John Mohd **Wani**

Assistant Professor (Non-tenure)

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Early Career Researcher

Research Interests

My main research interests include:

- High mountain permafrost processes,
- Permafrost modelling,
- Surface energy balance of snow, glacier and permafrost,
- Watershed modelling, climate change, natural hazards,
- Snow Processes
- Hydro-meteorological monitoring

To understand these processes, I use computer models and other tools like remote sensing, geographic information systems (GIS), data science (R programming language) together with field trips.

Education

Indian Institute of Technology Roorkee — *Roorkee, Uttarakhand, INDIA*

PhD — *2014-2019*

- Thesis title: Inferring Permafrost and its characteristics in the Cold-Arid Himalaya, Supervisor: Dr. C. S. P. Ojha and Co-Supervisor: Dr. Renoj J. Thayyen

National Institute of Technology Hamirpur — *Hamirpur, HP, INDIA*

M.Tech., Water Resources Engineering — *2012-2014*

- Dissertation title: Hydrological Modelling in the Upper Beas Basin Using SWAT Model, Supervisor: Dr. V. K. Sarda and Co-Supervisor: Dr. Sanjay Kumar Jain

University of Kashmir — *Hazratbal, Srinagar, J&K, INDIA*

B.E, Civil Engineering — *2007-2011*

- Dissertation title: Analysis of TRUSS type Bridge over Ferozpur Nallah, Supervisor: Er. Shaista Kanni

Work Experience

C3A - Center Agriculture Food Environment, University of Trento — *Trento, ITALY*

Assistant Professor (non tenure) — *Oct 25–present*

- Role: To develop an advanced modeling framework for cryo-hydrological modeling by integrating new process-based components in the GEOframe modelling system

C3A - Center Agriculture Food Environment, University of Trento — *Trento, ITALY*

CARITRO Postdoctoral Research Fellow — *Jun 2023–Sep 2025*

- Role: Quantifying and predicting the response of the snow dynamics to climate change using modelling and data analysis

School of Environmental Sciences, Jawaharlal Nehru University — *New Delhi, INDIA*

Research Associate — *July 2021–Dec 2022*

- Role: Data collection in the field, mapping spatial distribution of permafrost in the western Himalayan region, India and modelling its characteristics using the GEOtop model.

National Institute of Hydrology — *Roorkee, Uttarakhand, INDIA*

Research Associate — *Aug 2020–Jun 2021*

- Role: Installation of data loggers, data collection, permafrost mapping and its characterization in the western Himalayan region, India.

Publications Under Review

- **Wani, J.M.,** Gleason, K. E., Dall'Amico, M., Paolo, F., Tasin, S., Roati, G., Brian, M., Tornatore, F., and Rigon, R., (under Review, 2025) Three decades of snow water equivalent dynamics in the Po River Basin, Italy: Trends and Implications. *egusphere-2025-5520, Submitted 07 Nov 2025, The Cryosphere*. doi:

Peer Reviewed Publications

- Dall'Amico, M., Tasin, S., Paolo, F., Brian, M., , Leoni, P., Tornatore, F., Formetta, G.,**Wani, J.M.,**, Rigon, R., and Roati, G. (2025) 30-years (1991-2021) Snow Water Equivalent Dataset in the Po River District, Italy. *Scientific Data*, 12, 374. doi: https://doi.org/10.1038/s41597-025-04633-5.
- Pandey, A., Yadav, B. C., **Wani, J. M.**, Dimri, A. P. (2023) Permafrost estimation model in Upper Indus Basin. *Journal of Earth System Science*, 132, 156. doi: https://doi.org/10.1007/s12040-023-02176-0
- Ahamed, M. R. A., Sharma, A., **Wani, J. M.** and Dimri, A. P. (2023) The representation of summer monsoon rainfall over northeast India: assessing the performance of CORDEX-CORE model experiments. *Theoretical and Applied Climatology*, 151, 1949–1962. doi: https://doi.org/10.1007/s00704-023-04369-5
- **Wani, J. M.**, Dimri, A. P., & Thayyen, R. J. (2023) Permafrost in the Upper Indus Basin: An active layer dynamics. *Journal of Earth System Science*, 132, 61. doi: https://doi.org/10.1007/s12040-023-02074-5
- Thayyen, R. J., Mishra, P. K., Jain, S. K., **Wani, J. M.**, Singh, H., Singh, M. K., & Yadav, B. (2022) Hanging glacier avalanche (Raunthigad-Rishiganga) and Debris flow disaster of 7th February 2021, Uttarakhand, India, A Preliminary assessment. *Natural Hazards*, 114, 1939–1966. doi: https://doi.org/10.1007/s11069-022-05454-0
- **Wani, J. M.**, Thayyen, R. J., Ojha, C.S.P., & Gruber, S. (2021) The surface energy balance in a cold and arid permafrost environment, Ladakh, Himalayas, India. *The Cryosphere*, 15, 2273–2293. doi: https://doi.org/10.5194/tc-15-2273-2021
- **Wani, J. M.**, Thayyen, R. J., Gruber, S., Ojha, C.S.P., & Stumm, D. (2020) Single-year thermal regime and inferred permafrost occurrence in the upper Ganglass catchment of the cold-arid Himalaya, Ladakh, India. *Science of the Total Environment*, 703, 134631. doi:https://doi.org/10.1016/j.scitotenv.2019.134631
- **Wani, J. M.**, Sarda V. K., and Jain, S. K. (2017) Assessment of Trends and Variability of Rainfall and Temperature for the District of Mandi in Himachal Pradesh, India. 25(3), 15-22. *Slovak Journal of Civil Engineering*. DOI: 10.1515/sjce-2017-0014

