

**Parul Baranwal, PhD**  
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**EDUCATION**

**The University of Toledo, Toledo, Ohio** 2017–2022  
*PhD in Civil and Environmental Engineering*  
*Full scholarship recipient*

**Indian Institute of Technology (IIT), Roorkee, India** 2013 - 2015  
*MS, Environmental Management of Rivers and Lakes*  
*Full scholarship recipient*

**Dr M.G.R Educational and Research Institute, Chennai, India** 2009 - 2013  
*BS, Biotechnology*

**Google Project Management Specialization** 2023 - 2024

*Completed full specialization in Project Management*

*Courses Completed:*

- *Foundations of Project Management*
- *Project Initiation: Starting a Successful Project*
- *Project Planning: Putting It All Together*
- *Project Execution: Running the Project*
- *Agile Project Management*
- *Capstone: Applying Project Management in the Real World*

*Full Google scholarship recipient*

**WORK EXPERIENCES**

**United Social Service (USS)** Nov 2024 - Present  
*Chief Development Officer* *Volunteering remote position*

- Spearheaded grant applications and fundraising initiatives, successfully securing funding to support USS's mission and programs.
- Managed relationships with funding organizations, ensuring alignment with USS's strategic goals and sustainability objectives.
- Attended and contributed to Board meetings, providing insights and updates on the organization's financial health, development efforts, and long-term growth strategies.
- Developed and implemented strategies to expand USS's donor base, leveraging partnerships with businesses, foundations, and government entities.
- Led team efforts to ensure compliance with grant requirements and reporting, maintaining transparency and accountability in all development activities.

**City of Ames** July 2023 – Present  
*Deputy Director of water and pollution control* *Ames, Iowa*

- Develop job positions and descriptions in close collaboration with the HR department, ensuring clarity in roles and responsibilities for positions such as lab supervisor, environmental engineers, lab analysts, water plant operators, and control system analysts. Play a key role in decision-making during the hiring process for these roles to build an effective and skilled team.
- Develop the Vulnerability Assessment (VA) and Emergency Response Plan (ERP) as mandated by the Safe Drinking Water Act (SDWA) Section 1433, amended by America's Water Infrastructure Act (AWIA) Section 2013, requiring community water systems (CWSs) serving over 3,300 people to certify compliance with the EPA.

- Lead multi-million-dollar projects for the expansion and upgrade of drinking water and wastewater facilities, ensuring timely delivery within budget constraints.
- Supervise the operations of wastewater treatment facilities, ensuring efficient processes that meet regulatory standards and promote environmental sustainability.
- Oversee the installation, maintenance, and accurate reading of water meters to ensure efficient tracking of water usage and billing.
- Supervise the industrial pretreatment program, ensuring compliance with discharge regulations and fostering partnerships with local industries to protect water quality.
- Assist the Director in developing water and sewer rate models to maintain financial sustainability and equitable cost distribution for residents and businesses.
- Manage the Capital Improvement Plan (CIP) and oversee building renovation projects in collaboration with architects to enhance infrastructure and operational efficiency.
- Direct laboratory functions for water quality testing, including analysis of drinking water and wastewater samples to ensure compliance with health standards.
- Lead fluoride treatment projects to meet health recommendations and community needs. Supervised a 120-day pilot study to replace sodium fluorosilicate with 24% hydrofluorosilicic acid (HSA), following approval from the Iowa Department of Natural Resources. This included addressing challenges with the existing sodium fluorosilicate feed system, ensuring the use of NSF/ANSI 60-certified HSA without major changes to approved engineering conditions or new equipment.
- Ensure all operations comply with federal, state, and local regulations, conducting regular audits and inspections to uphold water quality standards.
- Develop and implement community programs to educate residents on water conservation, proper wastewater disposal, and the significance of water quality.
- Perform performance appraisals for employees under supervision, providing constructive feedback and fostering professional development.
- Deliver presentations to Council members, providing updates on project progress, a five-year capital improvement plan for the water department, and ensuring alignment with city priorities.

