RAKIBA SULTANA Curriculum Vitae

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SUMMARY

I am a Ph.D. Candidate at the Department of Geosciences, University of Wisconsin-Milwaukee. My research focuses on contaminant fate and transport in the vadose zone and groundwater during natural flooding events. My research methodology involves a combination of hydrogeological field work, analytical laboratory analysis, and numerical-analytical modeling of groundwater flow and contaminant transport.

EDUCATIONAL BACKGROUND

(i) Ph.D. in Hydrogeology Jan. 2021- August. 2025 (expected)
University of Wisconsin-Milwaukee, Milwaukee, USA
Dissertation: Sources and Transport Mechanisms of Contaminants during Flooding Events

(ii) M.S. in Petroleum Geology 2017-2019
University of Dhaka, Dhaka, Bangladesh
Thesis: Environmental Impact and Its Mitigation due to Waste Disposal by Crude Oil Processing at Eastern Refinery Limited, North Patenga, Chittagong

(iii) B.S. in Geology 2013-2017
University of Dhaka, Dhaka, Bangladesh
Project: Geological Field on Cox's Bazar, Teknaf, Maheshkhali and St. Martin's Island- Its Hydrogeological Scenario, Petroleum Prospect, and Geo Hazard Estimation

PEER-REVIEWED PUBLICATIONS (Google Scholar)

(4) Hasan, A.B.M.R., **Sultana, R.**, Paradis, C.J., Pillai, K.M., 2025. Experimental investigation of upward and downward cycling of salt contaminants in the vadose zone. Journal of Contaminant Hydrology 104686. https://doi.org/10.1016/j.jconhyd.2025.104686.

(3) Paradis, C.J., **Sultana, R.**, Dangelmayr, M.A., Johnson, R.H., Kent, R.D., 2025. Breakthrough Curve Separation Using Applied Solute Tracers. Groundwater gwat.13480. https://doi.org/10.1111/gwat.13480

(2) **Sultana, R.**, Johnson, R.H., Tigar, A.D., Wahl, T.J., Meurer, C.E., Hoss, K.N., Xu, S., Paradis, C.J., 2024b. Contaminant mobilization from the vadose zone to groundwater during experimental river flooding events. Journal of Contaminant Hydrology 265, 104391. https://doi.org/10.1016/j.jconhyd.2024.104391

(1) **Sultana, R**., Dangelmayr, M.A., Paradis, C.J., Johnson, R.H., 2024a. Combining fission-track radiography and scanning electron microscopy to identify uranium host phases. Environ Earth Sci 83, 56. https://doi.org/10.1007/s12665-023-11373-5

PUBLICATIONS IN REVIEW/REVISION

(1) **Sultana, R.**, Wallace, C.D., Tigar, A.D., Wahl, T.W., Hoss, K.H., Johnson, R.H., Paradis, C.J., 2025.Mechanisms for Contaminant Transport in the Vadose Zone During Infiltration Events. In prep for Journal of Contaminant Hydrology.

NON PEER-REVIEWED PUBLICATIONS

(1) Paradis, C. and **Sultana, R**., 2024. Tracer-based Separation of Advection and Dispersion from Breakthrough Curves. Geosciences Faculty Articles. 28. https://dc.uwm.edu/geosci_facart/28

SELECTED CONFERENCE PROCEEDINGS

(4) **Sultana, R.**, Johnson, R., Paradis, C., Fiene, M., 2024c. Workflow for Groundwater Flow from Saturated Zone to the Upper Vadose Zone to Explore River Flooding. AGU 2024 (Poster)

(3) **Sultana, R.**, Johnson, R., Paradis, C., 2024b. Contaminant Transport from Contaminated Groundwater to The Upper Vadose Zone. GSA Connects 2024, https://doi.org/10.1130/abs/2024AM-403929 (Poster)

(2) **Sultana, R.**, Owen, H., Paradis, C., Johnson, R., 2022. Microscale visualization and elemental analysis of solid-phase uranium geochemistry on contaminated sediments using fission track technology. GSA Connects 2022, https://doi.org/10.1130/abs/2022AM-379607 (Oral)

