THIRUNI THIRIMANNE

Phone # (905) 299-9014 • hdtdthir@uwaterloo.ca • https://www.linkedin.com/in/thirunithirimanne/

EDUCATION

UNIVERSITY WATERLOO — Waterloo, ON
Doctor of Philosophy in Civil Engineering — Present
Dr. Bruce MacVicar (P.Eng)

TORONTO METROPOLITAN UNIVERSITY — Toronto, ON
Certificate in Project Management — 2019-2025

UNIVERSITY WATERLOO — Waterloo, ON
Master of Applied Science in Civil Engineering — 2022-2025
Thesis Topic: Erosion Risk Modelling: An Improved Screening Tool for Urban Watershed Management
Dr. Bruce MacVicar (P.Eng)

UNIVERSITY WATERLOO — Waterloo, ON
Bachelor of Applied Science (BASc) in Civil Engineering (Honours) — 2017-2022
Water Resources Specialization

TECHNICAL SKILLS

Engineering Skills	Stormwater, sanitary, and water distribution design; site servicing and grading; hydraulic and hydrologic design calculations; stormwater modelling; demand estimation; modified rational method and fire flow analysis; Civil3D engineering drawing production; preparation of functional servicing reports, tender documents, ECA submissions, and regulatory response packages.
Hydrologic and Geomorphic Modelling	Watershed hydrology modelling, erosion risk screening, sediment transport analysis, and empirical and semi distributed modelling; evaluation of nature-based stormwater solutions.
Field Instrumentation and Monitoring	Deployment and management of soil moisture sensors, level loggers, pressure transducers, flow meters, and rainfall gauges; instrumentation planning, calibration, and hydrologic data QA/QC.
Programming and Computational Tools	Python for scientific computing, SPINpy development, data processing, and workflow automation; MATLAB for numerical analysis.
GIS and Spatial Analysis	ArcGIS Pro, ArcGIS Online, and QGIS for DEM processing, watershed delineation, hydrologic routing, spatial statistics, and geospatial dashboard development.
Data Visualization and Technical Reporting	Analytical dashboard development, Python-based visualization, and preparation of technical reports for academic and municipal applications.

RESEARCH INTERESTS

- Fluvial Geomorphology
- Sediment Transport Processes
- Geomorphic Indicators for Channel Stability Assessment
- Green Infrastructure Performance Monitoring
- Watershed Hydrology
- Water Quantity Analysis
- Urban Watershed Resilience
- Erosion Risk Modelling
- Nature Based Stormwater Solutions
- Integration Of Field Instrumentation
- GIS, And Modelling Tools for Data Driven Watershed Management

RESEARCH PROJECTS

UNIVERSITY OF WATERLOO — Waterloo, ON
Project Lead, Campus Stormwater Living Lab Project — August 2025 – Present

- Secured competitive Pearl Sullivan IDEAs Clinic funding to launch a campus-wide stormwater living lab focused on nature-based solutions and hydrologic resilience.
- Leading site selection, instrumentation planning, and early deployment of soil moisture, level, and flow sensors across priority green infrastructure sites.
- Managing a multidisciplinary team developing GIS layers, monitoring protocols, and data workflows.
- The project is currently being integrated into Civil and Environmental Engineering courses through planned field labs and modelling activities that support applied hydrologic learning and campus sustainability planning.

UNIVERSITY OF WATERLOO — Waterloo, ON
PhD Student, Civil and Environmental Engineering — May 2025 – Present

- Conducting doctoral research on hydrologic and geomorphic processes in urban and semi-urban channels, with emphasis on erosion risk modelling, water quantity analysis, and the design and evaluation of nature-based stormwater solutions.
- Developing integrated modelling frameworks that couple hydrology, sediment dynamics, and climate-driven stressors.
- Assessing geomorphic indicators and data needed to evaluate channel stability, sediment transport, and long-term performance of nature-based interventions on erosion reduction.