International Conferences

- **Wani, J. M.**, Bertoldi, G., Gleason, K. E., and Rigon, R.: Assessing the Impact of Forest Disturbances on Snowpack Dynamics: A Multi-Model Intercomparison, XIIth IAHS Scientific Assembly 2025, Roorkee, India, Oct 5-10 2025. IAHS25_ABS_L1269, 2025.
- Rigon, R., **Wani, J. M.**, Roati, G., Dall'Amico, M., Di Paolo, F., Tasin, S., and Gleason, K. E.: Analysing long-term (1991-2021) daily records of Snow Water Equivalent in the Po River District, Italy, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-12423, https://doi.org/10.5194/egusphere-egu25-12423, 2025.
- **Wani, J. M.**, Bertoldi, G., Bozzoli, M., Andreis, D., and Rigon, R.: Integrating snow-water equivalent simulated by a physically based model into a lumped model in an Alpine catchment in Italy, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-12258, https://doi.org/10.5194/egusphere-egu25-12258, 2025.
- **Wani, J. M.** (2022) Permafrost related disasters in the Himalayas, India: An overview. Cryosphere and Related Hazards in the High Mountain Asia in a Changing Climate, organised by UNESCO, AKAH, ICIMOD, Government of Kazakhstan, Central Asian Regional Glaciological Centre Almaty, Kazakhstan, on 1-4 November 2022.
- **Wani, J. M.** (2021) Permafrost in the cold-arid Himalaya. Cryosphere Forum 2021: Status of research on changing permafrost and associated impacts in the Hindu Kush Himalaya; ICIMOD and Tribhuvan University Nepal. (September 20, 2021; 10:20 AM Nepal Time).

- **Wani, J. M.**, Thayyen, R. J., Ojha, C.S.P., & Gruber, S. (2018) Inferring permafrost occurrence from surface energy balance and miniature temperature data (MTD) loggers in Cold-Arid Himalaya. 20th EGU General Assembly, EGU2018, Proceedings from the conference held 8-13 April, 2018 in Vienna, Austria, p.11929. URL: https://ui.adsabs.harvard.edu/abs/2018EGUGA..2011929W
- **Wani, J. M.**, Thayyen, R. J., Ojha, C.S.P., Gruber, S., & Stumm, D. (2018) Frozen ground in the cold-arid Himalaya: a case study from upper Ganglass catchment, Leh. 5th European Conference On Permafrost – Book of Abstracts, 23 June - 1 July 2018, Chamonix, France. URL: https://hal.archives-ouvertes.fr/hal-01816115/

Thesis supervised

1. Co-supervising a PhD student (Marianna Tavonatti) along with main supervisor Riccardo Rigon (University of Trento). The student is working on "Permafrost and Snow Dynamics Modeling for Sustainable Water Management" by developing new permafrost modules for the GEOframe modelling system.
2. Co-supervising a PhD student (Michele Bozzoli) along with main supervisor Giacomo Bertoldi (EURAC), and another co-supervisor Giuseppe Formetta (University of Trento). The student is working on the Snow and its modelling using GEOframe in the Val Venosta region.
3. Co-supervised a master's student (Marianna Tavonatti, 241567) with main supervisor Riccardo Rigon and another co-supervisor Stephan Gruber (Carleton University, Canada) for the academic year 2024–2025. The thesis title is "Analysis and Simulation of Permafrost Thermal Dynamics in the Canadian Arctic".