(1) **Sultana, R.**, Hoss, K., Meurer, C., Hatami, J., Johnson, R., Tigar, A., Paradis, C., 2021. Surface infiltration of river water to groundwater to simulate periodic flooding events at a uranium-contaminated site. GSA Connects 2021, https://doi.org/10.1130/abs/2021AM-366575 (Oral)

RESEARCH FUNDINGS

- Non-Academic Research Internships for Graduate Students (INTERN) Grant (2024-25), Supplementary Funding to Standard Grant: Award no. 2229869, Internship Host Organization: United States Geological Survey Upper Midwest Water Science Center, Madison, WI. Grant Amount: $37,980
- GSA Graduate Student Research Grant with Specialized Awards: John T. and Carol G. McGill Research Award (2022-23), Research: Residual Uranium Mineralogy at a Former Mill Tailings Site. Grant #: 13597-22. Grant Amount: $2700
- National Science and Technology Fellowship (NST), Awarded by The Ministry of Science and Technology, Government of Bangladesh (2018-19), Research: Environmental Impact and Its Mitigation due to Waste Disposal by Crude Oil

Processing at Eastern Refinery Limited, North Patenga, Chittagong, Bangladesh, Grant Amount: $500

TECHNICAL SKILLS

- Programming & Analysis tools: Python (FloPy, NumPy, Pandas, Matplotlib), Microsoft Excel
- Modeling & Software: MODFLOW 6, PEST++, Groundwater Vistas, ArcGIS, PHREEQC, Surfer
- Analytical Instruments: Scanning Electron Microscope-Energy Dispersive X-ray Spectroscopy, X-Ray Diffraction (XRD), Multiparameter instrument, Ion Selective Electrode, Peristaltic pump, Water level meters, Colorimeter, Manual titrators.
- Field Methods: Tracer experiments, Groundwater well monitoring, On-site groundwater sample analysis (dissolved oxygen, ferrous ion, alkalinity, pH, temperature, oxidation-reduction potential, iodide analysis).

AWARDS and SCHOLARSHIPS

- UW-Milwaukee Geosciences Department Research Excellence Award (2025) ($1400)
- NSF INTERN Award, Host organization: U.S. Geological Survey Upper Midwest Water Science Center, Madison, WI (2024-25) ($37,980)
- GSA Graduate Student Research Grant, John T. & Carol G. McGill Research Award (2022-23) ($2700)
- UW-Milwaukee Nelson Cherkauer Lasca Legacy Scholarship (2022 and 2023) ($7000)

EMPLOYMENT HISTORY

- Teaching Assistant, Department of Geosciences, UW-Milwaukee (2021-current):
  - Physical Hydrogeology- GEO SCI 463G (Fall 2022), Chemical Hydrogeology-GEO SCI 464G (Spring 2023 and Spring 2024), and Introduction to the Earth: GEO SCI 100 (Spring 2021, Spring 2023 and Spring 2024).
    Co-designed experiments and assignments for a bi-weekly laboratory in GEO SCI 464G and 464G, co-designed in-lab lectures and assignments for a bi-weekly laboratory in GEO SCI 100 course.
- Research Assistant, Department of Geosciences, UW-Milwaukee (2021-current):
  - 'Uranium Mobility Project' to characterize mechanisms of uranium transport during a flood (Funded through United States Department of Energy Office of Legacy Management, National Science Foundation and The Geological Society of America)

INTERDISCIPLINARY EXPERIENCE

ReSTORE Summer School, University College Dublin, Ireland, 4 July 2022-8 July 2022 (Funded by University College Dublin, Ireland)

PROFESSIONAL SERVICE

- Peer Reviewer (2025) - Physics and Chemistry of the Earth (Elsevier) (2)
- Guest lecture (2025) - Modelling Techniques for Hydrogeology (graduate-level course), Workflow for simulating steady-state and transient pumping test using MODFLOW6 and FloPy (1)
- Mentor (2021 and 2023) - UW-Milwaukee undergraduate student (1) and high school students (2)