## **Oregon Department of Environment Quality**

*Hydropower Water Quality Program Manager*

*Nov. 2023 – August 2024*

*Pendleton, Oregon*

- Lead and oversee the 401 water quality certification process for hydroelectric, hydropower, small hydropower, and related projects, in accordance with the Clean Water Act Section 401.
- Manage projects requiring licensing to the Federal Energy Regulatory Commission (FERC), a state water right, and 404 permit by the US Army Corps of Engineers (USACE).
- Lead tribal engagement activities, fostering meaningful relationships with tribal communities, consulting them on project impacts, and incorporating their perspectives into decision-making processes to promote inclusive and sustainable hydropower development.
- Provide guidance and leadership to technical staff involved in reviewing and certifying projects, ensuring adherence to established standards and regulations.
- Ensure that certified projects align with basin management plans and Total Maximum Daily Loads under development.
- Act as a subject matter expert in water quality standards, industry trends, regulations, and best practices for fish and wildlife protection, recreation, geological hazard and erosion potential, and instream flow requirements.
- Oversee National Environmental Policy Act (NEPA) projects, ensuring compliance with environmental regulations and guidelines throughout the planning and implementation phases.
- Facilitate coordination among Idaho, California, Oregon, and federal agencies such as EPA, NOAA, and the Bureau of Land Management to manage overlapping or complementary jurisdiction effectively.

- Act as liaison for the Department of Environmental Quality in engaging with external agencies and navigating legal proceedings, including court cases, to effectively represent organizational interests and objectives.

**Brunswick County Public Utilities**  
*Water Quality Program Manager*

*Dec. 2022 – Nov 2023*  
*Supply, North Carolina*

**EPA's Lead and Copper Rule Program Management:**

- Administered and provided oversight for EPA's Lead and Copper Rule's and Revisions program, a \$1.4 million project funded through ARPA.
- Advertised a Request for Proposals (RFP) for the Lead and Copper Compliance Program Management across various platforms to ensure inclusivity and diversity in vendor selection.
- Reviewed proposals from three firms, evaluated them against RFQ guidelines, and selected the most qualified firm after thorough consideration.

**Compliance and Regulatory Oversight:**

- Ensured compliance with state and federal safe drinking water regulations to maintain the quality of the county's water supply.
- Managed customer outreach programs, lead and copper service line inventory, and replacements to ensure adherence to regulations.
- Performed required sampling, testing, hydrant flushing, and record keeping to meet regulatory requirements.

**Corrosion Control Evaluation Study:**

- Directed a comprehensive corrosion control evaluation study at the county water treatment plant to ensure water safety.
- Coordinated multiple elements of the study, including analysis, sampling, and collaboration with stakeholders.
- Managed tight deadlines and collaborated with consultants, state, and federal employees to ensure project success.

**Stakeholder Engagement and Community Outreach:**

- Engaged in townhall meetings to connect with diverse communities, address concerns, and provide information about proposed programs.
- Maintained records of service line locations, replacements, and material status, ensuring accurate data for regulatory compliance.
- Directed supervisory personnel overseeing water quality investigations, laboratory research, and analyses.

**Diversity and Equity Initiatives:**

- Prioritized diversity in the RFP process by collaborating with platforms to solicit quotes from minority and women-owned businesses.
- Participated in townhall meetings to connect with diverse backgrounds and communities, fostering trust and inclusivity.
- Played a pivotal role in installing water filtration systems in underserved communities within Brunswick County, positively impacting residents' access to clean water.

**Water Quality Education and Empowerment:**

- Organized a water quality education event in partnership with a local community center serving immigrant families.
- Overcame language barriers by working with translators to ensure accessibility and tailored content to community needs.
- Proactively engaged and collaborated with underrepresented communities, reinforcing the importance of diverse perspectives in water management.

**The University of Toledo**  
*Lab Manager*

*Aug' 2017 – Dec 2022*  
*Toledo, Ohio*

**Supervisory experience**

- Supervised and instructed a class of 60 undergraduate students in water engineering lab skills.
- Mentored 15 master students on diverse science and engineering projects.
- Guided students through water quality projects, including disinfectant demand and decay reaction kinetic labs.

