KASHIF MAHMUD

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RESEARCH INTERESTS

Hydrogeology, subsurface characterization, sustainable groundwater, karst, geomatics, GIS, remote sensing, LiDAR, drone, image processing, big data analysis, supercomputing, numerical analysis, data assimilation, terrestrial biosphere modeling, carbon cycle, climate change

EDUCATION

PhD, Civil and Environmental Engineering   **2012-2015**
University of New South Wales (UNSW) Sydney Australia
Thesis title: Numerical methods for characterizing highly heterogeneous aquifer formations
PhD awarded on 4th of November 2015 with no corrections

MSc, Civil Engineering (Environmental)   **2010**
Bangladesh University of Engineering and Technology (BUET) Dhaka Bangladesh
Thesis title: Application of Fenton process in treating landfill leachate

BSc (Honors) in Civil Engineering - Placed 9th in order of merit   **2007**
Bangladesh University of Engineering and Technology (BUET) Dhaka Bangladesh
Thesis title: Finite Element Analysis of reinforced concrete frame with brick masonry infill due to lateral loads

PROFESSIONAL EXPERIENCE

Assistant Professor   **2022-Present**
Kimbell School of Geosciences, Midwestern State University, Wichita Falls, TX, USA

Adjunct Senior Lecturer   **2024-Present**
School of Biological, Earth and Environmental Sciences, University of New South Wales (UNSW) Sydney Australia

Adjunct Instructor   **2023-2024**
Department of Geography and GIS, Elmhurst University, IL, USA

Postdoctoral Fellow   **2019-2022**
Department of Geography, Indiana University, Bloomington, IN, USA

Postdoctoral Research Fellow   **2016-2019**
Hawkesbury Institute for the Environment, Western Sydney University, Australia

Postdoctoral Fellow   **2015**
School of Civil and Environmental Engineering, UNSW Australia

PhD candidate, School of Civil and Environmental Engineering and **Research Assistant**, Connected Waters Initiative Research centre, UNSW Australia   **2012-2015**

Assistant Professor   **2010-2012**
Department of Civil and Environmental Engineering, Islamic University of Technology, Bangladesh

Lecturer 2009-2010
Department of Civil and Environmental Engineering, Islamic University of Technology, Bangladesh

Lecturer 2007-2009
Department of Civil Engineering, Stamford University Bangladesh

PUBLICATIONS
Student (*) advisees are underlined
Google Scholar: citations = 1470; h-index = 19; i10-index = 21

Peer-reviewed Journals:
1. *Pervin R., Robeson S., Barnes M., Sitch S., Walker A., Poulter B., Maignan F., Sun Q., Colligan T., Zaehle S., **Mahmud K.**, Anthoni P., Arneth A., Arora V., Bastrikov V., Bogucki L., Decharme D., Delire C., Falk S., Ito A., Kato E., Kennedy D., Knauer J., O'Sullivan M., Yuan W., and MacBean N. (2025) "Importance of plant functional type, dynamic vegetation, and fire interactions for process-based modeling of gross carbon uptake across the drylands of western North America", *EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-2841*.

2. *Elkins, E., and **Mahmud, K.** (2025) "Estimating North Texas Urban Tree Above-Ground Biomass Based on Terrestrial LiDAR and Optimized Quantitative Structure Models" *AmericaView Journal of Earth Observation and Geospatial Applications*, 1(1), https://doi.org/10.65372/8w66ep09.

3. *Elkins, E., and **Mahmud, K.** (2025) "Quantifying Tree Structural Attributes using Terrestrial Laser Scanning and Geometric Modeling in an Urban University" *Metamorphosis*, Fall 2025.

4. Adams, H., Fulton, C., Southard, M., Shao, J., Reeder, S., Price, J., Appleton, E., Hansen, C., Ben Colvin, B., **Mahmud, K.,** Nix, D., and Masuoka, J., Odlare, M., and Ikehata, K. (2025) "Academia-Industry Collaboration: Water Chemistry and Environmental Education" *Journal of Chemical Education*, https://doi.org/10.1021/acs.jchemed.5c00246.

5. Scott, R.L., Johnston, M.R., Knowles, J.F., MacBean, N., **Mahmud, K.**, Roby, M.C., Dannenberg, M.P. (2023) "*Interannual variability of spring and summer monsoon growing season carbon exchange at a semiarid savanna over nearly two decades*" Agriculture and Forest Meteorology, 339, https://doi.org/10.1016/j.agrformet.2023.109584.

6. **Mahmud, K.**, Scott, R. L., Biederman, J., Litvak, M., Kolb, T., Meyers, T. P., Krishnan, P., Bastrikov, V., MacBean, N. (2021) "*Optimizing Carbon Cycle Parameters Drastically Improves Terrestrial Biosphere Model Underestimates of Dryland Mean Net CO_2 Flux and its Inter-Annual Variability*" Journal of Geophysical Research Biogeosciences, 126, https://doi.org/10.1029/2021JG006400.

7. Mingkai, J., Medlyn, B., Drake, J.E., Duursma, R.A., Anderson, I.C., Barton, C., Boer, M., Carrillo, Y., Castaneda-Gomez, L., Collins, L., Crous, K.Y., De Kauwe, M., dos Santos, B.M., Emmerson, K.M., Facey, S.L., Gherlenda, A.N., Gimeno, T.E., Hasegawa, S., Johnson, S.N., Kannaste, A., Macdonald, C.A., **Mahmud, K.**, Moore, B.D., Nazaries, L., Neilson, E., Nielsen, N., Niinemets, U., Noh, N.J., Ochoa-Hueso, R., Pathare, V.S., Pendall, E., Pihlblad, J., Pineiro, J., Powell, J.R., Power, S., Reich, P., Renchon, A., Riegler, M., Rinnan, R., Rymer, P., Salomon, R., Singh, B., Smith, B., Tjoelker, M.G., Walker, J., Wujeska-Klause, A., Yang, J., Zaehle, S. & Ellsworth, D.S. (2020) "*The fate of carbon in a mature forest under carbon dioxide enrichment*" Nature 580, 227–231, https://doi.org/10.1038/s41586-020-2128-9.

8. Yang, J., Duursma, R.A., De Kauwe, M.G., Kumarathunge, D., Mingkai, J., **Mahmud, K.**, Gimeno, T.E., Crous, K.Y., Ellsworth, D.S., Peters, J., Choat, B., Eamus, D., Medlyn, B. (2019) "*Incorporating non-stomatal limitation improves the performance of leaf and canopy models at high vapour pressure deficit*" Tree Physiology, Volume 39. Issue 12, pp. 1961-1974, https://doi.org/10.1093/treephys/tpz103.

9. **Mahmud, K.**, Medlyn, B., Duursma, R.A., Campany, C. and De Kauwe, M. (2018) "*Inferring the effects of sink strength on plant carbon balance from experimental measurements*" Biogeosciences, 15, 4003-4018, https://doi.org/10.5194/bg-15-4003-2018.

10. **Mahmud, K.**, Mariethoz, G., Baker, A. and Pauline, C.T. (2018) "*Hydrological characterization of cave drip waters in a porous limestone: Golgotha Cave, Western Australia*" Hydrol. Earth Syst. Sci., 22, 977-988, https://doi.org/10.5194/hess-22-977-2018.

11. **Mahmud, K.**, Mariethoz, G., Baker, A., Treble, P.C., Markowska, M. and McGuire, L. (2016). "*Estimation of deep infiltration in unsaturated limestone environments using cave LiDAR and drip count data*" Hydrol. Earth Syst. Sci., 20, 359-373, https://doi.org/10.5194/hess-20-359-2016.

12. **Mahmud, K.**, Mariethoz, G., Pauline, C.T., Baker, A. (2015). "*Terrestrial LiDAR Survey and Morphological Analysis to Identify Infiltration Properties in the Tamala Limestone, Western Australia,* IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, https://doi.org/10.1109/JSTARS.2015.2451088.

