

Utsho Bhowmik

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[LinkedIn](#) | [Google Scholar](#) | [GitHub](#)

RESEARCH INTERESTS

Groundwater Hydrology, Solute Transport Modeling, Computational Hydrology, Subsurface Heterogeneity and Uncertainty in Hydrologic Systems, Numerical Modeling of Groundwater Flow and Transport

RESEARCH EXPERIENCE

Undergraduate Thesis – “Modeling of Long-Term Chromium (Cr) Migration Assessment from Rajbandh Open Landfill: A Case Study”

- Developed a coupled MODFLOW–MT3DMS groundwater flow and transport model to simulate long-term chromium migration from an unlined landfill.
- Investigated plume development patterns, groundwater flow direction, the influence of hydraulic conductivity and natural clay layer breakthrough times.

Ongoing Research Project – “Spatial Analysis and Machine Learning for River Water Quality”

- Integrating spatial, climatic, land-use, and population data to investigate environmental drivers of heavy-metal contamination across major rivers in Bangladesh.
- Developing machine-learning models to predict heavy-metal concentrations using basin-scale environmental predictors and spatiotemporal datasets derived from Google Earth Engine.

Supervisor: Dr Md. Saiful Islam, Professor, Department of Civil Engineering, KUET

RESEARCH PUBLICATIONS

Journal Articles

[1] **Bhowmik, Utsho**, and Md Saiful Islam. "Modeling of long-term chromium migration from the Rajbandh open landfill: a case study." *Water Practice & Technology* 21, no. 4 (2026): 1567-1586.

DOI: [10.2166/wpt.2026.253](https://doi.org/10.2166/wpt.2026.253)

Conference Proceedings

[1] Ahomed, Md Tasin, Qazi Hamidul Bari, **Utsho Bhowmik**, and Abdullah Al Siam. "Study on Effect of Upflow and Downflow Forced Aeration on Composting in a Closed System Using a Software-Based Model." In *Proceedings of the 8th International Conference on Civil Engineering for Sustainable Development (ICCESD 2026)*. Khulna, Bangladesh: Khulna University of Engineering and Technology, 2026.

Paper Link: [886.pdf](#)

[2] Shuvo, Shuvendu Pal, Chaittee Das, Debbendu Saha, Md Asraful Islam, Abdullah Al Siam, Susmita Das Ringky, **Utsho Bhowmik** et al. "Multiscale Wavelet-Intelligence Synergy for Hydrological Prediction: A Critical and Quantitative Appraisal of MODWT and DWT." In *2026 IEEE 2nd International Conference on Quantum Photonics, Artificial Intelligence & Networking (QPAIN)*, pp. 1-4. IEEE, 2026.

DOI: [10.1109/QPAIN69676.2026.11545998](https://doi.org/10.1109/QPAIN69676.2026.11545998)

EDUCATION

B.Sc. in Civil Engineering

2020 – 2025

Khulna University of Engineering and Technology, Khulna, Bangladesh

- CGPA: 3.27/4.00 | Last Semester GPA: 3.53/4.00
- Result Published: October 2025

STANDARDIZED SCORES

- GRE: 315 (Quant: **166**, Verbal: 149, AWA: 3)
- IELTS Academic: Planned for late September 2026

PROJECTS

Urban Drainage System Design Using Different Methods

- Designed urban drainage system using kinematic wave method, rational method and time area method in different urban condition.
- [Project summary](#)

Bangladesh Urban Air Pollutant & AQI Explorer Using Python Libraries

- Analyzed 25 years of hourly air quality data across 30 Bangladeshi cities using Python (Pandas, NumPy, Matplotlib, Seaborn), identifying seasonal pollution trends and city-wise disparities, and uncovering a data quality inconsistency in the dataset through independent verification against published literature.
- [GitHub Repository](#)

Two-way Forced Aeration Simulation Using Python

- Built a 6-layer composting simulation model in Python, replicating heat, moisture, oxygen, and decomposition kinetics driving a two-way forced aeration system.
- [GitHub Repository](#)

Design of Sewerage System of a Part of Khulna City Corporation (Group Project)

- Used field observations and SewerGEMS software to design a sewerage system for a densely populated section of Khulna City Corporation.
- [Project Summary](#)

TECHNICAL SKILLS

Environmental & Hydraulic Modeling: MODFLOW, MT3DMS, ModelMuse, SewerGEMS

GIS, Remote Sensing & Geospatial Analysis: ArcGIS, QGIS, Google Earth Engine

Programming & Data Analysis: Python, C, JavaScript (GEE API), NumPy, Pandas, Matplotlib, Seaborn

Engineering Software: AutoCAD, ETABS

Other Tools: Microsoft Office, Origin

EXTRACURRICULAR ACTIVITIES

- Worked as a volunteer in developing and evaluating jute-based sustainable alternatives to plastics, organized by the German Funded SCIP Plastic Project (KUET Phase), KUET | [Project Certificate](#) | [Website](#)
- Assistant Coordinator of KUET Gym Association | [Member List \(2024-2025\)](#) | [Page](#)
- Vice President of Sylhet Association of KUET | [Member List \(2024-2025\)](#) | [Page](#)

SCHOLARSHIP & AWARDS

- **National Merit Scholarship** in Secondary School Certificate (2017) awarded for exceptional performance (90.3%) in the National 10th-grade public examination | [Marksheet](#)
- **Technical Scholarship** (2025) awarded by Government of Bangladesh issued by KUET for final year academic performance.
- First Runner Up at Truss Bridge Challenge (2022) Held at Department of Civil Engineering, KUET.

REFERENCES

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Dr. Sajal Kumar Adhikary

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