- Oversaw projects involving chlorination effects on organic matter and chlorine in drinking water.
- Guided the Jar Test to determine effective coagulant type, dosage, and pH for water coagulation.
- Managed correspondence with students, proctored exams, recorded grades, and prepared lecture presentations.
- Maintained accurate documentation of activities and analyses.
- Conducted training sessions for laboratory staff, covering BSL-specific procedures, safety protocols, and emergency response plans. Oversaw inventory management of biological materials, chemicals, and lab equipment. Ensured lab security through security measures and access logs.
- Organized and led educational trips for 60 undergraduate students to water treatment facilities, facilitating interactions with water plant managers. Successfully imparted various concepts of water treatment plant operations to enhance their learning experiences.
- Spearheaded the Lake Erie Sustainability Campaign, addressing pollution, nutrient runoff, and litter accumulation challenges through community engagement.
- Orchestrated educational programs in schools and communities, empowering individuals with knowledge about Lake Erie's ecosystem and pollution's impact.
- Managed ongoing water quality monitoring initiatives, collaborating with environmental agencies and volunteers to identify pollution sources and track progress.

### **The University of Toledo**

*Environmental Analyst*

*Aug' 2017 – Dec 2022*

*Toledo, Ohio*

### **Water Quality Analytics**

- Studied bacterial growth behavior and microbial interactions in a two-bacterial system.
- Detected growth-inhibiting and growth-promoting effects during co-cultivation of pathogenic bacteria and probiotics.
- Conducted batch culture competition studies using agar plating, zone of inhibition, and microtiter plate assays.
- Grew mature biofilms of *Staphylococcus aureus* on PVC membranes in a Centers for Disease Control and Prevention biofilm reactor.
- Evaluated bacterial biofilm under flowing conditions using flow cell method.
- Quantified bacterial cells and live vs. dead cells using flow cytometer.
- Developed protocols for High-performance liquid chromatography (HPLC) and Mass spectrometry to detect and quantify toxins in water samples.
- Extracted microcystins using Solid Phase Extraction from sludge and water samples.
- Performed genomic DNA and RNA extraction from water and sludge samples.
- Analyzed genomic sequences using R studio, constructed sequence tables, and assessed diversity.
- Performed biofilm studies using microtiter well plates and fluorescence EEM..
- Quantified organic matter variations using Parallel Factor Modeling (PARAFAC) from fluorescence and absorbance data.
- Conducted literature reviews, summarized experimental data, and wrote technical reports.
- Presented project results to research groups.

### **Central Pollution Control Board, Government of India**

*Water Quality Coordinator*

*June. 2015 – June. 2017*

*New Delhi, India*

### **Water Quality Analytics**

- Conducted microbiological analysis on various water samples to assess water quality:
- Executed Presumptive, Confirmatory, and Completed tests for total coliform, fecal coliform, *E. coli*, fecal streptococcus, and fecal enterococcus using the Multiple Tube Fermentation Technique (MTF).
- Prepared and autoclaved different types of growth media required for bacterial cultures.
- Performed growth promotion tests to ensure media viability.
- Prepared chemical reagents and dilutions, adhering to regulatory standards.
- Utilized techniques such as membrane filtration, ultra-filtration, titration, and chromatography for sample preparation.
- Maintained and subcultured reference cultures on plate and slant media.
- Conducted Gram staining and microscopic examination to differentiate between gram-positive and gram-negative bacteria.
- Ensured quality control routines were upheld according to NABL standards.

- Calibration of laboratory equipment was regularly performed.
- Supervised and mentored lab technicians and 20 student interns.

#### **Pollution Load Assessment and Reduction:**

- Assessed pollution load generation and reduction for various industries:
- Utilized industrial production data and wastewater generation factors.
- Analyzed pollution loads related to water and air pollution.
- Identified key pollutants and industries contributing to pollution.
- Estimated BOD and COD loads, as well as PM (particulate matter) loads.
- Evaluated effectiveness of pollution control measures.
- Highlighted challenges faced by small-scale industries.
- Emphasized the importance of data in assessing pollution control efforts.

#### **Water Quality Field Sampling and Plant Inspection:**

- Conducted water quality field sampling and equipment setup.
- Inspected water treatment plants for health hazards, environmental issues, and operational performance.
- Evaluated equipment status, water quality data, and environmental documentation.

#### **Documentation:**

- Prepared technical and environmental reports, including quality assurance project plans, monitoring/sampling plans, health and safety plans, field reports, and regulatory reports.
- Performed proofreading, formatting, and word-processing for department documents.
- Analyzed water quality results and generated tables and figures.
- Conducted an internal audit of the microbiology laboratory as per NABL.
- Maintained records of lab equipment calibration and quality control exercises.
- Documented and implemented various water quality parameters such as water temperature, dissolved oxygen, pH, alkalinity, turbidity, organic carbon, and total nitrogen.
- Evaluated fecal coliform levels, E. coli, and Enterococcus as indicators of water bacteriological quality.