13. **Mahmud, K.**, Mariethoz, Baker A. and Sharma A. (2015) "*Integrating Multiple Scales of Hydraulic Conductivity Measurements in Training Image-Based Stochastic Models*" Water Resources Research, Vol. 51(1), pp. 465–480, https://doi.org/10.1002/2014WR016150.

14. **Mahmud, K.**, Mariethoz, G., Tahmasebi, P., Caers, J. and Baker A. (2014) "*Simulation of Earth Textures by Conditional Image Quilting*" Water Resources Research, Vol. 50 (4), pp. 3088–3107, https://doi.org/10.1002/2013WR015069.

15. **Mahmud, K.**, Hossain, M.D. and Shams, S. (2012) "*Different Treatment Strategies for Highly Polluted Landfill Leachate in Developing Countries*", Waste Management, Volume 32, Issue 11, pp. 2096–2105, https://doi.org/10.1016/j.wasman.2011.10.026.

16. **Mahmud, K.**, Hossain, M.D., Shams, S. and Al-Amin, M. (2012) "*Comparative Analysis of Extended Aeration and Fenton Process in Landfill Leachate Treatment*", International Journal of Environmental Engineering, Vol. 4, No.3/4, pp. 233 – 252, https://doi.org/10.1504/IJEE.2012.050797 .

17. *Azom, M. R., K. **Mahmud, K.**, Yahya, S. M., Sontu, A. and Himon, S. B. (2012) "*Environmental Impact Assessment of Tanneries: A Case Study of Hazaribag in Bangladesh*", International Journal of Environmental Science and Development, Vol. 3, No. 2, pp. 152-156, https://doi.org/10.7763/IJESD.2012.V3.206.

18. **Mahmud, K.**, Yahya, S.M., Navid, E.H. and Hossain, S.M. (2011) "*Organic Contaminant Destruction from Landfill Leachate by Optimizing Fenton Treatment Process*", Canadian Journal on Environmental, Construction and Civil Engineering, Vol. 2, No. 5, pp. 118-124.

19. Shams, S. **Mahmud, K.** and Al-Amin M. (2011) "*Building Greener Homes Based on Coding and Rating System*", IACSIT International Journal of Engineering and Technology (IJET), Vol. 3, No. 5, pp. 480-484, https://doi.org/10.7763/IJET.2011.V3.273.

20. Rahman, M.T., **Mahmud, K.** and Ahsan, S. (2011) "*Stress – Strain Characteristics of Flexible Pavement using Finite Element Method*" International Journal of Civil and Structural Engineering, Vol. 2, No. 1, pp. 233-240.

21. **Mahmud, K.**, Hossain, M.D. and Ahmed S. (2011) "*Advanced Landfill Leachate Treatment with Least Sludge Production Using Modified Fenton Process*", International Journal of Environmental Sciences, Vol. 2, No. 1, pp. 259-270, https://doi.org/10.6088/ijes.00202010027.

22. *Islam, M. M., **Mahmud, K.**, Faruk, O. and Billah S. (2011) "*Textile Dyeing Industries in Bangladesh for Sustainable Development*", International Journal of Environmental Science and Development (IJESD), vol. 2, no. 6, pp. 428-436, https://doi.org/10.7763/IJESD.2011.V2.164.

23. Shams, S. **Mahmud, K.** and Al-Amin M. (2011) "*A comparative analysis of building materials for sustainable construction with emphasis on CO2 reduction*" Int. J. Environment and Sustainable Development, Vol. 10, No. 4, pp. 364-374, https://doi.org/10.1504/IJESD.2011.047767.

24. **Mahmud, K.**, Islam, M.R. and Al-Amin, M. (2010). "*Study the Reinforced Concrete Frame with Brick Masonry Infill due to Lateral Loads*", International Journal of Civil & Environmental Engineering IJCEE-IJENS, Vol.10, No.04, pp. 35-40.

Submitted:

25. *Kaspar M., *Brown K., **Mahmud, K.**, Price, J.D., and Vauter, B. "Mapping Groundwater Infiltration in Karst using LiDAR at Natural Bridge Caverns, TX" *under revision in Journal of Cave and Karst Studies.*

26. Hossain, M.S., Saiyara, N., Magumdar, T.K., Mazumder, L.C., Islam, S., Hossain, M.S., Raihan, S.UY., Bhuyan, M.A., Ahmed, S., **Mahmud, K.**, and Ahsan, S.M. "Flood Forecasting in a Highly Developed Urban Area: A Synergistic Approach to Pluvial and Fluvial Flooding Using MIKE+?" *under review in Computational Urban Science*.

27. *Kumarathunge, D., **Mahmud, K.**, Drake, J.E., Tjoelker, M.G., Francisco, J.C., and Medlyn, B. "Attributing the temperature response of tree seedling growth to underlying mechanisms?" *under review to Tree Physiology*.

28. *Brown, K., *Kaspar M., Price, J.D., Katumwehe, A., Vauter, B., and **Mahmud, K.** "Characterize Water Infiltration Pathways in Central Texas Cretaceous Formation using LiDAR Remote Sensing" *under review to International Journal of Speleology.*

29. *Remie, R., **Mahmud, K.**, Gary, M., Price, J.D., Katumwehe, A., and Vauter, B. "Using Drip Loggers to Characterize Groundwater Infiltration and Examine Hydrological Response in Cretaceous Karst Formation" *submitted to Journal of hydrology.*

30. *Winston, K., and **Mahmud, K.**, "Spatio-Temporal Analysis of Deforestation in Sumatra, Indonesia" *submitted to AmericaView Journal of Earth Observation and Geospatial Applications.*

In preparation:

31. **Mahmud, K.**, Medlyn, B., Kumarathunge, D., Drake, J.E., Aspinwall, M.J. and Tjoelker, M.G. "Contribution of climate warming impacts on individual plant physiological processes to plant growth" *to be submitted to Global Change Biology*.

32. **Mahmud, K.**, Raoult, N., Scott, R. L., and MacBean, N. "Data Assimilation as a Tool for Improving Seasonal Predictions of Evapotranspiration Partitioning in Southwestern US Semiarid Ecosystems" *to be submitted to Journal of Hydrology*.

33. **Mahmud, K.**, Medlyn, B., Duan, H., and Tissue, D.T. "Drought response of Eucalyptus seedling growth" *In preparation*.

34. **Mahmud, K.**, MacBean, N. "Comparison of in situ CO_2 fluxes, MODIS NDVI and PhenoCam GCC data for optimizing seasonal predictions of leaf phenology and gross carbon uptake" *In preparation*.

CONFERENCE CONTRIBUTIONS
Student (*) advisees are underlined

1. **Mahmud, K.**, *Ghose, R.K., *Remie R., *Kaspar, M., Katumwehe, A., Price, J.D., Vauter, B., and Gary, M. (2025). "Integrating Hydrology and Remote Sensing Data to Enhance Understanding of Water Infiltration in Heterogeneous Karst Formations" *AGU Fall meeting 2025*, New Orleans, LA, USA, 15-19 December 2025.

2. *Ghose, R.K., **Mahmud, K.,** Gary, M. Price, J.D., and Vauter, B. (2025). "LiDAR-Driven Insights into Groundwater Recharge Dynamics in a Heterogeneous Karst System" *GSA Connects 2025*, San Antonio, TX, USA, 19-22 October 2025.

3. *Remie, R., **Mahmud, K.,** Gary, M. Price, J.D., Katumwehe, A., and Vauter, B. (2025). "Utilizing Automatic Cave Drip Monitoring to evaluate Groundwater Infiltration and Hydrological Response at Natural Bridge Caverns, Texas" *AAPG SWS meeting 2025*, Fort Worth, TX, USA, 28-30 April 2025.

4. *Bullard, J., and **Mahmud, K.** (2025). "Mapping wildfire driven air pollution in Texas" *Spring 2025 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 24 April 2025.

