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## SUMMARY

Ph.D. in Contaminant Hydrogeology with over four years of experience in contaminated site investigation, groundwater monitoring and sampling, tracer experiments, data analysis, and numerical and analytical modeling. Skilled in aquifer test interpretation, environmental data management, and supporting site characterization and remedial design in collaboration with federal agencies.

## EDUCATION

Ph.D., Contaminant Hydrogeology, University of Wisconsin-Milwaukee, Aug. 2025

M.S., Petroleum Geology, University of Dhaka (2017-2019)

B.S., Geology, University of Dhaka (2013-2017)

## PROFESSIONAL/RESEARCH EXPERIENCE

Oct. 2021-Present      Quantitative Hydrogeologist, INTERA, Inc.

Conducting research on uranium mobility in the DOE Hanford site.

Jan. 2021-Aug. 2025      Research Assistant, Dept. of Geosciences, UW-Milwaukee

Conducted two-month field-scale tracer experiments in Riverton, WY (collaborator: U.S. Department of Energy), evaluating contaminant mobility under simulated flooding events (Data publicly available at [DOE LM Data](#)); collected soil and groundwater samples; compiled and analyzed hydrologic data using Python and Microsoft Excel to support site characterization and analytical modeling.

Aug. 2024-Jan. 2025      Graduate Research Intern, U.S. Geological Survey, Upper Midwest  
Water Science Center

Calibrated a pumping test model using MODFLOW 6 and PEST++, integrating hydrogeological principles to estimate aquifer hydraulic properties; built and documented an automated workflow to transfer and integrate hydrologic properties from regional to local-scale groundwater models using Python (FloPy).

December 2024      Collaborative Research Proposal

*Modeling Salinity Thresholds in the Everglades: Implications for Carbon Loss with Accelerated Sea Level Rise:* Co-developed a research proposal with Dr. Xavier Comas (Florida Atlantic University) on salinity thresholds and carbon loss in the coastal Everglades; contributed to the conceptual framing and writing, gaining expertise in

wetland hydrogeology and salinity-driven changes in peat soil structure and hydraulic properties.

### Research Interests

Hydrogeology, Groundwater Contamination, Vadose Zone Processes during Floods, Contaminant Transport, Flow and Transport Modeling, Wetland Hydrogeology, Salinity Intrusion

### PEER-REVIEWED PUBLICATIONS (Google Scholar)

- (5) **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. (*in review*)
- (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>

### 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](https://dc.uwm.edu/geosci_facart/28)

### SELECTED CONFERENCE PROCEEDINGS

- (4) **Sultana, R.**, Johnson, R., Paradis, C., Fiene, M., 2024b. 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., 2024a. 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)

## **TECHNICAL SKILLS**

- Field Methods: Pumping tests, Slug tests, Tracer experiments, Groundwater well monitoring and sample analysis, Soil boring and analysis, On-site aquifer sample analysis (dissolved oxygen, ferrous ion, alkalinity, pH, temperature, oxidation-reduction potential, iodide analysis)
- Modeling & Software: MODFLOW 6, PEST++, Groundwater Vistas, ArcGIS, PHREEQC, Surfer, Adobe Illustrator
- Languages & Analysis tools: Python (FloPy, NumPy, Pandas, Matplotlib), Microsoft Excel

## **TEACHING AND MENTORSHIP EXPERIENCE**

Teaching Assistant, Jan. 2021-Jun. 2025, UW-Milwaukee

Physical Hydrogeology- GEO SCI 463G (Fall 2022),

Chemical Hydrogeology-GEO SCI 464G (Spring 2023 and Spring 2024),

Introduction to the Earth: GEO SCI 100 (Spring 2021, 2023 and 2024, and Summer 2025).

Guided students of graduate-level hydrogeology courses through practical applications of pumping tests (steady-state and transient) and permeameter experiments to determine hydraulic conductivity for assessing groundwater availability

Mentor, Spring 2021 and Summer 2023

Nicolet High School students (2) on GIS mapping and UW-Milwaukee undergraduate student (1) on interpreting uranium distribution in the soil.

## **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)

## **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), Grant Amount: \$500

## **AWARDS and SCHOLARSHIPS**

- UW-Milwaukee Geosciences Department Research Excellence Award (2025) (\$1400)
- UW-Milwaukee Nelson Cherkauer Lasca Legacy Scholarship (2022 and 2023) (\$7000)
- GSA (Geological Society of America) Connects Travel Grant 2021 and 2022, \$300

## **INTERDISCIPLINARY EXPERIENCE**

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

## **GEOLOGICAL FIELD EXPERIENCES**

- Hydrogeological Field Work at Riverton, Wyoming in collaboration with the US Department of Energy (July - August 2021)
- Site Visit at Bangladesh Gas Fields Company Limited (BGFCL) (2017)
- Geological Field on Cox's Bazar, Teknaf, Maheshkhali and St. Martin's Island, Bangladesh. (2017)
- Geological Field on Jaintiapur and Tamabil Road cut Section, Sylhet, NE Bangladesh. (2016)
- Geological Field on Lichubagan Kaptai Road Cut Section, Kaptai, Rangamati, Chittagong, Bangladesh. (2015)
- Geological Field on Sitakunda Hill Range between Chotodarogarhat and Barabkunda, Chittagong-Tripura Fold Belt of Bengal Basin, Bangladesh. (2014)

## **TRAINING**

Responsible Conduct of Research Training, June 2024, Collaborative Institutional Training Initiative (CITI Program), Record no: 63332382