**Alternate Hydro Energy Center, Indian Institute of Technology (IIT)**  
Sustainability Analyst

May 2013 – May, 2015  
Roorkee, India

#### **City Sanitation Plan for Gorakhpur City:**

- Conducted in-depth research on Gorakhpur city's sanitation conditions, evaluating infrastructure, waste management practices, and public health data.
- Collected citizen feedback to identify areas of concern and potential improvements.
- Developed a comprehensive sanitation plan encompassing waste disposal, sewage management, public awareness campaigns, and infrastructure development.
- Created a detailed implementation roadmap to elevate urban hygiene and sanitation standards.
- Successfully completed Integrated Hazardous Waste and Solid Waste Management for city Sanitation Plan.
- Prepared NEPA documents for transportation projects within the city plan of Gorakhpur.
- Launched an educational campaign targeting residents, schools, and businesses to promote awareness of hazardous waste, spill prevention, and recycling.

#### **Conservation Plan for Ramgarh Lake:**

- Prepared NEPA documents for transportation projects within conservation plans for lakes.
- Conducted in-depth water quality analysis of Ramgarh Lake, assessing critical parameters including Nitrates, Nitrites, Ammonia, Phosphorus, Algal cell density, Algal Biomass, and primary production rates.
- Detected hypereutrophic conditions in Ramgarh Lake, indicating significant nutrient enrichment and pronounced algal growth, while conducting comprehensive risk assessments that involved data collection and analysis of nutrient concentrations, algal proliferation, and related factors.
- Advocated for the ecological significance of Ramgarh Lake and the imperative to address its declining water quality.

- Organized and conducted workshops, seminars, and educational programs to raise public awareness regarding lake conservation.
- Implemented erosion control measures, including the establishment and maintenance of natural vegetation buffer zones to reduce runoff into the lake.
- Organized public events such as lake clean-up days, bird-watching tours, and educational tours to engage the community.
- Contributed significantly to the development of a comprehensive conservation plan addressing hypereutrophic conditions in Ramgarh Lake.
- Collaborated with interdisciplinary teams to formulate effective strategies for nutrient management, sediment control, and aquatic vegetation restoration.
- Emphasized the importance of public awareness campaigns to promote responsible lake use and sustainable practices.
- Ensured alignment of the restoration plan with environmental sustainability principles and long-term ecosystem health.

#### **Data Collection and Communication:**

- Coordinated with subcontractors and other staff members of the water department to gather city pollution and water quality data.
- Conducted effective data analysis using appropriate tools and techniques to assess environmental conditions accurately.
- Communicated findings and recommendations to stakeholders, emphasizing the significance of informed decision-making for environmental conservation and management.

**Dr. MGR Educational and Research Institute**

*Research Fellow*

*May 2011 – April, 2013*

*Chennai, India*

#### **Medicinal Plant Extracts for Larvicidal Activity and Bacterial Pathogen Control**

- Evaluation of Larvicidal Activity of Medicinal Plant extracts and its effect on Bacterial Pathogens: An attempt has been made to develop an eco-friendly method of mosquito control.
- Performed different types of biochemical tests for identification of microbes.
- Performed antibiotic resistance test to understand the susceptibility of bacteria in different concentrations of antibiotics.

#### **PUBLICATIONS AND CONFERENCE PRESENTATIONS**

##### **Peer Reviewed Publications**

- Baranwal, P., Kang, D., Seo, Y (2022), Understanding the impact of organic matter on the biodegradation of microcystin-LR, Science of the Total Environment
- Jeon, Y., Baranwal, P., Li, L., Piezer, K., Seo, Y (2022), Review: Current understanding on Biological filtration for the removal of microcystin-LR, Chemosphere
- Baranwal, P., Seo, Y (2024), Understanding the MC-LR biodegradation pathway through whole genome sequencing and transcriptomic analysis: In preparation.
- Baranwal, P., Seo, Y (2024), Impact of microbial biofilm community composition, diversity on MC-LR biodegradation in drinking water biological filters, Water Research: Under review
- Baranwal, P., Nayak, S., Jindal M (2024), River Policy: Navigating Asia's Water Needs in a Changing Climate, River Basin Ecohydrology in the Indian Sub-Continent
- Baranwal, P., Agrawal, S (2020), A Pollution Assessment of Grossly Polluting Industries in India, International Journal of Environment and Waste Management, 2022 Vol.30 No.1, pp.30 - 54.
- Baranwal, P., Mishra, S., Singhal, S. K. (2015), Risk assessment and analysis of water quality in Ramgarh Lake, India, Journal of Integrated Science and Technology, 3(1), 22-27.
- Baranwal, P., Tripathi, M., Singal, S. K. (2014), Water Quality Analysis of Lake: A Case Study, Energy Technology Ecological Concerns: A Contemporary Approach ISBN, 978-81.