UNIVERSITY OF WATERLOO — Waterloo, ON
MASc Student, Civil and Environmental Engineering — Sept 2022 – Dec 2024

- Developed SPINpy 1 and SPINpy 2, iterations of watershed-scale erosion screening tools integrating stream power theory, hydrological modelling, and empirical discharge relationships.
- Development of the Residential Impact Scorecard for the Environment (RISE) beta scoring metrics.
- Designed modelling workflows for erosion sensitivity prediction, calibrated tools across multiple Ontario watersheds, and validated outputs using municipal datasets.
- Produced technical reports for the National Research Council, Brampton, Orangeville, and Credit Valley Conservation, enabling improved infrastructure planning and prioritization of erosion mitigation investments.
- Delivered national and international conference presentations demonstrating tool performance and methodological advances.

PUBLICATIONS, PRESENTATIONS, POSTERS

PUBLICATIONS

Thirimanne, T. (2025) SPINpy 2: A Watershed-Scale Erosion Assessment Tool for Urban Streams. MASc Thesis, Department of Civil and Environmental Engineering, University of Waterloo, Waterloo, Ontario, Canada. (MASc research).

PRESENTATIONS

Thirimanne, T., MacVicar, B (2025) "All Models Are Wrong, but Some Are Useful": Application of Modified Discharge Empirical Models for Erosion Screening. Presented at the GROWTH Conference, University of Ottawa, Ottawa, Ontario, Canada. (MASc research; presenting author).

Thirimanne, T. (2025) SPINpy 2: Watershed Scale Erosion Risk Screening Tool. Oral presentation presented at the Canadian Geophysical Union Student Conference (Hybrid), University of Waterloo, Waterloo, Ontario, Canada. (MASc research; presenting author).

Thirimanne, T., MacVicar, B. (2024) SPINpy 1 for Watershed Scale Erosion Analysis in Urban Streams. Oral presentation by Thiruni Thirimanne at the 16th International Conference on Urban Drainage (ICUD 2024), Delft University of Technology, Delft, Netherlands. (MASc research; presenting author).

Hire, P., Thirimanne, T., Ashmore, P., Ghunowa, K., MacVicar, B., and Papangelakis, E. (2023). Updates to SPIN: A tool for watershed-scale erosion sensitivity analysis in urban rivers using a stream power approach. Poster presented at Natural Channels Conference, Guelph, Canada. (MASc research; co-presenting author).

POSTERS

Thirimanne, T., (2024) SPINpy 1: A watershed-scale erosion assessment tool. Poster presented at World Water Day, University of Waterloo, Waterloo, Ontario. (MASc research; presenting author).

Thirimanne, T. (2023). Assessing Erosion Risk in Urban Watersheds: A Stream Power-Based Approach with SPINpy 1. Poster presented at the Latornell Conservation Symposium, Royal Botanical Gardens, Burlington, Ontario. (MASc research).

NON-PEER REVIEWED

Thirimanne, T., MacVicar, B. (2025). Brief Summary of SPINpy 2 for National Research Council of Canada, Coastal, and River Engineering. Technical Report, University of Waterloo, Waterloo, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., MacVicar, B. (2025). Review and Enhancement of Risk and Return on Investment (RROIT) for Stormwater Management. Technical Report SRA: 100113, University of Waterloo, Waterloo, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., MacVicar, B. (2025). City of Brampton Erosion Analysis with SPINpy 2 and Validation Using Available Data. Technical Report, University of Waterloo, Waterloo, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., MacVicar, B. (2025). Town of Orangeville Erosion Analysis with SPINpy2 and Validation Using Available Data. Technical Report, University of Waterloo, Waterloo, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., and MacVicar, B. (2024). Interim Progress Report: SPINpy 2 Development. Technical Report, National Research Council of Canada, Ottawa, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., and MacVicar, B. (2023). Interim Progress Report: SPINpy 2 Development. Technical Report, National Research Council of Canada, Ottawa, Ontario, Canada. (MASc research; lead author).

Thirimanne, T., MacVicar, B. (2022) Wetlands, Digital Elevation Models, and Stormwater Management. Save Ontario Wetlands. Available at: https://saveontariowetlands.weebly.com/wetlands-digital-elevation-models-and-stormwater-management.html. (MASc research).

