Saurav Bhattarai

Water Resource Engineer &
Hydro-climatology Researcher

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Objective

To become a skilled water resource engineer with expertise in hydro-climatology, leveraging advanced programming and modeling tools to contribute to the global challenge of water-resource management, focusing on the impacts of climate change and water-related hazards on society.

Current Positions

2023–Present **Graduate Research Assistant**, *Jackson State University*, Department of Civil and Environmental Engineering, 1400 John R. Lynch St, Jackson, MS 39217

2024–2025 **ORISE Graduate Fellow**, *U.S. Army Corps of Engineers - Engineer Research and Development Center*, Coastal and Hydraulics Laboratory (ERDC-CHL), 3909 Halls Ferry Road, Vicksburg, MS 39180

Education

2023–Present **Graduate Studies**, *Jackson State University*, USA, GPA: 4.0/4.0

2017–2022 **Bachelor of Civil Engineering**, *Tribhuvan University, Institute of Engineering (IOE)*, Pulchowk Campus, Nepal, Score: 80.14%

2015–2017 **Higher Secondary Education**, *Capital Secondary School (CCRC)*, Koteshwor, Kathmandu, Nepal, Score: 85.90%

2015 **Secondary Education**, *Karunanidhi Education Foundation School*, Simpani, Pokhara, Nepal, Score: 91.00%

Achievements

2025 Selected Participant, NCAR Graduate Visitor Program (GVP), Boulder, CO – Chosen to collaborate with scientists at the National Center for Atmospheric Research on climate-hydrology research as part of a competitive summer research residency.

2024–2025 ORISE Fellow, U.S. Department of Defense Research Participation Program (ERDC CHL): Selected for a prestigious fellowship focusing on hydrological modeling and analysis.

2024 Winner, AGU Catchment Hydrology Subcommittee Early Career Competition, American Geophysical Union – Awarded $300 for submission on rainfall-runoff modeling using LSTM sequence-to-sequence learning models.

2024 CyberTraining Workshop Travel Support: Awarded a travel grant to attend the CyberTraining workshop organized by the Natural Hazards Center.

2024 AGU-Chapman Travel Grant to support attendance at Chapman Conference on Remote Sensing of the Water Cycle, Honolulu, HI, Feb 13-16, 2024.

2023–Present Full Scholarship with a position of Graduate Research Assistant in the Department of Civil and Environmental Engineering under Prof. Dr. Rocky Talchabhadel in Jackson State University from the "Hydrological Impacts Computing, Outreach, and Resiliency Partnership (HICORPS) Project" in collaboration with ERDC and WOOLPERT.

2017–2021 Golden Jubilee Scholarship Scheme (GJSS) by H.E. Ambassador of India, Nepal.

2017–2021 Merit-Based Full Four-Year Scholarship awarded by Institute of Engineering (IOE), Pulchowk Campus for undergraduate study in Civil Engineering for securing 19th rank out of approximately 15,000 engineering aspirants.

2015–2017 Merit-Based Full Two-Year Scholarship awarded by Capital Secondary School (CCRC) for the higher secondary course.

2014 Second Position in Western Regional Inter-Secondary School Mathematics Quiz Contest organized by Council for Mathematics Education, Kaski.

2014 Served as President of Junior Red Cross Society at KEF High School, providing leadership and oversight of the chapter's activities and community service initiatives.

2013 Honored with Certificate of Participation in i-Plea; 1st International Environment Olympiad organized by City Montessori School (CMS), Lucknow, India.

2012 First Position in International Mathematics Competition Nepal organized by Asia Association of Education and Exchange (AAEE), Tokyo, Hachioji-shi 40.

Professional Organization Membership

Member American Geophysical Union (AGU)

Member American Society of Civil Engineers (ASCE)

Member European Geosciences Union (EGU)

Member Nepal Red Cross Society (NCRS)

Member Nepal Engineering Council

Teaching Experience

Spring 2025 **Teaching Assistant**, *Water Resources Engineering (CIV 370)*, Jackson State University

Spring 2024 **Teaching Assistant**, *Fluid Mechanics Lab (CIVL 330)*, Jackson State University

Project/Fellowship Proposals

Awarded

2024–2025 Co-I in Microsoft-AUC Mini-Grants program: "Climate Change Impact Assessment Training for Undergraduate Students: Leveraging Planetary-Scale Data and Cloud"

2024–2025 ORISE Fellow, U.S. Department of Defense Research Participation Program (ERDC CHL): Selected for a hydrological modeling and analysis fellowship.