## Conference Presentations

- Baranwal, P., Kang, D., Seo, Y (2022). Understanding the impact of natural organic matter on microcystin-LR biodegradation and their characterization using fluorescence PARAFAC analysis. 12th International Conference on Toxic Cyanobacteria
- Baranwal, P., Kang, D., Seo, Y (2022). The impact of multispecies biofilm on the bioaugmentation of a cyanotoxin-degrader in drinking water biological filters for MC-LR biodegradation. 12th International Conference on Toxic Cyanobacteria
- Baranwal, P., Seo, Y (2021). Understanding the effects of nutrients and organic matter on the biodegradation of microcystin-LR. Ohio Section American Water Works Association (OAWWA), Fresh Ideas Competition

## Research Statement

My research endeavors over the past seven years have been centered on developing cost-effective and energy-efficient biological methods for treating drinking water. This comprehensive approach aims not only to monitor but also to mitigate pollutants present in drinking water supplies. Specifically, my research has successfully encompassed the monitoring and treatment of a range of contaminants, including pathogens, nutrients, cyanotoxins, and other critical water quality parameters, through the application of innovative biological strategies. To achieve these objectives, I've employed a diverse array of qualitative and quantitative methodologies, underpinned by the principles of microbiology, molecular biology, and analytical chemistry.

**Geographical Application:** I've applied my research interests to distinct geographical regions, including:

- The Lake Erie region in Ohio, USA.
- Urban areas of Delhi, India, focusing on drinking water treatment plants.
- Rural lakes in Uttar Pradesh, India.

**Dissemination of Research:** My commitment to advancing the field of water quality management extends to sharing my research experiences with students and fellow researchers through various means:

- Published articles in scientific journals.
- Presentations at conferences and research seminars within university settings.

## Research Experiences:

### Impact of Organic Matter and Nutrients on Cyanotoxin Biodegradation:

- Investigated the biodegradation of cyanotoxins, which are produced by blue-green algae and pose a global challenge.
- Explored how natural organic matter, found in varying concentrations, affects bacterial degradation of cyanotoxins.
- Employed techniques such as Solid Phase Extraction, HPLC, and Mass spectrometry to detect and quantify cyanotoxin concentrations.
- Employed 3D excitation emission matrices, spectro-fluorometry, and UV spectrophotometry to characterize different organic matter in water samples.
- Utilized ultra-filtration membranes to quantify molecular sizes of organic matter.
- Determined total and dissolved carbon and total nitrogen concentrations using total organic carbon analyzers.
- Studied gene expression using qPCR and Reverse Transcriptase-PCR.
- Analyzed EEMs using computational techniques like PARAFAC and 2D-COS spectroscopy in R, revealing how organic matter inhibits cyanotoxin biodegradation.
- Research in press in the journal "Science of the Total Environment" (Impact factor: 10.753).

### Impact of Multispecies Biofilm on Cyanotoxin Biodegradation:

- Investigated the role of multispecies bacterial biofilms (MSB) in degrading toxins, focusing on cyanotoxins.
- Explored the symbiotic relationship between cyanotoxin-degrading bacteria and MSB using lab-scale sand column reactors and microtiter well plate assays.
- Quantified microbes using crystal violet assay, ATP assays, heterotrophic plate counting, and qPCR assays.
- Extracted DNA and RNA from bioaugmented MSB samples for further analysis.
- Applied DNA and RNA sequencing on the Illumina HiSeq 2000 platform to generate paired-end reads.
- Processed raw sequences using the DADA2 pipeline in R and analyzed microbiome profiles.
- Observed enhanced toxin degradation and increased biofilm formation in bioaugmented MSB through microbial community analysis.