5. *King, Z., *Elkins, E., and **Mahmud, K.** (2025). "Utilizing Terrestrial LiDAR for Enhanced Above-Ground Biomass Prediction of Urban Trees" *Spring 2025 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 24 April 2025.

6. *Greene, J., *Remie R., and **Mahmud, K.** "Classification of subsurface water flow paths using cave drip time series clustering" *National Conference on Undergraduate Research (NCUR) 2025*, Pittsburgh, PA, USA, April 7-9, 2025.

7. *Bullard, J., and **Mahmud, K.** (2025). "A Statewide Study of Wildfire Impacts on Air Quality" *National Conference on Undergraduate Research (NCUR) 2025*, Pittsburgh, PA, USA, April 7-9, 2025.

8. *King, Z., *Elkins, E., and **Mahmud, K.** (2025). "Advancing Urban Forestry: Enhanced Biomass Estimation Using Terrestrial LiDAR" *National Conference on Undergraduate Research (NCUR) 2025*, Pittsburgh, PA, USA, April 7-9, 2025.

9. *Elkins, E., and **Mahmud, K.** (2025). "Urban Tree Above Ground Biomass Estimate Using Remote Sensing LiDAR" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

10. *Bullard, J., and **Mahmud, K.** (2025). "A Statewide Study of Wildfire Impacts on Air Quality" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

11. *Kaspar, M., *Brown, K., **Mahmud, K.**, Price, J.D., and Vauter, B. (2025). "Subsurface water flow classification using remote sensing LiDAR - A case study at Natural Bridge Caverns TX" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

12. *Remie, R., **Mahmud, K.**, Gary, M. Price, J.D., Katumwehe, A., and Vauter, B. (2025). "Using Automatic Cave-Drip Monitoring to Characterize Groundwater Infiltration at Natural Bridge Caverns in Texas" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

13. *Shahparan, M., and **Mahmud, K.**, Gary, M. Price, J.D., Katumwehe, A., and Vauter, B. (2025). "Comparison of Spatial Interpolation Methods for Better Air Quality Estimation" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

14. *King, Z., *Elkins, E., and **Mahmud, K.** (2025). "Optimizing Urban Tree Biomass Estimation Through Terrestrial LiDAR Analysis" *GSA South-Central Sectional Meeting*, Conway, AK, USA, 9-11 March 2025.

15. **Mahmud, K.**, *Remie R., *Brown, K., *Greene, J., Katumwehe, A., Price, J.D., Vauter, B., and Gary, M. (2024). "Integrating Cave Drip Monitoring and Remote Sensing to Characterize Heterogenous Water Movement in Karst" *AGU Fall meeting 2024*, Washington, DC, USA, 9-13 December 2024.

16. *Elkins, E., and **Mahmud, K.** (2024). "How Does Tree Structure Impact LiDAR Based Urban Above-Ground Biomass Estimation?" *AGU Fall meeting 2024*, Washington, DC, USA, 9-13 December 2024.

17. *Kaspar, M., *Brown, K., **Mahmud, K.**, Katumwehe, A., Price, J.D., and Vauter, B. (2024). "The Effect of Spatial Resolution of LiDAR Point Cloud Data on the Accuracy of Identifying Subsurface Water Infiltration Properties" *AGU Fall meeting 2024*, Washington, DC, 9-13 December 2024.

18. *Francis, M., Katumwehe, A., Price, J.D., **Mahmud, K.**, Kazinda, M., and Yip, H. (2024). "Geophysical Imaging for Groundwater Resources through Electrical Resistivity Tomography and Airborne Magnetic Data" *AGU Fall meeting 2024*, Washington, DC, USA, 9-13 December 2024.

19. MacBean, N., Pervin, R., Naderi, C., Bogucki, L., Barnes, M., Robeson, S., **Mahmud, K.**, Moore, D., Reed, S., Smith, W.K., Poulter, B., Wang, L., Feldman, A., Maignan, F., Sitch, S., Walker, A., Zaehle, S., and TRENDY v11 Modelers. "Playing the Dryland Model Detective: Exploring the Current Status of Dryland Contributions to Global Carbon Cycling" *AGU Fall meeting 2024*, Washington, DC, USA, 9-13 December 2024.

20. *Bullard, J., and **Mahmud, K.** (2025). "Mapping wildfire driven air pollution in Texas" *Fall 2024 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 21 November 2024.

21. *King, Z., *Elkins, E., and **Mahmud, K.** (2025). "Utilizing Terrestrial LiDAR for Enhanced Above-Ground Biomass Prediction of Urban Trees" *Fall 2024 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 21 November 2024.

22. *Greene, J., *Remie R., **Mahmud, K.**, Katumwehe, A., Price, J.D., Vauter, B., and Gary, M. "Identify karst groundwater flow paths using cave water drips" *Fall 2024 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 21 November 2024.

23. *Greene, J., *Remie R., **Mahmud, K.**, Katumwehe, A., Price, J.D., Vauter, B., and Gary, M. "Hydrological characterization of cave drip time series in a heterogeneous karst environment" *COPLAC Midwest/West Regional virtual conference*, USA, 9 November 2024.

24. Adams, H., Fulton, C., Southard, M., Price, J., Reeder, S., Hansen, C., Appleton, E., Shao, J., Nix, D., **Mahmud, K.** and Colvin B. (2024). "Opportunities at the Interface of Academia and Industry" *ACS Southwest Regional Meeting (SWRM)*, Waco TX, USA, 20-23 October 2024.

25. **Mahmud, K.**, Price, J.D., *Brown, K., *Remie R., *Greene, J., Katumwehe, A., Vauter, B., and Gary, M. (2024). "Water in Caves – A study at Natural Bridge Caverns Texas" *MSU and CWF Environmental Conference 2024*, Wichita Falls, TX, USA, 5 October 2024.

26. *Remie R., *Greene J., **Mahmud K.**, Katumwehe A., Vauter, B., Gary, M., and Price, J.D. (2024). "Integrated Remote Sensing and Automatic cave-drip Monitoring to Characterize Groundwater Infiltration – A Study at Natural Bridge Caverns, Texas" *GSA Connects 2024*, Anaheim, CA, USA, 22-25 September 2024.

27. *Zantia K., *Elkins E., and **Mahmud K**. (2024). "Advancing Tree Above-Ground Biomass Estimation with Terrestrial LiDAR – A Study of North Texas Urban Tree Species" *GSA Connects 2024*, Anaheim, CA, USA, 22-25 September 2024.

28. *Remie R., **Mahmud K.**, Katumwehe A., Vauter, B., Gary, M., and Price, J.D. (2024). "Upscaling cave drip data using remote sensing LiDAR to quantify groundwater recharge" *43rd Annual National Association of Black Geoscientists*, Altanta, GA, USA, 4-7 September 2024.

29. *Zantia K., *Elkins E., and **Mahmud K**. (2024). "Estimating Urban Tree Attributes Using Terrestrial LiDAR Remote Sensing" *43rd Annual National Association of Black Geoscientists*, Altanta, GA, USA, 4-7 September 2024.

30. *Remie R., **Mahmud K.**, Katumwehe A., Price, J.D., Vauter, B., and Gary, M. (2024). "Characterization of Water Flow Pathways in Unsaturated Limestone Formations using Remote Sensing (LiDAR) and Automatic Drip Monitoring" *AAPG SWS meeting 2024*, Abilene, TX, USA, 27-30 April 2024.

31. *Shahparan M., and **Mahmud K**. (2024). "The Impacts of Wildfire Smoke Aerosols on Surface Air Quality in California: A Multi-Year Study using Geospatial Technologies" *GSA NC-SC meeting 2024*, Springfield, MO, USA, 21-23 April 2024.

32. *Zantia K., *Elkins E., and **Mahmud K**. (2024). "Using terrestrial laser scanning and model optimization for characterizing urban tree structural parameters" *GSA NC-SC meeting 2024*, Springfield, MO, USA, 21-23 April 2024.

