

HEMAL DEY

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EDUCATION

2021-2025 (Expected)	Ph.D.	Department of Geography and the Environment The University of Alabama, Tuscaloosa, AL, USA Dissertation Title: <i>Towards a More Comprehensive Flood Risk Assessment Using Machine Learning Models: Four Case Studies Along the U.S. Gulf Coast.</i> Committee: Wanyun Shao (Chair), Lisa Davis, Sagy Cohen, Hongxing Liu, Hamid Moradkhani.
2018	M.Sc.	Geography and Environment Jagannath University, Dhaka, Bangladesh
2017	B.Sc.	Geography and Environment Jagannath University, Dhaka, Bangladesh

PROFESIONAL EXPERIENCE

Jan 2024 to Present	Graduate Research Assistant , Risk Decision Making Lab, Department of Geography and the Environment, The University of Alabama. <i>Research project:</i> Exploring Decision-Makers' and Public Risk Perception and Information Seeking Behaviors Related to Water Quantity in the Southeastern U.S. Funded by National Oceanic and Atmospheric Administration (NOAA) under Cooperative Institute for Research to Operations in Hydrology (CIROH) project #NA22NWS4320003
Aug 2023 to Dec 2023	Graduate Teaching Assistant , Department of Geography and the Environment, University of Alabama
Aug 2022 to July 2023	Graduate Research Assistant , Risk Decision Making Lab, Department of Geography and the Environment, The University of Alabama. <i>Research project:</i> Integrating multi-scale observations, machine learning and systems modeling for coastal Monitoring, Assessment, and

Prediction (Coast-MAP) in the context of multiple stresses
Funded by Department of Treasury Project #A22-0297

Aug 2021 to July 2022	Graduate Council Fellow , Department of Geography and the Environment, The University of Alabama
July 2020 to Nov 2020	GIS Assistant , Geo-Planning for Advanced Development (GPAD), Dhaka.
Feb 2019 to March 2020	Research Assistant , Mohammad Abdul Quader Research Group, Department of Geography and Environment, Jagannath University, Dhaka

TECHNICAL SKILLS

- Processing and Analysis of Satellite Data: *Google Earth Engine, ERDAS Imagine*
- Analysis of Geospatial Data: *ArcMap, ArcGIS Pro, QGIS, Drone2Map*
- Statistical Packages: *SPSS, Excel*
- Programming Languages: *Python, JavaScript, R*
- Image Editing and Motion Pictures: *Adobe Photoshop CS, Adobe Lightroom*
- Web Designing: *Google Sites, HTML*

HONORS/AWARDS/FELLOWSHIP

2024	Travel Grant Fellowship from Cooperative Institute for Research to Operations in Hydrology (CIROH) at the University of Alabama (\$2000)
2024	Travel Grant Fellowship from the University of Alabama (\$1200)
2024	Outstanding Graduate Research Award (PhD category) from the Dept. of Geography and the Environment, The University of Alabama (\$200).
2024	Dr. Bobby Wilson Award from the Dept. of Geography and the Environment, The University of Alabama (\$250).
2023	CIROH Training and Developers Conference Travel Scholarship (\$1500).
2023	Travel Grant Fellowship from the University of Alabama (\$1000).
2022	Second place Award of the American Water Resources Association (AWRA) 2022 Spring Conference Paper Competition.
2021	Graduate Council Fellowship (GCF) (2021-2022) Award from Graduate School at The University of Alabama (\$52,326).
2021	National Science and Technology (NST) Fellowship Award (2020-2021)

- for MSc. thesis, Ministry of Science and Technology, Bangladesh (**\$700**).
- 2020 **Second place** Award on “Photography contest” in the BAPA BEN 4th International Conference on Bangladesh Environment (ICBEN), December 2020.
- 2018 **The Duke of Edinburgh’s International Award**, Bangladesh (Bronze Standard). September 2018.
- 2017 **First place** Award on “World Environment Day-2017 Photography Competition “organized by Geography and Environment department, Jagannath University, Bangladesh. June 2017.

RESEARCH EXPERIENCE

➤ Research Interest

Flood Risk Simulation GIS Remote Sensing Machine Learning

➤ Publications (peer reviewed papers in academic journals)

- i. **Dey, H.**, Haque, M. M., Shao, W., VanDyke, M., & Hao, F. (2024). “Simulating flood risk in Tampa Bay using a machine learning driven approach”. *npj Natural Hazards*, 1(1), 1-16. <https://doi.org/10.1038/s44304-024-00045-4>
- ii. **Dey, H.**, Shao, W., Haque, M. M., & VanDyke, M. (2024). Enhancing Flood Risk Analysis in Harris County: Integrating Flood Susceptibility and Social Vulnerability Mapping. *Journal of Geovisualization and Spatial Analysis*, 8(1), 19. <https://doi.org/10.1007/s41651-024-00181-5>
- iii. **Dey, H.**, Shao, W., Moradkhani, H., Keim, B. D., & Peter, B. G. (2024). Urban flood susceptibility mapping using frequency ratio and multiple decision tree-based machine learning models. *Natural Hazards*, 1-29. <https://doi.org/10.1007/s11069-024-06609-x>
- iv. **Dey, H.**, Shao, W., Pan, S., & Tian, H. (2023). The Spatiotemporal Patterns of Community Vulnerability in the US Mobile Bay from 2000–2020. *Applied Spatial Analysis and Policy*, 1-22. <https://doi.org/10.1007/s12061-023-09549-4>
- v. Tabassum, A., Basak, R., Shao, W., Haque, M. M., Chowdhury, T. A., & **Dey, H.** (2023). Exploring the relationship between land use land cover and land surface temperature: a case study in Bangladesh and the policy implications for the Global South. *Journal of Geovisualization and Spatial Analysis*, 7(2), 25. <https://doi.org/10.1007/s41651-023-00155-z>