### **Cyanotoxin Degradation Pathway Using Genomics and Transcriptomics:**

- Investigated unknown biodegradation mechanisms of cyanotoxin-degrading bacteria using whole genome sequencing and transcriptomic techniques.
- Analyzed complete genomic sequences of Paucibacter and Sphingopyxis to understand growth, metabolism, and toxin degradation.
- Performed transcriptomic analysis to uncover complex genetic networks in these bacteria.
- Conducted DNA and RNA extraction at different intervals, analyzing sequences through various Linux tools and online platforms.
- Identified differentially expressed gene sets in response to toxin exposure.
- Explored various metabolic pathways associated with toxin treatment at different time intervals.

### **Study of Biofilm Growth Characteristics in Water:**

- Investigated bacterial biofilm formation in drinking water pipe networks under flowing conditions using the flow cell method.
- Inoculated flow cells with bacterial cultures and quantified biofilm growth using standard microtiter assay plates.
- Analyzed biofilm heterogeneity through stereo and fluorescence microscopy.
- Discovered non-uniform growth patterns influenced by environmental and physiochemical parameters.

### **Inter-Competition between Bacteria in Drinking Water:**

- Explored bacterial interactions in multispecies biofilms by studying growth-inhibiting and growth-promoting effects.
- Co-cultivated pathogenic bacteria and probiotics in liquid medium to understand their behavior.
- Employed techniques like agar plating, zone of inhibition, and microtiter plate assays to quantify viable bacteria.

### **Performance Evaluation of Water Treatment Plants:**

- Conducted field sampling and equipment setup for water quality analysis.
- Inspected water treatment plants for health hazards, environmental issues, and operational performance.
- Assessed equipment status, water quality data, and environmental documentation.

### **Preliminary Water Quality Analysis:**

- Conducted microbiological tests using the Multiple Tube Fermentation Technique (MTF) for various water samples.
- Executed gram staining and microscopic examination to identify different microbes.

My research trajectory underscores my dedication to innovatively address drinking water quality concerns. By leveraging biological approaches and a multidisciplinary skillset, I aspire to continue contributing to the field and fostering collaborations with fellow researchers and students.

### **ACHIEVEMENTS**

- WWETT Young Professional Award 2025 – Recognized for outstanding contributions in the water industry.
- Google Career Certificate Scholarship Award 2023
- American Water Works Association American Water Scholarship Award 2021-2022
- The Ohio Section of the American Water Works Association Award 2021-2022
- Three Minute Thesis Competition, Honorable Award, 2022
- Robert N. Whiteford Memorial Scholarship Award 2021-2022
- Water Management Association of Ohio (WMAO) Scholarship 2020
- Three Minute Thesis Competition, Peoples Choice Award, 2020
- Government of India Scholarship, 2013-2015.
- Second Place International Speech Contest, Toastmasters International – Represented Westside Toastmasters Club, 2020

## COMMUNITY SERVICES

- **Speaker, Iowa State University** Civil and Environmental Engineering Department (Feb 2025): Delivered a STEM talk to senior-year students on my career journey, challenges, and opportunities in the field.
- **Speaker, Girlstart Organization**, Austin, TX (March 2025): Gave a talk to 4th and 5th standard girls about STEM, encouraging them to pursue careers in science, technology, engineering, and mathematics.
- **Judge** - NC One Water 2025 For executing water-related projects (Feb 2025) for elementary students.
- **Mentor** – Freedom Employability Academy (April 2022 – Present): Helped students from low-income backgrounds, particularly from rural villages, by equipping them with the tools necessary for personal growth and career development.
- **Judge** - NC Science and Engineering HYBRID Fair 2023 - North Carolina Science and Engineering Fair (March 2023)
- **Sustainability advisor** - Seaside Sustainability (Jan 2023 – Jan 2024): Developed hands-on STEM education workshops for over 550 students.
- **Education Mentor** - Clean Water Science Network (Sept 2022 – Dec 2023): Created a network for young professionals and students in the water sector.
- **Judge** - Judge Science Research Expo at Central Catholic High School, Toledo, Ohio (May 2021)
- **Treasurer** - South American and Hispanic Students Association at the University of Toledo (May 2020 – July 2021)
- **President** - Toastmasters International (June 2019 - June 2020)
- **Vice- President Education** - Toastmasters International (June 2020 - June 2021)
- **Water Engineering Course Instructor** – University of Toledo (August 2017 - August 2021)
- **Secretary** - Ballroom Dance Society, University of Toledo (March 2020 - May 2021)
- **STEM Education Community Outreach** (August 2018 - August 2020)