33. *Alexis, C., Katumwehe, A., Jonathan D.P., and **Mahmud, K.** (2024). "Machine Learning Application in Predictive Mineral Mapping of Southwestern Uganda: Leveraging Airborne Magnetic, Radiometric, and Electromagnetic Data" *GSA NC-SC meeting 2024*, Springfield, MO, USA, 21-23 April 2024.

34. *Remie R., **Mahmud K.**, Vauter, B., Gary, M., Katumwehe A., and Price, J.D. (2024). "Estimating Groundwater Infiltration using Automatic Drip Rate Logging System and LiDAR at Natural Bridge Caverns in Central Texas" *GSA NC-SC meeting 2024*, Springfield, MO, USA, 21-23 April 2024.

35. *Castillo, A., Katumwehe, A., **Mahmud, K.**, and Jonathan D.P. (2024). "Using ERT and LiDAR to detect void space in cretaceous formations at natural bridge caverns in Comal County, TX" *GSA NC-SC meeting 2024*, Springfield, MO, USA, 21-23 April 2024.

36. *Zantia K., Elkins E., and **Mahmud K**. (2024). "Characterizing Tree Structural Parameters using Terrestrial LiDAR and Geometric Modelling within an Urban University" *2024 MSU Texas UGRCA Forum,* Wichita Falls, TX, USA, 18 April 2024.

37. *Zantia K., Elkins E., and **Mahmud K**. (2024). "Characterizing Urban Trees and Estimating Above Ground Biomass using Terrestrial LiDAR and Quantitative Structure Models" *National Conference on Undergraduate Research (NCUR) 2024*, Long Beach, CA, USA, April 8-10, 2024.

38. *Pervin R., Barnes M., Robeson S., **Mahmud K.**, and MacBean N. (2023). "Continental and aridity-zone differences in the ability of DGVMs to capture dryland GPP" *AGU Fall meeting 2023*, San Francisco, CA, USA, 11-15 December 2023.

39. *Brown, K., **Mahmud, K.**, Vauter, B., Katumwehe, A., and Price, J.D. (2023). "Morphological and Spatial Analysis of Cave LiDAR Remote Sensing to Identify Karst Water Infiltration Pathways" *AGU Fall meeting 2023*, San Francisco, CA, USA, 11-15 December 2023.

40. *Elkins E., **Mahmud K.** and Pegg T. (2023). "Application of Remote Sensing Technique for Tree Above Ground Biomass Estimation" *2023 Midwest/West Regional Undergraduate Research, Scholarly, and Creative Activity Virtual Conference*, Virtual, Sonoma State University, USA, 4 Nov 2023.

41. *Elkins E., **Mahmud K.** and Pegg T. (2023). "Traditional and Remote Sensing-Based Above Ground Biomass Estimate for North Texas Tree Species" *2023 ASPRS International Technical Symposium*, Virtual, USA, 12-16 June 2023.

42. *Brown, K., **Mahmud, K.**, Katumwehe, A., and Price, J.D. (2023). "Characterize Water Infiltration Pathways in Central Texas Cretaceous Formation using LiDAR Remote Sensing" *2023 South-west Section of the American Association of Petroleum Geologists*, Wichita Falls, Texas, USA, 06-09 May 2023.

43. *Remie, R., **Mahmud, K.**, Katumwehe, A., and Price, J.D. (2023). "Groundwater Recharge Estimation based on Drip Loggers and LiDAR Data: Edwards Aquifer, Central Texas" *2023 South-west Section of the American Association of Petroleum Geologists*, Wichita Falls, Texas, USA, 06-09 May 2023.

44. *Elkins E. and **Mahmud K.** (2023). "Terrestrial remote sensing technology for improved forest biomass monitoring" *2023 MSU Texas UGRCA Forum*, Wichita Falls, TX, USA, 20 April 2023.

45. *Elkins E. and **Mahmud K.** (2023). "High resolution terrestrial laser scanning for non-destructive tree aboveground biomass estimation" *2023 ACU Undergraduate Research, Creativity and Innovation Festival*, Abilene, TX, USA, 11 April 2023.

46. *Elkins E. and **Mahmud K.** (2023). "Characterize urban tree attributes using terrestrial LiDAR and quantitative structure model" *23rd Ecological Integration Symposium*, College station, TX, USA, 30-31 March 2023.

47. *Castillo, A., Katumwehe, A., **Mahmud, K.**, and Jonathan D.P. (2023). "Using ERT and lidar to detect void space in cretaceous formations at natural bridge caverns in comal county, TX" *2023 South-Central Section of the Geological Society of America*, Stillwater, Oklahoma, USA, 13-14 March 2023.

48. *Pervin R., Barnes M., Robeson S., **Mahmud K.**, and MacBean N. (2022). "Global-Scale Benchmarking of TRENDY Dynamic Vegetation Model Spatiotemporal Estimates of Dryland Productivity using a Dryland-Specific, Ecohydrologically-Informed GPP Product" *AGU Fall meeting 2022*, Chicago, IL, USA, 12-16 December 2022.

49. **Mahmud K.**, Raoult N., Scott R. L., and MacBean N. (2022). "Parameter Optimization to Improve Seasonal Predictions of Evapotranspiration Partitioning in Semiarid Ecosystems" *AIMES Workshop on New Directions in Land Data Assimilation*, Virtual, USA, 13-15 June 2022.

50. Peylin P., Raoult N., Macbean N., Abadie C., Bastrikov V., Ottle C., **Mahmud K.**, Slamon E., Bacour C., Maigan F., Maugis P., Carenso M. (2022). "ORCHIDAS – The ORCHIDEE parameter optimization system" *AIMES Workshop on New Directions in Land Data Assimilation*, Virtual, USA, 13-15 June 2022.

51. **Mahmud K.**, Raoult N., Scott R. L., and MacBean N. (2021). "Data Assimilation as a Tool for Improving Seasonal Predictions of Evapotranspiration Partitioning in Southwestern US Semiarid Ecosystems" *AGU Fall meeting 2021*, New Orleans, LA, USA, 13-17 December 2021.

52. *Pervin R., Reed S., Smith W.K., Yan D., **Mahmud K.**, and MacBean N. (2021). "Novel Remote Sensing Approach for Estimating Biocrust Fractional Cover in Semiarid Ecosystems" *AGU Fall meeting 2021*, New Orleans, LA, USA, 13-17 December 2021.

53. MacBean N, **Mahmud K.**, and Scott R. L. (2021). "Evaluating Terrestrial Biosphere Model ET and ET partitioning in SW US Semiarid Ecosystems and Interactions with Vegetation and Carbon Cycling" *AmeriFlux evapotranspiration workshop 2021*, Virtual, USA, 02-04 November 2021.

54. **Mahmud K.**, Raoult N., Scott R. L., and MacBean N. (2021). "Using model-data fusion to improve terrestrial biosphere model predictions of evapotranspiration partitioning across 12 semiarid Ameriflux sites" *AmeriFlux annual meeting 2021*, Virtual, USA, 20-22 September 2021.

55. **Mahmud K.**, Biederman J., Scott R. L., Litvak M., Kolb T., Meyers T. P., Krishnan P., Bastrikov V., MacBean N. (2020). "Photosynthesis and Phenology Parameter Optimization Alleviates Terrestrial Biosphere Model Underestimate of Net CO_2 Flux Interannual Variability at Semiarid Sites" *AGU Fall meeting 2020*, Virtual, USA, 01-17 December 2020.

56. **Mahmud K.**, Biederman J., Scott R. L., Litvak M., Kolb T., Meyers T. P., Krishnan P., Bastrikov V., MacBean N. (2020). "Parameter Optimization at Multiple AmeriFlux Semiarid Sites Improves Terrestrial Biosphere Model Prediction of CO_2 Exchange" *AmeriFlux annual meeting 2020*, Virtual, USA, 07-09 October 2020.