- vi. Quader, M. A., **Dey, H.**, Malak, M.A., & Rahman, Z. (2023). A geospatial assessment of flood hazard in north-eastern depressed basin, Bangladesh. *Singapore Journal of Tropical Geography*. <https://doi.org/10.1111/sjtg.12476>
- vii. Quader, M. A., **Dey, H.**, Malak, M.A., & Sajib, A. M. (2021). Rohingya refugee flooding and changes of the physical and social landscape in Ukhiya, Bangladesh. *Environment, Development and Sustainability*, 23(3), 4634-4658. <https://doi.org/10.1007/s10668-020-00792-0>

➤ **Conference Paper and Posters**

- **Dey, H.**, Haque. M., Shao, W., VanDyke., M, Hao., F. “Simulating Flood Risk in Tampa Bay Using a Machine Learning Driven Approach”. This abstract has been accepted for a paper presentation at *AAG Annual Meeting 2025. Detroit, MI. March 24-28, 2024.*
- **Dey, H.**, Haque. M., Shao, W., VanDyke., M, Hao., F. “Simulating Flood Risk in Tampa Bay Using a Machine Learning Driven Approach”. This poster has been presented at *AGU 2024 Annual Meeting. Washington, D.C. December 09-13, 2024.*
- **Dey, H.**, Shao, W. “Crowded in High Flood Risk Zones: Assessing Flood Risk in Tampa Bay Using A Machine Learning Driven Approach”. The was presented at *ALWRC Meeting 2024. Orange Beach. September 04-06, 2024.*
- **Dey, H.**, Shao, W. “Toward a more comprehensive assessment of flood risk: Mapping flood susceptibility and social vulnerability” presented in Lightning Talks in *2023 CIROH Training and Developers Conference, Salt Lake, UT. May 16-18, 2023.*
- **Dey, H.**, Shao, W. “Toward a more comprehensive assessment of flood risk: Mapping flood susceptibility and social vulnerability” Paper was presented at *AAG Annual Meeting 2023. Denver, CO. March 23-27, 2023.* <https://aag.secure-platform.com/aag2023/gallery/rounds/54/details/35704>
- **Dey, H.**, Shao, W. Moradkhani, H., Keim, B.D., Peter, B.G. “Comparing Flood Susceptible Zones with Public Perceived Flood Risk Areas in the City of New Orleans” Paper was presented at the *AWRA 2022 Spring Conference. Tuscaloosa, AL. April 25-27, 2022.*
- Quader, M. A. and **Dey, H.**, 2020. Impact of Rohingyas on the vegetation cover at Kutupalong Camp in Ukhiya, Cox’s bazar, Bangladesh. Poster presented at International Virtual Conference on *Young Researchers’ Overseas Day 2020*, Organized by Royal Academy for Overseas Sciences (RAOS), Brussels, Belgium. 15 December 2020.

➤ **Journal manuscripts under review**

- Haque. M., Shao, W., **Dey, H.** “Exploring the influence of stakeholders' opinions on the selection and weighting of social vulnerability variables in flood risk management.” This article is under review in the *International Journal of Disaster Risk Reduction*.
- Begum, S., Putul, U.A., Malak, M.A., **Dey, H.**, Shao, W. “Evaluating LULC Transformation and Its Socioeconomic Effects on Payra Seaport Development: A SWOT

Perspective” This article is under review in *Environment, Development and Sustainability*.

TEACHING EXPERIENCE

Course: GY 552 - Environment Decision Making

Delivered a lecture on *How to measure flood susceptibility, social vulnerability, and flood risk*.

September 17, 2024

Course: Lab GY 101- Atmospheric Process & Pattern

❖ Lab Instructor

August 2023 to December 2023

MEMBERSHIPS

- American Geophysical Union (AGU). <https://www.agu.org/annual-meeting>
- Alabama Water Institute (AWI). <http://ovpred.ua.edu/alabama-water-institute/>
- American Water Resources Association (AWRA). <https://www.awra.org/>
- American Association of Geographers (AAG). <https://www.aag.org/>

JOURNAL REVIEWER

- Natural Hazard (Springer)
- Earth’s Future (AGU)
- Environmental Monitoring and Assessment (Springer)
- Geo-spatial Information Science (Taylor & Francis)

LEADERSHIP

- **Treasurer** (2022-2023) of the Bangladesh Students Association (BSA-UA), University of Alabama, Tuscaloosa, USA.