Publications

Published

2025 Bhattarai, S., Banjara, P., Pandey, V. P., Aryal, A., Pradhan, P., Al-Douri, F., Pradhan, N. R., Talchabhadel, R. Quantifying the cooling effects of blue-green spaces across urban landscapes: A case study of Kathmandu Valley, Nepal. Urban Climate 61, 102493 (2025). https://doi.org/10.1016/j.uclim.2025.102493

2025 Bhattarai, S., Bokati, L., Sharma, S. et al. Understanding spatiotemporal variation of heatwave projections across US cities. Sci Rep 15, 10643 (2025). https://doi.org/10.1038/s41598-025-95097-5

2024 Talchabhadel, R., Bhattarai, S., Bista, S. Projected Changes in Precipitation Extremes Across the Mississippi River Basin Using the NASA Global Daily Downscaled Datasets NEX-GDDP-CMIP6. International Journal of Climatology (2024). https://doi.org/10.1002/joc.8748

2024 Bhattarai, S., et al. Spatiotemporal Characterization of Heatwave Exposure across Historically Vulnerable Communities. Sci Rep (2024) https://doi.org/10.1038/s41598-024-71704-9

2024 Bhattarai, S.; Talchabhadel, R. Comparative Analysis of Satellite-Based Precipitation Data across the CONUS and Hawaii: Identifying Optimal Satellite Performance. Remote Sens. 2024, 16, 3058. https://doi.org/10.3390/rs16163058

2024 Banjara, P., Bhattarai, S., Pandey, V.P. et al. Spatiotemporal characterization of heat-waves on an urban center using satellite-based estimates. Theor Appl Climatol (2024). https://doi.org/10.1007/s00704-024-05026-1

2022 Bhattarai, T.N., et al. Projected changes in hydro-climatic extremes with CMIP6 climate model outputs: a case of rain-fed river systems in Western Nepal. Stoch Environ Res Risk Assess (2022). https://doi.org/10.1007/s00477-022-02312-0

Under Review

2024 Bista, S., Bhattarai, S., et al. Towards local-scale flood risk projections under climate change.[*Modeling Earth Systems and Environment*]

2024 Bhattarai, S., He, C., Sharma, S., Kumar, S., & Talchabhadel, R. Rainfall Relief or Humidity Havoc? The Boon and Curse of Precipitation During Heatwaves. [*Natural Hazards*]

2025 Bhattarai, S., Banjara, P., Pandey, V. P., et al. Assessing the efficacy of urban cooling entities: Geo-spatial assessment of urban parks, ponds, and forests. [*Urban Climate*]

2025 Talchabhadel, R., Panthi, J., Pandey, V. P., Rakhal, B., Ghimire, G. R., Bista, S., Bhattarai, S., Poudel, S., Bhattarai, Y., Prajapati, R., Thapa, B. R., Nepal, B., Sharma, S. Yesterday's Extremes, Today's New Normal: Flood Risk in the Kathmandu Valley, Nepal. [*Natural Hazards*]

Invited Talks

2024

Thapa, B. R., Talchabhadel, R., and Bhattarai, S. (2024). *Translating Multi-Hazard Risk Assessment to Compounding and Cascading Disaster Risk Management for Resilient Infrastructure*. Invited presentation at the 2nd GeoMandu International Conference, Kathmandu, Nepal, November 28–29.

Conference Papers/Abstracts

2025

Bhattarai, S., Talchabhadel, R.: Evaluating the Compound Effects of Precipitation and Storm Surge on Coastal Flooding Risk in the CONUS, ASCE EWRI World Environmental & Water Resources Congress, Anchorage, Alaska, May 20, 2025 [Oral Presentation]

Talchabhadel, R., Bhattarai, S., Bista, S., Poudel, S., Kafoury, R.: Projecting Extreme Temperatures and Precipitation for the Gulf Coast Region of the United States, ASCE EWRI World Environmental & Water Resources Congress, Anchorage, Alaska, May 20, 2025 [Oral Presentation]

2024

Bhattarai, S., Byrd, A., Talchabhadel, R.: Evaluating the Compound Effects of Precipitation and Storm Surge on Coastal Flooding Risk in the CONUS: A Detailed Case Study of Galveston, AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Poster Presentation]

Bhattarai, S., Sharma, S., Talchabhadel, R.: Detecting Multihazards in the United States Using Machine Learning: A Comparative Analysis of Individual and Compound Hazard Events, AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Poster Presentation]

Talchabhadel, R., Bhattarai, S., Banjara, P., and Pandey, V.P., Urban Cooling Strategies: Evaluating the Effectiveness of Green Spaces and Water Bodies in Mitigating Heat Exposure in Kathmandu Valley, Nepal, AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Poster Presentation]

Bista, S., Bhattarai, S., Sharma, S., and Talchabhadel, R., Implication of non-stationary climate dynamics for flood risk projections. AGU Fall Meeting, Washington, DC, Dec 3-31, 2024 [Online Poster Presentation]

Talchabhadel, R., Bernard, D., Johnson, K., Bhattarai, S., Bista, S., Poudel, S., Kafoury, R.: Evaluation of Climate Change Projections Using Open-Source Software Infrastructure across the Gulf Coast of the United States [NH13B-2293], AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Poster Presentation]

Bista, S., Bhattarai, S., Sharma, S., Talchabhadel, R.: Implications of non-stationary climate dynamics for flood risk projections [H05-13], AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Oral Presentation]

Banjara, P., Bhattarai, S., Pandey, V.P., Talchabhadel, R.: Assessing Heatwave Dynamics and Vulnerability in Nepal: A Geospatial Analysis [H34F-04], AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Oral Presentation]