57. **Mahmud K.**, Medlyn B., Kumarathunge D., Drake J.E., Aspinwall M.J. and Tjoelker M.G. (2018). "Resolving climate warming impacts on plant carbon balance processes – inference from data assimilation". *AGU Fall meeting 2018*, Washington D.C., USA, 10-14 December 2018.

58. Mingkai J., Medlyn B., Duursma R., Drake J.E., Anderson I., Barton C., Boer M., Carrillo Y., Collins L., Crous K.Y., De Kauwe M., Facey S.L., Gherlenda A., Gimeno T.E., Gomez L.C., Hasegawa S., MacDonald C., **Mahmud K.**, Moore B., Moreno R.L.S., Nazaries L., Nevado J.P., Noh N.J., Pathare V., Pendall E., Powell J., Power S., Reich P., Renchon A., Riegler M., Rymer P., Tjoelker M., Wujeska-Klause A., Yang J., Zaehle S., and Ellsworth D.S. (2018). "The fate of carbon in a mature Eucalypt woodland under CO_2 enrichment and phosphorus limitation". *AGU Fall meeting 2018*, Washington D.C., USA, 10-14 December 2018.

59. **Mahmud K.**, Medlyn B., Duursma R., Campany C. and De Kauwe M. (2018). "Use of data assimilation to infer the effects of sink strength on plant carbon balance processes". Society for Mathematical Biology *SMB2018*, Sydney, Australia, 8-12 July 2018.

60. Medlyn B., **Mahmud K.**, Duursma R., Pfautsch S., and Campany C. (2017). "When growth and photosynthesis don't match: implications for carbon balance models". *AGU Fall meeting 2017*, New Orleans, USA, 11-15 December 2017.

61. Baker A., Pauline C.T., Markowska M., Anderson M., Wang Z., **Mahmud, K.**, Coleborn K., and Cuthbert M. O. (2017). "Climate and groundwater recharge: the story from Australian caves". *Australasian Groundwater Conference 2017*, Canberra, ACT, Australia, 11-13 July 2017.

62. Baker A., Pauline C.T., Coleborn K., **Mahmud, K.**, Markowska M., Flemons I., Cuthbert M. O. Rau G. C. and Anderson M. (2015). "Hundreds of automatic drip counters reveal infiltration water discharge characteristics in Australian caves". *AGU Fall meeting 2015*, San Francisco, CA, USA, 14-18 December 2015.

63. Mariethoz G., **Mahmud, K.**, Baker A. and Pauline C.T. (2015). "Flow Classification and Cave Discharge Characteristics in Unsaturated Karst Formation". *AGU Fall meeting 2015*, San Francisco, CA, USA, 14-18 December 2015.

64. Treble P., Baker A., Fairchild I.J., Bradley C., **Mahmud K.**, Andersen M.S., Meredith K., Mariethoz M. (2015). "Roles of Transpiration, Forest Bioproductivity and Fire on a Long-Term Dripwater Hydrochemistry Dataset from Golgotha Cave, SW Australia". *AGU Fall meeting 2015*, San Francisco, CA, USA, 14-18 December 2015.

65. **Mahmud, K.**, Mariethoz G., Baker A., Pauline C.T., Markowska M. and McGuire L. (2015). "Characterising Groundwater Recharge from Cave Terrestrial LiDAR and Drip Water Analysis". *Australian Groundwater Conference 2015*, Canberra, ACT, Australia, 3-5 November 2015.

66. **Mahmud K**, Mariethoz G, Baker A, Sharma A (2014). Assimilating Hydraulic Conductivity Data Using Multiscale Training Images, *AGU Fall meeting 2014*, San Francisco, CA, USA, 15-19 December 2014.

67. **Mahmud K.**, Mariethoz G., Pauline C.T., Baker A. (2014). LiDAR Investigation of Infiltration Water Heterogeneity in the Tamala Limestone, SW WA. *AGU Fall Meeting 2014*, San Francisco, CA, USA, 15-19 December 2014.

68. **Mahmud K.**, Mariethoz G., Baker A. (2013). "Integrating Multiple Scales of Hydraulic Conductivity Measurements in Training Image-Based Stochastic Models". *AGU Fall Meeting 2013*, San Francisco, CA, USA, 9-13 December 2013.

69. **Mahmud K.**, Tahmasebi P., Mariethoz G., Caers J., Baker A. (2013). "Application of image quilting for conditional simulation of geological textures". *International Association of Hydrogeologists (IAH) 2013*, Perth, Australia, 15-20 September 2013.

70. **Mahmud K.**, Tahmasebi P., Mariethoz G., Caers J., Baker A. (2013). "Simulation of Earth textures by Conditional Image Quilting". *15th Annual Conference of the International Association for Mathematical Geosciences*, Madrid, Spain, 2-6 September 2013.

71. **Mahmud K.**, Mariethoz G. & Baker A. (2012). "Conditional Simulation of Geological Textures by Image Quilting" *1st International Conference on Advances in Civil Engineering*, 12-14 December, 2012.

72. *Islam M.M., **Mahmud K.**, Faruk O. and Billah S. (2011). "Assessment of Environmental Impacts for Textile Dyeing Industries in Bangladesh" Proceedings of the *International Conference on Green Technology and Environmental Conservation, GTEC 2011*, pp. 236-244.

73. Al–Amin M. **Mahmud K.**, Hosen S. and Islam M.A. (2011). "Domestic Water Consumption Patterns in a Village in Bangladesh" *4th Annual Paper Meet and 1st Civil Engineering Congress*, ISBN: 978-984-33-4363-5, pp. 83-85.

74. Hoq S.M.A. & Sabbir M.A. and **Mahmud, K.** (2011). "Introduction of rhombus frame to improve building performance in earthquake" *4th Annual Paper Meet and 1st Civil Engineering Congress*, ISBN: 978-984-33-4363-5, pp. 298-302.

75. **Mahmud K.**, Sabbir M.A. and Sakib N. (2011). "Characteristic Assessment of Matuail Landfill Leachate" Proceedings of the *International Conference – 2011 on Environmental Technology & Construction Engineering for Sustainable Development*, ISBN: 978-984-33-3055-0, pp. 410-419.

76. *Yahya S.M., **Mahmud K.**, Navid E.H. and Hossain S.M. (2011). "Ship Breaking and Recycling Industry in Bangladesh – Towards Sustainable Development to Mitigate Environmental Hazards" Proceedings of the *3rd CUTSE International Conference*, Curtin University, Sarawak, Malaysia, pp. 567-575.

77. Shams S., **Mahmud K.**, Al – Amin M. and Rahman M. T. (2011). "An Assessment of Greener Homes by Coding and Rating System" Proceedings of the *International Conference – 2011 on Environmental Technology & Construction Engineering for Sustainable Development*, ISBN: 978-984-33- 3055-0, pp. 603-612.

78. Sakib N., **Mahmud K.**, Mumtaz M. and Khusru S. (2011). "Fire Spread Parameters Regarding Knitwear: Generated Heat Flux and Thermal Insulation by Cotton Around Columns" Proceedings of the *International Conference – 2011 on Environmental Technology & Construction Engineering for Sustainable Development*, ISBN: 978-984-33-3055-0, pp. 440-445.

79. **Mahmud K.**, Hossain M.D. and Shams S. (2011). "Application of Fenton Process in Treating Landfill Leachate", Proceeding of *2nd International Conference on Solid Waste Management in Developing Countries, WasteSafe 2011*, ISBN: 978-984-33-2705-5, pp. 69 (1-8).

80. **Mahmud K.**, Sakib N. and Rahman M.T. (2011). "Effect of Soft Storey in Reinforced Concrete Frame Structure" Proceeding of the *Conference on Engineering Research, Innovation and Education, CERIE 2011*, ISBN: 978-984-33-2140-4, pp. 121-126.

81. Rahman S.M.S., Shams S. and **Mahmud K.** (2010). "Study of Solid Waste Management and its Impact on Climate Change: A Case Study of Dhaka City in Bangladesh", Proceedings of *International Conference on Environmental Aspects of Bangladesh (ICEAB10)*, Japan, Sept. 2010, pp. 229-231.