TEACHING EXPERIENCE

UNIVERSITY OF WATERLOO Waterloo, ON

Sessional Lecturer ENVE 382, Civil and Environmental Engineering Sept 2025 – Dec 2025

- Preparing and delivering lectures and supplementary materials, including labs, tutorials, and practice problems, to students.
- Established rapport with students and TAs to answer any questions regarding the content.
- Building strong connections with students, encouraging them to feel comfortable approaching me with questions and problems.
- Developing and refining my teaching skills, particularly in conveying information effectively to learners with diverse learning styles.
- Enhancing my time management abilities, successfully balancing my research

UNIVERSITY OF WATERLOO Waterloo, ON

Research Assistant, Civil and Environmental Engineering Jan 2025 – May 2025

- Continuation of research topics that were explored during my MASc in preparation for my PhD, including the further development of the urban width equation.
- Working on additional tasks involved with erosion risk analysis for the Credit Valley Conservation Authority.

UNIVERSITY OF WATERLOO Waterloo, ON

Sessional Lecturer CIVE 382, Civil and Environmental Engineering Jan 2025 – May 2025

- Preparing and delivering lecture and supplementary materials, including labs, tutorials, and practice problems, to students.
- Established rapport with students and TAs to answer any questions regarding the content.
- Building strong connections with students, encouraging them to feel comfortable approaching me with questions and problems.
- Developing and refining my teaching skills, particularly in conveying information effectively to learners with diverse learning styles.
- Enhancing my time management abilities, successfully balancing my research

UNIVERSITY OF WATERLOO Waterloo, ON

Graduate Teaching Assistant, Civil and Environmental Engineering Jan 2023 – Present

- Teaching assistant for classes such as CIVE 382: Hydrology and Open Channel Flow, ARCH 353: Geotechnical Engineering, and CIVE 153: Earth Engineering
- Established rapport with students and assisted professors to deliver tutorials, labs, proctoring and marking.

INDUSTRY EXPERIENCE

C.F. CROZIER CONSULTING ENGINEERS — Milton, ON
Land Development Engineering in Training (EIT), — May 2022 – November 2022

- Experienced in preparing technical engineering documents such as Functional Servicing Reports, Due Diligence Memos, Proposals, and Comment Response Matrices.
- Proficient in using Civil3D to prepare engineering drawings and supporting materials.
- Experienced in conducting design calculations and analyses for water demand, sanitary demand, and stormwater management using modelling software and MS Office suite products.

C.F. CROZIER CONSULTING ENGINEERS — Milton, ON
Land Development Engineering Assistant, — Sept 2021 – May 2022

- Skilled in utilizing ESRI Suite products such as ArcGIS Dashboards to display data and create impactful user experiences.
- Reviewed development application reports and verified the Region had suitable capacity to accommodate new developments.
- Maintained and reported water takings associated with Permit to Take Water (PTTW) and Environmental Activities Sector Registry (EASR) to the Ministry of Environment

REGION OF PEEL — Brampton, ON
Engineering Assistant, Infrastructure Planning, Growth, Water Resources, — Jan 2021 – July 2021

- Skilled in utilizing ESRI Suite products such as ArcGIS Dashboards to display data and create impactful user experiences.
- Reviewed development application reports and verified the Region had suitable capacity to accommodate new developments.
- Maintained and reported water takings associated with Permit to Take Water (PTTW) and Environmental Activities Sector Registry (EASR) to the Ministry of Environment

REGION OF PEEL — Brampton, ON
Engineering Assistant, Infrastructure Planning, Growth, Water Resources, — Sept 2019 – Dec 2019

- Proficient in preparing GIS figures and mapping for public meetings and reporting
- Experienced in hydraulic modelling of the Region's water and sanitary network models using Infoworks

C.F. CROZIER CONSULTING ENGINEERS — Milton, ON
Water Resources/Environmental Engineering Assistant, — Jan 2019 – May 2019

- Proficient in preparing various engineering documents such as Proposals, Functional Servicing Reports, Due Diligence Memos, Tender, Comment Response Matrices and ECA's.
- Efficiently performed calculations such as sanitary demand, water demand, and modified rational
- method, and fire flow calculations.
- Assisted with flow monitoring, data gathering, and field visits.

MGM CONSULTING ENGINEERS — Milton, ON
Engineering Assistant — May 2018 – Aug 2018

- Drafted engineering design drawings and addressed comments accordingly for resubmission.
- Preparing sanitary and stormwater management design sheets as required for each project.
- Drafted occupancy letters for final submission to the client.