## PROFESSIONAL MEMBERSHIPS

- **Proposal Reviewer**, 2025 IWC Graduate Research Competition: Reviewed proposal narrative, CV, Data Management Plan, and budget.
- **Member**, TWLA AWWA Leadership Cohort 2025 – Water Leaders from Across the United States and Canada
- **Member**, National Association of Clean Water Agencies (NACWA) (2024 - Present)
- **Member**, Water For People Committee, Iowa Water Environment Association (2024 - Present)
- **Member**, Philanthropy Committee, Iowa Section AWWA (2024 - Present)
- **Member**, American Water Works Association (AWWA) (2020 - Present)
- **Member**, National Hydropower Association (NHA) (2023 - 2024)
- **Member**, Association of Environmental Engineering and Science Professors (AEESP) (2022 - 2023)
- **Editor**, Book (Springer Nature), *Emerging Contaminants in Water* (2023 - 2024)
- **Peer Reviewer**, International Journal of Environment and Waste Management (2020 - 2023)
- **Reviewer** for the abstracts, NC One Water Annual Conference (2023 - 2024)

## TECHNICAL SKILLS

**Languages:** R Studio, Python, COMSTAT, MATLAB, QIIME2, GIS, AutoCAD, Microsoft Office, EPANET

**Communication and Collaboration Tools:** Microsoft Teams, Zoom, Gmail, Outlook

**Instruments for water quality and sand analysis :** HPLC, Mass spectrometry, TOC Analyzer, Excitation-Emission Matrix (EEM) Fluorescence Spectroscopy, Titrations, Polymerase chain reaction (PCR), Real-time PCR, UV Vis spectroscopy, gel electrophoresis, RNA/DNA quantification through nanodrop and qubit fluorometer, Autoclave Operations, pH and conductivity meter, Particle size analyzer, Flow Cytometer, Solid Phase extraction, Field Dissolved Oxygen meter, Colony Counter, Analytical Balance, Microscope Operations.

**Microbiology and molecular biology techniques:** Preparation of different types of media, Growth and maintenance of algal and bacterial cultures, Crystal Violet Assay, Microbial ATP measurement, Growth Promotion Test, Biochemical Test, Crystal violet assay, Maintenance and sub culturing of Reference Cultures, Heterotrophic plate count, gram staining, Genomic DNA Extraction, RNA extraction, cDNA synthesis, RT-PCR

## TECHNICAL TRAINING

- Attended the 2024 Pretreatment Virtual Workshop by **National Association of Clean Water Agencies (NACWA)**, which covered updates on regulatory and legislative actions related to pretreatment, along with case studies from utilities. The webinar included small-group roundtable sessions for in-depth discussions and networking with peers.
- Attended the 2024 **Annual Conference of the Iowa Association of Water Agencies** in Moravia, Iowa, where I engaged in discussions on legislation, federal talks with the AWWA, regulatory matters from the DNR, artificial intelligence, and participated in various group discussions and breakout sessions.
- Participated in the **Northwest Hydroelectric Association** 2024 Annual conference in Seattle, Washington. Delved into various aspects of hydropower, from legislation and regulatory practices to dam safety.
- Attended Small Hydro Workshop on February, 2024, Seattle, Washington.
- Attended Project Management training and Total Maximum Daily Load workshop on May, 2024, Portland, Oregon.
- Participated in the two-day **Umatilla River Vision tour** on April 10 -11, 2024, led by Confederated Tribes of the Umatilla Indian Reservation (CTUIR) staff, focusing on river ecology and water quality. Aimed to strengthen collaboration between CTUIR and Oregon Department of Environmental Quality while educating on factors affecting the river's ecosystem. Covered topics included morphology, water quality, floodplain connectivity, sediment transport, vegetation, and fish diversity.
- Attended Uncommon Dialogue's Feb 2024 **workshop on Hydropower, River Restoration, and Public Safety**, delving into sustainable hydropower and river restoration methods, with a focus on water quality. Explored diverse water quality technologies and innovations.
- Received **Hydropower 101 training** from Tom Russo, President of Russo on Energy LLC, offering fundamental insights into hydropower operations, encompassing its mechanics, project classifications, and definitions.
- Participated in an **EPA-organized grant writing workshop**, contributing insights and expertise.
- Participated in the **National State Revolving Fund (SRF) Workshop** organized by NEIWPCC, U.S. EPA, and partners in Raleigh, NC. The event offered insights into SRF program implementation via panel discussions and case studies, covering topics such as watershed partnerships, green infrastructure, program auditing, technical assistance, software strategies, and funding for emerging contaminants.
- Participated in workshops and webinars by CDM Smith, EPA, and Blue Conduit to develop the County **Implementation Framework for Lead Inventory Requirements under EPA's Lead and Copper Rule Revisions**.