Trainings & Workshops Organised

- Convening a short course on "Introducing GEOtop and GEOframe: Open Source Tools for Modeling Snow Dominated Catchments" in the upcoming European General Assembly (EGU) 2026 to be held in Vienna, Austria from 3–8 May 2026. Convener: John Mohd Wani | Co-conveners: Giacomo Bertoldi, Marialaura Bancheri, Matteo Dall'Amico and Giuseppe Formetta. https://meetingorganizer.copernicus.org/EGU26/session/57905
- Co-organised a side event "Introducing GEOtop and GEOframe: Open-Source Tools for Hydrological Modelling in Mountain Catchments" Venue: XIIth Scientific Assembly of the International Association of Hydrological Sciences (IAHS), IIT Roorkee, India, Wednesday, October 08, 2025 (17:30-19:30 IST)
- Co-organised a workshop on "Advanced Topics in Snow Hydrology: Measurements, Modeling, & Remote Sensing" from February 18 to 21, 2025 at University of Trento, Italy.
- Co-organised a workshop on "Recent Advances in Hydrological Modelling" from July 25 to July 31, 2024 at Indian Institute of Technology Bombay, Mumbai, India.

Public Talks

- **Field-based monitoring and energy balance-modelling of permafrost**. "Analysing permafrost in the Hindu Kush Himalaya using open access tools" organised by Cryosphere Initiative, **International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal**. (online on June 23, 2022). Click here for the link.
- **Application of Soft Computing Techniques in Permafrost**. "Advanced Soft Computing Techniques in Disaster Management and Risk Assessment" organised by National Institute of Disaster Management (NIDM), Ministry of Home Affairs (GoI), New Delhi and Manipal School of Architecture and Planning (MSAP), Manipal Academy of Higher Education (MAHE), Karnataka. (January 29, 2022).
- **Permafrost in the cold-arid Himalaya**. "Geospatial Applications for Disaster Management" organised by Manipal School of Architecture and Planning (MSAP), Manipal Academy of Higher Education (MAHE), Karnataka in collaboration with the National Institute of Disaster Management (NIDM), Ministry of Home Affairs (GoI), New Delhi. (December 30, 2021)

Academic Awards

2018 Dean of Resources and Alumni affairs, Indian institute of Technology Roorkee alumni travel grant for attending EGU General Assembly 2018 at Vienna, Austria during April 8-13, 2018. (No./IITR/DAA-122/SCDF/Vol-21/443): **477 Euros**

2018 CSIR foreign travel grant to attend and present paper at the fifth European Conference on Permafrost (EUCOP5) in Chamonix Mont-Blanc, France during 23 June to 01 July 2018 (Ref No. TG/9899/18-HRD): **1100 Euros**

2018 Permafrost Young Researchers Network (PYRN) travel grant to attend fifth European Conference on Permafrost (EUCOP5) in Chamonix Mont-Blanc, France during 23 June to 01 July 2018: **250 Euros**

Technical Skills

Coding Languages	Software	Models	OS	Other
R, Python and Java (Beginner)	MS OFFICE, ERDAS IMAGINE, ArcGIS, QGIS	SWAT, GEOtop, GEOframe, GlabTop2, r.avaflow	Windows, Ubuntu, Mac	GIT, Markdown, Beginner in Docker

Honours

- Qualified Graduate Aptitude Test in Engineering (GATE) in Civil Engineering for post graduate admissions conducted by Department of Higher Education, Ministry of Human Resources Development (MHRD), Government of India in June, 2012.

Other Relevant Activities & Skills

- Capable of carrying out field campaigns to high mountain remote regions. Furthermore, during my PhD, I have also developed my computer skills in self-directed learning. These skills include working with Linux OS, remote sensing (optical) and GIS, R programming language (for data analysis and plotting), use of scientific datasets (e.g., netCDF), etc.
- I was invited by **International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal** as an expert for a three day (*15th to 17th June 2022*) workshop on **Permafrost monitoring strategy for the Hindu Kush Himalaya (HKH).** Click here for information.

Service

Manuscript Reviews:

- Cold Regions Science and Technology (1), Geophysical Research Letters (2), Earth's Future (1).

Hobbies

Learning new skills, Playing Cricket, Reading Books, Watching Football

Languages

English (Proficient), Urdu and Kashmiri (Mother Tongue)

References

Referee details will be provided upon request.