

Nischal Kafle
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Education

University of Memphis, Memphis, Tennessee | 2021 - present

Doctor of Philosophy in Engineering Science | expected graduation date – May 2026

Dissertation: Effects of spatial and temporal resolution of the rain gauge network on regional depth-duration-frequency (DDF) values of extreme rainfall over short durations

Master of Science in Civil Engineering (Water Resources Concentration) | Dec 2024 | GPA – 3.95

Tribhuvan University, IOE Central Campus, Pulchowk, Kathmandu, Nepal

Bachelor of Engineering (Civil Engineering) | Dec 2010-Dec 2014 | Equivalent GPA – 3.92

Research Experiences

- Using machine learning techniques to identify optimal locations for Green Stormwater Infrastructure (GSI) using connectivity based lumped watershed descriptor
- Application of transformer-based deep learning models for disaggregating daily rainfall to sub-daily (n-minute) resolution (Manuscript in preparation)
- A neighborhood-based approach to detect non-stationarity in short-duration extreme rainfall in southeastern US (Manuscript in submitted)
 - Applied non-stationary GEV models using both frequentist and Bayesian approach
 - Proposed a novel neighborhood-based method to detect spatially consistent trends
- Effect of minimum-interevent-time (MIT) on regionally derived DDF values (Manuscript submitted)
- A novel method to extract spatially independent rainfall maxima for regional frequency analyses using partial duration series (Presented at AGU, manuscript in preparation)
 - Incorporate physical visualization of rainstorm structure
 - Leveraged analytical relationships and radar-based rainfall data for validation
- Effects of spatio-temporal resolution of the rain gauge network on short-duration DDF values (Presented at AGU and ASCE-EWRI, manuscript in preparation)
- Urban pluvial flood modelling in South Memphis using PCSWMM
 - Simulated urban flooding scenario using the 2018 Germantown, Memphis rainfall event
 - Developed flood inundation maps and animations based on design rainfall and detailed stormwater drainage inventories provided by the City of Memphis
- Comparing bias correction and downscaling methods for global circulation model (GCM) projections - (Case study for Chile)

Publications & Conference Presentations

Journal Papers

Kafle, N., & Meier, C. (2025). nsEVDx: A Python Library for Modeling Non-Stationary Extreme Value Distributions (v0.1.0). *Zenodo*. [Manuscript submitted for publication]. <https://doi.org/10.5281/zenodo.15850043>

Kafle, N., Peleg, N., & Meier, C. I. (2025). A neighborhood-based method to detect spatially consistent trend. *[Manuscript submitted for publication]*.

Kafle, N., Dell'Aira, F., Chadwick, C., & Meier, C. I. (2025). Does the choice of minimum interevent time affect regionally derived DDF values for short durations when using partial duration? *[Manuscript submitted for publication]*.

Technical Reports

Meier, C.I., Dell'Aira, F., Kafle, N., and Burnette, D.J. (2024). Updating Equations for Peak Flow Estimation in Urban Creeks and Streams of Tennessee (Part 1). Research final report from the University of Memphis, sponsored by the Tennessee Department of Transportation Long Range Planning Research Office & Federal Highway Administration

Conferences & Workshops

Kafle, N & Meier, C.I. (2025, May). Ensuring spatial independence of rainfall maxima in partial-duration-based regional frequency analyses. *ASCE EWRI 2025*

Kafle, N & Meier, C.I. (2025, May). Evaluating Methodologies for Detecting Trends in Short-Duration Extreme Rainfall in the Southeastern United States. *ASCE EWRI 2025*

Kafle, N., & Meier, C. I. (2024, December). A novel method for identifying spatially independent rainfall maxima in regional frequency analyses using partial duration series. *AGU Fall Meeting Abstracts*, 2024, A51L-1836.

<https://ui.adsabs.harvard.edu/abs/2024AGUFMA51L.1836K>

Meier, C. I., & Kafle, N. (2024, December). Does the choice of minimum interevent time affect regionally derived depth-duration-frequency values? *AGU Fall Meeting Abstracts*, 2024, H23I-1117. <https://ui.adsabs.harvard.edu/abs/2024AGUFMH23I.1117M>

Kafle, N., Dell'Aira, F., Burnette, D. J., & Meier, C. I. (2024, December). How does the low-resolution of the US rain-gauge network affect the uncertainty of regionally derived depth-duration-frequency estimates? *AGU Fall Meeting Abstracts*, 2024, H23I-1115.

<https://ui.adsabs.harvard.edu/abs/2024AGUFMH23I.1115K>

Kafle, N., Dell'Aira, F., Burnette, D.J., & Meier, C. I. (2024, April). Extreme Precipitation in the Southeastern United States: Are We Underestimating Depth-Duration-Frequency Values because of Low Rain Gauge Density and Temporal Resolution? TN AWRA 33rd Tennessee Water resource Symposium (1B Flooding)

Meier, C., Muñoz-Proboste, P., Marasini, A., Kafle, N., and Dell'Aira, F.: Attributing the Variability of Hershfield Rainfall Sampling Adjustment Factors at Sub-Hourly Durations, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-13420, <https://doi.org/10.5194/egusphere-egu24-13420>, 2024.

