

JAGRATI VERMA

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Date of Birth: 31 October 2003
Nationality: Indian
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EDUCATION

Central University of Rajasthan, India
M.Sc. Environmental Science; CGPA: 9.52/10 2024–Present
B.Sc. Environmental Science; CGPA: 8.00/10 2021–2024

EXAMINATIONS & ACCREDITATIONS

Nationwide: University Grants Commission–National Eligibility Test (NET) – Percentile: 97.9; AIR 211

RESEARCH EXPERIENCE (ISRO, CU RAJ, IIT BOMBAY)

Characterizing Glacier Features in the Himalayan Region Using High Resolution Optical And Synthetic Aperture Radar (SAR) Data Jun–Aug 2025
Internship at Space Applications Centre, ISRO (Indian Space Research Organisation)
Supervisor: Dr. Sushil Kumar (Senior Scientist (SG) and Head (CSD/CHSG/EPISA)

- Mapped glaciers and lakes using high-resolution LISS-III/IV optical and DEM data.
- Analyzed seasonal glacier dynamics using multi-temporal RISAT-1A SAR backscatter.
- Classified glacier snow–ice facies using Random Forest model. Optimized SAR preprocessing by testing multiple speckle filters and selecting the Frost filter for best edge preservation.
- Linked facies changes to ERA5 reanalysis temperature and snowfall trends.

CO₂ Sequestration using Basalt May–Jun 2022
Internship at IIT-Bombay
Supervisors: Prof. Vikram Vishal (Dept. of Earth Sciences), Prof. Arnab Dutta (Chemistry Department)

- Studied and understood literature of carbon dioxide sequestration potential of basalt via enhanced rock weathering for long-term CO₂ removal.
- Prepared basalt samples under controlled pH conditions and incubated them with CO₂ to promote carbonate mineral formation.
- Performed mineral phase identification using XRD (Powder X-Ray Diffraction) to detect formation of calcium and magnesium carbonates.

Glacier & Lake Dynamics in Sikkim: Identification, Climatic Analysis, & GLOF Prediction
MSc. Minor Project at Central University of Rajasthan Mar-May 2025
Supervisor: Prof. Rajesh Kumar (Dept. of Environmental Science)

- Studied climate variability in Sikkim using long-term ERA5 reanalysis datasets (1980–2024).
- Analyzed terrain characteristics (elevation, slope, aspect) and glacier distribution.
- Assessed Zemu Glacier changes (2013–2023) using Landsat imagery and NDSI to map retreat trends..
- Evaluated GLOF susceptibility based on lake dynamics and climatic triggers.

Assessing Climate Change Variability in the Beas Basin using LULC & ERA-5 Dataset
BSc. Final year Project at Central University of Rajasthan Feb-May 2024
Supervisor: Prof. Rajesh Kumar (Dept. of Environmental Science)

- Analyzed long-term temperature & precipitation trends in the Beas Basin using ERA5 datasets. Examined inter-seasonal & inter-annual variability using heatmaps & regression trend analysis.
- Performed spatial analysis of the basin with DEM data (slope, aspect, contour, and elevation maps).
- Classified and quantified Land use and land cover (LULC) changes from Sentinel-2 imagery for 2017-2022. Correlated temperature–precipitation variability ($r = -0.55$).

CONFERENCES & PRESENTATIONS

Climatic Variability and Warming Trends over the Beas Basin during the Last Four Decades
Poster Presentation at India International Science Festival (IISF) — Panchkula, Haryana 2025
Organized by Ministry of Earth Sciences and DST, Govt. of India

- Evaluated 43 years of climatic trends using IMD & TerraClimate data, revealing a significant 0.02°C/year rise in maximum temperature, particularly in Winter and Pre-monsoon seasons.
- Applied statistical tests (Mann-Kendall, Sen's Slope, Pettitt Test) to a 43-year dataset to detect monotonic trends and abrupt change points in regional hydro-climatology.

TECHNICAL & SOFTWARE SKILLS

- **GIS & Remote Sensing:** ArcGIS Pro, QGIS, ERDAS Imagine, ENVI, SNAP
- **Programming & Data Analysis:** Python, R, Machine Learning (TensorFlow)
- **Other Tools:** Data visualization, spatial modeling, statistical analysis

LEADERSHIP POSITIONS

- **Elected Member**, Student Council (top-1%); Central University of Rajasthan 2024-2025
- **Head Coordinator**, 'Abhivyakti' Literary Club; Central University of Rajasthan 2023-2025
- **Coordinator**, 'Kalakriti' Art Club; Central University of Rajasthan 2021-2025

COMMUNITY ENGAGEMENT & OUTREACH

- Led awareness sessions on single-use plastics as part of the **Tide Turners Plastic Challenge (TTPC)** organized by **WWF-India**. Conducted interactive workshops at **Kendriya Vidyalaya, Bandarsindhari** and **Government School, Mundoti**, including quizzes and poster-making activities to inspire sustainable practices among school students.
- Conducted an **Environmental Impact Assessment (EIA)** exercise around the university campus and nearby villages (Bandarsindhari & Mundoti). Initiated and co-established a **local library** by collecting books from students, professors, and their families to support rural education access.
- **SOHA - "Seeds of Hope"** exhibition on **SDGs** 2024
(Sustainable Development Goals) in collaboration with the *Soka Gakkai* organization.
- Volunteered in a workshop on **Career Counselling for Homemakers** organized with 2022
National Commission for Women, New Delhi.

ACHIEVEMENTS & EXTRACURRICULARS

- Represented State **Rajasthan** at **National Environmental Youth Parliament (NEYP)** 2025
Vidhan Sabha, Jaipur, among top 0.3% students in India.
- Winner in **Extempore Competition** on **National Space Day, CU Rajasthan** 2024
- Secured **2nd place** in **WIDS (Women in Data Science) Datathon, CU Rajasthan** 2023
Topic: *Adapting to Climate Change by Improving Extreme Weather Forecasts*.
- Winner in **Idea Presentation - Science Day, CU Rajasthan** 2023
Proposed a *Climate Change Modelling framework for South Asia*
- Winner in **SRIJAN - Inter School Volleyball, CU Rajasthan** 2022

HOBBIES

Creative: Painting, baking, doodling, free-style writing and dramatics. **Performing Arts:** Singing
Visual Arts: Photography.