PROFESSIONAL ORGANIZATIONS

Canadian Engineering Education Association (CEEA-ACEG) 2025–Present

American Geophysical Union (AGU) 2025–Present

European Geophysical Union (EGU) 2025–Present

Canadian Geophysical Union (CGU) 2025–Present.

International Association for Hydro-Environment Engineering and Research 2024–Present

International Water Association (IWA) 2024–Present

Joint Committee on Urban Drainage (JCUD) 2024–Present

Professional Engineers Ontario Engineering Intern (EIT) Program 2022–Present
- File # 100580570
- Successfully completed NPPE, working towards P.Eng

Urban Land Institute (ULI) 2022–2023

PROFESSIONAL DEVELOPMENT

Fundamentals of University Teaching, University of Waterloo, Center for Teaching Excellence (In Progress)

Waterloo Engineering Leadership Lab (WELL) Module, University of Waterloo, Civil and Environmental Engineering (In Progress)

Water Leadership Certificate, University of Waterloo, Water Institute

New Instructor Foundations Program, University of Waterloo, Center for Teaching Excellence

AWARDS AND HONORS

John Parish Memorial Scholarship, University of Waterloo, March 2026-March 2027

Provost Doctoral Entrance Award (PDEA) for Women, University of Waterloo, Sept 2025-Dec 2025

Engineering Dean's Entrance Award, University of Waterloo, May 2025-Dec 2025

Husky Injection Molding Systems Ltd. Student Opportunity Fund, Husky Inc., Jan 2020-May 2020

UW Merit Scholarship, University of Waterloo, Sept 2017-Dec 2017

LEADERSHIP AND SERVICE

Campus Stormwater Management Living Lab Project Lead, University of Waterloo, Civil and Environmental Engineering, Leading IDEAs Clinic Living Lab Project, 2025–Present

President, Women in Engineering, University of Waterloo, Faculty of Engineering, Equity and Outreach Programming, 2022–2025

Advocacy Lead, Engineers Without Borders, University of Waterloo Chapter, 2025–Present

Executive Member, Canadian Federation of University Women, Milton and District Chapter, Advocacy and Community Engagement, 2025–Present

Early Career Committee Member, European Geophysical Union, Hydrology Division, Early Career Activities and Programming, 2025–Present

Session Co-Convener, European Geophysical Union, General Assembly, Hydrology and Geomorphology Sessions, 2025–Present

Member, European Geophysical Union, Equity, Diversity and Inclusion Working Group, EDI Initiatives and Policy Development, 2025–Present

Member, European Geophysical Union, Hydrology Division Early Career Scientists, 2025–Present

Member, American Geophysical Union, Earth and Planetary Surface Processes Section, Mentorship and Early Career Networking Team, 2025–Present

Member, Canadian Geophysical Union, Canadian Young Hydrologists Section, CYHS Social Media and Outreach Lead, 2025–Present

Production and Managing Editor, GeoMorphica Journal, Editorial Board, Production Editor and Managing Editor, 2025–Present

Young Water Professionals Contributor, Joint Committee on Urban Drainage, International Water Association Affiliated, Young Professional Programming, 2024–Present

Contributor, National Research Council-Ocean, Coastal and River Engineering Research Center, Contributor to the Nature-Based Solutions Guideline Development, 2024–Present

Capstone Design Symposium Judge, University of Waterloo, Faculty of Engineering, Capstone Evaluation, 2023–Present

Member, Recent Engineering Alumni Council, University of Waterloo, Faculty of Engineering, Alumni Engagement and Mentorship Programming, 2023–Present

Reviewer, Engineering Outreach Applicant Videos, University of Waterloo, Faculty of Engineering, Admissions Review, 2023–Present

High School Outreach Volunteer, University of Waterloo, Faculty of Engineering Student Experience, Campus Tours and STEM Engagement, 2022–Present

Open House Volunteer, University of Waterloo, Faculty of Engineering, Recruitment and Outreach, 2022–Present

Content Development Committee, Engineers Without Borders, National Conference Committee, 2025–2026

President, Civil Environmental Geological and Architectural Engineering Society, University of Waterloo, Undergraduate Society Leadership, 2018–2022

Badminton Coach, Town of Milton, Community Services, Badminton Coaching and Tournament Convening, 2016–Present