82. Yahya S.M., Shams S., Islam A.K.M.S. and **Mahmud K.** (2010). "Climate Change Impacts on Flood Vulnerability for Dhaka City", Proceedings of *International Conference on Environmental Aspects of Bangladesh (ICEAB10)*, Japan, Sept. 2010, pp. 37-39.

INVITED TALKS

1. MSU Faculty Forum **2025**
   Talk title: Understanding Water Movement in Heterogenous Limestone Formation
   MSU Texas, Wichita Falls, TX, USA

2. MSU and CWF Environmental Workshop **2024**
   Talk title: Water in Caves - A study at Natural Bridge Caverns Texas
   MSU Texas, Wichita Falls, TX, USA

3. MSU and CWF Environmental Workshop **2024**
   Talk title: The Water Status
   MSU Texas, Wichita Falls, TX, USA

4. Texas Master Naturalist, Rolling Plains Chapter **2023, 2024, 2025, 2026**
   Talk title: Ecological concepts
   MSU Texas, Wichita Falls, TX, USA

5. North Texas Geological Society Meeting **2023**
   Talk title: Characterize Water Infiltration Pathways and Estimate Groundwater Recharge in Highly Heterogeneous Aquifer Formations
   Forum, Wichita Falls, TX, USA

6. MSU Texas International Education Week celebrations (Guest speaker) **2022**
   Talk title: The Importance of International Education

MSU Texas, Wichita Falls, TX, USA

7. Global Ecology and Modeling Lab seminar **2021**
   Talk title: Terrestrial laser scanning to quantify forest carbon stock
   Cornell University, Ithaca, NY, USA

8. Indiana University Geography Colloquium **2020**
   Talk title: Model-Data assimilation to quantify the effects of climate change on plant physiological processes
   Indiana University Bloomington, IN, USA

9. WSU Ecosystem Function and Integration theme meeting **2019**
   Talk title: Resolving climate change impacts on plant carbon balance processes – inference from data assimilation
   Hawkesbury Institute for the Environment, Western Sydney University, Australia

10. Sydney Plant Ecophysiological Group seminar **2018**
    Talk title: Inferring the effects of sink strength on plant carbon balance processes from experimental measurements
    University of Technology Sydney, Sydney, Australia

11. WSU Climate and Forest Ecosystem Modelling group meeting **2017**
    Talk title: When Photosynthesis & Growth don't match
    Hawkesbury Institute for the Environment, Western Sydney University, Australia

12. WSU Ecosystem Function and Integration theme meeting **2016**
    Talk title: Implication of Data Assimilation to correlate photosynthesis and plant growth under sink-limited condition
    Hawkesbury Institute for the Environment, Western Sydney University, Australia

13. Department of Civil and Environmental Engineering **2016**
    Talk title: Numerical methods for characterizing highly heterogeneous aquifer formations
    Islamic University of Technology, Bangladesh

14. UNSW Connected Waters Initiative (CWI) Research Centre **2015**
    Talk title: Lider investigation of infiltration water heterogeneity in the Tamala Limestone, SW WA
    CWI, UNSW Australia

15. UNSW Water Research Centre (WRC) **2014**
    Talk title: Implementation of Multivariate CIQ in hydraulic conductivity variations with scale of measurement
    WRC, UNSW Australia

16. Stanford Center for Earth Resources Forecasting **2013**
    Talk title: Conditional geological texture synthesis by Image Quilting process
    Stanford University, CA, USA

17. Department of Civil and Environmental Engineering **2011**
    Talk title: Application of Fenton process in treating landfill leachate
    Islamic University of Technology, Bangladesh

TEACHING EXPERIENCE

Course Instructor, Kimbell School of Geosciences, Midwestern State University, TX, USA
ENSC-1114 – Foundations of Environmental Science (**Fall 2022, 2023, 2024, 2025, Spring 2023, 2024, 2025, 2026)**
GEOS-3044 – Geographic Information System (**Fall 2022, 2023, 2024, 2025)**
GEOS-3084 – Computing in Geospatial Sciences (**Spring 2023, 2024, 2025**)
GEOS-4734 – Hydrology (**Spring 2026**)
GEOS-5033 – GIS for Geosciences (**Spring 2024, 2025, 2026**)
GEOS-6001 – Graduate Seminar in Geosciences (**Fall 2024, 2025**)

Course Instructor (Part-time, Online), Department of Geography and GIS, Elmhurst University, IL, USA
AGS 520 – Fundamentals of Geospatial Programming (**Fall 2023**)

AGS 592 – Geospatial Capstone Project (**Fall 2023, Summer 2024**)

Guest Lecturer, Department of Geography, Indiana University, Bloomington, IN, USA
GEOG-G338/538 – Geographic Information System (**Fall 2021**)
GEOG-G481/581 – Terrestrial Ecosystem Modelling (**Fall 2021**)
GEOG-G440/540 – Topics in Environmental Geography (**Spring 2020**)

Course Lecturer/Co-Instructor   **Spring 2018**
301114 Nature of Data (Hours per week = 4)
School of Computing, Engineering & Mathematics, WSU, Sydney, Australia

Laboratory Demonstrator   **2015-2016**
School of Civil and Environmental Engineering, UNSW Australia
  ➢ Principles of Water Engineering Laboratory: Contact hour = 72

Teaching Assistant   **2012-2015**
School of Civil and Environmental Engineering, UNSW Australia
  ➢ Principles of Water Engineering: Contact hour = 36 **(2013-2015)**
  ➢ Water Resources Engineering: Contact hour = 36 **(2012-2015)**
  ➢ Water and Wastewater Engineering: Contact hour = 36 **(2012-2014)**
  ➢ Engineering Computations for Environmental Engineers: Contact hour = 24 **(2012)**
  ➢ Civil Engineering Practice: Contact hour = 54 **(2013-2014)**
  ➢ Design Practice B – Water and Environmental: Contact hour = 36 **(2013-2015)**
  ➢ Advanced Water Engineering: Contact hour = 72 **(2015)**

Course Leader/Instructor   **2010–2012**
Department of Civil and Environmental Engineering, Islamic University of Technology, Bangladesh
Courses instructed: Statics, Strength of materials, Structural analysis and Design I, Environmental Management, Materials and Mechanics of solids sessional, Structural analysis and Design sessional I.

Course Leader/Instructor   **2009–2010**
Department of Civil and Environmental Engineering, Islamic University of Technology, Bangladesh
Courses instructed: Civil Engineering Drawing, Details of Construction, Foundation Engineering, Practical Surveying, Geotechnical Engineering Laboratory and Open Channel Flow sessional.

Course Leader/Instructor   **2007–2009**
Department of Civil Engineering, Stamford University Bangladesh
Courses instructed: Open Channel Flow, Irrigation and Flood Control, Foundation Engineering, Soil-water Interaction, Geotechnical Engineering Design sessional and Irrigation and Flood Control sessional.

