graduate Research Assistant, Department of Geosciences, **May 2020 to July 2020**
  - Wrote JavaScript code to support 'AlabamaView' website design.

TEACHING EXPERIENCE

- Department of Geosciences, Auburn University, Auburn; AL
  Teaching Assistant for courses- '***Global Geography***', '***Aerial photography and Remote Sensing***', and '***Geographic Information Systems'***; Fall 2018 to Spring 2020
  - Graded homework, and exam papers.
  - Assisted students in their lab.
  - Proctored during exam.
  - Lectured in classroom when main instructor is unavailable.

CONFERENCE ACTIVITIES

- **Session (Panel) Chair**: Towards a Sustainable Urban Climate: Confronting Heat and Air Pollution Challenges. American Association of Geographers (AAG) Annual Conference; Detroit, Michigan; March 2025.
- **Session (Paper) Co-Chair**: Navigating the urban Heat Crisis (1&2): Science, Solutions, and Social Equity. American Association of Geographers (AAG) Annual Conference; Detroit, Michigan; March 2025.
- **Session (Paper) Organizer**: Navigating the urban Heat Crisis (1&2): Science, Solutions, and Social Equity. American Association of Geographers (AAG) Annual Conference; Detroit, Michigan; March 2025.
- **Session (Paper) Co-Chair**: Environmental Data Deserts (1&2): Understanding the Causes and Consequences of the Unequal Coverage of Environmental Monitoring Networks. American Association of Geographers (AAG) Annual Conference; Honolulu, Hawaii; April 2024.
- **Session (Paper) Organizer**: Environmental Data Deserts (1 & 2): Understanding the Causes and Consequences of the Unequal Coverage of Environmental Monitoring Networks. American Association of Geographers (AAG) Annual Conference, Honolulu, Hawaii; April 2024.
- **Session (Paper) Organizer**: Stormwater Management and Solar Power Potential for Auburn University Campus. American Association of Geographers (AAG) Annual Conference, Washington D.C; April 2019.

SYMPOSIUM ACTIVITIES

- National Science Foundation (NSF) National Center for Atmospheric Research (NCAR) Research Symposium (**Fully Sponsored by NCAR**): Human and Geographic Dimensions of Extreme Heat and Heat Risk, Boulder Colorado; 23rd to 24th June 2025.
  Paper Presented: Molla, Alamin, David J. Sailor, and Aaron B. Flores. 2025. "Exploring Air Temperature Variability and Socio-Demographic Inequalities in Heat Exposure

through Machine Learning: A Case Study of Maricopa County, Arizona."

ACADEMIC SERVICE

- Peer reviewed several scientific papers in **Urban Climate** journal related to heat, and air quality.

VOLUNTARY SERVICES

- **Panel Reviewer**: NASA FINESST EARTH24 Panel 4 Earth Action (Climate Resilience), 4th to 5th June 2025.
- **Panel Reviewer**: Arizona Geographic Information Council (AGIC) ArcGIS Online Student Competition, 12 to 20 June 2025.
- **Panel Reviewer**: NASA solicitation, A.47 Earth Action: Community Action for Equity and Environmental Justice (EEJ), 12 to 21 June 2024.
- **Program Representative**: Graduate and Professional Student Association (GAPSA), George Mason University; AY 2021 – 2022.
- **Board Member**: 'International Student Advisory Board' (ISAB), George Mason University; AY 2021 – 2022.

INTERNSHIP

- RAJDHANI UNNAYAN KATRIPAKKA (RAJUK, Bangladesh Govt. prime authority for Dhaka city planning and development), Dhaka; Bangladesh; May 2014 to June 2014.
  - Contributed Dhaka Regional Development Plan (RDP) preparation.
  - Gained hands-on experience on plan approval procedure.

INDUSTRY EXPERIENCES

- **GIS Analyst**, Modern Engineers and Planners Consultancy Ltd, Dhaka, Bangladesh; January 2018 to June 2018.
  - Conducted GIScience and remote sensing tasks for supporting '25 Upazillas (administrative unit in Bangladesh) Master Plan Preparation.
  - Presented final work to Urban Development Directorate (UDD), Ministry of Housing and Public Works, Government of People's Republic of Bangladesh.

- **Junior GIS Specialist,** Geo-Planning for Advanced Development (GPAD), Dhaka, Bangladesh; January 2017 to December 2017.
  - Conducted GIScience tasks to support different ongoing projects.
  - Coordinated training certification of 'Introduction to Geographic Information Systems'.

SOFTWARE, PROGRAMMING & OTHER SKILLS

- Geographic Software: ArcGIS Pro, QGIS
- Remote Sensing software: ERDAS Imagine, eCognition, CloudCompare, Pix4D
- Programming Language & Others: Python, R JavaScript, HTML, Git Version Control
- Integrated Development Environment (IDE): Microsoft Visual Studio, IntelliJIDEA
- Operating System: Windows, Linux (Ubuntu), Mac

CLOUD PLATFORMS

- Sol Supercomputer; Arizona State University.
- ARGO/Hopper Supercomputer; George Mason University.
- Google Colab, Google Earth Engine; Google.

DATA SCIENCE

- **Machine Learning**
  - Regression: Linear, Logistic, Polynomial, Ridge, LASSO, ElasticNet
  - Classification: K-Means, DBSCAN, SVM, K-Nearest Neighbors, Decision Tree, Naïve Bayes, Random Forest, Gradient Boosting
  - Clustering: Agglomerative Hierarchical.
  - Dimensionality Reduction: Principal Component Analysis
- **Deep Learning**
  - Convolutional Neural Network: VGG, ResNet.
  - Framework: TensorFlow, PyTorch.
  - API: Keras

CERTIFICATIONS

- Graduate Student and Postdoctoral Researcher Responsible Conduct of Research (RCR), Collaborative Institutional Training Initiative; 2023.
- Machine Learning, Data Science and Deep Learning with Python, Udemy; 2022.
- Earth Observations Toolkit for Sustainable Cities and Human Settlements, NASA: 2022.
- Introduction to NASA Resources for Climate Change Applications, NASA; 2021.
- Learning Java, LinkedIn; 2021.
- Spatial Data Science: The New Frontier in Analytics, Environmental Systems Research Institute (ESRI) Inc.; 2020.

PROFESSIONAL MEMERSHIPS

- American Geophysical Union (**AGU**), 2024 to Present.
- American Association of Geographers (**AAG**), 2018 to Present

- Bangladesh Institute of Planners (**BIP**), 2016 to Present.

MEDIA COVERAGE

- ASU researcher calls attention to overlooked extreme heat issue – its effect on reproductive health
- How to measure heat correctly, according to scientists, and why it matters
- How Phoenix is paving the way on urban heat research and mitigation

VIDEO HIGHLIGHTS

- Annual Anthony Brazel Research Award, 2025
- Webinar on Urban Air Quality: Challenges and Insights Across Urban IFLs, 2025

REFERENCES

- **David J. Sailor**, Professor and Director, School of Geographical Sciences and Urban Planning; Arizona State University.
  Email: David.Sailor@asu.edu Phone: 480-965-4082
- **Chandana Mitra,** Associate Professor and Graduate Program Officer, Department of Geosciences; Auburn University.
  Email: czm0033@auburn.edu Phone: 334-844-4229
- **Aaron B. Flores**, Assistant Professor, School of Geographical Sciences and Urban Planning; Arizona State University.
  Email: aaron.b.flores@asu.edu Phone:
- **Heather Baier**, Assistant Professor (*incoming*), School of Geographical Sciences and Urban Planning; Arizona State University.
  Email: Phone: