Abdul Mobin Ibna Hafiz

Ph.D. Candidate and Graduate Research Assistant
Civil and Environmental Engineering, Florida State University, Tallahassee, FL 32301

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Research Interests

Microplastic transport modeling; Environmental pollutant fate and transport; Statistical, machine learning, and process-based integrated hybrid modeling; Water quality modeling; Urban stormwater management; Climate change impacts on water resources

Education

- **Florida State University** — *August 2023 – Present*
  Doctor of Philosophy in Civil and Environmental Engineering — Tallahassee, FL
- **Florida State University** — *Awarded September 2026*
  Master of Engineering in Civil and Environmental Engineering (earned en route to the Ph.D.) — Tallahassee, FL
- **Bangladesh University of Engineering and Technology (BUET)** — *February 2016 – February 2021*
  Bachelor of Science in Civil Engineering — Dhaka, Bangladesh

Work Experience

- **Graduate Research Assistant** — *August 2023 – Present*
  Resilient Infrastructure and Disaster Response (RIDER) Center, FAMU-FSU College of Engineering — Tallahassee, FL
- **Research Associate** — *November 2021 – June 2023*
  UKRI – GCRF Living Deltas Hub, Institute of Water and Flood Management (IWFM), BUET — Dhaka, Bangladesh

Licensure and Certifications

- Passed the **Fundamentals of Engineering (FE) Environmental** examination, National Council of Examiners for Engineering and Surveying (NCEES), 2026. [NCEES Record]

Technical Skills

- **Microplastic Sampling, Extraction, and Characterization:** Field collection and processing of stormwater runoff and urban drainage samples; size fractionation by wet sieving; oxidative digestion of organic matter; gravity settling and sediment separation; vacuum filtration; density separation; particle identification and characterization by stereomicroscopy and μ-FTIR spectroscopy; QA/QC assessment including procedural blanks, contamination control, and recovery testing.
- **Remote Sensing and Deep Learning:** Convolutional neural networks for semantic segmentation (U-Net) applied to land cover change detection; multi-temporal analysis of high spatial and temporal resolution satellite imagery; integration of detailed land cover raster products; TensorFlow, Keras, Google Earth Engine.
- **Geospatial Analysis and Hydrologic Modeling:** Watershed and stream network delineation, terrain and hydrologic conditioning, flood modeling, raster and vector overlay analysis, and cartographic production in ArcGIS; SWMM, HEC-RAS, HEC-HMS.
- **Programming and Quantitative Methods:** Python, R, and MATLAB for statistical analysis and hypothesis testing, machine learning model development and evaluation, process-based and data-driven modeling, and scripted geospatial analysis.
- **Scientific Software and Documentation:** Origin, PyMOL, Adobe Illustrator, AutoCAD, Git/GitHub, LaTeX, MS Office.

Funded Research

1. **RAPID: Short- and mid-term dynamics of microplastic transport in urban drainage systems after Hurricane Debby**
   Funding Agency: National Science Foundation (NSF) | *Award:* $200,000 (1 year)
   PI: Dr. Ebrahim Ahmadisharaf; *Co-PI:* Dr. Maryam Salehi | *Role:* Graduate Researcher

   - Collected stormwater samples across the Tallahassee urban drainage network following Hurricane Debby.
   - Processed and analyzed samples to have the preliminary microplastic data that supported the proposal.
   - Assisted the PI in writing and preparing the proposal.

2. **Tracking historical changes in vegetation across Seminole Tribe of Florida**
   Funding Agency: FSU Provost's Public Research Impact Grant (PPIRG) | *Period:* February 2026 – July 2026
   Role: Graduate Researcher

   - Developed the analytical framework and the U-Net deep learning model for satellite-based land cover change detection.
   - Ran preliminary analyses to generate the supporting results used in the proposal.
   - Assisted the PI in writing and preparing the proposal.
   - Trained and guided an incoming graduate student for the project

Publications

Journal Articles

1. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M., van Emmerik, T.H.M., Farner, J., Galloway, T., White, J.C., Zhang, Y., Han, N., & Zongguo, W. (2026). "A global dataset of microplastics in urban stormwater runoff (2018–2024)." *Scientific Data*. https://doi.org/10.1038/s41597-026-07137-y

2. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M., Farner, J., White, J.C., Zeng, E.Y., & Nazari, B. (2025). "A Review of Processes and Models for the Export of Microplastics From Terrestrial to Aquatic Systems." *WIREs Water*, 12(1), e70004. https://doi.org/10.1002/wat2.70004

3. **Ibna Hafiz, A.M.** (2023). "Intergenerational research on environmental change (Bangladesh, Asia)." In Oral History Society, International work. *Oral History*, 51(1), 34–41. https://www.jstor.org/stable/10.2307/48743712

Book Chapters

1. Rabby, S.H., Sun, X., **Ibna Hafiz, A.M.**, Yan, Z., Imtiaz, S.U., Azadani, M.N., Pakdehi, M., Moumouni, A.S., Ahmadisharaf, E., & Alamdari, N. (2026). "Chapter 11—Application of machine learning methods in water quality modeling." In Z. Lin & W.-C. Chou (Eds.), *Machine Learning and Artificial Intelligence in Toxicology and Environmental Health* (pp. 271–309). Academic Press. https://doi.org/10.1016/B978-0-443-30010-3.00016-7

2. Salehi, M., **Hafiz, A.M.I.**, Ahmadisharaf, E., Jazaei, F. (2025). "Release of Microplastics by Terrestrial Sources into Freshwater Environments." In: Bala, K., Nogueira, R., Darbha, G.K., Weichgrebe, D. (eds) *Occurrence, Detection, and Fate of Microplastics in Freshwater Ecosystems*. Springer, Singapore. https://doi.org/10.1007/978-981-95-0225-7_2

Conference Proceedings

1. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M., Feng, D., Abdolali, A. (2026). "Satellite-based microplastic detection in marine environments using machine learning algorithms." *IGARSS 2026 – 2026 IEEE International Geoscience and Remote Sensing Symposium*, Washington, DC, 9–14 August 2026. IEEE. https://doi.org/10.1109/IGARSS60577.2026.11730366

2. Pantho, M.J., Ishmam, Z.S., **Ibna Hafiz, A.M.**, Rahman, M.M. (2022). "NDVI: Detection of vegetation change using Remote Sensing and GIS. A study of Barishal City Corporation, Bangladesh." *6th International Conference on Civil Engineering for Sustainable Development (ICCESD)*.

3. **Ibna Hafiz, A.M.**, Billah, M. (2021). "Treatment of Raw Textile Effluent using Hybrid Constructed Wetland." *International Conference on Water and Flood Management (ICWFM)*, 2021.

Under Review / In Preparation

1. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M. "A global-scale deep learning model to predict microplastic concentration in marine environments." (In Preparation).
2. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M. "A predictive model to estimate microplastic flux in urban environments." (In Preparation).
3. **Ibna Hafiz, A.M.**, Zolfaghari, S., Bashir, A., Ahmadisharaf, E., Salehi, M. "Impacts of Hurricane Debby on microplastic characteristics in urban drainage networks." *Water Research* (Under Review).
4. **Ibna Hafiz, A.M.**, Bashir, A., Ahmadisharaf, E., Salehi, M. "Microplastic contamination in urban agricultural runoff: Abundance, Characteristics and Risk Assessment." *ACS ES&T* (Under Review).
5. **Ibna Hafiz, A.M.**, Rabby, S.H., Ahmadisharaf, E., Sridharan, V., Kumar, S., Zhang, H.X., Chao, X., Guzman, S., Quinn, N.W.T. "Opportunities to improve TMDLs using artificial intelligence and machine learning." *Journal of Environmental Engineering* (Under Review).
6. Rabby, S.H., Ahmadisharaf, E., Khan, M.I.S., **Ibna Hafiz, A.M.**, Sun, X., Cohen, M., Rains, M., Van Emmerik, T.V., Salehi, M., Kranz, S., Wahl, T., Mishra, A., Sadegh, M., AghaKouchak, A., Golden, H., Moradkhani, H. "Impacts of compound hydroclimatic events on coastal water quality." *Reviews of Geophysics* (Under Review).

PRESENTATIONS

Oral Presentations

1. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M., Feng, D., Abdolali, A. (2026). "Satellite-based microplastic detection in marine environments using machine learning algorithms." *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Washington, DC.
2. **Ibna Hafiz, A.M.**, Salehi, M., Ahmadisharaf, E. (2026). "Standardizing microplastic data in urban runoff: Development and applications of the DURUM database." *EWRI World Environmental & Water Resources Congress*, Mobile, AL.
3. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M., Feng, D. (2025). "Satellite-Based Marine Microplastic Detection Using Machine Learning Algorithms." *AGU Annual Meeting 2025*, New Orleans, LA.
4. **Ibna Hafiz, A.M.**, Bashir, A., Zolfaghari, S., Legrand, F., Ahmadisharaf, E., Salehi, M. (2025). "Hurricane-Induced Microplastics Contamination in Urban Drainage Systems: A Case Study of Tallahassee following Hurricane Debby." *EWRI Congress 2025*, Anchorage, AK.
5. **Ibna Hafiz, A.M.**, Bashir, A., Legrand, F., Ahmadisharaf, E., Salehi, M. (2025). "Microplastic Transport in Urban Agricultural Systems: Characterization, Drivers, and Implications for Stormwater Management." *EWRI Congress 2025*, Anchorage, AK.
6. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M. (2024). "The Export of Microplastics to Urban Agricultural Farms Under Different Weather Patterns." *Leon County Science Advisory Committee meeting*, 2024.

Poster Presentations

1. **Ibna Hafiz, A.M.**, Jalilvand, E., Ahmadisharaf, E. (2026). "Deep learning-based land cover change detection following Hurricane Michael using high-resolution multi-temporal satellite imagery." *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Washington, DC.
2. Zolfaghari, S., **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M. (2025). "Short- and mid-term impacts of Hurricane Debby on microplastic pollution in urban drainage systems of Tallahassee, Florida." *ACS Midwest Regional Meeting*, Columbia, MO.
3. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Salehi, M. (2024). "The Role of Microplastic Transport in Enhancing Stormwater Management." *Florida Stormwater Association Winter Conference*, 2024, Kissimmee, FL.

4. **Ibna Hafiz, A.M.**, Ahmadisharaf, E., Jalilvand, E. (2024). "Changes in Land Cover Aftermath of Hurricane Events: The case of Hurricane Michael." *AGU Chapman Conference on Remote Sensing of the Water Cycle: Sensors to Science to Society*, 2024, Honolulu, HI.

Awards and Recognitions

- **Honorable Mention, Best Use of Evidence**, FSU Graduate School Op-Ed Competition (2026), selected from 54 entries university-wide, Office of Graduate Fellowships and Awards.
- **2026 AIH-RISE Distinguished Recognition for Research and Scholarship**, American Institute of Hydrology (AIH).
- **Florida State University Graduate School Dissertation Research Grant** ($1,000).
- **CEE Graduate Student Research Excellence Poster Competition (Fall 2025)** – Winner (First Prize – $700).
- **CEE Graduate Research Excellence Award** (2025) – $1,000.
- **CEE Graduate Research Excellence Poster Competition (Spring 2025)** – Winner (Second Prize – $3,000).
- **2024 Florida Stormwater Association Educational Foundation Scholarship** ($2,000).
- **Travel grant** ($1,300) for the *AGU Chapman Conference on Remote Sensing of the Water Cycle: Sensors to Society*, 2024, Honolulu, HI.

Professional Services

- Member (Elect), EWRI-TMDL Analysis and Modeling Task Committee (November 2024 – Present).
- Session Convener, 2025 World Environmental & Water Resources Congress, Anchorage, Alaska.
- Abstract Reviewer, 2026 World Environmental & Water Resources Congress, Mobile, Alabama.

Media and Features

- Featured in the Student Spotlight, ***AGU Hydrology Section Newsletter***, October 2026, pp. 8–9.
- Grad Impact Profile, ***FSU Office of Graduate Fellowship and Awards.***
- Research featured in several media outlets, including ***Florida State University News***, ***Phys.org***, ***Water Online***.
- Co-authored blog "Oral History, Mapping and Photography in the Bangladesh Sundarbans" (2022), featured in ***UKRI GCRF Living Deltas Hub***.

References

1. **Dr. Ebrahim Ahmadisharaf**
   Assistant Professor, Department of Civil & Environmental Engineering,
   FAMU-FSU College of Engineering, Tallahassee, FL 32306, United States.
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2. **Dr. Maryam Salehi**
   Associate Professor, Civil and Environmental Engineering,
   College of Engineering, University of Missouri, MO 65211, United States.
   Email: mshfp@missouri.edu

3. **Dr. Jeffrey Farner**
   Assistant Professor, Department of Civil and Environmental Engineering,
   FAMU-FSU College of Engineering, Tallahassee, FL 32306, United States.
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