STUDENT ADVISOR

Doctoral Students

Carl Wang	**2026-**
School of Biological, Earth and Environmental Sciences, University of New South Wales (UNSW) Sydney Australia	**Present**
Thesis Topic: Cave-scale subsurface flow characterization using LiDAR mapping	
Rubaya Pervin	**2020-**
Department of Geography, Indiana University, Bloomington, IN, USA	**2025**
Thesis Topic: Remote sensing data fusion to identify vegetation cover	
Dushan Kumarathunge	**2016-**
Hawkesbury Institute for the Environment, Western Sydney University, Australia	**2019**
Thesis Topic: Predicting the effect of temperature on tree growth	

Masters Students, Kimbell School of Geosciences, Midwestern State University, TX, USA

Md Sabbir Ahmed Research Project Topic: Urban tree above ground biomass estimation using drone LiDAR and automated tree segmentation algorithm	**2025-Present**
Sayanti Kanungo Research Project Topic: Hydrological characterization of cave drip waters in cretaceous limestone from Central Texas	**2025-Present**
Rahul Kumar Ghose Research Project Topic: Quantify cave-scale groundwater recharge in karst formation using drip loggers and terrestrial remote sensing	**2024-Present**
Matthew Casper Research Project Topic: Mapping groundwater infiltration in karst using LiDAR at Natural bridge caverns, TX	**2023-2025**
Md. Shahparan Research Project Topic: Assessment of wildfire induced air pollution and associated health hazards using geospatial and statistical techniques	**2023-2025**
Elizabeth Elkins Research Project Topic: Estimating North Texas urban tree above-ground biomass based on terrestrial LiDAR and optimized quantitative structure models	**2023-2025**
Rowann Remie Thesis Topic: Using drip loggers to characterize groundwater infiltration and examine hydrological response in cretaceous karst formation	**2023-2025**
Krishna Winston Thesis Topic: Using remote sensing data and GIS tools to analyze human impacts on deforestation	**2023-2025**
Kathryn Brown Thesis Topic: Characterize cretaceous formations at Natural bridge caverns in Comal County, TX	**2023-2025**

Undergraduate Students, Kimbell School of Geosciences, Midwestern State University, TX, USA

Javaughn Bullard Research Project Topic: Mapping the Trend of U.S. Wildfires and Their Impact on Air Quality using GIS and geostatistical method	**2024-Present**
Sage Gilbert Research Project Topic: Digital Mapping of Camp Perkins, Texas	**2026-Present**
Jarette Greene Research Project Topic: Flow classification using cave drip time series at Natural bridge caverns in Central Texas	**2024-2025**
Anna Kough Research Project Topic: Assessment of wildfire driven air pollution using geospatial and statistical techniques	**2024**
Zantia King Research Project Topic: Better estimation of above ground biomass for Texas tree species with parameter optimization and model validation	**2023-2025**
Elizabeth Elkins Research Project Topic: Terrestrial remote sensing technology for improved forest biomass monitoring	**2022-2023**

Undergraduate Students, Department of Civil and Environmental Engineering, IUT Bangladesh

M. R. Azom, A. Sontu, S. B. Himon **2011**
Research Project Topic: Environmental impact assessment of tanneries: a case study of Hazaribag in Bangladesh

S. M. Yahya, S. M. Hossain, E. H. Navid **2011**
Research Project Topic: Environmental impact assessment of ship breaking and recycling industries - A case study for Bangladesh

M. M. Islam, O. Faruk, M. S. Billah **2010**
Research Project Topic: Textile dyeing industries in Bangladesh for sustainable development

GRANTS

External Grants:

AmericaView (USGS) 2023-2026	*PI: **Myself** - Midwestern State University* Title: Stateview program development and operations for the state of Texas **($76,500)**
Australian Research Council 2025-2029	*PI: Andy Baker (UNSW Australia)* Title: Caves and cave stalagmites - understanding present and future climate drivers of recharge **(AU$3,298,909)** Role: Collaborator to join LiDAR field work and research visit to Sydney Australia and remotely supervise PhD students
AmericaView Research and Education Grant 2025-2026	*PI: **Myself** - Midwestern State University* Title: Benchmarking Urban Trees Biomass Estimation: A Comparative Analysis of RayExtract and TLS2trees Algorithms using Large-Scale Airborne LiDAR **($5,000)**
AmericaView Research and Education Grant 2025-2026	*PI: **Myself** - Midwestern State University* Title: Investigating Vadose-Zone Storage and Drainage in a Karst Aquifer Using Cave Drip Monitoring and Remote Sensing **($5,000)**
National Cave and Karst Research Institute (NCKRI) Submitted (2026)	*PI: **Myself** - Midwestern State University* Title: Fracture-Controlled Water Pathways in Karst Critical Zones: Integrating Terrestrial LiDAR, Near-Surface Geophysics, and Drip Monitoring **($25,000)**
TTU Institute for One Health Innovation Not awarded (2025)	*PI: Clarissa Strieder-Barboza, TTU (Myself – Co-PI)* Title: Screening PFAS bioaccumulation in beef and dairy tissues: A One Health approach to regional exposure mapping at Texas Panhandle **($100,000)**
TTU Institute for One Health Innovation Not awarded (2025)	*PI: Babafela Awosile, TTU (Myself – Collaborator)* Title: Spatiotemporal and One Health analysis of association between rabies cases and climate factors in Texas **($100,000)**
National Cave and Karst Research Institute (NCKRI) Not awarded (2025)	*PI: **Myself** - Midwestern State University* Title: Integrate terrestrial LiDAR and drip data to quantify cave-scale groundwater recharge in karst aquifer **($25,000)**
AmericaView Research and Education Grant 2024-2025	*PI: **Myself** - Midwestern State University* Title: Airborne LiDAR for urban tree above ground biomass estimation **($3,400)**
AmericaView Research and Education Grant 2024-2025	*PI: **Myself** - Midwestern State University*

	Title: Mapping cave-scale groundwater infiltration in heterogenous karst formation using terrestrial remote sensing **($3,400)**
Texas Water Development Board 2024-2025	*PI: Jonathan D. Price **(Myself – Co-PI)*** - Midwestern State University Title: Texas water development board regional flood plan **($21,000)**
National Cave and Karst Research Institute (NCKRI) Not awarded (2024)	*PI: **Myself*** - Midwestern State University Title: Terrestrial LiDAR and cave drip analysis to characterise water movement in heterogenous karst formation **($25,000)**
AmericaView Research and Education Grant 2023-2024	*PI: **Myself*** - Midwestern State University Title: Assessment of wildfire driven air pollution and associated health impacts using geospatial and statistical techniques **($2,000)**
AmericaView Research and Education Grant 2023-2024	*PI: **Myself*** - Midwestern State University Title: Estimating urban above ground biomass using automated terrestrial laser scanning algorithm **($2,000)**
AmericaView Research and Education Grant 2023-2024	*PI: **Myself*** - Midwestern State University Title: Using LiDAR and automated drip rate logging systems to estimate groundwater recharge **($2,000)**
AmericaView Research and Education Grant 2022-2023	*PI: **Myself*** - Midwestern State University Title: Forest biomass estimation using terrestrial laser scanning **($2,000)**
AmericaView Research and Education Grant 2022-2023	*PI: **Myself*** - Midwestern State University Title: Remote sensing and morphological analysis to characterize cretaceous formations at Natural bridge caverns in Comal county, TX **($2,000)**
NASA Carbon Cycle Science Solicitation 2021-2023	*PI: Dr. Natasha MacBean* - Indiana University Title: Role of semi-arid ecosystems in the global carbon cycle **($900,000)** Role: Assist in proposal writing, analyze preliminary data, develop relationship with partners and implementing the research project
UNSW Faculty of Engineering Post-Doctoral Fellowship Grant 2015	*PI: **Myself*** - UNSW Australia Title: Hydrological characterization of cave drip waters in a porous limestone **(AU$10,645)**

Internal Grants (supported by MSU Texas):

MSU EURECA 2026	*PI: **Myself*** - Midwestern State University Title: Digital Mapping of Camp Perkins, Texas **($1,000)**
MSU EURECA 2025 - 2026	*PI: **Myself*** - Midwestern State University Title: Mapping the Trend of Texas Wildfires and Their Impact on Air Quality **($2,000)**
MSU UGROW 2025	*PI: **Myself*** - Midwestern State University Title: Comparative analysis of greenhouse gas emissions from U.S. transportation sector **($2,000)**
MSU EURECA 2024 - 2025	*PI: **Myself*** - Midwestern State University Title: Mapping California air pollution driven by wildfire using modeling and geostatistical method **($3,000)**
MSU EURECA	*PI: **Myself*** - Midwestern State University

2024 - 2025	Title: Impact of foliage in LiDAR-based above-ground biomass estimation for urban trees **($3,000)**
MSU Faculty Intramural Grant 2024-2025	*PI: **Myself*** - Midwestern State University Title: Tree above ground biomass estimation using Drone-based LiDAR and automated tree segmentation algorithm **($9,985)**
MSU UGROW 2024	*PI: **Myself*** - Midwestern State University Title: Flow classification using cave drip time series at Natural bridge caverns in Central Texas **($2,000)**
MSU EURECA 2023 - 2024	*PI: **Myself*** - Midwestern State University Title: Better estimation of above ground biomass for MSU Texas tree species with parameter optimization and model validation **($3,000)**
MSU UGROW 2023	*PI: **Myself*** - Midwestern State University Title: Traditional and remote sensing-based above ground biomass estimate for North Texas tree species **($2,000)**
MSU EURECA 2022 - 2023	*PI: **Myself*** - Midwestern State University Title: Terrestrial remote sensing technology for improved forest biomass monitoring **($2,000)**
MSU Faculty Intramural Grant 2022-2023	*PI: **Myself*** - Midwestern State University Title: Integrate remote sensing and water infiltration data to identify karst subsurface fractures and quantify groundwater recharge **($7,500)**

AWARDS, FUNDING AND SCHOLARSHIPS

2025 – 2027	MSU Texas C-STEM Scholar – **US$21,000**
2024	MSU Texas Faculty Development Award – **US$2,500**
2024	MSU Texas Office of Sponsored Program and Research (OSPR) Equipment Funding – **US$3,000**
2022	MSU Texas Faculty Development Award – **US$1,100**
2022	MSU Texas Office of Sponsored Program and Research (OSPR) Equipment Funding – **US$5,000**
2018	Highly commended early career presentation at Society for Mathematical Biology conference (SMB2018)
2015	CWI conference grant – **AU$3,000**
2012 – 2015	Tuition Fee Scholarship and living allowance, UNSW Australia – **AU$105,000**
2014 – 2015	CWI Gary Johnson Top-up scholarship – **AU$6,000**
2012 – 2014	NCGRT Top-up scholarship – **AU$15,000**
2013	NCGRT conference grant – **AU$3,000**
2012	The Postgraduate Research Student Support (PRSS) conference grant – **AU$4,000**
2003, 2007	University (BUET) Technical Scholarship in Level-1, Term-2 & Level-4, Term-1
2003, 2007	Dean's list Award after completion of Level-1 & Level-4 in BSc Engineering
2001	Board Scholarship for HSC result
1999	Talent pool Board Scholarship for placing 17th in SSC Exam

ACADEMIC SERVICE

Professional Activities
- 2025: Co-chair a session on Understanding Karst Hydrology and Karst Aquifers Using Innovative Tracers and Other Technologies at the Geological Society of America (GSA) Connects 2025
- 2025: Editor of AmericaView Journal of Earth Observation and Geospatial Applications
- 2025: Guest Editor of a special issue on Remote Sensing and GIScience for Natural Hazard Mitigation and Resilience under MDPI Journal Remote Sensing

- 2025: Organize 2025 El Paso Science Festival with AmericaView and LouisianaView
- 2025: Chair a session on Advancing Geosciences through Geospatial Innovations at the Geological Society of America (GSA) South-Central Section Meeting
- 2024–Present: Member of Landsat Advisory Subcommittee under the National Geospatial Advisory Committee (NGAC)
- 2022–Present: Member of AmericaView which is an educational non-profit organization supporting remote sensing education, applications, and research
- 2020–Present: Member of ORCHIDEE DA group (LSCE, France) to discuss and promote different use of DA tools with ORCHIDEE and potential improvement of the tools
- 2016–2019: Member of the EucFACE (Eucalyptus Free Air CO_2 Enrichment) experiment, designed to predict the effects of rapidly rising atmospheric carbon dioxide on Australia's unique native forests
- 2009-2010: Member of Amin Bazar Landfill Development Project, Dhaka City Corporation, Bangladesh to deliver technical advice for reducing leachate contamination
- 2007-2010: Member of Matuail Landfill Development Project, Dhaka City Corporation, Bangladesh to develop innovative leachate treatment technique
- Judge for Outstanding Student Paper Award, American Geophysical Union Fall Meeting 2018, 2024

Professional Activities – Journal Articles Reviewed

AmericaView JEOGA, Land, Photosynthesis Research, Ecosystems, Environments, Waste Management, Hydrology and Earth system sciences, Water resources research, Computers & Geosciences, Remote sensing, Mathematical Geosciences, Journal of Hydrology, Hydrogeology Journal

Service – MSU Texas

- 2025: Chair of the Search Committee for Bolin Endowed Chair (Tenure-track Associate/Full Professor) position in Petroleum Geology.
- 2024: Member of the Search Committee for Tenure-track Assistant Professor position in Geophysics.
- 2024–2026: Member of MSU Texas IT Advisory committee to evaluate and make recommendations to the Administrative Council on selection and use of software and hardware solutions.
- 2023–2025: Member of MCOSME research committee to review faculty research proposals and to recommend to the dean allocation of appropriated funds to research projects and to solicit and review project reports from the faculty conducting university-funded research.
- 2022–Present: Member of MSU Geosciences graduate committee for prospective student admission, successful research and defense of the student's master's thesis
- 2022–Present: Departmental service for the Research, securing quotes, purchasing committee
- 2022–Present: MCOSME faculty committee member for Sikes Lake Dredging project to provide support and advice along the progress of the project utilizing my Civil Engineering background

Service – UNSW Australia

- Guide and develop students' skills related to Civil Engineering project planning and management, environmental engineering assessment etc.

Service – Islamic University of Technology, Bangladesh

- Work as a Laboratory in-charge in Water Resources Engineering Laboratory for the development, operations and maintenance of the laboratory.
- Prepare and update course contents and laboratory manual for several undergraduate courses.
- Provide reports with recommendations, communicated in writing and verbally.
- Invigilator of the examination hall, scrutinizer for semester examination scripts and tabulator for semester examination.

Professional Affiliations

American Society for Photogrammetry and Remote Sensing (ASPRS), American Geophysical Union (AGU), European Geosciences Union (EGU), International Association of Hydrogeologists (IAH), Geological Society of America (GSA).

SKILLS AND TRAINING

Certifications
- Recreational UAS Safety Test (TRUST) certification for flying drones
- NASA's Applied Remote Sensing Training (ARSET) Program

Computer Skills
- Operating Systems: Windows, Mac OS, Unix, Ubuntu, HPC
- Computer programming, numerical and statistical analysis: MATLAB, R, R Markdown, Python, C, Java, Javascript, SQL, SGeMS, ParaView, LAStools, CloudCompare, Cyclone register 360, DJI Pilot and Terra, SCENE, ArcGIS, QGIS, ENVI, ANSYS, ETABS etc.
- Satellite Imagery: GEDI, Aqua, TERRA, Sentinel 1/2/3, SMAP, Landsat, GOES-series, GRACE, NLCD, SRTM
- Land surface models: ORCHIDEE, ORCHIDAS, GDAY
- Software development and version control platforms: GitHub, Bitbucket
- Desktop Editing and Productivity Software: Microsoft Office, TeX (LaTeX, BibTeX), Google Docs, Adobe Illustrator, Photoshop, Autocad, STADPRO, Google Sketchup etc.

Teaching Skills
- Develop and utilize online course contents at MSU Texas, IU, WSU's e-learning system, while record and upload lectures online for the students.
- Two-day training on tutorial demonstration, School of Civil and Environmental Engineering, UNSW Australia

Communication and building networks
- Preparing and presenting written and verbal communications for use in with a range of audiences: Academic (including inter-disciplinary audiences) and Students of mixed level and ability
- Building and maintaining internal and external networks, nationally and internationally

Teamwork
- Working on common projects in highly collaborative teams (e.g. LSCE (France), HIE, NCGRT, CWI and ANSTO)
- Sharing research in an inter-disciplinary environment

Project management
- Working effectively on multiple and diverse projects, adjusting priorities as required
- Working flexibly within dynamic time and resource restrictions, meeting tight deadlines