## **CERTIFICATIONS**

### **Nonprofit Leadership**

- Introduction to the Nonprofit Sector, Nonprofit Organizations, Nonprofit Leadership and Governance - State University of New York
- U.S. Public Policy: Social, Economic, and Foreign Policies - HarvardX
- Exercising Leadership: Foundational Principles - HarvardX

### **Project Management**

- **Professional Development Hours** - 12.75 Continuing Education Hours - NorthWest Hydroelectric Association

### **Sustainability and Environmental Management**

- Introduction to climate related disclosures - Climate Disclosure Standards Board.
- Understanding the recommendations of the Task force on Climate-related Financial Disclosures - Climate Disclosure Standards Board.
- Practicing Sustainability, Responsibility and Ethics - The University of Manchester.
- Sustainability Skills and Competencies - Arizona State University

### **Water and Wastewater**

- Household water treatment and safe storage - The Swiss Federal Institute of Aquatic Science and Technology.
- Water and Wastewater Operations By North Carolina WaterWorks Operators Association

### **Public Health and Genomics**

- Introduction to Genomic Technologies - John Hopkins University
- Introduction to Household Water Treatment and Safe storage - The Swiss Federal Institute of Aquatic Science and Technology.
- Genomic Data Science with Galaxy - John Hopkins University
- Epidemiological tools for Public Health - John Hopkins University
- Public Health Practice - John Hopkins University
- Public Health Surveillance Systems - John Hopkins University
- Metagenomic applied to surveillance of pathogens and antimicrobial resistance - Technical University of Denmark.
- Human health risks, health equity and Environmental Justice - University of Michigan

### **Technical and Programming Skills**

- Programming for Everybody (Getting started with Python)- University of Michigan
- Python for genomic data science - John Hopkins University

### **Public Health & Safety**

- Cybersecurity Tabletop Exercise for Water and Wastewater Utilities in Iowa - U.S. Environmental Protection Agency (3 Continuing Education Hours)
- Certified in Adult Mental Health First Aid USA - National Council for Mental Well-being
- C3 De-Escalation (3 Education Hours) - C3 De-Escalation Instructor
- Biosafety Officer Training - The Collaborative Institutional Training Initiative Program
- Biomedical Sciences RCR - The Collaborative Institutional Training Initiative Program
- Wildfire Smoke Training - Oregon OSHA Public Education

## **RELEVANT COURSEWORKS:**

### **Bachelor of Technology in Biotechnology**

- Biochemistry
- Microbiology
- Engineering Chemistry I and II
- Engineering Physics

- Chemistry Lab
- Biochemistry Lab
- Genetics
- Cell Biology
- Health Science
- Biomathematics
- Environmental Chemistry
- Microbial Biotechnology
- Enzyme Technology
- Microbial Biotechnology Lab
- Plant Physiology and Biochemistry
- Immunology
- Immunology Lab
- Recombinant DNA Technology
- Molecular Biology
- Plant Biotechnology
- Biostatistics I and II
- Bioremediation of Industrial Effluents
- Protein Science
- Downstream Processing
- Environmental Pollution Assessment and Monitoring
- Food Processing and Preservation
- Bioinformatics
- Pharmaceutical Technology
- Bioprocess technology
- Animal Biotechnology
- Clinical biochemistry
- Bioprocess lab

#### **Master of Technology in Environmental Management**

- Modelling, Simulations and Computer Applications
- Integrated Management of Water Bodies
- Aquatic Ecology
- Numerical Analysis, Probability and Statistics
- Watershed Behavior and Conservation Practices
- Project Formulation and Implementation
- Wastewater collection treatment and disposal
- Climate Change and Water Resources
- Urban Hydrology
- Environmental Planning and Management