Kafle, N., Dell'Aira, F., Burnette, D.J., & Meier, C. I. (2022, December). Hershfield Factors for Extreme Precipitation: Variability and a Proposal for a Unified Definition. SEDHYD-2023 (8A Frequency and Design Storm Analysis III)

Kafle, N., Dell'Aira, F., Cancelliere, A., & Meier, C. I. (2022, December). A shift in paradigm from regional to global flood frequency analysis. *AGU Fall Meeting Abstracts*, 2022, H52I-0567. <https://ui.adsabs.harvard.edu/abs/2022AGUFM.H52I0567K>

Professional Experience

Water Resources Engineer

Government of Gandaki Province, Ministry of Physical Infrastructure Development | August 2019 - August 2021

- Reviewed and corrected project feasibility reports, identified new projects, and drafted budgets of over 30 irrigation and disaster mitigation projects
- Collaborated with international partners (Asian Development Bank and World Bank) for developing water resource policy and procurement guidelines for 7 irrigation projects
- Conducted groundwater research for a federal project in the state of Lumbini

Engineer/Head of Technical Branch

Ministry of Irrigation, Department of Irrigation, Nepal | August 2015 - July 2019

- Managed technical operations for 150+ irrigation and disaster mitigation projects by working closely with local farmers and convincing them for active participation and contributions
- Led environmental impact assessments, hazard mapping, and community engagement initiatives, provided training to local farmers and user committees to enhance their knowledge and skills

GIS Expert and Project Manager

Bright Future International Pvt. Ltd. | Dec 2014 - July 2015

- Prepared municipality transportation master plan for 5 rural municipalities located in the hilly region of Nepal
- Conducted ward committee meetings to integrate the committee feedback into the master plan

Skills

Software: GIS (ArcGIS Pro, QGIS), PCSWMM, HEC-RAS, OpenFoam, Autocad & Civil 3D

Programming: C/C++, Python (Tensors and JAX numpy), R, Matlab

Computation: Bash scripting and High-Performance-Computing (HPC), MCMC simulations

Volunteering

Open source developer and contributor, Created an opensource Python library **nsEVDx** for modeling non-stationary extreme value distributions

Reviewer @*Journal of Open Source Software*

Judge, Helen-Hardin-Honors-College Work in Progress Symposium (WIPS), November 11, 2024, University of Memphis

Damage Assessment of buildings with a team, Sindhupalchowk District, Nepal (May 2015 – June 2015)

Relief Programs on Earthquake affected 14 Districts after devastating Earthquake of April-25 (May 2015), NEA

Leadership

ExecutiveMember, NSF Natural Hazards Engineering Research Infrastructure (NHERI)

Graduate Student Council (GSC), May 2024-present

Participated in meetings, online seminars and presented at the conference organized by NHERI

President, Nepalese Student Association at the University of Memphis (NSAUM), Oct 2023 – Oct 2024

Organized five cultural events and a Level 1 event with over 350 participants

General Assembly Representative, Graduate Student Association (GSA), Herff College of Engineering, University of Memphis, Mar 2022 – Aug 2023

Facilitated GSA services to the Departments of Herff College of Engineering, UofM
Reviewed travel grant applications of 10 applicants

Executive Member, Nepalese Student Association at the University of Memphis (NSAUM), Sep 2021 – Sep 2022

Organized five cultural events and a Level 1 event.

Election Officer, Sindhupalchowk, Nepal

Conducted the general election at an electoral booth with over 4000 voters (Nov 2017)

Conducted the local-level election at an electoral booth with over 2000 voters (May 2017)

Student Competition Coordinator, 6th National Civil Engineering Exhibition & Competition, CESS Nepal, Dec 2013

Managed logistics and execution of student's quiz and civil engineering design competitions
Reviewed civil engineering design projects

Honors and Awards

Recognized as **World-Class Achiever** by Division of International Affairs, University of Memphis

Graduate School Dissertation Completion Research Grants (\$5000) for summer (2025)

Graduate Assistantship, Department of Civil Engineering, University of Memphis (August 2021- Present)

Award of Appreciation for outstanding performance as a Water Resources Engineer, Department of Irrigation 2018.

Award of Appreciation for outstanding performance and conflict resolution works as an Election Officer, District Administration Office, Sindhupalchowk 2018.

Awarded full **Merit Based Scholarship** to pursue bachelor's in civil engineering after securing **rank 26** among **over ten thousand applicants** in the national entrance exam, IOE, Tribhuvan University (2010)

Memberships

- Tau Beta Pi – The Engineering Honor Society
- American Society of Civil Engineering (Membership Number – 000012320435)
- American Geophysical Union (Member ID – 1533077)
- Nepal Engineers Association (Registration number - 26158)
- Nepal Engineering Council (Category 'A' Civil Engineer, registration Number - 11800)

References

Dr. Claudio Meier, Advisor, cimeier@memphis.edu, +1-9012978855,

Dr. Daniel Wright, Dissertation committee member, danielb.wright@wisc.edu, +1-6082621978

Dr. Dorian Burnette, Dissertation committee member, djbrntte@memphis.edu, +1-9016784452