Talchabhadel, R., Bhattarai, S., Banjara, P., Pandey, V.P.: Urban Cooling Strategies: Evaluating the Effectiveness of Green Spaces and Water Bodies in Mitigating Heat Exposure in Kathmandu Valley, Nepal [GC51H-0059], AGU Fall Meeting, Washington DC, Dec 9-13, 2024 [Poster Presentation]

Talchabhadel, R., S. Bhattarai (2024). "Interconnected Hazards Data", in Natural Hazards Research Summit 2024: Interconnected Hazards: Retrospective Data Analysis for Climate Resilience in the United States. DesignSafe-CI. https://doi.org/10.17603/ds2-a2vx-sx21

Bhattarai, S., Talchabhadel, R.: Assessing Cascading and Compound Climate Extremes and Associated Vulnerabilities Across the United States; 3rd International Conference on Natural Hazards and Risks in a Changing World: Addressing Compound and Multi-Hazard Risk; 12-14 June, 2024; Amsterdam, Netherlands [Oral Presentation]

Bista, S., Bhattarai, Y., Bhattarai, S., Sharma, S., Talchabhadel, R., Amini, F: Urban Flood Inundation Prediction Under Climate Change, 2024 World Environmental & Water Resources Congress, Milwaukee, WI, May 19 – 22, 2024 [Oral Presentation]

Talchabhadel, R., Bhattarai, S., Bista, S., White, L., Amini, F: Providing undergraduate students with training on evaluating climate change projections within the framework of Open-source Software Infrastructure, 2024 World Environmental & Water Resources Congress, Milwaukee, WI, May 19 – 22, 2024 [Oral Presentation]

Bhattarai, S., Sharma, S., Talchabhadel, R.: Assessing Multidimensional Climate Extremes and Associated Vulnerabilities Across the United States, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-20600, https://doi.org/10.5194/egusphere-egu24-20600 [Oral Presentation]

Talchabhadel, R., Bhattarai, S., Bista, S.: Empowering Undergraduate Students in Remote Sensing for Climate Change Projection Evaluation Using Open-Source Software Infrastructure, AGU Chapman Remote Sensing of the Water Cycle: Sensors to Science to Society, Honolulu, HI, Feb 13-16, 2024. [Poster Presentation]

Bhattarai, S., Talchabhadel, R.: Heatwaves, Humidity, and the Water Cycle: A Remote Sensing Perspective on Climate Transformation, AGU Chapman Remote Sensing of the Water Cycle: Sensors to Science to Society, Honolulu, HI, Feb 13-16, 2024. [Poster Presentation]

Talchabhadel, R., Bhattarai, S., Banjara, P., Sharma, S.: Projecting heatwave consequences in urban centers of the United States under changing climate, American Meteorological Society's 15th Conference on Environment and Health, 104th AMS Annual Meeting, Baltimore, MD, Jan 28 - Feb 1, 2024, [Oral Presentation]

2023

Bhattarai, S., Bokati, L., Sharma, S., Talchabhadel, R.: Assessing Heatwave Impacts and Enhancing Climate Resilience in Highly Populated US Cities, AGU Fall Meeting, San Francisco, Dec 11-15, 2023 [Oral Presentation]

Bhattarai, S., Bista, S., Talchabhadel, R.: Projecting flood risk under climate change in Pearl River basin, Jackson State University Research Engagement Week, Jackson, MS, Oct 26, 2023 [Poster Presentation]

Professional Involvement

2025 **Lead Instructor:** Python Training Workshop 2025, Jackson State University, May 28–29, 2025 — Designed and led a hands-on Python programming workshop focused on hydroclimate and geospatial applications for undergraduate and graduate students.

2024 **Student Convener:** NH13B - Coastal Storm Risk Modeling and Analysis via Cloud Computing Poster Session, AGU Fall Meeting, Washington DC, Dec 9–13, 2024.

Primary Convener: Thomas C. Massey (USACE-ERDC)

Convener: Rocky Talchabhadel (Jackson State University)

Chairs: Rocky Talchabhadel (Jackson State University), Chris Bender (Taylor Engineering Inc.)

Professional Experience

May–Aug 2024 **Summer Intern**, *USACE ERDC (United State Army Corps of Engineer: Engineering Research and Development Center)*, Vicksburg, Mississippi, USA

Fall 2023–Present **Graduate Research Assistant**, *Jackson State University*, Jackson, Mississippi, USA, Under Prof. Dr. Rocky Talchabhadel

Spring 2025 **Teaching Assistant**, *Water Resources Engineering (CIV 370)*, Jackson State University

Spring 2024 **Teaching Assistant**, *Fluid Mechanics Lab (CIVL 330)*, Jackson State University

Mathematics and Physics Teacher, *Albright Academy*, Pokhara, Nepal

Software Skills

Spatial Tools	QGIS and Google Earth Engine (GEE)
Programming Tools	Python
AI & ML	Machine Learning, Artificial Intelligence, and Deep Learning
Modeling and Analysis	HEC-HMS and HEC-RAS (Basics), GSSHA (WMS)
Design and Drafting	AutoCAD, REVIT, Civil 3D (Basics)

References

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